08 AUG 1995

Ref: 95-F-1362

Mr. Thomas F. Haensly
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Seattle, WA 98104-7078

Dear Mr. Haensly:

This letter and documents respond to your June 21, 1995, Freedom of Information Act (FOIA) request which was received in this Directorate June 21, 1995. The telephone conversations with Commander Voorhies refer.

Due to the size and complexity of the Department of Defense (DoD), there is no central repository for all DoD records. This Directorate is responsible for responding to requests for records of the components of the Office of the Secretary of Defense (OSD) and Joint Staff (JS). The several components of the DoD, including the military departments, unified commands, and separate defense agencies, operate their own Freedom of Information offices to respond to requests for records for which they are responsible. These procedures are provided in DoD Regulation 5400.7-R, as published at 32 CFR 286.

Your request was processed by the Office of the Director for Program Analysis and Evaluation (PA&E). Mr. David L. McNicol, Deputy Director Resource Analysis, PA&E, an Initial Denial Authority, has determined that the release of one document must be denied pursuant to 5 USC 552(b)(1). This document is currently and properly classified pursuant to Executive Order 12365, Sec 1.3(a)(2), which pertains to the vulnerabilities or capabilities of systems, installations, projects, or plans relating to the national security.

You have the right to appeal Mr. McNicol's decision to deny this information. Any such appeal should offer justification to support reversal of the initial denial and should be forwarded within 60 calendar days of the date of this letter, to this office.

For your information and in accordance with the above regulation, your request has been categorized as commercial in nature. Commercial requesters are required to pay search, review, and reproduction costs associated with their requests. Established DoD fees are: clerical search or review at $12.00 per hour; professional search or review at $25.00 per hour;

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Please also note the billing date above since payments received later than 30 days after the billing date may incur additional interest charges.

Sincerely,

"Signed"

A. H. Passarella
Director
Freedom of Information
and Security Review

Enclosures:
As stated

THE ECONOMICS OF SIZING THE MILITARY MEDICAL ESTABLISHMENT

Executive Report
of the
Comprehensive Study of the Military Medical Care System

U.S. Department of Defense
Office of Program Analysis and Evaluation

April 1994

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SECTION I. INTRODUCTION AND BACKGROUND

The National Defense Authorization Act for Fiscal Years 1992 and 1993 directed the Department of Defense (DoD) to conduct an analysis of fundamental economic issues bearing on the size of the military medical system. The core issue to be evaluated is whether it is cheaper for DoD to provide medical care for its beneficiaries in DoD facilities or to reimburse beneficiaries for care obtained in the private sector. The Department's findings on that question are reported here in summary form. Responses to related questions that DoD was asked to consider are provided in separate reports issued as part of this study.

The question as to whether it is cheaper for DoD to "make" medical care in-house or, indirectly through beneficiaries, to "buy" care from private-sector providers amounts to a question about the appropriate size of the Department's medical establishment. To the extent that DoD "makes" more care, its medical establishment will be larger; to the extent that care is "bought," the medical establishment will be smaller.

Questions about the size of the DoD medical establishment traditionally have not been cast in terms of the "make/buy" decision but rather in terms of wartime requirements. It has for several decades been established policy that DoD should provide in military medical facilities substantially all of the medical care required by active-duty personnel and all of the treatment required by military casualties until such time as those requiring extended care are released to the Veterans Administration. Because the medical establishment is sized against the wartime requirement, it tends to provide more capacity in peacetime than is needed to meet the health care demands of the active force. DoD uses this extra peacetime capacity to provide care to other categories of beneficiaries--dependents of active-duty personnel, and military retirees and their dependents and survivors.[1]

It remains a generally accepted principle that the DoD medical establishment should be no smaller than the wartime mission requires. The question addressed in this report is whether DoD should maintain a health care establishment larger than required to carry out the wartime mission. The additional capacity would be used to provide in DoD facilities more of the peacetime medical benefits that non-active-duty beneficiaries are eligible to receive.

This is not an issue that would have arisen during the Cold War years because, by most accounts, the capacity then required for the wartime mission (but never achieved) exceeded that required to provide medical services to non-active-duty personnel. The situation has now

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[1]This practice reduces the Department's health care expenditures because the additional cost of providing care to non-active-duty beneficiaries in military treatment facilities does not include the significant "fixed costs" of maintaining DoD facilities for wartime. The variable costs of providing peacetime care are less than the market price DoD would pay to buy care for non-active-duty beneficiaries in the private sector. Moreover, the workload generated by only the active-duty population may be insufficient to maintain the wartime skills of DoD physicians.

changed, in two respects. First, while the active-duty force contracted somewhat during the Cold War years, the population of military retirees and of active-duty dependents increased.[2] Second, war plans of the Cold War era contemplated a global conflict on the scale of World War II, and perhaps much larger, as the United States faced the prospect of all-out war with the Soviet Union and its Warsaw Pact allies. The situation is now very different. Our nation faces threats that are challenging, but ones that are qualitatively different from those of the Cold War, require smaller forces, and present little prospect of involving casualties remotely on the scale of those that would likely have resulted from a global war with the Soviets.

Box 1.
Wartime Requirements

The starting point for assessments of wartime requirements is the Defense Planning Guidance (DPG), which serves as the basis for all planning and programming activities in the Department of Defense. Representations of potential combat operations--known as Illustrative Planning Scenarios--issued with the DPG form the analytical basis for determining planning and programming requirements. The wartime requirements portion of this study used the scenarios issued for fiscal years 1994-99, the last Departmentally-accepted set of planning scenarios. These scenarios define the nature of potential conflicts, including force levels and force arrival times in each scenario. Combat intensities and durations for the scenarios were generated by wargames performed and interpreted by the Joint Staff.

Medical workload and evacuation streams in both the continental United States (CONUS) and combat theaters were generated for the scenarios using the Medical Planning Module (MPM), an analytical tool maintained as part of the Department's Joint Operational Planning and Execution System (JOPES). The medical manpower required within theaters was divided into two portions: personnel who staff hospitals and personnel who serve outside the hospital system. Estimated requirements for those who staff hospitals in combat theaters were generated by an analysis of results from two sources: (1) the MPM, and (2) service-specific methodologies.

To determine the number of CONUS hospital personnel needed to care for military casualties evacuated from combat theaters, the study used the staff planning factors from the last Departmentally-accepted analysis, the 1988 *Wartime Medical Requirements Study*. All non-hospital medical staffing requirements in combat theaters and in CONUS were generated by service-specific methodologies.

The Illustrative Planning Scenarios and MPM are the standard tools for medical planning and analysis. The study's true challenge was the determination of the *input parameters* to use in the analysis. The history of military medicine indicates significant changes in many of the most important parameters in the model. Survival rates among those wounded have sharply increased, for example, and rates of disease among deployed forces have fallen. The study team reflected on these changes, but within the range of reasonable values, chose parameter values so as not to underestimate the wartime requirement.

The wartime medical requirement implied by current defense planning scenarios is the subject of a separate report done as part of this study (Box 1). That report provides estimates of the medical infrastructure and personnel that would be needed to support U.S. forces in wartime. DoD must maintain a somewhat larger number of physicians on active duty in peacetime than it needs to meet the wartime requirement. The additional peacetime demand arises from training programs and the need to maintain jobs in the continental United States (CONUS) into which personnel stationed overseas can be rotated. The appendix to this report discusses the issues involved in calculating the total number of physicians that must be maintained on active duty in peacetime in order to satisfy the wartime requirement. The current

[2]With the advent of the All-Volunteer Force in 1973, a larger fraction of the active-duty force came to be made up of married people, many with dependent children.

estimate of the total requirement constitutes about 40 to 50 percent of currently programmed physician inventories.

Should DoD then reduce the medical establishment it operates in peacetime to roughly half of the current size? If the objective is to meet only the wartime requirement, the answer to this question must be "yes." When costs are considered, however, there is reason to ask whether the size of the DoD medical establishment should be larger than required solely to meet wartime demands. Today's relatively large DoD medical establishment permits the Department to provide in military facilities much of the medical benefit demanded by those eligible for care. To the extent that the size of the medical establishment were reduced, however, statutory obligations would require DoD to pay for more care obtained from private-sector providers.

Substituting "bought" for "made" medical care does not necessarily reduce the total cost of the defense health program. Indeed, some have argued that it is cheaper for DoD to provide medical care in-house than it is to buy it from the private sector. Overall, therefore, the question addressed in this report is: Does economic analysis imply that the size of the DoD medical establishment should be driven solely by the wartime requirement, and thus that a correspondingly larger part of the medical benefits guaranteed to active-duty dependents and retired personnel and their dependents and survivors should be purchased from the private sector? Or do economic considerations permit the DoD medical establishment to be larger than the wartime requirement implies because it is cheaper to "make" medical care in military facilities than it is to buy it?

Box 2.
Survey of Beneficiaries

The National Defense Authorization Act for Fiscal Years 1992 and 1993 directed the Department of Defense to survey members of the armed forces and covered beneficiaries in order to determine their access to and use of inpatient and outpatient services in the military medical system. In addition, the survey was to determine the perceptions of beneficiaries about health care; the extent of their knowledge regarding quality, availability, and costs of care; and their likely responses to changes in the structures and costs of providing such care.

The survey consisted of 109 questions organized into seven sections, plus a comment sheet:

- Sponsor and Family Information
- Health Care Benefits
- Recent Medical History
- Most Recent Visit for Outpatient Care
- Most Recent Hospital Stay
- Most Recent Dental Visit
- General Information

Questionnaires were mailed to 44,293 active-duty personnel, retirees, and survivors eligible for military health benefits. Some 7,620 questionnaires were returned as postal nondeliverables, which left 36,673 beneficiaries who presumably received the survey. (The large number of nondeliverables was due primarily to inaccurate addresses for active-duty personnel. It is very difficult to keep active-duty addresses current on a real-time basis.) The overall response rate (adjusted for postal nondeliverables) was 71 percent, or about 26,000 responses.

With the exception of travel time, most beneficiary groups who used civilian facilities had better access than those who used military facilities. Knowledge of health care benefits varied widely across beneficiary groups. Generally, junior-enlisted families knew the least about their medical benefit. Outpatient utilization was divided almost evenly between military and non-military facilities, while inpatient utilization rates showed that stays in civilian hospitals (unadjusted for case-mix severity) were longer, on average, than stays in military hospitals. Satisfaction with outpatient and inpatient care was high across all beneficiary groups for both military and civilian facilities. Satisfaction with dental care, however, was substantially higher at civilian facilities, particularly for retirees and their families. A full discussion of the survey and its results is presented in *Analysis of the 1992 DoD Survey of Military Medical Care Beneficiaries*, issued as part of this study.

These are broad questions, and they are dealt with here in a broad way. The intended result is not a detailed "right sizing" plan for the DoD medical establishment, but an illumination of the basic economic considerations that should have a major role in determining policy on sizing the military medical establishment for the post-Cold War era.

The analysis presented here has been informed by the wartime requirements report mentioned above; by the results of a survey of DoD beneficiaries undertaken for this study by the Office of the Assistant Secretary of Defense for Personnel and Readiness (Box 2); and by analyses done under contract to the Department of Defense by the RAND Corporation and by the Institute for Defense Analyses (IDA). DoD's assessment of the shape of the "make/buy" issue (based on the RAND and IDA analyses) is presented in the sections that follow, with supplementary material appearing in boxes near the relevant portion of text. Readers interested in the technical findings of RAND and IDA, and in obtaining a full understanding of the basis of those findings, should consult the reports RAND and IDA submitted to DoD.[3]

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[3]Institute for Defense Analyses, *Analysis of the 1992 DoD Survey of Military Medical Care Beneficiaries*, IDA Paper P-2937 (January 1994); Institute for Defense Analyses, *Cost Analysis of the Military Medical Care System: Data, Cost Functions, and Peacetime Care*, IDA Paper P-2938 (January 1994); and RAND Corporation, *The Demand for Military Health Care: Supporting Research for a Comprehensive Study of the Military Health Care System*, MR-407-PA&E (January 1994).

SECTION II. MAIN FEATURES OF THE DEFENSE HEALTH PROGRAM

Approximately 8.7 million individuals were eligible for DoD health benefits during fiscal year 1993. Active-duty personnel (1.9 million) and their dependents (2.7 million), including the active reserves, accounted for 53 percent of the DoD beneficiary population. The remaining 47 percent (or 4.1 million beneficiaries) was made up of retired military personnel and their dependents and survivors.

The scope of medical services included in the DoD medical benefit is similar to that found in a good private-sector health plan. Many of the concerns with private-sector medical care also have their counterparts in the military medical system. There is, for example, a great concern with cost in both systems and, as is the case in the private sector, DoD is exploring the utility of various techniques of managed care. Apart from the wartime mission, the principal difference between DoD health care benefits and those of major private-sector employers is that DoD provides through its own facilities a substantial part of the care received by its beneficiaries. No large private-sector employer in the United States operates a remotely comparable system of in-house medical facilities. Unlike private-sector employers, then, DoD faces a true make/buy decision in which considerations of cost are inextricably involved.

The "Make" Portion of the System--Military Treatment Facilities

Health care services for DoD beneficiaries are provided by "military treatment facilities" (MTFs), operated by the military departments.[4] Collectively, MTFs are called the "direct care system." MTFs treat all categories of DoD beneficiaries--active-duty personnel, dependents of active-duty personnel, and military retirees and their dependents and survivors. MTFs are responsible for providing acute-care services, as opposed to long-term care. Provision of long-term care to qualified DoD beneficiaries who require it is the responsibility of the Veterans Administration. Within the realm of acute-care services, however, the direct care system provides the full range of medical services, from primary care to tertiary care.

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[4]This report focuses primarily on care provided to military beneficiaries through MTFs and civilian facilities. It does not address the considerable proportion of military medical personnel who are assigned to nonmedical units (flight surgeons attached to fighter wings, for example) or to medical units that deploy with combat forces (such as MASH units.) In addition to their wartime and training missions, some of these personnel are routinely involved in the provision of peacetime medical care to service members. This is true, for example, of the medical personnel serving on aircraft carriers. These "force structure" parts of the military medical system, however, provide comparatively little of the medical care available to active-duty personnel, and are a very small factor in the care provided to dependents of active-duty personnel and to military retirees and their dependents and survivors.

There are three main categories of MTFs: clinics, community hospitals, and medical centers (Box 3). These are distinguished from one another by the type and complexity of the services they provide.

Clinics. Clinics do not offer regular inpatient care (although some can do so in emergencies), and they provide only the simpler medical services referred to as "primary care." Cases requiring more extensive treatment are referred to other military facilities or to civilian providers. Within these limits, the medical services offered vary considerably from one clinic to the next. The direct care system includes more than 400 clinics within the United States. The majority of these tend to be relatively small, and to offer a fairly narrow range of services, and many are staffed to treat only minor on-the-job injuries and illnesses. In contrast, 74 "outlying" clinics, located outside hospital or medical center catchment areas, tend to offer a comparatively wide range of services. These facilities often are found on bases too small to justify a hospital.

Community Hospitals. DoD hospitals offer both primary and secondary care, and a few also provide some tertiary services. ("Secondary" care covers the broad range of medical services between primary care and the complicated medical or surgical procedures--some forms of chemotherapy and open heart surgery, for example--categorized as tertiary care.)

Box 3.
The MTF System

Military medical centers, community hospitals, and clinics provide care to active-duty personnel and their dependents, and to military retirees and their dependents and survivors. The tables below indicate, first, how the care received by each beneficiary group in military facilities is distributed across those facilities and, second, how the care delivered by the various types of MTFs is distributed across the three beneficiary groups.

Percentage of Each Beneficiary Group's MTF Medical Care Delivered by Type of MTF, FY 1992

	Medical Centers	Community Hospitals	Clinics[a]
Active Duty	42	53	5
Active-Duty Dependents	42	55	4
Other Beneficiaries	57	40	2

Percentage of Each MTF Type's Medical Care Delivered to Each Beneficiary Group, FY 1992

	Active Duty	Active-Duty Dependents	Other Beneficiaries
Medical Centers	26	32	42
Community Hospitals	32	41	27
Clinics[a]	39	38	23

SOURCE: FY 1992 Medical Expense and Performance Reporting System (MEPRS) data.

NOTE: Rows may not sum to 100 percent due to rounding.

[a]Only 29 of the more than 400 clinics report cost data separately to MEPRS.

There is considerable variation in the range of services offered in DoD hospitals. One hospital, for example, may have a maternity ward, but not a cardiac care unit; another may have a cardiac care unit and facilities for doing dialysis, but no physical therapy unit; and so on. Most DoD hospitals play the role of community hospitals for a military base, and the larger bases tend to have a hospital on them (Box 4). In December 1992, DoD had 69 small hospitals with fewer than 70 operating beds, and 30 medium-sized hospitals having from 70 to more than 200 operating beds.

Medical Centers. Military medical centers are generally large, tertiary-care facilities capable of handling very complex cases as well as providing primary and secondary care. Some of the Department's medical centers are well known--for example, Walter Reed Army Medical Center, Bethesda Naval Medical Center, and Wilford Hall Air Force Medical Center. These facilities function as referral hospitals and conduct residency training for military physicians. In some cases, a single tertiary-care facility provides all of a particular kind of care. For example, Wilford Hall performs all DoD bone marrow transplants, and Brooke Army Medical Center handles all severe burn cases. The 18 medical centers range in size from 120 to 1,000 operating beds.

Medical centers, while few in number, account for a disproportionate share of the MTF workload. In 1992, about 57 percent of MTF inpatient care (adjusted for case-mix severity) and 34 percent of outpatient visits were handled in medical centers. DoD community hospitals handled 43 percent of the MTF inpatient workload and 60 percent of the

Box 4.
Typical Military Hospital

DARNALL ARMY COMMUNITY HOSPITAL

Darnall Army Community Hospital, located at Fort Hood, Texas (home of the 1st Cavalry Division and Second Armored Division), is typical of the larger DoD community hospitals.

FY 1992 POPULATION: 111,107

PRIORITY I: 32,081 (29%) (Active duty)
PRIORITY II: 48,366 (44%) (Active-duty dependents)
PRIORITY III: 30,660 (27%) (Retirees and others)

Percentage of Bed Days in MTF and CHAMPUS by Beneficiary Group, FY 1992

	MTF	CHAMPUS
Priority I	28	NA
Priority II	48	80
Priority III	24	20

NOTE: NA = Not applicable.

BUILT: 1966 OPERATING BEDS: 212

ONE GME PROGRAM: Emergency Medicine

WORKLOAD: Average Daily Census: 121
Annual Dispositions: 15,986
Annual Visits: 128,908

SERVICES: Primary Care, Obstetrics/Gynecology, Pediatrics, General Surgery, Urology, Orthopedics, Otolaryngology, Audiology, Podiatry, Ophthalmology, Internal Medicine, Allergy/Immunization, Neurology, Cardiology, Physical Therapy, Occupational Therapy, Psychiatry/Psychology, Social Work, Dental, Aviation Medicine, Occupational Health, Industrial Hygiene, limited subspecialties.

REFERRALS: 89 percent to Brooke Army Medical Center and Wilford Hall Medical Center.

UTILIZATION: Most resource-intensive services provided at Darnall by major diagnostic categories were Obstetrics, Newborn, Digestive, Muscle/Tissue, and Mental Health.

MTF outpatient workload. The 29 clinics that report their workload separately from other medical facilities accounted for the remaining 6 percent of outpatient workload.

Managed Care. The Department currently is implementing major changes in the direct care system under the label "managed care." Lead agents will be established in each of twelve health service regions with explicit responsibility for controlling health care costs, quality, and access to medical services for all beneficiaries in their delivery areas. This responsibility will include not only services provided by MTFs but also care obtained by DoD beneficiaries from private-sector providers and partially reimbursed by DoD. All MTF commanders will be held accountable for practice patterns and costs in their areas of responsibility.

Provider incentives to monitor costs will be strengthened by implementation of "capitation budgeting" techniques, in which resources will be allocated to health care managers on a per capita basis. MTF commanders will assume responsibility for providing health services to a defined population, for a fixed amount per beneficiary. In combination with their responsibility for overseeing health care costs in their areas, capitation budgeting will encourage MTF commanders to employ all available medical resources as efficiently as possible. Capitation budgeting discourages inappropriate hospital admissions, excessive lengths of stay, and unnecessary services. The capitation amount will be set prospectively (independent of MTF commanders' influence), and budget execution will be closely monitored by the Office of the Assistant Secretary of Defense for Health Affairs and the Surgeons General of the Army, Navy, and Air Force.

In deciding to pursue managed care, the Department seeks to strengthen economical aspects of DoD health care, and is adapting tools taken from private-sector health maintenance organizations (HMOs) to make that happen. "Gate-keeping," "utilization management," and "utilization review" techniques, possibly executed through managed care support contractors, are expected to create additional incentives and information for providers so that only the most appropriate and cost-effective care is offered to DoD beneficiaries. Additionally, enrollment of beneficiaries into specific health care plans will enhance the ability of local MTF commanders to allocate resources cost-effectively. For example, the Department is implementing a new managed care program called TRICARE, which incorporates lessons learned from the CHAMPUS Reform Initiative (CRI).

The "Buy" Portion of the System--CHAMPUS

First priority in MTFs is accorded to active-duty personnel, who are required to use military facilities for their medical care. All other DoD beneficiaries are provided treatment in MTFs on a space-available basis. For at least the past 25 years, however, the DoD direct care system has not had the capacity to provide all of the medical care demanded by dependents of those on active duty, by retired military personnel, and by the dependents and survivors of military retirees. This is not a shortcoming of the direct care system, as it was sized primarily

to meet the wartime requirement, but it is a fact of crucial importance to the economics of the system.

CHAMPUS. Prior to 1966, beneficiaries other than active-duty personnel had to arrange for their own medical care, and make their own provisions for paying for it, if MTFs could not provide the treatment they required. That changed in 1966 with the inauguration of the Civilian Health and Medical Program of the Uniformed Services (CHAMPUS). In very broad terms, CHAMPUS provides supplemental health care coverage, available automatically to qualified DoD beneficiaries.

CHAMPUS does not cover active-duty personnel because, apart from emergency situations, they are required to obtain medical care from (or through) an MTF. CHAMPUS also is not available to retirees over age 65, or to their dependents or survivors over age 65, because these individuals are eligible for Medicare. CHAMPUS, then, is a program for the families of active-duty personnel, and for military retirees and their dependents and survivors under age 65.

CHAMPUS has three main features:

- Beneficiaries need not enroll to be eligible; CHAMPUS is automatically available to qualified DoD beneficiaries.
- CHAMPUS coverage is comparable to that provided by broader private-sector plans.
- CHAMPUS is not free; beneficiaries must cover all of their medical expenses up to an annual limit (the deductible) and then pay a portion of all costs (copayments) incurred thereafter.

The mechanics of CHAMPUS are familiar to anyone who has been enrolled in a commercial health insurance plan. Beneficiaries arrange for their own care, pay for it, and then submit a claim for reimbursement. The amount of cost-sharing varies somewhat among beneficiary groups. By way of example, dependents of officers and senior noncommissioned officers must meet annual deductibles of $150 per person or $300 per family, and pay 20 percent of the cost of outpatient care, but they are charged only a nominal portion of the cost of inpatient care.

CHAMPUS is an important component of care received by DoD beneficiaries (Box 5). In FY 1992, CHAMPUS expenditures stood at about $3.5 billion (including the costs to beneficiaries). This was nearly as large as the approximately $3.9 billion DoD spent on non-active-duty beneficiaries in the direct care system. Thus, CHAMPUS accounts for almost half of the costs of medical care delivered to non-active-duty beneficiaries through the DoD system.

Active-duty dependents accounted for 60 percent of CHAMPUS inpatient care expenditures in FY 1992, but for only 44 percent of spending on outpatient care. DoD expenditures for CHAMPUS outpatient care were divided almost equally between the two groups of non-active-duty beneficiaries. Overall, some 54 percent of DoD's FY 1992 CHAMPUS bill paid for active-duty dependent care, while the remaining 46 percent paid for care delivered to retirees, their dependents, and survivors.

New CHAMPUS Plans. CHAMPUS, like the direct care system, is evolving. The CHAMPUS Reform Initiative and other CHAMPUS programs point toward increased choice of health care plans for DoD beneficiaries. Some of these choices involve improved access, or emphasize preferred provider and HMO-like organizations rather than the more traditional "fee-for-service" plans that characterized the early years of CHAMPUS and civilian health care generally. Experience with CRI in California and Hawaii has demonstrated that beneficiaries indeed value having choices among health plans. Many beneficiaries have willingly traded provider choice for an HMO-like plan (CHAMPUS Prime) offering greater access to preventive health services and lower levels of cost-sharing. Others have elected CHAMPUS Extra, a plan that permits beneficiaries to choose from a preferred list of health care providers (who have agreed to offer discounts to DoD) but requires higher copayments and deductibles than CHAMPUS Prime. Still others have opted to continue using

Box 5.
The Composition of MTF and CHAMPUS Care

CHAMPUS spends more on inpatient care than outpatient care, while MTFs spend a higher percentage of their resources on out-patient care. For DoD as a whole, outpatient care constitutes a slight majority of medical expenditures.

MTF and CHAMPUS Costs, FY 1992
(In billions of dollars)

	MTFs	CHAMPUS	Total
Inpatient Care	2.4	1.6	4.0
Outpatient Care	3.2	1.1	4.3
Total	5.6	2.7[a]	8.3

[a]Does not include approximately $800 million in beneficiary out-of-pocket costs.

DoD expenditures on active-duty dependent and other beneficiary care are roughly equal, each amounting to about twice that for active-duty care.

DoD Expenditures on Medical Care, FY 1992
(In billions of dollars)

	MTFs	CHAMPUS	Total
Active Duty	1.7	0.0	1.7
Active-duty Dependents	2.1	1.5	3.5
Other Beneficiaries	1.9	1.3	3.2
Total	5.7	2.8	8.4

SOURCE: FY 1992 MEPRS data as provided by IDA and DoD's *CHAMPUS Chartbook of Statistics* (October 1993), p. IV-3. CHAMPUS estimates are DoD expenditures only and do not include drug, dental care, Program for the Handicapped, or administrative or overhead costs.

NOTE: Detail may not add to totals due to rounding.

Standard CHAMPUS, which offers the greatest freedom in the selection of providers but imposes higher copayments and deductibles than the other CHAMPUS plans.

Access to MTFs--The Make/Buy Split

The amount of care produced in-house and the amount reimbursed through CHAMPUS are the result of choices made by individual beneficiaries and physicians within the constraints of DoD regulations. These constraints--restricted access to MTFs (Box 6) and the rules for CHAMPUS use--largely determine how beneficiaries seek care from MTFs and CHAMPUS and through private health insurance plans.

Questions about the division of workload among MTFs, CHAMPUS, and privately-insured care do not arise to any important degree for active-duty personnel. As noted earlier, those on active duty are required to use MTFs for their medical care except in emergencies. The rules governing access to MTFs for other beneficiaries are somewhat complicated, however.

The degree of choice permitted to beneficiaries among MTFs and CHAMPUS differs for those living within the "catchment area" of an MTF--that is, within 40 miles of a facility--and those living outside that area. Those in a catchment area are assumed to be close enough to an MTF to seek treatment from it, and the applicable regulations are designed to ensure that MTF capacity is fully utilized. Accordingly, the regulations embody a presumption that beneficiaries should be allowed to obtain payment through CHAMPUS only if their local MTF cannot provide the services sought. Permission is automatically granted in advance, however, for beneficiaries to use CHAMPUS for certain comparatively routine outpatient services. For such services, beneficiaries may choose between seeking treatment at an MTF or visiting a private facility and obtaining reimbursement through CHAMPUS. For more serious conditions--including virtually all inpatient care--beneficiaries living in a catchment area must first apply for treatment at their local MTF. The MTF will provide the treatment or, if it does

Box 6.
Access and Utilization

Access is a concept that is used frequently in the medical field, is of great importance, but is surprisingly difficult to define in an unambiguous way. In general, it refers to the ability to obtain admission to the medical system and receive care. Access can be limited by a number of factors, including scarcity of providers, delays or difficulties in obtaining appointments, or high prices. Box 7 provides simple measures of access to the direct care system.

Because access is affected by so many factors, it has been very difficult to devise a single, appropriate measure of it. Such a measure would have to incorporate the influences of all important determining factors. The following example illustrates the problem: A decrease in waiting time or an increase in the ease of making an appointment clearly increases access. An increase in fees, some observers would argue, decreases access. Without a single, unifying measure of access, however, it is impossible to determine the net effect on access of decreasing waiting times through an increase in fees.

The complexity of the problem means that it is often difficult to define measures of access that are complete, and that distinguish the ability to obtain treatment from the actual utilization of medical care (the quantity of medical care received). Measures such as visits per thousand eligible beneficiaries indicate the rate at which medical care is utilized by the population under study. The utilization of care reflects factors such as the underlying health status of the population and the practice patterns of providers in treating medical conditions, as well as access to care. Utilization measures are, thus, a very poor indicator of access.

not offer the required services, issue a "nonavailability statement" (NAS), which the beneficiary must then submit to obtain reimbursement through CHAMPUS.[5]

Beneficiaries (other than active-duty personnel) living outside a catchment area are subject to somewhat different rules. These individuals are free to file claims for CHAMPUS reimbursement for the costs (less applicable copayments) of any covered service, or if they prefer, they may seek treatment at an MTF. The fact that these individuals live more than 40 miles from an MTF suggests that travel time or cost is a significant barrier to their seeking treatment at MTFs for minor medical problems. Beneficiaries living outside catchment areas, however, often seek the free care provided by MTFs for more serious and costly medical

Box 7.
Access to Outpatient Care

The survey done for this study sought the following information on access to outpatient care:

- The number of telephone calls required to make an appointment;
- The interval between the time an appointment was made and the date of the visit;
- Travel time to the facility; and
- The amount of time spent in the waiting room.

In general, persons receiving care from civilian facilities reported having somewhat greater access to those facilities than did persons using military facilities. Specifically:

- About one in five users of military medical facilities said that they either had to make several calls to book an appointment or were put on hold for a long time. This was true for fewer than one in twenty of those who used civilian facilities.

- More than 15 percent of beneficiaries who chose a military rather than a civilian facility had to wait more than two weeks for an appointment, compared to fewer than 6 percent of beneficiaries who selected a civilian facility. However, of those choosing a military facility, slightly more beneficiaries saw a provider the same day or the day after making an appointment.

- Travel time to MTFs and civilian facilities was generally similar. A notable exception, however, occurred in the case of retirees, more than 20 percent of whom had to travel more than 45 minutes to reach a military facility. Of those using civilian facilities, only about 10 percent had travel times exceeding 45 minutes.

- The proportion of beneficiaries reporting longer waiting times was greater for users of military facilities. A somewhat larger proportion of military-facility users reported waits of more than 30 minutes; this difference was larger still for those who reported having to wait more than one hour (13 percent for users of military facilities versus 5 percent for civilian-facility users).

Further evidence of difficulty in obtaining access to MTFs was seen in the responses to a series of questions asking why medical resources had not been sought when they were desired. Nearly half of all families who selected at least one reason said that "it was too hard to get an appointment." Users of civilian hospitals also exhibited higher satisfaction levels with the ability to see doctors of their choice, and to see specialists.

[5]Beneficiaries with private health insurance do not generally have to apply for treatment at their local MTF before using CHAMPUS as a second payer.

conditions. In fact, substantial numbers of visits to MTFs are made by beneficiaries living outside catchment areas.

How difficult is it for non-active-duty beneficiaries to receive care in an MTF? One indication is provided by beneficiary responses to the survey conducted for this study. (See Box 7 for a summary of the survey findings.) The responses indicate that scheduling visits to MTFs can be far more inconvenient than arranging appointments with civilian providers. To the extent that this is the case, some beneficiaries might be discouraged from using the direct care system.

A supporting perspective emerges from the *Management Information Summaries*, issued periodically by the Defense Medical Information Service (DMIS). DMIS reports, by beneficiary group, the number of inpatient admissions to MTFs and the number of nonavailability statements issued to beneficiaries in lieu of care provided in MTFs. Table 1 summarizes the data for FY 1991.[6] For every five admissions for non-active-duty care in an MTF, DoD issued one NAS authorizing reimbursement from CHAMPUS for services obtained from civilian providers.[7]

Table 1.
MTF Inpatient Admissions and Nonavailability Statements Issued

	MTF Inpatient Admissions	NAS Issuances	Percent of All Inpatient Episodes Admitted to MTFs
Active-Duty Dependents	306,953	78,315	79.7
Retirees	104,929	11,385	90.2
Retiree Dependents/Survivors	101,498	20,891	82.9
Other	19,593	316	98.4
Total, Non-Active Duty	532,973	110,907	82.8

[6]Beginning in FY 1992, NASs were required for a small number of outpatient services. The DMIS data do not currently distinguish outpatient from inpatient NASs. Table 1 therefore uses FY 1991 data to compare the volume of NAS issuances with the number of inpatient admissions to MTFs.

[7]Table 1 almost certainly underestimates the proportion of health care provided outside the direct care system that beneficiaries would prefer to receive from MTFs. Observers familiar with the DoD data system assert that NAS issuances are underreported and (as discussed earlier) that some beneficiaries do not attempt to obtain care from MTFs, although they would prefer to. These individuals use private health insurance or forgo receiving care, and so are not reflected in the data.

The discussion thus far has focused on choices beneficiaries have between CHAMPUS and MTFs. It is also important to consider the usage of military medical facilities as a whole versus care obtained from civilian providers and financed by private insurance policies. The opportunity to select among non-DoD health plans, subject to their rules and regulations, adds another dimension of choice for DoD beneficiaries, and is of crucial importance in analyzing patterns of utilization of DoD health care.

The survey of beneficiaries conducted for this study underscores the significance of these other plans to DoD beneficiaries.[8] Among retirees under age 65 and their families, 58 percent reported using a private health insurance plan to pay for their most recent outpatient visit to a civilian facility and 64 percent reported using private insurance for their last episode of inpatient care in a civilian facility. Sixty-four percent of families of retirees over age 65 used a private insurance plan for their last outpatient visit to a civilian facility, and 70 percent used a private plan for their most recent episode of inpatient care. Among active-duty families, the proportions using private insurance are much lower, but significant: 11 percent report using private insurance policies for outpatient care in civilian facilities, and 7 percent for inpatient care. The principal conclusion to be drawn from these data is that for retirees (and to a much lesser extent, active-duty dependents), private health insurance is an important component of the choices that DoD beneficiaries make regarding the medical care that they receive.

[8]These data are extracted from *Analysis of the 1992 DoD Survey of Military Medical Care Beneficiaries*, Tables 4.7 and 5.8.

SECTION III. UTILIZATION OF MTFs, CHAMPUS, AND CIVILIAN PLANS

The fact that military and civilian facilities share the task of delivering care to DoD beneficiaries points to the question: Should DoD attempt, for economic reasons, to attract more of the beneficiary caseload into the MTF system? Put another way, would it be cheaper for DoD to provide more medical care for its beneficiaries in DoD facilities, or should it continue to purchase that care indirectly, by reimbursing beneficiaries for medical services obtained in the private sector? This is not just a question of the comparative cost of doing a given volume of work. More than cost is involved because DoD cannot simply decide to move specific portions of the CHAMPUS workload in-house ("recapture" CHAMPUS work) or, conversely, shift work from MTFs to CHAMPUS. DoD is not the sole decisionmaker; the choice between seeking care in MTFs or CHAMPUS is determined in considerable part by beneficiaries. Moreover, as the previous section noted, many beneficiaries are not restricted to DoD health programs, but have access to care funded through private insurance plans.

Choosing Between MTFs and CHAMPUS

DoD data on inpatient care illustrate this point. Table 2 shows how ease of access to MTFs influenced decisions on inpatient care by families of retirees under age 65 who were surveyed for this study.[9] The data are presented according to beneficiaries' level of access to MTFs. Access is measured both in terms of distance to medical facilities (whether beneficiaries reside inside or outside of catchment areas) and in terms of MTF capacity (the number of beds per 1,000 beneficiaries). MTFs were grouped into two equally-sized categories based on the latter measure: facilities in "medium access" catchment areas had fewer than the median number of beds, while those in "high access" areas had more.[10]

Retired beneficiaries living outside catchment areas used an average of four MTF inpatient days annually per 100 beneficiaries. Those living in catchment areas with high access to MTFs used 10 times as many inpatient days. CHAMPUS usage showed the reverse pattern but much less strongly. In fact, CHAMPUS usage among retirees was slightly higher in high-access catchment areas than in medium-access areas. Overall, the data show at most a very modest recapture of CHAMPUS workload as access to MTF care increased.

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[9]This beneficiary group was chosen for illustration purposes because its demand for MTF care is most responsive to the availability of MTFs. The behavior of other beneficiary groups is described in the RAND Corporation report, *The Demand for Military Health Care: Supporting Research for a Comprehensive Study of the Military Health Care System*, MR-407-PA&E (January 1994).

[10]The median splits the sample in half and is equal to 1.34 beds per thousand beneficiaries.

Table 2.
Inpatient Days Annually per 100 Retired Beneficiaries[a]

	Live Outside Catchment Area	Live in "Medium Access" Catchment Area	Live in "High Access" Catchment Area
MTFs	4	15	41
CHAMPUS	15	10	12
DoD Total	19	25	53

[a]Includes retirees, their dependents, and survivors under age 65.

The clearest pattern in the data is evident in the last row of Table 2. In areas with greatest access to MTFs, the total volume of care demanded in the DoD system by retirees was significantly larger. Retirees living outside catchment areas used a total of 19 days annually of DoD inpatient care per 100 beneficiaries. In catchment areas with the greatest access, the total demand for DoD inpatient care was 53 days annually--almost three times that reported in non-catchment areas. Thus, as access to DoD facilities improved, MTF usage increased much more rapidly than CHAMPUS usage declined, and the total volume of inpatient care in the DoD system (MTF plus CHAMPUS) rose dramatically.

Broadly speaking, three mechanisms contribute to the patterns observed in the data. First, as MTF capacity increases, fewer of those who seek care through the DoD system will be denied access to the free medical services provided by MTFs.[11] In particular, fewer individuals who live in a catchment area and seek inpatient services will be issued nonavailability statements (and sent to seek care through CHAMPUS). Similarly, because more capacity is available, those living outside a catchment area who seek MTF care will more often be accommodated. To the extent that the perceived chance of obtaining care in an MTF is greater, these people also may be more inclined to seek it.

Second, improving access to MTFs will attract workload to the MTF system from beneficiaries who have private insurance and others who have deferred care because of the costs involved. The fundamental point here is that the DoD system is "open" in the sense that many who have the right to space-available care in MTFs or care arranged through CHAMPUS do not regularly use such care. An increase in the quantity of free care provided by MTFs will attract some non-users to the DoD system. Thus, referring back to Table 2, one explanation of the net increase in total inpatient care as access to MTFs improves is that additional workload is being

[11]This conclusion assumes the increase is in areas or services for which the direct care system is oversubscribed.

pulled into MTFs from outside the DoD system. That is, individuals not currently using MTFs or CHAMPUS might use a newly expanded MTF rather than seek care outside the military medical system.

Self-selection is a third mechanism that may contribute to the patterns observed in the data. Retirees who experience a relatively high incidence of illness may choose to live in high-access catchment areas in hopes of receiving relatively larger amounts of free MTF care, thus avoiding expensive CHAMPUS or private insurance cost-sharing. Accordingly, dissimilarities in the health status of the beneficiary population may account for some of the differences in inpatient days between high-access and medium-access catchment areas.

How Private Insurance Influences Beneficiary Choice

Table 3 presents data that strongly suggest that demand pulled in from outside the DoD system is the dominant reason why increased access to MTFs increases total DoD health care demand. This table expands the previous display by including the number of inpatient days reported in the survey from all sources of civilian care--CHAMPUS plus private health insurance. Consistent with the payment patterns for civilian care presented in Section II, these data indicate that retiree families use significant amounts of civilian care that is not purchased through CHAMPUS. Moreover, the non-CHAMPUS portion of that care also falls significantly in response to expanded access to MTFs. These data imply that a large part of the increase in MTF workload associated with improved access to the MTF system arises from workload that previously was accomplished outside the DoD system.[12]

The large increase in MTF inpatient workload shown in Table 3 may not be due entirely to beneficiary choice. The effect may be intensified by the practice patterns of MTF physicians. The training needs of a large physician force and extensive graduate medical education (GME) programs require a large number of patients to be available in MTFs. This, in concert with resource allocation practices that ratify the workloads done in hospitals in the past, could cause practice patterns to emphasize inpatient care over outpatient care in the military medical system. Additionally, funds have not been allocated to complete renovations of some existing facilities and to make investments that permit increased use of outpatient over inpatient care. For these reasons, when demand is attracted to the DoD system, some of it may show up as inpatient care whereas in the private sector, those services would be provided on an outpatient basis.

[12]The decrease in total civilian care is smaller than the increase in MTF care, indicating that there may be a price effect on the total demand for medical care. That is, there may be some types of inpatient care (hernia repair, for example) that individuals may defer if CHAMPUS or private insurance imposes significant costs but that they may seek from MTFs, where care is free.

Table 3.
Inpatient Days Annually per 100 Retired Beneficiaries[a] (Including Private Insurance)

	Live Outside Catchment Area	Live in "Medium Access" Catchment Areas	Live in "High Access" Catchment Areas
Defense Health Program Data			
DoD Total	19	25	53
Survey Data			
All Civilian Care	56	37	31

[a]Includes retirees, their dependents, and survivors under age 65.

Table 4 presents comparable statistics on outpatient visits.[13] These data exhibit generally the same patterns as found in the inpatient data presented earlier: care provided in MTFs increases as access to MTFs expands; care arranged through CHAMPUS decreases; the total amount of care provided through the DoD system increases; and (looking at the last row of the table) demand appears to be pulled in from outside the DoD system. In contrast to what was observed in the inpatient data, however, there is a sharp decline in CHAMPUS workload, and a more modest increase in total DoD workload, as access to MTFs improves. The data suggest that beneficiaries who use non-CHAMPUS civilian care respond more strongly to the greater cost savings associated with free inpatient care in MTFs than to the smaller cost savings associated with outpatient care.

The general tendency for MTF usage to increase and demand for other sources of care to decrease as access to MTFs improves is illustrated by the data presented in Tables 2 through 4. These tables do not, however, reflect differences in utilization patterns among retirees that are attributable to other characteristics of beneficiaries and the direct care system. Many factors--such as the health or marital status of beneficiaries or staffing levels in MTFs--affect utilization patterns. Furthermore, there are some variations from one part of the country to another in the terms under which CHAMPUS is provided. These variations in demographics and CHAMPUS terms are not an impediment to analysis; to the contrary, they constitute naturally occurring "experiments" that make it possible to observe how various factors, including access to MTFs, influence beneficiary choices.

[13]Because there is no analogous measure for outpatient capacity, hospital beds are used as a proxy for outpatient capacity as well. Larger MTFs are generally staffed with relatively more physicians, nurses, and equipment, thus increasing their capacity for outpatient care.

Table 4.
Outpatient Visits Annually
per 100 Retired Beneficiaries[a]

	Live Outside Catchment Area	Live in "Medium Access" Catchment Area	Live in "High Access" Catchment Area
Survey and CHAMPUS Data			
MTFs	76	160	212
CHAMPUS	197	154	104
DoD Total	273	314	316
Survey Data			
All Civilian Care	342	251	215

[a]Includes retirees, their dependents, and survivors under age 65.

The analysis must account for the effects of these other factors, however, to isolate the relationship between access and utilization. Because the factors are so numerous, a series of simple tables (such as Table 4) cannot capture their full effects on utilization. To do so would require a much larger number of tables--and for many of the cells there would be insufficient data to measure the utilization effect.

The RAND Analysis: Simulating Beneficiary Choices

The RAND analysis of demand did account for the influence of these other factors in estimating the relationship between access to MTFs and utilization. RAND used a standard multivariate statistical technique that incorporated more than 25 variables that characterize different demographic factors or aspects of the DoD health care benefit available within the United States (Box 8). Data on many of these variables were obtained by RAND by matching survey respondents to records for those same respondents from other data sources. The results of the RAND analysis are consistent with the trends observed in Tables 2 through 4. In particular, RAND found that as access to MTF care increases, demand for care obtained through CHAMPUS and non-CHAMPUS private insurance decreases.

Box 8.
RAND Demand Models

RAND's analysis used the following partitioning of DoD beneficiary demand for health care:

Active-duty personnel -- inpatient care in MTFs.
Active-duty dependents -- inpatient care in MTFs.
Retirees and dependents -- inpatient care in MTFs.
Active-duty personnel -- outpatient care in MTFs.
Active-duty dependents -- outpatient care in MTFs.
Retirees and dependents -- outpatient care in MTFs.
Active-duty dependents -- inpatient care under CHAMPUS.
Retirees and dependents -- inpatient care under CHAMPUS.
Active-duty dependents -- outpatient care under CHAMPUS.
Retirees and dependents -- outpatient care under CHAMPUS.

RAND analyzed individually each of these ten categories. The object of the exercise was to estimate statistically a relationship between utilization in each category and beneficiary characteristics and features of the DoD health care benefit. Each model included the following variables:

- Beneficiary Characteristics: Retired or active duty, sex, age, marital status, employment status, income, health status, and others.
- MTF Characteristics: Beds per thousand beneficiaries, staffing levels, military service.
- Civilian Market Characteristics: Presence of CHAMPUS demonstration programs (CAM, CRI).

Utilization of outpatient care was broken into two steps for both MTFs and CHAMPUS:

- Was there any outpatient usage during the year?
- If "yes," what was the number of visits during the year?

Thus, for example, two equations were used to characterize active-duty dependents' use of outpatient care provided by MTFs.

Utilization of inpatient care also was broken into two steps for both MTFs and CHAMPUS:

- Was there any inpatient usage during the year?
- If "yes," for both MTFs and CHAMPUS, the amount of inpatient care was assumed to be equal to recently observed rates for each beneficiary group. This assumption was made because the vast majority of users have no more than one hospital stay annually, and past studies have shown that hospitalization length is at best weakly correlated to demand factors.

RAND characterized the utilization effect of increased access to MTFs by comparing a "reference" case with a hypothetical case in which MTF capacity was expanded. The two cases made the same assumptions about the demographics of the DoD beneficiary population, the terms under which access to MTFs is granted, the degree of cost-sharing required under CHAMPUS, and use of the techniques of "managed care." Active-duty personnel were assumed to continue to have free care and top priority for access to MTFs. Active-duty dependents, retirees, and their dependents were assumed to continue to have the option of using CHAMPUS exclusively or seeking care from MTFs on a space-available basis, supplemented with CHAMPUS. The RAND analysis also assumed that these beneficiaries could enroll in a managed care option that included use of MTFs on a space-available basis and a local network of private providers.

The capacity of the direct care system differed between the two cases, however. The reference case assumed that the system's capacity reflects past decisions on downsizing and base closures. In contrast, the "expansion case" assumed a modest growth in MTF capacity.[14] The growth was defined in terms of both additional beds and additional staffing.

The results of the RAND analysis suggest that expanding the amount of free care offered by MTFs would have significant consequences for the total amount of care that these facilities provide. Table 5 summarizes the RAND results. The first row of the table reports the increase in inpatient and outpatient workloads in MTFs (relative to the base case) arising solely from the *removal of workload from CHAMPUS*. The second row reports the additional workload resulting from reductions in the usage of private insurance plans, higher rates of utilization of health care services within DoD facilities, and services sought by beneficiaries that they otherwise might have forgone. The third row reports the total increase.

Table 5.
Percentage Increase in MTF Workload
Relative to the Base Case

	Inpatient	Outpatient
Increase from CHAMPUS	6.5	5.3
Increase from Other Sources	10.9	2.3
Total Increase	17.4	7.6

The increase in total MTF inpatient workload is 168 percent larger than the increase produced by CHAMPUS alone; the increase in outpatient care is 42 percent larger. Weighting these two measures by the amount of dollars spent in MTFs for inpatient and outpatient care (about 55 percent of the dollars spent in FY 1992 went to outpatient care) yields a rough overall increase in MTF workload of 90 percent relative to that which was removed from the CHAMPUS system. This is called the "demand effect" in what follows.

These results are consistent with the patterns of utilization observed in the retiree data presented above. When access to MTFs increases, MTF usage rises strongly, CHAMPUS workload falls but not as sharply, and the sum of MTF and CHAMPUS care rises, reflecting the influx of previously non-CHAMPUS civilian workload and higher utilization rates within MTFs.

[14]As spelled out in detail in the RAND report, rules for adding new hospitals or expanding existing ones for the "expansion case" were given to RAND by the study team. The team defined a small expansion to illustrate the effect of increased access on beneficiary behavior.

Moreover, the influx of new workload into the DoD system is more pronounced for inpatient services than for outpatient services, as was observed earlier in the discussion of retiree utilization of the defense health program. Roughly speaking, RAND's results imply that, for every case that departs CHAMPUS in response to an increase in free MTF availability, about two additional cases will be treated in the MTF system.

SECTION IV. COSTS OF "MAKING" AND BUYING MEDICAL CARE

Is it conceivable that DoD could reduce overall medical program costs by expanding MTF access if it must treat in MTFs two cases for every one case recaptured from CHAMPUS? As is discussed below, MTFs do have a cost advantage over CHAMPUS, but that advantage is not sufficient to dominate the demand effect. There are, however, various means by which DoD could limit the extent to which an expansion of MTF capacity drew additional work into the direct care system. If these mechanisms are effective, and the costs for identical workloads are cheaper in MTFs than in CHAMPUS, perhaps the cost-effective solution to the make/buy decision would be to size the military medical establishment against the peacetime requirement. The "make/buy" decision then becomes a race between the effectiveness of utilization control measures and the MTF cost advantage.

Previous studies of the DoD health care system did not go deeply into the issue of cost. For example, the 1975 *Report of the Military Health Care Study* simply assumed that average costs remain the same as utilization and capacity grow. The 1985 *Final Report of the Blue Ribbon Panel on Sizing Department of Defense Medical Treatment Facilities* compared average CHAMPUS costs per admission for several categories of inpatient care with estimates of MTF marginal costs per admission. The study identified which categories of care appeared to be cheaper in the MTF system, and investigated the dollar savings associated with bringing that care in-house. The cost data reported in the study imply that, for those selected categories of care brought into the MTF system, military facilities enjoy a 44 percent cost advantage over CHAMPUS.

The 1985 study overstated the cost advantage enjoyed by MTFs in at least three respects, however. First, the study did not investigate the diagnostic mix of the workload identified as "recapturable." It acknowledged that the amount of realistic recapture potential may be less than indicated in the analysis. Second, the methodology assumed that the number of inpatient days per admission in MTFs if work were moved in-house would be identical to the number exhibited in civilian facilities providing care under CHAMPUS. Third, the analysis omitted several categories of DoD medical costs. In combination, these effects serve to overstate the cost savings attributable to MTFs. Moreover, the study recognized the existence of the demand effect in one portion of the analysis, but did not integrate the associated increases in total cost into the estimates of cost savings that it developed.

This treatment of cost issues may reflect the assumption, then unchallenged, that the direct care system should be sized solely against the wartime mission. If wartime requirements drive the size of the DoD medical establishment, then costs can be seen as consequences of sizing decisions rather than as inputs to them. The issue takes on added significance if, as is the case today, the direct care system is much larger than the wartime mission requires, and DoD has the opportunity to ask how to size that system cost-effectively. In such a circumstance, the objective becomes to pull work in-house if the full economic cost of doing so is less than the cost of purchasing care.

Application of that standard runs hard against some inadequacies in the accounting data on MTF costs. The key problem is that the costs specifically attributed to MTF inpatient and outpatient care in standard DoD data sources are incomplete; there are other elements of cost, not incorporated in the data sources, that can be ascribed to MTFs. The most important of these is the economic cost of facility depreciation. Other overhead costs not captured in the data systems also influence the costs of MTF care. Finally, several special program accounts reflected in the standard data systems, while directly related to MTF care, are not usually allocated against the costs of peacetime care. These additional "costs of doing business" must be captured to a reasonable extent to get a clear picture of how the costs of care provided by MTFs compare with the costs of care obtained in the private sector.

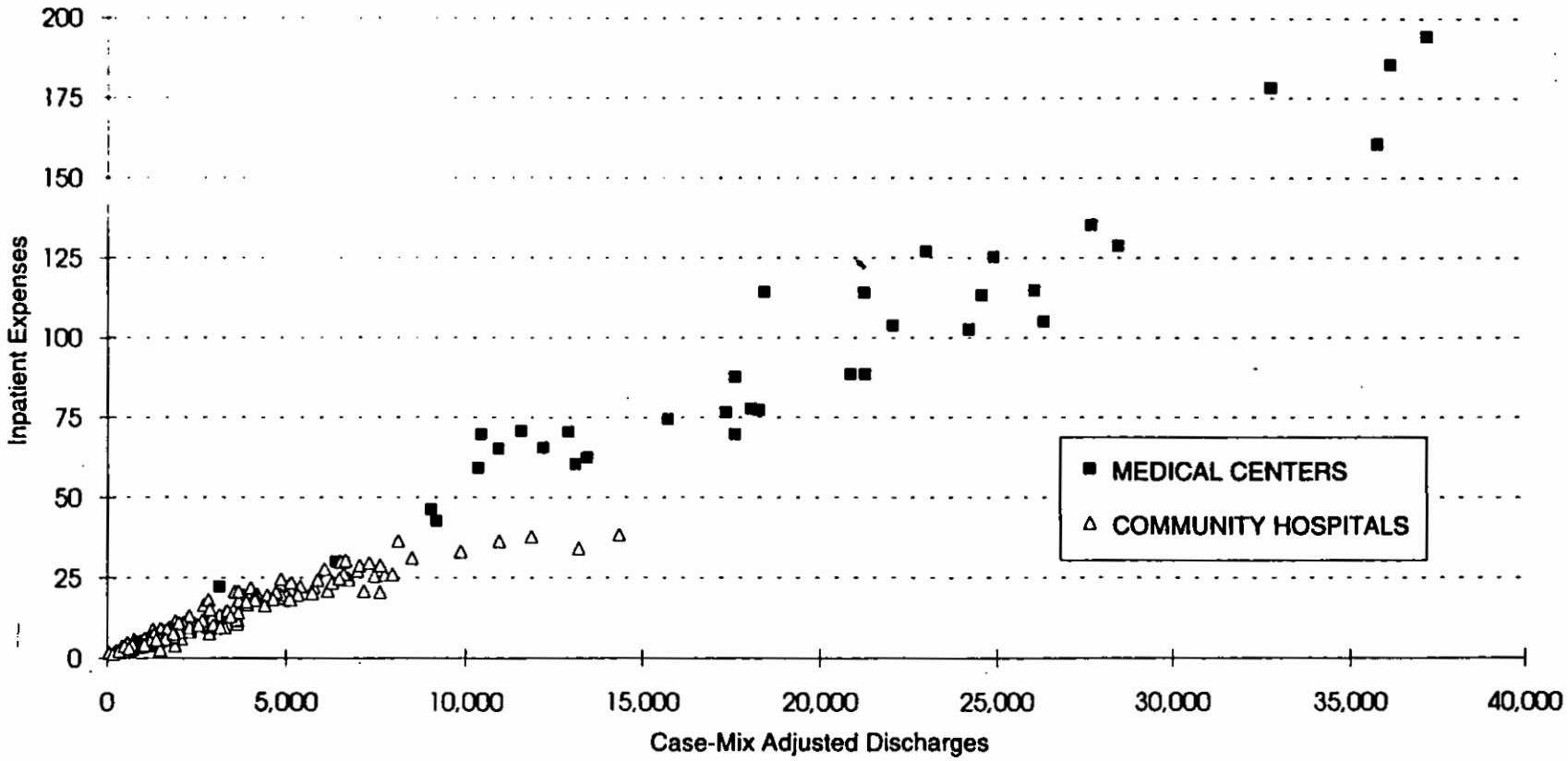
IDA's Analysis of MTF Costs

The Institute for Defense Analyses (IDA), as part of its contribution to this study, corrected most of these problems by adjusting data from the Medical Expense and Performance Reporting System (MEPRS) on FY 1990 and FY 1992 MTF costs.[15] Separate adjustment factors were developed for inpatient and outpatient costs, based on comparisons among the military services and on comparisons with external data sources (e.g., Future Years Defense Program appropriation data). The adjustments resulted in increases of 11.3 percent and 14.3 percent, respectively, in the outpatient and inpatient costs reported in MEPRS. IDA noted in its report that these adjustments may be incomplete: MEPRS costs were adjusted only for those items that were reasonably estimated and clearly associated with the provision of beneficiary care (as opposed to the wartime mission). IDA also identified other elements of cost that, with additional research, might appropriately be added to hospital costs. Nonetheless, IDA carefully implemented those adjustments it could identify, yielding costs of medical care at MTFs that are roughly comparable to prices charged by civilian providers (e.g., CHAMPUS).

IDA went on to construct cost relationships that describe how bringing work in-house would affect total MTF costs. These relationships were derived statistically from MEPRS data and other relevant information (Box 9). The main features of this approach are illustrated in Chart 1. Total costs incurred by particular MTFs in 1990 and 1992 are shown on the vertical axis of the figure; workload appears on the horizontal axis. Cost is plotted against workload for each of the 117 hospitals and medical centers in the DoD system in 1990 and 1992. As would be expected, costs tend to increase with increases in MTF workload, although not always in strict proportion.

[15]Data from FY 1991 were not used in this analysis because it was not possible to separate the effects on costs of peacetime care from those of Operations Desert Shield and Desert Storm.

Chart 1.
FY 1990 and FY 1992 Inpatient Expenses, by Facility Type
(In millions of FY 1992 dollars)



Workload is not the only influence on costs, and as is discussed later, IDA took account of the effects of other important variables. It is also relevant to note that separate cost functions were developed for inpatient and outpatient workloads. This is important for two reasons. First, beneficiary demands for inpatient care are more responsive to the terms and conditions under which care is offered than are demands for ambulatory care. RAND captured this effect in its beneficiary models, and IDA separated the cost functions to account more precisely for the differential impact on cost. Second, MEPRS cost data are reported separately for outpatient and inpatient care. These costs respond differently to characteristics of MTFs, and can be captured more accurately in separate models than in an aggregate cost model.

Equally important, IDA did not simply use inpatient discharges as a measure of inpatient workload. It is widely recognized that the resource requirements of inpatient discharges vary significantly depending on diagnosis, procedures performed, co-morbidities and complications, and so on. As is standard in the literature, IDA developed an inpatient work unit that reflects case-mix-adjusted workload using a weighting scheme based on Diagnosis Related Groups (DRGs). DRGs provide a method for classifying inpatient care into more than 500 groups having roughly similar resource requirements.[16]

Box 9.
IDA Cost Functions

The estimates of MTF costs used in this study were developed by the Institute for Defense Analyses. The cost-estimation involved two major tasks:

- Identifying the relevant costs and
- Estimating how those costs might change in differing circumstances.

Identifying Costs. DoD maintains at least two major sources of cost data. One of these--MEPRS--provides data on individual hospitals and other institutions. Because there are economic costs of providing care (such as the costs of building and maintaining facilities) that are not captured by MEPRS, IDA supplemented the MEPRS data with information drawn from the DoD Planning, Programming, and Budgeting System (PPBS). In particular, data on military construction, central automation support, and management headquarters activities were drawn from the Future Years Defense Program, which also served as a check on the values of other activities reported in MEPRS. Data for fiscal years 1990 and 1992 were used. The 1991 data were excluded because they are strongly influenced by the costs of Operations Desert Shield and Desert Storm.

Estimating How Costs Change. Several factors affect the costs of providing care. Among the most important are the amount of care provided; the size of the facility providing it; whether the facility is a medical center, hospital, or clinic; the military department that runs the facility; and the size of the physician specialty training programs that the hospital runs.

IDA included all of these elements in its analysis. It constructed two equations relating costs to these factors--one for inpatient care (adjusted for diagnosis related groups), and one for outpatient visits. These equations are presented in IDA Report P-2938, *Cost Analysis of the Military Medical Care System: Data, Cost Functions, and Peacetime Care*.

Costs incurred in any hospital are influenced both by the hospital's capacity and by the extent to which that capacity is utilized. Case-mix-adjusted workload is an adequate measure of inpatient utilization; number of visits is a reasonable measure of outpatient workload. As its

[16]Unfortunately, a DRG-like system does not exist for standardizing the resource requirements of outpatient procedures. For the outpatient cost models, IDA used a simple measure of outpatient visits.

measure of capacity, IDA used operating beds--that is, the number of staffed and equipped beds available for use in an MTF. Additionally, IDA accounted for the influence on costs of the volume of graduate medical education conducted at a given facility. Finally, the IDA cost functions recognized that medical centers, hospitals, and clinics have different fixed costs.

The cost functions estimated by IDA provide a basis for estimating costs for the "make" portion of the make-versus-buy comparison. Cost estimates for the "buy" portion of the comparison were provided by RAND. DoD and its beneficiaries generally pay market prices for medical care under CHAMPUS. The total cost of CHAMPUS is fundamentally these prices times the quantity of care provided, summed over all CHAMPUS users. In combining data from the survey and actual CHAMPUS payment records for the survey respondents, RAND estimated the costs to DoD and its beneficiaries of using CHAMPUS programs.

IDA's costing work permits the completion of the analysis of the reference and expansion cases introduced in the preceding section. As that earlier discussion noted, the two cases make the same assumptions about the demographics of the DoD beneficiary population, MTF access, CHAMPUS cost-sharing arrangements, and the use of "managed care." The reference case assumes that the capacity of the direct care system reflects downsizing and base closure decisions made to date. In contrast, the expansion case assumes a modest growth in MTF capacity relative to the current level.

Cost Implications of an Expanded MTF System

The question left open in the preceding section was the net effect on costs--MTF plus CHAMPUS--of a modest expansion of the MTF system. Table 6 addresses this issue, showing the effects on MTF and CHAMPUS costs of moving a fixed workload from CHAMPUS into the MTF system and of shifting work to MTFs from sources other than CHAMPUS (the demand effect). The costs reported in Table 6 reflect RAND's estimates of the effects on demand of expanding MTF capacity and IDA's analyses of costs of the MTF system, and include both DoD expenditures and beneficiary out-of-pocket costs.

The first line of the table shows that an expanded MTF system would pull $352 million of health care from CHAMPUS, and that this care could be provided in MTFs at an annual cost of $265 million, for a savings of $87 million. Thus, the cost (to both DoD and beneficiaries) of providing a given volume of care in MTFs is about 24 percent less than the cost of obtaining that

Table 6.
Change in Cost Relative to the Base Case
(In millions of dollars)

	MTFs	CHAMPUS[a]	Net[a]
Change Due to Shift from CHAMPUS	+265	-352	-87
Increase from Additional Workload (Demand Effect)	+206	NA	NA
Total Change	+471	-352	+119

NOTE: NA = Not applicable.

[a]Includes changes in both DoD and beneficiary payments.

care through CHAMPUS.[17] These savings are shared unequally between DoD and its beneficiaries. Beneficiaries avoid $70 million in out-of-pocket costs that they otherwise would have borne under CHAMPUS cost-sharing arrangements. DoD saves $17 million (the difference between $87 million and $70 million), or about 6 percent of DoD's cost of purchasing the work from CHAMPUS ($282 million).

The cost advantage enjoyed by MTFs is not the end of the story. The second line of Table 6 shows that DoD would pay an additional $206 million for the workload associated with the demand effect. This is the cost to DoD for the work generated by: beneficiaries who seek care in an expanded MTF system rather than using their civilian health plans, the increase in per capita utilization associated with beneficiaries who use the DoD system rather than civilian health plans, and treatment sought in MTFs that beneficiaries previously would have deferred. As discussed earlier, for every one case that leaves CHAMPUS, 1.9 new cases arrive in the MTF system.

The last line of Table 6 summarizes the net cost effects. The expansion of the MTF system reduces CHAMPUS costs by $352 million, but in so doing, it adds $471 million to MTF costs, for a net increase of $119 million, or 33 percent of the original CHAMPUS cost. The

[17]How the direct care system expands or contracts could have a significant effect on the size of the DoD cost advantage. If DoD were to add or subtract similarly operated MTFs, this estimate would remain indicative of the average cost advantage of the DoD system. If an unrepresentative set of facilities were added or subtracted (either the proportion of types of facilities did not replicate the current composition or the facilities were of a size that lay outside current experience), the estimated cost advantage could increase or decrease depending on the actual changes made in the direct care system.

implication is clear: increasing MTF capacity increases the costs of the DoD medical program--not because MTFs are less efficient in delivering a fixed amount of care but because in trying to recapture CHAMPUS workload, DoD also attracts new work from outside the DoD system. If the simulations had reduced MTF capacity rather than increasing it, the results would have been the same: A reduction in MTF capacity would force DoD beneficiaries into more expensive civilian plans, but the demand effect (working in reverse) would dominate the cost effect. People would leave the DoD system (using their private insurance and utilizing less health care generally), reducing DoD costs by far more than the increase resulting from the growth in the CHAMPUS workload.

The magnitude of the cost advantage that MTFs enjoy in providing a given amount of care may be surprising; however, there are specific areas in which MTFs have clear cost advantages. These include the absence of malpractice insurance premiums, less responsibility for uncompensated care of the indigent, and less stress on cost-increasing technological innovation. Moreover, private-sector health care providers compete, in large part, on the basis of service, often providing "conveniences" (private rooms, telephones, and other amenities) that typically are unavailable to patients in MTFs. While the quality of care provided in MTFs is comparable to that offered in the private sector, the setting within which care is delivered is more austere.

On the other hand, the cost advantage attributed to MTFs may be somewhat overstated because the DRG adjustment may incompletely account for the relative case-mix severity of MTFs and CHAMPUS. As noted earlier, other categories of medical facility costs might, on further examination, appropriately be added to the MTF cost functions.[18] Inclusion of these costs could trim the 24 percent cost advantage cited above to somewhere between 10 and 20 percent. (The budgetary savings to DoD would fall to 1 or 2 percent.) The RAND estimates, too, are subject to some uncertainty. The utilization estimates are based on the CRI experiment in California and Hawaii. Other possible models for future beneficiary behavior embody different health care services and cost-sharing arrangements than CRI. The Air Force experience with catchment area management, for example, would indicate a DoD cost advantage of 18 percent.[19]

Although the exact size of the cost advantage may be subject to question, the available evidence warrants this qualitative judgment: on average, MTFs appear to provide a given amount of care at significantly less cost than is the case in the private sector. This conclusion does not imply, however, that an expansion of the free care offered by MTFs would reduce DoD's total costs. To the contrary, the quantitative results indicate that expanding the MTF system would

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[18] These cost categories include examining activities, supplemental care for active-duty personnel, other health activities, and training activities not already captured elsewhere. IDA describes these omitted costs on page IV-15 of its report, *Cost Analysis of the Military Medical Care System: Data, Cost Functions, and Peacetime Care.*

[19] Adjusting for the omitted costs discussed earlier would probably reduce this estimate to somewhere between 5 and 15 percent. DoD's budgetary savings would fall proportionately.

increase costs because the demand effect of increasing access to free care overwhelms the cost advantage enjoyed by MTFs. Viewed from this angle, the cost analysis points to the importance of finding means to manage the demand effect.

SECTION V. IMPLICATIONS OF SINGLE-PLAN ENROLLMENT

This section examines the implications for the make/buy decision of incorporating "single-plan enrollment" in the DoD health care system. Single-plan enrollment refers to that feature of the President's health proposal which provides for the enrollment of all Americans in a health care plan. For DoD, implementation of single-plan enrollment would represent a sharp departure from current practices: whereas at present, many DoD beneficiaries are eligible to use military treatment facilities even though they are enrolled in health plans offered by their non-DoD employers, under single-plan enrollment, they could receive MTF care only if they were enrolled in a DoD-sponsored plan.

Consideration of single-plan enrollment is relevant for three reasons. First, it probably would be required for the integration of the DoD health care system into a reformed national health care system. Second, an analysis of single-plan enrollment leads to a more precise understanding of why, under the current DoD system, costs rise if sufficient capacity is retained to meet peacetime demand. Third, as is discussed briefly below, single-plan enrollment itself has important implications for strengthening DoD's control of utilization management.

Single-Plan Enrollment and the DoD Health Care System

The defining characteristic of a single-plan enrollment system is that beneficiaries must periodically make a selection, from the choices available to them, of the plan they will use in the upcoming period. This is a simple property, but one that touches basic aspects of the DoD health care system and which, if adopted, probably would entail fundamental changes in the system.

If single-plan enrollment were adopted, DoD would have to decide how many and what types of plans to make available to its beneficiaries. As was discussed in Section II, non-active-duty beneficiaries currently receive treatment in MTFs on a space-available basis, and those under age 65 who cannot obtain MTF care can seek treatment from civilian providers, reimbursable in part through CHAMPUS. This package--MTFs on a space-available basis, CHAMPUS otherwise--probably would not be feasible under a single-plan enrollment system, because it would require beneficiaries to make a commitment without knowing what space would be available and, hence, what their costs would be. Beneficiaries, especially those employed outside DoD who have access to employer-sponsored insurance plans, probably would require more certainty than the current MTF system provides about the terms on which care would be available.

Viewed from this perspective, single-plan enrollment strongly challenges the notion that DoD could continue to offer MTF services to non-active-duty beneficiaries only on a space-available basis. DoD presumably could include an MTF-based HMO among the menu of plans it sponsored. It is reasonable to presume, however, that those who elected this option would be entitled to care in MTFs.

There are corresponding implications for CHAMPUS. Since those who elected the MTF-based HMO would be entitled to MTF care, CHAMPUS would no longer be needed as a form of supplemental health insurance and probably would be discontinued. In its place, DoD would need to provide at least one civilian plan for those residing outside MTF catchment areas; given the mobility of the beneficiary population, that plan probably would be offered nationwide. Under a single-plan enrollment framework, therefore, DoD beneficiaries would likely be given a choice among regional MTF-based HMOs and one or more civilian plans (for example, a civilian HMO and a civilian fee-for-service plan).

The decision on whether to include MTF-based HMOs in the DoD health package would be a key aspect of the decision on whether to size the military medical system against peacetime demand. If a decision were made to size to the wartime requirement, MTF-based HMOs would probably not be offered because the restructured direct care system would be inappropriately configured to support an HMO alternative. In this circumstance, DoD beneficiaries would be offered only a choice among civilian plans. If the direct care system were, instead, sized to peacetime demand, MTF-based HMOs would be included among the DoD-sponsored plans, and those who elected this option would be entitled to care through the DoD system.

Another key aspect of single-plan enrollment is the cost-sharing provisions, if any, attached to the various plans offered. DoD beneficiaries already face copayments and deductibles under CHAMPUS, and cost-sharing presumably would continue to be a feature of DoD-sponsored civilian plans. The issue is what degree of cost-sharing would be required of those who elect MTF-based HMOs. As noted above, under single-plan enrollment, those who choose the MTF HMO option would be entitled to treatment through the HMO, rather than receiving care on a space-available basis, as is currently the case. This change might argue for imposing a premium of some magnitude for MTF-based HMOs. This is not a requirement of single-plan enrollment, however.

Finally, adoption of single-plan enrollment might entail changes in the assignment of responsibility for the employer's share of premiums of health care plans selected by DoD beneficiaries employed outside the Defense Department. Under a single-plan enrollment system, either DoD or the current employer would have to pay the employer's share of premium costs. This is quite different from the situation today. Currently, DoD pays for care obtained through the DoD system (less CHAMPUS copayments and deductibles). If the recipients are employed outside the Department of Defense and have coverage through their employer, DoD has the statutory authority to demand payment from third-party insurers. In practice, very little is received from private insurers due to accounting and other difficulties. Conversely, DoD pays nothing for care received by DoD beneficiaries under other insurance plans in which they are enrolled.

Modeling Single-Plan Enrollment

The RAND and IDA analyses conducted for this study can be used to model beneficiary behavior and the costs of the military medical system under a single-plan enrollment framework.[20]

Modeling single-plan enrollment requires estimating the number of DoD beneficiaries who would choose various competing plans, including an MTF-based HMO. On a conceptual plane, this is simply a variation on the problem (discussed in Section III) of characterizing the choices beneficiaries make between seeking treatment through the DoD system or through insurance they have through their non-DoD employer, and within the DoD system, choosing between CHAMPUS and MTFs. Expansion of the analysis to single-plan enrollment encounters a practical problem, however. The analysis in Section III considered options that are currently available to DoD beneficiaries, and was based on choices that were actually made. In contrast, the selection by beneficiaries of options that would be available under single-plan enrollment cannot be estimated from actual choices, but must predicated on information concerning beneficiary preferences among hypothetical alternatives.

RAND's analysis of single-plan enrollment used, in place of observed choices, the responses of DoD beneficiaries to questions concerning what plan they would choose under certain circumstances. The survey conducted for this study (Box 2) asked respondents to consider a choice between an MTF-based plan and a civilian plan offering the same coverage. The respondents were asked to focus only on the difference between the premiums of the civilian and military plans, hence leaving open the possibility that a small premium might be charged for the MTF-based plan. Respondents were asked, in particular, to indicate which plan they would choose under each of three alternative assumptions about differences in monthly premium levels:

- The premium for the civilian plan equalled that for the MTF-based plan.
- The civilian premium was $50 more per family than the military premium.
- The civilian premium was $75 more per family than the military premium.

The survey did not ask respondents to compare MTF-based and civilian plans on the basis of cost differences in premiums for single enrollees. RAND estimates that a $50 per month family differential equates to a $20 per month differential for a single enrollee and that a family differential of $75 per month translates into a $30 per month differential for an individual.

RAND's analysis of the survey responses proceeded along the lines described earlier (see Box 8). The responses indicated that DoD beneficiaries would be very sensitive to the premium

[20]A complete description of the analytical techniques used by RAND and IDA will be provided in future reports.

differential between the civilian plan and the MTF-based HMO if the plans' coverage was identical (Box 10). The estimates presented below assume that the premium for the civilian plan is $20 per month more for individuals and $50 per month more for families than the premium

Box 10.
The Effects of Premiums on Enrollment in an MTF-based Plan

RAND employed survey data to assess in what proportions DoD beneficiaries would select among competing civilian plans and an MTF-based plan if the plans differed only in premium amounts. Three variations in premium costs were investigated: in the base case, the monthly premium for the military plan equalled that for the civilian plans; in the second case, the military premium was $50 less per family (and $20 less per individual) than the civilian premiums; and in the third case, the MTF monthly premium advantage rose to $75 per family (or $30 per single enrollee).

The results of the analysis are presented in the table below. It should be noted that the table reports beneficiary preferences and does not reflect the impact of limiting enrollment in an MTF plan only to those beneficiaries living in catchment areas (as is assumed in Table 7). When the premiums of MTF and civilian plans are identical, a minority of non-active-duty beneficiaries opt to enroll in a military plan. The fraction of DoD beneficiaries selecting the MTF plan increases greatly as the military plan becomes relatively less expensive, however. As the premium advantage enjoyed by an MTF plan rises from zero to $30 per month for single enrollees or $75 per month for families, the fraction of active-duty families and retirees under age 65 enrolling in MTF plans triples and that of older retirees almost doubles.

Percent Choosing a Military Plan Rather Than a Civilian Plan as a Function of the MTF Monthly Premium Advantage

Single/Family Coverage	Active-Duty Dependents	Retirees Under Age 65	Retirees Over Age 65	Military Plan Enrollment (millions)
$0/$0	27	30	40	3.7
$20/$50	68	70	66	6.2
$30/$75	82	86	78	7.2

The last column of the table shows the number of beneficiaries (including active-duty personnel) who would enroll in an MTF-based plan under these relative premium levels. A $20/$50 premium advantage increases the number of beneficiaries by 70 percent relative to the $0/$0 case. Increasing the MTF cost advantage to $30/$75 per month roughly doubles enrollment compared with the $0/$0 case.

for the MTF-based plan.[21] This results in an MTF workload that most closely approximates the status quo--the reason why the $20 per month/$50 per month premium differential was selected as the basis for comparison.

The simulations also require assumptions about who pays the employer's portion of the premium for the roughly three-fifths of DoD's non-active-duty beneficiaries who are eligible for coverage under non-DoD employer-sponsored health plans. Currently, DoD has the statutory authority to collect from third-party insurers. The amounts collected remain small, however (see Box 11). In practice, DoD pays if a beneficiary employed outside DoD seeks treatment through an MTF or (subject to copayments and deductibles) through CHAMPUS; the non-DoD employer pays if treatment is provided under a plan sponsored by the employer. This arrangement will be referred to hereafter as "sponsor pays." (The sponsor in question is the sponsor of the health plan.)

Box 11.
Collections from Insurance Companies

The 1985 Consolidated Omnibus Budget Reconciliation Act gave DoD authority to collect payment from insurance companies for treatment rendered to DoD beneficiaries who have other health insurance coverage. Initially, the funds collected reverted to the U.S. Treasury, providing little incentive to actively pursue collections. In 1989, DoD was granted authority to keep the money. Collection authority was modified in the 1994 National Defense Authorization Act to permit the hospitals providing the treatment to keep 100 percent of the funds collected.

As incentives for collection improved, the amounts collected grew, rising from about $17 million in FY 1989 to about $76 million in FY 1992. (Collections are not yet complete for 1993, but $74 million in receipts have been received while $62 million in billings are yet to be resolved.)

Despite this rapid growth, significant problems remain in the collection process. First, beneficiaries have no incentive to inform DoD of outside coverage. (At best, informing a facility does not affect the patient; at worst, the beneficiary must file additional forms relating to the claim, and may fear adverse consequences from the insuring company.)

Second, DoD's accounting and finance systems were not designed to support the collection of claims from outside sources. Consequently, until recently, MTF commanders had little assistance in filing claims. Because DoD does not, in general, calculate costs on a Diagnosis Related Group or other basis, claims made were based largely on the average cost of a day of service. (MTFs in some high-cost areas bill third-party insurers at rates somewhat higher than the DoD average.) DoD will begin billing on a Diagnosis Related Group basis in FY 1995, but to date, its collection scheme has been nowhere near as sophisticated as those employed by civilian facilities. Amounts collected are very small relative to the size of the health program.

[21]The findings of the analysis would apply if no premium were charged for the MTF-based HMO (and premiums of $20 per month/$50 per month were charged for the civilian plans) or if a small monthly premium were charged for the MTF-based HMO and correspondingly higher premiums were charged for the civilian plans.

Table 7 compares the FY 1992 costs of the DoD health program with the estimated costs of the base case presented in Sections III and IV and the "sponsor pays" version of single-plan enrollment. Costs under the single-plan enrollment option are larger than those for the base case largely because a premium differential of $20 monthly for individuals and $50 monthly for families results in a direct care system that is somewhat larger than the current system.

Table 7.
Costs of the DoD Medical Program
(In billions of dollars)

	FY 1992 Cost[a]	Base Case	Sponsor Pays
MTF Costs	6.3	6.3	6.7
CHAMPUS Costs	3.8	3.8	3.7[b]
Total	10.1	10.1	10.4

[a]As adjusted by IDA (see Section IV).
[b] Cost of civilian plans sponsored by DoD.

As mentioned above, adoption of single-plan enrollment might entail changes in employer responsibility for the premiums of plans selected by non-active-duty beneficiaries employed outside DoD. The decision on assignment of the employer's share does not alter the choices faced by beneficiaries or the terms on which those alternatives are available to them. Thus, the RAND analysis of these two financial arrangements assumes no change in the choices made by beneficiaries. The issue is only whether DoD or the current employer pays the employer share of the premiums for DoD beneficiaries who are employed outside the Defense Department. Table 8 reports estimated costs of the DoD health care program under the "sponsor pays" option (essentially the current financing arrangement) and two alternative assignments of financial responsibility:

- DoD pays the employer's share of premiums for all of its beneficiaries, including those employed outside the Department who select a non-DoD plan.

- The current employers of DoD beneficiaries pay the employer's share of their health care premiums even if these individuals select a DoD plan. This

calculation also assumes that DoD is reimbursed by Medicare for those who select a DoD-sponsored plan.[22]

Table 8.
Effect of Premium-Sharing on Costs of Sizing to Peacetime Requirements
(In billions of dollars)

Sponsor Pays	DoD Pays	Non-DoD Employer Pays
10.4	12.7	6.5

This report offers no recommendation as to how financial responsibility for the employer's share should be assigned. Clearly, however, the implications for DoD are large. Under a "DoD pays" framework, the annual costs of DoD's health care program would be $2.3 billion higher than under the current "sponsor pays" rule. Alternatively, under a "non-DoD employer pays" rule, DoD's annual health care costs would decrease by about $3.9 billion. Moreover, as will be seen below, assigning financial responsibility also plays a key role in the question of whether DoD reduces its health care costs overall by doing more work in MTFs.

The Make-Versus-Buy Decision

The analytic framework developed above can be used to answer, within the context of single-plan enrollment, the central question of this report: Is it more cost-effective for DoD to size its medical system to wartime demands for care or to the projected peacetime demand? The approach used in this instance, however, must be somewhat different from that employed in Sections III and IV, which considered an expansion in MTF capacity and asked whether increasing access to MTFs would yield lower DoD health care costs overall. It is not possible to use an identical approach in this case because, under single-plan enrollment, the MTF-based HMO portion of the system would be sized to the demands of those who elect the HMO option and are entitled to care in MTFs. Under the current system, excess demands for MTF care can be refused, forcing beneficiaries to use CHAMPUS or private insurance. The models developed by RAND and IDA, however, permit the comparison of estimated costs in two cases--one in

[22]The RAND analysis of the "non-DoD employer pays" alternative is based on Congressional Budget Office estimates presented in the February 1994 CBO report, *An Analysis of the Administration's Health Proposal*. See pages 9, 10, and 30 of that report for a more detailed characterization of employer funding of health care premiums.

which the direct care system is sized to peacetime demand, and another in which it is sized against wartime requirements.

One further preliminary point must be made. Under single-plan enrollment, DoD has two means of adjusting the size of the direct care system:

- It can impose a premium for MTF-based HMOs, thereby reducing the cost advantage that this option enjoys relative to DoD-sponsored civilian plans (with a corresponding reduction in the likely enrollment rate).

- It could forgo offering MTF-based HMOs to non-active-duty beneficiaries, giving these individuals a choice among civilian plans only.

For example, an MTF premium that was equal to those of civilian plans would create an MTF system "sized to peacetime requirements" that would not be much larger than a system sized to wartime requirements. The simulations analyzed here, however, assume premiums for the MTF-based HMO in the peacetime case are set at a level that would yield an MTF system somewhat larger than the current system. Thus, in the size-to-peacetime case, about two-thirds of non-active-duty beneficiaries would be assumed to choose the MTF-based HMO. In the wartime case, these individuals would choose the DoD-sponsored civilian fee-for-service or HMO plans, or plans offered by their employers.

Table 9 compares the costs of the DoD medical program under the size-to-peacetime and size-to-wartime cases for the three financial arrangements defined previously. The top row of the table repeats the estimates presented earlier in Table 8; the bottom row presents corresponding estimates of the cost of a DoD direct care system sized against the wartime mission. The estimates for the two cases follow the same pattern: costs are highest under "DoD pays," lowest under "non-DoD employer pays," and fall somewhere in between for "sponsor pays." As the explanation of the pattern for the wartime case parallels that offered earlier for the peacetime case, no further comment on this aspect of the estimates is given.

The new element that appears in Table 9 lies in the comparison of costs under the wartime and peacetime sizing rules. Under "sponsor pays," the estimated cost of the DoD health program is lower if the system is sized to meet wartime requirements. Under "DoD pays" and "non-DoD employer pays," however, sizing to peacetime demand reduces, although only slightly, the estimated cost of the DoD medical program.[23] This cost advantage could increase as DoD implements managed care and capitation budgeting (see Box 12).

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[23]The cost advantage of sizing to peacetime requirements in the "non-DoD employer pays" case is somewhat larger than in the "DoD pays" case because the employer-pays calculation reflects premium payments to DoD on behalf of Medicare-eligible beneficiaries who enroll in MTF-based HMOs.

Table 9.
Effect of Premium-Sharing on Costs of Sizing to Peacetime or Wartime Requirements (in billions of dollars)

	Sponsor Pays	DoD Pays	Non-DoD Employer Pays
Size to Peacetime Requirement	10.4	12.7	6.5
Size to Wartime Requirement	8.6	12.9	7.4

Box 12.
Cost Reductions from Managed Care

The principal impetus behind managed care, according to a June 1992 Congressional Budget Office (CBO) memorandum, is a desire to improve quality and reduce costs by eliminating unnecessary or inappropriate care. Using established guidelines, managed care employs utilization review (UR) and feedback to physicians to achieve its ends. Forms of managed care are health maintenance organizations (HMOs), preferred provider organizations (PPOs), point-of-service (POS) plans offering choices to patients, and fee-for-service (FFS) plans that impose utilization controls.

Evidence that unnecessary or inappropriate care is sometimes administered is provided in a 1987 paper from the *Journal of the American Medical Association*, cited in the CBO analysis. In certain procedures studied, one-third of the care administered was deemed inappropriate. A potential thus exists for managed care to work, but how successfully it has met this end is an open question. Indeed, the available evidence suggests that the different forms of managed care vary considerably in their effectiveness.

The goal of the Department's managed care and capitation budget initiatives is to change incentives so that DoD facilities function more efficiently and their utilization rates are reduced to levels found in civilian HMOs. IDA estimated the costs of the MTF system in the size-to-peacetime case based on utilization levels (provided by RAND) that approximate the lower per capita rates of civilian HMOs. These analyses imply that the direct costs of care could fall by about $700 million annually. In addition, the Department would have an opportunity to reduce MTF capacity and the size and number of graduate medical education programs, perhaps saving in excess of another $1 billion annually.

The reversal is explained by the different assumptions regarding who pays the employer's share for treatment received through the DoD system by beneficiaries who have third-party insurance (that is, insurance obtained through a non-DoD employer). Under "sponsor pays," as an MTF expansion pulls such people into the DoD system, DoD pays costs that would otherwise be borne by the third-party insurer. Under the other two alternatives, however, there are only minor shifts in cost to or from DoD, or the employer is responsible for the employer's share of cost, regardless of where treatment is obtained.[24]

[24]The difference between the wartime and peacetime cases under "DoD pays" and "non-DoD employer pays" could not be expected to be in proportion to the cost advantage attributed to MTFs in Section IV because many DoD beneficiaries will elect civilian plans even if the MTF system is sized to peacetime demand. Moreover, ensuring that costs are appropriately billed to third-party insurers does not eliminate the utilization component of the demand effect, part of which is due to the tendency of beneficiaries to utilize the free care provided by MTFs somewhat more intensively then they do care subject to copayments and deductibles.

SECTION VI. CONCLUSION

It is generally agreed that DoD's direct care system should be large enough to support the wartime mission. The requirements of that mission are now much smaller than they were during the Cold War. This presents a new question to the Department of Defense: Is it cost-effective to maintain a direct care system that is sized to a peacetime demand that is much larger than the requirements of combat? Put another way, should DoD make or buy that portion of the health care required by its beneficiaries in peacetime that exceeds the care that would be provided in MTFs if the DoD system were sized to meet wartime requirements? This report follows two paths in resolving this issue: Sections III and IV examine the "make or buy" question within the context of the current arrangements for assigning financial responsibility for the employer share of health care costs. Section V discusses the impact of single-plan enrollment and alternative assignments of employer financial responsibility.

Both paths lead to the same essential element of the make/buy question: Can the Department effectively manage the demand effect associated with expanding access to the MTF system? If so, DoD could cost-effectively size the MTF system to peacetime demands for care. If not, the cost-effective solution for DoD is to size the MTF system to wartime requirements and buy peacetime care from civilian providers.

Two sources of the demand effect are identified in the report. First, beneficiaries with third-party health insurance are likely to make greater use of MTFs if these facilities become more accessible; as a result, DoD's costs would rise significantly. Under current procedures, however, very little additional revenue could be obtained from third-party insurers to offset the additional costs. Section V estimates that $3.9 billion in revenues (the difference in Table 8 between $10.4 billion in costs under "sponsor pays" and $6.5 billion under "non-DoD employer pays") could be generated annually if civilian employers of DoD beneficiaries were responsible for the employer portion of these individuals' insurance premiums. Second, a combination of beneficiary responses to free care and provider incentives within the MTF system causes utilization of DoD health care services to be much higher per capita than comparable rates under civilian health plans. RAND and IDA estimate (Box 12) that reducing utilization levels per capita to those of civilian HMOs could reduce DoD costs by $700 million. Thus, the impact of the third-party insurer component of the demand effect is about five times larger than that of the utilization component.

The increase in utilization caused by provider incentives and beneficiary behavior is an important problem which DoD is attempting to solve. Capitation budgeting and managed care hold great promise for reducing the costs of care within the DoD system. The cost reductions that can reasonably be expected are insufficient, however, under a "sponsor pays" system to make the size-to-peacetime case the cost-effective one for DoD.

Thus, sizing to peacetime requirements cannot be the cost-effective alternative unless DoD can manage the dominant component of the demand effect--the financial implications of non-payment to DoD by third-party insurers for care provided to DoD beneficiaries who are enrolled in third-party health plans. Since 1988, DoD has been authorized by statute to bill third-party insurers (except Medicare) for treatment provided in the DoD system. The revenues collected under this authority are very small, and significant hurdles remain in executing that mandate effectively. Current practice, then, closely approximates a "sponsor pays" system. The cleanest response lies in the implementation of single-plan enrollment, which would fix responsibility (either with DoD or non-DoD employers) for the employer share of health costs of DoD beneficiaries who are employed outside the Department. Making non-DoD employers responsible for these expenses would reduce DoD costs significantly and make the size-to-peacetime case the cost-effective option for the Department. Assigning DoD responsibility for the health care costs of its employed beneficiaries would entail a significant increase in DoD expenditures, but the (marginally) cost-effective response to that decision would, again, be to size to peacetime requirements.

Discussions of demand effects, the relative cost-effectiveness of MTFs and CHAMPUS, employer mandates, and Medicare subvention have been a part of the debate over the DoD medical system for some time. Work done for this study has added a more careful accounting of the full costs of DoD medical facilities, a quantitative assessment of what drives DoD health care costs, identification of the policy implications of that assessment, and an analysis of the salient aspects of single-plan enrollment for the future costs of the DoD medical system. The primary contribution of this report is in identifying management of the demand effect as the key to controlling DoD medical costs. DoD can cost-effectively size to peacetime requirements only if it manages the demand effect through a combination of:

- Single-plan enrollment;
- Assignment of responsibility for the employer share of health care costs;[25]
- Collection of payments from third-party insurers (including Medicare); and
- Managed care and capitation budgeting, possibly including copayments and deductibles for care received in MTFs.

If DoD is unable to implement these initiatives effectively, sizing to wartime requirements becomes the cost-effective alternative.

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[25]If DoD is assigned responsibility for the employer's share of health care costs for beneficiaries employed outside the Department, sizing to peacetime requirements will remain the cost-effective option, but the cost of the DoD health program will rise dramatically.

APPENDIX. ESTIMATING THE PEACETIME REQUIREMENT FOR PHYSICIANS

This appendix describes in greater detail how the peacetime requirement for military physicians is derived from the wartime requirement. What is said concerning the estimation of physician requirements is representative of issues faced in other personnel categories.

The wartime report identified four categories of physicians that support U.S. forces in combat: physicians assigned to nonmedical units in theater; physicians assigned to nonmedical units out of theater; physicians assigned to medical facilities in theater; and physicians assigned to medical facilities in the continental United States (CONUS). The wartime requirements for these respective physician categories are discussed in *Wartime Medical Requirements* (classified Secret), prepared as part of this study.

As noted in Section I of this report, DoD must maintain a somewhat larger number of physicians on active duty in peacetime than it needs to meet the wartime requirement. Two components of the peacetime military medical establishment are closely linked to the wartime mission:

- *Physicians assigned to nonmedical units, either at home or abroad.* These personnel, who often are referred to as "structure" physicians, remain with their units in wartime and are an explicit part of the wartime requirement. In peacetime, some of them work at great distances from MTFs; others (such as most CONUS-based structure physicians) are assigned to nonmedical units but work in MTFs, primarily delivering health care to active-duty personnel.

- *A CONUS-based training and rotation base for structure (and a few other) physicians.* By providing assignments in a clinical setting, these positions help medical personnel maintain and improve their skills. In addition, they enhance morale by providing relief from assignments outside of CONUS (OCONUS).[26] In peacetime, these positions are found in graduate medical education (GME) programs, some research programs, and in CONUS MTFs. In wartime, many of the personnel occupying such billets are mobilized and sent to medical facilities in theater or in CONUS.

The peacetime requirement for military physicians is shown in Table A-1 in comparison with currently programmed FY 1999 physician levels.

---

[26]It is DoD policy to operate facilities overseas in which active-duty personnel provide care for DoD beneficiaries. These individuals also require rotation base support.

Table A-1.
Calculation of Physician Requirements

Structure and OCONUS MTF Positions	3,078
Rotational Positions Required	1,853
Total Physicians	4,931
Programmed FY 1999 Physician Inventory	12,586

The number of rotational positions required is a product of three factors:

- The number of positions that must be maintained in the training and rotation base to support each physician requiring training/rotational support. This analysis assumes that each supported physician requires 1.2 positions in the base.
- The number of physicians who require support by the training and rotation base.
- The treatment of GME programs.

It should be noted that the general conclusions related to the requirement for active-duty physicians cannot be applied uniformly to the three military departments. There are service-specific missions, relating to both wartime and routine operational commitments, that create significant differences in total requirements for medical personnel and in the distribution of those personnel between the active and reserve components. Additionally, one service may be operating a lean peacetime force relative to its wartime requirements, while another may maintain a relatively large portion of its force overseas in peacetime, generating a much higher requirement for active physicians than the other services.

Two issues arise in the calculation of training and rotation base requirements. First, the current analysis assumes that only those physicians assigned to OCONUS MTFs or to OCONUS structure positions require support by the training and rotation base. Roughly 17 percent of Army and Air Force physicians assigned to nonmedical units, and Navy physicians assigned "with the fleet" or the Marine Corps, meet that standard. The rotation base requirement shown in the table above--1,853--represents a middle ground among conflicting opinions. Discussions are currently underway within the Department to refine the definition of personnel requiring rotation base support. Depending on the outcome of those discussions, the requirement could increase by as many as 600 positions relative to the number reported here.

The other source of disagreement concerning the training and rotation base involves the treatment of GME. This report treats GME as a source of physicians to fill the training and

rotation base. As such, GME programs cannot be said to generate an additional peacetime requirement in support of the wartime mission, but are included in the base.

Some assert that GME is an important and separate mission that cannot be satisfied within the current definition of peacetime support for the wartime mission. Currently, about 3,200 doctors participate in GME annually. Using a rough scaling algorithm and adjusting for the composition of the required GME programs, the number of GME physicians needed to support just the wartime requirement would be approximately 800 annually. These billets would have to be added to the peacetime requirement identified in Table A-1 if GME were to be treated as a separate element of that requirement.

Military department policies concerning specialty training for physicians differ dramatically. Some departments do much less GME in-house, while others do considerably more. This disparity in the approach to specialty training has no apparent effect on the relative quality of the physician corps among the military departments, and suggests that current GME programs tell us very little about GME "requirements." Granting that argument, however, and recognizing that GME programs based only on the wartime requirement will be much smaller than current programs, one could calculate a GME requirement that is as much as 800 physicians higher than the figure reported in Table A-1. Such an adjustment would raise the total requirement from 4,931 to 5,731 physicians, or about 46 percent of the physician inventory currently programmed for FY 1999.

The main purpose for pursuing this analysis is to assess whether a significant fraction of the current military medical establishment should be subject to the make/buy decision. The answer is clearly "yes." Additions to the wartime requirement of the size likely to be argued persuasively by various observers do not change the central conclusion of the analysis: about half of the currently programmed number of physicians cannot be justified on the basis of wartime requirements and should be subjected to a cost-effectiveness standard.

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The Congress, through enactment of the National Defense Authorization Act for Fiscal Years 1992 and 1993, Section 733, directed the DoD to conduct a survey of military medical care beneficiaries regarding the quality and availability of health and dental care. This report describes the survey requirements, design considerations, and sampling plan. It includes a discussion of access to care and knowledge of benefits, and presents analyses of the utilization of and satisfaction with outpatient, inpatient, and dental care.

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PREFACE

This paper was prepared by the Institute for Defense Analyses (IDA) for the Office of the Assistant Secretary of Defense (Personnel and Readiness), under a task entitled "Survey of Military Medical Care Beneficiaries." The objective of this task is to design a survey instrument and conduct analyses of the survey response data to determine access to and utilization of medical care services as well as the attitudes and knowledge of military medical care beneficiaries regarding various aspects of their health care benefits. This paper fulfills that objective by describing the survey design considerations; analyzing outpatient, inpatient and dental utilization; displaying satisfaction overall as well as with various aspects of outpatient, inpatient, and dental care; and summarizing comments made by survey respondents.

The authors are especially indebted to Arthur Kirsch, Chairman of the Department of Statistics at The George Washington University, for his help in designing the survey instrument.

This paper was reviewed within IDA by Arthur Fries, Christopher Jehn, and John Kane. It was also reviewed by two independent consultants, Katherine Railey and Wray Smith.

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EXECUTIVE SUMMARY

ES.1 BACKGROUND

The Congress, through enactment of the National Defense Authorization Act for Fiscal Years 1992 and 1993, Section 733, directed the Department of Defense to conduct a survey of military medical care beneficiaries regarding the quality and availability of health and dental care. According to the National Defense Authorization Act, "the study required by Sec. 733, subsection (a), shall ... include a survey of members of the Armed Forces and covered beneficiaries in order to —

> (1) determine their access to and use of inpatient and outpatient health care services in the military medical care system
>
> > (A) by source of care and source of payment, including private sector health insurance; and
> >
> > (B) in relation to civilian sector standards established for particular clinical services.
>
> (2) determine their attitudes and the extent of their knowledge regarding
>
> > (A) the quality and availability of health and dental care under the military medical care system;
> >
> > (B) their freedom of choice with respect to health care providers and level of health care benefits;
> >
> > (C) the premiums, fees, copayments, and other charges imposed under the military medical care system; and
> >
> > (D) any changes in the rules, regulations, or charges that characterize the military medical care system."

The body of this report provides detailed analyses in response to the congressional tasking. A summary of the results of the report is discussed in the following paragraphs.

ES.2 ACCESS TO CARE

The survey asked questions concerning four different aspects of access to outpatient care:

- number of telephone calls needed to make an appointment,
- time between making an appointment and the visit,
- time spent in the waiting room, and
- travel time to the facility.

The responses to these questions were compared for military and civilian facilities across several different beneficiary groups. Access to inpatient care was not considered because it is primarily controlled by the health care provider.

With the exception of travel time to the facility, most beneficiary family groups who used civilian facilities had better access than those who used military facilities. Because active-duty personnel tend to live closer to military facilities than retirees and survivors, active-duty personnel have shorter travel times to military facilities.

It was not uncommon to find large percentages (over 12 percent) of active-duty family members having to wait over two weeks for an appointment at a military facility. This applies to families of officers as well as enlisted, and to sponsors as well as other family members. Although retiree families also had long times to wait for an appointment at military facilities, this can be attributed to their lower priority for care, behind active-duty sponsors and their family members. There were also substantial numbers (13 percent of all beneficiaries) who had to wait over an hour in the waiting room at military facilities.

The disparities in access between military and civilian facilities were also reflected in respondents' satisfaction with certain aspects of care. These aspects include the four measures of access just discussed as well as several others that are more difficult to measure objectively, including:

- availability of parking,
- hours when facility is open,
- ability to see specialists when needed,
- ability to use emergency room/services,
- ability to get medical advice over the phone, and
- ability to see doctor of choice.

Dissatisfaction with these components of care was considerably higher for those beneficiaries who used military facilities than for those who used civilian facilities. Roughly a quarter of all active-duty families who used military facilities were dissatisfied with most of these components (about 10 percent were dissatisfied with the facility hours and about 15 percent were dissatisfied with emergency services). The corresponding numbers for beneficiaries who used civilian facilities generally ranged between 5 and 15 percent. Although retiree families generally have poorer access to military facilities than active-duty sponsors and their family members, fewer retirees expressed dissatisfaction with access.

ES.3 KNOWLEDGE OF HEALTH CARE BENEFITS

Beneficiaries' knowledge of military health care benefits was measured in two ways. First, one question asked if beneficiaries knew where to go or whom to contact to get

information on various aspects of their health care benefit. Second, a pair of questions asked beneficiaries about their current CHAMPUS deductibles and copayments. The choices for the latter pair of questions included the currently correct amounts, the amounts before they were changed (about a year prior to administration of the survey), and some incorrect choices that do not reflect the benefit at any point in time. The responses to these questions provided a means for examining whether beneficiaries knew about the benefits pertaining to their status and whether they were familiar with recent changes to those benefits.

As might be expected, knowledge of health care benefits varied widely across beneficiary type. Generally, junior-enlisted (E-1 to E-4) personnel knew the least about their benefits. This is undoubtedly because this group has the least experience with the military health care system. They seemed to know the least about freedom of choice in selecting health care providers and about when a Nonavailability Statement is needed. (Actually, their lowest level of knowledge was about health benefits after age 65, but it was not considered crucial that they know this.) Although senior-enlisted personnel (E-5 to E-9) and officers seemed to know a lot more about their benefits, they also knew the least about freedom of choice in selecting health care providers and when a Nonavailability Statement was needed (again, not counting health benefits after age 65).

Retirees seemed to know less about their benefits than active-duty personnel, except junior-enlisted. Retirees knew the least about dental care available at military facilities (retirees typically have difficulty accessing dental care at military facilities). A surprisingly large number (69 percent) of retirees under 65 did not know about military health benefits after age 65. Even retirees over 65 did not have a good understanding of the benefits pertaining to their age group; over 40 percent did not know where to obtain information about military health benefits after age 65.

Less than 20 percent of junior-enlisted personnel responded correctly to the questions concerning CHAMPUS deductibles and copayments. In no case did more than 30 percent of any other beneficiary group respond correctly to either question. A plurality of beneficiaries responded simply that they did not know what the deductibles and copayments were. In most instances, when beneficiaries specified a deductible or copayment amount, it was lower than the actual amount.

ES.4 UTILIZATION OF HEALTH CARE

ES.4.1 Outpatient Utilization

Outpatient utilization was measured as the average number of visits per beneficiary during a 12-month period. This period is defined as the 12 months prior to

the date the survey was completed, and can vary from respondent to respondent since the survey was in the field for six months. Beneficiaries were categorized into four groups for the purpose of this analysis: active-duty sponsors; family members of active-duty sponsors; retired sponsors or survivors under 65 and their families; and retired sponsors or survivors 65 and over and their families.

Active-duty sponsors were considered separately because they are generally required to use military treatment facilities (MTFs). Exceptions may occur when the required care is unavailable at an MTF or when private funds or insurance are used, but these are relatively rare. Family members of active-duty sponsors, on the other hand, have the option of using MTFs or civilian facilities for their care. For certain outpatient procedures, however, a Nonavailability Statement (NAS) must be obtained from the local MTF before CHAMPUS will pay for them. Retired sponsors, survivors, and their families also have the option of using civilian facilities, but are covered by CHAMPUS only if they are under 65. The latter category of beneficiary is more likely to live in a noncatchment area (more than 40 miles from a military hospital) and to have additional insurance coverage than active-duty families.

Table ES-1 shows the estimated number of annual visits to both military and non-military facilities (civilian, VA, and other facilities) for each beneficiary type. All visits are counted, regardless of whether they were paid for by the DoD.

Table ES-1 Average Number of Visits for Outpatient Care by Source of Care

Source of Care	Active-Duty Sponsors	Active-Duty Family Members	Retirees and Survivors < 65 and Family Members	Retirees and Survivors ≥ 65 and Family Members	All Beneficiaries
Military Facilities	3.1	3.1	1.6	1.8	2.4
Civilian Facilities	0.1	1.2	2.7	4.2	1.9
VA Facilities	0	0	.2	.3	.1
Other Facilities	.1	.1	.1	.1	.1
All Facilities	3.3	4.4	4.6	6.4	4.5

Note that the numbers in Table ES-1 are considerably smaller than those derived from official data sources. This is because of the way the official numbers are developed. For example, visits to separately organized clinics during a medical examination (e.g., optometry, physical exam, immunization, etc.) are each counted by the DoD as distinct visits. Also, phone calls for medical advice (if documented) are counted as outpatient visits. However, it is unlikely that most respondents think of an outpatient visit in this manner. A visit to several different clinics during a physical examination is likely to be

thought of as a single visit and a phone call for medical advice is not likely to be thought of as a visit at all. Therefore, the survey numbers are smaller because the beneficiaries and DoD are defining visits differently.

Among all beneficiaries together, the average number of visits was 4.5 per year. This compares with approximately 5 visits per year in the general population. Overall, utilization was almost evenly divided between military and non-military facilities. There were large differences in utilization patterns across beneficiary groups, however. As expected, active-duty sponsors used military facilities almost exclusively for their care, averaging slightly over three visits per year. Active-duty family members predominately used military facilities, but used civilian facilities for about one-fourth of their care. Because of access difficulties to military facilities and residence closer to civilian facilities, retirees/survivors and their family members predominately used civilian facilities for their care. Retirees/survivors under 65 and their family members averaged between four and five visits per year, almost 60 percent of which were to civilian facilities. Retirees/survivors 65 and over and their family members used more outpatient care than other groups, over six visits per year. Two-thirds of these visits were to civilian facilities.

As for method of payment, the majority of active-duty family members used CHAMPUS to pay for care at civilian facilities. A sizable number (about 20 percent) also cited using private health insurance or one of the new military health care programs (see Appendix B for a description of these programs) to pay for care. The majority of retiree families used either private insurance or a combination of private insurance and Medicare Part B (depending on whether the sponsor was over 65). Over 40 percent of retirees under 65 also used CHAMPUS to pay for their care.

ES.4.2 Inpatient Utilization

The measure of inpatient utilization was divided into two components—the likelihood of being admitted to the hospital and the length of stay in the hospital, both during a 12-month period. This period is defined as the 12 months prior to the date the survey was completed, and can vary from respondent to respondent since the survey was in the field for six months. Beneficiaries were categorized into the same four groups used for the outpatient analysis: active-duty sponsors; family members of active-duty sponsors; retired sponsors or survivors under 65 and their families; and retired sponsors or survivors 65 and over and their families.

Table ES-2 shows the percentages of beneficiaries hospitalized at both military and non-military hospitals (civilian, VA, and other hospitals) for each beneficiary type. All inpatient episodes are counted, regardless of whether they were paid for by the DoD.

Table ES-2 Percentage of Beneficiaries Hospitalized by Source of Care

Source of Care	Active-Duty Sponsors	Active-Duty Family Members	Retirees and Survivors < 65 and Family Members	Retirees and Survivors ≥ 65 and Family Members	All Beneficiaries
Military Hospitals	7.2%	9.2%	3.7%	5.6%	6.4%
Civilian Hospitals	.8	6.1	8.5	15.8	7.2
VA Hospitals	.2	0	.8	1.8	.6
Other Hospitals	.4	.4	.6	.6	.5
All Hospitals	8.6	15.7	13.6	23.8	14.7

Almost 15 percent of the beneficiary population was hospitalized at least once during the 12-month period prior to the survey. This compares with 7.8 percent of the general population who had at least one inpatient episode. Excluding those who used VA and other hospitals (only one percent of the population), utilization was almost evenly divided between military and civilian hospitals. There were large differences in utilization patterns across beneficiary groups, however. As expected, the vast majority of active-duty sponsors used military hospitals for inpatient care. Active-duty family members also used military hospitals for the majority of their inpatient care, but a substantial number also used civilian hospitals. The majority of inpatient episodes for this beneficiary group, at both military and civilian hospitals, were for childbirth. Retirees/survivors and their family members predominately used civilian hospitals for inpatient care, particularly the group with a sponsor age 65 or over. As the latter group is older, on average, than the other beneficiary groups, a larger percentage of this group requires hospitalization during a year.

Table ES-3 shows the average length of stay (in nights) at both military and civilian hospitals for each beneficiary type. VA and other hospitals are not shown because so few beneficiaries were hospitalized there.

Table ES-3 Average Nights of Stay by Beneficiary Type

Source of Care	Active-Duty Sponsors	Active-Duty Family Members	Retirees and Survivors < 65 and Family Members	Retirees and Survivors ≥ 65 and Family Members	All Beneficiaries
Military Hospitals	5.4	4.0	6.0	7.0	5.0
Civilian Hospitals	2.9	6.1	6.4	8.0	6.6

For all beneficiary groups except active-duty sponsors (who seldom use civilian hospitals), stays in civilian hospitals were longer, on average, than stays in military hospitals. This disparity persisted even when the reason for the hospitalization was taken into account (there could, however, be a great deal of variation in the scope and severity of the problem treated). As expected, retirees and survivors over 65 and their families had the longest average stays.

Regarding method of payment, the patterns were very similar to those for outpatient care. The large majority of active-duty family members used CHAMPUS to pay for care at civilian hospitals. Almost 10 percent of senior-enlisted (E-5 to E-9) families and over 10 percent of officer families used private health insurance to pay for inpatient care. The majority of retiree families used either private insurance or a combination of private insurance and Medicare (depending on whether the sponsor was over 65). Over 50 percent of retirees under 65 also used CHAMPUS to pay for their care.

ES.5 SATISFACTION WITH HEALTH CARE

ES.5.1 Satisfaction With Outpatient Care

Satisfaction with outpatient care was determined from the responses to questions asking the beneficiary to rate the facility and staff with regard to a number of different factors. There was also a question addressing overall satisfaction. All questions were directed to the most recent visit for outpatient care, provided it was within the last six months. This period of time was considered long enough to allow for a sufficient number of responses while not placing undue burden on beneficiaries' recall abilities. Because respondents were asked to evaluate their most recent visit only, the ratings for military and civilian facilities were made by different beneficiaries.

Overall satisfaction was high for both military and civilian facilities across all beneficiary groups. For active-duty families who used military facilities, the rate of satisfaction (either "very satisfied" or "satisfied") ranged from 73 percent for junior-enlisted (E-1 to E-4) families to 83 percent for officers. The corresponding range for active-duty families who used civilian facilities was 86 to 90 percent. Retiree families experienced the highest levels of satisfaction with military facilities of all the beneficiary groups. This may seem surprising in light of this group's poorer access to military facilities and its expressed dissatisfaction with various aspects of outpatient care. It may be that the primary source of this group's overall satisfaction is the free care provided at military facilities.

ES.5.2 Satisfaction With Inpatient Care

Satisfaction with inpatient care was determined from the responses to questions, parallel to those for outpatient care, asking the beneficiary to rate the hospital and staff with regard to a number of different factors. There was also a question addressing overall satisfaction. All questions were directed to the most recent hospitalization, provided it was within the last 12 months. This was a longer period of time than allowed for outpatient visits because hospitalizations are far more infrequent and because it is easier to recall an inpatient episode. Because respondents were asked to evaluate their most recent hospital stay only, the ratings for military and civilian hospitals were made by different beneficiaries.

Patterns of satisfaction with inpatient care were similar to those for outpatient care, except that overall levels were higher. For active-duty families, the satisfaction rate (either "very satisfied" or "satisfied") for those who used military hospitals ranged from 81 percent for senior-enlisted (E-5 to E-9) to 86 percent for officers. The corresponding range for those who used civilian hospitals was 84 to 90 percent. Again, retiree families experienced the highest levels of satisfaction with military hospitals of all the beneficiary groups. In fact, a substantially higher percentage of over-65 retiree families stated they were "very satisfied" with military hospitals (68 percent for military hospitals versus 50 percent for civilian hospitals). This difference in satisfaction was apparent throughout the various components of inpatient care as well.

ES.5.3 Satisfaction With Dental Care

Satisfaction with dental care was determined in a manner similar to that for outpatient and inpatient care. The family member with the most recent dental visit (within the last 6 months) was asked to rate various aspects of dental care as well as to give an overall rating. Although the majority of beneficiary families were either satisfied or very satisfied with dental care (from 67 percent for retirees and survivors under 65, to 84 percent for officers), overall satisfaction with dental care at military facilities was lower than for either inpatient or outpatient care. Beneficiary families also appeared to be more polarized regarding dental care, as evidenced by a high rate of dissatisfaction ("dissatisfied" or "very dissatisfied") ranging from 7 percent for officers to 23 percent for retirees and survivors under 65.

The satisfaction rate with civilian facilities was substantially higher, particularly for retirees and their families. (Access to dental care at military facilities by retirees and family members is quite limited.) The group most dissatisfied with dental care at military

facilities—retirees and survivors under 65—was one of the most satisfied (91 percent) with the care received at civilian facilities. Overall satisfaction with civilian facilities ranged from 84 percent for junior-enlisted families to 92 percent for retirees and survivors age 65 and over.

ES.6 ANALYSIS OF COMMENTS

Enclosed with each questionnaire was a Comment Sheet for any written comments respondents cared to make. A sample of 4,678 respondents' comments was analyzed. Approximately 34 percent of the sample wrote comments. The issues outlined in the respondent comments were primarily negative in nature. About a third of those writing comments were dissatisfied or very dissatisfied with their military medical benefits, whereas of those not writing comments, only about one-eighth were dissatisfied or very dissatisfied.

Concerns frequently mentioned by respondents included: inadequate dental care, inadequate resources and specialists available at health-care facilities, excessive waiting periods associated with obtaining appointments, rude or unresponsive attitudes of health-care providers and/or staff, and difficulties in obtaining medications and dealing with pharmacies.

It is important to note that respondents were not entirely negative. Comments were often coupled with suggestions and recommendations on how to improve the military health care system.

1.0 INTRODUCTION

1.1 CONGRESSIONAL MANDATE

The Congress, through enactment of the National Defense Authorization Act for Fiscal Years 1992 and 1993, Section 733, directed the Department of Defense (DoD) to conduct a comprehensive review of the military medical care system, private sector alternatives, and beneficiary attitudes and knowledge regarding the quality and availability of health and dental care. According to the National Defense Authorization Act, "the study required by Sec. 733, subsection (a), shall ... include a survey of members of the Armed Forces and covered beneficiaries in order to —

(1) determine their access to and use of inpatient and outpatient health care services in the military medical care system

(A) by source of care and source of payment, including private sector health insurance; and

(B) in relation to civilian sector standards established for particular clinical services.

(2) determine their attitudes and the extent of their knowledge regarding

(A) the quality and availability of health and dental care under the military medical care system;

(B) their freedom of choice with respect to health care providers and level of health care benefits;

(C) the premiums, fees, copayments, and other charges imposed under the military medical care system; and

(D) any changes in the rules, regulations, or charges that characterize the military medical care system."

The congressional tasking was analyzed, and it was determined that a number of issues could be addressed only by the survey. These issues received the highest priority. Other issues could be addressed either by the survey or by other means. Many of these issues were also included in the survey. The decision on inclusion was based on the potential length and complexity of the questionnaire.

1.2 SURVEY REQUIREMENTS

In addition to the congressional mandate, there were other reasons why a survey of beneficiaries was needed. The last comprehensive survey of beneficiaries was conducted in 1984, over nine years ago. Since 1984, many significant changes have been made to the

Military Health Services System (MHSS). These include cost containment measures such as paying civilian hospitals according to diagnosis-related groups,[1] financial changes for beneficiaries such as higher CHAMPUS (Civilian Health and Medical Program of the Uniformed Services) outpatient deductibles and copayments, and changes in the administration and delivery of health care designed to reduce costs to both the government and the beneficiary.

Another vital function of the survey is to provide data on utilization levels by beneficiary class. Some gaps in the MHSS health care utilization data sources, particularly for outpatient care, cannot be filled practically from other sources. DoD has access to data on utilization of military health facilities and CHAMPUS-reimbursed utilization levels. However, the extent to which beneficiaries use the civilian system for health care not paid for by DoD is unknown.

Knowledge of utilization levels helps in responding to issues that arise about the consumption of care by military beneficiaries relative to non-beneficiaries. Do military beneficiaries consume more health care than civilians outside the MHSS? If so, are there reasons such as military requirements (pre-flight physicals, occupational injury) for these differences?

Utilization information also is important in forecasting future demand for DoD-funded health care. For budgetary planning, DoD might find it useful to be able to predict utilization on the basis of personnel characteristics. For people with other coverage, DoD is the payer of last resort, which means that an increase in unemployment or in jobs without health benefits can increase demand for DoD-financed care.

1.3 QUESTIONNAIRE DESIGN PROCESS

The questionnaire was designed in five phases:

- framework development,
- initial design,
- iterative revision,
- pretest, and
- final revision and approval.

The framework development phase began with a meeting with the Survey Working Group to define goals. Project staff included staff members from the Office of the Assistant Secretary of Defense (Personnel and Readiness) [OASD(P&R)], Institute

[1] This is a classification scheme for standardizing and limiting payments for inpatient care used by Medicare and other civilian payers.

for Defense Analyses (IDA), Vector Research Incorporated (VRI), and consultants. The project staff worked closely with the joint Survey Working Group, which consisted of representatives from the Office of the Secretary of Defense (OSD), the military Services, and the Office of Management and Budget (OMB). OASD(P&R) staff, working with IDA, identified additional issues and held individual meetings with the Survey Working Group members to solicit any additional issues or questions they felt were important to include in the questionnaire. Table 1.1 shows the Health Care Survey issues that were contained in the congressional mandate as well as those identified by project staff.

Table 1.1. DoD Health Care Survey Issues

A. Congressional issues:
   1. Access to and use of inpatient and outpatient health care services.
   2. Attitudes and knowledge regarding military health care benefits and services.

B. Other Issues:
   1. Valuation of health care benefits.
   2. Utilization of preventive health care services.
   3. Satisfaction with obstetrical/gynecological (OB/GYN) services.
   4. Expected utilization of health care facilities in the future.
   5. Hypothetical use of new kinds of health plans.

Because the purpose of this section is to describe the considerations that influenced the survey design process, all issues that were considered are shown in Table 1.1. However, this report deals only with the analysis of the congressional issues.

The design phase began with the collection and review of related survey instruments. Next, questions were selected and adapted from other surveys that related to the issues identified in Table 1.1. Additional questions were constructed as necessary to cover all the issues.

Once all the essential issues were covered, an initial draft of the questionnaire was developed. The order of the questions was changed to improve the question flow for the respondent. This meant moving from simpler to more complex questions and moving from less sensitive to more sensitive topics. Questions were consolidated by grouping together those that had similar topics and response patterns, and the questions were grouped by subject area. Project staff then put together a draft questionnaire for review.

The next stage was iterative revision. The questionnaire was provided to the

Survey Working Group and the Integration and Study Management Group (the latter was responsible for overseeing and coordinating the efforts of researchers involved in the evaluation of the cost of wartime and peacetime medical care, the survey of military medical care beneficiaries, and an assessment of the quality of medical care provided to beneficiaries) for comment. In response to those comments, wording was revised, questions rearranged into a logical order, and additional "skip logic" devised to route respondents around items that did not apply to them.

Next, the questionnaire was pretested at three different sites with a variety of respondents. The pretest results are described in section 1.4. The questionnaire was revised to reflect the lessons learned from the pretests.

The final stage was the final approval and revision. After a final review within OSD, the instrument was sent to the Defense Manpower Data Center (DMDC) for printing and distribution. The final instrument is described in section 1.5 and is reproduced as Appendix A. The plan for drawing the sample of approximately 45,000 potential respondents is described in section 1.6, the survey operations in section 1.7, and the preparation for analysis in section 1.8.

1.4 PRETEST RESULTS

Once an acceptable version of the questionnaire was developed, the questionnaire was ready for pretesting. The purpose of pretesting is to make sure respondents are interpreting the questionnaire as the authors intended. The interpretation of questions and the range of choices offered is explored as well as the clarity of instructions and appropriateness of the reading level. The questionnaire was pretested at Charleston, South Carolina (Navy/Marine Corps), on July 16-17, 1992; Fort Knox, Kentucky (Army), on July 24, 1992; and Dover, Delaware (Air Force), on August 4, 1992. The Service representatives on the Survey Working Group recommended the sites and asked the medical commanders at the sites to recruit pretest respondents for separate meetings of officers, enlisted personnel, and retirees. The total pretest population included 27 officers, 47 enlisted personnel, and 46 retirees.

At each meeting, respondents were asked to fill out the questionnaire, marking any questions or instructions that were difficult to understand, incomplete (i.e., did not have the full range of possible answers), or missed the point. After the questionnaires were completed, the OASD(P&R) staff member conducting the pretest went through the questionnaire asking for comments about the individual questions. Often, discussion and "stories" accompanied questions. As a result of the first two pretests, the questionnaire was revised for the Dover

pretest. Most of the modifications to the pretest versions concerned the wording of questions and the exhaustiveness and exclusivity of the response categories.

The wording of questions needs to be clear, direct, and unambiguous. For categories of responses to be useful, they must be well-defined, univocal, exhaustive, and, where possible, mutually exclusive. Well-defined means that different researchers working independently will sort the same response into the same category. Univocal means measuring only one behavior or opinion with a single category. Exhaustive means the set of response categories account for all conceivable responses to a particular question. Finally, mutually exclusive means a response can be sorted into only one category. Often, responses to questions with the instructions "Mark all that apply" are not mutually exclusive.

The results of the pretest were generally encouraging. All of the problems were solved by improving the precision of question wording, by providing additional instructions in concise, simple language, and by clearly defining categories and response options in accordance with the principles of good category design. The reading level established seemed appropriate. Wherever possible, clinical terms were avoided and common terms used. Respondents were queried about what they did not understand about a question so that ambiguities could be resolved or questions rephrased. The length of the questionnaire did not pose a problem for the pretest respondents. Respondents completed the items within the 30 minutes established as a maximum. For single members without dependents and in good health, the questionnaire took only 10 minutes on average to complete.

1.5 FINAL SURVEY INSTRUMENT

1.5.1 Overview

The final survey instrument (reproduced as Appendix A) consists of 109 questions organized into the following seven sections plus a Comment Sheet:

- Sponsor and Family Information,
- Health Care Benefits,
- Recent Medical History,
- Most Recent Visit for Outpatient Care,
- Most Recent Hospital Stay,
- Most Recent Dental Visit, and
- General Information.

Each of these sections is described below.

1.5.1.1 Sponsor and Family Information

The first 19 questions asked for demographic and geographic information, such as family size, location, age, employment status, use of assistance programs, and income.

1.5.1.2 Health Care Benefits

In this section (Questions 20-33), the survey addressed CHAMPUS benefits, beneficiaries' insurance coverage, and their knowledge of their military health care benefits. Beneficiaries whose families are eligible for CHAMPUS were asked about the type of coverage they had and who paid for it. Some basic informational questions were asked to determine respondents' familiarity with the Military Health Services System. All respondents were asked if they know whom to contact or where to get information on various aspects of the system such as DEERS enrollment procedures.[2] Those eligible for CHAMPUS coverage were asked about the level of CHAMPUS deductibles and copayments.

1.5.1.3 Recent Medical History

The section on recent medical history (Questions 34-49) collected health status and health care utilization data. For each family member, questions were asked about health status, number of outpatient visits in the last year, number of hospital nights in the last year, number of outpatient visits expected in the next year, and whether any inpatient stays were expected in the next year.

To enrich the utilization analysis, more detailed information was requested for a "randomly-selected" family member. The selection was made by choosing the person with the most recent birthday. In other sections of the questionnaire, questions were asked regarding the person with the most recent outpatient visit or hospital stay. For the analyses of satisfaction, questions about the most recent visit were asked to elicit responses from people who were familiar with the system and had used it recently. However, for the analyses of utilization levels, information on the most recent visit is biased toward people who have high utilization, and a randomly-selected family member is therefore more appropriate.

1.5.1.4 Most Recent Visit for Outpatient Care

This section (Questions 50-71) addressed the most recent visit for outpatient care

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[2] The Defense Enrollment Eligibility Reporting System (DEERS) is a system for maintaining control over access to military health care services by authorized persons; enrollment is mandatory for non-emergency medical care.

for the person in the family with the most recent visit, provided that visit occurred within the last six months. Questions asked about the reasons for the visit and the location and type of medical facility used. There were also questions designed to objectively measure access such as the number of phone calls needed to make an appointment, as well as questions about the patient's overall satisfaction with care, satisfaction with specific aspects of the facility and staff, time medical professionals spent with the patient, and sources of funds used to pay for the visit.

1.5.1.5 Most Recent Hospital Stay

This section (Questions 72-89) asked questions parallel to those in the outpatient section, but about the most recent hospital stay. Because patients were more likely to recall a hospital stay than an outpatient visit, respondents are asked to answer the questions if anyone in the family had a hospital stay within the last year. As with outpatient care, respondents were asked to rate their satisfaction with the overall quality of care and with specific aspects of the facility and staff, to report the type and location of the hospital, and to report the sources of funds that were used to pay for the stay. There were also questions about whether surgery was performed during the stay and whether the patient was admitted from the emergency room.

1.5.1.6 Most Recent Dental Visit

The section on dental care (Question 90-99) asked about the reason for the most recent visit (provided it was within the last six months), the type and location of the facility used, satisfaction with aspects of the facility and staff, and overall satisfaction with the care received.

1.5.1.7 General Information

This section (Questions 100-109) contained questions that did not reasonably belong in any of the previous sections. Respondents were asked about reasons for family members not getting health care when they wanted to, and about satisfaction with the overall military health care benefit. They were also given a list of possible concerns about military treatment facilities (such as difficulty getting an appointment) and were asked if they have any of these concerns. To get respondents' views of alternative medical plans, the questionnaire posited two hypothetical choices, a civilian Health Maintenance Organization (HMO) and a military HMO, and asked respondents whether they would prefer each HMO to the current system, given various charges. Women were asked about their satisfaction with specific aspects of obstetrical and gynecological care, including the

ability to get routine tests and availability of appointments. Finally, respondents were asked who completed the questionnaire, when it was completed, and whether they had any comments.

1.5.1.8 Comment Sheet

A Comment Sheet was enclosed with the questionnaire. The respondent was asked to provide some background information on the Comment Sheet plus his/her written comments. The results of an analysis of the comments are included in Chapter 9.

1.5.2 Issues Addressed

The questionnaire was designed to address all the congressionally-mandated issues, as well as additional issues that were important to OSD. Table 1.2 contains a cross-reference list of the survey issues and the questions that address them.

Table 1.2 Survey Issues and Related Questions

Survey Issue	Survey Question Numbers
1. Access to and use of inpatient and outpatient health care services:	
(A) By source of care and source of payment, including private health insurance	24, 25, 27-30, 46, 47, 49, 56-67, 71, 78-80, 82-85, 89, 95-98, 100, 101
(B) In relation to civilian-sector standards established for particular clinical services	34-38, 44, 48, 57, 78, 81, 95
2. Attitudes and knowledge regarding:	
(A) The quality and availability of health and dental care under the MHSS	20, 26, 68-70, 86-88, 99, 102, 104
(B) Their freedom of choice with respect to health care providers and level of health care benefits	20, 26
(C) The premiums, fees, copayments, and other charges imposed under the MHSS	20-23, 68-70, 86-88, 99
(D) Any changes in the rules, regulations, or charges that characterize the MHSS	21-23
3. Valuation of health care benefits	31-33
4. Utilization of preventive health care services	45
5. Satisfaction with OB/GYN services	103
6. Expected utilization of health care facilities in the future	39, 40
7. Hypothetical use of new kinds of health plans	105, 106

1.6 SAMPLING PLAN

1.6.1 Development of Survey Sampling Plan

Based on related survey analyses and discussions with the Survey Working Group members and staff, a consensus was reached that the variables with the strongest likely impact on the study outcomes (access, utilization, satisfaction, etc.) are beneficiary category, family status (with or without dependents), and geographic region. The beneficiary categories are:

- junior enlisted (E-1 to E-4),
- senior enlisted (E-5 to E-9),
- officers (warrant and commissioned),
- retirees under age 65,
- retirees age 65 and over, and
- survivors of deceased service members and retirees.

Active-duty personnel are required to use military treatment facilities for their care unless the required services are unavailable. Family members, however, may use civilian medical facilities for most of their outpatient care, and for inpatient care if they reside more than 40 miles from a military hospital. Junior enlisted personnel tend to be in better health and to have lower family incomes than the other beneficiary groups. They or their spouses are also more likely to be pregnant. These factors will determine freedom of choice in selecting military or civilian health care providers and will affect utilization rates. In addition, the military is a hierarchical system based on rank and, consequently, paygrade and whether one is enlisted or an officer may affect access to health care. (This is not a matter of official policy, but it is a fact of life in the military.) Retirees are older, need more health care, and reside farther from military treatment facilities. Once retirees reach age 65, they become eligible for Medicare and lose their CHAMPUS eligibility. These considerations led to the beneficiary categories given above.

Over the past several years, numerous military health care initiatives and demonstration projects have been implemented across the country. These initiatives vary in scope, features, and cost by geographic region. All are designed to save the government and the beneficiary money by providing more efficient management and delivery of health care services. To facilitate the generation of the sample, a mapping of ZIP codes to the proposed regional stratification groups defined by the health care initiatives and demonstration projects was developed. Estimates of the beneficiary populations in these groups were then produced. Several iterations of the mapping and estimating had to be performed, because the resulting population estimates often provided

information that led to redefinition of the regional stratification groups. At the end of this process, 14 major groups with large beneficiary populations were identified:

- Army Catchment Area Management (CAM) sites,
- Army Gateway to Care sites,
- Navy CAM sites,
- Air Force CAM sites,
- CHAMPUS Reform Initiative (CRI) sites,
- TRICARE (Tidewater region) sites,
- MTFs in overlapping catchment areas,
- Southeast region Fiscal Intermediary/Preferred Provider Organization (FI/PPO),
- PRIMUS/NAVCARE sites,
- New Orleans CRI-like demonstration,
- Noncatchment areas,
- Outside the 50 states,
- No initiatives, and
- Shipboard.

Descriptions of these groups and their associated initiatives are given in Appendix B, and the method used to link beneficiaries to the regional stratification groups is described in Appendix C. Classifying sponsors by family status, survey region, and beneficiary category yielded 73 stratification cells (not all combinations are represented). These cells constituted the first stage of the sampling plan.

The traditional rationale for stratification is to use the reduced variance in homogeneous groups to obtain a better estimate of a population parameter (such as a satisfaction rate). That was a factor in the decision to stratify by beneficiary category and region. In the case of this survey, there is a second reason for stratification—to ensure that the sample is large enough to identify any differences in responses among different groups.

1.6.2 Final Sampling Plan

Tables 1.3 and 1.4 contain the Stage 1 and Stage 2 sampling plans for the survey. The total planned sample size was about 45,000. The Stage 1 plan was based on the initial framework for the study. A description of the assumptions and methodology used to determine the sample size in each cell of the Stage 1 sampling plan can be found in Appendix D. The Stage 2 plan was added to accommodate requests for oversampling of Army enlisted personnel and reserve retirees.

Table 1.3 Stage 1 Sampling Plan

	Without Dependents			With Dependents					
REGION	Enlisted E-1 to E-4	Enlisted E-5 to E-9	Officers	Enlisted E-1 to E-4	Enlisted E-5 to E-9	Officers	Retirees Under 65	Retirees 65 and Over	Survivors
Army CAM Sites				590	590	590	590	590	
Army Gateway to Care Sites				590	590	590	590	590	
Navy CAM Sites				590	590	590	590	590	
Air Force CAM Sites				590	590	590	590	590	
CRI Regions				590	590	590	590	590	
Tidewater Region				590	590	590	590	590	
MTFs in Overlapping Catchment Areas				590	590	590	590	590	
Southeast Region FI/PPO				590	590	590	590	590	
PRIMUS/NAVCARE Sites				590	590	590	590	590	
New Orleans CRI-Like Demonstration				590	590	590	590	590	
Noncatchment Areas				590	590	590	590	590	
Outside the 50 States				590	590	590	590	590	
No Initiatives				590	590	590	590	590	
Shipboard				590	590	590			
Total	590	590	590	8,260	8,260	8,260	7,670	7,670	590

Table 1.4 Stage 2 Sampling Plan

Army Catchment Area	Army Enlisted E-1 to E-4	Army Enlisted E-5 to E-9	Reserve Retirees Under 65	Reserve Retirees 65 and Over
Area 1	10	10		
Area 2	10	10		
Area 3	10	10		
⋮	⋮	⋮		
Area 38	10	10		
Total	380	380	590	590

The Stage 1 sampling plan uses the health care initiatives described in Section 1.6.1 to stratify the active-duty beneficiaries with dependents and the retirees only. The remaining categories are active-duty beneficiaries without dependents, and survivors. The former are required to use military treatment facilities and are unlikely to be greatly affected by the health care initiatives. The latter are relatively few in number and most are over 65 without eligible children. It was therefore decided to sample relatively few of these beneficiary groups—590 each of junior-enlisted, senior-enlisted, officers, and survivors—and not to stratify that part of the sample by health care initiative.

The Stage 2 sampling plan adds 760 Army enlisted personnel, stratified by pay group and catchment area, to the sample. It also adds reserve retirees as a separate group—590 who are under age 65, and 590 who are age 65 and over.

1.7 SURVEY OPERATIONS

1.7.1 Survey Packets

The final comments of the Survey Working Group, the Integration and Study Management Group, and the members of the Steering Committee were incorporated into the questionnaire by September. An optical scan instrument was then prepared. The questionnaire was accompanied by the comment sheet, a return envelope, a letter from the Assistant Secretary of Defense (Personnel and Readiness) requesting responses, and a one-page request that the family member who knew the most about the family's health care should assist with the response.

1.7.2 Mailings

The first mailing to active-duty members and retirees sampled was in late November 1992. Two weeks later, a postcard reminding potential respondents of the importance of the questionnaire was mailed to all active-duty members and retirees sampled. Because there were delays in the first mailings due to the Christmas season, a second mailing of the questionnaire was delayed until late February 1993. This mailing was to those who had not returned their questionnaires by the cut-off date (approximately three weeks before the mailing date). A separate mailing to survivors took place in early March. Finally, questionnaires were mailed for a third time in mid-April to active-duty members who had not responded.

1.7.3 Data Reduction

The questionnaires were scanned using an Opscan 20 optical scanner. Prior to scanning, forms were visually reviewed to correct for errors in the completion of forms (e.g., forms completed in ink rather than No. 2 pencils or where marks were too light for optical scanning). Information from the survey instrument was then matched to the population file to ensure that administrative data (military Service, paygrade, beneficiary status, etc.) from the population file were available for analysis.

1.7.4 Response Rates

The survey questionnaire was sent to 44,293 active-duty sponsors, retirees, and survivors eligible for military health benefits. Of these, 7,620 were returned as "postal nondeliverable" (PND), leaving 36,673 beneficiaries who presumably received the survey. The large PND rate was due primarily to inaccurate addresses for active-duty personnel. Nearly 24 percent of questionnaires mailed to active-duty personnel were returned as nondeliverable. The corresponding number for retirees and survivors was only 7 percent. The reason for this discrepancy is that the active-duty population is very mobile (particularly the Army and Navy) and it is difficult to keep addresses current on a real-time basis. Of those who received the survey, 25,978 responded (any survey that was returned with at least one question filled in was considered a response), yielding an adjusted survey response rate of 71 percent.

Figure 1.1 displays the response rates for each beneficiary group and Figure 1.2 displays them by Service. The dashed line in each figure represents the survey average. As can be seen, officers and all the retiree groups responded at a very high rate—nearly 80 percent. Senior-enlisted personnel (E-5 to E-9) responded at close to the survey average but junior-enlisted personnel (E-1 to E-4) and survivors responded at a rate of less than 50 percent. Historically, junior-enlisted personnel have been a difficult group to capture, largely because they are infrequent users of military health care and, consequently, have less interest in filling

out a health care survey. Although the DoD is very concerned about the opinions and experiences of this population, their infrequent use of military health care means they will have a relatively small impact on the satisfaction and utilization analyses. Regarding survivors, this group received fewer follow-up mailings and consequently responded at a lower rate. However, their numbers in the population are so small that they are unlikely to have much impact on the satisfaction and utilization analyses.

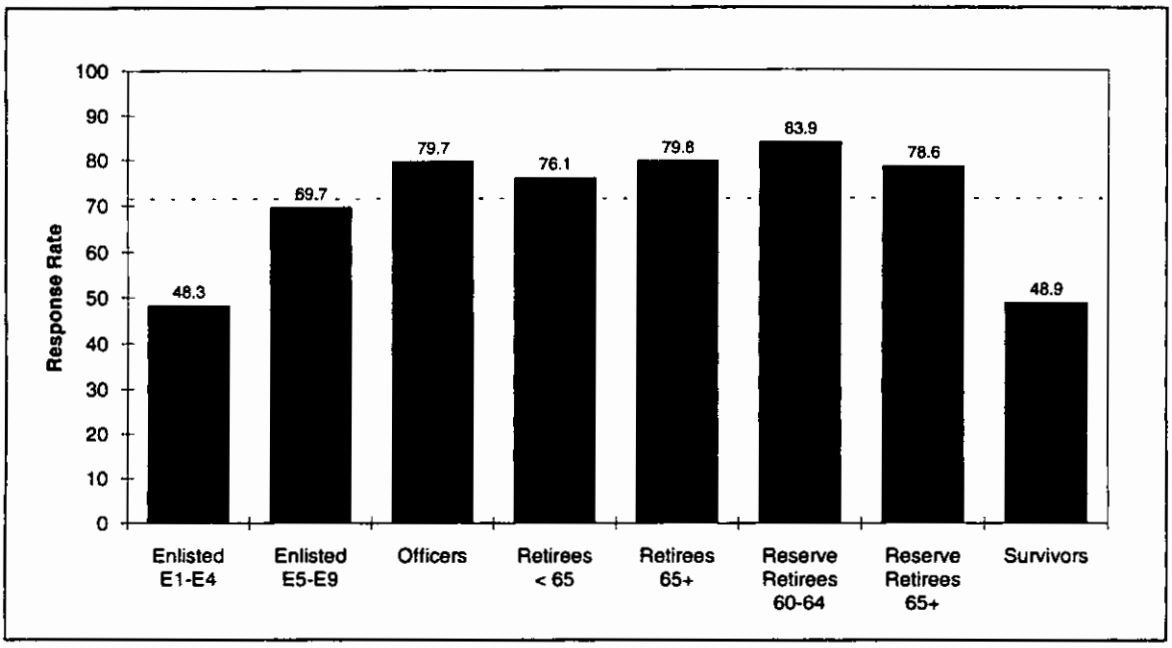

Figure 1.1 Survey Response Rates by Beneficiary Group

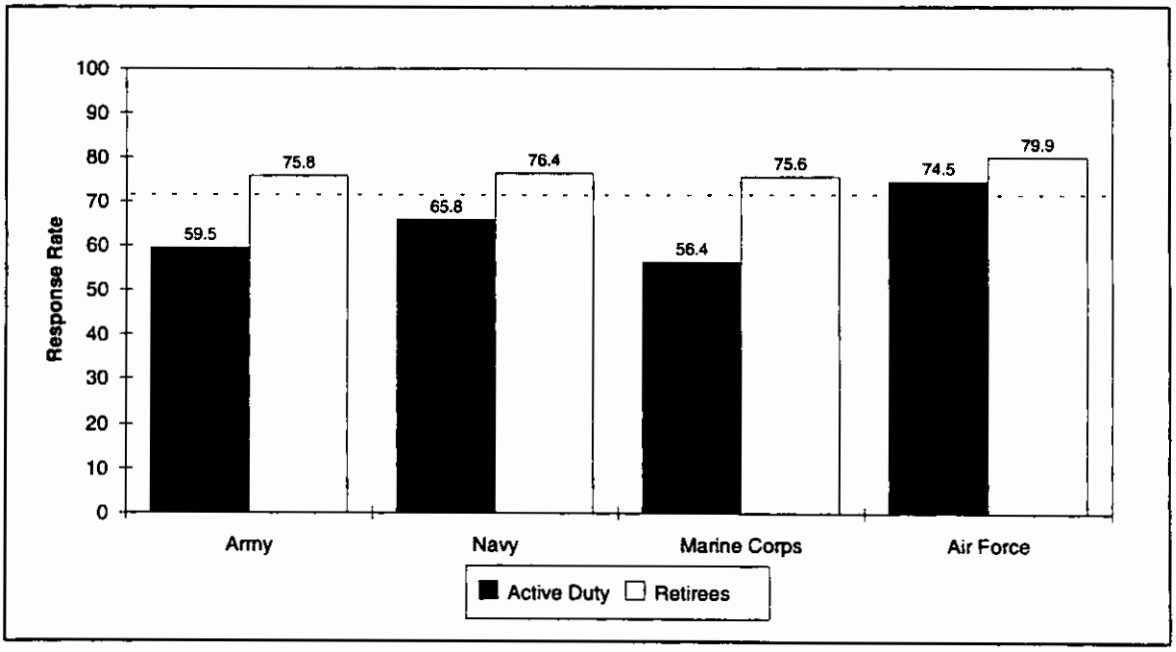

Figure 1.2 Survey Response Rates by Service

Figure 1.2 shows that the retiree samples in each Service responded at about the same rate (76 to 80 percent). Within the active-duty sample, the Army and Marine Corps responded at the lowest rate (less than 60 percent), the Navy responded at a somewhat higher level (66 percent), and the Air Force responded at the highest rate (75 percent).

