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Selecting a Health Care Option for Military Beneficiaries that Minimizes Health Care Costs While Maintaining Personal Desires for Choice

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THESIS

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THESIS

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Norm Pallister

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Abstract

Tricare, the triservice, triple-option, managed care plan for the uniformed services, incorporates a managed care support contract to complement Military Treatment Facilities. Currently being implemented throughout the CONUS, Tricare provides more equitable health care service to all military beneficiaries, improved access to care, a reduction in health care costs, and provides beneficiaries with an expanded choice of medical-care providers. This thesis examines the Tricare program and reviews relevant health care literature, both military and civilian. Using these inputs, the author presents a deterministic decision analysis model that allows a military beneficiary to select a health care option that minimizes his or her annual out-of-pocket costs while maintaining personal desires for choice among health care providers. Using several carefully selected examples that span the pool of military beneficiaries, the results of this study are presented. Every individual faced with the Tricare decision, approximately six million people, will gain insight from this thesis. While individual impact may only be on a scale of thousands of dollars, the impact for the entire pool of beneficiaries ranges well into the millions.

CHAPTER I

INTRODUCTION

Background. Since the mid-1960s, dependents of active-duty members of the U.S. Armed Forces, along with retirees and their dependents, requiring medical care had to rely on military health-care facilities (hospitals and clinics) or, when such facilities were not available, the Civilian Health and Medical Program of the Uniformed Services (CHAMPUS). CHAMPUS works as a fee for service health-insurance plan, when beneficiaries use private health-care providers. CHAMPUS does not require premiums, but users must share the cost of their treatment. Due to the reduction in the number of military health-care facilities as the Cold War ended, coupled with a dramatic increase in the cost of CHAMPUS, Congress and the DOD took steps to ensure the availability of health benefits and to control costs. Their solution was Tricare, a multi-billion dollar managed health-care program effecting close to 6 million beneficiaries. According to the Department of Defense, the goals of Tricare are to provide more equitable service, improve access to care, contain costs, and provide a choice of medical-care providers (14:66). Tricare provides eligible beneficiaries with three options (renewable each fiscal year), each with different out-of-pocket costs:

1) Tricare Prime - Using a primary-care manager (physician) from a military treatment facility and a group of civilian health-care providers, this option works much

like a civilian health maintenance organizations (HMO). Eligible beneficiaries, other than active duty dependents, must pay an annual enrollment fee and co-payments (the beneficiary's share of the total cost), but no annual deductible.

2) Tricare Extra - This option is a preferred-provider network requiring no annual enrollment fee, but beneficiaries must pay deductibles and higher co-payments compared to Tricare Prime.

3) Tricare Standard - This program is CHAMPUS under a new name. While providing the greatest flexibility in selecting a health-care provider, it is the most costly option for a beneficiary in terms of deductibles and co-payments.

Problem Statement. This research will identify which Tricare option a beneficiary should select, based on his/her situation, to minimize the total cost of his or her health care. The factors which contribute to this decision include age, rank, status (active duty or retired), number of dependents, life expectancy, current health risks, pre-existing health conditions, access to military treatment facilities (MTF), attitude towards health-care choice, availability of other insurance plans, and whether a beneficiary has multiple, non co-located domiciles. Many articles and pamphlets have been written explaining Tricare, its associated costs, and its different options. However, no one has provided potential beneficiaries with any guidance to help them decide which Tricare option is best for their personal situation.

Research Objectives. Using a Decision Analysis model, this research will provide beneficiaries increased knowledge to help them make the best decision on their choice of

health coverage. The focus of the research will be to build a decision/economic analysis model of the Tricare options, which incorporate the factors stated in the problem statement, to aid a beneficiary (decision maker) in selecting (purchasing) his or her lowest cost option under Tricare.

Scope and Assumptions. This thesis examines the Tricare program and reviews relevant health care literature, both military and civilian. Using these inputs, the author presents a deterministic decision analysis model that allows a military beneficiary to select a health care option that minimizes his or her annual out-of-pocket costs while maintaining personal desires for choice among health care providers. Using several carefully selected examples that span the pool of military beneficiaries, the results of this study are presented. Every individual faced with the Tricare decision, approximately six million people, will gain insight from this thesis. While individual impact may only be on a scale of thousands of dollars, the impact for the entire pool of beneficiaries ranges well into the millions. Obviously the final decision on health care coverage will remain a personal, individual decision. The results of this research is intended as only a guide in examining the key, relevant factors relating to the Tricare health care coverage decision.

Thesis Outline. In this thesis the reader should gain a solid understanding of the Tricare program and the author's selection model. Chapter 2 provides a literature review of health care topics. Chapter 3 presents an in-depth discussion of the author's model. Chapter 4 provides model results and sensitivity analysis. Chapter 5 offers the reader conclusions, and recommendations for further research.

CHAPTER II

REVIEW OF THE LITERATURE

Introduction

This review of the literature provides a background on civilian health care plans, the history of military medicine, the Tricare program, and the factors a beneficiary should considered when selecting a health care plan. Due to the specific nature of the medical environment, the first section lists a detailed glossary of civilian and military health care terms. The reader should first read and then refer back to this glossary for a greater understanding of the terms discussed in the remainder of this paper. The discussion of civilian health care options provides a foundation on managed care from which Tricare originated. A history of military medicine provides the reader with details of how the military's has handled dependent and retired military care in the past and the reasons behind the military's move into managed care (Tricare). After developing a fundamental understanding of the Military Health Services System (MHSS), the Tricare program is explained in detail. This chapter concludes with a discussion on the factors an individual should considered when selecting a health care plan. This will enable the reader to understand how the Tricare selection model of chapter three came to life.

Glossary of Terms

Balance Billing: When a provider charges more for a service than what an insurance company allows for that service, the provider bills the patient for the difference. If a provider is a "participant" in the CHAMPUS program, they can not, by-law, charge a patient over the CHAMPUS allowable.

Beneficiary: Anyone covered by a health insurance plan. For example, active-duty, retired military, and their respective family members are beneficiaries of the military health system (54:8).

Capitation: Instead of being paid for each visit or service, a health care provider receives a set payment per beneficiary per month (51:79).

Catastrophic Cap: A predetermine amount of out-of-pocket costs (paid by a beneficiary), above which, the insurer will pay all costs (20:10).

CHAMPUS Allowable: The amount CHAMPUS regards as a fair price for a doctor's visit or service, and will help pay. Any charge above this must be paid by the patient -- referred to as balance billing (54:8).

Civilian Health and Medical Program of the Uniformed Services (CHAMPUS): a cost-sharing program that helps military families and retirees pay for civilian medical care when military care is not available. CHAMPUS is basically a fee-for-service health insurance plan (54:8).

Co-payment (Co-pay): A set fee or percentage of total cost paid by a beneficiary for any service provided (25:10).

Deductible: In many traditional health insurance plans such as a fee-for-service plan, it is the amount a beneficiary must pay out-of-pocket for care before the insurance company begins to share costs. For example, under CHAMPUS, the family deductible is $300 per year for an E-5 or above (25:10).

Dependent: In this paper, the term dependent refers to dependents of both active duty and retired personnel; it includes the spouse, unmarried children under age 21 (23 if in college), and unremarried spouses of deceased active-duty members or retirees (23:4).

Direct (Military) Health Care: Care provided at a military treatment facility by a military provider or an in-house contracted provider and, therefore, there is no cost to the beneficiary.

Empanelment: Assigning a patient to a Primary Care Manager.

Fee-for-Service Health Insurance: The patient and/or his/her insurer pays for each visit to a provider as well as each service provided. Before the rush to insure with an HMO, this was the traditional type of health insurance policy. CHAMPUS is a fee-for-service plan (49:34).

Health Care Finder (HCF): A contractor employee who makes test and specialty-care appointments for Tricare Prime enrollees and users of Tricare Extra. These appointments will be at military treatment facilities or with one of the contracted network providers (54:8).

Health Maintenance Organization (HMO): Using the principles of managed care, an HMO finances, organizes, and provides health care using a network of health care

providers that have agreed to accept a certain level of payment for their services (13:77).

Inpatient: An individual who is admitted to a hospital bed to receive medical treatment and stays overnight in the hospital for at least one night (26:187).

Lead Agent: The commander of a major military medical center selected to institute and operate a region's Tricare program. There are 12 Lead Agents, one per region. They are responsible for developing a multi-service, regional health plan for beneficiaries of the Military Health Services System including the development of a single, integrated health care network for each region. The Lead Agent, however, does not have the authority to make decisions regarding direct care funds or personnel actions within a MTF of another service (33:9).

Managed Care: A system that provides a beneficiary's health care and the payments for any required services. A managed care organization, such as an HMO, establishes contractual arrangements with physicians and other providers to obtain discounted fees, sets policies on standards of care, and monitors their performance. Primary Care Managers act as patient advocates, monitoring all care, avoiding needless care, and referring patients to economical care sources. The main principle of managed care is to keep people healthy through health promotion and preventive medicine (25:10).

Medicare Eligible: Once an American citizen reaches the age of 65, he/she is eligible for the U. S. government's health care system - Medicare (28:21).

Military Health Services System (MHSS): The entire DoD sponsored medical system composed of 127 military hospitals and medical centers and 500 clinics worldwide. The

MHSS provides health care for active-duty troops and all other military medical beneficiaries through a worldwide system of hospitals and an enormous health insurance program (Tricare/CHAMPUS). In addition, it operates a medical school, provides extensive graduate medical education programs, conducts medical research, and provides medical personnel to operational assignment world wide. The MHSS has two missions: wartime readiness - maintaining the health of active-duty personnel and treating combat casualties; and providing health care for the families (dependents) of active-duty personnel, retirees and their families, and survivors (5:3).

Military Treatment Facility (MTF): Military hospital and clinics capable of providing health care for military members, retirees, and the dependents of each. Available care depends on the size and scope of the facility.

Network: Physicians, hospitals, and other providers who fall under an HMO's contract to provide care for its members (25:10).

Outpatient: An individual who receives treatment in a provider's office or receives same day surgery and does not require an overnight stay in a hospital bed (26:187).

Point-of Service Plan: A plan that allows beneficiaries to use out-of-network services only if they pay a deductible and a percentage of the cost (19:9).

Preferred Provider Organization/Network (PPO/PPN): A network of providers and health care facilities that contract with an insurer to accept discounted fees to provide care for its policyholders. Under Tricare Prime and Extra, a group of civilian practitioner have agreed by contract to supplement military medicine, charge discounted fees, and file patient's claims in exchange for referrals (25:10).

Premium: The out-of-pocket cost to enroll in a particular health plan (usually based on a 12 month time period).

Primary Care: Medical fields which take care of the health and well being of individuals and families. They include family practice, pediatrics, internal medicine, emergency medicine, and obstetrics and gynecology. Primary care providers can handle most health care needs without the use of specialists such a surgeons, radiologists, and psychiatrists (5:17).

Primary Care Manager (PCM): Physician who is the initial point of contact for all the medical needs of a beneficiary under a managed care system. Acting as a "gatekeeper," a PCM makes referrals for tests and specialty care and monitors the adequacy and continuity of care while avoiding un-needed, costly care. PCMs can be physicians, physician assistants, or nurse practitioners. Under Tricare Prime, PCMs will be military providers whenever possible (54:8).

Provider: Anyone who can prescribe medical treatment -- physicians, physician assistants, nurse practitioners, mental health counselors, chiropractors, etc. (26:187).

Referral: When one medical provider refers a patient to another provider for a second opinion, further tests, and/or a procedure.

Tricare Enrollment: Signing up for Tricare Prime at a Tricare Service Center (active-duty military are automatically enrolled in Prime) and paying the annual enrollment fee (for retired beneficiaries only). Military medical beneficiaries do not sign up for Tricare Extra and Standard. If not in Prime, they use these programs as required including paying the required deductibles and co-payments (44:13).

Tricare Extra: Voluntary option for military medical beneficiaries to choose on a case-by-case basis by electing to use a provider from the contractor's Preferred Provider Network. Extra co-payments are lower than Standard co-payments. No enrollment is required (35:31).

Tricare Prime: Similar to a civilian Health Maintenance Organization offering managed care to everyone enrolled. Military Treatment Facilities are the core of this program, supplemented by a contractor's Preferred Provider Network. Active-duty service members are automatically enrolled. Everyone else must actively enroll every twelve months (42:4).

Tricare Service Centers (TSC): Operated by the Tricare contractor, these facilities handle the administrative aspects of the Tricare program including enrollment and Health Care Finders (HCF) services (54:8).

Tricare Standard: CHAMPUS under a new name. Allows military medical beneficiaries to select any provider they want. Standard allows for the most choice, but under most situations will be the most costly of the Tricare options. No enrollment is required (35:32).

Utilization Management: Process used by HMOs to ascertain whether its members are receiving care according to the guidelines and treatment protocols set forth in the contractual agreements with the providers. HMOs use this to control costs by eliminating, in their opinion, unnecessary tests and procedures (25:10).

Civilian Health (Managed) Care

Overview. The roots of managed health care in the United States parallel the transformation of our society from a rural, self-employed, agricultural economy focused on individual orientation to an economy based on urban manufacturing and institutional domination. At the same time, according to Dr. Gordon K. MacLeod, Professor of Medicine at the University of Pittsburgh:

> ...medical practice made the transition from generalist to specialist, from solo to group practice, from direct payment for health care to group insurance, and from a predominately cottage industry to increasing emphasis on the corporate management of medical care (34:3).

The first managed care practice started in 1929 when two California doctors contracted with a water company to provide health care to their employee in exchange for a set, monthly fee (34:5). In 1973, Congress passed a law requiring companies with 25 or more employees to offer a choice between traditional fee-for-service health plans and a membership in a Health Maintenance Organizations (HMO) (25:9). Since the 1970s many corporation, in hopes of containing runaway health insurance costs, have replaced, or discouraged through high premiums, traditional fee-for-service plans. The plan of choice by most has been HMOs. Today more than 51 million people are enrolled in HMOs (49:34).

Managed care has blossomed due to tremendous inflation in the health care industry. For example, between 1980 and 1990, national health care costs increased 166 percent (5:28). There are many reasons behind this spiraling increase in health care costs. They include: the expanding use of expensive technology, "cost shifting" by doctors and

hospitals to pay for care given to people who cannot pay or who are underinsured, the aging of our population, personal expectations that everyone should have a long and healthy life, the practice of defensive medicine brought about by numerous lawsuits, high administrative costs, and a wide variation in the efficiency, quality, and cost from one provider to another (34:xvii). Unfortunately, managed care will not totally eliminate any of these reasons for health care cost inflation.

In today's marketplace, individuals and families can choose from over 1,000 different health care plans. However, each of these plans fall into four basic groups of health care insurance: traditional indemnity (fee-for-service plans), preferred provider organizations (PPO), point-of-service plans (POS), and health maintenance organizations (HMO) (57:161). The two biggest difference between these four groups are cost and a beneficiary's degree of choice in selecting a provider. Most people, 74 percent, who have health care insurance purchase it through their employer (57:160). An employer typically contracts for different types of health care plans on an annual basis and shares the cost of a selected plan with each employee. If the employee selects the "baseline" or basic plan (most likely an HMO plan), he/she will usually pay little or no monthly premium. Selection of a higher quality plan will mean additional premium costs. Most people rate the quality of a health plan based on the degree of choice it provides in the selection of providers and the scope of its coverage (what procedures it does or does not cover) (57:160). Typically, fee-for-service plans are the most expensive followed respectively by PPOs, POSs, and HMOs.

Fee-for-Service Plans. Traditional indemnity plans, or fee-for-service plans, allow beneficiaries to see any doctor at any time (49:34). They pay a fee to the provider for services rendered and then the insurance company reimburses them after they file the necessary paperwork (usually at 80 percent of the total bill, once an annual deductible is met). Because this type of plan does not have any restrictions, it is the most costly. Many health care industry experts feel this type of health insurance will soon be cost prohibited (57:162).

Managed Care. The other three basic groups of health insurance policies (PPOs, POSs, and HMOs) fall under the category of managed care. Managed care is

> ...a system that encompasses both the delivery of health care and payment for those services. Instead of simply paying claims submitted by independent physicians and hospitals, HMOs and other managed care organizations enter into formal contractual arrangements with these providers, set policies for what doctors and hospitals can and can't do, and keep a close watch over them (25:10).

Members of a managed care plan have a specific list or "network" of providers and facilities who have agreed to (by contract) treat plan members for a fixed rate plus a small co-payment (a pre-determined cost share for services rendered, usually $5-$10) (57:161).

