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Impact of Increasing Obligated Service for Physician Scholarships

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Contents

Executive summary

Previous Center for Naval Analyses (CNA) studies, The Health Professions' Retention-Accession Incentive Study (HPRAIS) [1-2] and the Life-Cycle-Cost (LCC) study [3-4], showed that:

1. Growing fully trained military physician specialists is very expensive, and the Services need to increase their return on these investments (increase physician retention) [3-4].
2. Most uniformed physician specialties are not very responsive to increases in special pays; it takes large increases in pay to modestly increase retention [1-2].

As a result, the Office of the Under Secretary of Defense for Personnel and Readiness (P&R) is evaluating the feasibility of increasing the active duty obligation (ADO) for the physician Armed Forces Health Professions Scholarship Program (AFHPSP) accessions to lower costs and improve their return on investment. P&R has asked CNA to evaluate the impact of extending the AFHPSP ADO. The principal tasking of this study was to evaluate the impact of increasing the AFHPSP ADO for a 4-year subsidization from 4 to 7 years. Because this is a large percentage increase, we have also evaluated the impact of more marginal increases (5- or 6-year obligation for 4 years of subsidization).

Major findings

Simply put, this study answers the following two questions. If DoD increases the physician ADO, (1) how will AFHPSP accession requirements and costs change, and (2) what will happen to the scholarship applicant pool in terms of both quantity and quality?

Changes in requirements and costs

A major determinant of the degree to which AFHPSP accession requirements (and, ultimately, costs to DoD) fall is the way that the

Services currently size and are willing to alter their in-house graduate medical education (GME) program.

Our analysis shows that DoD can decrease its annual medical student AFHPSP accessions by 13 percent by altering in-house GME to only access those students needed to ultimately fill specialty requirements versus those simply needed to fill *current* in-house GME startups. We estimate that DoD could save $61 million in the steady state through this better business practice alone.

If we assume that the current in-house GME startups are fixed, this severely limits the Services' ability to reap the maximum potential benefit from increasing the AFHPSP ADO. We find that by increasing the AFHPSP ADO to 5 years, holding GME startups constant, DoD could save $68 million by increasing the AFHPSP ADO to 5 years, but increasing the AFHPSP ADO beyond 5 years actually *increases* costs. This occurs because the Services are constrained to access enough people to meet their fixed GME requirements—people who may not be needed to meet billet requirements. The result is a substantial excess of physicians relative to billet requirements.

Finally, when we increase the AFHPSP ADO from 4 to 5 years *and let the model choose the economic-optimal number of GME startups*, we estimate that AFHPSP annual accession requirements will fall by 24 percent, resulting in DoD savings of $113 million annually. Increasing the ADO to 6 or 7 years reduces requirements by an estimated 36 and 44 percent and saves $165 and $201 million, respectively.

Changes in the applicant pool

Our analysis of the Services' ability to attract and access both the quantity and quality of candidates required for the AFHPSP program supports increasing the ADO from 4 to 5 years for 4 years of subsidization. We based this finding on several factors.

First, the recruiters we interviewed generally felt that they could still meet the AFHPSP recruiting mission if the ADO were increased from 4 to 5 years, but not if the ADO were more than 5 years. Second, recruiters' historical ability to meet fluctuating recruiting targets suggests that the Services have not exhausted the AFHPSP market.

Third, recruiting incentives could easily be altered to put more emphasis on both the quality and quantity of AFHPSP accessions. Fourth, there is downward pressure on the medical billet file. Fifth, the recent downward trend in the national applicant pool is projected to change, which should increase AFHPSP applicants to the degree that the number of AFHPSP applicants follows national trends.