1.8 PREPARATION FOR ANALYSIS

1.8.1 Data Integrity Checks

Once the survey data file was received from DMDC, integrity checks and cleaning procedures were applied to the survey response data. These checks and procedures were formulated to accomplish several goals:

- identify and eliminate contradictory responses;
- attempt to fill in missing responses to demographic questions based on information provided in the remainder of the questionnaire; and
- prepare the survey response data set for statistical analyses.

A detailed description of the procedures employed to clean the data is provided in Appendix E.

1.8.2 Weighting

Survey weights are used to adjust the sample composition so that it more nearly reflects the population composition with respect to selected factors. Factors are selected if they are believed to have an impact on an outcome of interest (such as the average outpatient utilization rate), either in terms of the outcome level or its variance. Proper use of weighting can improve the precision of estimates and could possibly reduce nonresponse bias to the extent that it is related to the selected factors. All the results in subsequent chapters, with the exception of tabulations based on the entire beneficiary population and analyses of survey comments, are derived using the survey weights. A description of the method used to obtain the survey weights is given in Appendix F.

1.9 ANALYSES

The chapters that follow contain a description of the basic analyses from the Survey. Chapter 2 contains a description of the beneficiary population; Chapter 3 covers access and availability of care, Chapters 4 and 5 cover outpatient and inpatient utilization, respectively; Chapters 6 and 7 cover satisfaction with outpatient and inpatient care, respectively; Chapter 8 covers dental utilization and satisfaction with care; and Chapter 9 describes the analysis of the Comment Sheet.

2.0 DESCRIPTION OF BENEFICIARY POPULATION

The beneficiary survey contains a variety of questions that characterize respondent families according to sponsor characteristics (such as sex, race, education, marital status, and living quarters) and family characteristics (such as family size, employment, family income, health insurance coverage, and health status). This chapter summarizes this demographic information.

2.1 BENEFICIARY STATUS

Table 2.1 presents the number and distribution of beneficiary families by sponsor beneficiary status. There were more than 3.5 million families eligible for military health care in 1992, and 53 percent of these families were retiree or survivor families.

Table 2.1 Composition of FY92 Beneficiary Population

Beneficiary Status	Number of Families	Percentage
Junior Enlisted	709,399	20.0%
Senior Enlisted	702,905	19.8
Officers	268,068	7.6
Retirees Under 65	1,136,784	32.1
Retirees 65 and Over	541,589	15.3
Survivors	185,872	5.2
Total	3,544,617	100.0

Source: 1992 DoD Health Care Survey

The composition of beneficiary families has changed substantially since the 1984 DoD Health Care Survey [1], as demonstrated in Figure 2.1. The share of families with an active-duty sponsor has decreased from 57 percent in 1984 to 47 percent in 1992. Figure 2.2 illustrates that, in 1992, the share of families with an active-duty sponsor varied by Service branch, ranging from 43 percent of Air Force families to 55 percent of Marine Corps families.

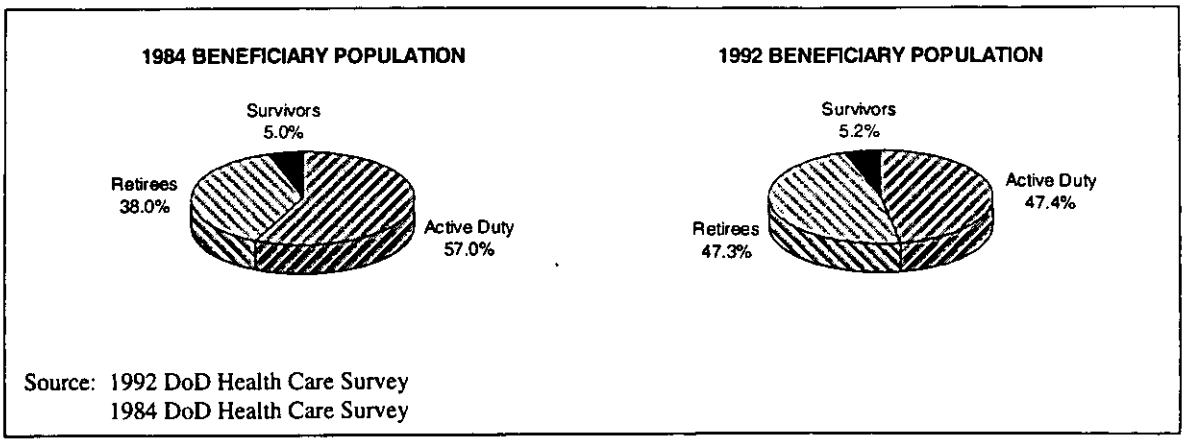

Figure 2.1 Composition of Beneficiary Population

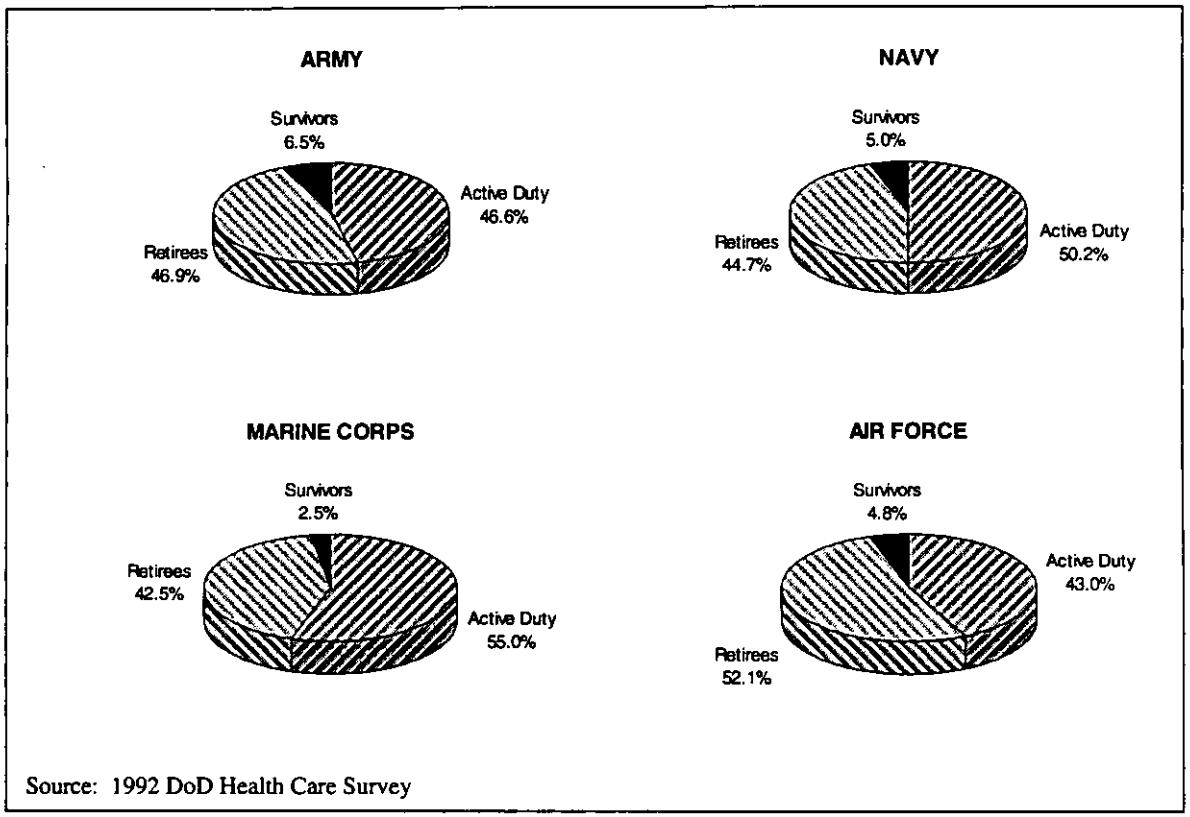

Figure 2.2 Beneficiary Families by Service Branch

Table 2.2 presents the distribution of sponsors by beneficiary status within each survey region. Note that the beneficiary groups presented were selected because there were insufficient responses to separate survivor families by age group (under and over age 65). Retirees and survivors were separated by those under age 65 and age 65 and over because sponsors over age 65 are generally not eligible for CHAMPUS benefits. Beneficiaries over age 65 rely primarily on the direct care system and Medicare for their health care. These beneficiary groups are used throughout the remainder of this chapter.

Table 2.2 Sponsor's Beneficiary Status by Survey Region

Survey Region	Junior Enlisted	Senior Enlisted	Officers	Retirees and Survivors Under 65	Retirees and Survivors 65 and Over
Army CAM	25.5%	22.7%	11.4%	28.7%	11.7%
CRI	21.2	17.9	6.7	31.1	23.1
Army Gateway to Care	27.9	24.6	9.4	27.4	10.8
Tidewater Region (TRICARE)	19.7	27.8	9.1	30.6	12.9
Overlapping Catchment Areas	12.7	16.4	10.5	37.5	22.8
Southeast Region FI/PPO	9.0	11.1	5.6	47.5	26.8
New Orleans CRI-Like	2.3	15.7	4.6	50.6	26.8
PRIMUS / NAVCARE	22.2	18.0	6.6	35.3	18.0
Non-Catchment Areas	2.9	4.7	1.8	58.1	32.5
Outside the U.S.	42.1	39.2	11.3	5.5	2.0
Navy CAM	16.8	23.6	5.9	40.1	13.7
Air Force CAM	6.9	8.7	3.5	52.3	28.6
No Initiatives	18.3	18.9	8.7	37.0	17.1
Shipboard FPOs	52.0	39.6	8.4	0.0	0.0

Source: 1992 DoD Health Care Survey

2.2 SPONSOR'S SEX

The overwhelming majority, more than 93 percent, of sponsors were male. Table 2.3 shows that the percentage of active-duty sponsors who were male was less than that of retirees and that there were fewer male sponsors among the junior-enlisted (84 percent) than the senior-enlisted (92 percent) or officers (90 percent).

Table 2.3 Sponsor's Sex by Beneficiary Status

Sponsor's Sex	Junior Enlisted	Senior Enlisted	Officers	Retirees Under 65	Retirees 65 and Over	All Beneficiaries
Male	84.0%	91.6%	90.0%	98.4%	98.3%	93.3%
Female	16.0	8.4	10.0	1.5	1.7	6.7
No response	0.0	0.0	0.0	0.1	0.1	0.0

Source: 1992 DoD Health Care Survey
Question 2 - "Is the sponsor: (1) Male (2) Female?"

2.3 SPONSOR'S RACE / ETHNICITY

Table 2.4 displays the ethnic composition (Hispanic/Spanish origin or descent) of each beneficiary group. The proportion of Hispanic sponsors is clearly larger in the younger/less-senior beneficiary groups.

Table 2.4 Sponsor's Ethnicity by Beneficiary Status

Sponsor's Ethnicity	Junior Enlisted	Senior Enlisted	Officers	Retirees Under 65	Retirees 65 and Over	All Beneficiaries
Hispanic	9.9%	7.4%	4.3%	3.8%	2.4%	5.6%
Non-Hispanic	87.7	91.0	94.7	93.9	92.7	91.9
No response	2.5	1.6	1.0	2.3	4.9	2.5

Source: 1992 DoD Health Care Survey
Question 4 - "Is the sponsor of Hispanic/Spanish origin or descent?"

Table 2.5 displays the racial composition of each beneficiary group. A larger percentage of officers (89 percent) responded "White/Caucasian" than did the junior-enlisted (72 percent) or senior-enlisted (69 percent).

Table 2.5 Sponsor's Race by Beneficiary Status

Sponsor's Race	Junior Enlisted	Senior Enlisted	Officers	Retirees Under 65	Retirees 65 and Over	All Beneficiaries
White/Caucasian	71.5%	69.4%	88.8%	84.7%	91.9%	80.2%
Black/African-American	13.4	18.9	5.8	9.5	3.4	11.0
Oriental/Asian or Pacific Islander	3.2	3.9	2.1	2.3	1.1	2.6
Native American or Alaskan Native	0.8	0.6	0.4	0.7	0.5	0.7
Other	7.6	4.7	2.0	1.1	0.4	3.2
No response	3.5	2.4	0.8	1.8	2.7	2.4

Source: 1992 DoD Health Care Survey
Question 5 - "What is the sponsor's race?"

2.4 SPONSOR'S LIVING QUARTERS

Table 2.6 shows the distribution of current quarters, and the time spent at current quarters, by beneficiary status. An overwhelming majority of non-active-duty sponsors lived in civilian housing. For active-duty officers, 69 percent lived in civilian housing, while a sizable minority lived in base family housing (22 percent).

A review of the time spent at the current quarters shows that nearly 22 percent of all families responded that they had lived in their current quarters less than 12 months. Note that nearly 20 percent of all families did not respond to the question.

Table 2.6 Sponsor's Living Quarters by Beneficiary Status

Current Quarters	Junior Enlisted	Senior Enlisted	Officers	Retirees and Survivors Under 65	Retirees and Survivors 65 and Over	All Beneficiaries
Does not apply-sponsor deceased	0.4%	0.2%	0.1%	4.4%	18.0%	5.0%
Unaccompanied base quarters	37.3	9.9	3.9	0.0	0.0	9.8
Base family housing	14.5	30.5	22.3	0.2	0.1	10.6
Off-base, military provided housing	4.8	4.2	2.7	0.0	0.0	2.0
Civilian housing (rented or owned)	33.6	50.3	69.2	89.6	70.2	65.4
Aboard ship	6.6	2.9	0.8	0.8	0.0	2.0
Navy lodge	0.0	0.0	0.0	0.0	0.0	0.0
Other	1.7	1.2	0.7	2.4	3.5	2.1
No response	1.1	0.8	0.2	3.3	8.1	3.1
Time at Current Quarters	**Junior Enlisted**	**Senior Enlisted**	**Officers**	**Retirees Under 65**	**Retirees 65 and Over**	**All Beneficiaries**
3 months or less	9.4%	6.4%	7.1%	0.4%	0.3%	4.1%
Between 3 and 6 months	13.2	10.2	11.6	1.6	0.5	6.4
Between 6 and 12 months	23.4	17.2	18.4	3.4	0.9	11.3
Over 12 months	36.7	47.6	48.9	72.9	75.2	58.4
No response	17.3	18.6	14.0	21.8	23.1	19.8

Source: 1992 DoD Health Care Survey
Question 7 - "What is the location of the sponsor's current living quarters?"
Question 9 - "How long has the sponsor lived at his/her current living quarters (including aboard ship)?"

2.5 SPONSOR'S MARITAL STATUS

Table 2.7 displays the share of sponsors in each beneficiary group who were single, married and living in the same quarters, or married but living in separate quarters. Marital status is correlated with age and, as expected, a larger percentage of junior-enlisted sponsors were single (52 percent) compared with all other beneficiary groups. A larger share of senior-enlisted sponsors were married and living in separate quarters (10 percent) compared to all other groups, which was due to a combination of their high marriage rate and the types of duty assignments received by senior-enlisted personnel.

Table 2.7 Sponsor's Marital Status by Beneficiary Status

Marital Status	Junior Enlisted	Senior Enlisted	Officers	Retirees Under 65	Retirees 65 and Over	All Beneficiaries
Single	52.0%	17.7%	22.7%	12.2%	13.5%	22.9%
Married, living in same quarters	39.0	71.7	72.3	82.5	79.1	69.6
Married, living in separate quarters	7.2	9.7	4.7	2.2	1.7	4.9
No response	1.8	0.9	0.3	3.0	5.7	2.6

Source: 1992 DoD Health Care Survey
Question 10 - "Is the sponsor currently married?"

2.6 FAMILY SIZE

Table 2.8 presents the number of eligible family members, excluding the sponsor and spouse, by beneficiary status and the age of the eligible family member. Each row of the table sums to 100 percent to show the percentage of sponsors who had a given number of eligible family members within each age category. In general, for all beneficiary groups roughly 70-75 percent of the families did not have any additional eligible family members beyond the sponsor and spouse. Note that several retiree and survivor families with a sponsor age 65 or over identified one or more family members aged 24-64 who were eligible for care. Only in special circumstances are children over age 23 eligible for care, so such responses may reflect a lack of knowledge of their health care benefits or misinterpretation of the question.

2.7 SPONSOR'S EDUCATION

Table 2.9 shows the distribution of the highest completed education level by sponsor beneficiary status. Over half of junior-enlisted sponsors had at most a high school diploma or equivalent, while the majority of senior-enlisted sponsors had attended college, and 92 percent of all officers had completed a four-year degree or higher. The distribution of education level for retiree and survivor families was more diverse.

2.8 SPONSOR'S EMPLOYMENT

The sponsor's employment, along with the spouse's employment (discussed in the next section), especially outside the military, provides opportunities for additional income and/or health insurance coverage. Table 2.10 shows the percentage of sponsors that indicated each employment status option. Note that each respondent was permitted to select more than one response. While 51 percent of retiree and survivor sponsors under age 65 worked full-time, less than 4 percent over age 65 worked full-time.

Table 2.8 Number of Eligible Family Members Excluding Sponsor and Spouse by Beneficiary Status

	Number of Eligible Family Members					
Age of Family Member	None	One	Two	Three	Four	Five or More
Junior Enlisted						
Under 1 year old	66.7%	32.3%	0.8%	0.1%	0.2%	0.0%
1-5 years old	29.3	41.3	22.5	5.9	0.6	0.5
6-18 years old	62.5	23.7	8.6	3.5	0.5	1.3
19-23 years old	89.4	6.7	2.7	1.2	0.0	0.0
24-64 years old	77.0	9.4	6.1	2.5	3.5	1.5
Over 64 years old	98.8	1.2	0.0	0.0	0.0	0.0
All ages	70.6	19.1	6.8	2.2	0.8	0.5
Senior Enlisted						
Under 1 year old	87.9%	10.9%	0.8%	0.2%	0.0%	0.2%
1-5 years old	50.3	33.4	13.9	1.8	0.5	0.1
6-18 years old	21.3	25.4	31.2	15.4	4.4	2.3
19-23 years old	93.8	5.3	0.7	0.1	0.1	0.0
24-64 years old	86.6	10.9	2.4	0.0	0.0	0.0
Over 64 years old	99.4	0.6	0.0	0.0	0.0	0.0
All ages	73.2	14.4	8.2	2.9	0.8	0.4
Officers						
Under 1 year old	87.8%	11.7%	0.5%	0.0%	0.0%	0.0%
1-5 years old	53.3	29.2	15.3	1.9	0.2	0.1
6-18 years old	26.4	21.6	32.5	13.7	4.3	1.5
19-23 years old	87.4	10.4	2.0	0.2	0.0	0.0
24-64 years old	91.3	7.0	1.3	0.0	0.3	0.1
Over 64 years old	99.4	0.5	0.0	0.0	0.0	0.1
All ages	74.3	13.4	8.6	2.6	0.8	0.3
Retirees and Survivors < 65						
Under 1 year old	96.4%	2.3%	1.2%	0.1%	0.0%	0.0%
1-5 years old	87.2	9.9	2.2	0.4	0.0	0.4
6-18 years old	24.9	31.5	26.7	12.4	2.2	2.2
19-23 years old	64.4	30.6	4.7	0.2	0.1	0.0
24-64 years old	77.7	12.4	6.8	1.4	1.4	0.3
Over 64 years old	99.0	0.7	0.0	0.0	0.4	0.0
All ages	74.9	14.6	6.9	2.4	0.7	0.5
Retirees and Survivors ≥ 65						
Under 1 year old	87.5%	9.0%	3.4%	0.1%	0.0%	0.0%
1-5 years old	84.3	9.8	4.5	1.3	0.0	0.0
6-18 years old	61.9	9.1	21.0	2.6	5.4	0.1
19-23 years old	70.2	9.4	10.0	6.8	0.3	3.2
24-64 years old	28.5	24.7	26.3	10.4	4.1	6.0
Over 64 years old	94.5	4.2	1.3	0.0	0.0	0.0
All ages	71.2	11.0	11.1	3.5	1.6	1.6

Source: 1992 DoD Health Care Survey
Question 16 - "Other than the sponsor and spouse, how many currently eligible family members are there in each of the following age groups?"

Table 2.9 Sponsor's Highest Completed Grade/Degree by Beneficiary Status

Highest Grade/Degree	Junior Enlisted	Senior Enlisted	Officers	Retirees Under 65	Retirees 65 and Over	All Beneficiaries
Less than 12 years of school (no diploma)	0.3%	0.4%	0.0%	2.3%	7.9%	2.2%
GED or other high school equivalency certificate	2.1	4.1	0.1	12.9	15.5	8.2
High school diploma	50.1	28.0	1.0	15.6	16.7	24.6
Some college, but did not graduate	35.6	41.7	3.3	25.9	20.8	28.7
2-year college degree (AA/AS)	5.3	16.0	3.0	13.6	5.7	10.2
4-year college degree (BA/BS)	2.2	5.2	35.9	8.5	9.2	8.7
Some graduate school, but no post-graduate degree	0.9	1.6	15.2	4.6	6.5	4.3
Post-graduate degree	0.5	0.9	41.1	11.7	11.3	9.3
No response	3.1	2.0	0.4	4.7	6.3	3.7

Source: 1992 DoD Health Care Survey
Question 6 - "What is the highest school grade or academic degree that the sponsor has?"

Table 2.10 Sponsor's Employment by Beneficiary Status

Sponsor's Employment	Junior Enlisted	Senior Enlisted	Officers	Retirees Under 65	Retirees 65 and Over	All Beneficiaries
On military active duty	96.7%	97.5%	98.0%	0.4%	0.5%	48.6%
Retired from military service	0.4	1.1	1.1	87.5	88.3	44.5
Work 35 hours or more per week	10.8	9.2	9.1	50.7	3.7	22.9
Work 20-34 hours per week	2.0	1.3	0.3	3.8	1.5	2.2
Work less than 20 hours per week	0.6	0.6	0.1	1.4	1.3	0.9
Work a variable number of hours per week	2.5	1.2	0.6	2.3	1.6	1.9
Self-employed	0.8	1.0	0.3	9.5	5.4	4.5
In school	6.1	4.2	2.6	2.8	0.1	3.3
Unemployed, looking for work	0.9	0.3	0.4	5.0	0.5	2.1

Continued on next page

Table 2.10—*Continued*

Sponsor's Employment	Junior Enlisted	Senior Enlisted	Officers	Retirees Under 65	Retirees 65 and Over	All Beneficiaries
Disabled, unable to work	0.1	0.0	0.0	7.3	7.6	3.7
Retired from civilian employment	0.0	0.0	0.0	9.9	41.9	10.1
Homemaker	0.8	1.2	0.6	1.1	1.7	1.1
Unpaid volunteer	1.2	2.1	1.3	4.0	6.8	3.3
Other	0.2	0.3	0.2	0.9	1.2	0.6
No response	2.1	1.5	0.5	1.7	3.3	1.9

Source: 1992 DoD Health Care Survey
Question 17 - "What is the current employment status for the sponsor and spouse?"

2.9 SPOUSE'S EMPLOYMENT

Table 2.11 shows the distribution of spouse employment status by sponsor beneficiary status. Just over 15 percent of junior-enlisted sponsors had spouses who were on military active duty. For other active-duty sponsors, 8 percent and 7 percent of senior-enlisted and officer sponsors, respectively, had spouses who were on military active duty. Nearly 21 percent of spouses of junior-enlisted sponsors worked full-time, while 29 percent and 24 percent of senior-enlisted and officer spouses worked full-time, respectively. Over 33 percent of retirees and survivors under age 65 had spouses who worked full-time.

2.10 FAMILY INCOME

Table 2.12 displays the distribution within and estimated mean family income[1] of each beneficiary group. Mean family income ranged from $16,314 for junior-enlisted families to $51,222 for officer families. Overall mean family income was $34,151. The majority of junior-enlisted families had incomes of less than $15,000. The largest plurality of senior-enlisted families had incomes in the $15,000 to $24,999 range. More than 75 percent of officer families had family incomes greater than $35,000, while nearly 60 percent of families with a retiree sponsor under age 65 had family incomes greater than $35,000. As military retirees and their spouses retire from civilian jobs, their family incomes decline; this is reflected by the more than 20-percent decrease in mean income when retiree/survivor families with a sponsor under age 65 are compared with retiree/survivor families with a sponsor over age 65.

[1] Respondents were asked to specify their incomes within predetermined intervals. Mean incomes were estimated by fitting a log-normal distribution to the interval counts. The log-normal distribution provided an excellent fit to the income data.

Table 2.11 Spouse's Employment by Beneficiary Status

Spouse's Employment	Junior Enlisted	Senior Enlisted	Officers	Retirees and Survivors Under 65	Retirees and Survivors 65 and Over	All Beneficiaries
On military active duty	15.3%	8.2%	6.5%	0.5%	0.1%	4.3%
Retired from military service	3.9	4.7	2.9	1.3	1.3	2.4
Work 35 hours or more per week	20.9	29.3	24.4	33.2	4.0	24.0
Work 20-34 hours per week	9.8	9.5	7.7	7.9	2.0	7.2
Work less than 20 hours per week	2.2	2.9	4.8	3.2	1.3	2.7
Work a variable number of hours per week	2.2	3.0	2.7	2.0	0.9	2.1
Self-employed	2.7	3.6	5.1	5.7	1.8	4.0
In school	12.8	7.4	8.8	2.0	0.2	4.6
Unemployed, looking for work	13.3	9.5	5.2	2.2	0.5	4.9
Disabled, unable to work	0.3	0.6	0.3	3.0	4.1	2.2
Retired from civilian employment	0.2	0.3	0.3	5.4	24.6	7.4
Homemaker	31.3	34.3	46.3	40.4	54.3	41.4
Unpaid volunteer	2.8	5.4	12.0	5.3	8.5	6.2
Other	1.7	1.7	0.9	0.6	1.5	1.2
No response	4.8	2.1	0.8	7.2	15.1	7.1

Source: 1992 DoD Health Care Survey
Question 17 - "What is the current employment status for the sponsor and spouse?"

Table 2.12 Family Income by Beneficiary Status

Family Income	Junior Enlisted	Senior Enlisted	Officers	Retirees and Survivors Under 65	Retirees and Survivors 65 and Over	All Beneficiaries
Less than $15,000	54.3%	3.4%	0.3%	7.2%	11.0%	16.2%
$15,000 to $24,999	32.4	41.1	6.5	16.6	26.1	25.6
$25,000 to $34,999	7.2	32.3	16.7	18.6	21.4	19.4
$35,000 to $49,999	2.0	16.3	31.1	23.5	17.0	17.1
$50,000 to $74,999	0.3	3.9	31.5	20.1	12.0	12.2
$75,000 to $99,999	0.0	0.3	9.1	6.2	2.8	3.4
$100,000 and over	0.0	0.1	3.5	4.2	2.1	2.1
No response	3.7	2.7	1.4	3.7	7.6	4.0
Est. Mean Income	$16,314	$28,425	$51,222	$43,876	$34,887	$34,151

Source: 1992 DoD Health Care Survey
Question 19 - "What was the total income, before taxes, for the sponsor and spouse over the last 12 months?"

2.11 USE OF ASSISTANCE PROGRAMS

Table 2.13 presents the use of various assistance programs available to military and civilian families. Nearly 8 percent of junior-enlisted families received benefits through the Women, Infants, and Children (WIC) program and over 4 percent of senior-enlisted families received benefits through WIC. Over 25 percent of retiree/survivor families with a sponsor under age 65 received Veterans Affairs (VA) disability benefits.

Table 2.13 Use of Assistance Programs by Beneficiary Status

Program	Junior Enlisted	Senior Enlisted	Officers	Retirees and Survivors Under 65	Retirees and Survivors 65 and Over	All Beneficiaries
Unemployment compensation	1.2%	2.1%	0.7%	2.1%	0.3%	1.5%
Women, Infants, and Children (WIC)	7.8	4.1	0.1	0.3	0.0	2.5
Worker's compensation	0.2	0.2	0.1	0.6	0.5	0.4
VA disability	0.2	0.7	0.6	26.7	15.3	12.2
Other disability	0.0	0.1	0.1	2.9	1.8	1.3
Food stamps	1.7	0.5	0.0	0.6	0.1	0.7
Aid for Dependent Children (AFDC)	0.0	0.2	0.0	0.1	0.1	0.1
Social Security	1.3	1.0	0.7	17.0	80.9	21.5
Supplemental Security Income	0.7	0.5	0.1	1.0	1.2	0.8
Medicaid	0.4	0.4	0.2	0.9	3.6	1.2
Other	1.3	1.2	0.5	2.3	6.2	2.5
None	79.5	83.3	91.8	51.7	12.4	59.1
No response	8.7	6.9	5.7	6.1	4.4	6.4

Source: 1992 DoD Health Care Survey
Question 18 - "Does your family receive assistance from any of the following programs?"

2.12 INSURANCE COVERAGE

Table 2.14 displays the percentage of sponsors, spouses, and households that had insurance coverage under various health programs. Household coverage means either the sponsor or the spouse (or both) is covered. Respondents were permitted to indicate as many programs as applied, and a nonresponse was appropriate for active-duty sponsors as they may not be eligible for care outside the MHSS direct care system (only their spouses and children are CHAMPUS-eligible). For retirees/survivors under 65 years of age, over 16 percent of the households had CHAMPUS supplemental insurance and 36 percent were covered by private insurance. Less than 11 percent of families with an active-duty sponsor had CHAMPUS

supplemental insurance, and private insurance was available in 6 percent, 7 percent, and 5 percent of junior-enlisted, senior-enlisted, and officer families, respectively.

Table 2.14 Insurance Coverage by Beneficiary Status

Sponsor's Insurance Coverage	Junior Enlisted	Senior Enlisted	Officers	Retirees Under 65	Retirees 65 and Over	All Beneficiaries
Standard CHAMPUS	34.1%	36.0%	30.1%	66.6%	4.6%	40.6%
CHAMPUS Supplemental	5.9	3.6	3.4	14.5	2.5	7.6
Medicare Part B	2.9	1.1	0.6	6.8	66.7	13.9
Private Insurance	3.7	1.9	1.4	32.3	46.7	19.8
Other	4.3	1.6	1.3	6.6	13.8	5.8
No response	57.7	59.9	67.0	14.9	13.0	37.1
Spouse's Insurance Coverage	**Junior Enlisted**	**Senior Enlisted**	**Officers**	**Retirees and Survivors Under 65**	**Retirees and Survivors 65 and Over**	**All Beneficiaries**
Standard CHAMPUS	60.5%	65.3%	68.6%	66.0%	20.4%	57.4%
CHAMPUS Supplemental	8.1	6.5	12.4	14.0	7.5	10.3
Medicare Part B	2.6	3.6	1.9	7.7	53.2	13.4
Private Insurance	4.9	7.7	6.4	35.0	45.4	24.4
Other	4.3	2.7	2.5	6.5	12.6	6.1
No response	31.1	28.0	25.4	13.7	10.7	19.6
Household Insurance Coverage	**Junior Enlisted**	**Senior Enlisted**	**Officers**	**Retirees and Survivors Under 65**	**Retirees and Survivors 65 and Over**	**All Beneficiaries**
Standard CHAMPUS	45.0%	60.5%	58.2%	68.8%	15.6%	51.6%
CHAMPUS Supplemental	7.8	7.2	10.2	16.4	6.0	10.5
Medicare Part B	3.9	3.3	1.8	10.2	68.1	17.8
Private Insurance	6.0	7.0	5.1	36.3	51.1	24.9
Other	5.5	3.0	2.9	7.5	14.6	7.2
No response	45.1	32.9	36.4	12.2	9.3	24.1

Source: 1992 DoD Health Care Survey
Question 29 - "Who in your family is now covered by any of the following health insurance programs?"

2.13 FAMILY HEALTH STATUS

Table 2.15 presents the health status of sponsors, spouses, and children by beneficiary status. In general, officers and their families reported excellent or very good health at a higher rate than senior-enlisted and junior-enlisted families. Based on information in the 1991 National Health Interview Survey (NHIS), nearly 71 percent of the U.S. population age 65 and over reported good, very good, or excellent health [2, p. 112]. For retiree/survivor sponsors age 65 and over and spouses, 64 percent and 66 percent, respectively, reported good, very

good, or excellent health. Note that 9 percent of sponsors and 7 percent of spouses did not reply for retiree/survivor families age 65 and over. Thus, for this age group the reported health status of military beneficiaries was comparable to the U.S. population overall. Of all people age 0-17, approximately 80 percent reported excellent or very good health according to the 1991 NHIS, while 78 percent of all military beneficiary children reported excellent or very good health, again illustrating that the military population was comparable to the U.S. population as a whole in terms of reported health status.

Table 2.15 Family Health Status by Beneficiary Status

Sponsor's Health Status	Junior Enlisted	Senior Enlisted	Officers	Retirees Under 65	Retirees 65 and Over	All Beneficiaries
Excellent	41.3%	39.6%	65.1%	18.7%	10.3%	30.1%
Very Good	35.7	34.8	24.3	28.6	24.0	30.3
Good	15.3	18.6	7.5	33.0	30.1	23.8
Fair	3.8	3.6	1.4	12.0	17.9	8.6
Poor	1.2	0.6	0.4	4.5	8.6	3.3
No response	2.6	2.9	1.4	3.3	9.0	3.8
Spouse's Health Status	**Junior Enlisted**	**Senior Enlisted**	**Officers**	**Retirees and Survivors Under 65**	**Retirees and Survivors 65 and Over**	**All Beneficiaries**
Excellent	31.1%	25.9%	49.5%	16.5%	7.8%	21.7%
Very Good	35.0	36.3	30.0	29.4	23.9	30.8
Good	23.9	26.4	14.1	34.9	34.1	29.7
Fair	6.6	7.4	3.5	12.5	20.0	11.1
Poor	2.0	1.8	1.4	4.0	7.6	3.7
No response	1.5	2.2	1.4	2.7	6.5	3.0
Children's Health Status	**Junior Enlisted**	**Senior Enlisted**	**Officers**	**Retirees and Survivors Under 65**	**Retirees and Survivors 65 and Over**	**All Beneficiaries**
Excellent	46.0%	41.7%	62.0%	49.4%	24.1%	46.8%
Very Good	29.1	34.6	23.8	30.9	29.1	31.4
Good	18.3	17.8	11.1	13.9	33.1	16.1
Fair	4.3	4.8	2.5	3.1	9.2	4.0
Poor	2.0	1.0	0.6	2.4	2.6	1.4
No response	0.2	0.1	0.0	0.3	1.9	0.2

Source: 1992 DoD Health Care Survey
Question 34 - "How would you describe the health status of your eligible family members in general?"

2.14 SUMMARY OF KEY FINDINGS

This chapter described the characteristics of the population of military medical care beneficiaries. The key results are:

- There were more than 3.5 million families eligible for military medical benefits in 1992, the majority of them sponsored by retirees and survivors. The percentage of active-duty families declined from 57 percent in 1984 to 47 percent in 1992.
- Sponsors were overwhelmingly male (93 percent), with the largest percentage of female sponsors (16 percent) among the junior-enlisted. Most of the beneficiary families consisted of a sponsor alone or sponsor and spouse. Less than 30 percent had other dependents. Active-duty sponsors were a transient group, with nearly half of junior-enlisted sponsors indicating they had lived in their current quarters for a year or less.
- Over a third of spouses of active-duty sponsors engaged in homemaking activities. Spouses of active-duty sponsors were employed full-time in about a quarter of the cases.
- Among retirees and survivors, a bare majority of the under-65 retiree sponsors were employed full-time, and about a third of their spouses were also employed full-time. In the over-65 retiree group, less than 10 percent of sponsors and spouses reported full-time or part-time employment.
- Mean income among all respondents was $34,151, with junior-enlisted families having the lowest mean income and officer families the highest.
- Health insurance coverage other than military medical benefits was not widespread among active-duty beneficiaries. Less than 11 percent of active-duty families had CHAMPUS supplemental insurance, and less than 7 percent had private insurance.
- Among retirees and survivors and their family members, additional coverage such as private insurance or Medicare was considerably more common than among active-duty beneficiaries.

3.0 ACCESS AND AVAILABILITY OF CARE

Key elements of quality in a health care system are access and availability of care. Access to and availability of outpatient care were addressed in the survey by questions regarding the number of telephone calls required to make an appointment, the time between when an appointment was made and the day of the visit, travel time to the facility, and the amount of time spent in the waiting room. Results of the analysis of access to care are presented in Section 3.1. In addition, Section 3.2 addresses the availability of care through questions related to reasons for not seeking care. Section 3.3 reviews beneficiary concerns about care at military treatment facilities (MTFs). Lastly, beneficiaries' knowledge of their health care benefits was reviewed, and the results of this analysis are presented in Section 3.4.

The tables in Section 3.1 are presented such that active-duty sponsors, active-duty spouses and children, and retiree/survivor families are distinguished because their MHSS benefits are different. In general, active-duty sponsors are restricted to using the direct care system, while their spouses and children are eligible for care at MTFs or civilian facilities through CHAMPUS. Retiree/survivor families, including the sponsor, spouse, and/or children are provided MHSS care at MTFs on a space-available basis only, or in civilian facilities through CHAMPUS or Medicare. Retirees/survivor families are separated into families with a sponsor under age 65 or a sponsor age 65 and over to distinguish beneficiaries who rely primarily on Medicare (sponsors age 65 and over) versus CHAMPUS (sponsors under age 65). Questions related to reasons for not seeking care, concerns about care at MTFs, and knowledge of health care benefits were directed to the family rather than individual family members. Thus, the beneficiary groups presented in Sections 3.2 through 3.4 reflect families rather than individual family members. Lastly, note that statistics based on fewer than 100 actual responses are not displayed in the tables presented in this chapter, and the symbol "–" is substituted in their place.

3.1 ACCESS TO OUTPATIENT CARE

The following subsections discuss access to outpatient care. Note that access to inpatient care is primarily controlled by the health care provider. Beneficiary satisfaction with

inpatient care, including some measures of access and availability, is discussed in Chapter 7.0. The analysis of access to care was based on responses to the following questions:

- *Question 61*: "How many phone calls were made by (or for) this family member before getting through to the appointment clerk?"
- *Question 62*: "How long after the appointment clerk or receptionist was first contacted did this family member have to wait for the appointment at the medical facility used most recently for outpatient care?"
- *Question 64*: "About how long did it take this family member to get to the medical facility used most recently for outpatient care?"
- *Question 65*: "After this family member arrived at the medical facility used for the most recent outpatient visit, how long was the wait to see the doctor or other health care provider?"

Only responses by families who reported an eligible family member having an outpatient visit within six months of completing the survey, excluding visits for dental care or prescriptions, were included in this analysis. Note, that since the analysis is based on a family member's most recent visit, this is a comparison of beneficiaries who obtained care at a military facility to beneficiaries who received care at a civilian facility. The survey does not ask respondents for a direct comparison of experiences by a single individual for both civilian and military facilities.

The questions are addressed in the order presented above within the following four subsections.

3.1.1 Telephone Calls Required for an Appointment

The first aspect of beneficiary access to care considered is the number of telephone calls required to set up an appointment. As shown in Table 3.1, nearly 20 percent of beneficiaries who used a military facility found that several calls were necessary or that they were put on hold for a long time when making the appointment for care. This occurred less than 5 percent of the time for beneficiaries who chose civilian facilities. Approximately 40 percent of beneficiaries who chose either type of provider did not try to make an appointment by phone, and fewer than 5 percent of all beneficiaries gave up trying to make an appointment by phone and went to the facility in person.

Table 3.1 Number of Phone Calls Needed to Make Appointment by Source of Care

	Sponsor			Spouse/Child			Sponsor and Family		
Number of Phone Calls	Junior Enlisted	Senior Enlisted	Officers	Junior Enlisted	Senior Enlisted	Officers	Retirees/ Survivors Under 65	Retirees/ Survivors 65 and Over	All Beneficiaries
Users of Military Facilities									
Did not try to make appointment over the phone	67.7%	57.6%	52.9%	25.2%	28.4%	29.0%	23.0%	27.3%	39.8%
Made appointment with 1 or 2 phone calls	22.1	25.5	27.6	36.5	34.2	37.4	39.0	37.5	31.9
Had to make several calls	7.1	10.9	12.7	27.1	26.3	24.9	28.7	27.8	20.2
Gave up trying to make appointment by phone	0.6	4.3	5.3	5.5	5.7	5.0	7.2	5.2	4.9
Don't know	2.4	1.8	1.4	5.7	5.5	3.7	2.2	2.2	3.2
Users of Civilian Facilities									
Did not try to make appointment over the phone	–	–	–	48.5%	36.9%	35.1%	41.7%	52.4%	43.9%
Made appointment with 1 or 2 phone calls	–	–	–	32.1	42.0	49.6	47.3	38.6	43.6
Had to make several calls	–	–	–	5.1	6.7	6.8	4.7	4.1	4.9
Gave up trying to make appointment by phone	–	–	–	1.0	2.6	2.6	2.0	2.0	2.0
Don't know	–	–	–	13.2	11.9	6.0	4.2	3.0	5.5

Source: 1992 DoD Health Care Survey
Question 61 - "How many phone calls were made by (or for) this family member before getting through to the appointment clerk?"

3.1.2 Time Between Contact and Visit

The second aspect of access to outpatient care examined involves the length of time between contacting the appointment clerk and the day of the appointment. Table 3.2 shows the time between making the appointment and occurrence of the visit for military and civilian facility users by beneficiary category. Beneficiaries who selected a military facility were in general less likely to intentionally make an appointment in advance (10 percent of military users versus 20 percent of civilian facility users), which may reflect differences in appointment scheduling procedures. More beneficiaries who chose a military facility saw a provider the same day as or the day after making the appointment. However, more than 15 percent of beneficiaries who selected a military facility had to wait more than two weeks (fewer than 6 percent of beneficiaries who visited a civilian facility had to wait more than two weeks).

3.1.3 Travel Time to Medical Facility

Physical access to care, viewed in terms of travel time to a facility, is presented in Table 3.3. As expected, active-duty families were located much closer to a military facility than were any of the retiree groups. Recall that the table presented compares people who used either a military facility <u>or</u> a civilian facility, and the travel times do not reflect a comparison of the travel time to either type of facility for the same individual.

In general, the travel time to the MTF for those beneficiaries who chose to use a military facility was very similar to that for beneficiaries who selected a civilian provider. Some notable exceptions are that nearly 20 percent of retiree/survivor families with a sponsor under age 65, and more than 25 percent of the retiree/survivor family members with a sponsor age 65 or over, who selected a military facility, traveled more than 45 minutes to reach the military facility. This occurred in only 7 percent of the cases for families with a sponsor under age 65, and 13 percent of the cases for families with a sponsor age 65 or over, when a civilian facility was chosen. This may reflect the willingness of beneficiaries to tolerate a longer driving time to receive free care at military facilities.

3.1.4 Time Spent in Waiting Room

Table 3.4 illustrates differences in time spent in the waiting room for military and civilian facility users. Generally, beneficiaries who used civilian facilities waited less than 30 minutes more frequently than those who used military facilities (76 percent versus 64 percent, respectively). In addition, the percentage of beneficiaries who used MTFs and had to wait more than one hour was more than twice as large as the percentage of users of civilian facilities (13 percent versus 5 percent). Active-duty officer sponsors who used MTFs generally had the shortest wait of all other MTF users.

Table 3.2 Time Between Appointment Contact and Visit by Source of Care

Time Between Contact and Visit	Sponsor			Spouse/Child			Sponsor and Family		All Beneficiaries
	Junior Enlisted	Senior Enlisted	Officers	Junior Enlisted	Senior Enlisted	Officers	Retirees/ Survivors < 65	Retirees/ Survivors ≥ 65	
Users of Military Facilities									
Did not make an appointment	52.6%	41.2%	38.6%	19.2%	22.0%	20.4%	16.2%	13.0%	26.8%
Appointment intentionally made in advance	7.3	9.6	11.8	11.5	7.7	10.5	11.5	20.0	10.3
Same or next day	12.3	18.5	12.7	24.3	29.7	26.5	17.1	10.9	20.8
More than 1 day but less than a week	6.4	9.1	7.9	12.3	12.4	12.9	13.3	13.1	11.3
Between 1 and 2 weeks	10.1	8.2	8.6	15.5	11.0	12.0	15.2	17.9	12.4
Between 2 weeks and a month	8.5	8.5	13.9	9.7	9.1	9.2	17.5	15.1	11.2
More than a month	2.0	3.7	5.5	4.1	3.9	4.4	7.5	9.1	4.8
Don't know	0.9	1.2	1.1	3.4	4.3	4.0	1.7	0.9	2.5
Users of Civilian Facilities									
Did not make an appointment	–	–	–	27.2%	28.6%	27.1%	31.5%	37.8%	32.3%
Appointment intentionally made in advance	–	–	–	26.5	16.5	20.1	17.9	25.0	20.1
Same or next day	–	–	–	17.5	24.1	24.5	21.1	11.4	19.0
More than 1 day but less than a week	–	–	–	10.9	8.0	10.8	14.0	11.8	12.3
Between 1 and 2 weeks	–	–	–	3.4	7.6	6.4	7.3	6.7	7.0
Between 2 weeks and a month	–	–	–	1.5	4.4	4.6	3.3	4.0	3.6
More than a month	–	–	–	3.5	2.2	1.7	1.6	2.0	1.9
Don't know	–	–	–	9.4	8.7	4.9	3.2	1.2	3.9

Source: 1992 DoD Health Care Survey
Question 62 - "How long after the appointment clerk or receptionist was first contacted did this family member have to wait for the appointment at the medical facility used most recently for outpatient care?"

Table 3.3 Travel Time to Medical Facility by Source of Care

	Sponsor			Spouse/Child			Sponsor and Family		
Travel Time to Facility	Junior Enlisted	Senior Enlisted	Officers	Junior Enlisted	Senior Enlisted	Officers	Retirees/ Survivors Under 65	Retirees/ Survivors 65 and Over	All Beneficiaries
Users of Military Facilities									
15 minutes or less	73.0%	60.5%	52.8%	59.5%	52.7%	49.0%	24.8%	16.2%	48.7%
16-30 minutes	17.4	25.8	29.1	26.9	32.4	36.7	40.6	37.1	31.2
31-45 minutes	4.0	5.2	9.1	8.2	8.4	8.4	14.6	20.1	9.6
46 minutes to an hour	1.0	3.6	4.2	1.5	2.8	2.9	8.7	9.4	4.2
More than an hour	3.4	4.8	4.8	3.5	2.4	2.6	11.0	17.1	5.7
Don't know	1.2	0.1	0.0	0.4	1.3	0.4	0.2	0.1	0.6
Users of Civilian Facilities									
15 minutes or less	–	–	–	50.3%	42.4%	52.0%	50.3%	43.3%	47.5%
16-30 minutes	–	–	–	29.0	39.1	33.9	31.7	33.4	33.1
31-45 minutes	–	–	–	7.2	11.0	5.2	9.3	9.1	9.1
46 minutes to an hour	–	–	–	4.2	1.6	3.5	3.2	6.4	3.9
More than an hour	–	–	–	4.5	2.8	4.1	4.2	6.6	4.6
Don't know	–	–	–	4.7	3.1	1.3	1.3	1.2	1.7

Source: 1992 DoD Health Care Survey
Question 64 - "About how long did it take this family member to get to the medical facility used most recently for outpatient care from the location marked in Question 63 above?"

Table 3.4 Time Spent in Waiting Room by Source of Care

Time Spent in Waiting Room	Sponsor			Spouse/Child			Sponsor and Family		
	Junior Enlisted	Senior Enlisted	Officers	Junior Enlisted	Senior Enlisted	Officers	Retirees/ Survivors Under 65	Retirees/ Survivors 65 and Over	All Beneficiaries
Users of Military Facilities									
15 minutes or less	31.7%	29.3%	38.2%	27.7%	20.5%	26.1%	23.9%	25.4%	26.0%
16-30 minutes	38.4	35.2	31.1	34.3	38.3	36.1	37.9	44.8	37.5
31-45 minutes	9.7	12.6	14.0	12.7	13.8	13.5	19.1	16.6	14.2
46 minutes to an hour	5.6	7.5	5.7	7.5	8.1	6.6	6.8	5.2	6.9
More than an hour	12.9	13.9	10.6	15.4	14.6	13.7	10.5	6.6	12.8
Don't know	1.7	1.5	0.3	2.4	4.7	4.0	1.8	1.3	2.7
Users of Civilian Facilities									
15 minutes or less	–	–	–	41.1%	42.8%	49.7%	44.0%	40.6%	43.1%
16-30 minutes	–	–	–	27.7	29.9	28.2	32.3	37.5	32.8
31-45 minutes	–	–	–	10.0	10.0	8.4	11.1	9.8	10.4
46 minutes to an hour	–	–	–	5.9	3.9	3.2	4.4	4.7	4.4
More than an hour	–	–	–	5.6	5.9	5.0	4.7	4.2	4.8
Don't know	–	–	–	9.8	7.4	5.4	3.5	3.2	4.4

Source: 1992 DoD Health Care Survey
Question 64 - "After this family member arrived at the medical facility used for the most recent outpatient visit, how long was the wait to see the doctor or other health care provider?"

3.2 REASONS FOR NOT SEEKING HEALTH CARE WHEN WANTED

The survey presented a series of reasons why family members may not have sought medical care in the question below:

- *Question 101*: "During the past 12 months, what were the most important reasons that members of your family didn't see a doctor or health care provider when they wanted to?"

Table 3.5 shows the percentage of families who selected each of the given reasons for not seeking care. The beneficiary groups are slightly different from those presented in Section 3.1 because reasons for not seeking care were asked of the family as a whole rather than separately of the sponsor, spouse, and children. Note that 21 percent of all families selected at least one reason for not seeking care. Families not selecting a reason included families who always sought care when needed, did not seek care in the previous twelve months, or skipped the question.

The most frequently selected reason, 49 percent of all families who selected at least one reason, was that "it was too hard to get an appointment." The next three most frequently selected reasons were:

- it might cost too much (24 percent),
- type of care needed was not covered or not available (24 percent), and
- didn't want to miss work or school (23 percent).

Concerning the difficulty of getting an appointment, a comparison by beneficiary group revealed that the highest rate was found for officer families (61 percent), followed closely by senior enlisted families (58 percent). Not seeking care because families thought it may cost too much was less a concern for active-duty families than non-active-duty families.

3.3 CONCERNS ABOUT MILITARY MEDICAL TREATMENT FACILITIES

The types of concerns expressed about MTFs are presented in Table 3.6. These concerns were solicited through the question presented below:

- *Question 102*: "Do you and your family have any of the following concerns about Military Medical Treatment Facilities?"

The percentages in the table are based only on families who selected at least one concern (marking more than one concern was allowed). Overall, 16 percent of the respondents had no particular concerns with MTFs.

Table 3.5 Distribution of Beneficiaries Citing Given Reasons for Not Seeking Care*

Reasons for Not Seeking Care	Junior Enlisted	Senior Enlisted	Officers	Retirees and Survivors Under 65	Retirees and Survivors 65 and Over	All Beneficiaries
Didn't have the time	21.7%	14.2%	21.8%	10.1%	3.7%	14.2%
Didn't want to miss work or school	22.8	24.6	29.1	25.6	2.8	22.9
Couldn't get off work	23.5	15.3	10.4	8.4	1.6	13.0
Thought it might cost too much	11.1	18.6	14.9	40.5	25.1	24.4
Type of care needed was not covered or not available	17.8	24.4	24.5	29.1	21.2	24.2
Didn't have confidence in available doctors	17.0	18.5	17.0	9.8	9.2	14.3
Too hard to get an appointment	43.3	58.3	60.8	44.0	39.7	48.9
Facility's staff was not helpful	19.8	14.4	15.8	8.9	6.5	13.2
Didn't want the hassle of filing a claim	3.6	6.3	6.9	9.9	6.4	7.0
Didn't want to give up their leisure time	1.6	0.8	0.5	0.3	1.9	0.9
Would have had to travel too far	4.2	7.6	6.4	11.6	9.1	8.2
Couldn't see doctor of choice	9.6	13.8	14.1	11.4	9.9	11.7
Couldn't find the kind of doctor they needed	12.7	8.2	6.7	9.0	8.6	9.3
Couldn't find anyone to stay with the children	7.6	8.2	7.3	1.2	0.1	4.9
Didn't have any transportation to the doctor's office	5.6	3.7	1.0	2.7	2.8	3.4
Were not enrolled in DEERS	1.5	0.8	0.8	2.8	6.6	2.1
Other reason	20.8	13.3	11.1	8.5	20.6	13.8
Percentage marking at least one response	22.0	27.9	27.5	19.9	10.3	20.7

* Those who always sought care when needed were to skip this question.

Source: 1992 DoD Health Care Survey
Question 101 - "During the past 12 months, what were the most important reasons that members of your family did not see a doctor or other health care provider when they wanted to?"

Table 3.6 Family Concerns About Military Medical Treatment Facilities

Concerns	Junior Enlisted	Senior Enlisted	Officers	Retirees and Survivors Under 65	Retirees and Survivors 65 and Over	All Beneficiaries
Facility lacks the services needed	8.0%	14.3%	13.3%	12.2%	8.8%	11.2%
Facility lacks the specialists needed	11.2	17.8	16.5	14.1	10.9	13.8
Staff does not treat patients courteously	13.6	13.1	11.6	7.3	2.3	9.1
Doctors are not thorough in their examinations	14.0	14.5	9.4	8.6	3.2	9.9
Hard to get tests when needed	8.3	13.2	13.3	13.6	8.3	11.4
Doctors never spend enough time with their patients	11.6	13.8	9.5	9.0	4.3	9.6
See a different doctor each time	27.6	38.3	34.9	24.1	14.5	26.5
Too hard to find parking	17.3	21.9	18.1	10.7	5.9	13.8
Facility's office hours are not convenient	10.5	8.1	9.7	5.3	1.4	6.5
Too hard to get an appointment	23.0	37.1	41.9	36.2	21.4	31.4
Too long between appointment and actual visit	25.4	35.3	34.5	31.3	17.5	28.5
Waiting room time is too long	31.6	36.9	33.9	25.3	12.2	27.0
Facilities are not comfortable or clean	1.3	3.2	3.5	19.7	20.1	11.6
Concerned about the quality of care	5.7	6.2	7.0	8.0	7.3	7.0
Family has other preferred health care coverage	30.6	17.9	21.1	14.9	17.9	19.7
Other reason	2.8	3.0	4.6	2.2	0.9	2.4
No particular concerns	15.8	24.9	22.9	15.1	7.6	16.3
No response	4.2	4.0	3.3	5.1	16.7	6.8

Source: 1992 DoD Health Care Survey
Question 102 - "Do you and your family have any of the following concerns about Military Medical Treatment Facilities?"

The top three concerns represented access problems and were:

- too hard to get an appointment (31 percent),
- too long between appointment and visit (29 percent), and
- waiting room time is too long (27 percent).

These concerns appear in the top five concerns of each beneficiary group, except retiree/survivor families with a sponsor age 65 or over. These latter families were primarily concerned with a facility not being located nearby. In addition, a major concern of families with a senior-enlisted or officer sponsor was the inability to see the same doctor each time (over a third of these families cited this concern).

3.4 KNOWLEDGE OF HEALTH BENEFITS

Beneficiaries' knowledge of their health benefits was solicited through several questions, including:

- *Question 20*: "Do you know who to contact or where to get information about the following?" (Benefit topics are shown in Appendix A and in Table 3.7.)

- *Question 22*: "What are the current deductibles (payments you make before you receive any money from CHAMPUS), for you and your family, for outpatient services (no overnight stays) covered under CHAMPUS?"

- *Question 23*: "What are the current copayments (your out-of-pocket costs after the deductible is met), for you and your family members, for outpatient services covered under CHAMPUS?"

As illustrated in Table 3.7, a smaller fraction of junior enlisted families knew where to obtain benefit information than did other active-duty families. In most subject areas, the senior enlisted and officer families displayed greater knowledge of information sources than other families. The largest differences between active-duty and non-active-duty families, were for information concerning dental care. Retiree and survivor families are not eligible for the Active Duty Dependents Dental Plan, and typically do not receive care in military dental facilities. Dental care at military facilities is provided to active-duty dependents and non-active-duty sponsors and family members on a space-available basis only.

Table 3.7 Percent Indicating Knowledge of Where to Obtain Benefit Information*

Benefit Topic	Junior Enlisted	Senior Enlisted	Officers	Retirees and Survivors Under 65	Retirees and Survivors 65 and Over	All Beneficiaries
Health services available at MTFs	80.0%	89.5%	92.4%	76.7%	68.2%	79.6%
Charges for overnight stays at military hospitals	48.1	72.1	74.0	58.3	42.4	57.3
Health services and procedures covered by CHAMPUS	47.2	77.1	75.5	72.2	23.1	59.6
Charges for health services and procedures covered by CHAMPUS	43.9	73.5	72.4	64.8	21.3	55.1
DEERS enrollment procedures	49.1	86.5	80.1	78.0	63.4	71.4
When you need to obtain a Nonavailability Statement	27.5	58.2	61.4	51.4	26.2	44.1
Freedom of choice in selecting doctors, clinics, and hospitals	34.9	48.3	53.1	52.7	43.7	46.6
CHAMPUS claims filing procedures	40.9	72.1	72.0	70.4	21.5	56.1
Problems with a CHAMPUS claim	37.3	64.1	66.0	58.0	17.1	48.3
Health benefits available after age 65	13.7	24.4	32.6	30.8	58.3	31.2
Dental care available at Military Facilities	71.4	75.7	79.9	37.8	31.7	54.2
Active Duty Dependents Dental Plan	42.5	71.9	70.5	6.6	2.2	30.8

* Excludes those who responded "does not apply" and nonrespondents.

Source: 1992 DoD Health Care Survey
Question 20 - "Do you know who to contact or where to get information about the following?"

The exception to active-duty families reporting greater knowledge of information sources was for health benefits available after age 65. Not surprisingly, a greater share of families with a sponsor over age 65 knew where to obtain information about these benefits.

Table 3.8 illustrates beneficiary knowledge of CHAMPUS deductibles and copayments. The shaded areas denote the correct response for each beneficiary group. The correct responses reflect the deductibles and copayments in effect since April 1, 1990. Prior to that date, the deductibles were $50 per person and $100 per family for all beneficiaries. Copayments did not change for any beneficiary group.

Table 3.8 Knowledge of CHAMPUS Deductibles and Copayments*

Knowledge of Deductibles	Junior Enlisted	Senior Enlisted	Officers	Retirees and Survivors Under 65	Retirees and Survivors 65 and Over
No deductibles	19.0%	8.9%	7.8%	6.0%	5.3%
$50 per person, $100 per family	19.5	12.5	14.6	14.8	10.9
$100 per person, $200 per family	3.8	12.1	10.5	10.8	12.2
$150 per person, $300 per family	9.2	24.9	25.9	29.1	21.8
None of the above	4.0	8.6	7.0	5.3	11.5
Don't know	44.4	33.1	34.3	34.1	38.3
Knowledge of Copayments					
No copayments	17.9%	12.7%	14.9%	8.1%	6.8%
10%	5.7	5.4	5.2	2.2	2.2
20%	17.7	26.1	28.8	20.2	18.6
25%	3.3	9.3	8.8	28.4	19.2
None of the above	4.9	8.4	7.5	7.7	15.3
Don't know	50.4	38.0	34.9	33.3	37.9

* Correct responses are shaded. Percentages are based on families who reside in non-catchment, non-initiative, and overlapping catchment areas, all of which did not have CHAMPUS demonstration projects. Excludes non-respondents.

Source: 1992 DoD Health Care Survey
Question 22 - "What are the current deductibles (payments you make before you receive any money from CHAMPUS), for you and your family, for outpatient services (no overnight stays) covered under CHAMPUS?"
Question 23 - "What are the current copayments (your out-of-pocket costs after the deductible is met), for you and your family members, for outpatient services covered under CHAMPUS?"

The analysis of beneficiary knowledge of CHAMPUS deductibles and copayments was based on respondents who resided in regions with no initiatives, non-catchment areas, and overlapping catchment areas. These regions did not have MHSS demonstration projects at the time of the survey and were selected for the analysis because many MHSS demonstration projects allow enrollment in programs that change beneficiary copayments and deductibles. As reflected in the table, less than 20 percent of junior enlisted personnel responded correctly to questions concerning either deductibles or copayments. In no case, did more than 30 percent of the families respond correctly to either question.

Another important factor to consider when assessing beneficiaries' knowledge of benefits is the extent to which beneficiaries understand the new military health care initiatives and demonstration projects that have been (at least partially) implemented in various regions across the country. These initiatives vary in scope, features, and cost among each other and from the current system of providing care. Because later chapters will address utilization and satisfaction by geographic region, it is important to know to what extent regional variations are affected by the new military health care programs.

Although knowledge of the new military health care programs is not measured directly by the survey, it can be determined whether beneficiaries recognize their use of these programs by associating reported usage with the regions in which the programs are in effect. Table 3.9 shows the reported use of the new military health care programs by region.

Table 3.9 Reported Use of New Military Health Care Programs by Region

Region	CHAMPUS Prime/Extra	Army Gateway to Care	Army CAM	Air Force CAM	Navy CAM	None
Army CAM	4.7%	11.5%	3.0%	0.4%	0%	80.4%
CRI	17.8	0.2	0	0.1	0.7	81.2
Army Gateway to Care	8.2	6.9	0.2	0	0	84.6
Tidewater Region	5.4	0.4	0.1	0.1	1.2	92.8
Overlapping CAs	4.8	0.8	0	0.1	0.3	94.1
SE Region FI/PPO	6.8	0.3	0.1	0.1	0.5	92.2
New Orleans CRI-Like	22.5	0	0.1	0.5	0.8	75.9
PRIMUS/NAVCARE	6.8	0.2	0.1	0.3	0.3	92.3
Noncatchment Areas	6.2	0	0.1	0.2	0	93.4
Outside U.S.	2.8	0.3	0	0.1	0.1	96.7
Navy CAM	5.6	0	0	0.6	7.2	86.7
Air Force CAM	2.9	0.1	0.1	18.1	0	78.8
No Initiatives	5.4	0.2	0	1.3	0	93.1
Shipboard	11.3	0	0	0.1	0.6	88.0

Source: 1992 DoD Health Care Survey
Question 27 - "Do you or any members of your family use any of the following military health care programs?"

The low reported usage of some of the new programs may reflect the fact that these programs were only partially implemented at the time of the survey. For those reporting usage of one of the new programs, a large percentage reported using a program that is not available in their region. For example, almost 42 percent of beneficiaries in the Navy CAM region who reported using one of the new programs indicated they used

CHAMPUS Prime or CHAMPUS Extra,[1] which are available only in the CRI region. This clearly indicates confusion among beneficiaries regarding whether they actually used these programs. Consequently, it will not be possible to sort out the effects of these new programs on utilization and satisfaction.

3.5 SUMMARY OF KEY FINDINGS

This chapter addressed access to outpatient care and beneficiaries' knowledge of their health care benefits. The key results are:

- Except for travel time to the facility, most beneficiary families who used civilian facilities had better access than those who used military facilities. Users of civilian facilities got through to the appointment clerk more easily on the telephone, had shorter intervals between making the appointment and the visit, and spent less time in waiting rooms.
- Some of the differences in time between making the appointment and the visit may be attributable to different appointment procedures in military and civilian facilities and different priorities for care among different groups at military facilities. Between a third to half of the time, active-duty sponsors did not try to make a telephone appointment. Active-duty family members who used military facilities were more likely to be seen the same or the next day than civilian facility users. Still, over 13 percent of active-duty spouses and children had to wait two weeks or more for an appointment at a military facility. Retiree families have a lower priority for care at military facilities, and they experienced more delays than active-duty families.
- The most frequently selected reason for not seeking care was that "it was too hard to get an appointment." Other barriers to seeking care included excessive cost, lack of coverage or availability of care, and need to fulfill work and school obligations.
- The disparities in access between military and civilian facilities were also reflected in respondents' satisfaction with certain aspects of care. Dissatisfaction with such components of care as hours when the facility is open, the ability to see specialists when needed, the ability to see doctor of choice, and the ability to get medical advice over the phone was considerably

[1] This number is obtained by dividing the percentage in the Navy CAM region who reported using CHAMPUS Prime or CHAMPUS Extra by the percentage who reported using any of the new programs.

higher for military facility users than for civilian facility users. In a question containing a list of potential concerns about military facilities, the top three concerns selected were all access issues—difficulty getting an appointment, too much time until the appointment, and waiting room time too long.

- Knowledge of where to obtain information about health benefits varied by beneficiary group. Generally, junior-enlisted families knew the least about their benefits, probably because this group has the least experience with the military health care system. Retirees seemed to know less about their benefits than any active-duty families, except junior-enlisted. A surprisingly large number (65 percent) of retirees under 65 did not know where to obtain information about military health benefits after age 65.
- Knowledge of CHAMPUS deductibles and copayments was minimal. Even when regions with MHSS demonstration projects (where deductibles and copayments can vary from the national standard) were excluded, fewer than 30 percent of families could recall the correct deductibles and copayments. In most instances, when beneficiaries specified a deductible or copayment amount, it was lower than the actual amount.

4.0 OUTPATIENT UTILIZATION

4.1 BACKGROUND

Critical to the effective management of health care resources is an understanding of patterns of utilization, so the impact of potential changes in policy can be assessed. Specifically, it is necessary to know who uses military health care, how much care is used, what type of care is received, where it is received, and how it is paid for. In this chapter, patterns of outpatient utilization in both military and civilian facilities is addressed. Inpatient utilization is addressed in the next chapter.

The beneficiary survey allows the opportunity to evaluate beneficiary utilization outside the MHSS. For example, care provided outside DoD facilities to beneficiaries over age 65 is generally paid for through Medicare and is not monitored in DoD information systems. In addition, when providing outpatient care, very few DoD facilities record beneficiary residence information in central information systems. The survey allows a more precise evaluation of who is being served by DoD facilities and how far people travel to obtain outpatient care in DoD facilities.

The basic level of analysis of utilization was by beneficiary type. Analyses were performed separately for the following types of beneficiaries:

- active-duty sponsors,
- family members of active-duty sponsors,
- retirees and survivors under age 65, and their families, and
- retirees and survivors age 65 and over, and their families.

Active-duty sponsors were considered separately because they are generally required to use military treatment facilities (MTFs). Exceptions may occur when the required care is unavailable at a MTF or when private funds or insurance are used, but these are relatively rare. The new military health care initiatives and insurance coverage are therefore not likely to be important factors in determining utilization by this class of beneficiaries. Family members of active-duty sponsors, on the other hand, have the option of using MTFs or civilian facilities for their care. For certain outpatient procedures, however, a Nonavailability Statement (NAS) must be obtained from the local MTF before CHAMPUS will pay for them. Retired sponsors, survivors, and their

families also have the option of using civilian facilities, but are covered by CHAMPUS only if they are under 65. The latter category of beneficiary is more likely to live in a noncatchment area and to have additional insurance coverage than active-duty families.

In addition to estimating the utilization levels for the different beneficiary types, this chapter is concerned with answering the following questions:

- Do utilization patterns vary by region?
- How does utilization vary by medical condition?
- How do insurance coverage and beneficiary demographics such as age, sex, and health status affect utilization?
- Do improved access to MTFs and lower costs to beneficiaries at certain civilian facilities result in a tradeoff in usage between military and civilian facilities, or does total utilization increase? In other words, do the new health care programs create incentives for beneficiaries to use more health care?
- How do beneficiaries pay for their care?

4.2 OUTPATIENT UTILIZATION BY SOURCE OF CARE

The basis for determining outpatient utilization levels is survey question number 47, which asked a randomly-selected family member how many visits he or she made to each of several types of facilities during the past 12 months. The exact wording of this question is as follows:

- *Question 47*: "During the past 12 months, how many times did this family member (the one with the last birthday) visit a medical doctor or assistant at any of the following places for his or her own medical care?" (Places are shown in Appendix A and in subsequent tables in this chapter.)

For the purpose of this analysis, military hospitals or clinics (excluding sick call), military hospitals or clinics (sick call visits only), and PRIMUS or NAVCARE clinics are combined into the single category "military facilities." The single survey option of "civilian doctor's office, hospital, or clinic" was used to define the category "civilian facilities."

The number of outpatient visits to each type of facility was recorded on a scale from 0 to 10+. Because the last scale value included counts of 10 or more visits, the average number of visits per year could not be calculated directly. Rather, a model had to be assumed for estimating the number of visits beyond 10. A description of the model that was used is given in Appendix G.

The average level of outpatient utilization is summarized in Table 4.1. Note that, on average, beneficiaries made very few visits to VA or other facilities. The latter two types of facilities are therefore excluded from consideration throughout the remainder of this chapter.

Table 4.1 Average Number of Visits for Outpatient Care by Source of Care

Source of Care	Active-Duty Sponsors	Active-Duty Family Members	Retirees and Survivors < 65 and Family Members	Retirees and Survivors ≥ 65 and Family Members	All Beneficiaries
Military Facilities	3.1	3.1	1.6	1.8	2.4
Civilian Facilities	0.1	1.2	2.7	4.2	1.9
VA Facilities	0	0	.2	.3	.1
Other Facilities	.1	.1	.1	.1	.1
All Facilities	3.3	4.4	4.6	6.4	4.5

Source: 1992 DoD Health Care Survey
Question 47 - During the past 12 months, how many times did this family member (the one with the last birthday) visit a medical doctor or assistant at any of the following places for his or her own medical care?

Among all military medical care beneficiaries, the average number of visits was 4.5 per year. This compares with approximately 5 visits per year in the general population.[1] Active-duty sponsors made an average of 3.3 visits per year, almost exclusively to military facilities. Active-duty family members made about the same number of visits to MTFs as sponsors, 3.1 visits per year, but also made an average of 1.2 visits per year to civilian facilities. Retirees and survivors and their family members used civilian facilities for most of their care. They averaged only 1.6-1.8 visits per year to MTFs, and had the highest total utilization, 4.6 visits per year for families of retirees or survivors under age 65 and 6.4 visits for families of retirees or survivors age 65 and over.

Note that the numbers of visits to military facilities in Table 4.1 are considerably smaller than those derived from official data sources.[2] This is because of the way the official numbers are developed. For example, visits to separately-organized clinics during a medical examination (e.g., optometry, physical exam, immunization, etc.) are each counted

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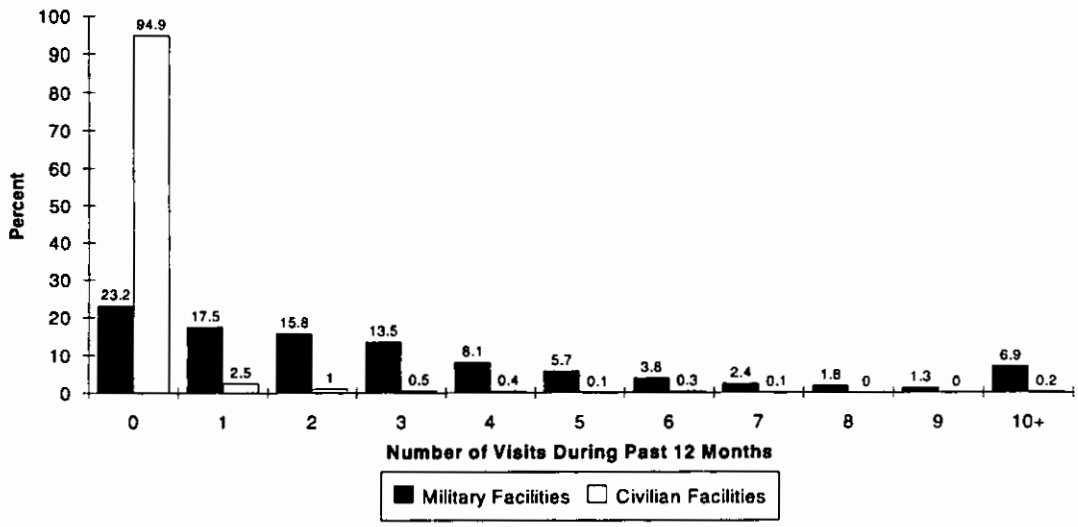
[1] A recent study [2, p. 114] reported the average number of physician contacts as 5.7 per year. This included telephone (.7 contacts), office (3.3 contacts), hospital (.8 contacts), and other (.9 contacts) means of contacting a physician. Assuming most people would not consider a telephone contact as a "visit," the average number of visits in the general population is about five per year.

[2] Data on inpatient and outpatient utilization are available from the Biometrics data base, part of the Defense Medical Information System (DMIS).

by the DoD as distinct visits. Also, phone calls for medical advice (if documented) are counted as outpatient visits. However, it is unlikely that most respondents think of an outpatient visit in this manner. A visit to several different clinics during a physical examination is likely to be thought of as a single visit and a phone call for medical advice is not likely to be thought of as a visit at all. Therefore, the lower numbers of visits reported in the survey are probably due to differences in the definition of an outpatient visit.

Figures 4.1 to 4.4 show the distributions of visits to military and civilian facilities for each of the four beneficiary groups.

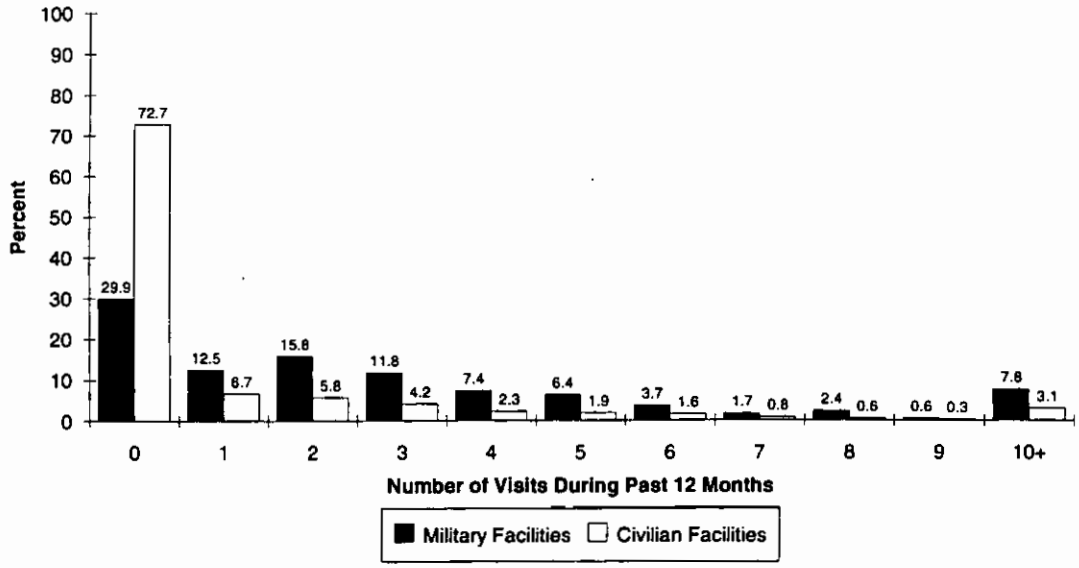


Source: 1992 DoD Health Care Survey
Question 47 - During the past 12 months, how many times did this family member (the one with the last birthday) visit a medical doctor or assistant at any of the following places for his or her own medical care?

Figure 4.1 Outpatient Utilization by Active-Duty Sponsors

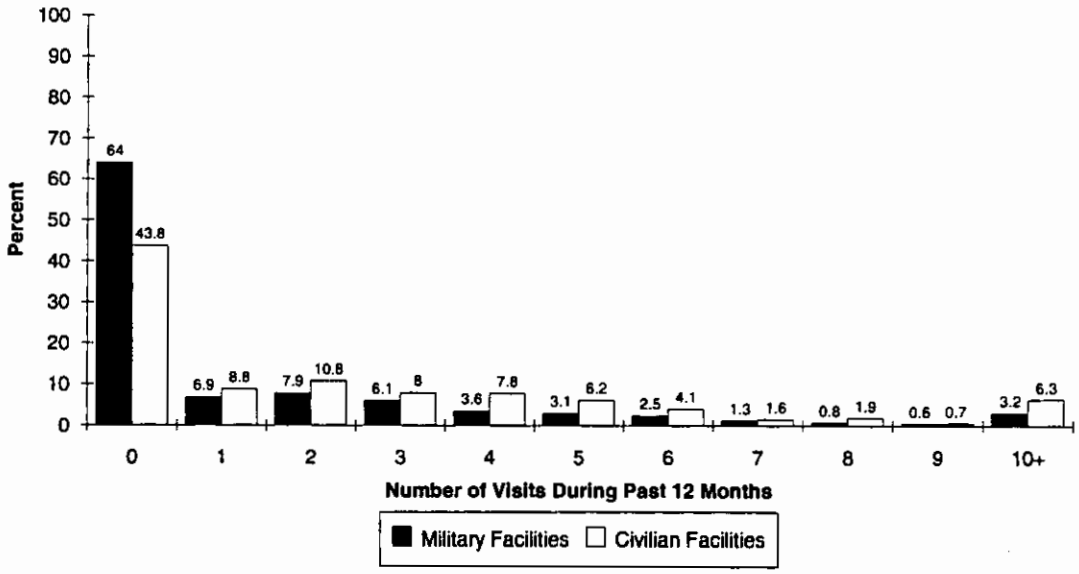
Figure 4.1 confirms that using civilian facilities is a rare event for active-duty sponsors; 95 percent of them used no civilian care in the past year. Only 23 percent of sponsors did not use the military facilities at all. Almost 7 percent of sponsors had 10 or more outpatient visits to military facilities.

Active-duty family members (Figure 4.2) also received most of their outpatient care in military facilities. Nearly 73 percent of family members did not use civilian facilities at all, while only 30 percent did not use military facilities. A somewhat higher portion of family members had 10 or more visits (8 percent to military facilities and 3 percent to civilian facilities).



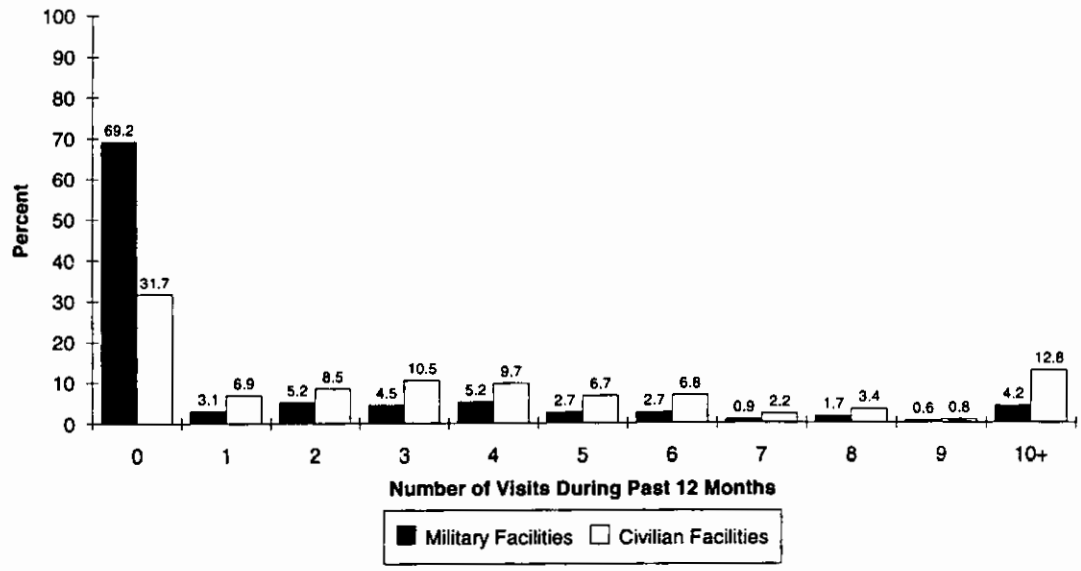
Source: 1992 DoD Health Care Survey
Question 47 - During the past 12 months, how many times did this family member (the one with the last birthday) visit a medical doctor or assistant at any of the following places for his or her own medical care?

Figure 4.2 Outpatient Utilization by Active-Duty Family Members



Source: 1992 DoD Health Care Survey
Question 47 - During the past 12 months, how many times did this family member (the one with the last birthday) visit a medical doctor or assistant at any of the following places for his or her own medical care?

Figure 4.3 Outpatient Utilization by Under-65 Retirees and Family Members



Source: 1992 DoD Health Care Survey
Question 47 - During the past 12 months, how many times did this family member (the one with the last birthday) visit a medical doctor or assistant at any of the following places for his or her own medical care?

Figure 4.4 Outpatient Utilization by Over-65 Retirees and Family Members

Retirees and survivors under 65 and their family members (Figure 4.3) relied more heavily on civilian facilities for their care, perhaps reflecting their lower priority for care at MTFs, as well as their increased insurance coverage. In this group, 64 percent did not use military facilities at all, while 43.8 percent did not use civilian facilities during the year. The distribution of visits included 6.3 percent with 10 or more visits to civilian facilities and 3.2 percent with 10 or more visits to military facilities.

Retirees and survivors 65 and over and their family members (Figure 4.4) also used civilian facilities more than military facilities. In this group, 69.2 percent did not use military facilities at all during the year. Only 4.2 percent had 10 or more visits to military facilities. However, civilian facilities were used more heavily than in the other beneficiary groups. Only 31.7 percent did not use civilian outpatient care during the year, probably reflecting more health problems and Medicare eligibility in this group. The percentages having multiple visits were higher than for the other beneficiary groups, and many had 10 or more visits (12.8 percent to civilian facilities and 4.2 percent to military facilities).

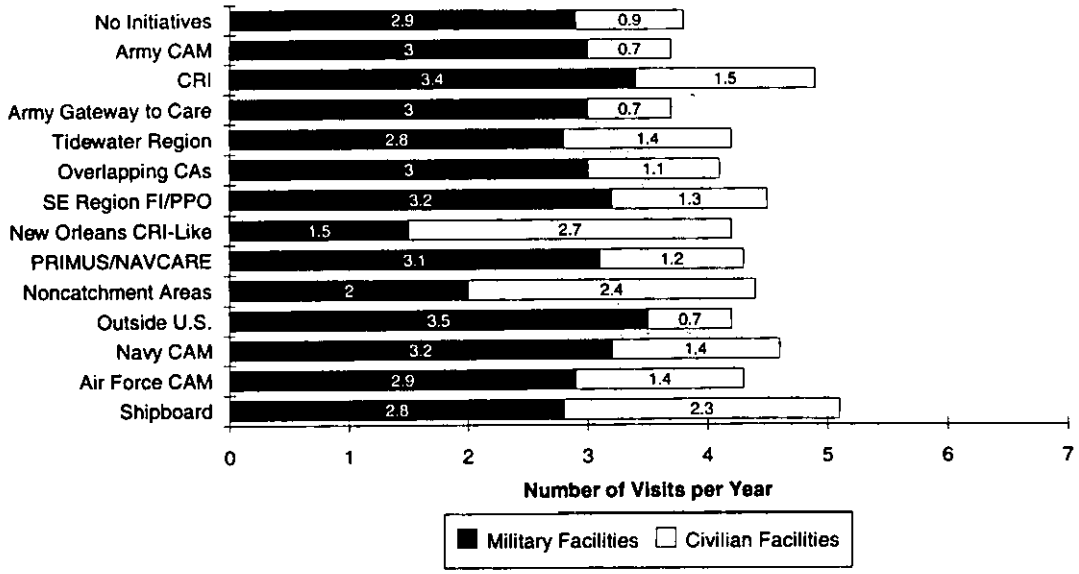
4.3 OUTPATIENT UTILIZATION BY REGION

A necessary first step in understanding how the new military health care initiatives have affected utilization patterns is to examine variations in utilization by region. As previously discussed, active-duty sponsors are generally required to use military facilities and are unlikely to be affected by the new military health care initiatives. However, active-duty family members and retirees and survivors may be affected.

Caution must be used when interpreting the regional results because there is no clear indication from the survey that respondents actually used the new initiatives that were in place in some of these regions. From the discussion of Table 3.9 at the end of Chapter 3, it is evident that beneficiaries were confused about whether they actually used one of the new initiatives. Therefore, differences in utilization are as likely to reflect differences in regional demographics and catchment area resources as differences in regional demonstration programs.

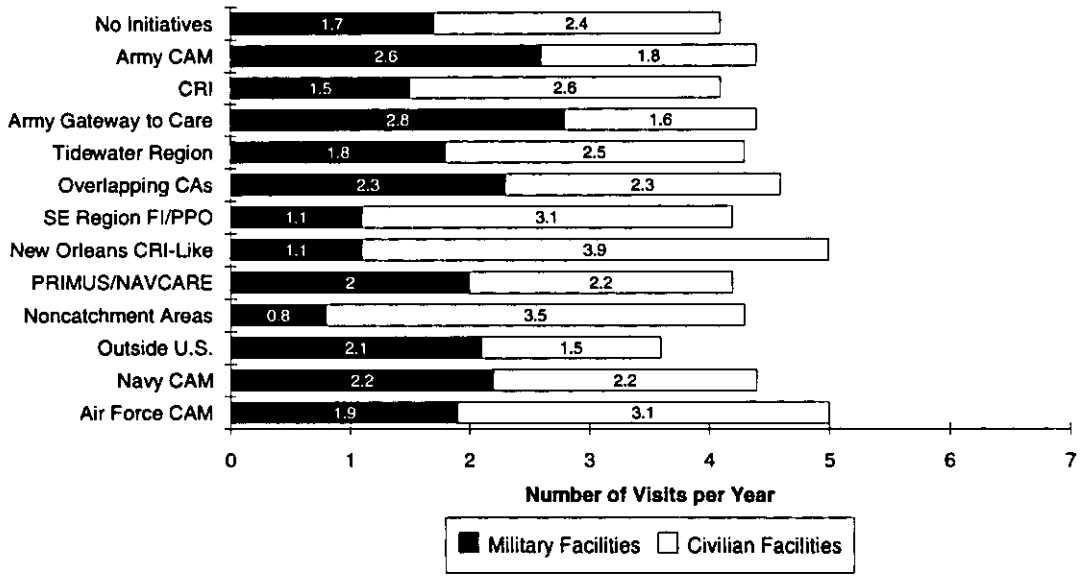
Figure 4.5 shows the outpatient utilization of active-duty family members by the sponsor's region. In regions with no military health care initiatives and no special characteristics, active-duty family members had an average of 3.8 outpatient visits per year, 2.9 of them to military facilities. The regions with the highest utilization levels overall were those with shipboard sponsors (5.1 visits) and the CRI region (4.9 visits). The lowest utilization overall was in the Army Gateway to Care region (3.7 visits). The highest military facility utilization (3.5 visits) was for active-duty family members with sponsors outside the United States. The New Orleans CRI-like region had very low utilization of military facilities (1.5 visits), less even than in noncatchment areas (2 visits), but had the highest level of civilian utilization (2.7 visits). The most likely reason for this pattern is that there are only two small military clinics (one Coast Guard and one Navy) in the New Orleans area. The lowest civilian utilization, 0.7 visits, occurred in the Army CAM region, the Army Gateway to Care region, and outside the United States.

Figure 4.6 shows the outpatient utilization of retirees and survivors under 65 and their family members by region. Total utilization ranged from a low of 3.6 visits per year for those outside the United States to a high of 5 visits per year in the Air Force CAM region and the New Orleans CRI-like region. The highest military facility utilization was in the Army Gateway to Care region (2.8 visits), and the lowest was in noncatchment areas (0.8 visits), where military facilities are less accessible. The highest civilian utilization was in the New Orleans CRI-like region (3.9 visits), and the lowest was in areas outside the United States (1.5 visits).



Source: 1992 DoD Health Care Survey
Question 47 - During the past 12 months, how many times did this family member (the one with the last birthday) visit a medical doctor or assistant at any of the following places for his or her own medical care?

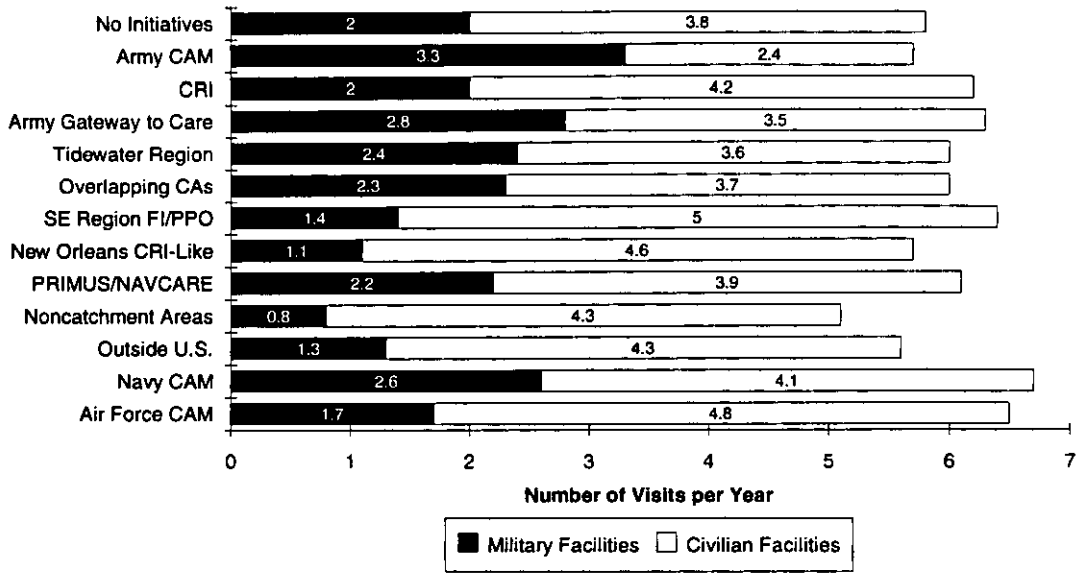
Figure 4.5 Outpatient Utilization of Active-Duty Family Members by Sponsor's Region



Source: 1992 DoD Health Care Survey
Question 47 - During the past 12 months, how many times did this family member (the one with the last birthday) visit a medical doctor or assistant at any of the following places for his or her own medical care?

Figure 4.6 Outpatient Utilization of Under-65 Retirees and Families by Sponsor's Region

Figure 4.7 shows the numbers of visits by retirees and survivors over 65 and their families, by region. Total utilization levels for this group were generally higher than for other beneficiary groups. They ranged from a low of 5.1 visits in noncatchment areas to a high of 6.7 visits in the Navy CAM region. As expected, noncatchment areas had the lowest utilization of military facilities, 0.8 visits per year. The highest use of military facilities was 3.3 visits in the Army CAM region. The Army CAM region also had the lowest utilization rate for civilian facilities, 2.4 visits per year. The highest use of civilian facilities was in the New Orleans CRI-like region (4.5 visits), where there are few military facilities.



Source: 1992 DoD Health Care Survey
Question 47 - During the past 12 months, how many times did this family member (the one with the last birthday) visit a medical doctor or assistant at any of the following places for his or her own medical care?

Figure 4.7 Outpatient Utilization of Over-65 Retirees and Families by Sponsor's Region

4.4 REASONS FOR USING OUTPATIENT CARE

The reasons for using outpatient care provide useful information on the variations in needs among the different beneficiary groups and possible differing availability of types of treatment in military vs. civilian facilities. Table 4.2 gives the percentages of beneficiaries who cited the given reasons for using outpatient care at military and civilian facilities.

Active-duty sponsors are required to use military facilities whenever possible. The largest group of active-duty sponsors, 27 percent, sought treatment for short-term illness. The next two most common reasons for active-duty sponsors to use outpatient

Table 4.2 Percentage Distribution of Reasons for Using Outpatient Care by Beneficiary Type and Source of Care

	Active-Duty Sponsors		Active-Duty Family Members		Retirees and Survivors < 65 and Families		Retirees and Survivors ≥ 65 and Families	
Reason for Visit	Military Facilities	Civilian Facilities	Military Facilities	Civilian Facilities	Military Facilities	Civilian Facilities	Military Facilities	Civilian Facilities
Routine pediatric care	1%	0%	18%	12%	4%	2%	1%	1%
Allergy shots	1	1	3	5	2	3	2	3
Pre-natal care	2	20	8	15	0.3	1	0	0
Other OB/GYN services	8	7	17	14	12	9	8	5
Follow-up after hospital stay	7	17	5	9	9	12	18	17
Sexually-transmitted diseases	1	0	0	0.1	0	0	0	0
Treatment for recurring illness	7	15	8	9	22	20	25	24
Treatment for short-term illness	27	10	32	24	22	20	9	11
Treatment for injuries	24	32	8	6	7	8	5	4
Minor surgery	5	9	3	9	5	9	5	11
Mental health care	2	1	2	7	2	4	1	2
Alcohol or drug treatment	1	0	0	1	0	0.2	0	0.2
Physical or occupational therapy	6	2	1	1	2	3	2	3
Eye care or vision problems	8	7	5	5	10	8	17	21
Ear care or hearing problems	4	2	8	6	5	4	5	4
Routine medical exam	23	8	10	10	32	33	48	42

Source: 1992 DoD Health Care Survey
Question 57 - What were the reasons for this family member's most recent outpatient visit?
Question 58 - What type of medical facility did this family member use for the most recent outpatient visit?

care were treatment for injuries (24 percent) and routine medical examinations (23 percent). No other reasons were given by more than 10 percent of active-duty sponsors.

Reasons active-duty sponsors gave for using civilian facilities were very different from those given for using military facilities. About 95 percent of active-duty sponsors did not use civilian facilities at all over the course of a year. Because they are required to use military facilities whenever possible, their reasons for using civilian facilities represent types of conditions that military facilities do not have the equipment, personnel, or capacity to treat. The most common reason for using a civilian facility was treatment for injuries (32 percent), when people are more likely to use the closest facility. Other common reasons for using outpatient care in civilian facilities include pre-natal care (20 percent), follow-up after hospital stay (17 percent), and treatment for recurring illness (15 percent). No other reason was cited by more than 10 percent of those who received civilian outpatient care.

Active-duty family members also sought treatment at military facilities most often for short-term illness (32 percent). Other common reasons (cited by more than 10 percent) included routine pediatric care (18 percent) and OB/GYN services other than prenatal care (17 percent). The most common reason for active-duty family members to seek care at civilian facilities was the same as at military facilities—treatment for short-term illness (24 percent). Other reasons included prenatal care (15 percent), other OB/GYN services (14 percent), and routine pediatric care (12 percent).

Among retirees and survivors under 65 and their families, the most prevalent reason for using outpatient care was for routine medical exams. About a third of both the military and civilian facility users cited this reason. Other common reasons included treatment for short-term illness and treatment for recurring illness.

The most common reason for the older group of retirees and survivors and their family members to use outpatient care was for routine medical examinations (48 percent of those who used military facilities, 42 percent of those who used civilian facilities). Treatment for recurring illness was the next most common reason (around a quarter of both military and civilian facility users) Other common reasons included eye care or vision problems (17 percent of military facility users and 21 percent of civilian facility users) and follow-up after hospital stay (18 percent of military facility users and 17 percent of civilian facility users).

Table 4.3 compares the use of military and civilian facilities among those who sought care for a given problem. For example, among active-duty family members who used routine pediatric care, 82 percent used military facilities and 18 percent used civilian facilities.

Table 4.3 Percentage of Beneficiaries Using Military and Civilian Facilities by Reason for Seeking Care

	Active-Duty Sponsors		Active-Duty Family Members		Retirees and Survivors < 65 and Families		Retirees and Survivors ≥ 65 and Families	
Reason for Visit	Military Facilities	Civilian Facilities	Military Facilities	Civilian Facilities	Military Facilities	Civilian Facilities	Military Facilities	Civilian Facilities
Routine pediatric care	–	–	82%	18%	54%	46%	29%	71%
Allergy shots	99	1	65	35	31	69	27	73
Pre-natal care	79	21	61	39	26	74	–	–
Other OB/GYN services	97	3	79	21	43	57	43	57
Follow-up after hospital stay	92	8	63	37	32	68	34	66
Sexually-transmitted diseases	–	–	48	52	77	23	–	–
Treatment for recurring illness	94	6	72	28	39	61	34	66
Treatment for short-term illness	99	1	80	20	40	60	28	72
Treatment for injuries	96	4	79	21	33	67	36	64
Minor surgery	95	5	50	50	25	75	18	82
Mental health care	99	1	50	50	21	79	22	78
Alcohol or drug treatment	–	–	24	76	4	96	0	100
Physical or occupational therapy	99	1	81	19	33	67	29	71
Eye care or vision problems	97	3	77	23	44	56	28	72
Ear care or hearing problems	98	2	82	18	43	57	33	67
Routine medical exam	99	1	76	24	37	63	35	65

Source: 1992 DoD Health Care Survey
Question 57 - What were the reasons for this family member's most recent outpatient visit?
Question 58 - What type of medical facility did this family member use for the most recent outpatient visit?

As expected, military facilities provided virtually all outpatient care for active-duty sponsors. The three areas in which civilian facilities were used the most were pre-natal care (21 percent of visits to civilian facilities), follow-up after hospital stay (8 percent), and treatment for recurring illness (6 percent).

Table 4.3 shows that, for active-duty family members, military facilities provide care for a wide range of conditions. For most routine conditions, military facilities provided care over 70 percent of the time. Short-term illnesses were treated 80 percent of the time at military facilities. Military facilities also provided 76 percent of routine examinations for this group. There were only four conditions for which the majority of care was provided at civilian facilities. These were alcohol or drug treatment (76 percent), sexually-transmitted diseases (52 percent), mental health care (50 percent), and minor surgery (50 percent). Other conditions for which civilian facilities were used more than a third of the time include pre-natal care (39 percent), follow-up after hospital stay (37 percent), and allergy shots (35 percent).

Retirees and survivors and their family members were more likely to use civilian facilities for most conditions. In the under-65 retiree and survivor group, virtually all (96 percent) alcohol and drug treatment was provided by civilian facilities. Other conditions for which civilian facilities were heavily used included mental health care (79 percent), minor surgery (75 percent), and pre-natal care (74 percent). Treatment for both short-term and recurring illnesses was provided approximately 60 percent of the time at civilian facilities. Civilian facilities also provided 63 percent of the routine medical examinations for this group. Military facilities provided the majority of care for only two conditions for this group—routine pediatric care (54 percent of visits provided by military facilities) and sexually-transmitted diseases (77 percent, but a very small category).

In the over-65 retiree and survivor group, the reliance on civilian facilities was even more pronounced. All outpatient alcohol and drug treatment occurred in civilian facilities, as well as 82 percent of minor surgery, 78 percent of mental health care, and 65 percent of routine medical examinations. There was not a single condition for which military facilities provided the majority of the care. The areas in which military facilities were used more than a third of the time include OB/GYN services other than pre-natal care (43 percent), treatment for injuries (36 percent), routine medical examinations (35 percent), follow-up after hospital stay (34 percent), and treatment for recurring illness (34 percent).

4.5 FACTORS INFLUENCING OUTPATIENT UTILIZATION

The next series of analyses used non-linear regression analysis to examine the most important factors influencing outpatient utilization levels. Regression analysis is useful because it can sort out the influence of individual factors that may simultaneously affect utilization. It also provides a convenient way of assessing the effects of many factors on utilization without resorting to cumbersome cross-tabulations. Details of the regression model can be found in Appendix G.

To simplify the presentation, results are given in terms of the expected (predicted) numbers of visits for people with a given characteristic. Table 4.4 gives results for active-duty sponsors, Table 4.5 gives the results for active-duty family members, and Table 4.6 gives the results for retirees and survivors and their family members. In each case, the expected number of visits for a given characteristic controls for other factors. For example, the expected number of visits for senior-enlisted sponsors controls for region, marital status, sex, race, income, insurance coverage, military service, other-service facility, and medical problems. Statistically significant differences from the base case are highlighted with an asterisk. The base case for a set of variables is displayed as the first in the list. For example, the base region against which the others are compared is the "no initiatives" region.

4.5.1 Factors Influencing Outpatient Utilization of Active-Duty Sponsors

Active-duty sponsors use military facilities almost exclusively. Civilian facilities are used only when military facilities are not available, or in the case of some of the new initiatives. Therefore, this analysis covers only military facilities. Table 4.4 shows the regression results for active-duty sponsors, with the number of outpatient visits to military facilities as the dependent variable.

There were no significant differences in outpatient utilization by rank. Junior-enlisted, senior-enlisted, and officer sponsors all had an expected 2.6 to 2.7 visits. The "no initiatives" region had an expected utilization level of 2.7 visits, and the only significant difference from that was in the Tidewater region, where sponsors had only 2 visits. The Tidewater Virginia area is hosting a demonstration project (TRICARE) that involves pooling of medical assets across services, along with a choice of plans for beneficiaries. Active-duty personnel were automatically enrolled in the Preferred Plan HMO, in which management selects the primary care provider from MTF, NAVCARE, and civilian providers in the network. Thus, active-duty personnel might be directed to use civilian facilities if they were less expensive.

Table 4.4 Expected Number of Visits to Military Facilities for Active-Duty Sponsors

Variable	Expected Visits	Variable	Expected Visits
Junior Enlisted	2.7	No Private Insurance	2.7
Senior Enlisted	2.6	Private Insurance	1.6*
Officers	2.6	Army	3.0
No Initiatives	2.7	Navy	2.4*
Army CAM	3.1	Marine Corps	3.4*
CRI	2.6	Air Force	2.4*
Army Gateway to Care	2.5	Facility Operated by Same Service	2.6
Tidewater Region	2.0*	Facility Operated by Another Service	3.1*
Overlapping Catchment Areas	2.5	No Medical Problems	1.5
SE Region FI/PPO	2.6	Lung Problems	2.2*
New Orleans CRI-Like	2.8	Heart Problems	2.7*
PRIMUS/NAVCARE	2.5	High Blood Pressure	2.1*
Noncatchment Areas	2.4	Diabetes	2.4
Outside U.S.	2.5	Joint/Muscular Problems	3.0*
Navy CAM	2.5	Back Problems	2.2*
Air Force CAM	3.5	Cancer (except skin)	4.2*
Shipboard	2.8	Skin Cancer	2.3*
Single	2.5	Mental Health Problems	1.9*
Married, Living With Spouse	2.7*	Allergies	1.9*
Married, Not Living With Spouse	2.4	Alcohol/Drug Problems	1.6
Age of Sponsor	2.6	Cold or Flu	2.5*
Female	4.2	Digestive Problems	2.3*
Male	2.5*	Bladder/Urinary Problems	2.6*
White	2.6	Eye/Vision Problems	1.8*
Black	3.1*	Ear/Hearing Problems	2.2*
Other Race	2.5	Prostate Problems	1.3
Family Income	2.6	Menstrual Problems	1.9*
		Other Problems	2.7*

* Statistically significant at the 5-percent level.

Source: Regression analysis based on responses to 1992 DoD Health Care Survey
Question 41 - Of the family members who are currently eligible for military medical benefits, who had the last birthday?
Question 47 - During the past 12 months, how many times did this family member visit a medical doctor or assistant at any of the following places for his or her own medical care?

Single sponsors had 2.5 visits, and those married and living with their spouses had 2.7 visits. Those married but not living with their spouses were not significantly different from the single sponsors.

Female sponsors had an expected 4.2 visits, and male sponsors had significantly fewer, 2.5 visits. Black sponsors had significantly more expected visits, 3.1, than white sponsors, with 2.6. Those with private insurance had a predicted utilization of military

facilities significantly less (only 1.6 visits) than those without private insurance (2.7 visits).

All of the differences (relative to the Army) by military service were statistically significant. Marine Corps sponsors had the highest number of expected visits (3.4), followed by Army sponsors (3), then Navy and Air Force sponsors (2.4 each). Where the military facility is run by a service different from the sponsor (e.g., an Army sponsor in an Air Force catchment area), sponsors used significantly more care, 3.1 visits vs. 2.6, in areas where their own service manages the military treatment facility.

As expected, medical conditions accounted for much of the variation in outpatient utilization. Those with no medical problems were predicted to have 1.5 visits. The highest number of visits, 4.2, was for those with cancer (other than skin cancer). Other conditions with 2.5 or more expected visits included joint/muscular problems (3 visits), heart problems and problems other than those listed (2.7 visits each), bladder/urinary problems (2.6 visits), and cold or flu (2.5 visits).

4.5.2 Factors Influencing Outpatient Utilization of Active-Duty Family Members

Table 4.5 shows the regression results for active-duty family members, with visits to military facilities and visits to civilian facilities as separate dependent variables. The numbers in the table represent the expected number of visits for people with each characteristic. Note that statistical significance was determined only for visits to military and civilian facilities, not for total visits.[3]

Family members of senior-enlisted personnel are expected to have 3.4 visits, significantly less than family members of junior-enlisted personnel, who are expected to have 4.0 visits. Utilization by family members of officers was not significantly different from that by family members of junior-enlisted personnel.

There were several significant regional differences in outpatient utilization among active-duty family members. In the region set as the baseline—areas with no initiatives—the expected utilization was 2.5 visits to military facilities and 1 visit to civilian facilities. In overlapping catchment areas, as expected, active-duty family members used military facilities more often (2.9 visits) and civilian facilities less often (0.8 visits).

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[3] Determining significance of a total based on the sum of non-linear models requires simultaneous estimation of the models. This was not considered feasible for the current effort.

Table 4.5 Expected Number of Visits for Active-Duty Family Members

Variable	Expected Visits to Military Facilities	Expected Visits to Civilian Facilities	Total Expected Visits
Junior Enlisted	2.8	1.2	4.0
Senior Enlisted	2.5*	0.9*	3.4
Officers	2.5	1.2	3.7
No Initiatives	2.5	1.0	3.5
Army CAM	2.6	0.8	3.4
CRI	3.1*	1.0	4.1
Army Gateway to Care	2.8	0.7*	3.5
Tidewater Region	2.5	0.9	3.4
Overlapping Catchment Areas	2.9*	0.8*	3.6
SE Region FI/PPO	2.7	1.1	3.8
New Orleans CRI-Like	1.6	2.1	3.7
PRIMUS/NAVCARE	2.8	0.8	3.6
Noncatchment Areas	1.6*	2.7*	4.3
Outside U.S.	2.8	0.5*	3.3
Navy CAM	3.1	1.1	4.2
Air Force CAM	2.3	1.5	3.8
Shipboard	2.8	1.6*	4.4
Single	1.7	1.1	2.8
Married, Living With Spouse	2.6*	0.6*	3.2
Married, Not Living With Spouse	2.3*	1.2	3.5
Age of Family Member	2.5*	1.1	3.6
Female	2.7	1.1	3.8
Male	2.3*	1.0	3.3
White	2.7	1.1	3.8
Black	2.1*	0.9*	3.0
Other Race	2.1*	1.2	3.2
Family Income	2.5	1.1	3.6
No Supplemental Insurance	2.6	1.0	3.7
CHAMPUS Supplemental Insurance	2.6	1.1	3.7
Private Insurance	1.7*	1.8*	3.4
Army	2.6	1.1	3.7
Navy	2.3	1.5*	3.9
Marine Corps	2.2*	2.0*	4.2
Air Force	2.8*	0.7*	3.5
Facility Operated by Same Service	2.6	1.0	3.6
Facility Operated by Another Service	2.3*	1.4*	3.7

Continued on next page

Table 4.5—*Continued*

Variable	Expected Visits to Military Facilities	Expected Visits to Civilian Facilities	Total Expected Visits
No Medical Problems	1.5	0.6	2.1
Lung Problems	2.6*	1.3*	3.9
Heart Problems	2.2*	1.0	3.2
High Blood Pressure	2.0*	0.8*	2.9
Diabetes	2.5*	1.3*	3.8
Joint/Muscular Problems	1.5	0.9*	2.4
Back Problems	2.1*	0.7	2.9
Cancer (except skin)	4.3*	2.5*	6.8
Skin Cancer	3.0	0.6	3.6
Mental Health Problems	2.0*	4.2*	6.2
Allergies	2.0*	1.1*	3.2
Alcohol/Drug Problems	1.4	1.0*	2.5
Cold or Flu	2.3*	0.7*	3.0
Digestive Problems	2.0*	1.2*	3.1
Bladder/Urinary Problems	2.3*	0.7	3.0
Eye/Vision Problems	1.9*	0.8*	2.7
Ear/Hearing Problems	2.3*	0.8	3.2
Prostate Problems	1.5	1.8	3.3
Menstrual Problems	1.7*	0.6	2.4
Other Problems	2.6*	1.2*	3.8

* Statistically significant at the 5-percent level.

Source: Regression analysis based on responses to 1992 DoD Health Care Survey
Question 41 - Of the family members who are currently eligible for military medical benefits, who had the last birthday?
Question 47 - During the past 12 months, how many times did this family member visit a medical doctor or assistant at any of the following places for his or her own medical care?

By contrast, in noncatchment areas (areas outside a 40-mile radius of a military hospital), active-duty family members used military facilities less often (1.6 visits) and civilian facilities more often (2.7 visits). Their total utilization was higher than beneficiaries in areas with no initiatives. In the CRI region, utilization of military facilities was significantly higher (3.1 visits), while utilization of civilian facilities was the same, resulting in higher total utilization. Family members of shipboard sponsors used significantly more civilian care (1.6 visits), while two groups used significantly less civilian care—those in the Army Gateway to Care region (0.7 visits) and those outside the United States (0.5 visits).

Members of families where the sponsor is married and living with the spouse used significantly more care (3.2 visits) than members of families with single sponsors (2.8 visits). The former used more military care and less civilian care. Members of families

where the sponsor is married but not living with the spouse used significantly more military care (2.3 visits) than members of families with single sponsors (1.7 visits).

The age of the sponsor had a significant but very small negative impact on use of military facilities. Males used significantly less military care than females (2.3 visits vs. 2.7 visits). Blacks and other races used significantly less military care than whites (2.1 visits vs. 2.7 visits). Blacks also used significantly less civilian care than whites (0.9 visit vs. 1.1 visits).

Insurance coverage had a significant effect on utilization. Those with private insurance used significantly less military care than those with no supplemental insurance (1.7 visits vs. 2.6 visits). Instead, they used civilian care (1.8 visits, vs. 1.0 visit for those without supplemental insurance). Having CHAMPUS supplemental insurance did not have an effect on utilization.

Family members of Marine Corps sponsors used significantly less military care and more civilian care than family members with sponsors from the Army, which was the base case. Air Force family members used more military care but less civilian care. Navy family members used significantly more civilian care. Family members in areas where the MTF was operated by a different service from the sponsor had 0.3 fewer visits to military facilities and 0.4 more visits to civilian facilities. Thus, their total utilization was not much different.

A number of medical conditions resulted in increased utilization. The main conditions by far were cancer (except skin) and mental health problems. Cancer patients expected to have 4.3 visits to military facilities and 2.5 visits to civilian facilities. In the case of mental health problems, usage was directed to civilian facilities. Those with mental health problems were predicted to have 2 visits to military facilities and 4.2 visits to civilian facilities.

4.5.3 Factors Influencing Outpatient Utilization of Retirees and Survivors

Table 4.6 shows the regression results for retirees/survivors and family members, with visits to military facilities and visits to civilian facilities as separate dependent variables. The numbers in the table represent the expected number of visits for people with each characteristic. Again, note that statistical significance was determined only for visits to military and civilian facilities, not for total visits.

Table 4.6 Expected Number of Visits for Retirees/Survivors and Family Members

Variable	Expected Visits to Military Facilities	Expected Visits to Civilian Facilities	Total Expected Visits
Retirees Under 65	1.5	2.4	3.9
Retirees 65 and Over	1.8*	2.9*	4.8
Reserve Retirees Under 65	0.6*	4.1*	4.7
Reserve Retirees 65 and Over	1.1*	3.4*	4.5
Survivors Under 65	1.8	3.5*	5.3
Survivors 65 and Over	1.5	3.6*	5.1
No Initiatives	1.5	2.6	4.2
Army CAM	2.2	2.0*	4.1
CRI	1.6	3.1*	4.7
Army Gateway to Care	2.3*	2.0*	4.3
Tidewater Region	1.5	2.8	4.4
Overlapping Catchment Areas	2.3*	2.3*	4.5
SE Region FI/PPO	1.0*	3.7*	4.8
New Orleans CRI-Like	0.8	4.4	5.2
PRIMUS/NAVCARE	1.8	2.3	4.2
Noncatchment Areas	0.6*	3.9*	4.5
Outside U.S.	1.5	2.3	3.7
Navy CAM	2.3	2.5	4.9
Air Force CAM	1.5	3.2	4.6
Single	1.3	2.2	3.5
Married, Living With Spouse	1.4	2.9*	4.4
Married, Not Living With Spouse	4.3*	2.2	6.4
Age of Family Member	1.5	2.8	4.3
Female	1.6	2.9	4.6
Male	1.3*	2.1*	3.4
White	1.5	2.9	4.3
Black	1.6	2.4*	4.0
Other Race	1.3	2.1*	3.3
Family Income	1.5*	2.8*	4.3
No Supplemental Insurance	1.7	2.2	3.9
CHAMPUS Supplemental Insurance	1.8	2.4*	4.3
Medicare Part B	1.6	3.0*	4.6
Private Insurance	1.2*	3.0*	4.2
Army	1.5	2.6	4.1
Navy	1.3*	3.2*	4.4
Marine Corps	1.1*	3.2*	4.2
Air Force	1.6	2.7	4.4
Facility Operated by Same Service	1.5	2.8	4.3
Facility Operated by Another Service	1.4	2.9	4.2

Continued on next page

Table 4.6—*Continued*

Variable	Expected Visits to Military Facilities	Expected Visits to Civilian Facilities	Total Expected Visits
No Medical Problems	0.7	1.4	2.1
Lung Problems	1.2*	2.3*	3.5
Heart Problems	1.0*	2.0*	3.0
High Blood Pressure	1.1*	1.9*	3.0
Diabetes	0.9*	1.8*	2.7
Joint/Muscular Problems	1.1*	1.8*	2.8
Back Problems	0.9*	1.7*	2.6
Cancer (except skin)	1.4*	2.8*	4.2
Skin Cancer	0.8	2.1*	2.9
Mental Health Problems	0.9	2.9*	3.8
Allergies	0.8	1.9*	2.6
Alcohol/Drug Problems	0.6	1.2	1.8
Cold or Flu	0.9*	1.7*	2.6
Digestive Problems	1.0*	1.5*	2.5
Bladder/Urinary Problems	1.1*	1.8*	2.9
Eye/Vision Problems	0.8	1.7*	2.5
Ear/Hearing Problems	0.7	1.3	2.0
Prostate Problems	1.3*	1.7*	3.0
Menstrual Problems	0.8	1.9*	2.8
Other Problems	1.0*	2.0*	2.9

* Statistically significant at the 5-percent level.

Source: Regression analysis based on responses to 1992 DoD Health Care Survey
Question 41 - Of the family members who are currently eligible for military medical benefits, who had the last birthday?
Question 47 - During the past 12 months, how many times did this family member visit a medical doctor or assistant at any of the following places for his or her own medical care?

In this analysis, the under-65 retirees were used as the baseline group. They were expected to have 1.5 visits to military facilities and 2.4 visits to civilian facilities. One of the groups, over-65 retirees, had significantly more visits to military facilities (1.8). Two groups had significantly fewer visits—over-65 reserve retirees (1.1 visits) and under-65 reserve retirees (0.6 visits). All five groups used significantly more civilian care than the baseline group. Reserve retirees under 65 had the most (4.1 visits), then survivors (3.6 visits for survivors 65 and over, 3.5 visits for the under-65 group), reserve retirees 65 and over (3.4 visits) and retirees 65 and over (2.9 visits).

There were a variety of regional variations in utilization. In four regions, both military and civilian utilization were significantly different from the baseline "no initiatives" region. In the region with no initiatives, expected utilization was 1.5 military visits and 2.6 civilian visits. In the Army Gateway to Care region, total utilization was

about the same, but military utilization was significantly higher (2.3 visits) and civilian utilization significantly lower (2.0 visits). In overlapping catchment areas, there was more military utilization (2.3 visits) and less civilian utilization (2.3 visits), but total utilization was still higher than in the no-initiatives region. In noncatchment areas (areas outside a 40-mile radius of a military hospital), very low military utilization (0.6 visits) was more than offset by very high civilian utilization (3.9 visits). The Southeast demonstration region also had low military utilization (1 visit) and high civilian utilization (3.7 visits). In the CRI region, civilian utilization was significantly higher (3.1 visits), resulting in higher overall utilization. In the Army CAM region, civilian utilization was significantly lower (2.0 visits), while utilization of MTFs was not significantly different from the no-initiatives region.

Single retirees and survivors had 3.5 expected visits, 1.3 to military facilities and 2.2 to civilian facilities. Married retirees and survivors living with their spouses had more civilian visits (2.9), and those married but not living with their spouses had many more military visits (4.3).

Male retirees, survivors, and family members used significantly less outpatient care than females. Males were predicted to have 1.3 military visits (vs. 1.6 for females) and 2.1 civilian visits (vs. 2.9 for females).

Race made no significant difference in the use of military outpatient care. However, both Blacks (2.4 visits) and other races (2.1 visits) used significantly less civilian care than whites (2.9 visits). Family income had a significant negative effect on utilization of military facilities and a significant positive effect on utilization of civilian facilities.

People with additional insurance tended to use more civilian care and more care overall. Those with CHAMPUS supplemental insurance and those with Medicare Part B insurance had more civilian visits (2.4 and 3 visits, respectively) and about the same number of military visits as those without extra insurance. Those with private insurance used less military outpatient care (1.2 visits) and more civilian care (3 visits).

Army and Air Force beneficiaries had roughly similar utilization patterns. Navy and Marine Corps beneficiaries used significantly less military care and significantly more civilian care.

Those with no medical problems had 2.1 visits overall, 0.7 to military facilities and 1.4 to civilian facilities. A number of medical problems contributed to higher utilization. The two biggest contributors were cancer (except skin) (1.4 military visits and 2.8 civilian visits) and mental health problems (0.9 military visits—not significant, and 2.9 civilian visits).

4.6 OUTPATIENT UTILIZATION BY SOURCE OF PAYMENT

Beneficiaries used a variety of methods to pay for care. Table 4.7 shows the percentage who used a given payment method for outpatient care at civilian facilities. Note that the percentages in each column may sum to more than 100 percent because more than one payment option can be used at a time. For example, beneficiaries who use CHAMPUS or private insurance to pay for care at a civilian facility are likely to use their own money to cover deductibles and copayments.

Table 4.7 Percentage of Beneficiaries Using Given Methods of Payment for Outpatient Care at Civilian Facilities

Method of Payment	Junior Enlisted	Senior Enlisted	Officers	Retirees/ Survivors < 65	Retirees/ Survivors ≥ 65
Did Not Have to Pay	12%	9%	9%	5%	7%
Standard CHAMPUS	56	58	62	42	9
CHAMPUS Supplemental	5	5	15	10	4
New Military Health Care Program	10	12	8	3	1
Medicare Part B	1	0.2	0.2	3	67
Private Health Insurance	10	12	9	58	64
Public Assistance	2	1	0.1	0.2	1
Own Money	26	29	31	29	29

Source: 1992 DoD Health Care Survey
Question 71 - "Which of the following was (or will be) used to pay for this family member's most recent visit for outpatient care?"
Question 58 - "What type of medical facility did this family member use for the most recent outpatient visit?"

Table 4.8 Percentage of Beneficiaries Using Given Methods of Payment for Outpatient Care at Military Facilities

Method of Payment	Junior Enlisted	Senior Enlisted	Officers	Retirees/ Survivors < 65	Retirees/ Survivors ≥ 65
Did Not Have to Pay	90%	92%	96%	80%	84%
Standard CHAMPUS	9	7	4	16	2
CHAMPUS Supplemental	1	1	0.2	1	1
New Military Health Care Program	1	1	1	3	2
Medicare Part B	0.1	0	0	1	12
Private Health Insurance	0.1	0.2	0.1	8	9
Public Assistance	0.1	0	0	0	0.3
Own Money	1	1	1	1	1

Source: 1992 DoD Health Care Survey
Question 71 - "Which of the following was (or will be) used to pay for this family member's most recent visit for outpatient care?"
Question 58 - "What type of medical facility did this family member use for the most recent outpatient visit?"

The most common source of payment for civilian care among active-duty families was standard CHAMPUS. Over half of active-duty beneficiaries used this source, and it was used most often by officers (62 percent) as compared with enlisted. The next most prevalent payment source for active-duty beneficiaries was their own money (26-31 percent), again, used most often by officers. Officer beneficiaries used CHAMPUS supplemental insurance considerably more often (15 percent of the time) than enlisted beneficiaries did (around 5 percent). Private health insurance was used 9-12 percent of the time, more often by senior-enlisted family members and less often by family members of officers. A fairly substantial percentage of active-duty beneficiaries, ranging from 9 to 12 percent, indicated that they did not have to pay for care at civilian facilities. This could be because they belonged to HMOs, or they used one of the new military health care programs, or they had access to free care (such as when a referral to a civilian facility was obtained from a military facility with limited capacity or resources). One of the new military health care programs was cited as a payment source by 8 percent of the family members of officers, 10 percent of junior-enlisted family members, and 12 percent of senior-enlisted family members. Public assistance and Medicare Part B were used less than two percent of the time (use of Medicare Part B indicates that a beneficiary is elderly or disabled).

Standard CHAMPUS was widely used by the under-65 retirees and survivors (42 percent) but much less by the over-65 group (9 percent, the least of all the beneficiary groups). This result is not surprising because beneficiaries generally lose their CHAMPUS eligibility upon reaching age 65 (when they become eligible for Medicare), but family members below that age retain their CHAMPUS eligibility.

Within the under-65 retiree and survivor group, private insurance was the most common source of payment for civilian care (58 percent), with standard CHAMPUS (42 percent) and personal funds (29 percent) also frequently used. Around 10 percent used CHAMPUS supplemental insurance, and only 3 percent cited one of the new military health care programs as a source of payment. Within the over-65 group, Medicare Part B (67 percent) and private insurance (64 percent) were the largest sources of payment, with personal funds (28 percent) also a frequent source. Only 4 percent of the over-65 group used CHAMPUS supplemental insurance, and fewer than 1 percent used a new military health program. Some retirees (5 percent of the under-65 group and 7 percent of the over-65 group) said that they did not have to pay for civilian outpatient care.

At military facilities (Table 4.8), over 90 percent of active-duty beneficiaries indicated they did not have to pay for their care. This is not surprising since care at MTFs

is generally free. A relatively small percentage of active-duty beneficiaries cited standard CHAMPUS as a payment source (4 percent of officer families, 7 percent of senior-enlisted families, and 9 percent of junior-enlisted families).

Among families of retirees and survivors, standard CHAMPUS was cited by 16 percent of the under-65 group and Medicare Part B was cited by 12 percent of the over-65 group. Since neither CHAMPUS nor Medicare pay for care at a military facility, the numbers indicated for these sources of payment show a lack of understanding among beneficiaries about how military care is compensated. Another cited source of payment for care at military facilities was private insurance (about 8 percent for both age groups). About 80 percent of the under-65 group and 84 percent of the over-65 group said they did not have to pay for care. The new military health care programs were cited by only 3 percent of the under-65 retirees and 2 percent of the over-65 group.

4.7 SUMMARY OF KEY FINDINGS

This chapter addressed outpatient utilization as measured by the average number of visits per beneficiary per year. The key results are:

- Among all beneficiaries together, utilization was almost evenly divided between military and non-military facilities. Beneficiaries averaged 4.5 visits per year, close to the 5 visits per year reported as the average for the general population.
- There were large differences in utilization across beneficiary groups. As expected, active-duty sponsors used military facilities almost exclusively for their care. Active-duty family members predominately used military facilities, but used civilian facilities for about one-fourth of their care. Nearly 73 percent of active-duty family members did not use civilian facilities at all, while only 30 percent did not use military facilities at any time during the year. Retirees/survivors and their family members predominately used civilian facilities for their care. Retirees/survivors under 65 and their family members averaged between four and five visits per year, almost 60 percent of which were to civilian facilities. Retirees/survivors 65 and over and their family members used more outpatient care than other groups, over six visits per year. Two-thirds of these visits were to civilian facilities.
- The average numbers of visits to military facilities derived from the survey are considerably lower than the officially-published DoD statistics, due to differences in the definition of a visit.

- Sponsors in areas where the military facility is run by a service different from the sponsor (e.g., an Army sponsor in an Air Force catchment area) tend to place more demands on military facilities, using more visits. In such cases, their family members tend to use more civilian care, perhaps because the military facilities are being filled by sponsors.
- Insurance coverage had a significant effect on utilization. In all beneficiary groups, those with private insurance used less military care and more civilian care. CHAMPUS supplemental insurance coverage did not affect utilization by active-duty beneficiaries, but among beneficiaries with a retiree or survivor sponsor, it resulted in more civilian care and about the same level of military care.
- The majority of active-duty family members used CHAMPUS to pay for care at civilian facilities. A sizable number (about 20 percent) also cited using private health insurance or one of the new military health care programs to pay for care. The majority of retiree families used either private insurance or a combination of private insurance and Medicare Part B. Over 40 percent of retirees under 65 also used CHAMPUS to pay for their care.

5.0 INPATIENT UTILIZATION

5.1 BACKGROUND

In order to effectively manage limited military health care resources, it is critical to understand the patterns of utilization among beneficiaries of the military health care system. Once this information has been obtained, it can be used to provide baseline utilization rates against which to measure the impact of potential changes in policy. Specifically, it is necessary to know who uses military health care, how much care is used, what type of care is received, where it is received, and how it is paid for. This chapter addresses patterns of inpatient utilization, both in military and civilian hospitals.

The beneficiary survey allows an opportunity to evaluate several components of inpatient utilization not monitored in DoD information systems. For example, MHSS beneficiaries who are Medicare-eligible may receive care in the civilian sector; this care is not reported in DoD systems. Using the survey, one can measure the portion of care received by Medicare-eligible beneficiaries that is provided by DoD hospitals.

The basic level of analysis of utilization was by beneficiary type. Analyses were performed separately for the following types of beneficiaries:

- active-duty sponsors,
- family members of active-duty sponsors,
- retirees and survivors under age 65 and their families, and
- retirees and survivors age 65 and over and their families.

Active-duty sponsors were considered separately because they are generally required to use military treatment facilities (MTFs) and, therefore, have very low hospitalization rates at civilian hospitals. Exceptions may occur when the required care is unavailable at an MTF or when private funds or insurance are used, but these are relatively rare. The new military health care initiatives and insurance coverage plans are therefore not likely to be important factors in determining utilization by this class of beneficiaries. Family members of active-duty sponsors, on the other hand, have the option of using MTFs or civilian hospitals for their care, but are covered by CHAMPUS only if they live more than 40 miles from the nearest MTF. Retired sponsors, survivors, and their families also have the option of using civilian hospitals, but are covered by

CHAMPUS only if they are under 65 and are subject to the same distance requirement as active-duty family members. Exceptions to the distance requirement are made for emergency situations or when the required care is unavailable at an MTF and a Nonavailability Statement (NAS) is obtained. Retirees and survivors are also more likely to live in a noncatchment area and to have additional insurance coverage than active-duty families.

In addition to estimating the utilization levels for the different beneficiary types, this chapter is concerned with answering the following questions:

- Do utilization patterns vary by region?
- How does utilization vary by medical condition?
- How do insurance coverage and beneficiary demographics such as age, sex, and health status affect utilization?
- How do beneficiaries pay for their care?

5.2 INPATIENT UTILIZATION BY SOURCE OF CARE

Inpatient utilization is measured both in terms of the hospitalization rate (the percentage of the beneficiary population that is hospitalized at least once during a 12-month period) and the average length of stay in the hospital once admitted. The basis for determining inpatient utilization levels is survey question number 48, which asks a randomly-selected family member for the total number of nights he or she spent in each of several types of hospitals during the past 12 months, and question number 81, which asks the family member with the most recent hospital stay (not necessarily the same family member identified in question 48) how many nights he or she spent in the hospital during that particular stay. The exact wording of these questions is as follows:

- *Question 48*: "During the past 12 months, how many nights did this family member (the one with the last birthday) stay overnight as a patient in any of the following places?" (Places are shown in Appendix A and in subsequent tables.)
- *Question 81*: "How many nights did this family member stay in the medical facility used for the most recent hospital stay?"

Question 48 allows for responses from 0 to 10+ nights. In determining the percentage of the population with at least one inpatient episode, the answers to question 48 were treated as binary responses. In other words, respondents who marked zero nights in the hospital were counted as not having an inpatient episode. Those who answered one or more nights were counted as having at least one overnight stay.

This section gives a general summary of inpatient utilization among military beneficiaries. Hospitalization rates, length of stay patterns, and reasons for admission to military and civilian hospitals, presented by beneficiary type, are also subjects of analysis.

5.2.1 Hospitalization Rates

Table 5.1 shows the percentage of each beneficiary group hospitalized within a 12-month period. This period, defined as the 12 months prior to the date the survey was completed, varies from respondent to respondent because the survey was in the field for six months.

Table 5.1 Percentage of Beneficiaries Hospitalized by Source of Care

Source of Care	Active-Duty Sponsors	Active-Duty Family Members	Retirees and Survivors < 65 and Family Members	Retirees and Survivors ≥ 65 and Family Members	All Beneficiaries
Military Hospitals	7.2%	9.2%	3.7%	5.6%	6.4%
Civilian Hospitals	.8	6.1	8.5	15.8	7.2
VA Hospitals	.2	0	.8	1.8	.6
Other Hospitals	.4	.4	.6	.6	.5
All Hospitals	8.6	15.7	13.6	23.8	14.7

Source: 1992 DoD Health Care Survey
Question 48 - During the past 12 months, how many nights did this family member (the one with the last birthday) stay overnight as a patient in any of the following places?

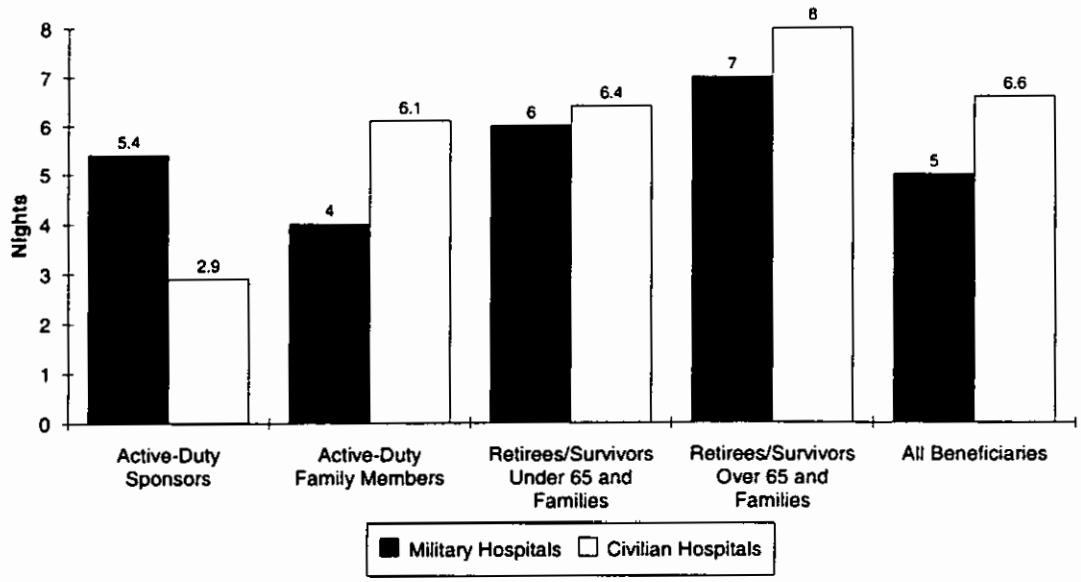
Among all military medical care beneficiaries, 14.7 percent were hospitalized over the course of a year. (There is some double counting here, since beneficiaries can have separate stays in different types of hospitals. However, those with separate stays in different types of hospitals amounted to less than one half of one percent of the beneficiary population.) This compares with 7.8 percent of the general population who had at least one inpatient episode at a short-term hospital [2, p. 118] (this excludes psychiatric institutions where people can stay for years). The large difference between the military and general populations is likely due to different population demographics, e.g., a younger military population with more pregnancies.

Overall, 6.4 percent of beneficiaries were admitted to military hospitals, while 7.2 percent were admitted to civilian hospitals. Only 0.6 percent were admitted to VA hospitals and 0.5 percent were admitted to other hospitals. Because utilization of VA and other hospitals is so low, these hospitals are excluded from consideration throughout the remainder of this chapter.

Utilization patterns varied considerably by beneficiary group. Among active-duty sponsors, 8.6 percent were hospitalized, the majority (7.2 percent) of which were at military hospitals. Active-duty sponsors were hospitalized less than family members or retirees and survivors. Family members of active-duty sponsors used hospitals more often, with a 15.7-percent hospitalization rate. They entered military hospitals at a rate of 9.2 percent. They also used civilian hospitals more often, with a 6.1-percent hospitalization rate. Retirees and survivors under 65 and their family members had a 13.6-percent hospitalization rate overall. They used military hospitals less often than active-duty beneficiaries, with a 3.7-percent hospitalization rate. Their high use of civilian hospitals (8.5-percent hospitalization rate) relative to military hospitals undoubtedly reflects their lower priority for admission to military hospitals and additional private insurance coverage. Retirees and survivors over 65 and their families had the highest overall hospitalization rate, 23.8 percent, probably because health problems increase with age. Their hospitalization rate at military hospitals was 5.6 percent, higher than the younger retirees but not as high as the active-duty beneficiaries. However, they used civilian hospitals more often than any other group, with a 15.8-percent hospitalization rate. As with the younger retirees, the disparity in hospitalization rates between military and civilian hospitals for retirees and survivors over 65 and their families is likely due to their lower priority for admission to military hospitals and their additional insurance coverage.

5.2.2 Average Length of Stay

For each beneficiary group, Figure 5.1 shows the average length of stay by hospital type. Overall, the average length of stay in civilian hospitals (6.6 nights) was longer than in military hospitals (5 nights). This pattern was true for all beneficiary groups except active-duty sponsors. Active-duty sponsors stayed an average of 5.4 nights in military hospitals and 2.9 nights in civilian hospitals. Family members of active-duty personnel stayed an average of 4 nights in military hospitals and 6.1 nights in civilian hospitals. The younger retiree group had only slightly longer stays in civilian hospitals—6 nights in military hospitals and 6.4 nights in civilian hospitals. Retirees and survivors over 65 and their families had the longest average stays—7 nights in military hospitals and 8 nights in civilian hospitals.



Source: 1992 DoD Health Care Survey
Question 81 - How many nights did this family member stay in the medical facility used for the most recent hospital stay?

Figure 5.1 Average Length of Hospital Stay by Beneficiary Type and Source of Care

5.3 REASONS FOR USING INPATIENT CARE

5.3.1 Conditions Treated at Military and Civilian Hospitals

This section addresses the conditions treated at military and civilian hospitals subsequent to admission. The reasons for using inpatient care provide useful information in examining the variations in needs among the different beneficiary groups and possible differing availability of types of treatment in military vs. civilian hospitals. Table 5.2 reports the percentages of the respondents admitted to the hospital during a 12-month period who were treated for any of the problems listed. Because beneficiaries can be admitted for more than one reason (in particular, diagnostic tests frequently accompany many procedures), the numbers in Table 5.2 sum to more than 100 percent. The purpose of Table 5.2 is to compare, across all beneficiary groups, the mix of conditions treated at military and civilian hospitals. For example, Table 5.2 allows one to see the differences between relative percentages of admissions to military and civilian hospitals for accidents, heart disease, cancer, etc. In addition, the table allows comparison between the mix of procedures conducted within a military or civilian hospital for active-duty sponsors, their family members, and retirees/survivors.