Health Maintenance Organizations. Individuals who enroll in an HMO plan are assigned (or they can select from a list) a primary care physician, also known as a primary care manager (PCM), to "watch over" their health care needs. In non-emergency situations, members must first see their PCM (a general practitioner) and be authorized in advance before they can go to another provider for treatment (49:36). Since most medical problems can be handled by a general practitioner, the goal is to keep costs down by

avoiding unneeded, costly treatments offered by specialists. If a PCM feels a specialist is required, the PCM determines who the specialist will be (usually a specialist that is in the network of providers). HMOs also emphasize prevention and early detection (13:79). Since providers in an HMOs are paid a flat monthly fee for each member, they are motivated to keep their patients well because healthy people generally consume fewer health care resources. Providers do this by ensuring their enrollees receive regular check-ups and standard screenings such as mammograms and Pap smears. Members of an HMO have no annual deductibles to meet, pay only a small co-payment for each service, and have no paperwork to file. However, because of the requirement to first see your PCM, HMOs offer the least amount of choice in health care. While you may request a change in your PCM, you can not go outside the HMO umbrella (network), without paying the entire cost of the care out of your own pocket.

Preferred Provider Organizations. Preferred provider organizations contract with health care providers to provide care at a discounted rate in return for patient referrals. As long as members of a PPO go to a provider in the established network, they will generally only have to pay a small co-payment once their annual deductible is met. PPOs do not employ primary care managers, but rather allow unlimited choice within the network. If members decide to go outside the network, they pay just as they would under a fee-for-service policy. Because PPO members have greater choice in their health care, and typically have to pay an annual deductible, PPOs are more expensive than HMOs (57:162).

Point-of-Service Plans. Point-of-service plans combine the managed care of an HMO with the unlimited choice of fee-for-service plans. As long as you are satisfied with your HMO style care (managed care under the supervision of a primary care manager), participant costs remain equivalent to a standard HMO policy. However, if you are not satisfied with your managed care, POS plans allow you to by-pass your PCM and the network of providers and see any provider you choose (25:10). If you do, you are then covered similar to a fee-for-service plan (you will have to pay a deductible and a percent of the cost). Point-of-service plans are experiencing the fastest growth among any of the four primary groups of health plans because they offer the best features of both worlds (57:162). You can control your health care costs without limiting your alternatives. However, because of this added flexibility, POS plans typically have higher premiums than HMOs.

Areas of Concern. Two key areas of managed care, particularly when associated with "for profit" HMOs, have become very controversial: utilization management and capitation. HMOs use utilization management

> ...to determine whether members are receiving care that is consistent with practice guidelines adopted by the organization (the health care company). These are standardized diagnostic and treatment protocols designed to eliminate unnecessary procedures, uninformative tests, and costly treatments that may work no better than less expensive or less invasive ones (25:10).

Opponents of HMOs feel that by emphasizing cost, beneficiaries may miss out on useful tests and procedures. Capitation determines how some providers associated with a managed care organization receive payment. Many receive a set fee per month for each patient assigned to them. In addition, a provider can keep money that is not spent on

patient health care. If providers exceed the company's allotment for patient care, they may lose their contract with the HMO. Under standard fee-for-service plans, doctors are paid for each procedure, therefore, they are rewarded for overtreatment. However, this also allows doctors to do what they believe best without taking money out of their pockets. With capitation, doctors are forced to decide between being a patient advocate or looking out for their own financial self interests (25:11).

History of Military Medicine

The primary mission of military medicine is to ensure the health of active-duty personnel so they are able to perform their assigned missions and to provide health care for the sick and wounded during time of war. In support of active-duty members, the Military Medical Health System (MMHS) provides health care for dependents of active-

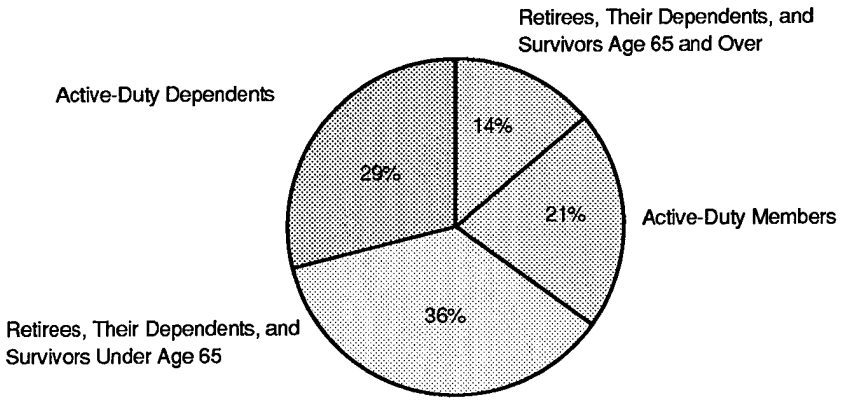


Figure 2.1: 1995 MHSS Population by Beneficiary Category (5:23)

duty personnel, retirees, and the families of retirees (5:14-15). Figure 2.1 shows the 1995 MMHS population by beneficiary category (5:23).

Prior to 1956, active-duty dependents, retirees, and retired family members received medical care from the closest medical treatment facility (MTF) on a space available basis. If they were unable to gain access to an MTF for whatever reason, they had to arrange and pay for their own medical care through the private sector (14:64). In 1956, Congress took steps to remedy this situation by establishing "military Medicare," a fee-for-service health care plan that paid for some hospitalizations, minor surgery, and for maternity care when military beneficiaries were unable to use a military treatment facility.

In 1966, Congress passed legislation to make military Medicare equivalent to the leading civilian health insurance policies of the time by offering comprehensive coverage of outpatient care, psychiatric care, and prescription drugs. Two years later, to avoid any confusion with Social Security's Medicare program, military Medicare was renamed CHAMPUS (Civilian Health and Medical Program of the Uniformed Services) (23:2). The 1966 legislation, titled "The Military Medical Benefits Amendments 1966" states:

> ...Congress recognized "The Fading Promise" to retired military personnel, as well the plight of dependents of active duty members who were located away from military medical facilities and passed the CHAMPUS program to be effective the first day of 1967. This legislation also resulted from the comparatively disadvantageous position in which the military dependents and retirees were placed, with Federal government employees health plans blossoming profusely, while the ability of military facilities to provide health care for all concerned was diminishing (56:4).

In effect, CHAMPUS became, as it remains today, the military's equivalent of a health insurance plan, run by the DoD for the dependents of active duty personnel, military retirees and their dependents, and unmarried dependent children or unremarried spouses

of deceased service personnel or retirees. Active-duty personnel are not eligible for CHAMPUS benefits and must receive their health care at military treatment facilities (45:4). Retirees remain eligible for CHAMPUS until they become eligible for Medicare at age 65 (15:64).

Although CHAMPUS requires no monthly premium, the program does include deductibles and co-payments, expenses not incurred for treatment at military medical

Table 2.1: Cost-Sharing Requirements for Military Facilities and CHAMPUS (5:22)

Inpatient Military Facility	Inpatient CHAMPUS	Outpatient Military Facility	Outpatient CHAMPUS
Active-duty			
$4.75 per day	Not eligible	$0	Not eligible
Active-duty dependents			
$9.50 per day	$25 for each admission or $9.50 per day, whichever is greater.	$0	E-4 and below: Annual deductible of $50 per dependent or $100 per family and then 20% of allowable charges. Above E-4: Annual deductible of $150 per dependent or $300 per family and then 20% of allowable charges.
Other beneficiaries			
$0 for enlisted retirees. $4.75 per day for retired officers. $9.50 per day for others.	25% of billed hospital charges or $323 per day, whichever is less, and 25% of other provider's allowable charges.	$0	Annual deductible of $150 per person or $300 per family and then 25% of allowable charges.

facilities. Table 2.1 lists cost-sharing requirements for military facilities and CHAMPUS (Note: Beneficiaries annual cost-sharing liability is limited to $1,000 for active-duty families and $7,500 for all other CHAMPUS-eligible families).

Health care at MTFs, on the other hand, has always been on a space available basis, with active-duty personnel receiving priority over dependents and retirees. In addition, available services from one MTF to another can vary greatly. While some

military installations have large hospitals covering a large range of medical specialties, many bases only have clinics to handle primary care. In addition, many beneficiaries, particularly the retired community, may have to travel great distances to even reach an MTF. The lack of space available at MTFs has become an even greater problem with the base closures and military cut-backs of the post cold war era. At the same time, however, to ensure maximum utilization of military treatment facilities (the direct care system), CHAMPUS does not cover civilian inpatient hospital care and some high-cost outpatient care for beneficiaries living within a 40-mile radius of an MTF without a statement of nonavailability (45:5). A statement of nonavailability indicates the local MTF can not provide required medical care within established time frames or do not have the necessary resources (5:22).

CHAMPUS remained virtually unchanged from conception until the late 1980's. Prior to 1988, the Office of the Secretary of Defense paid the bill for CHAMPUS, not the individual military departments. This policy put no pressure on the individual services to keep CHAMPUS costs down. In addition, as the demand for medical care increased beyond the capabilities of the military medical facilities, more and more beneficiaries turned to CHAMPUS. These effects combined to bring about annual shortfalls in the DoD's CHAMPUS budget. The Secretary of Defense had to make yearly pleas to Congress for additional funding to cover CHAMPUS costs. In 1988, in a direct response to this problem, Congress forced the individual services to pay their CHAMPUS costs out of their own budgets. Starting in fiscal year 1990 the military departments began

allocating the CHAMPUS budget by the total number of beneficiaries in each catchment area (55:10). A catchment area is the area defined by approximately a 40-mile radius around a military treatment facility. This policy forced each MTF to be responsible for properly allocating its CHAMPUS dollars and to maximize their direct care.

This change in CHAMPUS budget procedures integrated the military's two health care systems, direct care and CHAMPUS (55:10). Military health care costs, however, still remained a major burden on the defense budget.

> Military medical costs have risen twice as fast as any other military cost. One main reason: the armed forces and the Veteran Affairs having to pay increasingly larger amounts to private health-care providers now being used to supplement in-house military care (11:45).

The high utilization rate experienced by military health care services is also burdening the DoD health care budget. The Government Accounting Office (GAO) reported in 1995: "DoD beneficiaries use health care services as much as 50 percent more than civilians in fee-for-service health care plans. Experts attribute this to the availability of virtually free care in the military facilities" (5:29). In 1984, DoD spent $7.2 billion on health care and medical readiness; by 1990, the annual outlay increased to over $14 billion (46:24). In 1985 the cost of CHAMPUS was $1.36 billion (20:ill-3). In 1995, CHAMPUS consumed over $3.6 billion, a much higher percentage of a shrinking defense budget (5:25).

While the number of active-duty personnel has been drastically reduced since the end of the cold war, the military's medical beneficiary population has held relatively steady (see Figure 2.2) (4:24). This is because the all volunteer force of the post Vietnam

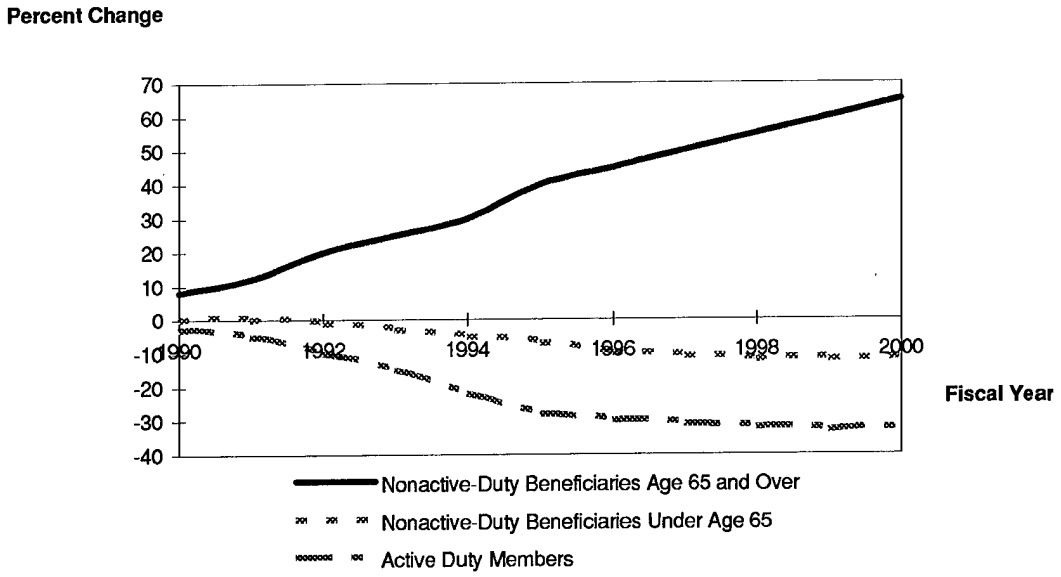


Figure 2.2: Percent Change in Beneficiary Population (4:24)

Era brought in career minded men and women who are much more likely to have dependents, as compared to the selected service force which was composed of mostly of single men and women. Along with this factor is the increase in the number of retired beneficiaries, reflecting the large standing force of the Cold War (46:33). At the same time, the military drawdown has made it more difficult for beneficiaries to find space available direct care at MTFs due to military hospital closures, decreasing hospital budgets, and decreasing hospital staffs (46:33). According to John T. Correll, Editor in Chief of the Air Force Magazine, "since 1988 more than 500,000 retired beneficiaries have lost access to military hospitals and clinics" (18:3). DoD statistics help support this claim:

> Since 1989, the number of operating beds has been reduced by 21 percent, military hospitals by 30 percent, and military and civilian medical staffs by 13 percent. During this same period, the DoD beneficiary population decreased by only about 8.5 percent (16:48).

These factors have forced beneficiaries to use civilian health care to a much larger extent, driving up the cost of CHAMPUS. This is highlighted by the fact that between 1988 and 1992 the number of eligible CHAMPUS users dropped slightly from 6 million to 5.9 million, but during the same time the number of CHAMPUS claims increase 65 percent (46:27). It became obvious to many that the military services needed alternatives to their direct care and CHAMPUS programs. The military turned to managed care, and in order to make managed care a reality, military medicine became a joint service endeavor.

On 1 October 1991, The Office of the Deputy Secretary of Defense published a memorandum, "Strengthening the Medical Functions of the Department of Defense." The memorandum states:

> The Assistant Secretary of Defense for Health Affairs shall implement a program to ensure coordination within appropriate geographical areas of the provision of medical care in DoD facilities with the provision of medical care through the Civilian Health and Medical Program of the Uniformed Services. The objective of the program shall be to maximize cost-effectiveness in the delivery of high quality health care in the accomplishment of the Department's medical mission (47:1).

In direct response to this memorandum, in August 1992 the Assistant Secretary of Defense for Health Affairs published "Policy Guidelines on the Department of Defense Coordinated Care Program." The document states a military managed care program

> will enable the DoD and the Military Departments to better accomplish the medical mission by improving beneficiary access to health care services, controlling health care costs, and ensuring quality care to all Military Health Services System (MHSS) beneficiaries (1:1).

After several demonstration programs to test managed care principles, Tricare was developed in 1993. Using both direct care at MTFs and contracted civilian providers,

Tricare gives beneficiaries the opportunity to reduce their health care cost by offering alternatives to CHAMPUS while at the same time improving beneficiary access to care, ensuring high quality and consistent care no matter where a beneficiary resides, providing more choice for non-active duty participants, and containing health care costs for the DoD (3:1).

The Tricare Program

Goals. Tricare is the Department of Defense's comprehensive medical program for active-duty personnel, retirees, and their dependents. The program's goals are to expand access to medical care for military beneficiaries, to maintain quality of care, control the rapid growth of the military's health care budget while limiting medical costs for beneficiaries, and improve the military's medical readiness (33:5). According to Dr. Stephen C. Joseph, Assistant Secretary of Defense for Health Affairs, Tricare

> ...offers us the ability to retain military medicine. With the tremendous reshuffling of world politics, the national security objectives of our country have changed. The scope and size of the armed forces have changed and will continue to change. And there is considerable pressure in each re-examination of the Military Health Services System to retain only that which is necessary to deploy in support of contingency operations (32:1).