Although most critical indicators support increasing the AFHPSP ADO, there are a few notes of caution. First, the average MCAT scores of AFHPSP matriculants have fallen by 1 point since FY 1998 and are currently about 1 point below the national average. Second, DoD is accessing a large share of osteopathic medical students compared to the national average. This may ultimately affect the Services' ability to train the required number of procedure-based specialists it requires. Third, 51 percent of current AFHPSP medical students who were asked about their willingness to consider AFHPSP indicated that they would accept the scholarship again if the obligation were 5 years rather than 4. Although we believe that this is an underestimate given the respondents' incentives, this response rate should be seriously considered before increasing the AFHPSP ADO.

Major recommendations

Based on our analysis and findings, we do not recommend increasing the physician AFHPSP ADO to 6 or 7 years for 4 years of subsidization because it is not supportable from a recruiting standpoint or based on the willingness of current AFHPSP students to incur obligations of these lengths. However, we recommend that DoD consider increasing the physician AFHPSP ADO from 4 to 5 years for 4 years of subsidization because the applicant pool would support it and it would result in cost savings, particularly if DoD is willing to alter the size of in-house GME programs. Because not all AFHPSP accessions are subsidized for 4 years, we recommend structuring the obligation as follows:

- 4-year scholarship—5-year obligation
- 3-year scholarship—4-year obligation
- 2-year scholarship—3-year obligation

- 1-year scholarship—2-year obligation.

Before implementing this AFHPSP obligation, we strongly recommend that DoD consider its other principal alternative for increasing obligated service—altering the GME obligation. We believe that the data support the 5-year AFHPSP obligation, but it is not DoD's only alternative; therefore, it may not be DoD's best option. In a parallel study for TRICARE Management Activity/Health Affairs (TMA/HA), we are looking at the viability and consequences of increasing the GME obligation. The final results of this study will be published in December 2003.

We strongly recommend that the Services clearly define and closely track the desired retention rate goals for their major physician specialties. The Services currently report "overages" for some physician specialties. If force management tools are not developed and monitored—in concert with an increased AFHPSP ADO—DoD may create further specialty surpluses. In terms of addressing shortages in some specialties in the short run, we recommend that the current accession bonus authority be further evaluated to help DoD more quickly increase required inventories.

This analysis focused exclusively on the AFHPSP ADO for physicians. Clearly, the physician AFHPSP ADO needs to be the same across the Services; however, it does not necessarily need to be the same for other communities (such as dentists, pharmacists, optometrists, clinical psychologists, or certified registered nurse anesthetists) as it is for physicians. Though we don't recommend increasing the AFHPSP ADO to 6 or 7 years for physicians, these may be viable options for other communities with substantially smaller civilian-military pay gaps. We recommend that these options be further explored in a separate study.

Introduction

The Department of Defense charges the Military Health System (MHS) with maintaining a healthy active duty force, attending to the sick and wounded in time of conflict, and successfully competing for and treating patients within the peacetime benefit mission. To effectively perform these sometimes disparate missions, the MHS and three Service medical departments must attract and access a sufficient number of high-quality active duty health care professionals, cultivate an environment that retains the required inventory of these highly skilled professionals, and ultimately ensure that these personnel are competent in both wartime and peacetime benefit settings.

With the end of the draft in 1972, DoD needed a reliable way to obtain and retain a sufficient number of qualified military physicians to meet the demands of the Armed Forces [5]. To address this need, Public Law 92-426 established two complementary physician accession sources—the Armed Forces Health Profession Scholarship Program (AFHPSP)[1] and the Uniformed Services University of the Health Sciences (USUHS)[2] [6]. A review of the legislative history of Public Law 92-426 indicates that the legislative goal was to ensure continuity and leadership for the MHS, to include medical readiness and preservation of lessons learned during combat and casualty care. To this end, AFHPSP was envisioned as a flexible and reliable accession source for the large quantity of physicians required by the Armed Forces, most of which were not expected to stay in the military for a significant period of time past their initial active obligation. USUHS

1. In general, AFHPSP accessions divide into two groups—direct and deferred accessions. We will discuss this in more detail later.