Table 5.2 Percentage Distribution of Reasons for Admission by Beneficiary Type and Source of Care

	Active-Duty Sponsors		Active-Duty Family Members		Retirees and Survivors < 65 and Families		Retirees and Survivors ≥ 65 and Families	
Reason for Admission	Military Hospitals	Civilian Hospitals	Military Hospitals	Civilian Hospitals	Military Hospitals	Civilian Hospitals	Military Hospitals	Civilian Hospitals
Pregnancy	23%	58%	52%	58%	3%	5%	0.1%	0%
Infant Care	1	5	11	15	0.2	2	0	0
Accidents/Injuries	16	19	4	6	6	11	4	5
Back, Spinal, or Bone Problems	8	2	3	4	9	12	3	9
Joint or Muscular Problems	6	1	1	1	8	7	10	9
Digestive System Problems	6	6	3	4	11	11	12	11
Ear, Nose, or Mouth Problems	11	1	7	5	7	4	1	2
Heart Problems	4	3	2	2	21	25	23	38
Skin or Breast Problems	1	0	2	1	5	2	5	3
Lung or Breathing Problems	4	0.4	9	10	11	10	18	15
Gynecological Problems	2	4	8	3	9	10	3	4
Nervous System Problems	4	0	1	1	1	2	2	1
Alcohol or Drug Problems	3	0	0	1	1	1	0	1
Mental Health Problems	9	2	0.4	6	1	3	0.1	2
Kidney, Bladder Problems	6	3	5	4	7	11	22	18
Eye Care or Vision Problems	1	0	1	1	1	1	9	4
Male Reproductive System Problems	3	0	1	0.1	1	3	8	9
Liver or Pancreas Problems	1	0	1	0.2	4	1	2	4
Diabetes or Other Blood Problems	3	2	1	2	4	8	11	7
Sexually-Transmitted Diseases	2	0	0	0	0.4	0	0	0
AIDS	2	0	0	0	4	0	0	0
Treatment for Short-Term Illness	6	2	6	2	2	2	2	3
Diagnostic Tests	6	4	4	2	10	7	6	10

Source: 1992 DoD Health Care Survey
Question 78 - What were the reasons for this family member's most recent hospital stay?
Question 82 - What type of medical facility did this family member use for the most recent hospital stay?

As previously noted, active-duty sponsors stayed primarily in military hospitals. The main reason active-duty sponsors were admitted to military hospitals was pregnancy (23 percent). The second largest percentage (16 percent) of active-duty sponsors were admitted to military hospitals as a result of accidents/injuries and the third greatest cause of admission (11 percent) was ear, nose, or mouth problems. Following closely behind were admissions for mental health problems (9 percent), and back, spinal, or bone problems (8 percent). The lowest percentage of those treated at MTFs (1 percent) were for skin or breast problems (this is evident before the numbers are rounded).

Fewer than 1 percent of active-duty sponsors were admitted to a civilian hospital over the course of a year. Although the number admitted to civilian hospitals is very small, it is still of interest to display the reasons for admission to these hospitals because active-duty sponsors can use civilian hospitals only if the care they need is not available at a nearby MTF. Most admissions of active-duty personnel to civilian hospitals were for pregnancies (58 percent) or accidents and injuries (19 percent). No other single cause accounted for more than 10 percent of admissions to civilian hospitals.

With regard to members of active-duty sponsors' families, almost two-thirds of all stays at MTFs were a result of pregnancy (52 percent) and infant care (11 percent) combined. At civilian hospitals, almost three-quarters of all stays were a result of pregnancy (58 percent) combined with infant care (15 percent). The third largest segment of this group (9 percent) went to the MTF and to the civilian hospital (10 percent) for lung or breathing problems. In MTFs, these three types of treatments were followed closely by gynecological procedures, which accounted for 8 percent of family stays, and ear, nose, and mouth treatments, which accounted for 7 percent. Mental health problems accounted for only 0.4 percent of stays in MTFs and there were no stays for alcohol/drug problems, sexually-transmitted diseases, or AIDS among family members of active-duty personnel. In civilian hospitals, 6 percent of family members were treated for accidents or injuries, and 6 percent for mental health problems. Male reproductive problems accounted for the lowest frequency (0.1 percent) of family member stays at civilian hospitals and liver/pancreas disease for the second lowest (0.2 percent) frequency of stay.

Heart problems were the most prevalent reason for admission among the retiree/survivor groups, for both military and civilian hospitals. In the younger retiree group (retirees and survivors under 65 and their families), heart problems accounted for 25 percent of admissions to civilian hospitals and 21 percent of admissions to military hospitals. In the older retiree group (retirees and survivors 65 or over and their families), over a third (38 percent) of admissions to civilian hospitals and 23 percent of admissions to military hospitals

occurred because of heart problems. For the younger retiree group, other common reasons for hospital admission included digestive system problems, back, spinal, or bone problems, and lung or breathing problems. For the older retiree group, the top three reasons for admission were the same for both military and civilian hospitals. These problems—heart problems, kidney/bladder problems, and lung or breathing problems—accounted for over 60 percent of admissions to military hospitals and over 70 percent of admissions to civilian hospitals.

5.3.2 Reasons for Using Military vs. Civilian Hospitals

Table 5.3 compares the use of military and civilian hospitals among those who were admitted for a given problem. For example, given that a family member of an active-duty sponsor was admitted for joint or muscular problems, he/she had a 71 percent chance of staying in a military hospital and a 29 percent chance of staying in a civilian hospital. Note that the numbers for military and civilian hospitals sum to 100 percent because VA and other hospitals are excluded.

The majority of active-duty sponsors are able to be accommodated in military hospitals for all the medical conditions shown. The most frequent reasons members of this group are admitted to civilian hospitals are pregnancy, infant care (respondents may be confusing this with pregnancy since infant care pertains to a newborn, not the sponsor), and gynecological problems.

Except for mental health and alcohol/drug problems, which were treated almost exclusively in civilian hospitals, military hospitals provided over 45 percent of the care for all other problems of active-duty family members. A high of 87 percent were treated for male reproductive system problems in military hospitals while a low of 47 percent were treated for back, spinal, and bone problems. Over two-thirds of those admitted for gynecological problems used military hospitals. Treatment for such common conditions as pregnancy, infant care, and lung or breathing problems was divided fairly evenly between military and civilian hospitals.

In the younger retiree/survivor group, civilian hospitals were used much more often than military hospitals. Most pregnancy care (79 percent) and virtually all infant care (94 percent) were provided by civilian hospitals. Aside from the fairly uncommon conditions of sexually-transmitted diseases and AIDS, the medical conditions causing the largest proportions of younger retirees/survivors to use military hospitals were skin or breast problems (56 percent) and liver or pancreas problems (57 percent). Over 70 percent of those admitted for the two most common conditions—heart problems and digestive system problems—used civilian hospitals.

Table 5.3 Percentage of Beneficiaries Using Military and Civilian Hospitals by Reason for Admission

	Active-Duty Sponsors		Active-Duty Family Members		Retirees and Survivors < 65 and Families		Retirees and Survivors ≥ 65 and Families	
Reason for Admission	Military Hospitals	Civilian Hospitals	Military Hospitals	Civilian Hospitals	Military Hospitals	Civilian Hospitals	Military Hospitals	Civilian Hospitals
Pregnancy	75%	25%	55%	45%	21%	79%	–	–
Infant Care	58	42	49	51	6	94	–	–
Accidents/Injuries	86	14	49	51	17	83	22	78
Back, Spinal, or Bone Problems	96	4	47	53	22	78	11	89
Joint or Muscular Problems	97	3	71	29	32	68	28	72
Digestive System Problems	88	12	50	50	28	72	29	71
Ear, Nose, or Mouth Problems	98	2	68	32	42	58	21	79
Heart Problems	92	8	50	50	25	75	18	82
Skin or Breast Problems	100	0	75	25	56	44	39	61
Lung or Breathing Problems	99	1	52	48	30	70	30	70
Gynecological Problems	82	18	76	24	26	74	25	75
Nervous System Problems	100	0	66	34	28	72	28	72
Alcohol or Drug Problems	100	0	2	98	21	79	0	100
Mental Health Problems	98	2	8	92	12	88	3	97
Kidney, Bladder Problems	93	7	71	29	20	80	30	70
Eye Care or Vision Problems	100	0	61	39	32	68	44	56
Male Reproductive System Problems	100	0	87	13	12	88	23	77
Liver or Pancreas Problems	100	0	85	15	57	43	12	88
Diabetes or Other Blood Problems	94	6	51	49	19	81	35	65
Sexually-Transmitted Diseases	100	0	–	–	100	0	–	–
AIDS	100	0	–	–	100	0	–	–
Treatment for Short-Term Illness	96	4	84	16	28	72	25	75
Diagnostic Tests	92	8	67	33	37	63	17	83

Source: 1992 DoD Health Care Survey
Question 78 - What were the reasons for this family member's most recent hospital stay?
Question 82 - What type of medical facility did this family member use for the most recent hospital stay?

The older retirees also used civilian hospitals for most conditions. For the most common problems in this age group—heart, lung, and kidney conditions—civilian hospitals were used approximately 70 percent of the time. Civilian hospitals were used for virtually all treatment of alcohol, drug, and mental health problems, for 78 percent of accidents and injuries, and for 83 percent of diagnostic tests. Aside from pregnancy, an uncommon condition for this group (although the sponsor is over 65, there may be family members of child-bearing age), the greatest use of military hospitals was for eye care or vision problems (44 percent) and for skin or breast problems (39 percent).

5.4 HOSPITALIZATION RATES

The purpose of this section is to present a detailed analysis of hospitalization rates among the respondents to the health care survey who had an overnight stay in a hospital during a 12-month period. Utilization is discussed first in terms of the percentage of the respondents who were hospitalized during this 12-month period. Hospitalization rates are presented as a function of selected demographic variables, including rank, sponsor's region, sex, age, marital status, service affiliation, and general health prior to admission. General health prior to admission is determined from the responses to survey question 44, which asks whether a randomly-selected family member suffered from one or more of a long list of medical conditions during the previous 12 months. This question is worded as follows:

- *Question 44*: "During the past 12 months, did this family member (the one with the last birthday) have any of the following medical conditions?" (Conditions are shown in Appendix A and in subsequent tables in this chapter.)

By relating the demographic and health status variables to the hospitalization rate in a non-linear regression model, the probability of an inpatient episode for a variable, holding constant the values of all other variables (at their means), was computed (see Appendix H for a detailed description of the model). Regression analysis is useful because it can sort out the influence of individual factors that may simultaneously affect utilization. It also provides a convenient way of assessing the effects of many factors on utilization without resorting to cumbersome cross-tabulations.

The discussion to follow highlights only those hospitalization rates for which the probability of a chance deviation from the base case chosen for each variable was less than 0.05. Hospitalization rates found to differ significantly from the base case are indicated with an asterisk (*). The base case for a set of variables is displayed as the first in the list. For example, the base region against which the others are compared is the "no initiatives" region.

5.4.1 Hospitalization Rates for Active-Duty Sponsors at Military Hospitals

Table 5.4 presents the expected hospitalization rate as a percentage of a particular segment of the population (as denoted by rank, sex, region, etc.) of active-duty personnel who were admitted to a military hospital during a 12-month period.

Table 5.4 Expected Hospitalization Rates at Military Hospitals for Active-Duty Sponsors

Variable	Hospitalization Rate	Variable	Hospitalization Rate
Junior Enlisted	5.3%	Army	4.0%
Senior Enlisted	4.5	Navy	4.3
Officers	2.9*	Marine Corps	2.8
		Air Force	6.3
No Initiatives	6.1		
Army CAM	7.2	Facility Operated by Same Service	6.7
CRI	5.4	Facility Operated by Another Service	2.9*
Army Gateway to Care	3.6*		
Tidewater Region	2.5*	No Medical Problems	3.2
Overlapping Catchment Areas	4.3	Lung Problems	4.4
SE Region FI/PPO	5.6	Heart Problems	8.4*
New Orleans CRI-Like	3.9	High Blood Pressure	4.2
PRIMUS/NAVCARE	4.4	Diabetes	5.7
Noncatchment Areas	2.6	Joint/Muscular Problems	3.4
Outside U.S.	3.1*	Back Problems	2.9
Navy CAM	4.2	Cancer (except skin)	12.6
Air Force CAM	9.8	Skin Cancer	0
Shipboard	6.6	Mental Health Problems	5.7*
		Allergies	2.0*
Single	4.3	Alcohol/Drug Problems	2.7
Married, Living With Spouse	4.7	Cold or Flu	4.4*
Married, Not Living With Spouse	4.0	Digestive Problems	3.9
Age of Sponsor	4.5	Bladder/Urinary Problems	9.5*
		Eye/Vision Problems	1.8
Female	13.0	Ear/Hearing Problems	2.4
Male	3.9*	Prostate Problems	3.1
No Private Insurance	4.3	Menstrual Problems	1.7
Private Insurance	13.3*	Other Problems	11.5*

* Statistically significant at the 5-percent level.

Source: Regression analysis based on responses to 1992 DoD Health Care Survey
Question 41 - Of the family members who are currently eligible for military medical benefits, who had the last birthday?
Question 48 - During the past 12 months, how many nights did this family member (the one with the last birthday) stay overnight as a patient in any of the following places?

In terms of rank, officers had a significantly lower estimated probability of an inpatient episode (2.9 percent) than junior-enlisted personnel (5.3 percent). For sponsor's region, the hospitalization rates that were significantly different from the "no initiatives" region (6.1

percent) were 3.6 percent for the Army Gateway to Care region, 2.5 percent for the TRICARE (Tidewater) region, and 3.1 percent outside the United States. Note that there is no clear indication from the survey that respondents actually used the new initiatives in these regions. From the discussion of Table 3.9 at the end of Chapter 3, it is evident that beneficiaries were confused about whether they actually used one of the new initiatives. Therefore, differences in hospitalization rates are as likely to reflect differences in regional demographics and catchment area resources as differences in regional demonstration programs.

Table 5.4 also shows that male sponsors are much less likely to have an inpatient episode (3.9 percent) than female sponsors (13 percent). A large portion of this difference is undoubtedly due to pregnancies among active-duty females. Also, those who have private insurance are likely to enter the hospital at a much higher rate (13.3 percent) than those who do not (4.3 percent). Although there were no significant differences for service affiliation, there is a higher probability of a stay (6.7 percent) in a hospital operated by the sponsor's service than in a hospital operated by another service (2.9 percent).

With regard to medical conditions, six of the problem categories were significantly different from the base case of "no medical problems." Note that those reporting no medical problems over a 12-month period nevertheless had a 3.2-percent hospitalization rate. This may be due to pregnancies or other medical conditions for which the respondent did not perceive the condition to be a "problem." (Survey Question 44 asks if the respondent suffered from any of a number of medical problems.) For specific problems, the condition with the highest significant probability of a hospital stay was bladder problems at 9.5 percent, and the condition with the lowest significant probability was allergy problems at 2 percent. The highest significant hospitalization rate of 11.5 percent was associated with the category of "other medical problems."

5.4.2 Hospitalization Rates for Active-Duty Family Members

Table 5.5 gives expected hospitalization rates at both military and civilian hospitals among family members of active-duty sponsors. Note that there is some double counting in the computation of the overall hospitalization rate, because beneficiaries can have separate stays in different types of hospitals. However, those with separate stays in different types of hospitals amounted to only a fraction of a percent. Note also that statistical significance was determined only for hospitalization rates at military and civilian hospitals, not for the overall hospitalization rate.[1]

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[1] Determining significance of a total based on the sum of non-linear models requires simultaneous estimation of the models. This was not considered feasible for the current effort.

Table 5.5 Expected Hospitalization Rates for Active-Duty Family Members

Variable	Hospitalization Rate at Military Hospitals	Hospitalization Rate at Civilian Hospitals	Overall Hospitalization Rate
Junior Enlisted	10.7%	6.7%	17.4%
Senior Enlisted	5.7*	3.5*	9.1
Officers	6.8*	3.7*	10.6
No Initiatives	4.4	4.5	8.9
Army CAM	9.7*	2.6	12.2
CRI	6.9*	3.8	10.7
Army Gateway to Care	8.1*	2.9	11.0
Tidewater Region	3.3	4.1	7.5
Overlapping Catchment Areas	8.3*	4.9	13.3
SE Region FI/PPO	7.1*	6.0	13.1
New Orleans CRI-Like	2.7	8.2	10.9
PRIMUS/NAVCARE	6.4	3.5	9.9
Noncatchment Areas	2.4	9.4*	11.8
Outside U.S.	7.9*	2.6*	10.5
Navy CAM	6.7	7.7	14.4
Air Force CAM	5.0	7.4	12.3
Shipboard	10.7*	6.5	17.2
Single	3.5	4.2	7.8
Married, Living With Spouse	7.3*	2.6*	9.9
Married, Not Living With Spouse	5.3	3.1	8.4
Age of Family Member	6.8*	4.1*	11.0
Female	7.4	4.4	11.8
Male	5.9*	3.5*	9.4
White	7.3	4.2	11.4
Black	5.0*	3.9	9.0
Other Race	7.3	4.0	11.3
Family Income	6.8	4.1*	11.0
No Supplemental Insurance	7.1	4.0	11.1
CHAMPUS Supplemental Insurance	6.3	7.5*	13.7
Private Insurance	4.7*	2.9	7.6
Army	7.0	5.4	12.4
Navy	5.8	5.3	11.2
Marine Corps	5.6	4.3	10.0
Air Force	8.1	2.4*	10.5
Facility Operated by Same Service	6.9	4.1	11.1
Facility Operated by Another Service	6.2	3.8	10.0
No Medical Problems	6.4	3.8	10.2
Lung Problems	18.7*	8.1*	26.9
Heart Problems	12.0*	9.4*	21.4
High Blood Pressure	20.4*	2.8	23.2

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Table 5.5—*Continued*

Variable	Hospitalization Rate at Military Hospitals	Hospitalization Rate at Civilian Hospitals	Overall Hospitalization Rate
Diabetes	17.0*	11.3*	28.3
Joint/Muscular Problems	11.5*	4.3	15.8
Back Problems	3.0*	4.9	7.9
Cancer (except skin)	22.2*	14.5*	36.7
Skin Cancer	0	0	0
Mental Health Problems	4.9	10.7*	15.6
Allergies	5.4	3.8	9.2
Alcohol/Drug Problems	5.1	5.4	10.5
Cold or Flu	4.0*	2.4*	6.4
Digestive Problems	5.7	5.9*	11.6
Bladder/Urinary Problems	9.0*	5.3	14.3
Eye/Vision Problems	5.9	1.8*	7.8
Ear/Hearing Problems	7.2	6.3	13.5
Prostate Problems	4.7	10.2	14.8
Menstrual Problems	9.3*	4.8	14.1
Other Problems	13.4*	6.7*	20.1

* Statistically significant at the 5-percent level.

Source: Regression analysis based on responses to 1992 DoD Health Care Survey
Question 41 - Of the family members who are currently eligible for military medical benefits, who had the last birthday?
Question 48 - During the past 12 months, how many nights did this family member (the one with the last birthday) stay overnight as a patient in any of the following places?

In the case of family members of active-duty personnel, hospitalization rates were generally higher and more were significant when compared with active-duty sponsors. Family members of junior-enlisted personnel had the highest probabilities of hospitalization at both military (10.7 percent) and civilian (6.7 percent) hospitals and therefore the highest overall hospitalization rate of 17.4 percent (the sum of the military and civilian rates). Families of senior-enlisted personnel had the lowest probabilities of hospitalization with a 5.7 percent probability for military hospitals and 3.5 percent for civilian hospitals.

Seven of the *sponsor's* regions were associated with significantly different (from the "no initiatives" region) hospitalization probabilities for military hospitals but only two were significant for civilian hospitals. The highest probability of an inpatient episode at military hospitals (10.7 percent) was found among family members of sponsors serving aboard ship, and the lowest probability (6.9 percent) was in the CRI region. The highest probability of an inpatient episode at civilian hospitals (9.4 percent) was in the noncatchment areas, while the lowest (2.6 percent) was outside the United States. Again, it is important to remember that respondents did not necessarily use the new initiatives in place in some of these regions.

Family members who were married and living together at the time of the survey had an expected hospitalization rate at military hospitals of 7.3 percent and at civilian hospitals of 2.6 percent. Female family members had a higher probability of an inpatient episode at both types of hospitals (7.4 percent for military and 4.4 percent for civilian) than males (5.9 percent and 3.5 percent, respectively). Black family members had a lower estimated chance of hospitalization than whites at military hospitals of 5 percent, while the chances of an inpatient episode for whites were 7.3 percent at military hospitals and 4.2 percent at civilian hospitals.

Those family members who had private health insurance had a significantly lower hospitalization rate (4.7 percent) at military hospitals than those with no supplemental insurance coverage (7.1 percent), while family members who had CHAMPUS supplemental insurance had a significantly higher hospitalization rate (7.5 percent) at civilian hospitals than those with no supplemental insurance coverage (4 percent).

There were no significant differences in hospitalization rates across the Services with the exception that family members of Air Force sponsors had a significantly lower admission rate to civilian hospitals of 2.4 percent.

Regarding the general health of active-duty family members, the data show that six of the problems are associated with significantly different hospitalization rates (relative to those with no medical problems) for both military and civilian hospitals. The highest overall hospitalization rate (36.7 percent) was associated with cancer. This was composed of a 22.2-percent chance of being admitted to a military hospital and a 14.5-percent chance of being admitted to a civilian hospital. The lowest overall hospitalization rate, 6.4 percent, was associated with the flu. For military hospitals only, the highest chance of admission was for cancer while the lowest probability (3 percent) was associated with back problems. Other problems associated with relatively high hospitalization probabilities were high blood pressure (20.4 percent), lung problems (18.7 percent), and diabetes (17 percent). For civilian hospitals, the highest hospitalization rate was also associated with cancer and the lowest, 1.8 percent, was associated with eye and vision problems. Other relatively high rates were associated with diabetes (11.3 percent), mental illness (10.7 percent), and heart disease (9.4 percent).

5.4.3 Hospitalization Rates for Retirees/Survivors and Family Members

The focus of the analysis shown in Table 5.6 is retirees/survivors and their family members who were admitted to military and civilian hospitals during a 12-month period. Again, note that statistical significance was determined only for hospitalization rates at military and civilian hospitals, not for the overall hospitalization rate.

Table 5.6 Expected Hospitalization Rates for Retirees/Survivors and Families

Variable	Hospitalization Rate at Military Hospitals	Hospitalization Rate at Civilian Hospitals	Overall Hospitalization Rate
Retirees Under 65	2.2%	6.7%	8.9%
Retirees 65 and Over	2.8*	8.5	11.3
Reserve Retirees Under 65	0.6*	11.9	12.6
Reserve Retirees 65 and Over	1.0*	11.0	12.0
Survivors Under 65	1.3*	14.0	15.3
Survivors 65 and Over	2.3	6.8	9.2
No Initiatives	2.8	7.2	10.0
Army CAM	4.0	5.3	9.3
CRI	2.2	8.3	10.5
Army Gateway to Care	6.1*	5.1	11.2
Tidewater Region	2.5	8.7	11.2
Overlapping Catchment Areas	4.6*	5.5*	10.1
SE Region FI/PPO	1.8*	9.0	10.9
New Orleans CRI-Like	1.7	12.3	14.0
PRIMUS/NAVCARE	2.2	5.9	8.2
Noncatchment Areas	0.9*	8.4	9.4
Outside U.S.	2.4	6.2	8.6
Navy CAM	3.0	6.7	9.8
Air Force CAM	1.4	7.1	8.5
Single	3.0	6.8	9.8
Married, Living With Spouse	2.0*	7.5	9.5
Married, Not Living With Spouse	6.7*	4.2	10.9
Age of Family Member	2.1*	7.3*	9.5
Female	1.6	7.5	9.1
Male	2.8*	7.2	10.0
White	2.1	7.6	9.7
Black	2.3	5.9	8.1
Other Race	2.3	4.5*	6.8
Family Income	2.1*	7.3	9.5
No Supplemental Insurance	2.9	5.8	8.7
CHAMPUS Supplemental Insurance	3.5	9.5*	12.9
Medicare	2.3	7.0*	9.3
Private Insurance	1.3*	8.3*	9.7
Army	2.1	6.9	9.0
Navy	2.1	7.4	9.5
Marine Corps	2.2	6.8	9.0
Air Force	2.1	8.0	10.1
Facility Operated by Same Service	2.2	7.4	9.6
Facility Operated by Another Service	1.8	7.2	9.0

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Table 5.6—*Continued*

Variable	Hospitalization Rate at Military Hospitals	Hospitalization Rate at Civilian Hospitals	Overall Hospitalization Rate
No Medical Problems	1.6	5.7	7.3
Lung Problems	3.8*	8.4*	12.3
Heart Problems	3.9*	17.9*	21.7
High Blood Pressure	1.6	6.4	8.0
Diabetes	2.4*	7.2*	9.6
Joint/Muscular Problems	1.3	5.8	7.1
Back Problems	1.4	6.2	7.6
Cancer (except skin)	7.1*	19.9*	27.0
Skin Cancer	1.3	4.1*	5.4
Mental Health Problems	0.7*	6.8	7.4
Allergies	0.9*	3.3*	4.3
Alcohol/Drug Problems	2.6	7.7	10.3
Cold or Flu	1.5	4.7*	6.2
Digestive Problems	3.3*	7.7*	11.0
Bladder/Urinary Problems	3.0*	8.5*	11.5
Eye/Vision Problems	1.7	4.0*	5.7
Ear/Hearing Problems	0.8*	5.3	6.1
Prostate Problems	1.5	7.1	8.6
Menstrual Problems	2.6*	7.7	10.3
Other Problems	2.5*	8.8*	11.4

* Statistically significant at the 5-percent level.

Source: Regression analysis based on responses to 1992 DoD Health Care Survey
Question 41 - Of the family members who are currently eligible for military medical benefits, who had the last birthday?
Question 48 - During the past 12 months, how many nights did this family member (the one with the last birthday) stay overnight as a patient in any of the following places?

Several levels of beneficiary status were included in this analysis to differentiate among categories of retirees/survivors. Of these, four yielded significantly different hospitalization rates (from the base case of retirees under 65) at military hospitals but none was significantly different at civilian hospitals. Retirees over 65 had a 2.8 percent chance of being admitted to a military hospital during a 12-month period. Reserve retirees under 65 had a 0.6 percent chance, and reserve retirees over 65 were admitted to military hospitals at the expected rate of 1 percent. Survivors under 65 had a probability of an inpatient episode of 1.3 percent for military hospitals.

Four of the sponsor's regions were associated with hospitalization rates at military hospitals that were significantly different from the base case ("no new initiatives"), while only one region was significantly different from the base case for civilian hospitals. The highest hospitalization rate at military hospitals (6.1 percent) was found among retirees

and survivors in the Army Gateway to Care region and the lowest (0.9 percent) was in the noncatchment areas. Beneficiaries in overlapping catchment areas had about the same overall hospitalization rate as the "no initiatives" region, but they used military hospitals significantly more often and civilian hospitals significantly less often (most likely because of the greater prevalence and availability of military hospitals in overlapping catchment areas). Again, there was no indication that respondents actually took advantage of the new initiatives that were in place in these regions.

Retirees and survivors who were married and living with their spouses at the time of the survey showed a chance of admission to military hospitals of 2 percent, while those not living with their spouses were likely to be admitted to military hospitals at the rate of 6.7 percent. Both of these figures were significantly different from the base case of "single." Male retirees/survivors had a 2.8-percent chance of admission to military hospitals, a rate that was significantly higher than the base case of "female" (1.6 percent).

Retirees/survivors who used CHAMPUS supplemental insurance were the most likely to be admitted to civilian hospitals (9.5 percent), and those who used Medicare entered civilian hospitals at a rate of 7 percent. Those using private insurance entered military hospitals at the expected rate of 1.3 percent and civilian hospitals at 8.3 percent. All of these probabilities were significantly different from the base case of "no supplemental insurance" (2.9 percent for military hospitals and 5.8 percent for civilian hospitals).

Regarding the health problems experienced by retirees/survivors, the data show that 11 are significantly different from the base case of "no medical problems" for military hospitals, and 11 for civilian hospitals, with eight of these significantly different for both. The highest overall admission rate (27 percent) was associated with cancer with the expected rate of admission in military hospitals at 7.1 percent and in civilian hospitals at 19.9 percent. The lowest overall admission rate (4.3 percent) was associated with allergy problems.

For military hospitals, the next highest probability of an inpatient episode was 3.9 percent for heart disease and the lowest was 0.7 percent for mental health problems. In civilian hospitals the second highest chance of an inpatient episode (17.9 percent) was associated with heart disease, while the lowest (3.3 percent) was for allergy problems.

5.5 LENGTH OF HOSPITAL STAYS

This section addresses the length of stay associated with selected demographic variables and clinical problems. The results presented here were calculated from responses to questions 81 and 82, which provided data on the length of stay and type of

hospital used for the most recent inpatient episode, respectively. Question 78 addressed the reasons for the hospitalization. The responses to each of these questions were investigated in terms of a group of selected demographic variables, including rank, beneficiary status, geographic region, and sex.

All of the demographic variables and the responses to question 78 were entered as independent variables in a non-linear regression model (discussed in detail in Appendix H), where the length of stay served as the dependent variable. The discussion in this section highlights only those hospitalization rates for which the probability of a chance deviation from the base case chosen for each variable was less than 0.05. Hospitalization rates found to differ significantly from the base case are indicated with an asterisk (*). As before, the base case for a set of variables is displayed as the first in the list.

Table 5.7 shows the beneficiary groups, the regions investigated, and the reasons for admission to both military and civilian hospitals. The figures represent the expected number of nights (determined from the regression model) spent in the hospital. The dashes indicate that the corresponding variables were not included in the regression model because there were no observations on those variables. For example, there were no hospitalizations aboard civilian ships.

Four of the beneficiary groups accounted for significant differences from the base group (junior-enlisted) in length of a military hospital stay. Those four are senior-enlisted who stayed 2.3 nights in the hospital, retirees under 65 who stayed 2.4 nights, retirees over 65 who stayed 3.1 nights, and survivors under 65 who stayed 3.8 nights. The trend appears to be longer hospital stays with advancing age with the exception of survivors under 65, who exhibited longer average stays than the older retirees.

Table 5.7 also shows the expected length of a stay in both military and civilian hospitals associated with the region in which the sponsor was located. For stays at military hospitals, only one of the regions—Air Force CAM—was significantly different from the region in which there were no new initiatives. Beneficiaries in the Air Force CAM region had an average length of stay of 3 nights in military hospitals, significantly longer than the average of 2.4 nights in regions with no initiatives. For stays at civilian hospitals, beneficiaries in three of the regions had significantly shorter stays than the 3.8 nights expected for the "no initiatives" region—noncatchment areas (3.3 nights), CRI (3.1 nights), and PRIMUS/NAVCARE (3 nights). These differences were observed among all respondents in the region; there was no indication whether respondents actually used the new initiatives in these regions.

Table 5.7 Expected Length of Stay at Military and Civilian Hospitals

Variable	Nights at Military Hospitals	Nights at Civilian Hospitals
Junior Enlisted	2.0	2.8
Senior Enlisted	2.3*	3.1
Officers	2.2	3.2
Retirees Under 65	2.4*	3.5*
Retirees 65 and Over	3.1*	3.8*
Reserve Retirees Under 65	3.2	4.0*
Reserve Retirees 65 and Over	2.0	4.1*
Survivors Under 65	3.8*	3.2
Survivors 65 and Over	2.5	7.2*
No Initiatives	2.4	3.8
Army CAM	2.6	3.4
CRI	2.2	3.1*
Army Gateway to Care	2.2	3.8
Tidewater Region	2.3	3.6
Overlapping Catchment Areas	2.4	3.5
SE Region FI/PPO	2.2	3.5
New Orleans CRI-Like	2.6	3.7
PRIMUS/NAVCARE	2.1	3.0*
Noncatchment Areas	2.3	3.3*
Outside U.S.	2.2	3.5
Navy CAM	1.8	3.5
Air Force CAM	3.0*	3.8
Shipboard	2.1	3.4
Age of Family Member	2.3*	3.5
Female	2.3	3.5
Male	2.3	3.4
No Supplemental Insurance	2.3	3.1
CHAMPUS Supplemental Insurance	2.4	3.3
New Military Health Care Program	2.0	3.0
Medicare	2.5	3.7*
Private Insurance	2.0	3.3*
Public Assistance	0.7	3.6
Own Family's Money	2.8	3.8
Hospitalized Within U.S.	2.3	3.5
Hospitalized Outside U.S.	2.4	3.7
Hospitalized Aboard Ship	4.2	–
Army	2.3	3.4
Navy	2.3	3.8*
Marine Corps	2.3	4.1*
Air Force	2.3	3.2
No Surgery Performed	2.8	5.8
Surgery Performed	2.4*	4.1*

Continued on next page

Table 5.7—*Continued*

Variable	Nights at Military Hospitals	Nights at Civilian Hospitals
Not Admitted From Emergency Room	2.7	5.3
Admitted From Emergency Room	2.5*	4.1*
Diagnostic Tests	2.1	3.0
Pregnancy	2.6*	2.7
Infant Care	3.1*	5.2*
Accidents/Injuries	1.9	2.8
Back, Spinal, or Bone Problems	2.1	3.8*
Joint or Muscular Problems	1.9*	3.4
Digestive System Problems	3.0*	3.6*
Ear, Nose, or Mouth Problems	1.5*	1.9*
Heart Problems	2.6*	3.6*
Skin or Breast Problems	2.8*	2.1*
Lung or Breathing Problems	2.7*	4.7*
Gynecological Problems	2.2	3.3
Nervous System Problems	2.3	3.2
Alcohol or Drug Problems	29.1*	9.3*
Mental Health Problems	3.9*	14.3*
Kidney, Bladder Problems	2.6*	2.9
Eye Care or Vision Problems	1.3*	3.5
Male Reproductive System Problems	1.8	3.5
Liver or Pancreas Problems	3.0*	5.5*
Diabetes or Other Blood Problems	4.5*	5.8*
Sexually-Transmitted Diseases	0.4*	–
AIDS	6.8*	–
Treatment for Short-Term Illness	2.0	3.0
Other Problems	1.7*	2.5*

* Statistically significant at the 5-percent level.

Source: Regression analysis based on responses to 1992 DoD Health Care Survey
Question 41 - Of the family members who are currently eligible for military medical benefits, who had the last birthday?
Question 81 - How many nights did this family member stay in the medical facility used for the most recent hospital stay?

There were many significant differences from the base case (no illness) in the various reasons for admission to the hospital. The highest average number of nights in a military hospital (29.1) was associated with alcohol/drug problems and the next highest (6.8 nights), with AIDS. The lowest average number of nights in military hospitals (0.4 nights) was for sexually-transmitted diseases and the next lowest (1.3 nights) was associated with eye/vision problems.

The highest average number of nights in a civilian hospital (14.3) was associated with mental health problems and the next highest (9.3 nights) with alcohol/drug problems. The

lowest average number of nights in civilian hospitals (1.9 nights) was for ear, nose, or mouth problems and the next lowest (2.1 nights) was associated with skin or breast problems.

5.6 INPATIENT UTILIZATION BY SOURCE OF PAYMENT

Tables 5.8 and 5.9 show the methods of payment for care at civilian and military hospitals, respectively. It is important to note that the percentages sum to more than 100 percent because beneficiaries can use more than one method of payment for their hospital stay.

Table 5.8 Percentage of Beneficiaries Using Given Methods of Payment for Inpatient Care at Civilian Hospitals

Method of Payment	Junior Enlisted	Senior Enlisted	Officers	Retirees/ Survivors < 65	Retirees/ Survivors ≥ 65
Did Not Have to Pay	10%	8%	12%	4%	3%
Standard CHAMPUS	74	70	76	53	8
CHAMPUS Supplemental	6	7	8	14	4
New Military Health Care Program	7	10	3	2	1
Medicare	2	0.2	0.4	8	80
Private Health Insurance	4	9	13	64	70
Public Assistance	3	2	0.2	2	1
Own Money	1	3	2	0.3	0

Source: 1992 DoD Health Care Survey
Question 89 - Which of the following was (or will be) used to pay for this family member's most recent hospital stay?
Question 82 - What type of medical facility did this family member use for the most recent hospital stay?

Table 5.8 shows that the most prevalent source of payment among active-duty beneficiaries (sponsors and family members combined) at civilian hospitals was standard CHAMPUS (over 70 percent), while a moderate percentage (from 8 percent of senior-enlisted families to 12 percent of officer families) said they did not have to pay. The latter are most likely due to referrals to civilian hospitals from military hospitals that were unable to provide the necessary care. In this case, the civilian hospital charges are paid by the military from supplemental care funds. Private insurance was used more often by officers (13 percent of the time) than by senior-enlisted (9 percent) or junior-enlisted (4 percent) beneficiaries. The new military health care programs accounted for a relatively small portion of the payment methods (a high of 10 percent for senior-enlisted families).

Table 5.9 Percentage of Beneficiaries Using Given Methods of Payment for Inpatient Care at Military Hospitals

Method of Payment	Junior Enlisted	Senior Enlisted	Officers	Retirees/ Survivors < 65	Retirees/ Survivors ≥ 65
Did Not Have to Pay	78%	84%	91%	77%	67%
Standard CHAMPUS	15	13	7	12	1
CHAMPUS Supplemental	2	1	1	3	4
New Military Health Care Program	1	1	1	2	1
Medicare	1	0.2	0	1	19
Private Health Insurance	0	1	1	14	22
Public Assistance	0	0	0	1	1
Own Money	4	3	2	1	5

Source: 1992 DoD Health Care Survey
Question 89 - Which of the following was (or will be) used to pay for this family member's most recent hospital stay?
Question 82 - What type of medical facility did this family member use for the most recent hospital stay?

Among retirees and survivors, payment methods for civilian care were very different depending on whether the sponsor was over or under 65. In the under-65 group, private insurance was used most often (64 percent), and standard CHAMPUS came next (53 percent). CHAMPUS supplemental insurance was used 14 percent of the time. This was the highest usage of CHAMPUS supplemental insurance by any beneficiary group. In the over-65 group, 80 percent of beneficiaries who used civilian care used Medicare, and 70 percent used private health insurance. Only 8 percent of the older group used standard CHAMPUS, and 4 percent used CHAMPUS supplemental insurance. These numbers are not surprising because, while most sponsors over 65 are no longer eligible for CHAMPUS, some members of their families under age 65 may be eligible.

Table 5.9 shows that the great majority of beneficiaries reported they did not have to pay for inpatient care at military hospitals. However, the only group that does not have to pay a nominal daily charge is retired enlisted beneficiaries. Perhaps the other beneficiary groups did not consider the nominal fee for inpatient care (less than $10 per day) to be worth reporting (note the small percentage who indicated they used their own money). Many beneficiaries also cited CHAMPUS or Medicare as sources of payment, indicating a lack of understanding by beneficiaries about how military inpatient care is compensated since neither CHAMPUS nor Medicare pay for inpatient care in a military hospital. However, the percentages paying with private health insurance (14 percent of under-65 retirees/survivors, and 22 percent of over-65 retirees/survivors) are believable because the military will try to collect from private insurance companies.

5.7 SUMMARY OF KEY FINDINGS

This chapter addressed inpatient utilization as measured by the percentage of the beneficiary population having at least one hospital stay per year, and by the average length of a hospital stay. The key results are:

- Almost 15 percent of the beneficiary population was hospitalized during the 12-month period prior to the survey. This is considerably higher than the 7.8 percent hospitalization rate in the overall population. The reasons for this higher rate were not specifically investigated, but they could include demographic differences between military medical care beneficiaries and the general population, such as a higher proportion of beneficiaries in their childbearing years.
- Excluding those who used VA and other hospitals (only one percent of the population), utilization was almost evenly divided between military and civilian hospitals.
- As expected, the vast majority of active-duty sponsors used military hospitals. Pregnancy was the most prevalent reason for admission to military hospitals (23 percent), followed by accidents (16 percent). Active-duty family members also used military hospitals for the majority of their inpatient care, but a substantial number also used civilian hospitals. Most inpatient episodes among active-duty family members were for childbirth.
- Retirees/survivors and their family members predominately used civilian hospitals, particularly among the group with sponsors 65 or over. Heart problems were the most common reason for admission.
- For all beneficiary groups except active-duty sponsors (who seldom use civilian hospitals), stays in civilian hospitals were longer, on average, than stays in military hospitals. Among all beneficiaries, the average stay was 5 nights in military hospitals and 6.6 nights in civilian hospitals. This disparity persisted even when the reason for the hospitalization was taken into account.
- As expected, retirees/survivors and family members, especially those with a sponsor over 65, had the longest hospital stays.
- Methods of payment were very similar to those used for outpatient care. The large majority of active-duty families used CHAMPUS to pay for care at civilian hospitals. Almost 10 percent of senior-enlisted families and over 10

percent of officer families used private health insurance to pay for inpatient care. The majority of retiree families used either private insurance or a combination of private insurance and Medicare. Over 50 percent of retirees under 65 also used CHAMPUS to pay for their care.

6.0 SATISFACTION WITH OUTPATIENT CARE

6.1 INTRODUCTION

Ultimately, if the DoD is to find alternative ways of delivering health care at lower cost, it will have to assess the impact of any changes to the current system on the beneficiary population it serves. Ideally, a potential alternative should be designed to ensure that the level of beneficiary satisfaction relative to the current system is not diminished. This chapter addresses one of the baselines from which any alternatives will have to be measured—namely, current beneficiary satisfaction with outpatient care. Satisfaction with inpatient care is addressed in the next chapter.

Attitudes regarding outpatient care are measured in terms of satisfaction with the facility and staff, as well as with the overall quality of care received. The facility is rated primarily on measures of access and cost. The staff is rated on the perceived competence and conduct of the doctors and staff. Overall satisfaction encompasses the total health care experience.

Satisfaction with outpatient care is determined from beneficiaries' responses to survey questions 68 (facility), 69 (staff), and 70 (overall). These questions are worded as follows:

- *Question 68*: "Thinking of this family member's most recent visit for outpatient care, please rate the satisfaction with the facility used on each of the following factors." (Factors are shown in Appendix A and in subsequent tables.)
- *Question 69*: "Thinking of this family member's most recent visit for outpatient care, please rate the satisfaction with the staff at the facility used on each of the following factors." (Factors are shown in Appendix A and in subsequent tables.)
- *Question 70*: "Please rate the overall satisfaction with the quality of care this family member received during the most recent visit for outpatient care."

In each question above, "this family member" refers to the person with the most recent visit for outpatient care, provided it took place within the last six months. Visits to only military or civilian facilities are considered in this analysis (i.e., visits to Department of

Veterans Affairs and other facilities are omitted). Each question offers a choice of six responses: very satisfied, satisfied, mixed/neither, dissatisfied, very dissatisfied, and does not apply/don't know. ("Does not apply" is not an option for question 70 (overall satisfaction).)

Because respondents are asked for their feelings concerning the most recent visit only, their opinions pertain to either military or civilian facilities, but not both. This means that different populations of respondents are evaluating military and civilian facilities. If beneficiaries gravitate to the facility they like best, there is a potential bias when comparing military with civilian facilities (because respondents who like military facilities are evaluating military facilities and respondents who like civilian facilities are evaluating civilian facilities). However, beneficiaries do not necessarily prefer the facility they use. For example, some beneficiaries (particularly retirees) may prefer to use a military facility but do not live close to one; or some may use a military facility because the civilian provider they prefer does not accept CHAMPUS. Therefore, the exact nature and magnitude of the bias are not clear-cut, but there is no indication that it is substantial.

For the purpose of this analysis, it was decided to treat satisfaction as a family attribute. This was done for two reasons. First, the person with the most recent outpatient visit was frequently a child, for whom satisfaction was rated by a parent or guardian. Second, there is likely to be a high correlation among the responses of individual family members. Family members usually share their feelings and experiences with other family members, and this tends to produce a common family perception about the care received. Because satisfaction is thought to vary by beneficiary type, the following groups of beneficiary families are considered in this analysis:

- junior enlisted (E-1 to E-4),
- senior enlisted (E-5 to E-9),
- officers (W-1 to O-10),
- retirees and survivors under 65, and
- retirees and survivors age 65 and over.

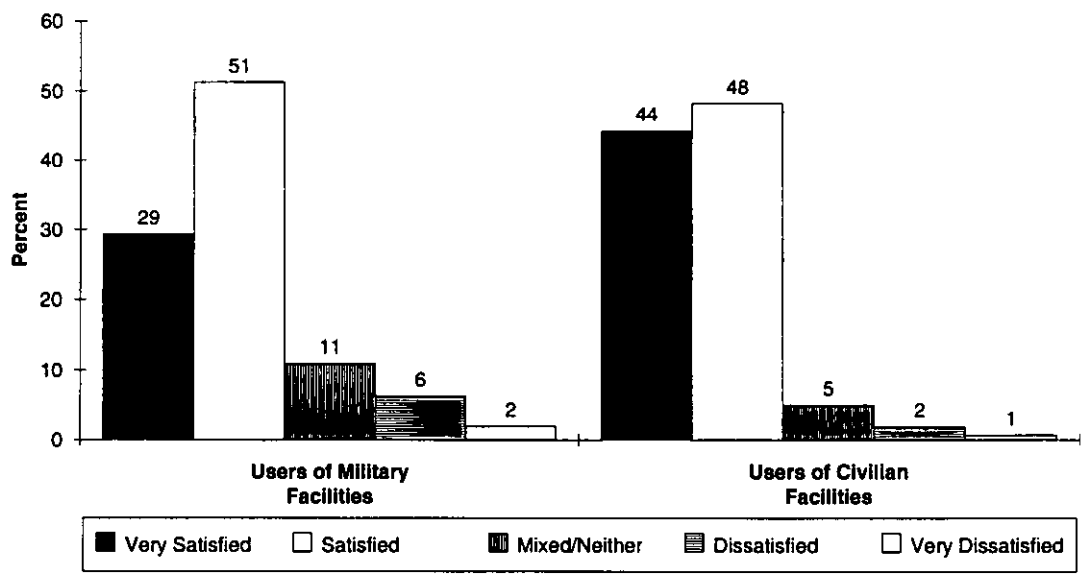
Each beneficiary group is determined by the status of the sponsor. The retiree groups include retirees from both active service and the Reserves.

The overall level of satisfaction with outpatient care is discussed first in this chapter. Variations in satisfaction by facility type used, service, and demographic variables are then discussed. Next is a look at the satisfaction with the components of outpatient care. Finally, there is an analysis of levels of dissatisfaction with outpatient care. "Does not apply/don't know" responses are not included in the percentages reported in the analyses. Percentages based on fewer than 100 responses are also not reported.

6.2 OVERALL SATISFACTION WITH OUTPATIENT CARE BY FACILITY TYPE AND BENEFICIARY GROUP

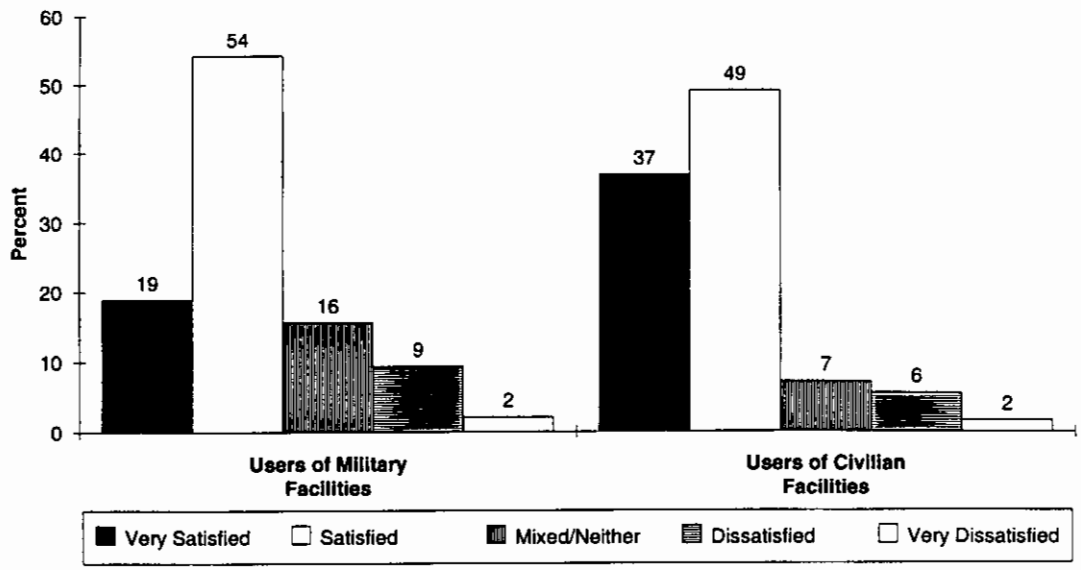
Overall satisfaction with outpatient care is displayed here in six figures (Figures 6.1 to 6.6), one for all beneficiaries combined and one for each beneficiary group. The figures display all five response options for the question on overall satisfaction, excluding "don't know," for users of military and users of civilian facilities.

Figure 6.1 shows responses to the question of overall satisfaction with outpatient care for all beneficiaries, based on the most recent visit. Users of military facilities were clearly less satisfied with their care than users of civilian facilities. The percentage of civilian facility users who responded that they were very satisfied with their care (44 percent) was considerably higher than the corresponding percentage of military facility users (29 percent). Combining responses of "satisfied" and "very satisfied," 80 percent of military facility users were generally satisfied, compared with 92 percent of civilian facility users. About 11 percent of military facility users and 5 percent of civilian facility users had mixed feelings about their care, but only 2 percent of MTF users and 1 percent of civilian facility users considered themselves very dissatisfied.



Source: 1992 DoD Health Care Survey
Question 70 - Please rate the overall satisfaction with the quality of care this family member received during the most recent visit for outpatient care.

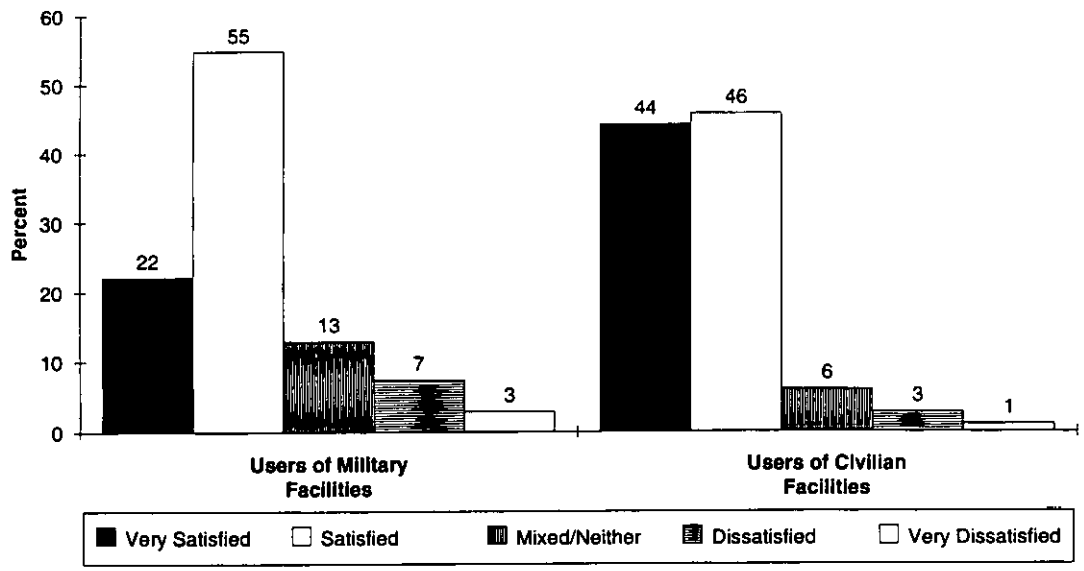
Figure 6.1 Overall Satisfaction With Outpatient Care



Source: 1992 DoD Health Care Survey
Question 70 - Please rate the overall satisfaction with the quality of care this family member received during the most recent visit for outpatient care.

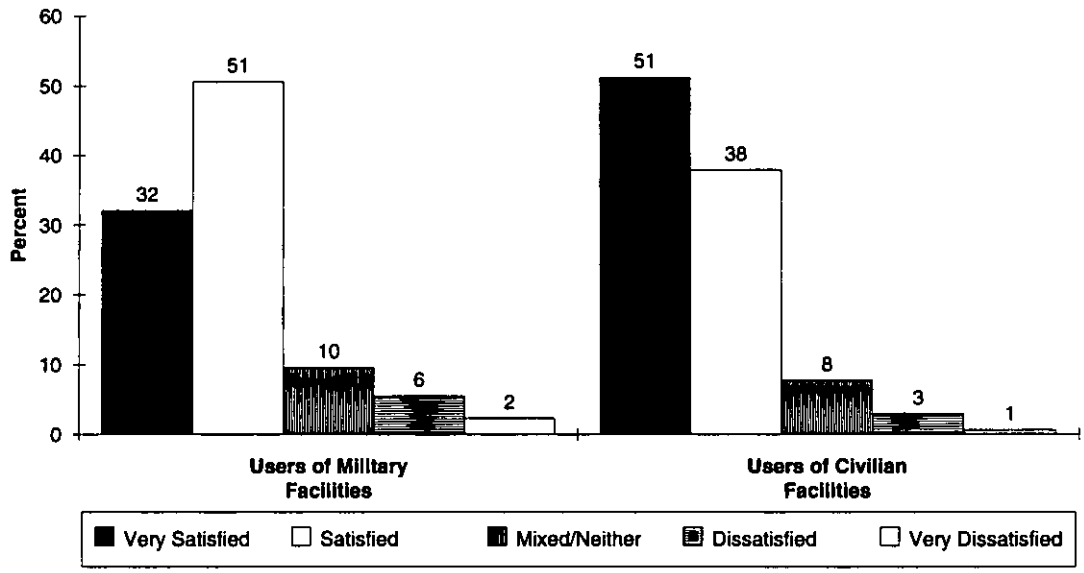
Figure 6.2 Overall Satisfaction With Outpatient Care for Junior-Enlisted Families

Patterns of response among junior-enlisted families (Figure 6.2) and senior-enlisted families (Figure 6.3) were very similar, with the senior-enlisted families exhibiting somewhat higher satisfaction levels. For both beneficiary groups, the percentage who were very satisfied with civilian facilities was about twice as high as the corresponding percentage for military facilities. The majority of enlisted families who used military facilities (54 percent for junior-enlisted families, 55 percent for senior-enlisted families) said that they were satisfied with outpatient care overall. The percentage who reported a "mixed/neither" level of satisfaction was more than twice as large for military facilities as for civilian facilities. The percentage who said that they were very dissatisfied was less than 3 percent for junior- and senior-enlisted families in both military and civilian facilities.



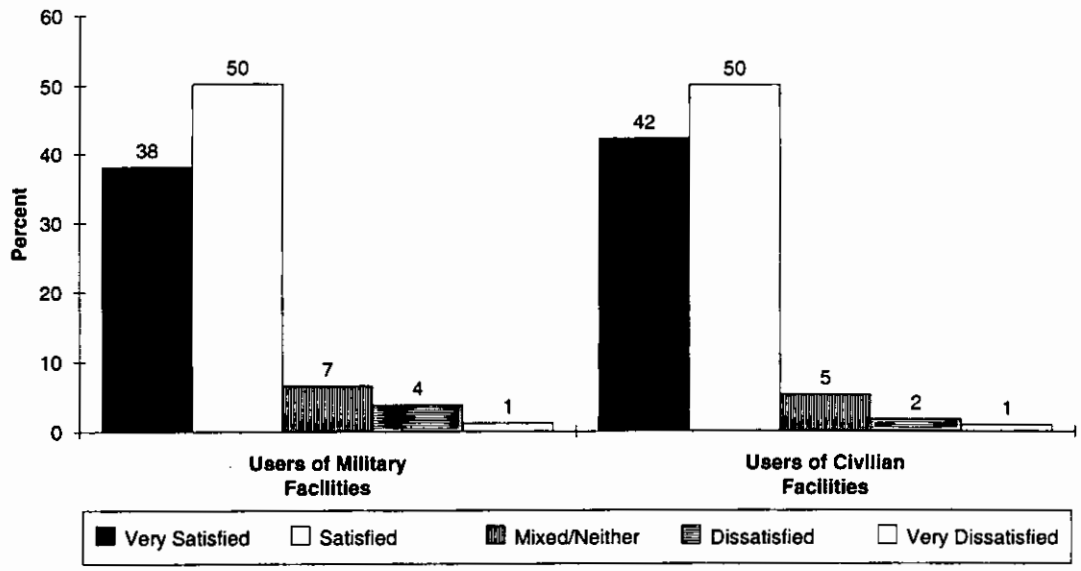
Source: 1992 DoD Health Care Survey
Question 70 - Please rate the overall satisfaction with the quality of care this family member received during the most recent visit for outpatient care.

Figure 6.3 Overall Satisfaction With Outpatient Care for Senior-Enlisted Families



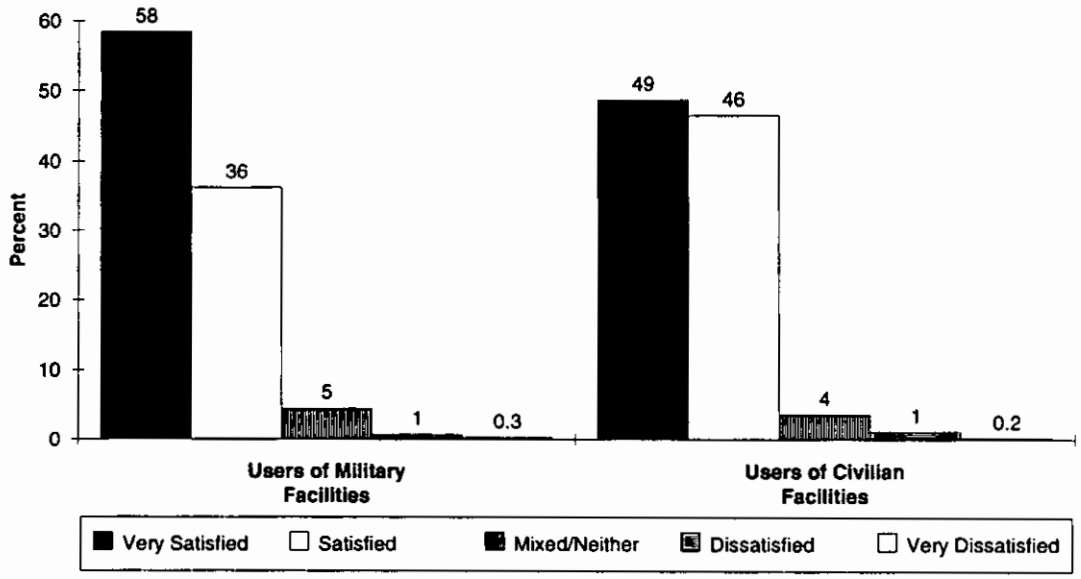
Source: 1992 DoD Health Care Survey
Question 70 - Please rate the overall satisfaction with the quality of care this family member received during the most recent visit for outpatient care.

Figure 6.4 Overall Satisfaction With Outpatient Care for Officer Families



Source: 1992 DoD Health Care Survey
Question 70 - Please rate the overall satisfaction with the quality of care this family member received during the most recent visit for outpatient care.

Figure 6.5 Overall Satisfaction With Outpatient Care for Under-65 Retiree/Survivor Families



Source: 1992 DoD Health Care Survey
Question 70 - Please rate the overall satisfaction with the quality of care this family member received during the most recent visit for outpatient care.

Figure 6.6 Overall Satisfaction With Outpatient Care for Over-65 Retiree/Survivor Families

Officer families had a higher proportion who were very satisfied (Figure 6.4) than did enlisted families. The majority of those who used civilian facilities (51 percent) said that they were very satisfied, while 32 percent of those who used military facilities were very satisfied. The majority of officers who used military facilities (51 percent) said that they were satisfied with outpatient care overall. Less than 10 percent of those who used military facilities characterized their satisfaction level as mixed/neither, and percentages who were very dissatisfied were again under 3 percent.

About half of the under-65 retiree/survivor families (Figure 6.5) said they were satisfied, both for users of military facilities and users of civilian facilities. A slightly higher proportion of those who used civilian facilities (42 percent) said they were very satisfied, as compared with those who used military facilities (38 percent). Less than 7 percent had a mixed/neither satisfaction level, and the very dissatisfied were only 1 percent for military facilities and 1 percent for civilian facilities.

More over-65 retiree/survivor families (Figure 6.6) were very satisfied with outpatient care than any beneficiary group, and relatively more military facility users (58 percent) than civilian facility users (49 percent) were very satisfied. Most of the remainder of this group were simply satisfied with the care they received. The "mixed/neither," "dissatisfied," and "very dissatisfied" responses taken together represent only about 6 percent of the total for users of military facilities and about 5 percent of the total for users of civilian facilities.

6.3 SATISFACTION WITH OUTPATIENT CARE BY BENEFICIARY DEMOGRAPHICS

In this section, differences in satisfaction by region, military service, sex, ethnic group, race, education, marital status, and family income are addressed.

6.3.1 Sponsor's Region

Table 6.1 contains the percentages satisfied or very satisfied displayed by region. Region is an important variable, because DoD is working to improve care through several regional health care demonstration projects. It is therefore useful to know how satisfaction varies among the regions. Although they are called "regions," they encompass different methods of delivering care and different options for beneficiaries. The region used here is the one in which the sponsor lives. Because sponsors and family members in these regions are not necessarily enrolled in any particular experimental program, it is not possible to sort out the effects of these programs on regional satisfaction.

Table 6.1 Overall Satisfaction With Outpatient Care by Region and Beneficiary Group

Sponsor's Region	Junior Enlisted	Senior Enlisted	Officers	Retirees and Survivors Under 65	Retirees and Survivors 65 and Over
No Initiatives	78%	72%	75%	86%	95%
Army CAM	81	83	85	89	93
CRI	64	74	78	86	94
Army Gateway to Care	72	77	81	87	96
Tidewater Region	79	75	88	93	95
Overlapping Catchment Areas	85	75	83	93	94
SE Region FI/PPO	91	88	86	93	96
New Orleans CRI-Like	–	74	79	93	94
PRIMUS/ NAVCARE	84	82	89	92	95
Noncatchment Areas	78	83	82	89	95
Outside U.S.	84	84	85	84	96
Navy CAM	88	85	93	89	93
Air Force CAM	77	77	87	90	98
Shipboard	60	82	81	–	–

Source: 1992 DoD Health Care Survey
Question 70 - Please rate the overall satisfaction with the quality of care this family member received during the most recent visit for outpatient care.

There are substantial differences among the regions. It is still important to note that the percentage of respondents satisfied or very satisfied was quite high for most of the regions and beneficiary groups. The lowest observed percentage was for junior-enlisted families with the sponsor on board ship, and that was 60 percent. Junior-enlisted families had the largest variation in percentage satisfied, from 60 percent for those where the sponsor was on board ship, to 91 percent for those in the Southeast Region FI/PPO. Over-65 retirees and survivors had the least amount of variation, ranging from 93 percent for Army CAM to 98 percent for Air Force CAM.

Among active-duty families, the service CAM regions did quite well, except for Air Force CAM among the enlisted, which exhibited relatively low percentages. The CAM regions were roughly in the middle of the rankings for the under-65 retirees and survivors, and rankings varied depending on service for the over-65 retirees.

The CRI region had relatively low percentages satisfied in four of the five beneficiary groups. Among under-65 retirees and survivors, it ranked roughly in the middle.

6.3.2 Sponsor's Military Service

In Table 6.2, the percentages of families who said that they were satisfied or very satisfied with outpatient care overall are given by service and facility type for each beneficiary group. The lowest percentage was 59 percent of Marine Corps junior-enlisted families who used military facilities. Table 6.2 shows that, in general, retiree families with a sponsor over 65 have the highest percentage who are satisfied or very satisfied, while junior- and senior-enlisted families have the lowest.

In the active-duty population, a greater proportion of families who used civilian facilities were satisfied than those who used military facilities. In the case of retirees and survivors 65 and over, the proportion of military facility users who were satisfied was almost the same as for civilian facility users. Comparing the service responses, the Air Force had the highest proportion satisfied with military facilities, and the Marine Corps had the highest proportion satisfied with civilian facilities.

Table 6.2 Overall Satisfaction With Outpatient Care by Service and Source of Care

Service/ Source of Care	Junior Enlisted	Senior Enlisted	Officers	Retirees and Survivors Under 65	Retirees and Survivors 65 and Over
Army					
Military Facility	67%	77%	79%	86%	95%
Civilian Facility	–	89	82	92	95
Navy					
Military Facility	75	76	84	85	94
Civilian Facility	75	91	92	92	95
Marine Corps					
Military Facility	59	71	81	–	–
Civilian Facility	–	95	95	91	–
Air Force					
Military Facility	84	78	85	93	95
Civilian Facility	88	86	90	93	95

Source: 1992 DoD Health Care Survey
Question 70 - Please rate the overall satisfaction with the quality of care this family member received during the most recent visit for outpatient care.
Question 58 - What type of medical facility did this family member use for the most recent outpatient visit?

6.3.3 Sponsor's Sex

Table 6.3 displays the percentage satisfied or very satisfied with outpatient care by demographic group. Among junior-enlisted families, the percentage satisfied or very satisfied was higher for female sponsors than for males, 80 percent vs. 73 percent. Among senior-enlisted and officer families, there were no large gender differences. There were not enough female sponsors in the retiree group to make a comparison.

Table 6.3 Overall Satisfaction With Outpatient Care by Sponsor Demographics

Sponsor Demographics	Junior Enlisted	Senior Enlisted	Officers	Retirees and Survivors Under 65	Retirees and Survivors 65 and Over
Sex					
Male	73%	79%	84%	91%	95%
Female	80	77	85	–	–
Ethnic Group					
Hispanic	81	78	82	90	94
Non-Hispanic	74	79	84	91	95
Race					
White	74	78	84	91	95
Black	81	86	83	92	95
Other	77	79	81	81	–
Education					
Less Than 12 Years	–	–	–	–	90
GED	–	82	–	88	94
High School Diploma	77	81	–	91	95
Some College	74	78	77	90	96
2-Year College Degree	66	79	76	89	94
4-Year College Degree	–	80	83	96	95
Some Graduate School	–	–	82	89	99
Post-Graduate Degree	–	–	86	93	94
Marital Status					
Unmarried	69	81	84	93	95
Married, Living With Spouse	79	79	84	91	95
Married, Not Living With Spouse	78	78	80	–	–
Family Income					
< $15,000	72	–	–	83	92
$15,000 - $24,999	77	78	87	87	93
$25,000 - $34,999	77	81	81	90	96
$35,000 - $49,999	73	81	82	92	96
$50,000 - $74,999	–	77	85	93	96
$75,000 - $99,999	–	–	90	92	99
≥ $100,000	–	–	86	95	97

Source: 1992 DoD Health Care Survey
Question 70 - Please rate the overall satisfaction with the quality of care this family member received during the most recent visit for outpatient care.

6.3.4 Sponsor's Ethnic Group

Among junior-enlisted families, those with a Hispanic sponsor had a higher percentage satisfied or very satisfied than those with a non-Hispanic sponsor. Among senior-enlisted sponsors, Hispanic descent made no real difference in the percentage satisfied or very satisfied. Among officers, a slightly smaller proportion of Hispanic families were satisfied than of non-Hispanic respondents. Among retirees, Hispanic descent did not make much difference in the percentage satisfied or very satisfied.

6.3.5 Sponsor's Race

Among the enlisted population, a smaller proportion of whites were satisfied than blacks, while members of other races were in between whites and blacks in proportion satisfied. For officers, differences in satisfaction by race were small. Among the retirees, the differences between whites and blacks were not pronounced. Members of other races in the under-65 retiree group were less satisfied than either blacks or whites.

6.3.6 Sponsor's Education

Patterns of satisfaction by education level varied depending on beneficiary status. Among junior-enlisted families, there appeared to be an inverse relationship between satisfaction and education level, while for officers, satisfaction and education were positively related. The highest proportion of junior-enlisted families satisfied (77 percent) were those where the sponsor had only a high school diploma, while the lowest (66 percent) were those where the sponsor had a two-year college degree. Among officers, the lowest proportion (76 percent) was among those with a two-year college degree, and the highest (86 percent) was for those with a post-graduate degree. Among the senior-enlisted, the patterns were less clear, but the highest proportion satisfied (82 percent) was among those with the least education.

Among retirees, the differences in satisfaction by education level were smaller (about 8 percentage points from low to high), and there were no clear linear relationships. Among the under-65 retirees, the highest proportion satisfied were those with a 4-year college degree (96 percent), and the lowest proportion satisfied were those with a GED (88 percent). Among retirees and survivors over 65, the highest proportion satisfied were those with some graduate school (99 percent), while the lowest proportion satisfied was among those with less than 12 years of education (a still-high 90 percent).

6.3.7 Sponsor's Marital Status

Differences in satisfaction by marital status were generally very small within beneficiary groups. The few exceptions are noted here. Unmarried junior-enlisted sponsors had a lower proportion satisfied (69 percent) than those who were married (78 percent). Among officers, those who were married and living with their spouses had the highest proportion satisfied (84 percent), while those who were married but not living with the spouse had a slightly lower satisfaction rate (80 percent).

6.3.8 Family's Annual Income

Among junior- and senior-enlisted families, there were no discernible patterns in the proportion satisfied by income levels. Low-income junior-enlisted families (< $15,000) had almost as high a proportion satisfied as those in the income class from $35,000-$49,999. There was also no linear pattern among officer families. Among the retirees, satisfaction was roughly positively correlated with income—wealthier retirees had a higher proportion satisfied.

6.4 SATISFACTION WITH THE FACILITY AND STAFF

Table 6.4 contains the percentage satisfied or very satisfied for each component of satisfaction, for military and civilian facilities, across the five beneficiary groups.

6.4.1 Satisfaction With the Facility Used for Outpatient Care

Question 68 addresses satisfaction with the outpatient facility in terms of such indicators as convenience, availability, comfort, cleanliness, confidentiality, quality, and cost.

Some patterns can be observed in these responses. In every case, the over-65 retirees had the highest percentage satisfied of all the beneficiary groups. In 18 of the 32 cases, including overall satisfaction with the facility, senior-enlisted families had the lowest percentage satisfied of all the beneficiary groups.

More active-duty families who used civilian facilities were satisfied than those who used military facilities, both overall and in terms of their components, often by a substantial margin. There were a few exceptions: 1) the cost of a visit to a military facility (such visits are free) was rated more satisfying than the cost of a visit to a civilian facility; 2) with respect to convenience of location and access to medical records, military and civilian facility users in the two enlisted groups were equally satisfied; and 3) a higher percentage of officer families were satisfied with the locations of military facilities than with the locations of civilian facilities.

Table 6.4 Satisfaction With Components of Outpatient Facility by Source of Care

Components of Facility/ Source of Care	Junior Enlisted	Senior Enlisted	Officers	Retirees and Survivors Under 65	Retirees and Survivors 65 and Over
Convenience of location					
Military Facility	87%	87%	86%	89%	90%
Civilian Facility	89	87	83	91	93
Availability of parking					
Military Facility	53	59	67	76	84
Civilian Facility	69	83	87	92	94
Hours when facility is open					
Military Facility	78	82	83	93	98
Civilian Facility	84	90	91	93	97
Cleanliness of facility					
Military Facility	89	89	88	95	98
Civilian Facility	95	94	95	96	98
Ability to see specialists when needed					
Military Facility	49	49	56	64	78
Civilian Facility	74	76	80	84	90
Ability to use emergency room/services					
Military Facility	67	69	70	81	91
Civilian Facility	79	80	75	86	91
Ability to make appointments by phone					
Military Facility	56	50	47	57	69
Civilian Facility	83	85	87	90	93
Time waiting between appointment and visit					
Military Facility	48	50	55	58	74
Civilian Facility	78	80	84	85	87
Time waiting for treatment					
Military Facility	47	51	58	68	82
Civilian Facility	71	78	79	84	84
Ability to get medical advice over the phone					
Military Facility	42	38	39	47	62
Civilian Facility	74	72	75	75	79

Continued on next page

Table 6.4—*Continued*

Components of Facility/ Source of Care	Junior Enlisted	Senior Enlisted	Officers	Retirees and Survivors Under 65	Retirees and Survivors 65 and Over
Ability to see doctor of choice					
Military Facility	44%	40%	47%	57%	78%
Civilian Facility	74	75	79	85	91
Confidentiality of care					
Military Facility	70	74	81	88	96
Civilian Facility	90	91	92	94	98
Access to medical records					
Military Facility	81	79	82	89	95
Civilian Facility	81	78	84	84	89
Quality of medical records					
Military Facility	73	74	76	84	94
Civilian Facility	85	79	85	85	91
Cost of visit					
Military Facility	91	85	90	91	93
Civilian Facility	67	60	62	67	76
Overall satisfaction with facility					
Military Facility	71	72	76	85	92
Civilian Facility	86	87	88	90	93

Source: 1992 DoD Health Care Survey
Question 68 - Thinking of this family member's most recent visit for outpatient care, please rate the satisfaction with the facility used on each of the following factors.
Question 58 - What type of medical facility did this family member use for the most recent outpatient visit?

Retirees had a more favorable view of military facilities. The under-65 group had only a slightly higher percentage satisfied with civilian facilities overall than with military facilities, and the over-65 group had roughly equal proportions satisfied among military and civilian facility users. Both retiree groups were equally satisfied with military and civilian facilities in terms of their locations, hours, and cleanliness. Retirees were more satisfied with the access to and quality of medical records from military facilities than records from civilian facilities. Not surprisingly, retirees who used military facilities were also more satisfied with the cost of the visit than those who used civilian facilities.

Of all the facility components, the highest satisfaction level was with cost by users of military facilities, and with cleanliness and convenience of location, both by users of military and users of civilian facilities. The ability to get medical advice over the phone from military facilities had the lowest satisfaction level among users of military facilities. Other areas with low satisfaction—all for users of military facilities—include ability to see the doctor of choice, ability to make appointments by phone, time between appointment and visit, and the ability to see specialists when needed.

6.4.2 Satisfaction With the Staff at the Facility Used for Outpatient Care

Question 69 dealt with the medical and other staff at the facility. Table 6.5 shows the percentage satisfied or very satisfied for each component of staff behavior, by beneficiary group.

Overall satisfaction with the staff of military facilities ranged from 71 percent for junior-enlisted families to 94 percent for over-65 retirees. For civilian facilities, overall satisfaction with staff was higher, ranging from 89 percent for senior-enlisted families to almost 96 percent for over-65 retirees.

Active-duty beneficiaries and under-65 retirees had similar responses to this question, while the over-65 retirees exhibited completely different patterns. We will discuss the active-duty beneficiaries and the under-65 retirees first. The components of military facilities that had low ratings with this group included attentiveness of staff other than doctor, doctor's willingness to discuss alternative treatment options, thoroughness of treatment, advice on preventing illness and injury, and time spent with doctor. The components of military facilities that had the highest percentage satisfied included the thoroughness of examinations and the bedside manner of doctors. Highly-rated aspects among users of civilian facilities included the staff overall, the courtesy of the staff, and thoroughness of examinations. The low-rated aspects of civilian facilities included time spent with the doctor and clarity of explanations of tests and procedures.

Table 6.5 Satisfaction With Components of Staff Behavior at Outpatient Facility by Source of Care

Components of Staff/ Source of Care	Junior Enlisted	Senior Enlisted	Officers	Retirees and Survivors Under 65	Retirees and Survivors 65 and Over
Thoroughness of examinations					
Military Facility	72%	80%	85%	88%	93%
Civilian Facility	85	90	91	93	96
Thoroughness of treatment					
Military Facility	66	76	82	88	94
Civilian Facility	87	88	89	91	94
Clarity of doctor's explanations					
Military Facility	72	78	84	87	95
Civilian Facility	79	88	89	90	92
Time spent with doctor					
Military Facility	69	74	82	88	95
Civilian Facility	72	86	88	90	91
Doctor's "bedside manner"					
Military Facility	78	78	83	89	93
Civilian Facility	88	88	88	90	93
Attentiveness of staff (other than doctor)					
Military Facility	65	72	76	85	93
Civilian Facility	87	88	89	90	94
Courtesy of staff (other than doctor)					
Military Facility	70	76	79	88	95
Civilian Facility	88	90	92	92	95
Advice on preventing illness or injury					
Military Facility	71	76	76	85	93
Civilian Facility	88	86	89	89	89
Doctor's willingness to discuss treatment options					
Military Facility	68	74	79	84	93
Civilian Facility	87	88	87	90	92
Overall satisfaction with staff					
Military Facility	71	76	83	88	94
Civilian Facility	91	89	90	93	98

Source: 1992 DoD Health Care Survey
Question 69 - Thinking of this family member's most recent visit for outpatient care, please rate the satisfaction with the staff at the facility used on each of the following factors.
Question 58 - What type of medical facility did this family member use for the most recent outpatient visit?

Over-65 retirees had a different pattern of responses. The overall percentage satisfied, ranging from 89 percent to 96 percent, was much higher than for other groups, and the range of variation was narrower. Compared with other beneficiary groups, over-65 retirees who used military facilities were somewhat more satisfied with the staff than those who used civilian facilities. The five components with the lowest percentage satisfied were all for civilian facilities. They included advice on preventing illness or injury, time spent with doctor, doctor's willingness to discuss treatment options, clarity of explanations of tests and procedures, and doctor's bedside manner.

When considering the satisfaction with components of staff behavior, the junior-enlisted families generally had the lowest percentage satisfied, followed in order by senior-enlisted families, officer families, under-65 retirees, and over-65 retirees.

6.5 DISSATISFACTION WITH ASPECTS OF OUTPATIENT CARE

A separate analysis of the percentage of people for each item who were dissatisfied or very dissatisfied was also performed. Table 6.6 displays these percentages. The percentage of people who regarded themselves as dissatisfied or very dissatisfied overall was low, ranging from 1 percent to 11 percent, depending on the beneficiary group and the source of care. The analysis in this section examines which components of outpatient care were most troublesome to beneficiaries. Rankings of sources of dissatisfaction were obtained prior to rounding.

For four of the five beneficiary classes, the principal source of dissatisfaction was with telephone appointment procedures in military facilities. The exception, junior-enlisted families, was most dissatisfied with the availability of parking in military facilities; telephone appointment procedures ranked third with this group.

Almost a third of senior-enlisted and officer families who used military facilities were dissatisfied with telephone appointment procedures. Over-65 retirees exhibited much lower overall levels of dissatisfaction than the other beneficiary groups. Still, 17 percent were dissatisfied, and it was their principal source of dissatisfaction. While telephone appointment procedures were only the third-highest source of dissatisfaction for junior-enlisted families, 26 percent were dissatisfied with them.

For four of the five beneficiary groups, the top seven sources of dissatisfaction were all given by users of military facilities. In the order they ranked with officer families, they are: ability to make appointments over the phone, ability to get medical advice over the phone, waiting time between appointment and visit, the ability to see specialists when needed, the ability to see the doctor of one's choice, time waiting

Table 6.6 Dissatisfaction With Components of Outpatient Care by Source of Care

Components of Outpatient Care/ Source of Care	Junior Enlisted	Senior Enlisted	Officers	Retirees and Survivors Under 65	Retirees and Survivors 65 and Over
Convenience of location					
Military Facility	5%	5%	6%	5%	4%
Civilian Facility	3	4	6	3	2
Availability of parking					
Military Facility	29	28	22	16	9
Civilian Facility	18	7	6	4	2
Hours when facility is open					
Military Facility	12	7	7	3	.4
Civilian Facility	7	3	3	3	1
Cleanliness of facility					
Military Facility	3	3	3	2	1
Civilian Facility	2	1	1	1	1
Ability to see specialists when needed					
Military Facility	25	28	25	17	10
Civilian Facility	12	8	8	6	4
Ability to use emergency room/services					
Military Facility	17	14	12	8	4
Civilian Facility	10	5	4	4	1
Ability to make appointments by phone					
Military Facility	26	32	32	27	17
Civilian Facility	9	5	6	6	4
Time waiting between appointment and visit					
Military Facility	26	28	25	23	12
Civilian Facility	10	9	8	8	6
Time waiting for treatment					
Military Facility	27	28	22	16	7
Civilian Facility	13	9	12	8	5
Ability to get medical advice over the phone					
Military Facility	24	31	26	27	17
Civilian Facility	14	10	9	9	9

Continued on next page

Table 6.6—*Continued*

Components of Outpatient Care/ Source of Care	Junior Enlisted	Senior Enlisted	Officers	Retirees and Survivors Under 65	Retirees and Survivors 65 and Over
Ability to see doctor of choice					
Military Facility	24%	28%	24%	18%	7%
Civilian Facility	12	9	10	7	3
Confidentiality of care					
Military Facility	10	5	3	3	1
Civilian Facility	3	1	1	1	.1
Access to medical records					
Military Facility	6	7	6	5	2
Civilian Facility	4	3	3	2	2
Quality of medical records					
Military Facility	7	6	6	5	2
Civilian Facility	3	2	2	2	1
Cost of visit					
Military Facility	1	2	1	2	2
Civilian Facility	15	21	16	13	11
Thoroughness of examinations					
Military Facility	13	10	7	6	2
Civilian Facility	4	4	4	2	1
Thoroughness of treatment					
Military Facility	12	11	7	6	2
Civilian Facility	4	4	5	3	1
Clarity of doctor's explanations					
Military Facility	13	9	67	5	1
Civilian Facility	10	5	3	3	2
Time spent with doctor					
Military Facility	14	11	7	7	2
Civilian Facility	9	5	5	4	3
Doctor's "bedside manner"					
Military Facility	6	8	7	5	3
Civilian Facility	8	4	4	3	2

Continued on next page

Table 6.6—*Continued*

Components of Outpatient Care/ Source of Care	Junior Enlisted	Senior Enlisted	Officers	Retirees and Survivors Under 65	Retirees and Survivors 65 and Over
Attentiveness of staff (other than doctor)					
Military Facility	14%	11%	9%	6%	1%
Civilian Facility	7	4	4	3	1
Courtesy of staff (other than doctor)					
Military Facility	13	9	8	4	1
Civilian Facility	8	4	3	3	1
Advice on preventing illness or injury					
Military Facility	10	7	6	5	1
Civilian Facility	4	3	2	2	2
Doctor's willingness to discuss treatment options					
Military Facility	13	10	8	6	2
Civilian Facility	8	4	4	3	2

Source: 1992 DoD Health Care Survey
Question 68 - Thinking of this family member's most recent visit for outpatient care, please rate the satisfaction with the facility used on each of the following factors.
Question 69 - Thinking of this family member's most recent visit for outpatient care, please rate the satisfaction with the staff at the facility used on each of the following factors.
Question 58 - What type of medical facility did this family member use for the most recent outpatient visit?

for treatment, and availability of parking. (Over-65 retirees ranked two aspects of civilian facilities, cost of the visit and telephone advice, fourth and sixth, respectively.)

Among users of civilian facilities, the greatest areas of dissatisfaction were: cost of the visit, treatment waiting time, telephone advice, seeing the doctor of choice, appointment waiting time, and seeing specialists. Junior-enlisted families displayed the highest percentage of dissatisfaction with parking (18 percent), but other groups did not have much dissatisfaction with it.

There were also some aspects of outpatient care with very low rates of dissatisfaction. For example, the cost of a visit to a military facility had very low dissatisfaction rates (less than 2 percent). The following aspects of civilian facilities had less than five percent dissatisfied for all beneficiary groups: cleanliness, confidentiality, record quality, prevention advice, record access, clarity of explanations, and thoroughness of examinations. Cleanliness of military facilities and cost of the visit to military facilities also had less than five percent dissatisfied responses for all groups.

6.6 SUMMARY OF KEY FINDINGS

This chapter addressed satisfaction with outpatient care as determined from questions about the most recent outpatient visit, provided it was within the last 6 months. Because respondents were asked to evaluate their most recent visit only, the ratings for military and civilian facilities were made by different beneficiaries. The key results are:

- Overall satisfaction was high (at least 73 percent satisfied or very satisfied) among both military- and civilian-facility users across all beneficiary groups.
- Among active-duty beneficiaries, the percentage of civilian-facility users who considered themselves satisfied or very satisfied overall was higher than the corresponding percentage of military-facility users.
- Retiree families had the highest levels of satisfaction with military facilities of all the beneficiary groups. Retiree families with a sponsor age 65 or over who used military facilities were somewhat more satisfied than members of the same group who used civilian facilities.
- There were considerable differences in satisfaction by region. The Southeast Region FI/PPO area had the highest satisfaction levels for three of the five beneficiary groups. The service CAM regions were well-regarded by active-duty beneficiaries, while the CRI region exhibited relatively low satisfaction

levels. It is important to note, however, that respondents were not necessarily enrolled in any experimental program, and that some of the programs had not been underway for very long at the time of the survey.

- The aspect of care at military facilities that had the highest level of satisfaction was the cost of the visit. Both military- and civilian-facility users had high satisfaction levels with respect to cleanliness of the facility and convenience of location.
- Aspects of the staff that received high satisfaction ratings include the courtesy of the staff other than the doctor (civilian-facility users), doctor's bedside manner (military-facility users), and thoroughness of examinations (both military- and civilian-facility users).
- The percentage of people who regarded themselves as dissatisfied or very dissatisfied was low, ranging from 1 percent to 11 percent, depending on the beneficiary group and the source of care. For all beneficiary groups except junior-enlisted, the aspect of care at military facilities that had the highest level of dissatisfaction was the ability to make appointments by phone.

7.0 SATISFACTION WITH INPATIENT CARE

7.1 INTRODUCTION

An important consideration when assessing potential changes to the current military health care system is how the changes are likely to affect beneficiaries' satisfaction with the care they receive. The previous chapter addressed beneficiaries' satisfaction with outpatient care, which provides a baseline against which potential alternatives can be compared. This chapter addresses satisfaction with inpatient care.

Attitudes regarding inpatient care are measured in terms of satisfaction with the hospital and staff, as well as with the overall quality of care received. The hospital is rated primarily on measures of access and cost. The staff is rated on the perceived competence and conduct of the doctors and staff. Overall satisfaction encompasses the total hospital experience.

Satisfaction with inpatient care is determined from beneficiaries' responses to survey questions 86 (hospital), 87 (staff), and 88 (overall). These questions are worded as follows:

- *Question 86*: "Thinking of this family member's most recent hospital stay, please rate the satisfaction with the facility used on each of the following factors." (Factors are shown in Appendix A and in subsequent tables.)
- *Question 87*: "Thinking of this family member's most recent hospital stay, please rate the satisfaction with the staff at the facility used on each of the following factors." (Factors are shown in Appendix A and in subsequent tables.)
- *Question 88*: "Please rate the overall satisfaction with the quality of care this family member received during the most recent hospital stay."

In each question above, "this family member" refers to the person with the most recent hospital stay, provided it took place within the last 12 months. Visits to only military or civilian hospitals are considered in this analysis (i.e., visits to Department of Veterans Affairs and other hospitals are omitted). Each question offers a choice of six responses: very satisfied, satisfied, mixed/neither, dissatisfied, very dissatisfied, and does not apply/don't know. ("Does not apply" is not an option for question 88 (overall satisfaction).)

Because respondents are asked for their feelings concerning the most recent hospital stay only, their opinions pertain to either military or civilian hospitals, but not both. This means that different populations of respondents are evaluating military and civilian hospitals. In Chapter 6 (Satisfaction With Outpatient Care), it was noted that evaluations from different populations could potentially bias the comparison between military and civilian hospitals (because respondents who like military hospitals are evaluating military hospitals and respondents who like civilian hospitals are evaluating civilian hospitals). This bias is likely to be much less of a problem with inpatient care, however, because beneficiaries are ordinarily referred to hospitals by their physicians, i.e., hospitals are not being evaluated only by beneficiaries who prefer them.

For the purpose of this analysis, it was decided to treat satisfaction as a family attribute. This was done for two reasons. First, the person with the most recent hospital stay was sometimes a child, for whom satisfaction was rated by a parent or guardian. Second, there is likely to be a high correlation among the responses of individual family members. Family members usually share their feelings and experiences with other family members, and this tends to produce a common family perception about the care received. Because satisfaction is thought to vary by beneficiary type, the following groups of beneficiary families are considered in this analysis:

- junior enlisted (E-1 to E-4),
- senior enlisted (E-5 to E-9),
- officers (W-1 to O-10),
- retirees and survivors under 65, and
- retirees and survivors age 65 and over.

Each beneficiary group is determined by the status of the sponsor. The retiree groups include retirees from both active service and the Reserves.

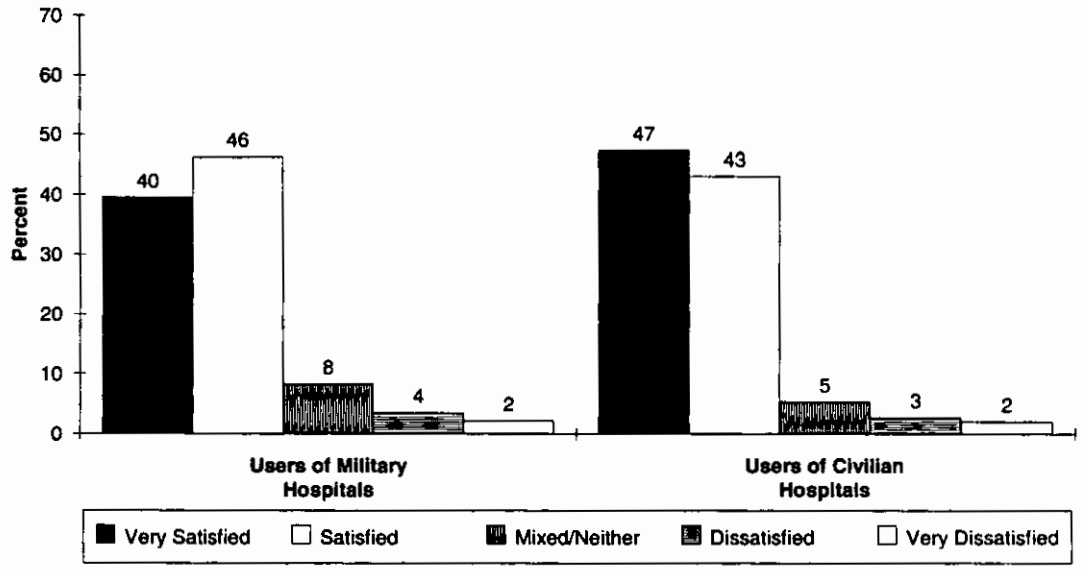
The overall level of satisfaction with inpatient care is discussed first in this chapter. Variations in satisfaction by hospital type used, service, and demographic variables are then discussed. Next is a look at the satisfaction with the components of inpatient care. Finally, there is an analysis of levels of dissatisfaction with inpatient care. "Does not apply/don't know" responses are not included in the percentages reported in the analyses. Percentages based on fewer than 100 responses are also not reported.

7.2 OVERALL SATISFACTION WITH HOSPITAL CARE BY HOSPITAL TYPE AND BENEFICIARY GROUP

Overall satisfaction with inpatient care is displayed here in six figures (Figures 7.1 to 7.6), one for all beneficiaries combined and one for each beneficiary group. The

figures display all five response options for the question on overall satisfaction, excluding "don't know," for users of military and users of civilian hospitals. The tables in later sections present the results in terms of the percentage of respondents satisfied or very satisfied with inpatient care or one of its components.

Figure 7.1 shows responses to the question of overall satisfaction with inpatient care for all beneficiaries, based on the most recent hospital stay within the past year.



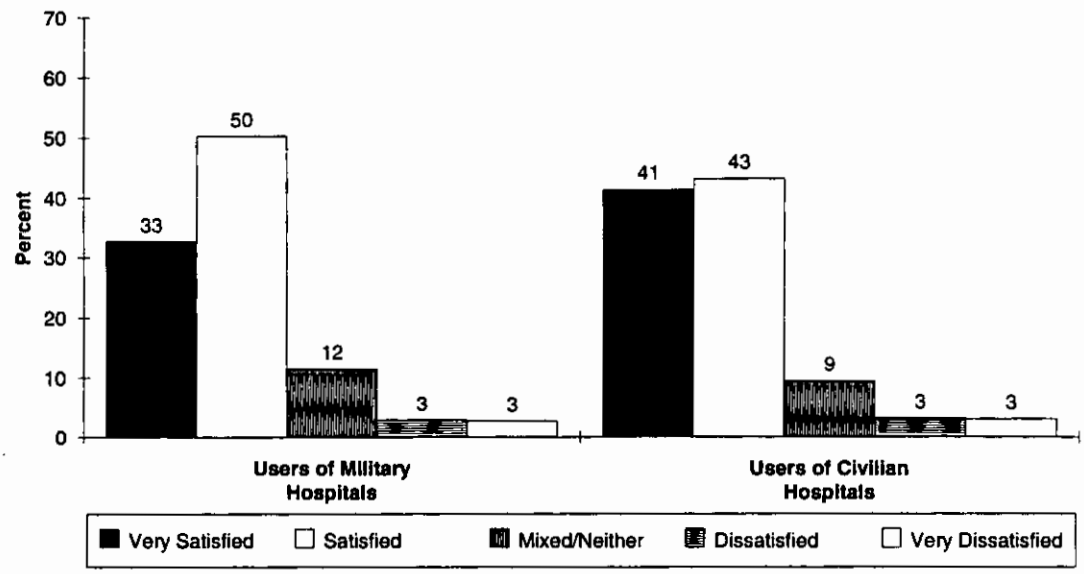
Source: 1992 DoD Health Care Survey
Question 88 - Please rate the overall satisfaction with the quality of care this family member received during the most recent hospital stay.

Figure 7.1 Overall Satisfaction With Inpatient Care

As indicated in Chapter 5, 6.4 percent of all respondents were admitted to a military hospital sometime during the year, and 7.2 percent were admitted to a civilian hospital. Overall satisfaction was quite high and the disparity between military and civilian facilities was much less than it was for outpatient care (satisfaction with outpatient care at civilian facilities was considerably higher than at military facilities). Forty percent of military hospital users and 47 percent of civilian hospital users said they were very satisfied with their care. Combining responses of "satisfied" and "very satisfied," 86 percent of military facility users were generally satisfied, compared with 90 percent of civilian facility users. The combination of mixed, dissatisfied and very dissatisfied responses amounted to only 14 percent of military hospital users and 10 percent of civilian hospital users. Only 2 percent of each group said they were very dissatisfied.

7.2.1 Overall Satisfaction by Beneficiary Group

Figure 7.2 graphically depicts overall satisfaction (question 88) with the inpatient care provided in military and civilian hospitals for junior-enlisted (E-1 to E-4) families.

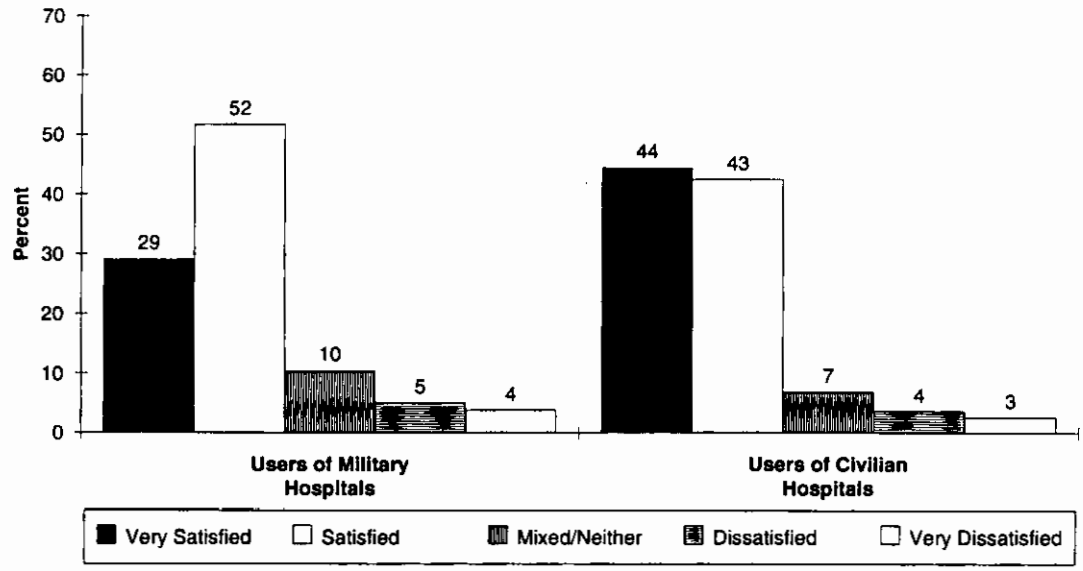


Source: 1992 DoD Health Care Survey
Question 88 - Please rate the overall satisfaction with the quality of care this family member received during the most recent hospital stay.

Figure 7.2 Overall Satisfaction With Inpatient Care for Junior-Enlisted Families

According to the survey, 33 percent of the junior-enlisted families were very satisfied and 50 percent were satisfied with the care they received in a military hospital during their last stay. On the other hand, only 3 percent were very dissatisfied and another 3 percent dissatisfied. The results for users of civilian hospitals show that a higher proportion were very satisfied (41 percent) than users of military hospitals. The very satisfied and satisfied responses taken together sum to about the same percentage both for users of military hospitals and users of civilian hospitals.

Figure 7.3 shows overall satisfaction (question 88) with the inpatient care provided in military and civilian hospitals for senior-enlisted (E-5 to E-9) families.

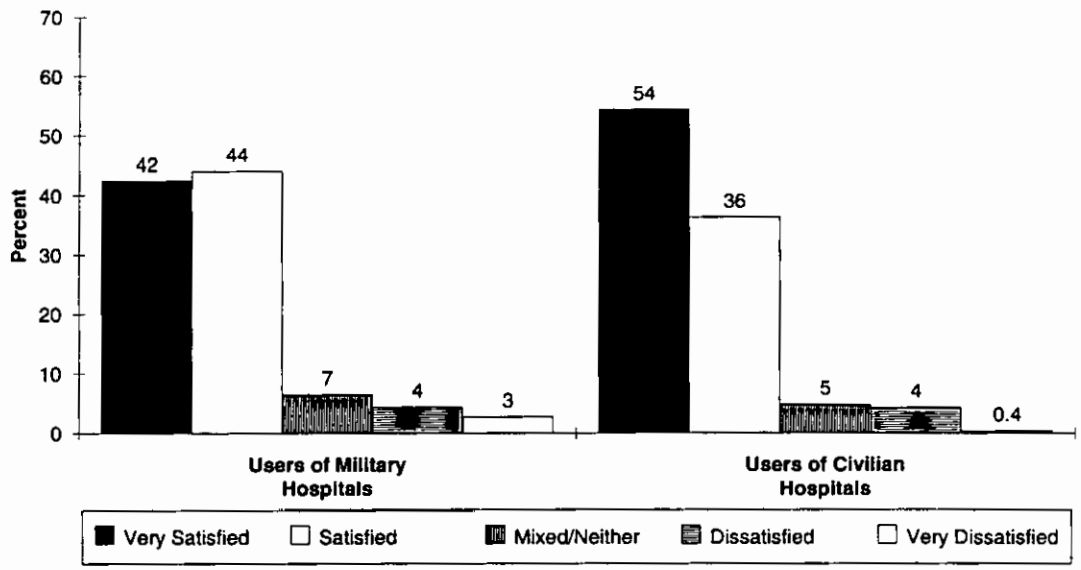


Source: 1992 DoD Health Care Survey
Question 88 - Please rate the overall satisfaction with the quality of care this family member received during the most recent hospital stay.

Figure 7.3 Overall Satisfaction With Inpatient Care for Senior-Enlisted Families

Senior-enlisted families exhibited patterns of satisfaction similar to their junior-enlisted counterparts. The percentages very satisfied (29 percent) and satisfied (52 percent) with military hospitals were about the same as for junior-enlisted families. However, the senior-enlisted families were somewhat more dissatisfied (5 percent) or very dissatisfied (4 percent) than their junior-enlisted counterparts. Like the junior-enlisted families, a higher proportion of senior-enlisted families who used civilian hospitals were very satisfied with the care they received (44 percent) than those who used military hospitals (29 percent). Another 43 percent considered themselves satisfied with civilian hospitals. The proportions of those who had a mixed attitude, were dissatisfied, or were very dissatisfied were all lower for users of civilian hospitals than for users of military hospitals.

Figure 7.4 reports overall satisfaction (question 88) with the inpatient care provided in military and civilian hospitals for officer (W-1 to O-10) families.

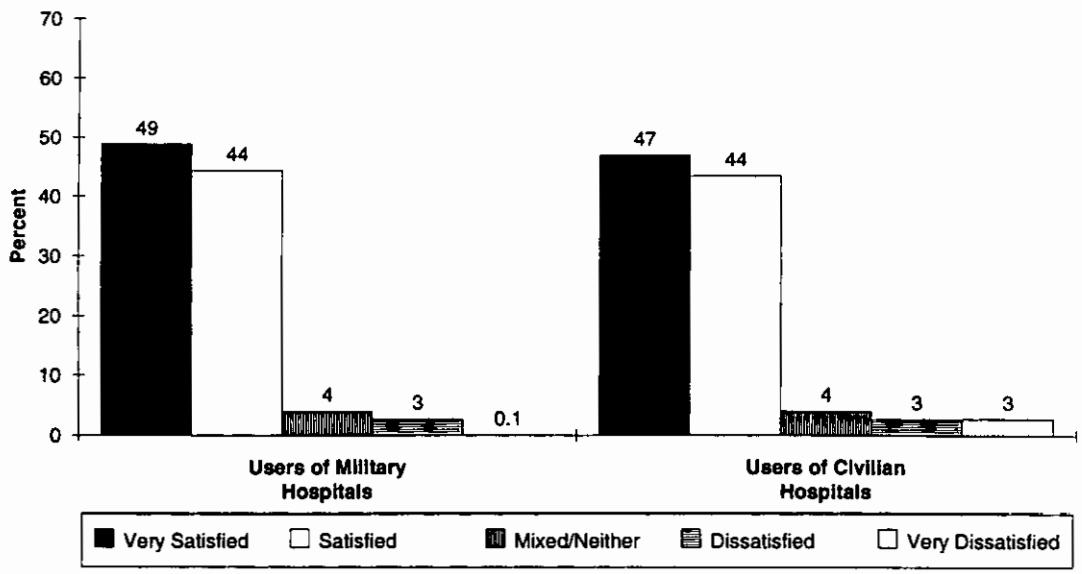


Source: 1992 DoD Health Care Survey
Question 88 - Please rate the overall satisfaction with the quality of care this family member received during the most recent hospital stay.

Figure 7.4 Overall Satisfaction With Inpatient Care for Officer Families

A higher proportion (42 percent) of officer families were very satisfied with military hospitals than their enlisted counterparts. An additional 44 percent described themselves as satisfied with military inpatient care. With 4 percent dissatisfied and 3 percent very dissatisfied with military inpatient care, officer families were slightly more negative than the junior-enlisted and less negative than the senior-enlisted families. Officers and their families were the most enthusiastic of any beneficiary group about the inpatient care they received in civilian hospitals with 54 percent very satisfied and 36 percent satisfied. They also had few families dissatisfied with civilian hospitals—only 4 percent dissatisfied and 0.4 percent very dissatisfied.

Figure 7.5 displays overall satisfaction (question 88) with the inpatient care provided in military and civilian hospitals for families (including the sponsor) of retirees and survivors under 65.

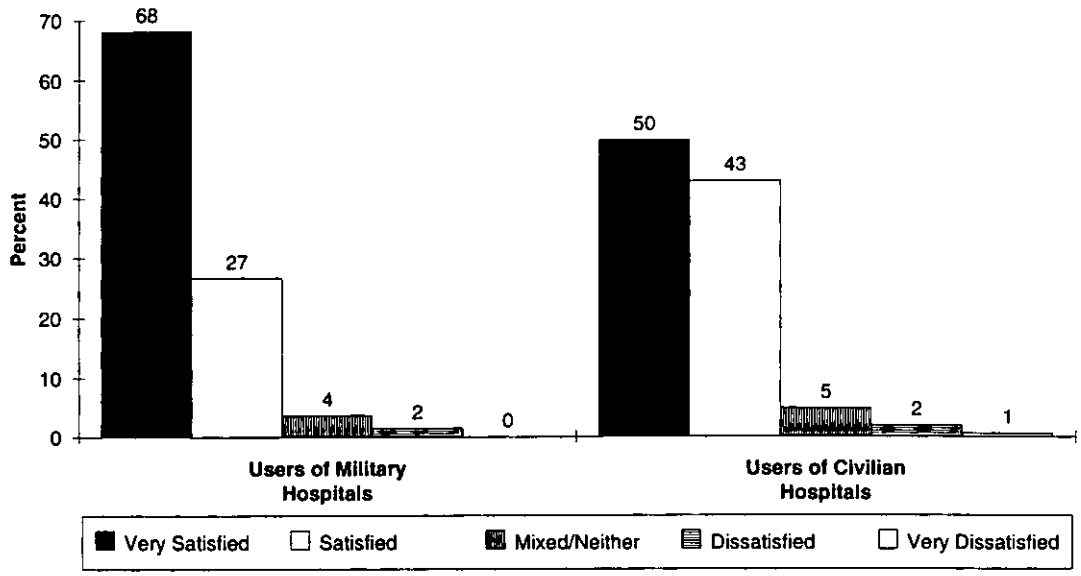


Source: 1992 DoD Health Care Survey
Question 88 - Please rate the overall satisfaction with the quality of care this family member received during the most recent hospital stay.

Figure 7.5 Overall Satisfaction With Inpatient Care for Under-65 Retiree/Survivor Families

Families of retired/survivor sponsors under 65 exhibited the most similar distribution of ratings across military and civilian hospitals. The results show that 49 percent of them were very satisfied and 44 percent satisfied with military hospital care. Compared with active-duty families, they were also less negative with only 0.1 percent very dissatisfied and 3 percent dissatisfied. With regard to care in civilian hospitals, the younger retirees/survivors provided ratings almost identical to those given by users of military hospitals; 47 percent of them were very satisfied and 44 percent satisfied. However, they were slightly more negative regarding civilian hospitals; 3 percent were very dissatisfied and 3 percent dissatisfied.

Figure 7.6 shows overall satisfaction (question 88) with the inpatient care provided in military and civilian hospitals for families (including the sponsor) of retirees and survivors over 65.



Source: 1992 DoD Health Care Survey
Question 88 - Please rate the overall satisfaction with the quality of care this family member received during the most recent hospital stay.

Figure 7.6 Overall Satisfaction With Inpatient Care for Over-65 Retiree/Survivor Families

The retired/survivor sponsors over 65 and their families were the most positive toward the care they received in military hospitals. Of this group, 68 percent were very satisfied and 27 percent satisfied, while none were very dissatisfied and only 2 percent were dissatisfied. In rating the care received in civilian hospitals, a lower proportion of the senior retirees/survivors (50 percent) were very satisfied relative to users of military hospitals, while 43 percent were satisfied. In terms of negative ratings, only 1 percent of the group was very dissatisfied and 2 percent dissatisfied.

Reviewing Figures 7.2 to 7.6, it is evident that retiree/survivor families, both with sponsors under and over age 65, were the only beneficiary groups more satisfied with military than with civilian hospitals.

7.2.2 Overall Satisfaction by Hospital Type and Service

Table 7.1 shows the overall satisfaction results from question 88 as a function of hospital type and service affiliation. As discussed above, question 88 addressed patients' overall satisfaction with their most recent hospital stay in either a military or civilian hospital. In this and subsequent tables, satisfaction level represents the percentage of respondents who were positively disposed (i.e., very satisfied or satisfied) toward the care they received in the hospital. Satisfaction levels are presented for the type of hospital used, the respondent's branch of service, and the beneficiary status group to which the respondent belongs. The

dashes in Tables 7.1 indicate that the number of responses was fewer than 100. These low sample sizes provide estimates whose statistical precision is not comparable to those obtained from the many larger samples in the analyses, and are therefore omitted from the subsequent discussions. Because hospitalizations occur relatively infrequently, there are many cells in this and subsequent tables with too few respondents.

Table 7.1 Overall Satisfaction Levels With Hospital Care by Service, Hospital Type, and Beneficiary Group

Service/ Hospital Type	Junior Enlisted	Senior Enlisted	Officers	Retirees and Survivors Under 65	Retirees and Survivors 65 and Over
Army					
Military Hospital	86%	82%	89%	93%	90%
Civilian Hospital	–	–	–	90	94
Navy					
Military Hospital	–	79	82	–	99
Civilian Hospital	–	88	89	88	91
Marine Corps					
Military Hospital	–	–	–	–	–
Civilian Hospital	–	–	–	–	–
Air Force					
Military Hospital	87	80	87	93	97
Civilian Hospital	72	–	93	93	95

Source: 1992 DoD Health Care Survey
Question 88 - Please rate the overall satisfaction with the quality of care this family member received during the most recent hospital stay.
Question 82 - What type of medical facility did this family member use for the most recent hospital stay?

The levels of overall satisfaction in Table 7.1 are very high. They range from a low of 72 percent (for Air Force junior-enlisted families in civilian hospitals) to a high of 99 percent (for Navy retirees and survivors over 65 in military hospitals). The table shows that Army retirees under 65 are the most satisfied (93 percent) with military inpatient care and that Navy senior-enlisted families are the least satisfied (79 percent). However, only the two retiree groups contain enough responses for accurate measurement of overall satisfaction in civilian hospitals. The retirees and survivors under 65 were slightly less positive (90 percent) toward civilian hospital care than were the retirees and survivors over 65 at 94 percent. The results for Navy families also show the retirees and survivors to be more positive toward hospital care, especially military care.

Of the Services, the Air Force results are the most complete. Here, there is a clear positive relationship between age/rank of the beneficiary and level of satisfaction with military hospital care. (The only exception is between the junior- and senior-enlisted families.) In the case of civilian hospital care, the relationship between satisfaction and beneficiary group is

less clear because of sparse data. Clearly, however, the junior-enlisted families are much less satisfied with the care they receive in civilian hospitals than are the officers or retirees.

7.2.3 Overall Satisfaction by Sponsor's Region

Table 7.2 indicates the overall satisfaction by sponsor's region for all five beneficiary groups. The percentages in this table are also combined (satisfied plus very satisfied) satisfaction levels, and the dashes again indicate cells with frequencies under the threshold for statistical reliability. These tables classify beneficiaries by the region in which the sponsor lives. Sponsors and family members in these regions are not necessarily enrolled in any particular experimental military health program.

Table 7.2 Overall Satisfaction With Hospital Care by Region and Beneficiary Group

Sponsor's Region	Junior Enlisted	Senior Enlisted	Officers	Retirees and Survivors Under 65	Retirees and Survivors 65 and Over
No Initiatives	88%	–	–	92%	89%
Army CAM	–	–	88	–	96
CRI	–	87	85	–	95
Army Gateway to Care	–	–	–	–	96
Tidewater Region	–	–	–	–	80
Overlapping Catchment Areas	–	–	–	91	98
SE Region FI/PPO	–	79	–	94	96
New Orleans CRI-Like	–	–	–	–	91
PRIMUS/ NAVCARE	–	–	–	–	91
Noncatchment Areas	–	–	–	89	90
Outside U.S.	–	–	–	–	–
Navy CAM	–	–	88	–	93
Air Force CAM	–	–	–	–	94
Shipboard	–	–	86	–	–

Source: 1992 DoD Health Care Survey
Question 88 - Please rate the overall satisfaction with the quality of care this family member received during the most recent hospital stay.

In most cases, there were not enough responses to support firm conclusions about regional variations in overall satisfaction. For junior-enlisted families, the only result was for the region in which there were no new initiatives. In that region, 88 percent of junior-enlisted families were satisfied or very satisfied. The data for senior-enlisted families show two regions. Of these, the senior-enlisted families living in the CRI region had higher satisfaction (87 percent) than their colleagues in the SE Region FI/PPO (79 percent).

For officers, the highest level of satisfaction was in the Army CAM region and the lowest was in the CRI region. The results for younger retirees and survivors show the highest satisfaction level was in the region with no new initiatives and the lowest was in the noncatchment areas, but the differences among regions were relatively small. In the case of the senior retirees and survivors, all the regions except "shipboard" (there are no retirees on board ship) had enough responses to calculate a meaningful percentage. The older retirees and survivors had the highest satisfaction with the care they received in the overlapping catchment areas and the lowest satisfaction in the Tidewater region.

7.2.4 Overall Satisfaction by Sponsor Demographics

Table 7.3 shows the ratings of satisfaction with both military and civilian hospitals given by the five beneficiary groups for several demographic variables, including sex, race, education, marital status, and income. The table does not include breakdowns by ethnic group because there were not enough (at least 100) Hispanic sponsors with an inpatient episode in any of the beneficiary groups. For variables that are displayed, the dashes in some cells indicate that the number of responses was fewer than 100. Consequently, the statistical precision of the estimates in these cells is not comparable to those obtained from the many larger samples in the analyses, and are therefore omitted from the subsequent discussions.

The general trend appears to be toward higher levels of satisfaction with advancing age and rank. This relationship is not totally consistent; there are several reversals. With regard to the sex of the patient, the two beneficiary groups with sufficient numbers of females showed mixed results relative to their male counterparts. The junior-enlisted females had slightly lower satisfaction levels than their male counterparts, while the senior-enlisted females had higher satisfaction levels than their male counterparts. The highest satisfaction level of all beneficiary families occurred among the male retirees/survivors over 65 (93 percent). Black service members had consistently higher satisfaction levels across all beneficiary groups than did their white colleagues. The highest satisfaction level (97 percent) in Table 7.3 was by black retirees and survivors under 65.

The education variable shows a trend toward lower satisfaction with higher levels of education, certainly among the active-duty families. The highest satisfaction in the enlisted ranks was among those with a high school diploma and the lowest was among those with a college degree. For officers, the highest satisfaction was among those who had a college degree and the lowest among those who had some graduate school.

Table 7.3 Overall Satisfaction With Hospital Care by Sponsor Demographics

Sponsor Demographics	Junior Enlisted	Senior Enlisted	Officers	Retirees and Survivors Under 65	Retirees and Survivors 65 and Over
Sex					
Male	84%	82%	87%	91%	93%
Female	82	86	–	–	–
Race					
White	83	82	88	91	93
Black	93	88	–	97	–
Other	–	–	–	–	–
Education					
Less Than 12 Years	–	–	–	–	85
GED	–	–	–	92	91
High School Diploma	85	85	–	95	94
Some College	82	84	–	90	96
2-Year College Degree	–	81	–	90	–
4-Year College Degree	–	–	91	88	89
Some Graduate School	–	–	85	–	98
Post-Graduate Degree	–	–	86	98	96
Marital Status					
Unmarried	–	–	–	–	90
Married, Living With Spouse	81	82	87	92	95
Married, Not Living With Spouse	–	88	–	–	–
Family Income					
< $15,000	81	–	–	–	–
$15,000 - $24,999	82	81	–	93	92
$25,000 - $34,999	88	82	89	84	92
$35,000 - $49,999	–	87	86	93	96
$50,000 - $74,999	–	–	88	93	94
$75,000 - $99,999	–	–	90	–	–
≥ $100,000	–	–	–	–	–

Source: 1992 DoD Health Care Survey
Question 88 - Please rate the overall satisfaction with the quality of care this family member received during the most recent hospital stay.

For retirees, the highest satisfaction occurred among those who had post-graduate degrees. Considering all the beneficiary groups, the data suggest that the families of younger retirees and survivors with post-graduate degrees had the highest satisfaction level (98 percent), and families of senior-enlisted sponsors with associates' degrees had the lowest (81 percent).

The level of satisfaction of married respondents living with their spouses went up consistently with age/rank. Junior-enlisted families had the lowest satisfaction level (81 percent) and the families of senior retirees/survivors had the highest at 95 percent.

The last demographic variable investigated was income. When the responses are considered as a whole, it appears that the higher the income level, the higher the satisfaction with hospital care. Looking across the beneficiary groups, the table shows that the highest satisfaction rating (96 percent) was given by senior retiree/survivor families with incomes between $35,000-$49,000 per year, and the lowest (81 percent) by junior-enlisted families with incomes under $15,000 and senior-enlisted families with incomes between $15,000 and $24,999 per year.

7.3 SATISFACTION WITH THE HOSPITAL AND STAFF

In this section, the results for each of the components of inpatient care are reported. Questions 86 and 87 were designed to ascertain levels of satisfaction with specific aspects of the hospital and the staff. The first analysis presented deals with respondents' ratings of satisfaction with aspects of the hospital and the second, with the staff.

7.3.1 Satisfaction With the Hospital Used for Inpatient Care

Table 7.4 displays results based on the responses to question 86 that addressed the respondents' satisfaction with the hospital itself in terms of such indicators as convenience, availability, comfort, cleanliness, confidentiality, quality, and cost. For the most part, the satisfaction ratings were high, both among users of military and users of civilian hospitals. They ranged from a high of 98 percent to a low of 50 percent.

Table 7.4 shows the satisfaction levels for military and civilian hospitals across all beneficiary groups. Some patterns can be observed among the beneficiary groups. In every case, the older retirees had the highest satisfaction levels of all the beneficiary groups. In 16 of the 30 cases, including military hospitals overall, senior-enlisted families had the lowest satisfaction levels of all the beneficiary groups. Junior-enlisted families had the lowest satisfaction levels in 12 cases, including civilian hospitals overall.

Table 7.4 Satisfaction With Components of Inpatient Care by Source of Care

Components of Inpatient Care/ Source of Care	Junior Enlisted	Senior Enlisted	Officers	Retirees and Survivors Under 65	Retirees and Survivors 65 and Over
Convenience of location					
Military Hospital	80%	78%	81%	85%	95%
Civilian Hospital	86	79	80	89	92
Availability of parking					
Military Hospital	66	59	64	67	83
Civilian Hospital	77	84	81	89	90
Ability to see doctor of choice					
Military Hospital	58	53	61	73	91
Civilian Hospital	78	82	83	86	94
Ability to see specialists when needed					
Military Hospital	73	65	70	83	92
Civilian Hospital	79	83	85	89	96
Ability to arrange a stay in the hospital					
Military Hospital	84	80	83	86	96
Civilian Hospital	90	91	92	93	98
Ability to use emergency services					
Military Hospital	78	75	74	91	94
Civilian Hospital	88	87	89	96	97
Convenience of visiting hours					
Military Hospital	78	84	89	95	97
Civilian Hospital	79	91	90	95	98
Comfort/privacy of rooms					
Military Hospital	62	62	66	76	89
Civilian Hospital	69	83	82	89	94
Cleanliness of facility					
Military Hospital	83	83	84	92	95
Civilian Hospital	86	91	95	93	97
Admission and discharge procedures					
Military Hospital	81	76	79	90	95
Civilian Hospital	91	89	89	90	95

Continued on next page

Table 7.4—*Continued*

Components of Inpatient Care/ Source of Care	Junior Enlisted	Senior Enlisted	Officers	Retirees and Survivors Under 65	Retirees and Survivors 65 and Over
Confidentiality of care					
Military Hospital	86%	82%	87%	95%	97%
Civilian Hospital	85	88	93	94	97
Access to medical records					
Military Hospital	86	78	84	90	96
Civilian Hospital	83	76	82	81	88
Quality of medical records					
Military Hospital	85	77	84	87	96
Civilian Hospital	78	77	84	84	90
Cost of stay					
Military Hospital	85	87	92	93	98
Civilian Hospital	58	63	60	50	67
Overall satisfaction with facility					
Military Hospital	82	81	85	93	98
Civilian Hospital	81	87	91	89	94

Source: 1992 DoD Health Care Survey
Question 86 - Thinking of this family member's most recent hospital stay, please rate the satisfaction with the facility used on each of the following factors.
Question 82 - What type of medical facility did this family member use for the most recent hospital stay?

Satisfaction with aspects of civilian hospitals was generally higher than with aspects of military hospitals. Users of civilian hospitals exhibited clearly higher satisfaction levels for the ability to see the doctor of choice, the ability to see specialists, and the comfort and privacy of rooms. However, users of civilian and users of military hospitals showed similar satisfaction levels with regard to such aspects as convenience of visiting hours and convenience of location. Respondents were much more satisfied with the cost of military hospitals (only a nominal daily fee is charged, with the exception of retired enlisted beneficiaries, for whom there is no charge) than the cost of civilian hospitals. Respondents also had somewhat higher satisfaction with access to medical records and quality of medical records at military hospitals than at civilian hospitals. When asked to rate hospital aspects overall, all groups had satisfaction levels over 80 percent. Junior-enlisted families and both retiree groups had higher satisfaction with military hospitals. Senior-enlisted and officer families had higher satisfaction with civilian hospitals.

The following aspects of civilian hospitals had satisfaction levels of over 85 percent for all beneficiary groups: cleanliness, ability to arrange the stay, admission and discharge procedures, confidentiality, and ability to use emergency services. The cost of military hospitals had similarly high satisfaction levels. The lowest satisfaction levels were for the cost of civilian care for all groups except the senior-enlisted. Other areas with low satisfaction levels—all among users of military hospitals—include ability to see the doctor of choice (the lowest among senior-enlisted), comfort and privacy of rooms, and parking.

7.3.2 Satisfaction With the Staff at the Hospital Used for Inpatient Care

Table 7.5 displays the results of the analysis of satisfaction with the staff of the hospital by type of hospital for the five beneficiary groups. The indicators of satisfaction with the staff included thoroughness, knowledge, time spent with the doctor, bedside manner, privacy, and willingness to discuss treatment options. For the most part, satisfaction levels were high for both military and civilian hospitals. They ranged from a high of 99 percent to a low of 67 percent.

Satisfaction levels varied by type of hospital, but not uniformly. Among the junior-enlisted, differences between military and civilian hospitals were usually small. Users of military hospitals had satisfaction levels more than five percentage points higher for time spent with the doctor, while users of civilian hospitals expressed higher levels of satisfaction with the knowledge, skills, and abilities of doctors. Senior-enlisted families

Table 7.5 Satisfaction With Components of Staff Behavior by Source of Care

Components of Staff/ Source of Care	Junior Enlisted	Senior Enlisted	Officers	Retirees and Survivors Under 65	Retirees and Survivors 65 and Over
Thoroughness of examinations					
Military Hospital	88%	85%	89%	94%	99%
Civilian Hospital	88	92	92	94	96
Accuracy of diagnoses					
Military Hospital	84	80	86	87	96
Civilian Hospital	87	86	88	92	92
Knowledge, skills, and abilities of doctors					
Military Hospital	85	84	89	92	97
Civilian Hospital	91	91	91	93	95
Thoroughness of treatment					
Military Hospital	87	81	87	88	97
Civilian Hospital	86	87	90	91	94
Clarity of doctor's explanations					
Military Hospital	84	84	87	91	94
Civilian Hospital	82	86	85	91	92
Time spent with doctor					
Military Hospital	73	76	78	88	96
Civilian Hospital	67	79	82	86	91
Doctor's "bedside manner"					
Military Hospital	81	82	84	92	94
Civilian Hospital	85	83	88	90	94
Courtesy of staff (other than doctor)					
Military Hospital	82	81	86	88	97
Civilian Hospital	86	87	93	92	95
Attentiveness of staff (other than doctor)					
Military Hospital	80	79	84	85	93
Civilian Hospital	78	86	91	89	93
Respect shown for privacy					
Military Hospital	78	77	83	87	93
Civilian Hospital	75	86	88	91	95

Continued on next page

Table 7.5—*Continued*

Components of Staff/ Source of Care	Junior Enlisted	Senior Enlisted	Officers	Retirees and Survivors Under 65	Retirees and Survivors 65 and Over
Doctor's willingness to discuss treatment options					
Military Hospital	83%	82%	85%	92%	96%
Civilian Hospital	84	83	89	90	93
Overall satisfaction with staff					
Military Hospital	86	81	86	91	96
Civilian Hospital	87	86	91	91	95

Source: 1992 DoD Health Care Survey
Question 87 - Thinking of this family member's most recent hospital stay, please rate the satisfaction with the staff at the facility used on each of the following factors.
Question 82 - What type of medical facility did this family member use for the most recent hospital stay?

and officer families had higher satisfaction levels for civilian hospitals than for military hospitals in every case except for clarity of explanations among the officer families. Among the younger retiree families, differences were generally small, and satisfaction levels for the staff overall were equal for military and civilian hospitals. The older retirees generally had higher satisfaction levels for military hospitals, but variations were small.

There were no clear patterns in which aspects had the highest or lowest satisfaction levels. Knowledge, skills, and abilities of doctors in civilian hospitals and thoroughness of examinations in both military and civilian hospitals had high satisfaction levels, although officer families had higher satisfaction with courtesy in civilian hospitals. The aspects with low satisfaction levels included time spent with the doctor in both military and civilian hospitals and privacy in military hospitals.

In every case, older retiree families had the highest satisfaction level of any beneficiary group. Their satisfaction levels ranged from 91 to 99 percent. Senior-enlisted families had the lowest satisfaction levels in 14 of the 24 cases, including overall staff ratings for both military and civilian hospitals.

7.4 DISSATISFACTION WITH ASPECTS OF INPATIENT CARE

In order to understand the amount and focuses of dissatisfaction with inpatient care more directly, an analysis was performed in which the two negative response categories—dissatisfied and very dissatisfied—were merged. The percentages of respondents who were dissatisfied or very dissatisfied are called "dissatisfaction levels" here. Dissatisfaction levels for the components of inpatient care are presented in Table 7.6. The percentage of families who regarded themselves as dissatisfied or very dissatisfied overall was low, ranging from 2 to 9 percent (Figures 7.1 through 7.5). The analysis in this section focuses on dissatisfaction with specific aspects of inpatient care.

Table 7.6 shows that dissatisfaction levels with aspects of inpatient care ranged from 0 percent to 30 percent. The highest percentage of respondents dissatisfied with various aspects of military hospitals was among the senior-enlisted beneficiary group and the smallest, among the retirees and survivors over 65 regarding civilian hospitals.

Of all the components that make up dissatisfaction with inpatient care at military hospitals, families were most dissatisfied with the availability of parking. Senior-enlisted families had the highest dissatisfaction level (30 percent) and retirees over 65 had the lowest (12 percent). Nevertheless, among the older retirees, parking had the highest dissatisfaction level of the aspects of military inpatient care.

Table 7.6 Dissatisfaction With Components of Inpatient Care by Source of Care

Components of Inpatient Care/ Source of Care	Junior Enlisted	Senior Enlisted	Officers	Retirees and Survivors Under 65	Retirees and Survivors 65 and Over
Convenience of location					
Military Hospital	8%	12%	11%	10%	2%
Civilian Hospital	6	11	9	4	3
Availability of parking					
Military Hospital	27	30	25	23	12
Civilian Hospital	14	9	7	5	5
Ability to see doctor of choice					
Military Hospital	17	19	17	10	2
Civilian Hospital	9	9	6	5	2
Ability to see specialists when needed					
Military Hospital	11	16	14	8	3
Civilian Hospital	8	7	5	4	2
Ability to arrange a stay in the hospital					
Military Hospital	5	6	5	4	2
Civilian Hospital	7	3	1	2	
Ability to use emergency services					
Military Hospital	9	7	8	3	1
Civilian Hospital	7	2	1	.2	1
Convenience of visiting hours					
Military Hospital	10	5	4	1	0
Civilian Hospital	14	3	3	2	
Comfort/privacy of rooms					
Military Hospital	25	20	20	11	4
Civilian Hospital	20	8	6	4	1
Cleanliness of facility					
Military Hospital	7	6	7	3	1
Civilian Hospital	5	4	1	2	1
Admission and discharge procedures					
Military Hospital	8	10	10	3	2
Civilian Hospital	6	4	3	3	2

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Table 7.6—*Continued*

Components of Dissatisfaction/ Source of Care	Junior Enlisted	Senior Enlisted	Officers	Retirees and Survivors Under 65	Retirees and Survivors 65 and Over
Confidentiality of care					
Military Hospital	7%	5%	4%	.2%	1%
Civilian Hospital	3	3	1	2	.1
Access to medical records					
Military Hospital	6	7	5	4	1
Civilian Hospital	4	8	3	4	2
Quality of medical records					
Military Hospital	5	6	4	4	2
Civilian Hospital	2	6	2	3	1
Cost of stay					
Military Hospital	9	3	2	4	1
Civilian Hospital	13	19	20	26	14
Thoroughness of examinations					
Military Hospital	5	8	6	1	0
Civilian Hospital	2	3	4	2	2
Accuracy of diagnoses					
Military Hospital	7	11	8	5	2
Civilian Hospital	5	4	4	4	2
Knowledge, skills, and abilities of doctors					
Military Hospital	5	6	5	1	1
Civilian Hospital	5	4	2	2	1
Thoroughness of treatment					
Military Hospital	6	10	7	5	1
Civilian Hospital	6	7	4	5	2
Clarity of doctor's explanations					
Military Hospital	6	8	6	2	1
Civilian Hospital	9	7	5	3	3
Time spent with doctor					
Military Hospital	12	14	9	6	1
Civilian Hospital	14	10	7	6	3

Continued on next page

Table 7.6—*Continued*

Components of Dissatisfaction/ Source of Care	Junior Enlisted	Senior Enlisted	Officers	Retirees and Survivors Under 65	Retirees and Survivors 65 and Over
Doctor's "bedside manner"					
Military Hospital	8%	8%	7%	2%	1%
Civilian Hospital	4	7	4	5	2
Courtesy of staff (other than doctor)					
Military Hospital	8	8	6	4	1
Civilian Hospital	6	6	1	5	1
Attentiveness of staff (other than doctor)					
Military Hospital	8	9	8	5	2
Civilian Hospital	7	6	2	6	1
Respect shown for privacy					
Military Hospital	8	12	10	4	1
Civilian Hospital	7	7	5	3	.4
Doctor's willingness to discuss treatment options					
Military Hospital	6	8	7	3	2
Civilian Hospital	9	7	4	5	3

Source: 1992 DoD Health Care Survey
Question 86 - Thinking of this family member's most recent hospital stay, please rate the satisfaction with the facility used on each of the following factors.
Question 87 - Thinking of this family member's most recent hospital stay, please rate the satisfaction with the staff at the facility used on each of the following factors.
Question 82 - What type of medical facility did this family member use for the most recent hospital stay?

In general, senior-enlisted families had the highest dissatisfaction levels, followed by junior-enlisted and officer families. After parking at military hospitals, junior-enlisted families had the highest dissatisfaction levels with comfort and privacy of rooms (military and civilian hospitals), ability to see doctor of choice (military hospitals), and parking (civilian hospitals). The top four dissatisfaction levels among senior-enlisted families were for parking at military hospitals (30 percent), comfort and privacy of rooms at military hospitals (20 percent), ability to see doctor of choice at military hospitals (19 percent), and the cost of civilian care (19 percent). Officers had the same top four concerns but in a different order: parking at military hospitals (25 percent), cost of civilian hospitals (20 percent), comfort and privacy of rooms at military hospitals (20 percent), and ability to see doctor of choice at military hospitals (17 percent). The cost of civilian care was a key concern for senior-enlisted and officer families, but only 13 percent of junior-enlisted families were dissatisfied with it, despite their higher admission rates to civilian hospitals.

The responses of the retirees and survivor groups were different from active-duty families, perhaps reflecting their different access to military hospitals. Both retiree groups had the highest dissatisfaction with the cost of civilian hospitals. Among the younger retirees, 26 percent were dissatisfied with the cost of civilian hospitals, followed by parking at military hospitals (23 percent), comfort and privacy of rooms at military hospitals (11 percent), and ability to see doctor of choice at military hospitals (10 percent). Among the older retirees, the highest dissatisfaction levels were with the cost of civilian hospitals (14 percent) and parking at military hospitals (12 percent). None of the other aspects of inpatient care had more than 5 percent of the older retirees dissatisfied.

The highest dissatisfaction levels were mostly for factors relating to the hospital. Dissatisfaction levels with factors relating to the staff were relatively low. The staff factors with the highest dissatisfaction levels included time spent with doctor in both military and civilian hospitals and respect for privacy, accuracy of diagnoses, and thoroughness of treatment in military hospitals.

7.5 SUMMARY OF KEY FINDINGS

This chapter addressed satisfaction with inpatient care as determined from questions about the most recent hospital stay, provided it was within the last 12 months. Because respondents were asked to evaluate their most recent stay only, the ratings for military and civilian hospitals were made by different beneficiaries. The key results are:

- Patterns of satisfaction with inpatient care were very similar to those for outpatient care, except that overall levels were higher.
- For active-duty families, the satisfaction levels for those who used civilian hospitals were slightly higher than the satisfaction levels for those who used military hospitals.
- Retiree families experienced the highest levels of satisfaction with military hospitals of all the beneficiary groups. In fact, a substantially higher percentage of over-65 retiree families stated that they were very satisfied with military hospitals (68 percent for military-hospital users versus 50 percent for civilian-hospital users).
- When asked to rate the facility and the hospital staff overall, all groups had satisfaction levels over 80 percent. Among aspects of the facility, civilian-hospital users had high satisfaction with cleanliness, ability to arrange the stay, admission and discharge procedures, confidentiality, and ability to use emergency services. Military-hospital users had high satisfaction with the cost of the stay. Junior-enlisted families and both retiree groups who used military hospitals had higher satisfaction with the facility than those who used civilian hospitals. Among aspects of the staff, there were no clear patterns favoring military or civilian hospitals.
- Dissatisfaction levels with aspects of inpatient care ranged from 0 percent to a high of 30 percent. The highest dissatisfaction levels among military-hospital users were with the availability of parking and the comfort and privacy of rooms. Civilian-hospital users were most dissatisfied with the cost of the stay.

8.0 DENTAL UTILIZATION AND SATISFACTION

The survey contained several questions regarding dental care utilization and satisfaction. Responses to these questions were used to evaluate utilization of dental care and both overall and components of satisfaction with dental services provided by either civilian or military providers. This chapter summarizes this evaluation and is presented in two sections: Section 8.1 discusses dental care utilization and Section 8.2 presents a review of beneficiary satisfaction with dental care.

The highest priority for dental care provided at military facilities is given to active-duty sponsors, then their families, and finally retirees/survivors and their families. Because satisfaction with medical and dental care is generally a family issue, the information presented in this chapter is oriented around families rather than individuals within the family. In addition, the analysis was based on a family member's *most recent* visit for dental care, so the analysis presented is a comparison of beneficiaries who received care at a military facility with those who received care at a civilian facility. The survey does not ask respondents for a direct comparison of experiences by a single individual in both civilian and military facilities. Visits to VA and other facilities, which comprised less than 3 percent of all dental visits, were excluded from all analyses presented in this chapter.

8.1 BENEFICIARY UTILIZATION OF DENTAL CARE

Beneficiary utilization of dental care was evaluated based on several questions including:

- *Question 90*: "Which eligible family member made the most recent visit for dental care?"
- *Question 93*: "Thinking about this family member's most recent visit for dental care, when was it?"
- *Question 95*: "What were the reasons for this family member's most recent visit for dental care?"
- *Question 96*: "What type of facility did this family member use for the most recent visit for dental care?"

Due to the structure of the survey, and because beneficiaries were not expected to recall details of a dental visit that occurred more than six months ago, Questions 95 and 96 were answered only when a family member had a visit within six months of the date the survey was completed.

Table 8.1 displays the source of care (military vs. civilian facility) for the most recent dental visit by family member. Overall, 46 percent of the beneficiaries chose a military facility and 52 percent chose a civilian facility. A vast majority of active-duty sponsors received care at a military facility. For families overall, however, junior-enlisted families relied more heavily on military facilities (88 percent of most recent visits) compared to senior-enlisted and officer families (67 percent and 64 percent, respectively).

Table 8.1 Distribution of Source of Care for Most Recent Dental Visit by Family Member*

Family Member/ Source of Care	Junior Enlisted	Senior Enlisted	Officers	Retirees and Survivors Under 65	Retirees and Survivors 65 and Over	All Beneficiaries
Sponsor						
Military Facility	98.5%	96.9%	96.3%	17.0%	12.3%	63.6%
Civilian Facility	0.2	1.9	2.7	78.1	83.9	33.8
Spouse						
Military Facility	49.5	35.3	25.0	6.6	3.0	18.2
Civilian Facility	49.9	63.9	75.0	92.1	96.6	81.1
Child						
Military Facility	24.1	27.7	20.2	10.4	27.1	20.5
Civilian Facility	75.0	70.7	79.2	89.5	72.9	78.6
Other						
Military Facility	19.8	36.9	58.8	14.9	0.0	26.8
Civilian Facility	80.2	63.1	41.2	85.0	100.0	73.2
Overall						
Military Facility	88.0	67.4	64.0	12.9	8.3	45.5
Civilian Facility	10.2	31.4	35.2	83.7	89.3	52.3

* The military and civilian percentages may not sum to 100 percent because visits to VA and other facilities are not displayed.

Source: 1992 DoD Health Care Survey
Question 96 - "What type of facility did this family member use for the most recent visit for dental care?"

Table 8.2 presents information about the source of care selected by family income level. Results are presented only where at least 100 responses were provided for each income level and beneficiary group. In general, the proportion of families who selected civilian facilities increased as income increased. Nearly 60 percent of families with an income level between $15,000 and $24,999 chose a military facility for their most recent

dental care, while fewer than 25 percent of families with income over $50,000 selected a military facility.

Table 8.2 Distribution of Source of Care for Most Recent Dental Visit by Family Income*

Family Income/ Source of Care	Junior Enlisted	Senior Enlisted	Officers	Retirees and Survivors Under 65	Retirees and Survivors 65 and Over	All Beneficiaries
< $15,000						
Military Facility	94.7%	–	–	–	18.2%	84.1%
Civilian Facility	3.4	–	–	–	79.5	13.3
$15,000-$24,999						
Military Facility	82.0	72.5	86.2	27.3	9.7	59.4
Civilian Facility	16.8	26.0	12.3	63.3	86.4	37.6
$25,000-$34,999						
Military Facility	68.6	63.4	73.6	17.2	5.8	42.7
Civilian Facility	29.2	35.4	24.8	78.0	92.1	54.9
$35,000-$49,999						
Military Facility	–	65.2	62.3	9.3	7.5	30.8
Civilian Facility	–	34.6	37.4	88.6	89.7	67.6
$50,000-$74,999						
Military Facility	–	54.1	57.6	8.2	7.1	21.6
Civilian Facility	–	45.4	41.7	91.0	92.0	77.6
$75,000-$99,999						
Military Facility	–	–	63.3	6.7	6.3	19.4
Civilian Facility	–	–	36.0	91.0	93.2	79.0
$100,000+						
Military Facility	–	–	59.9	7.0	3.6	12.9
Civilian Facility	–	–	39.8	92.2	96.0	86.5
Overall						
Military Facility	88.0	67.4	64.0	12.9	8.3	45.5
Civilian Facility	10.2	31.4	35.2	83.7	89.3	52.3

* The military and civilian percentages do not sum to 100 percent because visits to VA and other facilities are not displayed.

Source: 1992 DoD Health Care Survey
Question 96 - "What type of facility did this family member use for the most recent visit for dental care?"
Question 19 - "What was the total income, before taxes, for the sponsor and spouse over the last 12 months?"

Table 8.3 presents selected reasons for the family member's most recent dental visit. Respondents were asked to mark all reasons that applied. In general, the distribution of reasons was similar across beneficiary groups. An exception was an increased incidence of tooth removals for junior-enlisted families, which likely reflects extractions of wisdom teeth for young active-duty sponsors and their spouses.