Background. Tricare is very similar to a civilian health-maintenance organization (HMO). It is managed by the military, but health care services are provided by both the military and participating civilian contract providers and hospitals. It incorporates cost control features of private-sector managed care programs such as primary care managers, capitation budgeting, and utilization management (3:3). To implement and administer Tricare, the DoD organized its medical delivery system into 12 joint-service

regions (includes the continental United States and Hawaii) making Tricare one of the most ambitious joint service endeavors ever undertaken by the Defense Department,

Table 2.2: Location of 12 Tricare Regions (3:4; 16:46-47)

Region	Lead Agent	States in Region	Implementation Date
1	National Capital (Bethesda, Walter Reed, Malcolm Grow Medical Centers)	CT, DE, DC, ME, MD, MA, NH, NJ, NY, PA, RI, VT, Northern VA	August 1997
2	Portsmouth Naval Hospital	NC, Southern VA	September 1997
3	Eisenhower Army Medical Center	GA, SC, Parts of FL	July 1996
4	Keesler Air Force Medical Center	AL, TN, Parts of FL and LA	July 1996
5	Wright-Patterson Air Force Medical Center	IL, IN, KY, MI, OH, WV, WI	September 1997
6	Wilford Hall Air Force Medical Center	AR, OK, Parts of LA and TX	November 1995
7	William Beaumont Army Medical Center	AZ, NV, NM, Parts of TX	February 1997
8	Fitzsimons Army Medical Center	CO, IA, KS, MN, MO, MT, NE, ND, SD, UT, WY, Parts of ID	February 1997
9	San Diego Naval Hospital	Southern CA	April 1996
10	David Grant Air Force Medical Center	Northern CA	April 1996
11	Madigan Army Medical Center	OR, WA, Parts of ID	March 1995
12	Tripler Army Medical Center	Hawaii	April 1996

see Table 2.2. Headed by a Lead Agent, who is the commander of a military medical center in that region, all military health care facilities in a region share resources and contract for civilian medical services to supplement any service they can not directly provide. Civilian health care companies bid for these multi-billion dollar regional contracts. The contractor organizes networks of civilian providers throughout their region to supplement the military treatment facilities (54:3). They also operate Tricare Service

Centers to provide administrative services to military treatment facilities and military beneficiaries. These services include enrollment duties and supplying Health Care Finders (HCF). A HCF is a contract employee responsible for making test and specialty-care appointments for military beneficiaries at both military facilities and with civilian network providers (52:52082).

The Options. Except for active-duty personnel, who will be automatically enrolled in Tricare Prime, active-duty dependents and retired beneficiaries must choose between three Tricare options - Prime, Extra, or Standard.

Tricare Prime. Tricare Prime operates very similar to a civilian Health Maintenance Organization (HMO) by acting as the focal point for each beneficiaries health requirements (43:5). Under Prime, each military medical facility will be augmented by a civilian preferred provider network (PPN) established by the contractor. Each beneficiary receives a primary care manager (PCM), either a military or civilian provider, to supervise and oversee his/her health and well being (14:66). Enrollees will be assigned a military PCM if at all possible. Once all available slots at their local MTF are utilized, additional enrollees will receive a civilian PCM. Except for emergency care, all health care decisions are first made by the PCM, including referrals for tests and specialty care (45:3). The contractor operated Health Care Finder office will make test and specialty appointment for each beneficiary. To enroll in Prime, beneficiaries other than active-duty personnel must go to their Tricare Service Center. Table 2.3 contains the costs of enrolling and using Prime for visits to civilian providers and facilities. As in the past, there is no cost

Table 2.3: Costs of Tricare Options (21:2)

BENEFIT	STATUS (Category)	TRICARE STANDARD	TRICARE EXTRA	TRICARE PRIME
Choice of Care	All CHAMPUS Eligibles	Unlimited	From Approved Network Chosen by Patient	From Approved Network Selected by PCM
Annual Enrollment Fee	Active-Duty Retirees & Family	None None	None None	None $230 Ind or $460 Family
Annual Outpatient Deductibles	E-4 and Below E-5 and Above Retirees & Family	$ 50 Ind or $100 Family $150 Ind or $300 Family $150 Ind or $300 Family	$ 50 Ind or $100 Family $150 Ind or $300 Family $150 Ind or $300 Family	None None None
Outpatient Civilian Care Co-payments	E-4 and Below E-5 and Above Retirees & Family	20 % 20% 25%	15 % 15 % 20%	$ 6 $12 $12
Laboratory & X-ray Services	E-4 and Below E-5 and Above Retirees & Family	20 % 20% 25%	15 % 15 % 20%	$ 6 (note 1) $12 (note 1) $12 (note 1)
Civilian Hospitalization Co-payments	Active-Duty Retirees & Family	$ 9.50/day ($25 min) $323/day + 25 % of Physician Charges	$ 9.50/day ($25 min) $250/day + 20 % of Physician Charges	$ 11/day (note 2) $ 11/day (note 2)
Ambulance Service	E-4 and Below E-5 and Above Retirees & Family	20 % 20% 25%	15 % 15 % 20%	$ 10 $ 15 $20
Emergency Room Visit	E-4 and Below E-5 and Above Retirees & Family	20 % 20% 25%	15 % 15 % 20%	$ 10 $ 30 $ 30
Outpatient Surgery	Active-Duty Retirees & Family	$ 25 25 %	15 % ($25 max) 20 %	$ 25 $ 25
Prescription Drugs	Active-Duty Retirees & Family	20 % 25 %	15 % (no deductible) 20 % (no deductible)	$ 5 (up to 30 day supply) $ 9 (up to 30 day supply)
Home/Family Health	E-4 and Below E-5 and Above Retirees & Family	20 % 20% 25%	15 % 15 % 20%	$ 6 $12 $12
Medical Equip/ Supplies	E-4 and Below E-5 and Above Retirees & Family	20 % 20% 25%	15 % 15 % 20%	10 % 15 % 20 %

Note 1: No cost if provided as part of an office visit and a co-payment is collected for the visit.
Note 2: For mental health/sub abuse - $20/day for Active-duty, $40/day for retirees & family.
Co-payments apply to civilian care provided outside a MTF
Active-Duty in this chart refers to dependents of active-duty member.

associated with using military treatment facilities or military providers.

Tricare Prime's advantages:

- Building an established relationship with your Primary Care Manager who will monitor and supervise your health care needs.
- No enrollment fee for active-duty members and their dependents.
- There is no annual deductible and you have to pay only a small co-payment when you see a provider in the established civilian preferred provider network.
- Beneficiaries do not have to fill out any paperwork. Providers file claims with he contractor to receive payment.
- Guaranteed appointments for urgent care within one day, routine care within one week, and well-visit and specialty care within four weeks (contracted access standards) (16:49).
- No balance billing.
- Retain away from home emergency coverage for true emergencies.
- Catastrophic health care cap for retirees reduced from $7,500 to $3,000 (53:14).

Tricare Prime's disadvantages:

- Enrollment fee for retirees, even if they do not incur any health care costs (Table 2.3).
- Once enrolled in Prime you must stay in the program for 12 months or forfeit your enrollment fee (each time you select this option).
- Limited choice -- except for true emergencies, you must use your PCM and network providers for all health care needs. If you go outside of the Prime network for non-emergencies and use what is referred to as the "Point of Service" option, you will pay a $600 deductible and a 50 percent co-payment on the care provided (45:3). Your PCM must refer you before seeing a specialist.
- Available only in the area surrounding a military medical facility.

Tricare Standard. Tricare Standard is CHAMPUS under a new name. When health care is not available at a military treatment facility, Standard offers beneficiaries almost unlimited choice in finding a civilian provider provided the care is covered by CHAMPUS (i.e. most elective plastic surgery procedures are not covered by CHAMPUS). Under Standard, you pay an annual deductible, a co-payment for each visit

based on the cost of the procedure, and the balance of the bill if it exceeds the "CHAMPUS allowable rate," see Table 2.3 (54:4). Free medical care at a military medical facility is still an option, but retired Prime enrollee have a higher priority for space available than those using Standard (active-duty family members not enrolled in Prime, however, maintain a higher priority over retirees enrolled in Prime) (41:14).

Tricare Standard's Advantages:

- Unlimited provider choice.
- No enrollment fees.
- Available almost anywhere in the world.
- If you opt to use a network provider, you automatically switch to Tricare Extra.

Tricare Standard's disadvantages:

- The most expensive option unless you and your dependents require very little health care. Patient responsible for a deductible, co-payments, and balance billing if the provider is non-participating in CHAMPUS.
- Beneficiaries must file their own claims and wait for reimbursement.
- You do not have a Primary Care Manager to watch over your health needs.
- If you live within 40 miles of an MTF, many procedures require a non-availability statement before you can see a civilian provider (53:15).

Tricare Extra. Like Tricare Standard, Tricare Extra requires no official enrollment or annual fee. However, unlike Standard where you can seek health care at a provider of your choice, beneficiaries using Extra must select from providers within the contracted network of providers (54:5). In selecting to use Extra, you call a Health Care Finder at your Tricare service center. The HCF will make an appointment for you at a military treatment facility, if space is available, or with a contracted health care provider. While Extra's annual deductibles are the same as Standard, the per visit co-payments are reduced by five percent in exchange for using contracted providers, see Table 2.3.

Tricare Extra Advantages:

- Extra is less expensive than Standard because co-payments are 5 percent less.
- No balance billing.
- There is no enrollment required and therefore, no enrollment fees.
- All claim forms are filed by the providers.
- You can still use Tricare Standard if you desire.

Tricare Extra Disadvantages:

- It is generally more expensive than Prime unless you and your family do not require much health care. Patient responsible for a deductible and co-payments.
- You do not have a Primary Care Manager to oversee your health care needs.
- Provider choice is limited to the network of providers established by the contractor.
- If you live within 40 miles of an MTF, many procedures require a non-availability statement before you can see a civilian provider.

According to Lt Col Richard M. Hodge of the Managed Care Division, U.S. Army Medical Command, Fort Sam Houston, Texas

> Tricare is the Department of Defense's attempt to preserve and improve your health care benefits which you earned through a career of service to our nation. Unfortunately, more military installations and hospitals will likely close and health care costs will continue to go up. Enrollment in Tricare Prime guarantees you a place and timely access to health care at reasonable controlled costs (54:5).

Military retirees and their dependents 65 years and older fall under Medicare and current law excludes them from the Tricare options. They can still seek treatment at military medical facilities, but space available care will be very limited. Tricare is currently being phased in across the country one region at a time, with complete nation-wide coverage scheduled for Fall 1997.

Factors in Health Care Plan Selection

With some employers, the choice of which health care plan to select is simple because they only offer one. But like the military under Tricare, many employers offer multiple plans, presenting a wide variety of options, usually at different costs, to their employees. Choosing a health care plan when multiple options are offered can be difficult. A beneficiary must look at the benefits, exclusions, rates and financial responsibilities (out-of-pocket costs) of each plan (50:A-9). It is also important to determine if a given health plan fits your general health, the way you use health care, and your lifestyle. Specifically, you must evaluate your: current health status and that of your family, utilization of health care or the types of medical care you presently use, desires to retain choice in your health care, and the cost of each plan (50:A-9).

Current Health Status. If asked, most people can tell you their current health status or answer the question "how do you feel?" using the categories excellent, good, fair, or poor. But, it is important when determining your health status to look beyond those limited categories and include chronic or pre-existing health problems, family medical history, current health risks, age, life expectancy, and any anticipated medical needs such as surgery or pregnancy. In doing so you can evaluate each health care option to see if it meets your families current health situation.

Utilization. Utilization of health care includes what kind of health care services you use/need, and how often you use it. For example: How many times did you visit an emergency room or your family doctor over the last 12 months? Do you require the care of a mental health provider or another specialist such as a allergist? Do you see an

optometrist or need numerous prescriptions filled? The bottom line: make sure you select a health care plan that provides for you and your family's utilization of health care. The Center for Public Health Research and Evaluation summarized, in a 1994 report, thirteen of the most important studies on health care utilization over the last two decades and determined that medical care over the last 12 months is "the strongest predictor of future utilization" (27:96). This study also reports that your health care costs over the last 12 months is a good predictor of your health care costs for the next 12 months (i.e. what you spent last year on yourself and/or your family approximates what you will have to spend over the next twelve months (27:96).

Choice. One of the disadvantages in using direct military health care is the MHSS places a limit on your choice of provider. When you make an appointment, you usually have to accept the assigned provider. One of the major arguments against President Clinton's health care plan of 1993 was people felt they would loose the ability to choose a provider. A government's health care system could have forced that change on the American people. When selecting a health care plan, you must decide how important having a choice of providers and/or hospitals is to you and select a plan accordingly (38:298). Typically, fee-for-service plans give the most choice, HMOs the least, with the other types of plans falling somewhere in between (49:36). If you do not consider choice in selecting a health plan, you may be surprised to find your current doctor is not included in the plan you selected (50:A-9).

Cost. While you should not pick a health plan based solely on cost, for many, cost is a large driving factor. When considering costs of a health plan, you must examine:

annual premiums, deductibles, co-payment schedules, and the difference between the plan's allowable coverage and actual fees charged by providers. Usually if you want maximum choice, such as with a fee-for-service plan, you will have to pay higher out-of-pocket costs (51:77). Recall, as mentioned in the discussion on utilization, your health care costs over the next 12 months will be approximately what you will spend over the last twelve months. This should allow you to approximate your out-of-pocket costs for each health care plan offered.

In selecting a Tricare option all the above factors are important. However, since Tricare is a military sponsored health care program, three additional factors must be included: rank, status (active-duty or retired), and proximity to a military medical facility. Under Tricare, rank and status determine the premium cost, co-payments schedules, and the amount of the annual deductible (see Table 2.3). If you do not live near a military facility or in an area with a large number of military beneficiaries, Tricare Prime and Tricare Extra may not be practical alternatives because you will be too far from the available network of providers.

Conclusion

The Military Health Services System has changed. Tricare, the military's managed care health program, is the present and the future. Beneficiaries must now weigh the factors and decide which Tricare option will best provide for their medical needs and desires. Chapter 3 of this thesis presents a decision analysis model of the factors involved in the decision that minimizes cost while at the same time provides for an individual's health care needs and desires.

CHAPTER III

METHODOLOGY

Introduction

Chapter II provided an overview of civilian health care, military medicine, and the DoD's new managed care health plan, Tricare. When fully implemented throughout the United States, Tricare will provide beneficiaries increased access to health care and uniform coverage without regard to location while easing the burden of medical care on the DoD's budget. Tricare allows beneficiaries to select between three options, (detailed in Chapter II), Prime, Extra, and Standard. For beneficiaries with working spouses and/or retirees who are currently employed, the selection of a health care option becomes even more complex because their employers may also offer health care coverage. The Military Health Services System does not offer a health care plan "selection model" to its beneficiaries, only advice if you ask the right questions. To fill this void, the author built a health care selection model to aid military beneficiaries in selecting the best health care plan for themselves and their families. As first stated in chapter I, the objective of the model is to select the lowest cost health care option for a military beneficiary while maintaining personal desires for choice of health care provider.

Model Design

Programming. Using Clemen's (1996) concepts of Decision Analysis, the author built a decision/economic analysis model to minimize health care costs while maintaining personal desires for choice of provider (17). The model accounts for the following variables and uses the listed assumptions.

Variables. After a thorough review of health care literature, the factors (and therefore the variables of the model) effecting the selection of a health care option for an active-duty or retired military member are:

- Age -- Children and the elderly use a disproportionate amount of health care.
- Rank -- Active-duty E-4s and below, have lower co-payments and deductibles under Tricare (see Table 2.3).
- Status (active-duty or retired) -- Active-duty personnel have lower co-payments than retirees under Tricare and pay no enrollment fee for Tricare Prime. (see Table 2.3).
- Number of Dependents -- On average the more dependents in a family, the greater the annual cost of health care.
- Life Expectancy -- A person should base their health care decisions on how long they expect to live.
- Current Health Risks -- Health care decisions should take into account potential future health needs.
- Pre-Existing Health Conditions -- A selected health care plan should cover any pre-existing health conditions or risk paying large out-of-pocket costs.
- Access to Military Treatment Facilities -- At this time, treatment at an MTF is free. However, if a beneficiary is not co-located near an MTF, it will be extremely difficult for a beneficiary to seek care without incurring out-of-pocket travel costs.
- Attitude Towards Choice in Health Care -- How important it is for a person to be able to select their own provider at their time and choosing.
- Availability of Options Other Than Tricare -- A working spouse and/or a retired military member may have other health care options available through their place of work.
- Multiple Domiciles -- Spending long periods of time in different, non co-located homes. This makes it all but impossible to belong to a HMO plan because, when needed, your PCM might not be available (HMOs allow for only one PCM).

Appendix B discusses how the model accounts for each of the above variables.

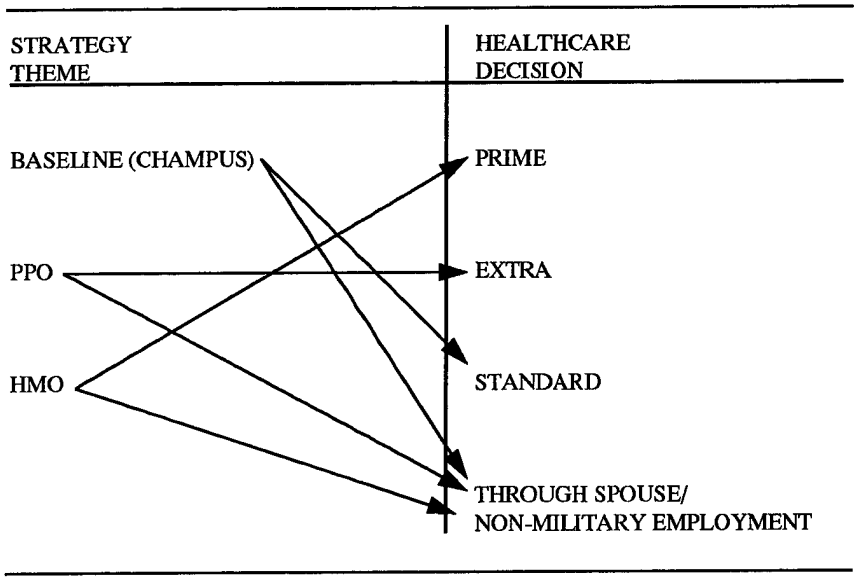
Assumptions. Deciding on a health care plan is a complicated decision. The following assumptions allow the model to quantify the costs of each plan for comparison.