2. USUHS is the DoD-sponsored medical school in Bethesda, Maryland. Each Service receives graduates from USUHS annually. Currently, the Army expects 63 USUHS graduates annually; the Navy and Air Force each expect 51 USUHS graduates annually.

was established to provide a cadre of military officers to serve careers as active duty physicians and meet the organizational imperatives for clinical experience and military medicine leadership [7].

Tasking

Based on previous CNA research and findings, the Office of the Under Secretary of Defense for Personnel and Readiness (P&R) asked CNA to evaluate the impact of changing the active duty obligation (ADO) for physicians accessed through AFHPSP. The specific tasking CNA received was to study the feasibility of increasing the AFHPSP ADO from 4 to 7 years for 4 years of subsidization to reduce costs. Because this increase is relatively large in percentage terms, we also looked at the impact and feasibility of more marginal increases—specifically, increasing the ADO to either 5 or 6 years for 4 years of subsidization.

By extending the ADO, policy-makers are effectively lengthening the career path (years of practice) of the average AFHPSP physician in the medical corps. To evaluate the impact of an ADO increase, this study will help answer two major questions for policy-makers:

- What is the potential impact on AFHPSP continuation and retention of changing the ADO for AFHPSP accessions?
- What is the potential impact on the pool of AFHPSP applicants of changing the ADO for this accession source?

By increasing the AFHPSP ADO, we reduce the attrition from the medical corps, giving DoD more years of practice (or more return on its investment) on average from each accession. The catch is that increasing the ADO to improve continuation and retention may constrain how many AFHPSP accessions the Services can acquire. Hence, increasing the AFHPSP ADO is prudent only if the constrained number of accessions will provide at least the number and quality of accessions the Services require. Essentially it is a balancing act.

Although the tasking of this study focuses on increasing the AFHPSP ADO for physicians, the study's findings and recommendations have implications to other health care professions that use AFHPSP as one

of its accession sources. For example, dentists, optometrists, pharmacists, clinical psychologists, and certified registered nurse anesthetists receive AFHPSP scholarships.

AFHPSP accessions

Before we discuss our approach to estimating the impact of increasing the ADO for AFHPSP accessions, it is important to understand the various types of AFHPSP accessions, their typical career paths, and how they discharge their active duty obligation. AFHPSP is the largest accession source for military physicians.[3] As table 1 shows, AFHPSP accessions (direct and deferred) account for 70 percent of all accessions, with USUHS and financial assistance program (FAP)[4] accessions accounting for an additional 13 and 8 percent, respectively [3].[5]

Table 1. Percentage of physician accessions by Service and accession source (FY 1998–2001)

Source	Army	Navy	Air Force	Total
AFHPSP direct	60	52	45	52
AFHPSP deferred	12	20	21	18
USUHS	17	12	9	13
FAP	3	6	14	8
Other	8	10	10	9
Total[a]	100	100	100	100

a. Total may not equal 100 because of rounding.

3. Although AFHPSP also sponsors students of dentistry, optometry, pharmacy, and other uniformed health professions, it is beyond the scope of this study to evaluate these specialists.

4. In the 1990s, Congress authorized DoD a third subsidized accession program to obtain required physician specialists. Each Service receives a small inventory of specialists through the FAP. The FAP allows the Services to access physicians that are in a civilian residency program: They receive an annual grant for each year subsidized and the same monthly stipend as AFHPSP students in return for an ADO.

5. DoD Directive 6000.12 states that the total number of AFHPSP and FAP participants shall not exceed 5,000 at any given time. The Army, Navy, and Air Force are authorized a maximum of 1,666 participants in AFHPSP and FAP at any given time. Each Service must budget appropriately for its AFHPSP/FAP [8].

What is AFHPSP?

Under the AFHPSP, the Services pay medical school tuition and fees as well as stipends for civilian medical school students. In return, after graduation, program participants must serve 1 year of active duty military service for each year of their AFHPSP scholarship with a 2-year minimum obligation. Scholarship program participants also incur an obligation to serve in the reserves for a period of time that depends on the number of years of subsidization received.