Table 8.3 Reasons for Family Member's Most Recent Visit

Reasons for Visit	Junior Enlisted	Senior Enlisted	Officers	Retirees and Survivors Under 65	Retirees and Survivors 65 and Over	All Beneficiaries
Routine Exam	77%	73%	73%	64%	67%	70%
X-rays	25	26	25	32	29	28
Orthodontics	2	6	7	5	2	4
Toothache	7	7	5	10	5	7
Fillings	28	24	22	25	25	25
Tooth Removal	11	7	4	13	11	10
Caps/Crowns/Bridges	5	8	8	21	21	13
Gum/Bone Disease	2	4	3	7	5	4
Dentures	1	2	1	8	14	5
Root Canal	4	5	4	7	8	6
Oral Surgery	6	4	2	4	4	4
Other	4	4	4	3	2	4
Unknown	0.4	0.4	0.1	0.3	1	0.3

Source: 1992 DoD Health Care Survey
Question 95 - "What were the reasons for this family member's most recent visit for dental care?"

8.2 BENEFICIARY SATISFACTION WITH DENTAL CARE

This section presents an evaluation of beneficiary satisfaction with dental care by source of care and a review of the components of satisfaction as measured by the following question:

- *Question 99*: "Thinking of this family member's most recent visit for dental care, please rate the satisfaction with the facility used on each of the following factors." (Factors are shown in Appendix A and in subsequent tables.)

Recall that this analysis was based on responses from families who had a dental care visit within six months of completing the survey.

Table 8.4 shows overall satisfaction with dental care by chosen source of care and beneficiary group. Overall, nearly 80 percent of the beneficiaries who selected military facilities were either satisfied or very satisfied with their most recent dental care, while beneficiaries who selected civilian facilities were either satisfied or very satisfied at a rate of over 90 percent. Junior- and senior-enlisted families who selected civilian providers, however, expressed somewhat lower satisfaction rates (74 percent and 79 percent, respectively) than did other families who selected civilian providers.

Table 8.4 Satisfaction with Most Recent Dental Visit by Source of Care

Source of Care/ Satisfaction	Junior Enlisted	Senior Enlisted	Officers	Retirees and Survivors Under 65	Retirees and Survivors 65 and Over	All Beneficiaries
Military Facility						
Very Satisfied	24.0%	26.8%	31.2%	31.7%	39.3%	27.0%
Satisfied	54.5	53.1	52.6	35.0	31.6	51.5
Mixed	10.1	11.2	9.0	9.0	13.2	10.3
Dissatisfied	5.6	4.8	4.6	9.1	6.9	5.5
Very Dissatisfied	4.3	2.5	2.1	14.1	7.9	4.4
NA/Don't Know	1.6	1.7	0.5	1.0	1.2	1.4
Civilian Facility						
Very Satisfied	34.2	38.9	43.3	43.5	50.7	44.2
Satisfied	49.8	50.2	46.5	47.8	41.6	46.6
Mixed	6.4	5.8	5.2	6.1	4.3	5.6
Dissatisfied	3.1	1.9	3.1	1.4	0.9	1.5
Very Dissatisfied	4.9	1.6	1.4	0.7	1.3	1.2
NA/Don't Know	1.6	1.8	0.5	0.5	1.2	0.9

Source: 1992 DoD Health Care Survey
Question 96 - "What type of facility did this family member use for the most recent visit for dental care?"
Question 99 - Part N: Overall satisfaction with dental care and services.

Table 8.5 presents satisfaction with recent dental care by family income level and the source of care selected. Beneficiaries who chose military facilities for their most recent visit generally expressed similar levels of satisfaction over all income levels. The share of these beneficiaries who were either satisfied or very satisfied varied from a minimum of 76 percent to a maximum of 81 percent, showing no general pattern of increased satisfaction with increased level of income. For beneficiaries who selected civilian facilities, however, the share of beneficiaries who were satisfied or very satisfied ranged from a minimum of 76 percent (income level less than $15,000) to a maximum of more than 95 percent (income level greater than $100,000). In addition, satisfaction increased with income. This potentially identifies cost as being a significant component in determining satisfaction with dental care.

Table 8.6 presents satisfaction by the various components of satisfaction for each beneficiary group. The values presented represent the percentage of respondents who were either very satisfied or satisfied for each component. Similarly, Table 8.7 provides information on the level of dissatisfaction with each component. The values in Table 8.7 represent the percentage of respondents who were either dissatisfied or very dissatisfied for each component.

Table 8.5 Satisfaction with Most Recent Dental Visit by Family Income and Source of Care

Source of Care/ Satisfaction	Under $15,000	$15,000 -24,999	$25,000 -34,999	$35,000 -49,999	$50,000 -74,999	$75,000 -99,999	$100,000+	All Income Levels
Military Facility								
Very Satisfied	25.2%	25.7%	28.2%	28.9%	29.8%	36.4%	24.6%	27.0%
Satisfied	54.6	50.6	50.0	50.7	50.6	42.7	56.1	51.5
Mixed	10.6	10.7	11.0	8.9	9.9	10.7	12.9	10.3
Dissatisfied	3.8	7.1	5.2	6.1	4.1	7.9	2.9	5.5
Very Dissatisfied	4.4	4.6	4.7	4.0	4.6	2.4	3.5	4.4
NA/Don't Know	1.5	1.4	0.9	1.5	1.0	0.0	0.0	1.4
Civilian Facility								
Very Satisfied	36.3	40.4	40.4	42.0	47.3	54.2	55.7	44.2
Satisfied	49.2	48.3	48.7	48.8	44.9	39.8	39.5	46.6
Mixed	6.6	6.2	6.6	5.7	4.7	4.7	3.5	5.6
Dissatisfied	1.9	1.8	2.4	1.6	1.2	0.7	0.1	1.5
Very Dissatisfied	5.2	1.8	0.7	1.3	0.9	0.6	1.2	1.2
NA/Don't Know	0.8	1.5	1.1	0.7	1.1	0.1	0.0	0.9

Source: 1992 DoD Health Care Survey
Question 96 - "What type of facility did this family member use for the most recent visit for dental care?"
Question 99 - Part N: Overall satisfaction with dental care and services.
Question 19 - "What was the total income, before taxes, for the sponsor and spouse over the last 12 months?"

Reviewing satisfaction first, 88 percent or more of both beneficiaries who chose a military facility or beneficiaries who chose a civilian facility expressed satisfaction with the convenience of the location of the facility and cleanliness of the facility. More than 89 percent of those who chose to go to a civilian provider were satisfied with the ability to make an appointment by phone and the time spent waiting for treatment. In contrast, fewer than 70 percent of those who chose a military facility were satisfied with these components of their dental care. As might be expected, 92 percent of the beneficiaries who chose a military facility, where dental care is provided with no out-of-pocket charge to the patient, were satisfied with the cost of the visit.

Focusing on components of dissatisfaction presented in Table 8.7, the greatest source of dissatisfaction for patients who chose a military facility was the ability to make an appointment by phone (22 percent were dissatisfied). For patients who chose a civilian provider, the cost of the visit was the greatest source of dissatisfaction with 22 percent of these beneficiaries expressing dissatisfaction.

Table 8.6 Components of Satisfaction with Most Recent Dental Visit by Source of Care

Component of Satisfaction/ Source of Care	Junior Enlisted	Senior Enlisted	Officers	Retirees and Survivors Under 65	Retirees and Survivors 65 and Over	All Beneficiaries
Convenience of Location						
Military Facility	91%	94%	94%	89%	88%	92%
Civilian Facility	89	92	92	93	95	93
Availability of Parking						
Military Facility	73	76	77	91	95	77
Civilian Facility	92	91	93	95	96	95
Hours Facility is Open						
Military Facility	84	87	87	93	98	87
Civilian Facility	94	94	92	95	98	96
Cleanliness of Facility						
Military Facility	93	94	94	97	98	94
Civilian Facility	98	98	97	98	99	98
Availability of Dentists						
Military Facility	73	79	78	67	73	75
Civilian Facility	91	92	94	96	98	95
Emergency Response						
Military Facility	70	73	76	70	80	72
Civilian Facility	82	89	86	93	95	92
Make Appointments by Phone						
Military Facility	68	69	66	51	62	66
Civilian Facility	92	95	95	98	99	97
Waiting Time						
Military Facility	65	69	68	60	70	66
Civilian Facility	89	90	91	93	95	93
See Dentist of Choice						
Military Facility	53	55	51	41	45	52
Civilian Facility	82	87	92	94	98	94

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Table 8.6—*Continued*

Component of Satisfaction/ Source of Care	Junior Enlisted	Senior Enlisted	Officers	Retirees and Survivors Under 65	Retirees and Survivors 65 and Over	All Beneficiaries
Quality of Preventive Procedures						
Military Facility	81%	86%	87%	79%	84%	83%
Civilian Facility	90	95	95	96	97	96
Quality of Fillings						
Military Facility	72	78	81	79	91	76
Civilian Facility	84	91	91	94	96	94
Quality of Restorative Procedures						
Military Facility	64	73	72	59	61	68
Civilian Facility	69	84	87	92	94	91
Cost of Visit						
Military Facility	93	92	95	86	94	92
Civilian Facility	65	64	64	60	66	63
Overall Satisfaction						
Military Facility	80	81	84	68	72	80
Civilian Facility	85	91	90	92	93	92

Source: 1992 DoD Health Care Survey
Question 99 - Please rate the satisfaction with the facility used on each of the following factors.

Table 8-7. Components of Dissatisfaction with Most Recent Dental Visit by Source of Care

Component of Dissatisfaction/ Source of Care	Junior Enlisted	Senior Enlisted	Officers	Retirees and Survivors Under 65	Retirees and Survivors 65 and Over	All Beneficiaries
Convenience of Location						
Military Facility	3%	2%	3%	6%	8%	3%
Civilian Facility	6	3	3	2	2	2
Availability of Parking						
Military Facility	14	16	15	6	3	14
Civilian Facility	3	3	2	2	2	2
Hours Facility is Open						
Military Facility	5	4	4	4	0.3	4
Civilian Facility	0.3	3	2	1	0.3	1
Cleanliness of Facility						
Military Facility	1	2	1	1	1	1
Civilian Facility	1	1	0.3	0.4	0.1	0.4
Availability of Dentists						
Military Facility	12	11	11	23	16	13
Civilian Facility	3	4	2	2	1	2
Emergency Response						
Military Facility	11	8	7	17	8	10
Civilian Facility	2	3	2	1	1	1
Make Appointments by Phone						
Military Facility	21	19	22	36	21	22
Civilian Facility	1	1	2	1	1	1
Waiting Time						
Military Facility	19	16	17	27	17	18
Civilian Facility	4	4	4	2	1	2
See Dentist of Choice						
Military Facility	15	15	18	28	26	17
Civilian Facility	2	5	2	1	1	2

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Table 8.7—*Continued*

Component of Dissatisfaction/ Source of Care	Junior Enlisted	Senior Enlisted	Officers	Retirees and Survivors Under 65	Retirees and Survivors 65 and Over	All Beneficiaries
Quality of Preventive Procedures						
Military Facility	7%	5%	5%	16%	13%	7%
Civilian Facility	7	2	1	1	1	1
Quality of Fillings						
Military Facility	11	8	7	12	4	9
Civilian Facility	2	2	2	2	1	2
Quality of Restorative Procedures						
Military Facility	12	10	9	34	29	14
Civilian Facility	4	5	3	3	3	3
Cost of Visit						
Military Facility	1	1	0.3	5	1	1
Civilian Facility	23	23	22	24	16	22

Source: 1992 DoD Health Care Survey
Question 99 - Please rate the satisfaction with the facility used on each of the following factors.

8.3 SUMMARY OF KEY FINDINGS

This chapter addressed utilization of and satisfaction with dental care as determined from questions about the most recent dental visit, provided it was within the last 6 months. Because respondents were asked to evaluate their most recent visit only, the ratings for military and civilian facilities were made by different beneficiaries. The key results are:

- Of the most recent visits for dental care, 46 percent were to military facilities and 52 percent were to civilian facilities. Active-duty sponsors used military facilities almost exclusively, while family members and retirees used civilian facilities in most cases.
- Over two-thirds of all dental visits were for routine examinations.
- Although the majority of beneficiaries were either satisfied or very satisfied with dental care, overall satisfaction with dental care at military facilities was lower than for either inpatient or outpatient care. Satisfaction levels among military-facility users ranged from 67 percent for retirees and survivors under 65 to 84 percent for officers. Satisfaction with civilian facilities ranged from 84 percent for junior-enlisted families to 92 percent for retirees and survivors age 65 and over.
- More than 85 percent of both military-facility users and civilian-facility users were satisfied with the facility's location and cleanliness. Civilian-facility users were considerably more satisfied with the ability to make an appointment by phone and the time spent waiting for treatment than were military-facility users. However, military-facility users were considerably more satisfied with the cost of the visit (military facilities provide dental care with no out-of-pocket charge).
- Military-facility users were most dissatisfied with the ability to make an appointment by phone (22 percent), and civilian-facility users were most dissatisfied with the cost of the visit (22 percent).

9.0 ANALYSIS OF SURVEY COMMENTS

9.1 METHODOLOGY

This chapter addresses the written comments made by survey respondents.[1] Approximately 34 percent of respondents wrote comments. Comments were written by active-duty members, retirees and survivors, and spouses. The initial step was to select a simple random sample of 100 comment sheets written by active-duty members, 100 written by retirees/survivors, and 50 written by spouses or other family members. The three samples were reviewed with the purpose of identifying common issue categories that were likely to represent topics and views expressed by respondents. After agreement was reached on the basic issue categories, a sample of 2,000 active-duty respondents and 2,000 retirees/survivors was selected. Since only 678 spouses or other family members wrote comments, a census of their sheets was examined. Each comment sheet was individually reviewed and coded according to the categories developed for the appropriate population. As anticipated, some new issue categories were identified in the comprehensive screening. The numbers of comment sheets on which the issues were raised are included in the tables in this chapter. Each count is also provided as a percentage of all the comment sheets examined. Typically, respondents mentioned more than one issue in the comments they provided. Occasionally, individuals included entire reports, newspaper articles, and other material they deemed relevant to the issues at hand.

9.2 COMPILATION OF FINDINGS

The issues outlined in the respondent comments were primarily negative in nature. Such a commenting population can be expected given that people tend to be less likely to devote the time needed to provide positive feedback than they are to provide negative feedback. Suggestions also were provided on ways to improve the health care system—indicating the respondents' desire to have their experiences make a positive difference.

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[1] This chapter is based on a report prepared by the Human Resources Research Organization (HumRRO) under contract to the Defense Manpower Data Center (DMDC). The report, "Comments Analysis of the 1992 Health Care Surveys of Active Duty Personnel and Military Retirees," Final Report 93-26, HumRRO FR-PRD-93-26, is available from DMDC, 1600 Wilson Blvd., Arlington, VA 22209.

The commenting population is also quite different from the non-commenting population with respect to overall satisfaction with military health care benefits. This is demonstrated in Table 9.1.

Table 9.1 Satisfaction With Benefits for Commenting and Non-Commenting Populations

Satisfaction With Benefits	Commenting Population	Non-Commenting Population
Very Satisfied	10%	15%
Satisfied	31	45
Mixed/Neither	21	19
Dissatisfied	19	9
Very Dissatisfied	12	3
Does Not Apply	7	9

Source: 1992 DoD Health Care Survey
Question 104 - "In general, how satisfied are you and your family with your military health care benefit (including care at both Military Medical Treatment Facilities and through CHAMPUS?"
Question 109 - "Is there anything else about your health care and benefits that you would like us to know?"

Table 9.1 clearly shows that people who wrote comments tend to be more dissatisfied with their health care benefits. Almost a third of those with comments were either dissatisfied or very dissatisfied compared to only 12 percent of those without comments.

9.2.1 Active-Duty Personnel

The majority of the comments of active-duty personnel focused on obstacles that prevented individuals from obtaining satisfactory health care. The difficulties most frequently mentioned included: inadequate dental care, insufficient coverage related to military health care policy/benefits, unsatisfactory retiree and dependent health care, excessive waiting periods associated with obtaining appointments, rude or unresponsive attitudes of health-care providers and/or staff, and inadequate resources at health-care facilities. In addition, many respondents commented about the survey itself. Although the majority of respondents' remarks were unfavorable, it should be noted that many comments were coupled with specific recommendations and expressed a willingness to contribute input toward the improvement of the current military health care system.

Table 9.2 displays the issue category by number of respondents and percentage of survey-related comments for active-duty personnel. The percentages in this and subsequent tables reflect the number commenting on a particular issue out of the sample of comments analyzed.

Table 9.2 Numbers and Percentages of Active-Duty Personnel Making Survey-Related Comments by Issue Category*

Issue Category	Number Voicing Concern	Percentage Voicing Concern
Special Concerns/Recommendations	612	31%
Survey-Related Comments	525	27%
Issues Related to Dental Care	359	18%
Structure of Military Health Care Benefits/Policy	356	18%
Structure of Civilian Health Care Benefits/Policy	6	0.3%
Structure of Health Care Benefits/Policy (General)	38	2%
Health Care Provided to Retirees/Dependents	249	13%
Waiting Period to Get Appointment; Scheduling Difficulties	235	12%
Dissatisfaction with Military Health Care	229	12%
Dissatisfaction with Civilian Health Care	10	1%
Dissatisfaction with Health Care (General)	24	1%
Attitude of Health Care Provider and/or Staff	226	11%
Resources at Health Care Facilities	221	11%
Satisfaction with Military Health Care	205	10%
Satisfaction with Civilian Health Care	52	3%
Satisfaction with Health Care (General)	27	1%
Competence of Health Care Practitioners	177	9%
Lack of Health Care Specialists/Services	146	7%
Accessibility of Health Care Facilities	144	7%
Waiting Period at Health Provider's Office	138	7%
Desire for Access to Alternative Health Care Provider	112	6%
Prescription/Medication Issues	108	5%
Handling of Reimbursement	92	5%
Recommendations for New Health Care Plan	89	4%
Health Care-Related Information	86	4%
Cost of Military Health Care	74	4%
Cost of Civilian Health Care	24	1%
Cost of Health Care (General)	30	2%
Bureaucracy/Paperwork Regarding Military Health Care	69	4%
Bureaucracy/Paperwork Regarding Civilian Health Care	–	–
Bureaucracy/Paperwork Regarding Health Care (General)	17	0.1%
Inconsistent Quality of Military Health Care	68	3%
Deviation from Health Care Coverage Promised	66	3%
Medical Records and Lab Samples	62	3%
Effects of Budgetary Constraints on Health Care	52	3%
Concerns Related to Eye Care	41	2%
Lack of Priority for Active-Duty Personnel	38	2%

* N=1,968 (32 surveys contained comments not related to health care).

The issue of special concerns and recommendations was the category that received the greatest number of responses from this sample (31 percent of the responses). This category addressed examples, experiences, and recommendations regarding health-care-related issues that were of particular concern to the individual respondent. The issues respondents brought up tended to be highly specific in nature, addressing numerous and diverse areas that pertained both to military and non-military health care. Some examples of the types of comments included are:

"Military medicine is a glorified version of socialized medicine."

"Cost sharing is a dangerous way to pay for medical treatment."

"Do away with military health-care providers."

"I am an attending physician so I know the defects first hand."

"American doctors are not sensitive to cultural differences of Korean patients."

However, there were a few topics that were mentioned by more than one individual. Specifically, several respondents mentioned that the parking facilities at various military locations were lacking, either because the parking lot had too few spaces or because the spaces were inconveniently located in relation to the military health-care facility. Another commonly cited issue involved the desire for health-care facilities to employ only English-speaking doctors. The specific recommendations for solutions to such problems were, again, diverse. The high endorsement of this category may be reflective of the breadth and intricacy of the health care topic, as well as the numerous unique situations and points of view necessarily associated with it. Another contributing factor may lie in the fact that the survey questions themselves were thought-provoking and asked the respondents to answer according to personal preferences and judgments.

Survey-related comments were set forth by 27 percent of the sample. The comments in this category varied in tone and content; however, the bulk of them addressed two substantive issues: survey design and administration and elaboration of responses to items within the scannable portion of the questionnaire. Comments related to survey design and administration were made by slightly fewer than half of those individuals whose remarks fell in this category. Specifically, many respondents mentioned that the questionnaire was very confusing and that they could not understand or answer questions as a result. Some individuals mentioned that the survey should not have been sent to them because it did not apply to their situation. Numerous respondents commented about the memorandum that accompanied the survey. Some respondents

mentioned that it incorrectly stated that they had already received a survey.[2] Other respondents mentioned that they had already received the first survey and had returned it, but that they had nevertheless been willing to complete and return a second.[3] Several respondents noted that the survey took more time to complete than the memorandum had suggested. The second substantive issue, elaboration of response items, encompassed slightly greater than half of the remarks for this category. Here, the respondent simply gave an explanation or elaboration of a response made previously in the survey instrument itself.

Issues related to dental care were addressed by more than 18 percent of the active-duty respondents. In most instances, the comments were negative and discussed particular areas that were in need of improvement. Most of the concerns raised mirrored those addressing general health care. A great number of respondents indicated, in some fashion, either that dental care services were only partially covered or were not covered at all by the military dental care policy. Respondents noted that they often needed to obtain dental services outside the military health care system and, as a result, had to pay for those services out of their own pockets. Other issues of concern included the inadequate availability of dental services for dependents (DDP★Delta); the lack of sufficient basic, preventive dental care, such as semi-annual cleanings; and the lack of coverage for orthodontics, root canals, and bridges.

The structure of military health care benefits/policy also was commented on by over 18 percent of the sample. This category was fairly homogenous in content and in tone. The bulk of comments were negative and there was general consensus that the military health care policy (CHAMPUS was cited most frequently) is inadequate. A particular problem mentioned was the partial or total absence of coverage for health care services with a specific focus, such as non-elective surgeries, emergency services, and health care received from civilian health-care providers/facilities. Many respondents wrote about situations where the sponsor had to pay a lot of money because there was an extremely high deductible. Several individuals stated that the structure of the military health care policy was inflexible and that an individual could use only a restricted pool of health-care providers if s/he wanted to be reimbursed.

The issue of health care provided to retirees/dependents was also frequently mentioned by respondents, with 13 percent of the sample expressing concern about this

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[2] Some respondents were erroneously sent a memorandum intended to accompany the second questionnaire (i.e., suggesting they had not returned their survey) with their first questionnaire.

[3] If more than one survey was received from a respondent, only one response was kept in the survey data base.

matter. The majority of the comments again were negative and focused on the health care provided to dependents. Respondents commenting about dependent care most frequently expressed general concern for the well-being of their dependents, as well as anxiety about the limited capabilities of the military medical system to accommodate this population. The comments about retirees primarily involved concerns pertaining to the retired service members' eligibility regarding military health care. Another concern frequently mentioned was the retirees' perceived lack of priority in the military health care system.

The waiting period to get an appointment was addressed by 12 percent of the active-duty personnel who responded. This category was predominantly negative in character and homogeneous in content. Many of the comments in this category addressed the excessive waiting time associated with getting through to the appointment clerk and the inability to obtain an appointment for timely medical care. Many people mentioned that by the time they were able to see a health-care professional, they were extremely sick, had sought treatment elsewhere, or were no longer ill.

Comments on the resources at health-care facilities were made by 11 percent of the sample. Once again, the comments cited were predominantly negative. Many respondents expressed concern about the lack of medical equipment available and the generally poor condition of the military health-care facilities. Most of the comments addressed the lack of staff, particularly physicians, as a problem. Several respondents thought that this problem was exacerbated by the excessive number of patients overloading the system and that this overcrowding contributed to the hurried and typically rude treatment they received both from health-care providers and staff. Not surprisingly, the category pertaining to the attitudes of health-care providers and/or staff received an 11-percent endorsement by the sample also.

Overall content and overall discontent with the military health care system were noted by 10 percent and 12 percent of the sample, respectively. The category addressing discontent with the system contained negative, general comments, the majority of which mentioned the poor treatment respondents had received in the past. The satisfaction noted with system was expressed in terms of positive, general comments including memories and experiences cited by the respondents. Several respondents mentioned that CHAMPUS Prime contributed to their positive impressions of military medical care.

9.2.2 Military Retirees/Survivors

The second sample drawn consisted of mostly retired service members and a few survivors of deceased service members. The comments made by these individuals were both

positive and negative. Table 9.3 displays the issue category by number of respondents and percentage of survey-related comments for military retirees and survivors. The majority of the comments discussed the health care experiences of the retiree/survivor, both past and present. In many cases, the respondents compared and contrasted their past experiences with the military health care system to their more recent experiences with a private health insurance carrier. The categories most frequently addressed by the retiree/survivor sample included: survey-related comments; special concerns and recommendations; issues related to dental care; use of other health care plans; prescription, medication, and pharmacy issues; health care coverage promised or expected; and the accessibility of resources at military health-care facilities.

Survey-related comments were made by 26 percent of the military retirees/survivors sampled. Most of the comments addressed various aspects of the survey's design. The majority of those commenting stated they had difficulty answering certain questions because they no longer received health care through the military system. Numerous respondents also mentioned that the survey was not targeted toward the retiree/survivor population, which also made its completion difficult as it simply did not apply to them as written. Some respondents addressed issues related to survey administration. Specifically, individuals noted that they had received and completed a first survey, but they were nevertheless completing and returning a second. Several respondents also stated that the survey was too long and took a considerable amount of time to complete. A few respondents elaborated on their responses to specific questionnaire items. In these cases, the respondents gave additional specifics concerning answers they had provided in the scannable portion of the questionnaire.

The issue of special concerns and recommendations encompassed 25 percent of the sample's comments. This category contained examples, experiences, and recommendations regarding health-care-related issues that were of particular concern to the individual respondent and were highly specific in nature, addressing numerous and diverse issues about both military and non-military health care. Some areas were addressed by more than one individual, although the suggestions or recommendations that followed varied from one individual to the next. Specifically, several of the respondents had concerns about the closure of specific military facilities that were located near their residence. Recommendations then followed about ways to streamline the military health care system, as did suggestions as to how the health care system could be better managed. In addition, there were respondents who expressed their skepticism as to the motives of a "greedy government" and the moral character of those who strive to achieve free health care.

Table 9.3 Numbers and Percentages of Military Retirees/Survivors Making Survey-Related Comments by Issue Category*

Issue Category	Number Voicing Concern	Percentage Voicing Concern
Survey-Related Comments	486	26%
Special Concerns/Recommendations	467	25%
Issues Related to Dental Care	433	23%
Use of Other Health Care Plans	316	17%
Prescription/Medication/Pharmacy Issues	248	13%
Eligibility Status Regarding Military Health Care	247	13%
Satisfaction with Military Health Care	246	13%
Satisfaction with Civilian Health Care	43	2%
Satisfaction with Health Care (General)	30	2%
Health Care Coverage Promised or Expected	237	13%
Resources at Health Care Facilities	233	13%
Accessibility of Health Care Facilities	189	10%
Excessive Waiting Period To Get Appointment; Scheduling Difficulties	181	10%
Recommendations for New Health Care Plan	133	7%
Structure of Military Health Care Benefits/Policy	128	7%
Structure of Civilian Health Care Benefits/Policy	11	1%
Structure of Health Care Benefits/Policy (General)	16	1%
Health Care Related Information	128	7%
Lack of Health Care Specialists/Services	118	6%
Attitude of Health Care Provider and/or Staff	112	6%
Concerns Related to Eye Care	112	6%
Lack of Priority for Retirees/Survivors	101	5%
Supplemental Insurance	98	5%
Handling of Reimbursement	82	4%
Dissatisfaction with Military Health Care	77	4%
Dissatisfaction with Civilian Health Care	26	1%
Dissatisfaction with Health Care (General)	6	0.3%
Inconsistent Quality of Military Health Care	77	4%
Competence of Health Care Practitioners	74	4%
Health Care Provided to Dependents	65	4%
Excessive Waiting Period at Health Provider's Office	57	3%
Desire for Access to Alternative Health Care Provider	40	2%
Cost of Military Health Care	23	1%
Cost of Civilian Health Care	30	2%
Cost of Health Care (General)	61	3%

Continued on next page

Table 9.3—*Continued*

Issue Category	Number Voicing Concern	Percentage Voicing Concern
Elaboration of Medical History or Current Situation	23	1%
Paperwork Regarding Military Health Care	22	1%
Paperwork Regarding Civilian Health Care	8	0.4%
Paperwork Regarding Health Care (General)	7	0.4%
Effects of Budgetary Constraints on Health Care	22	1%
Medical Records and Lab Samples	22	1%

* N=1,849 (151 surveys contained comments not related to health care).

Issues related to dental care were endorsed by more than 23 percent of the population. In the vast majority of cases, the comments were negative—respondents simply stated that adequate dental care in the military system did not exist for retirees/survivors. Many other respondents mentioned that it existed, but only on a space-available basis, and even then, the quality of care was less than spectacular. Numerous retirees/survivors thought it was ironic that the least amount of dental care is made available to them at a time when they need it the most. Several respondents made references to the need for specific dental services and appliances (e.g., dentures). Another issue of concern included the lack of available dental services for dependents (DDP★Delta).

Use of other health care plans received a 17-percent endorsement from the sample. This category was fairly homogeneous and contained mostly statements of fact. The majority of respondents stated either that they did not use military health-care facilities or that they used them in a limited fashion (e.g., for pharmaceutical services only) because they had switched to a private carrier. Such a switch was made either due to personal preference or because the respondent was no longer eligible to receive military health care benefits. The category of eligibility status regarding military health care was commented on by 13 percent of the military retirees/survivors. The majority of these respondents expressed their disappointment and great anxiety that upon reaching retirement age they were no longer able to maintain full or even partial military health care benefits. Numerous retirees/survivors also mentioned they considered their military health care benefits to be an extremely important asset that they hoped would continue.

Comments addressing health care coverage promised or expected were made by 13 percent of the sample. The content of this category was overwhelmingly negative. Nearly all of the respondents expressed the sentiment that continued health care for the retiree was a right and not a privilege, and that they had worked hard to earn that right. Many individuals expressed resentment and frustration that they had been told upon

enlistment or at some point during their term of service that with their commitment to the military came life-long, quality health care that would be free of charge. The respondents, almost unanimously, stated that they felt the government had reneged on its promise and that they were bitter as a result.

Prescription, medication, and pharmacy issues received an endorsement from slightly over 13 percent of the sample. This category frequently cited the exorbitant costs associated with medications, the unavailability of desired drugs (particularly those that are newer and more costly), the excessive distance needed to travel to reach the nearest pharmacy, and the excessive waiting times associated with obtaining needed medications. Many respondents suggested that the dispensation of drugs through the mail would be of great benefit.

More than 13 percent of the sample expressed satisfaction with the military health care system. Many general comments were made about positive experiences and associated memories connected with the receipt of military health care. Many retirees/survivors wrote about receiving high-quality care that paralleled or exceeded the care currently being provided through private health care insurance, particularly in comparison with Medicare/Medicaid.

Comments on the resources at health-care facilities and the accessibility of health-care facilities were made by over 10 percent of the population. Most of the respondents mentioned that the lack of staff, and particularly the lack of physicians, was a problem and that it contributed to the lack of medical attention received at times. In addition, retirees/survivors mentioned that the long commutes associated with the geographical inaccessibility of military health-care facilities was difficult and that they were not comfortable driving the long distance necessary to reach the facilities they were expected to visit.

9.2.3 Spouse or Other Family Member

The issues addressed by spouses or other family members were predominantly negative. The majority of the comments focused on obstacles that prevented the spouses, or other family members, from obtaining satisfactory health care. Specifically, these obstacles included the excessive waiting periods associated with obtaining health-care appointments, the excessive waiting periods experienced at the health-care providers' offices, the discourteous and incompetent treatment received from health-care practitioners and staff members, the inadequate dental care and dental care coverage available, the insufficient resources and specialists available at health-care facilities, the inaccessibility of health-care facilities, and the obstacles associated with obtaining

medications and dealing with pharmacies. In addition, many respondents made survey-related comments. It is important to note that in many cases, respondents were not exclusively negative. Comments were often coupled with suggestions and recommendations as to how to improve the military health care system. This population frequently expressed gratitude at being given the opportunity to respond to the questionnaire, particularly as health care was believed to be such an important issue.

Table 9.4 displays the issue category by number of respondents and percentage of survey-related comments for spouses or other family members. The issue of special concerns and recommendations was the category that received the greatest number of responses from this population, receiving a 36-percent endorsement. This category contained examples, experiences, and recommendations regarding health-care-related issues that were of particular concern to the individual respondent. These comments were highly specific in nature and addressed issues that were numerous and diverse, discussing both military and non-military health care. A number of topics received mention by more than one individual, although the suggestions or recommendations tended to vary. Specifically, several of the respondents mentioned that the parking adjacent to military facilities was of concern. Another issue addressed was the inflexibility of health-care facilities with regard to their hours of operation. This comment was frequently coupled with a specific suggestion as to how the hours of operation ought to be changed so that they would be more convenient for the particular respondent. In addition, as with the military retiree/survivor sample, several respondents expressed discontent with the motives of what they called a "greedy government" and with the moral character of those individuals who desire free health care. There were also several recommendations made regarding the streamlining of the health care system in order for it to become more efficient.

The excessive waiting period to get appointments and the excessive waiting period at health-care providers' offices respectively encompassed 23 percent and 12 percent of this population's comments. These categories were predominantly negative in content. The comments in the first category addressed the waiting time associated with getting through to the appointment clerk and the inability to obtain an appointment in order to receive timely medical care. The statements indicated that it is not uncommon for respondents to wait up to an hour to make an appointment and then wait several months in order to receive care. The second category contained comments about the excessive amount of time spent in waiting rooms, especially in the emergency clinic, before medical attention was obtained. A majority of the respondents mentioned that, on average, it would take more than several hours to be seen by a health-care practitioner.

Table 9.4 Numbers and Percentages of Spouses or Other Family Members Making Survey-Related Comments by Issue Category*

Issue Category	Number Voicing Concern	Percentage Voicing Concern
Special Concerns/Recommendations	236	36%
Excessive Waiting Period to Get Appointment; Scheduling Difficulties	150	23%
Attitude of Health Care Provider and/or Staff	128	19%
Issues Related to Dental Care	120	18%
Structure of Military Health Care Benefits/Policy	118	18%
Structure of Civilian Health Care Benefits/Policy	4	1%
Structure of Health Care Benefits/Policy (General)	7	1%
Survey-Related Comments	109	16%
Satisfaction with Military Health Care	105	16%
Satisfaction with Civilian Health Care	16	2%
Satisfaction with Health Care (General)	12	2%
Resources at Health Care Facilities	100	15%
Competence of Health Care Practitioners	98	15%
Health Care Provided to Retirees/Dependents	87	13%
Lack of Health Care Specialists/Services	81	12%
Excessive Waiting Period at Health Provider's Office	81	12%
Dissatisfaction with Military Health Care	72	11%
Dissatisfaction with Civilian Health Care	4	1%
Dissatisfaction with Health Care (General)	7	1%
Prescription/Medication/Pharmacy Issues	72	11%
Accessibility of Health Care Facilities	69	10%
Use of Other Health Care Plans	64	10%
Desire for Access to Alternative Health Care Provider	57	9%
Inefficient Handling of Reimbursement	50	8%
Inconsistent Quality of Military Health Care	49	7%
Health Care-Related Information	45	7%
Medical Records and Lab Samples	39	6%
Need for Expanded Women's Health Care	32	5%
Paperwork Regarding Military Health Care	31	5%
Paperwork Regarding Civilian Health Care	1	0.2%
Paperwork Regarding Health Care (General)	2	0.3%
Deviation from Health Care Coverage Promised	27	4%
Concerns Related to Eye Care	24	4%

Continued on next page

Table 9.4—*Continued*

Issue Category	Number Voicing Concern	Percentage Voicing Concern
Cost of Military Health Care	23	3%
Cost of Civilian Health Care	18	3%
Cost of Health Care (General)	21	3%
Effects of Budgetary Constraints on Health Care	16	2%
Lack of Priority for Non-Military Personnel	15	2%
Civilian Doctor Refuses to Accept CHAMPUS	14	2%

* N=663 (15 surveys contained comments not related to health care).

The categories addressing the attitude of health-care providers and/or staff and the competence of health-care practitioners were respectively addressed by 19 percent and 15 percent of the respondents. Although the majority of the responses in these categories were negative, positive comments were also cited. The former category contained many references to polite and caring health-care providers. Other comments discussed the display of rude and discourteous behavior, particularly on the part of physicians. Many of the comments made regarding the receipt of poor treatment implied that it may have been related to the respondent's sex (predominantly female) and beneficiary status (not active-duty personnel). Many of the respondents who commented on the latter category said that they had received excellent care. Many other individuals stated that the health-care providers in question had failed to diagnose a medical condition, had made an improper diagnosis, or had rendered treatment that was simply below standard.

Issues related to dental care and the structure of military health care benefits/policy were each mentioned by 18 percent of the population. In most instances, for both categories, the comments were predominantly negative and discussed particular areas that needed improvement. The dental care category addressed a wide variety of issues. A great number of respondents indicated that dental care coverage was inadequate—specifically, that the military dental care policy did not fully cover the dental services needed. Other issues of concern included inadequate availability of dental services for dependents (DDP★Delta), the lack of sufficient preventative dental care, and the lack of coverage for services beyond basic dental care. Comments addressing the structure of health care benefits/policy most frequently addressed CHAMPUS deductibles that were too high. In addition, the high costs associated with treatments rendered by civilian practitioners were frequently cited, as was the fact that CHAMPUS typically would not cover such costs.

Survey-related comments were made by 16 percent of the population. The comments in this category varied in tone and content. Most of the comments addressed survey design and administration. Specifically, numerous respondents stated that while they had already received and completed a first survey, they were nevertheless completing and returning a second. Some respondents also noted that the survey was too long and that it took a considerable amount of time to complete. Several respondents mentioned that the questionnaire itself, or that particular survey items, were poorly worded. Many respondents chose to elaborate on specific questionnaire items. In these cases, the individual gave additional specifics concerning an answer s/he had given in the scannable portion of the survey. As previously noted, many respondents took the opportunity to express their gratitude at being able to contribute to the overall health care improvement effort.

The resources at health-care facilities were addressed by 15 percent of the spouses or other family members who responded. The comments in this category were predominantly negative. Most of the respondents commented on the excessive number of patients and the corresponding lack of adequate staff, particularly of physicians, available to accommodate that load. The lack of health-care specialists and services was also cited as a problem and was mentioned by 12 percent of the respondents. In addition, several respondents commented on the lack of equipment available in and overall poor condition of military health-care facilities. A few respondents stated that military facilities do not allow patients to have enough privacy.

The issue of health care provided to retirees/dependents was also frequently mentioned by respondents, with 13 percent of the population expressing concern about this matter. In this category, the majority of the comments were negative and addressed the health care provided to dependents. As experienced with other respondent groups, the individuals commenting about dependents most frequently expressed concern for the dependents' well-being and discussed the limited capabilities of the military medical system to accommodate them. The majority of the comments about retirees expressed concern regarding their lack of eligibility to continue to receive military health care benefits.

Prescription, medication, and pharmacy issues received a slightly higher than 10-percent endorsement. This category contained comments regarding the exorbitant costs associated with medications, the unavailability of desired drugs, and the excessive travelling distance needed to reach the pharmacy. Similarly, the category of accessibility of health-care facilities was addressed by approximately 10 percent of the population.

The overwhelming majority of these comments mentioned that the distance one needed to travel to reach military health-care facilities was excessive. Several respondents noted that the travel time made health care a "hassle" and that a simple appointment typically ended up being an all-day affair.

9.3 SUMMARY OF KEY FINDINGS

This chapter addressed the issues raised by beneficiaries who provided written comments about military health care. The key results are:

- Approximately 34 percent of the sample wrote comments. The issues outlined in the respondent comments were primarily negative in nature. About a third of those writing comments were dissatisfied or very dissatisfied with their military medical benefits, whereas of those not writing comments, only about one-eighth were dissatisfied or very dissatisfied.
- The majority of comments from active-duty personnel focused on obstacles that prevented individuals from obtaining satisfactory health care. Specifically, the difficulties most frequently mentioned included: inadequate dental care, insufficient coverage related to military health care policy/benefits, excessive waiting periods associated with obtaining appointments, rude or unresponsive attitudes of health-care providers and/or staff, and inadequate resources at health-care facilities.
- The majority of comments from retired service members and survivors discussed their health-care experiences, both past and present. In many cases, the respondents compared and contrasted their past experiences with a private health insurance carrier. The categories most frequently addressed by the retiree/survivor sample included: survey-related comments; special concerns and recommendations; issues related to dental care; use of other health-care plans; prescription, medication, and pharmacy issues; health care promised or expected; and the accessibility of resources at military health-care facilities.
- The issues addressed by spouses or other family members were predominately negative. The majority of the comments focused on obstacles that prevented the spouses or other family members from obtaining satisfactory health care. These obstacles included: excessive waiting periods associated with obtaining health-care appointments, excessive waiting periods experienced at the health-care providers' offices, discourteous and incompetent treatment received from

health-care practitioners and staff members, inadequate dental care and dental care coverage available, insufficient resources and specialists available at health-care facilities, inaccessibility of health-care facilities, and obstacles associated with obtaining medications and dealing with pharmacies.

- It is important to note that respondents were not entirely negative. Comments were often coupled with suggestions and recommendations on how to improve the military health care system.

APPENDIX A

THE 1992 DoD HEALTH CARE SURVEY

RCS: DD-FM&P (OT) 1903

1992 DoD Health Care Survey

SURVEY PURPOSE

The Department of Defense is conducting an effort to evaluate and improve the Military Health Services System. As part of this effort, DoD is conducting a survey of recipients of military health care benefits to examine (1) access to and use of inpatient and outpatient medical care services and (2) attitudes and knowledge regarding the Military Health Services System's policies, benefits, and costs. You and your family have been selected to participate in this important survey. Please read the instructions before you begin the questionnaire.

PRIVACY NOTICE

AUTHORITY: 10 U.S.C. 136

PRINCIPAL PURPOSE OR PURPOSES: Information collected in this survey will be used to sample attitudes toward and use of the Military Health Services System. This information will assist in the formulation of policies that may be needed to improve the Military Health Services System.

ROUTINE USES: None

DISCLOSURE: Voluntary. Failure to respond will not result in any penalty to the respondent. However, maximum participation is encouraged so that the data will be complete and representative. Your survey questionnaire will be treated as confidential. Any identifiable information will be used only by persons engaged in, and for the purposes of, the survey. Only group statistics will be reported.

* U.S. GOVERNMENT PRINTING OFFICE: [illegible]

23028

PLEASE DO NOT MARK IN THIS AREA

INSTRUCTIONS FOR COMPLETING THE SURVEY

- Please use a No. 2 pencil.

- Make heavy black marks that fill the circle for your answer.
- Please do not make stray marks of any kind.

INCORRECT MARKS ○ ✗ ✓ ◒ CORRECT MARK ○ ○ ● ○

- Unless otherwise specified in the instructions for a question, only one answer should be marked.

Example:

How would you describe your health in general?

- ● Excellent
- ○ Very good
- ○ Good
- ○ Fair
- ○ Poor

If your answer is "Excellent," then mark just one circle as shown above.

- Sometimes you will be asked to "Mark ALL that apply." When this instruction appears, you may mark more than one answer.

Example:

Who completed this questionnaire? Mark ALL that apply.

- ● Active–duty or retired service member
- ● Spouse of active–duty, retired, or deceased service member
- ○ Son or daughter of active–duty, retired, or deceased service member
- ○ Parent of active–duty, retired, or deceased service member
- ○ Other family member (relationship) _____
- ○ Non-family member (specify) _____

If your answer is "Active–duty or retired service member" and "Spouse of active–duty, retired, or deceased service member," then mark those two circles clearly.

- Sometimes you will be asked to "Mark ALL that apply" for each item in a list. When this instruction appears, you may mark more than one answer for each item.

Example:

Who in your family is now covered by any of the following health insurance programs? Mark all that apply.

	Sponsor	Spouse
Standard CHAMPUS	○	●
CHAMPUS supplemental insurance	○	○
Medicare Part B	○	○
Private health insurance (Blue Cross/Blue Shield, Prudential, AARP, etc) or HMO (Health Maintenance Organization)	○	●
Other (specify) _____	○	○

- Sometimes you will be asked to enter a number in a row of boxes. When this occurs, you should write the requested information in the row of boxes and blacken the corresponding circles under the numbers you wrote.

Example:

How long (in minutes) did it take you to complete this questionnaire?

- Write the numbers in the boxes, making sure that the last number is always placed in the right-hand box.
- Fill in the unused boxes with zeros.
- Then, mark the matching circle below each box.

- Sometimes you will be asked to "Mark one answer for each item." When this instruction appears, mark the answer that best applies for each item in the list.

Example: How satisfied are you with the following aspects of your CHAMPUS benefits? Mark one answer for each item.

	Very Satisfied	Satisfied	Mixed/ Neither	Dissatisfied	Very Dissatisfied	Does not apply/ Don't know
Doctors' willingness to file CHAMPUS claims	●	○	○	○	○	○
CHAMPUS claims filing procedures	○	○	●	○	○	○
Timely solving of claims problems	○	○	○	●	○	○
Time waiting for payments from CHAMPUS	○	○	○	○	●	○
Amount of CHAMPUS deductible	○	●	○	○	○	○
Amount of CHAMPUS copayment	○	●	○	○	○	○
Services and procedures covered by CHAMPUS	○	○	●	○	○	○
Ease of obtaining a Nonavailability Statement	○	○	○	○	○	●

I SPONSOR AND FAMILY INFORMATION

In this section, you will be asked questions about the sponsor and family. By sponsor we mean the person whose military service makes it possible to get military health care benefits. If you are a survivor of a deceased service member, please answer for that deceased service member. If both the sponsor and spouse are active-duty or retired service members, consider the sponsor to be the person to whom this survey is addressed.

1. What is the sponsor's current paygrade or retirement paygrade? Please answer for active-duty, retired, or deceased service member.

Enlisted	Warrant Grade	Officer Grade
○ E-1	○ W-1	○ O-1
○ E-2	○ W-2	○ O-2
○ E-3	○ W-3	○ O-3
○ E-4	○ W-4	○ O-4
○ E-5	○ W-5	○ O-5
○ E-6		○ O-6
○ E-7		○ O-7 to O-10
○ E-8		
○ E-9		

2. Is the sponsor:
- ○ Male
- ○ Female

3. What was the sponsor's age on his/her last birthday?
- ○ Does not apply, sponsor is deceased
- • Write the numbers in the boxes.
- • Then, mark the matching circle below each box.

4. Is the sponsor of Hispanic/Spanish origin or descent?
- ○ Yes
- ○ No

5. What is the sponsor's race?
- ○ White/Caucasian
- ○ Black/African-American
- ○ Oriental/Asian or Pacific Islander
- ○ Native American or Alaskan Native
- ○ Other (specify)_____

6. What is the *highest* school grade or academic degree that the sponsor has?
- ○ Less than 12 years of school (no diploma)
- ○ GED or other high school equivalency certificate
- ○ High school diploma
- ○ Some college, but did not graduate
- ○ 2-year college degree (AA/AS)
- ○ 4-year college degree (BA/BS)
- ○ Some graduate school, but no post-graduate degree
- ○ Post-graduate degree

7. What is the location of the sponsor's current living quarters?
- ○ Does not apply, sponsor is deceased. GO TO QUESTION 12
- ○ Unaccompanied base quarters (include BEQ, BOQ, MOQ, Transient Personnel Billeting, barracks)
- ○ Base family housing
- ○ Off-base, military-provided housing
- ○ Civilian housing (rented or owned)
- ○ Aboard ship
- ○ Navy lodge
- ○ Other (specify) _____

8. What is the ZIP code, APO code, or FPO code of the sponsor's current living quarters (including aboard ship)?
- • Write the numbers in the boxes.
- • Then, mark the matching circle below each box.

9. How long has the sponsor lived at his/her current living quarters (including aboard ship)?
- ○ 3 months or less
- ○ Between 3 and 6 months
- ○ Between 6 and 12 months
- ○ Over 12 months

10. Is the sponsor currently married?
- ○ No, GO TO QUESTION 16
- ○ Yes, living in same quarters as spouse, GO TO QUESTION 13
- ○ Yes, not living in same quarters as spouse

11. How long have the sponsor and current spouse lived in separate living quarters?
- ○ 3 months or less
- ○ Between 3 and 6 months
- ○ Between 6 and 12 months
- ○ Over 12 months

12. What is the ZIP code, APO code, or FPO code of the SPOUSE's current living quarters? Please answer for the spouse of the sponsor (the active-duty, retired, or deceased service member).
- • Write the numbers in the boxes.
- • Then, mark the matching circle below each box.

PLEASE DO NOT MARK IN THIS AREA 23028

13. **What is (was) the status of the SPOUSE's military service? Please answer for the spouse of the sponsor (the active-duty, retired, or deceased service member).**

- ○ Spouse never served in the military, GO TO QUESTION 15
- ○ Spouse a former service member but not retired
- ○ Spouse a retired service member
- ○ Spouse currently on active duty
- ○ Spouse currently in the Guard/Reserve

14. **What is (was) the SPOUSE's highest paygrade?**

○ Not sure

Enlisted	Warrant Grade	Officer Grade
○ E-1	○ W-1	○ O-1
○ E-2	○ W-2	○ O-2
○ E-3	○ W-3	○ O-3
○ E-4	○ W-4	○ O-4
○ E-5	○ W-5	○ O-5
○ E-6		○ O-6
○ E-7		○ O-7 to O-10
○ E-8		
○ E-9		

15. **What was the SPOUSE's age on his/her last birthday?**

- Write the numbers in the boxes.
- Then, mark the matching circle below each box.

0	0
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9

16. **Other than the sponsor and spouse, how many CURRENTLY ELIGIBLE (for military medical benefits) family members are there in each of the following age groups? Mark the number of family members in each age group as of their last birthday. Include ELIGIBLE family members from all marriages. Please answer both Part A and Part B.**

○ No other eligible family members

	Part A: Number of Eligible Family Members	Part B: Number Who Live With Sponsor
Under 1 year old	0 1 2 3 4 5+	0 1 2 3 4 5+
Between 1 and 5 years old	0 1 2 3 4 5+	0 1 2 3 4 5+
Between 6 and 18 years old	0 1 2 3 4 5+	0 1 2 3 4 5+
Between 19 and 23 years old	0 1 2 3 4 5+	0 1 2 3 4 5+
Between 24 and 64 years old	0 1 2 3 4 5+	0 1 2 3 4 5+
Over 64 years old	0 1 2 3 4 5+	0 1 2 3 4 5+

17. **What is the current employment status for the sponsor and spouse? Mark ALL that apply.**

	Sponsor	Spouse
On military active duty	○	○
Retired from military service	○	○
Work for employer 35 hours or more per week	○	○
Work for employer 20-34 hours per week	○	○
Work for employer less than 20 hours per week	○	○
Work for employer a variable number of hours per week	○	○
Self-employed	○	○
In school	○	○
Unemployed, looking for work	○	○
Disabled, unable to work	○	○
Retired from civilian employment	○	○
Homemaker	○	○
Unpaid volunteer	○	○
Other (specify) _____	○	○

18. **Does your family receive assistance from any of the following programs? Mark ALL that apply.**

- Unemployment Compensation
- Women, Infants, and Children (WIC)
- Worker's Compensation
- VA Disability
- Other Disability
- Food Stamps
- Aid for Dependent Children (AFDC)
- Social Security
- Supplemental Security Income (SSI)
- Medicaid (income-tested health insurance program)
- Other (specify) _____
- None

19. **What was the total income, before taxes, for the sponsor and spouse over the last 12 months? Please include all income, including wages, salaries, allowances, tips, interest, dividends, alimony, pensions, and any programs listed in QUESTION 18.**

- ○ Less than $15,000
- ○ $15,000 to $24,999
- ○ $25,000 to $34,999
- ○ $35,000 to $49,999
- ○ $50,000 to $74,999
- ○ $75,000 to $99,999
- ○ $100,000 and over

II HEALTH CARE BENEFITS

In this section, you will be asked questions about how you and your eligible family members use your military and other health care benefits, whether for military or civilian medical care.

20. **Do you know who to contact or where to get information about the following?** Mark one answer for each item.

	Yes	No	Does not Apply
Health services and procedures available at Military Medical Treatment Facilities	○	○	○
Charges for overnight stays at military hospitals	○	○	○
Health services and procedures covered by CHAMPUS	○	○	○
Charges for health services and procedures covered by CHAMPUS	○	○	○
DEERS enrollment procedures	○	○	○
When you need to obtain a Nonavailability Statement (NAS)	○	○	○
Freedom of choice in selecting doctors, clinics, and hospitals (military or civilian)	○	○	○
CHAMPUS claims filing procedures	○	○	○
Problems with a CHAMPUS claim	○	○	○
Health benefits available after age 65	○	○	○
Dental care available at Military Medical Treatment Facilities	○	○	○
Active Duty Dependents Dental Plan (DDP★ Delta)	○	○	○

21. **Are any members of your family (including the sponsor) eligible for CHAMPUS benefits?**

- Yes
- No, GO TO QUESTION 28

22. **What are the current DEDUCTIBLES (payments you make before you receive any money from CHAMPUS), FOR YOU AND YOUR FAMILY, for *outpatient* services (no overnight stays) covered under CHAMPUS? Do not count CHAMPUS supplemental coverage.**

- No deductibles, CHAMPUS covers all expenses
- $50 per person, $100 per family
- $100 per person, $200 per family
- $150 per person, $300 per family
- None of the above
- Don't know

23. **What are the current COPAYMENTS (your out-of-pocket costs after the deductible is met), FOR YOU AND YOUR FAMILY MEMBERS, for *outpatient* services covered under CHAMPUS? Do not count CHAMPUS supplemental coverage.**

- ○ No copayments, CHAMPUS covers all expenses
- ○ 10 percent of covered expenses after deductible is met
- ○ 20 percent of covered expenses after deductible is met
- ○ 25 percent of covered expenses after deductible is met
- ○ None of the above
- ○ Don't know

PLEASE DO NOT MARK IN THIS AREA

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24. **During the past 12 months, how many times did you or ELIGIBLE members of your family use a CIVILIAN medical doctor, clinic, or hospital for medical care WITHOUT FILING A CHAMPUS CLAIM? Please count visits for services *only* if CHAMPUS might have paid for them. Do not count visits for prescriptions.**

- ○ Does not apply, no eligible family members used a civilian medical facility during the past 12 months. GO TO QUESTION 26
- ○ Always filed a CHAMPUS claim, GO TO QUESTION 26
- ○ Did not file a claim once or twice
- ○ Did not file a claim 3 or 4 times
- ○ Did not file a claim 5 or more times
- ○ Don't know, GO TO QUESTION 26

25. **During the past 12 months, what were the reasons you did NOT file a CHAMPUS claim for your family's visits for medical care to civilian medical facilities?** Mark ALL that apply.

- ○ There were no charges for the medical care received
- ○ Didn't obtain a Nonavailability Statement (NAS) before care was received
- ○ Wasn't worth the hassle of filing a CHAMPUS claim
- ○ CHAMPUS deductible not met
- ○ Doctor did not accept CHAMPUS
- ○ Other insurance covered all or most of the charges
- ○ Payments from CHAMPUS take too long
- ○ Not eligible for CHAMPUS at time of care
- ○ Not enrolled in DEERS
- ○ Didn't have to file a claim for payment
- ○ CHAMPUS didn't cover the type of care received
- ○ Another reason (specify) _____

26. **How satisfied are you with the following aspects of your CHAMPUS benefits?** Mark one answer for each item.

	Very Satisfied	Satisfied	Mixed/ Neither	Dissatisfied	Very Dissatisfied	Does not apply/Don't Know
Doctors' willingness to file CHAMPUS claims	○	○	○	○	○	○
CHAMPUS claims filing procedures	○	○	○	○	○	○
Time it takes to solve claims problems	○	○	○	○	○	○
Time waiting for payments from CHAMPUS	○	○	○	○	○	○
Amount of CHAMPUS deductible	○	○	○	○	○	○
Amount of CHAMPUS copayment	○	○	○	○	○	○
Services and procedures covered by CHAMPUS	○	○	○	○	○	○
Ease of obtaining a Nonavailability Statement	○	○	○	○	○	○

27. **Do you or any members of your family currently use any of the following military health care programs?**

- ○ CHAMPUS Prime or CHAMPUS EXTRA
- ○ Army Gateway to Care
- ○ Army Catchment Area Management (CAM)
- ○ Air Force MEDEXCEL
- ○ Navy CAMCHAS PRIME
- ○ None of the above

28. **Are you or any members of your family ELIGIBLE for PRIVATE medical insurance, such as Blue Cross/Blue Shield, Prudential, Aetna, or another PRIVATE insurance company? Please count employer-sponsored insurance plans and prepaid health plans or HMOs (Health Maintenance Organizations). Do not count CHAMPUS or MEDICARE.**

- ○ Yes
- ○ No

29. **Who in your family is now covered by any of the following health insurance programs?** Mark ALL that apply.

	Sponsor	Spouse
Standard CHAMPUS	○	○
CHAMPUS supplemental insurance (Medical insurance you usually get through military or retiree associations. It helps pay the amount due after CHAMPUS pays its share of charges for medical care.)	○	○
Medicare Part B	○	○
Private health insurance (Blue Cross/Blue Shield, Prudential, AARP, etc) or a prepaid health plan or HMO (Health Maintenance Organization)	○	○
Other (specify) _____	○	○

30. **If any members of your family are covered by a prepaid health plan or HMO (Health Maintenance Organization), or by other private health insurance, who pays for this insurance?** Mark ALL that apply.

- ○ Does not apply, do not have this type of plan
- ○ Cost paid entirely by myself or my family
- ○ Cost shared by my family and current or former employers
- ○ Cost paid entirely by current or former employers
- ○ Other (specify) _____

31. In the civilian sector, health insurance is often paid for jointly by employer and employee contributions, and the employee has a range of choices about the kinds of insurance provided. In the military, uniform health care is provided by the government either at Military Medical Treatment Facilities or through CHAMPUS or MEDICARE.

Assuming that the total value of your pay (active-duty or retirement) and health care benefits remains the same, would you prefer:

- ○ More pay in exchange for less medical coverage
- ○ Same pay and same medical coverage
- ○ Less pay in exchange for more medical coverage

32. If you had to buy a private insurance policy that would provide you and your family with the same level of coverage as your military medical benefits, how much do you think you would have to pay per month?

- ○ Less than $10 per month
- ○ $10 to $24 per month
- ○ $25 to $49 per month
- ○ $50 to $99 per month
- ○ $100 to $199 per month
- ○ $200 to $299 per month
- ○ $300 to $399 per month
- ○ $400 to $499 per month
- ○ $500 or more per month

33. Suppose you and your family were assigned to a duty station or lived in an area where military medical services and CHAMPUS are not available and that you would be paid an additional monthly allowance to make up for the lack of these services. How much of an additional monthly allowance do you think would be fair to make up for these services?

- Write the numbers in the boxes, making sure that the last number is always placed in the right-hand box.
- Fill in the unused boxes with zeros.
- Then, mark the matching circle below each box.

Per Month

$ ☐☐☐

0	0	0
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7
8	8	8
9	9	9

IN THE FOLLOWING SECTIONS, YOU WILL BE ASKED QUESTIONS ABOUT RECENT MEDICAL CARE YOU AND YOUR FAMILY HAVE RECEIVED FROM ANY SOURCE, WHETHER MILITARY OR CIVILIAN.

III RECENT MEDICAL HISTORY

In this section, you will be asked questions about medical care received during the past 12 months by the sponsor and family members who are eligible to receive military medical benefits.

34. How would you describe the health of your ELIGIBLE family members in general?

	Excellent	Very Good	Good	Fair	Poor
Sponsor	○	○	○	○	○
Spouse	○	○	○	○	○
Children (Enter first names below, from oldest to youngest)					
Child 1 _____	○	○	○	○	○
Child 2 _____	○	○	○	○	○
Child 3 _____	○	○	○	○	○
Child 4 _____	○	○	○	○	○
Child 5 _____	○	○	○	○	○
Child 6 _____	○	○	○	○	○
Child 7 _____	○	○	○	○	○
Child 8 _____	○	○	○	○	○
Child 9 _____	○	○	○	○	○
Child 10 _____	○	○	○	○	○
Other family members (Enter relationship below)					
Family member 1 _____	○	○	○	○	○
Family member 2 _____	○	○	○	○	○

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35. **During the past 12 months, did you or any ELIGIBLE family members visit a medical doctor or assistant at any type of military or civilian hospital, clinic, or doctor's office? DO NOT count doctors seen while an overnight patient in a hospital, dental care, or visits to pick up prescriptions.**

○ Yes ○ No, GO TO QUESTION 37

36. **During the past 12 months, how many times did you or any ELIGIBLE family members visit a medical doctor or assistant at any type of military or civilian hospital, clinic, or doctor's office? DO NOT count doctors seen while an overnight patient in a hospital, dental care, or visits to pick up prescriptions. Your best guess will do.**

	0	1	2	3	4	5	6	7	8	9	10+
Sponsor	0	1	2	3	4	5	6	7	8	9	10+
Spouse	0	1	2	3	4	5	6	7	8	9	10+
Children (Enter first names below from oldest to youngest)	0	1	2	3	4	5	6	7	8	9	10+
Child 1 _____	0	1	2	3	4	5	6	7	8	9	10+
Child 2 _____	0	1	2	3	4	5	6	7	8	9	10+
Child 3 _____	0	1	2	3	4	5	6	7	8	9	10+
Child 4 _____	0	1	2	3	4	5	6	7	8	9	10+
Child 5 _____	0	1	2	3	4	5	6	7	8	9	10+
Child 6 _____	0	1	2	3	4	5	6	7	8	9	10+
Child 7 _____	0	1	2	3	4	5	6	7	8	9	10+
Child 8 _____	0	1	2	3	4	5	6	7	8	9	10+
Child 9 _____	0	1	2	3	4	5	6	7	8	9	10+
Child 10 _____	0	1	2	3	4	5	6	7	8	9	10+
Other family members (Enter relationship below)	0	1	2	3	4	5	6	7	8	9	10+
Family member 1 _____	0	1	2	3	4	5	6	7	8	9	10+
Family member 2 _____	0	1	2	3	4	5	6	7	8	9	10+

37. **During the past 12 months, did you or any ELIGIBLE family members stay OVERNIGHT as a patient in a civilian or military hospital?**

○ Yes ○ No, GO TO QUESTION 39

38. **During the past 12 months, how many nights did you or any ELIGIBLE family member stay OVERNIGHT as a patient in a civilian or military hospital? Your best guess will do.**

	0	1	2	3	4	5	6	7	8	9	10+
Sponsor	0	1	2	3	4	5	6	7	8	9	10+
Spouse	0	1	2	3	4	5	6	7	8	9	10+
Children (Enter first names below, from oldest to youngest)	0	1	2	3	4	5	6	7	8	9	10+
Child 1 _____	0	1	2	3	4	5	6	7	8	9	10+
Child 2 _____	0	1	2	3	4	5	6	7	8	9	10+
Child 3 _____	0	1	2	3	4	5	6	7	8	9	10+
Child 4 _____	0	1	2	3	4	5	6	7	8	9	10+
Child 5 _____	0	1	2	3	4	5	6	7	8	9	10+
Child 6 _____	0	1	2	3	4	5	6	7	8	9	10+
Child 7 _____	0	1	2	3	4	5	6	7	8	9	10+
Child 8 _____	0	1	2	3	4	5	6	7	8	9	10+
Child 9 _____	0	1	2	3	4	5	6	7	8	9	10+
Child 10 _____	0	1	2	3	4	5	6	7	8	9	10+
Other family members (Enter relationship below)	0	1	2	3	4	5	6	7	8	9	10+
Family member 1 _____	0	1	2	3	4	5	6	7	8	9	10+
Family member 2 _____	0	1	2	3	4	5	6	7	8	9	10+

39. In the NEXT 12 months, how many times do you or any member of your family EXPECT to visit a medical doctor at any type of military or civilian hospital, clinic, or doctor's office? Your best guess will do.

○ Do not expect any family members to visit a medical doctor in the next 12 months

	None	1	2	3-5	6-10	11-15	Over 15
Sponsor	○	○	○	○	○	○	○
Spouse	○	○	○	○	○	○	○
Children (Enter first names below, from oldest to youngest)	○	○	○	○	○	○	○
Child 1 _____	○	○	○	○	○	○	○
Child 2 _____	○	○	○	○	○	○	○
Child 3 _____	○	○	○	○	○	○	○
Child 4 _____	○	○	○	○	○	○	○
Child 5 _____	○	○	○	○	○	○	○
Child 6 _____	○	○	○	○	○	○	○
Child 7 _____	○	○	○	○	○	○	○
Child 8 _____	○	○	○	○	○	○	○
Child 9 _____	○	○	○	○	○	○	○
Child 10 _____	○	○	○	○	○	○	○
Other family members (Enter relationship below)	○	○	○	○	○	○	○
Family member 1 _____	○	○	○	○	○	○	○
Family member 2 _____	○	○	○	○	○	○	○

40. In the NEXT 12 months, do you EXPECT that you or any member of your family will stay OVERNIGHT as a patient in any type of hospital? Your best guess will do.

○ Do not expect any family members to have any hospital stays in the next 12 months

	Yes	No
Sponsor	○	○
Spouse	○	○
Children (Enter first names below, from oldest to youngest)	○	○
Child 1 _____	○	○
Child 2 _____	○	○
Child 3 _____	○	○
Child 4 _____	○	○
Child 5 _____	○	○
Child 6 _____	○	○
Child 7 _____	○	○
Child 8 _____	○	○
Child 9 _____	○	○
Child 10 _____	○	○
Other family members (Enter relationship below)	○	○
Family member 1 _____	○	○
Family member 2 _____	○	○

41. Of the family members who are CURRENTLY ELIGIBLE for military medical benefits, who had the LAST birthday (include newborns)? We are not asking for the youngest family member but, rather, the family member whose birthday happened most recently. If 2 or more members had birthdays on the same day, please mark the one listed first in QUESTION 40.

○ Sponsor, GO TO QUESTION 44
○ Spouse, GO TO QUESTION 44
Child (Enter child number as listed in QUESTION 40) ①②③④⑤ ⑥⑦⑧⑨⑩
Other family member (Enter family member number as listed in QUESTION 40) ①②

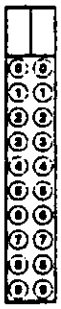
42. Is the family member specified above (the one with the LAST BIRTHDAY):

○ Male
○ Female

43. How old was this family member (the one with the LAST BIRTHDAY) on his/her last birthday?

○ Less than 1 year old

- Write the numbers in the boxes, making sure that the last number is always placed in the right-hand box.
- Fill in the unused boxes with zeros.
- Then, mark the matching circle below each box.



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44. During the past 12 months, did this family member (the one with the LAST BIRTHDAY) have any of the following medical conditions? Mark ALL that apply.

- ○ Did not have any medical problems during the past 12 months
- ○ Chronic bronchitis, asthma, emphysema, or other severe lung problems
- ○ Chest pain, heart attack, or angina
- ○ High blood pressure (hypertension)
- ○ Varicose veins
- ○ Hemorrhoids
- ○ Diabetes or pre-diabetes (sugar in blood, sugar disease)
- ○ Joint problems (including arthritis, gout, rheumatism)
- ○ Back problems (including disc, spine, or hip impairments)
- ○ Cancer (except skin cancer)
- ○ Skin cancer
- ○ Depression or other mental health conditions
- ○ Hay fever or other allergies
- ○ Overweight problems
- ○ Trouble with alcohol or drugs
- ○ Stomach flu or virus (gastroenteritis) with vomiting or diarrhea
- ○ Sore throat, cold, or flu, lasting more than 3 days
- ○ Frequent digestive upsets, stomach trouble, or intestinal trouble
- ○ Bladder or urinary tract problems
- ○ Vision problems
- ○ Hearing problems
- ○ Prostate trouble
- ○ Menstrual troubles (irregular bleeding, bleeding between periods, chronic infection, or menopausal problems)
- ○ Some other problems (specify) _____
- ○ Don't know

45. During the past 12 months, did this family member (the one with the LAST BIRTHDAY) see a doctor or other health care provider for any of the following preventive health services? Mark ALL that apply.

- ○ Routine physical exam
- ○ Immunizations
- ○ Cholesterol test
- ○ Other blood test
- ○ Blood pressure check
- ○ HIV test (AIDS)
- ○ Tuberculin (TB) test
- ○ Electrocardiogram (test for heart irregularities)
- ○ Examination for skin cancer
- ○ Testicular examination
- ○ Prostate examination
- ○ Breast examination
- ○ Mammogram
- ○ Pap smear
- ○ Rectal examination
- ○ Counseling or instruction to promote healthy lifestyle changes
- ○ Some other preventive health service (specify) _____
- ○ Did not have any visits for preventive health services during the past 12 months
- ○ Don't know

46. Which of the following places does this family member (the one with the LAST BIRTHDAY) USUALLY go to when sick or when advice is needed about his/her health? DO NOT include places this family member goes to for dental care. Mark ALL that apply.

- ○ Military hospital outpatient clinic
- ○ Military hospital emergency room
- ○ PRIMUS or NAVCARE clinic
- ○ Veterans Administration (VA) hospital outpatient clinic
- ○ Civilian doctor's office
- ○ Civilian hospital emergency room
- ○ Civilian prepaid health plan or HMO (Health Maintenance Organization)
- ○ Another type of military place (specify) _____
- ○ Another type of civilian place (specify) _____
- ○ Don't know

47. During the past 12 months, how many times did this family member (the one with the LAST BIRTHDAY) visit a medical doctor or assistant at any of the following places for his or her OWN MEDICAL CARE? DO NOT count doctors seen while an overnight patient in a hospital, dental care, or visits to pick up prescriptions. Your best guess will do.

○ Does not apply, this family member did not visit a doctor or assistant during the past 12 months

	0	1	2	3	4	5	6	7	8	9	10+
Military or field/fleet hospital or clinic (not including sick call)	0	1	2	3	4	5	6	7	8	9	10+
For active-duty sponsors only:											
Sick call visits to a military hospital or clinic	0	1	2	3	4	5	6	7	8	9	10+
Civilian doctor's office, hospital, or clinic	0	1	2	3	4	5	6	7	8	9	10+
PRIMUS or NAVCARE clinic	0	1	2	3	4	5	6	7	8	9	10+
Veterans Administration (VA) hospital or clinic	0	1	2	3	4	5	6	7	8	9	10+
Another type of place (specify) _____	0	1	2	3	4	5	6	7	8	9	10+

○ Don't know

48. During the past 12 months, how many nights did this family member (the one with LAST BIRTHDAY) stay OVERNIGHT as a patient in any of the following places? Your best guess will do.

○ Does not apply, this family member had no hospital stays during the past 12 months.

	0	1	2	3	4	5	6	7	8	9	10+
Military or field/fleet hospital	0	1	2	3	4	5	6	7	8	9	10+
Civilian hospital	0	1	2	3	4	5	6	7	8	9	10+
Veterans Administration (VA) hospital	0	1	2	3	4	5	6	7	8	9	10+
Another type of place (specify) _____	0	1	2	3	4	5	6	7	8	9	10+

○ Had a stay but don't know what type of place

49. Did or will you use standard CHAMPUS or any of the new military health care programs to pay for the health care this family member (the one with the LAST BITHDAY) received from a CIVILIAN doctor, hospital, or clinic in the past 12 months?
Note: The new military health care programs have different names in different areas. They are called Catchment Area Management, CAM, Gateway to Care, MEDEXCEL, CAMCHAS PRIME, CHAMPUS PRIME, and CHAMPUS EXTRA.

○ Does not apply, this family member is not eligible for CHAMPUS
○ Does not apply, this family member did not receive any civilian care in the past 12 months
○ Yes, used CHAMPUS to pay for ALL of this family member's civilian care
○ Yes, used CHAMPUS to pay for MOST of this family member's civilian care
○ Yes, used CHAMPUS to pay for SOME of this family member's civilian care
○ No, did not use CHAMPUS to pay for any of this family member's civilian care

IV MOST RECENT VISIT FOR OUTPATIENT CARE

In this section, you will be asked questions about the most recent visit for *outpatient* care, to either a civilian or military medical facility, by a family member (sponsor, spouse, child, or other dependent) who is eligible to receive military medical benefits. By *outpatient* care we mean any service or procedure that does *not* require an overnight stay in the hospital. This includes visits to doctors, clinics, hospitals, and emergency rooms if not admitted. It does not include visits for dental care, oral surgery, or prescriptions.

50. Which ELIGIBLE family member made the MOST RECENT visit for *outpatient* care? If 2 or more family members made an outpatient visit at the same time, please select the oldest. If possible, please consult this person for the remainder of this section.

○ Sponsor, GO TO QUESTION 53
○ Spouse, GO TO QUESTION 53
○ Child
○ Other family member (specify) _____

51. Is the family member specified in QUESTION 50:

○ Male
○ Female

52. How old was this family member (the one with the MOST RECENT outpatient visit) on his/her last birthday?

○ Less than 1 year old

- Write the numbers in the boxes, making sure that the last number is always placed in the right-hand box.
- Fill in the unused boxes with zeros.
- Then, mark the matching circle below each box.

53. How would you describe the health of this family member (the one with the MOST RECENT outpatient visit) in general?

○ Excellent
○ Very good
○ Good
○ Fair
○ Poor

54. Thinking about this family member's MOST RECENT visit for *outpatient* care (do *not* include visits for dental care, or prescriptions), when was it?

○ Within the last 30 days
○ Between 1 and 3 months ago
○ Between 3 and 6 months ago
○ More than 6 months ago, GO TO QUESTION 72

If this family member's most recent *outpatient* visit to a medical facility was 6 months ago or less, please answer the following questions. Otherwise GO TO QUESTION 72.

55. Did this family member live with the sponsor at the time of the MOST RECENT *outpatient* visit?

○ Does not apply, this family member is the sponsor
○ Yes
○ No

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56. Is this family member enrolled in a Primary Care Clinic at a Military Medical Treatment Facility?

- ○ No
- ○ Yes, Family Practice
- ○ Yes, Internal Medicine
- ○ Yes, Pediatrics
- ○ Yes, Ambulatory Gynecology (GYN)
- ○ Yes, Other (specify) _____
- ○ Don't know

57. What were the reasons for this family member's MOST RECENT *outpatient* visit? Mark ALL that apply.

- ○ Routine pediatric care
- ○ Allergy shots
- ○ Pre-natal care (pregnancy)
- ○ Other Obstetric/Gynecological (OB/GYN) services
- ○ Follow-up after surgery or hospital stay
- ○ Sexually-transmitted diseases
- ○ Treatment for recurring, long-term illness
- ○ Treatment for short-term illness (cold, flu, etc.)
- ○ Treatment for injuries (not requiring overnight stay)
- ○ Minor surgery (any surgery not requiring overnight stay)
- ○ Mental health care
- ○ Alcohol or drug treatment
- ○ Physical or occupational therapy
- ○ Eye care or vision problems
- ○ Ear care or hearing problems
- ○ Routine medical examination, blood test, X-rays, etc.
- ○ Other (specify) _____
- ○ Don't know

58. What type of medical facility did this family member use for the MOST RECENT *outpatient* visit?

- ○ Military hospital emergency room
- ○ Military or field/fleet hospital, clinic, or dispensary (including sick call)
- ○ Civilian hospital emergency room
- ○ Civilian doctor's office, hospital, or clinic
- ○ Veterans Administration (VA) hospital or clinic
- ○ Another type of place (specify) _____
- ○ Don't know

59. What is the location of the medical facility this family member used for the MOST RECENT *outpatient* visit?

- ○ Within the 50 American states
- ○ Outside the 50 American states
- ○ Aboard ship

60. If this family member's MOST RECENT *outpatient* visit was to a Military Medical Treatment Facility within the 50 American states, please mark the place used from the list below.

ALABAMA
- ○ Fort McClellan
- ○ Fort Rucker
- ○ Maxwell Air Force Base
- ○ Redstone Arsenal
- ○ Other military facility

ALASKA
- ○ Adak Naval Hospital
- ○ Elmendorf Air Force Base
- ○ Fort Wainwright
- ○ Other military facility

ARIZONA
- ○ Davis Monthan Air Force Base
- ○ Fort Huachuca
- ○ Luke Air Force Base
- ○ Williams Air Force Base
- ○ Other military facility

ARKANSAS
- ○ Blytheville Air Force Base
- ○ Little Rock Air Force Base
- ○ Other military facility

CALIFORNIA
- ○ Beale Air Force Base
- ○ Camp Pendleton Naval Hospital
- ○ Castle Air Force Base
- ○ Edwards Air Force Base
- ○ Fort Irwin
- ○ Fort Ord
- ○ George Air Force Base
- ○ Lemoore Naval Hospital
- ○ Letterman Army Medical Center
- ○ Long Beach Naval Hospital
- ○ March Air Force Base
- ○ Mather Air Force Base
- ○ Oakland Naval Hospital
- ○ San Diego Naval Hospital
- ○ Travis Air Force Base
- ○ Twentynine Palms Naval Hospital
- ○ Vandenberg Air Force Base
- ○ Other military facility

COLORADO
- ○ Fitzsimons Army Medical Center
- ○ Fort Carson
- ○ USAF Academy
- ○ Other military facility

CONNECTICUT
- ○ Groton Naval Hospital
- ○ Other military facility

DELAWARE
- ○ Dover Air Force Base
- ○ Other military facility

DISTRICT OF COLUMBIA
- ○ Walter Reed Army Medical Center
- ○ Other military facility

FLORIDA
- ○ Eglin Air Force Base
- ○ Homestead Air Force Base
- ○ Jacksonville Naval Hospital
- ○ MacDill Air Force Base
- ○ Orlando Naval Hospital
- ○ Patrick Air Force Base
- ○ Pensacola Naval Hospital
- ○ Tyndall Air Force Base
- ○ Other military facility

Continue

Question 60 continued

GEORGIA
- Fort Benning
- Fort Gordon
- Fort Stewart
- Moody Air Force Base
- Robins Air Force Base
- Other military facility

HAWAII
- Tripler Army Medical Center
- Other military facility

IDAHO
- Mountain Home Air Force Base
- Other military facility

ILLINOIS
- Chanute Air Force Base
- Great Lakes Naval Hospital
- Scott Air Force Base
- Other military facility

INDIANA
- Fort Benjamin Harrison
- Grissom Air Force Base
- Other military facility

IOWA
- Military clinic

KANSAS
- Fort Leavenworth
- Fort Riley
- McConnell Air Force Base
- Other military facility

KENTUCKY
- Fort Campbell
- Fort Knox
- Other military facility

LOUISIANA
- Barksdale Air Force Base
- England Air Force Base
- Fort Polk
- Other military facility

MAINE
- Loring Air Force Base
- Other military facility

MARYLAND
- Andrews Air Force Base
- Bethesda Naval Hospital
- Fort Meade
- Homewood Hospital Center
- Patuxent River Naval Hospital
- Other military facility

MASSACHUSETTS
- Brighton Marine Health Center
- Fort Devens
- Other military facility

MICHIGAN
- K.I. Sawyer Air Force Base
- Wurtsmith Air Force Base
- Other military facility

MINNESOTA
- Military clinic

MISSISSIPPI
- Columbus Air Force Base
- Gulfport Naval Home
- Keesler Air Force Base
- Other military facility

MISSOURI
- Fort Leonard Wood
- Whiteman Air Force Base
- Other military facility

MONTANA
- Malmstrom Air Force Base
- Other military facility

NEBRASKA
- Offutt Air Force Base
- Other military facility

NEVADA
- Nellis Air Force Base
- Other military facility

NEW HAMPSHIRE
- Pease Air Force Base
- Other military facility

NEW JERSEY
- Fort Dix
- Fort Monmouth
- Other military facility

NEW MEXICO
- Cannon Air Force Base
- Holloman Air Force Base
- Kirtland Air Force Base
- Other military facility

NEW YORK
- Bayley-Seton Hospital
- Griffiss Air Force Base
- Plattsburgh Air Force Base
- West Point
- Other military facility

NORTH CAROLINA
- Camp Lejeune Naval Hospital
- Cherry Point Naval Hospital
- Fort Bragg
- Seymour Johnson Air Force Base
- Other military facility

NORTH DAKOTA
- Grand Forks Air Force Base
- Minot Air Force Base
- Other military facility

OHIO
- Wright-Patterson Air Force Base
- Other military facility

OKLAHOMA
- Altus Air Force Base
- Fort Sill
- Tinker Air Force Base
- Other military facility

OREGON
- Military clinic

PENNSYLVANIA
- Philadelphia Naval Hospital
- Other military facility

RHODE ISLAND
- Newport Naval Hospital
- Other military facility

SOUTH CAROLINA
- Beaufort Naval Hospital
- Charleston Naval Hospital
- Fort Jackson
- Myrtle Beach Air Force Base
- Shaw Air Force Base
- Other military facility

SOUTH DAKOTA
- Ellsworth Air Force Base
- Other military facility

TENNESSEE
- Millington Naval Hospital
- Other military facility

TEXAS
- Bergstrom Air Force Base
- Carswell Air Force Base
- Corpus Christi Naval Hospital
- Dyess Air Force Base
- Fort Bliss
- Fort Hood
- Fort Sam Houston
- Hospital of St. John
- Lackland Air Force Base
- Laughlin Air Force Base
- Reese Air Force Base
- Sheppard Air Force Base
- Other military facility

UTAH
- Hill Air Force Base
- Other military facility

VERMONT
- Military clinic

VIRGINIA
- Fort Belvoir
- Fort Eustis
- Fort Lee
- Langley Air Force Base
- Portsmouth Naval Hospital
- Other military facility

WASHINGTON
- Bremerton Naval Hospital
- Fairchild Air Force Base
- Fort Lewis
- Oak Harbor Naval Hospital
- Pacific Medical Center
- Other military facility

WASHINGTON, D.C.
- See DISTRICT OF COLUMBIA

WEST VIRGINIA
- Military clinic

WISCONSIN
- Military clinic

WYOMING
- F.E. Warren Air Force Base
- Other military facility

61. How many phone calls were made by (or for) this family member before getting through to the appointment clerk?
- ○ Does not apply, did not try to make appointment over the phone
- ○ Made appointment with 1 or 2 short phone calls
- ○ Had to make several calls or was put on hold for a long time
- ○ Gave up trying to make appointment by phone and came in personally
- ○ Don't know

62. How long after the appointment clerk or receptionist was first contacted did this family member have to wait for the appointment at the medical facility used MOST RECENTLY for *outpatient* care?
- ○ Does not apply, did not make an appointment
- ○ Appointment intentionally made in advance
- ○ Same or next day
- ○ More than 1 day but less than a week
- ○ Between 1 and 2 weeks
- ○ Between 2 weeks and a month
- ○ More than a month
- ○ Don't know

63. When this family member visited the medical facility used MOST RECENTLY for *outpatient* care, was he/she living at:
- ○ Primary residence or other location within 40 miles of primary residence
- ○ Another location more than 40 miles away from primary residence (second home, vacation home, hotel, etc.)

64. About how long did it take this family member to get to the medical facility used MOST RECENTLY for *outpatient* care from the location marked in QUESTION 63 above?
- ○ 15 minutes or less
- ○ 16-30 minutes
- ○ 31-45 minutes
- ○ 46 minutes to an hour
- ○ More than an hour
- ○ Don't know

65. After this family member arrived at the medical facility used for the MOST RECENT *outpatient* visit, how long was the wait to see the doctor or other health care provider?
- ○ 15 minutes or less
- ○ 16-30 minutes
- ○ 31-45 minutes
- ○ 46 minutes to an hour
- ○ More than an hour
- ○ Don't know

66. What medical staff member spent the most time with this family member during the MOST RECENT visit for *outpatient* care?
- ○ Doctor
- ○ Nurse
- ○ Midwife
- ○ Physician's assistant or nurse practitioner
- ○ Physical or occupational therapist
- ○ Mental health professional
- ○ Medical corpsman, paramedic, or technician
- ○ Other (specify) _____
- ○ Don't know

Questions 67 to 70 ask for this family member's opinions about the medical facility used for the most recent outpatient visit. If this family member is a child, please answer from the parents' point of view.

67. Was the facility this family member used for the MOST RECENT *outpatient* visit chosen for any of the following reasons? Mark ALL that apply.
- ○ It was required in order to be covered by military health benefits
- ○ It was the only one available
- ○ He/she was referred there by his/her doctor
- ○ It has good emergency room services

68. Thinking of this family member's MOST RECENT visit for *outpatient* care, please rate the satisfaction with the facility used on each of the following factors. Mark one answer for each item.

	Very Satisfied	Satisfied	Mixed/ Neither	Dissatisfied	Very Dissatisfied	Does not apply/Don't Know
Convenience of location	○	○	○	○	○	○
Availability of parking	○	○	○	○	○	○
Hours when facility is open	○	○	○	○	○	○
Cleanliness of facility	○	○	○	○	○	○
Ability to see specialists when needed	○	○	○	○	○	○
Ability to use emergency room/services	○	○	○	○	○	○
Ability to make appointments by phone	○	○	○	○	○	○
Time waiting between appointment and visit	○	○	○	○	○	○
Time waiting for treatment	○	○	○	○	○	○
Ability to get medical advice over the phone	○	○	○	○	○	○
Ability to see doctor of choice	○	○	○	○	○	○
Confidentiality of care	○	○	○	○	○	○
Access to medical records	○	○	○	○	○	○
Quality of medical records	○	○	○	○	○	○
Cost of this visit	○	○	○	○	○	○
Overall satisfaction with facility	○	○	○	○	○	○

PLEASE DO NOT MARK IN THIS AREA 23028

69. Thinking of this family member's MOST RECENT visit for *outpatient* care, please rate the satisfaction with the staff at the facility used on each of the following factors. Mark one answer for each item.

	Very Satisfied	Satisfied	Mixed/ Neither	Dissatisfied	Very Dissatisfied	Does not apply/Don't Know
Thoroughness of examinations	○	○	○	○	○	○
Thoroughness of treatment	○	○	○	○	○	○
Clarity of doctor's explanations of tests and procedures	○	○	○	○	○	○
Time spent with doctor	○	○	○	○	○	○
Doctor's "bedside manner"	○	○	○	○	○	○
Attentiveness of staff (other than doctor)	○	○	○	○	○	○
Courtesy of staff (other than doctor)	○	○	○	○	○	○
Advice on preventing illness or injury	○	○	○	○	○	○
Doctor's willingness to discuss treatment options	○	○	○	○	○	○
Overall satisfaction with staff	○	○	○	○	○	○

70. Please rate the overall satisfaction with the quality of care this family member received during the MOST RECENT visit for *outpatient* care.

- ○ Very satisfied
- ○ Satisfied
- ○ Mixed/neither
- ○ Dissatisfied
- ○ Very dissatisfied
- ○ Don't know

71. Which of the following was (or will be) used to pay for this family member's MOST RECENT visit for *outpatient* care? Mark ALL that apply.

- ○ Does not apply, did not or will not have to pay for this visit.
- ○ Standard CHAMPUS
- ○ CHAMPUS supplemental insurance (Medical insurance you usually get through military or retiree associations. It helps pay the amount due after CHAMPUS pays its share of charges for medical care.)
- ○ One of the new military health care programs available in some areas (these new programs have names such as CHAMPUS PRIME or EXTRA, Catchment Area Management (CAM), Gateway to Care, MEDEXCEL, CAMCHAS Prime, etc.)
- ○ Medicare Part B
- ○ Private health insurance (Blue Cross/Blue Shield, Prudential, AARP, etc.) or a prepaid health plan or HMO (Health Maintenance Organization)
- ○ Public assistance (such as Medicaid)
- ○ Your own or your family's money
- ○ Other (specify) _____
- ○ Don't know

V MOST RECENT HOSPITAL STAY

In this section, you will be asked questions about the MOST RECENT hospital stay in a civilian or military hospital, by a family member (sponsor, spouse, child, or other dependent) who is eligible to receive military medical benefits.

72. Which ELIGIBLE family member had the MOST RECENT hospital stay? If 2 or more family members were admitted to the hospital at the same time, please select the oldest. If possible, please consult this person for the remainder of this section.

- ○ Does not apply, no one in my family has ever had a hospital stay, GO TO QUESTION 90
- ○ Sponsor, GO TO QUESTION 75
- ○ Spouse, GO TO QUESTION 75
- ○ Child
- ○ Other family member (specify) _____

73. Is the family member specified in QUESTION 72 above:

- ○ Male
- ○ Female

74. How old was this family member (the one with the MOST RECENT hospital stay) on his/her last birthday?

- ○ Less than 1 year old

- Write the numbers in the boxes, making sure that the last number is always placed in the right-hand box.
- Fill in the unused boxes with zeros.
- Then, mark the matching circle below each box.

0	0
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9

75. **How would you describe the health of this family member (the one with the MOST RECENT hospital stay) in general?**
- ◯ Excellent
- ◯ Very good
- ◯ Good
- ◯ Fair
- ◯ Poor

76. **Thinking about this family member's MOST RECENT hospital stay, when was it?**
- ◯ Less than 3 months ago
- ◯ Between 3 and 6 months ago
- ◯ Between 6 and 12 months ago
- ◯ More than 12 months ago, GO TO QUESTION 90

If this family member's most recent hospital stay was 12 months ago or less, please answer the following questions. Otherwise, GO TO QUESTION 90.

77. **Did this family member live with the sponsor at the time of the MOST RECENT hospital stay?**
- ◯ Does not apply, this family member is the sponsor
- ◯ Yes
- ◯ No

78. **What were the reasons for this family member's MOST RECENT hospital stay? Mark ALL that apply.**
- ◯ Pregnancy
- ◯ Infant care
- ◯ Accidents/injuries
- ◯ Back, spinal, or bone problems
- ◯ Arthritis, rheumatism, or other joint or muscular problems
- ◯ Digestive system problems
- ◯ Ear, nose, or mouth problems
- ◯ Heart problems
- ◯ Skin or breast problems
- ◯ Lung or breathing problems
- ◯ Gynecological problems
- ◯ Nervous system problems
- ◯ Alcohol or drug problems
- ◯ Mental health problems
- ◯ Kidney, bladder, or other urinary tract problems
- ◯ Eye care or vision problems
- ◯ Male reproductive system problems (including prostate)
- ◯ Liver or pancreas problems
- ◯ Diabetes or other blood problems
- ◯ Sexually-transmitted diseases
- ◯ AIDS
- ◯ Treatment for short-term illness (such as the flu)
- ◯ Diagnostic tests
- ◯ Other (specify) _____
- ◯ Don't know

79. **Did this family member have surgery on the MOST RECENT hospital stay?**
- ◯ Yes
- ◯ No

80. **Was this family member admitted to the medical facility used for the MOST RECENT hospital stay from the emergency room?**
- ◯ Yes
- ◯ No
- ◯ Don't know

81. **How many nights did this family member stay in the medical facility used for the MOST RECENT hospital stay?**
- ◯ Don't know
- ◯ 100 days or more

82. **What type of medical facility did this family member use for the MOST RECENT hospital stay?**
- ◯ Military hospital or field/fleet hospital
- ◯ Civilian hospital
- ◯ Veterans Administration (VA) hospital
- ◯ Another type of place _____
- ◯ Don't know

83. **What is the location of the medical facility this family member used for the MOST RECENT hospital stay?**
- ◯ Within the 50 American states
- ◯ Outside the 50 American states
- ◯ Aboard ship

84. **If this family member's MOST RECENT hospital stay was in a military hospital within the 50 American states, please mark the hospital used from list below.**

ALABAMA
- ◯ Fort McClellan
- ◯ Fort Rucker
- ◯ Maxwell Air Force Base
- ◯ Redstone Arsenal

ALASKA
- ◯ Adak Naval Hospital
- ◯ Elmendorf Air Force Base
- ◯ Fort Wainwright

ARIZONA
- ◯ Davis Monthan Air Force Base
- ◯ Fort Huachuca
- ◯ Luke Air Force Base
- ◯ Williams Air Force Base

ARKANSAS
- ◯ Blytheville Air Force Base
- ◯ Little Rock Air Force Base

Continue

23028

PLEASE DO NOT MARK IN THIS AREA

Question 84 continued

CALIFORNIA
- Beale Air Force Base
- Camp Pendleton Naval Hospital
- Castle Air Force Base
- Edwards Air Force Base
- Fort Irwin
- Fort Ord
- George Air Force Base
- Lemoore Naval Hospital
- Letterman Army Medical Center
- Long Beach Naval Hospital
- March Air Force Base
- Mather Air Force Base
- Oakland Naval Hospital
- San Diego Naval Hospital
- Travis Air Force Base
- Twentynine Palms Naval Hospital
- Vandenberg Air Force Base

COLORADO
- Fitzsimons Army Medical Center
- Fort Carson
- USAF Academy

CONNECTICUT
- Groton Naval Hospital

DELAWARE
- Dover Air Force Base

DISTRICT OF COLUMBIA
- Walter Reed Army Medical Center

FLORIDA
- Eglin Air Force Base
- Homestead Air Force Base
- Jacksonville Naval Hospital
- MacDill Air Force Base
- Orlando Naval Hospital
- Patrick Air Force Base
- Pensacola Naval Hospital
- Tyndall Air Force Base

GEORGIA
- Fort Benning
- Fort Gordon
- Fort Stewart
- Moody Air Force Base
- Robins Air Force Base

HAWAII
- Tripler Army Medical Center

IDAHO
- Mountain Home Air Force Base

ILLINOIS
- Chanute Air Force Base
- Great Lakes Naval Hospital
- Scott Air Force Base

INDIANA
- Fort Benjamin Harrison
- Grissom Air Force Base

KANSAS
- Fort Leavenworth
- Fort Riley
- McConnell Air Force Base

KENTUCKY
- Fort Campbell
- Fort Knox

LOUISIANA
- Barksdale Air Force Base
- England Air Force Base
- Fort Polk

MAINE
- Loring Air Force Base

MARYLAND
- Andrews Air Force Base
- Bethesda Naval Hospital
- Fort Meade
- Homewood Hospital Center
- Patuxent River Naval Hospital

MASSACHUSETTS
- Brighton Marine Health Center
- Fort Devens

MICHIGAN
- K.I. Sawyer Air Force Base
- Wurtsmith Air Force Base

MISSISSIPPI
- Columbus Air Force Base
- Gulfport Naval Home
- Keesler Air Force Base

MISSOURI
- Fort Leonard Wood
- Whiteman Air Force Base

MONTANA
- Malmstrom Air Force Base

NEBRASKA
- Offutt Air Force Base

NEVADA
- Nellis Air Force Base

NEW HAMPSHIRE
- Pease Air Force Base

NEW JERSEY
- Fort Dix
- Fort Monmouth

NEW MEXICO
- Cannon Air Force Base
- Holloman Air Force Base
- Kirtland Air Force Base

NEW YORK
- Bayley-Seton Hospital
- Griffiss Air Force Base
- Plattsburgh Air Force Base
- West Point

NORTH CAROLINA
- Camp Lejeune Naval Hospital
- Cherry Point Naval Hospital
- Fort Bragg
- Seymour Johnson Air Force Base

NORTH DAKOTA
- Grand Forks Air Force Base
- Minot Air Force Base

OHIO
- Wright-Patterson Air Force Base

OKLAHOMA
- Altus Air Force Base
- Fort Sill
- Tinker Air Force Base

PENNSYLVANIA
- Philadelphia Naval Hospital

RHODE ISLAND
- Newport Naval Hospital

SOUTH CAROLINA
- Beaufort Naval Hospital
- Charleston Naval Hospital
- Fort Jackson
- Myrtle Beach Air Force Base
- Shaw Air Force Base

SOUTH DAKOTA
- Ellsworth Air Force Base

TENNESSEE
- Millington Naval Hospital

TEXAS
- Bergstrom Air Force Base
- Carswell Air Force Base
- Corpus Christi Naval Hospital
- Dyess Air Force Base
- Fort Bliss
- Fort Hood
- Fort Sam Houston
- Hospital of St. John
- Lackland Air Force Base
- Laughlin Air Force Base
- Reese Air Force Base
- Sheppard Air Force Base

UTAH
- Hill Air Force Base

VIRGINIA
- Fort Belvoir
- Fort Eustis
- Fort Lee
- Langley Air Force Base
- Portsmouth Naval Hospital

WASHINGTON
- Bremerton Naval Hospital
- Fairchild Air Force Base
- Fort Lewis
- Oak Harbor Naval Hospital
- Pacific Medical Center

WASHINGTON, D.C.

See DISTRICT OF COLUMBIA

WYOMING
- F.E. Warren Air Force Base

Questions 85 to 88 ask for this family member's opinions about the medical facility used for the MOST RECENT hospital stay. If this family member is a child, please answer from the parents' point of view.

85. Was the facility this family member used for the MOST RECENT hospital stay chosen for any of the following reasons? Mark ALL that apply.

- ○ It was required in order to be covered by military health benefits
- ○ It was the only one available
- ○ He/she was referred there by his/her doctor
- ○ It has good emergency room services

86. Thinking of this family member's MOST RECENT hospital stay, please rate the satisfaction with the facility used on each of the following factors. Mark one answer for each item.

	Very Satisfied	Satisfied	Mixed/ Neither	Dissatisfied	Very Dissatisfied	Does not apply/Don't Know
Convenience of location	○	○	○	○	○	○
Availability of parking	○	○	○	○	○	○
Ability to see doctor of choice	○	○	○	○	○	○
Ability to see specialists when needed	○	○	○	○	○	○
Ability to arrange a stay in the hospital	○	○	○	○	○	○
Ability to use emergency services	○	○	○	○	○	○
Convenience of visiting hours	○	○	○	○	○	○
Comfort/privacy of rooms	○	○	○	○	○	○
Cleanliness of facility	○	○	○	○	○	○
Admission and discharge procedures	○	○	○	○	○	○
Confidentiality of care	○	○	○	○	○	○
Access to medical records	○	○	○	○	○	○
Quality of medical records	○	○	○	○	○	○
Cost of this visit	○	○	○	○	○	○
Overall satisfaction with facility	○	○	○	○	○	○

87. Thinking of this family member's MOST RECENT hospital stay, please rate the satisfaction with the staff at the facility used on each of the following factors. Mark one answer for each item.

	Very Satisfied	Satisfied	Mixed/ Neither	Dissatisfied	Very Dissatisfied	Does not apply/Don't Know
Thoroughness of examinations	○	○	○	○	○	○
Accuracy of diagnoses	○	○	○	○	○	○
Knowledge, skills, and abilities of doctors	○	○	○	○	○	○
Thoroughness of treatment	○	○	○	○	○	○
Clarity of doctor's explanations of tests and procedures	○	○	○	○	○	○
Time spent with doctor	○	○	○	○	○	○
Doctor's "bedside manner"	○	○	○	○	○	○
Courtesy of staff (other than doctor)	○	○	○	○	○	○
Attentiveness of staff (other than doctor)	○	○	○	○	○	○
Respect shown for privacy	○	○	○	○	○	○
Doctor's willingness to discuss treatment options	○	○	○	○	○	○
Overall satisfaction with staff	○	○	○	○	○	○

PLEASE DO NOT MARK IN THIS AREA 23028

88. **Please rate the overall satisfaction with the quality of care this family member received during the MOST RECENT hospital stay.**

- ○ Very satisfied
- ○ Satisfied
- ○ Mixed/neither
- ○ Dissatisfied
- ○ Very dissatisfied
- ○ Don't know

89. **Which of the following was (or will be) used to pay for this family member's MOST RECENT hospital stay? Mark ALL that apply.**

- ○ Does not apply, did not or will not have to pay for this stay
- ○ Standard CHAMPUS
- ○ CHAMPUS supplemental insurance (Medical insurance you usually get through military or retiree associations. It helps pay the amount due after CHAMPUS pays its share of charges for medical care.)
- ○ One of the new military health care programs available in some areas (these new programs have names such as CHAMPUS PRIME or EXTRA, Catchment Area Management (CAM), Gateway to Care, MEDEXCEL, CAMCHAS Prime, etc.)
- ○ Medicare
- ○ Private health insurance (Blue Cross/Blue Shield, Prudential, AARP, etc.) or a prepaid health plan or HMO (Health Maintenance Organization)
- ○ Public assistance (such as Medicaid)
- ○ Your own or your family's money
- ○ Other (specify) _____
- ○ Don't know

VI MOST RECENT DENTAL VISIT

In this section, you will be asked questions about the MOST RECENT visit for dental care, to either a civilian or military dental facility, by a family member (sponsor, spouse, child, or other dependent) who is eligible to receive military medical benefits. By dental care we mean any dental service or procedure (including oral surgery) that is ordinarily performed in a dentist's office or clinic and does not require an overnight stay in the hospital.

90. **Which ELIGIBLE family member had the MOST RECENT visit for dental care? Include visits to any dentist, dental office, or dental clinic, whether military or civilian. If 2 or more family members made a dental visit at the same time, please select the oldest. If possible, please consult this person for the remainder of this section.**

- ○ Does not apply, no one in my family has ever made a visit for dental care, GO TO QUESTION 100
- ○ Sponsor, GO TO QUESTION 93
- ○ Spouse, GO TO QUESTION 93
- ○ Child
- ○ Other family member (specify) _____

91. **Is the family member specified in QUESTION 90:**

- ○ Male
- ○ Female

92. **How old was this family member (the one with the MOST RECENT dental visit) on his/her last birthday?**

- ○ Less than 1 year old

- **Write the numbers in the boxes, making sure that the last number is always placed in the right-hand box.**
- **Fill in the unused boxes with zeros.**
- **Then, mark the matching circle below each box.**

93. **Thinking about this family member's MOST RECENT visit for dental care, when was it?**

- ○ 6 months ago or less
- ○ More than 6 months ago, GO TO QUESTION 100

If this family member's most recent visit to a dental facility was 6 months ago or less, please answer the following questions. Otherwise, GO TO QUESTION 100.

94. **Did this family member live with the sponsor at the time of the MOST RECENT dental visit?**

- ○ Does not apply, this family member is the sponsor
- ○ Yes
- ○ No

95. **What were the reasons for this family member's MOST RECENT visit for dental care?**
Mark ALL that apply.

- ○ Routine oral exam, teeth cleaning/polishing, fluoride treatment, etc.
- ○ X-rays
- ○ Orthodontics (braces, space maintainers, etc.)
- ○ Toothache
- ○ Fillings
- ○ Tooth removal or extraction
- ○ Caps, crowns, and bridges
- ○ Gum or bone disease treatment
- ○ Denture fitting or repair
- ○ Root canal treatment
- ○ Oral surgery
- ○ Other (specify) _____
- ○ Don't know

96. **What type of facility did this family member use for the MOST RECENT visit for dental care?**
- ○ Military or field/fleet hospital, clinic, or dispensary
- ○ Civilian dentist's office or clinic
- ○ Veterans Administration (VA) hospital or clinic
- ○ Another type of place (specify) _____
- ○ Don't know

97. **What is the location of the facility this family member used for the MOST RECENT dental visit?**
- ○ Within the 50 American states
- ○ Outside the 50 American states
- ○ Aboard ship

Questions 98 and 99 ask for this family member's opinions about the facility used for the most recent dental visit. If this family member is a child, please answer from the parents' point of view.

98. **Was the facility this family member used for the MOST RECENT dental visit chosen for any of the following reasons? Mark ALL that apply.**
- ○ It was required in order to be covered by military health benefits
- ○ It was the only one available
- ○ He/she was referred there by his/her doctor
- ○ It has good emergency room services

99. **Thinking of this family member's MOST RECENT visit for dental care, please rate the satisfaction with the facility used on each of the following factors.**
Mark one answer for each item.

	Very Satisfied	Satisfied	Mixed/ Neither	Dissatisfied	Very Dissatisfied	Does not apply/Don't Know
Convenience of location	○	○	○	○	○	○
Availability of parking	○	○	○	○	○	○
Hours when facility is open	○	○	○	○	○	○
Cleanliness of facility	○	○	○	○	○	○
Availability of dentists	○	○	○	○	○	○
How quickly dentists handle emergencies	○	○	○	○	○	○
Ability to make appointments by phone	○	○	○	○	○	○
Time waiting for treatment	○	○	○	○	○	○
Ability to see dentist of choice	○	○	○	○	○	○
Quality of preventive procedures (oral exams, X-rays, teeth cleaning, space maintainers, etc.)	○	○	○	○	○	○
Quality of fillings	○	○	○	○	○	○
Quality of other restorative procedures (crowns, bridges, dentures, etc.)	○	○	○	○	○	○
Cost of this visit	○	○	○	○	○	○
Overall satisfaction with dental care and services	○	○	○	○	○	○

VII GENERAL INFORMATION

100. **During the past 12 months, did members of your family always see a doctor or other health care provider when they wanted to?**
- ○ Yes, GO TO QUESTION 102
- ○ No
- ○ Does not apply, they didn't need any medical care. GO TO QUESTION 102

101. **During the past 12 months, what were the MOST IMPORTANT reasons that members of your family didn't see a doctor or other health care provider when they wanted to? Mark ALL that apply.**
- ○ They didn't have the time
- ○ They didn't want to miss work or school
- ○ They couldn't get off work
- ○ They thought it might cost too much
- ○ Type of care needed was not covered or not available
- ○ They did not have confidence in the available doctors
- ○ It was too hard to get an appointment
- ○ The facility's staff were not helpful
- ○ They didn't want the hassle of filing a claim
- ○ They didn't want to give up their leisure time
- ○ They would have had to travel too far
- ○ They couldn't see doctor of choice
- ○ They couldn't find the kind of doctor they needed
- ○ They couldn't find anyone to stay with the children
- ○ They didn't have any transportation to the doctor's office
- ○ They were not enrolled in DEERS
- ○ Other (specify) _____

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102. **Do you and your family have any of the following concerns about Military Medical Treatment Facilities?** Mark ALL that apply.

- ○ No facility is located nearby
- ○ The facility lacks the services my family needs
- ○ The facility lacks the specialists my family needs
- ○ The staff does not treat patients courteously
- ○ The doctors are not thorough in their examinations
- ○ It is hard to get tests when needed
- ○ The doctors never spend enough time with their patients
- ○ See a different doctor each time
- ○ It is too hard to find parking
- ○ The facility's office hours are not convenient
- ○ It is too hard to get an appointment
- ○ It takes too long between making an appointment and the actual visit
- ○ The waiting time, once at the facility, is too long
- ○ The facilities are not comfortable or clean
- ○ My family is concerned about the quality of care
- ○ My family has other insurance/health care coverage that we prefer
- ○ Other (specify) _____
- ○ No particular concerns

The following question is for women only. If the sponsor is a man, the question should be answered by his spouse. Unmarried men should skip this question and GO TO QUESTION 104.

103. **Thinking about visits for Obstetrical and Gynecological (OB/GYN) services during the past 12 months (including both civilian and military facilities), please rate the satisfaction with the care received on each of the following factors.** Mark one answer for each item.

○ Does not apply, had no visits for OB/GYN care during the past 12 months

	Very Satisfied	Satisfied	Mixed/ Neither	Dissatisfied	Very Dissatisfied	Does not apply/Don't Know
Ability to get pap smears when needed	○	○	○	○	○	○
Ability to get mammograms when needed	○	○	○	○	○	○
Timely notice of results of pap smears	○	○	○	○	○	○
Timely notice of results of mammograms	○	○	○	○	○	○
Availability of OB/GYN appointment times	○	○	○	○	○	○
Availability of epidural anesthesia for normal vaginal deliveries	○	○	○	○	○	○

IMPORTANT: Everyone should answer the following question

104. **In general, how satisfied are you and your family with your military health care benefit (including care at both Military Medical Treatment Facilities and through CHAMPUS)?**

- ○ Very satisfied
- ○ Satisfied
- ○ Mixed/neither
- ○ Dissatisfied
- ○ Very dissatisfied
- ○ Does not apply, never had to use military health care benefits

Suppose there was a new kind of military health plan and you could choose the new plan or continue to get your health care the way you do now. Questions 105 and 106 ask you to compare your current military plan as it is now with two new plans, and to answer whether or not you would change.

IMPORTANT: Answering these questions will not affect your current military health plan. These questions are for research purposes only and do not describe actual plans that exist now.

105. **The first new military health plan we want you to consider is a CIVILIAN Health Maintenance Organization or HMO. Suppose this plan offered the services and benefits listed in Table 1 below. A decision to change to this plan means you would use it instead of military medical treatment facilities or CHAMPUS.**

TABLE 1: DESCRIPTION OF NEW MILITARY HEALTH PLAN #1

SERVICES COVERED:	Same as CHAMPUS but includes adult annual physical exams and routine eye care.
CHOOSING YOUR HOSPITAL AND DOCTOR	
CHOOSING A HOSPITAL:	Use the civilian hospital associated with the plan.
CHOOSING A DOCTOR:	Visit doctor at the plan facility.
YOUR SHARE OF THE COST OF SERVICES	
HOSPITAL STAYS:	No charge for sponsor or family members.
OUTPATIENT DOCTOR VISITS:	Sponsor and family members pay $5 per visit.
YOUR ABILITY TO GET AN APPOINTMENT:	For routine physical exam: appointment in 3 days. For illness that is not serious: appointment in 2 days. For serious illness: same day appointment. If care is not available from the plan's doctor, you will be sent to another doctor.

Would you join this new plan instead of your current MILITARY HEALTH PLAN?

	Yes	No
a. If there was a charge of $75 per month per family	○	○
b. If there was a charge of $50 per month per family	○	○
c. If there was no charge to join	○	○

106. **The second new military health plan we want you to consider is a military HMO. This plan would offer the benefits and services listed in Table 2 below. A decision to change to this plan means you would no longer be able to use CHAMPUS. If you do not live near a military hospital, consider what you would prefer if you did live near a military hospital.**

TABLE 2: DESCRIPTION OF NEW MILITARY HEALTH PLAN #2

SERVICES COVERED:	Same as CHAMPUS but includes adult annual physical exams and routine eye care.
CHOOSING YOUR HOSPITAL AND DOCTOR	
CHOOSING A HOSPITAL:	Use the military hospital.
CHOOSING A DOCTOR:	Visit doctor at the military hospital.
YOUR SHARE OF THE COST OF SERVICES	
HOSPITAL STAYS:	No charge for sponsor or family members.
OUTPATIENT DOCTOR VISITS:	Sponsor and family members pay $5 per visit.
YOUR ABILITY TO GET AN APPOINTMENT:	For routine physical exam: appointment in 3 days. For illness that is not serious: appointment in 2 days. For serious illness: same day appointment. If care is not available from the plan's doctor, you will be sent to another doctor.

Would you join this new plan instead of your current MILITARY HEALTH PLAN?

	Yes	No
a. If there was a charge of $75 per month per family	○	○
b. If there was a charge of $50 per month per family	○	○
c. If there was no charge to join	○	○

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107. **Who completed this questionnaire?**
Mark ALL that apply.

- ○ Active duty or retired service member
- ○ Spouse of active duty, retired, or deceased service member
- ○ Son or daughter of active duty, retired, or deceased service member
- ○ Parent of active duty, retired, or deceased service member
- ○ Other family member (relationship) _____
- ○ Non-family member (specify) _____

108. **On what date did you complete this questionnaire?**

- **Write the numbers in the boxes, making sure that the last number is always placed in the right-hand box.**
- **Fill in the unused boxes with zeros.**
- **Then, mark the matching circle below each box.**

Month	Day	
		1992
0 0	0 0	
1 1	1 1	
2 2	2 2	
3 3	3 3	
4 4	4 4	
5 5	5 5	
6 6	6 6	
7 7	7 7	
8 8	8 8	
9 9	9 9	

109. **Is there anything else about your health care and benefits that you would like us to know?**
○ Yes (Please write your comments on the attached COMMENTS SHEET) ○ No

THANK YOU FOR COMPLETING THIS SURVEY!

COMMENT SHEET

THE FOLLOWING QUESTIONS SHOULD BE ANSWERED BY THE PERSON MAKING COMMENTS.

What is your beneficiary status?

- O Active duty service member
- O Retired service member
- O Survivor of deceased service member
- O Spouse or other family member

Are you:

- O Male
- O Female

In which military service does (did) the sponsor serve?

- O Army
- O Navy
- O Air Force
- O Marine Corps
- O Coast Guard

What is your current location?

- O Within the 50 American states
- O Outside the 50 American states
- O Aboard ship

PLEASE USE THIS AREA FOR ANY COMMENTS YOU MAY HAVE. IF YOU NEED ADDITIONAL SPACE, USE THE BACK SIDE OF THIS PAGE.

APPENDIX B

HEALTH CARE INITIATIVES AND REGIONAL STRATIFICATION GROUPS

APPENDIX B

HEALTH CARE INITIATIVES AND REGIONAL STRATIFICATION GROUPS

Through discussion among project staff members, a list of the catchment areas participating in various military health care initiatives and demonstration projects was assembled. This list, in combination with the geographic locations of military hospitals, formed the basis for the assignment of military hospital catchment areas to the stratification groups shown in Chapter 1. A description of each of these stratification groups is given below.

1. Army Catchment Area Management

This group consists of the Army catchment areas involved in catchment area management (CAM). The purpose of CAM is to show that the escalating cost of CHAMPUS can be contained by giving the local hospital commander fiscal responsibility for and management authority over all care rendered in the catchment area. CHAMPUS funds, are turned over to the local military hospital commander, who manages the health care for all catchment area beneficiaries, whether they receive their care in the civilian community or in the military hospital. The CAM model of integrated health care delivery is based on the assumption that the local hospital commanders know the needs of their beneficiaries, the capabilities of their military assets, and the nature of their local medical communities. Among the mechanisms used in connection with the Catchment Area Management model are means such as the "health care finder system" to assist beneficiaries with referrals to care, and a system of enrollment in one of several alternative programs.

2. Army Gateway to Care

Gateway to Care is the label applied to the Army's implementation of the DoD Coordinated Care Program. The centerpiece of the program is a local health care delivery system based on arrangements between military and civilian health care organizations managed by the MTF commander. Beneficiary enrollment allows local MHSS managers to plan and provide care to a defined, enrolled population. A primary care case manager refers the enrolled beneficiary to other sources of care as needed. The program is further characterized by improved education of beneficiaries regarding options available in

seeking health care and how to maintain and improve their own health status through family risk management, diet, exercise, and appropriate use of health services.

3. Navy Catchment Area Management

This group consists of the Navy catchment area management site. The Navy selected Naval Hospital, Charleston, South Carolina, as the site for its CAM demonstration based on an anticipated ability to demonstrate alternatives to standard CHAMPUS-funded treatment as well as to prove the applicability of CAM at a typical Navy medical installation.

4. Air Force Catchment Area Management

This group consists of the two Air Force catchment area management sites, Luke Air Force Base (AFB) and Bergstrom AFB. The purpose of the Air Force CAM project is to demonstrate that the rapidly rising rate of expenditures by OCHAMPUS (Office of the Civilian Health and Medical Program of the Uniformed Services) within two catchment areas can be contained while maintaining or improving accessibility, patient and staff satisfaction, and health care quality. This is to be accomplished by vesting in the MTF commander the authority to manage the MTF budget (composed of operating and maintenance and investment equipment dollars) and the CHAMPUS funds allocated for the catchment area. The commander must then provide or obtain health care services required to meet the needs of the beneficiary population within the catchment area.

5. CHAMPUS Reform Initiative

The objectives of the CHAMPUS Reform Initiative (CRI) are to apply generally accepted managed care techniques to the CHAMPUS program in order to contain costs and enhance services. The government awarded a contract that requires the government and the contractor to share financial risk for all health care services provided in the civilian sector to CHAMPUS beneficiaries in California and Hawaii. Three alternatives are available to beneficiaries in this demonstration: (1) CHAMPUS Prime, an enrollment program that features enhanced CHAMPUS benefits such as new preventive care benefits and reduced beneficiary cost-sharing requirements while preserving all other CHAMPUS benefits; (2) CHAMPUS Extra, which has no enrollment incentives but provides a contracted provider network of care; and (3) Standard CHAMPUS.

CRI activities/services include enhanced benefits, improved coordination between the military and civilian components of the MHSS, increased access to care, and enhanced quality assurance activities.

6. TRICARE (Tidewater Region)

The purpose of this demonstration project, which began in October 1992 in the Tidewater, Virginia, area (USAF Hospital Langley, McDonald Army Hospital Fort Eustis, and Naval Hospital Portsmouth) is to show the effect of pooling medical assets across a service area. The TRICARE program offers three options for enrolled beneficiaries: (1) the Preferred Plan HMO, in which TRICARE selects the primary care provider from MTF, NAVCARE, and civilian providers in the network, while the beneficiary pays a reduced cost share; (2) the Choice Plan PPO, in which beneficiaries get a list of approved network providers, pay a 20-25% standard deductible based on the discounted network rate, and are assured of no balance billing by the provider; and (3) standard CHAMPUS. Standard CHAMPUS provides maximum freedom of choice but also maximum beneficiary cost. All active-duty members are automatically enrolled in the Preferred Plan HMO. All other DEERS-eligible beneficiaries may select from all three options. Medicare beneficiaries may choose either the Preferred Plan or the Choice Plan.

7. Overlapping Catchment Areas

These catchment areas contain a significant fraction of beneficiaries whose ZIP code is within 40 miles of more than one facility. Beneficiaries in overlapping catchment areas are assigned to the MTF of the same service branch or to the MTF of another service branch if it is more than ten miles closer. These beneficiaries, however, may receive care at more than one facility.

8. Southeast Region Fiscal Intermediary/Preferred Provider Organization

The Southeast Region Fiscal Intermediary/Preferred Provider Organization (FI/PPO) provides for CHAMPUS fee discounts and utilization management. While initially operative in Florida and Georgia in July 1988, it has been extended to cover the entire Southeast region. The purpose of the Southeast Region Fiscal Intermediary Managed Care Program (MCP) is to offer an efficient and cost-effective alternative health delivery system to regular CHAMPUS that complements and is coordinated with the MTFs. The MCP is designed to reduce CHAMPUS health care costs while maintaining quality of care.

The foundation of the MCP exists in the establishment and operation of point-of-service preferred provider networks (institutional and professional) in coordination with the MTFs, implementation and operation of quality assessment and utilization

management programs, and establishment and implementation of a marketing (education) program. The MCP includes the placement of experienced, full-time, fiscal intermediary employees at the MTFs in the Southeast region. These individuals provide on-site coordination between the MTF staff, the networks, and the fiscal intermediary.

To encourage the use of the network providers, the MCP offers cost-share reductions and additional health care benefits for CHAMPUS beneficiaries using the MCP network; the objective is to maximize the use of the network providers by current CHAMPUS users.

9. PRIMUS/NAVCARE

PRIMUS/NAVCARE consists of contractor-owned and operated primary care clinics established near heavily utilized military hospitals to augment the delivery of basic outpatient services. PRIMUS/NAVCARE clinics are considered by the services to be an extension of the parent MTF, not unlike a branch military clinic.

10. New Orleans CRI-Like Demonstration

This CRI-like demonstration project in the New Orleans, Louisiana, area is administered by the Office of Coordinated Care Operations in the Office of the Deputy Assistant Secretary of Defense (Health Services Financing) and OCHAMPUS.

11. Noncatchment Areas

This group consists of the state-based areas that are not allocated to any catchment area and that are not in any of the other groups.

12. Outside the 50 States

This group consists of locations outside the continental United States, Alaska, and Hawaii. The group includes overseas catchment and noncatchment areas.

13. No Initiatives

This group contains the remaining catchment areas not elsewhere grouped.

14. Shipboard

This group consists of all Fleet Post Office (FPO) addresses.

APPENDIX C

MATCHING BENEFICIARIES TO SURVEY REGIONS

APPENDIX C

MATCHING BENEFICIARIES TO SURVEY REGIONS

Drawing a stratified sample for the beneficiary survey requires a link between the beneficiaries and the various regional stratification groups. The method adopted involves constructing a mapping that first links the ZIP codes of beneficiaries to catchment and noncatchment areas, and then maps these areas to the regional stratification groups. This section describes the construction of this mapping.

Since inpatient catchment areas (a catchment area is defined as a 40-mile-radius region around a military hospital, with allowances for natural barriers) and noncatchment areas are already mapped to the regional stratification groups, a mapping of beneficiary ZIP codes to survey groups can be obtained by first mapping the ZIP codes to inpatient catchment areas. The Defense Medical Information System (DMIS) maintains an inpatient catchment area directory that served as the starting point for this mapping. Catchment areas for hospitals that are slated for downgrading to clinic or aid station status and eventual closure were deleted. Specifically, catchment areas were deleted if they were defined in the 30 September 1991 DMIS catchment area directory for a hospital that will no longer be a hospital on 30 September 1992, as called for in the Services' Base Realignment and Closure (BRAC) Act II transition plan.

Beneficiaries with ZIP codes within 40 miles of more than one hospital are allocated to the closest hospital of the same Service branch as their sponsor. However, if the closest hospital of any Service branch is more than ten miles closer than the hospital of the same Service branch, the beneficiary is assigned to the closest hospital. A noncatchment area in the United States consists of the ZIP codes within a state that are not in a catchment area.

Besides the inpatient catchment areas defined in the standard DMIS catchment area directory, a special set of additional "catchment areas" were used. These special areas include areas around Uniformed Services Treatment Facilities (formerly Public Health Service hospitals), the New Orleans area, and the area around Fort Drum (the latter two areas were considered because new health care initiatives are being

implemented there). ZIP codes for each of these areas were also obtained from the DMIS.

Since the unique assignment of beneficiaries to catchment areas in overlapping areas depends on the sponsor Service branch and the Service branch of military hospitals, assignment to survey groups may also depend on Service branch. Beneficiaries in ZIP codes that are not mapped to catchment areas are assigned to noncatchment areas according to the first three digits of their ZIP code.

APPENDIX D

DETERMINATION OF SAMPLE SIZE

APPENDIX D

DETERMINATION OF SAMPLE SIZE

The formula for the sample size when a simple random sample is taken within each survey stratification cell is [4]:

$$n = \frac{\dfrac{t_\alpha^2 P(1-P)}{d^2}}{1+\dfrac{1}{N}\left(\dfrac{t_\alpha^2 P(1-P)}{d^2}-1\right)}$$

$$\approx \frac{n_0}{1+(n_0/N)},$$

where P is the true (unknown) population proportion, N is the population size, d is the degree of precision desired, t_α is the abscissa of the normal probability curve that cuts off an area α at the tails, and $n_0 = t_\alpha^2 P(1-P)/d^2$. If n_0/N is negligible, the denominator is effectively equal to 1, and the sample size becomes $n = n_0$. (If n_0/N is not negligible within a cell, the effect of assuming it is negligible is to increase the estimate of sample size.) Further, if the sample size estimate is scaled to account for expected nonresponse, the sample size needed is $n = n_0/r$, that is,

$$n = \frac{t_\alpha^2 P(1-P)}{r d^2}, \tag{D-1}$$

where r is the response rate.

The sample size estimates for each cell were based on the following assumptions:

- The quantity being measured is a population proportion, such as a satisfaction rate.
- The true population proportion is 0.5. This gives the maximum possible variance in the sample proportion and yields the most conservative (i.e., on the high side) estimate of the sample size needed.
- The degree of precision desired in the estimated proportion is ± 0.05 (i.e., the sample proportion should be within ± 0.05 of the true population proportion).

- The probability that the sample proportion will be within ± 0.05 of the true population proportion is 0.95.
- The population size in each cell is effectively infinite, so that finite-sample corrections need not be employed. The effect of this assumption is a more conservative estimate of the necessary sample size.
- The response rate in each cell is 65 percent.

From past experience it is known that the response rate varies by beneficiary type (enlistees, officers, retirees, etc.), Service, and other beneficiary attributes. There are, however, two reasons why a constant response rate was assumed for the purpose of sample size computation. First, the total sample size was constrained to a maximum of about 45,000 sponsors. This means that increasing the sample size in cells with low expected response rates would necessarily result in decreasing the sample size in cells with higher expected response rates, that is, good responders would have been penalized in favor of poor responders. Second, inflating the sample size to account for expected nonresponse does not necessarily increase the precision of the quantity being estimated; the response rate would still be low and the estimates may be biased. To the extent that the response rate for a particular design stratification cell falls markedly below the target rate of 65 percent, the desired degree of precision (± 0.05) in the estimated proportion of the quantity being measured (such as a satisfaction rate) may not be attained and any bias problems could be aggravated.

Given the assumptions stated previously, $\alpha = .025$, $t_\alpha = 1.96$, $P = .5$, $d = .05$, and $r = .65$. Substituting these values into equation (D-1) gives:

$$\begin{aligned} n &= \frac{(1.96)^2(.5)(.5)}{(.65)(.05)^2} \\ &= 591 . \end{aligned}$$

This number was rounded down to 590 and became the sample size selected in each cell of the Stage 1 sampling plan.

APPENDIX E

SURVEY DATA CLEANING AND INTEGRITY CHECKS

APPENDIX E

SURVEY DATA CLEANING AND INTEGRITY CHECKS

This appendix provides a detailed description of the data integrity checks and data cleaning procedures that were applied to the survey response data. These checks and procedures were formulated to accomplish several goals:

- identify and eliminate contradictory responses,
- attempt to fill in missing responses to demographic questions based on information provided in the remainder of the questionnaire, and
- prepare the survey response data set for statistical analyses.

Section E.1 provides a summary of these procedures and Section E.2 describes these procedures in greater detail.

E.1 SUMMARY OF THE DATA INTEGRITY CHECKS AND CLEANING PROCEDURES

The checking and cleaning process was separated into several steps. Each step was performed separately and information from previous steps was used in subsequent steps of the cleaning process. Table E-1 presents a summary of the data cleaning procedures and the impact on the survey response data set.

Step 1

Several survey forms were returned blank or only partially completed and a determination was made as to whether to include these forms as responses or non-responses. Cases where the entire survey form was blank were determined to be non-responses (419 cases) and cases that were partially complete were determined to be responses (31 cases).

Step 2

This step filled in missing responses to the spouse's age and sex and the sponsor's sex (questions 2, 3, and 15). If the information was identified within the remainder of the survey, then it was used to fill in the missing

demographic data. Otherwise, the sponsor's sex was filled in based on the population data from which the survey sample was drawn.

Step 3

This step in the cleaning process attempted to reduce the number of survey responses with answers to question 41 that indicated that the family member with the last birthday was both the sponsor and a dependent (the instructions explicitly state to select one beneficiary in cases where 2 or more family members had birthdays on the same day). The algorithm used the age and sex reported in questions 42 and 43 and attempted to determine the correct response to question 41.

Step 4

The survey form had a printing error for questions 34, 36, 38, 39, and 40 and extraneous response "bubbles" were provided on the form. Responses provided in these bubbles were deleted.

Step 5

This step used the cleaned demographic data (step 2) to impute answers to missing survey responses for questions 41, 50, 72, and 90. Specifically, this related to the family member with the last birthday, outpatient visit, overnight stay and/or dental visit. The algorithm inferred who the family member was (sponsor, spouse, or child) based on demographic data provided in several sections of the survey.

Step 6

To facilitate data analysis, after inferring which family member had the last birthday, outpatient visit, hospital stay and dental visit based on demographic data, these demographic data were copied into relevant locations. In addition, when the sex of the person about whom medical information was provided and inconsistent sex-specific medical procedures were reported to have been performed, the medical procedures were changed so they were marked as not having been performed. Lastly, where skip patterns existed but were not followed, responses were blanked out where appropriate (e.g., if the response indicated no visit occurred in the last 12 months, then where information concerning visits was provided it was changed to no response).

Step 7

The final step was performed in order to complete responses to partially completed questions. For example, question 36 asked how many times each eligible family member visited a doctor. If the question was answered for some of the reported family members but not all, the remainder were filled assuming zero visits. Similar corrections were made for questions 38, 39, 40, 44, 45, 47, and 48 which record stays, expected visits, expected stays, medical conditions, preventive procedures, and type of facility used.

Table E-1 Summary of Data Cleaning Procedures

Question	Data Cleaning Procedure	Impact
Response Status	Reset response status to reflect correct survey status	419 status fields corrected
2	Replace non-response for sponsor sex with a valid response	332 non-responses modified
3	Replace non-response for sponsor age with a valid response	514 non-responses modified
15	Replace non-response for spouse age with a valid response	421 non-responses modified
41	Eliminate multiple answers to the family member who had the last birthday	93 total corrections
34, 36, 38, 39, and 40	Eliminate answers from extra response bubbles on the survey questionnaire	All responses left after cleaning criteria were deleted
41	Infer response to family member who had last birthday	Inferred sponsor 0 times; spouse 76 times; child 49 times
41	Infer response to family member who had last birthday	Inferred sponsor 0 times; spouse 76 times; child 49 times
50	Infer response to family member who had last outpatient visit	Inferred sponsor 156 times; spouse 121 times; child 64 times
72	Infer response to family member who had most recent inpatient stay	Inferred sponsor 30 times; spouse 28 times; child 18 times
90	Infer response to family member who had most recent dental visit	Inferred sponsor 68 times; spouse 58 times; child 36 times
3, 7	Force both questions to agree that the sponsor is deceased	Enforce survey skip pattern for question 3b

Continued on next page

Table E-1—*Continued*

Question	Data Cleaning Procedure	Impact
10	Enforce survey skip pattern for sponsor marital status, while leaving possibly useful data	Blank questions 11, 12, 13, and 14 where appropriate
17	Force questions 3, 10, and 17 to report employment status in a consistent manner.	Blank question 17 part A or B
13	Enforce survey skip pattern for spouse's military service	Blank question 14 where appropriate
21	Force questions 21, 29, 49, and 71 to consistently report CHAMPUS eligibility	Set question 21 to "Yes" where appropriate
24	Enforce survey skip pattern for CHAMPUS use	Blank question 25 where appropriate
28	Force questions 28, 29, and 30 to consistently report private insurance	Set question 28 to "Yes" where appropriate
44, 45	Remove procedures associated with a particular sex when patient is reported to be of the opposite sex	Blank 44 and 45 where appropriate
54	Enforce survey skip pattern for the time frame of the most recent outpatient visit	Blank questions 55-71 where appropriate
57	Remove procedures associated with a particular sex when patient is reported to be of the opposite sex	Blank question 57 where appropriate
60	Remove MTF reported, if visit occurred overseas or aboard ship or not at an MTF	Blank question 60 where appropriate
76	Enforce survey skip pattern for the time frame of the most recent inpatient stay	Blank questions 77-89 where appropriate
84	Remove MTF reported, if stay occurred overseas or aboard ship or not at an MTF	Blank question 84 where appropriate
93	Enforce survey skip pattern for the time frame of the most recent dental visit	Blank questions 94-99 where appropriate
103	Force questions 2, 10, 16, and 103 to consistently reflect single male sponsors and OB/GYN visits	Blank question 103 where appropriate
36, 38, 39, and 40	Zero fill in stays, visits, expected stays, and expected visits for partially completed responses	Fill questions 36, 38, 39 and 40 when necessary
44	Zero fill medical conditions for partially filled responses	Fill question 44 if needed
45	Zero fill preventative procedures for partially filled responses	Fill question 45 if needed
47, 48	Zero fill partial responses to type of facility used	Fill each category as necessary

E.2 DETAILS OF THE DATA INTEGRITY CHECKS AND CLEANING PROCEDURES

This section describes the data integrity checks and cleaning procedures in detail. To simplify the discussion, questions were referred to by number. To follow the discussion it is beneficial to have a copy of the 1992 DoD Health Care Survey. Many questions have several parts. The text refers to each part of these question in the order that the parts were presented using "A" to signify the first part, "B" to signify the second parts, etc. For example, question 68B was the second part of question number 68. Each phase is described in general and then the algorithm applied is summarized below the description.

Phase 1

The first step in the cleaning process corrected the response status associated with each survey record. If the returned survey was blank the response status was changed from R to U. If the response status incorrectly indicates a non-response or an undeliverable survey the response status was corrected to reflect response to the survey, and set to R.

Response Status

Check 1	If the entire survey was blank.
	Otherwise go to check 3
Check 2	If response status was R.
•	Set response status equal to U
Check 3	If response status does not equal R.
•	Set response status equal to R

Phase 2

The purpose of this step was to fill questions 2, 3 and 15 as completely as possible. The general rule was to use survey responses first and then use information provided by the survey population data file. Question 41, 50, 71, and 90 were used to identify which family member was the subject of the subsequent questions.

Question 2 asked for the sex of the sponsor. If it was blank, the information could be found in questions 42, 51, 73, or 91. If the sponsor was the family member of interest in any of the subsections and the sponsor's sex was reported, question 2 was filled with

this data. Otherwise the sponsor's sex provided in the survey population file was used to fill in question 2.

Question 3 asked for the age of the sponsor. If it was blank, the information could be found in questions 43, 52, 74, or 92. If the sponsor was the family member of interest in any of the subsections and the sponsor's age was reported, question 3 was filled with this data. Otherwise the sponsors age provided in the survey population file was used to fill question 3.

Question 15 asked for the age of the spouse. If it was blank, the information could be found in questions 43, 52, 74, or 92. If the spouse was the family member of interest in any of the subsections and the spouse's age was reported, question 15 was filled with this data.

Question 2 Sponsor's sex

Check 1	If Q2 was blank, sponsor's sex.
Check 2	If Q41A equals 1 and Q41B and Q41C were blank, family member with last birthday was the sponsor and the question was properly filled out.
Check 2A	If Q42 was not blank, sex of family member with last birthday was available.
•	Set Q2 equal to Q42
Check 3	If Q50 equals 1, the family member with last outpatient visit was the sponsor.
Check 3A	If Q51 was not blank, sex of family member with last outpatient visit was available.
•	Set Q2 equal to Q51
Check 4	If Q72 equals 2, the family member with last overnight stay was the sponsor.
Check 4A	If Q73 was not blank, sex of family member with last overnight stay was available.
•	Set Q2 equal to Q73
Check 5	If Q90 equals 2, the family member with last dental visit was sponsor.
Check 5A	If Q91 was not blank, sex of the family member with dental visit was available.
•	Set Q2 equal to Q91

Check 6 If the sponsor's sex available in the survey sample population data file was not blank.

- Set Q2 = sex reported in population data file

Question 3 Sponsor's age

Check 1 If Q3B was blank or less than 17 or a single digit and Q3A was blank and Q7 does not equal 1, sponsor's age needs correcting.

Check 2 If Q41A equals 1 and Q41B and Q41C were blank, family member with last birthday was sponsor and the question was properly filled out.

Check 2A If Q43B was not blank and ≥ 17, age of the family member with last birthday was available and a legitimate sponsor age.

- Set Q3B equal to Q43B

Check 3 If Q50 equals 1, family member with last outpatient visit was sponsor.

Check 3A If Q52B was not blank and ≥ 17, age of the family member with the last outpatient visit was available and a legitimate sponsor age.

- Set Q3B equal to Q52B

Check 4 If Q72 equals 2, family member with last overnight stay was sponsor.

Check 4A If Q74B was not blank and ≥ 17, age of the family member with overnight stay was available and legitimate.

- Set Q3B equal to Q74B

Check 5 If Q90 equals 2, family member with last dental visit was sponsor.

Check 5A If Q92B was not blank and ≥ 17, age of the family member with dental visit was available.

- Set Q3B equal to Q92B

Check 6 If age reported in the survey population data file was not blank and less than 100.

- Set Q3B equal to the age found in the population data file

Phase 3

The third step in the cleaning process attempted to eliminate multiple answers to question 41 parts A and B - "Which eligible family member had the last birthday?". If there were answers to questions 42 and 43 sex and age of family member with the last

birthday, the answers were compared to questions 2, 3, and 15. If they matched the information for the sponsor or the spouse, question 41 was reset to reflect this match. If not, question 16 was used to see if the age in reported in 43 fell into an age group with at least one dependent. Otherwise, the multiple answers were eliminated.

Question 41 Which eligible family member had the most recent birthday?

Check 1: If Q41A and Q41B were both answered.

* There should be one response for all parts of this question.

Check 2 If Q42, Q43A, or Q43B were not blank.

* If the age or sex of the person was available it might have been possible to determine which answer was correct.

Check 3 If Q43B equals Q3B and Q43B was not blank. The age of the person with the last birthday matches the sponsor's age and was not blank.

Check 3A If Q42 equals Q2 and Q2 was not blank or if Q3B does not equal Q15, the sex of the person with the last birthday matches the sponsor's sex and was not blank or the age of the sponsor differs from the age of the spouse.

- Fill in Q41A as sponsor '1' and blank Q41B

* The age and sex exactly match or the ages exactly match and are unique.

Check 4 If Q43B equals Q15 and Q43B was not blank, the age of the person with the last birthday matches the spouse's age and was not blank.

Check 4B If Q42 does not equal Q2, and Q2 and Q42 were not blank, the sex of the person with the last birthday matches the spouse's sex and neither was blank. Or if the Q3B does not equal Q15, the sponsor's and spouse's ages differ.

- Fill in Q41A as spouse '2' and blank Q41B

Check 5 If the age reported in Q43B falls into a group with at least one reported dependent in Q16A, the age of the person with the last birthday was a dependent child.

- Blank Q41A

Phase 4

This step in the cleaning process attempted to eliminate responses to Q34C, Q36C, Q38C, Q39C, and Q40C. Questions 16 and 10 were used to determine the range of expected answers. If an expected spouse answer was missing, the extra answer was moved into the slot for the spouse. Otherwise, the number of children with answers was checked against the

expected number. If one was missing, the answers were all moved down one. Otherwise the number of expected answers was recalculated, assuming question 16 included the sponsor and the spouse. Then the number of expected answers verses the number of answers reported was rechecked, moving the extra answer when appropriate. Any extra answers left were then removed.

Question 16 Clarify the number of eligible children.

Check 1 If Q16 equals 1, no other eligible family members.

- Fill-in all Q16A's and Q16A's with "zeros".

Check 1A If Q16A1-Q16A6 were non-zero

- Set Q16 equal to "blank".

* Our preference was for accepting answers for other members over marking the "no other" bubble.

* Continue with check 3.

Check 2 If Q16 was blank, non-response or other eligible family members.

Check 2A If Q16A1 to Q16A6 non-blank, response to one or more of the age categories.

- Set all blank Q16A and Q16B to 0

Check 2B If all Q16A to Q16B were 0, response but all were zero.

- Set Q16 to 1

Check 3 Compare Q16A's with corresponding Q16B's. if Q16A1 was less than Q16B1.

- Set Q16B1 = Q16A1

* If Q16A2 was less than Q16B2, then set Q16B2 = Q16A2, etc.

* This clarifies that the number of eligible members living with the sponsor cannot be more than the total number of eligible family members.

Check 4 Creates a comparison value for future checking use.

Create: NUMCLD = sum(Q16A1-A5) {Note: exclude A6}

* This attempts to create a check-figure for later questions regarding the eligible children of the sponsor.

Questions 34, 36, 38, 39, and 40

To correct for questions 34C, 36C, 38C, 39C, and 40C being mistakenly filled-in. The following demonstrates using question 34.