- Twelve Month Planning Horizon -- A beneficiary can change his/her selected health care plan after 12 months without penalty. If a participant was enrolled in Prime, he or she can elect not to re-enroll at the end of a 12 month period. If the beneficiary was using Standard or Extra, they can enroll through normal channels (31:1).
- Health Care Costs Over the Next 12 Months Can Be Approximated by Health Care Costs Over the Previous 12 Months -- Age, current health risks, pre-existing health conditions, and number of dependents factor into these cost figures. The Center for Public Health Research and Evaluation stated, in a report that summarizes 13 of the most important studies on health care costs and utilization, an individual's (or family's) health care costs over the last 12 months is a good predictor of health care costs for the next 12 months. (27:96).
- If Using Tricare Prime, the Beneficiary Has a Civilian Primary Care Manager -- Since military PCMs do not charge a co-payment for an office visit but civilian PCMs do, this assumption will provide better comparison to the other options.
- Choice Is Calculated as a Cost in a Given Health Care Plan Option -- A beneficiary can determine how much they are willing to pay for a specified degree of provider choice.
- Attitudes Towards Risk Incorporated into Value of Choice -- There is a tradeoff between potential higher out-of-pocket costs and having a greater choice in selecting a provider. For Tricare, risk is limited by annual catastrophic caps: for active-duty -- $1,000 with or without Prime and for retirees -- $3,000 with Prime, $7500 without.
- Because Prime Enrollees Will Have Priority for Appointments at MTFs, Except for Prescriptions, MTF Appointments Will Not Be Available for Non-Prime Enrollees -- According to Air Force Tricare Representatives, only about five percent of available appoints at an MTF will go to non-Prime enrollees (39:1).
- Distance from an MTF Is Not a Factor -- Currently Prime networks only exist adjacent to MTFs, where large segments of the military's beneficiary population live. If you live close to an MTF, you can enroll in Prime and compete for appointments at that MTF. If you reside in an area outside a 40 mile radius (approximately), you will not have Prime available and therefore, will have an extremely hard time making an appointment at an MTF (based on appointment priorities).
- Beneficiaries eligible for Medicare are not eligible for Tricare (15:63).

- Beneficiaries with alternatives other than Tricare will compare each of these alternatives one at a time against the Tricare options. If the civilian alternative(s) include PPO and or fee-for-service plans, it is assumed the dual coverage of Tricare Standard and these plans will cover all out-of-pocket medical expenses.
- A PPO provides a beneficiary 50 percent of the provider choice when compared to a fee-for-service plan (36:1).
- Under Tricare, a pre-existing conditions does not limit a beneficiary's options.

The Model. Based on the variables and assumptions, the author built the flowchart of a military beneficiary's health care decision, shown in Figure 3.1. A strategy generation table, found in Table 3.1, provides an initial analysis of feasible strategies. Finally, using the variables,

Table 3.1: Strategy Generation Diagram for the Health Care Decision



assumptions, the flowchart, and the strategy generation table, the author built a deterministic decision analysis model to minimize cost while maintaining personal desire for choice. Figure 3.2 contains the model. The model has four main components: Cost with Prime (node 3), Cost with Standard (node 4), Cost with Extra (node 5), and Cost of a Civilian Option (node 6).

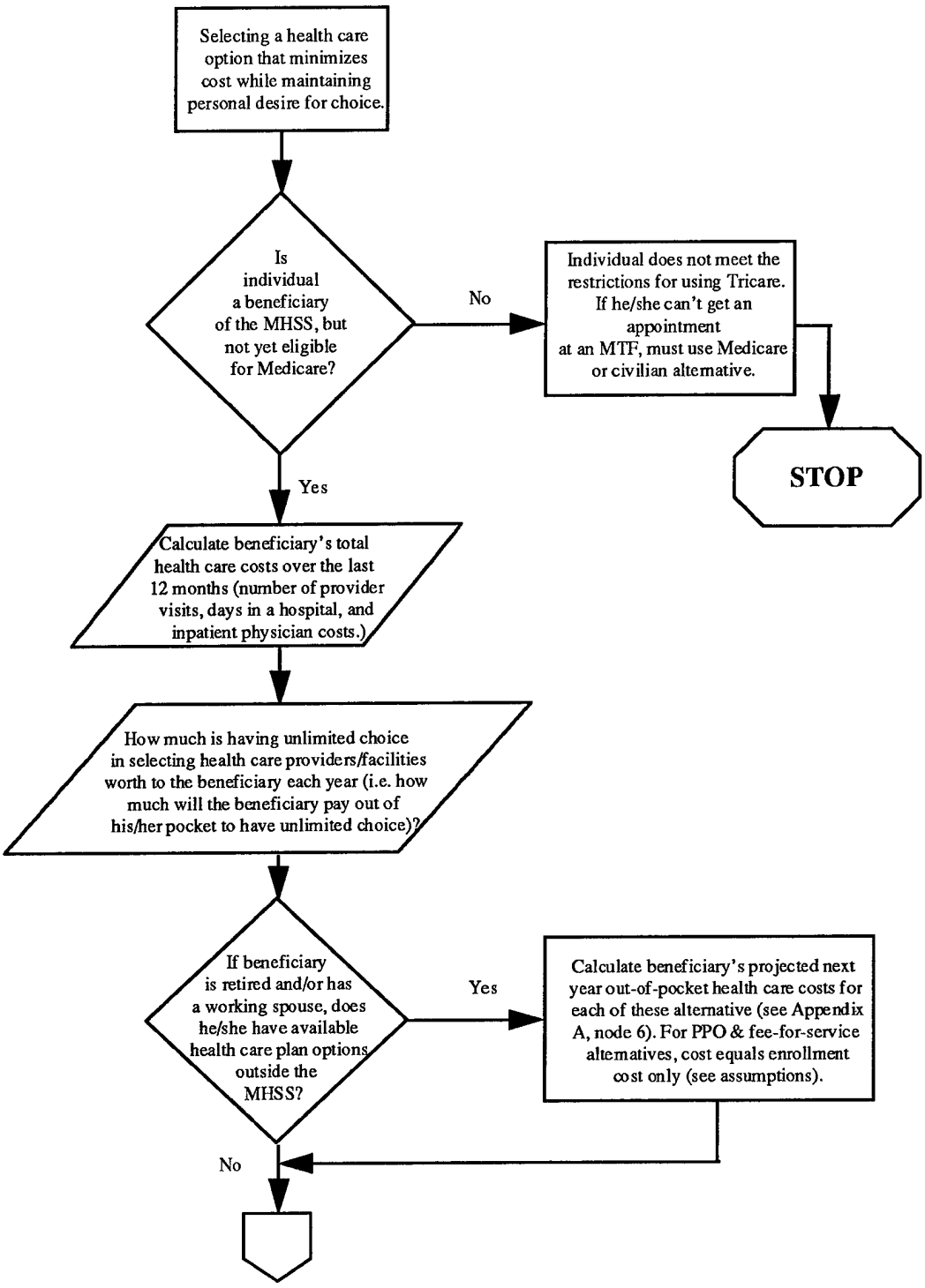


Figure 3.1: Flowchart of a Military Beneficiary's Health Care Decision

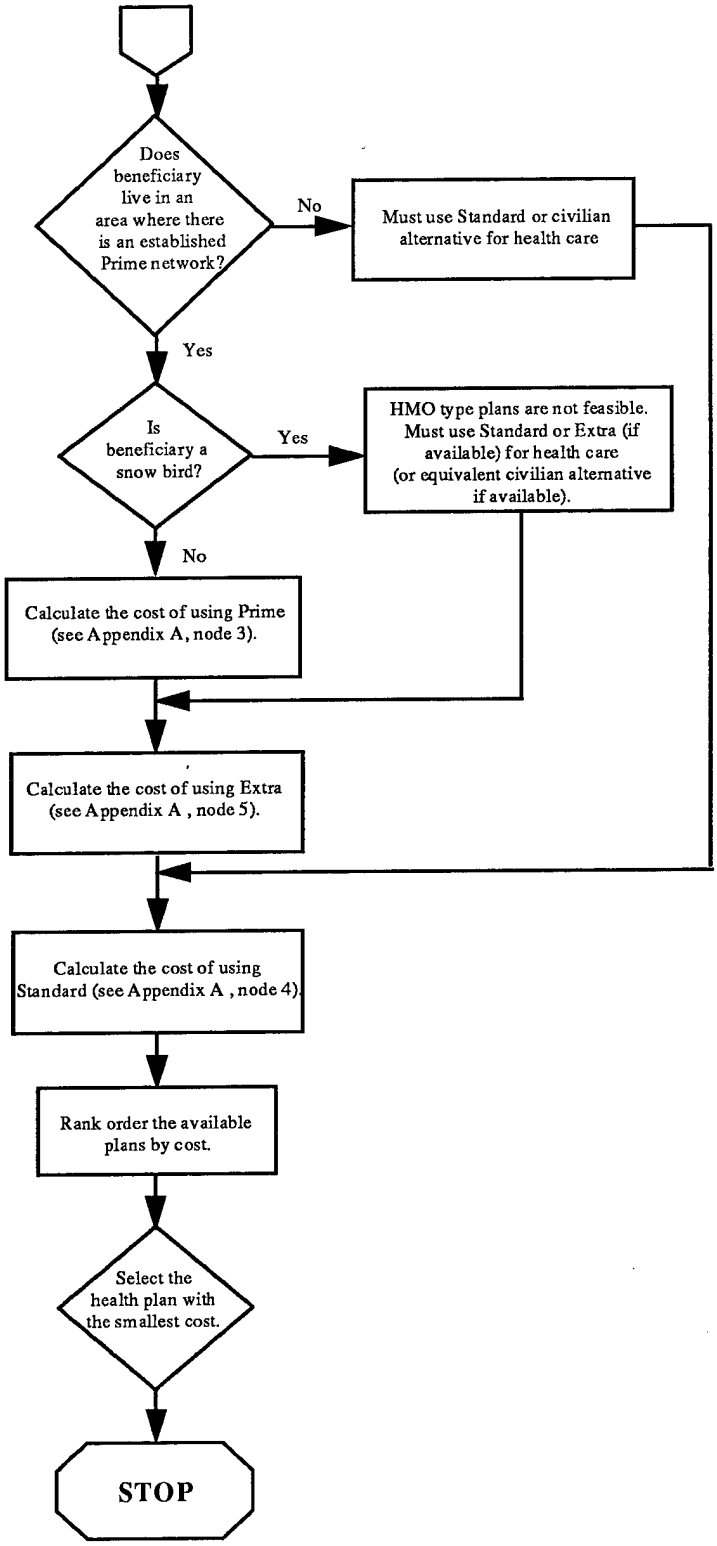


Figure 3.1: Flowchart of a Military Beneficiary's Health Care Decision (continued)

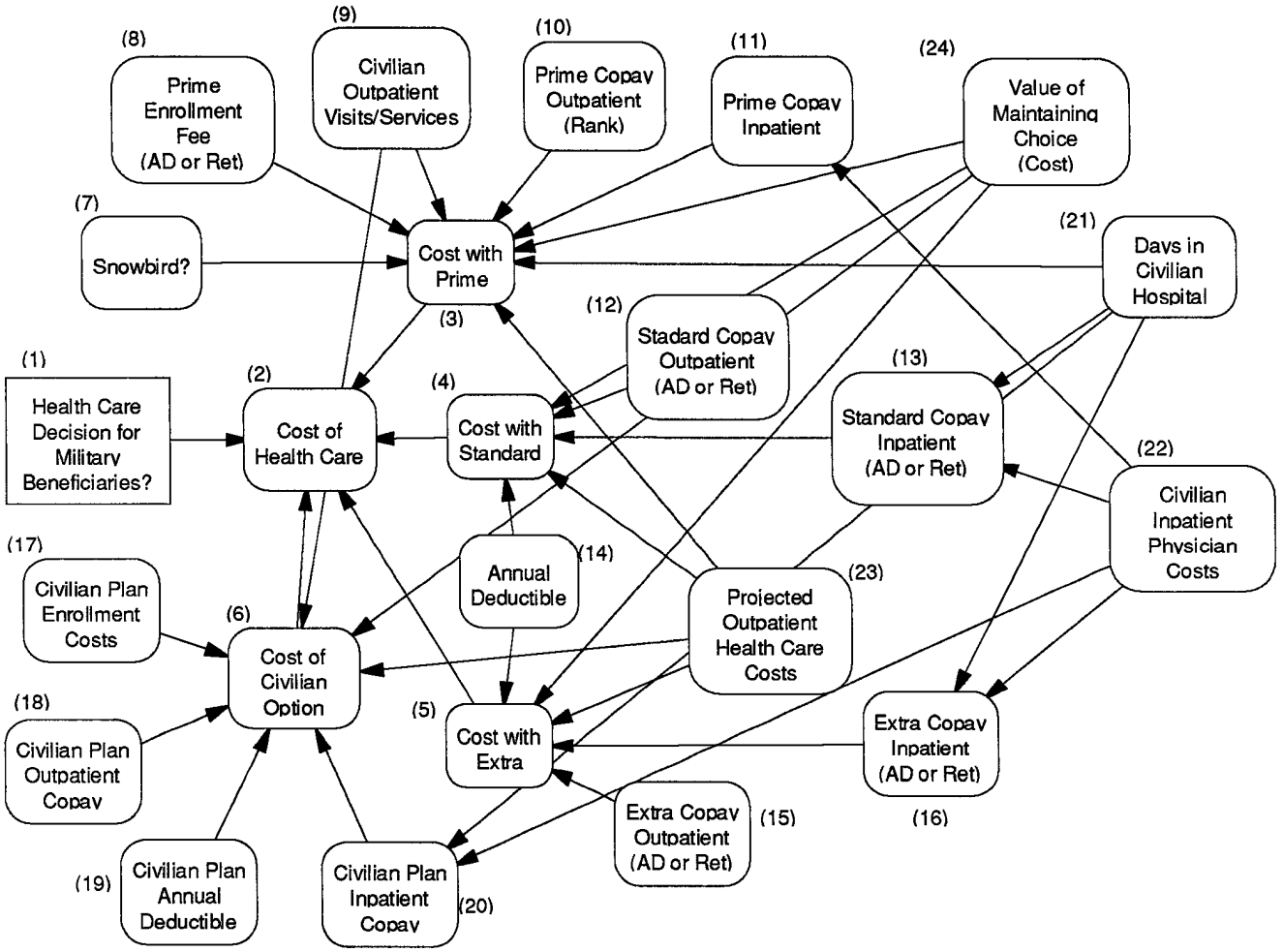


Figure 3.2: DPL Model of Health Care Decision

Cost with Prime. This portion of the model calculates the annual out-of-pocket costs for a beneficiary if he or she selects Tricare Prime. Using cost figures from Table 2.3 for enrollment fees and co-payment schedules, along with inputs from the beneficiary on projected outpatient costs, inpatient costs, and the value of maintaining provider choice, this portion of the model calculates the cost of using Prime over the next 12 months. Appendix A presents an in-depth explanation of each node associated with Prime as well as the mathematical equations used in the actual calculations.

Cost with Standard. This portion of the model calculates the annual out-of-pocket costs for a beneficiary if he or she uses Tricare Standard. Using cost figures from Table 2.3 for deductible schedules and co-payment fees along with inputs from the beneficiary on projected outpatient costs, inpatient costs, and the value of maintaining provider choice, this portion of the model calculates the cost of using Standard over the next 12 months. Appendix A presents an in-depth explanation of each node associated with Standard as well as the mathematical equations used in the actual calculations.

Cost with Extra. This portion of the model calculates the annual out-of-pocket costs for a beneficiary if he or she uses Tricare Extra. Using cost figures from Table 2.3 for deductible schedules and co-payment fees along with inputs from the beneficiary on projected outpatient costs, inpatient costs, and the value of maintaining provider choice, this portion of the model calculates the cost of using Extra over the next 12 months. Appendix A presents an in-depth explanation of each node associated with Extra as well as the mathematical equations used in the actual calculations.

Cost of Using a Civilian Option. Because a military beneficiary might have alternatives to Tricare through a civilian employer or working spouse, the model also considers this option. Using appropriate cost figures for deductibles, co-payments, and enrollment fees, along with inputs from the beneficiary on projected outpatient costs, inpatient costs, and the value of maintaining provider choice, this portion of the model calculates the cost of using a given civilian option over the next 12 months. Appendix A presents an in-depth explanation of each node associated with a civilian option as well as the mathematical equations used in the actual calculations.