Typical AFHPSP career path

Most physicians accessed into the military through AFHPSP have their medical school paid for in exchange for a 4-year active duty obligation.[6] In general, AFHPSP accessions are either direct or deferred. A few AFHPSP accessions (called 1-year delays) complete a civilian internship and then come on active duty and complete a military residency program. We don't consider these accessions in our analysis, however, because they are not a predominant accession source.

AFHPSP direct

On completing medical school, the Services access the majority of AFHPSP graduates into an active duty internship (PGY-1).[7] On completion of this internship, they enter an "in-house" residency program (PGY-2+) at a military medical center or family practice teaching facility. The intern year is obligation neutral, but there is a commensurate obligation for every year a physician is in a military residency program. This is the typical career path of Army and Air Force AFHPSP direct accessions. In the Navy, after the intern year but before commencing a residency, about 73 percent of its AFHPSP direct accessions serve as general medical officers (GMOs) [9]. The typical GMO

6. Based on input from Service representatives, we determined that the military predominantly subsidizes AFHPSP medical students for 4 years of medical school.

7. PGY-1 stands for the first postgraduate year, commonly referred to as an internship. PGY-2+ stands for the postgraduate years after the intern year, commonly referred to as a residency or fellowship.

tour is 2 years, and GMOs discharge a year of their initial ADO for every year they serve as a GMO.

AFHPSP deferred

The military in-house graduate medical education programs aren't large enough to handle all of the AFHPSP accessions, so the Services defer about 26 percent of AFHPSP accessions each year into civilian internships and residency programs.[8] On completion of their residency programs, these fully trained specialists go on active duty. Because they begin active duty as fully trained specialists, they don't serve a GMO tour but go directly into a specialty utilization tour.

Discharging the AFHPSP ADO

For convenience in this study, we will refer to the actual number of years physicians owe before they can make a stay-leave decision as the effective ADO. Note that the effective and AFHPSP ADOs are the same for AFHPSP deferred accessions because they don't incur any while in a civilian residency program. However, for AFHPSP direct accessions who complete an in-house residency, the actual number of years they owe before they can make a decision to leave the military depends on the obligation they incur for their in-house residency program. Consequently, before we can evaluate the prudence of changing the AFHPSP ADO policy, we must understand the historical and current policy for discharging the ADO for AFHPSP direct accessions and its interplay with the residency ADO.[9]

The active duty obligation for both AFHPSP and GME is 1 year of obligation for each year in the program with a 2-year minimum. Hence, a medical student in AFHPSP for 4 years has a 4-year AFHPSP ADO. Similarly, those who go through a 4-year residency program

8. The percentage of AFHPSP deferred differs by Service—Army, 17 percent; Navy, 29 percent; and Air Force, 32 percent. (Percentages are based on FY 1998-2001 accessions.)

9. The ADO for AFHPSP deferred accessions has not changed since the program's inception. Students receive a 1-year ADO for each year of participation (subsidization) or for 2 years, whichever is greater.

have a 4-year GME ADO. The effective ADO is the combination of the AFHPSP and GME ADOs.

For example, most AFHPSP direct accessions in the Navy serve a 2-year GMO tour after their internship but before commencing a residency program. This means that they discharge 2 years of their AFHPSP ADO before starting their residency program, as table 2 shows. If they complete a 3-year residency, they have a 3-year GMO ADO in addition to the 2 years they have remaining on their AFHPSP ADO. Combining these, their effective ADO is 4 years, not 5, because the AFHPSP and GME ADOs are served concurrently rather than consecutively.