Check 1 Q34C was non-blank

Check 2 Create a check value using the number of entries in Q34D through Q34M

- Create: CK34 = sum (Q34D-M)

Check 3 If NUMCLD was "0" and Q34B was non-blank, there were no eligible children and spouse was already filled in.

- Blank-out Q34C

* Checks for possible miscoding of spouse before making Q34C blank.

Check 4 If Q34B was "blank" and Q10 was 2 or 3, and NUMCLD was "0", spouse response was missing and there were no children.

- Set Q34B = Q34C and blank-out Q34C

* Corrects for miscoding of spouse data.

Check 5 CK34 = NUMCLD

- Blank Q34C

* Assumes Q34C was an extra response.

Check 6 If CK34 = (NUMCLD - 1), number of coded children one less than expected number of children.

- Set Q34M = Q34L and Q34L = Q34K

  Q34K = Q34J and Q34J = Q34I

  Q34I = Q34H and Q34H = Q34G

  Q34G = Q34F and Q34F = Q34E

  Q34E = Q34D and Q34D = Q34C

* Corrects Q34C by moving the following responses up one position.

Check 7 Create another check figure in case the sponsor and spouse were mistakenly counted in Q16 (probably Q16A5).

Create CKSUM = Q34A-M

Check 8 NUMCLD = CKSUM

- Set Q34M = Q34L and Q34L = Q34K

  Q34K = Q34J and Q34J = Q34I

Q34I = Q34H and Q34H = Q34G

Q34G = Q34F and Q34F = Q34E

Q34E = Q34D and Q34D = Q34C

* Also corrects Q34C by moving the following responses up one position.

- Blank all remaining Q34C

Phase 5

The fifth step in the cleaning process attempted to fill in missing responses to question 41, 50, 72, and 90. These questions recorded which family member had the last birthday, made the most recent visit, hospital stay, or dental visit. The process is illustrated using question 41.

If there were answers to questions 42 and 43 sex and age of family member with the last birthday, the answers were compared to questions 2, 3, and 15 to see if they matched the information for the sponsor or the spouse. If not, question 16 was used to see if the age in reported in 43 fell into an age group with at least one dependent. When a match was made, the blank question was reset.

Question 41 Family member with most recent birthday.

Check 1 If Q41A, Q41B and Q41C were all blank.

Check 2 If Q42, Q43A, or Q43B was not blank.

* If the age or sex of the person was available it might have been possible to determine which answer was correct.

Check 3 If Q43B equals Q3B and Q43B was not blank. The age of the person with the last birthday matches the sponsor's age and was not blank.

Check 3A If Q42 equals Q2 and Q2 was not blank or if Q3B does not equal Q15, the sex of the person with the last birthday matches the sponsor's sex and was not blank or the age of the sponsor differs from the age of the spouse.

- Fill in Q41A as sponsor '1'

* The age and sex exactly match or the ages exactly match and were unique.

Check 4 If Q43B equals Q15 and Q43B was not blank. The age of the person with the last birthday matches the spouse's age and was not blank.

Check 4B — If Q42 does not equal Q2, and Q2 and Q42 were not blank, the sex of the person with the last birthday matches the spouse's sex and neither was blank. Or if the Q3B does not equal Q15, the sponsor's and spouse's age differ.

- Fill in Q41A as sponsor '2'

Check 5 — If the age in Q43B matches an age group in question 16 which reports at least one child, then Q43B was the dependents age.

Check 5A — If the number of child in the age bracket equals 1, the child number can be determined.

- Compute the child number, sum children in the age group and older

* Exclude Q16A6

Check 5B — If the child has a response in question 34, 36, 38, 39, or 40, the computed child number has responses in other survey questions.

- Set Q41B equal to the computed child number

Questions 50, 72, 90

Family member who made the last outpatient visit, hospital stay, and dental visit. Each of these questions was handled the same way and will be illustrated using question 50.

Check 1 — If Q50 was blank.

Check 2 — If Q51, Q52A, or Q52B was not blank.

* If the age or sex of the person was available it may be possible to determine correct answer to Q50.

Check 3 — If Q52B equals Q3B and Q52B was not blank. The age of the person who made last visit matches the sponsor's age and was not blank.

Check 3A — If Q51 equals Q2 and Q2 was not blank or if the Q3B does not equal Q15, the sex of the person who made last visit matches the sponsor's sex and was not blank or the age of the sponsor differs from the age of the spouse.

- Fill in Q50 as sponsor '1'

* The age and sex exactly match or the age exactly matches and was unique.

Check 4 — If Q52B equals Q15 and Q52B was not blank. The age of the person who made last visit matches the spouse's age and was not blank.

Check 4B — If Q51 does not equal Q2, and Q2 and Q51 were not blank, the sex of the person with the last birthday matches the spouse's sex and neither was blank. Or if the Q3B does not equal Q15, the sponsor's and spouse's age differ.

- Fill in Q50 as sponsor '2'

Check 5 — If the age in Q52B matches an age group in question 16 which reports at least one child, then Q52B was the dependents age.

- Set Q50 to 3

Phase 6

During this phase many of the algorithms developed to remove inconsistent or illogical responses were implemented. Questions 3 and 7 both give the survey respondent the opportunity to indicate that the sponsor was deceased. If either of the questions indicated that the sponsor was deceased, then each of the questions were reset to report consistent information. The skip patterns for both questions were then enforced. This blanked question 3 part B, and questions 8 through 12.

Question 17 asked for the current employment status of the sponsor and the spouse. Responses referring to the sponsor were removed if question 3 indicated the sponsor was deceased. Responses referring to the spouse were removed if question 10 indicated that the sponsor was not married.

Question 14 asked for the spouse's paygrade. This was removed if question 13 indicated that the spouse never served in the military.

Question 21 asked about CHAMPUS eligibility. This question was set to yes if question 29, 49, 71, or 89 indicated CHAMPUS eligibility or that CHAMPUS was used to pay for medical services.

Question 24 asked why a claim was not filed, question 25 ask for the reasons a claim was not filed. If question 24 was answered as "does not apply", answers to question 25 were blanked.

Question 28 asked if any members of the respondent's family were eligible for private medical insurance. Questions 29 and 30 asked for the same information in greater detail. Question 28 was set to yes if either of the following questions indicated that someone was covered by private health insurance.

Questions 44 and 45 asked about medical conditions and preventive procedures associated with the family member with the last birthday. Questions 41, 42, and 2 were

used to determine the sex of the family member with the last birthday. Then contradictory sex-specific answers were removed for questions 44 and 45.

Question 54 asked how long ago the most recent outpatient visit was made. If it was more then six months ago, questions 55 through 71 were blanked out.

Question 57 referred to the reasons for the most recent outpatient visit. Questions 50, 51, and 2 were used to determine the sex of the family member who made the most recent outpatient visit. Any contradictory sex-specific reasons were then removed from question 57.

Question 60 asked which MTF was used during the most recent outpatient visit. If question 58 indicated that an MTF was not used or question 59 indicated that the visit was overseas or aboard ship then question 60 was blanked.

Question 76 asked how long ago the most recent inpatient stay was. If it was more then one year ago, questions 77 through 89 were blanked out.

Questions 84 asked which MTF was used during the most recent inpatient stay. If question 82 indicated that an MTF was not used or question 83 indicated that the visit was overseas or aboard ship then question 84 was blanked.

Question 93 asked how long ago the most recent dental visit was. If it was more then six months ago, questions 94 through 99 were blanked out.

Question 103 reports on OB/GYN visits during the past twelve months. Question 2, sponsor's sex, question 10, marital status, and question 16, dependents were used to eliminate responses to question 103 for unmarried male sponsors with zero dependents.

Questions 3A and 7

Force the two questions to agree that the sponsor is deceased.

Check 1 If question 3A was non-blank or question 7 equals 1

- Set both 3A and 7 to one
- Blank question 3B and questions 9 through 12

Question 17

Blank part A for a deceased sponsor and part B for a non-married sponsor.

Check 1 If question 3A equals 1

- Blank question 17 part A

Check 2 If question 10 equals 1

- Blank question 17 part B

Question 10

Blank out unnecessary information by enforcing the skip pattern yet leaving responses which will be useful during the augmentation process.

Check 1 If question 10 equals 1

- Blank question 11
- Blank questions 13 and 14
- * Leave the spouse's ZIP code for use in computing distances.

Check 2 If question 10 equals 2

- Blank questions 11 and 12

Question 14

Remove spouse's pay grade, if spouse did not serve in military.

Check 1 If question 13 equals 1

- Blank question 14

Question 21

Force question 21, CHAMPUS eligibility, to reflect the use of CHAMPUS to pay for services or other reports of eligibility.

Check 1 If any of the following

Question 29A1 equals 1	Standard CHAMPUS
Question 29A2 equals 1	
Question 29B1 equals 1	Extended CHAMPUS
Question 29B2 equals 1	
Question 49 equals 3, 4, or 5	Used CHAMPUS
Question 71B non-blank	Used CHAMPUS
Question 71C non-blank	
Question 89B non-blank	Used CHAMPUS
Question 89C non-blank	

- Set question 21 equal to 1 CHAMPUS eligible

Question 21

Enforce the skip pattern if no family members were eligible for CHAMPUS.

Check 1 If question 21 equals 2

- Blank questions 22 through 27

Question 24

If always filed a CHAMPUS claim enforce the skip pattern, by removing the answers to why they did not file a claim.

Check 1 If Question 24 equals 1, 2, or 6

- Blank question 25

Question 28

If the use or eligibility of private medical insurance was reported in question 29 or 30 force question 28 to reflect the eligibility.

Check 1 If Question 29A4 or 29B4 was non-blank

- Set question 28 to 1

Check 2 If Question 30B, 30C, 30D, or 30E was non-blank

- Set question 28 to 1

Questions 44-45

Check the sex of the person receiving the care, if the procedure performed was illogical remove the response.

Check 1 If question 42 equals 1 (male)

- Blank question 44 part W and question 45 parts M and N

Check 2 If question 42 equals 2 (female)

- Blank question 44 part V and question 45 parts J and K

Check 3 If question 41A equals 1 (sponsor)

Check 3A If question 2 equals 1 (sponsor was male)

- Blank question 44 part W and question 45 parts M and N.

Check 3B If the question 2 equals 2 (sponsor was female)

- Blank question 44 part V and question 45 parts J and K

Check 4 If question 41A equals 2 (spouse)

Check 4A If question 2 equals 2 (male spouse)

- Blank question 44 part W and question 45 parts M and N.

Check 4B If the question 2 equals 1 (female spouse)

- Blank question 44 part V and question 45 parts J and K

Question 54

Enforce the skip pattern if the visit was more than six months ago.

Check 1 If question 54 equals 4

- Blank questions 55 through 71

Question 57

Check sex of person who made last visit to determine reported procedures were logical.

Check 1 If question 51 equals 1

- Blank question 57 parts C and D

Check 2 If question 50 equals 1 (sponsor)

Check 2A If question 2 equals 1 (male sponsor)

- Blank question 57 parts C and D

Check 3 If question 50 equals 2 (spouse)

Check 3A If question 2 equals 2 (male spouse)

- Blank question 57 parts C and D

Question 60

If outpatient visit was outside of the 50 American states or aboard ship or not at an MTF, remove the MTF reported to have been used in question 60.

Check 1 If question 58 equals 3, 4, 5, 6 or question 59 equals 2 or 3

- Blank question 60

Question 76

If most recent stay was more than a year ago enforce the skip pattern by blanking questions 77 through 89.

Check 1 If question 76 equals 4

- Blank 77 through 89

Question 84

If hospital stay was outside of the 50 American states or aboard ship or not at an MTF, remove the MTF reported to have been used in question 84.

Check 1 If question 82 equals 2, 3, or 4 or question 83 equals 2 or 3

- Blank question 84

Question 93

If the most recent dental visit was more than six months ago enforce the skip pattern, by blanking questions 94 through 99.

Check 1 If question 93 equal 2

- Blank 94 through 99

Question 103

If the respondent was an unmarried male sponsor with zero dependents remove the responses to the OB/GYN question.

Check 1 If question 2 equals 1 and question 10 equals 1 and question 16 equals 1

- Blank question 103

Phase 7

During the last phase of the cleaning process several questions were zero filled and several inconsistencies were resolved. For example, the number of visits made by each family member was zero filled for all blank family members, if any were filled by the respondent.

Questions 36, 38, 39, and 40 asked for the actual number of outpatient visits and inpatient stays and the expected number of outpatient visits and inpatient stays for each family member. If there were responses for some family members then any blank family members were zero filled. Question 16 was used to compute the number of dependents in the family. Question 3 was used to determine if the sponsor was still alive. Question 10 was used to determine if the sponsor was married.

Question 44 asked about any medical conditions associated with the family member with the last birthday. If this question was partially answered or response

indicated that the family member did not have any medical problems, then any blank responses were zero filled.

Question 45 asked about any preventative services used by the family member with the last birthday. If the this question was partially answered or the response indicated that the family member did not use any preventive procedures, then any blank responses were zero filled.

Questions 47 and 48 asked how many outpatient visit and inpatient stays the family member with the last birthday made at various types of medical facilities. If the question was partially answered, any blank facility types were set to zero. The numbers in each question were then totaled and used to change responses to questions 36 and 38.

Questions 36, 38, 39, and 40

These questions asked for the actual and expected number of outpatient visits and overnight stays made by each family member. All of these questions were handled in the same manner and are illustrated using question 39. For question 39, zero filling implies answering none, which is equal to a '1'.

Check 1	Compute the number of dependents reported in question Q16A, parts 1 through 5. NUMCLD = sum(Q16A1 - 16A5)
Check 2	If Skip question indicates no answers Q39 equals 1, Q40 equal 1, Q35 = 2, and Q37 = 2
•	Otherwise go to check 3
Check 2A	If the sponsor response was blank and Q3A was blank
•	Zero fill sponsor response, Q39A = 1
Check 2B	If Spouse response was blank and Q10 equals 2 or 3
•	Zero fill spouse response, Q39B = 1
Check 2C	If child response was blank
•	Zero fill children up NUMCLD, Q39child_num = 1
Check 2D	Loop over entire family, if any member does not have a zero response
•	Reset skip question to reflect answers Q39 to blank.
Check 3	If skip question was blank or indicates answers.
Check 3A	Loop over entire family looking for answers.
Check 3B	If sponsor response was blank and Q3A was blank
•	Zero fill sponsor response, Q39A = 1

Check 3C If Spouse response was blank and Q10 equals 2 or 3

- Zero fill spouse response, Q39B = 1

Check 3D If child response was blank

- Zero fill children up NUMCLD, Q39child_num = 1

Question 44

Did family member with last birthday have any medical problems during the last 12 months.

Check 1 If Q44A equals 1

Check 1A Loop over parts B through X, if blank

- Set to zero
- Otherwise reset Q44A to blank

Check 2 Loop over parts B through X, if any were answered

- Loop over B to X setting blanks to 0

Question 45

Did family member with last birthday make any preventive health care visits during the last 12 months?

Check 1 If Q44R equals 1

Check 1A Loop over parts A through Q, if blank

- Set to zero
- Otherwise reset Q45R to blank

Check 2 Loop over parts A through Q, if any were answered

- Loop over A to R setting blanks to 0

Question 47 and 48

Number of times family member with most recent birthday visited or stayed at each type of facility.

Check 1 If the skip question = 1, Q47 or Q48 indicates there were no answers in the remainder of the question

* Otherwise go to check 3

Check 2 Loop over all parts of the question

•	Zero the blank facilities
Check 2A	If A non-zero answer was found
•	Reset the skip question and total all occurrences
*	Go to check 4
Check 3	Loop over all parts of the question.
Check 3A	If non-blank answers were found.
•	Total and zero fill the rest of the facilities
Check 4	Determine family member specified in question 40.
*	Q41A = 1 sponsor, Q41A = 2 spouse, Q41B = child number,
*	Q41C = number of other member
Check 5	If total incidence reported in question > 10
•	Reduce the total to 10
Check 6	If the number of incidence reported for this family member was less then the amount shown in the corresponding question and the corresponding question was not a non-response.
•	Increase the amount reported in the corresponding question
*	The total number of visits reported in question 47 corresponds to the number reported in question 36 for the person with the last birthday. Question 48 matches 38.

APPENDIX F

CALCULATION OF SURVEY WEIGHTS

APPENDIX F

CALCULATION OF SURVEY WEIGHTS

The basic survey weight for an individual is the inverse of the probability of being selected by the sampling mechanism. In the case of the present survey, the probability of selection varies across strata but is the same within each stratum. If the strata are formed as the set of all possible combinations of family status (with or without dependents), beneficiary status, and region, the basic weight within each stratum is:

$$w_h = \frac{N_h}{n_h} ,$$

where N_h is the number in the population from stratum h, and n_h is the corresponding number in the sample.[1]

If not everyone in the sample responds (as is almost always the case), the sample weights for the responders will not add up to the population counts. Furthermore, even if nonresponse bias were not an issue, it may be desirable to poststratify the sample to bring its composition into greater conformity with the population. Poststratification involves partitioning the sample into homogeneous subgroups, using a factor not used to design the sample. For example, the sample could be further partitioned by the Service of the sponsor. If it is desired to adjust the basic weight for both nonresponse and poststratification, care must be taken not to adjust for too many factors to avoid placing undue weight on spurious influences. The factors used to adjust the basic weight in the present survey were:

- all combinations of family status, beneficiary status, and region,
- service of the sponsor,
- sex of the sponsor,
- enlisted or officer status for retirees, and
- age of the sponsor (using U.S. Census groupings).

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[1] Postal nondeliverables, that is, sampled individuals who could not be reached at the address in DMDC's files, are excluded from the sample.

Because there were not enough data to adjust for all possible combinations of the above factors, a method called Generalized Regression (GREG) was used to adjust the weights. Rather than attempt to reproduce the population counts for all possible combinations of factors, this method allows us to reproduce the marginal totals for some factors. In particular, the basic weights were adjusted to reflect the number of respondents for each combination of family status, beneficiary status, and region, but only the marginal numbers for all other factors. The adjustment is accomplished through application of the following formula:

$$\mathbf{w}(s) = \mathbf{W}_s\mathbf{Z}_s(\mathbf{Z}_s'\mathbf{W}_s\mathbf{Z}_s)^{-1}\mathbf{N} ,$$

where $\mathbf{W}_s$ is a diagonal matrix of basic survey weights, $\mathbf{Z}_s$ is a matrix of indicator variables, $\mathbf{N}$ is a vector of population counts for each factor (or combination of factors), and $\mathbf{w}(s)$ is the sample-adjusted weight. The matrix of indicator variables consists of columns of zeros and ones, where the ones represent the presence of an attribute (for example, sex = male) and the zeros represent the absence of that attribute. A separate column appears for every level of every factor.

The GREG method has the desirable property that $\mathbf{Z}_s\,\mathbf{w}(s) = \mathbf{N}$, so the method is guaranteed to yield weights that sum to the desired marginal totals. The GREG approach to weighting should also serve to compensate, in part, for the postal-nondeliverables. However, if this method attempts to adjust for too many factors, it is possible for some of the adjusted weights to be negative—an obviously undesirable result. Therefore, care was taken not to "over-adjust" the weights.

The survey weight yielded by the GREG method is termed the "household weight" because households (as represented by the sponsor or survivor), not individual beneficiaries, were sampled. This is the appropriate weight to use when the unit of analysis is the household or sponsor, e.g., when computing mean family income or determining knowledge of benefits. However, there are situations where the unit of analysis is an individual beneficiary, such as the family member with the most recent birthday, outpatient visit, or hospital stay. The appropriate weight to use for analyses involving the family member with the most recent birthday (such as estimating utilization) is the "beneficiary weight," which is calculated by multiplying the household weight by the number of eligible family members (including the sponsor). The appropriate weights to use for the family members with the most recent outpatient visit and hospital stay are the "outpatient weight" and "inpatient weight," respectively, which are calculated by multiplying the household weight by the number of eligible family members who had a visit or stay.

APPENDIX G

OUTPATIENT UTILIZATION REGRESSION MODELS

APPENDIX G

OUTPATIENT UTILIZATION REGRESSION MODELS

The number of visits for outpatient care during the past 12 months is recorded in the response to survey question 47, which asks for the number of visits by source of care. The responses for each source of care are measured on a scale from 0 to 10+, where 10+ means 10 or more visits. Because the exact number of visits beyond 10 are unknown, the average number of visits cannot be calculated directly from the data; rather, it must be calculated from a model of outpatient utilization. The model used to estimate outpatient utilization is a negative-binomial counting model. This model is derived from the assumptions that the number of visits for each individual has a Poisson distribution with utilization rate λ_i, i.e.,

$$p(y_i|\varepsilon) = \frac{\lambda_i^{y_i} e^{-\lambda_i}}{y_i!} ,$$

and that

$$\log \lambda_i = \beta' \mathbf{x}_i + \varepsilon ,$$

where $p(y_i|\varepsilon)$ is the probability that individual i makes y_i visits, $\mathbf{x}_i$ is a set of individual characteristics (independent variables), and $\exp(\varepsilon)$ has a gamma distribution with mean 1 and variance α. Multiplying $p(y_i|\varepsilon)$ by the distribution of ε and integrating out ε results in the following model:

$$p(y_i) = \frac{\Gamma(y_i + \theta)}{\Gamma(\theta) y_i!} \left(\frac{\theta}{\lambda_i + \theta} \right)^{\theta} \left(\frac{\lambda_i}{\lambda_i + \theta} \right)^{y_i} ,$$

where $\theta = 1/\alpha$. The parameters of this model are estimated by maximum likelihood. This model has the properties that

$$E(y_i) = e^{\beta' \mathbf{x}_i} \tag{G-1}$$

and

$$V(y_i) = e^{\beta' \mathbf{x}_i} (1 + \alpha e^{\beta' \mathbf{x}_i}) .$$

The negative-binomial model allows for increasing variability in utilization as the average level increases. It reduces to the Poisson model when $\alpha = 0$.

Tables G-1 to G-5 show the estimated coefficients from the negative-binomial models of outpatient utilization for each beneficiary group. A positive coefficient means that utilization increases as the variable with which it is associated increases. A negative coefficient means that utilization declines as the variable increases. Note that most of the variables in the regressions are dummy variables, i.e., they take on values of 1 or 0 where these values indicate the presence or absence of an attribute, respectively. The expected utilization levels reported in Chapter 4 are derived from these tables by substituting in the value of the variable in question and holding all other variables at their means (shown in the last column of each table) in equation (G-1). A discussion of the results also appears in Chapter 4.

Table G-1. Outpatient Utilization Regression for Active-Duty Sponsors

Variable	Coefficient	Standard Error	t-Value	Significance Level	Variable Mean
Constant	0.882	0.096	9.214	0.000	
Senior Enlisted	-0.017	0.044	-0.380	0.704	0.350
Officers	-0.024	0.065	-0.368	0.713	0.391
Army CAM	0.110	0.096	1.144	0.253	0.060
CRI	-0.036	0.060	-0.595	0.552	0.086
Army Gateway to Care	-0.083	0.067	-1.236	0.216	0.067
TRICARE Region	-0.296	0.090	-3.298	0.001	0.056
Overlapping Catchment Areas	-0.098	0.065	-1.522	0.128	0.082
SE Region FI/PPO	-0.069	0.078	-0.887	0.375	0.076
New Orleans CRI-Like	0.034	0.487	0.070	0.944	0.035
PRIMUS/NAVCARE Sites	-0.085	0.074	-1.158	0.247	0.070
Noncatchment Areas	-0.131	0.093	-1.418	0.156	0.066
Outside U.S.	-0.097	0.056	-1.718	0.086	0.076
Navy CAM	-0.085	0.188	-0.454	0.650	0.066
Air Force CAM	0.257	0.249	1.034	0.301	0.062
Shipboard	0.038	0.069	0.556	0.579	0.108
Married, Living With Spouse	0.105	0.038	2.767	0.006	0.670
Married, not Living With Spouse	-0.025	0.060	-0.412	0.680	0.065
Age	0.002	0.003	0.551	0.582	31.512
Male	-0.526	0.052	-10.202	0.000	0.876
Black	0.171	0.040	4.264	0.000	0.125
Other Race	-0.041	0.056	-0.737	0.461	0.065
Family Income	0.008	0.013	0.620	0.535	3.512
Private Insurance	-0.539	0.084	-6.426	0.000	0.019
Navy	-0.212	0.044	-4.820	0.000	0.310
Marine Corps	0.127	0.056	2.268	0.023	0.080
Air Force	-0.213	0.045	-4.745	0.000	0.362
Facility Operated by Another Service	0.193	0.057	3.413	0.001	0.100

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Table G-1—*Continued*

Variable	Coefficient	Standard Error	t-Value	Significance Level	Variable Mean
Lung Problems	0.358	0.084	4.274	0.000	0.028
Heart Problems	0.591	0.087	6.771	0.000	0.024
High Blood Pressure	0.343	0.089	3.831	0.000	0.034
Diabetes	0.459	0.263	1.747	0.081	0.004
Joint/Muscular Problems	0.690	0.046	15.159	0.000	0.091
Back Problems	0.375	0.051	7.361	0.000	0.111
Cancer (except skin)	1.013	0.340	2.979	0.003	0.002
Skin Cancer	0.408	0.185	2.205	0.027	0.005
Mental Health Problems	0.205	0.083	2.476	0.013	0.017
Allergies	0.244	0.049	4.943	0.000	0.098
Alcohol/Drug Problems	0.029	0.089	0.330	0.742	0.031
Cold or Flu	0.513	0.032	16.080	0.000	0.386
Digestive Problems	0.415	0.078	5.309	0.000	0.043
Bladder/Urinary Problems	0.530	0.112	4.715	0.000	0.030
Eye/Vision Problems	0.157	0.073	2.158	0.031	0.065
Ear/Hearing Problems	0.397	0.091	4.384	0.000	0.024
Prostate Problems	-0.180	0.254	-0.709	0.478	0.008
Menstrual Problems	0.243	0.112	2.172	0.030	0.022
Other Problems	0.574	0.034	16.843	0.000	0.225
α	0.508	0.021	24.183	0.000	

Table G-2. Regression for Active Duty Family Members Using Military Facilities

Variable	Coefficient	Standard Error	t-Value	Significance Level	Variable Mean
Constant	0.372	0.095	3.901	0.000	
Senior Enlisted	-0.099	0.034	-2.911	0.004	0.387
Officers	-0.110	0.058	-1.881	0.060	0.403
Army CAM	0.031	0.098	0.318	0.750	0.071
CRI	0.212	0.060	3.519	0.000	0.075
Army Gateway to Care	0.104	0.068	1.533	0.125	0.067
TRICARE Region	-0.023	0.085	-0.271	0.786	0.065
Overlapping Catchment Areas	0.128	0.063	2.027	0.043	0.078
SE Region FI/PPO	0.067	0.072	0.925	0.355	0.075
New Orleans CRI-Like	-0.468	0.307	-1.524	0.127	0.042
PRIMUS/NAVCARE Sites	0.102	0.077	1.321	0.187	0.069
Noncatchment Areas	-0.454	0.078	-5.818	0.000	0.078
Outside U.S.	0.096	0.058	1.656	0.098	0.070
Navy CAM	0.206	0.190	1.083	0.279	0.079
Air Force CAM	-0.107	0.196	-0.548	0.584	0.074
Shipboard	0.114	0.068	1.677	0.094	0.073

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Table G-2—*Continued*

Variable	Coefficient	Standard Error	t-Value	Significance Level	Variable Mean
Married, Living With Spouse	0.412	0.073	5.684	0.000	0.883
Married, not Living With Spouse	0.305	0.084	3.655	0.000	0.070
Age	-0.005	0.001	-3.795	0.000	18.223
Male	-0.152	0.034	-4.501	0.000	0.325
Black	-0.223	0.040	-5.617	0.000	0.121
Other Race	-0.255	0.045	-5.699	0.000	0.071
Family Income	-0.016	0.011	-1.401	0.161	3.846
CHAMPUS Supplemental	-0.023	0.055	-0.416	0.677	0.095
Private Insurance	-0.442	0.058	-7.600	0.000	0.071
Navy	-0.085	0.048	-1.755	0.079	0.289
Marine Corps	-0.171	0.061	-2.821	0.005	0.087
Air Force	0.092	0.043	2.133	0.033	0.382
Facility Operated by Another Service	-0.112	0.056	-2.018	0.044	0.099
Lung Problems	0.544	0.062	8.709	0.000	0.062
Heart Problems	0.380	0.110	3.458	0.001	0.015
High Blood Pressure	0.313	0.086	3.651	0.000	0.020
Diabetes	0.522	0.137	3.804	0.000	0.007
Joint/Muscular Problems	0.004	0.085	0.045	0.964	0.040
Back Problems	0.352	0.064	5.474	0.000	0.056
Cancer (except skin)	1.053	0.192	5.491	0.000	0.004
Skin Cancer	0.700	0.497	1.408	0.159	0.003
Mental Health Problems	0.289	0.077	3.771	0.000	0.032
Allergies	0.305	0.051	5.980	0.000	0.111
Alcohol/Drug Problems	-0.039	0.076	-0.521	0.603	0.042
Cold or Flu	0.425	0.030	14.101	0.000	0.464
Digestive Problems	0.286	0.070	4.069	0.000	0.044
Bladder/Urinary Problems	0.445	0.061	7.273	0.000	0.060
Eye/Vision Problems	0.241	0.056	4.290	0.000	0.063
Ear/Hearing Problems	0.447	0.095	4.718	0.000	0.022
Prostate Problems	-0.022	0.843	-0.026	0.979	0.001
Menstrual Problems	0.157	0.066	2.364	0.018	0.066
Other Problems	0.539	0.032	16.597	0.000	0.264
α	0.941	0.024	39.201	0.000	

Table G-3. Regression for Active-Duty Family Members Using Civilian Facilities

Variable	Coefficient	Standard Error	t-Value	Significance Level	Variable Mean
Constant	0.007	0.245	0.030	0.976	
Senior Enlisted	-0.323	0.086	-3.744	0.000	0.387
Officers	0.013	0.131	0.099	0.921	0.403
Army CAM	-0.276	0.212	-1.302	0.193	0.071
CRI	-0.019	0.134	-0.141	0.888	0.075
Army Gateway to Care	-0.391	0.138	-2.833	0.005	0.067
TRICARE Region	-0.110	0.171	-0.645	0.519	0.065
Overlapping Catchment Areas	-0.297	0.138	-2.155	0.031	0.078
SE Region FI/PPO	0.038	0.153	0.251	0.802	0.075
New Orleans CRI-Like	0.720	1.161	0.620	0.535	0.042
PRIMUS/NAVCARE Sites	-0.232	0.154	-1.507	0.132	0.069
Noncatchment Areas	0.965	0.209	4.612	0.000	0.078
Outside U.S.	-0.727	0.129	-5.634	0.000	0.070
Navy CAM	0.048	0.356	0.134	0.893	0.079
Air Force CAM	0.389	0.372	1.046	0.295	0.074
Shipboard	0.409	0.164	2.489	0.013	0.073
Married, Living With Spouse	-0.600	0.195	-3.076	0.002	0.883
Married, not Living With Spouse	0.087	0.213	0.408	0.683	0.070
Age	-0.002	0.003	-0.511	0.610	18.223
Male	-0.099	0.087	-1.144	0.252	0.325
Black	-0.212	0.095	-2.229	0.026	0.121
Other Race	0.078	0.113	0.694	0.488	0.071
Family Income	0.019	0.024	0.783	0.433	3.846
CHAMPUS Supplemental	0.074	0.136	0.540	0.589	0.095
Private Insurance	0.539	0.149	3.615	0.000	0.071
Navy	0.310	0.113	2.733	0.006	0.289
Marine Corps	0.609	0.133	4.587	0.000	0.087
Air Force	-0.470	0.088	-5.325	0.000	0.382
Facility Operated by Another Service	0.269	0.115	2.339	0.019	0.099
Lung Problems	0.865	0.145	5.975	0.000	0.062
Heart Problems	0.604	0.315	1.919	0.055	0.015
High Blood Pressure	0.373	0.190	1.965	0.049	0.020
Diabetes	0.811	0.335	2.421	0.015	0.007
Joint/Muscular Problems	0.502	0.212	2.371	0.018	0.040
Back Problems	0.272	0.166	1.640	0.101	0.056
Cancer (except skin)	1.493	0.525	2.843	0.004	0.004
Skin Cancer	0.130	0.977	0.133	0.894	0.003
Mental Health Problems	2.027	0.209	9.685	0.000	0.032
Allergies	0.713	0.120	5.932	0.000	0.111
Alcohol/Drug Problems	0.621	0.183	3.401	0.001	0.042
Cold or Flu	0.177	0.069	2.549	0.011	0.464
Digestive Problems	0.733	0.159	4.606	0.000	0.044
Bladder/Urinary Problems	0.242	0.138	1.756	0.079	0.060

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Table G-3—*Continued*

Variable	Coefficient	Standard Error	t-Value	Significance Level	Variable Mean
Eye/Vision Problems	0.319	0.142	2.244	0.025	0.063
Ear/Hearing Problems	0.407	0.261	1.561	0.119	0.022
Prostate Problems	1.169	2.386	0.490	0.624	0.001
Menstrual Problems	0.084	0.150	0.562	0.574	0.066
Other Problems	0.757	0.077	9.813	0.000	0.264
α	4.943	0.170	29.006	0.000	

Table G-4. Regression for Retiree/Survivor Family Members Using Military Facilities

Variable	Coefficient	Standard Error	t-Value	Significance Level	Variable Mean
Constant	0.405	0.166	2.437	0.015	
Retirees Over 65	0.182	0.093	1.963	0.050	0.331
Reserve Retirees Under 65	-0.935	0.133	-7.008	0.000	0.065
Reserve Retirees Over 65	-0.324	0.121	-2.678	0.007	0.134
Survivors Under 65	0.145	0.179	0.810	0.418	0.006
Survivors Over 65	-0.015	0.185	-0.081	0.935	0.011
Army CAM	0.348	0.270	1.285	0.199	0.077
CRI	0.041	0.105	0.388	0.698	0.076
Army Gateway to Care	0.422	0.156	2.707	0.007	0.071
TRICARE Region	0.006	0.178	0.032	0.975	0.074
Overlapping Catchment Areas	0.392	0.108	3.627	0.000	0.086
SE Region FI/PPO	-0.400	0.100	-4.013	0.000	0.083
New Orleans CRI-Like	-0.617	0.379	-1.629	0.103	0.063
PRIMUS/NAVCARE Sites	0.187	0.128	1.459	0.144	0.073
Noncatchment Areas	-0.945	0.096	-9.834	0.000	0.113
Outside U.S.	-0.027	0.247	-0.110	0.913	0.057
Navy CAM	0.433	0.351	1.234	0.217	0.070
Air Force CAM	-0.016	0.203	-0.077	0.939	0.074
Married, Living With Spouse	0.088	0.101	0.864	0.387	0.847
Married, not Living With Spouse	1.166	0.206	5.663	0.000	0.017
Age	-0.003	0.002	-1.779	0.075	58.778
Male	-0.214	0.058	-3.708	0.000	0.556
Black	0.096	0.111	0.861	0.389	0.060
Other Race	-0.127	0.158	-0.804	0.422	0.027
Family Income	-0.046	0.010	-4.449	0.000	4.376
CHAMPUS Supplemental	0.060	0.086	0.699	0.484	0.104
Medicare Part B	-0.069	0.084	-0.823	0.410	0.341
Private Insurance	-0.360	0.054	-6.686	0.000	0.411

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Table G-4—*Continued*

Variable	Coefficient	Standard Error	t-Value	Significance Level	Variable Mean
Navy	-0.157	0.073	-2.160	0.031	0.259
Marine Corps	-0.336	0.116	-2.902	0.004	0.043
Air Force	0.105	0.066	1.577	0.115	0.337
Facility Operated by Another Service	-0.098	0.072	-1.361	0.174	0.236
Lung Problems	0.487	0.095	5.145	0.000	0.098
Heart Problems	0.360	0.095	3.804	0.000	0.102
High Blood Pressure	0.401	0.065	6.181	0.000	0.269
Diabetes	0.249	0.104	2.409	0.016	0.084
Joint/Muscular Problems	0.378	0.062	6.098	0.000	0.265
Back Problems	0.207	0.071	2.911	0.004	0.170
Cancer (except skin)	0.667	0.147	4.523	0.000	0.040
Skin Cancer	0.093	0.118	0.792	0.428	0.073
Mental Health Problems	0.175	0.115	1.522	0.128	0.047
Allergies	0.042	0.077	0.553	0.580	0.117
Alcohol/Drug Problems	-0.254	0.412	-0.616	0.538	0.006
Cold or Flu	0.231	0.062	3.729	0.000	0.299
Digestive Problems	0.283	0.089	3.190	0.001	0.102
Bladder/Urinary Problems	0.420	0.087	4.803	0.000	0.123
Eye/Vision Problems	0.130	0.075	1.742	0.081	0.202
Ear/Hearing Problems	-0.077	0.089	-0.865	0.387	0.112
Prostate Problems	0.581	0.124	4.676	0.000	0.086
Menstrual Problems	0.123	0.148	0.828	0.408	0.033
Other Problems	0.278	0.061	4.540	0.000	0.272
α	3.873	0.106	36.619	0.000	

Table G-5. Regression for Retiree/Survivor Family Members Using Civilian Facilities

Variable	Coefficient	Standard Error	t-Value	Significance Level	Variable Mean
Constant	-0.521	0.095	-5.483	0.000	
Retirees Over 65	0.204	0.051	3.970	0.000	0.331
Reserve Retirees Under 65	0.538	0.106	5.078	0.000	0.065
Reserve Retirees Over 65	0.346	0.082	4.247	0.000	0.134
Survivors Under 65	0.389	0.154	2.528	0.011	0.006
Survivors Over 65	0.391	0.122	3.223	0.001	0.011
Army CAM	-0.288	0.108	-2.662	0.008	0.077
CRI	0.165	0.061	2.694	0.007	0.076
Army Gateway to Care	-0.265	0.076	-3.509	0.000	0.071
TRICARE Region	0.075	0.109	0.692	0.489	0.074
Overlapping Catchment Areas	-0.150	0.058	-2.589	0.010	0.086
SE Region FI/PPO	0.353	0.062	5.662	0.000	0.083

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Table G-5—*Continued*

Variable	Coefficient	Standard Error	t-Value	Significance Level	Variable Mean
New Orleans CRI-Like	0.507	0.266	1.905	0.057	0.063
PRIMUS/NAVCARE Sites	-0.125	0.073	-1.715	0.086	0.073
Noncatchment Areas	0.406	0.057	7.151	0.000	0.113
Outside U.S.	-0.152	0.113	-1.349	0.177	0.057
Navy CAM	-0.031	0.166	-0.186	0.852	0.070
Air Force CAM	0.181	0.118	1.535	0.125	0.074
Married, Living With Spouse	0.291	0.059	4.957	0.000	0.847
Married, not Living With Spouse	-0.006	0.119	-0.049	0.961	0.017
Age	-0.001	0.001	-0.622	0.534	58.778
Male	-0.322	0.034	-9.366	0.000	0.556
Black	-0.158	0.059	-2.682	0.007	0.060
Other Race	-0.327	0.089	-3.697	0.000	0.027
Family Income	0.058	0.007	7.932	0.000	4.376
CHAMPUS Supplemental	0.123	0.051	2.411	0.016	0.104
Medicare Part B	0.322	0.044	7.343	0.000	0.341
Private Insurance	0.335	0.035	9.688	0.000	0.411
Navy	0.194	0.044	4.405	0.000	0.259
Marine Corps	0.197	0.068	2.901	0.004	0.043
Air Force	0.056	0.039	1.431	0.152	0.337
Facility Operated by Another Service	0.031	0.041	0.768	0.442	0.236
Lung Problems	0.544	0.055	9.846	0.000	0.098
Heart Problems	0.380	0.055	6.885	0.000	0.102
High Blood Pressure	0.338	0.040	8.424	0.000	0.269
Diabetes	0.266	0.061	4.371	0.000	0.084
Joint/Muscular Problems	0.253	0.039	6.561	0.000	0.265
Back Problems	0.211	0.044	4.834	0.000	0.170
Cancer (except skin)	0.715	0.098	7.312	0.000	0.040
Skin Cancer	0.432	0.072	6.000	0.000	0.073
Mental Health Problems	0.759	0.073	10.412	0.000	0.047
Allergies	0.314	0.050	6.282	0.000	0.117
Alcohol/Drug Problems	-0.103	0.140	-0.735	0.462	0.006
Cold or Flu	0.217	0.035	6.221	0.000	0.299
Digestive Problems	0.103	0.052	1.983	0.047	0.102
Bladder/Urinary Problems	0.293	0.055	5.350	0.000	0.123
Eye/Vision Problems	0.211	0.044	4.771	0.000	0.202
Ear/Hearing Problems	-0.028	0.054	-0.523	0.601	0.112
Prostate Problems	0.216	0.075	2.885	0.004	0.086
Menstrual Problems	0.348	0.087	3.980	0.000	0.033
Other Problems	0.377	0.035	10.775	0.000	0.272
α	1.440	0.033	43.687	0.000	

APPENDIX H

INPATIENT UTILIZATION REGRESSION MODELS

APPENDIX H

INPATIENT UTILIZATION REGRESSION MODELS

H.1 MODEL FOR HOSPITALIZATION RATES

The number of nights spent in the hospital during the past 12 months is recorded in the response to survey question 48, which asks for the total number of nights by source of care. The responses for each source of care are measured on a scale from 0 to 10+, where 10+ means 10 or more nights. The objective of this analysis is to relate characteristics of the respondent sample to the probability of being admitted to the hospital during a 12-month period. Therefore, the answers to question 48 were collapsed into a binary variable. In other words, if the respondent marked zero nights in the hospital, he was counted as not having a hospitalization. If he chose one or more nights, he was counted as having at least one overnight stay.

The model used to relate respondent characteristics to the hospitalization rate is a binary logit model. This model assumes that the probability of an inpatient episode can be expressed as:

$$p_i = \frac{e^{\beta' \mathbf{x}_i}}{1 + e^{\beta' \mathbf{x}_i}} , \qquad \text{(H-1)}$$

where $\mathbf{x}_i$ is a vector of independent variables for individual i and β is a vector of unknown parameters. The parameters of this model are estimated by maximum likelihood.

Tables H-1 to H-5 show the estimated coefficients from the logit models of outpatient utilization for each beneficiary group. A positive coefficient means that the probability of an inpatient episode increases as the variable with which it is associated increases. A negative coefficient means that the probability of an inpatient episode declines as the variable increases. Note that most of the variables in the regressions are dummy variables, i.e., they take on values of 1 or 0 where these values indicate the presence or absence of an attribute, respectively. The expected hospitalization rates reported in Chapter 5 are derived from these tables by substituting in the value of the variable in question and holding all other variables at their means (shown in the last column of each table) in equation (H-1). A discussion of the results also appears in Chapter 5.

Table H-1. Hospitalization Rate Regression for Active-Duty Sponsors

Variable	Coefficient	Standard Error	t-Value	Significance Level	Variable Mean
Constant	-2.004	0.349	-5.749	0.000	
Senior Enlisted	-0.171	0.169	-1.009	0.313	0.416
Officers	-0.647	0.249	-2.600	0.009	0.159
Army CAM	0.186	0.361	0.515	0.607	0.025
CRI	-0.127	0.231	-0.550	0.582	0.123
Army Gateway to Care	-0.553	0.270	-2.052	0.040	0.092
Tidewater Region	-0.907	0.396	-2.288	0.022	0.039
Overlapping Catchment Areas	-0.371	0.247	-1.501	0.133	0.100
SE Region FI/PPO	-0.091	0.279	-0.328	0.743	0.058
New Orleans CRI-Like	-0.458	2.568	-0.178	0.858	0.001
PRIMUS/NAVCARE	-0.338	0.280	-1.209	0.227	0.068
Noncatchment Areas	-0.878	0.472	-1.858	0.063	0.031
Outside U.S.	-0.697	0.216	-3.223	0.001	0.187
Navy CAM	-0.373	0.783	-0.477	0.634	0.006
Air Force CAM	0.519	0.688	0.754	0.451	0.005
Shipboard	0.096	0.324	0.297	0.767	0.133
Married, Living With Spouse	0.091	0.149	0.613	0.540	0.577
Married, not Living With Spouse	-0.083	0.242	-0.345	0.730	0.084
Age of Sponsor	0.014	0.011	1.290	0.197	28.888
Male	-1.316	0.158	-8.352	0.000	0.875
Private Insurance	1.220	0.250	4.888	0.000	0.034
Navy	0.091	0.192	0.475	0.635	0.281
Marine Corps	-0.348	0.259	-1.346	0.178	0.095
Air Force	0.494	0.270	1.829	0.067	0.290
Facility Operated by Another Service	-0.889	0.243	-3.658	0.000	0.468
Lung Problems	0.326	0.296	1.103	0.270	0.029
Heart Problems	1.026	0.298	3.450	0.001	0.023
High Blood Pressure	0.284	0.308	0.923	0.356	0.026
Diabetes	0.602	0.710	0.848	0.397	0.004
Joint/Muscular Problems	0.055	0.202	0.272	0.786	0.094
Back Problems	-0.103	0.207	-0.497	0.619	0.103
Cancer (except skin)	1.480	1.022	1.447	0.148	0.003
Skin Cancer	-11.328	161.100	-0.070	0.944	0.004
Mental Health Problems	0.619	0.300	2.062	0.039	0.020
Allergies	-0.490	0.211	-2.326	0.020	0.107
Alcohol/Drug Problems	-0.155	0.363	-0.426	0.670	0.029
Cold or Flu	0.339	0.129	2.628	0.009	0.378
Digestive Problems	0.211	0.293	0.720	0.472	0.038
Bladder/Urinary Problems	1.162	0.280	4.156	0.000	0.022
Eye/Vision Problems	-0.558	0.302	-1.850	0.064	0.053
Ear/Hearing Problems	-0.288	0.380	-0.758	0.448	0.028
Prostate Problems	-0.031	0.863	-0.036	0.972	0.005
Menstrual Problems	-0.645	0.344	-1.875	0.061	0.031
Other Problems	1.370	0.124	11.099	0.000	0.226

Table H-2. Hospitalization Rate Regression for Active Duty Family Members Using Military Facilities

Variable	Coefficient	Standard Error	t-Value	Significance Level	Variable Mean
Constant	-2.704	0.318	-8.518	0.000	
Senior Enlisted	-0.695	0.097	-7.197	0.000	0.575
Officers	-0.492	0.168	-2.934	0.003	0.188
Army CAM	0.840	0.266	3.156	0.002	0.025
CRI	0.470	0.187	2.520	0.012	0.129
Army Gateway to Care	0.644	0.201	3.204	0.001	0.101
Tidewater Region	-0.289	0.319	-0.905	0.366	0.044
Overlapping Catchment Areas	0.677	0.188	3.597	0.000	0.110
SE Region FI/PPO	0.499	0.212	2.352	0.019	0.061
New Orleans CRI-Like	-0.510	1.879	-0.271	0.786	0.001
PRIMUS/NAVCARE	0.391	0.223	1.753	0.080	0.063
Noncatchment Areas	-0.641	0.392	-1.635	0.102	0.032
Outside U.S.	0.612	0.167	3.677	0.000	0.178
Navy CAM	0.446	0.548	0.815	0.415	0.007
Air Force CAM	0.126	0.622	0.202	0.840	0.006
Shipboard	0.951	0.209	4.553	0.000	0.116
Married, Living With Spouse	0.757	0.258	2.938	0.003	0.855
Married, not Living With Spouse	0.429	0.288	1.489	0.136	0.104
Age of Family Member	-0.017	0.004	-4.486	0.000	16.436
Male	-0.235	0.097	-2.428	0.015	0.343
Black	-0.386	0.132	-2.939	0.003	0.164
Other Race	0.010	0.133	0.073	0.942	0.103
Family Income	-0.044	0.035	-1.242	0.214	3.193
CHAMPUS Supplemental Insurance	-0.131	0.162	-0.811	0.418	0.073
Private Insurance	-0.431	0.222	-1.941	0.052	0.059
Navy	-0.192	0.146	-1.317	0.188	0.281
Marine Corps	-0.231	0.182	-1.268	0.205	0.085
Air Force	0.162	0.121	1.340	0.180	0.306
Facility Operated by Another Service	-0.114	0.154	-0.739	0.460	0.092
Lung Problems	1.213	0.134	9.068	0.000	0.064
Heart Problems	0.687	0.283	2.426	0.015	0.015
High Blood Pressure	1.316	0.214	6.150	0.000	0.025
Diabetes	1.095	0.357	3.071	0.002	0.007
Joint/Muscular Problems	0.638	0.214	2.976	0.003	0.033
Back Problems	-0.809	0.238	-3.401	0.001	0.053
Cancer (except skin)	1.424	0.483	2.949	0.003	0.003
Skin Cancer	-10.451	216.000	-0.048	0.961	0.001
Mental Health Problems	-0.293	0.270	-1.088	0.276	0.028
Allergies	-0.174	0.147	-1.179	0.238	0.100
Alcohol/Drug Problems	-0.250	0.253	-0.987	0.324	0.039
Cold or Flu	-0.510	0.090	-5.661	0.000	0.449
Digestive Problems	-0.134	0.222	-0.603	0.546	0.042

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Table H-2—*Continued*

Variable	Coefficient	Standard Error	t-Value	Significance Level	Variable Mean
Bladder/Urinary Problems	0.366	0.170	2.147	0.032	0.056
Eye/Vision Problems	-0.083	0.188	-0.444	0.657	0.060
Ear/Hearing Problems	0.128	0.289	0.441	0.659	0.020
Prostate Problems	-0.338	2.406	-0.140	0.888	0.000
Menstrual Problems	0.401	0.168	2.380	0.017	0.056
Other Problems	0.817	0.086	9.464	0.000	0.247

Table H-3. Hospitalization Rate Regression for Active-Duty Family Members Using Civilian Facilities

Variable	Coefficient	Standard Error	t-Value	Significance Level	Variable Mean
Constant	-1.294	0.313	-4.139	0.000	
Senior Enlisted	-0.692	0.118	-5.866	0.000	0.575
Officers	-0.621	0.220	-2.826	0.005	0.188
Army CAM	-0.577	0.424	-1.361	0.174	0.025
CRI	-0.180	0.234	-0.769	0.442	0.129
Army Gateway to Care	-0.446	0.253	-1.761	0.078	0.101
Tidewater Region	-0.089	0.307	-0.291	0.771	0.044
Overlapping Catchment Areas	0.095	0.234	0.405	0.686	0.110
SE Region FI/PPO	0.308	0.253	1.218	0.223	0.061
New Orleans CRI-Like	0.637	1.018	0.625	0.532	0.001
PRIMUS/NAVCARE	-0.258	0.285	-0.904	0.366	0.063
Noncatchment Areas	0.792	0.278	2.853	0.004	0.032
Outside U.S.	-0.561	0.228	-2.460	0.014	0.178
Navy CAM	0.570	0.532	1.071	0.284	0.007
Air Force CAM	0.525	0.696	0.754	0.451	0.006
Shipboard	0.394	0.241	1.639	0.101	0.116
Married, Living With Spouse	-0.494	0.213	-2.317	0.020	0.855
Married, not Living With Spouse	-0.338	0.247	-1.368	0.171	0.104
Age of Family Member	-0.011	0.005	-2.365	0.018	16.436
Male	-0.243	0.120	-2.028	0.043	0.343
Black	-0.061	0.145	-0.419	0.675	0.164
Other Race	-0.033	0.166	-0.199	0.842	0.103
Family Income	-0.099	0.047	-2.094	0.036	3.193
CHAMPUS Supplemental Insurance	0.662	0.157	4.204	0.000	0.073
Private Insurance	-0.339	0.248	-1.368	0.171	0.059
Navy	-0.017	0.161	-0.107	0.915	0.281
Marine Corps	-0.228	0.201	-1.135	0.256	0.085
Air Force	-0.857	0.169	-5.087	0.000	0.306
Facility Operated by Another Service	-0.100	0.221	-0.449	0.653	0.092

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Table H-3—*Continued*

Variable	Coefficient	Standard Error	t-Value	Significance Level	Variable Mean
Lung Problems	0.800	0.167	4.783	0.000	0.064
Heart Problems	0.960	0.282	3.402	0.001	0.015
High Blood Pressure	-0.324	0.299	-1.084	0.278	0.025
Diabetes	1.166	0.391	2.983	0.003	0.007
Joint/Muscular Problems	0.118	0.275	0.428	0.668	0.033
Back Problems	0.259	0.217	1.198	0.231	0.053
Cancer (except skin)	1.448	0.574	2.521	0.012	0.003
Skin Cancer	-10.314	210.300	-0.049	0.961	0.001
Mental Health Problems	1.106	0.215	5.144	0.000	0.028
Allergies	-0.015	0.177	-0.084	0.933	0.100
Alcohol/Drug Problems	0.368	0.232	1.590	0.112	0.039
Cold or Flu	-0.464	0.111	-4.192	0.000	0.449
Digestive Problems	0.460	0.216	2.127	0.033	0.042
Bladder/Urinary Problems	0.348	0.199	1.747	0.081	0.056
Eye/Vision Problems	-0.748	0.270	-2.767	0.006	0.060
Ear/Hearing Problems	0.518	0.298	1.737	0.082	0.020
Prostate Problems	1.044	1.778	0.587	0.557	0.000
Menstrual Problems	0.243	0.204	1.188	0.235	0.056
Other Problems	0.590	0.106	5.546	0.000	0.247

Table H-4. Hospitalization Rate Regression for Retiree/Survivor Family Members Using Military Facilities

Variable	Coefficient	Standard Error	t-Value	Significance Level	Variable Mean
Constant	-3.588	0.341	-10.522	0.000	
Retirees 65 and Over	0.267	0.179	1.496	0.135	0.173
Reserve Retirees Under 65	-1.238	0.666	-1.860	0.063	0.026
Reserve Retirees 65 and Over	-0.748	0.399	-1.876	0.061	0.050
Survivors Under 65	-0.503	0.521	-0.967	0.334	0.016
Survivors 65 and Over	0.069	0.378	0.183	0.855	0.028
Army CAM	0.353	0.380	0.927	0.354	0.015
CRI	-0.246	0.222	-1.104	0.269	0.126
Army Gateway to Care	0.808	0.229	3.530	0.000	0.054
Tidewater Region	-0.118	0.366	-0.321	0.748	0.027
Overlapping Catchment Areas	0.499	0.191	2.618	0.009	0.141
SE Region FI/PPO	-0.450	0.220	-2.046	0.041	0.134
New Orleans CRI-Like	-0.543	1.170	-0.464	0.643	0.003
PRIMUS/NAVCARE	-0.248	0.265	-0.939	0.348	0.069
Noncatchment Areas	-1.109	0.227	-4.881	0.000	0.250
Outside U.S.	-0.166	0.454	-0.366	0.714	0.015
Navy CAM	0.073	0.636	0.114	0.909	0.007

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Table H-4—*Continued*

Variable	Coefficient	Standard Error	t-Value	Significance Level	Variable Mean
Air Force CAM	-0.694	0.555	-1.250	0.211	0.019
Married, Living With Spouse	-0.446	0.181	-2.469	0.014	0.863
Married, not Living With Spouse	0.831	0.292	2.848	0.004	0.023
Age of Family Member	0.010	0.004	2.288	0.022	50.051
Male	0.576	0.131	4.397	0.000	0.524
Black	0.083	0.194	0.429	0.668	0.077
Other Race	0.090	0.307	0.294	0.769	0.035
Family Income	-0.072	0.026	-2.716	0.007	4.417
CHAMPUS Supplemental Insurance	0.164	0.161	1.019	0.308	0.124
Medicare Part B	-0.236	0.165	-1.425	0.154	0.207
Private Insurance	-0.811	0.138	-5.871	0.000	0.375
Navy	0.015	0.156	0.094	0.925	0.248
Marine Corps	0.065	0.232	0.280	0.780	0.070
Air Force	0.026	0.144	0.184	0.854	0.337
Facility Operated by Another Service	-0.214	0.143	-1.496	0.135	0.200
Lung Problems	0.918	0.143	6.414	0.000	0.093
Heart Problems	0.935	0.142	6.603	0.000	0.092
High Blood Pressure	0.049	0.132	0.368	0.713	0.216
Diabetes	0.435	0.171	2.541	0.011	0.068
Joint/Muscular Problems	-0.182	0.140	-1.301	0.193	0.232
Back Problems	-0.119	0.153	-0.778	0.437	0.165
Cancer (except skin)	1.578	0.200	7.876	0.000	0.027
Skin Cancer	-0.177	0.252	-0.704	0.482	0.050
Mental Health Problems	-0.882	0.285	-3.093	0.002	0.046
Allergies	-0.501	0.194	-2.585	0.010	0.121
Alcohol/Drug Problems	0.509	0.410	1.243	0.214	0.009
Cold or Flu	-0.050	0.124	-0.399	0.690	0.344
Digestive Problems	0.778	0.151	5.151	0.000	0.098
Bladder/Urinary Problems	0.673	0.158	4.268	0.000	0.099
Eye/Vision Problems	0.084	0.145	0.577	0.564	0.166
Ear/Hearing Problems	-0.655	0.209	-3.134	0.002	0.091
Prostate Problems	-0.045	0.221	-0.205	0.838	0.046
Menstrual Problems	0.538	0.262	2.056	0.040	0.051
Other Problems	0.498	0.120	4.164	0.000	0.256

Table H-5. Hospitalization Rate Regression for Retiree/Survivor Family Members Using Civilian Facilities

Variable	Coefficient	Standard Error	t-Value	Significance Level	Variable Mean
Constant	-3.523	0.249	-14.131	0.000	
Retirees 65 and Over	0.256	0.120	2.137	0.033	0.173
Reserve Retirees Under 65	0.639	0.199	3.222	0.001	0.026
Reserve Retirees 65 and Over	0.543	0.165	3.296	0.001	0.050
Survivors Under 65	0.819	0.278	2.943	0.003	0.016
Survivors 65 and Over	0.024	0.279	0.084	0.933	0.028
Army CAM	-0.330	0.371	-0.887	0.375	0.015
CRI	0.152	0.146	1.048	0.295	0.126
Army Gateway to Care	-0.381	0.216	-1.764	0.078	0.054
Tidewater Region	0.203	0.237	0.855	0.393	0.027
Overlapping Catchment Areas	-0.288	0.148	-1.941	0.052	0.141
SE Region FI/PPO	0.243	0.137	1.776	0.076	0.134
New Orleans CRI-Like	0.590	0.544	1.084	0.278	0.003
PRIMUS/NAVCARE	-0.211	0.185	-1.139	0.255	0.069
Noncatchment Areas	0.163	0.129	1.270	0.204	0.250
Outside U.S.	-0.157	0.369	-0.426	0.670	0.015
Navy CAM	-0.074	0.471	-0.158	0.875	0.007
Air Force CAM	-0.021	0.284	-0.073	0.942	0.019
Married, Living With Spouse	0.112	0.152	0.740	0.459	0.863
Married, not Living With Spouse	-0.499	0.346	-1.443	0.149	0.023
Age of Family Member	0.007	0.003	2.442	0.015	50.051
Male	-0.046	0.083	-0.549	0.583	0.524
Black	-0.284	0.170	-1.669	0.095	0.077
Other Race	-0.556	0.261	-2.131	0.033	0.035
Family Income	-0.024	0.016	-1.534	0.125	4.417
CHAMPUS Supplemental Insurance	0.536	0.106	5.051	0.000	0.124
Medicare Part B	0.207	0.104	1.997	0.046	0.207
Private Insurance	0.396	0.077	5.138	0.000	0.375
Navy	0.077	0.100	0.770	0.441	0.248
Marine Corps	-0.019	0.167	-0.114	0.910	0.070
Air Force	0.157	0.092	1.713	0.087	0.337
Facility Operated by Another Service	-0.022	0.099	-0.217	0.828	0.200
Lung Problems	0.422	0.110	3.830	0.000	0.093
Heart Problems	1.281	0.096	13.412	0.000	0.092
High Blood Pressure	0.123	0.086	1.426	0.154	0.216
Diabetes	0.254	0.125	2.034	0.042	0.068
Joint/Muscular Problems	0.019	0.089	0.215	0.829	0.232
Back Problems	0.090	0.099	0.913	0.361	0.165
Cancer (except skin)	1.412	0.148	9.534	0.000	0.027
Skin Cancer	-0.344	0.163	-2.109	0.035	0.050
Mental Health Problems	0.185	0.152	1.217	0.224	0.046
Allergies	-0.565	0.129	-4.382	0.000	0.121

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Table H-5—*Continued*

Variable	Coefficient	Standard Error	t-Value	Significance Level	Variable Mean
Alcohol/Drug Problems	0.325	0.364	0.893	0.372	0.009
Cold or Flu	-0.195	0.083	-2.335	0.020	0.344
Digestive Problems	0.325	0.110	2.954	0.003	0.098
Bladder/Urinary Problems	0.425	0.108	3.939	0.000	0.099
Eye/Vision Problems	-0.364	0.103	-3.539	0.000	0.166
Ear/Hearing Problems	-0.081	0.126	-0.643	0.520	0.091
Prostate Problems	0.234	0.150	1.562	0.118	0.046
Menstrual Problems	0.317	0.164	1.931	0.054	0.051
Other Problems	0.472	0.079	5.943	0.000	0.256

H.2 MODEL FOR LENGTH OF HOSPITAL STAY

The number of nights spent in the hospital for the family member with the last inpatient episode is recorded in the response to survey question 81. The response grid allows for responses of up to 99 nights. A separate "bubble" is checked if the family member had a stay of over 100 nights. The latter cases (albeit very few in number) are treated as "censored" observations (i.e., lower bounds) in this analysis. The objective of this analysis is to relate characteristics of the respondent sample to the length of stay in the hospital. The model used to estimate outpatient utilization is called a Burr model. This model is derived from the assumptions that the length of stay for each individual has a Weibull distribution, i.e.,

$$f(t_i|\varepsilon) = p\lambda_i(\lambda_i t)^{p-1} e^{-(\lambda_i t)^p} ,$$

and that

$$\log \lambda_i = \beta' \mathbf{x}_i + \varepsilon ,$$

where $f(t_i|\varepsilon)$ is the density function for the length of stay t_i, p and λ_i are shape parameters, $\mathbf{x}_i$ is a set of individual characteristics (independent variables), and $\exp(\varepsilon)$ has a gamma distribution with mean 1 and variance α. Multiplying $f(t_i|\varepsilon)$ by the distribution of ε and integrating out ε results in the following model:

$$f(t_i) = [1 + \alpha(\lambda_i t)^p]^{-\frac{1}{\alpha}-1} .$$

The parameters of this model are estimated by maximum likelihood. This model has the property that

$$E(t_i) = e^{\beta' \mathbf{x}_i} . \qquad \text{(H-2)}$$

It reduces to the Weibull model when $\alpha = 0$.

Tables H-6 to H-7 show the estimated coefficients from the Burr models of outpatient utilization for each beneficiary group. A positive coefficient means that utilization increases as the variable with which it is associated increases. A negative coefficient means that utilization declines as the variable increases. Note that most of the variables in the regressions are dummy variables, i.e., they take on values of 1 or 0 where these values indicate the presence or absence of an attribute, respectively. The expected utilization levels reported in Chapter 5 are derived from these tables by substituting in the value of the variable in question and holding all other variables at their means (shown in the last column of each table) in equation (H-2). A discussion of the results also appears in Chapter 5.

Table H-6. Regression for Length of Stay at Military Hospitals

Variable	Coefficient	Standard Error	t-Value	Significance Level	Variable Mean
Constant	0.886	0.109	8.142	0.000	
Senior Enlisted	0.127	0.037	3.406	0.001	0.279
Officers	0.101	0.052	1.942	0.052	0.258
Retirees Under 65	0.181	0.061	2.980	0.003	0.116
Retirees 65 and Over	0.423	0.087	4.870	0.000	0.111
Reserve Retirees Under 65	0.457	0.290	1.576	0.115	0.003
Reserve Retirees 65 and Over	-0.014	0.162	-0.084	0.933	0.014
Survivors Under 65	0.644	0.163	3.940	0.000	0.001
Survivors 65 and Over	0.203	0.180	1.124	0.261	0.003
Army CAM	0.074	0.081	0.907	0.364	0.110
CRI	-0.062	0.055	-1.123	0.262	0.081
Army Gateway to Care	-0.071	0.059	-1.212	0.225	0.092
Tidewater Region	-0.058	0.079	-0.724	0.469	0.066
Overlapping Catchment Areas	-0.014	0.053	-0.255	0.799	0.095
SE Region FI/PPO	-0.084	0.066	-1.278	0.201	0.074
New Orleans CRI-Like	0.074	0.537	0.139	0.890	0.019
PRIMUS/NAVCARE	-0.118	0.066	-1.787	0.074	0.070
Noncatchment Areas	-0.050	0.098	-0.506	0.613	0.028
Outside U.S.	-0.094	0.076	-1.234	0.217	0.087
Navy CAM	-0.256	0.169	-1.517	0.129	0.075
Air Force CAM	0.244	0.115	2.132	0.033	0.070
Shipboard	-0.121	0.075	-1.607	0.108	0.043
Age of Family Member	0.003	0.001	2.550	0.011	34.660
Male	0.025	0.033	0.742	0.458	0.441
CHAMPUS Supplemental Insurance	0.032	0.048	0.664	0.507	0.090
New Military Health Care Program	-0.129	0.137	-0.944	0.345	0.015
Medicare	0.100	0.098	1.016	0.310	0.027
Private Insurance	-0.127	0.071	-1.787	0.074	0.044

Continued on next page

Table H-6—*Continued*

Variable	Coefficient	Standard Error	t-Value	Significance Level	Variable Mean
Public Assistance	-1.204	154.900	-0.008	0.994	0.000
Own Family's Money	0.183	0.094	1.956	0.051	0.019
Hospitalized Outside U.S.	0.067	0.067	0.996	0.319	0.092
Hospitalized Aboard Ship	0.614	0.606	1.012	0.311	0.001
Navy	-0.013	0.042	-0.311	0.756	0.230
Marine Corps	-0.002	0.061	-0.025	0.980	0.067
Air Force	0.001	0.036	0.015	0.988	0.379
Surgery Performed	-0.126	0.033	-3.755	0.000	1.483
Admitted From Emergency Room	-0.094	0.032	-2.957	0.003	1.690
Pregnancy	0.184	0.049	3.729	0.000	0.222
Infant Care	0.360	0.079	4.591	0.000	0.037
Accidents/Injuries	-0.105	0.058	-1.819	0.069	0.065
Back, Spinal, or Bone Problems	-0.028	0.062	-0.451	0.652	0.047
Joint or Muscular Problems	-0.131	0.067	-1.957	0.050	0.041
Digestive System Problems	0.339	0.061	5.556	0.000	0.051
Ear, Nose, or Mouth Problems	-0.357	0.065	-5.488	0.000	0.071
Heart Problems	0.206	0.060	3.421	0.001	0.061
Skin or Breast Problems	0.246	0.087	2.831	0.005	0.021
Lung or Breathing Problems	0.220	0.059	3.746	0.000	0.060
Gynecological Problems	0.009	0.066	0.130	0.897	0.065
Nervous System Problems	0.057	0.125	0.456	0.649	0.013
Alcohol or Drug Problems	2.606	0.144	18.162	0.000	0.009
Mental Health Problems	0.602	0.108	5.567	0.000	0.011
Kidney, Bladder Problems	0.202	0.064	3.170	0.002	0.064
Eye Care or Vision Problems	-0.477	0.131	-3.633	0.000	0.021
Male Reproductive System Problems	-0.169	0.119	-1.418	0.156	0.023
Liver or Pancreas Problems	0.344	0.118	2.926	0.003	0.012
Diabetes or Other Blood Problems	0.730	0.093	7.849	0.000	0.024
Sexually-Transmitted Diseases	-1.664	0.711	-2.339	0.019	0.001
AIDS	1.147	0.180	6.378	0.000	0.002
Treatment for Short-Term Illness	-0.060	0.077	-0.777	0.437	0.027
Other Problems	-0.221	0.041	-5.413	0.000	0.220
α	2.459	0.176	13.986	0.000	
p	3.701	0.180	20.515	0.000	

Table H-7. Regression for Length of Stay at Civilian Hospitals

Variable	Coefficient	Standard Error	t-Value	Significance Level	Variable Mean
Constant	1.887	0.126	14.969	0.000	
Senior Enlisted	0.086	0.066	1.311	0.190	0.135
Officers	0.122	0.084	1.447	0.148	0.146
Retirees Under 65	0.226	0.085	2.662	0.008	0.209
Retirees 65 and Over	0.305	0.110	2.780	0.005	0.214
Reserve Retirees Under 65	0.363	0.135	2.677	0.007	0.044
Reserve Retirees 65 and Over	0.372	0.121	3.067	0.002	0.130
Survivors Under 65	0.141	0.169	0.835	0.404	0.002
Survivors 65 and Over	0.937	0.156	6.013	0.000	0.005
Army CAM	-0.121	0.174	-0.694	0.487	0.037
CRI	-0.212	0.067	-3.149	0.002	0.074
Army Gateway to Care	-0.009	0.096	-0.092	0.927	0.052
Tidewater Region	-0.038	0.109	-0.345	0.730	0.067
Overlapping Catchment Areas	-0.069	0.066	-1.041	0.298	0.071
SE Region FI/PPO	-0.072	0.063	-1.156	0.248	0.091
New Orleans CRI-Like	-0.029	0.219	-0.133	0.895	0.092
PRIMUS/NAVCARE	-0.238	0.078	-3.051	0.002	0.070
Noncatchment Areas	-0.153	0.058	-2.613	0.009	0.141
Outside U.S.	-0.069	0.130	-0.533	0.594	0.044
Navy CAM	-0.090	0.211	-0.427	0.669	0.075
Air Force CAM	0.014	0.131	0.110	0.912	0.071
Shipboard	-0.106	0.102	-1.039	0.299	0.039
Age of Family Member	-0.002	0.002	-1.280	0.201	46.989
Male	-0.023	0.037	-0.640	0.522	0.430
CHAMPUS Supplemental Insurance	0.059	0.041	1.443	0.149	0.423
New Military Health Care Program	-0.032	0.101	-0.321	0.748	0.052
Medicare	0.181	0.059	3.074	0.002	0.293
Private Insurance	0.080	0.040	2.008	0.045	0.442
Public Assistance	0.163	0.129	1.259	0.208	0.010
Own Family's Money	0.219	0.207	1.056	0.291	0.010
Hospitalized Outside U.S.	0.078	0.128	0.606	0.545	0.039
Navy	0.103	0.047	2.197	0.028	0.311
Marine Corps	0.183	0.067	2.714	0.007	0.072
Air Force	-0.075	0.041	-1.838	0.066	0.319
Surgery Performed	-0.338	0.038	-9.006	0.000	1.495
Admitted From Emergency Room	-0.267	0.034	-7.890	0.000	1.615
Pregnancy	-0.134	0.069	-1.954	0.051	0.183
Infant Care	0.542	0.090	6.016	0.000	0.031
Accidents/Injuries	-0.078	0.072	-1.087	0.277	0.059
Back, Spinal, or Bone Problems	0.219	0.070	3.124	0.002	0.063
Joint or Muscular Problems	0.101	0.086	1.167	0.243	0.043
Digestive System Problems	0.164	0.064	2.566	0.010	0.070
Ear, Nose, or Mouth Problems	-0.480	0.086	-5.575	0.000	0.030

Continued on next page

Table H-7—*Continued*

Variable	Coefficient	Standard Error	t-Value	Significance Level	Variable Mean
Heart Problems	0.158	0.047	3.344	0.001	0.162
Skin or Breast Problems	-0.372	0.150	-2.484	0.013	0.014
Lung or Breathing Problems	0.427	0.058	7.420	0.000	0.084
Gynecological Problems	0.085	0.099	0.856	0.392	0.050
Nervous System Problems	0.049	0.163	0.300	0.764	0.014
Alcohol or Drug Problems	1.124	0.178	6.308	0.000	0.008
Mental Health Problems	1.548	0.102	15.194	0.000	0.039
Kidney, Bladder Problems	-0.060	0.062	-0.967	0.334	0.081
Eye Care or Vision Problems	0.129	0.142	0.905	0.365	0.016
Male Reproductive System Problems	0.148	0.104	1.432	0.152	0.036
Liver or Pancreas Problems	0.585	0.132	4.435	0.000	0.009
Diabetes or Other Blood Problems	0.646	0.087	7.403	0.000	0.035
Treatment for Short-Term Illness	-0.027	0.137	-0.201	0.841	0.023
Other Problems	-0.179	0.044	-4.022	0.000	0.172
α	1.374	0.110	12.547	0.000	
p	2.457	0.103	23.764	0.000	

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ABBREVIATIONS

ABBREVIATIONS

AFB	Air Force Base
AFDC	Aid for Dependent Children
AIDS	Acquired Immune Deficiency Syndrome
BRAC	Base Realignment and Closure
CAM	Catchment Area Management
CHAMPUS	Civilian Health and Medical Program of the Uniformed Services
CRI	CHAMPUS Reform Initiative
DDP	Dependents Dental Plan
DEERS	Defense Enrollment Eligibility Reporting System
DMDC	Defense Manpower Data Center
DMIS	Defense Medical Information System
DoD	Department of Defense
FI	Fiscal Intermediary
FPO	Fleet Post Office
FY	Fiscal Year
GED	General Equivalency Diploma
GREG	Generalized Regression
HMO	Health Maintenance Organization
IDA	Institute for Defense Analyses
MCBS	Medicare Current Beneficiary Survey
MCP	Managed Care Program
MHSS	Military Health Services System
MTF	Military Treatment Facility
NA	Not Applicable
NAS	Nonavailability Statement
NHIS	National Health Interview Survey
OASD(P&R)	Office of the Assistant Secretary of Defense (Personnel and Readiness)
OB/GYN	Obstetrical/Gynecological
OCHAMPUS	Office of the Civilian Health and Medical Program of the Uniformed Services
OMB	Office of Management and Budget
OSD	Office of the Secretary of Defense
PND	Postal Nondeliverable
PPO	Preferred Provider Organization
SE	Southeast
USAF	United States Air Force
VA	(Department of) Veterans Affairs
VRI	Vector Research Incorporated
WIC	Women, Infants, and Children

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In response to a congressional request, the DoD is conducting a comprehensive review of its military medical care system. IDA has been tasked with analyzing the cost of DoD's in-house medical facilities, under both current policies and proposed alternatives. This paper describes the data used in the analysis and the cost functions that were estimated. The paper also assesses the in-house costs of two policy alternatives for the provision of medical care during peacetime.

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PREFACE

This paper was prepared by the Institute for Defense Analyses (IDA) for the Office of the Director (Program Analysis and Evaluation) under a task entitled "Cost Analysis of the Military Medical Care System." The objective of the task is to analyze the cost of U.S. military medical care facilities under current policies and under proposed alternatives. This paper partially fulfills that objective by describing the data used in the analysis, explaining the cost functions that were estimated, and assessing the in-house costs of two alternatives for peacetime medical care.

This paper was reviewed by Thomas P. Christie, Thomas P. Frazier, Christopher Jehn and Katherine L. Railey.

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I. INTRODUCTION AND SUMMARY

A. BACKGROUND

Section 733 of the National Defense Authorization Act for Fiscal Years 1992 and 1993 directed the DoD to conduct "a systematic review of the military medical care system required to support the Armed Forces *during a war or other conflict*, and any adjustments to that system required to provide *cost-effective health care in peacetime to covered beneficiaries.*" [Emphasis added.][1] To satisfy this mandate, the DoD contracted with several organizations, among them the Institute for Defense Analyses (IDA). Under two separate task orders, IDA is conducting a survey of military health-care beneficiaries, and a cost analysis of military hospitals. The results of the survey analysis are reported in a companion paper.[2] The methodology behind the cost analysis was described in a previous paper.[3] The current paper reports most of the findings of the cost-analysis task. Additional findings and supporting documentation will be provided in a subsequent paper.

The motivation behind the congressional concern is illustrated by reference to Figure I-1. DoD medical expenditures may be roughly measured by the medical program elements in Major Force Program 8 of the Future Years Defense Program (FYDP).[4] Measured against the right-hand scale, medical expenditures have grown steadily, reaching about $14 billion by fiscal year (FY) 1991. This growth has persisted even in light of the reductions in weapon-system procurement observed during the late 1980s. It might be

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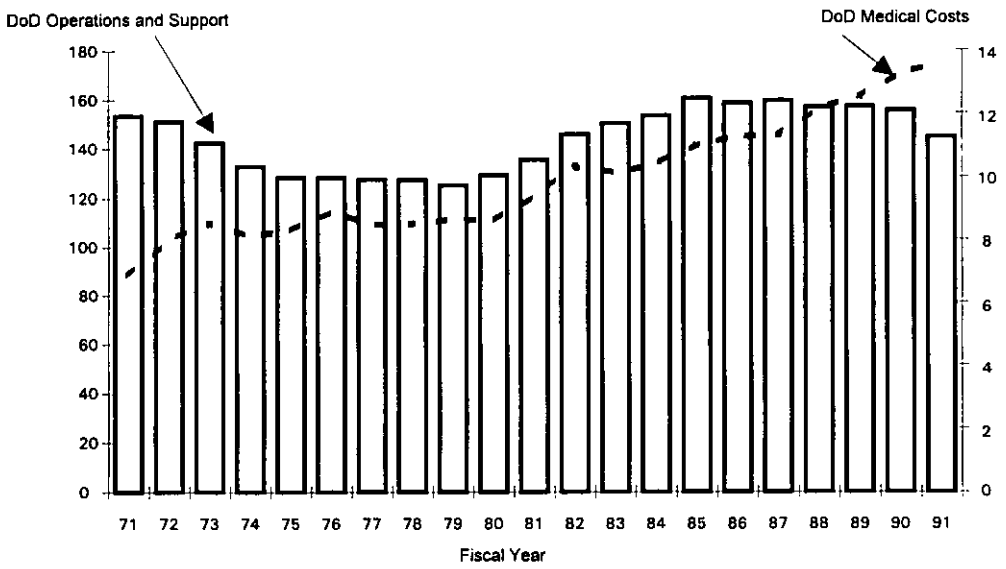
1 United States House of Representatives, "National Defense Authorization Act for Fiscal Years 1992 and 1993," Conference Report, Report 102-311, November 13, 1991, Section 733, pp. 123-126.

2 Philip M. Lurie, Karen W. Tyson, Michael L. Fineberg, Larry A. Waisanen, James A. Lee, James A. Roberts, Mark E. Sieffert, and Bette S. Mahoney, "Analysis of the 1992 DoD Survey of Military Medical Care Beneficiaries," Institute for Defense Analyses, Paper P-2937, forthcoming, January 1994.

3 Matthew S. Goldberg, Thomas P. Frazier, Timothy J. Graves, Stanley A. Horowitz, Stephen K. Welman, Kathryn L. Wilson, and Joseph-Paul Wilusz, "Cost Analysis of the Military Medical Care System: An Interim Report," Institute for Defense Analyses, Paper P-2850, June 1993.

4 It is possible to construct more comprehensive measures of medical expenditures, which consider Major Force Programs other than just Program 8 (Training, Medical, and Other General Personnel Activities). Indeed, IDA has constructed such measures, and they will be discussed in a subsequent IDA paper. For examining aggregate trends, however, expenditures in Program 8 are sufficient.

argued that weapon-system procurement does not provide a proper basis of comparison for medical expenditures, because such expenditures are driven more by the existing force structure than by new procurement. Therefore, we have displayed for comparison not the total DoD budget, but rather the total operations and support cost (on the left-hand scale), defined as operations and maintenance plus military personnel cost. Even relative to this more stable baseline, the share accounted for by medical expenditures has shown a dramatic increase.



Note: Costs are in billions of FY92 dollars.

Figure I-1. DoD Trend Analysis: Operations and Support Versus Medical Costs

The increase in medical expenditures largely parallels that observed in the civilian sector.[5] One partial explanation is common to both sectors: the introduction of new, expensive technology for diagnosis and treatment of disease. In addition, both sectors are subject to demographic changes that may drive even larger cost growth in the future. For example, retired military personnel are eligible for medical care within Military Treatment Facilities (MTFs) on a space-available basis. Retired military personnel under age 65 are also eligible for DoD-sponsored care from civilian providers under the Civilian Health and

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5 The literature is voluminous; one recent example is Burton A. Weisbrod, "The Health Care Quadrilemma: An Essay on Technology Change, Insurance, Quality of Care, and Cost Containment," *Journal of Economic Literature*, Vol. 29 (June 1991), pp. 523-552.

Medical Program of the Uniformed Services (CHAMPUS). Although the size of the active-duty force is being reduced, the population of retired personnel is projected to remain relatively stable; moreover, retired personnel have longer life expectancies than ever before. Figure I-2 displays official OASD (Health Affairs) projections of trends in the beneficiary population. According to these projections, the number of active-duty medical beneficiaries will decrease from 2.05 million in FY92 to 1.78 million in FY98, a 13% cumulative decline. However, the number of retired beneficiaries under age 65 will decline only slightly over the same period, from 1.16 million to 1.09 million.

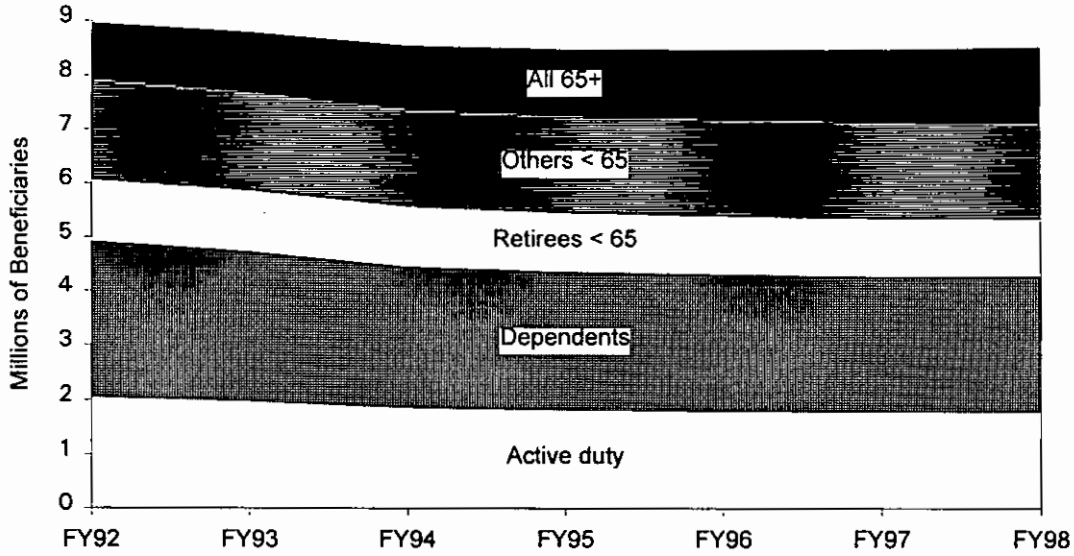

Figure I-2. Trends in Beneficiary Population

B. THE SECTION 733 STUDY

Careful analysis is required to isolate the major components of cost growth in military medicine: trends in the beneficiary population, trends in per-capita utilization, trends in unit cost that are common to both the military and civilian sectors, and differential trends in unit cost between the military and civilian sectors. To best analyze the components of cost growth, DoD has formed several internal working groups and contracted with outside organizations, including IDA. The Section 733 Study is being coordinated by the Director, Program Analysis and Evaluation (PA&E). He chairs a Steering Committee consisting of the Assistant Secretary of Defense for Health Affairs, the

Assistant Secretary of Defense for Personnel and Readiness (P&R), the Assistant Secretary of Defense for Reserve Affairs, the DoD Comptroller, the Joint Staff Director for Logistics (J-4), and representatives of the three Service Secretaries.

The team structure that supports the Steering Committee is illustrated in Table I-1. The survey of beneficiaries was directed by an internal working group, chaired by an official from OASD (P&R). The IDA Survey-Analysis Team designed the survey questionnaire, developed the sampling plan, and analyzed the survey responses. Technical support to the IDA Survey-Analysis Team was provided by the Defense Manpower Data Center (DMDC), which is an element of OASD (P&R). In particular, DMDC fielded the survey and coded the survey responses.

Table I-1. Assignment of Tasks

Organization	Task Description
Beneficiary Survey Working Group [OASD (P&R)]	Survey of beneficiaries
IDA Survey-Analysis Team	Survey of beneficiaries (questionnaire, sampling plan, analysis)
Defense Manpower Data Center	Survey of beneficiaries (fielding, coding of responses)
Peacetime Alternatives and Costs Working Group [OD (PA&E)]	Design, cost analysis of peacetime alternatives
IDA Cost-Analysis Team	Cost analysis of in-house medical system
RAND Corporation	Utilization and civilian cost projections (largely based on survey data)
Wartime Medical Requirements Working Group [OD (PA&E)]	Wartime medical requirements
OASD (Health Affairs)	Other medical issues

The cost analysis was directed by an internal working group, chaired by an official from OD (PA&E). The current paper documents the efforts of the IDA Cost-Analysis Team, charged with estimating the costs of in-house medical care. The RAND Corporation is charged with projecting peacetime health-care utilization under several analytical cases. These cases involve either increasing or decreasing the number of MTFs, plus a variety of contractual arrangements to obtain care for DoD beneficiaries from the civilian sector. RAND's utilization analysis is largely based on analysis of the survey developed by IDA. In turn, RAND's utilization analysis forms the basis for IDA's

estimation of in-house medical costs. RAND is responsible for estimating the cost of civilian-sector care under each analytical case.

The development of wartime medical requirements was directed by an internal working group, chaired by an official from OD (PA&E). Finally, a team within OASD (Health Affairs) is examining other medical issues raised in the congressional language.

The relationships among the various teams are further illustrated in Figure I-3. As shown in the lower left-hand portion of the figure, the IDA Survey-Analysis Team designed the survey questionnaire. Some questions were contributed by RAND, with an eye toward its utilization analysis. Once the IDA Survey-Analysis Team completed both the survey questionnaire and the sampling plan, DMDC performed the actual fielding of the survey and coding of the responses. The raw survey database was then returned to IDA, where the data were "cleaned" (i.e., screened for inconsistent responses). The IDA Survey-Analysis Team also augmented the data, by merging it via Social Security numbers with administrative data on military sponsors. The cleaned and augmented data were then passed to RAND for its utilization analysis.

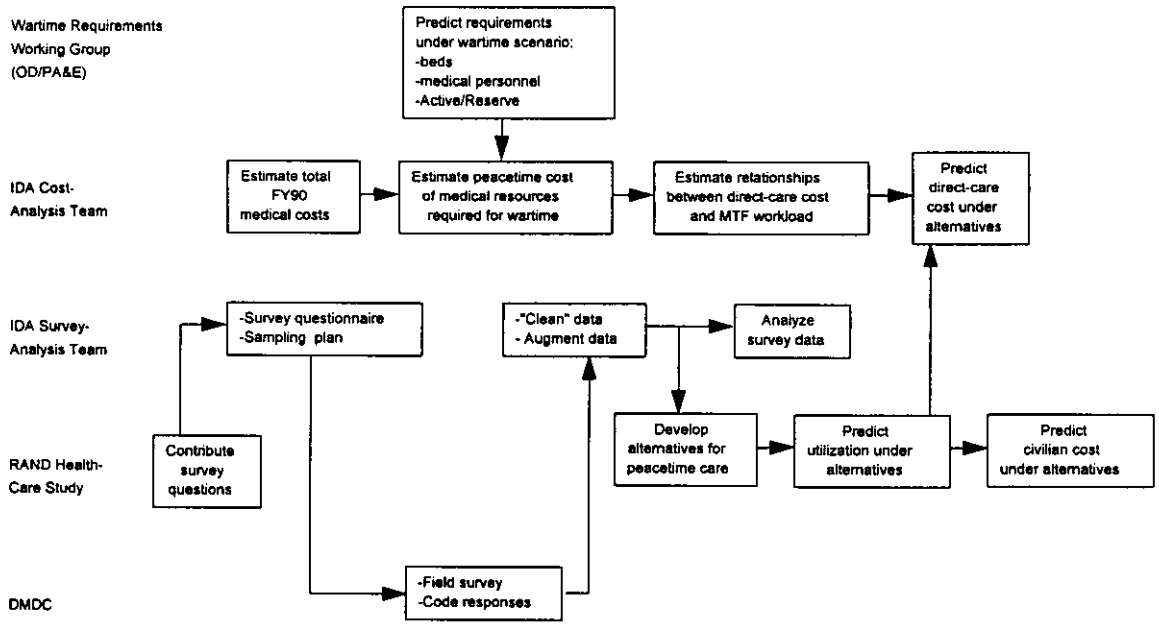

Figure I-3. Information Flow on the 733 Study

The upper portion of Figure I-3 describes the activities of the IDA Cost-Analysis Team. The first task was to estimate total medical expenditures in the FY90 FYDP. Primarily, this task involved identifying medical expenditures outside of Major Force Program 8 (Training, Medical, and Other General Personnel Activities). The second task was to estimate the portion of the total that represents the peacetime cost of the medical resources required for wartime. The wartime requirements, expressed as numbers of beds (by Service, theater, and echelon of care) and medical personnel (by Service, medical specialty, and Active or Reserve component) were provided by the OD (PA&E) Wartime Requirements Working Group. The findings of these two IDA tasks will be documented in subsequent IDA papers.

The current paper reports on the final two tasks of the IDA Cost-Analysis Team: estimating regression relationships between medical workload and cost at MTFs, and predicting MTF costs under each analytical case. Although the tasks appear separable, the first two tasks delimit the last two tasks in the following way: the analytical cases must preserve sufficient in-house medical resources, even during peacetime, to meet the wartime medical demand. Therefore, cost-effectiveness criteria are applied only to the portion of in-house medical resources above that required for wartime.

C. DATA AND COST MODELS

Chapters II and III describe the regression models that IDA has developed to relate cost and workload at MTFs. The primary data source is the Medical Expense and Performance Reporting System (MEPRS). It is important to recognize that MEPRS is not a patient-level cost-accounting system. Instead, MEPRS reports cost and workload within a three-digit hierarchical chart of accounts, corresponding to workcenters within an MTF. MEPRS includes the costs of materials and supplies, plus military, civilian, and contract personnel. In addition, MEPRS includes a depreciation allowance for purchases of modernization and replacement equipment.

In order to compare the cost-effectiveness of in-house medical care versus medical care purchased from the civilian sector, the same set of cost elements must be present on both sides of the ledger. We investigated six areas in which MEPRS potentially omits or understates cost elements required for comparability with the civilian sector: (1) base

operations and real property maintenance, (2) management headquarters, (3) facilities construction, (4) central automation support, (5) military personnel pay, and (6) MEPRS Special Programs accounts. The understatement of costs proved significant in all but areas (1) and (5). Table I-2 shows the factors that we developed to adjust for the understatement of costs. These factors are specific to Service branch and inpatient versus ambulatory care. The factors range between 10.6% and 16.9%, and are described in detail in Chapter II.

Table I-2. MEPRS Adjustment Factors

Service Branch	Inpatient Expenses	Ambulatory Expenses
Army	16.9%	13.2%
Air Force	12.8%	10.6%
Navy	13.3%	11.2%

Chapter III develops the MTF cost models used to project the cost of inpatient and ambulatory care under each analytical case. The models project cost at each individual facility given levels of inpatient and ambulatory workload, physical capacity measured in terms of operating beds, and the volume of Graduate Medical Education (GME) activity. The facility-level costs are then summed over all facilities to estimate the system-wide costs of providing care at military hospitals under each analytical case. Costs of providing care within the civilian sector, and paid through CHAMPUS, will be separately estimated by the RAND Corporation.

The cost models reveal a constant marginal cost of about $3,000 per inpatient discharge from medical centers. The marginal cost per discharge from community hospitals is not a constant; instead, it decreases for the larger hospitals, which exhibit returns to scale. Similarly, the marginal cost of an ambulatory visit is constant for medical centers, constant (at a higher level) for stand-alone clinics, but decreasing for the larger community hospitals. The cost models also contain estimates of the cost per additional operating bed, and the cost per additional resident or intern enrolled in a hospital's GME program.

D. COST ESTIMATES FOR THE ANALYTICAL CASES

The Section 733 Study has thus far examined two analytical cases for the provision of peacetime care.[6] Under both cases, MTF capacity is increased by the addition of 784 operating beds at 14 existing hospitals, plus the construction of a new 94-bed hospital at Ft. McPherson, Georgia. The analytical cases would provide access to MTFs for individuals who currently must use CHAMPUS.

The difference between the two analytical cases rests in the rate at which MTF workload replaces CHAMPUS workload. Under the first case, workload is drawn into MTFs at a one-to-one rate, so that total (i.e., MTF plus CHAMPUS) workload is held constant. This case resolves to a pure efficiency comparison between care provided in MTFs and care purchased through CHAMPUS. Under the second case, it is recognized that the increase in MTF workload probably exceeds the reduction in CHAMPUS workload, because beneficiaries respond to the lower co-payments in MTFs. Total cost is higher under this case, which reflects an increase in demand for medical care as well as an efficiency comparison.

Cost estimates for the analytical cases are presented in Chapter IV. The increased in-house cost of moving from the current system to the first case described above is $265 million or 4.2%. Computation of the *net* change in total cost requires an estimate of the corresponding reduction in CHAMPUS cost, which is found in the RAND Corporation publication. The full movement to the second case, recognizing the increase in total workload, is an additional $206 million or 3.2%. The overall increase in cost is rather modest, because the increase in 878 operating beds represents only about 7% of the FY92 capacity of roughly 12,000 operating beds in the continental United States (CONUS) plus Alaska and Hawaii.

Future analysis will consider analytical cases that reduce as well as those that increase MTF capacity. For cases that reduce MTF capacity, care must be exercised to preserve sufficient capacity to meet the wartime medical requirements. The wartime requirements specify not only numbers of CONUS evacuation beds, but also numbers of physicians (by specialty) to treat casualties and disease non-battle injuries (DNBI) in the

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6 A detailed description of the analytical cases is found in Susan D. Hosek, Bruce W. Bennett, Kimberly A. McGuigan, Jan M. Hanley, Roger Madison, and Afshin Rastegar, "The Demand for Military Health Care: Supporting Research for a Comprehensive Study of the Military Health Care System," RAND Corporation, MR-407-PA&E, January 1994.

theater. The CONUS hospitals must be configured in peacetime with enough billets to occupy all of the wartime-required physicians that will be drawn from the Active Component. In addition, the beneficiary population served by the remaining CONUS hospitals must supply enough clinical material to keep these physicians fully trained. The construction of analytical cases along these lines is now underway, and the cost estimates will be provided in the near future.

II. DATA DESCRIPTION

The Medical Expense and Performance Reporting System (MEPRS) is the primary data source on cost and workload at Military Treatment Facilities (MTFs). This chapter first provides a general description of MEPRS. Next, some adjustments to the MEPRS data are developed. In order to compare the cost-effectiveness of in-house medical care versus medical care purchased from the civilian sector, the same set of cost elements must be included on both sides of the ledger. Prices charged by civilian-sector providers reflect all elements of cost, including corporate overhead, inter-divisional transfer, and amortization of real property. Because MEPRS was designed for a different purpose than were commercial cost-accounting systems, some of these cost elements are missing from MEPRS. The adjustments developed in this chapter are critical to allow a fair comparison with medical costs charged in the civilian sector.

We made every effort to be conservative in developing the adjustments to MEPRS. That is, we included additional cost elements only when we could clearly justify them as comparable to costs charged in the civilian sector. Moreover, we included cost elements only when we could clearly identify them with DoD's peacetime health-care mission, as opposed to its wartime readiness mission. Having made the MEPRS adjustments, we assess their impact by comparing the reported and adjusted costs for FY92. Finally, we close the chapter by identifying the sources for the few remaining data elements outside of MEPRS.

A. MEPRS COST AND WORKLOAD DATA

According to the MEPRS manual:[1]

> The purpose of the Medical Expense and Performance Reporting System (MEPRS) for DoD Medical Operations is to provide consistent principles, standards, policies, definitions, and requirements for accounting and

[1] "Medical Expense and Performance Reporting System for Fixed Military Medical and Dental Treatment Facilities," Office of the Assistant Secretary of Defense (Health Affairs), Publication DoD 6010.13M, January 1991, p. 1.3.

reporting of expense, manpower, and performance by DoD fixed military medical facilities. Within these specific objectives the MEPRS also provides in detail: uniform performance indicators; common expense classification by work centers; uniform reporting of personnel utilization data by work centers; and a cost assignment methodology.

Before describing in detail what MEPRS *is*, it is useful to describe what MEPRS is *not*. First, MEPRS is *not* the hospital commander's annual budget. Some cost elements in MEPRS are "non-reimbursable" meaning that, although the hospital makes a cost estimate, no funds are actually spent from the hospital commander's budget. Instead, the hospital receives services "free," usually from the host military base. Examples include fire and police protection and snow removal provided by the host base. Similarly, MEPRS entries for depreciation do not represent current-year outlays. The link between MEPRS expenses and Future Years Defense Program (FYDP) obligations is further clouded because, depending on the type of appropriation, obligated funds may translate into outlays (and thus appear in MEPRS) over a multi-year time window. None of these observations are intended as pejorative, because MEPRS was designed for a different purpose than the budgeting system.

Along these lines, it is critical to recognize that MEPRS is *not* a patient-level cost-accounting system: MEPRS *cannot* be used to directly estimate the cost of performing a particular procedure on a particular patient. The DoD has not yet seen the need to develop a patient-level accounting system, because patients are not billed individually for medical services provided in-house. Although this observation may appear startling at first, we should point out that Kaiser Permanente does not bill patients individually either, nor do they have a patient-level accounting system. Instead, they set premiums for large groups of patients by relating aggregate cost experience to summary demographic and epidemiological characteristics.

Given these limitations, we will now describe procedures for indirectly estimating unit cost at MTFs (i.e., cost per inpatient discharge or cost per ambulatory visit) based on MEPRS data. MEPRS reports cost and workload within a three-digit hierarchical chart of accounts. The entire set of one-digit account codes is shown in Table II-1, along with an illustrative partial set of two-digit and three-digit account codes. Costs are available at any of these three levels of aggregation: the two-digit cost is the sum of its constituent three-digit costs; similarly, the one-digit cost is the sum of its constituent two-digit costs. Our regression modeling was conducted at the one-digit level of aggregation (e.g., Inpatient

and Ambulatory). However, we examined costs down to the three-digit level in order to better understand the data system, and to develop adjustment factors where necessary.

Table II-1. Partial List of MEPRS Account Codes

MEPRS Account Code	Account Title	Status
A	Inpatient	final operating account
AA	Medical Care	final operating account
AAA	Internal Medicine	final operating account
AAB	Cardiology	final operating account
AAC	Coronary Care	final operating account
AAD	Dermatology	final operating account
AAE	Endocrinology	final operating account
AAF	Gastroenterology	final operating account
AAG	Hematology	final operating account
AAH	Intensive Care	final operating account
AAI	Nephrology	final operating account
AAJ	Neurology	final operating account
AAK	Oncology	final operating account
AAL	Pulmonary	final operating account
AAM	Rheumatology	final operating account
AAN	Physical Medicine	final operating account
AAO	Clinical Immunology	final operating account
AAP	HIV (AIDS)	final operating account
AAQ	Bone Marrow Transplant	final operating account
AAR	Infectious Disease	final operating account
AAS	Allergy	final operating account
AAZ	Other Medical Care	final operating account
AB	Surgical Care	final operating account
AC	Obstetrical/Gynecological Care	final operating account
AD	Pediatric Care	final operating account
AE	Orthopedic Care	final operating account
AF	Psychiatric Care	final operating account
AG	Family Practice Care	final operating account
B	Ambulatory	final operating account
C	Dental	final operating account
D	Ancillary	**intermediate operating account**
E	Support	**intermediate operating account**
F	Special Programs	final operating account

The Ancillary and Support accounts are labeled "intermediate operating accounts," indicating that the costs are "stepped-down" or allocated to the final operating accounts.

For example, costs in ancillary account DFA (Anesthesiology) are stepped-down to the final operating accounts based on the minutes of service provided to each receiving account. Similarly, costs in support account EFA (Housekeeping) are stepped-down based on the square footage cleaned for each receiving account. The step-down procedure is hard-wired into MEPRS, so that the costs in final operating accounts are available to analysts only post-stepdown, not pre-stepdown.

MEPRS includes costs in four major categories: materials, supplies, depreciation, and personnel. Materials and supplies should be interpreted broadly to include all non-personnel Operations and Maintenance expenses funded through the following program elements: 0807711 (Care in Regional Defense Facilities), 0807714 (Other Medical Activities), 0807715 (Dental Care Activities), 0807790 (Audio-Visual Activities, Medical), and 0807792 (Station Hospitals and Clinics).[2]

MEPRS includes a depreciation allowance for purchases, funded through the Other Procurement appropriation, of modernization and replacement equipment in excess of a dollar threshold. The threshold is increased periodically to reflect price inflation. Depreciation is taken on a straight-line basis over eight years. Depreciation allowances are assigned as indirect expenses during the step-down process, rather than being directly assigned to a work center upon acquisition.

Personnel are classified by skill category: clinicians (i.e., physicians and dentists), direct-care professionals, direct-care paraprofessionals, registered nurses, and administrative/clerical/logistical personnel. Personnel are further classified by type: officer, enlisted, civilian, contract, and other. Timesheets are used to allocate personnel time across three-digit MEPRS accounts. Within each three-digit account, personnel expenses are then estimated by multiplying full-time equivalents (FTEs) times standard pay factors, which are specific to both skill category and personnel type.

Each three-digit MEPRS account has its own measure of workload performed. As already indicated, the D (Ancillary) and E (Support) accounts have workload measures, such as square feet, that facilitate stepping-down their costs to the final operating accounts. The workload measures for the A (Inpatient) accounts are dispositions and occupied bed days. The workload measure for the B (Ambulatory) accounts is the number of visits.

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2 See "Medical Expense and Performance Reporting System for Fixed Military Medical and Dental Treatment Facilities," p. 3.6.

B. ADJUSTMENTS TO MEPRS COST DATA

We made several adjustments for cost elements that are undercounted or, in some cases, completely ignored in MEPRS. We made these adjustments to allow a fair comparison with medical costs charged in the civilian sector, recognizing that MEPRS was not designed to include all of the cost elements found in commercial cost-accounting systems. Many of the adjustments were based on a side-by-side comparison between subsets of MEPRS and corresponding subsets of the FYDP. Other adjustments relied upon comparisons between MEPRS data for the three Services, with one Service acting as the benchmark for the other two. This section develops and justifies the various adjustments that were made, based primarily on FY90 MEPRS data.

1. Base Operations and Real Property Maintenance

Of the MTFs in the continental United States (CONUS), all but seven reside on a host military base. The seven stand-alone MTFs are as follows: Walter Reed Army Medical Center (AMC), Fitzsimons AMC, National Naval Medical Center (NNMC) Bethesda, Naval Hospital (NH) Oakland, NH Portsmouth, NH San Diego, and NH Beaufort. For all but these seven, a considerable portion of base operations and real property maintenance activity (RPMA) is provided by the host base. Among the services provided by the host base are: utilities, property maintenance, minor construction, transportation, and fire and police protection. The purpose of this section is to determine whether support services provided by the host base are adequately reflected in MEPRS, or whether some adjustment in necessary.

Base operations and RPMA are reflected in MEPRS in one of three ways. If the hospital transfers funds to the host base in return for services provided, then the services are deemed "reimbursable." The amount of money transferred appears in the two-digit ED account of MEPRS (Support Services, Funded or Reimbursable). If the hospital receives services but does not transfer any funds, then the services are deemed "non-reimbursable." In this instance, the hospital makes an estimate of the value of services received, and reports this estimate in the EC account of MEPRS (Support Services, Non-reimbursable). Although the basis for the estimate varies by detailed three-digit cost element, the most common basis is the number of square feet within the hospital. Finally, housekeeping costs are sometimes grouped together with base operations and RPMA. Military hospitals pay for all of their own housekeeping, and these costs are reported in the EF account of MEPRS (Housekeeping).

The Defense Business Operations Fund (DBOF) was introduced, though not fully implemented, in FY92. The effect of DBOF is to make more support services reimbursable. Hence, the more recent data should show more costs in the ED and EF accounts and fewer costs in the EC accounts. However, the EC accounts were still used quite extensively in FY90. Therefore, we must assess the estimates that hospitals made of the value of support services received from their host bases.

a. Comparison Among the Three Services

Officials in the Naval Bureau of Medicine and Surgery (BuMed) indicated that Navy hospitals pay essentially all of their own base operations and RPMA. Similarly, officials in the Air Force Office of the Surgeon General indicated that they pay essentially all costs within a 50-foot radius of the hospital. By contrast, most base operations and RPMA were *not* considered reimbursable by Army hospitals during FY90. For the Army, therefore, the majority of these costs should appear as estimates in the EC accounts of MEPRS.

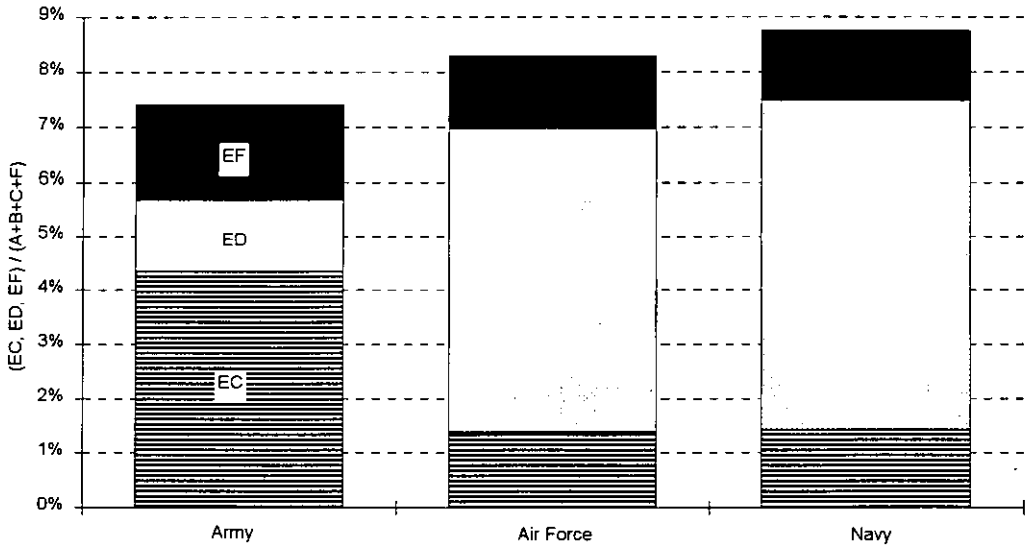
There is a *prima facie* case that reporting of base operations and RPMA is more accurate and comprehensive for the Navy and the Air Force than for the Army. The Navy and Air Force report funds actually transferred, whereas the Army relies on estimates of the value of support services received. Figure II-1 provides some evidence on this hypothesis. The figure displays support-service costs as a fraction of total "direct" MEPRS costs. More specifically, the numerator is the sum of MEPRS expenses in accounts EC, ED and EF, world-wide for all MTFs in FY90. The denominator is the sum of MEPRS expenses in accounts A (Inpatient), B (Ambulatory), C (Dental), and F (Special Programs). The latter are the broad clinical accounts that are supported by reimbursable and non-reimbursable expenses.

As expected, the Navy and the Air Force show much larger proportions of reimbursable (ED) than non-reimbursable (EC) expenses. In addition, the ratio of support to direct costs is nearly equal for these two Services, perhaps indicating that both are reporting costs comprehensively.

Also as expected, the Army shows a much larger proportion of non-reimbursable support expenses (EC). The surprising feature is the magnitude of the EC account, about 4.3% of total direct costs. In combination, the EC, ED and EF accounts for the Army sum to 7.4% of total direct costs, a figure nearly comparable to that observed for the Navy and

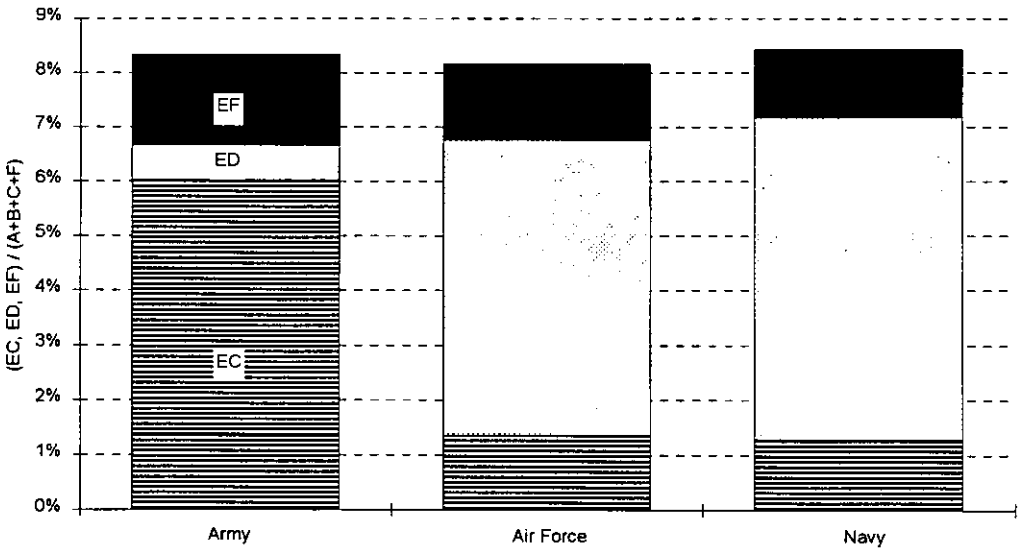
the Air Force. If we accept the latter two Services as a benchmark, then the Army estimates may be reasonable.

Further evidence is provided by Figure II-2, which presents an average over the four-year period, FY87-FY90. The ratios for the three Services are nearly identical when viewed over this longer time horizon. We conclude that the Army support-cost ratios require no adjustment relative to the Navy and the Air Force.



Note: EC=non-reimbursable expenses, ED=reimbursable expenses, and EF=directly-funded expenses.

Figure II-1. Support Accounts as a Percentage of Direct Accounts: MEPRS, FY90



Note: EC=non-reimbursable expenses, ED=reimbursable expenses, and EF=directly-funded expenses.

Figure II-2. Support Accounts as a Percentage of Direct Accounts: MEPRS, FY87-FY90

b. Comparison Between MEPRS and the FYDP

A different perspective is obtained by comparing MEPRS data not among the Services, but rather to the corresponding Program Elements (PEs) in the FYDP. Real property maintenance for military hospitals is funded in PE 0807794, and base operations are funded in PE 0807796.[3] The Army FYDP data are of limited use in this comparison, because PE 0807796 funded only three sites during FY90: Walter Reed AMC, Fitzsimons AMC, and Ft. Detrick.[4]

The Air Force data are of much greater interest in this regard, because Air Force Regulation 170-5 (15 May 1992) provides a cross-walk between MEPRS clinical accounts and the PEs from which they are funded. For example, each three-digit MEPRS code beginning with A (Inpatient), B (Ambulatory), or D (Ancillary) maps into two admissible PEs: 0807711 (Care in Regional Defense Facilities) and 0807792 (Station Hospitals and Medical Clinics). Similarly, each three-digit MEPRS code beginning with C (Dental) maps into PE 0807715 (Dental Care Activities).

The regulation also indicates the three-digit MEPRS accounts that map into the PE 0807794. If all the obligated funds are faithfully reported in MEPRS, then the MEPRS subtotal in these accounts should equal the FYDP obligation in PE 0807794. Table II-2 indicates that the MEPRS subtotal and the FYDP obligation were remarkably close in FY90, differing by about $2 million or less than two percent. Therefore, the Air Force support-cost ratio, shown previously in Figures II-1 and II-2, indeed appears to be an adequate benchmark for the other two Services. In light of the similarity in support-cost ratios across the three Services, we concluded that MEPRS requires no adjustment for base operations or RPMA.

2. Management Headquarters

For comparability with prices charged in the civilian sector, the cost of military medicine should include a component for management headquarters. This component includes the three Service Surgeons General and their immediate headquarters staff. A comparable cost in the civilian sector might be, for example, the regional headquarters for

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3 An exception is that the Air Force does not use PE 0807796; instead, both base operations and RPMA are combined into the single PE 0807794.

4 Ft. Detrick, Maryland, is not an MTF, but is a stand-alone facility providing automation support and other services to the DoD medical community.

Kaiser Permanente. This cost would be passed along to customers in the prices charged by civilian-sector providers.

Table II-2. Comparison of Air Force Support Accounts, FY90

MEPRS Code	Account title	MEPRS Expenses	FYDP Operations and Maintenance (O&M) Obligations (PE 0807794)
EDB	Funded Operation of Utilities	$37,324,181	
EDC	Funded Maintenance of Real Property	$39,950,243	
EDD	Funded Minor Construction	$14,112,953	
EDE	Funded Other Engineering Support	$8,534,615	
EDF	Funded Lease of Real Property	$395,866	
EFA	In-house Housekeeping	$760,089	
EFB	Contract Housekeeping	$30,562,408	
Subtotal		$131,640,355	$129,410,000

Costs for management headquarters are not reported in MEPRS, but an estimate may be made from FYDP data. Program element 0807798 contains FYDP obligations for Management Headquarters, Medical. This PE showed $21.7 million each for the Army and the Navy in FY90. The Air Force did not report any obligations in this PE in FY90. Although the management-headquarters function is certainly present in the Air Force, it is not visible in the FYDP.

We have charged the Air Force $21.7 million for management headquarters, precisely the amount reported by the other two Services in the FY90 FYDP. The MEPRS totals for that year are displayed in Figure II-3, by Service and one-digit MEPRS account. The Army had the highest MEPRS total, followed by the Air Force and then the Navy. The headquarters allocation of $21.7 million amounts to 0.68% of the Army MEPRS total of $3.173 billion, and 1.11% of the Navy MEPRS total of $1.948 billion. The Air Force is bracketed between the other two Services, with the headquarters allocation representing 0.85% of its MEPRS total of $2.548 billion.

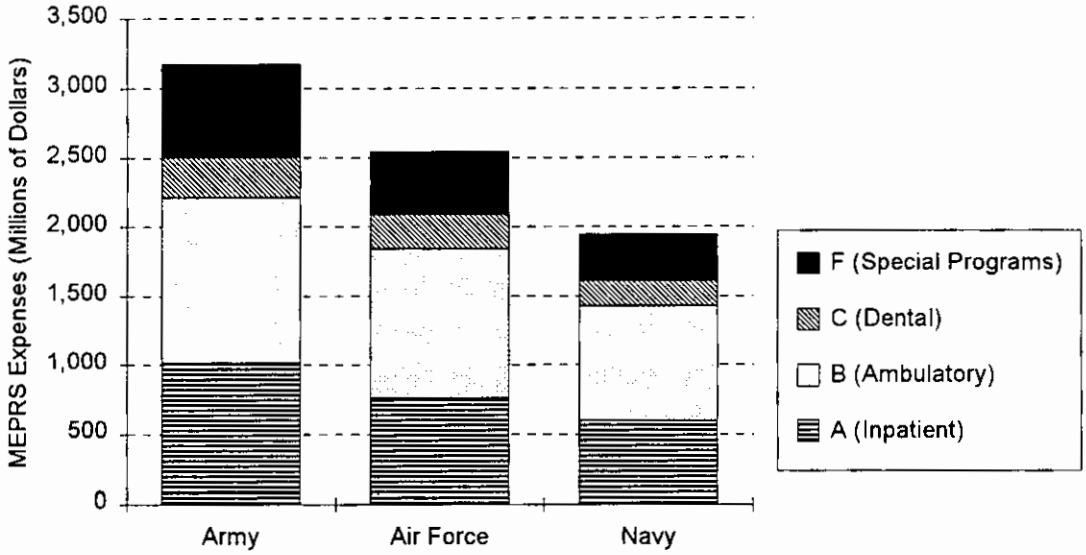

Figure II-3. FY90 MEPRS Expenses, by Service and Functional Category

3. Facilities Construction Allowance

Civilian-sector medical prices include an amortization for facilities construction. However, there is no corresponding cost element in MEPRS.[5] The purpose of this section is to develop a facilities construction allowance, again with the goal of making costs comparable between the military and civilian sectors. The remainder of this section describes three approaches to developing a facilities construction allowance. Based on these three approaches, our best estimate of the construction allowance is 4.3% of MEPRS operating expense.

a. Economic Analyses of Hypothetical Military Hospitals

First, economic analyses were examined for the construction of 14 hypothetical military hospitals. Multiple scenarios were available for some of the hospitals, yielding a total of 37 construction scenarios. Under each scenario, the hospital was designed to serve a specified annual workload. Engineering estimates were then made of both initial construction costs and recurring operating costs corresponding to each hypothetical

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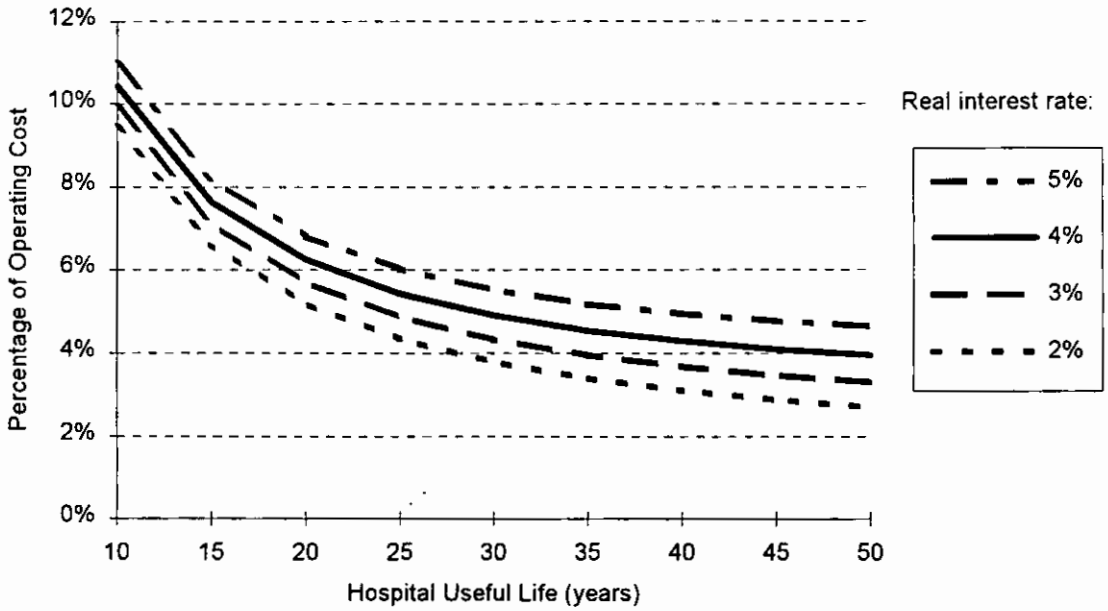
5 The EA account of MEPRS contains a depreciation allowance for modernization and replacement equipment. However, MEPRS does not contain any estimate of depreciation associated with: (1) new and expanded facilities, (2) real property installed equipment (such as environmental control units and elevators), or (3) war readiness material. See "Medical Expense and Performance Reporting System for Fixed Military Medical and Dental Treatment Facilities," p. 2E-4.

workload. Construction costs include the following elements: new building construction, initial medical equipment, supporting facilities, contingencies, plus allowances for supervision, inspection and overhead. The engineering estimates of operating cost correspond roughly to the total of the A (Inpatient), B (Ambulatory), C (Dental) and F (Special Programs) accounts of MEPRS. In particular, the C and F accounts were included in the cost basis because construction costs support all of these activities, not just inpatient and ambulatory care. Among the operating cost elements included are: physician salaries, supporting staff salaries, supplies, ancillary procedures, and support (e.g., base operations, RPMA, and housekeeping).

It would be unreasonable to charge the entire construction cost against a single year's operating budget. Instead, the construction cost was amortized over the notional lifetime of the facility. Ranges were considered for both the real interest rate and the notional facility lifetime. The relationship between amortized construction costs and annual operating costs was found to be the same for both community hospitals and medical centers. This relationship is depicted in Figure II-4.



Note: Operating cost corresponds to MEPRS A (Inpatient), B (Ambulatory), C (Dental), and F (Special Programs) accounts.

Figure II-4. Amortized Construction Cost as a Percentage of Annual Operating Cost (at Various Real Interest Rates)

For long lifetimes, the four curves are essentially proportional to the real interest rate. Although a range of interest rates was considered, the preferred estimate uses a real annual rate of 4.0%, roughly the historical average yield on 30-year government bonds. The amortization curves flatten out beyond a useful life of about 35 years. Medicare's capital-cost reimbursement system uses an estimated 40-year lifetime, and we view this estimate as appropriate for military hospitals as well. The combination of a 40-year lifetime and a 4.0% real interest rate yields a construction-cost adjustment equal to 4.3% of MEPRS operating expense.

b. Comparison of Hospital Size and Historical Operating Costs

The second approach uses actual FY90 MEPRS operating costs, as opposed to engineering estimates based on hypothetical annual workloads. Similarly, the construction-cost estimates are obtained by multiplying actual square footage of 87 CONUS hospitals and 17 medical centers, by official DoD estimates of construction cost per square foot.[6]

The construction-cost estimates were amortized over a 40-year lifetime at a 4.0% real interest rate. The ratio of amortized construction costs to MEPRS operating costs provides an alternative estimate of the construction-cost adjustment factor. This procedure yielded an estimate of 4.1 percent. It is encouraging that this estimate, computed using entirely different data sources, is so close to the previous estimate of 4.3 percent.

c. Analysis of FYDP Military Construction Appropriations

Finally, a construction-cost adjustment factor may be estimated by analyzing military-construction appropriations in the FYDP. Of course, construction appropriations for a single fiscal year do not correspond to operating expenses for that same year. Instead, the existing inventory consists of facilities that were built in many previous years. In principle, the construction cost of each individual facility could be separately identified in the historical data, then adjusted to constant dollars after correcting for inflation, depreciation, obsolescence, major maintenance and renovation, and so on.

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6 The construction cost estimates are contained in: "Area Cost Factors and Unit Prices for FY 1994-1995 Department of Defense Facilities Construction," Tri-Service Committee on Cost Engineering, Office of the Assistant Secretary of Defense (Production and Logistics), July 1992. In addition to facilities construction (i.e., brick and mortar), these estimates include an allowance for initial equipment to be used in both in-patient and ambulatory care.

Because the requisite historical data are difficult to obtain, we pursued a much less ambitious and more approximate approach. We obtained data on FY89 through FY92 construction projects from the Defense Medical Facilities Office (DMFO). That office divides construction projects into four categories: (1) minor construction, projects smaller than $300,000; (2) unspecified minor construction (UMC), projects between $300,000 and $1.5 million; (3) major construction, projects larger than $1.5 million, which are line-item authorized; and (4) planning and design (P&D), which is not separately identified by Service.[7] At our request, DMFO also divided construction projects into those relating to peacetime health-care, and those relating to wartime-contingency facilities. Table II-3 summarizes the DMFO data on categories (2) through (4).[8]

Table II-3. DMFO Major Construction and P&D/UMC Projects (Millions of Then-Year Dollars)

	Army		Air Force		Navy		
Fiscal Year	Peacetime	Total	Peacetime	Total	Peacetime	Total	P&D/UMC
1989	143.7	143.7	92.7	107.9	33.4	52.9	30.6
1990	102.0	103.5	29.2	29.2	56.7	74.7	45.7
1991	77.2	77.2	61.7	61.7	63.0	69.5	47.0
1992	64.6	64.6	30.5	33.5	119.6	141.6	46.2
Four-Year Average:	96.9		53.5		68.2		

Note: P&D = planning and design, UMC = unspecified minor construction.

The military-construction appropriations show wide year-to-year variations. As a crude attempt to smooth the data, we computed the four-year average of the peacetime-related projects. The Army average of $96.9 million amounts to 3.1% of the Army MEPRS total of $3.173 billion in FY90. The Air Force average of $53.5 million amounts

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7 There is a separate Program Element for P&D, 0807716D (Medical Facilities, Planning and Design). The other categories of construction are funded through Program Element 0807717D (Medical Facilities, Military Construction). In each case, the "D" suffix indicates that these are OSD, rather than Service, Program Elements.

8 Regarding category (1), the Services control minor construction (projects smaller than $300,000). The FYDP showed $30.4 million of minor construction for the Navy in FY90, and $15.4 million for the Army. The BuMed staff provided a breakout of the $30.4 million, which funded construction of bachelor enlisted quarters (BEQs) and parking structures associated with Navy hospitals. We deemed these expenditures unrelated to the peacetime-care mission, and thereby excluded them from the analysis. Although we did not have access to a breakout of the Army's $15.4 million, we excluded these expenditures as well. Thus, minor construction had no effect on our final estimates.

to 2.1% of the Air Force MEPRS total of $2.548 billion. Finally, the Navy average of $68.2 million represents 3.5% of the Navy MEPRS total of $1.948 billion.

These factors are smaller than those computed by the first two methods. We consider this last method to be the least reliable of the three, because the volatile military-construction appropriations for FY89 through FY92 need not reflect the replacement costs for facilities already in place during that time period. We believe our best estimate of the construction allowance is 4.3% of MEPRS operating expense, based on the first method discussed.

4. Central Automation Support

The Defense Medical Systems Support Center (DMSSC) provides central automation support to the entire DoD medical community, including CHAMPUS as well as military hospitals. An adjustment to MEPRS is required, because the corresponding cost would be passed along to customers in the prices charged by civilian-sector providers. However, we must be careful to pass along only a portion of the DMSSC cost to MEPRS; the remainder is implicitly passed along to CHAMPUS, which is also supported by DMSSC.

Figure II-5 displays the DMSSC appropriations, in detail for FY90 and in total for FY91 and FY92. DMSSC is funded through Program Element 0807791D, and the total appropriation has remained relatively stable over the period FY90 to FY92.

We have spread the FY90 DMSSC total appropriation across the three Services in proportion to the sum of each Service's CHAMPUS expenses plus its total MEPRS expenses in accounts A, B, C and F. This procedure is illustrated in Table II-4. The DoD total in MEPRS plus CHAMPUS[9] was $10.3 billion in FY90. The $133 million DMSSC total represents 1.29% of the DoD total. Therefore, we impose a charge of 1.29 cents on each dollar of MEPRS expense, as well as a similar charge on each dollar of CHAMPUS expense. In effect, this procedure allocates $40.9 million to Army MEPRS cost, $32.8 million to Air Force MEPRS cost, and $25.1 to Navy MEPRS cost. The presumption is that the Army, having the largest MEPRS cost, derives the most benefit from DMSSC.

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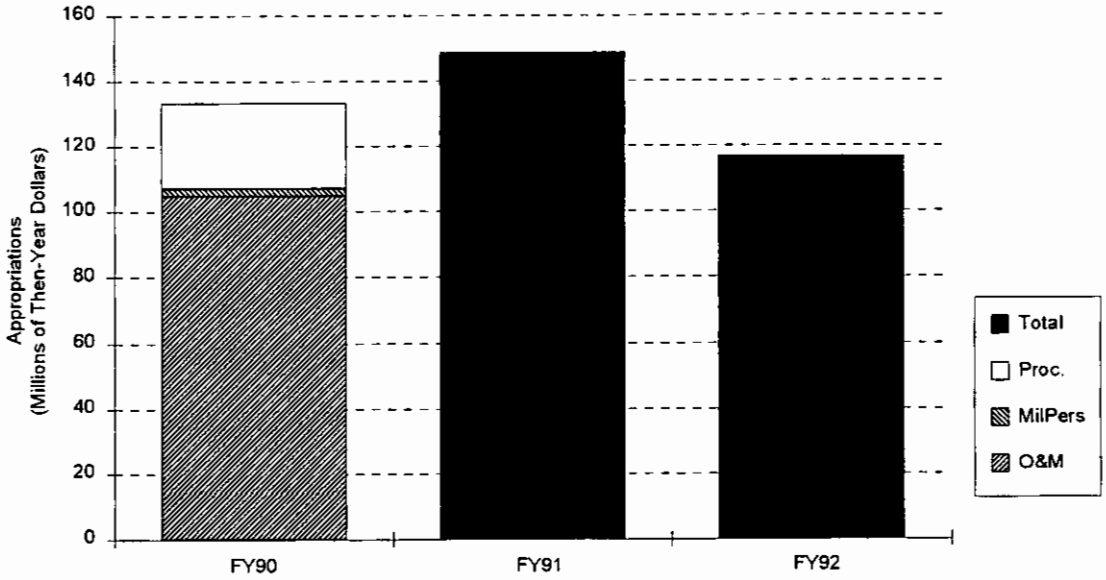
9 The source for the CHAMPUS data is "CHAMPUS Chartbook of Statistics," Office of the Civilian Health and Medical Program of the Uniformed Services, Publication 5400.2-CB, October 1992, p. IV-7. We used the government cost, excluding European claims but including both the CHAMPUS Reform Initiative and the CHAMPUS mental health demonstration (Norfolk, Virginia).



Note: O&M=Operations and Maintenance, MilPers=Military Personnel, and Proc.=Procurement.

Figure II-5. DMSSC Appropriations

Table II-4. Allocation of FY90 DMSSC Appropriation (Millions of Dollars)

	Army	Air Force	Navy	DoD total
MEPRS Account:				
A (Inpatient)	1,016	763	597	2,377
B (Ambulatory)	1,198	1,077	827	3,102
C (Dental)	292	250	185	727
F (Special Programs)	666	458	338	1,462
MEPRS Total:	3,173	2,548	1,948	7,669
CHAMPUS	904	756	1,001	2,661
Service Total:	4,076	3,304	2,949	10,329
DMSSC Allocation to MEPRS	40.9	32.8	25.1	98.7
DMSSC Allocation to CHAMPUS	11.6	9.7	12.9	34.3
Total DMSSC Allocation:	52.5	42.5	38.0	133.0

5. Military Personnel Pay Factors

MEPRS imputes military-personnel compensation as the product of full-time equivalents (FTEs) recorded at the MTF and a set of annual pay factors. The MEPRS pay factors are dimensioned by fiscal year, Service, and either officer rank or enlisted paygrade. However, no account is taken of occupational specialty, or of the associated specialty pays and bonuses. Therefore, MEPRS imputes the same salary to an O-4 Medical Service Corps (MSC) officer as to an O-4 thoracic surgeon. The purpose of this section is to determine whether the neglect of occupational specialty pay leads to an understatement of MEPRS expenses.

The MEPRS pay factors were surprisingly difficult for us to obtain, but are generally presumed to be equal to the composite standard military rates used by the Service comptrollers for inter-Service exchange; the latter are much easier to obtain.[10] We were able to obtain the MEPRS pay factors in one case, the Air Force in FY91. Looking across all the officer ranks and enlisted paygrades, the MEPRS pay factors differed from the Service-comptroller rates by at most 1.65 percent. IDA has attempted to improve on the MEPRS and Service-comptroller pay factors. We did this by first adopting, with minor modifications, some pay factors estimated explicitly for medical personnel by OASD (Health Affairs). We then calculated the difference in total MEPRS expense when the new pay factors are substituted for the MEPRS pay factors.

We began with a set of FY91 medical-personnel pay factors computed by OASD (Health Affairs). These factors are based on tabulations from the Joint Uniformed Military Payroll System (JUMPS) files.[11] The OASD (Health Affairs) factors are available in the following personnel categories: physician, dentist, optometrist, veterinarian, nurse, MSC officer, and medical enlisted. Unfortunately, these is no further detail by physician specialty. The most important element of these factors is the medical special pay, which, in the case of physicians, is computed as a weighted average over all physician specialties. We adjusted these factors by adding one omitted component, the employer contribution to Social Security, and deleting a few other components that are accounted for elsewhere in our analysis.

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[10] For example, the FY91 rates for all four Services are contained in "Composite Standard Military Rates, Basic Allowance for Quarters Rates, and Permanent Change of Station Expense Rates, Effective 1 October 1990," Comptroller of the Navy, NavComptNote 7041, October 1990.

[11] Further documentation is available from Commander D. Sevier, OASD (Health Affairs).

An example of the IDA pay factors is found in Table II-5. For an Air Force major (rank O-4) during FY91, the comptroller pay factor was $79,746, and the MEPRS pay factor was $80,420. These two factors differ by only 0.85 percent. As shown in the table, the IDA pay factor for an Air Force O-4 *physician* is $105,314. These pay factors differ primarily because the IDA factor includes medical special pay of $38,071. This quantity replaces a much smaller, average special pay for all Air Force majors (not necessarily physicians) that is implicit in the comptroller and MEPRS pay factors.

Table II-5. IDA Pay Factor: Air Force Physician, Rank O-4 (Major), FY91

Pay Element	Pay
Base Pay	$36,868
Allowances	$11,130
Medical Special Pays	$38,071
Other Pays	$365
Retirement Accrual	$15,743
Employer Social Security Contribution	$3,137
Total:	$105,314

Table II-6 is an attempt to assess, in the aggregate, the effect of substituting the IDA pay factors for the MEPRS pay factors. We report the average (across ranks[12] and paygrades) of the IDA pay factors and the MEPRS pay factors, for the Air Force in FY91. The averages were computed by weighting across rank/paygrade distributions provided by the Defense Manpower Data Center (DMDC). We multiplied the pay differences by the number of FTEs in each category, as reported in MEPRS, to obtain the pay adjustment (in millions of dollars).

Although MEPRS understates average physician compensation by over $17,000, it *overstates* the compensation of nurses, MSC officers, and medical enlisted personnel. In light of the relatively large number of medical enlisted personnel, the net effect is actually a *downward* adjustment to MEPRS of $11.1 million. However, this adjustment represents a mere 0.60% of the Air Force MEPRS inpatient and ambulatory subtotal. Because this adjustment is so small, and because the exact MEPRS pay factors were not readily

[12] The average physician salaries are slightly below the O-4 figures cited previously in the text. Military physicians begin their careers at rank O-3, and this is actually the modal rank. For the Air Force, the *average* physician rank (excluding general officers) is 3.9.

available for other combinations of Service branch and fiscal year, we have ignored the adjustment in our subsequent calculations.

Table II-6. Adjustment for MEPRS Military-Personnel Pay Factors, Air Force, FY91

Personnel Category	IDA Pay Factor	MEPRS Pay Factor	IDA Factor Minus MEPRS Factor	Full-Time Equivalents (FTEs)	Pay Adjustment (Millions of FY91 Dollars)
Physicians	$95,236	$78,091	$17,144	2,968	50.9
Nurses	$59,703	$64,738	-$5,035	3,625	-18.3
Medical Service Corps	$64,975	$68,428	-$3,453	2,381	-8.2
Medical Enlisted	$27,815	$29,877	-$2,061	17,213	-35.5
Total Adjustment					-11.1
MEPRS Subtotal					1,840
Percent Adjustment					-0.60%

While the MEPRS pay factors impart no bias in the aggregate, they do give a misleading picture of the *relative* costs of various categories of personnel. For other purposes, such as determining the optimal mix of physicians, nurses, and medical enlisted personnel, it would be better to use the adjusted pay factors reported here. Otherwise, the standard pay factors may lead to a mix that is too rich in physicians relative to the other categories of personnel.

6. Allocation of MEPRS Special-Programs Accounts

The MEPRS F (Special Programs) accounts were originally designed to measure costs incurred at MTFs in support of DoD's wartime readiness mission. Over the years, as additional three-digit accounts were added, some costs related instead to the peacetime health-care mission have migrated to the F accounts. The purpose of this section is to fold back to the A (Inpatient) and B (Ambulatory) accounts those specific three-digit F accounts that are demonstrably and exclusively related to the peacetime-care mission.

The F accounts that we have selected are analyzed in Table II-7. The Area Reference Laboratories provide clinical laboratory and forensic toxicology procedures and tests to other MTFs. Of the ten laboratories, nine are operated by the Army, and the remaining one is operated by the Navy at NNMC Bethesda. However, the Navy did not

Table II-7. Allocation of MEPRS Special-Programs Accounts, FY90

Account Code	Account Title	Army	Air Force	Navy	DoD Total
FAA	Area Reference Laboratories				21,227,080
	Allocation of FAA, by Service	8,579,128	7,128,386	5,519,567	21,227,080
FAH	Clinical Investigation Program	15,710,656	13,046,012	3,118,337	31,875,005
FAK	Student Expenses	103,386,956	40,321,354	39,395,058	183,103,368
FAL	Continuing Health Education	25,842,780	16,443,939	16,136,399	58,423,118
	Subtotal	153,519,520	76,939,691	64,169,361	294,628,571
FEA	Patient Transportation	37,165,712	7,002,563	11,022,300	55,190,575
FEB	Patient Movement Expenses	848,523	9,611,576	1,683,270	12,143,369
FEC	Transient Patient Care	14,980	11,283	55,119	81,382
	Subtotal	38,029,215	16,625,422	12,760,689	67,415,326
	Total	191,548,735	93,565,113	76,930,050	362,043,897
A	Total inpatient expenses	1,016,201,564	763,289,016	597,216,755	2,376,707,335
	Allocation excluding FEA and FEB	70,453,035	31,918,880	26,900,111	
	Percentage adjustment	6.93%	4.18%	4.50%	
	Allocation of FEA and FEB	38,029,215	16,625,422	12,760,689	
	Percentage adjustment	3.74%	2.18%	2.14%	
	Total inpatient adjustment	10.68%	6.36%	6.64%	
B	Total ambulatory expenses	1,198,135,627	1,076,600,769	827,424,836	3,102,161,232
	Allocation excluding FEA and FEB	83,066,484	45,020,811	37,269,249	
	Total ambulatory adjustment	6.93%	4.18%	4.50%	

report any expenses in MEPRS account FAA (Area Reference Laboratories) in either FY90 or FY92. The Army total of $21.2 million supported not just Army MTFs, but actually all MTFs. Therefore, we allocated this sum across the Services in proportion to their total MEPRS inpatient and ambulatory expenses. This allocation amounts to 0.39% of the MEPRS A and B accounts. In absolute terms, the allocations are $8.6 million for the Army, $7.1 million for the Air Force, and $5.5 million for the Navy. To the extent that the Army laboratories disproportionally support Army MTFs, as is often asserted, these allocations will bias the costs low for the Army and high for the other two Services.