Capturing Utility. The model captures an individual's utility (a beneficiary's preference) towards a specific health care option with the variable, *Value of Maintaining Provider Choice.* If a beneficiary prefers to have choice in selecting a provider, his or her preference is captured by this individual's willingness to pay more out-of-pocket costs to maintain choice. This dollar figure, supplied by each beneficiary, is included in the cost calculations for each health care alternative.

Conclusion. Once the model calculates the out-of-pocket costs of the four options, the model selects the option that minimized cost (Appendix A explains each node of the DPL model including the mathematical formulas of the model). The author believes this model will allow any beneficiary of the Military Medical Services System to determine which health care option will minimize his/her out-of-pocket medical expenses while maintaining personal desire for choice of provider.

Using several carefully selected examples, that span the military beneficiary population, Chapter 4 presents the results of the model.

CHAPTER IV

RESULTS

Introduction

The beneficiaries of DoD's Tricare program are the dependents of active duty personnel, military retirees and their dependents, and unmarried dependent children or unremarried spouses of deceased service personnel or retirees. Under Tricare, active-duty personnel continue to receive all their health care at military treatment facilities. Retirees remain eligible for Tricare until they become eligible for Medicare at age 65. Today, the total pool of military beneficiaries number slightly less than 6 million (46:27). The author's health care plan selection model will help each of theses beneficiaries select between one of four possible alternatives (Prime, Standard, Extra, or a civilian alternative if available). However, for most, the model will present varying degrees of differences in an individual's projected annual health care costs over the next twelve months because no two beneficiaries will have the same values for the input variables. To present the results of his model, the author selected several examples that span the beneficiary population. These examples, presented below, are based on their category (active-duty dependent E-4 and below, active-duty dependent E-5 and above, and retirees and their dependents), which is identical to the way Tricare groups individuals for determining a beneficiary's out-of-pocket costs for a particular Tricare option.

Research Examples

Under the Tricare Program, military beneficiaries are placed in one of three categories; active-duty E-4 and below, active-duty E-5 and above, and Retirees. The enrollment fees, deductibles and co-payments a beneficiary pays for each option depends on his or her Tricare category (Table 2.3). All the other variables of the model are independent of a particular Tricare option. They are dependent only on an individual's particular set of circumstances. For example, each military beneficiary, regardless of rank or active-duty status might have: a different attitude towards choice in health care; different projected health care costs over the next twelve months; and a difference in the availability of non-Tricare options (civilian plans offered by an employer or through a working spouse) for his or her health care needs. Therefore, the author selected three examples, each from a different Tricare category, to span the beneficiary population. Because beneficiaries who live in areas not covered by a Tricare Prime network only have one DoD sponsored health care option available (Standard) , the author did not consider these individuals as research examples.

1) An active-duty E-4, married with two children. His wife (her husband) works outside the home, but does not have available health care insurance through her (his) job. (Represents active-duty E-4s and below).

2) An active-duty O-3, married with three children. The spouse is a homemaker. (Represents active-duty E-5 and above).

3) A retired 0-5, currently employed by a business that offers health care plans. He is married with two dependent children and his wife is a homemaker. (Represents the retired population).

Through detailed sensitivity analysis, the author feels these three examples will capture a majority of the different aspects of the beneficiary population.

Active-Duty E-4

Inputs. To compute a baseline cost figure and an initial determination of which Tricare option this beneficiary should select, the following inputs were applied to the model. The precision of these inputs figures, supplied by the beneficiary, are not critical to the results because sensitivity analysis will provide insight, to a large degree, over the range of the possible input values.

Table 4.1: Active-Duty E-4's Model Inputs

Number of outpatient office visits/services over the next 12 months.*	10
Cost of outpatient medical services over the next 12 months.*	$800
Number of days a dependent will stay in a hospital over the next 12 months.*	0
Inpatient physician costs over the next 12 months.*	$0
Value of maintaining choice of provider.	$0
Cost of enrollment, co-payments, and deductibles.	see Table 2.3 for active-duty E-4
Cost of civilian options (enrollment fee, co-payments, and deductibles) for the next 12 months.	no civilian option available

*Projected from figures over the last 12 months (supplied by the beneficiary).

Results. Table 4.2 reports the results of the model based on the inputs from Table 4.1. Appendix C contains the actual decision analysis software printouts.

Table 4.2: Model Results for the Active-Duty E-4

Health care costs for next 12 months using:	
Prime.	$60
Standard.	$205
Extra.	$240
Health care option that should minimize this beneficiaries out-of-pocket costs while maintaining personal desire for choice.	Tricare Prime

Sensitivity Analysis. Performing a sensitivity analysis on the inputs in Table 4.1 revealed

only a change in the *Value of Maintaining Choice of Provider*, changes the model's recommended option. If this E-4 was willing to pay more than $180 dollars to maintain a choice in selecting a provider, the model would recommend using Tricare Standard (all other inputs unchanged). Appendix C contains a thorough sensitivity analysis of the input variables.

Conclusion. For most active-duty E-4s and below, Tricare Prime should be the least expensive option. However, if an E-4 or below was willing to pay more than $180 per year to maintain provider choice, he or she would select Tricare Standard to minimize annual out-of-pocket health care costs.

Active-Duty O-3

Inputs. To compute a baseline cost figure and an initial determination of which Tricare option this beneficiary should select, the following inputs were applied to the model. Again, the exact accuracy of these inputs figures, supplied by the beneficiary, are not

Table 4.3: Active-Duty O-3's Model Inputs

Number of outpatient office visits/services over the next 12 months.*.	15
Cost of outpatient medical services over the next 12 months.*	$1200
Number of days a dependent will stay in a hospital over the next 12 months.*	1
Inpatient physician costs over the next 12 months.*	$800
Value of maintaining choice of provider.	$500
Cost of enrollment, co-payments, and deductibles.	see Table 2.3 for active-duty O-3
Cost of civilian options (enrollment fee, co-payments, and deductibles) for the next 12 months.	no civilian option available

*Projected from figures over the last 12 months (supplied by the beneficiary).

critical to the results because sensitivity analysis will provide insight, to a large degree, over the range of the possible input values.

Results. Table 4.4 reports the results of the model based on the inputs from Table 4.3. Appendix D contains the actual decision analysis software printouts.

Table 4.4: Model Results for the Active-Duty O-3

Health care costs for the next 12 months using:	
Prime.	$691
Standard.	$489.5
Extra.	$694.5
Health care option that should minimize this beneficiaries out-of-pocket costs while maintaining personal desire for choice.	Tricare Standard

Sensitivity Analysis. Performing a sensitivity analysis on the inputs in Table 4.3 revealed only changes in the *Value of Maintaining Choice of Provider* and *Projected Outpatient Health Care Costs*, change the model's recommended option. If this O-3's value of maintaining choice of provider falls below $298, the model would recommend using Tricare Prime. The model would also recommends using Tricare Prime if his projected outpatient health care costs become greater than $2,207. In both cases, all the other inputs are not significant factors and remain unchanged. Appendix D contains a thorough sensitivity analysis of the input variables, including two-way analysis on both of the impact variables.

Conclusion. For most active-duty E-5s and above, the Tricare option that minimizes out-of-pocket health care costs while maintaining personal desire for provider choice is dependent on two variables. The value they are willing to pay to maintain provider choice and their projected outpatient health care costs.

Retired O-5

Inputs. To compute a baseline cost figure and an initial determination of which Tricare option this beneficiary should select, the following inputs were applied to the model. The precision of these inputs figures, supplied by the beneficiary, are not critical to the results because sensitivity analysis will provide insight, to a large degree, over the range of the possible input values.

Table 4.5: Retired O-5's Model Inputs

Number of outpatient office visits/services over the next 12 months.*	12
Cost of outpatient medical services over the next 12 months.*	$1000
Number of days a dependent will stay in a hospital over the next 12 months.*	0
Inpatient physician costs over the next 12 months.*	$0
Value of maintaining choice of provider.	$0
Cost of enrollment, co-payments, and deductibles.	see Table 2.3 for retired O-5
Cost of civilian options (enrollment fee, co-payments, and deductibles) for the next 12 months.	$804.72

*Projected from figures over the last 12 months (supplied by the beneficiary).

Results. Table 4.6 reports the results of the model based on the inputs from Table 4.5. Appendix E contains the actual decision analysis software printouts.

Table 4.6: Model Results for the Active-Duty O-5

Health care costs for the next 12 months using:	
Prime.	$604
Standard.	$440
Extra.	$475
Civilian Option.	$804.72
Health care option that should minimize this beneficiaries out-of-pocket costs while maintaining personal desire for choice.	Tricare Extra

Sensitivity Analysis. Performing a sensitivity analysis on the inputs in Table 4.5 revealed changes in the *Value of Maintaining Choice of Provider*, *Number of Days Spent in a Hospital*, *Inpatient Physician Costs*, and *Projected Outpatient Health Care Costs*, change the model's recommended option (while holding all other inputs constant). Table 4.7 lists the value at which each of these variables change the decision.

Table 4.7: Sensitivity Analysis for a Retired O-5

Variable	Value (above which) Decision Changes from Tricare Extra	Model's Recommended Option
Value of maintaining choice of provider.	$70	Tricare Standard
Number of days spent in a hospital.	0 days (one day or more)	Tricare Prime
Inpatient physician costs.*	$820	Tricare Prime
Projected outpatient health care costs.	$1800	Tricare Prime

*Inpatient physician costs are only charged during a hospital stay.

The decision for a retired individual becomes more complex because, unlike active-duty personnel, he or she has to pay an enrollment fee and the cost of a hospital stay goes up dramatically (Table 2.3). Appendix E contains a thorough sensitivity analysis of the input variables.

Conclusion. If a retired person projects low outpatient health care costs (less than $1800), does not anticipate any hospital stays, and does not place great value in maintaining choice of provider, Tricare Extra will minimize his or her health care costs. If this is not the case, Table 4.7 provides assistance in the decision process.

Conclusion

The results from these three examples should provide most military beneficiaries with a guide to select the best option for their health care coverage. Of course, the best use of the model would be to individually apply it to each beneficiary faced with the Tricare decision, as specific, individual requirements, may effect the individual's decision.

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

The purpose of this research project was to develop a model to assist beneficiaries of the Military Health Services System (MHSS) in the selection of a health care option. Many MHSS beneficiaries have, at the most, three health care options: Tricare Prime, Tricare Extra, or Tricare Standard. Some beneficiaries, through a civilian employer or a working spouse, have additional civilian health care plans to consider. The author's deterministic decision analysis model considers each of these options and selects the plan that minimizes a beneficiary's out-of-pocket health care costs while maintaining that individual's personal desire for provider choice in his or her health care.

To apply the results of this paper, a beneficiary needs to find the results in Chapter 4 for his or her category (E-4 and below, E-5 and above, or retired), and apply his or her own inputs to the appropriate sensitivity analysis table to determine which option should minimize his or her health care costs. However, as stated early in this paper, these results are intended only to assist beneficiaries in the selection of a health care option. The actual decision remains a personal choice.

Recommendations

Future areas to consider in the arena of selecting health care options using decision analysis are:

1) Attempt to quantify the quality of each health care plan and add this to the present model. The present model, assumes the available health care options are equal in quality.
2) As Tricare supplements become available, add the effects of these supplements to the model. Beneficiaries can reduce the cost of co-payments and deductibles by purchasing supplements.
3) Modify the existing model for civilian use only. Remove Tricare inputs and replace with appropriate civilian inputs.

Appendix A: Explanation of the Health Care Selection Model

To present the reader with a thorough explanation of the decision analysis model, the author presents, in Table A.1, an in-depth explanation of each node of the model. In addition, Table A.1 includes the mathematical equations for each calculation. The overall model appears in Figure A.1 for quick reference.

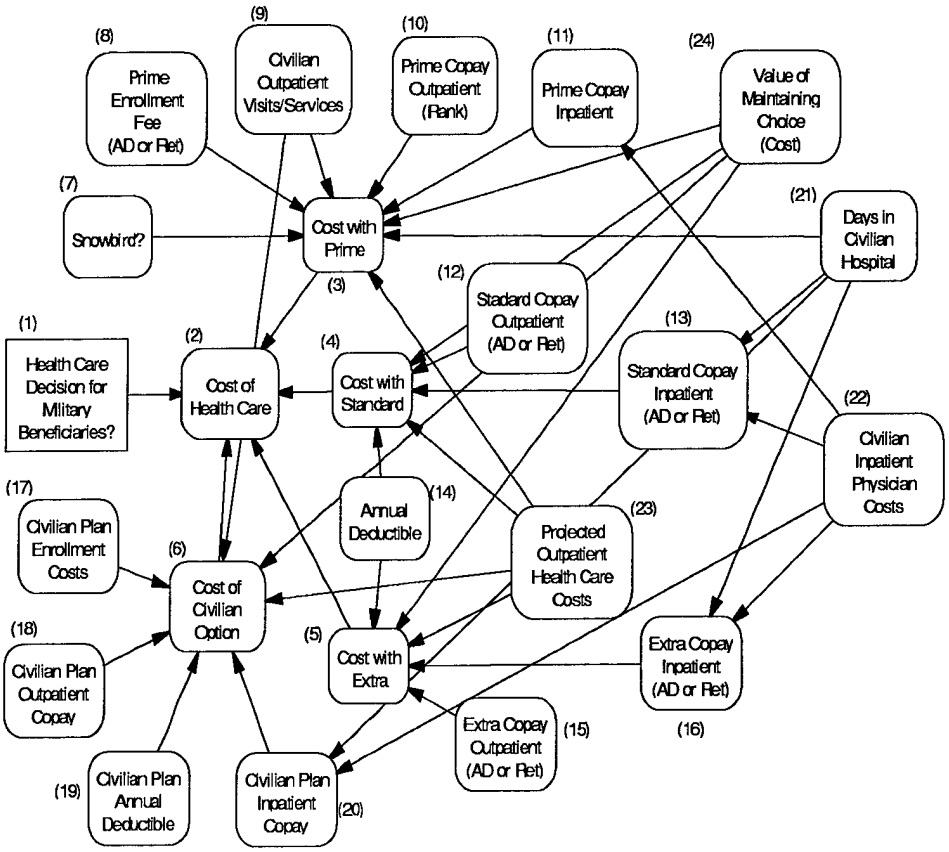


Figure A.1: DPL Model of Health Care Decision

Table A.1: Explanation of the Health Care Selection Model

NODE	EXPLANATION
1	Selects the health care plan (Prime, Standard, Extra, civilian option) that minimized cost
2	Tabulates the cost of each option
3	Calculates the cost of using Prime [Snowbird factor + Enrollment fee + (Number of Outpatient visits x Prime outpatient co-pay) + (Days in a Civilian Hospital x Prime co-pay inpatient) + (Value, or cost, of Maintaining Choice x 1.0)]
4	Calculates the cost of using Standard [Annual deductible + Standard co-pay for civilian hospital stays (room and physician costs) + ((Projected outpatient health care costs - Annual deductible) x Standard co-pay outpatient care) + (Value, or cost, of Maintaining Choice x 0.0)]
5	Calculates the cost of using Extra [Annual deductible + Extra co-pay for civilian hospital stays (room and physician costs) + ((Projected outpatient health care costs - Annual deductible) x Extra co-pay outpatient care) + (Value, or cost, of Maintaining Choice x 0.0)]
6	Calculates the cost of using a civilian option (through a civilian employer or spouse plan) [Annual enrollment cost + Annual deductible + Civilian plan co-pay for civilian hospital stays (room and physician costs) + ((Projected outpatient health care costs - Annual deductible) x Civilian plan outpatient co-pay) + (Value, or cost, of Maintaining Choice x 1.0 for an HMO, 0.5 for a PPO, or 0.0 for a fee-for-service plan)]
7	If an individual has two or more non co-located domiciles, using Prime will not be feasible because each enrollee can only have one PCM. Enter 0 if a beneficiary is not a "snowbird" otherwise enter the respective catastrophic cap (for active-duty -- $1,000 with or without Prime and for retirees -- $3,000 with Prime, $7500 without.). Therefore, it acts as a 0-1 variable
8	The beneficiary's appropriate cost figure for Prime enrollment, from Table 2.3
9	The beneficiary's projected number of civilian outpatient visits for the next 12 months
10	The beneficiary's appropriate outpatient co-pay for Prime, from Table 2.3
11	$11 (see Table 2.3)
12	The beneficiary's appropriate outpatient co-pay for Standard, from Table 2.3
13	Calculates the cost of staying in a civilian hospital under Standard [(Days in a civilian hospital x Standard co-pay for inpatient stay -- see Table 2.3) + (Civilian inpatient physician costs x Standard co-pay for inpatient physician costs -- see Table 2.3)]
14	The beneficiary's appropriate deductible for Standard or Extra, from Table 2.3
15	The beneficiary's appropriate outpatient co-pay for Extra, from Table 2.3
16	Calculates the cost of staying in a civilian hospital under Extra [(Days in a civilian hospital x Extra co-pay for inpatient stay -- see Table 2.3) + (Civilian inpatient physician costs x Extra co-pay for inpatient physician costs -- see Table 2.3)]
17	The beneficiary's appropriate annual enrollment costs for a selected health care plan outside the MHSS (if applicable, otherwise $3,000 -- approximate annual cost of a non-employee sponsored civilian health care plan)
18	The beneficiary's appropriate outpatient co-pay for his/her health care plan outside the MHSS
19	The beneficiary's appropriate deductible for his/her health care plan outside the MHSS
20	Calculates the cost of staying in a civilian hospital under a non-MHSS health care plan[(Days in a civilian hospital x appropriate civilian plan co-pay for inpatient stay) + (Civilian inpatient physician costs x appropriate civilian plan co-pay for inpatient physician costs)]
21	Number of days the beneficiary project to stay in a civilian hospital over the next 12 months
22	The beneficiary's projected civilian inpatient physician costs over the next 12 months
23	The beneficiary's projected civilian outpatient physician costs over the next 12 months
24	How much a beneficiary is willing to pay above the normal costs of a health care plan to have unlimited choice in his/her health care decisions

Appendix B: How the Model Accounts for the Variables in Selecting a Health Care Plan

After a thorough review of health care literature, the factors (and therefore the variables of the model) effecting the selection of a health care option for an active-duty or retired military member are:

- Age.
- Rank
- Status (active-duty or retired)
- Number of Dependents
- Life Expectancy
- Current Health Risks
- Pre-Existing Health Conditions
- Access to Military Treatment Facilities
- Attitude Towards Choice in Health Care
- Availability of Options Other Than Tricare
- Multiple Domiciles

Table B.1 discusses how the model accounts for each of the above variables.