We allocated accounts FAH (Clinical Investigation Program), FAK (Student Expenses), and FAL (Continuing Health Education) directly to each Service. The FAH account records expenses intended to: "advance the quality of healthcare rendered in military medical facilities, as measured by presently accepted professional standards, including statistical health data [and] accreditation evaluation.[13]" The FAK account reports student salary expenses in the following categories: continuing post-graduate education for physicians, dentists, veterinarians, and nurses; and continuing training for medical specialists, allied health-science personnel, administrators, other enlisted direct-care paraprofessionals, and assigned non-medical personnel.[14] Specifically, the FAK account reports: "student salary expenses [for] time the student is in a pure learner role (classroom, work-center learning, etc.)....Salary expenses related to that time a student directly contributes to work-center output may be charged to the work center.[15]" Physicians charge all of their time to FAK during their first year of post-graduate training, and a nominal 50% of their time during their second and subsequent years of training. Finally, the FAL account records: "operating expenses required to support continuing education...[including] tuition, TAD [temporary additional duty] and/or TDY [temporary duty] expenses, salaries, fees, and contractual expenses."[16]

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13 See "Medical Expense and Performance Reporting System for Fixed Military Medical and Dental Treatment Facilities," p. 2F-8.

14 Ibid., pp. 2E-10 to 2E-11. Note that expenses other than student salaries (e.g., instructor salaries, medical library, medical illustration, and medical photography) are reported in MEPRS accounts EBE (Graduate Medical Education Support) and EBF (Education and Training Program Support). These intermediate operating accounts are stepped-down to the final operating accounts (i.e., Inpatient, Ambulatory, or Dental) based on FTEs as recorded in personnel timesheets. Thus, they are already reflected in MEPRS, and need not be treated as additional adjustments.

15 Ibid., p. 2F-9.

16 Ibid., p. 2F-9.

We allocated these accounts across each Service's total MEPRS inpatient and ambulatory expenses. For example, of the Army subtotal of $153.5 million in accounts FAA, FAH, FAK, and FAL, we allocated $70.4 million to inpatient expenses and $83.1 million to ambulatory expenses. Thus, we increased the MEPRS A and B accounts by a factor of 6.93% each. Similarly, we increased these accounts by 4.18% in the Air Force and 4.50% in the Navy.

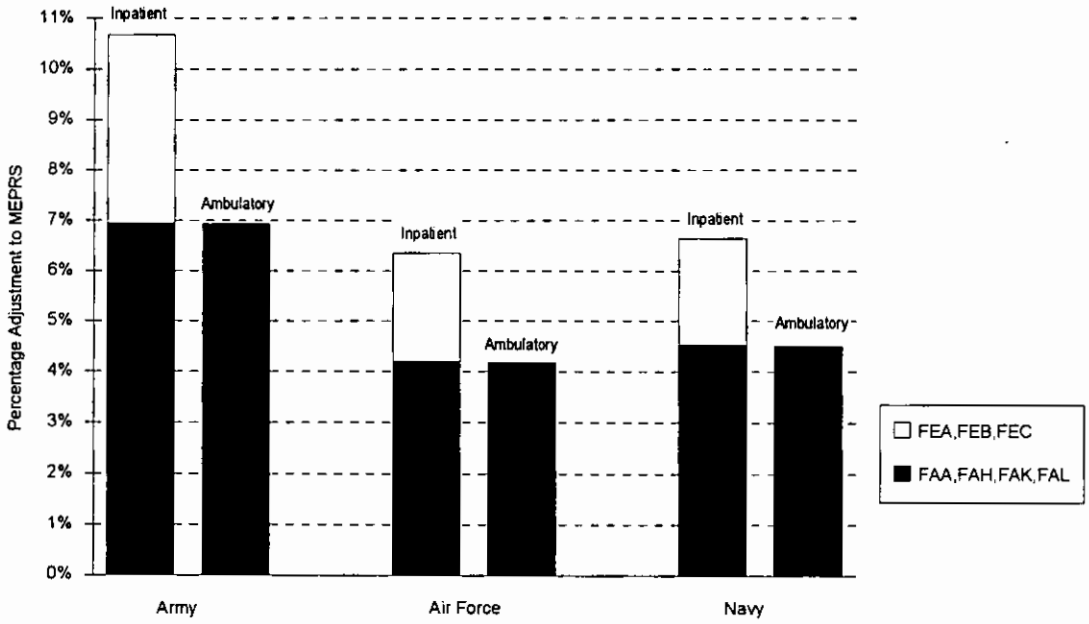
Expenses in the FAK account are accrued primarily in medical centers and the few community hospitals that offer Graduate Medical Education (GME), although some expenses may be accrued at smaller facilities that train enlisted medical specialists and paraprofessionals. Had we allocated these costs directly (and exclusively) to the medical centers and teaching hospitals, these facilities would have appeared more expensive than the remaining hospitals. We felt it inappropriate to burden the medical centers and teaching hospitals with the entire FAK total. Instead, GME supports the flow of new physicians to replenish *all* of the hospitals in the system. For this reason, we treated the FAK account as system-wide overhead.

Along these lines, we considered including adjustments for PE 0806721 (Uniformed Services University of the Health Sciences) and PE 0806722 (Armed Forces Scholarship Program). Ultimately, we decided to treat these two activities as "below-the-line," and we did not include them in the MEPRS adjustments. These activities do not represent patient care provided in MTFs; in particular, the Armed Forces Scholarship Program funds medical education provided by civilian institutions. Rather than incorporating these activities into MEPRS, they should be added back to the sum of the IDA and RAND cost estimates for any analytical cases under consideration. An example of this approach is given in Chapter IV. If these activities are expected to change under the analytical cases, then that calculation should be conducted independently of either the IDA or RAND cost analyses.

We also considered MEPRS accounts FEA (Patient Transportation), FEB (Patient Movement Expenses), and FEC (Transient Patient Care). Account FEA covers expenses to: "operate and maintain emergency medical vehicles and ambulances...for the movement of non-emergency inpatients and out-patients to, from, and between MTFs...[and for] patients who require immediate care on an unscheduled basis enroute to an MTF." Account FEB records expenses to: "move inpatients, out-patients, and attendants between medical facilities to provide optimum care." Account FEC covers expenses to: "provide

care to transient patients [at] facilities located on air routes used by the aeromedical evacuation system.[17]" These three accounts pertain to transportation assets, such as buses and ambulances, that are owned by the medical community, *not* airlift assets owned by operational units in Major Force Program 2 (General Purpose Forces). Although the MEPRS manual mentions out-patients as well as inpatients, our experience reveals that most of these expenses are related to inpatients. Therefore, we have allocated accounts FEA, FEB, and FEC to the MEPRS A account only. This allocation amounts to 3.74% for the Army, 2.18% for the Air Force, and 2.14% for the Navy.

The total F account adjustments are illustrated in Figure II-6. The total inpatient adjustments are 10.68% for the Army, 6.36% for the Air Force, and 6.64% for the Navy. The adjustment is largest for the Army, primarily because they operate the largest GME program, as reflected by the total of $103 million in their FAK (Student Expenses) account in FY90.



Notes: FAA=Area Reference Laboratories, FAH=Clinical Investigation Program, FAK=Student Expenses, FAL=Continuing Health Education, FEA=Patient Transportation, FEB=Patient Movement Expenses, and FEC=Transient Patient Care.

Figure II-6. Percentage Adjustments Based on MEPRS F Accounts

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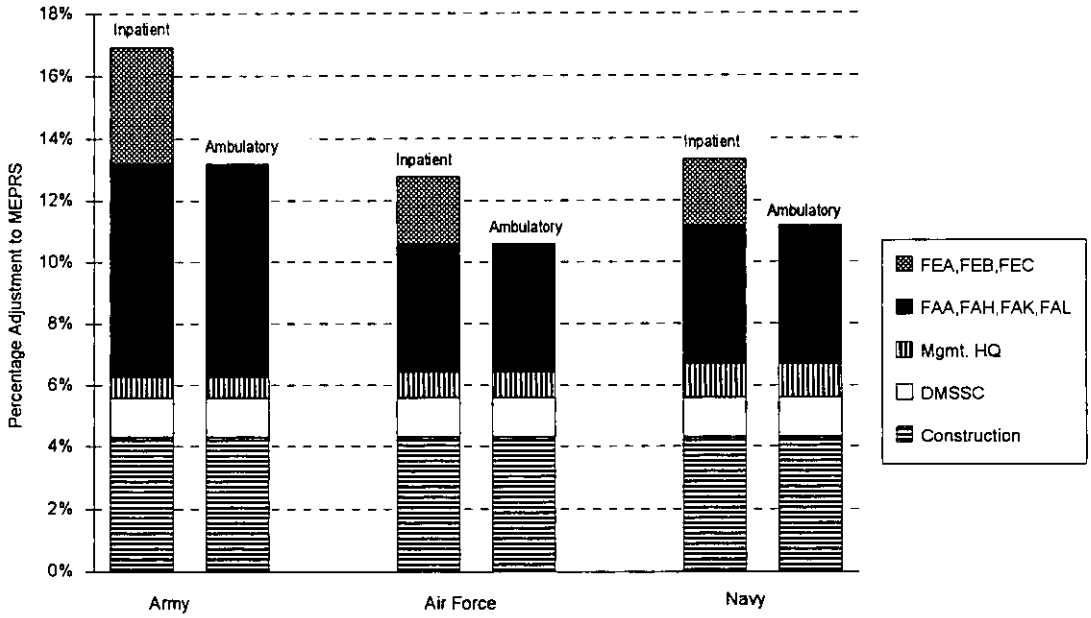
17 See "Medical Expense and Performance Reporting System for Fixed Military Medical and Dental Treatment Facilities," p. 2F-20.

7. Summary

Figure II-7 summarizes our adjustments to the FY90 MEPRS expenses. Recall that our analyses of base operations and military-personnel pay factors did not lead to any net adjustments. We developed a 4.3% facilities-construction allowance, based upon amortizing construction costs over a 40-year lifetime at a 4.0% real interest rate. Our factor of 1.29% for DMSSC was derived by spreading the DMSSC appropriation across the three Services, in proportion to their total MEPRS expenses. The adjustment for management headquarters was based on an expenditure of $21.7 million per Service. Finally, the adjustments based on MEPRS F accounts were given in Figure II-6, with larger adjustments for inpatient care to reflect patient transportation and movement expenses.



Notes: FAA=Area Reference Laboratories, FAH=Clinical Investigation Program, FAK=Student Expenses, FAL=Continuing Health Education, FEA=Patient Transportation, FEB=Patient Movement Expenses, FEC=Transient Patient Care, and DMSSC=Defense Medical Systems Support Center.

Figure II-7. Summary of Adjustments to FY90 MEPRS Expenses

The total adjustments are approximately equal for the Air Force and the Navy: 12.8% for Air Force inpatient expenses, 13.3% for Navy inpatient expenses, 10.6% for Air Force ambulatory expenses, and 11.2% for Navy ambulatory expenses. The adjustments are larger for the Army: 16.9% for inpatient expenses, and 13.2% for ambulatory

expenses. The larger Army adjustments result from larger totals in the F accounts; as shown previously in Table II-7, the Army subtotal in accounts FAA, FAH, FAK, FAL, FEA, FEB, and FEC is twice as large as either the Air Force or the Navy subtotal. By far the largest factor in this difference is the FAK (Student Expenses) account, reflecting the fact that the Army operates the largest GME program among the Services.

C. ASSESSMENT OF ADJUSTED MEPRS EXPENSES

The MEPRS adjustments may be assessed by examining their impact on aggregate MEPRS expenses. Table II-8 shows the reported FY92 MEPRS expenses, by inpatient versus ambulatory care, Service branch, and hospital size. Reported inpatient expenses were $2.41 billion for inpatient care, and $3.20 billion for ambulatory care. The corresponding adjusted figures are $2.76 billion for inpatient care, and $3.56 billion for ambulatory care. The aggregate percentage adjustments are 14.3% and 11.3%, respectively. Having made these adjustments, we are much more confident about making a fair comparison to medical costs in the civilian sector.

Table II-8. Comparison of Reported and Adjusted FY92 MEPRS Expenses (Millions of FY92 Dollars)

		MEPRS FY92 Reported	MEPRS FY92 Adjusted
Inpatient			
Army	Medical Center	688.4	799.9
	Hospital	393.7	457.5
Air Force	Medical Center	383.7	432.5
	Hospital	335.7	378.3
Navy	Medical Center	373.4	420.8
	Hospital	236.8	266.9
Inpatient Total		2,411.7	2,755.9
Ambulatory			
Army	Medical Center	527.9	593.9
	Hospital	696.6	783.7
	Clinic	19.0	21.4
Air Force	Medical Center	295.8	326.9
	Hospital	658.9	728.1
	Clinic	98.1	108.3
Navy	Medical Center	362.4	400.8
	Hospital	457.7	506.2
	Clinic	81.7	90.4
Ambulatory Total		3,198.1	3,559.6
Total Cost		5,609.8	6,315.5

D. ADDITIONAL DATA ELEMENTS

A few of the data elements required for the regression analysis derive from sources other than MEPRS. These data elements and their sources are described here.

1. Bed Capacity

The two candidate measures of bed capacity for inpatient care are normal beds and operating beds. Both measures are reported by the Services to DMFO. Normal bed capacity is defined as:

> Space for patients' beds measured in terms of beds, which can be set up in wards or rooms designated for patients' beds and spaced approximately 100 to 120 square feet per bed. *This definition refers only to space and excludes equipment and staff capability.* For containment-type hospitals still in use, bed capacity may be measured in beds spaced on 8-foot centers. Former ward or room space, which has been disposed of or has been altered so that it cannot be readily reconverted to ward or room space, is not included in computing bed capacities. Space for beds used only in connection with examination or brief treatment periods, such as that in examining rooms or in the physiotherapy department, is not included in this figure. Nursery space is not included in the bed capacity, but is accounted for separately in terms of the number of bassinets it accommodates. [Emphasis added.][18]

By contrast, an operating bed is defined as: "a bed that is currently set up and ready in all respects for the care of a patient. *It must include supporting space, equipment, and staff to operate under normal conditions.* Excluded are transient patients' beds, incubators, bassinets, labor beds, and recovery beds."[19] [Emphasis added.] Because operating beds are fully staffed, they appear to be the more appropriate capacity measure for hospitals in peacetime. Indeed, preliminary regression models using normal beds did not predict MTF costs as accurately as the later models using operating beds.

The data on normal and operating beds have not always been regularly updated. In our judgment, the FY90 data had not been updated recently enough to be of use in this study. The FY92 data, however, appear both more recent and more relevant. Therefore,

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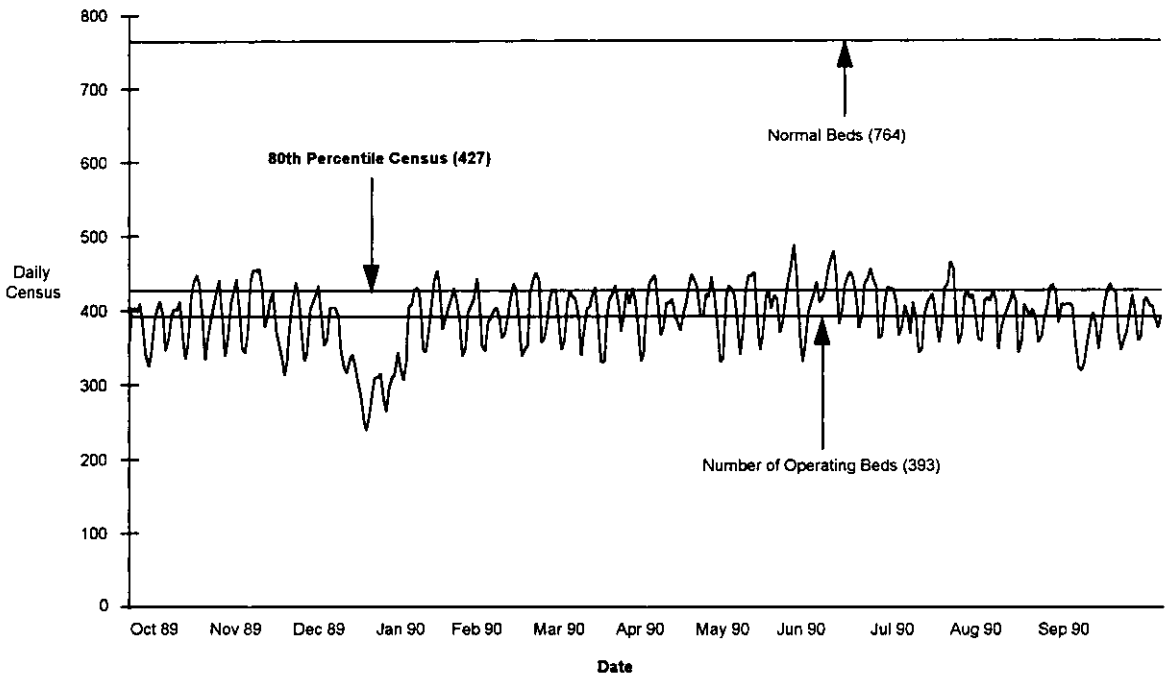
[18] See "Medical Expense and Performance Reporting System for Fixed Military Medical and Dental Treatment Facilities," p. A-18.

[19] Ibid., p. A-19.

we applied the FY92 numbers of normal and operating beds in our analyses of both FY90 and FY92 data on cost and workload.

The relationship between normal and operating beds is illustrated in Figure II-8. The jagged curve represents the trend in daily census at Naval Hospital San Diego during FY90. For reference, we note that the average daily census equals 392, and the 80th percentile of the daily census equals 427. Operating beds were reported as 393. This figure certainly lies within the range observed for the daily census. If operating beds represent staffed capacity, however, one might expect this value to exceed the mean and possibly exceed the 80th percentile as well. We suspect that operating beds are not updated frequently enough to reflect seasonal changes in staffing that occur within the fiscal year.



Note: Average daily census = 392.

Figure II-8. Naval Hospital San Diego, FY90 Daily Census

By contrast, normal beds were reported as 764. This figure bears no apparent relationship to the trend in daily census, and offers little indication of peacetime capacity. Similar patterns were observed at several other MTFs that we examined. We conclude

that FY92 reported operating beds, though imperfect, provide the best available proxy for peacetime capacity.

2. Graduate Medical Education

We measured the volume of GME by the headcount of residents and interns at each MTF. This information was provided by OASD (Health Affairs/Professional Affairs and Quality Assurance). This measure differs from the one used by the Health Care Financing Administration (HCFA) for Medicare reimbursement.[20] The HCFA measure is defined as the headcount of resident and interns, divided by the number of staffed beds at each hospital; the HCFA definition of staffed beds is roughly analogous to the DoD definition of operating beds. The HCFA measure is relevant for inpatient care only, with staffed beds serving as a capacity variable. There is no obvious capacity variable for ambulatory care. In our data on MTFs, we found evidence that GME affects the cost of ambulatory care as well as inpatient care. The advantage of our GME measure (i.e., the simple headcount) is that it does not require a capacity variable; thus, it is well-defined even on the ambulatory side.

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[20] Health Care Financing Administration, "Federal Register," Vol. 52, No. 169, September 1, 1987.

III. DEVELOPMENT OF MEDICAL TREATMENT FACILITY COST FUNCTIONS

This chapter discusses the Military Treatment Facility (MTF) cost functions used to project the total cost of providing care at DoD hospitals under several analytical cases. These cases will be described further in Chapter IV. The cost functions estimate the total costs of operating each individual facility, given projections of inpatient and ambulatory workload at each facility, the capacity of each facility measured in terms of operating beds, and the number of residents and interns enrolled in each facility's Graduate Medical Education (GME) program (where applicable). The facility-level costs are then summed over all facilities to estimate the system-wide costs of providing care at DoD hospitals under each analytical case. The costs of providing care within the civilian sector, and paid through the Civilian Health and Medical Program of the Uniformed Services (CHAMPUS), are being separately estimated by the RAND Corporation.

To develop the cost functions, econometric modeling was applied to identify independent variables that explain the variation in cost across DoD hospitals. Several independent variables were considered, including workload performed, facility operating capacity, size of GME program, geographic location of the facility, and type of facility (i.e., medical center, community hospital, or free-standing ambulatory clinic). The existence of economies of scale and scope was also investigated. A summary of the modeling methodology is presented next, and an attempt is made to identify the critical assumptions on which the analysis hinges. Then the estimated inpatient and ambulatory cost functions are presented.

A. GENERAL METHODOLOGY

The cost functions were developed both to better understand the relationship between costs and workload within DoD hospitals and to project total facility costs for various levels of workload. The cost functions are based on adjusted Medical Expense and Performance Reporting System (MEPRS) data, as described in Chapter II. Most of the

adjustment factors were based on analysis of FY90 MEPRS data, though there were a few exceptions.[1] Our preliminary modeling efforts were based exclusively on FY90 data. When the Section 733 Study began, the data for FY92 were not yet complete. Moreover, the data for FY91 are widely viewed as anomalous because of Operation Desert Storm. As the study progressed and FY92 data became available, we began to combine these new data with the FY90 data. We found that the regression relationships between cost and workload were statistically indistinguishable for the two fiscal years, once we corrected for the escalation in unit cost. Thus, we were able to combine the two years of data, thereby doubling the sample size for the regression analysis with an attendant increase in the precision of our estimates.

Specifically, we escalated the FY90 expenses by the average increase in cost per unit workload (i.e., cost per inpatient discharge or cost per ambulatory visit) observed between FY90 and FY92. Separate escalation factors were applied to the inpatient and ambulatory expense data, and to each facility type (i.e., medical center, community hospital, or clinic). These escalation factors are shown in Table III-1. The MEPRS adjustment factors, derived in Chapter II and repeated here in Table III-1, were applied to both the FY90 and FY92 MEPRS expense data. Then the escalation rates were applied only to the FY90 expenses, in order to express them in FY92 dollars.

Table III-1. Escalation Rates and MEPRS Adjustment Factors

	Inpatient Expenses	Ambulatory Expenses
FY90 to FY92 Cumulative Escalation Rate:		
Medical Centers	26.8%	27.3%
Community Hospitals	16.7%	23.5%
Clinics	Not Applicable	15.2%
MEPRS Adjustment Factors:		
Army	16.9%	13.2%
Air Force	12.8%	10.6%
Navy	13.3%	11.2%

[1] The analysis of support-cost ratios used the time period FY87-FY90; the analysis of military-construction appropriations used the time period FY89-FY92; the analysis of MEPRS pay factors used the single year FY91.

The escalation rates shown in Table III-1 are surprisingly high. These are two-year cumulative rates, but the implied annual rates are still quite high (e.g., 12.6% for inpatient expenses in medical centers). These escalation rates cannot be strictly interpreted as price indices for medical care, because rapid technological advance invalidates the concept of comparing prices for a constant set of goods or services. In addition, some of the FY92 outlays may represent the spend-out of FY91 obligations made in connection with Operation Desert Storm.

The MEPRS cost-assignment methodology separates cost and workload into inpatient and ambulatory functional categories. To take advantage of the MEPRS methodology for allocating ancillary, support, and overhead costs to functional categories, separate inpatient and ambulatory cost functions were developed. The predictions of the two models may simply be added to predict total cost at a given facility. We also experimented with a model to predict combined inpatient and ambulatory costs, using separate inpatient and ambulatory workload measures as independent variables. However, we found a high correlation between the inpatient and ambulatory workload measures across facilities. The combined model suffered from unstable coefficient estimates as compared to the separate inpatient and ambulatory models reported here.

The cost models also required a weighting process to adjust for heteroskedasticity (i.e., non-uniform error variance within groups) as well as groupwise variance differences (i.e., differences in relative modeling error between medical centers, community hospitals and clinics). Through the use of weighted regression, with additional adjustments for groupwise differences, the basic assumption of constant variance (homoskedasticity) in the data was restored when applying least squares regression.

To better establish a baseline from which to construct military-hospital cost models, we reviewed previous work by Vector Research, Incorporated (VRI), on military-hospital cost functions, as well as numerous research publications on civilian-hospital cost functions. These papers aided in identifying potential independent variables that were considered for the cost functions. Table III-2 gives a brief summary of the findings contained in these papers.

We have summarized the procedure for developing the facility-level expenses used as the dependent variable in the cost functions, as well as the procedure for identifying potential independent variables. The remainder of this chapter describes the resulting inpatient and ambulatory cost functions.

Table III-2. Summary of Civilian-Hospital Cost Function Research

- Most models specified in the form of a log-log model (1, 3, 7) (others used were general linear--with scale and scope terms--or translog models)
- Teaching activity significantly contributes to higher total costs (1, 2, 3, 5, 6, 7)
- Diminishing marginal costs generally exist for hospitals having up to 300 beds (1, 2, 3, 5, 7)
- Outpatient visits by clinical area generally do not have significantly different cost coefficients (1, 3)
- Economies of scope exist between pediatric care and other inpatient care (2)
- Diseconomies of scope exist between emergency room services and inpatient care (1, 2, 7)
- Level of forecasted workload has a significant effect on costs (if forecasted workload is higher than realized workload, then incur excess capacity costs) (3, 4, 5, 7)
- Specialty care may be more expensive than general medical care even after case-mix adjustment (1, 3, 5)
- Inpatient care is frequently separated into discharges and bed days to measure the impact of changes in average length of stay

Note: The numbers refer to formal references, listed below, from which the statements were derived.

1. "Estimating Hospital Costs - A Multiple Output Analysis." Thomas W. Grannemann, Randall S. Brown, and Mark V. Pauly, *Journal of Health Economics*, No. 5, 1986, 107-127.
2. "Multiproduct Short-Run Hospital Cost Functions: Empirical Evidence and Policy Implications From Cross-Section Data." Thomas G. Cowing and Alphonse G. Holtman, *Southern Economic Journal*, Volume 49, January 1983, 637-653.
3. "Determinants of Hospital Costs-Outputs, Inputs, and Regulation In the 1980s." Jack Hadley and Stephan Zuckerman, Urban Institute Report 91-10, 1991.
4. "A New Approach to Hospital Cost Functions and Some Issues In Revenue Regulation." Bernard Friedman and Mark V. Pauly, *Health Care Financing Review*, No. 4, March 1983, 105-114.
5. "Hospital Output Forecasts and the Cost of Empty Hospital Beds." Mark V. Pauly and Peter Wilson, *Health Services Research*, Volume 21, August 1986, 403-428.
6. "Development of Cost Models to Support Diagnosis Related Management," VRI-DMIS-2.60 WP91-1R, Vector Research Incorporated, 7 November 1991.
7. "Why Are Urban Hospital Costs So High? The Relative Importance of Patient Source of Admission, Teaching, Competition, and Case Mix." Kenneth E. Thorpe, *Health Services Research*, Volume 22:6, February 1988.

B. INPATIENT COST FUNCTION

Two cost functions were developed: one for inpatient expense data and one for ambulatory expense data. MEPRS separately identifies inpatient and ambulatory costs, and uses a standard methodology for assigning ancillary, support and overhead expenses to each clinical area within the hospital. The inpatient cost function, based on expenses reported in the MEPRS A (Inpatient) accounts, is described next. The ambulatory cost function is discussed in a later section.

1. Construction of Case-Mix Adjusted Workload

The objective of this section is to develop a single, homogeneous work unit for inpatient care. It is well-known that different clinical procedures vary widely in resource

intensity. Simply adding the total number of discharges, without regard to the procedures performed, would not yield a homogeneous work unit even for a single facility. Moreover, it would be virtually impossible to compare unit costs across facility types. For example, community hospitals refer many of their most difficult cases to medical centers, so that medical centers would always appear more expensive unless some adjustment were made for complexity.

Our homogeneous work unit uses a weighting scheme for resource intensity based on Diagnosis Related Groups (DRGs). The DRG system provides a method for classifying inpatient care into over 500 groups having roughly similar within-group resource requirements. DRGs form the basis for prospectively determining hospital payments within the Medicare and CHAMPUS programs. By following a DRG schedule, hospitals that treat the more resource-intensive cases are credited with larger payments. We have applied DRGs in a reverse fashion from their conventional usage. We observe differences in unit costs across MTFs. We have used DRGs to rationalize part of these differences, effectively crediting the medical centers with more work units.

Specifically, we have assigned individual inpatient discharges from military hospitals to particular DRGs, based on the diagnoses, procedures performed, comorbidities and complications, and other factors. However, because (as mentioned in Chapter II) military hospitals do not have a patient-level accounting system, it is not possible to directly estimate an average cost by DRG for military hospitals. Instead, we have used the CHAMPUS FY91 (Version 8) DRG Grouper, with its associated average costs and outlier criteria.[2] The assumption here is that *relative* cost by DRG based on CHAMPUS experience provides a good predictor for (unobserved) relative cost by DRG in military hospitals.

Table III-3 presents a simplified, fictional example to illustrate how DRG-based case-mix adjustments work. In this example, a vaginal delivery is accompanied by either a normal newborn or a low-birthweight newborn, yielding a total of two discharges. The table demonstrates that the cost per discharge prior to case-mix adjustment ranges between $400 and $40,000. Because high-risk deliveries are typically identified in advance and referred to medical centers, a preponderance of low-birthweight infants are delivered in

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2 CHAMPUS FY91 (Version 8) DRG weights and outlier criteria were published in the *Federal Register*, Vol. 55, No. 214, November 5, 1990.

medical centers. Thus, prior to case-mix adjustment, one would expect a higher average cost per discharge at medical centers than at community hospitals.

Table III-3. Derivation of DRG Weights

DRG	Description	Total Cost	Total Discharges	Cost per Unadjusted Discharge	DRG Weight	Cost per DRG Weight
373	Vaginal Delivery	$14,240,000	5,000	$2,848	0.712	$4,000
391	Normal Newborn	$1,760,000	4,400	$400	0.100	$4,000
610	Low Birthweight Newborn	$24,000,000	600	$40,000	10.000	$4,000
	Total/Average:	$40,000,000	10,000	$4,000	1.000	$4,000

Continuing with this example, Table III-3 compares average costs before and after case-mix adjustment. The DRG weight is computed in each row of the table as the ratio of cost per unadjusted discharge, divided by the overall average cost (i.e., divided by $4,000). We see that average cost is equalized after application of the DRG weights, so that the cost and workload data at medical centers may be combined with the data from community hospitals, which are less likely to treat high-risk cases. For example, vaginal delivery (DRG 373), most likely performed at a community hospital, is counted in our data as 0.712 weighted discharges. The average cost per *weighted* discharge equals $4,000. Low-birthweight neonatal care (DRG 610), most likely provided at a medical center, is counted in our data as 10.0 weighted discharges. The average cost per *weighted* discharge again equals $4,000. By expressing workload in terms of weighted discharges, we have work units that are equally costly on average. Thus, the weighted discharges may be added to form a homogeneous predictor of total inpatient cost at a given facility.[3]

We should reiterate the fundamental assumption of this section: the relative cost by DRG based on CHAMPUS experience provides a good predictor for relative cost by DRG in military hospitals. Unfortunately, in the absence of a patient-level accounting system, there is no way to *directly* assign relative resource weights to individual discharges from military hospitals. Further research may be warranted to investigate the adequacy of using CHAMPUS DRG weights as a proxy.

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[3] In addition, for certain exceptional cases with extremely long or short stays, the DRG weight is not entirely appropriate. We have adjusted the weighted workload down for exceptionally short stays or up for exceptionally long stays. These adjustments were made in accordance with the outlier criteria and methodology used by CHAMPUS in FY91 for the Version 8 DRG Grouper.

2. Regression Estimates

Figure III-1 displays the relationship between inpatient expenses (FY90 and FY92 data measured in FY92 dollars) and inpatient case-mix adjusted workload (i.e., the sum of weighted discharges by facility), with symbols identifying the facilities by type. The scatterplot demonstrates that medical centers in general are larger than community hospitals in terms of total inpatient workload. Where the two facility types overlap, roughly between 8,000 and 14,000 discharges, medical centers have higher costs than community hospitals. This visual analysis, reinforced with statistical tests, indicated fundamental differences between the cost structures of medical centers and community hospitals. These differences were taken into consideration in the model through the use of facility-type dummy variables, where required. Also, while the scatter of points for medical centers appears linear, the scatter for community hospitals indicates decreasing marginal costs for the largest hospitals. This phenomenon was modeled by introducing a quadratic term (i.e., workload squared) for the community hospitals only.

Figure III-2 visually demonstrates that the FY90 data points are well interspersed with the FY92 data points after application of the escalation rates. Thus the escalation rates we used seem appropriate. In addition, statistical tests indicated that the separate regression relationships for the two years were indistinguishable, thereby justifying our decision to combine them into a single cost function.

The inpatient cost-function parameter estimates, summary statistics, and data point exclusions are presented in Table III-4. As indicated by visual inspection of Figure III-1, the regression function is linear for medical centers, but includes a quadratic effect (i.e., decreasing marginal costs) for community hospitals.[4] The model also reveals that facility operating capacity and GME intensity are significant predictors of inpatient expenses. Recall that operating capacity was measured by the number of operating beds, and GME intensity was measured by the number of residents and interns enrolled at an MTF. Recall

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[4] The literature on civilian-hospital cost functions, as summarized previously in Table III-2, often uses more exotic mathematical functions than our linear-quadratic. For example, the translog function is sometimes used to account for sample variation in the prices of inputs such as labor and materials. We suspect that price variation across MTFs is minimal; the largest component of cost, military labor, shows no price variation at all. Consistent with this hypothesis, we found no evidence of geographical variation in total inpatient cost across MTFs. Therefore, we saw no need to consider the translog function.

also that we used FY92 reported operating beds for both fiscal years, because the FY90 reported operating-bed data were judged unreliable.

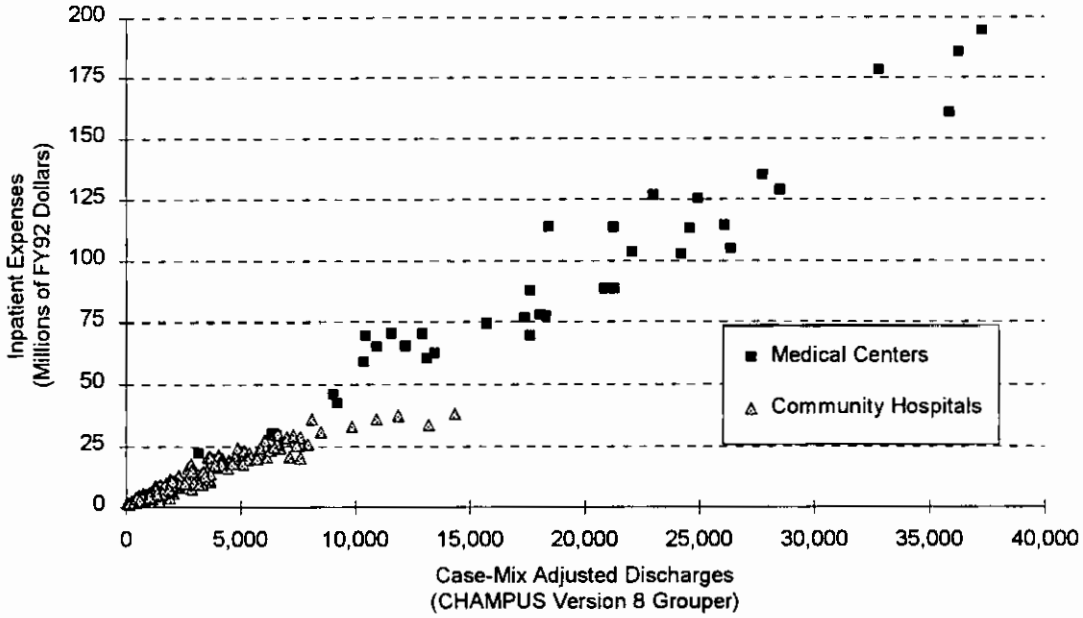


Figure III-1. FY90 and FY92 Inpatient Expenses (FY92 Dollars), by Facility Type

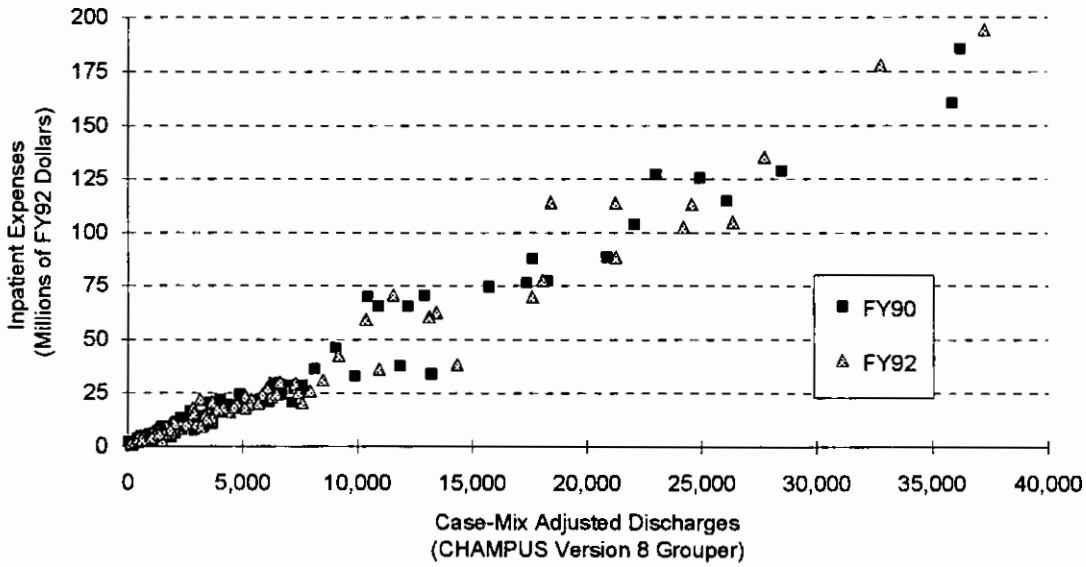


Figure III-2. FY90 and FY92 Inpatient Expenses (FY92 Dollars), by Fiscal Year

Table III-4. Final Inpatient Model

Model Functional Form:

Inpatient Expenses = (Intercept + Community Hospital Intercept Adjustment + B1*Case-Mix Adjusted Discharges + B2*Community Hospital Case-Mix Adjusted Discharges + B3*Community Hospital Case-Mix Adjusted Discharges Squared + B4*Operating Beds + B5*GME) * (1 + B6*NAVY)

Variables	Mean Value	Coefficient Estimate	t-Statistic	95% Confidence Interval	
Intercept		9,548,815	2.474	1,942,709	17,154,921
Community Hospital Intercept Adj.		-8,467,472	-2.193	-16,076,618	-858,325
Case-Mix Adjusted Discharges (CMAs)	5,321	2,979	7.990	2,244	3,714
Community Hospital CMA Adj.	2,314	+223	0.590	-523	969
Community Hospital CMAs Squared	1.07e+7	-0.0601165	-2.728	-.1035426	-.0166905
Operating Beds	103	35,256	5.005	21,373	49,138
GME (Residents & Interns)	31	65,862	2.910	21,254	110,471
Navy % Adjustment		7.36%	2.690	1.97%	12.76%

The following data points were removed from the model before estimation:

Facility Name	Fiscal Year	Reason
Letterman	FY92	Structural
Womack	FY90, FY92	High Leverage
NH Newport	FY92	Outlier
Cutler	FY90, FY92	Missing Data
BH NAVSTA Adak	FY92	Missing Data
509th Strategic Hospital	FY90, FY92	Missing Data
354th Medical Group	FY90, FY92	Missing Data

Number of valid observations: 227

The coefficients are interpreted in the following manner:

- Intercept: The cost that would be predicted at a medical center if all regression variables were set to zero. Because medical centers are never observed in this situation, the confidence interval is extremely wide; the estimate involves extrapolation well outside the range of observed data. Moreover, the estimate is counterfactual because it considers a medical center with not only zero inpatient workload, but also zero bed capacity.
- Community Hospital Intercept Adjustment: The difference between the medical-center intercept and community-hospital intercept; the resulting community-hospital intercept is $1.08 million.

- Case-Mix Adjusted Discharges (CMAs): The marginal cost of producing an additional discharge at a medical center.
- Community Hospital CMA Adjustment: The difference between the marginal cost of producing an additional discharge at a community hospital, versus the marginal cost of producing an additional discharge at a medical center, *prior* to adjusting for the diminishing marginal costs identified at the former. Thus, the marginal cost of the first discharge from a community hospital equals $2,979 plus $223, or $3,202. We retain the difference, $223, even though it is not statistically significant, because it represents our best point estimate.
- Community Hospital CMAs Squared: The square of discharges is used as an independent variable to identify potential increasing or decreasing marginal costs with increases in workload. The negative coefficient implies that marginal costs decrease with an increase in workload (i.e., economies of scale).
- Operating Beds: Staffed beds that are ready to be occupied by patients (operating beds) are a measure of a hospital's operating capacity. The coefficient represents the cost of each staffed bed, and is a combination of fixed (i.e., physical plant) and marginal (i.e., staff) costs.
- GME (Residents and Interns): An estimate of the additional *patient-care* cost incurred by providing graduate medical education, measured in terms of cost per enrolled resident or intern. This estimate reflects student FTEs charged directly to the MEPRS A (Inpatient) account. It also reflects classroom time factored into total expenses via the FAK-account (Student Expenses) adjustment, as described in Chapter II. Recall, however, that the FAK accounts were spread as system-wide overhead, rather than being assigned directly (and exclusively) to teaching facilities.
- Navy % Adjustment: Due to structural and accounting differences, it was necessary to include a variable to distinguish Navy facilities from Army and Air Force facilities.

The Navy adjustment should *not* be interpreted as evidence that Navy hospitals are more expensive or less efficient than Army or Air Force hospitals. Although MEPRS purports to be a standardized accounting system, there are workload and cost-accounting differences between the Services that cannot be explained through econometric modeling given the variables at hand. We expand on this point later in the section on ambulatory cost models. We present comparisons between medical workload as reported in the accounting systems, and medical workload as self-reported by beneficiaries in the 1992 DoD Health Care Survey. The accounting systems report more workload than the survey,

but the difference is less pronounced for the Navy than for the other two Services. Thus, the accounting systems may understate Navy workload (or overstate it less), fostering the appearance of higher unit cost for that Service. Further research is clearly warranted to improve the comparability of cost and workload data across the three Services.

Inpatient marginal costs are constant with respect to workload for medical centers, but decrease over the range of data for community hospitals. The model estimates of marginal cost are depicted in Figure III-3. At a level of approximately 1,860 total discharges, the marginal cost of a discharge at a medical center is equal to the marginal cost of a discharge at a community hospital. Therefore, very small community hospitals appear most expensive on the margin. Marginal costs for community hospitals remain positive until the point of approximately 26,600 discharges. This level is substantially greater than the highest observed value of 14,363 discharges for community hospitals, and well beyond the relevant range of application of the cost function for community hospitals.

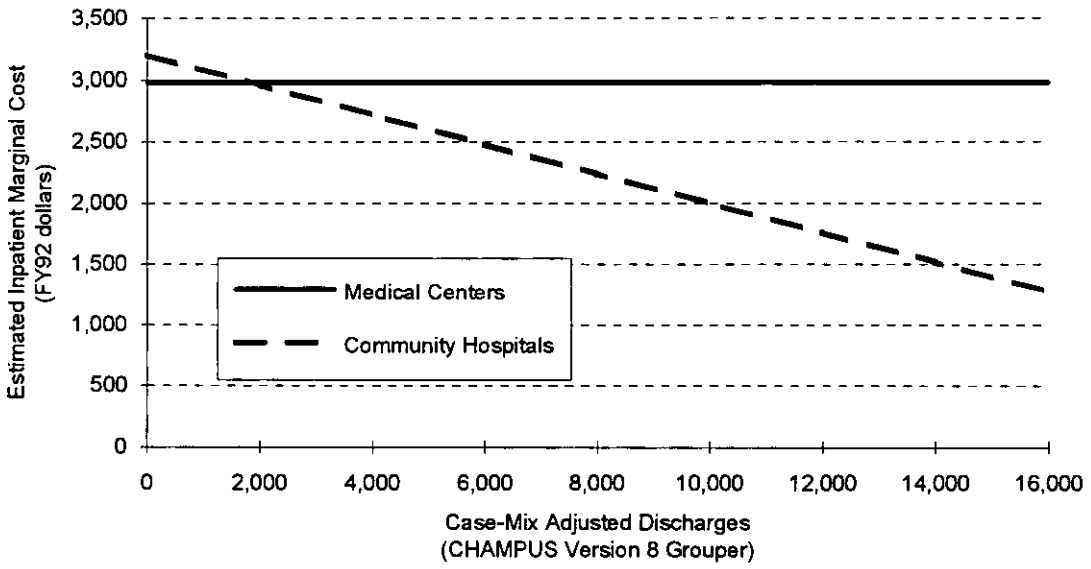
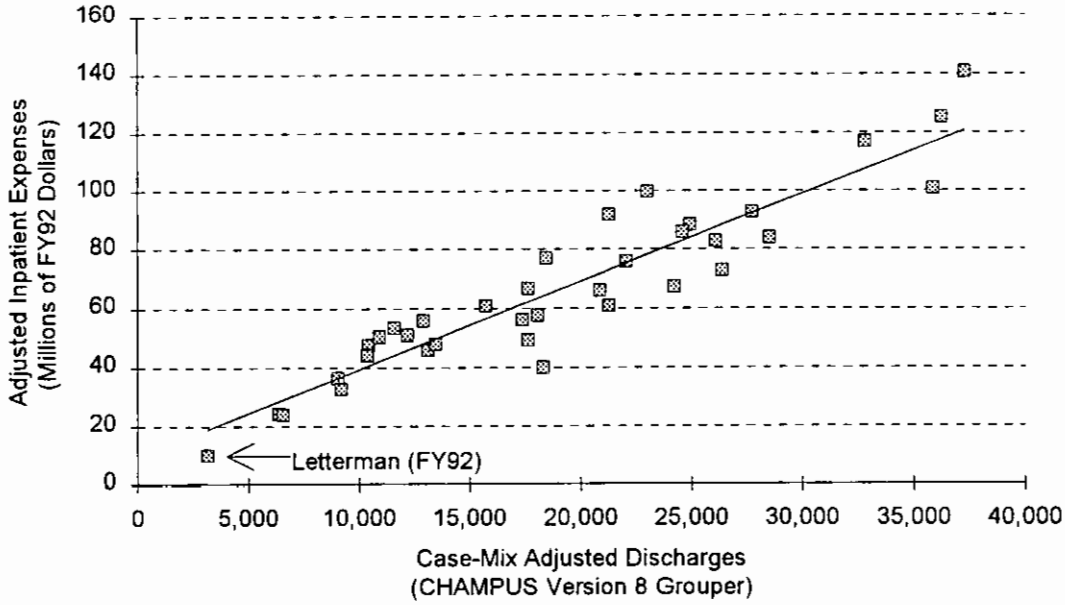


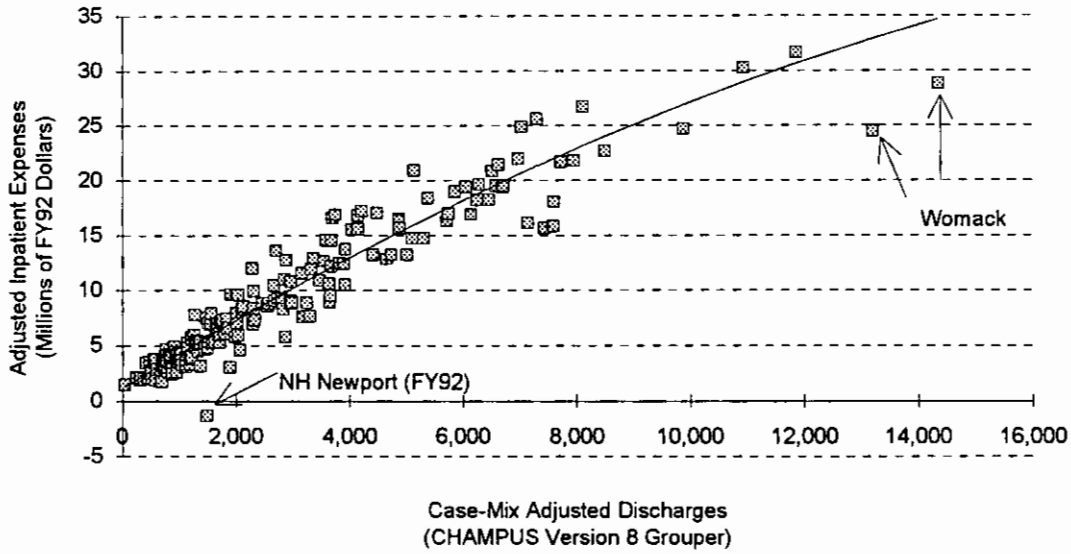
Figure III-3. Inpatient Marginal Cost Versus Workload, by Facility Type

Figures III-4 and III-5 display the relationship between total inpatient expenses and workload, respectively, for medical centers and community hospitals, after adjusting for all independent variables other than case-mix adjusted discharges. As shown previously in Table III-4, several data points were excluded from the model for various reasons. FY92 data for Letterman Army Medical Center were removed because operations were



Note: Expenses adjusted for other regression right-hand variables.

Figure III-4. Medical Center Inpatient Expenses Versus Workload (FY92 Dollars)



Note: Expenses adjusted for other regression right-hand variables.

Figure III-5. Community Hospital Inpatient Expenses Versus Workload (FY92 Dollars)

substantially reduced in preparation for closing, making this an atypical observation. Womack Army Hospital at Fort Bragg was excluded because this facility had undue influence on the regression parameters. Inclusion of this facility would yield a much stronger quadratic effect (i.e., more rapidly decreasing marginal cost), that is not suggested by the other community hospitals in the data set. Naval Hospital Newport was not a representative data point because its observed expenses were more than three standard deviations from the regression line. Finally, several facilities did not report expenses, workload, or operating beds for a particular fiscal year, and were necessarily excluded from the model.

Figure III-6 is a histogram of the percentage deviations between the observed inpatient expenses and the predicted inpatient expenses. Positive values indicate that observed expenses exceed predicted expenses. Only those facilities that were included in the regression are shown in the histogram, thereby indicating the goodness-of-fit of the regression line relative to the data from which it was estimated. With the possible exception of the two endpoints, the histogram indicates a normal distribution of the percentage errors, implying that the statistical properties of the regression model are sound.

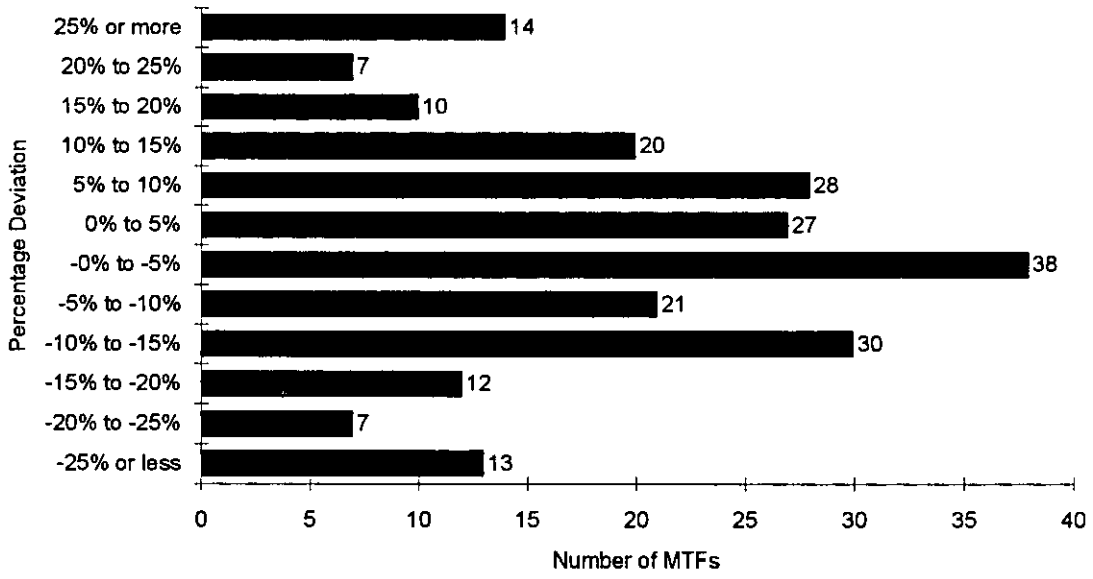


Figure III-6. Percentage Deviation Between Observed and Predicted Inpatient Expenses

The relatively high mass at each endpoint (i.e., errors of 25% or more) indicates that we were conservative in discarding data points. These data points were retained, despite the large percentage errors, because they fell within three standard deviations of the regression line. As demonstrated in Figure III-5, the observed costs for a given level of workload vary substantially in the basic data. For example, the observed costs to produce 8,000 discharges, after adjusting for other independent variables, range between approximately $15 million and $27 million, an 80-percent spread. With this much spread in the basic data, it is inevitable that a few data points will stray from the regression line.

It is important to remember that the cost functions were not developed to estimate resource requirements for a particular facility. Rather, they were developed to estimate the change in system-wide costs as the aggregate level of workload is changed. The cost functions presented here are more than adequate for the task, and predict hospital costs at least as well as most of their counterparts in the literature on civilian-hospital costs cited previously in Table III-2.

C. AMBULATORY COST FUNCTION

The ambulatory cost function was developed in a similar manner to the inpatient cost function. Because most ambulatory care in the civilian sector is not provided at hospitals, there was little basis for comparison between the civilian and military sectors in this case. Nor was there any system comparable to DRG weights to enable an adjustment for relative resource-intensity. Before turning to the regression estimates, we must discuss the workload exchange rates. These rates were developed by the Section 733 Study to reflect the differences between medical workload as reported in the accounting systems, and medical workload as self-reported by medical beneficiaries.

1. Workload Exchange Rates

The RAND Corporation used data from the 1992 DoD Health Care Survey[5] to calibrate its models that forecast utilization under analytical cases. RAND then provided IDA with inpatient and ambulatory workload estimates for each analytical case. However, the amount of medical workload differs, often dramatically, between MEPRS and the

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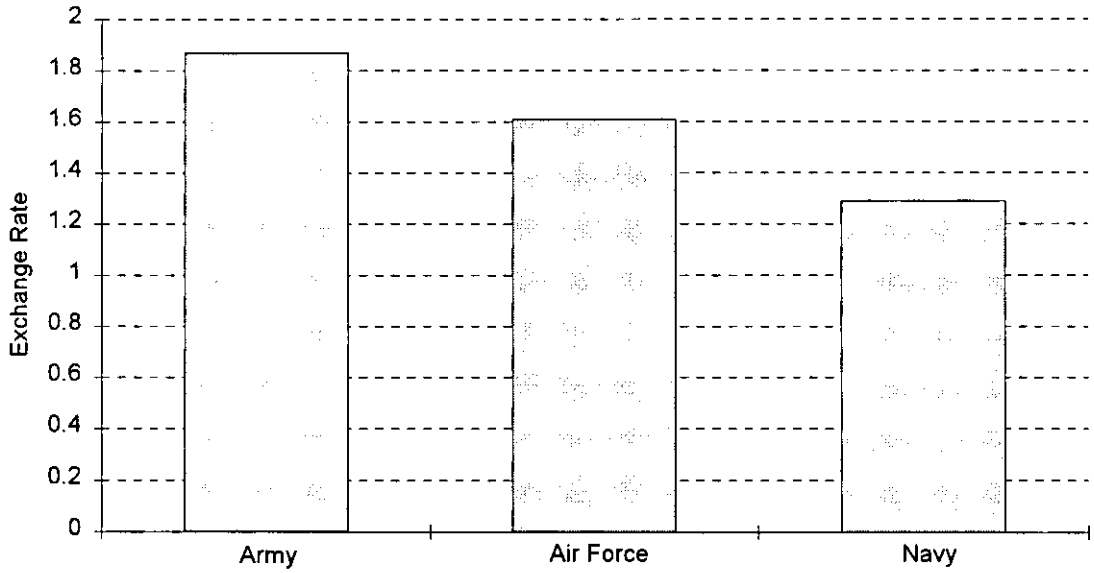
5 The survey design and findings are documented in Philip M. Lurie, et al., "Analysis of the 1992 DoD Survey of Military Medical Care Beneficiaries," Institute for Defense Analyses, Paper P-2937, forthcoming, 1994.

beneficiary survey. Thus, the hypothetical workloads are measured along one scale, but the IDA cost functions require workload measured along a different scale. A conversion is clearly necessary to make the RAND workload numbers "fit" into the IDA cost functions.

To circumvent this problem, RAND has computed a set of "exchange rates," which play a role analogous to the rates used in converting two currencies (e.g., dollars to yen). RAND has computed the exchange rates along various dimensions (e.g., inpatient versus outpatient care, beneficiary category, and Service branch).[6] As an example, Figure III-7 shows the exchange rates, by Service branch, for ambulatory visits. The figure reveals that more workload is reported in MEPRS than in the beneficiary survey, but the difference is less pronounced for the Navy than for the other two Services.



Note: FY92 ambulatory visits reported in MEPRS, divided by ambulatory visits estimated from the beneficiary survey.

Figure III-7. Ambulatory-Workload Exchange Rates, by Service Branch

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6 The complete set of exchange rates is available in Susan D. Hosek, Bruce W. Bennett, Kimberly A. McGuigan, Jan M. Hanley, Roger Madison, and Afshin Rastegar, "The Demand for Military Health Care: Supporting Research for a Comprehensive Study of the Military Health Care System," RAND Corporation, MR-407-PA&E, January 1994.

A critical assumption is being made when using the exchange rates to "fit" hypothetical workload numbers into the IDA cost functions. Specifically, it is being assumed that the historical relationships between the two measurement systems will be maintained under the analytical cases. For example, suppose that the beneficiary survey initially shows 100 visits to Air Force hospitals, whereas MEPRS data show 160 visits (reflecting the Air Force exchange rate of 1.6). If survey-based analysis predicts a 10% increase to 110 visits, then the new workload figure for the MEPRS-based cost function also increases by 10%, to 176 visits. As long as the exchange rate remains constant at 1.6 under the analytical case, this procedure is valid. The procedure would fail only if some feature of the analytical case drove a wedge between the incentives to report workload under the two systems. Although we are not aware of any such feature, the calculation and use of exchange rates between data systems requires additional research.

2. Regression Estimates

The ambulatory cost function was estimated using expenses reported in the MEPRS B (Ambulatory) accounts. The MEPRS adjustment factors, derived in Chapter II, were applied to both the FY90 and FY92 MEPRS expense data. Then the escalation rates were applied only to the FY90 expenses, in order to express them in FY92 dollars.

Figure III-8 displays the relationship between ambulatory expenses (FY90 and FY92 data measured in FY92 dollars) and the number of visits, with symbols identifying the facilities by type. Again, we see different cost structures for different classes of facilities. Total costs are generally highest at medical centers, even in the wide region of overlap with community hospitals. The scatter for community hospitals again indicates decreasing marginal costs. These phenomena were modeled using facility-type dummy variables, plus a quadratic term for the community hospitals only.

The data include a total of 35 observations over the two years on clinics outside of the continental United States (OCONUS). As is shown later, inclusion of the OCONUS clinics had virtually no effect on the coefficient estimates, but did improve their precision by increasing the sample size. Finally, as previously discussed for the inpatient model, there is large variation in observed expenses for a given level of workload. For example, facilities operating at roughly 900,000 visits per year report expenses ranging between approximately $50 million and $110 million, a 120-percent spread.

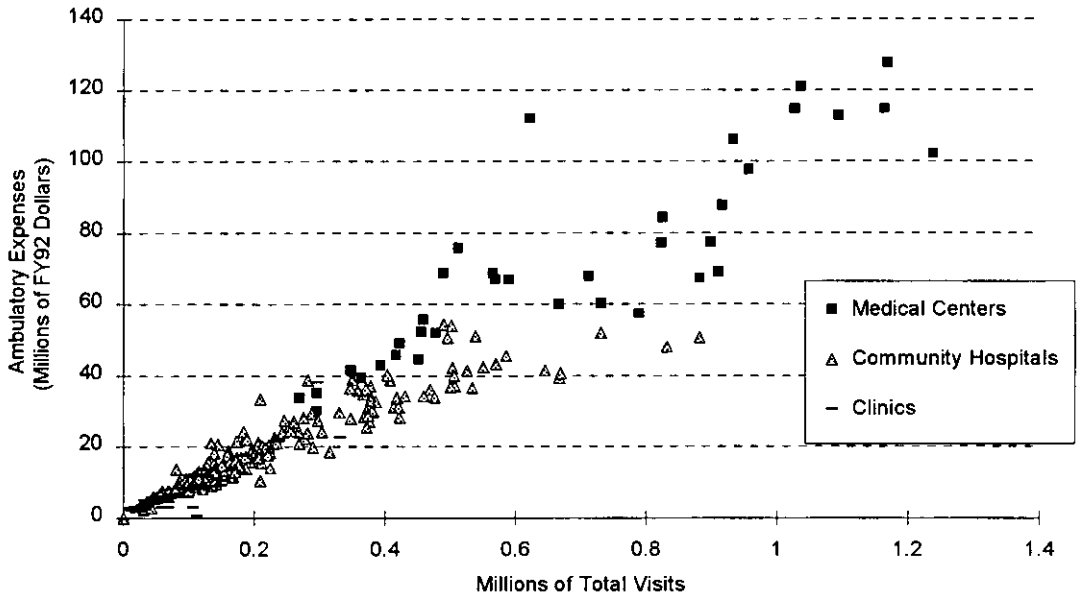

Figure III-8. FY90 and FY92 Ambulatory Expenses (FY92 Dollars), by Facility Type

Figure III-9 visually demonstrates that the FY90 data points are again well interspersed with the FY92 data points after application of the escalation rates. Statistical tests indicated that the separate regression relationships for the two years were indistinguishable, thereby justifying our decision to combine them into a single cost function.

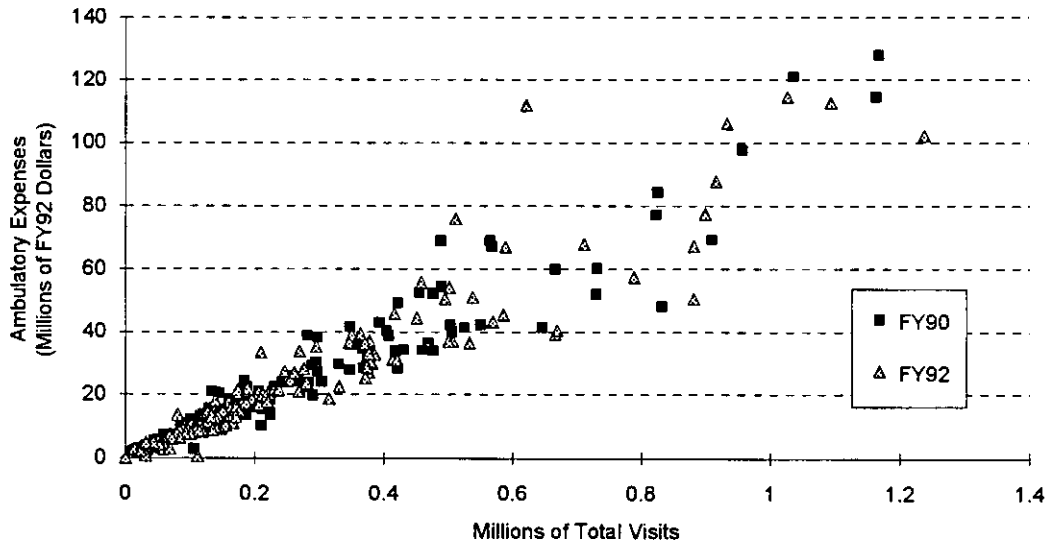

Figure III-9. FY90 and FY92 Ambulatory Expenses (FY92 Dollars), by Fiscal Year

The ambulatory cost-function parameter estimates, summary statistics, and data point exclusions are presented in Table III-5. The regression function is linear for medical centers and clinics, but includes a quadratic effect (i.e., decreasing marginal costs) for community hospitals.

Table III-5. Final Ambulatory Model

Model Functional Form:

Ambulatory Expenses = (Intercept + Community Hospital Intercept Adjustment + Clinic Intercept Adjustment + B1*Total Visits + B2*Community Hospital Total Visits + B3*Clinic Total Visits + B4*Community Hospital Total Visits Squared + B5*GME) * (1 + B6*NAVY)

Variables	Mean Value	Coefficient Estimate	t-Statistic	95% Confidence Interval	
Intercept		19,814,482	5.146	12,113,576	27,515,388
Community Hospital Intercept Adj.		-19,919,506	-5.147	-27,659,104	-12,179,908
Clinic Intercept Adj.		-18,633,084	-4.834	-26,342,532	-10,923,636
Total Visits	217,676	42	4.370	23	61
Community Hospital Total Visits	144,141	+58	5.583	38	79
Clinic Total Visits	17,769	+27	2.634	7	47
Community Hospital Total Visits Squared	4.87e+10	-0.0000527	-7.927	-.0000658	-.0000396
GME (Residents & Interns)	16	102,915	5.281	64,564	141,266
Navy % Adjustment		12.41%	5.475	7.95%	16.87%

The following data points were removed from the model before estimation:

Facility Name	Fiscal Year	Reason
NH Oakland	FY90, FY92	High Leverage
NH Portsmouth	FY90, FY92	High Leverage
NH San Diego	FY90, FY92	High Leverage
Letterman	FY92	Structural
Walter Reed	FY90	High Leverage
509th Strategic Hospital	FY92	Missing Data
7020th ABG Clinic	FY92	Missing Data
Air University	FY90	Outlier
NH Long Beach	FY90, FY92	Outlier
Port Hueneme	FY90, FY92	Outlier
Bethesda	FY92	Outlier
NH Patuxent River	FY92	Outlier
Kimbrough AH	FY92	Outlier
NH Corpus Christi	FY92	Outlier
Pearl Harbor	FY90	Outlier

Number of valid observations: 308

The coefficients are interpreted in the following manner:

- Intercept: The cost that would be predicted at a medical center if all regression variables were set to zero. Because medical centers are never observed in this situation, the confidence interval is extremely wide; the estimate involves extrapolation well outside the range of observed data.
- Community Hospital Intercept Adjustment: The difference between the medical-center intercept and community-hospital intercept. The net result is an intercept that is negative but not significantly different from zero at the 95% confidence level.
- Clinic Intercept Adjustment: The difference between the medical-center intercept and clinic intercept. The net result is an intercept of approximately $1.2 million, which is significantly different from zero at the 95% confidence level.
- Total Visits: The marginal cost of producing an additional visit at a medical center.
- Community Hospital Total Visits: The difference between the marginal cost of producing an additional visit at a community hospital, versus the marginal cost of producing an additional visit at a medical center, *prior* to adjusting for the diminishing marginal costs identified at the former. Thus, the marginal cost of the first visit at a community hospital equals $42 plus $58, or $100.
- Community Hospital Total Visits Squared: The square of the visits is used as an independent variable to identify potential increasing or decreasing marginal costs with increases in workload. The negative coefficient implies that marginal costs decrease with an increase in workload (i.e., economies of scale).
- Clinic Total Visits: The difference between the marginal cost of producing an additional visit at a clinic, versus the marginal cost of producing an additional visit at a medical center. Because there is no evidence of economies of scale for clinics, the marginal cost of a visit is $42 plus $27, or $69 for all levels of clinic workload.[7]

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[7] To determine whether CONUS and OCONUS clinics have the same cost structure, we reestimated the regression after deleting the OCONUS clinics. The result was a marginal cost of $73. The estimate of $69 reported in the text is more precise (i.e., has a smaller standard error), because it is based on more observations. For this reason, and because the two estimates are so close, we view $69 as our best estimate of the marginal cost for clinics.

- GME (Residents and Interns): An estimate of the additional *patient-care* cost incurred by providing graduate medical education, measured in terms of cost per enrolled resident or intern. This estimate reflects student FTEs charged directly to the MEPRS B (Ambulatory) account. It also reflects classroom time factored into total expenses via the FAK-account (Student Expenses) adjustment, as described in Chapter II. Recall, however, that the FAK accounts were spread as system-wide overhead, rather than being assigned directly (and exclusively) to teaching facilities.
- Navy % Adjustment: Due to structural and accounting differences, it was necessary to include a variable to distinguish Navy facilities from Army and Air Force facilities.

As previously discussed, the Navy adjustment should *not* be interpreted as evidence that Navy hospitals are more expensive or less efficient than Army or Air Force hospitals. The Navy exchange rate in Figure III-7 is 20% lower than the Air Force rate, and 31% lower than the Army rate. The Navy's apparent conservatism in recording MEPRS workload could easily explain the 12.4% difference in unit cost identified in the regression analysis. However, further research is clearly warranted to improve the comparability of cost and workload data across the three Services.

Ambulatory marginal costs are constant with respect to workload for medical centers and clinics, but decrease over the range of data for community hospitals. The model estimates of marginal cost are depicted in Figure III-10. Marginal costs for community hospitals fall to zero at a level of approximately 950,000 total visits, which is nearly 70,000 more than the highest observed value for community hospitals. The marginal cost for medical centers equals the marginal cost for community hospitals at a level of roughly 554,000 total visits; only five community hospitals operate at this level or greater. The marginal cost for clinics equals the marginal cost for community hospitals at a level of approximately 300,000 visits; about one-quarter of all community hospitals operate at this level or greater.

The estimates of patient-care costs associated with GME in the inpatient and ambulatory cost functions are additive. That is, for each resident or intern enrolled in an average teaching facility's GME program, the increase in patient-care cost is estimated as $65,862 for inpatient care plus $102,915 for ambulatory care. Thus, the total addition to patient-care cost at the average teaching facility is estimated as $168,777 per resident and intern. This estimate is clearly too high to represent simply the salaries of the medical

students. It represents, more generally, the different approach to medical care that is pursued at teaching hospitals.[8]

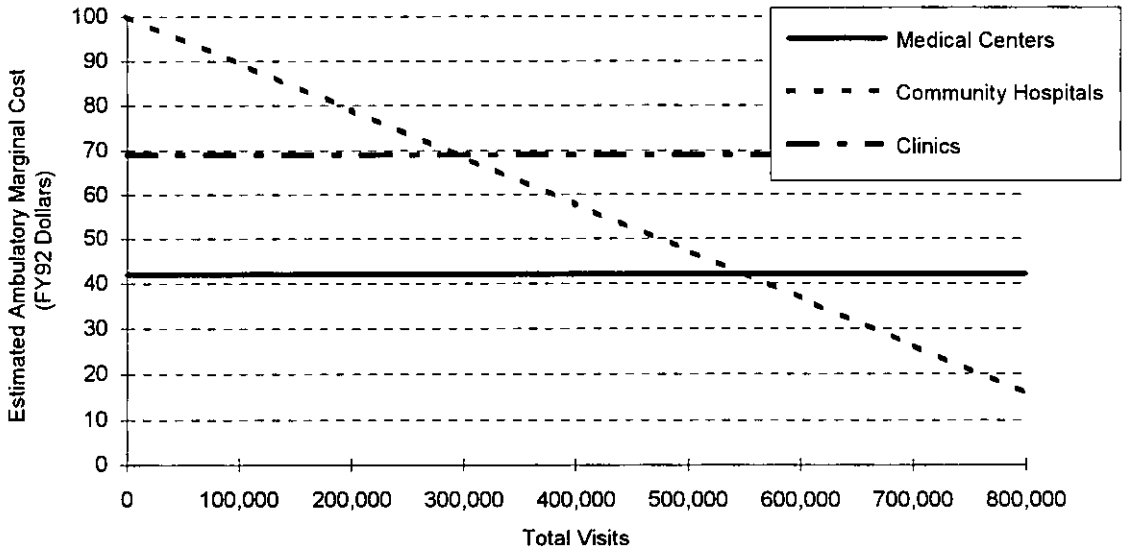

Figure III-10. Ambulatory Marginal Cost Versus Workload, by Facility Type

It is difficult to compare the estimate for ambulatory care with the civilian sector, because ambulatory care in the civilian sector is generally not provided at hospitals. Regarding inpatient care, recall that we measure GME by the headcount of enrolled residents and interns, whereas HCFA divides the headcount by the number of staffed beds in computing its hospital reimbursement factor. We experimented with some inpatient cost models in which we divided the headcount by reported operating beds, recognizing that operating beds are an imperfect measure of capacity. We found coefficients on this variable quite similar to those used in the HCFA reimbursement formula.[9] However, more research is needed to assess the efficiency with which military hospitals provide GME.

Figures III-11 through III-13 display the relationships between total ambulatory expenses and workload, for each facility type, after adjusting for the effects of GME and

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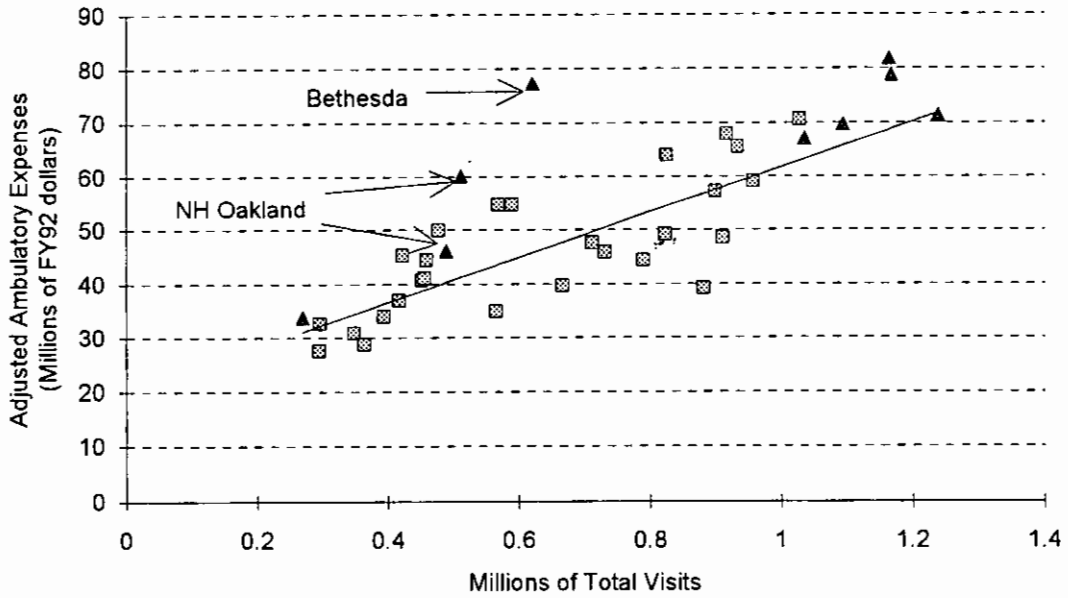
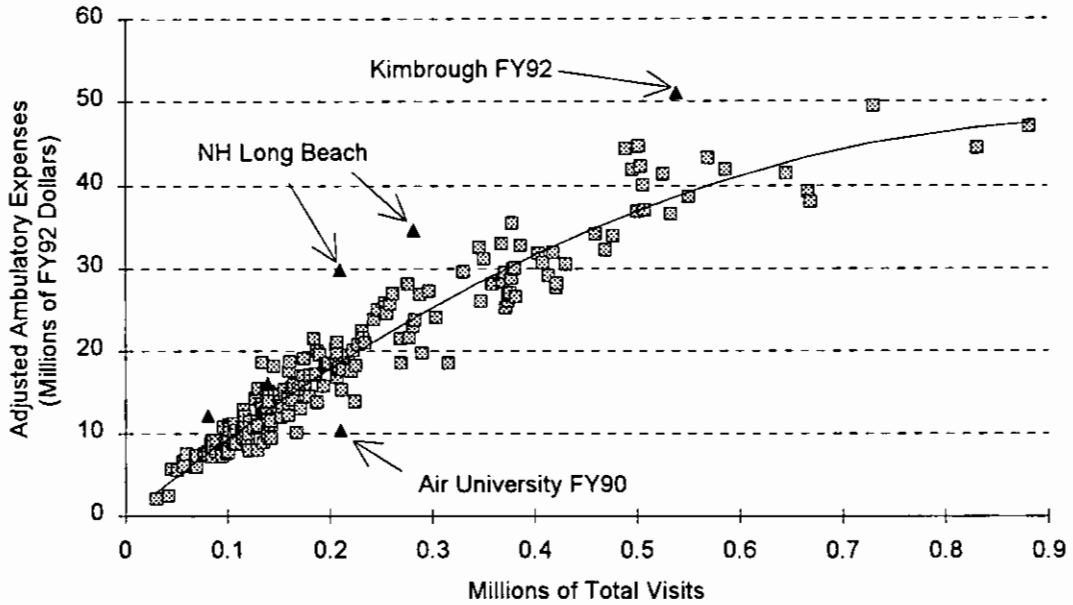
8 One important component of the difference is shown in the EBE (Graduate Medical Education Support) and EBF (Education and Training Program Support) accounts of MEPRS. As indicated in Chapter II, these two accounts are stepped-down to the Inpatient and Ambulatory accounts, and are thereby reflected in our regression equations. These accounts record expenses accrued primarily at teaching hospitals (e.g., instructor salaries, medical library, medical illustration, and medical photography).

9 Health Care Financing Administration (HCFA), *Federal Register*, Vol. 52, No. 169, September 1, 1987.



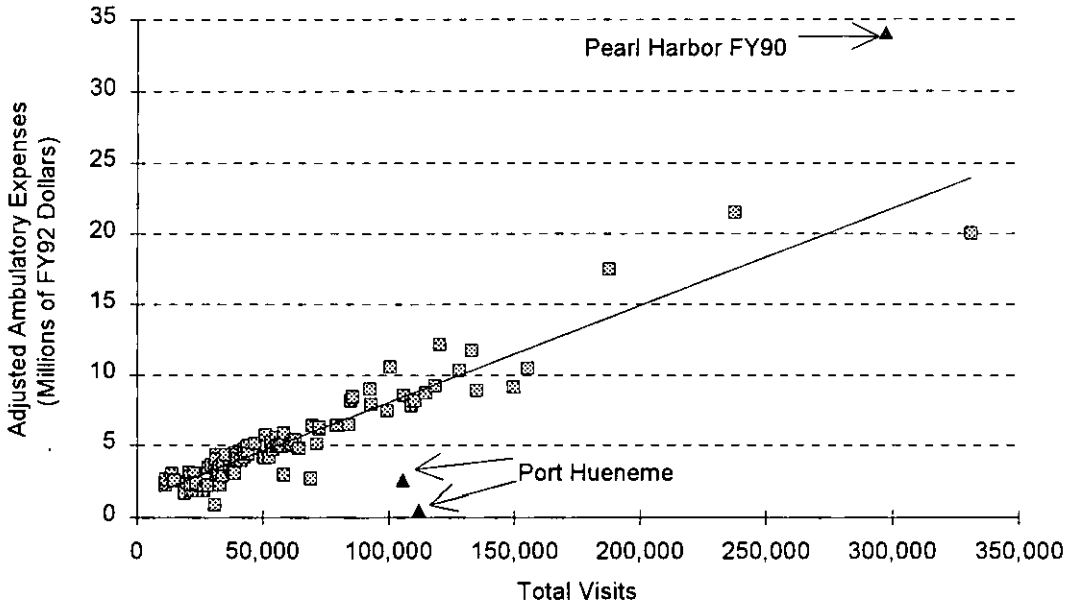
Note: Expenses adjusted for other regression right-hand variables.

Figure III-11. Medical Center Ambulatory Expenses Versus Workload (FY92 Dollars)



Note: Expenses adjusted for other regression right-hand variables.

Figure III-12. Community Hospital Ambulatory Expenses Versus Workload (FY92 Dollars)



Note: Expenses adjusted for other regression right-hand variables.

Figure III-13. Clinic Ambulatory Expenses Versus Workload (FY92 Dollars)

Service branch. Recall from Table III-5 that several data points were excluded from the model as outliers, highly-leveraged data points, or facilities with missing data. Data points excluded from the regression are indicated by triangular symbols; the most extreme such data points are also identified by facility name. Again, FY92 data for Letterman Army Medical Center were removed because operations were reduced in preparation for closing. All data points identified as outliers have observed expenses more than three standard deviations from the regression line.

Seven data points were removed due to having high leverage. These data points have undue influence on one or more of the regression parameters. A two-dimensional scatterplot of costs versus workload may show these data points near the regression line. However, a scatterplot of costs versus number of residents and interns, after adjusting for workload, may show that a particular facility has undue influence on the GME coefficient, perhaps because its GME program is substantially larger than those at most other facilities. The method used to identify highly-leveraged data points considers each independent variable in turn, and compares the value of that variable for each facility relative to the mean across all facilities. The influence on the regression model as a whole is then

considered to determine whether or not each point is highly leveraged.[10] The data points excluded, primarily a few of the Navy medical centers, typically caused substantial changes in the Navy adjustment, the GME coefficient, or the marginal cost of a medical-center visit. Based on analysis of the alternative models generated when including or excluding these data points, it was determined that the model selected here best represents the data set as a whole.

Figure III-14 is a histogram of the percentage deviations between the observed ambulatory expenses and the predicted ambulatory expenses. Positive values again indicate that observed expenses exceed predicted expenses. Only those facilities used in the regression analysis are included in this histogram. The histogram indicates a normal distribution of percentage deviations from the regression line. Also, the mass at each endpoint again indicates that we were conservative in discarding data points.

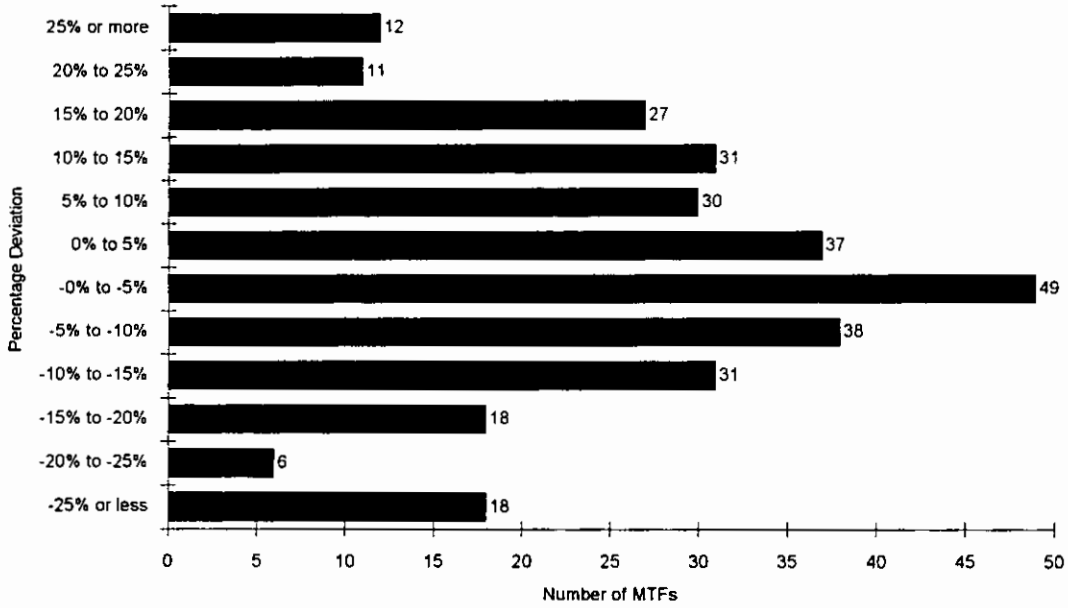


Figure III-14. Percentage Deviation Between Observed and Predicted Ambulatory Expenses

Several additional independent variables were considered in an attempt to improve the model fit, including geographic variation in labor or total costs, economies or diseconomies of scope (i.e., facilities that offer a greater variety of services experience

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10 See D. A. Belsley, E. Kuh, and R. E. Welsch, *Regression Diagnostics*, New York: Wiley, 1980; or R. D. Cook and S. Weisberg, *Residuals and Influence in Regression*, London: Chapman Hall, 1982.

lower or higher marginal costs), and demographics of the patient population served. However, none of these variables were significant in reducing the error in our models.

D. SUMMARY OF MTF COST FUNCTIONS

The inpatient and ambulatory cost functions just described will be used to cost the hypothetical workloads corresponding to the analytical cases. The RAND Corporation is conducting the utilization analysis of each analytical case. RAND has provided IDA with inpatient and ambulatory workload estimates for each analytical case, as well as any changes to operating-bed capacity or the volume of GME. Prior to delivering the workloads to IDA, RAND applied the appropriate exchange rates. Once again, these exchange rates are valid only if the historical relationships will be maintained between workload as reported in the accounting systems and workload as self-reported in the survey data. Because the link between survey-based utilization and the accounting data is critical for making cost-effectiveness comparisons, the exchange rates clearly warrant further research.

IV. COST ESTIMATES FOR THE ANALYTICAL CASES

This chapter contains the estimates of Military Treatment Facility (MTF) costs for the hypothetical workloads corresponding to the analytical cases. Before presenting the detailed cost estimates, we motivate the cases considered by developing a decomposition of the total change in cost into efficiency and demand effects. This decomposition addresses the issue of whether or not total (i.e., MTF plus CHAMPUS) workload is held constant when evaluating the net change in cost. Next, we give a brief summary description of the analytical cases considered, in terms of changes in the inpatient and ambulatory workloads at MTFs and changes in operating-bed capacity. We then present the detailed estimates of MTF cost for each case. Finally, we discuss "below the line" cost elements that are not explicitly modeled by either IDA or RAND, but that must be added to the IDA and RAND figures to round-out the estimate of total peacetime medical expenditures.

A. DECOMPOSITION OF EFFICIENCY AND DEMAND EFFECTS

A major objective of the 733 Study is to determine whether it is more cost-effective to expand MTF capacity and move workload in-house or, conversely, to reduce MTF capacity and move workload into CHAMPUS. This question can be answered by combining IDA's cost functions for in-house medical care with the CHAMPUS cost estimates developed by RAND. This section demonstrates the procedure for combining the IDA and RAND cost estimates. The numerical examples in this section are purely illustrative, and do not reflect actual cost estimates.

An important concept in performing this analysis is the *tradeoff factor*. Suppose that MTF capacity is increased, yielding 100 additional MTF visits. If the number of CHAMPUS visits decreases by exactly 100, then the tradeoff factor is 1.0. However, it is likely that the increase in MTF visits will exceed the reduction in CHAMPUS visits. Co-payments are zero for outpatient care provided in MTFs, but range between 20% and 25% for outpatient care provided under CHAMPUS. With the availability of more *free* care, 100 MTF visits might replace 80 CHAMPUS visits. The tradeoff factor is defined as the ratio of the increase in MTF visits, divided by the decrease in CHAMPUS visits.

For analytical purposes, it is useful to partition the change in total cost into an efficiency effect and a demand effect. The efficiency effect is defined as the change in total (MTF plus CHAMPUS) cost when the tradeoff factor is set to 1.0. Workload is held constant in this comparison, and the only issue is whether a given increment in workload can be produced at higher or lower cost in MTFs versus CHAMPUS. Next, the tradeoff factor is relaxed to a larger value, more consistent with empirical experience. Because demand increases, costs will increase beyond the level estimated for a unitary tradeoff factor. However, this latter increase does not reflect an efficiency comparison, because total workload is no longer held constant.

These principles will now be illustrated in a series of numerical examples.

1. Equal Marginal Costs

In the first example, the two sectors have equal marginal costs of $10 per visit. However, the cost functions in Figure IV-1 have been drawn such that the intercept is higher by $100 in MTFs.

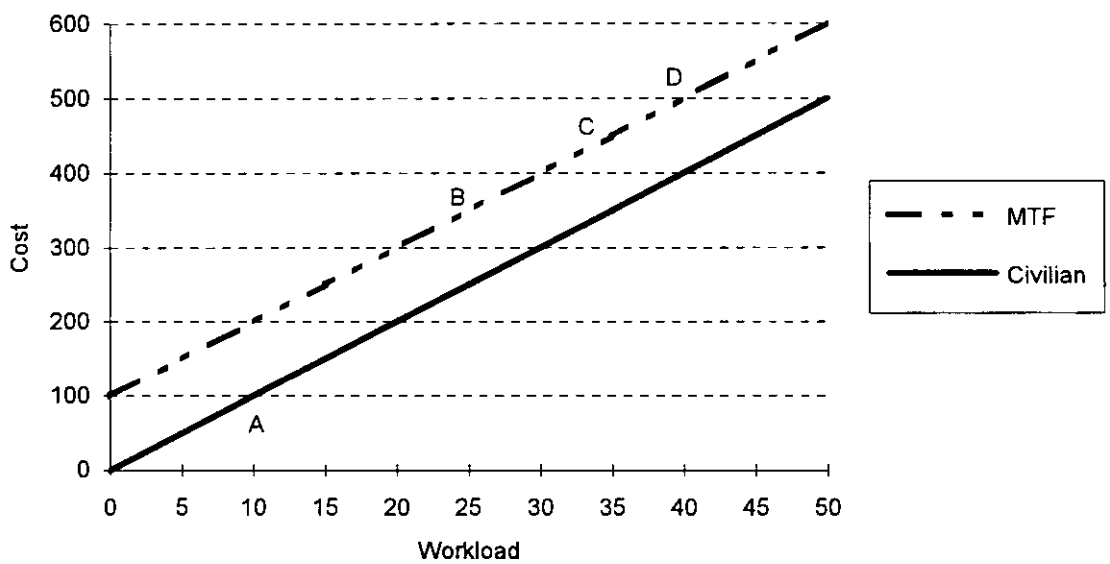

Figure IV-1. Cost and Workload: Equal Marginal Costs

Suppose Case 1 has workloads of 10 visits to civilian physicians under CHAMPUS, and 25 visits to MTFs. The respective costs are $100 and $350 (points A and B). Case 2 moves workload from CHAMPUS back into the MTFs. We decompose the

total movement into two effects. First, we fix the tradeoff factor at exactly 1.0. Thus, the 10 CHAMPUS visits are replaced by *exactly* 10 MTF visits. The new total of 35 MTFs visits costs $450 (point C). Total cost does not change, because the marginal cost of reduced CHAMPUS workload equals the marginal cost of increased MTF workload.

Now introduce a tradeoff factor $\Theta = 1.5$. The 10 CHAMPUS visits are now replaced with 15 MTF visits, and total cost increases to $500 (point D).

2. Unequal Marginal Costs

In the second example, the intercept is still higher by $100 in MTFs. In addition, the marginal cost per visit in MTFs is now higher as well, $12 versus $10. These values are reflected in the two cost curves shown in Figure IV-2.

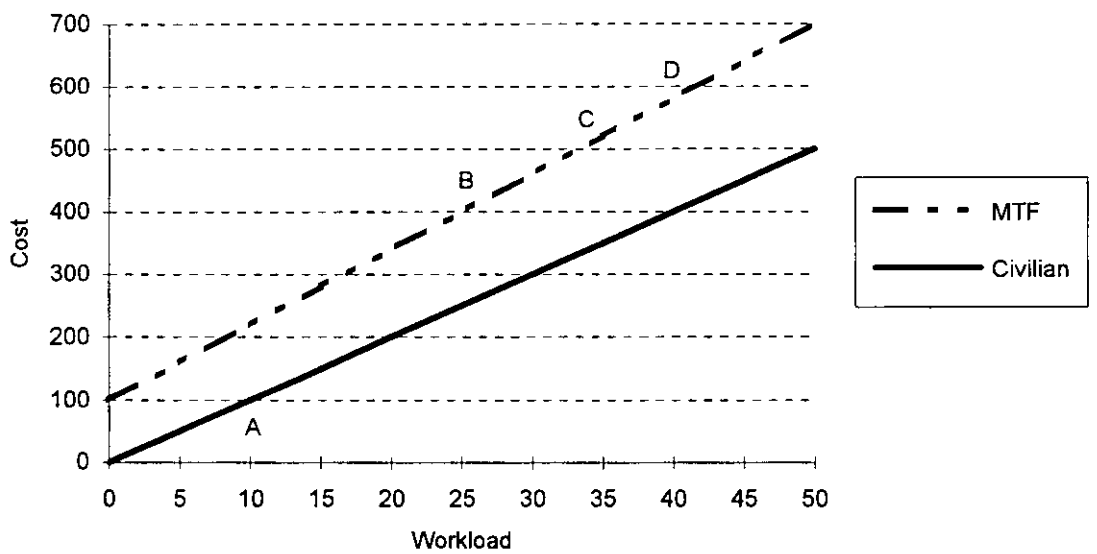

Figure IV-2. Cost and Workload: Unequal Marginal Costs

Case 1 still has workloads of 10 visits to civilian physicians under CHAMPUS, and 25 visits to MTFs. The respective costs are $100 and now $400 (points A and B). Case 2 moves workload from CHAMPUS back into the MTFs. We again decompose the total movement into two effects. First, we fix the tradeoff factor at exactly 1.0. Thus, the 10 CHAMPUS visits are replaced by *exactly* 10 MTF visits. The new total of 35 MTFs visits costs $520 (point C). Total cost has increased by $20, because the 10 marginal units are being performed at a higher marginal cost ($12 versus $10 each).

Now introduce a tradeoff factor $\Theta = 1.5$. The 10 CHAMPUS visits are now replaced with 15 MTF visits, and total cost increases further to $580 (point D).

3. Diminishing Marginal Costs

In our final example, we introduce a quadratic term into the MTF cost function, to represent diminishing marginal costs (i.e., increasing returns).[1] Thus, the MTF cost function is drawn as concave to the origin in Figure IV-3. MTF costs equal $400 at 25 visits (point B) but, because of the non-linearity, only $510 at 35 visits (point C). Marginal cost declines continuously from $12 to $10 over this range. Total cost equals $558 at 40 visits (point D), the workload resulting from application of the tradeoff factor, $\Theta = 1.5$.

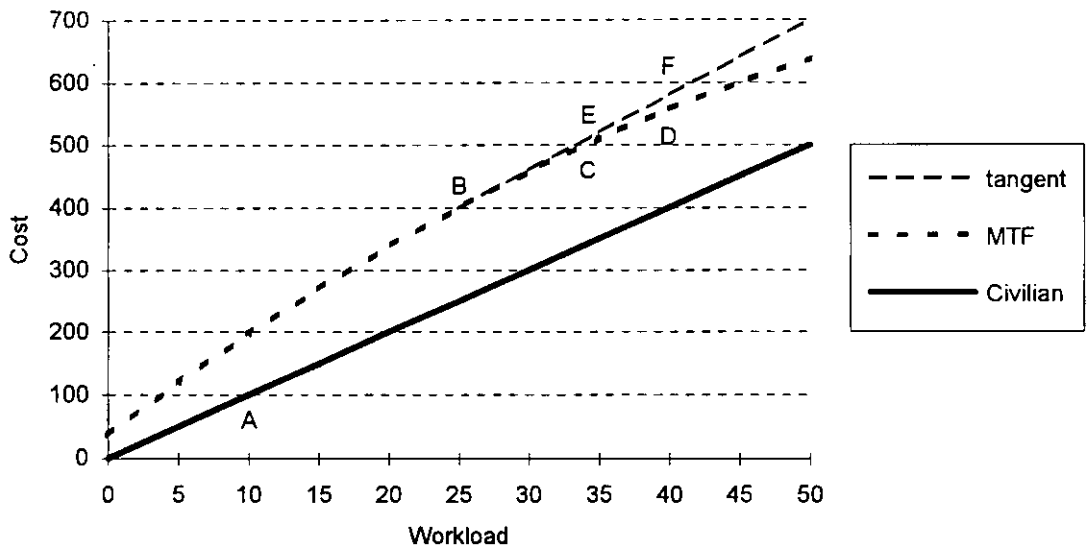

Figure IV-3. Cost and Workload: Diminishing Marginal Costs

The only danger here is extrapolating MTF costs along the tangent line, with fixed slope of $12 (i.e., the marginal cost at a workload of 25 visits). We would over-estimate MTF costs at $520 (point E) for a tradeoff factor of $\Theta = 1.0$, and at $580 (point F) for a tradeoff factor of $\Theta = 1.5$.

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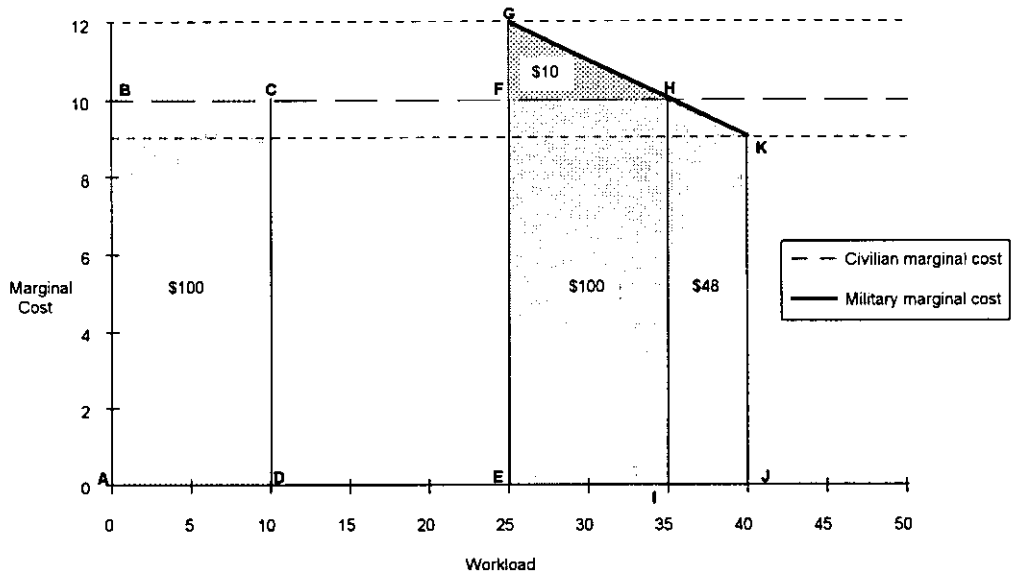
1 The cost function for this example is: $C = 37.57 + 17.0\,X - .10\,X^2$. Quadratic functions of this form were reported in Chapter III, although the coefficients in this example purely illustrative.

4. Efficiency and Demand Effects

It is illuminating to analyze the previous example using marginal cost curves. The marginal cost curve for visits to civilian physicians (curve BCFH in Figure IV-4) is horizontal at $10, reflecting perfectly elastic supply in a competitive medical market. Over the range of interest, the marginal cost curve for visits to MTFs (curve GHK) declines continuously from $12 at 25 visits, to $10 at 35 visits, to $9 at 40 visits.



Note: Triangle FGH = efficiency effect; trapezoid HIJK = demand effect.

Figure IV-4. Workload Shift from Civilian to Military Sector: Efficiency and Demand Effects

Consider first the transfer of 10 visits from civilian physicians to MTFs, which occurs when we set the tradeoff factor Θ=1.0. Costs incurred in the civilian sector decrease by $100, depicted on the diagram by the rectangle ABCD. Cost incurred in MTFs increase by $110. This increase is depicted by the area under the MTF marginal-cost curve over the interval from 25 to 35 visits, or the trapezoid EFGHI. The net increase in cost is equal to EFGHI minus ABCD, or just the triangle FGH. We label this triangle the *efficiency effect.*

Now relax the tradeoff factor to Θ = 1.5. MTFs now provided an additional five visits. The cost of these five visits is $48, depicted by the area under the MTF marginal-cost curve over the interval from 35 to 40 visits, or the trapezoid HIJK. Note that MTFs

are actually more efficient than the civilian sector over this range, so that the increased cost does *not* reflect an efficiency loss. Instead, we label this trapezoid the *demand effect*.

Both the efficiency and demand effects must be weighed in assessing the overall cost-effectiveness of increasing MTF capacity. The efficiency effect represents an increase in cost in our example, but one could just as easily construct examples where the efficiency effect represents a decrease in cost. In either instance, the efficiency effect must be balanced against the demand effect, which necessarily entails an increase in cost. The net effect on total cost may be of either algebraic sign. Moreover, the sign of the net effect is not by itself sufficient to judge the cost-effectiveness of increasing MTF capacity. Beneficiary health-status may improve with the increase in health-care utilization. In addition, the shift from CHAMPUS to MTFs leads to a reduction in beneficiary co-payments, again affecting beneficiary well-being. To account for all of these issues requires a combination of the MTF cost estimates presented later in this chapter, plus the companion RAND analyses of utilization and civilian-sector costs.

B. DESCRIPTION OF THE ANALYTICAL CASES

The analytical cases are fully developed in a companion RAND publication.[2] It is not our purpose here to describe either the rationale behind each case, or the method of workload estimation. Instead, we give a summary description of the analytical cases in this section, then estimate the in-house cost under each case in the following section.

Case 1 is a minor excursion from the historical FY92 data as reported in MEPRS. The difference reflects managed-care initiatives that had not yet been fully implemented during that year. As shown in Table IV-1, the system-wide difference is an increase of 1.9% in the number of inpatient dispositions, and 0.1% in the number of ambulatory visits. However, as shown in Figures IV-5 and IV-6, these increases in workload are not uniformly distributed across MTFs. Inpatient dispositions rise at every MTF, but the increases range from about 0.5% to slightly over 4%. Ambulatory visits actually fall at 44 MTFs, although the largest decrease is only about 0.5%.

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2 Susan D. Hosek, Bruce W. Bennett, Kimberly A. McGuigan, Jan M. Hanley, Roger Madison, and Afshin Rastegar, "The Demand for Military Health Care: Supporting Research for a Comprehensive Study of the Military Health Care System," RAND Corporation, MR-407-PA&E, January 1994.

Table IV-1. Summary of Analytical Cases

	MEPRS FY92 Actual	Case 1	Case 2C	Case 2
Inpatient Dispositions:				
Number (thousands)	715.9	729.4	776.5	856.3
Ratio to FY92 Actual	1.000	1.019	1.085	1.196
Ambulatory Visits:				
Number (millions)	37.96	38.01	40.04	40.90
Ratio to FY92 Actual	1.000	1.001	1.055	1.078

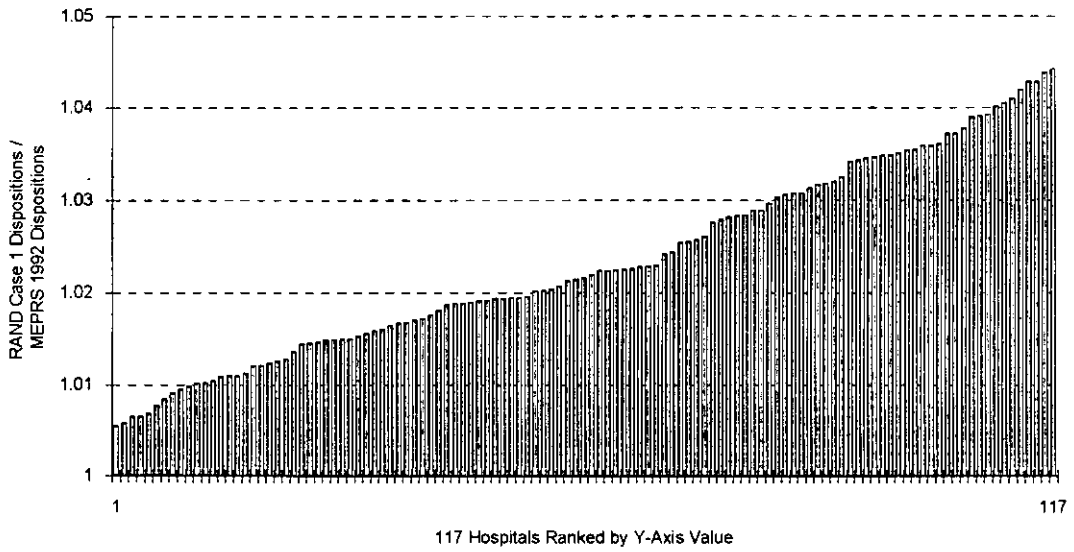

Figure IV-5. Comparison of Case 1 and MEPRS Inpatient Dispositions

Cases 2 and 2C involve an increase in MTF capacity, so some portion of CHAMPUS workload is drawn into the MTFs. Capacity expansion is reflected in the addition of 878 operating beds spread over some 15 facilities, as displayed in Table IV-2. Note that 94 of these operating beds are associated with construction of a new hospital at Ft. McPherson, based on the size of the beneficiary population in that region.

The sole difference between Cases 2 and 2C is in the implicit tradeoff factor. Case 2C artificially sets the tradeoff factor at $\Theta = 1.0$. Relative to our earlier terminology, the movement from Case 1 to Case 2C isolates a pure efficiency effect, because the total (MTF plus CHAMPUS) workload is held constant. Note, however, that IDA has estimated only the increased *in-house* cost associated with the influx in MTF workload. A

complete analysis of the efficiency effect also requires an estimate of the reduced CHAMPUS cost, in order to compute the net effect on total cost. The CHAMPUS cost estimates are found in the previously cited RAND Corporation publication. Finally, the movement from Case 2C to Case 2 represents the demand effect, because the tradeoff factor is no longer artificially set at $\Theta = 1.0$. Instead, the RAND utilization analysis implicitly allows a greater than one-for-one transfer of workload into MTFs.

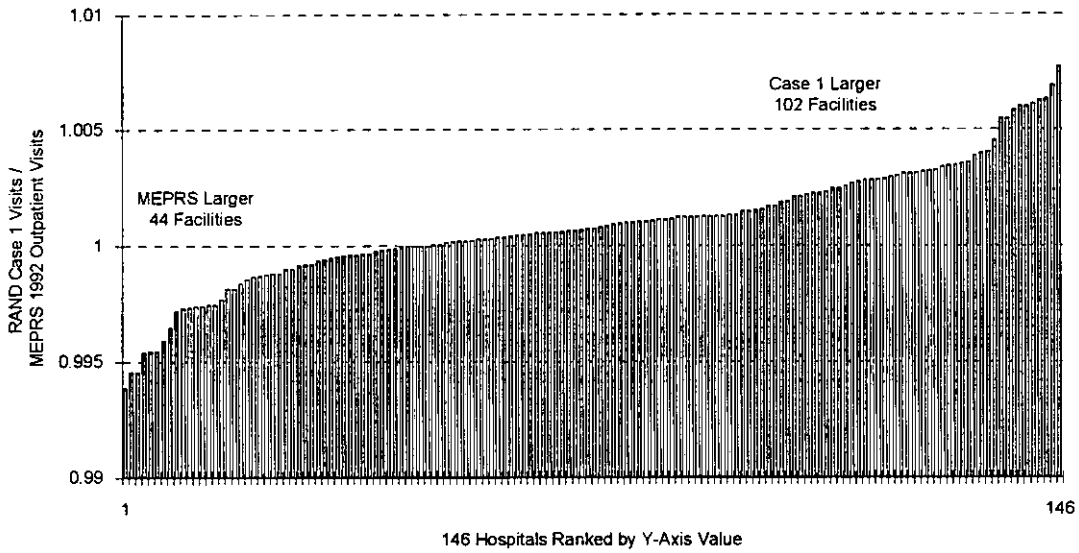

Figure IV-6. Comparison of Case 1 and MEPRS Ambulatory Visits

Table IV-1 shows the system-wide differences among all the cases. Compared to historical FY92 data, Case 2C shows an increase of 8.5% in the number of inpatient dispositions, and 5.5% in the number of ambulatory visits. Case 2 is a larger departure from history, with increases of 19.6% in the number of inpatient dispositions and 7.8% in the number of ambulatory visits. Again, the increases in workload are not spread uniformly across MTFs. The distributions of workload increase by MTF are shown in Figures IV-7 and IV-8 for Case 2C, and Figures IV-9 and IV-10 for Case 2. Workload rises at virtually every MTF, but the percentage increases are quite variable. In particular, ten MTFs experience a doubling or more of inpatient dispositions under Case 2.

Table IV-2. Additional Operating Beds Under Cases 2 and 2C

MTF	State	FY92 Actual Operating Beds	Case 2/Case 2C Operating Beds	Increase in Operating Beds
MacDill AFB	FL	55	170	115
Ft. Dix	NJ	36	145	109
Mather AFB	CA	35	115	80
Ft. Bragg	NC	206	283	77
Tinker AFB	OK	25	89	64
Patrick AFB	FL	15	77	62
Nellis AFB	NV	35	91	56
NH Long Beach	CA	166	217	51
Davis Monthan AFB	AZ	35	72	37
Ft. Eustis	VA	42	78	36
March AFB	CA	80	111	31
Offutt AFB	NE	50	81	31
Ft. Lee	VA	52	73	21
Carswell AFB	TX	100	114	14
			Subtotal:	784
Ft. McPherson	GA	0	94	94
			Total:	878

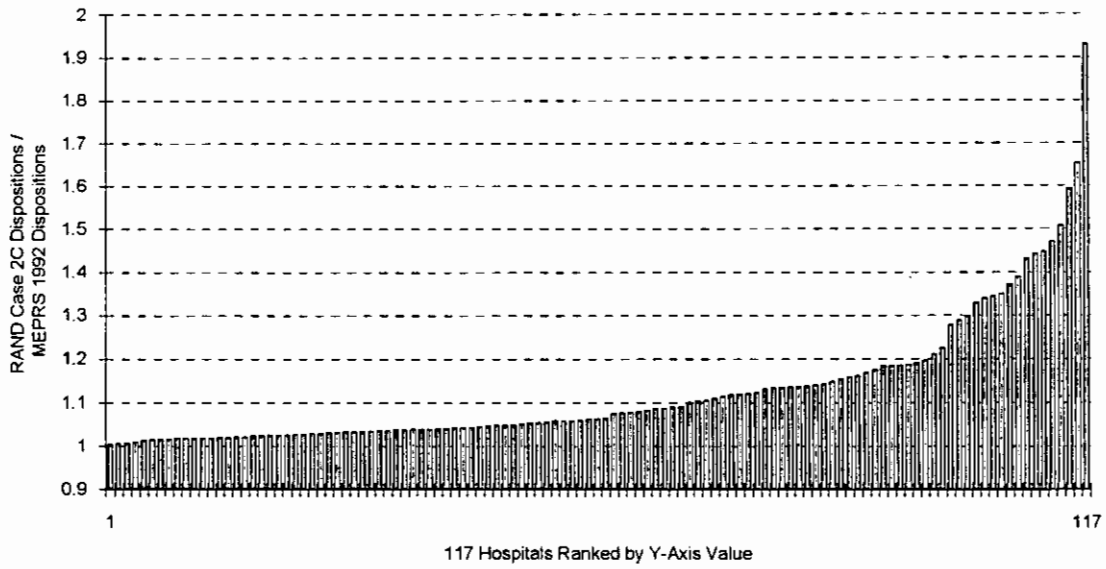

Figure IV-7. Comparison of Case 2C and MEPRS Inpatient Dispositions

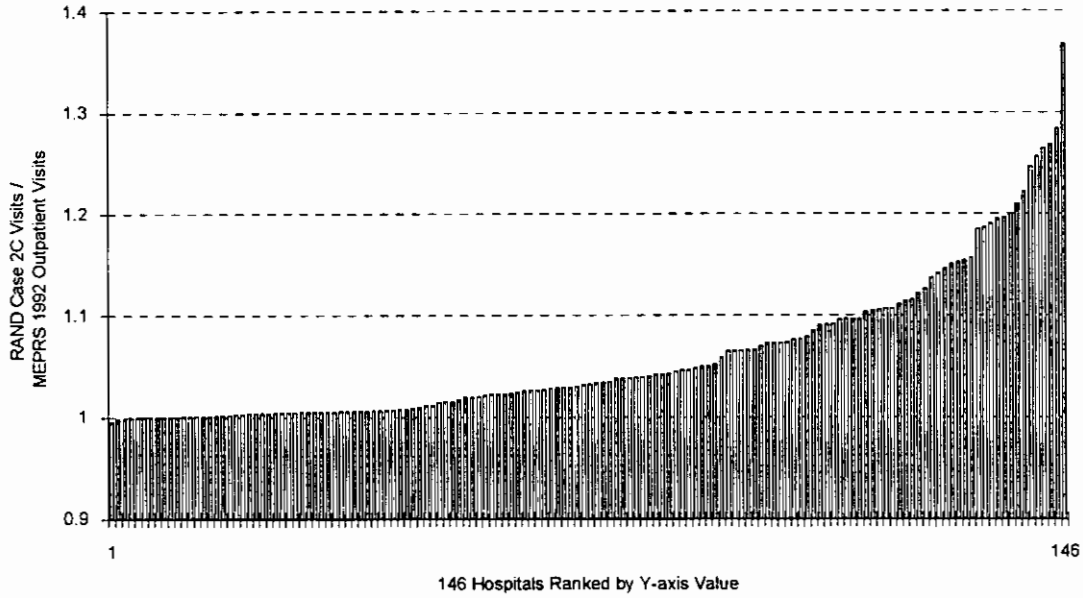

Figure IV-8. Comparison of Case 2C and MEPRS Ambulatory Visits

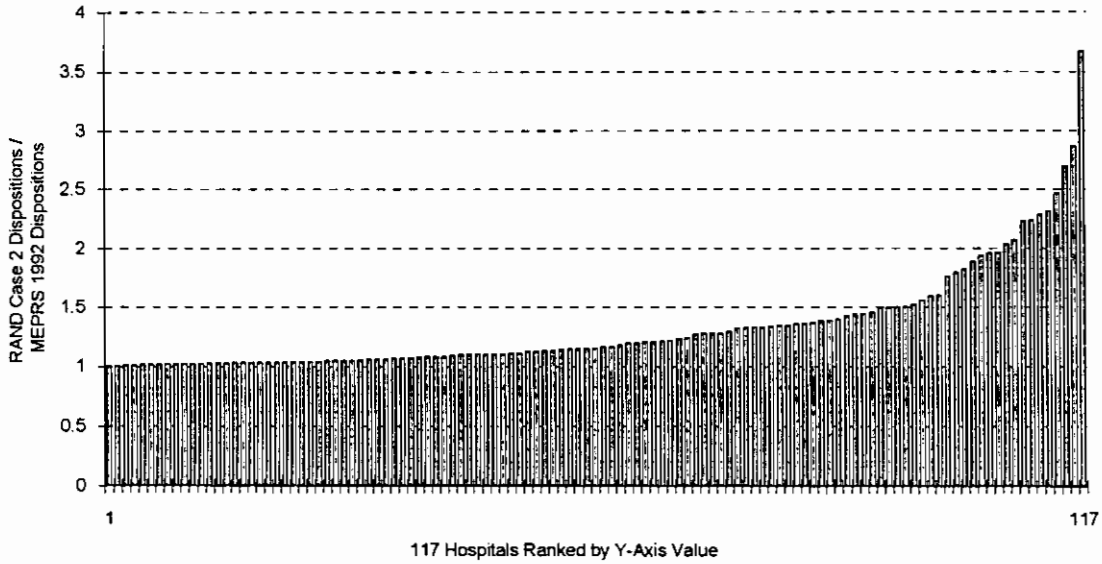

Figure IV-9. Comparison of Case 2 and MEPRS Inpatient Dispositions

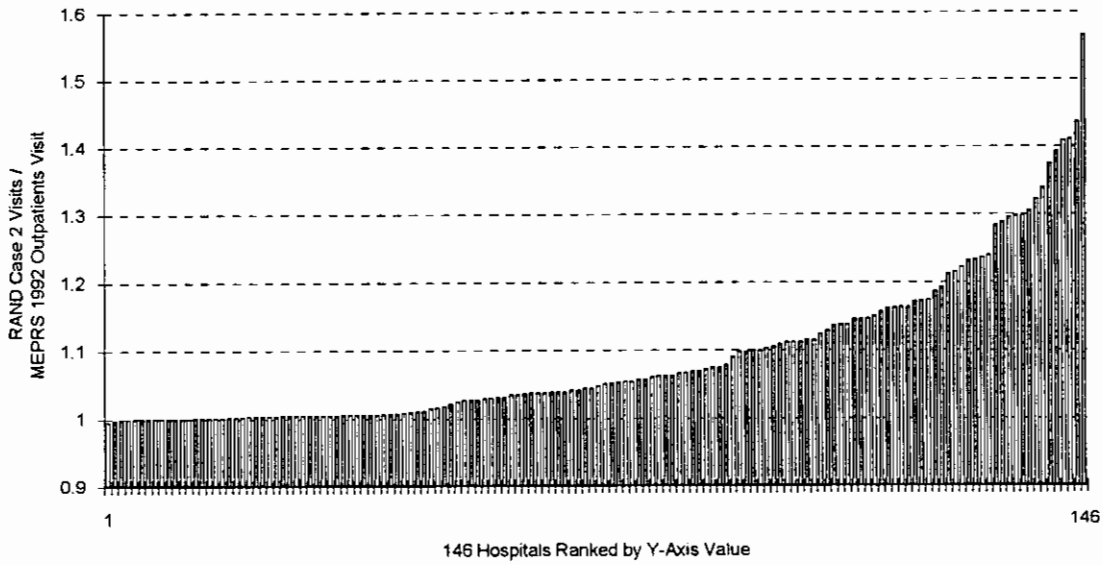

Figure IV-10. Comparison of Case 2 and MEPRS Ambulatory Visits

C. ESTIMATION OF MTF COSTS FOR THE ANALYTICAL CASES

We estimated the MTF costs for the analytical cases by substituting the RAND workload projections into the cost functions developed in Chapter III. Recall that the RAND workload projections are based on models calibrated from the 1992 DoD Health Care Survey. However, these workloads are measured along a different scale from the MEPRS workloads used in estimating the IDA cost functions. The exchange rates (illustrated in Figure III-7) were used to translate workloads from one scale to the other. The use of exchange rates is valid on the assumption that the historical relationships between the two measurement systems will be maintained under the analytical cases.

The detailed cost estimates are shown in Table IV-3, and a summary is displayed in Figure IV-11. The "MEPRS FY92 Reported" column in the table shows reported inpatient and ambulatory costs for FY92. The "MEPRS FY92 Adjusted" column represents an application of the MEPRS adjustment factors developed in Chapter II (Figure II-7). This column gives a more accurate and comprehensive estimate of historical costs than that found in the standard reporting systems.

Table IV-3. Cost Breakout by Analytical Case

		MEPRS FY92 Reported	MEPRS FY92 Adjusted	Case 1	Case 2C	Case 2
Inpatient						
Army	Medical Center	688.4	799.9	853.0	865.3	883.8
	Hospital	393.7	457.5	471.3	508.4	538.3
Air Force	Medical Center	383.7	432.5	456.0	463.7	478.2
	Hospital	335.7	378.3	372.6	419.8	474.2
Navy	Medical Center	373.4	420.8	418.7	419.9	422.7
	Hospital	236.8	266.9	291.6	305.7	332.9
Inpatient Total		2,411.7	2,755.9	2,863.1	2,982.7	3,130.1
Ambulatory						
Army	Medical Center	527.9	593.9	584.3	591.0	594.1
	Hospital	696.6	783.7	775.1	826.8	838.7
	Clinic	19.0	21.4	17.6	17.6	17.6
Air Force	Medical Center	295.8	326.9	312.7	317.9	320.4
	Hospital	658.9	728.1	706.6	795.7	786.0
	Clinic	98.1	108.3	110.8	114.3	116.1
Navy	Medical Center	362.4	400.8	335.1	336.0	336.4
	Hospital	457.7	506.2	486.1	510.1	522.9
	Clinic	81.7	90.4	93.6	93.9	93.9
Ambulatory Total		3,198.1	3,559.6	3,421.9	3,567.3	3,626.2
Total Cost		5,609.8	6,315.5	6,284.9	6,549.9	6,756.3

Note: Costs are in millions of FY92 dollars.

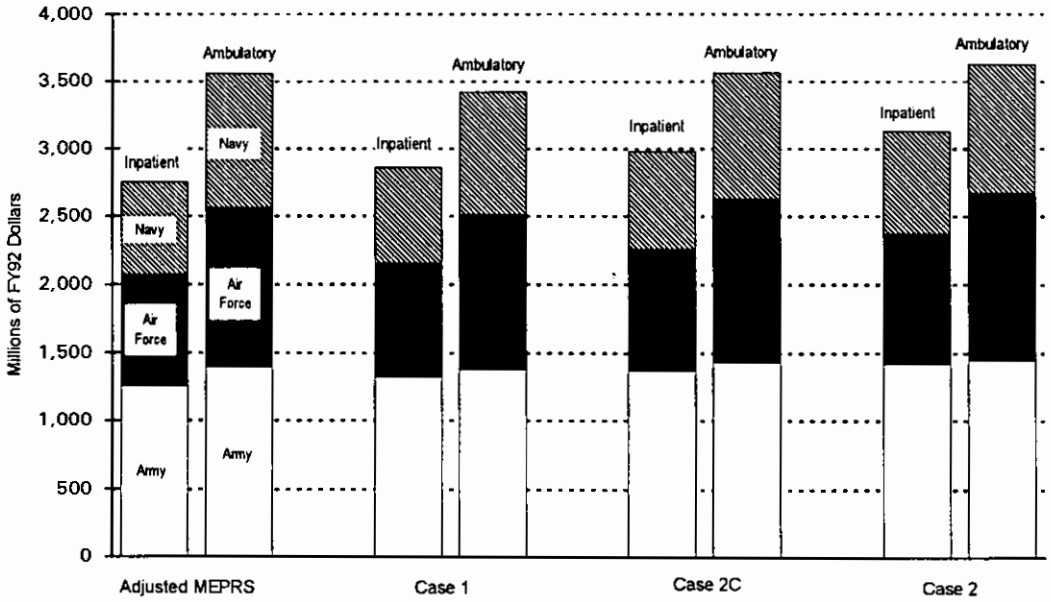

Figure IV-11. Cost Breakout by Analytical Case

The increased in-house cost of moving from Case 1 to Case 2C is $265 million or 4.2%. Computation of the net change in total cost requires an estimate of the corresponding reduction in CHAMPUS cost, which is found in the RAND Corporation publication. The full movement to Case 2 incorporates the demand effect as well as the efficiency effect. The additional increase in MTF cost is $206 million or 3.2%. The overall increase is relatively small, because it represents the net addition of only 878 operating beds system-wide.

The MTF costs from the "MEPRS FY92 Adjusted" column of Table IV-3 may be added to the CHAMPUS costs estimated by RAND, giving an indication of total peacetime medical costs during that fiscal year. This sum is necessarily smaller than the total medical cost in Major Force Program 8 of the Future Years Defense Program (FYDP), because certain program elements relate to wartime readiness or other missions apart from peacetime care. This point is explored in Table IV-4. The selection and classification of Program Elements (PEs) is based on the OASD (Health Affairs) Cost of Medical Activities (COMA) Data Book, with minor modifications.[3] One difference is that we display the FYDP total from all appropriations, whereas the COMA report concentrates on the Operations and Maintenance (O&M) appropriation. The four PEs in the category "PEs Used in IDA Adjustments to MEPRS" approximate the adjustments described previously in Chapter II. However, those adjustments were based on FY90 data, whereas the current table is based on FY92 data. Note that PEs 0807716 (Medical Facilities, Planning and Design) and 0807717 (Medical Facilities, Military Construction) are included here to proxy for the construction-cost adjustment to MEPRS. These two PEs do not appear in the COMA report, because they are funded outside of the O&M account.

It is impossible to develop a complete reconciliation between MEPRS and the FYDP, partly because FYDP obligations translate into outlays over a multi-year time window. In addition, there is no standard crosswalk between MEPRS and any particular subset of PEs, nor is it our intention to create such a crosswalk here.[4] Finally, the IDA adjustments include both a reallocation of costs reported within MEPRS (i.e., factoring

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3 *Defense Health Program, Data Book, Fiscal Year 1994, Cost of Medical Activities*, Office of the Assistant Secretary of Defense (Health Affairs), 1993.

4 A partial crosswalk for the Air Force is given in Air Force Regulation 170-5 (15 May 1992). However, there are no corresponding regulations for the other two Services. Moreover, even the Air Force regulation does not address adjustments for cost elements excluded from MEPRS (e.g., as reflected in the OSD program elements).

back some of the Special Programs accounts), and the addition of costs omitted from MEPRS (e.g., management headquarters).

Table IV-4. Reconciliation of FY92 Medical Obligations in Major Force Program 8

Category	Program Element	Description	Funding	Subtotal	Cumulative FYDP Total	MEPRS Reported, Excluding Dental	MEPRS Adjusted, Excluding Dental
Patient Care, Excluding Dental	0807711	Care in Regional Defense Facilities	$2,317,862				
	0807792	Station Hospitals and Medical Clinics	$3,936,866				
				$6,254,728	$6,254,728		
Base Support	0807756	Environmental Compliance	$5,818				
	0807776	Minor Construction, Health Care	$2,661				
	0807778	Maintenance and Repair, Health Care	$52,165				
	0807790	Visual Information Activities	$9,513				
	0807795	Base Communications, Health Care	$30,952				
	0807796	Base Support, Health Care	$564,563				
				$665,672	**$6,920,400**	**$5,609,788**	
PEs Used in IDA Adjustments to MEPRS	0807716	Medical Facilities, Planning & Design	$40,623				
	0807717	Medical Facilities, Military Construction	$230,600				
	0807791	Defense Medical Program Activity	$116,705				
	0807798	Management Headquarters, Medical	$50,065				
				$437,993	**$7,358,393**		**$6,315,506**
CHAMPUS	0807712	CHAMPUS	$3,763,999				
				$3,763,999	**$11,122,392**		

Table IV-4. Reconciliation of FY92 Medical Obligations in Major Force Program 8 (Continued)

Category	Program Element	Description	Funding	Subtotal	Cumulative FYDP Total	MEPRS Reported, Excluding Dental	MEPRS Adjusted, Excluding Dental
Dental	0807715	Dental Care Activities	$616,093				
				$616,093	$11,738,485		
Education and Training	0806721	Uniformed Services University of the Health Sciences (USUHS)	$80,330				
	0806722	Armed Forces Scholarship Program	$97,079				
	0806761	Education and Training, Health Care	$907,561				
				$1,084,971	$12,823,456		
Other Patient Care Support	0801712	Examining Activities	$23,522				
	0807713	Care in Non-Defense Facilities	$519,910				
	0807714	Other Health Activities	$1,050,164				
				$1,593,596	**$14,417,051**		

Note: Costs are in thousands of FY92 dollars.

With these qualifications, the cumulative FYDP total for "Patient Care, Excluding Dental" plus "Base Support" should approximate the "MEPRS Reported, Excluding Dental." In fact, the former ($6.92 billion) is 23.4% larger than the latter ($5.61 billion). Similarly, the cumulative FYDP total including "IDA Adjustments to MEPRS" should approximate the "MEPRS Adjusted, Excluding Dental". In this case, the former ($7.36 billion) is 16.5% larger than the latter ($6.32 billion). The reduction in the discrepancy when looking at the *adjusted* subtotals is some indication that the adjustment is working in the correct direction.

Further adding the RAND estimate of CHAMPUS expenses should approximate the cumulative FYDP total of $11.12 billion. Even this figure falls short of the Program 8 total of roughly $14 billion, because the latter includes Dental Care Activities, Examining Activities, Care in Non-Defense Facilities (i.e., supplementary care), Other Health Activities, and training activities not already subsumed in the other PEs. We treat these activities as "below the line," and we do not attempt to model them with even the adjusted

MEPRS data. Rather, they should be added back to the sum of the IDA and RAND estimates for any analytical cases under consideration. If these activities are expected to change under an analytical case, then that calculation should be conducted independently of either the IDA or RAND cost analyses.

Program Element 0807714 (Other Health Activities) includes, among other things, spending for wartime contingencies. A portion of this PE may correlate to the MEPRS F accounts, though not to any of the three-digit peacetime-related F accounts identified for the MEPRS adjustments in Chapter II. Also as discussed in Chapter II, we treat PE 0806721 [Uniformed Services University of the Health Sciences (USUHS)] and PE 0806722 (Armed Forces Scholarship Program) as "below the line," because they do not represent patient care provided in MTFs. The costs of these two PEs are held constant in the analytical cases compared in this paper, and do not contribute to the differences between the cases.

Finally, PE 0806761 (Education and Training, Health Care) is a catch-all account that is difficult to fully reconcile with MEPRS. For students being trained at MTFs (as opposed to USUHS or civilian hospitals), salary expenses are captured either in MEPRS account FAK (Student Expenses) or else directly in the Inpatient or Ambulatory accounts. Expenses other than student salaries (e.g., instructor salaries, medical library, medical illustration and medical photography) are reported in MEPRS accounts EBE (Graduate Medical Education Support) and EBF (Education and Training Support). Accounts EBE, EBF, and FAK may correlate to PE 0806761, but the data systems are not adequate to allow complete reconciliation of the dollar totals.

D. ADDITIONAL ANALYTICAL CASES

The analytical cases considered in this chapter involve an increase in MTF capacity. Future analysis will consider cases that reduce MTF capacity as well. For those cases, care must be exercised to preserve sufficient capacity to meet the wartime medical requirements. The wartime requirements specify not only numbers of CONUS evacuation beds, but also numbers of physicians (by specialty) to treat casualties and disease non-battle injuries (DNBI) in the theater. The CONUS hospitals must be configured in peacetime with enough billets to occupy all of the wartime-required physicians that will be drawn from the Active Component. In addition, the beneficiary population served by the

remaining CONUS hospitals must supply enough clinical material to keep these physicians fully trained. The construction of analytical cases along these lines is now underway, and the cost estimates will be provided in the near future.

V. CONCLUSIONS AND AGENDA FOR FUTURE RESEARCH

This paper has used MEPRS data to model the relationship between cost and workload at military hospitals. Prior to estimating the models, we adjusted the MEPRS data to include the same set of cost elements that would be reflected in the prices charged by civilian-sector providers. These adjustments ranged between 10.6% and 16.9%, depending on the Service branch and the type of care (i.e., inpatient or ambulatory).

In developing the adjustment factors, we concluded that the Service comptroller pay factors used in MEPRS are too low for physicians, but too high for nurses, MSC officers, and medical enlisted personnel. Although these errors average out to zero in the aggregate, they impart a bias in the relative costs of the various categories of personnel. For certain purposes, such as determining the optimal mix of personnel by category, it would be preferable to use the medical-specific pay factors developed in this paper. Further research may be desirable to assess the impact of using alternative pay factors in making decisions on staffing mix.

We developed regression models to predict cost as a function of the inpatient and ambulatory workloads, the number of operating beds, and the level of GME provided at each MTF. The facility-level costs can then be summed to predict the system-wide costs of in-house medical care. Corresponding cost estimates for care provided in the civilian sector are being prepared by the RAND Corporation.

Several difficulties were encountered in developing the regression models. Foremost, inpatient discharges were case-mix adjusted using CHAMPUS Version 8 DRG weights. This procedure was necessary to account for the differences across clinical areas in resource intensity. The use of DRG weights enabled us to form a homogeneous work unit for inpatient care at each MTF. Moreover, the case-mix adjustment enabled us to combine data from medical centers with data from community hospitals. These two sources of data would be incommensurable without a case-mix adjustment, because community hospitals refer many of their most difficult cases to medical centers.

By using CHAMPUS DRG weights, we assume that the relative cost by DRG based on CHAMPUS experience provides a good predictor of the relative cost by DRG in military hospitals. Further research may be necessary to investigate the validity of this assumption, and to explore alternative methods of case-mix adjustment. Additional research may also be required to develop corresponding measures of resource intensity for ambulatory care.

Another difficulty involved correcting for the escalation in unit cost observed at MTFs between FY90 and FY92. The two-year cumulative escalation rates ranged between 15.2% and 27.3%, depending on the type of facility (i.e., medical center, community hospital, or ambulatory clinic) and the type of care (i.e., inpatient or ambulatory). These escalation rates cannot be strictly interpreted as price indices for medical care, because rapid technological advance invalidates the concept of comparing prices for a constant set of goods or services. Nonetheless, the escalation rates are surprisingly high, and merit further investigation.

We estimated the costs associated with GME programs at military hospitals. Our estimates include student salaries, as recorded both directly in classroom time and indirectly in patient-care time. Our estimates also include instructor salaries, plus some miscellaneous expenses incurred at teaching hospitals such as medical library, medical illustration, and medical photography. We find that each additional enrolled resident or intern adds nearly $170,000 in total to these elements of hospital cost. More research would be desirable to both improve the accounting of GME costs at military hospitals, and to assess the cost-effectiveness of military GME programs.

In developing the regression models, we encountered difficulties in comparing cost and workload data across the three Services. In particular, unit cost as computed from MEPRS data appears to be higher for the Navy than for the Army or the Air Force. Insight into this result was provided by examining the ratios between workload as reported in MEPRS, and workload as estimated from the 1992 DoD Health Care Survey. More workload is reported in MEPRS than in the survey, but the difference is less pronounced for the Navy than for the other two Services. Thus, MEPRS may understate Navy workload (or overstate it less), fostering the appearance of higher unit cost for the Navy. Although MEPRS purports to be a standardized accounting system, further research may be warranted to improve the comparability of data across the Services.

The ratios between MEPRS-based and survey-based workload were also important in the interaction between the IDA and RAND elements of the Section 733 Study. RAND projected hypothetical inpatient and ambulatory workloads under two analytical cases. The RAND projections were based on models calibrated from the 1992 DoD Health Care Survey. The IDA cost models, however, were estimated from MEPRS data on cost and workload. A conversion was necessary to make the RAND workloads fit into the IDA cost models. The conversion factors, or "exchange rates," were computed by RAND along various dimensions such as inpatient versus ambulatory care, beneficiary category, and Service branch. Additional research may be justified to improve the process of combining accounting-system data with self-reported survey data.

Both of the analytical cases considered thus far have involved an increase in system-wide MTF capacity. The two cases differ in the assumed response of beneficiaries to the greater availability of MTF care. The second case recognizes that total medical workload is likely to increase, because co-payments are lower for care provided at MTFs than for care purchased through CHAMPUS. This paper reports estimates of the increased in-house cost associated with the two analytical cases. Estimates of the corresponding reductions in CHAMPUS cost, which are necessary for computing the net change in total cost, are reported in a RAND Corporation publication.

Subsequent analysis will consider analytical cases that reduce MTF capacity as well as those that increase it. Those cases are currently being constructed, and the cost estimates will be provided in the near future.

ABBREVIATIONS

ABBREVIATIONS

AFB	Air Force Base
AMC	Army Medical Center
BuMed	Bureau of Medicine and Surgery
CHAMPUS	Civilian Health and Medical Program of the Uniformed Services
COMA	Cost of Medical Activities
CONUS	continental United States
DBOF	Defense Business Operations Fund
DMDC	Defense Manpower Data Center
DMFO	Defense Medical Facilities Office
DMSSC	Defense Medical Systems Support Center
DNBI	disease non-battle injuries
DoD	Department of Defense
DRG	Diagnosis Related Group
FTE	full-time equivalent
FY	fiscal year
FYDP	Future Years Defense Program
GME	Graduate Medical Education
HCFA	Health Care Financing Administration
IDA	Institute for Defense Analyses
JUMPS	Joint Uniformed Military Payroll System
MEPRS	Medical Expense and Performance Reporting System
MilPers	military personnel
MSC	Medical Service Corps
MTF	Military Treatment Facility
NH	Naval Hospital
NNMC	National Naval Medical Center
O&M	Operations and Maintenance

OASD	Office of the Asistant Secretary of Defense
OASD(P&R)	Office of the Assistant Secretary of Defense (Personnel and Readiness)
OCONUS	outside the continental United States
OD(PA&E)	Office of the Director (Program Analysis and Evaluation)
OSD	Office of the Secretary of Defense
P&D	planning and design
P&R	Personnel and Readiness
PA&E	Program Analysis and Evaluation
PE	Program Element
RPMA	real property maintenance activity
TAD	temporary additional duty
TDY	temporary duty
UMC	unspecified minor construction
USUHS	Uniformed Services University of the Health Sciences

RAND

The Demand for Military Health Care

Supporting Research for a Comprehensive Study of the Military Health-Care System

Susan D. Hosek, Bruce W. Bennett, Joan L. Buchanan, M. Susan Marquis, Kimberly A. McGuigan, Janet M. Hanley, Rodger Madison, Afshin Rastegar, Jennifer Hawes-Dawson

Prepared for the Office of the Secretary of Defense

National Defense Research Institute

Approved for public release; distribution unlimited

Preface

This report documents supporting research for the Comprehensive Study of the Military Medical Care System, which was requested by the National Defense Authorization Act for Fiscal Years 1992 and 1993. Within the Department of Defense, the study was entrusted to the Director of Program Analysis and Evaluation (PA&E), who asked RAND to undertake research on the utilization of health care by military beneficiaries and the costs of care provided through the Civilian Health and Medical Program of the Uniformed Services (CHAMPUS). The analyses cover current utilization and costs, and they project utilization and costs for several analytic cases that alter the structure of the military system. In its report to Congress, PA&E assessed the total costs of the military system by combining the results of this research with research conducted by the Institute for Defense Analyses on the costs of care provided in military health facilities.

The work reported here was sponsored by PA&E and was carried out within the Forces and Resources Policy Center of RAND's National Defense Research Institute (NDRI). NDRI is a federally funded research and development center sponsored by the Office of the Secretary of Defense, the Joint Staff, and the defense agencies.

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Summary

The Military Health Services System (MHSS) provides health care to active-duty service members, military retirees, and their dependents. Over the past several years, the system has faced the twin challenges of downsizing in consonance with the rest of the Department of Defense (DoD) and of controlling escalating health care costs. These challenges cannot, however, be dealt with independently. Closing military treatment facilities (MTFs) could drive non-active-duty beneficiaries to seek more expensive medical care from the civilian sector, care that is reimbursed by DoD through the Civilian Health and Medical Program of the Uniformed Services (CHAMPUS). In 1991, in response to a congressional request, the Director of Program Analysis and Evaluation (PA&E) undertook an evaluation of health care utilization and costs within the current system and of various possible alternatives to that system. PA&E turned to RAND's National Defense Research Institute (NDRI) for analytic support in responding to Congress. Specifically, we were asked to compare current utilization by military beneficiaries with use by civilians, to develop analytic cases to study alternatives to the current medical structure, and to assess costs and changes in utilization associated with these cases (with the exception of MTF costs, which are being assessed by the Institute for Defense Analyses).

We compared utilization data from a survey fielded as part of the PA&E study with data from ongoing civilian-sector surveys. After correcting for demographic differences and other factors unrelated to military service that might influence health care use, we were able to verify previous research findings that utilization by military beneficiaries is higher than use in the civilian sector. We found that the rates at which military beneficiaries used inpatient and outpatient services were on the order of 30 to 50 percent higher than those of civilians in fee-for-service plans. We suspect that these differences result from the more generous health benefits available in the military, from the greater risk of injury faced by service members in contrast to civilians, from military practice patterns and work-excuse rules, and from the influence of those factors on the proclivity of military families to use health care services.

Surveys are not the only source of data on utilization by military beneficiaries. The MHSS collects its own data, data that suggest dramatically different utilization rates for some groups of beneficiaries. After careful review, we found that various aspects of MHSS data collection, recording, and reporting can make

it difficult to draw reliable inferences from these data on health care utilization. These findings suggest that caution be exercised in the uncritical use of such data.

We developed analytic cases that incorporate four very different ways of providing military health care in the future. The first two cases stipulate modified versions of the current MHSS:

- Nationwide implementation of managed-care options such as those now in place in California, Hawaii, the Southeast, and elsewhere. DoD has now amassed considerable experience with these options and expects that with some modifications, they will control costs while improving beneficiary satisfaction.
- Expansion of the number of MTFs as well as the size and staffing of selected facilities. This alternative takes the system in the opposite direction from the current downsizing trend in the interests of shifting more dependents and retirees from CHAMPUS coverage to MTFs, which are generally thought to be less costly. It raises the question, however, as to whether increasing access to MTFs, where care is free to beneficiaries, might increase the demand for health care and draw in beneficiaries now using private health insurance plans.

In the other two cases, most beneficiaries would choose among several health plans. Both cases would offer commercial health plans; the first would close most MTFs and offer commercial plans only, whereas the second would retain the MTFs and allow beneficiaries who live near an MTF to choose between an MTF-based plan and commercial plans.

- Reduce the number of military hospitals from more than 100 to around 10, enough to handle casualties returning from an overseas conflict either through treatment or through referral to civilian-sector hospitals. Under this alternative, most hospitals at military installations would survive only as outpatient clinics. All non-active-duty beneficiaries would enroll in civilian managed-care health plans, and care for active-duty personnel beyond what the clinics could provide would be furnished by civilian-sector providers under the supervision of the clinics. This alternative would greatly reduce MTF fixed costs while putting into place a mechanism for controlling civilian-sector costs.
- Establish competing military and civilian health care plans: one health maintenance organization (HMO) operated by military hospitals and the others by commercial plans. Service members would enroll in the military

plan, while other beneficiaries would choose from among the military HMO and civilian plans. This would allow DoD to take advantage of the usual efficiency enhancements that result from competition.

For the first two analytic cases, our analysis was based on what we know about the way in which utilization by military beneficiaries currently rests on the cost and availability of military and civilian health care resources. We projected that MTF utilization in the expanded-MTF case would be roughly 15 percent greater than that in the modified current system envisioned in the first case but that CHAMPUS-funded use would be less, albeit not by as much—only by enough to permit a 9 percent drop in CHAMPUS costs. For every CHAMPUS visit not made in the expanded-MTF case, 1.7 additional visits would be made at the MTF; for every CHAMPUS hospitalization avoided, 3.4 additional patients are admitted to the MTF.

Cases 3 and 4 envision more far-reaching changes in the MHSS and so our analysis also incorporated information about health care utilization and costs in the civilian sector. Using hypothetical health-plan choices reported in the beneficiary survey, we concluded that between 60 and 70 percent of military families would prefer a civilian health plan to a military health plan if the two plans covered the same services and required the same cost sharing. However, if the family would have to pay a premium contribution for the civilian plan, but not for the military plan, most families would prefer the military plan. To induce enough families (65–70 percent) to choose the military plan to sustain the current MTF system, we estimate that DoD would have to charge $50 per month per family for civilian plans. CHAMPUS-eligible families are more sensitive to premium contribution levels than Medicare-eligible families.

Civilian plan costs varied only slightly by case and type of plan—fee-for-service (FFS) or health maintenance organization (HMO). We predicted costs for FFS plans from a simulation model of health care expenditures, based on the benefit package currently provided by CHAMPUS. *For those families we predicted would choose a civilian FFS plan,* we estimated FY92 per-person costs of approximately $2,100 for dependents of junior enlisted personnel, $1,950 for other active-duty dependents, and $2,900 for retirees and their dependents. Out-of-pocket costs range from $200 for active-duty dependents to over $600 for retirees and dependents. These estimates assume enrolled beneficiaries receive all their health care through this FFS plan. We determined HMO costs from the premiums charged by HMOs participating in the Federal Employees Health Benefits Program; in FY92, these HMOs charged $1,850 for a single person and $4,625 for a family. Although individual HMOs charge more or less than these amounts, we found little systematic variation in premiums across the country.

Case 4 envisions transforming the MTFs into a military HMO, responsible for providing all the health care for enrolled beneficiaries either directly or by purchasing civilian health care at MTF expense. Under this arrangement, the MTFs would have strong incentives to lower utilization. To determine the potential for lower MTF utilization in case 4, we estimated three sets of utilization for those families predicted to enroll in the MTF plan. The first set assumed that beneficiaries would continue to use health care at rates currently observed in areas with substantial MTF capacity. The second set assumed that utilization rates would decline to the rates we measured for comparable civilian HMO enrollees. The third set assumed that the MTFs would induce beneficiaries to use less care by charging a clinic fee. To reach HMO utilization levels, this fee would have to be equivalent to 25 percent of the average cost of a visit (perhaps $25). In general, we conclude that utilization could decline by 25 percent if the MTFs were restructured as an HMO.

Finally, we estimated the potential savings to DoD if the civilian employers of military beneficiaries were mandated to contribute 80 percent of the cost of the beneficiaries' health insurance and health reform were implemented in a manner that discouraged retaining dual coverage by employer plans and the MHSS. These savings would amount to $5 billion in 1994 dollars.

1. Introduction

Section 733 of the National Defense Authorization Act for Fiscal Years 1992 and 1993 requires that the Secretary of Defense conduct a comprehensive study of the military health care system to include two major elements: (1) a "systematic review of the . . . system required to support the Armed Forces during a war or other conflict and any adjustments to that system that would be required to provide cost-effective health care in peacetime"; and (2) a "comprehensive review of the existing . . . civilian health care . . . programs that are available as alternatives to . . . the existing military medical care system." Within the Department of Defense (DoD), this study was entrusted to the Director of Program Evaluation and Analysis (PA&E), who requested that RAND carry out supporting research on the peacetime demand for health care by military beneficiaries. The purpose of the current report is to document the first phase of this research. A subsequent version of the report will incorporate the rest of the research.

The congressional language also delineated some requirements for the content of the study report. With respect to the provision of peacetime health care, the report was to include:

- An evaluation of beneficiaries' utilization of inpatient and outpatient services, identifying deviations from utilization patterns in civilian health plans;
- A list of methods for providing care that are available as alternatives to the current military health care system;
- The relationship between the demand for health care and the availability of military medical resources;
- The likely response of beneficiaries to any planned changes in the costs they bear for care; and
- A comparison of the costs of providing care in military treatment facilities with those of indemnity plans or health maintenance organizations (HMOs).

We take up these items in order, following a brief description of the military health care system and of recent efforts to reform that system (Section 2). Section 3 then compares health service utilization in the military system with that of civilian health plans, investigates potential reasons for the differences measured,

and compares measures of military utilization derived from different data sources. Section 4 describes in some detail the alternative systems that were developed as analytic cases for the study. Although the general shape of these cases was determined by PA&E, the details needed for analysis were developed by RAND. Estimates of the effects of two cases on health care utilization and civilian care costs are provided in Section 5; the effects of the other cases are discussed in Section 6.[1] We did not estimate the costs associated with utilization of military health facilities. This task was carried out by the Institute for Defense Analyses (IDA), based on utilization estimates we provided to them. The report concludes in Section 7 with some observations about the results.

This study of the military health care system was carried out as the nation considered health care reform. Even without federal legislation, the health care marketplace is undergoing extensive changes. The legislation submitted in the fall of 1993 by the President would have authorized DoD to establish one or more health plans and collect premium contributions from private employers of military beneficiaries who enroll in a military plan. DoD would have had wide latitude in structuring its health program, so any of the alternatives developed as analytic cases for this study could be pursued with national health reform. However, with or without federal action, national reform will alter DoD's health care costs and may affect beneficiaries' use of the military system under all alternatives. An analysis of the potential impact of national reform was beyond the scope of this study, but we did roughly estimate the savings DoD might realize if private employers were required to offer their employees health care benefits.

[1]We did not analyze the effects of alternative systems on other health care outcomes, such as patient satisfaction or health status. These outcomes are addressed elsewhere in the study.

2. Structure of the Current Military Health Services System

The Military Health Services System (MHSS) provides health care to roughly 9.2 million beneficiaries, including active-duty military personnel and their dependents, retired military personnel and their dependents, and survivors of military personnel.[1] Approximately 8.5 million of these beneficiaries live in the United States, where at the end of FY92 the MHSS provided direct military care through 117 military hospitals and some 400 military clinics.[2] With military downsizing and base closures, the number of military facilities has declined and is expected to continue to decline such that by about 1997 only 101 military hospitals are expected to remain in operation.[3] The MHSS augments this military treatment facility (MTF) system with CHAMPUS,[4] a health insurance plan that finances civilian health care for most non-active-duty beneficiaries under the age of 65. Since MTF care is free, whereas CHAMPUS requires beneficiary cost sharing, the real benefits available to military beneficiaries are greater for those living near an MTF.

Health Care Services in Military Treatment Facilities

Military hospitals provide care to all military beneficiaries free of charge as capacity permits. By law, such hospitals accord first priority to active-duty personnel, followed by active-duty dependents and then retirees, their dependents, and other beneficiaries (see Figure 1).

These hospitals vary widely both in size and in the range of services they can provide. The largest are medical centers, which have hundreds of operating beds each and which offer a comprehensive range of health care services; medical centers also provide graduate medical education (GME) to train many of the

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[1]In addition, the MHSS provides health care for National Guard and Reserve members serving on active duty (and their families), civilian employees at selected DoD facilities, and other beneficiaries of government health care.

[2]The almost 400 military clinics mentioned here independently report workload and other data into biometrics military data systems; other clinics report data only through their parent hospitals. We have not included Coast Guard clinics or U.S. treatment facilities (formerly the Public Health Service hospitals).

[3]This assumes that all planned base closures are ultimately implemented, including those in the 1993 BRAC (Base Realignment and Closing) actions.

[4]Civilian Health and Medical Program of the Uniformed Services.

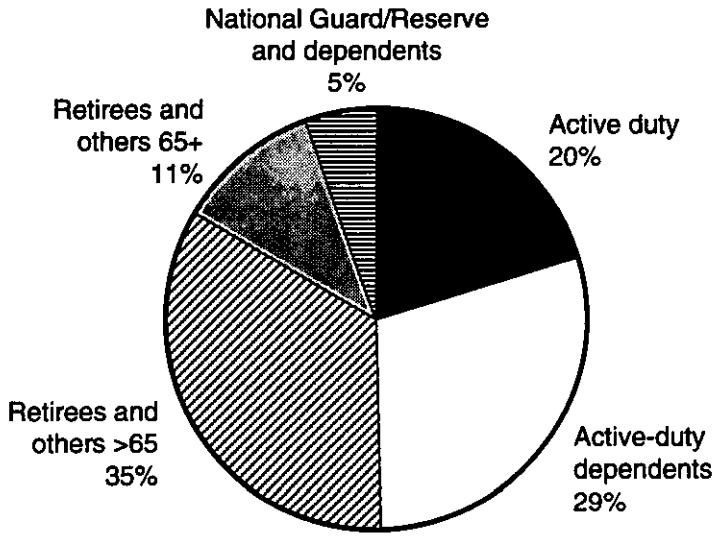

Figure 1—Composition of the Military Beneficiary Population, FY92

doctors who will be used by the military. The remaining hospitals can be classified either as small hospitals—those that operate fewer than 70 beds and provide basic medical care—or as medium hospitals that operate from 70 to about 200 beds and offer a broader range of services, albeit not as broad as those of medical centers. At the end of 1992, the MHSS had 69 small hospitals, 30 medium hospitals, and 18 medical centers; by 1997, the MHSS will have 60 small hospitals, 24 medium hospitals, and 17 medical centers.

Each military hospital has a defined service area—called a catchment area. This area generally includes the zip code areas within 40 miles of the hospital. Maps of the continental United States, showing the location of the MTFs still open in 1997, may be found at the end of Section 4. Many MTFs are located in the Southeast and Southwest. Most military beneficiaries live near an MTF. Military hospitals and their associated outpatient clinics serve 87 percent of all active-duty personnel, 80 percent of their dependents, and 57 percent of retirees and all other beneficiaries. Including freestanding military clinics, these percentages rise to 90, 89, and 68, respectively.

A few catchment areas have extended their MTF capacity through PRIMUS/NAVCARE clinics. These clinics, which are operated by civilian contractors off-base, provide primary care at no cost to non-active-duty beneficiaries.

Some military bases have only a military outpatient clinic. Such military clinics provide care primarily to active-duty personnel; some provide little or no care to other beneficiaries, whereas others offer primary care and referrals as required to military or civilian specialists and hospitals. Some of the larger of these clinics also provide a "holding area"—an infirmary-like facility in which overnight care and observation can be provided, especially for active-duty personnel.

Outside of military hospitals and clinics, the military has a large number of corpsmen and doctors who serve as part of military units. For example, some doctors are assigned to ships, providing care for ship personnel both in port and while away from port. Finally, when necessary, the military also deploys "detached" medical facilities in the form of field hospitals and hospital ships. These facilities provide inpatient as well as outpatient services.

CHAMPUS

Non-active-duty beneficiaries under the age of 65 may also obtain health care from civilian providers through CHAMPUS. Beneficiaries living near an MTF, however, must use that MTF instead of CHAMPUS for high-cost outpatient services as well as for all inpatient services if such services are available there. This rule applies to all CHAMPUS-eligible beneficiaries who live in a given MTF's defined catchment area, which extends approximately 40 miles from that MTF. When military beneficiaries reach the age of 65, CHAMPUS eligibility automatically ends and Medicare coverage begins; eligibility for treatment at military facilities continues.

Under the standard CHAMPUS plan, beneficiaries who use a civilian provider for outpatient care face a small deductible along with a copayment of 20 to 25 percent. Active-duty dependents pay only a nominal copayment for civilian inpatient care, but retirees and dependents face the same copayment and deductible as those associated with outpatient care. The first column in Table 1 lists standard CHAMPUS benefits in more detail.

Ongoing Reform in the MHSS

Since 1988, DoD has experimented with several new programs that offer beneficiaries managed-care alternatives to the standard CHAMPUS plan with more generous benefits. Programs that were in operation at the end of 1992 included the CHAMPUS Reform Initiative (CRI), which is offered in California

Table 1

Benefits and Coverage of Various MHSS Plans, FY 1992

Benefit/ Coverage Element	Standard MTF/ CHAMPUS Plan	CRI/CAM Enrollment Plans	PPOs
Enrollment Fee	None	None	None
Military Treatment Facility Care			
Copayment	None	None	None
Services for which MTF may be required	Inpatient care; some high-cost outpatient services	All outpatient specialty and inpatient care	Inpatient care; some high-cost outpatient services
Civilian Care			
Annual deductible	Deps. of jr. enlisted: $50 individual, $100 family Others: $150 individual, $300 family	None in CRI, AF CAM 50% of standard deductible in Navy CAM	Same as standard deductible
Physician services copayment	Active-duty deps.: 20% of CHAMPUS allowable Others: 25% of CHAMPUS allowable	CRI: $5 per visit AF CAM: free primary care; standard copayment minus 5% otherwise Navy CAM: standard copayment minus 5%	Standard copayment minus 5%
Outpatient mental health copayment	Same as physician services copayment	CRI: $10 per individual visit; $5 per group visit CAM: Same	Same as standard deductible
Coverage for preventive services	No coverage except well-baby care and routine eye exams	Routine physical exams, Pap smears, and similar preventive care	Same as standard coverage
Hospitalization copayment			
Active-duty dependents	Greater of $25 or $8.05/day	No copayment	No copayment
Retired and dependents	Lesser of $175/day or 25% of charges	$75/day to $750 max. per admission	Lesser of $125/day or 25% of charges
Outpatient prescription copayment	Same as physician services copayment	CRI: $4 copayment CAM: Same	Same as standard copayment
Providers covered	Free to use any provider except if MTF is required	Must use network providers while enrolled	Must use network providers for episode of care
Paperwork required	Beneficiary often files own claim	No beneficiary claims filing	No beneficiary claims filing

and Hawaii;[5] the Catchment Area Management (CAM) program, which subsumes three catchment areas;[6] and a preferred-provider organization (PPO) in the Southeast. CRI and CAM were also designed to encourage better coordination between the MTFs and CHAMPUS, to improve beneficiary access and satisfaction, and to make the system more cost-effective. Specifically, CRI offers beneficiaries the choice of (1) remaining in the standard MTF/CHAMPUS plan, which is enhanced with an optional PPO that lowers the CHAMPUS copayment for beneficiaries who use selected civilian providers, or (2) enrolling in an HMO that eliminates most cost sharing for civilian care but covers only care that is obtained from MTFs or from selected civilian providers. The CAM programs offer beneficiaries a choice of either the standard plan (without the PPO option) or an HMO plan (Air Force) and a PPO plan (Navy).[7] Table 1 also summarizes the benefits offered in the CRI and CAM enrollment plans as well as in the optional PPO available both in the CRI and in the Southeast-region program.

On the basis of its experience with these programs, DoD has developed a permanent managed-care reform to the MHSS that is based on the CRI but encompasses some revision in its cost-sharing provisions. Most beneficiaries who enroll in the HMO option will pay a small annual enrollment fee and somewhat higher copayments for outpatient visits than they did in the early CRI programs. This reform is discussed further in Section 4. A related reform—capitation budgeting—will allocate health care resources to catchment areas on a per-capita basis. This reform is just now being implemented.

A key characteristic of the MHSS lies in its blending of military and civilian health care options in a single health plan, for which all military beneficiaries are automatically eligible (the reform programs offer additional choices).[8] Although some of the analytic cases considered in this study maintain the current structure, others involve more radical changes.

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[5]For an evaluation of CRI, see Hosek et al. (1993) and Sloss and Hosek (1993). A similar evaluation of CAM is under way.

[6]The CAM demonstration program was implemented at five sites, but two of these sites were no longer operational by the end of 1992 because their demonstration authority had ended.

[7]The Army CAM program ended in FY92; its enrollment plan was an HMO.

[8]Enrollment is simple and occurs automatically as part of routine personnel processing, so almost all eligible beneficiaries are enrolled.

3. Health Care Utilization in the MHSS

Policymakers in DoD and Congress often ask whether military beneficiaries are underserved or overserved by the MHSS. Answering this question demands an assessment not just of the number of services beneficiaries use but also of the appropriateness and quality of the care provided. Nonetheless, utilization levels are broadly suggestive of the level of service available. Earlier studies of the military health care system found that utilization rates were substantially higher in the military than in the civilian population (Phelps et al., 1984; Congressional Budget Office, 1988); active-duty personnel appeared to make two to three times as many outpatient visits as did their civilian counterparts, in part because of the requirement for an unusually high state of health in the active-duty force. Active-duty dependents' utilization rates were also estimated to be 40 to 50 percent higher than those of the civilian population. Measured rates of retirees and their dependents were sometimes lower, but these rates did not account for all their use of health care services; the MHSS data used in the comparisons excluded utilization outside the military system. As part of the legislation mandating this study, Congress requested that a new comparison be made of military and civilian health care utilization. In this section, we present that comparison and explain the differences we found. We also show the sources of care used by military beneficiaries.

To compare military and civilian utilization rates, we used the beneficiary survey Congress included in its request for this study along with a national survey of the civilian population. To measure military utilization by source of care, we used the beneficiary survey together with routinely collected MHSS data. For various reasons, we found that these two data sources are not always comparable. Although greatly improved in recent years, MHSS data are prone to errors that limit their usefulness for calculating utilization rates, especially by geographic area. Because these limitations are likely to pose difficulties for many kinds of analyses, we devote some space to them in the second half of this section.

Military-Civilian Comparison

We compared two measures of annual health care use: the average number of outpatient visits per person and the percentage of recipients who had received any hospital care. Calculations of these measures were adjusted for differences

in military and civilian populations in age, sex, and other characteristics known to affect utilization. We present comparisons for outpatient and inpatient use followed by some possible explanations for the differences we found. First, though, we review critical aspects of the surveys and comparison methodology.

Overall, this analysis tends to confirm the findings of earlier studies. Our results can be summarized as follows:

- Military beneficiaries use more health care than do comparable civilians. Much of this difference in utilization can be explained by the generosity of military health benefits, particularly the availability of free MTF care—although other factors may also come into play.
- Those beneficiaries with the highest priority for MTF care—active-duty personnel, followed by their dependents—obtain a large proportion of their care from MTFs and very little of that care from non-MHSS sources.
- Other beneficiaries—retirees, survivors, and their dependents—get less than half their care from MTFs if they live in catchment areas and almost none if they live in noncatchment areas. For those under age 65, CHAMPUS financed (at least in part) almost three-quarters of civilian outpatient care but only half as much civilian inpatient care. We should note, however, that these estimates are imprecise in that they rest on a comparison of CHAMPUS and survey data.
- Although MHSS data can generate reasonably accurate aggregate inpatient utilization rates for active-duty personnel and their dependents, the rates estimated by geographic location are unreliable. These data are similarly useful for measuring aggregate utilization of MHSS inpatient services for other beneficiaries, but they cannot be used to estimate total utilization.
- MHSS data yield substantially higher MTF outpatient utilization rates than do the beneficiary survey data. The reasons for this discrepancy, which is even larger when rates are calculated for specific geographic areas, cannot be investigated with current MHSS outpatient data systems. Therefore, MHSS outpatient data should be used with caution.

Overview of the Surveys Used in the Comparison

Data for civilian utilization rates were derived from the National Health Interview Survey (NHIS), which is fielded annually by the federal government to

a sample of the U.S. civilian noninstitutionalized population.[1] The NHIS assesses health status and health service utilization by interviewing a sample of approximately 50,000 households and 120,000 individuals each year. We used the 1989 NHIS because that year's data contained information regarding insurance coverage—information that is essential to ensuring the comparability of the samples. To determine whether the different time periods for the two surveys would affect the comparison, we reviewed NHIS data for the years 1987 to 1991 for evidence of a trend in utilization. We found that outpatient use by the civilian population (e.g., visits per person) had not changed during these years and that inpatient admission rates had also remained constant, while the average length of a hospital stay had declined. By comparing the percentage of recipients hospitalized but not the number of hospital days, we thus concluded that we could use the 1989 NHIS.

To facilitate comparison, the questionnaire for this study's military beneficiary survey included the same questions on utilization and health status as those in the NHIS. The military survey was fielded by mail in late 1992 and early 1993 to a sample of 45,000 military households, whose sponsors were active-duty personnel with and without dependents, active and reserve retirees, and survivors of military personnel. We principally used the results from the portion of the survey that was directed toward one randomly selected member of each family. This portion asked for the number of outpatient visits, the number of hospital days (which we used to determine whether the person was hospitalized), and other information about this individual.

The sample for the military survey was randomly selected within each of 73 population strata, with different sampling rates used for the different strata.[2] To obtain estimates for the military population rather than just the survey sample, we weighted the survey data to account for different sampling and nonresponse rates. The methods we used to obtain survey weights are detailed in Appendix A.

Methods for Estimating Utilization Levels

We estimated utilization rates using NHIS and military survey data for individuals age 1 to 64 who lived in the United States. In the case of the NHIS, we excluded individuals without private-insurance coverage in efforts to render

[1]See the National Center for Health Statistics (1990) for a description of the 1989 survey.

[2]The strata were defined by beneficiary category (e.g., active duty, retired), family status (with or without dependents), and military health program type (e.g., CRI, Army CAM, noncatchment area).

the civilian sample more comparable to the military sample, all of whose members have health insurance. We excluded from the military sample survivor and retired Reserve/National Guard households as well as active-duty personnel who were considered to be afloat (but not their families). We then used standard regression analysis techniques to express health care utilization as a function of whether an individual belonged to the military or civilian population and of other characteristics potentially related to utilization: education, income, family size, and self-reported health status. We also included information on whether the individual was covered by a fee-for-service (FFS) or an HMO plan (for civilians) to permit estimates to be made for these different types of civilian health plans. Using the regression results, we then estimated average utilization levels for military beneficiaries and for comparable individuals in the civilian population. These estimates are thus adjusted for any military-civilian utilization differences other than whether or not an individual was a military beneficiary. Appendix B describes our methods in greater detail and reports the results of the regression analysis.

We compare utilization for five beneficiary groups: active-duty personnel, active-duty dependents, retirees under age 65, retirees' dependents under age 65, and retirees and dependents 65 and over. We report separate civilian utilization rates for HMOs and FFS plans for all the under-65 groups, as research has typically shown that HMOs experience higher outpatient utilization and lower inpatient utilization than do FFS plans. Since HMO enrollment rates are very low in the Medicare popualation, we do not report civilian rates by type of plan.

As a check on the comparability of these two surveys, we also compared utilization rates in the NHIS for civilians and the limited number of military beneficiaries included in the NHIS sample. In doing so, we were able to identify active-duty dependents but not military retirees. A comparison of utilization rates adjusted for age and sex (but not for health status) yielded results that were similar to those we obtained from comparing the military survey with the NHIS.

Comparison of Military and Civilian Outpatient Use

The first three columns of data in Table 2 show the average number of visits for each group of military beneficiaries and their counterparts in civilian FFS and HMO plans. For military beneficiaries, we include all visits, not just those made at MTFs or through CHAMPUS. As in earlier studies, we find that active-duty personnel and their dependents have substantially higher outpatient utilization levels. Compared with civilians in FFS plans, these differences—43 percent for active-duty personnel and 38 percent for dependents—are somewhat smaller

Table 2

Comparison of Outpatient Utilization in the Military Population and Comparable Civilian Populations

	Average Visits per Person			Probability of Having Any Visits		
		Civilian			Civilian	
Beneficiary Group	Military	FFS	HMO	Military	FFS	HMO
Active-duty personnel	3.09	2.16	2.28	0.82	0.68	0.70
Active-duty dependents	3.84	2.78	2.92	0.89	0.78	0.80
Retirees under 65	4.37	3.32	3.49	0.84	0.73	0.76
Retired dependents under 65	4.33	3.27	3.42	0.90	0.81	0.83
Retirees & dependents over 65	5.70	4.51[a]		0.91	0.91[a]	

NOTE: Estimates control for differences in sociodemographic characteristics and health status between the military and civilian populations. For all beneficiary groups, the differences in average visits between the military beneficiaries and both civilian groups are statistically significant at $p < .05$.

[a]Total for all-civilian.

than those previously measured. Outpatient utilization tends to be higher in HMOs than in FFS plans because the out-of-pocket cost is lower. Therefore, compared with civilian HMO enrollees, active-duty personnel and dependents make only 36 and 32 percent more visits, respectively.

When we consider all sources of care and not just MHSS sources, military retirees and their dependents under age 65 are also found to have higher visit rates, but the differences are about five percentage points lower than those for active-duty dependents. The difference is even smaller (26 percent) for beneficiaries 65 and over, almost all of whom get some care whether or not they are in the military population.

Military outpatient utilization rates may be underestimated somewhat in relation to civilian rates. The military survey windsorized the data at 10 visits—i.e., limited the number of visits that could be recorded for each health care location to 10 or more. We similarly limited the NHIS data. To the extent that the tendency for military beneficiaries to use more health care extends to those making more than 10 visits per year, we have underestimated military-civilian differences in utilization.[3]

[3]We considered correcting the military survey data instead of windsorizing the NHIS data. There are no similar data on military beneficiaries' self-reported utilization by source of care from which we could determine the frequency of visits above 10. Therefore, making this correction would have required that some assumptions be made about this frequency, which would have led to

The last three columns of data in Table 2 show the fraction of beneficiaries with any outpatient visits in comparable military and civilian populations. Generally, about one-third to one-half of the military-civilian differential is due to a higher probability of having any outpatient use at all. The remainder is attributable to an increased number of visits for those with some use.

Utilization rates are often reported by age and sex without adjusting for other health-related characteristics. Figures 2 and 3 compare outpatient visit rates by age and sex in the military survey with those in the MHIS. The age-sex utilization profiles for the two populations generally have the same shape. With the exception of the youngest children, however, military beneficiaries of both sexes average a higher number of outpatient visits at all ages.

Comparison of Military and Civilian Inpatient Use

All four military beneficiary groups also tend to display higher inpatient utilization rates, as measured by the annual probability of being hospitalized, than do persons who are similar but unconnected with the military (Table 3). Within the civilian population, the rate of hospitalization is usually found to be lower in HMOs than in FFS plans—a pattern we also find here.[4] Focusing on those in FFS plans, we see that the differential in military inpatient use is about equal to the outpatient differential for active-duty dependents and Medicare eligibles, but is smaller for the other beneficiary groups. The military differential is considerably higher if the civilian comparison group consists of HMO enrollees.

Why Do Military Beneficiaries Use More Health Care?

One explanation usually advanced for the higher health care use found in the military population pivots on the availability of free MTF care. Typical civilian health plans include a deductible, often in the amount of about $200 per individual, as well as a copayment of 20 percent. CHAMPUS has similar cost-sharing provisions, but, as shown below, MTFs provide roughly two-thirds of the care used by active-duty dependents and one-third of the care used by retirees and dependents. The differences we estimate—military utilization that is 32 to 43 percent higher than FFS outpatient use and 23 to 33 percent higher than

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unknown biases in the estimates. We chose instead to windsorize the NHIS data because this approach would yield a conservative estimate of military-civilian utilization differences.

[4]See, for example, Bradbury et al. (1991), Luft (1981), Manning et al. (1984), and Welch (1985).

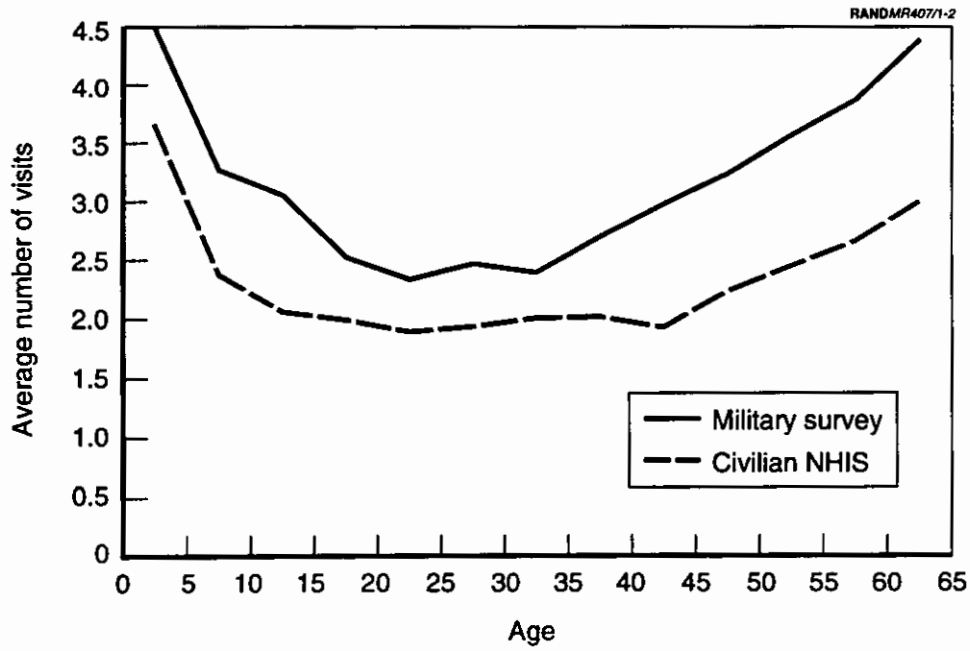

Figure 2—Average Self-Reported Outpatient Visits by Age and Sex, Males (windsorized at 10 visits)

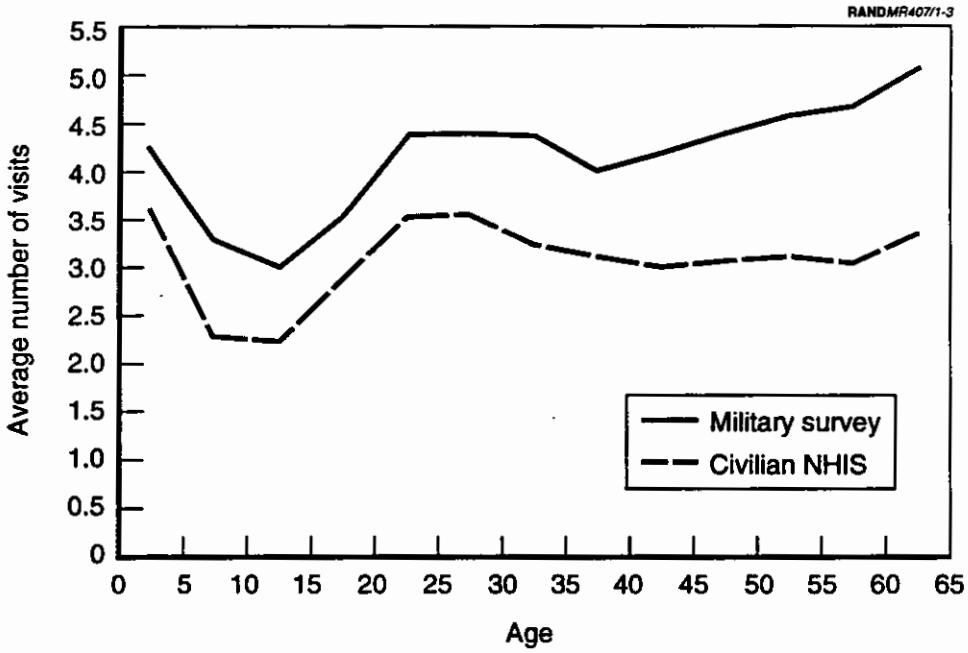

Figure 3—Average Self-Reported Outpatient Visits by Age and Sex, Females (excludes active duty) (windsorized at 10 visits)

Table 3

Comparison of Inpatient Utilization in the Military Population and Comparable Civilian Populations

	Probability of Having Any Overnight Hospital Care		
		Civilian	
Beneficiary Group	Military	FFS	HMO
Active-duty personnel	0.095	0.073	0.065
Active-duty dependents	0.113	0.086	0.076
Retirees under 65	0.151	0.122	0.109
Retirees' dependents under 65	0.112	0.091	0.081
Retirees & dependents over 65	0.24	0.18	

NOTE: Estimates control for differences in sociodemographic characteristics and health status between the military and civilian populations. For all beneficiary groups, the differences in average visits between the military beneficiaries and both civilian groups are statistically significant at $p < .05$.

FFS inpatient use—are generally consistent with evidence on the effects of cost sharing.

The best evidence on the effects of cost sharing can be found in a large health-insurance experiment conducted in the 1970s. By randomly assigning families to insurance plans that differed only in their cost-sharing arrangements, the experiment estimated changes in the number of episodes of health care used due to cost sharing. Families assigned to a free plan had 41 percent more outpatient episodes than did families assigned to a plan with cost sharing and 21 percent more inpatient episodes (Keeler et al., 1988). Since not all the care military beneficiaries receive is from MTFs and therefore free, the effects of cost sharing on military utilization would be less than those for families in the experiment.

There are other possible explanations for the higher health care utilization rates found in the military population; one centers on different patterns of medical practice in the military. The health literature contains many studies that document the variability of medical practice, for example, by geographic area. In the military, there is some incentive to increase utilization because MTF resources are determined by historical utilization levels. A comparison of military and civilian practice patterns is, however, well beyond the scope of this study; thus, we mention practice patterns only as a possibility. Other potential explanations derive from the military's emphasis on good health, which may encourage broader health care use, as well as from family separations, which may lead active-duty spouses to more frequently seek medical advice, especially for their children.

Military Utilization by Health Care Source: MHSS Data Versus the Beneficiary Survey

Military beneficiaries have three major sources of care: MTFs, CHAMPUS, and non-MHSS sources. The beneficiary survey asked for visits and days of hospitalization according to the location of care: (1) an MTF or PRIMUS/NAVCARE clinic; (2) a civilian hospital, doctor's office, or clinic; or (3) a Veterans Administration (VA) hospital or clinic or other source. The survey also asked whether CHAMPUS paid for any portion of the civilian care used, although it did not ask how many of the reported visits and days were covered—information that is available from CHAMPUS claims data.[5] The survey is, however, the only source of data on total civilian utilization. To examine military utilization by source of care, we therefore looked both at the survey data and at regularly collected MHSS data. These two data sets yielded differences that have implications for other analyses of military utilization. The remainder of this section describes the MHSS data sources we used, the mix of health care sources used according to the survey and MHSS data, and the differences we found between the two types of data.

MHSS Data Systems

The MHSS maintains a number of data systems that can be used to estimate health care utilization rates. Since these data omit civilian care not financed by CHAMPUS and care obtained through other government programs (e.g., Medicare and the VA), however, they offer an incomplete record of utilization for many military beneficiaries. The beneficiary survey data are more comprehensive and, as discussed earlier, more comparable to the data provided by civilian surveys. Such survey data are, however, subject to a number of biases. Our original intent in comparing these two data sources was to assess incompleteness in the MHSS data and bias in the survey data—but in carrying out this comparison, we uncovered a number of other problems in the MHSS data that, if not corrected, render such data inadequate to the task of measuring utilization rates even for MHSS services.

Calculating Utilization Rates Using MHSS Data Systems

Per-capita utilization rates can be estimated by dividing aggregate utilization by the number of beneficiaries generating that utilization. Accurate estimates

[5]Respondents cannot usually provide this kind of information in a self-administered survey.

require accurate utilization and beneficiary population data; in particular, the utilization measure must be for the same beneficiaries included in the population data. A method that is more difficult but that ensures a match between utilization and population involves the averaging of data collected for individual beneficiaries. Since MTF outpatient data are not reported for individuals, however, only the first method can be used with routinely collected MHSS data.

The Defense Medical Information System (DMIS) is the principal source of routinely collected data on the MHSS. Within DMIS, the following sources provide the data needed to calculate utilization rates:

- The Defense Eligibility Enrollment Reporting System (DEERS) records basic information on each eligible beneficiary and reports beneficiary counts by geographic area. The FY92 counts we used to calculate utilization rates correct the DEERS counts for (1) new ZIP codes in several catchment areas; (2) fluctuations in the active-duty population at training facilities such that counts reflect average training loads; and (3) mislocation of some active-duty dependents.[6]
- Two data systems—biometrics and the Medical Expense and Performance Reporting System (MEPRS)—record MTF utilization. As part of the biometrics data system, the MTFs generate a summary discharge record for each hospitalized patient; thus, patient-level data are available for inpatient utilization. However, that is not the case for outpatient utilization. The biometrics and MEPRS data systems also include annual counts by MTF of outpatient visits, admissions and/or discharges, and inpatient days. These counts are reported by clinical service or beneficiary category, although the data for CHAMPUS- and Medicare-eligible retired beneficiaries are combined and survivors and other beneficiaries are combined with retired dependents.
- CHAMPUS utilization is recorded on extracts of the individual claims submitted for payment. Quarterly summary reports display data assembled three months after the end of the fiscal year; since not all the claims have been submitted by that date, the CHAMPUS office estimates that the reports are only about 88 percent complete.

[6]In 1992, DEERS showed almost double the number of overseas active-duty dependents as in previous years and an offsetting decline in active-duty dependents in the United States (especially in noncatchment areas). The change reflected new rules for locating dependents lacking a recent address. Our analysis of the survey data and other data sources suggested that the new rules incorrectly located enough dependents of active-duty personnel on unaccompanied assignments to noticeably bias non-catchment-area and some catchment-area population counts.

Outpatient Utilization by Source of Care

Since MTF services are less available in noncatchment areas and since the use of some civilian services may be lower in catchment areas, we sought to identify the sources of care used in both types of areas. From the survey, we can easily tie outpatient visits by source of care (e.g., MTF, civilian, or other) to individuals, thus allowing us to estimate average visits by source for both catchment-area and non-catchment-area populations. The MHSS data can support a similar calculation for CHAMPUS visits but not for MTF visits; we must therefore assume that outpatient visits at military hospitals are made by local catchment-area beneficiaries and that visits at outlying clinics are made by non-catchment-area beneficiaries. The result is a misestimation of the true utilization rates in both areas. Estimates of non-CHAMPUS civilian visits and other government visits are available only from the survey.

Figures 4 to 7 show the average number of visits recorded for the major beneficiary groups in the MHSS data in FY92 and in the survey in early FY93. Here we provide information for beneficiaries age 65 and over in addition to the other groups. The figures lead us to two general conclusions about the use of outpatient services, as measured by the two data sources. First, the military beneficiary groups rely to a varying extent on MTFs to meet their health care demands. Second, routinely collected MHSS data generate higher estimates of use than the survey shows. The difference is especially large for active-duty personnel and for MTF outpatient use.

Active-duty personnel obtain essentially all their health care from MTFs, whether or not they live in a catchment area; for the vast majority of active-duty dependents who live in a catchment area (87 percent), MTFs provide at least three-fourths of their outpatient care. Those living in other areas report that they do use MTFs; making one-third of their visits to such facilities. Retirees and their dependents of all ages are least reliant on MTFs for outpatient care, those living in catchment areas obtain half or more of their care from MTFs, but in noncatchment areas the civilian sector provides most outpatient care. Finally, military beneficiaries' utilization of VA and other providers' outpatient services is limited. Military retirees report that they make only about 5 percent of their visits to VA clinics.

Differences in MTF Visit Rates by Data Source. MTF visit rates estimated from MHSS data for catchment-area beneficiaries are considerably higher than survey estimates (the bottom portions of the bars in Figures 4 to 7). Non-catchment-area clinics also record high visit rates for their active-duty population, but the visit rates for other beneficiaries are low in relation to survey estimates. As

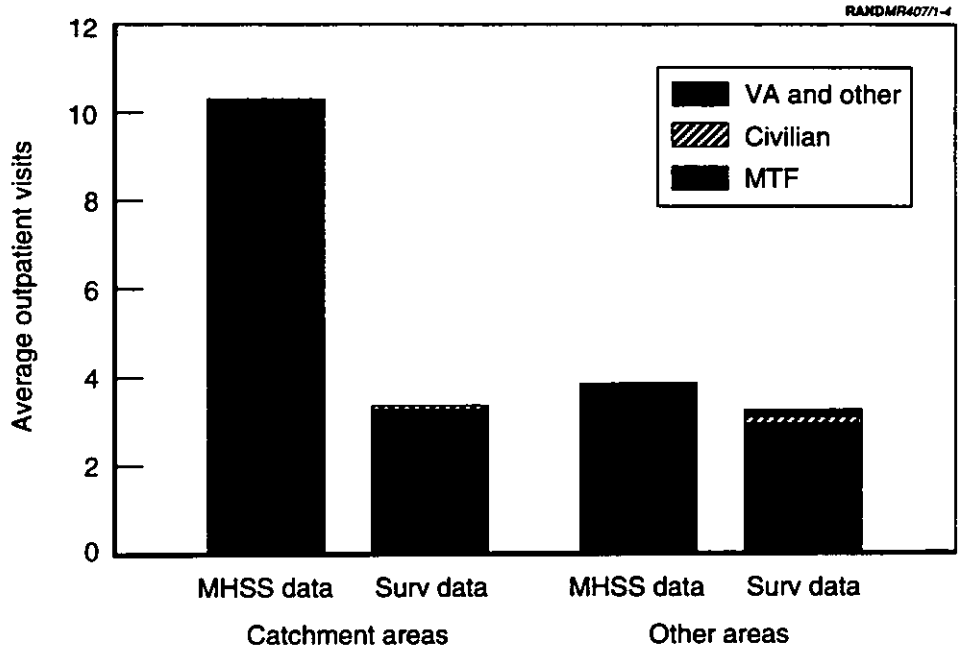

Figure 4—Active-Duty Outpatient Use by Source

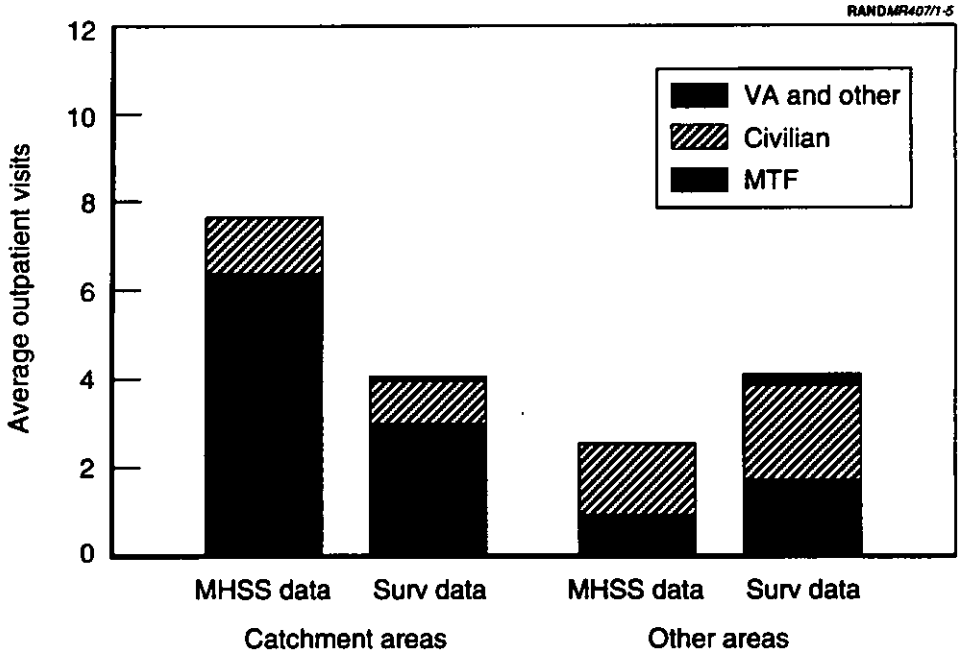

Figure 5—Active-Duty Dependent Outpatient Use by Source

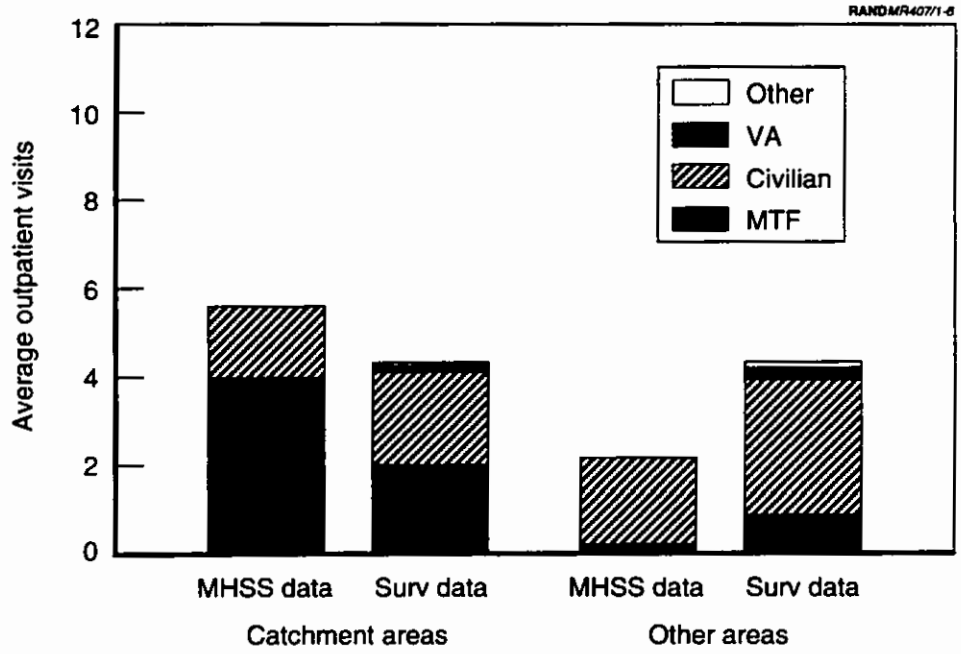

Figure 6—Retiree/Dependent/Survivor Under 65 Outpatient Use by Source

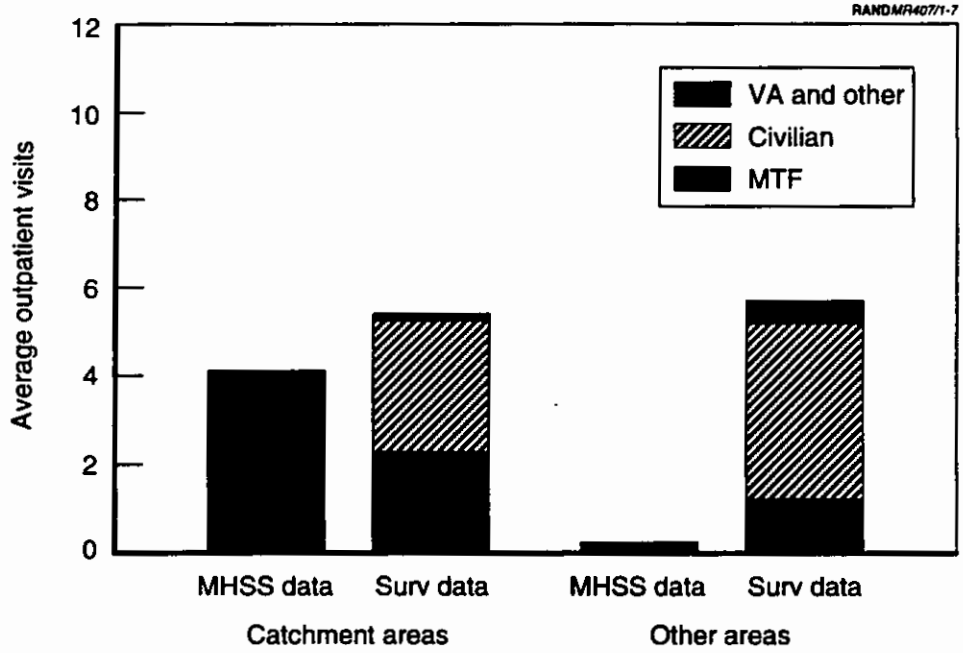

Figure 7—Medicare Outpatient Use by Source

mentioned earlier, we were unable to verify that the population DEERS records for a catchment area is the population that is making the visits recorded by the MHSS data. Therefore, we believe that the catchment-area and non-catchment-area rates are misestimated; most probably, the former are overestimated and the latter underestimated. If we combine the areas to eliminate these locational problems, the MTF visit rates estimated from MHSS data are higher than the survey estimates by 200 percent for active-duty personnel, 90 percent for active-duty dependents, 70 percent for retirees, survivors, and dependents under age 65, and 50 percent for over-65 beneficiaries.

The differences in MTF visit rates measured from MHSS data and survey data probably result from errors in both data sources. The survey data underestimate the number of outpatient visits for two reasons. First, numerous studies have shown that recall bias causes mail-survey respondents to underestimate outpatient use by approximately 20 percent (Jobe et al., 1990; Siemiatycki, 1979; Yaffe et al., 1978). Second, adding to the effects of recall bias is this survey's design, which limits the number of visits that can be reported for each person to 10. In their report on the survey, Lurie et al. (1994) estimated what the visit rates would be without this limitation. A comparison of our survey estimates, which are unadjusted, with the survey report's adjusted estimates indicates that our estimates are as much as 15 percent too low. Since these two error sources taken together account for less than a 40 percent difference, however, other factors must play a role as well.

The differences in MTF utilization rates measured from MHSS data and the survey also reflect varying criteria for defining a visit and probably an incentive to overreport MTF utilization. MHSS data systems treat each outpatient encounter as a visit; the survey asked about visits "to a doctor or an assistant." Some examples of encounters that are recorded as visits in the MHSS data but not necessarily in the survey responses include picking up a prescription refill from a clinic, a telephone inquiry, immediate follow-up care, or a telephone consultation with a second provider or clinic. Moreover, because funding of almost all MTFs during FY92 was based on historical workload, such facilities had an incentive to be as inclusive as possible in counting outpatient visits.

Other possible reasons for the differences include (1) incorrect recall of the location of a visit (MTF versus civilian) by some in the survey; and (2) use of a survey sample that is not fully representative of the beneficiary population from which it was drawn. Included in the first category would be misidentification of PRIMUS and NAVCARE clinic visits, which we include in the MTF counts as civilian visits.

Differences in Civilian/Other Visit Rates by Data Source. The only source of data we had on civilian utilization for active-duty personnel and Medicare-eligible beneficiaries was the survey. For the other beneficiaries, MHSS data systems record civilian utilization only if it is financed at least in part by CHAMPUS; by contrast, the survey asked for all civilian utilization, regardless of the payer. Few active-duty dependents have other insurance, but just over half of all retirees and dependents under age 65 report having other coverage. Thus, the civilian visit rates calculated from MHSS data are similar to the survey-based rates for active-duty dependents but are lower for other beneficiaries.

A comparison of the MHSS data on civilian care, which includes services obtained only through CHAMPUS, with the survey will yield an imprecise estimate of the CHAMPUS share of civilian care. The ratio of CHAMPUS visits to total civilian visits reported in the survey is actually above 1.00 for active-duty dependents and .70 for retirees and their dependents—.80 in catchment areas but only .60 in noncatchment areas.

Inpatient Utilization Rates by Source of Care

From the survey, we calculated the fraction of beneficiaries hospitalized for at least one night during a 12-month period. CHAMPUS routinely reports the number of beneficiaries with hospital claims. We counted the number of beneficiaries hospitalized in MTFs from individual patient records, separating catchment-area residents from non-catchment-area residents using the ZIP codes listed in the records. Figures 8 to 11 plot these admission probabilities.[7] Estimates of civilian hospitalizations not financed by CHAMPUS and other government hospitalizations are available only from the survey.

The mix of sources of care used by each beneficiary group for inpatient care generally resembles that used for outpatient care. However, active-duty personnel report getting more inpatient than outpatient care from civilian providers, especially in noncatchment areas. As far as we can tell, these civilian hospitalizations are not recorded in MHSS data systems. The other notable difference in the mix of inpatient and outpatient sources lies in the heavier use of VA and other services for inpatient care; almost 10 percent of Medicare-eligible recipients reporting some hospital use in the survey list the source as "other."

[7]We did not estimate utilization rates for National Guard and Reserve personnel. A match of the MTF inpatient and DEERS records showed that only about one-fourth of those hospitalized are listed in DEERS. Therefore, the utilization and population counts are not comparable. If we had the patient-level visit data to perform a similar check, we would expect to find the same mismatch.

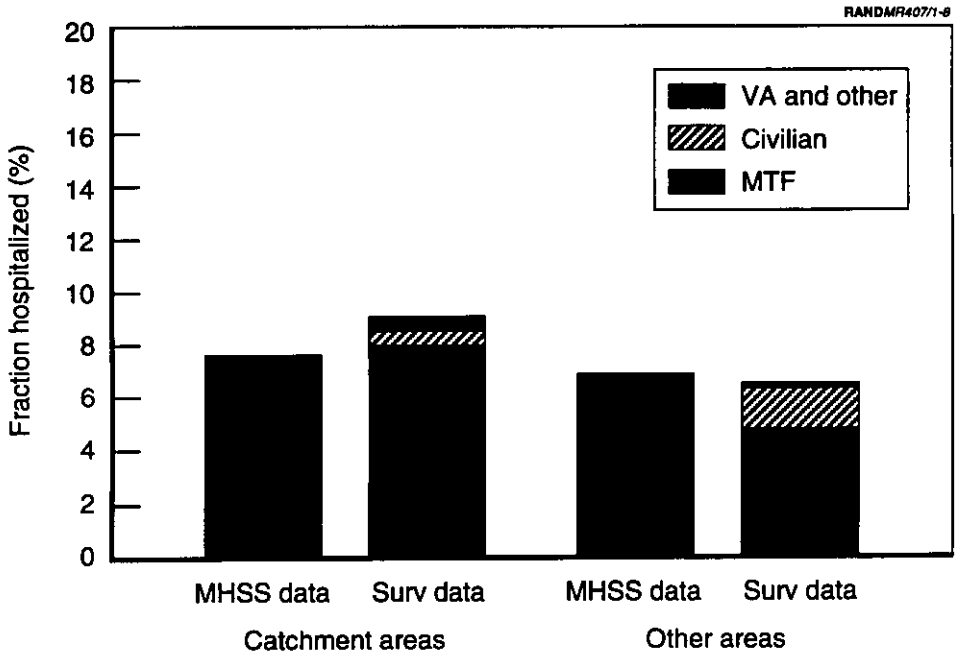

Figure 8—Active-Duty Inpatient Use by Source

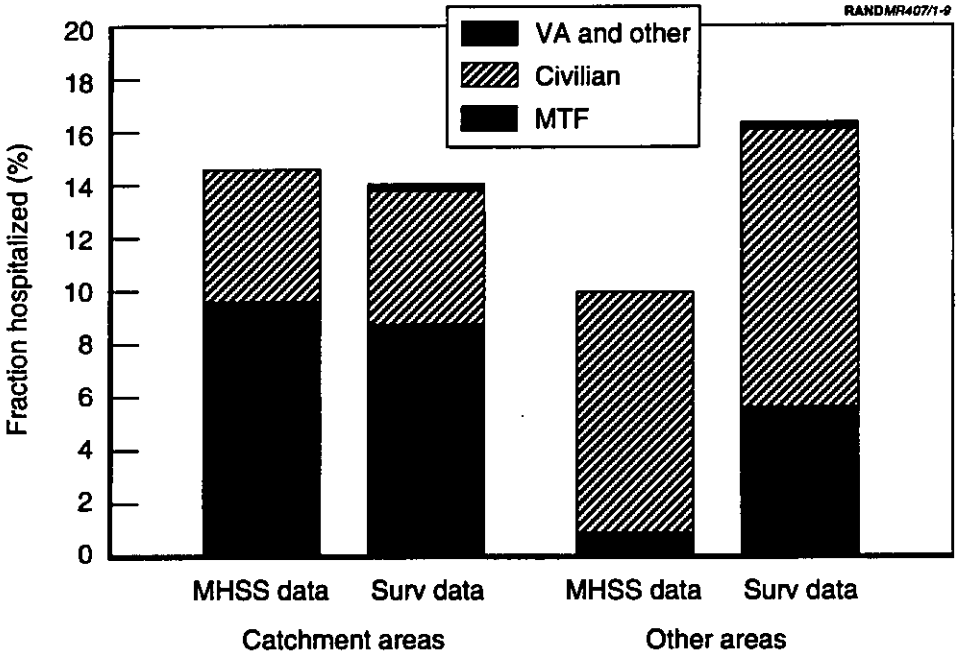

Figure 9—Active-Duty Dependent Inpatient Use by Source

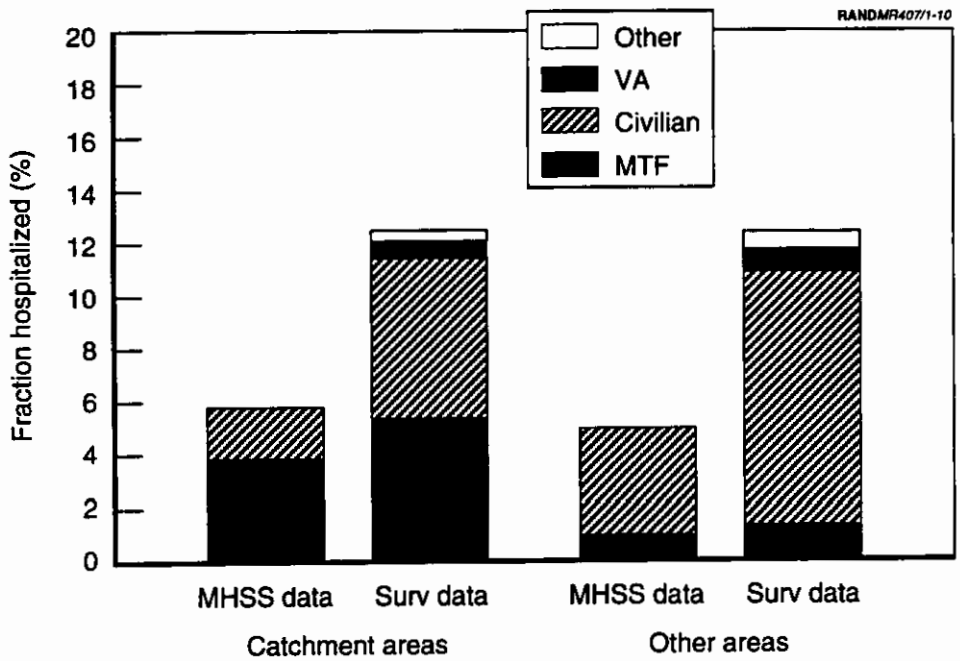

Figure 10—Retiree/Dependent/Survivor Under 65 Inpatient Use by Source

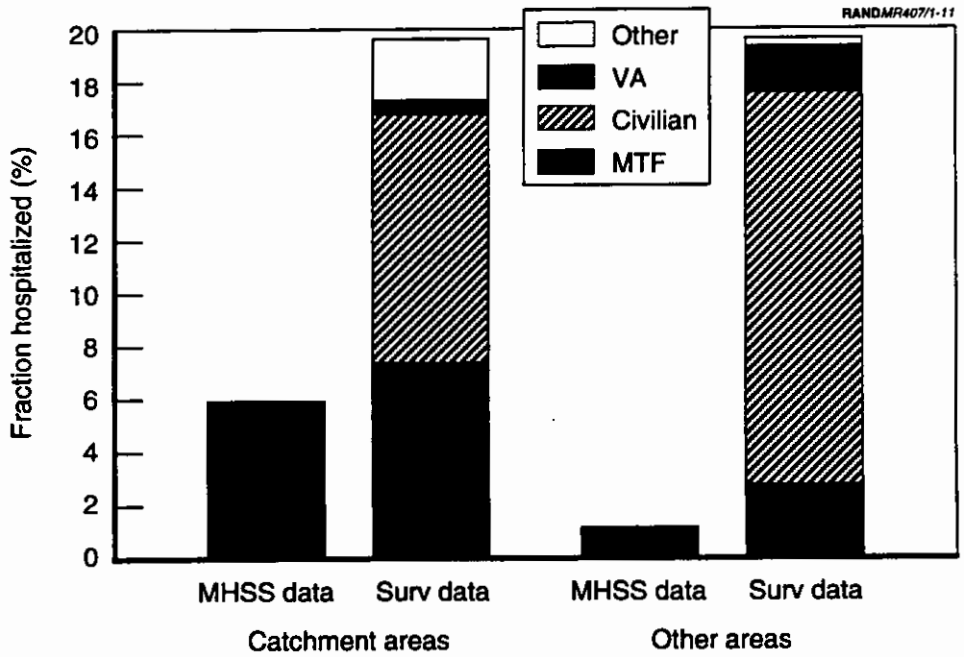

Figure 11—Medicare Inpatient Use by Source

Differences in MTF Hospitalization Rates by Data Source. The two estimates of MTF use are more similar for catchment-area populations of active-duty personnel and their dependents than for non-catchment-area populations. Further investigation showed that replacing the ZIP codes listed in the MTF inpatient data with the ZIP codes in DEERS decreases the number of hospitalizations attributed to non-catchment-area residents by two-thirds for active-duty personnel while increasing it by one-third for active-duty dependents. While this is sufficient to lower the active-duty hospitalization rate to a level below the survey estimate, it eliminates only some of the difference in the estimates for active-duty dependents. The ZIP-code source used to assign location makes less difference for retirees and other beneficiaries and for all beneficiaries in catchment areas.

If problems in locating beneficiaries are the principal source of the sizable differences in inpatient estimates in noncatchment areas, such differences should disappear if we combine the two types of areas. The fractions hospitalized in all areas measured with the two data sources are within 3 percent for active-duty personnel and 10 percent for their dependents, but the MHSS-based rates are only 70 percent of the survey-based rates for retirees and their dependents. Possible explanations for the difference for this last group include (1) recall bias in the survey, with respondents reporting some hospitalizations that occurred more than one year previously; (2) incorrect recall of the location of hospitalization (MTF versus civilian) by some in the survey; (3) survey respondents counting nonovernight hospitalizations; and (4) a nonrepresentative survey sample.

Differences in Civilian/Other Hospitalization Rates. The estimates of civilian hospital use derived from CHAMPUS records and from the survey are similar for active-duty dependents, although the fraction of non-catchment-area residents with an MTF hospitalization may be underestimated in the MHSS data. For other CHAMPUS eligibles, the ratio of the fraction with CHAMPUS hospital use to that reporting any civilian use in the survey is under 40 percent overall—33 percent in catchment areas and 40 percent in noncatchment areas.[8] Even if we consider the "extra" MTF hospitalizations reported for catchment-area residents in the survey to be mistaken civilian hospitalizations, the fraction of those residents with a CHAMPUS hospitalization is at most 50 percent of the survey-based civilian hospitalization rate for retirees, survivors, and their dependents under age 65. Thus, the CHAMPUS share of these beneficiaries' civilian care is

[8]CHAMPUS cannot be used by Medicare-age beneficiaries, so we do not report CHAMPUS use in Figure 11.

considerably smaller for inpatient than for outpatient services, probably because CHAMPUS inpatient benefits are less generous in relation to civilian plans. Beneficiaries with other insurance will often find it covers most inpatient costs but that they must turn to CHAMPUS to fill in gaps in outpatient coverage—especially for mental health and preventive care.

4. Analytic Cases Developed to Study Demand in the MHSS

Numerous potential alternatives exist for restructuring the MHSS. Only a small number of alternatives were chosen as analytic cases for this study. The four principal analytic cases examined are:

1. A managed-care program like the one currently being implemented (the baseline case);
2. Maximum practicable health care provision in MTFs;
3. Minimum health care provision in MTFs with two options:
   a. Provision of only reception and referral centers in U.S. military hospitals during wartime, augmented by care in civilian and Veterans Administration hospitals, or
   b. Provision of all required care in U.S. military hospitals; and
4. Military-civilian competition in providing health care, with a choice of MTF HMOs and civilian HMO and fee-for-service (FFS)/PPO options.

Table 4 summarizes the health plans that would be available to beneficiaries in each case. In addition to varying the number and size of military health care facilities, the cases vary how the MHSS structures health plans using MTFs and civilian providers. The current system, with its managed-care reforms, employs a structure that is retained in the second ("maximum military") case—one that combines in one or more health plans both MTFs and civilian providers, with care from the latter financed through a health-insurance program like CHAMPUS. The reform programs introduce a second health plan that beneficiaries may choose instead of the traditional option. This managed-care option combines MTFs with a much smaller civilian provider network, manages patients more aggressively, and offers beneficiaries enhanced benefits in return for more restricted provider choice. The third ("minimum military") case replaces this structure with civilian health plans for non-active-duty beneficiaries. The fourth case would allow beneficiaries to choose between an MTF-based plan and one or more commercial civilian plans. In this case, the MTFs are converted to military HMOs that are responsible for providing all care to enrolled beneficiaries either through their own staffs or through civilian

Table 4

Health Plan Options Across the Analytic Cases

Case	Health Plan Options
1. Managed-care (baseline case)	In hospital catchment areas and most clinic service areas: the current MTF/CHAMPUS system with a managed-care enrollment option in all catchment areas
	In other areas: CHAMPUS
2. Maximum MTF	Same as case 1, but with more military hospitals, expanded beds at military hospitals that are particularly short, and expanded staffing at most hospitals
3. Minimum MTF	For active duty: direct provision of care at or through MTFs, many of which would be primary care clinics
	For other beneficiaries: commercial health plan(s)
4. Military-civilian competition	In hospital catchment areas and some clinic service areas: beneficiaries choose an MTF-based HMO or commercial plan. MTFs arrange all medical services for their enrollees and provide no services for commercial plan enrollees
	Outside these areas: beneficiaries choose a commercial plan.

contractors. Beneficiaries have the choice of enrolling in this military HMO or in a commercial health care plan. This case therefore places MTFs in direct competition for beneficiary enrollment with the civilian market, which is not true of the first three cases. Although it was developed before the President's health reform plans, this case generally describes the choices military beneficiaries are expected to have when national health reform is implemented.

Base closures and personnel drawdowns will continue to affect the MHSS until 1997 and possibly beyond. In light of these ongoing changes, we have specified two versions of the cases. The first is based on the current MTF system and beneficiary population, and the second incorporates the changes expected in both of these variables by 1997.[1]

The remainder of this section describes each of the cases in sufficient detail to support a broad analysis. Obviously, many details that would be necessary to actually implement the changes outlined in these cases are omitted by the scope of this report.

[1]We based the 1997 estimates on planned base closures and the recent DoD "bottom-up review."

The Current Managed-Care Case (#1)

As was described in Sec. 2, DoD is gradually implementing a managed-care program that is based on the CRI model.[2] This program would offer beneficiaries the choice of (1) the standard MTF/CHAMPUS plan along with an optional PPO that would offer discounts for beneficiaries who chose selected civilian providers or (2) an HMO that would combine military and selected civilian providers.[3] In addition to offering lower-cost shares, the HMO plan would cover some additional services (e.g., adult preventive care). The proposed benefit package for the two plans is shown in Table 5.

Other key components of the current managed-care case include:

- Assignment of beneficiaries who choose the HMO to a primary care provider who serves as a "gatekeeper" to specialty care.

Table 5

Overview of Current Managed-Care Benefits for Civilian Care

	Active-Duty Dependents		Retirees and Dependents
	Jr. Enlisted	Other	
Standard plan			
Annual premium	$0	$0	$0
Deductible	$50/person; $150/family	$100/person; $300/family	$100/person; $300/family
Outpatient copayment	20%	20%	25%
Inpatient copayment	$9.30/day or $25[a]	$9.30/day or $25[a]	25% or $265/day[b]
Enrollment option			
Annual premium	0	$35/person; $70/family	$50/person; $100/family
Deductible	0	0	0
Outpatient clinic fee	$5/visit	$10/visit	$15/visit
Inpatient copayment	$9.30/day or $25[a]	$9.30/day or $25[a]	25% or $125/day[b]

[a]Whichever is larger.
[b]Whichever is less.

[2]In reality, this alternative would also incorporate capitation budgeting, which is currently being implemented. Until recently, most MTF resources have been allocated based on the MTFs' workloads during the previous year. OSD has directed that in FY94 all MTFs receive a budget based on the number of MHSS users they serve. If strictly enforced, capitation budgeting should alter future utilization patterns and costs in this alternative. However, we have not incorporated capitation budgets because at this early stage we would be guessing at the changes that would occur. In the final version of the report, we will indicate how we expect capitation budgeting might affect our results.

[3]Actually, beneficiaries would automatically be enrolled in the first option unless they voluntarily enrolled in the HMO.

- A health care "finder service" that refers enrolled patients in need of specialized care to the most cost-effective providers and that may provide general referral information to nonenrolled patients.
- Quality assurance (QA) and utilization review (UR) programs to ensure that the care provided is appropriate, of high quality, and delivered in the most cost-effective setting.

The managed-care plan would be provided at 117 hospitals at the end of 1992 and at the 101 military hospitals that will remain open after BRAC 3 in 1997. Table 6 lists these hospitals. The managed-care plan might also be offered in areas served by a number of outlying military clinics. However, a managed-care plan may be impractical in some of these clinic areas, and there are insufficient data for predicting the costs for managed-care programs in clinic areas. In areas without an MTF, we have assumed that this case would offer only the standard plan.

The Maximum-MTF Case (#2)

The maximum-MTF case has the same basic structure and benefit package as that defined for the managed-care case, but features an expanded number of military hospitals and an increase in the size and staffing of existing military hospitals. To lend practicality to this case, we established a minimum-size criterion for adding new hospitals: that the catchment-area beneficiary population must support at least 70 beds.[4] In determining where to add facilities, we considered:

- The size of the non-Medicare beneficiary population. We determined that roughly 1.5 beds per 1,000 beneficiaries represented a reasonable planning factor for determining hospital size.[5]

[4]Inasmuch as the research literature on hospital economies of scale inadequately adjusts for patient mix and other cost factors, it is difficult to determine whether small hospitals are in fact inefficient. However, we decided not to consider very small hospitals because the literature does suggest that quality improves with volume in hospitals, and it seemed unlikely that constructing small hospitals serving few beneficiaries would appreciably decrease MHSS costs. See Luft et al. (1979), Luft (1980), and Keeler et al. (1992).

[5]HMOs typically use fewer than 2 beds per 1,000 enrollees. The estimate of 2 beds per 1,000 is compatible with the assumptions that the population under 65 years of age uses 350 hospital days per year per 1,000 enrollees and that the population 65 or older uses 2,430 days per 1,000; see Kronick et al. (1993). By way of comparison, in 1990 the military operated about 1.7 beds per 1,000 non-Medicare beneficiaries. To calculate this figure, we used workload by beneficiary category to allocate 85 percent of the MTFs' 14,000 beds to this population. Hospitals with 70 or more beds that are not medical centers operated 1.5 beds per 1,000 (with an interquartile range of 1.3 to 1.8). Given our principal interest of adding facilities of this type, we used 1.5 beds per 1,000 non-Medicare beneficiaries as our planning factor.

Table 6

Military Hospitals for the Managed-Care Case

Hospital	Year 92	Year 97	Hospital	Year 92	Year 97	Hospital	Year 92	Year 97
Redstone Arsl, AL	H	H	Patrick AFB, FL	H	H	Ft. Bragg, NC	H	H
Ft. McClellan, AL	H	H	Ft. Gordon, GA	H	H	Seymour Jnsn, NC	H	H
Ft. Rucker, AL	H	H	Ft. Benning, GA	H	H	Camp Lejeune, NC	H	H
Maxwell AFB, AL	H	H	Ft. Stewart, GA	H	H	Cherry Point, NC	H	H
Ft. Wainwright, AK	H	H	Moody AFB, GA	H	H	Grand Forks, ND	H	H
Elmendorf AFB, AK	H	H	Robins AFB, GA	H	H	Minot AFB, ND	H	H
Adak NH, AK	H	H	Ft. Shafter, HI	H	H	Wright-Patt, OH	H	H
Ft. Huachuca, AZ	H	H	Mountain Hme, ID	H	H	Tinker AFB, OK	H	H
Luke AFB, AZ	H	H	Chanute AFB, IL	H		Altus AFB, OK	H	H
Davis Monthan, AZ	H	H	Scott AFB, IL	H	H	Ft. Sill, OK	H	H
Little Rock, AR	H	H	Great Lakes, IL	H	H	Newport NH, RI	H	H
Travis AFB, CA	H	H	Ft. Ben Hrrsn, IN	H		Shaw AFB, SC	H	H
Beale AFB, CA	H	H	Ft. Riley, KS	H	H	Charlestn NH, SC	H	H
McClellan AFB, CA	H	H	Ft. Leavnwrth, KS	H	H	Beaufort NH, SC	H	H
Castle AFB, CA	H		Ft. Campbell, KY	H	H	Ft. Jackson, SC	H	H
Vandenbrg AFB, CA	H	H	Ft. Knox, KY	H	H	Ellswrth AFB, SD	H	H
Edwards AFB, CA	H	H	Barksdle AFB, LA	H	H	Millingtn NH, TN	H	H
March AFB, CA	H	C	Ft. Polk, LA	H	H	Ft. Bliss, TX	H	H
Presidio, CA	H	C	Loring AFB, ME	H		Ft. Sam Hstn, TX	H	H
Ft. Ord, CA	H	C	Andrews AFB, MD	H	H	Ft. Hood, TX	H	H
Camp Pendletn, CA	H	H	Bethesda NH, MD	H	H	Reese AFB, TX	H	H
Long Beach NH, CA	H	C	Patuxent Rvr, MD	H	H	Dyess AFB, TX	H	H
Oakland NH, CA	H	C	Ft. Meade, MD	H	H	Sheppard AFB, TX	H	H
Lemoore NH, CA	H	H	Ft. Devens, MA	H	C	Laughlin AFB, TX	H	H
San Diego NH, CA	H	H	K.I. Sawyer, MI	H		Bergstrm AFB, TX	H	
29 Palms, CA	H	H	Keesler AFB, MS	H	H	Carswell AFB, TX	H	
Ft. Irwin, CA	H	H	Columbus AFB, MS	H	H	Lackland AFB, TX	H	H
Fitzsmmns AMC, CO	H	H	Ft. Leonrd Wd, MO	H	H	Corpus Chsti, TX	H	H
Ft. Carson, CO	H	H	Whiteman AFB, MO	H	H	Hill AFB, UT	H	H
USAF Academy, CO	H	H	Offutt AFB, NE	H	H	Langley AFB, VA	H	H
Groton NH, CT	H	H	Nellis AFB, NV	H	H	Ft. Eustis, VA	H	H
Dover AFB, DE	H	H	Ft. Monmouth, NJ	H	H	Ft. Lee, VA	H	H
WR-Washington, DC	H	H	McGuire AFB, NJ	H	H	Ft. Belvoir, VA	H	H
Pensacola NH, FL	H	H	Kirtland AFB, NM	H	H	Portsmouth, VA	H	H
Jacksonville, FL	H	H	Holloman AFB, NM	H	H	Ft. Lewis, WA	H	H
Orlando NH, FL	H	C	Cannon AFB, NM	H	H	Bremerton NH, WA	H	H
Eglin AFB, FL	H	H	West Point, NY	H	H	Oak Harbor, WA	H	H
Tyndall AFB,FL	H	H	Plattsburg, NY	H		Fairchld AFB, WA	H	H
MacDill AFB, FL	H	H	Griffiss AFB, NY	H	C	FE Warrn AFB, WY	H	H

NOTE: An "H" means hospital, while a "C" means clinic only.

- Providing the military hospitals enough capacity to allow Medicare beneficiaries the same MTF access that they currently enjoy. This access varies significantly with the service and with the size of the military hospitals; we added 1.9 beds per 1,000 Medicare beneficiaries, the average for DoD's midsize hospitals.[6]
- Increasing the physician-to-bed ratio for most hospitals up to the 90th-percentile level.

These factors imply that we would establish new hospitals in areas where at least 47,000 noncatchment, non-Medicare military beneficiaries are located within a 40-mile catchment area, with a smaller threshold in cases where Medicare beneficiaries require a significant number of beds. We found seven areas in which the beneficiary numbers in the late 1990s will meet this criterion, as shown in Table 7. With the exception of Atlanta, the one area that qualified for the addition of a military hospital in 1992, all of these areas are served by military hospitals that will be closed between 1992 and 1997. The areas that fall just below our criterion in 1997 are New York, New York (54 beds), Miami, Florida (49 beds), Harrisburg, Pennsylvania (44 beds), New Orleans, Louisiana (43 beds), Austin, Texas (43 beds), and Monterey, California (40 beds).

Table 7

Added Military Hospitals in Maximum-MTF Case

			Beds Required				
					Non-Medicare		
City	St.	Hospital	Total	Medicare	Active Duty	Active-Duty Dependents	Retirees/ Dependents
1997							
Los Angeles	CA	West L.A. VA	122	38	15	22	47
San Bernardino	CA	March AFB	85	30	4	6	45
San Francisco	CA	Presidio	74	30	6	7	31
Orlando	FL	Orlando NTC	82	33	2	2	45
Atlanta	GA	Ft. McPherson	83	20	6	14	43
Boston	MA	S. Boston VA	86	23	12	18	33
Dallas	TX	Carswell AFB	99	26	3	6	64
1992							
Atlanta	GA	Ft. McPherson	99	19	9	22	49

[6]In FY90, medium-size MTFs averaged 1.3 occupied beds per 1,000 Medicare beneficiaries, with the interquartile range running from 0.8 to 3.1 (Navy MTFs averaged considerably fewer beds occupied by Medicare beneficiaries than Army and Air Force MTFs). On average, the medium-size MTFs averaged 0.69 bed occupied per operating bed. Dividing the 1.3 by the 0.69 yields the required number of beds per 1,000 Medicare beneficiaries.

In some cases, MTFs might also be expanded to better serve the beneficiary populations. We expanded MTFs if they met the following criteria: (1) if the beneficiary population could support at least 70 beds; (2) if a substantial expansion of the MTF is indicated, i.e., the capacity needed for the non-Medicare population must be at least half again the current capacity; and (3) if the catchment area did not noticeably overlap with that of another MTF.[7] We used the criterion of 1.5 beds per 1,000 non-Medicare beneficiaries to determine which hospitals to add or expand, but we also included 1.9 beds per 1,000 Medicare beneficiaries in establishing the number of beds for each of these hospitals. Table 8 shows these bed criteria.[8] The resulting list of hospitals warranting expansion totals 16 in 1992 and 13 in 1997, as shown in Table 9 (where the category of "beds required" includes both non-Medicare and Medicare beds).

We also examined the current staffing at the military hospitals and determined that there were substantial variations in full-time equivalents (FTEs) per operating bed. Many hospitals might well be better able to serve military beneficiaries if their physician levels were simply increased. We decided to increase the FTEs per bed up to the 90th-percentile level, which in FY92 was 1.2 FTEs per bed in small hospitals and 0.9 FTE per bed in medium-size hospitals and medical centers.

In developing this case, we also considered increasing the number of military clinics located in noncatchment areas. In FY92, there were 74 of these clinics. Using a criterion of at least 5,000 military beneficiaries within a 20-mile service

Table 8

FY90 Bed Requirements per 1,000 Medicare Beneficiaries

	Medium-Size MTFs			Medical Centers		
Service	Beds Occupied	Avg. Census	Beds Reqd.	Beds Occupied	Avg. Census	Beds Reqd.
Army	2.5	82%	3.0	8.2	81%	10.0
Air Force	1.6	67%	2.4	8.0	69%	11.6
Navy	0.6	55%	1.15	2.8	62%	4.5

[7]Both Fort Belvoir and Fort Meade would otherwise be on the expansion list, but many of the beneficiaries from their catchment areas actually receive care at either Walter Reed Army Medical Center or Bethesda Naval Hospital, and this pattern would likely continue even if Fort Belvoir's and Fort Meade's operating capacities were expanded.

[8]We used the average bed usage per 1,000 Medicare beneficiaries rather than current usage at the specific facilities because as these facilities expand, we would expect them to provide a wider range of medical specialists and thus to require that fewer Medicare beneficiaries be referred to other MTFs (especially medical centers).

Table 9

Military Hospitals with Likely Expansion Requirements

Hospital	St.	Current Operating Beds	Beds Required: Medical Center	Beds Required: Other	Beds Required: Total	Expanded Wartime Beds
1997						
Luke AFB	AZ	55	29	77	106	190
Travis AFB	CA	220	241	111	352	480
McClellan AFB	CA	35	28	73	101	106
Camp Pendleton	CA	128	50	195	245	624
San Diego NH	CA	393	273	381	654	764
MacDill AFB	FL	55	53	92	145	150
Patrick AFB	FL	15	23	49	72	83
Scott AFB	IL	115	78	68	146	422
Offutt AFB	NE	50	6	70	76	123
Nellis AFB	NV	35	12	66	78	50
McGuire AFB	NJ	36	31	100	131	617
Tinker AFB	OK	25	13	62	75	90
Ft. Hood	TX	126	8	174	182	1770
1992						
Luke AFB	AZ	55	32	63	95	190
Davis Mon AFB	AZ	35	19	53	72	112
McClellan AFB	CA	35	31	83	115	106
March AFB	CA	80	31	81	111	190
Long Beach	CA	120	30	166	196	692[a]
MacDill AFB	FL	55	59	111	170	150
Patrick AFB	FL	15	25	52	77	83
Scott AFB	IL	115	69	89	158	422
Ft. Devens	MA	35	35	70	106	116[a]
Offutt AFB	NE	50	7	74	81	123
Nellis AFB	NV	35	16	76	91	50
McGuire AFB	NJ	36	43	101	145	617
Ft. Bragg	NC	206	61	222	283	400
Tinker AFB	OK	25	15	74	89	90
Ft. Eustis	VA	42	11	66	78	100
Ft. Lee	VA	52	16	56	73	121

[a]Numbers from 1988.

area, we identified 41 additional locations for military clinics. However, for reasons discussed in the next section, we did not include the added clinics in the final version of this case.

The Minimum-MTF Case (#3)

The minimum-MTF case attempts to shift as many military beneficiaries as possible to civilian health care while retaining the military's capacity to perform its wartime medical mission. The facilities and staff required for the wartime

mission are employed in peacetime to provide primary care for active-duty personnel. Since active-duty workloads may be inadequate to fill the facilities and maintain the skills of military personnel, this case incorporates strategies for employing any excess capacity.

Civilian Health Plans

In this case, DoD would select from among the large number of civilian health plans available within the United States. Although some plans combine features from more than one type, these are of three major types:

- Fee-for-service plans, which historically have dominated the civilian market. These plans cover services obtained from any health care provider, with payment made according to the nature and extent of the services provided. Today, most FFS plans incorporate some managed-care features, such as prior authorization for hospital treatment.
- Preferred-provider organization plans, which modify FFS plans by establishing a network of providers who negotiate discounted payment rates and agree to submit their treatment decisions to utilization review. Most PPOs are "point of service"—that is to say, plan members may elect to use a network or a nonnetwork provider at the point of service. If members do elect to use the network, the plan usually pays a higher fraction of the cost and may cover some services that would not otherwise be covered.
- Health maintenance organization plans that were developed many years ago. The key feature of an HMO resides in its payment mechanism; unlike FFS and PPO plans, payment is per capita (per patient) rather than per service, and the patient's choice of provider is limited. There are two major types of HMOs. The first, independent practice associations (IPAs), contract with physicians in private practice; primary care physicians (e.g., family practitioners and pediatricians) receive a per-capita payment, and specialists and hospitals are paid per service. The second, group-model and staff-model HMOs, effectively employ their own providers and usually maintain hospitals. These two types of HMOs differ only in the way their providers are organized.

As Figure 12 shows, PPOs enjoy a large share of the civilian market. FFS plans are available everywhere, but PPOs and HMOs are not found in rural areas or even in some small cities. DoD could, however, encourage PPOs and HMOs to

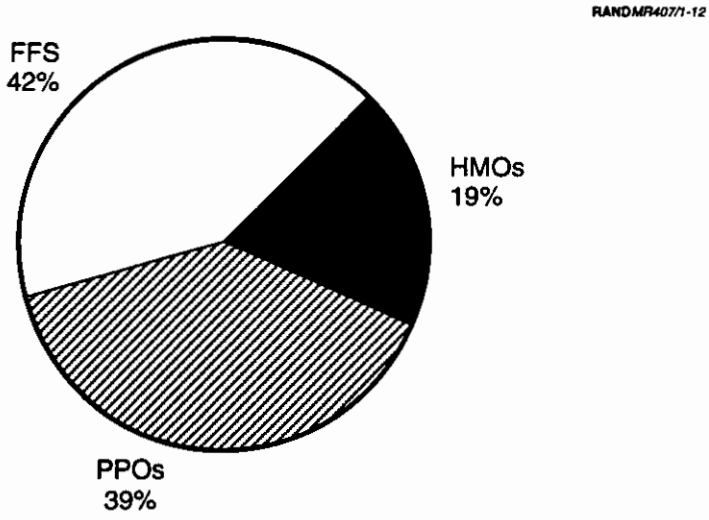

Figure 12—Shares of the Current Civilian Health Care Market

operate in areas with sizable military populations, and these plans are likely in any event to spread with national health reform.

Benefit Package

Under the minimum-MTF case, active-duty personnel would continue to receive free comprehensive care at or through military facilities. The benefits for other beneficiaries would depend on the type of civilian plan chosen. This case was specified to be consistent with the current MHSS benefit package. FFS plans are assumed to require the same cost sharing and to cover the same services that CHAMPUS does now. As in CRI and the FI-PPO program, use of an optional PPO in these plans would lower the coinsurance rate by five percentage points. HMO plans would have the same benefits as the managed-care enrollment option in cases 1 and 2; this would mean that standard HMO packages would have to be modified, particularly to expand mental health benefits.[9]

MTFs Needed to Meet Wartime Requirements

We define two options for meeting the wartime military bed requirement in the United States. In the first option (reception and referral), military facilities would serve as reception facilities for casualties being returned to the United States,

[9]National health reform would lead to changes in the benefit packages in civilian plans and probably in the MHSS as well.

provide some casualties with additional treatment, and refer the remainder to civilian or Veterans Administration hospitals. This option would maintain six military hospitals to fulfill this requirement, all located near military airlift bases and balanced both geographically and along service lines, as shown in Table 10.[10] We also assume that Dover will remain a major airlift base on the East Coast, but since its hospital is so small, we have added Walter Reed as the major medical center close to Dover to provide in-depth reception ability. In neither list are the hospitals definitive; if others were chosen instead, however, there would be little change in the analysis.

The second option (military care) provides a sufficient number of military hospitals to meet the wartime bed requirements for CONUS care within the expanded bed capacities of the hospitals;[11] these hospitals are also distributed across the United States to allow recovering casualties to be as close to family members as possible. The list of hospitals in Table 10 generally includes newer and better-equipped facilities.[12] The 1992 and 1997 versions of this case include the same list of hospitals.

Under this concept, the 11 hospitals identified in Table 10 would provide most of the care for active-duty personnel in their catchment areas and would likely expand the services they provide to military personnel from other areas. In addition, as discussed below, they could provide care for non-active-duty beneficiaries under contract to the civilian health plans that cover these beneficiaries. At other military bases that now have military hospitals (listed in Table 11), only a clinic facility would be retained to care for active-duty personnel.

In setting up this case, we required that an outlying clinic have a noncatchment population of 1,600 active-duty personnel to remain open.[13] This would mean closing 57 of the 74 outlying clinics existing in FY92.

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[10]Bethesda Naval Hospital is not included in either of the options. Although the capabilities of this facility cannot be disputed, there does not appear to be a wartime need for two medical centers in the Washington, D.C., area.

[11]The overall DoD requirement is somewhat less than the service-specific bed requirements because the timing of the service requirements differs among services. The Army and Navy totals from this list are somewhat less than their service-specific requirements given the lower DoD total.

[12]An even more radical option would be to ignore the service-specific bed requirements and simply choose the best military hospitals regardless of their service. Such an approach would yield only a few changes from the list in Table 10.

[13]In some cases, we list a clinic even though DEERS does not show the required number of personnel because current active-duty workloads suggest that the population estimates are in error.

Table 10

Military Hospitals, Minimum-MTF Case

Reception-and-Referral		Military Care	
Hospital	St.	Hospital	St.
San Diego NH	CA	San Diego NH	CA
Dover AFB	DE	WRAMC-Washington	DC
WRAMC-Washington	DC	Jacksonville NH	FL
Lackland AFB	TX	Ft. Shafter	HI
Portsmouth NH	VA	Ft. Campbell	KY
Ft. Lewis	WA	Ft. Bragg	NC
		Camp Lejeune	NC
		Ft. Hood	TX
		Lackland AFB	TX
		Portsmouth NH	VA
		Ft. Lewis	WA

Employing Excess MTF Capacity and Sustaining the MTF's Case Mix

The minimum-MTF case considers a substantial reduction in the size of the military system and, as a result, raises additional issues. An important issue is: To what degree would military hospitals need other than local, active-duty patients to fill their capacity in peacetime?

In FY92, the eleven hospitals in the military-care option admitted about 224,000 patients, while the six hospitals in the reception-and-referral option admitted over 135,000 patients. In each case, about 28 percent of the admissions were active-duty personnel—not a sufficient number to sustain the staffing of these hospitals. They would clearly require a significant number of other patients. While some would argue that the roughly 200,000 active-duty hospitalizations in 1992 would fill the military hospitals in the reception-and-referral option and nearly fill them in the military-care option, such an approach would lead to the wrong case mix for the physicians required in wartime and would involve tremendous costs of moving large numbers of military personnel around the United States. We therefore reject such an approach as inefficient and likely to generate excessive costs.

To provide workload and the right case mix, this case assumes that DoD's contracts with civilian health plans would require that they reimburse for services provided in MTFs and that their managed-care plans refer to the MTFs to fill capacity. Versions of both provisions already exist. Military hospitals are reimbursed by private insurance for military patients with such insurance and for nonmilitary patients, although collecting from the many private plans is

Table 11

Military Hospitals Converted to Clinics in the Minimum-MTF Case

Clinic	Year 92	Year 97	Clinic	Year 92	Year 97	Clinic	Year 92	Year 97
Redstone Arsl, AL	C	C	Ft. Gordon, GA	C	C	Griffiss AFB, NY	C	
Ft. McClellan, AL	C	C	Ft. Benning, GA	C	C	Ft. Bragg, NC*	C	C
Ft. Rucker, AL	C	C	Ft. Stewart, GA	C	C	Seymour Jnsn, NC	C	C
Maxwell AFB, AL	C	C	Moody AFB, GA	C	C	Cmp Lejeune, NC*	C	C
Ft. Wainwright, AK	C	C	Robins AFB, GA	C	C	Cherry Point, NC	C	C
Elmendorf AFB, AK	C	C	Ft. Shafter, HI*	C	C	Grand Forks, ND	C	C
Adak NH, AK	C	C	Mountain Hme, ID	C	C	Minot AFB, ND	C	C
Ft. Huachuca, AZ	C	C	Chanute AFB, IL	C		Wright-Patt, OH	C	C
Luke AFB, AZ	C	C	Scott AFB, IL	C	C	Tinker AFB, OK	C	C
Davis Monthan, AZ	C	C	Great Lakes, IL	C	C	Altus AFB, OK	C	C
Little Rock, AR	C	C	Ft. Ben Hrrsn, IN	C		Ft. Sill, OK	C	C
Travis AFB, CA	C	C	Ft. Riley, KS	C	C	Newport NH, RI	C	C
Beale AFB, CA	C	C	Ft. Leavnwrth, KS	C	C	Shaw AFB, SC	C	C
McClellan AFB, CA	C	C	Ft. Campbell, KY*	C	C	Charlestn NH, SC	C	C
Castle AFB, CA	C		Ft. Knox, KY	C	C	Beaufort NH, SC	C	C
Vandenbrg AFB, CA	C	C	Barksdle AFB, LA	C	C	Ft. Jackson, SC	C	C
Edwards AFB, CA	C	C	Ft. Polk, LA	C	C	Ellswrth AFB, SD	C	C
March AFB, CA	C		Loring AFB, ME	C		Millingtn NH, TN	C	C
Presidio, CA	C		Andrews AFB, MD	C	C	Ft. Bliss, TX	C	C
Ft. Ord, CA	C		Bethesda NH, MD	C	C	Ft. Sam Hstn, TX	C	C
Camp Pendletn, CA	C	C	Patuxent Rvr, MD	C	C	Ft. Hood, TX*	C	C
Long Beach NH, CA	C		Ft. Meade, MD	C	C	Reese AFB, TX	C	C
Oakland NH, CA	C		Ft. Devens, MA	C		Dyess AFB, TX	C	C
Lemoore NH, CA	C	C	K.I. Sawyer, MI	C		Sheppard AFB, TX	C	C
29 Palms, CA	C	C	Keesler AFB, MS	C	C	Laughlin AFB, TX	C	C
Ft. Irwin, CA	C	C	Columbus AFB, MS	C	C	Bergstrm AFB, TX	C	
Fitzsmmns AMC, CO	C	C	Ft. Leonrd Wd, MO	C	C	Carswell AFB, TX	C	
Ft. Carson, CO	C	C	Whiteman AFB, MO	C	C	Corpus Chsti, TX	C	C
USAF Academy, CO	C	C	Offutt AFB, NE	C	C	Hill AFB, UT	C	C
Groton NH, CT	C	C	Nellis AFB, NV	C	C	Langley AFB, VA	C	C
Dover AFB, DE**	C	C	Ft. Monmouth, NJ	C	C	Ft. Eustis, VA	C	C
Pensacola NH, FL	C	C	McGuire AFB, NJ	C	C	Ft. Lee, VA	C	C
Jacksonville, FL*	C	C	Kirtland AFB, NM	C	C	Ft. Belvoir, VA	C	C
Orlando NH, FL	C		Holloman AFB, NM	C	C	Bremerton NH, WA	C	C
Eglin AFB, FL	C	C	Cannon AFB, NM	C	C	Oak Harbor, WA	C	C
Tyndall AFB,FL	C	C	West Point, NY	C	C	Fairchld AFB, WA	C	C
MacDill AFB, FL	C	C	Plattsburg, NY	C		FE Warrn AFB, WY	C	C
Patrick AFB, FL	C	C						

*These MTFs are clinics only in the "reception-and-referral" option.
**These MTFs are clinics only in the "military-care" option.

difficult. A requirement to refer patients to the MTFs when possible is included in current CRI contracts. Such an arrangement allows us to include the cost of any MTF care provided to non-active-duty beneficiaries in civilian plan rates.

The Military-Civilian Competition Case (#4)

The fourth case would offer most non-active-duty beneficiaries the choice of a military HMO plan based on the MTFs or one or more commercial health plans. All active-duty personnel would be enrolled in the military HMO if assigned to an MTF area; otherwise, they would receive care through small clinics as in the third case. MTFs would be responsible for all health care for beneficiaries who chose to enroll in the military plan, although some services would be provided by civilian providers at MTF expense. The MTFs' budgets for peacetime health care delivery would be based on a per-capita "payment" for each enrollee.

Non-active-duty beneficiaries who preferred civilian care would be offered one or more commercial plans (if possible, at least one HMO and one PPO and/or FFS plan). These beneficiaries would receive all of their care through the commercial plan they chose, and they would not be eligible for any care at the MTF. In areas where the military plan could not be offered, only commercial plans would be available.[14] All beneficiaries would receive health care only within the plan they chose, with no health care provided outside the enrolled plan.[15] CHAMPUS would be terminated.

We assumed the different plans in this case would have benefits (e.g., deductibles, copayments, coverages) similar to those of current plans:

- Military HMO: the benefits offered in CRI Prime (the HMO option),
- FFS plans: current CHAMPUS benefits,
- Civilian HMOs: the benefits offered in HMOs available through the Federal Employees Health Benefits Plan.

If military beneficiaries are ever given a direct choice between military and civilian health plans, premiums will be the most direct policy tool for ensuring sufficient enrollment in the military plan to fill MTF capacity. Therefore, in this case we varied the premium contribution beneficiaries would have to pay for these plans to see how differential premium costs might affect enrollment in the military HMO. We considered two premium structures: equal premiums for all

[14]Some beneficiaries in noncatchment areas, especially those living just beyond catchment-area boundaries, may prefer enrollment in an MTF HMO rather than one of the civilian options. Although the analysis could consider such a choice as a variant of this basic alternative design, it would affect costs only if there were a significant number of such beneficiaries and if the MTF plan were significantly more or less expensive than commercial plans.

[15]DoD could ensure that all active-duty dependents are covered by mandating a default enrollment choice for all eligible dependents; this requirement could be waived for those who offer proof of private insurance coverage. With national health reform, DoD might collect premium contributions from private employers and even contribute the premium for employer plans.

plans (either none or about 20 percent of the typical plan's cost) and premiums only for civilian plans (again, about 20 percent).

The per-capita cost of care in the military HMO would depend on the level of utilization by enrollees. As we described in Section 3, current utilization levels for military beneficiaries are high. Reorganizing the MTFs to operate like the most cost-effective civilian HMOs would lower inpatient utilization levels in particular. Alternatively, the military plans might require enrollees to pay a share of the costs of their care, forgoing the tight utilization controls associated with an HMO. To explore the cost implications of these different approaches, we estimated three sets of utilization rates for military HMO enrollees, based on: (1) current utilization by the military population, (2) civilian HMO utilization, and (3) utilization under cost-sharing arrangements.

For this case, the MTF hospitals will be as specified in Table 6 for case 1. All military clinics would remain open to treat active-duty personnel, but we have not assumed that they would offer the HMO plan. Conceivably, some of these clinics could operate an HMO by directly providing primary care and either arranging for more specialized services within the MTF system or contracting with civilian providers for such services as civilian IPAs do now. However, our data were not adequate for estimating utilization and costs for clinic-based HMOs.

A Comparison of the Four Analytic Cases

Tables 12 and 13 show the number of MTFs and the proportion of the population who are expected to live near them in 1997. Figures 13–15 map the hospital catchment areas and clinic service areas in 1997.[16]

The managed-care case (Figure 13) would serve a large fraction of military beneficiaries in the United States. Most active-duty personnel and their dependents would live in areas with a hospital (Table 13).[17] Just over one-half of retiree and survivor families would live near an MTF. The military-civilian competition case assumes that some military hospitals continue to operate, but

[16]These figures assume that all catchment areas reach out 40 miles, whereas in reality catchment areas are defined by ZIP codes and may have a smaller radius based on physical barriers (such as rivers and bays), state boundaries, and overlaps with other catchment areas. In cases of overlaps, ZIP-code assignments sometimes vary by service; for example, naval personnel in Washington, D.C., are assigned to Bethesda Naval Hospital, whereas Army personnel are assigned to Walter Reed Army Medical Center.

[17]The fractions would be even higher if we were to include areas with a military clinic in Table 13—94 percent for active-duty personnel and 89 percent for their dependents.

Table 12

Estimated Number of MTFs Under Each Case

Case	1992 Hospitals	1992 Clinics	1997 Hospitals	1997 Clinics
1. Managed care	117	74	101	86
2. Maximum MTF	118	72	108	72
3. Minimum MTF				
a) Reception/referral	6	128	6	118
b) Military care	11	123	11	113
4. Military-civilian competition	117	30	101	40

Table 13

Percentage of Military Beneficiaries in 1997 Catchment/Service Areas

Case	Active Duty	Active-Duty Dependents	Retirees and Dependents
1. Managed care	87%	80%	57%
2. Maximum MTF	89%	83%	64%
3. Minimum MTF			
a. Reception/referral	25%	—	—
b. Military care	41%	—	—
4. Military-civilian competition	87%	80%	57%

NOTE: Percentages are shown for active-duty personnel only for case 3 because other beneficiaries are enrolled in civilian health plans and would get care from MTFs only through contract with their civilian plan.

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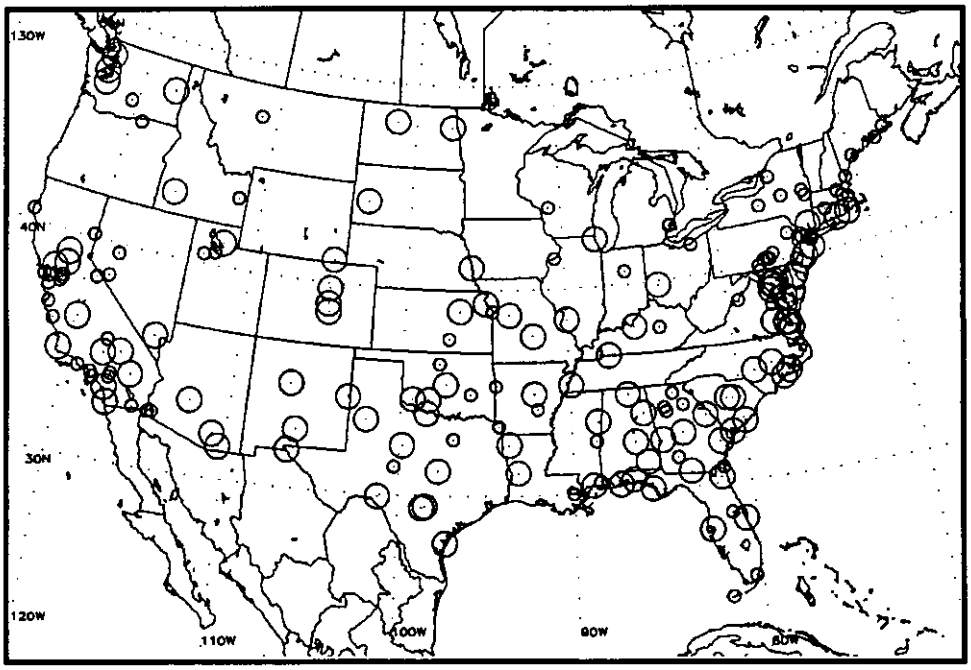

Figure 13—Locating 1997 MTFs for the Managed-Care and Military-Civilian Competition Cases

the clinics would serve only active-duty personnel. The MTFs in this case would cover essentially the same fraction of the active-duty population as the baseline case, but they would cover fewer non-active-duty beneficiaries. The maximum-MTF case (Figure 14) would have its greatest effect on the retired population and their dependents, raising the fraction who have access to a military hospital to almost two-thirds. The military hospitals retained in the minimum-MTF case (Figure 15) would serve only about 25 to 40 percent of active-duty personnel. However, with the added clinics the system would cover 90 percent in the United States (not shown)—only slightly less than the baseline managed-care case.

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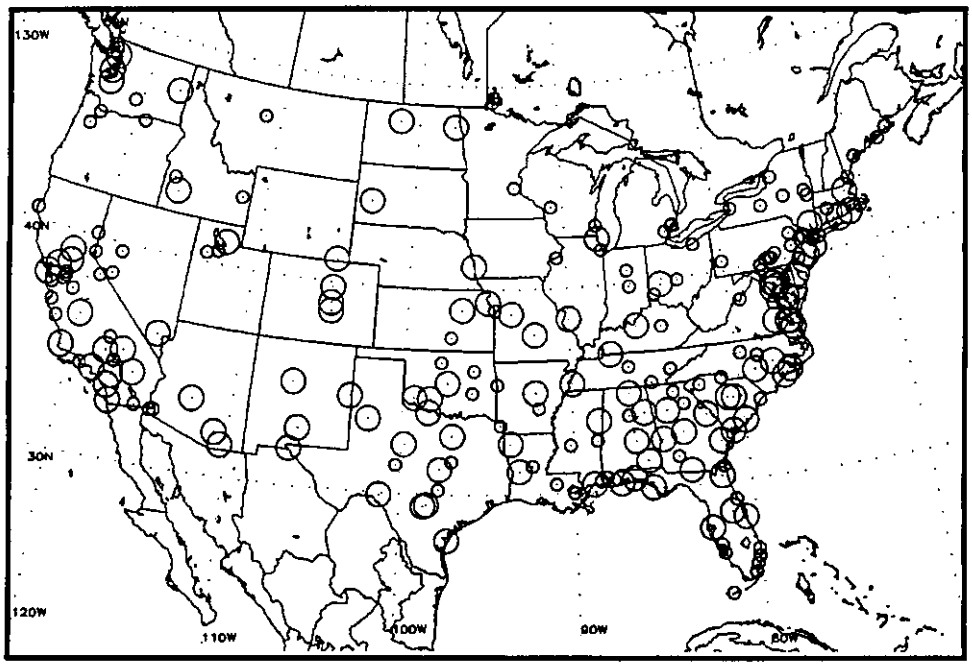

Figure 14—Locating 1997 MTFs for the Maximum-MTF Case

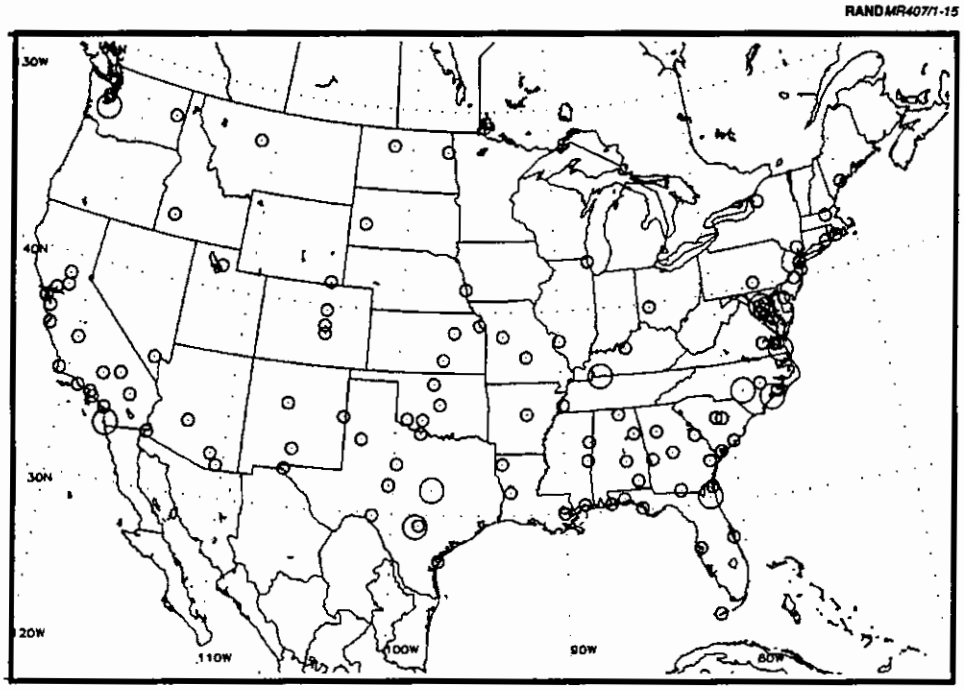

Figure 15—Locating 1997 MTFs for the Military-Care Option of the Minimum-MTF Case

5. The Effects of Changes in the MHSS on Health Care Demand

Military beneficiaries' demand for health care is determined by numerous factors (as we discussed in Section 3), including:

- Personal characteristics,
- Family characteristics,
- Local (military and civilian) health-system characteristics, and
- Health-plan characteristics.

Although these factors are the same as those that shape health care demand in nonmilitary populations, the precise effects of each factor may differ in the two populations. Within the military population, there would also appear to be demand differences across the services that are not explained by these factors.

To illustrate effects on military health care utilization, Table 14 shows how demand for health care on the part of retirees and their dependents (under age 65) varies with two of these factors—health status and MTF capacity. Health status is measured by the number of reported health conditions (0–2 versus 3 or more), and MTFs are categorized according to whether their operating beds per 1,000 beneficiaries are above or below the median for all MTFs. The table shows that MTF utilization is higher in areas with more MTF capacity in relation to the beneficiary population, whereas civilian utilization is lower. At the same time, utilization in both sectors is higher for less healthy beneficiaries. These data are based on the beneficiary sample surveyed for the study and are weighted to reflect the population of retirees and dependents under age 65 in the United States.

Our task was to predict the effects of changing a subset of these factors—e.g., the size of the MTF system, nationwide implementation of managed care, or offering a choice of current health plans and commercial plans—on health care utilization and civilian health care costs. To do this, we had to be able to estimate the effects of changing these factors while holding all other factors constant. As an example, consider the prediction of utilization and cost in a system with a larger MTF capacity. To simulate only the effect of expanding MTFs, we would need to hold constant health status and other factors that influence demand. To do so, we

Table 14

Average Health Care Utilization by Health Status and MTF Capacity, Retirees and Dependents Under Age 65 Living in U.S.

	Noncatchment areas	Catchment Areas: MTF Beds/1,000 Beneficiaries	
		1.34 & Under	Over 1.34
Healthier beneficiaries			
MTF visits	0.74	1.10	1.47
Civilian visits	1.40	1.05	0.79
Total MHSS visits	2.14	2.15	2.26
MTF hospital days	.007	.098	.295
Civilian hospital days	.083	.049	.070
Total MHSS days	.090	.147	.365
Less healthy beneficiaries			
MTF visits	0.82	2.62	3.21
Civilian visits	3.54	2.55	1.55
Total MHSS visits	4.36	5.17	4.76
MTF hospital days	.109	.232	.627
Civilian hospital days	.302	.185	.227
Total hospital days	.411	.417	.854

could construct average utilization rates by demand factor and beneficiary group, but sorting out all the important factors would require a very large table; for many of the cells, there would be insufficient data to measure utilization rates. Instead, we applied statistical methods to these data to accomplish the same purpose.

Methodology

Although the analytic methods we used were similar for all the analytic cases studied, such methods did differ depending on whether a given case was structured like the current MHSS—with MTFs and civilian health care financed by CHAMPUS (cases 1 and 2), or whether it incorporated commercial health plans as well (cases 3 and 4). This section first describes the methods we used to study cases based on the current system and then summarizes the results.[1] Our analysis involved the following four steps:

1. Structuring the analysis through the determination of the components of demand and the beneficiary groups to be analyzed;

[1]Our final report will include a second section that focuses on alternatives that encompass commercial health plans.

2. Development of measures of demand (utilization and cost) and of the factors that affect demand;
3. Estimation of demand equations for each demand component and beneficiary group that describe the independent effects of individual, family, and health-system factors on utilization and civilian care costs in the MHSS; and
4. Use of the equations derived in step 3 to predict utilization and civilian care costs in the analytic cases that represent alternative military health care systems.

The study's beneficiary survey served as the principal data source for this analysis. As described earlier, the survey was fielded during the winter and spring of 1992–1993 and provided information on about 16,000 active-duty, retiree, and survivor households eligible for military health care.[2] We augmented the survey data with information from CHAMPUS claims, the MEPRS and biometrics data systems, and the 1990 Area Resource File.

Structuring the Demand Analysis

The two "sectors" of the current MHSS—the MTFs and CHAMPUS—differ in the range of health services they cover, in the extent of beneficiary access, and in their cost both to beneficiaries and to DoD. Within each sector, beneficiaries may obtain outpatient care, measured in visits, as well as inpatient care, measured in hospital admissions. We further decomposed each of these four components of utilization—MTF visits, MTF admissions, CHAMPUS visits, and CHAMPUS admissions—into two components: the probability of having some utilization, and the level of utilization only for those beneficiaries who had some utilization. This decomposition of health care utilization into probability and level of use for outpatient and inpatient care is frequently used by health researchers. We similarly structured our analysis of CHAMPUS costs[3] in two parts: the probability of incurring nonzero CHAMPUS costs and the level of costs for those who had some costs. This structure resulted in ten components of demand.

As Table 15 shows, we conducted a full analysis for only eight of the ten components thus derived. Since very few beneficiaries are admitted to the hospital more than once per year, and since other studies have shown that the level of inpatient utilization is relatively unresponsive to demand factors, we did

[2]This excludes overseas populations, single active-duty personnel, and Reserve retirees. See Lurie et al. (1994) for more information regarding this survey.

[3]MTF costs are estimated by IDA in a separate report (Goldberg et al., 1994).

Table 15

Components of Demand Analyzed

MHSS Sector		Components
MTF	Utilization:	1. Probability of using any outpatient care
		2. For outpatient users only, number of visits
		3. Probability of using any inpatient care
CHAMPUS	Utilization:	1. Probability of using any outpatient care
		2. For outpatient users only, number of visits
		3. Probability of using any inpatient care
	Costs:	4. Probability of incurring any costs
		5. For those with costs, the level of costs

not attempt to analyze the number of admissions either in the MTFs or in CHAMPUS. Instead, this component of demand was held constant across the cases studied.

The demand analysis focused on active-duty dependents, retirees and their dependents, and survivors and their dependents living in the United States.[4] We assumed that because of the readiness mission, active-duty personnel would receive the same health care services they now obtain in all cases. Total active-duty utilization therefore varies only with the number of active-duty personnel. With the data available, an analysis of MTF utilization by beneficiaries living overseas, DoD's civilian employees, retired Reserve personnel, or other populations was not possible; hence the per-capita utilization rates of such personnel were also held constant across the cases.

The beneficiaries whom we studied were grouped as shown in Table 16 to accommodate differences in the structure of their health care demand. The analysis separated beneficiaries who live in MTF catchment areas from those in noncatchment areas because of the obvious difference in their access to MTF services. Further groupings differed for the MTF and CHAMPUS analyses. For MTF utilization, which we measured for individual beneficiaries, we grouped the catchment-area population according to CHAMPUS eligibility and age. Owing to their small sample size, the non-catchment-area population was studied in one group. In all instances, we assigned survey respondents to these groups according to the home ZIP code they reported in the survey rather than according to the location reported by DEERS.

[4]The 50 states and the District of Columbia.

Table 16

Population Groups Whose Demand Was Analyzed Separately

MTF Utilization
(unit of observation is the individual beneficiary)

	CHAMPUS Adult Eligibles	Children	Medicare Eligibles
Catchment Areas	I	II	III
Noncatchment Areas		IV	

CHAMPUS Utilization and Costs
(unit of observation is the family)

	Active-Duty Families	Retired Families
Catchment Areas	I	II
Noncatchment Areas	III	IV

For CHAMPUS utilization and cost, we had data for entire families, not just individuals. Our use of family-level data facilitated the analysis of civilian health costs in particular. Since costs are highly variable, they are difficult to predict with any precision; summing costs across family members allowed us to effectively increase the number of people being studied and decrease the proportion of the sample with zero costs. In addition, it was easier for us to match claims records to families, which is done by sponsor social security number, than to individuals, which also requires a series of difficult matches on sometimes inaccurate birthdate and sex information.[5]

The population of families with CHAMPUS-eligible members was grouped as shown in Table 16. Owing to the differences in CHAMPUS cost-sharing requirements, separate analyses were conducted for active-duty and retiree families in catchment areas; the sample in noncatchment areas was too small to separate the two family groups.

[5]Family-level analysis was not possible for MTF utilization because the survey asked for utilization by source of care only for a single family member.

Defining Measures of Demand and Factors Affecting Demand

Utilization and cost data were obtained from the self-reported survey data on MTF outpatient utilization and FY92 MTF inpatient records and CHAMPUS claims records for the survey respondents. We used a CHAMPUS hospital-episode file created by the Army's Directorate of Health Care Studies and Analyses, but we processed the outpatient claims ourselves. We defined a CHAMPUS outpatient visit for each same-patient/same-provider/same-day combination if the procedure codes indicated that an encounter with a provider had occurred. If only ancillary services had been provided, we did not define a visit. We summed costs from all hospital and professional inpatient claims and outpatient claims for each family and random family member.

Table 17 lists the variables that were included in the demand regressions as determinants of utilization and costs. Not all variables were included in every equation; for example, the MTF variables were not included in regressions for people living in noncatchment areas. In addition, some variables were deleted from some or all of the equations because they did not significantly affect demand. Education has elsewhere been shown to affect demand in other populations but did not do so in this population; the variable for officers (as opposed to enlisted personnel) includes the effects of education as well as other military-specific effects.

We did not include variables measuring premiums, deductibles, and copayment levels because there is little variation in cost sharing currently in the MHSS. We did identify those individuals who were subject to different cost-sharing arrangements through CRI and CAM. We did not include a variable indicating those with other insurance coverage because the decision to take such coverage is influenced by health care utilization. Instead, we included a variable indicating those who might have access to other insurance because someone in their family is employed on a full-time basis. Finally, the survey did not include a question about distance or travel time to the nearest MTF—an important factor in demand for care in the MTFs and CHAMPUS.

We defined many of these variables in an obvious manner from the survey information. However, some were obtained from other data sources or require additional explanation.

Table 17

Individual, Family, and Health Care Characteristics Included in Demand Regressions

Type	Variable
Individual characteristics[a]	Age
	Sex
	Number of reported health conditions
Family characteristics	Age of spouse or (if no spouse) sponsor[b]
	Sponsor is an officer
	Sponsor not affiliated with military service that operates MTF (catchment areas only)
	Sponsor (retired only) or spouse is employed full time
	Income
	Number of family members
	Enrolled in CRI Prime
	Living in CRI area but not enrolled
	Enrolled in Air Force CAM plan
	Living in Air Force CAM area but not enrolled
	Enrolled in Navy CAM plan
	Living in Navy CAM area but not enrolled
	Minimum health status for any family member[b]
MTF characteristics	Military service
	Operating beds per 1,000 military population in catchment area
	Clinical staff per operating bed
	County has military clinic that provides outpatient care (>1 visit per year) to non-active-duty beneficiaries[c]
Civilian health characteristics	Beds per 1,000 total population in county
	Physicians (active) per 1,000 total population in county

[a]MTF regressions only.
[b]CHAMPUS regressions only.
[c]Noncatchment areas only.

Individual Characteristics

We defined a number of age variables that capture the relationship between age and health care use shown in Figure 3. For all groups, we included a variable for age squared as well as for age. For regressions that included active-duty spouses, we also included a variable to indicate women of child-bearing age (18 to 34) because their use is high during these years. When we combined children and adults—e.g., in noncatchment areas—we defined different age variables for the two groups. We experimented with several ways of representing information on health conditions; we used a simple count of the number of conditions reported because it was effective in explaining demand and because it allowed us to keep the variable list short—an advantage for statistical reasons.

Family Characteristics

With the exception of the CRI and CAM enrollment variables, the family variables are straightforward. The survey question combined CRI's CHAMPUS Prime (the enrollment plan) and CHAMPUS Extra (the optional PPO) options in the same answer, but we wanted to identify just those who had enrolled in Prime. We also found that respondents who lived in CAM areas sometimes reported that they were enrolled in Prime, which happens to be the name of the Navy's enrollment plan as well. In addition, we modified the survey data to make them more consistent. If the ZIP code reported by the respondent was in a CRI area, we considered the family to be enrolled if (s)he reported that the family used CHAMPUS Prime/Extra. We included all of these people because doing so gave us enrollment rates that were very close to those reported by the CRI contractor at the time of the survey. If the ZIP code was in a CAM area, we considered the family to be enrolled if they reported use of either CHAMPUS Prime/Extra or the appropriate CAM program. As for CRI, the enrollment rates we obtained in this way were consistent with other information on enrollment.

MTF Characteristics

We used the MTF data available through the DMIS data systems with some modifications. Since the recorded number of operating beds was out of date for many MTFs, we replaced it with information collected more recently by Health Affairs. We also corrected the DEERS catchment-area population counts for the more important discrepancies described in Section 3. We used MEPRS MTF staffing data for FY92, combining the data for hospitals and clinics in the same catchment area and, where possible, deleting staffing in satellite clinics located outside catchment areas. We also combined several catchment areas that substantially overlapped; these included areas in and near the District of Columbia, San Antonio, and Colorado Springs.

For the noncatchment population, we determined whether areas were served by a military clinic by matching respondents to counties using reported ZIP codes and by identifying those counties with a military clinic. We deleted clinics that reported under one visit per non-active-duty beneficiary in the FY92 biometrics reports. We also explored the possibility of further differentiating areas with clinics that provide a higher level of service to these beneficiaries, but our sample proved too small to make this feasible.

Civilian Health Characteristics

Again using ZIP-code information, we matched respondents to county data on hospital beds, physicians, and population in the 1990 Area Resource File—the most recent data available in a single source.

Estimating Demand Equations

The structure developed in step 1 required that we estimate twelve MTF utilization equations (three components of demand for each of four groups of individual beneficiaries), twelve CHAMPUS utilization equations (the same three components for each of four groups of families), and eight CHAMPUS cost equations (two components of cost for the four family groups). Each equation quantifies the relationship between a component of utilization or cost and the factors—the independent variables in the equation—that determine that particular component. The equations are estimated separately using standard multiple regression techniques, as described more fully in Appendix C.

Predicting Utilization and Costs for the Analytic Cases

Utilization and costs for the analytic cases were generated from the demand equations. The first step lay in determining which demand factors would change in each case and how they would change. (The manner in which this was done for the expanded-MTF case is described below.) Then, for each individual or family in the survey sample, we substituted revised values for the variables that measure the factors that change. The updated variables were entered into the demand equations to obtain a prediction for each individual or family for each component of demand and, subsequently, for the utilization and cost measures of interest: MTF visits, MTF admissions, CHAMPUS visits, CHAMPUS admissions, and CHAMPUS costs. We estimated per-capita utilization and costs for the population by averaging the predictions for individuals (MTF) and families (CHAMPUS), weighting the survey sample so that it reflected the DoD population as a whole, not just survey participants. Finally, we estimated total utilization and costs by multiplying the per-capita averages for the population by the total number of individuals and families in the population.

The base case used in our analysis is the current military system with managed care—specifically a CRI-type program—in all catchment areas. Since 1988, the military health care system has adopted a number of reforms, the most important of which is managed care. Only a part of the system now has managed-care programs, but DoD is moving rapidly to expand CRI-like programs nationwide.

Since information about the expansion of managed care to noncatchment areas is limited, we did not attempt to estimate utilization and costs with managed care in these areas. As part of the regression analysis, the change in demand associated with managed care was estimated from the current CRI programs. However, since DoD plans some changes in future CRI programs, and to the extent that there is some uncertainty regarding our estimates of the effects even of the current CRI program, we also investigated the sensitivity of our results to the type of program we chose to simulate.

Although we sought to replicate as closely as possible DoD's immediate plans, our primary purpose in simulating nationwide implementation of managed care for case 1 (the "baseline" system) was technical: to keep other conditions the same when predicting the effects of the changes envisioned in case 2. Unless we simulated proportional increases in MTF capacity in all areas, we might otherwise "grow" managed-care areas more or less than "standard" areas and mistakenly attribute the results entirely to changes in case 2. Instead of CRI, we could have simulated a baseline case without managed care in any area. We chose to base case 1 on CRI because it is most similar to current DoD plans for the future. In addition, CRI has been tested in numerous catchment areas (instead of two currently for CAM), so our estimates of program effects are less likely to be affected by local circumstances unrelated to managed care.

The specific procedure used to predict utilization and costs for the analytic cases depended on the specific changes envisioned in each case. The following describes the procedures used for the expanded-MTF case. Like the base case, the expanded-MTF case incorporates managed care. In addition, as described in Section 4, it supposes an expanded version of the FY92 MTF system that included the following:

- A military hospital in Atlanta, Georgia;
- Expanded physical capacity (as measured by the number of operating beds) at 16 existing military hospitals; and
- Increased staffing levels at most hospitals.

Prediction of utilization and costs for this case required only limited changes in the variables in the demand equations. For example, we reassigned the beneficiaries in our sample who live in the Atlanta catchment area from the non-catchment-area group to the catchment-area group and assumed that they would have access to an MTF with operating beds and staff appropriate to the Atlanta catchment-area military population. Their utilization and costs are then predicted using catchment-area demand equations. Beneficiaries already living

in a catchment area stay in the same population group, and their utilization and costs are predicted using the demand equations for that group, but the variables that describe their MTF might change.

In both the baseline and expanded-MTF cases, we needed to incorporate the effects of expanding CRI to all catchment areas. We assumed that each active-duty dependent has a 35 percent probability, and each retiree and dependent a 26 percent probability, of enrolling in the managed-care plan; these are the enrollment rates reported in the survey for CRI populations. Each person's utilization (or cost) is predicted to be a weighted average of utilization if enrolled and utilization if not enrolled, with the enrollment probability used as the weight.

The final prediction step is a series of adjustments to the predictions. For MTF utilization, this step adds the predicted utilization for the population groups studied to the current utilization for the groups held constant or not studied—e.g., active-duty personnel and overseas beneficiaries. It also adjusts the predicted visits and admissions, derived from the survey data, to make them compatible with the data that are reported in MEPRS, and it allocates the utilization to the individual MTFs. The survey-MEPRS adjustment is necessary because IDA uses MEPRS data in estimating the cost functions that are applied to our utilization estimates to obtain MTF costs. Appendix D provides more information about these MTF utilization adjustments. CHAMPUS utilization is not adjusted, but CHAMPUS costs are inflated both to include claims processing and other overhead costs and to correct for any incompleteness.[6]

Effects of Demand Factors: Summary of Regression Results

To aid in understanding the utilization projections for the different analytic cases, we summarize here the effects of the variables listed above on past utilization, as reflected in the demand equations. Tables 18 to 20 indicate whether each factor increases or decreases each component of demand. The sample sizes, estimated coefficients, and standard errors for the regressions are reported in Appendix C.

[6]We estimated completed costs from the CHAMPUS Health Care Summary Report using the completion factor calculated by CHAMPUS for that report. We then multiplied our cost estimates by the percentage our estimate of current CHAMPUS costs differed from the adjusted CHAMPUS figure. Like the CHAMPUS reports, our data were incomplete.

Table 18

Summary of Regression Results for MTF Outpatient Visits and Hospital Admissions

	Catchment adults			Catchment children			Catchment Medicare			Noncatchment (all)		
	Visits		Adm.	Visits		Adm.	Visits		Adm.	Visits		Adm.
Variable	>0	no.	>0	>0	no.	>0	>0	no.	>0	>0	no.	>0
Age	+	(+)	(–)	(–)	–	–	–	+	(+)	(+)	–	(–)
Age squared	–	(+)	(+)	(–)	+	+				(–)	(+)	+
Retiree/dependent	–	–	(–)	(+)	–	–				–	(+)	(–)
Medicare eligible										+	+	(+)
Female retiree/dep.	+	+	–				(–)	+	–	+	(–)	(–)
Female age 18–34	+	+	(+)									+
Health status	+	+	+	+	+	+	(+)	+	+	+	+	
Officer	(+)	(–)		+	(–)		(+)	–	–	(–)	–	(–)
Not MTF's service	–	(+)	–	(+)	(+)	(–)	–	(+)	(–)			
Employed full time	–	–	–	–	(+)	+				(–)	–	(–)
Income	(+)	–	(–)	(+)	(–)	–				(–)	(+)	(+)
Income—retired	–	(–)	(–)	–	(–)		(–)	+	+	(+)	(–)	(–)
No. in family	+	+	(+)	+	+	(+)	–	–	–	–	–	(–)
CRI/enrolled			(+)			(+)						
AD dependents	(–)	(+)		(–)	–							
Retirees/others	(+)	(+)		(+)	(+)							
AF CAM/enrolled			(–)			(–)						
AD dependents	(–)	(+)		(–)	(–)							
Retirees/others	(–)	(+)		(+)	(–)							
Navy CAM/enrolled			(–)			(–)						
AD dependents	(+)	(–)		(–)	(–)							
Retirees/others	(+)	(–)		(+)	(–)							
Army vs. AF MTF	–	+	(+)	–	(+)	–	(+)	–	–			
Navy vs. AF MTF	–	(+)	(–)	–	(–)	–	–	(–)	–			
MTF beds/1000	+	+	(+)	+	+	+	+	(+)	+			
MTF MDs/bed	+	+	(+)	+	+	+	(–)	(+)	(+)			
Mil. clinic										+	–	(–)

NOTE: ( ) indicates that the coefficient is not statistically significant at the .05 level. Variables with no sign were not included in the regression.

Table 19

Summary of Regression Results for CHAMPUS Outpatient Visits and Hospital Admissions

	Catchment-area active duty			Catchment-area retired			Noncatchment areas (all)		
	Outpatient		Adm.	Outpatient		Adm.	Outpatient		Adm.
Variable	>0	no.	>0	>0	no.	>0	>0	no.	>0
Spouse/sponsor age	+	(+)	(-)	+	(-)	(+)	(+)	(+)	(+)
Sp. age squared	-	(-)	(+)	(-)	(+)	(-)	(-)	(+)	(-)
Fam. health status	+	+	+	+	+	+	+	+	+
Officer	+	+	(+)	+	+	(-)	+	+	+
Employed full time	(+)	+	-	-	(+)	(-)	+	(-)	(+)
Income	+	(+)	(-)	+	+	(+)	+	(+)	(+)
No. in family	+	+	+	+	(+)	+	+	+	(+)
CRI/enrolled	+	+	+	+	+	+			
CRI/standard	-	+	-	-	(+)	(-)			
AF CAM/enrolled	(+)	(+)	(-)	+	(-)	(+)			
AF CAM/standard	(-)	(-)	(-)	(+)	(+)	(-)			
Navy CAM/enrolled	+	(+)	(-)	(+)	(+)	(+)			
Navy CAM/standard	(+)	(-)	+	(+)	(+)	(-)			
Army vs. AF MTF	(-)	(+)	(+)	(-)	(-)	(+)			
Navy vs. AF MTF	+	+	+	+	+	(+)			
MTF beds/1000	-	-	-	-	-	-			
MTF MDs/bed	-	-	-	-	(-)	(-)			
Mil. clinic area							(+)	(+)	(-)
Civ. beds/1000	(+)	(-)	(+)	+	(+)	(+)	(+)	(-)	(+)
Civ. MDs/1000	-	+	(+)	-	(-)	(-)	-	+	-

NOTE: ( ) indicates that the coefficient is not statistically significant at the .05 level. Variables with no sign were not included in the regression.

Table 20

Summary of Regression Results for CHAMPUS Costs (paid by DoD)

Variable	Catchment-area active duty		Catchment-area retired		Noncatchment areas (all)	
	>$0	$ Amount	>$0	$ Amount	>$0	$ Amount
Spouse/sponsor age	+	(+)	+	–	(+)	+
Sp. age squared	(–)	(–)	(–)	+	(–)	–
Child < 1 year old	+	+	(+)	(–)	+	+
Retired					–	(+)
Fam. health status	+	+	+	+	+	+
Officer	+	(+)	(+)	+	+	+
Employed full time	(–)	–	(–)	(–)	+	–
Income	(–)	(–)	+	(–)	–	(–)
Income—ret.					(+)	(–)
No. in family	+	+	+	+	+	+
CRI/enrolled	+	+	+	+		
CRI/standard	–	(+)	–	+		
AF CAM/enrolled	(+)	(+)	+	(–)		
AF CAM/standard	–	(+)	(–)	(+)		
Navy CAM/enrolled	+	(–)	(+)	(+)		
Navy CAM/standard	(+)	(+)	(–)	(–)		
Army vs. AF MTF	(–)	(+)	(+)	(–)		
Navy vs. AF MTF	(–)	+	+	+		
MTF beds/1000	(–)	–	(–)	–		
MTF MDs/bed	–	–	(–)	(–)		
Mil. clinic area					(+)	(+)
Civ. beds/1000	(+)	(+)	+	(+)	(+)	(+)
Civ. MDs/1000	–	(+)	–	(–)	–	(+)

NOTE: ( ) indicates that the coefficient is not statistically significant at the .05 level. Variables with no sign were not included in the regression.

The estimated coefficients for age generally mirror the patterns seen in Figure 3. Poor health status is strongly and positively associated with higher utilization and costs. Members of the families of officers and sponsors from the same military service that operates the MTF typically are more likely to seek care; however, the higher propensity of officers' families to use MTF care is not statistically significant for most groups. As expected, those in a family with a full-time civilian worker are less likely to receive their care from MTFs, but that does not necessarily apply to CHAMPUS. Family income has no consistent relationship to demand, although higher-income families are more likely to use CHAMPUS.

Most measures of the propensity to use MTFs are lower for Army MTFs and almost all are lower for Navy MTFs than for Air Force MTFs. The managed-care programs (CRI and CAM) have no significant effect on MTF utilization, but enrollees use more CHAMPUS outpatient care. Inpatient CHAMPUS utilization seems to be lower for nonenrollees. MTF demand increases with MTF capacity, as measured by beds and clinical staffing per thousand beneficiaries in the area. By contrast, CHAMPUS demand decreases with capacity, suggesting that the two are substitutes. In noncatchment areas, access to a military clinic increases the propensity to use MTF outpatient care but does not decrease CHAMPUS outpatient use. The CHAMPUS cost results generally follow from the utilization results.

Predicted Demand in Baseline and Expanded MTF Cases (1 & 2)

Tables 21 to 25 summarize our predictions of utilization in the MTFs and CHAMPUS, and of CHAMPUS costs, for cases 1 and 2. As described in Section 4, case 1 is the current system with a nationwide managed-care program based on CRI. Case 2 is the same managed-care program with expanded MTF capacity. The outpatient utilization tables (Tables 21 and 23) show the predicted per-person visit rate for MTF services and the per-family rate for CHAMPUS services for cases 1 and 2 in the first two columns. The other four columns show predicted values for the two components of the visit rate: the probability of having any visits and the number of visits conditional on being a user. The inpatient utilization tables (Tables 22 and 24) show only the probability that a person or family has any hospital care.

MTF Utilization

Although overall utilization rates differ somewhat, the differences in utilization between the baseline and expanded-MTF cases are the same in 1992 and 1997.[7] For beneficiaries living in catchment areas in either year, we predict an increase of approximately 15 percent in MTF outpatient-service use by non-active-duty personnel with the added MTF capacity and higher staffing levels in case 2 (Table 21).[8] Sixty percent of the outpatient increase represents additional users and 40 percent higher levels of use. Many of the added visits are for CHAMPUS-eligible retirees and dependents. These beneficiaries have a lower priority for MTF care than do active-duty dependents, so it is not surprising that they benefit most when MTF capacity expands. It is surprising, however, that Medicare-eligible retirees and dependents do not show the same increase as the younger retired group. It may be that their utilization is constrained more by the lack of resources appropriate to treat the elderly in the many small military hospitals than by access to the services the MTFs can provide.

Table 21

MTF Outpatient Demand in Baseline and Expanded Cases (1 & 2) (FY 1992 and 1997 MTFs and populations)

	Visits/Person		Probability of Use		Visits/User	
Beneficiary Category	Baseline (1)	Expanded MTF (2)	Baseline (1)	Expanded MTF (2)	Baseline (1)	Expanded MTF (2)
			1992			
Catchment areas	2.35	2.70	0.57	0.62	4.11	4.36
AD dependents	2.84	3.09	0.70	0.73	4.04	4.23
Retirees & deps.	1.95	2.50	0.47	0.56	4.05	4.44
Medicare	1.96	2.06	0.42	0.43	4.69	4.75
Other areas	0.97	0.97	0.24	0.24	4.00	4.01
All areas	1.95	2.22	0.47	0.51	4.10	4.31
			1997			
Catchment areas	2.39	2.75	0.57	0.62	4.17	4.42
AD dependents	2.90	3.17	0.71	0.75	4.07	4.20
Retirees & deps.	2.08	2.63	0.49	0.58	4.17	4.38
Medicare	1.87	2.00	0.40	0.43	4.60	4.84
Other areas	0.93	0.93	0.23	0.23	4.08	4.09
All areas	1.84	2.10	0.44	0.48	4.15	4.36

[7]For the baseline case, average use for all beneficiaries will be lower in 1997, primarily because a larger fraction of beneficiaries will be living in noncatchment areas.

[8]Recall that the survey truncated the visits data at 10. The figures we report in these tables do not correct for this truncation.

We found only minor differences in MTF utilization between standard and either CRI or CAM areas, so these results would not change appreciably if we substituted the standard program or CAM for CRI in these two cases. We estimate, for example, that MTF outpatient utilization with CRI is under 1 percent higher than without CRI for CHAMPUS beneficiaries in catchment areas. The CRI evaluation also found a small increase in MTF outpatient utilization (just over 2 percent) two years into the program after controlling for preprogram differences in utilization between CRI and other areas (Hosek et al., 1993).

The overall increase in the proportion of catchment-area beneficiaries who use the MTFs' inpatient services in case 2—17 percent (Table 22)—is comparable to the outpatient increase of 15 percent. Here the difference is larger for active-duty dependents; the regression results show that inpatient utilization by adult retiree family members is more responsive to MTF capacity than that of adult active-duty family members, but the opposite is the case for the retirees' children.

As we discussed earlier, we considered a version of case 2 that would add 41 outpatient clinics as well as add one or more hospitals and expanded the hospitals' staffing. The regression analysis showed that MTF inpatient utilization actually declines when military outpatient clinics are added. MTF outpatient utilization increases by perhaps 10 percent; more people obtain MTF care, but

Table 22

MTF Inpatient Demand in Baseline and Expanded Cases (1 & 2) (FY 1992 and 1997 MTFs and populations)

	Probability of Hospital Use	
Beneficiary Category	Baseline (1)	Expanded MTF (2)
	1992	
Catchment areas	0.062	0.075
AD dependents	0.086	0.104
Retirees & deps.	0.036	0.045
Medicare	0.062	0.074
Other areas	0.016	0.016
All areas	0.049	0.059
	1997	
Catchment areas	0.063	0.077
AD dependents	0.091	0.110
Retirees & deps.	0.038	0.047
Medicare	0.058	0.071
Other areas	0.014	0.014
All areas	0.045	0.055

users have fewer MTF visits. As Table 23 shows, the MTF outpatient increase is complemented by a slight increase in non-catchment-area CHAMPUS outpatient utilization. These results suggest that beneficiaries in areas without a clinic may try to get their referral care in the MTFs but that beneficiaries who use outlying military clinics may be more likely to be referred to the local civilian community. We urge that caution be exercised in interpreting the predictions for noncatchment areas, however, because they are based on a small sample, and some uncertainty remains about the actual location of active-duty families in particular. It is also possible that people who live near a military clinic and people who live away from any MTF differ in other ways not captured in the regressions, and that these differences are engendering the utilization patterns we observe. For these reasons, we did not include the added clinics in the final version of case 2.