Table B.1: How the Model Accounts for the Variables in Selecting a Health Care Plan

VARIABLE	HOW ACCOUNTED FOR IN THE MODEL
Age	As stated in the assumptions, the previous year's health care costs are used to project next year's health care costs. The impact an individuals age had on his/her last year's cost will very closely impact next year's projected costs as well.
Rank	Active-duty E-4s and below, have lower co-payments and deductibles under Tricare. Inputs to the model on co-payments and deductibles will account for a beneficiary rank, if active-duty.
Status (Active-Duty or Retired)	Active-duty personnel have lower co-payments than retirees under Tricare and pay no enrollment fee for Tricare Prime. Inputs to the model on co-payments and enrollment fees will account for a beneficiary status.
Number of Dependents	As stated in the assumptions, the previous year's health care costs are used to project next year's health care costs. The number of dependents a beneficiary has will have the same effect on costs last year and the forth coming year.
Life Expectancy	Because Tricare enrollment is only for 12 months at a time and Tricare costs are not based on age, life expectancy was not included in the model.
Current Health Risks	The cost of Tricare, deductibles, co-payments, enrollment fees, do not change for an individual who possesses health risks, therefore, current health risks were not included in the model.
Pre-Existing Health Conditions	As stated in the assumptions, the previous year's health care costs are used to project next year's health care costs. Therefore, any costs from pre-existing health conditions will be projected into the expected health care costs over the next 12 months.
Access (proximity) to an MTF	Over 95% of available appointments at an MTF will go to Prime enrollees (they have priority over all non-enrollees). Currently, Prime networks are only available in the vicinity of an MTF. Because of this, in order to receive free health care at an MTF, proximity to an MTF is not a factor (unless you have already decided to enroll in Prime).
Attitude Towards Choice	The model accounts for attitude towards choice by charging a cost to all alternatives that do not provide unlimited choice (i.e. Standard allows unlimited choice, Prime allow no choice without PCM approval). The beneficiary determines this cost through answering the questions: "How much are you willing to pay each year for choice of providers?"
Other Health Care Options	The model allows a civilian alternative, if available, to be compared to the Tricare plans.
Multiple Domiciles	The model accounts for multiple domiciles with the "snowbird" node (see Appendix A, node 7).

Appendix C: Results and Sensitivity Analysis for an Active-Duty E-4

The Beneficiary. An active-duty E-4, married with two children. His wife (her husband) works outside the home, but does not have available health care insurance through her (his) employer.

Inputs. To compute a baseline cost figure and an initial determination of which Tricare option this beneficiary should select, the inputs from Table C.1 were applied to the model. The precision of these inputs figures, supplied by the beneficiary, are not critical to the results because sensitivity analysis will cover, to a large degree, the range of the possible input values.

Table C.1: Active-Duty E-4's Model Inputs

Number of outpatient office visits/services over the next 12 months.*	10
Cost of outpatient medical services over the next 12 months.*	$800
Number of days a dependent will stay in a hospital over the next 12 months.*	0
Inpatient physician costs over the next 12 months.*	$0
Value of maintaining choice of provider.	$0
Cost of enrollment, co-payments, and deductibles.	see Table 2.3 for active-duty E-4
Cost of civilian options (enrollment fee, co-payments, and deductibles) for the next 12 months.	no civilian option available

*Projected from figures over the last 12 months (supplied by the beneficiary).

Results. Figure C.1 contains the decision analysis software results of the model, based on the inputs from Table C.1. The E-4 should select Tricare Prime to minimize his or her out-of-pocket health care costs (projected to be $60 over the next 12 months).

Sensitivity Analysis. A *tornado diagram*, shown in Figure C.2 (produced using decision analysis software), allows for simultaneous, one-way sensitivity analysis of each input

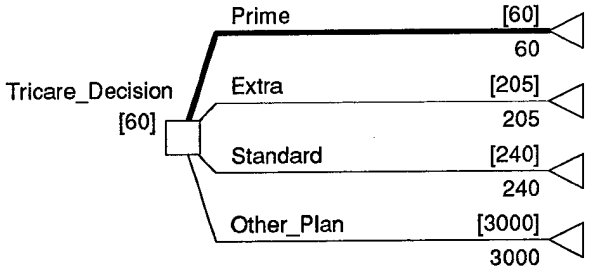


Figure C.1: Decision for an Active-Duty E-4

variable in order to observe which variables make a difference in the decision at hand. By inputting the extreme values of each input variable, the tornado diagram provides a

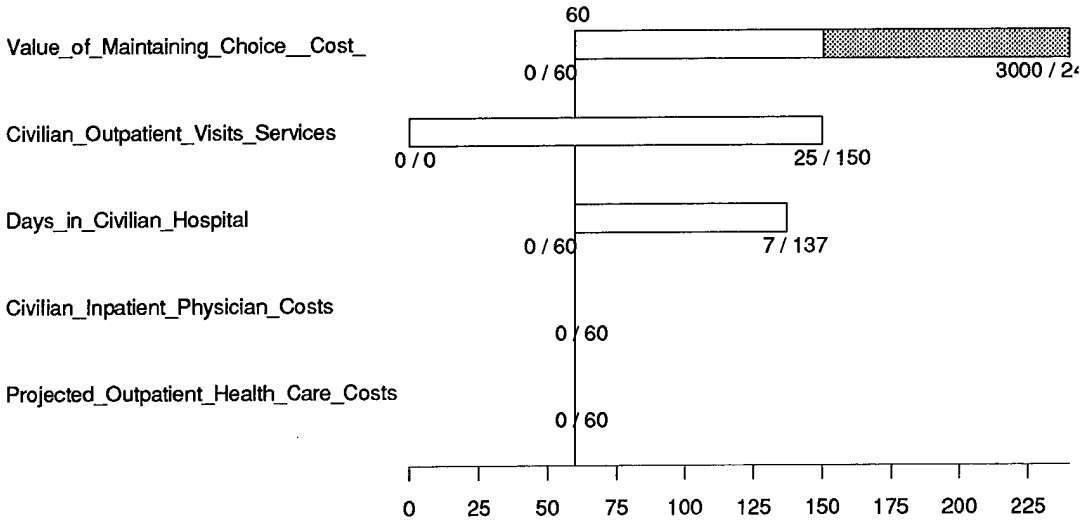


Figure C.2: Tornado Diagram of the E-4's Decision (Sensitivity Analysis)

corresponding value for cost (expected value), at the end of each bar, for each extreme value. A color change in the bar of a particular variable indicates a policy change (or different decision) occurs somewhere over the range of values for that variable, but does not indicate the precise point where the change occurs. Figure C.2 shows only the value of the variable *Value of Maintaining Choice of Provider* impacts the decision on which health care option to select (shown in the tornado diagram by a color change for that variable). A *rainbow diagram*, also produced using decision analysis software and shown in Figure C.3, is an in-depth look at the effects of changing a single input variable on the optimal decision (for this study, which health care option to select). A rainbow diagram indicates (approximately) where, along the range of values for a variable (horizontal axis), a change in policy, or decision, will occur. This is represented by a color change in the graph. The expected value (cost in this case) corresponding to the input variable appears

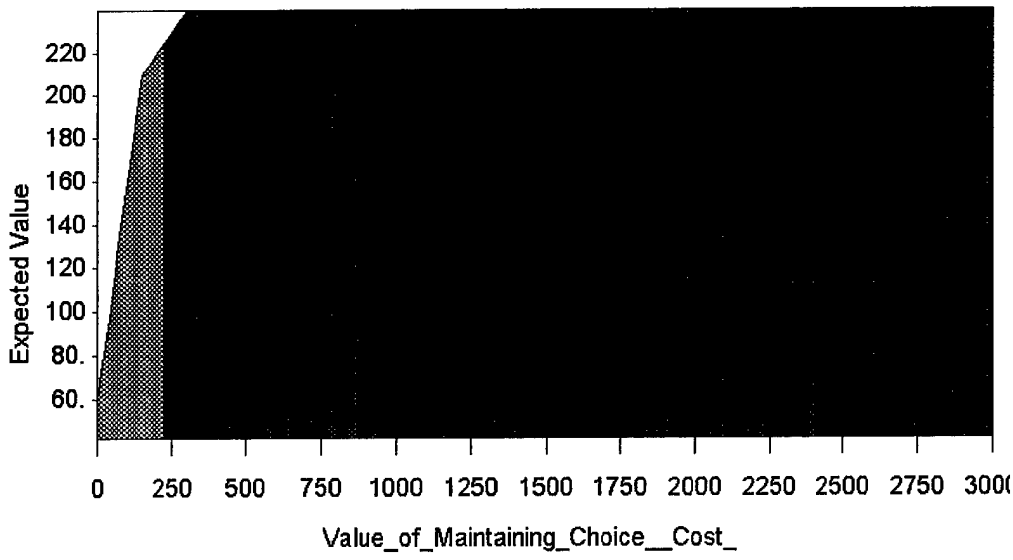


Figure C.3: Rainbow Diagram for the E-4's Value of Maintaining Choice of Provider (Sensitivity Analysis)

along the vertical axis. In this study, because the tornado diagram indicated the value of *Maintaining Provider Choice* might change the E-4's decision, the author produced a rainbow diagram for this variable, Figure C.3. Based on this rainbow diagram and through additional model runs, the author determined if the E-4 was willing to pay more than $180 to maintain provider choice, the model recommendation would change from Tricare Prime to Standard.

Conclusion. For most active-duty E-4s and below, Tricare Prime would be the least expensive option. However, if they are willing to pay more than $180 per year to maintain provider choice, Tricare Standard would minimize their annual out-of-pocket health care costs.

Appendix D: Results and Sensitivity Analysis for an Active-Duty O-3

The Beneficiary. An active-duty O-3, married with three children. His spouse is a homemaker.

Inputs. To compute a baseline cost figure and an initial determination of which Tricare option this beneficiary should select, the inputs from Table D.1 were applied to the model. The precision of these inputs figures, supplied by the beneficiary, are not critical to the results because sensitivity analysis will cover, to a large degree, the range of the possible input values.

Table D.1: Active-Duty O-3's Model Inputs

Number of outpatient office visits/services over the next 12 months.*.	15
Cost of outpatient medical services over the next 12 months.*	$1200
Number of days a dependent will stay in a hospital over the next 12 months.*	1
Inpatient physician costs over the next 12 months.*	$800
Value of maintaining choice of provider.	$500
Cost of enrollment, co-payments, and deductibles.	see Table 2.3 for active-duty O-3
Cost of civilian options (enrollment fee, co-payments, and deductibles) for the next 12 months.	no civilian option available

*Projected from figures over the last 12 months (supplied by the beneficiary).

Results. Figure D.1 contains the decision analysis software results of the model, based on the inputs from Table D.1. The O-3 should select Tricare Standard to minimize his out-of-pocket health care costs (projected to be $489.5 over the next 12 months).

Sensitivity Analysis. A Tornado Diagram, Figure D.2, produced using decision analysis software, shows only the values of the variables *Value of Maintaining Choice of Provider*

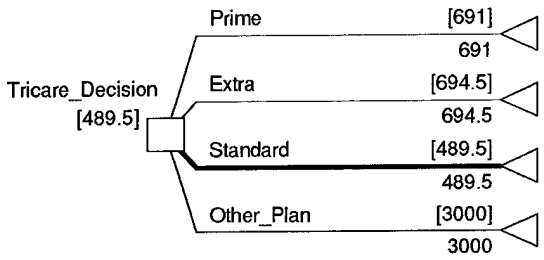


Figure D.1: Decision for an Active-Duty O-3

and *Projected Outpatient Health Care Costs* impact the decision on which health care option to select (shown in the Tornado Diagram by a color change for those variables). Rainbow Diagrams, also produced using decision analysis software and shown in

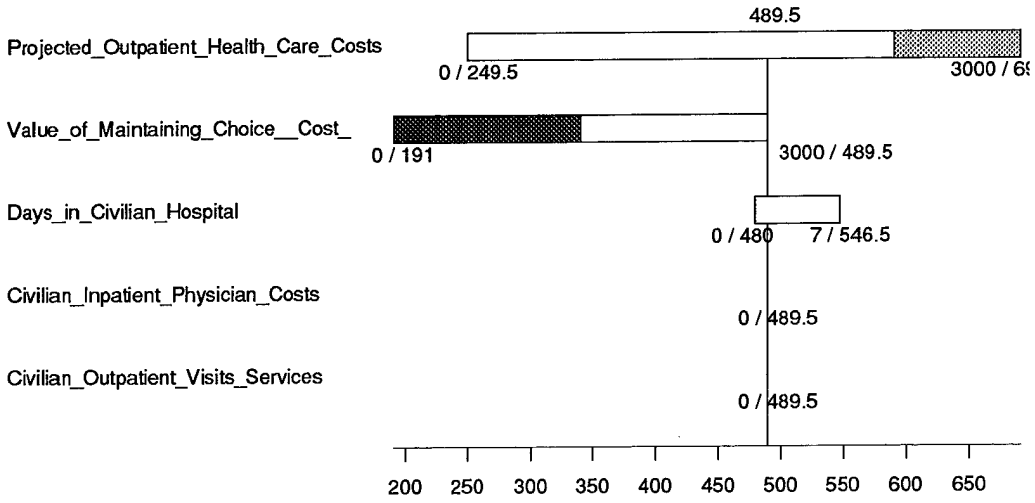


Figure D.2: Tornado Diagram of the O-3's Decision (Sensitivity Analysis)

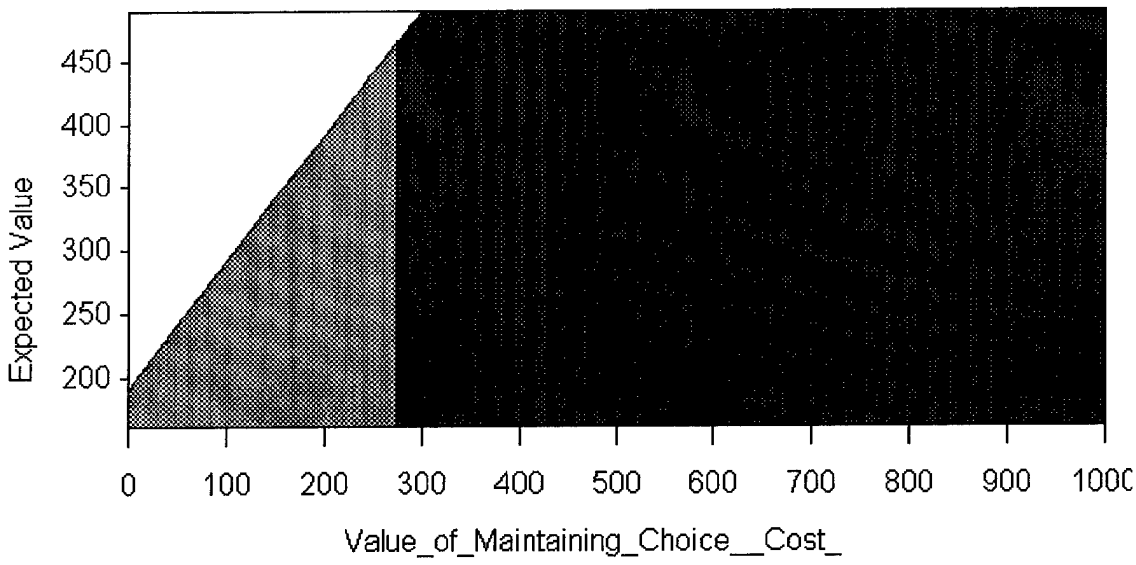


Figure D.3: Rainbow Diagram for the O-3's Value of Maintaining Choice of Provider (Sensitivity Analysis)