CHAMPUS Utilization

As expected, we project that beneficiary families living in catchment areas would decrease their CHAMPUS utilization if MTF capacity were expanded as envisioned in case 2. The results for 1992 and 1997 are very similar. We saw above that retirees and their dependents especially would use more MTF outpatient services, and Table 23 shows that they would also have the largest decrease in CHAMPUS outpatient use. CHAMPUS inpatient utilization also decreases in case 2—by about the same fraction for both catchment-area groups

Table 23

CHAMPUS Outpatient Demand in Baseline and Expanded Cases (1 & 2)
(FY 1992 and 1997 MTFs and populations)

	Visits/Family		Probability of Use		Visits/User Family	
Beneficiary Category	Baseline (1)	Expanded MTF (2)	Baseline (1)	Expanded MTF (2)	Baseline (1)	Expanded MTF (2)
			1992			
Catchment areas	4.05	3.48	0.39	0.36	10.35	9.73
Active duty	3.72	3.31	0.39	0.36	9.66	9.21
Retired < age 65	4.40	3.66	0.40	0.35	10.98	10.20
Other areas	5.83	5.81	0.52	0.52	11.10	11.08
All areas	4.54	4.11	0.43	0.40	10.61	10.18
			1997			
Catchment areas	3.79	3.27	0.38	0.35	9.96	9.41
AD dependents	3.58	3.14	0.38	0.35	9.51	9.08
Retirees & deps.	4.21	3.50	0.39	0.35	1.73	9.96
Other areas	5.84	5.79	0.53	0.53	11.02	10.93
All areas	4.42	4.00	0.43	0.40	10.37	9.97

(Table 24). Especially for active-duty dependents, the decrease in outpatient use is smaller than the decrease in inpatient use.

To estimate how total military-system utilization (MTF and CHAMPUS) in catchment areas would change with MTF expansion, we need to convert the per-family visit rates that we estimated for CHAMPUS to per-person rates. The average active-duty family has 2.59 CHAMPUS-eligible members, and the average non-Medicare retired family has 2.37 members. In catchment areas, then, the decrease in CHAMPUS use is 0.16 visit per active-duty dependent and 0.31 visit per retired family member—64 percent and 56 percent, respectively, of the increase in MTF visits.[9] With CHAMPUS outpatient use decreasing less than MTF use increases, we conclude that total demand for outpatient services by CHAMPUS eligibles increases as MTF capacity expands.

DoD defines the ratio of the change in MTF utilization to CHAMPUS utilization when MTF capacity is increased as the "tradeoff factor." Previous estimates of this factor were derived from aggregate MTF and CHAMPUS data and were for

Table 24

CHAMPUS Inpatient Demand in Baseline and Expanded Cases (1 & 2) (FY 1992 and 1997 MTFs and Populations)

Beneficiary Category	Probability of Use: Baseline (1)	Probability of Use: Expanded MTF (2)
	1992	
Catchment areas	0.038	0.031
AD dependents	0.042	0.034
Retirees & deps.	0.034	0.027
Other areas	0.076	0.076
All areas	0.048	0.043
	1997	
Catchment areas	0.036	0.029
AD dependents	0.038	0.030
Retirees & deps.	0.033	0.026
Other areas	0.080	0.081
All areas	0.050	0.044

[9]Both our MTF and CHAMPUS visit estimates are subject to some error. As discussed in Section 3, the MTF data are subject to recall error and are therefore underestimated. CHAMPUS claims may be submitted for some time after the date of service; the data we received should be over 90 percent complete. With accurate data, we might expect that the decrease in CHAMPUS would be a somewhat smaller fraction of the increase in the MTFs. Therefore, the tradeoff factor should be higher with more accurate data.

all beneficiaries. Using these beneficiary-level data, we can estimate the tradeoff factor just for CHAMPUS-eligible beneficiaries living in catchment areas. Taking ratios of the estimated increase in MTF visits to the decrease in CHAMPUS visits as we move from case 1 to case 2, we calculate tradeoff factors of 1.56 for active-duty dependents and 1.79 for retirees, survivors, and their dependents. The tradeoff factor for the two combined is 1.67. Inclusion of other beneficiaries, such as those covered by Medicare for civilian care, would increase the tradeoff factor because there is no decrease in CHAMPUS to offset their increased MTF use.[10]

To calculate the tradeoff factor for inpatient services, we first multiply the probabilities in Tables 22 and 24 by the number of hospitalizations per person and family, respectively, with at least one hospitalization. Then, using the same calculation method we used for outpatient visits, we estimate that there would be an increase of 17 MTF admissions and a decrease of 5 CHAMPUS admissions per 1,000 beneficiaries in the expanded-MTF case. The tradeoff factor is 3.4—double the outpatient tradeoff factor.

In both cases, CHAMPUS utilization and costs vary more across program types (standard, CRI, CAM) than does MTF utilization. The catchment-area outpatient utilization rates shown in Table 23 for the baseline case, which are based on CRI, are 18 percent higher than the rates we measure in the standard program; if we were to simulate a CAM program instead, the baseline rates would be 7 to 10 percent higher than the standard program (not shown). In contrast, CHAMPUS inpatient utilization rates are lower in the managed-care programs; the baseline probabilities of hospitalization with CRI, as shown in Table 24, are 25 percent lower than without managed care. This pattern of higher outpatient utilization and lower inpatient utilization is characteristic of HMO plans.

CHAMPUS Costs

The 9 percent decrease in CHAMPUS costs that we predict for case 2 (versus case 1) is slightly lower than the percentage decrease in CHAMPUS utilization. Table 25 shows per-family costs and total program costs in the two cases—first costs to DoD and then total costs to all payers. The latter, which include payments by CHAMPUS and others for all costs allowed by CHAMPUS, exclude billed charges that exceed CHAMPUS fee limits and services not covered by CHAMPUS. These cost estimates have been adjusted for incompleteness and include administrative costs, as mentioned earlier in this section.

[10]Viewed from a government-wide perspective, there is presumably an offsetting decrease in Medicare-financed utilization by beneficiaries 65 and older.

Table 25

CHAMPUS Cost in Baseline and Expanded Cases (1 & 2) (FY 1992 and 1997 MTFs and U.S. populations)

	Government Paid		Total Cost	
Beneficiary Category	Baseline (1)	Expanded MTF (2)	Baseline (1)	Expanded MTF (2)
			1992	
Cost/family	$1,428	$1,299	$1,739	$1,578
AD dependents	1,492	1,342	1,607	1,454
Retirees & deps.	1,363	1,255	1,871	1,739
Total cost (bil.)	$3.14	$2.86	$3.82	$3.47
			1997	
Cost/family	$1,446	$1,318	$1,782	$1,619
AD dependents	1,480	1,315	1,592	1,421
Retirees & deps.	1,419	1,320	1,937	1,781
Total cost (bil.)	$3.20	$2.92	$3.95	$3.59

Like CHAMPUS utilization, costs for the baseline case vary with the managed-care program we simulate. There are few differences in the results for 1992 and 1997; cost per household is higher in 1997 because more beneficiaries live in noncatchment areas, but the total population is smaller and so total costs are almost the same. Total CHAMPUS costs paid by DoD for case 1 (with CRI) are predicted to be 11 percent higher than actual estimated costs for FY92, which were $2.83 billion for beneficiaries living in the United States. Two studies conclude that the benefits changes DoD has made in its new CRI programs and other changes expected to affect costs should largely eliminate these higher costs in the future (Congressional Budget Office, 1993; Lewin-VHI, 1993a and 1993b).

Although not shown here, we did use our regression results to simulate a CAM program instead of CRI, based on the limited CAM data we had. Using CAM as the model for managed care, we predict that CHAMPUS costs would be closer to actual costs for FY92. As suggested earlier, the CAM estimates may be influenced by other factors, since we have data for only one Navy site and one Air Force site. However, we can use the CAM results as an indication of what the CHAMPUS savings in case 2 would be in a less costly program than CRI. With CAM, we would still predict a drop in CHAMPUS costs of 8 percent in case 2—a savings of about $230 million instead of $282 million for the CRI case.

Total costs, including those paid by the beneficiary and other insurance as well as DoD, are over 20 percent higher than DoD costs alone. The difference is considerably smaller for active-duty dependents (8 percent) than for other beneficiaries (37 percent) because the CHAMPUS benefits for active-duty

personnel are more generous and because such beneficiaries are much less likely to have private insurance.[11] Compared with those in case 1, total allowed costs are $352 million, or 9 percent, lower in case 2 with CRI.

[11]For both groups, the difference between DoD costs and allowed costs would be higher without managed care.

6. Utilization and Costs in Cases with Commercial Health Plans

As Congress directed, some of the cases studied included commercial health plans, which would constitute the only health care source for enrollees. It is not possible to predict the costs of these plans from CHAMPUS data because, for most beneficiaries, CHAMPUS augments the MTFs and/or private health plans and is rarely the sole source of care. Instead, we predicted costs for the cases that included stand-alone civilian plans from civilian-sector data. Since beneficiaries would generally have a choice of plans in these cases, our first step was to predict the health-plan choices of military beneficiaries if these cases were adopted.

To predict plan choice, we developed a two-part model of family health-plan choices using data from the beneficiary survey regarding preferences for military versus civilian plans and data from a national survey regarding choices between civilian HMOs and FFS plans. We used this model to predict, for cases 3 and 4, the fraction and types of military families who would choose each of the types of health plan envisioned.

We then estimated per-capita costs in each of the cases' health plans, based on the characteristics of the plans and the families they would enroll. We employed different costing methods for the three major types of health plans: (1) for commercial FFS plans, we predicted per-capita costs from an expenditure simulation model that predicts health care expenditures and plan costs for families with different characteristics and FFS plans with different benefit packages, (2) for commercial HMO plans, we used the premiums charged by HMOs offered through the Federal Employees Health Benefits Plan in different geographic areas, and (3) for MTF plans, we predicted outpatient and inpatient workloads, using the models developed for cases 1 and 2, which were then costed by IDA. FFS and MTF plan predictions were based on the characteristics of the families predicted to choose these types of plans. HMO costs do not necessarily reflect true costs for the military population expected to enroll in HMOs because we lacked the data necessary for estimating population-specific costs and many HMOs do not set different premiums for different enrolled populations. We estimated MTF workload levels for three scenarios: (1) the MTFs operate as they do now, (2) the MTFs charge a modest fee for each clinic visit, and (3) the MTFs operate as a staff-model HMO.

Appendix E gives more detailed descriptions of the analyses we conducted for cases 3 and 4. In the remainder of this section, we will summarize our analysis of plan choice in cases 3 and 4, and then of civilian-plan costs and MTF workloads. The section concludes with an estimate of the employer contributions for military beneficiaries under health reform, based on the Clinton proposal.

Plan Choice

Case 3 would offer military families a choice of commercial FFS and HMO plans, depending on what plans are available in each geographic area or can be induced to serve areas with sizeable military populations. To analyze this case requires predicting how many families, and which families, would choose an FFS plan and how many would choose an HMO. Case 4 adds to these two commercial choices a largely MTF-based plan in areas served by an MTF. We modeled this three-way choice as a sequential decision. First, families choose whether to enroll in one of the civilian plans or the MTF plan. Families that choose the civilian system then select either an FFS plan or an HMO. Therefore, both cases require an analysis of the choice between civilian FFS and HMO plans and case 4 requires a preceding analysis of the choice between civilian and MTF plans.

Choice Between the Civilian and Military Health Care Systems

To measure relative preferences for health plans that rely on the civilian versus the military system, the beneficiary survey asked respondents to indicate their potential interest in replacing their current health coverage with each of two hypothetical health plans. The hypothetical plans were both HMOs, requiring beneficiaries to obtain their care at or through MTFs or civilian providers. In all other respects, the plans were identical: They added preventive examinations and routine eye care to the current CHAMPUS benefit package and the only cost sharing was a $5-per-visit charge for outpatient visits. In addition, the plans guaranteed access to care within 0–3 days, depending on the type of care. For each plan—civilian or MTF—survey respondents were asked whether they would choose the new plan instead of their current military health coverage if the new plan charged them a premium of $75 a month, $50 a month, or nothing. Each respondent thus made six hypothetical choices, each between current benefits and one of the two new plans at one of three premium levels; we obtained 89,281 responses about preferences for hypothetical plans. (We reproduce the survey questions at the end of Appendix E.)

We use probit regression to estimate the relationship between the probability of choosing an MTF-based HMO over the current coverage and the probability of

choosing a civilian HMO over the current coverage. We use these relationships, along with expected utility theory and its assumption that preferences are transitive, to predict families' preferences between the civilian and military health care systems. (Our methods are explained in detail in Appendix E.) To illustrate, suppose the model predicts that a family with specified characteristics prefers a civilian HMO to current care and prefers current care to the MTF-HMO. Then we can infer that the family would prefer the civilian HMO to the MTF-HMO. Although our survey questions do not explicitly ask about civilian fee-for-service plans, we assume that a family that prefers the civilian HMO to the MTF-HMO would also prefer a civilian fee-for-service plan to the military plan, and that a preference for the MTF-HMO over the civilian HMO would extend to a preference for the military plan over other civilian alternatives. These assumptions then allow us to use our estimated regression to predict preferences between the civilian and military health systems. Although our predictions are based on responses to hypothethical questions, the marketing and economic literatures provide some evidence that stated preferences do predict actual behavior (see Manning and Marquis, 1989, for a summary of some of that literature). The explanatory variables in our regression include:

- military service, age, sex, and race of the military sponsor;
- whether the family has insurance in addition to its military coverage;
- length of residence in the area;
- family income;
- health status and expected health care use in the future;
- whether the family's usual source of care is civilian or military;
- characteristics of the MTF(s) in the area;
- whether the new option is a civilian or military plan;
- the premium cost to enroll;
- interactions between the type of new option and family characteristics to capture any differences in system preferences for different types of families.

We estimated separate models for active-duty families, families of retirees under age 65, and families of retirees 65 and older. Since each respondent reported his or her choice for six different optional plans, we had multiple observations on the dependent variable for each family. We corrected for the intrafamily correlation resulting from the multiple observations.

The regression results are shown in the appendix in Tables E.1–E.3, which report the effect of a change in each explanatory variable on the probability of choosing the military HMO or the civilian HMO in preference to current military coverage.

There are similar patterns of findings across the different subgroups. Price is an important factor in all groups; a $10 per month increase in the cost of joining a new plan reduces the probability of selecting it by about 6 to 7 percentage points.[1] Those who currently use the MTF for most of their care are more likely to report they would join a military HMO and less likely to be interested in the civilian HMO than those who usually obtain their health care from civilian providers. In all three groups, male sponsors and families with insurance in addition to their military benefit are more likely to prefer the new civilian plan to their current military coverage; nonwhites and older sponsors in all groups are more likely to prefer the military HMO than others. In all three subgroups, families who expect to have a large number of physician visits are less willing to switch from their current CHAMPUS or military plan into either of the new options. Perhaps those who expect to need care are reluctant to change providers and believe that a change in plan would entail such a provider change. Although not completely consistent across all subgroups, there is a tendency for persons who expect to have a hospitalization to be more likely to express a willingness to switch into one of the new plans; since the new plans required no cost sharing for inpatient care, this finding may reflect the effect of expected out-of-pocket payments on plan preferences.

We used the estimated model to simulate whether active-duty and retired families would choose a military plan or a civilian plan using methods described in Appendix E. Table 26 illustrates our results, assuming that all military personnel have the military HMO option available. In actual implementation of our model, our simulations restrict the choice of the military option to families in catchment areas (see the discussion below), and consequently the probabilities shown in Table 26 overstate predicted enrollment in the MTF-based plan under case 4. However, our intention here is to illustrate the findings and the role of personal characteristics on choices, without confounding the opportunity set with these characteristics. For the results in Table 26, we have replicated each family's choice 50 times. The proportion selecting the military option shown is the average proportion over the 50 replications.

[1]The change in probability is evaluated at the mean probability for the subgroup.

Table 26

Percentage of Families Selecting Military Versus Civilian Plan by Premium Level, Health Status, and Usual Source of Care

	Dependents of Active-Duty Personnel	Retirees Under Age 65	Retirees Age 65 and Older
Premium level for civilian plan[a]			
$0	27	30	40
$20 single/$50 family	68	70	66
$30 single/$75 family	82	86	76
Health status of sickest family member			
Excellent	68	69	64
Good	69	70	66
Fair	68	73	67
Poor	62	77	66
Usual source of care			
Civilian	60	63	60
Military	70	80	74

[a]Cost of military plan assumed zero. Military and civilian options assumed available to all families.

The choice of system is responsive to differences in the premium cost to beneficiaries. The arc elasticity of demand implied by the choices shown in Table 26 for the two positive premiums for the civilian plan is –0.6. This means that a 1 percent increase in the premium level for the civilian plan leads to a 0.6 percent decrease in the probability of choosing that plan. This compares quite favorably to the price elasticity of demand estimates based on observed choices of nonmilitary personnel, which range from –0.16 to –0.54 (Marquis, Kanouse, and Brodsley, 1985; Manning and Marquis, 1989).

Selection effects—differences in plan choice by health status—differ among the subpopulations. There is some small, favorable health selection into the military plan by active-duty dependents, in contrast to adverse selection among the retirees under age 65. These differences are the total effects of health status and other characteristics that vary with health on choices. The net effects of health status controlling for other characteristics also show similar patterns (see the marginal effects from the probit regression parameters given in Appendix E). Not surprisingly, the preference for the military HMO is much higher among those for whom the military currently provides most of the care.

Choice Among Civilian Systems

For the second stage of our sequential decisionmaking model, we used data from the 1987 National Medical Expenditure Survey (NMES) to estimate a model of choice between civilian FFS and HMO plans. The NMES was a panel survey that was administered to a cross section of the civilian, noninstitutional population to measure health-insurance coverage, health status and health care use.

The sample for our estimation was limited to families with an insured, working family head who had a choice of health-insurance plans from his or her employer. The estimation sample included 1,508 families. We limited the sample in this way to model the FFS-HMO enrollment decision among families who had the opportunity to enroll in an HMO. Our criterion, however, imperfectly selects those families who have this opportunity. For some families who have a choice of insurance plans, the choice will be among high- and low-option FFS plans. For others, the choice may be between an FFS plan and some managed-care plan other than an HMO. However, the data available to us do not provide the information to make more accurate selections.

We used a probit regression, similar to the regression used for the military-civilian choice model, to estimate the relationship between family characteristics and the decision to enroll in an HMO instead of an FFS plan.[2] Our model results are given in Table E.4. Male, educated, and nonwhite primary insureds are more likely to elect an HMO. The coefficient estimates also suggest some adverse health selection into the HMO, but the health status effects are not statistically significant.

Simulating Health-Plan Choices for Cases 3 and 4

For case 3, we simulated the choice between a civilian FFS plan and a civilian HMO, using the model we estimated from the NMES data and simulation methods described in Appendix E. As we described above, the HMO enrollment rate we measured in the NMES probably underestimates enrollment in a population able to choose an HMO. In our estimation sample, 25 percent of families were enrolled in an HMO. Other data from the Bureau of Labor Statistics (BLS), however, suggest that actual HMO enrollments are about 35 percent when employees are offered this type of plan. Enrollment in CRI Prime and the Air Force's CAM program, which offer benefits similar to a civilian HMO's benefits, also exceeded 30 percent after several years. Therefore, we

[2]We do not have details about the benefits or costs of the options that the family faces to include in our estimation model.

adjusted our probit model to result in predicted probabilities of HMO enrollment that accord with the BLS overall estimate of 35 percent.[3]

To predict choices for case 4, we combined the two choice models we estimated to form a sequential decision model in which military families first choose whether to enroll in the MTF plan or one of the civilian plans and then, if they choose a civilian plan, between FFS and HMO. These choices are assumed to be available to all families residing in MTF catchment areas; in other areas, families may choose only between the two types of civilian plans. Our approach assumes that the choice of civilian plans is independent of whether an MTF plan is among the options available to the family. While this is a strong and untestable assumption, we believe it is reasonable to assume that families' first choice is whether they want to receive care from military or civilian providers and that relative preferences among civilian alternatives are similar for military personnel living in catchment areas and those not in catchment areas.

Table 27 presents our simulation results for active-duty dependents (we assumed all active-duty personnel are automatically enrolled in the MTF plan) and for families of retirees under age 65.[4] The simulations assume that, to enroll in a civilian health plan, beneficiaries pay a premium contribution (either $20 or $30 a month for single coverage and $50 or $75 a month for family coverage); those enrolling in the MTF plan pay nothing. At current utilization levels, a $20/$50 premium differential would be necessary to assure that enough beneficiaries enroll in the MTF plan to sustain the current MTF system.

Table 27

Military Families' Plan Choices for Case 4

	Civilian Plan			Military
	FFS	HMO	Medicare	Plan
Active-duty dependents				
$20 single/$50 family premium	28%	15%		57%
$30 single/$75 family premium	20%	11%		69%
Retirees, dependents under 65				
$20 single/$50 family premium	38%	17%		47%
$30 single/$75 family premium	31%	14%		55%
Retirees, dependents 65 and over				
$20 per person premium			60%	40%
$32 per person premium			52%	48%

Note: Those not in catchment areas assumed to choose between civilian plans only.

[3]Since our cost estimates for civilian FFS and HMO plans were similar, this adjustment had little effect on estimated costs for alternative 3.

[4]We did not simulate choice of the civilian HMO among older retirees but rather assumed that they would select HMOs at the selection rate of other Medicare beneficiaries.

Civilian Plan Costs for Cases 3 and 4

To estimate the costs for beneficiaries who enroll in a civilian fee-for-service plan, we used a health expenditures simulation model previously developed by RAND. This model predicts individual and family health-plan expenditures as a function of the structure of the fee-for-service insurance plan; both plan and out-of-pocket expenditures are estimated. As described further in Appendix E, the model is based on the results of the RAND Health Insurance Experiment. The experiment was conducted in the 1970s and 1980s to determine the effects of cost sharing on health care demand. For this study, we updated the experimental data to 1990 using the National Medical Expenditures Survey and then to 1992 using the medical component of the Consumer Price Index. We ran the simulation for three CHAMPUS beneficiary groups: all eligibles, those predicted to enroll in a civilian fee-for-service plan in case 3, and those predicted to enroll in case 4. We assumed that the benefits in this civilian plan would resemble the current CHAMPUS benefits shown in Table 1, but we also simulated costs for retirees for a benefit package similar to the Clinton Administration's proposed Health Security Act. We included a 5 percent administrative loading fee in all simulations.

For beneficiaries predicted to enroll in a civilian HMO plan, we used the premiums currently paid for HMOs in the Federal Employees Health Benefits Plan (FEHBP). We analyzed the data for all HMOs offered in 1991 to determine whether there were significant differences in premium costs by geographic region. Although the premiums do vary from plan to plan, there was little regional variation in the median premium. Therefore, we simply set the costs of HMO enrollees in cases 3 and 4 at the median of FEHBP premiums for 1992, including the government and employee contributions.

For Medicare eligibles, we also needed a rough estimate of Medicare costs for those not enrolling in an MTF plan. We used per-capita Medicare costs for 1992, calculated from data reported in the 1993 Statistical Supplement to the Social Security Bulletin (U.S. Department of Health and Human Services, 1993). We set total costs equal to average charges plus administrative costs and government costs as average reimbursements plus administrative costs.

Even though many more beneficiaries are predicted to enroll in a fee-for-service plan in case 3 (there is no MTF plan), the estimated cost per person is relatively unaffected (Table 28). In either case, dependents of junior enlisted personnel incur higher expenditures than other active-duty personnel because the

Table 28

Civilian Plan Costs for Projected Enrolled Populations in Cases 3 and 4 (1992)

	Members of Families by Sponsor Type				
Type of Plan	All <65	Jr. Enlisted	Other Active Duty	Retired (<65)	Retired (65+)
FFS—cost per person					
Case 3					
Paid by plan		$1,967	$1,736	$2,201	
Out-of-pocket covered		109	149	529	
Out-of pocket uncov'd.		118	62	134	
Case 3—Clinton					
Paid by plan				$2466	
Out-of-pocket covered				498	
Out-of pocket uncov'd.				84	
Case 4					
Paid by plan		$1,835	$1,730	$2,175	
Out-of-pocket covered		106	146	529	
Out-of pocket uncov'd.		141	81	134	
HMO—avg. premium per covered household					
Single coverage	$1,850				
Family coverage	4,625				
Medicare					
Paid by plan					$3,075
Not paid by plan					2,820

Note: "Out-of-pocket covered" costs are the deductible and copayment costs for services covered by the plan. "Out-of-pocket uncovered" costs are for services not covered by the plan.

deductibles they face are lower and they include spouses of childbearing age and infants. Despite the higher copayment they must pay, expenditures for retired family members are high because they are older. That the Clinton health plan's benefits are better than current CHAMPUS retiree benefits can be seen from the higher plan expenditures for the Clinton plan. HMO costs are not much different from fee-for-service plan costs, at least if the FEHBP premiums reflect what DoD's premiums would be for civilian HMOs.

Utilization in the MTF Plan in Case 4

We adapted the methods we used for cases 1 and 2 to estimate utilization for beneficiaries predicted to enroll in the MTF plan in case 4. In this case, recall that beneficiaries can enroll in *either* a civilian plan or an MTF plan, but they may not obtain health care from both. The MTF would provide all the health care for its enrollees, either directly or by arranging for and financing care from civilian providers. Therefore, we based our prediction of MTF utilization in case 4 on the total health utilization—civilian plus military—observed in areas where MTF

capacity is large relative to the population served. We also estimated how this utilization would be different if the MTF plan operated like a civilian HMO or required that the patient share in the costs of care.

The first step in our analysis for case 4 was to reestimate the utilization regressions for cases 1 and 2, substituting the total number of civilian and military visits and admissions reported by survey respondents. We used the survey data on civilian utilization, rather than CHAMPUS records, because we wanted to include civilian utilization not financed through CHAMPUS. The regressions are reported in Tables E.6 through E.8.

To simulate non-active-duty utilization in case 4's MTF plans, *assuming no change in MTF operations or benefits*, we used the same general prediction method we used for the expanded MTF case 2. We did not use case 2's expanded list of MTFs, but we assumed the same high levels of beds per capita and staff (FTEs) per bed and a managed-care approach similar to CRI. We held active-duty utilization constant at current levels.

We then conducted a sensitivity analysis to determine how the utilization levels of non-active-duty MTF enrollees might vary—for example, if the MTF were to operate like a civilian HMO or charge its enrollees fees for care. (We continued to hold active-duty utilization constant.) For the HMO case, we substituted the HMO visit and admission rates we estimated for military beneficiaries from the National Health Interview Survey in Section 3. We based our estimates on the decrease in the number of health care episodes, relative to the number of episodes with free care, in the Health Insurance Experiment (HIE) for three different levels of cost sharing: (1) 25 percent for all services, (2) 10 percent for outpatient visits (approximately equivalent to a $15 clinic fee, and (3) 5 percent for outpatient services. The HIE results showed that cost sharing reduced the number of episodes generated by patients, but had little effect on the cost per episode. Therefore, the percentage decrease in utilization with cost sharing is predicted by the percentage decrease in episodes (Keeler et al., 1988).

Table 29 shows the average number of visits and the probability of having any inpatient care in the MTF plan for beneficiaries predicted to enroll in that plan in case 4. Visit rates are lower for all beneficiary groups in the HMO and cost-sharing cases, although the HMO levels are only slightly lower for retirees and dependents under 65. The probability of hospitalization drops in the civilian HMO scenario, especially for active-duty dependents, and there are more modest decreases for the scenario that would charge patients the equivalent of a 25 percent cost share. Charging nuisance fees for outpatient visits does decrease the average number of visits, but not the probability of hospitalization. Given the

Table 29

Utilization for MTF Enrollees

	Active-Duty Dependents	Retirees & Dependents	
		Under 65	65 & Over
Average visits			
Current MTF levels	4.03	3.60	5.88
Civilian HMO levels	2.92	3.36	4.51
25% for all services	3.02	2.70	4.41
10% for visits	3.30	2.95	4.82
5% for visits	3.47	3.10	5.06
Probability of any inpatient care			
Current MTF levels	0.142	0.111	0.238
Civilian HMO levels	0.076	0.092	0.180
25% for all services	0.107	0.083	0.179
10% for visits	0.142	0.111	0.238
5% for visits	0.142	0.111	0.238

range of estimates in Table 29, we conclude that utilization levels in an exclusive MTF plan are uncertain; with incentives to control utilization, military beneficiaries might decrease their high utilization rates to those of their civilian counterparts.[5]

As we did for cases 1 and 2, we adjusted these utilization figures for the differences between the survey data and the workloads reported by the MTFs, multiplied them by the total eligible population, and sent estimates of MTF workloads to IDA for costing.

Employer Contributions Under the Clinton Health Proposal

The Clinton health reform proposal included an employer mandate that would require most employers to contribute 80 percent of the cost of health insurance for their employees. To explore the effects of an employer mandate on military health costs, we estimated the contributions that would be required for working military beneficiaries under the provisions of the proposed legislation. Of course, these are not the only provisions possible, but we did not attempt to estimate contributions for other provisions.

[5]The HIE did not find that decreases in utilization with cost sharing led to lower health status for most persons. See Appendix E for a brief summary of these results and Newhouse (1994) for a report on the experiment.

Under the Clinton Plan, an employer would have been required to pay an amount for each employee that depends on the type of family (single person, married couple, one-parent family, two-parent family) and the number of hours worked. Hours worked were translated into fraction of FTE using a formula specified in Title I, Subtitle J, Section 1902 of the Health Security Act: hours worked in a month/120. In its report on the plan, the Congressional Budget Office (1994) calculated the average employer share per FTE in 1994 dollars.[6] Title VIII, Subtitle A, of the proposed legislation authorized DoD to collect employer contributions for its beneficiaries who choose a DoD health plan (MTF-based or civilian) instead of obtaining care through a health alliance.

We estimated the employer contributions that would be paid for all military beneficiaries to be $5 billion. The calculation is a simple one—the number of FTE workers in each family type times the employer contribution per FTE for that family type.

We determined the number of military families of each of the four types defined in the legislation from the beneficiary survey (Table 30). For active-duty families, we did not include the sponsor in defining family type because we assumed that DoD and not the family's health plan would provide active-duty health care. Therefore, we assumed that employers would be able to pay single-parent rates for active-duty families with two parents.

We estimated the number of FTEs for each group from the beneficiary survey and Current Population Survey (CPS) data. The beneficiary survey provides

Table 30

Distribution of Military Families by Type

	Family's Sponsor		
Family Type	Jr. Enlisted	Other Active Duty	Retired <65
Single	24.3%	10.8%	4.4%
2 adults	—	—	46.1%
1 adult+children	65.6%	83.9%	1.3%
2 adults+children	—	—	48.2%
Children only	10.1%	5.3%	—

Note: We assumed that benefits for active-duty personnel would not be recovered from their spouses' civilian employers. Therefore, we treated active-duty families with two adults as having only one adult.

[6]We used CBO's figures because they were the only publicly available figures that actually derived employer contributions in addition to health-plan premiums. The two differ because of families with two workers.

hours worked by category (35+, 20–34, <20, variable) for sponsors (retired only) and spouses. Self-employed workers are a separate category, and so no hours were recorded for them. Those working 35+ hours are counted as full-time workers. To determine the number of FTEs for the part-time categories, we used the mean number of hours worked from the CPS within the range for the two part-time categories: 26.4 and 9.4 hours (these figures did not differ by sex).[7] Since working less than 120 hours a month is relatively uncommon, changing the values for part-time workers would not have much effect on these calculations. Our initial calculations did not include contributions for those reporting variable hours or who are self-employed, so our estimates are somewhat conservative—especially for retired families. When we counted all self-employed as full-time workers and included variable-hour workers in the lowest part-time group, our estimate of contributions increased to $5.5 billion.

[7] We did not include that fraction of the workers in the <20-hours category estimated from the CPS to have worked fewer than 40 hours per month because the legislation does not define them as part-time employees.

7. Conclusions

All groups of military beneficiaries are heavier users of medical care than are comparable civilian populations. The research on the effects of cost sharing on health care demand suggests that much of the difference—30–40 percent for outpatient visits and 20–30 percent for the fraction hospitalized—can be attributed to the availability of free care in MTFs. However, other factors may also be playing a role: a higher incidence of certain health conditions (e.g., injuries) coupled with an emphasis on health maintenance for active-duty personnel, frequent family separations, and the incentive inherent in medical resource allocation to maximize MTF workload counts.

If free MTF care is an important factor, as seems likely, expanding the availability of MTF care should increase quantity demanded. Our analysis of the 1992 Military Beneficiary Survey data shows that CHAMPUS-eligible beneficiaries respond to higher MTF resource levels (beds and staff) by increasing their MTF utilization and decreasing their CHAMPUS utilization. However, the MTF increase is considerably larger than the CHAMPUS decrease—70 percent higher for outpatient care and 150 percent higher for inpatient care. Medicare-eligible beneficiaries also use more MTF services. We were not able to estimate the change in their civilian utilization, but any civilian-sector savings now accrue to Medicare rather than the MHSS.

This finding that demand for MHSS services increases with the availability of free care is supported by previous reports on DoD's experience with two programs that increased the availability of free or almost-free care: PRIMUS/NAVCARE clinics, in which civilian contractors provide primary care to military beneficiaries, and the CHAMPUS Reform Initiative, which offered an enrollment option with low CHAMPUS charges. Both programs led to increased utilization (Kennell et al., 1991, and Hosek et al., 1993).

How beneficial is the added health care used when MTF care is more readily available? Answering this difficult question was beyond the scope of this study. The health-insurance experiment conducted in the 1970s invested a considerable effort to assess the relationship between health care use and health status. After three to five years, individuals given more generous insurance used considerably more care, but there were at most small changes in their health status (Brook et al., 1984). Most of the improvements observed were for the poor.

The MTF system was built to support the medical requirements for wartime. With these requirements declining in the post–Cold War era, DoD could consider a major structuring of the MTF system, limiting its role in providing peacetime health care and offering commercial

health plans instead to some or all non-active-duty beneficiaries. Our analysis of beneficiary preferences suggests that many might prefer civilian plans, *provided that there was no erosion of benefits in these plans.* A comparison of the costs in a restructured system and in the current system requires that our results be combined with the results of IDA's research; in preparing its report to Congress on the Comprehensive Study of the Military Health Care System (Department of Defense, 1994), PA&E did combine these results and concluded that DoD should size its MTF system to meet the peacetime demand from military beneficiaries only if it can control this demand through a combination of initiatives.

Appendix
A. Survey Weights

Overview of Method

We calculated survey weights to ensure that our utilization and cost estimates would reflect the characteristics of the population from which the sample was drawn, assuming simple random sampling within cells. Using the parametric approach to calculating nonresponse weights as described below allowed us to account for differential rates of response (e.g., by sponsor race) that were not included in the weights provided with the survey data.

Our approach to weighting proceeded in two steps. First, we calculated weights based on the sampling fraction from the survey design:

$$w_j = \text{(number in population in cell } j\text{)/(number sampled in cell } j\text{)}$$

where w_j is the inverse of the sampling fraction. Cells indexed by j are defined in the sampling grid by sponsor status and region. Second, we calculated nonresponse weights from a logistic regression with response status as the dependent variable and independent variables reported on the survey header.[1] The nonresponse weight, γ_i for household i is calculated as $1/\hat{p}_i$ where

$$1 - \hat{p}_i = \frac{e^{(\alpha + \Sigma\beta_\ell X_{i\ell})}}{1 + e^{(\alpha + \Sigma\beta_\ell X_{i\ell})}} \qquad (1)$$

Here, $1 - \hat{p}_i$ is the probability of nonresponse, and $\hat{p}_i$ is the probability of response.

The weight for household i in cell j is the product of $w_{j_{(i)}} * \gamma_i$, scaled by a multiplicative constant, k, where

$$k = \#\ respondents\ /\ \sum_i (\gamma_i \times w_{j_{(i)}})\ .$$

[1]Separate models were fit for active-duty sponsors and retirees/survivors since information was missing for all non-active-duty sponsors for some potential predictors of nonresponse: education, race, and number of dependents.

This scales the weights to the original sample size. Omitting k, the household weights would then sum to the total population of households.

Sampling Weights

Sampling weights, 1/sampling fraction, are reported in Table A.1. The reader is referred to Lurie et al. (1994) for details regarding survey sampling methods for this study.

Nonresponse Analyses

A total of 44,293 sponsors were included in the survey sample. Of these, 58.7 percent were respondents, 17.2 percent were postal return nonrespondents, and 24.1 percent were other nonrespondents or refusals. A 0/1 logit model was specified, categorizing respondents (0) versus all categories of nonresponse (1). Model coefficients are reported in Tables A.2 (active duty) and Table A.3 (retirees, survivors).

For each predictor variable, the odds ratio for nonresponse versus response, controlling for other predictor variables in the model, is given by the antilog (the exponential) for the estimated logit regression coefficient. For a dichotomous predictor variable such as "FEMALE," this leads to the odds ratio for the two groups defined by the predictor variable (FEMALES versus MALES). For a continuous predictor variable such as AGE, this leads to the odds ratio for two groups that differ by one unit on the predictor variable.

Active-Duty Households

Overall, 51 percent of active-duty households were respondents and 49 percent were included in one of the nonresponse categories.

Positive relationships between sponsor characteristics and probability of nonresponse were identified for the following variables: reservists, blacks, and those sampled from the Tricare-Tidewater and Air Force CAM regions.

Negative relationships between sponsor characteristics and probability of nonresponse were found for the following: age, female, married, those sampled from Army CAM locations, and all other service-rank groups.

These rates control for other predictors in the model. The joint effects of these variables can be calculated using equation 1. For illustration, the estimated probability of nonresponse for an unmarried, nonblack male, age 20, Navy

Table A.1

Sampling Weights

Region	Beneficiary Group					
	E1–E4 w/Deps.	E5–E9 w/Deps.	Officer w/Deps.	E1–E4 No Deps.	E5–E9 No Deps.	Officer No Deps.
Army CAM	1832.9	6945.6	3723.8	3051.8	732.4	1061.9
CRI	11834.0	42333.6	15429.5	19867.6	9288.5	5336.2
Army GTC	7963.1	27402.9	9572.0	12971.3	3775.3	3287.7
Tricare	2631.7	11662.0	4597.9	2957.0	2305.6	662.0
Overlapping	8113.9	34695.0	21833.1	9217.2	6687.8	5638.6
Southeast PPO	5336.4	22175.8	8988.3	5139.4	4356.1	2604.2
New Orleans CRI	73.0	534.8	175.0	—	101.5	86.0
PRIMUS/NAVCARE	6947.8	19414.3	7267.8	7384.8	3321.5	2520.1
Noncatchment	2832.0	12601.3	4477.4	2968.2	2084.4	1145.6
Overseas	17162.5	58800.4	17056.2	17712.4	9845.9	5477.2
Navy CAM	782.7	2913.9	740.8	931.3	369.2	153.6
Air Force CAM	735.4	1910.1	631.5	291.0	416.3	184.0
No initiatives	17339.1	45190.6	17055.4	18439.8	8199.8	4806.3
Naval afloat	10926.7	39672.3	9018.6	23410.6	12037.9	4364.2

Table A.1—continued

Region	Beneficiary Group					
	Retirees Under 65	Retirees Over 65	Reserve Ret. <65	Reserve Ret. 65+	Survivor Under 65	Survivor Over 65
Army CAM	13134.7	4296.0	145.6	435.6	—	536.8
CRI	89638.7	52174.1	3540.6	13660.4	2417.7	13709.1
Army GTC	43374.2	14005.6	1356.8	3569.7	2468.7	2521.2
Tricare	21824.1	6815.9	236.7	794.3	1335.0	1348.3
Overlapping	95135.1	43563.7	6110.3	15622.7	4269.7	8289.6
Southeast PPO	106830.5	47111.0	5467.9	14173.0	2682.7	8679.3
New Orleans CRI	2275.0	865.1	237.3	538.0	—	—
PRIMUS/NAVCARE	52716.6	20249.7	1599.2	5124.5	1618.5	4313.2
Noncatchment	183127.0	66836.8	17569.0	37394.0	6777.2	14114.6
Overseas	10922.2	2800.0	626.4	758.1	—	233.0
Navy CAM	6032.5	1677.2	133.3	325.0	337.0	301.5
Air Force CAM	14642.7	6206.9	610.3	1899.2	648.0	981.0
No initiatives	102706.1	34110.9	6307.1	13303.8	1964.9	5866.3
Naval afloat	—	—	—	—	—	—

Table A.2

Logistic Regression of Nonresponse for Active-Duty Sponsors

Variable	Parameter Estimate	Standard Error
Intercept	1.7747	0.0755
Air Force Reserve	0.1180	0.0837
Army Reserve	0.1231	0.0830
Navy Reserve	0.3015	0.0833
Age	–0.0327	0.0024
Female	–0.3512	0.0450
Black	0.5018	0.0349
Married	–0.0729	0.0361
Army CAM	–0.1565	0.0532
Tricare	0.2853	0.0519
Air Force CAM	0.2615	0.0536
Army E5–E9	–0.6886	0.0610
Army officer	–0.5915	0.0753
Navy E1–E4	–0.2843	0.0592
Navy E5–E9	–0.9817	0.0585
Navy officer	–1.3617	0.0675
Air Force E1–E4	–0.9804	0.0590
Air Force E5–E9	–1.2919	0.0657
Air Force officer	–1.1589	0.0713

Table A.3

Logistic Regression of Nonresponse for Retirees/Survivors

Variable	Parameter Estimate	Standard Error
Intercept	6.4820	0.4155
Navy	0.1052	0.0426
Air Force	–0.1137	0.0438
Age	–0.2636	0.0138
Age squared	0.0021	0.0001
Enlisted paygrade	0.5967	0.0413
Permanent disability	0.5403	0.0569
Temporary disability	–0.9361	0.2543
Survivor	1.3297	0.0881
Overseas	0.3294	0.0660

E1–E4 was 70 percent, while the estimated probability of nonresponse for a married, nonblack Air Force officer, age 30, was 39 percent.

Retirees, Survivors

For retirees and survivors, 74 percent were respondents and 26 percent were included in one of the nonresponse categories.

As indicated above, retirees generally showed lower rates of nonresponse than the active-duty sponsors. For example, the estimated probability of nonresponse for a retired, nondisabled Naval officer aged 50 residing in CONUS was 21 percent.

Postal Return Nonresponse

A separate set of household weights were calculated by IDA that excluded postal return nonrespondents from nonresponse weight calculations. This approach assumes that postal return nonrespondents are effectively missing "at random." To test this assumption an analysis of postal return nonresponse was performed.

Results suggest that predictors of postal returns show similar patterns to those for overall nonresponse for retirees/survivors. For active-duty sponsors, the effects of some demographic and location variables are similar between the models predicting postal returns and overall nonresponse. Other results are detailed below.

Differences between the two types of nonresponse for active-duty sponsors are shown in stronger effects for "region" and reversed directions of coefficients for Army E5–E9, Army officers, and Navy E1–E4 (Table A.4). Those with postgraduate education are less likely to be postal return nonrespondents, when no effect of educational level was found in the nonresponse model. Marital status was not a significant predictor of postal returns; however, other demographic variables (age, female, black) showed similar patterns to the combined nonresponse analysis. Data show that those sampled from Air Force CAM sites were more likely to be postal return nonrespondents. Controlling for this effect, Air Force officers were not significantly different from Army E1–E4 in likelihood of postal nonresponse.

For retirees/survivors, those in Air Force CAM sites were also more likely to be postal return nonrespondents. Otherwise, these predictors showed similar

Table A.4

Logistic Regression of Postal Return Nonresponse for Active-Duty Sponsors

Variable	Parameter Estimate	Standard Error
Intercept	–0.6107	0.0824
Age	–0.0156	0.0027
Female	–0.1323	0.0512
Black	0.1389	0.0383
Graduate education	–0.1829	0.0570
Army CAM	–0.3576	0.0655
CRI	–0.2853	0.0629
Army Gateway to Care	–0.2074	0.0595
Tricare	0.3555	0.0624
Southeast PPO	0.2244	0.0598
New Orleans CRI	–0.6006	0.0959
PRIMUS/NAVCARE	–0.1730	0.0628
Noncatchment areas	0.2457	0.0604
Navy CAM	–0.1049	0.0699
Air Force CAM	0.2984	0.0651
Navy afloat	–0.5502	0.0730
Army E5–E9	0.1839	0.0573
Army officer	0.7006	0.0601
Navy E1–E4	0.2201	0.0638
Navy E5–E9	–0.3681	0.0643
Navy officer	–0.2922	0.0730
Air Force E1–E4	–0.4542	0.0599
Air Force E5–E9	–0.3759	0.0663
Air Force officer	0.0086	0.0648

relationships to postal return nonresponse as in the original nonresponse analyses (Table A.5).

Although some differences in models were noted, there does not appear to be compelling evidence to distinguish postal return nonrespondents from other nonresponse subjects in the survey design. Also, the assumption that postal returns are missing at random does not appear to be supported by the analyses reported here.

Tables A.6 and A.7 report the household weights we received with the data and the weights we calculated.

Table A.5

Logistic Regression of Postal Return Nonresponse for Retirees/Survivors

Variable	Parameter Estimate	Standard Error
Intercept	2.4149	0.5711
Navy	0.3977	0.0159
Air Force	–0.0159	0.0765
Age	–0.1791	0.0195
Age squared	0.0014	0.0002
Enlisted paygrade	0.5859	0.0768
Permanent disability	0.6967	0.0852
Temporary disability	–0.1885	0.3020
Survivor	0.3179	0.1676
Overseas	0.6159	0.0990
Air Force CAM	0.3477	0.1129

Table A.6

Original Household Weights

Region	Beneficiary Group					
	E1–E4 w/Deps.	E5–E9 w/Deps.	Officer w/Deps.	E1–E4 No Deps.	E5–E9 No Deps.	Officer No Deps.
Army CAM	6384.9	12347.1	5408.1	9606.3	1874.2	1757.3
CRI	37894.5	70967.1	22965.2	64041.9	15055.2	9180.4
Army GTC	26488.0	54678.6	18503.7	45680.4	8991.6	5762.0
Tricare	8764.0	24549.0	7833.3	12317.8	5214.2	1932.5
Overlapping	21809.4	57893.8	34826.9	32113.6	12114.4	9999.0
Southeast PPO	13654.3	33915.3	15027.1	18738.4	5973.0	5167.1
New Orleans CRI	177.3	1008.0	258.1	—	181.1	87.5
PRIMUS/NAVCARE	20547.8	35657.1	11682.9	30791.3	5902.6	3584.2
Noncatchment	6867.8	20644.8	7113.2	8078.6	3452.6	1985.8
Overseas	51016.6	106954.0	27000.0	87873.6	22449.1	10241.3
Navy CAM	1823.7	4798.5	1052.9	2235.1	919.5	371.6
Air Force CAM	1555.2	3282.7	1123.7	1496.7	557.3	439.4
No initiatives	35663.9	71792.6	29111.4	44821.9	11304.1	9001.7
Naval afloat	35050.9	72626.8	13200.4	88108.9	21112.2	6611.3

Table A.6—continued

Region	Beneficiary Group					
	Retirees Under 65	Retirees Over 65	Reserve Ret. <65	Reserve Ret. 65+	Survivor Under 65	Survivor Over 65
Army CAM	17828.3	5474.6	197.8	501.8	—	1362.3
CRI	139949.4	70440.2	3936.6	13781.3	5501.9	26826.3
Army GTC	64920.3	18448.4	1811.5	4627.9	4188.3	4954.6
Tricare	30479.4	9356.4	405.8	1021.5	696.8	3420.5
Overlapping	139143.6	60855.8	8753.1	14570.1	10941.1	21940.3
Southeast PPO	159011.3	63703.1	6728.3	14302.1	5008.2	18435.1
New Orleans CRI	3521.0	1319.5	304.3	710.2	—	—
PRIMUS/NAVCARE	76236.8	26656.2	1774.2	8185.5	3647.8	6801.5
Noncatchment	265920.6	94823.1	18333.3	43034.0	14317.7	29202.2
Overseas	17325.2	4472.3	728.3	1255.7	—	744.0
Navy CAM	8979.5	2217.3	95.2	414.2	637.6	679.7
Air Force CAM	20412.9	8267.1	608.6	2247.4	2122.1	2113.6
No initiatives	149279.7	47413.6	8470.4	12759.3	4643.6	15147.6
Naval afloat	—	—	—	—	—	—

Table A.7

RAND Household Weights

Region	Beneficiary Group					
	E1–E4 w/Deps.	E5–E9 w/Deps.	Officer w/Deps.	E1–E4 No Deps.	E5–E9 No Deps.	Officer No Deps.
Army CAM	5424.7	12567.5	6152.1	11910.7	1645.1	1914.5
CRI	33488.6	75754.3	24548.1	66245.9	17232.6	9190.2
Army GTC	29071.8	56711.3	19209.8	50720.1	8144.0	7553.4
Tricare	9546.3	23717.3	7738.9	12559.4	4965.7	1127.2
Overlapping	22782.3	62188.8	34796.6	31632.5	12498.4	9987.4
Southeast PPO	12550.3	37350.3	14598.0	16223.2	8474.1	4348.2
New Orleans CRI	232.0	982.8	254.6	—	282.0	139.8
PRIMUS/NAVCARE	20246.8	34955.1	11822.9	27297.7	6515.1	4668.0
Noncatchment	6758.8	22056.4	7345.7	7579.3	3605.5	2053.7
Overseas	47926.7	107795.3	30142.1	53006.3	18491.6	11484.3
Navy CAM	1855.0	4921.7	1122.3	2125.0	629.4	248.4
Air Force CAM	1615.5	3265.8	1081.5	607.3	746.2	394.6
No initiatives	36885.7	75148.5	28388.0	53246.3	13689.2	8206.5
Naval afloat	33864.5	70644.7	13596.8	78249.5	23055.4	7350.4

Table A.7—continued

Region	Beneficiary Group					
	Retirees Under 65	Retirees Over 65	Reserve Ret. <65	Reserve Ret. 65+	Survivor Under 65	Survivor Over 65
Army CAM	18603.0	5653.5	178.5	551.9	—	1320.9
CRI	128511.6	71300.4	4333.4	17574.7	4976.5	29249.6
Army GTC	61747.2	19059.4	1712.7	4532.1	4864.2	5740.7
Tricare	31826.1	9184.2	292.9	1023.2	3217.7	3042.6
Overlapping	139318.8	58985.8	7691.6	19896.9	9138.5	18787.5
Southeast PPO	151492.0	62933.6	6851.6	18116.9	5776.0	18039.9
New Orleans CRI	3370.5	1172.7	294.3	685.0	—	—
PRIMUS/NAVCARE	76045.3	27252.1	1978.0	6500.8	5709.3	9018.4
Noncatchment	284415.5	90427.4	21872.7	47418.9	16947.0	30860.2
Overseas	17617.8	4308.7	836.7	1102.3	—	2665.5
Navy CAM	8602.2	2274.5	160.4	426.3	695.7	512.6
Air Force CAM	20326.9	8075.0	757.0	2447.1	1539.6	2102.6
No initiatives	144102.2	44940.5	7819.7	16938.6	4109.3	13225.7
Naval afloat	—	—	—	—	—	—

B. Military/Civilian Utilization Comparisons: Data and Methods

Data Sources

Military Beneficiary Survey

For the purposes of this study, a beneficiary survey was fielded to active-duty, retiree, and survivor households.[1] For one randomly selected family member, the survey asked for counts of visits and inpatient nights by location of care. These locations include: MTF, including clinic, hospital, or field/fleet hospital; PRIMUS or NAVCARE clinic; civilian providers; Veterans Administration hospitals; or other, unspecified locations. For active-duty sponsors, visits to military facilities for sick call are distinguished from visits for other medical reasons. For each source, respondents could indicate the number of visits up to "10 or more" during the previous year. Therefore, the survey underestimates the number of visits made by high-frequency users.

In addition to health-services measures, the beneficiary survey provides information regarding household socioeconomic status (household income, sponsor education) and health status for the randomly selected individual (5-point health status scale and number of acute and chronic health conditions).

National Health Interview Survey

Data for civilian utilization rates are taken from the National Health Interview Survey (NHIS). Fielded annually by the U.S. Public Health Service, this survey assesses health status and health-services utilization for a civilian noninstitutionalized sample of approximately 50,000 households and 120,000 individuals. The survey obtains the same information as the military survey on household socioeconomic status and health status for each individual in the household.

We selected the subsample of households from the NHIS that were covered by private insurance for comparisons to the military beneficiary survey. This

[1]While included in the survey, data for reservists and OCONUS beneficiaries are not included in this report.

required us to use the 1989 NHIS, as only this year's data collection contains information regarding insurance coverage. Since we found no secular trends in civilian outpatient use or inpatient admissions between 1987 and 1991, the 1987 data can be compared with the military survey. We randomly selected one person from each civilian household for this analysis. Thus, corrections for intracluster correlation in utilization within households are not required to adjust standard errors of estimates.

Methods

We estimated logistic regressions for the probability of any outpatient visits (Table B.1) and the probability of any inpatient admissions (Table B.4). Our exploratory analysis indicated that the military and civilian samples could be pooled. However, we could not pool the samples for the least-squares regressions we estimated to model the number of outpatient visits, conditional on any visits occurring. Therefore, we estimated separate models for the conditional number of visits for the military group (Table B.2) and the civilian group (Table B.3). The dependent variable for these regressions was the natural logarithm of number of visits.

Since the military survey permitted answers only up to 10 visits for each source of care, we truncated the data in both data sets to make them more comparable. We carried out the analysis with truncations at 10 and 30 visits. The results were similar, and so we report only the results for the truncation at 10.

We used the regression models to calculate the military and civilian utilization rates shown in Section 3 in Tables 2 and 3. The method we used in these calculations differed slightly for the outpatient and inpatient estimates. To estimate per-capita visits, we first predicted the probability that each person in the military sample would have any visits from the logistic regression model in Table B.1 if that person were:

- a military beneficiary,
- a civilian in an FFS plan, and
- a civilian in an HMO plan.

The next step was to estimate from the regression models in Table B.2 and B.3 the number of visits (s)he would have, conditional on having some visits, under the same three scenarios. For that person, we calculated the predicted number of visits in each scenario by multiplying the predicted probability of having any visits by the expected numbers of visits, conditional on having any. The final

step was to calculate the average predicted number of visits within each military population group in each scenario.

To estimate the fraction with inpatient care in each of the three scenarios, we first predicted the probability of having any inpatient use for each individual in the military sample under that scenario. We then calculated the average probability of inpatient use within each military population group.

Regression Variables

Three measures were used in assessing health-services utilization: a 0/1 indicator of any outpatient care; a 0/1 indicator of any inpatient care; and number of outpatient visits winsorized[2] at 10.

Preliminary analyses showed that the relationship between utilization and age is nonlinear, and that it differs by gender. While other functional forms were considered to control for these demographic variables (e.g., modeling via splines, with separate terms by gender), the final models specify age by groups—ages 0–17, 18–44, and 45–64—with separate coefficients for males and females for each group. Separate models were fit for Medicare eligibles (beneficiaries over age 64).

Measures of health status include a five-point scale (excellent, very good, good, fair, poor) of self-reported health status and self-reported acute and chronic conditions.

Household income, educational attainment for head of household (civilian) or sponsor (military), and number in household are indicators of household socioeconomic status. Preliminary analyses showed that a linear specification was adequate for these variables.

For civilians, an indicator variable is included that distinguishes those covered by HMO plans from these covered by FFS plans. This indicator is present only for the non-Medicare population.

Finally, we included indicator variables for observations with missing socioeconomic or health status variables (Table B.5).

[2]Winsorization accumulates observations at a truncation point. See, for example, Amemiya, 1985.

Table B.1

Any Outpatient Visits, Military and Civilian Populations

Variable	Estimated Coefficient	Standard Error
Intercept	0.4686	0.1384
Civilian	–1.0321	0.0831
Ages 0–17	0.7833	0.0524
Ages 45–64	0.0916	0.0444
Female	0.4676	0.0393
Female, childbearing age	0.5056	0.0588
Active-duty indicator	0.6865	0.0687
Female active-duty indicator	–0.0802	0.2146
Junior enlisted	–0.4760	0.1478
Black	–0.3326	0.0902
Other ethnicity	–0.1736	0.1133
Black civilian	0.3041	0.1072
Other civilian	–0.2051	0.1436
Catchment	0.0592	0.0673
Health status (1=excellent, 5=poor)	0.2221	0.0188
Acute conditions	0.1891	0.0243
Chronic conditions	0.3400	0.0257
Military acute conditions	1.1094	0.0570
Military chronic conditions	0.0085	0.0693
Income	0.0056	0.0011
Education	0.0626	0.0066
Number in household	–0.0157	0.0130
HMO	0.1627	0.0422
Military missing condition	0.2182	0.0835
Civilian missing income	–0.0851	0.0552
Civilian missing education	–0.3337	0.1641
Military missing income	–0.1665	0.1743
Military missing education	–0.1585	0.1824
Civilian missing health status	–1.1878	0.2674
Civilian missing health status	–1.1878	0.2674
Number of Observations	33473	

Table B.2

Log (Number of Outpatient Visits) Military Beneficiaries with Some Visits Truncated at 10

Variable	Estimated Coefficient	t-statistic
Intercept	0.7972	23.54
Ages 0–17	0.0761	5.26
Ages 45–64	–0.0089	–0.63
Female	0.0896	9.20
Female, childbearing age	0.0734	4.62
Active-duty indicator	–0.0245	–1.50
Female active-duty indicator	0.1792	5.81
Junior enlisted	–0.0272	–1.21
Black	0.0216	1.64
Other ethnicity	–0.0554	–2.98
Catchment	0.0324	3.55
Health status (1=excellent, 5=poor)	0.1474	34.63
Acute conditions	0.1277	27.77
Chronic conditions	0.1107	24.58
Income	0.0007	2.45
Education	0.0017	0.78
Number in household	–0.0252	–7.85
Military missing conditions	0.0229	2.71
Military missing income	0.0257	0.89
Military missing education	0.1333	5.55
Military missing health status	0.0361	0.97
Number of observations	12550	
R^2	0.1978	

Table B.3

Log (Number of Outpatient Visits) Civilians with Some Visits Truncated at 10

Variable	Estimated Coefficient	t-statistic
Intercept	0.2908	10.63
Ages 0–17	0.1006	9.06
Ages 45–64	–0.0144	–1.20
Female	0.0853	9.17
Female, childbearing age	0.1866	14.11
Black	–0.1808	–14.23
Other ethnicity	–0.1169	–5.87
Health status (1=excellent, 5=poor)	0.2082	45.48
Acute conditions	0.0650	16.97
Chronic conditions	0.1303	29.83
Income	0.0014	5.27
Education	0.0093	5.91
Number in household	0.0195	–6.39
HMO (civilian only)	0.0272	3.16
Civilian missing income	–0.0591	–4.67
Civilian missing education	–0.0183	–0.38
Civilian missing health status	–0.1087	–1.59
Number of observations	14150	
R^2	0.1253	

Table B.4

Any Hospital Stays, Military and Civilian Populations

Variable	Estimated Coefficient	Standard Error
Intercept	–3.2653	0.1721
Civilian	–0.2494	0.0805
Ages 0–17	–0.3579	0.0808
Ages 45–64	0.1836	0.0673
Female	–0.0953	0.0536
Female, childbearing age	0.8251	0.0738
Active-duty indicator	–0.2056	0.0941
Female active-duty indicator	0.5406	0.1525
Junior enlisted	0.6701	0.1715
Black	0.0579	0.1022
Other ethnicity	–0.0749	0.1296
Black civilian	–0.2974	0.1405
Other civilian	0.0454	0.2016
Catchment	–0.0785	0.0666
Health status (1=excellent, 5=poor)	0.4209	0.0211
Acute conditions	0.0781	0.0263
Chronic conditions	0.2077	0.0232
Military acute conditions	0.1011	0.0403
Military chronic conditions	–0.0741	0.0346
Income	–0.0044	0.0015
Education	–0.0179	0.0093
Number in household	0.0887	0.0175
HMO (civilian only)	–0.1390	0.0701
Military missing conditions	0.5123	0.0570
Civilian missing income	–0.0294	0.0929
Civilian missing education	0.0894	0.2946
Military missing income	–0.2719	0.1931
Military missing education	0.2143	0.1661
Civilian missing health status	0.2959	0.5227
Military missing health status	0.2665	0.2126
Number of observations	33473	

Table B.5

Means and Standard Deviations for Regression Variables

Variable	Mean	Standard Deviation
Civilian indicator	0.540	0.498
Indicator age 0–17	0.212	0.409
Indicator age 45–64	0.291	0.454
Female indicator	0.501	0.500
Female childbearing age	0.198	0.399
Active-duty indicator	0.129	0.335
Female active-duty indicator	0.014	0.118
Junior enlisted	0.011	0.104
Black	0.103	0.304
Other ethnicity nonwhite	0.047	0.212
Black civilian	0.064	0.246
Civilian of other ethnicity	0.022	0.148
In catchment area	0.367	0.482
HMO	0.156	0.363
Income (in $1,000)	36.402	16.412
Education (in years)	13.804	2.620
Number in household	2.806	1.410
Health status (1=excellent, 5=poor)	1.953	0.985
Acute conditions scale	0.006	0.999
Chronic conditions scale	0.008	1.005
Acute conditions—military	0.006	0.678
Chronic conditions—military	0.006	0.682
Military missing conditions	0.146	0.353
Civilian missing income	0.067	0.250
Civilian missing education	0.006	0.079
Military missing income	0.010	0.100
Military missing education	0.010	0.098
Civilian missing health status	0.002	0.043
Military missing health status	0.007	0.082
Any outpatient visits	0.827	0.378
Any inpatient stays	0.084	0.277
Number of visits (range 0–10)	3.116	3.079

C. Regression Methods for Predicting Demand in Alternative Systems

In the subsequent discussion, we will use the following variables:

y_i = health expenditures (or utilization) for individual i,

x_i = vector of individual characteristics,

d_i = vector of military and civilian health care variables.

The goal of this analysis is to evaluate the impact of system changes (included in the vector d_i) on the mean level of health care expenditures (y_i) and to perform some simple policy simulations. To accomplish this task, we need to account for the nonnormal statistical properties of health data. In particular, the observed distribution of health care expenditures has a mass point at zero, and for positive values it has excess weight in the tail that is inconsistent with a truncated normal distribution. Because these data are similar to those found in the RAND Health Insurance Experiment, we employ similar methods (Manning et al., 1987; and Duan et al., 1982).

The following specification determines whether an individual has positive expenditures, where the subscript i has been suppressed for convenience:

$$I^* = x\alpha_x + d\alpha_d + \epsilon_I$$

$$\epsilon_I \sim N\ (0,1)$$

$$\text{If } \begin{pmatrix} I^* > 0 \\ I^* \leq 0 \end{pmatrix}, \text{ then we observe } \begin{pmatrix} y > 0 \\ y = 0 \end{pmatrix}.$$

Conditional on an observation of positive expenditures (or equivalently a realization of ϵ_I), we model the distribution of (log) expenditures as follows:

$$log(y)\ |\ (y > 0) = xb_x + db_d + \epsilon_2$$

$$\epsilon_2 |\ y > 0 \sim F\left(0, \sigma^2\right)$$

where $F\left(0, \sigma^2\right)$ denotes a distribution (possibly nonnormal) with mean 0 and variance σ^2.

In this model, we assume x and d are nonstochastic.[1] The assumption of normality yields a convenient representation for the conditional mean of the untransformed expenditures:

$$E[y \mid z, y > 0] = \exp(z\beta)\gamma$$

$$\beta = (\beta_x, \beta_d);\ z = (x, d);\ \gamma = E\left[exp(\epsilon^2)\right],$$

where γ is the retransformation factor that adjusts the bias in taking the antilog for the logarithmic-scale prediction $z\beta$.

Therefore, the unconditional mean of y can be computed as

$$E[y \mid z] = \Phi(z\alpha)\exp(z\beta)\gamma$$

$$\alpha = (\alpha_x, \alpha_d),$$

where $\Phi(\bullet)$ denotes the standard normal cumulative distribution function.

Point Estimation

We estimate the two-part model sequentially. In the first stage, we use maximum likelihood techniques under the assumption of normality (weighted probit) to compute an estimate of α. In the second stage, we estimate ordinary least squares regressions with (log) utilization or cost level *for those individuals with positive use* as the dependent variable and the same covariates to get an estimate of β. We compute a consistent estimate for the retransformation factor, γ, using the smearing estimator.[2] As a result, we obtain a consistent estimate of the mean health care utilization or cost of an individual with demographic characteristics x_i and dummy specification d_i using

$$\hat{E}(y_i \mid z_i) = \hat{\text{Prob}}(y_i > 0 \mid z_i)\hat{E}(y_i \mid z_i, y_i > 0) = \Phi\left(z_i'\hat{\alpha}\right)\exp\left(z_i'\hat{\beta}\right)\hat{\gamma}.$$

For policy simulation, we use the estimated coefficients to predict utilization and costs for the survey sample, weighted to reflect the total population. We first specify new values for the variables in the d vector of health-system variables, incorporating the changes we want to simulate. If $z_i \equiv (x_i, d_i)$, then $\hat{E}(y_i \mid z_i)$ denotes the mean level of expenditures for a particular survey participant. We

[1]The vector d contains dummy variables indicating membership in the CRI and CAM enrollment programs. Enrollment is endogenous to utilization because beneficiaries base their enrollment decision on expected utilization. We could not control for this endogeneity.

[2]The smearing estimator is the sample average of the exponentiated residuals (i.e., $\hat{\gamma} = \frac{1}{N}\Sigma\ \exp(\hat{\epsilon}_i)$). Duan (1983) discusses this estimator in detail.

can then construct the vector $z_i^* \equiv (x_i, d_i^*)$, where d_i^* differs from d_i only in that it incorporates the changes to be simulated. Thus, for example, z_i^* may be thought of as a pseudo-individual who differs from the original z_i only in that z_i^* is now in a CRI plan instead of the standard program or is now served by a new military hospital instead of no MTF. The quantity $\hat{E}(y_i|z_i^*)$ denotes the predicted utilization of this pseudo-individual under standard CHAMPUS. The difference $\hat{E}(y_i|z_i) - \hat{E}(y_i|z_i^*)$ represents the expected change in mean health care utilization for individual z_i under a changed system, relative to the baseline situation. If w_i denotes the population weight associated with a survey participant, then an overall estimate of the mean impact of the simulated change may be computed as

$$\Delta \equiv \frac{1}{\sum w_i} \sum_{i=1}^{k} w_i \left[\hat{E}(y_i|z_i) - \hat{E}(y_i|z_i^*) \right].$$

Tables C.1 to C.10 contain the point estimates and t-statistics for all equations estimated. Tables C.11 and C.12 contain weighted means and standard deviations.

Table C.1

MTF Use for CHAMPUS-Eligible Adults in Catchment Areas

	Probability of Visits>0		No. Visits if Visits>0		Probability: Hosp. Nights>	
Variable	Coefficient	Stand. Error	Coefficient	Stand. Error	Coefficient	Stand. Error
Intercept	–0.50330	0.22927	0.38089	0.15636	–1.42981	0.36598
Retired	–0.29566	0.11116	–0.29662	0.07706	–0.20371	0.17320
Retired female	0.09681	0.04334	0.10105	0.03254	–0.23984	0.07756
Officer	0.04218	0.05187	–0.00302	0.03651	—	—
Not MTF service	–0.23934	0.04119	0.03739	0.03041	–0.15897	0.07172
Employed	–0.11023	0.03959	–0.05859	0.02783	–0.21963	0.06382
Family income	0.00827	0.01746	–0.04684	0.01116	–0.02309	0.02295
Family size	0.07709	0.01462	0.03365	0.00946	0.01620	0.02229
Age	0.03372	0.00970	0.01183	0.00681	–0.01183	0.01592
Age squared	–0.00038	0.00012	0.00002	0.00008	0.00023	0.00019
Female age 18–34	0.20764	0.06832	0.20395	0.04478	0.13298	0.10383
No. health cond.	0.11465	0.01629	0.15474	0.00885	0.08475	0.01728
AFCAM enrolled	–0.42700	0.76411	0.13526	0.47626	–0.03102	0.41320
NAVCAM enrolled	0.56900	0.69206	–0.70287	0.30193	–0.40251	0.71260
CRI enrolled	–0.01388	0.12824	0.13721	0.07887	0.15682	0.12183
AFCAM—ret.	0.03546	0.79898	0.06705	0.51654	—	—
NAVYCAM—ret.	–0.10938	0.82494	0.53868	0.41121	—	—
CRI—ret.	0.11587	0.16672	–0.04895	0.10996	—	—
Army MTF	–0.17098	0.04455	0.07056	0.02955	0.08657	0.06947
Navy MTF	–0.31971	0.04642	0.03562	0.03247	–0.04458	0.07687
log(MTF beds/pop.)	0.10688	0.06731	0.12957	0.03920	0.15398	0.09270
log(beds/pop.)—ret.	0.31857	0.07645	0.01390	0.04886	0.10501	0.11383
log(MTF MDs/bed)	0.26271	0.11502	0.22326	0.06945	0.20551	0.16561
log(MDs/bed)—ret.	0.23662	0.13910	–0.00044	0.09814	0.04664	0.22280
Income—ret.	–0.06318	0.01788	0.03144	0.01174	0.00444	0.02679
Health cond.—ret.	–0.01259	0.01881	–0.03923	0.01145	–0.05099	0.02303

Table C.2

MTF Use for CHAMPUS–Eligible Children in Catchment Areas

	Probability of Visits>0		No. Visits if Visits>0		Probability: Hosp. Nights>0	
Variable	Coefficient	Stand. Error	Coefficient	Stand. Error	Coefficient	Stand. Error
Intercept	0.28965	0.12309	1.06130	0.06818	–0.21093	0.17730
Retired	0.24234	0.16564	–0.23645	0.10759	–0.33170	0.17584
Officer	0.19114	0.08501	–0.06832	0.04633	—	—
Not MTF service	0.01886	0.07056	0.00873	0.03933	–0.01257	0.11504
Employed	–0.14548	0.06011	0.01395	0.03452	0.18296	0.09499
Family income	0.00789	0.02114	–0.00344	0.01161	–0.04828	0.02628
Family size	0.02614	0.02076	–0.02746	0.01229	–0.03276	0.03493
Age	–0.01663	0.01845	–0.05008	0.01045	–0.28567	0.02824
Age squared	–0.00026	0.00107	0.00156	0.00060	0.01252	0.00177
No. health cond.	0.35513	0.02712	0.27240	0.01259	0.06190	0.03281
AFCAM enrolled	–0.30640	0.54436	–0.03155	0.31580	–0.59270	1.07884
NAVCAM enrolled	–0.37034	0.53916	–0.01182	0.31777	0.02828	0.88608
CRI enrolled	–0.00832	0.10392	–0.15169	0.05479	0.04358	0.15086
AFCAM—ret.	0.69934	1.05825	0.82536	0.60264	—	—
NAVYCAM—ret.	0.56979	1.34909	–0.06042	0.81203	—	—
CRI—ret.	0.02785	0.27382	0.38646	0.18622	—	—
Army MTF	–0.20227	0.06514	0.00424	0.03470	–0.25923	0.09487
Navy MTF	–0.24879	0.06849	–0.01405	0.03716	–0.52123	0.11364
log(MTF beds/pop.)	0.28134	0.06096	0.06344	0.03187	0.45055	0.08921
log(beds/pop.—ret.	0.40827	0.11854	0.11694	0.05921	–0.47187	0.25481
log(MTF MDs/bed)	0.53372	0.10701	0.57225	0.15142	0.45089	0.17268
log(MDs/bed)—ret.	0.16338	0.22540	0.11115	0.07389	–0.35571	0.50106
Income—ret.	–0.03657	0.02937	0.05470	0.01766	—	—
Health cond.—ret.	–0.29217	0.04298	0.04276	0.03277	—	—

Table C.3

MTF Use for Medicare Eligibles in Catchment Areas

	Probability of Visits>0		No. Visits if Visits>0		Probability: Hosp. Nights>0	
Variable	Coefficient	Stand. Error	Coefficient	Stand. Error	Coefficient	Stand. Error
Intercept	0.72758	0.36728	0.04210	0.27968	–3.01164	0.60249
Officer	0.12264	0.07027	–0.25667	0.05062	–0.28850	0.11791
Female	–0.09778	0.06112	0.08290	0.04430	–0.19876	0.09703
Not MTF service	–0.37418	0.05871	0.07692	0.04401	–0.10597	0.09720
Family income	–0.00364	0.01563	0.07402	0.01104	0.10554	0.02139
Family size	–0.11852	0.06938	–0.30716	0.05266	–0.32468	0.12907
Age	–0.01124	0.00514	0.01004	0.00396	0.01555	0.00848
No. health cond.	0.01169	0.01165	0.13082	0.00851	0.08385	0.01732
Army MTF	0.03979	0.06915	–0.12876	0.04732	–0.27268	0.10786
Navy MTF	–0.51342	0.07412	–0.03557	0.05844	–0.43881	0.12642
log(MTF beds/pop.)	0.31131	0.05263	0.042715	0.03983	0.38831	0.08259
log(MTF MDs/bed)	–0.05662	0.10515	0.05221	0.08922	0.12064	0.17625

Table C.4

MTF Use in Noncatchment Areas

	Probability of Visits>0		No. Visits if Visits>0		Probability: Hosp. Nights>0	
Variable	Coefficient	Stand. Error	Coefficient	Stand. Error	Coefficient	Stand. Error
Intercept	–0.32341	0.20290	1.75087	0.16154	–1.23268	0.39660
Retired	–0.59340	0.17697	0.19601	0.15228	–0.58411	0.38341
Retired female	0.14021	0.06394	–0.01608	0.06280	–0.34453	0.17963
Medicare eligible	0.24189	0.13345	0.36487	0.13563	0.16996	0.32541
Officer	–0.06476	0.07849	–0.16151	0.07019	—	—
Employed	–0.10904	0.06811	–0.12690	0.05943	–0.03619	0.17105
Family income	–0.00534	0.03942	0.00989	0.02983	0.03453	0.06145
Family size	–0.04354	0.02344	–0.13819	0.02231	–0.10023	0.06269
Age	0.00761	0.00740	–0.01456	0.00647	–0.00290	0.01592
Age squared	–0.00014	0.00010	0.00005	0.00008	0.00003	0.00022
Female age 18–34	0.18497	0.11839	–0.18303	0.08973	0.08115	0.26214
No. health cond.	0.11945	0.04716	0.19904	0.03457	–0.06863	0.09819
Age—child	0.09128	0.03655	–0.07166	0.02998	0.02879	0.08494
Age squared—child	–0.00643	0.00236	0.00416	0.00194	–0.00404	0.00632
Health cond.—child	0.03236	0.06065	–0.00791	0.04850	0.03798	0.13912
Income—ret.	0.00296	0.03978	–0.00934	0.03089	–0.10791	0.07633
Health cond.—ret.	–0.09876	0.04788	–0.10840	0.03598	0.10351	0.10151
Mil. clinic area	0.47009	0.09457	–0.18864	0.06330	–0.12556	0.19912

Table C.5

CHAMPUS Use, Catchment, Active-Duty Families

	Probability of Visits>0		No. Visits if Visits>0		Probability: Hosp. Nights>0	
Variable	Coefficient	Stand. Error	Coefficient	Stand. Error	Coefficient	Stand. Error
Intercept	–1.80957	0.24327	–0.02561	0.33233	–2.28821	0.34135
Officer	0.14866	0.05034	0.19925	0.06168	0.09770	0.08657
Employed	0.03500	0.03538	0.10465	0.04392	–0.17378	0.06426
Family income	0.02293	0.01174	0.00101	0.01473	–0.03742	0.02134
Family size	0.09117	0.01209	0.09690	0.01568	0.04673	0.01969
Family age	0.03968	0.01511	0.02776	0.02073	0.00234	0.02088
Family age squared	–0.00055	0.00023	–0.00031	0.00031	0.00001	0.00031
Family health	0.10892	0.01407	0.08791	0.01729	0.10373	0.02250
Child < age 1	0.09826	0.04700	–0.10121	0.05757	0.91366	0.05997
AFCAM	–0.33482	0.27757	–0.00740	0.40703	–0.04177	0.46498
AFCAM enrolled	0.66900	0.42199	0.25429	0.54373	–0.00533	0.74979
NAVCAM	0.12691	0.11968	–0.04720	0.13483	0.39208	0.16133
NAVCAM enrolled	0.69471	0.34496	0.10456	0.30190	–0.12048	0.44885
CRI	–0.16270	0.04820	0.13883	0.06402	–0.45187	0.09929
CRI enrolled	0.72367	0.07194	0.30954	0.08090	0.65689	0.12209
Army MTF	–0.01575	0.03856	0.02248	0.04967	0.05665	0.06697
Navy MTF	0.38966	0.04404	0.26802	0.05250	0.33064	0.07172
log(MTF beds/pop)	–0.24586	0.03323	–0.08407	0.04105	–0.36669	0.05517
log(MTF MDs/bed)	–0.21993	0.05818	–0.14528	0.06319	–0.31301	0.08654
log(Civ beds/pop)	0.00817	0.00556	–0.00198	0.00706	0.00957	0.00901
log(Civ MDs/pop)	–0.03760	0.01889	0.04959	0.02493	0.02439	0.03149

Table C.6

CHAMPUS Use, Catchment, Retiree Families

	Probability of Visits>0		No. Visits if Visits>0		Probability: Hosp. Nights>0	
Variable	Coefficient	Stand. Error	Coefficient	Stand. Error	Coefficient	Stand. Error
Intercept	–2.18029	0.32507	1.17683	0.53112	–3.37253	0.80145
Officer	0.20305	0.06087	0.17601	0.06954	–0.01209	0.11250
Employed	–0.14456	0.04850	0.02559	0.05633	–0.05814	0.08638
Family income	0.03656	0.00962	0.04881	0.01106	0.01491	0.01738
Family size	0.20372	0.02046	0.03237	0.02404	0.08467	0.03486
Family age	0.02782	0.01384	–0.02101	0.02201	0.02527	0.03314
Family age squared	–0.00015	0.00015	0.00021	0.00023	–0.00015	0.00035
Family health	0.12729	0.02058	0.18126	0.02417	0.20562	0.03675
Child < age 1	–0.03094	0.30121	–0.32266	0.34014	0.31911	0.42333
AFCAM	0.01478	0.20958	0.16272	0.26268	–0.10581	0.41764
AFCAM enrolled	0.61949	0.32839	–0.19545	0.35733	0.25441	0.57344
NAVCAM	0.11664	0.20725	0.06985	0.23448	–0.16052	0.46020
NAVCAM enrolled	0.25517	0.47846	0.07408	0.49271	0.44319	0.81961
CRI	–0.40983	0.07148	0.08842	0.09576	–0.28036	0.15216
CRI enrolled	1.46073	0.14073	0.38246	0.12862	0.71072	0.20265
Army MTF	–0.02048	0.05382	–0.02016	0.06885	0.00888	0.09728
Navy MTF	0.37087	0.06030	0.28204	0.06947	0.03504	0.10835
log(MTF beds/pop)	–0.25689	0.04036	–0.20163	0.05081	–0.27341	0.07650
log(MTF MDs/bed)	–0.28787	0.07899	–0.13437	0.08823	–0.19472	0.13489
log(Civ beds/pop)	0.01561	0.00712	0.00576	0.00779	0.00641	0.01224
log(Civ MDs/pop)	–0.13220	0.02946	–0.02951	0.03539	–0.09449	0.05546

Table C.7

CHAMPUS Use, Noncatchment, All

	Probability of Visits>0		No. Visits if Visits>0		Probability: Hosp. Nights>0	
Variable	Coefficient	Stand. Error	Coefficient	Stand. Error	Coefficient	Stand. Error
Intercept	–1.14600	0.29514	0.34161	0.31405	–2.30383	0.50472
Officer	0.22159	0.07625	0.46085	0.07135	0.46731	0.11246
Employed	0.25151	0.05545	–0.05116	0.05467	0.12480	0.08671
Family income	–0.07356	0.03645	–0.02653	0.03710	–0.18030	0.05662
Income—ret.	0.07420	0.03640	0.02593	0.03702	0.09075	0.05711
Family size	0.12775	0.02200	0.11862	0.02120	0.05229	0.02886
Family age	0.02305	0.01430	0.00784	0.01560	0.04877	0.02551
Family age squared	–0.00010	0.00016	0.00001	0.00017	–0.00045	0.00028
Family health	0.14595	0.02238	0.15014	0.02146	0.10954	0.03392
Child < age 1	0.71504	0.13801	0.28813	0.10665	0.82126	0.14554
Mil. clinic area	0.03018	0.08706	0.06441	0.08516	–0.07399	0.12841
Retired	–0.53955	0.15230	0.14463	0.15988	–0.74090	0.23426
log(Civ beds/pop)	0.00965	0.00815	–0.01080	0.00748	0.01803	0.01114
log(Civ MDs/pop)	–0.08315	0.02438	0.08284	0.02512	–0.10270	0.04140

Table C.8

CHAMPUS Costs, Catchment, Active-Duty Families

	Probability of Costs > 0		Costs if Costs > 0	
Variable	Coefficient	Stand. Error	Coefficient	Stand. Error
Intercept	–1.00579	0.20000	4.12380	0.33997
Officer	0.09952	0.04929	0.13489	0.08546
Employed	0.00776	0.03437	–0.08887	0.06016
Family income	-0.01176	0.01145	–0.02137	0.02068
Family size	0.11950	0.01172	0.11241	0.02122
Family age	0.02821	0.01214	0.02340	0.02029
Family age squared	–0.00033	0.00018	–0.00029	0.00029
Family health	0.09397	0.01379	0.15762	0.02316
Child < age 1	0.41912	0.04736	0.73859	0.07320
AFCAM	–0.57718	0.25555	0.19389	0.54190
AFCAM enrolled	0.05293	0.40750	0.31381	0.76898
NAVCAM	0.04284	0.12043	0.10584	0.20516
NAVCAM enrolled	0.92930	0.39493	–0.34293	0.46320
CRI	–0.44949	0.04636	0.05004	0.09249
CRI enrolled	0.76747	0.07179	0.66889	0.12244
Army MTF	–0.06899	0.03724	0.09321	0.06340
Navy MTF	–0.01056	0.04355	0.59551	0.07413
log(MTF beds/pop)	–0.01838	0.03205	–0.41641	0.05321
log(MTF MDs/bed)	–0.12588	0.05728	–0.28116	0.09329
log(Civ beds/pop)	0.00270	0.00548	0.00415	0.00897
log(Civ MDs/pop)	–0.05010	0.01825	0.03031	0.03431

Table C.9

CHAMPUS Costs, Catchment, Retiree Families

	Probability of Costs > 0		Costs if Costs > 0	
Variable	Coefficient	Stand. Error	Coefficient	Stand. Error
Intercept	–2.43217	0.34521	6.44535	0.79919
Officer	0.08010	0.06085	0.28092	0.09862
Employed	–0.02928	0.04801	–0.07550	0.07772
Family income	0.02966	0.00953	–0.00538	0.01546
Family size	0.19990	0.02057	0.08897	0.03362
Family age	0.04537	0.01467	–0.07832	0.03275
Family age squared	–0.00030	0.00016	0.00089	0.00034
Family health	0.15487	0.02035	0.21728	0.03419
Child < age 1	0.53304	0.32964	–0.45132	0.41763
AFCAM	–0.29374	0.20866	0.03825	0.40705
AFCAM enrolled	1.08929	0.35003	–0.58368	0.52785
NAVCAM	–0.00851	0.20765	–0.36452	0.35221
NAVCAM enrolled	0.42034	0.48689	0.09331	0.71458
CRI	–0.71872	0.07210	0.42553	0.15467
CRI enrolled	1.46532	0.13627	0.46986	0.20497
Army MTF	0.07995	0.05265	–0.14726	0.09057
Navy MTF	0.14767	0.05999	0.32901	0.10209
log(MTF beds/pop)	–0.07058	0.03942	–0.21954	0.06743
log(MTF MDs/bed)	–0.13848	0.07842	–0.20321	0.12682
log(Civ beds/pop)	0.01344	0.00702	0.00177	0.01123
log(Civ MDs/pop)	–0.13601	0.02887	–0.08612	0.04919

Table C.10

CHAMPUS Costs, Noncatchment, All

	Probability of Costs > 0		Costs if Costs > 0	
Variable	Coefficient	Stand. Error	Coefficient	Stand. Error
Intercept	–1.12812	0.30039	3.71696	0.50140
Officer	0.25997	0.07670	0.55198	0.11739
Employed	0.26458	0.05609	–0.31644	0.08996
Family Income	–0.10460	0.03708	–0.05719	0.05689
Income—ret.	0.11307	0.03708	–0.00886	0.05706
Family size	0.13889	0.02246	0.14770	0.03385
Family age	0.02484	0.01455	0.05462	0.02514
Family age squared	–0.00007	0.00016	–0.00063	0.00028
Family health	0.18720	0.02281	0.24952	0.03588
Child < age 1	0.95784	0.15076	0.82101	0.16603
Mil. clinic area	0.13406	0.08875	0.09744	0.13134
Retired	–0.98735	0.15598	0.33623	0.25134
log(Civ beds/pop)	0.00115	0.00821	0.01788	0.01279
log(Civ MDs/pop)	–0.08214	0.02471	0.04472	0.04269

Table C.11

Weighted Means and Standard Deviations for Variables in MTF Regressions

	Catchment Areas						Non-Catchment Areas	
	CHAMPUS-Eligible Adults		Children		Medicare Eligibles		All Beneficiaries	
Variable	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Any visits	0.5288	0.4984	0.6455	0.4725	0.4122	0.4830	0.2418	0.4216
log (visits)	1.1710	0.7306	1.0748	0.7045	1.2592	0.6878	1.1481	0.6569
Any inpatient	0.0565	0.2309	0.0653	0.2472	0.0543	0.2267	0.0158	0.1246
Retired	0.6699	0.4703	0.2579	0.4376			0.8225	0.3892
Retired female	0.3300	0.4703			0.5277	0.4905	0.4264	0.4946
Medicare							0.1884	0.3911
Officer	0.2040	0.4030	0.1829	0.3866	0.4324	0.4955	0.2174	0.4125
Not MTF service	0.2582	0.4377	0.1756	0.3805	0.3907	0.4880		
Employed	0.4752	0.4982	0.2971	0.4570			0.3223	0.4674
Family income grp.	4.3089	0.0175	3.3842	1.9513	3.3735	2.1256	3.6011	2.3219
Family size	3.0152	1.4301	4.1749	1.4017	0.0162	0.0223	2.7910	1.5602
Single					0.3481	0.4765		
Age	43.2124	14.0893	7.8237	5.0853	72.3642	5.9810	44.1336	23.1304
Female age 18–34	0.2447	0.4289					0.0770	0.2626
No. conditions	2.2936	2.2447	1.4737	1.4352	3.1355	2.3572	2.3699	2.2792
AFCAM enrolled	0.0059	0.0763	0.0027	0.0523				
NAVCAM enrolled	0.0025	0.0498	0.0020	0.0448				
CRI enrolled	0.0481	0.2141	0.0678	0.2514				
AFCAM—ret.	0.0054	0.0733	0.0012	0.0339				
NAVYCAM—ret.	0.0016	0.0394	0.0004	0.0191				
CRI—ret.	0.0277	0.1641	0.0124	0.1108				
Army MTF	0.3820	0.4859	0.4193	0.4935	0.3489	0.4767		
Navy MTF	0.2749	0.4465	0.2847	0.4513	0.3064	0.4611		
log(MTF beds/pop)	0.4143	0.7179	0.4393	0.6855	0.4219	0.7379		
log(beds/pop)—ret.	0.2707	0.6548	0.0988	0.4325				
log(MTF MDs/bed)	–0.3340	0.3694	–0.3321	0.3627	–0.3254	0.3899		
log(MDs/bed)—ret.	–0.2301	0.3497	–0.0875	0.2474				
Area w/ clinic							0.0920	0.2891
Income—ret.	3.1424	3.2137	0.9387	2.0109			3.0444	2.6253
Health cond—chld							0.3230	0.8569
Health cond.—ret.	1.6180	2.2030	0.4481	0.4481	0	0	0000000	0000000

Table C.12

Weighted Means and Standard Deviations for Variables in CHAMPUS Regressions

	Catchment Areas				Non-Catchment Areas	
	Active-Duty Families		Retired Families		All Families	
Variable	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Any visits	0.3591	0.4798	0.4053	0.4910	0.6034	0.48930
log (visits)	1.4337	1.0144	1.6550	1.0401	1.7806	1.07290
Any inpatient	0.0622	0.2415	0.0391	0.1939	0.1091	0.31180
Any govt. costs	0.5361	0.4987	0.4916	0.5000	0.6099	0.48790
log (govt. costs)	5.6712	1.7114	5.6603	1.5787	6.2287	1.82560
Any costs	0.5726	0.4947	0.5347	0.4989	0.6721	0.46950
log(total costs)	5.8606	1.6432	6.1560	1.5968	6.5308	1.69010
Officer	0.1844	0.3878	0.1968	0.3976	0.2771	0.4476
Employed	0.2755	0.4468	0.5120	0.4999	0.3186	0.4660
Family income catg.	3.2464	1.8982	4.5681	2.7431	3.8776	2.2979
Family income—ret.					1.6340	2.6694
Family size	3.6008	1.3148	2.5048	1.1885	3.1405	1.3636
Family age	30.9373	7.3634	50.5150	9.7165	40.1596	12.7471
Family health	2.3458	1.0827	2.8082	1.0816	2.5014	1.1391
Child < age 1	0.1242	0.3299	0.0050	0.0702	0.0454	0.2081
AFCAM	0.0052	0.0719	0.0167	0.1282		
AFCAM enrolled	0.0019	0.0438	0.0063	0.0792		
NAVCAM	0.0170	0.1295	0.0131	0.1137		
NAVCAM enrolled	0.0020	0.0449	0.0022	0.0472		
CRI	0.1931	0.3948	0.1696	0.3753		
CRI enrolled	0.0651	0.2467	0.0399	0.1958		
Army MTF	0.4329	0.4955	0.3598	0.4800		
Navy MTF	0.2978	0.4673	0.2704	0.4442		
log(MTF beds/pop)	0.4464	0.6244	0.3923	0.7517		
log(MTF MDs/bed)	–0.3240	0.3509	–0.3343	0.3756		
Area w/ clinic					0.2462	0.4309
Retired family					0.3954	0.4890
Civ beds/pop	4.4272	3.2950	4.3828	3.6593	5.2418	3.2778
Civ MDs/pop	1.6427	0.9692	1.7120	0.8801	1.9117	1.2928

D. Adjustments to MTF Utilization Estimates for Costing by IDA

The demand analysis yielded estimates of per-capita MTF visits and the fraction of beneficiaries hospitalized. Before these estimates could be sent to IDA for costing, we needed to modify them in four ways:

1. Adjust the per-capita estimates derived from the survey to make them compatible with MEPRS workload data,
2. Multiply by the number of beneficiaries to get total MTF workloads for the beneficiaries studied,
3. Add the workloads for active-duty personnel and "other beneficiaries," and the workloads in the United States for overseas beneficiaries, and
4. Allocate the total workload to individual MTFs.

The third step is self-explanatory, so this appendix focuses on the other three steps.

Adjusting to MEPRS Workload Levels

An adjustment was necessary because all of our predictions of utilization are based upon the survey (the only source of utilization outside of the MTFs and CHAMPUS), while all of the estimates for costing the MTFs are based upon workload derived from the accounting systems (specifically MEPRS).

The method we used to determine the adjustment factors was simple. First, we used the demand regressions (described in Section 5 and Appendix C) to predict the average number of visits and the fraction of beneficiaries hospitalized for each type of beneficiary under the 1992 conditions. The beneficiary groups were: active-duty dependents; retirees under age 65; retirees' dependents, survivors, and their dependents under age 65; and all beneficiaries 65 and older. We then calculated a second set of per-capita utilization figures—in this case, average number of visits and admissions—by dividing the utilization reported in MEPRS by the DEERS-based population estimates described below. For each beneficiary group, the adjustment factors equaled the MEPRS/DEERS utilization estimates divided by the utilization estimates predicted from the regressions. We

examined all areas in the United States, excluding only overseas hospitalizations and outpatient visits.

Factors for Outpatient Care

The outpatient visit adjustment factors are shown in Table D.1. These numbers are what the survey-derived estimates of outpatient visits must be multiplied by to produce the per-capita number of MEPRS outpatient visits for each of these types of beneficiary. These factors include: (1) an adjustment for the windsorized survey data (at 10), (2) downward bias in the survey data because of imperfect recall, and (3) the inclusion of more types of patient encounters in MEPRS.

Table D.1

Outpatient Adjustment Factors

Active-Duty Dependents	Retirees Under 65	Retired Dependents/ Survivors Under 65	Beneficiaries 65 and Over
1.80	2.07	1.33	1.48

Since IDA's analysis showed that outpatient costs are higher in Navy MTFs, we looked to see whether the adjustment factors differed by service. Table D.2 compares the factors for outpatient visits by service for all nonoverlapping catchment areas. The Navy factors are lower, suggesting that there may be some modest difference in the accounting procedures among the services.

We also looked for other possible differences (e.g., whether medical centers varied consistently one way or another), but we did not find any consistent patterns.

Table D.2

Service Differences in Outpatient Exchange Factors

Service	Exchange Factor
Army	1.87
Air Force	1.61
Navy	1.29

Factors for Inpatient Care

The raw inpatient exchange factors are shown in Table D.3. These numbers are what the survey-derived estimates of the average probabilities of being hospitalized must be multiplied by to produce the per-capita number of MEPRS inpatient admissions for each beneficiary group. These multipliers include: (1) same-day hospitalizations—included in MEPRS but not in the data used in the regressions, and (2) the average number of hospitalizations per person hospitalized.

Table D.3

Inpatient Exchange Factors

Active-Duty Dependents	Retirees Under 65	Retired Dependents/ Survivors Under 65	Beneficiaries 65 and Over
1.33	1.25	1.21	1.25

Estimating the Number of Beneficiaries

Table D.4 compares the estimates of FY92 beneficiary populations in the official DEERS data, our adjusted figures for FY92, and a late-90s estimate of the beneficiary populations, assuming the closing of all MTFs affected through BRAC 3 and a reduction in the DoD population consistent with DoD's recently completed "Bottom-Up Review."

The short-record DEERS record that is archived and released for analysis records the sponsor's zip code for all active-duty dependents. This ignores the fact that many active-duty members are sent overseas each year for unaccompanied duty, their family often returning to live with relatives in noncatchment areas. In FY90, this assumption increases the number of active-duty dependents counted as being overseas by some 300,000, with nearly the same reduction in the noncatchment areas.[1] We used a modified version of the short record that provides actual locations for active-duty dependents. We adjusted these data at the individual zip-code level because of the following:

[1]This problem is related to the change in counting active duty dependents in FY92 that is noted above.

- A distance check of the zip codes around military hospitals showed that several zip codes with large numbers of beneficiaries were well within 40 miles of the hospital, and yet treated in DEERS as though these areas were noncatchment areas. An examination of the zip codes with the largest military populations showed that they had been introduced since 1990, and thus were omitted from the catchment-area directory of zip codes. We have corrected the more obvious of these problems, transferring roughly 1,000 active-duty personnel, 7,000 active-duty dependents, and 11,000 retired and other beneficiaries from noncatchment to catchment areas.
- While the year-end DEERS theoretically reports beneficiary location on September 30th of the given year, it is actually compiled some months thereafter, reflecting the movement of any beneficiaries who have reported to new locations. However, because DEERS also includes information on personnel recruited but not yet inducted into the military, the DEERS data must be handled with a strict date of effectiveness, which we have chosen to

Table D.4

Beneficiary Populations

Type of Beneficiary	Location	FY92 DEERS	Adjusted FY92 DEERS	Late-90s Estimate
Active duty	Catchment	1,350,489	1,383,956	1,117,418
Active-duty dependent	Catchment	1,930,885	1,958,358	1,520,383
Nat'l. Guard/Reserve	Catchment	110,211	113,092	66,166
NG/Reserve dependent	Catchment	152,503	153,049	92,770
Retired < 65	Catchment	711,217	714,178	579,748
Retired 65+	Catchment	318,331	319,738	293,190
Other < 65	Catchment	1,222,749	1,227,917	1,049,148
Other 65+	Catchment	310,453	311,681	289,543
Active duty	Noncatch	136,798	123,077	130,649
Active-duty dependent	Noncatch	286,837	438,061	321,419
Nat'l. Guard/Reserve	Noncatch	100,251	90,622	63,426
NG/Reserve dependent	Noncatch	96,044	95,498	86,072
Retired < 65	Noncatch	415,441	412,480	491,687
Retired 65+	Noncatch	216,177	214,770	305,303
Other < 65	Noncatch	599,737	594,569	723,702
Other 65+	Noncatch	152,246	151,018	226,213
Active duty	Overseas	307,920	307,920	182,093
Active-duty dependent	Overseas	349,332	169,078	131,594
Nat'l. Guard/Reserve	Overseas	1,469	1,469	1,787
NG/Reserve dependent	Overseas	6,799	6,799	3,822
Retired < 65	Overseas	11,125	11,125	14,828
Retired 65+	Overseas	1,468	1,468	3,820
Other < 65	Overseas	17,838	17,838	17,064
Other 65+	Overseas	892	892	3,079
Total	All	8,807,212	8,818,654	7,714,924

NOTE: Total does not include beneficiaries in unknown locations.

retain at September 30, 1992. But since the data on location is actually many months later for many individuals, training bases (such as Ft. Jackson, Great Lakes, Lackland AFB, or Parris Island) have very low counts of trainees (those of E-1 rank, both active duty and National Guard/Reserve) because many of the trainees have moved on by the time DEERS was compiled. We therefore used DoD and Army estimates of personnel in the training pipeline and actual personnel at selected bases to adjust the DEERS estimates for both active-duty personnel and active-duty dependents. For example, DEERS shows Ft. Jackson with only about 7,000 active-duty personnel at the end of FY92, whereas Army and DoD figures would suggest a number closer to 13,000 (counting National Guard and Reserve personnel, in each case). Besides the basic training facilities, we have also made population adjustments at training facilities such as Ft. Irwin, where the Army reports that the DEERS numbers of active-duty beneficiaries are only about half of the active-duty population, on average, at Ft. Irwin. These adjustments cause a net increase in active-duty and Guard/Reserve personnel and their dependents in catchment areas, and a decrease in noncatchment areas.

- The 1992 DEERS counts show a substantial increase in the number of overseas active-duty dependents compared with previous years, and an offsetting decline in active-duty dependents in the United States (especially in noncatchment areas). The change is reportedly an accounting change, whereby dependents lacking a recent address update are now located at the unit address of their sponsor. DEERS thus considers many dependents of sponsors on overseas, unaccompanied tours to be overseas as well. Because this change appears wrong, we have adjusted the active-duty dependent numbers to more closely reflect the pattern of location in previous years, shifting about 180,000 active-duty dependents back to the United States (mostly to noncatchment areas).

To project beneficiaries for the late 1990s, we began with the FY92 DEERS data and an aggregate RAPS (Resource Analysis and Planning System) estimate of beneficiaries by catchment area. We adjusted these to reflect the results of BRAC 3 and the problem with the training bases noted above. The result is a zip-code-level projection of the beneficiary population for the late 1990s, which can be aggregated to catchment area or grand total levels (the latter shown in Table D.3 above).

Our explorations uncovered several problems in using the DEERS data that either did not affect the beneficiary groups we studied or could not be corrected:

- Because military personnel move fairly often, are promoted regularly, add dependents, and so forth, DEERS is almost always somewhat out-of-date. Civilian health plans have similar problems, as individuals move and/or change employers. HMOs, which must plan using per-capita information by location, go to considerable effort to update addresses (e.g., checking them at each encounter with the beneficiary).
- Some advanced education locations like the Army War College at Carlisle Barracks apparently only have their staff properly located in DEERS; their students appear to be shown as part of a training command located elsewhere. The same is true for the many military personnel involved in detached training at various locations around the country.
- The location given for active-duty beneficiaries may be a unit address or home address. An active-duty beneficiary who lives in Northern Virginia in the Ft. Belvoir catchment area but works in Washington, D.C., in the Walter Reed catchment area, might be counted in either area (and also might get care in either area).
- In recent years, over 200,000 active-duty Navy personnel have been considered "AFLOAT," which apparently means that they are assigned to a ship. The average surface ship appears to be at sea about 40 percent of the time, and in its home port only about half of the remaining time. Therefore, many of these personnel are not, at any given time, living in their assigned catchment area.
- For FY92, DEERS lists some 230,000 Army National Guard and Reserve personnel on active duty, whereas the National Guard Bureau suggested that the number may be perhaps only a third as much. Apparently some Guard and Reserve personnel not on regular active duty are included in DEERS, and some are not.
- The definitions of catchment areas have some potential flaws. For example, there is no catchment area for Ft. Drum, which has a clinic but has arranged for its providers to treat patients in the local civilian hospital, but there is a catchment area for Newport NS, which has a similar arrangement. Catchment areas are defined for several of the U.S. Treatment Facilities (former Public Health Service hospitals). Unless many military beneficiaries use these facilities, creating these catchment areas causes an underestimate of the noncatchment population and of the catchment-area population for facilities that overlap (such as Ft. Meade).

Distributing Workload to MTFs

The workloads at the MTFs for the analytic cases are predicted for all beneficiaries living in aggregated U.S. catchment or noncatchment areas. For inpatient use, the aggregation is to type of beneficiary in either catchment or noncatchment areas. For outpatient use, the aggregation is to type of beneficiary in 10 catchment-area groups (small hospitals, medium hospitals, and medical centers for the Army, Navy, and Air Force, plus an overlapping catchment-area group), and also a non-catchment-area group. For costing, we needed to distribute the aggregate workloads to the individual MTFs and by broad specialty categories.

To make this distribution for case 1, we developed a "referral" matrix. The inpatient referral matrix was calculated from FY90 biometrics data to show the fraction of people from each catchment-area group hospitalized in that group and other groups. For example, 59 percent of retirees under 65 living in small Navy catchment areas were hospitalized in those facilities, while 25 percent were hospitalized in MTFs with overlapping catchment areas, 5 percent in Navy medical centers, and 4 percent in medium Naval hospitals. We estimated a similar matrix for outpatient referrals by comparing our predicted workloads by group with MEPRS workloads for the same groups (the latter do not report the location of people receiving outpatient care at the various MTFs). These matrices were used for case 1, but not case 2, because there was no reason to expect that the added workloads in case 2 would follow the referral patterns described in the matrices.

An example of how we used these matrices to distribute the MTF workloads predicted for case 1 may be helpful. If Air Force medical centers had 1,000,000 outpatient visits by active-duty dependents in FY90, and Scott AFB had 150,000 of these, then we allocated to Scott 15 percent of the case 1 visits we predicted for Air Force medical centers.

For case 2, we used regression analysis to estimate MTF production functions that we could use to predict the increase in each MTF's inpatient and outpatient workloads that would result from an increase in operating beds and staffing. We then allocated the increase in predicted workloads from case 1 to case 2 in proportion to the workload increase that we predicted from the production function. For example, if we predicted 120,000 added visits at Scott AFB and a total increase at all MTFs of 6,000,000 extra visits, then if the total number of active-duty-dependent visits increased by 1,000,000 in case 2, Scott would receive 50,000 of these added visits.

Finally, we allocated the workloads by specialty category—medical, obstetrics and gynecology, pediatrics, psychiatry, and surgery—according to the historical specialty distribution at each MTF. For example, if the hospital at Scott AFB had 12 percent of its outpatient workload in surgery in FY90 and total outpatient visits increased from 300,000 in case 1 to 350,000 in case 2, then Scott would have 42,000 visits in surgery.

E. Analyses to Predict MTF Utilization and Civilian Costs for Cases 3 and 4

This appendix gives more detailed descriptions of the analyses conducted to study cases 3 and 4, including: (1) the regression models for predicting choice of health plan; (2) the simulation model for simulating the costs of civilian fee-for-service plans; (3) a summary of the effects of cost sharing on health care costs and outcomes measured in the Health Insurance Experiment, whose results we relied on in several of the analyses; and (4) the regressions estimated to predict MTF utilization for case 4.

Choice of Health Care Plan

The simulation of health-plan choices is based on a sequential decisionmaking model. Families are assumed to choose whether to enroll in the military health plan or to receive their care through the civilian health care system. Conditional on the choice of the civilian system, families select whether to enroll in an HMO or a fee-for-service health care plan. This appendix describes the behavioral models in our choice simulation and the simulation methods.

Choice Between the Military and Civilian Health Care System

The data for the model of health care system choice come from the 1992 DoD Health Care Survey described in Section 3. Participants in the survey were presented with two hypothetical alternatives to their existing military health plan.[1] Both alternatives cover the same broad scope of services as the CHAMPUS program with the added benefit of preventive exams and routine eye care. In both plans, the only cost sharing is a $5-per-visit charge for outpatient visits. One plan is a military HMO that would require patients to receive all care from the military treatment facility. The other plan was described as a civilian health maintenance organization; however, we interpret the responses to this plan as evidencing a preference for civilian care over the current mixed system. For each of these plans, survey respondents were asked to indicate whether they would join the new plan instead of their current military plan if the new plan

[1]The relevant questions from the survey instrument are reproduced at the end of this appendix.

charged a premium of $75 per month, a premium of $50 per month, or no premium.

We estimate the parameters of the enrollment choice model by drawing on expected utility theory. A family will prefer one of the hypothetical plans presented in the survey to their current coverage if the expected utility of the hypothetical plan exceeds the expected utility of the current plan, i.e., if

$$EU(New\ Option) - EU(Current\ Plan) > 0. \tag{1}$$

We assume that this difference, which we will denote as I^*, is a linear function of characteristics of the family (x) and plan (p) and is given by :

$$I^* = xA + pB + u, \tag{2}$$

where u is a stochastic term. Let $y = 1$ if the family reports that it would purchase the new option; we have:

$$\Pr(y = 1) = \Pr(I^* > 0) = \Pr(xA + pB + u > 0).$$

If the u is from a normal distribution, then we can estimate the parameters A and B using probit regression. The family characteristics (x) in the regression model include: demographic characteristics of the sponsor; whether the family has insurance in addition to the military coverage; length of residence in the area; family size; family income; health status and expected health care use; whether the family's usual source of care is the military or civilian system; service; and characteristics of the military health-supply system in the residence area. The characteristics of the plan are whether it is a military or civilian option and the premium cost to enroll. Interactions between family characteristics and the type of alternative plan are included in the model to detect differences in preferences for the military and civilian system among different subgroups. We fit separate models for three subgroups of families: dependents of active-duty military; retirees under age 65; and retirees age 65 and older.

Because each family was asked to report about six different plans (the military HMO at three premium quotes and the all-civilian option at three premium quotes), we have multiple observations on the dependent variable for each family. Our estimation sample included 89,281 responses about preferences for hypothetical plans. We correct inference statistics for the intrafamily correlation resulting from these multiple observations using available software for the probit based on Huber's (1967) approach for nonparametric estimates.

The results of our estimation models are given in Tables E.1–E.3 for dependents of active-duty personnel, for retirees under age 65, and for older retirees,

respectively. Each table reports the effect of a change in the explanatory variable on the probability of choosing the military HMO in preference to CHAMPUS or other military plan in which the family is enrolled and the effect on the probability of choosing the new civilian plan in preference to CHAMPUS; the changes in probability are evaluated at the mean probability for the group.

Table E.1

Effects of Family and Plan Characteristics on Preference for Hypothetical Plans: Dependents of Active-Duty Personnel

	Change in Probability of Preferring New Plan to CHAMPUS with Change in Characteristic		
Characteristic	Civilian Plan	Military Plan	Significant Difference
Demographic and economic characteristics			
Sponsor characteristics			
Male	2.4*	–2.4	*
White	–1.5*	–5.4*	*
Education[a]			
Some college/college grad.	0.2	–3.1*	*
Post college	–1.5	–6.0*	*
Age (10% increase)	0.1	1.1*	*
Family has other insurance	2.2*	0.2	*
At current location over 1 year	–0.3	–1.4	
Family size			
Number eligible adults	0.1	2.4*	*
Number eligible children	–0.4	–0.8*	
Income (10% change)	0.2*	0.1	*
Health characteristics			
Sickest member health[b]			
Good	1.8*	0.6	*
Fair	1.9*	-0.4	*
Poor	2.6	-2.7	*
Expected hospitalization if MTF usual source	–0.2	1.5	
Expected hospitalization if civilian usual source	2.1	6.0*	
Expected doctor visits if MTF usual source	–0.1	–0.3*	*
Expected doctor visits if civilian usual source	–0.2*	–0.6*	*
Usually use military facility	–4.0*	2.6*	*
Service[c]			
Navy	0.4	–5.3*	*
Air Force	–3.3*	–4.5*	
Marines	–2.8*	–5.3*	
MTF supply characteristics			
Operating beds/1000 population (10% increase)	–0.1*	0.0	*
Clinical FTE/operating beds (10% increase)	0.0	0.0	
Premium ($10/month increase)	–7.3*		

[a]High school or less category omitted.
[b]Excellent or very good category omitted.
[c]Army category omitted.
*Significant at p = 0.05.

Table E.2

Effects of Family and Plan Characteristics on Preference for Hypothetical Plans: Retirees Under Age 65

Characteristic	Change in Probability of Preferring New Plan to CHAMPUS with Change in Characteristic		
	Civilian Plan	Military Plan	Significant Difference
Demographic and economic characteristics			
Sponsor characteristics			
Male	4.5*	2.1	
White	0.5	–6.5*	*
Education[a]			
Some college/college grad.	–0.0	–0.0	
Post college	–0.1	–1.7	
Age (10% increase)	0.2	2.9*	*
Family has other insurance	4.0*	2.9*	*
At current location over 1 year	–1.7	–2.8	
Family size			
Number eligible adults	–0.1	0.9	
Number eligible children	0.6	0.7	
Income (10% change)	0.2*	–0.0	*
Health characteristics			
Sickest member health[b]			
Good	0.5	0.1	
Fair	–0.5	–0.1	
Poor	–4.3*	–3.5	
Expected hospitalization if MTF usual source	1.0	3.6*	
Expected hospitalization if civilian usual source	0.7	2.5	
Expected doctor visits if MTF usual source	–0.2*	–0.4*	
Expected doctor visits if civilian usual source	–0.2*	–0.6*	
Usually use military facility	–5.8*	6.1*	*
Service[c]			
Navy	0.3	–2.4	
Air Force	–0.6	–1.3	
Marines	–0.6	–11.9*	*
MTF supply characteristics			
Operating beds/1000 population (10% increase)	0.0	0.2	
Clinical FTE/operating beds (10% increase)	0.0	0.0	
Premium ($10/month increase)	–5.5*		

[a]High school or less category omitted .
[b]Excellent or very good category omitted.
[c]Army category omitted.
*Significant at p = 0.05.

Table E.3

Effects of Family and Plan Characteristics on Preference for Hypothetical Plans: Retirees Age 65 or Older

Characteristic	Change in Probability of Preferring New Plan to CHAMPUS with Change in Characteristic		
	Civilian Plan	Military Plan	Significant Difference
Demographic and economic characteristics			
Sponsor characteristics			
Male	7.5*	6.0	
White	2.9	–7.8*	*
Education[a]			
Some college/college grad.	–0.1	0.1	
Post college	–0.7	1.6	
Age (10% increase)	–0.5	1.0	*
Family has other insurance	3.0*	3.0*	
At current location over 1 year	0.0	–0.9	
Family size			
Number eligible adults	1.8*	3.0*	
Number eligible children	–0.6	–1.0	
Income (10% change)	0.3*	–0.1	*
Health characteristics			
Sickest member health[b]			
Good	0.6	1.8	
Fair	–0.9	–0.9	
Poor	–0.4	–1.0	
Expected hospitalization if MTF usual source	2.7*	2.3	
Expected hospitalization if civilian usual source	2.9*	4.2*	
Expected doctor visits if MTF usual source	–0.4*	–0.3*	
Expected doctor visits if civilian usual source	–0.4*	–0.6*	
Usually use military facility	–7.0*	1.1	*
Service[c]			
Navy	–0.6	0.9	
Air Force	2.4*	3.8*	
Marines	–0.6	–2.9	
MTF supply characteristics			
Operating beds/1000 population (10% increase)	–0.1*	–0.0	*
Clinical FTE/operating beds (10% increase)	–0.2*	–0.1	
Premium ($10/month increase)	–5.7*		

[a]High school or less category omitted.
[b]Excellent or very good category omitted.
[c]Army category omitted.
*Significant at p = 0.05.

The parameters of the model were estimated on the basis of responses from all military personnel, including personnel living in catchment areas and those not in catchment areas. The latter were asked to respond to the questions as if they lived near an MTF.[2] We tested whether the reported preference for the different options did vary between those living in catchment areas and others and whether their response to variations in the premium differed. We did not find statistically significant differences for any of the three groups (Chi-square with 3 degrees of freedom equals 4.8 for active-duty personnel, 0.1 for retirees under age 65, and 3.9 for retirees over age 65). We also tested for a different response to the premium depending on whether the option was a military or civilian plan, and found no statistically significant differences in the three groups (t=0.7 for active-duty personnel and for retiress under age 65, t=0.6 for retirees over age 65).

To study case 4, we use our estimated model to simulate whether active-duty and retired military personnel and their families living in catchment areas would choose to enroll in a military HMO or to obtain care in the civilian system. Families in noncatchment areas are restricted to a choice among alternative civilian plans as described below. To simulate the choice of delivery system for those in catchment areas, we use Eq. 2 to predict the difference in the expected utility of a military HMO as compared with the current CHAMPUS system, $I^*(M)$, as

$$I^*(M) = xA(M) + pB + u(M),$$

and the difference in the expected utility of a civilian plan and the current system, $I^*(C)$, as

$$I^*(C) = xA(C) + pB + u(C),$$

using the parameters from the probit model and assumptions about the premium for the plans. The $u(M)$ and $u(C)$ are drawn from a bivariate normal distibution with unit variance. We estimate the correlation between the $u(M)$ and $u(C)$ using a sample of the residuals from the probit regression measured as the difference between the reported 0,1 preference response for a new plan and the predicted probability of selecting the plan. The estimated correlation beween the $u(M)$ and $u(C)$ was 0.45 for families of active-duty personnel, 0.57 for families of retirees under age 65, and 0.67 for retirees age 65 and older.

[2]In our simulation of case 4, however, personnel who live in a noncatchment area are assumed to select one of the civilian options; that is, they do not have a choice between the military and civilian delivery systems.

Choice Between Alternative Civilian Plans

For the second stage of our sequential decisionmaking model, we used data from the 1987 National Medical Expenditure Survey (NMES) to estimate a model of choice between civilian FFS and HMO plans. The NMES was a panel survey that was administered to a cross section of the civilian, noninstitutional population to measure health-insurance coverage, health status and health care use.

The sample for our estimation was limited to families with an insured, working family head who had a choice of health-insurance plans from his or her employer. The estimation sample included 1,508 families. We limited the sample in this way to model the FFS-HMO enrollment decision among families who had the opportunity to enroll in an HMO. Our criterion, however, imperfectly selects those families who have this opportunity. For some families who have a choice of insurance plans, the choice will be among high- and low-option FFS plans. For others, the choice may be between an FFS plan and some managed-care plan other than an HMO. However, the data available to us do not provide the information to make more accurate selections.

We used a probit regression, similar to the regression used for the military-civilian choice model, to estimate the relationship between family characteristics and the decision to enroll in an HMO instead of an FFS plan.[3] Our model results are given in Table E.4.

For families who are predicted to use the civilian sector in the first stage of the decision and for families who are not in catchment areas, we use the model estimated from the NMES data to determine whether the family enrolls in the civilian HMO or the civilian fee-for-service plan. Our sequential decision model assumes that the choice of civilian HMO is independent of whether a military plan is among the options available to the family.

While this is a strong and untestable assumption, we believe it is reasonable to assume that families' first choice is whether they want to receive care from military or civilian providers and that relative preferences among civilian alternatives are similar for military personnel living in catchment areas and those not in catchment areas.

Using the model fit with the NMES data, a family in the civilian delivery system is determined to enroll in the civilian HMO instead of the FFS plan if $\gamma X + \varepsilon > 0$, where γ is the estimated parameters of the model and ε is drawn

[3]We do not have details about the benefits or costs of the options that the family faces to include in our estimation model.

Table E.4

Effects of Family Characteristics on Choice of HMO Among Civilian Options: Results from National Medical Expenditure Survey

Characteristic	Change in Probability of Selecting HMO for Change in Characteristic
Demographic and economic characteristics	
Primary insured characteristics	
Male	+12.0*
White	–12.5*
Education[a]	
Some college/college grad.	6.9*
Post-college	7.7*
Age (10% increase)	–0.5
Family has other insurance	–0.2
Number persons in insurance unit	
Income (10% change)	0.5
Health characteristics	
Sickest member health[b]	
Good	0.6
Fair	3.6
Poor	7.8
Hospital days past year	–0.2
Physician visits past year	–0.0

[a]High school or less category omitted.
[b]Excellent or very good category omitted.
*Significant at $p = 0.05$.

from a standard normal distribution. As we discussed in Section 6, we believe the HMO enrollments in our NMES estimation sample underestimate enrollments among families who have a choice of plan because data limitations did not allow us to identify precisely those families that were offered an HMO as an alternative. Therefore, we adjusted the fitted intercept in our probit model to result in predicted probabilities that accord with the BLS overall estimate of 35 percent enrollments.

Health Expenditures Simulation Model

To estimate costs for beneficiaries predicted to enroll in a fee-for-service civilian health plan, we used a health expenditures simulation model developed at RAND. The model predicts individual and family health-plan expenditures for fee-for-service health-insurance plans as a function of the structure of that insurance.

Health-insurance plans typically include a mix of deductibles, coinsurance rates, and upper limits on the patient's out-of-pocket expenses in a year. The price that

an individual faces when making medical-care decisions may change during the course of a year from 100 percent of the charge (before the deductible is exceeded), to the coinsurance rate (a specified share of the billed charge), to zero or full coverage (when the upper limit is exceeded). Thus the plan presents the consumer with a price schedule rather than a single price.

The price that the consumer faces at any time may affect two decisions about a treatment episode. The first is the decision to begin an episode by contacting a doctor, for example, when flu symptoms are experienced or when it is time for an annual physical. An episode of treatment includes all the expenditures associated with a particular bout of illness; any individual typically has several treatment episodes during a year. Once a patient has decided to obtain care, the patient and doctor determine how much to spend on care for that episode. This decision, too, may be affected by the share of the cost the patient will have to bear.

The Health Insurance Experiment (HIE) examined the effect of price and individual characteristics on four types of medical episodes: hospitalization, outpatient chronic, outpatient acute, and well care. The results of the analyses showed that price has a significant impact on the rate at which the patient initiates episodes. For example, with 25 percent cost sharing, the rate of occurrence of ambulatory episodes is about 75 to 80 percent of the occurrence rate with no cost sharing. Initial deductibles further reduce the rate at which patients initiate episodes. The effect of price on hospital episodes is somewhat smaller than the effect of price on ambulatory episodes. Price, however, has only a small effect on the total cost of an episode; that is, it appears that cost sharing affects patients' decisions to initiate episodes but has only small effects on doctors' decisions about how to treat patients.[4] The analyses also revealed that price appears to be relatively unimportant when catastrophic illness occurs. Specifically, the rate at which "catastrophic" or very expensive hospitalizations occur was not affected by the level of patient cost sharing (Keeler et al., 1988).

The behavioral results of the HIE episode analysis have been incorporated in a stochastic simulation model that generates the occurrence of episodes for a family throughout the year depending on characteristics of the members of the family and the price facing the family (see Buchanan et al., 1991).

[4]This HIE result pertains only to the effects of patient cost sharing on doctors' decisions about treatment. With the growth of managed-care plans, it is possible that doctors' treatment decisions may vary with other aspects of plan design, including whether the plan requires utilization review and fee discounting. The two studies that have investigated this question (Garnick et al., 1990, and Wouters, 1990) reached different conclusions. However, both studies were limited to relatively routine types of care that were not subject to utilization review at the time and did not separate physician decisions on treatment from patient decisions to seek care.

Each family is assumed to have an underlying propensity to experience each of the four medical episode types (hospitalization, outpatient chronic, outpatient acute, and well care). The propensity to experience each episode type consists of a measured component determined by characteristics of the family and its individual members along with an unmeasured component that reflects unobserved characteristics of the family. The unmeasured component for each episode type is drawn from a gamma distribution across episode types. This reflects the finding that families who have an above-average propensity to experience hospital episodes (given the family-measured characteristics) also have an above-average propensity to experience outpatient acute and chronic episodes, and that the occurrence rates for the outpatient medical episodes are also correlated. The propensity for any family is the sum of the propensities for each family member; these individual propensities depend on the demographic and health characteristics of the individual and on economic characteristics of the family, such as income.

Given the estimated propensity to experience episodes, the model simulates the actual occurrence of episodes for a family one at a time during a year. The episodes are generated from a Poisson process. For each episode, the model determines the type of episode and the family member to whom it occurs based on the propensities for each family member to experience each episode type.

Once an episode occurs, the total expenditure for the episode is estimated. The log expenditure of the episode is randomly generated from a normal distribution, with a mean that depends on the type of episode and the characteristics of the individual experiencing it. Because the health care utilization patterns depicted in the HIE are now somewhat outdated, we have introduced an adjustment to the episode-size calculation to account for changes in the medical intensity of treatment patterns through time. These intensity parameters were derived from the Health Care Financing Administration's (HCFA's) National Expenditure Accounts.

The rate at which the family experiences episodes and, to a lesser extent, the cost of an episode depend on the effective coinsurance rate facing the family at that time. For example, if the insurance plan specifies a deductible, the effective coinsurance rate at the start of the year is 100 percent, and the occurrence of episodes is simulated assuming 100 percent coinsurance. As a family experiences episodes during the year, the effective coinsurance rate may change. For example, when the family's cumulative expenditures exceed the deductible, the effective coinsurance rate will fall to the nominal coinsurance rate specified in the plan. When the family's cumulative out-of-pocket maximum is reached, the effective coinsurance rate falls to zero for the rest of the year. The model keeps

track of the total expenditures and family out-of-pocket expenditures throughout the year as episodes are generated. As the family's expenditures cause the effective coinsurance rate to change, the rate at which episodes are generated and the predicted expenditure of episodes that occur are adjusted accordingly.

Rather than directly adjust the Poisson rates to the effective coinsurance rate, the simulation model actually generates episodes for the family, assuming no cost sharing by the family, then randomly censors episodes if the individual remains responsible for a share of the cost. The episode loss rate at nonzero cost sharing is equal to one minus the observed HIE occurrence ratio for the effective cost sharing relative to that of no cost sharing. The cost of the episode is predicted assuming no cost sharing and adjusted downward in cost if the family is responsible for a share of the cost.

The procedure of censoring full-coverage episodes rather than changing the Poisson rates when the coinsurance rate changes has several advantages. First, it reduces the variance of the estimated difference in total expenditures between different insurance plans. Second, it allows us to realize catastrophic hospital episodes at the same rate irrespective of the effective coinsurance rates; that is, when the model predicts a catastrophic hospitalization, assuming full coverage, the hospitalization is not censored even if the effective coinsurance rate is greater than zero. This corresponds to the observation that when serious hospitalizations occurred, cost sharing had no effect. Third, it also allows us to realize more hospital episodes when families are close to their out-of-pocket limit than when the amount of out-of-pocket expenditures remaining is high. The HIE results indicated that when families are within about $1,125 (in 1989 dollars) of their out-of-pocket limit, they experience only about 10 percent fewer episodes than when the remaining out-of-pocket expenditure is higher (see Keeler et al., 1988, for a more complete description).

Using this simulation model, we can compute the effects on total health expenditures, insurance company payments, and out-of-pocket expenditures of different specifications of insurance coverage and cost sharing.

For this study, we simulated fee-for-service health-plan expenditures for a set of plans that looked like the current military health care benefit. The plan structure, that is, the copayment requirements, differed for active-duty families and retiree families. Within the active-duty population, the benefit was slightly more generous for enlisted families with rank up to E4. The plan structures for each of these groups are shown in Table E.5.

We estimated fee-for-service plan expenditures for three alternate samples: (1) the entire population, (2) individuals and families that selected a fee-for-service

Table E.5

Current CHAMPUS Cost Sharing (used in simulating costs for civilian fee-for-service plans)

	Deductible	Inpatient and Cost Share	Outpatient and Cost Share	Cap
E1-E4	50	0	.20	1000
E5 and up	150	0	.20	1000
Retirees	150	.25	.25	7500

plan under alternative 3, and (3) individuals and families who selected a fee-for-service option under alternative 4. In all cases, we assumed that the active-duty members would obtain their health care through a separately arranged military health care option and thus eliminated them from our estimates.

Finally, for retirees we estimated an alternate fee-for-service health-plan benefit that looked like the Clinton health care plan.

Effects of Cost Sharing on Health Care Costs and Health Outcomes: The Health Insurance Experiment

The definitive study of the effects of cost sharing is the Health Insurance Experiment (HIE), conducted by RAND from 1974 through 1981. The experiment, which is documented in Newhouse (1994), enrolled 5,809 nonaged individuals randomly into 14 different fee-for-service insurance plans. The plans had different levels of cost sharing. The coinsurance rates tested were 0, 25, 50, and 95 percent, and the maximum levels of out-of-pocket expenditures were 5, 10, and 15 percent of family income (but no more than $1,000). The study followed these people for up to five years, collecting extensive data on their health care use, health status, and other outcomes related to health care.

The HIE data clearly show that the use of medical services responds to changes in the amount paid out of pocket. The per-capita expenses for health care on the free plan were 45 percent higher than on the plan with 95 percent coinsurance and 23 percent higher than on the 25 percent plan (coinsurance on all plans is subject to the limit on out-of-pocket costs of up to $1,000). Cost sharing primarily affects patient decisions to seek care, but has little effect on the amount of care delivered once care is initiated. Outpatient care is more responsive to cost sharing than inpatient care; in fact, inpatient care for children is unaffected by cost sharing. The response to cost sharing does not generally vary by income, health status, or local market characteristics. Cost sharing deterred contact with the medical system across the entire spectrum of illnesses and problems seen in

the outpatient setting. However, the evidence does suggest that use of chronic care was less responsive than use of acute or preventive care. There was no difference in the rates of decrease according to the medical appropriateness of the service.

The study measured the effects of cost sharing on various measures of health:

- participants' ratings of their physical health, role functioning, mental health, social contacts, and general health;
- smoking behavior, weight, cholesterol level, diastolic blood pressure level, visual acuity, and an index of the risk of dying related to specific risk factors (systolic blood pressure, cholesterol, and smoking habits) in adults;
- anemia, hearing loss, fluid in the middle ear, and visual disorder in children.

Overall, the health effects measured were negligible. Free care did not affect the major health habits associated with cardiovascular disease and cancer in adults. It had at most a small effect on the general health measures for the average person. People having specific conditions with well-established diagnostic and therapeutic procedures (myopia, hypertension) benefited from free care, and these improvements appeared to be greater among the poor. It is possible that a longer follow-up of the participants would have uncovered health effects that were not apparent after three to five years. However, given the relatively high rates of inappropriate (i.e., potentially harmful) treatment documented in other studies, the researchers also concluded that, in the free plan, the positive effects of using more appropriate care may have been offset by the negative effects of using more inappropriate care.

Regression Models for Predicting MTF Utilization in Case 4

The methods used to estimate MTF utilization for case 4 were essentially the same as the methods used for cases 1 and 2. They are described in Appendices C and D. For case 4, we substituted the total visits and admissions for MTF visits and admissions in the regressions. We measured total utilization by summing military and civilian utilization reported in the beneficiary survey, substituting the self-reported civilian utilization data for CHAMPUS data because the former include utilization paid for by others. We assume that beneficiaries who would enroll in an MTF plan in case 4 would obtain all their care from that plan. Our health-plan choice models indicate that those with other insurance would generally enroll in civilian plans, where they could better coordinate their military and private coverage. We predicted utilization rates for case 4 using the

same methods we used for case 2, with the exception that we did not expand the list of available MTFs beyond those operational in 1992. The regression models we estimated for case 4 are shown in Tables E.6–E.8.

Table E.6

Total Use for CHAMPUS-Eligible Adults in Catchment Areas

	Probability of Visits>0		No. Visits if Visits>0		Probability: Hosp. Nights>0	
Variable	Coefficient	Stand. Error	Coefficient	Stand. Error	Coefficient	Stand. Error
Intercept	–0.2334	0.2782	0.3028	0.1350	–1.2361	0.2814
Retired	–0.6941	0.1453	–0.1765	0.0651	–0.3741	0.1349
Retired female	0.3025	0.0585	0.1303	0.0248	–0.1910	0.0539
Officer	0.0970	0.0690	0.0275	0.0290	—	—
Not MTF service	–0.1615	0.0535	–0.0284	0.0233	–0.1390	0.0516
Employed	0.0007	0.0527	–0.0723	0.0233	–0.2935	0.0504
Family income	0.0685	0.0241	–0.0154	0.0098	–0.0727	0.0212
Family size	0.0291	0.0183	0.0217	0.0081	0.0601	0.0165
Age	0.0077	0.0121	0.0186	0.0056	0.0022	0.0119
Age squared	0.0000	0.0001	–0.0001	0.0001	0.0001	0.0001
Female age 18–34	0.2147	0.0818	0.2680	0.0395	0.2054	0.0824
No. health cond.	0.4254	0.0349	0.1685	0.0080	0.0834	0.0156
AFCAM enrolled	–0.4954	0.9379	0.0747	0.4323	–0.5209	0.3452
NAVCAM enrolled	1.4764	2.2675	–0.1079	0.2894	–0.4608	0.5003
CRI enrolled	0.7702	0.2144	0.1284	0.0677	0.0399	0.0978
AFCAM—ret.	–0.1908	0.9763	0.0221	0.4623	—	—
NAVYCAM—ret.	–1.4925	2.3330	–0.1451	0.3827	—	—
CRI—ret.	–0.7533	0.2553	–0.0680	0.0912	—	—
Army MTF	0.1003	0.0584	0.0285	0.0246	–0.0129	0.0527
Navy MTF	–0.0255	0.0594	0.1277	0.0260	–0.0216	0.0556
log(MTF beds/pop.)	–0.1572	0.0851	0.0375	0.0361	0.0507	0.0776
log(beds/pop.)—ret.	0.1672	0.0967	0.0159	0.0415	0.0521	0.0889
log(MTF MDs/bed)	–0.0066	0.1535	0.1196	0.0617	0.1919	0.1324
log(MDs/bed)—ret.	0.2042	0.1788	–0.0063	0.0759	–0.3520	0.1617
Income—ret.	–0.0119	0.0252	0.0081	0.0101	0.0226	0.0237
Health cond.—ret.	0.0873	0.0423	–0.0215	0.0096	0.0504	0.0187
Privately insured	–0.1314	0.1189	–0.0679	0.0524	0.1118	0.1103
Priv. insured—ret.	0.4677	0.1323	0.2101	0.0584	0.0902	0.1239

Table E.7

Total Use for CHAMPUS-Eligible Children in Catchment Areas

	Probability of Visits>0		No. Visits if Visits>0		Probability: Hosp. Nights>0	
Variable	Coefficient	Stand. Error	Coefficient	Stand. Error	Coefficient	Stand. Error
Intercept	0.8520	0.1507	0.9899	0.0660	–0.0179	0.1572
Retired	0.2052	0.2456	0.1825	0.0956	0.0198	0.1651
Officer	0.3224	0.1147	–0.0770	0.0439	—	—
Not MTF service	–0.0638	0.0867	0.0597	0.0376	0.0965	0.0999
Employed	0.0406	0.0782	0.0229	0.0336	0.0697	0.0863
Family income	0.0350	0.0271	0.0232	0.0113	–0.0359	0.0220
Family size	–0.0258	0.0262	–0.0032	0.0114	–0.0145	0.0295
Age	–0.1294	0.0235	–0.0596	0.0099	–0.3920	0.0247
Age squared	0.0055	0.0014	0.0021	0.0006	0.0189	0.0015
No. health cond.	0.6826	0.0427	0.2910	0.0127	0.1139	0.0263
AFCAM enrolled	–0.3162	0.6296	0.0647	0.3027	0.9717	0.5039
NAVCAM enrolled	0.1396	0.7471	–0.0483	0.2888	0.4953	0.5553
CRI enrolled	0.0560	0.1331	–0.0800	0.0532	–0.0008	0.1266
AFCAM—ret.	4.9476	4444.0500	0.6258	0.5452	—	—
NAVYCAM—ret.	–0.7253	1.5040	0.5106	0.8531	—	—
CRI—ret.	–1.0083	0.3061	0.4185	0.1755	—	—
Army MTF	–0.0733	0.0802	–0.0358	0.0339	0.0841	0.0895
Navy MTF	–0.0356	0.0869	0.0197	0.0359	0.1249	0.0946
log(MTF beds/pop.)	0.0011	0.0733	0.0134	0.0312	–0.0089	0.0784
log(MTF MDs/bed)	0.0044	0.1310	0.0728	0.0560	0.2789	0.1386
log(MDs/bed)—ret.	–0.0093	0.3033	0.3442	0.1164	0.0032	0.3414
log(beds/pop.)—ret.	–0.3215	0.1562	0.1415	0.0625	–0.0212	0.1843
Income—ret.	0.0293	0.0488	–0.0238	0.0160	—	—
Health cond.—ret.	–0.0485	0.0948	–0.0784	0.0233	—	—
Privately insured	–0.0909	0.1214	0.0133	0.0507	–0.0695	0.1302
Priv. insured—ret.	0.0402	0.2002	0.0973	0.0829	–0.4496	0.2504

Table E.8

Total Use for Medicare Eligibles in Catchment Areas

	Probability of Visits>0		No. Visits if Visits>0		Probability: Hosp. Nights>0	
Variable	Coefficient	Stand. Error	Coefficient	Stand. Error	Coefficient	Stand. Error
Intercept	1.1917	0.5017	1.2373	0.1841	–3.9396	0.3941
Officer	0.5930	0.1144	0.0002	0.0348	–0.5356	0.0784
Female	0.2311	0.0922	–0.0164	0.0306	0.1195	0.0659
Not MTF service	–0.1961	0.0860	–0.0162	0.0292	–0.1561	0.0642
Family income	–0.0587	0.0236	0.0613	0.0078	0.0916	0.0165
Family size	–0.5370	0.0991	–0.1261	0.0354	–0.0659	0.0771
Age	–0.0079	0.0071	–0.0031	0.0025	0.0398	0.0054
No. health cond.	0.2747	0.0276	0.1361	0.0058	0.1197	0.0123
Army MTF	0.5056	0.1046	–0.0804	0.0349	–0.3574	0.0759
Navy MTF	0.2381	0.1038	–0.1801	0.0366	–0.1820	0.0781
log(MTF beds/pop.)	–0.2584	0.0782	0.0332	0.0260	0.0190	0.0566
log(MTF MDs/bed)	–0.2162	0.1566	0.0712	0.0511	0.0272	0.1109

F. SURVEY QUESTIONS USED TO PREDICT HEALTH PLAN CHOICE

SUPPOSE THERE WAS A NEW KIND OF MILITARY HEALTH PLAN AND YOU COULD CHOOSE THE NEW PLAN OR CONTINUE TO GET YOUR HEALTH CARE THE WAY YOU DO NOW. QUESTIONS 105 AND 106 ASK YOU TO COMPARE YOUR CURRENT MILITARY PLAN AS IT IS NOW WITH TWO NEW PLANS, AND TO ANSWER WHETHER OR NOT YOU WOULD CHANGE.

IMPORTANT: ANSWERING THESE QUESTIONS WILL NOT AFFECT YOUR CURRENT MILITARY HEALTH PLAN. THESE QUESTIONS ARE FOR RESEARCH PURPOSES ONLY AND DO NOT DESCRIBE ACTUAL PLANS THAT EXIST NOW.

105. The first new military health plan we want you to consider is a CIVILIAN Health Maintenance Organization or HMO. Suppose this plan offered the services and benefits listed in Table 1 below. A decision to change to this plan means you would use it instead of Military Medical Treatment Facilities or CHAMPUS.

TABLE 1: DESCRIPTION OF NEW MILITARY HEALTH PLAN #1

SERVICES COVERED:	Same as CHAMPUS but includes adult annual physical exams and routine eye care.
CHOOSING YOUR HOSPITAL AND DOCTOR	
CHOOSING A HOSPITAL:	Use the civilian hospital associated with the plan.
CHOOSING A DOCTOR:	Visit any doctor at the plan facility.
YOUR SHARE OF THE COST OF SERVICES	
HOSPITAL STAYS:	No charge for sponsor or family members.
OUTPATIENT DOCTOR VISITS:	Sponsor and family members pay $5 per visit.
YOUR ABILITY TO GET AN APPOINTMENT:	For routine physical exam: appointment in 3 days. For illness that is not serious: appointment in 2 days. For serious illness: same day appointment. If care is not available from the plan's doctor, you will be sent to another doctor.

Would you join this new plan instead of your current MILITARY HEALTH PLAN?

	Yes	No
a. If there was a charge of $75 per month per family	O	O
b. If there was a charge of $50 per month per family	O	O
c. If there was no charge to join	O	O

106. The second new military health plan we want you to consider is a military HMO. This plan would offer the benefits and services listed in Table 2 below. A decision to change to this plan means you would no longer be able to use CHAMPUS. If you do not live near a military hospital, consider what you would prefer if you did live near a military hospital.

TABLE 2: DESCRIPTION OF NEW MILITARY HEALTH PLAN #2

SERVICES COVERED:	Same as CHAMPUS but includes adult annual physical exams and routine eye care.
CHOOSING YOUR HOSPITAL AND DOCTOR	
CHOOSING A HOSPITAL:	Use the military hospital.
CHOOSING A DOCTOR:	Visit doctor at the military hospital.
YOUR SHARE OF THE COST OF SERVICES	
HOSPITAL STAYS:	No charge for sponsor or family members.
OUTPATIENT DOCTOR VISITS:	Sponsor and family members pay $5 per visit.
YOUR ABILITY TO GET AN APPOINTMENT:	For routine physical exam: appointment in 3 days. For illness that is not serious: appointment in 2 days. For serious illness: same day appointment. If care is not available from the plan's doctor, you will be sent to another doctor.

Would you join this new plan instead of your current MILITARY HEALTH PLAN?

	Yes	No
a. If there was a charge of $75 per month per family	O	O
b. If there was a charge of $50 per month per family	O	O
c. If there was no charge to join	O	O

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