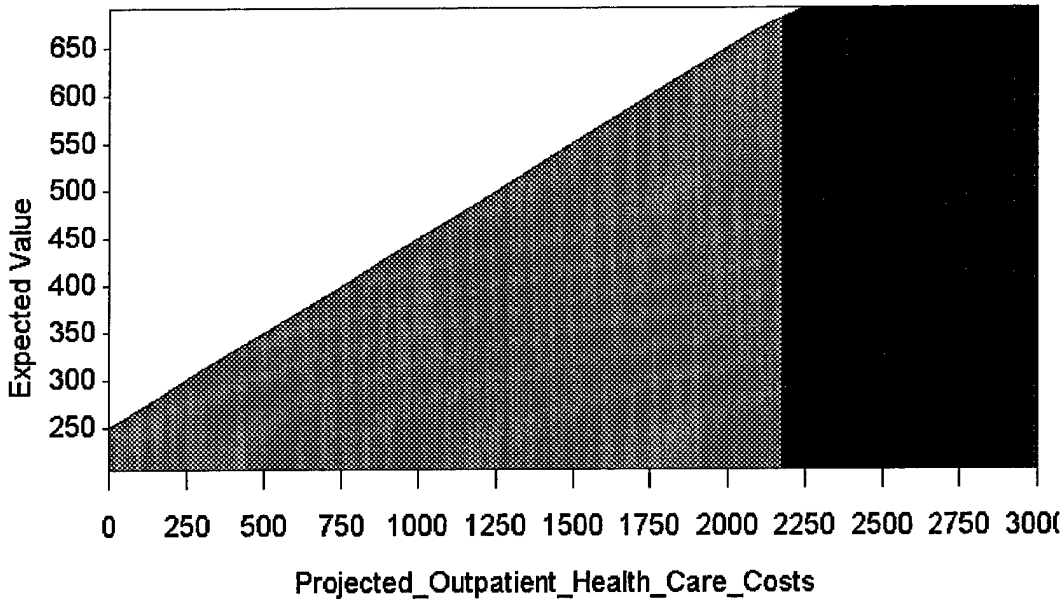


Figure D.4: Rainbow Diagram for the O-3's Projected Outpatient Health Care Costs (Sensitivity Analysis)

Figure D.3 and Figure D.4 , show (approximately) the respective values of *Maintaining Provider Choice* and *Projected Outpatient Health Care Costs* that change the decision.

Based on the Rainbow Diagrams and through additional model runs, the author determined:

1) If the O-3 was willing to pay no more than $298 to maintain provider choice, the model's recommendation would change from Tricare Standard to Prime.

2) If the O-3's projected the outpatient health care costs for his dependents to be greater than $2,207, the model's recommendation would change from Tricare Standard to Prime.

The tornado diagram and rainbow diagrams provide significant insight into the O-3's decision on health care, but these insights are limited to what happens when only one variable changes at a time. To discover the impact of changing two variables simultaneously, a *two-way sensitivity* graph can be used. In the case of the O-3, setting the cost equations for Standard and Prime equal to each other, inserting the input values from Table D.1 for all but the two variables that impact the decision (value of maintaining provider choice and outpatient health care costs), and then solving for one variable as the function of the other yields:

Value of Maintaining Provider Choice = 58.5 + 0.2(Outpatient Health Care Costs)

The graph of this line, shown in Figure D.5, displays to the beneficiary which option to select based on his inputs for the two variables of interest. If his or her inputs intersect above the line, Tricare Standard should be selected to minimize costs. Below the line, he or she should select Tricare Prime.

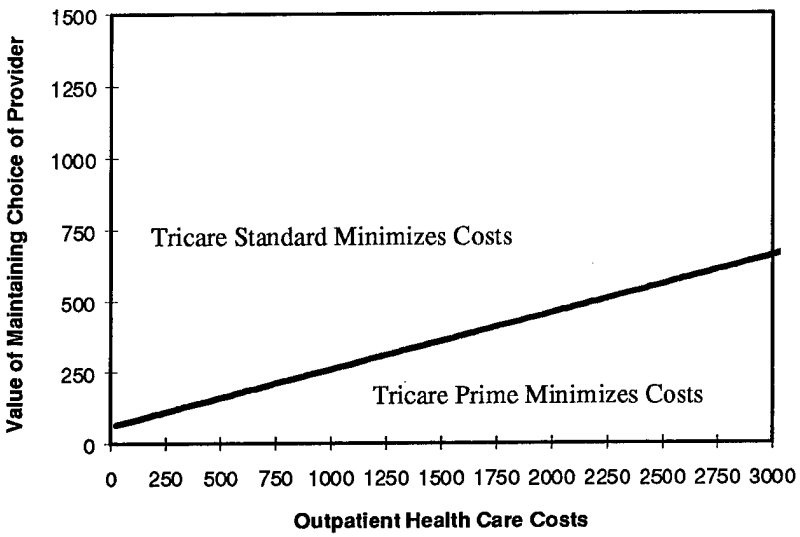


Figure D.5: Two-Way Sensitivity Analysis for O-3's Decision

Conclusion. For most active-duty E-5s and above, the Tricare option that minimizes out-of-pocket health care costs while maintaining personal desire for provider choice is dependent on two variables. The value an individual is willing to pay to maintain provider choice and his or her projected outpatient health care costs.

Appendix E: Results and Sensitivity Analysis for a Retired O-5

The Beneficiary. A retired 0-5, currently employed by a business that offers health care plans. He is married, with two dependent children, and his wife is a homemaker.

Inputs. To compute a baseline cost figure and an initial determination of which Tricare option this beneficiary should select, the inputs from Table E.1 were applied to the model. The precision of these inputs figures, supplied by the beneficiary, are not critical to the results because sensitivity analysis will cover, to a large degree, the range of the possible input values.

Table 4.5: Retired O-5's Model Inputs

Number of outpatient office visits/services over the next 12 months.*	12
Cost of outpatient medical services over the next 12 months.*	$1000
Number of days a dependent will stay in a hospital over the next 12 months.*	0
Inpatient physician costs over the next 12 months.*	$0
Value of maintaining choice of provider.	$0
Cost of enrollment, co-payments, and deductibles.	see Table 2.3 for retired O-5
Cost of civilian options (enrollment fee, co-payments, and deductibles) for the next 12 months.	$804.72

*Projected from figures over the last 12 months (supplied by the beneficiary).

Results. Figure E.1 contains the decision analysis software results of the model, based on the inputs from Table E.1. The retired O-5 should select Tricare Extra to minimize his out-of-pocket health care costs (projected to be $440 over the next 12 months).

Sensitivity Analysis. A Tornado Diagram, Figure E.2, produced using decision analysis software, shows the values of the variables *Value of Maintaining Choice of Provider*, *Projected Outpatient Health Care Costs*, *Number of Days in a Hospital*, and *Civilian*

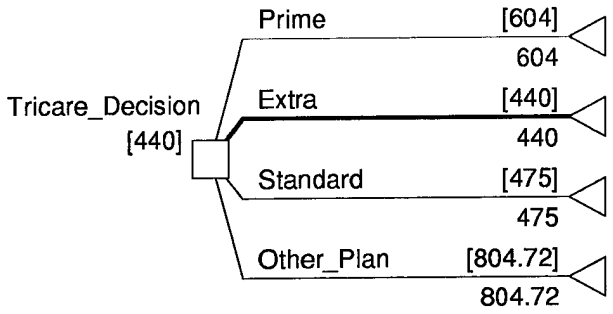


Figure E.1: Decision for a Retired O-5

Inpatient Physician Costs impact the decision on which health care option to select (based on the color change for that variable). Rainbow Diagrams, also produced using decision

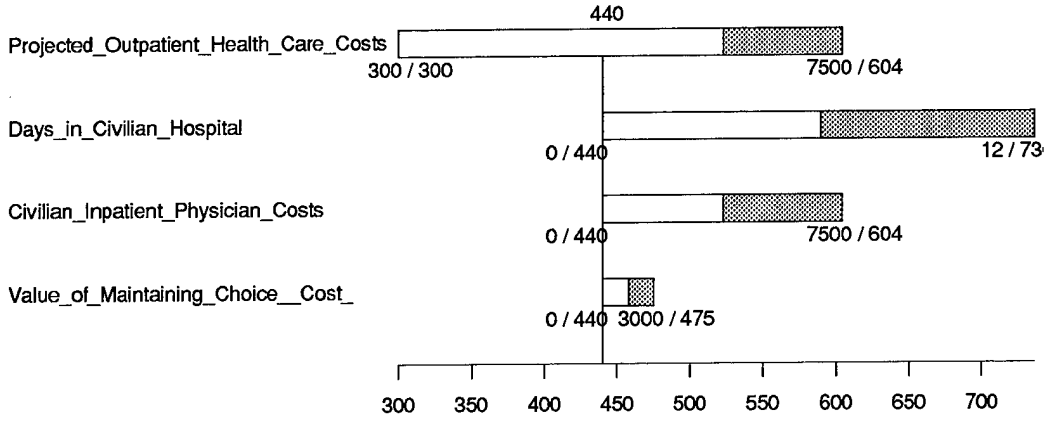


Figure E.2: Tornado Diagram of the Retired O-5's Decision (Sensitivity Analysis)

analysis software and shown in Figures E.3 through E.6, show (approximately) the respective values of *Value of Maintaining Choice of Provider*, *Projected Outpatient Health Care Costs*, *Number of Days in a Hospital*, and *Civilian Inpatient Physician Costs* that change the decision. Based on the Rainbow Diagrams and through additional model runs, the author determined:

1) If the retired O-5 was willing to pay $70 or more to maintain provider choice, the model's recommendation would change from Tricare Extra to Standard.

2) If the retired O-5 projects his dependents will use more than $1,800 in outpatient health care, the model's recommendation would change from Tricare Extra to Prime.

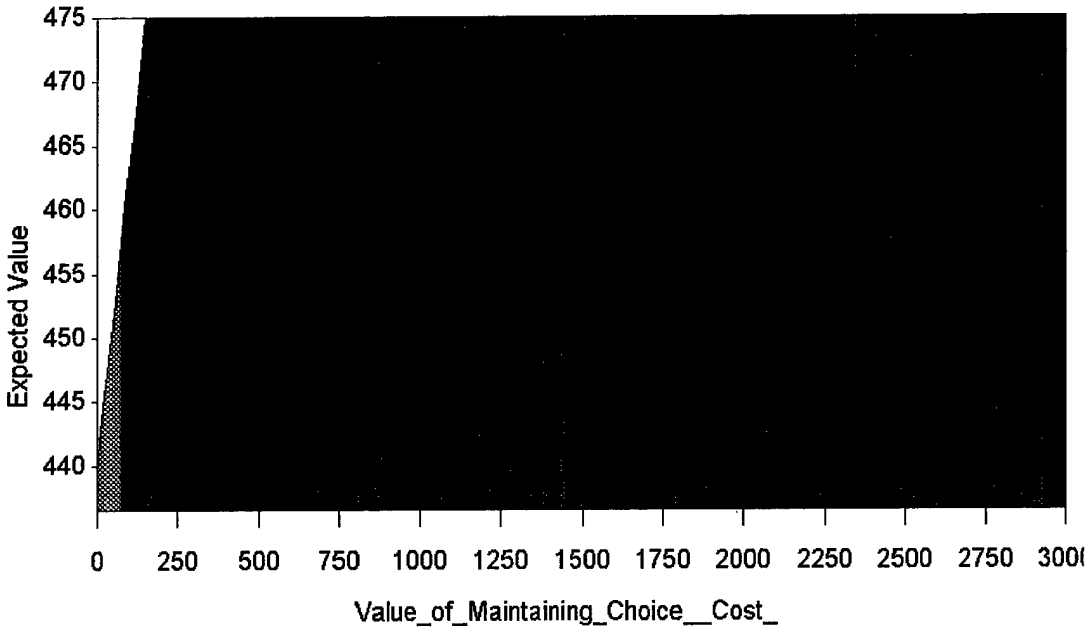


Figure E.3: Rainbow Diagram for the Retired O-5's Value of Maintaining Choice of Provider (Sensitivity Analysis)

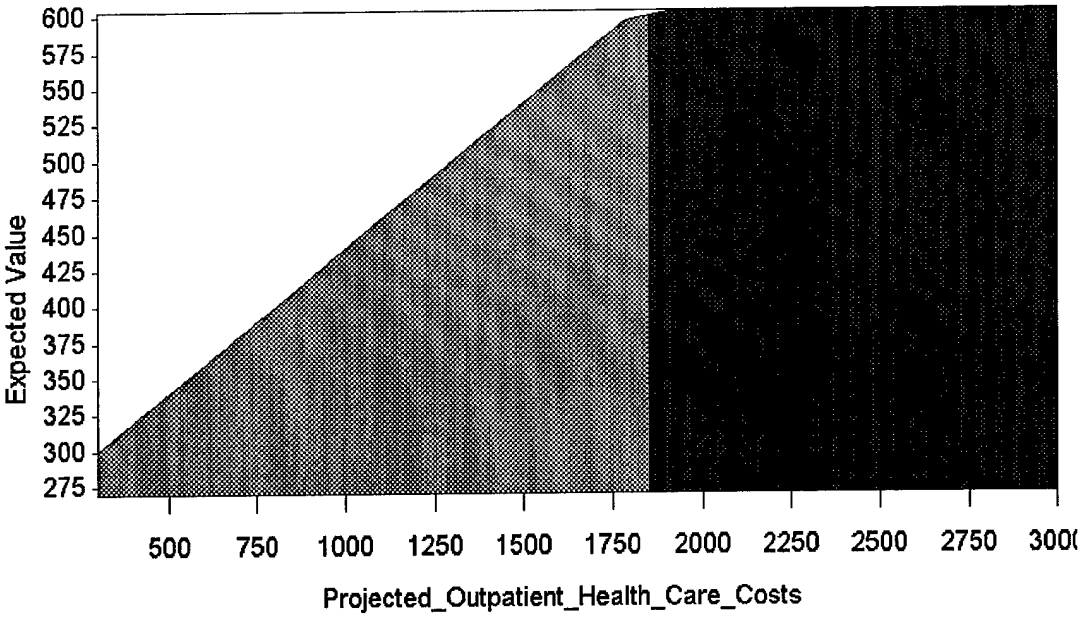


Figure E.4: Rainbow Diagram for the Retired O-5's Projected Outpatient Health Care Costs (Sensitivity Analysis)

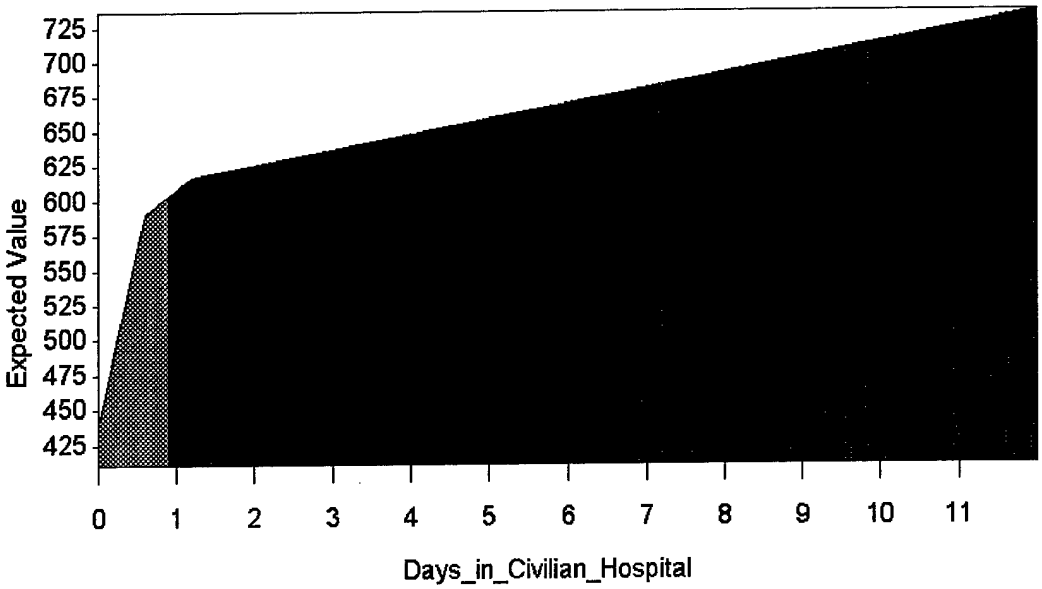


Figure E.5: Rainbow Diagram for the Retired O-5's Projected Number of Days in the Hospital (Sensitivity Analysis)

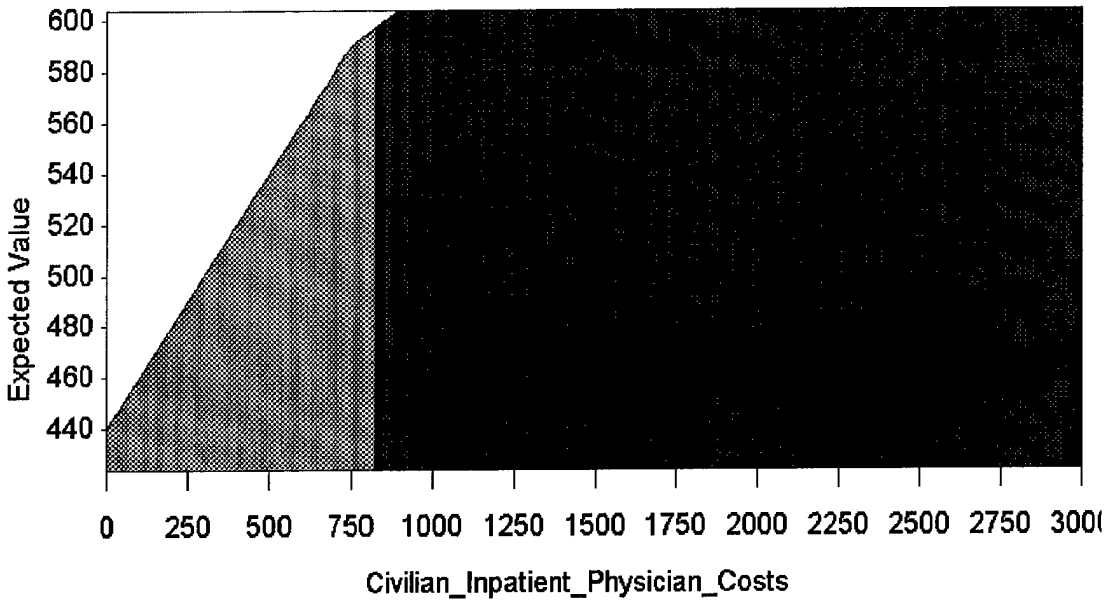


Figure E.6: Rainbow Diagram for the Retired O-5's Projected Inpatient Physician Costs (Sensitivity Analysis)

3) If the retired O-5 projects his dependents will require 1 or more days in a hospital, the model's recommendation would change from Tricare Extra to Prime.

4) If the retired O-5 projects his dependents will require more than $820 of inpatient physician costs, the model's recommendation would change from Tricare Extra to Prime (obviously, inpatient physician costs are only charged during a hospital stay).

Table E.2 lists the value at which each of these variables change the decision.

The tornado diagram and rainbow diagrams provide significant insight into the retired O-5's decision on health care, but these insights are limited to what happens when only one variable changes at a time. To discover the impact of changing two variables simultaneously, a *two-way sensitivity* graph can be used. However, for this retired O-5, there are four variables that impact his or her decision. To understand the relationship between changes in *Value of Maintaining Choice of Provider*, *Projected Outpatient*

Table E.2: Sensitivity Analysis for a Retired O-5

Variable	Value (above which) Decision Changes from Tricare Extra	Model's Recommended Option
Value of maintaining choice of provider.	$70	Tricare Standard
Number of days spent in a hospital.	0 days (one day or more)	Tricare Prime
Inpatient physician costs.*	$820	Tricare Prime
Projected outpatient health care costs.	$1800	Tricare Prime

Health Care Costs, *Number of Days in a Hospital*, and *Civilian Inpatient Physician Costs*, the author completed numerous runs of the decision model. Table E.3 lists the results, along with the variable inputs. Based on these results, that span a large percentage of the possible input ranges for the variables in question, the author concluded:

1) If a retired beneficiary is not concerned with the *Value of Maintaining Choice of Provider*, Tricare Prime will be his or her best choice to minimize costs.

2) Once the beneficiary becomes concerned with the *Value of Maintaining Choice of* Provider, Tricare Standard will be his or her best choice until overall health care costs reach the level of purchasing the civilian option. At this point, the civilian option becomes the best choice to minimize out-of-pocket health care costs. If no civilian option is available to the retiree, he or she should stay with Tricare Standard.

The decision for a retired individual becomes more complex because, unlike active-duty personnel, he or she has to pay an enrollment fee and the cost of a hospital stay, when using Extra or Standard, goes up dramatically (Table 2.3).

Conclusion. If a retired person projects low outpatient health care costs (less than $1800), does not anticipate any hospital stays, and does not place great value in maintaining choice of provider, Tricare Extra will minimize his or her health care costs. If a retiree projects outpatient health care costs greater than $1,800 or anticipates hospital stays, but still does not place great value in maintaining choice of provider, Tricare Prime should minimize his or her health care costs. However, once a retiree's value of maintaining provider choice exceeds approximately $200, Tricare Standard or in the case of this retired O-5 his civilian option, should minimize his or her health care costs while maintaining personal desire for choice of provider.

Table E.3: Results of Multiple Model Runs on Impact Variables for Retired O-5

Value of Maintaining Provider Choice	Outpatient Health Care Costs	Days in a Hospital	Inpatient Physician Costs*	Plan that Minimizes Costs	Out-of-Pocket Costs with that Plan ($)
0	500	0	0	Extra	340
0	1000	0	0	Extra	440
0	1500	0	0	Extra	540
0	2000	0	0	Prime	604
0	2500	0	0	Prime	604
0	3000	0	0	Prime	604
250	500	0	0	Standard	350
250	1000	0	0	Standard	475
250	1500	0	0	Standard	600
250	2000	0	0	Standard	725
250	2500	0	0	Civilian	804.72
250	3000	0	0	Civilian	804.72
500	500	0	0	Standard	350
500	1000	0	0	Standard	475
500	1500	0	0	Standard	600
500	2000	0	0	Standard	725
500	2500	0	0	Civilian	804.72
500	3000	0	0	Civilian	804.72
750	500	0	0	Standard	350
750	1000	0	0	Standard	475
750	1500	0	0	Standard	600
750	2000	0	0	Standard	725
750	2500	0	0	Civilian	804.72
750	3000	0	0	Civilian	804.72
1000	500	0	0	Standard	350
1000	1000	0	0	Standard	475
1000	1500	0	0	Standard	600
1000	2000	0	0	Standard	725
1000	2500	0	0	Civilian	804.72
1000	3000	0	0	Civilian	804.72
0	500	1	500	Prime	615
0	1000	1	500	Prime	615
0	1500	1	500	Prime	615
0	2000	1	500	Prime	615
0	2500	1	500	Prime	615
0	3000	1	500	Prime	615
250	500	1	500	Standard	798
250	1000	1	500	Civilian	804.72
250	1500	1	500	Civilian	805.72
250	2000	1	500	Civilian	806.72
250	2500	1	500	Civilian	807.72
250	3000	1	500	Civilian	808.72
500	500	1	500	Standard	798
500	1000	1	500	Civilian	804.72
500	1500	1	500	Civilian	805.72
500	2000	1	500	Civilian	806.72
500	2500	1	500	Civilian	807.72
500	3000	1	500	Civilian	808.72
750	500	1	500	Standard	798
750	1000	1	500	Civilian	804.72
750	1500	1	500	Civilian	805.72
750	2000	1	500	Civilian	806.72
750	2500	1	500	Civilian	807.72
750	3000	1	500	Civilian	808.72
1000	500	1	500	Standard	798

Value of Maintaining Provider Choice	Outpatient Health Care Costs	Days in a Hospital	Inpatient Physician Costs*	Plan that Minimizes Costs	Out-of-Pocket Costs with that Plan ($)
1000	1000	1	500	Civilian	804.72
1000	1500	1	500	Civilian	805.72
1000	2000	1	500	Civilian	806.72
1000	2500	1	500	Civilian	807.72
1000	3000	1	500	Civilian	808.72
0	500	2	1000	Prime	626
0	1000	2	1000	Prime	626
0	1500	2	1000	Prime	626
0	2000	2	1000	Prime	626
0	2500	2	1000	Prime	626
0	3000	2	1000	Prime	626
250	500	2	1000	Civilian	804.72
250	1000	2	1000	Civilian	805.72
250	1500	2	1000	Civilian	806.72
250	2000	2	1000	Civilian	807.72
250	2500	2	1000	Civilian	808.72
250	3000	2	1000	Civilian	809.72
500	500	2	1000	Civilian	810.72
500	1000	2	1000	Civilian	811.72
500	1500	2	1000	Civilian	812.72
500	2000	2	1000	Civilian	813.72
500	2500	2	1000	Civilian	814.72
500	3000	2	1000	Civilian	815.72
750	500	2	1000	Civilian	816.72
750	1000	2	1000	Civilian	817.72
750	1500	2	1000	Civilian	818.72
750	2000	2	1000	Civilian	819.72
750	2500	2	1000	Civilian	820.72
750	3000	2	1000	Civilian	821.72
1000	500	2	1000	Civilian	822.72
1000	1000	2	1000	Civilian	823.72
1000	1500	2	1000	Civilian	824.72
1000	2000	2	1000	Civilian	825.72
1000	2500	2	1000	Civilian	826.72
1000	3000	2	1000	Civilian	827.72
0	500	3	1500	Prime	637
0	1000	3	1500	Prime	638
0	1500	3	1500	Prime	639
0	2000	3	1500	Prime	640
0	2500	3	1500	Prime	641
0	3000	3	1500	Prime	642
250	500	3	1500	Civilian	804.72
250	1000	3	1500	Civilian	805.72
250	1500	3	1500	Civilian	806.72
250	2000	3	1500	Civilian	807.72
250	2500	3	1500	Civilian	808.72
250	3000	3	1500	Civilian	809.72
500	500	3	1500	Civilian	810.72
500	1000	3	1500	Civilian	811.72
500	1500	3	1500	Civilian	812.72
500	2000	3	1500	Civilian	813.72
500	2500	3	1500	Civilian	814.72
500	3000	3	1500	Civilian	815.72
750	500	3	1500	Civilian	816.72
750	1000	3	1500	Civilian	817.72
750	1500	3	1500	Civilian	818.72
750	2000	3	1500	Civilian	819.72

Value of Maintaining Provider Choice	Outpatient Health Care Costs	Days in a Hospital	Inpatient Physician Costs*	Plan that Minimizes Costs	Out-of-Pocket Costs with that Plan ($)
750	2500	3	1500	Civilian	820.72
750	3000	3	1500	Civilian	821.72
1000	500	3	1500	Civilian	822.72
1000	1000	3	1500	Civilian	823.72
1000	1500	3	1500	Civilian	824.72
1000	2000	3	1500	Civilian	825.72
1000	2500	3	1500	Civilian	826.72
1000	3000	3	1500	Civilian	827.72
0	500	4	2000	Prime	648
0	1000	4	2000	Prime	648
0	1500	4	2000	Prime	648
0	2000	4	2000	Prime	648
0	2500	4	2000	Prime	648
0	3000	4	2000	Prime	648
250	500	4	2000	Civilian	804.72
250	1000	4	2000	Civilian	805.72
250	1500	4	2000	Civilian	806.72
250	2000	4	2000	Civilian	807.72
250	2500	4	2000	Civilian	808.72
250	3000	4	2000	Civilian	809.72
500	500	4	2000	Civilian	810.72
500	1000	4	2000	Civilian	811.72
500	1500	4	2000	Civilian	812.72
500	2000	4	2000	Civilian	813.72
500	2500	4	2000	Civilian	814.72
500	3000	4	2000	Civilian	815.72
750	500	4	2000	Civilian	816.72
750	1000	4	2000	Civilian	817.72
750	1500	4	2000	Civilian	818.72
750	2000	4	2000	Civilian	819.72
750	2500	4	2000	Civilian	820.72
750	3000	4	2000	Civilian	821.72
1000	500	4	2000	Civilian	822.72
1000	1000	4	2000	Civilian	823.72
1000	1500	4	2000	Civilian	824.72
1000	2000	4	2000	Civilian	825.72
1000	2500	4	2000	Civilian	826.72
1000	3000	4	2000	Civilian	827.72
0	500	5	2500	Prime	659
0	1000	5	2500	Prime	659
0	1500	5	2500	Prime	659
0	2000	5	2500	Prime	659
0	2500	5	2500	Prime	659
0	3000	5	2500	Prime	659
250	500	5	2500	Civilian	804.72
250	1000	5	2500	Civilian	805.72
250	1500	5	2500	Civilian	806.72
250	2000	5	2500	Civilian	807.72
250	2500	5	2500	Civilian	808.72
250	3000	5	2500	Civilian	809.72
500	500	5	2500	Civilian	810.72
500	1000	5	2500	Civilian	811.72
500	1500	5	2500	Civilian	812.72
500	2000	5	2500	Civilian	813.72
500	2500	5	2500	Civilian	814.72
500	3000	5	2500	Civilian	815.72
750	500	5	2500	Civilian	816.72

Value of Maintaining Provider Choice	Outpatient Health Care Costs	Days in a Hospital	Inpatient Physician Costs*	Plan that Minimizes Costs	Out-of-Pocket Costs with that Plan ($)
750	1000	5	2500	Civilian	817.72
750	1500	5	2500	Civilian	818.72
750	2000	5	2500	Civilian	819.72
750	2500	5	2500	Civilian	820.72
750	3000	5	2500	Civilian	821.72
1000	500	5	2500	Civilian	822.72
1000	1000	5	2500	Civilian	823.72
1000	1500	5	2500	Civilian	824.72
1000	2000	5	2500	Civilian	825.72
1000	2500	5	2500	Civilian	826.72
1000	3000	5	2500	Civilian	827.72
0	500	6	3000	Prime	670
0	1000	6	3000	Prime	670
0	1500	6	3000	Prime	670
0	2000	6	3000	Prime	670
0	2500	6	3000	Prime	670
0	3000	6	3000	Prime	670
250	500	6	3000	Civilian	804.72
250	1000	6	3000	Civilian	805.72
250	1500	6	3000	Civilian	806.72
250	2000	6	3000	Civilian	807.72
250	2500	6	3000	Civilian	808.72
250	3000	6	3000	Civilian	809.72
500	500	6	3000	Civilian	810.72
500	1000	6	3000	Civilian	811.72
500	1500	6	3000	Civilian	812.72
500	2000	6	3000	Civilian	813.72
500	2500	6	3000	Civilian	814.72
500	3000	6	3000	Civilian	815.72
750	500	6	3000	Civilian	816.72
750	1000	6	3000	Civilian	817.72
750	1500	6	3000	Civilian	818.72
750	2000	6	3000	Civilian	819.72
750	2500	6	3000	Civilian	820.72
750	3000	6	3000	Civilian	821.72
1000	500	6	3000	Civilian	822.72
1000	1000	6	3000	Civilian	823.72
1000	1500	6	3000	Civilian	824.72
1000	2000	6	3000	Civilian	825.72
1000	2500	6	3000	Civilian	826.72
1000	3000	6	3000	Civilian	827.72

*Assumes $500 dollars per day for each day in the hospital

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13. ABSTRACT *(Maximum 200 words)*
Tricare, the triservice, triple-option, managed care plan for the uniformed services, incorporates a managed care support contract to complement Military Treatment Facilities. Currently being implemented throughout the CONUS, Tricare provides more equitable health care service to all military beneficiaries, improved access to care, a reduction in health care costs, and provides beneficiaries with an expanded choice of medical-care providers. This thesis examines the Tricare program and reviews relevant health care literature, both military and civilian. Using these inputs, the author presents a deterministic decision analysis model that allows a military beneficiary to select a health care option that minimizes his or her annual out-of-pocket costs while maintaining personal desires for choice among health care providers. Using several carefully selected examples that span the pool of military beneficiaries, the results of this study are presented. Every individual faced with the Tricare decision, approximately six million people, will gain insight from this thesis. While individual impact may only be on a scale of thousands of dollars, the impact for the entire pool of beneficiaries ranges well into the millions.

14. SUBJECT TERMS	15. NUMBER OF PAGES
TRICARE, Decision Analysis, Military Health Care Selection Model, HMO, MHSS, CHAMPUS	80
	16. PRICE CODE

17. SECURITY CLASSIFICATION OF REPORT	18. SECURITY CLASSIFICATION OF THIS PAGE	19. SECURITY CLASSIFICATION OF ABSTRACT	20. LIMITATION OF ABSTRACT
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