Table 2. An example of the effective ADO for those with and without a GMO tour

	With a GMO tour			Without a GMO tour		
Reason for obligation change	AFHPSP ADO	GME ADO	Effective ADO	AFHPSP ADO	GME ADO	Effective ADO
4-year AFHPSP	4		4	4		4
Internship (1 year)	4		4	4		4
GMO tour (2 years)	2		2	NA	NA	NA
Residency (3 years)	2	3	3	4	3	4

Now consider this same example except that we assume they don't serve a GMO tour (which is the predominant career path in the Army and Air Force). When their residency is complete, they will owe 4 years for AFHPSP and 3 years for GME. But, again, because the obligations are served concurrently, their effective ADO is 4 years, not 7.

As these examples illustrate, for those with a GMO tour, it is the GME obligation that determines the effective ADO. In comparison, it is the AFHPSP ADO that determines the effective ADO for those without a GMO tour unless the residency program is 5 or 6 years. Moreover, this means that increasing the AFHPSP ADO by one year will not increase the effective ADO for those with a GMO tour who have a residency program of 3 years or more. But, it would increase the effective ADO for those without a GMO tour who have a residency program that is 4 years or fewer.

Background

This study draws from a large body of research on accessing, training, compensating, and retaining physicians and other health care professions. The Health Professions' Retention-Accession Incentives Study (HPRAIS) examined the adequacy of military compensation for physicians and other health care professionals [1]. For physicians, this study found that the civilian-military pay gap varies widely by specialty, is larger for those with fewer years of service, and has widened over the last decade.

Given these pay gaps, HPRAIS estimated the responsiveness of physician retention with respect to pay. It found that retention of military physicians is only modestly sensitive to changes in compensation, and this sensitivity varies across the specialties [2]. Moreover, these findings are consistent with previous research looking at the same issue [10-12]. The low sensitivity to pay increases stems from the fact that the civilian-military pay gap is so large in some specialties that even a $10,000 pay increase still leaves a substantial pay gap. Consequently, the return on the investment for pay increases is relatively small.

Given the findings from HPRAIS, CNA was asked to conduct the Life-Cycle Cost (LCC) study. The purpose of estimating the life-cycle costs for physicians and other health care professionals was to determine the optimal mix of accessions given the systems constraints and the impact these constraints have on the optimal accession mix.

We found that the costs of accessing and training physicians account for 8 to 49 percent of costs for physicians depending on the specialty and accession source [3]. For AFHPSP accessions who complete an in-house residency program, training costs account for 33 to 46 percent of costs depending on the specialty. Similarly, training costs account for 18 to 26 percent of the cost for those who complete a civilian residency program.

These figures indicate that training costs are substantial, but *the costs of the medical corps accession programs should not be considered in isolation.* The cost and the benefit—the return on the investment—need to be jointly considered. For example, the LCC study showed that, even though USUHS accessions are more costly than all other physician

accession sources, the return on investment in terms of retention means that these accessions are the most cost-effective for filling O-6 requirements [4].

The LCC study also addressed the cost of filling requirements through increased military compensation [4]. Specifically, the LCC study found that the cost-effectiveness of pay increases hinges on the predominant career path [4]. In particular, pay increases were not cost-effective for the Navy because of its policy to send most of its USUHS and AFHPSP accessions on a 2-year general medical officer (GMO) tour following their internship but before their residency. The vast majority of physicians in the Army or Air Force don't serve a GMO tour, which elongates the average career path in the Navy relative to the Army or Air Force. As for the Air Force, pay increases were cost-effective because the length of the average career path of its physicians is "short" compared with the Army or Navy because a higher proportion of its AFHPSP accessions complete a civilian rather than an in-house residency.

What this demonstrates is that career path—*which drives the number of years of service and years of practice before a physician becomes unobligated*—has a significant impact on retention. The closer physicians are to retirement eligibility when they become unobligated, the better their retention will be and the less effective pay increases will be. Consequently, DoD may be able to significantly reduce cost by increasing the active duty obligation to delay the first stay-leave decision because it elongates the average career path.

Because there is no history of changes in the active duty obligation for the AFHPSP program, there is obviously no prior research documenting the consequences that an AFHPSP ADO change would have. However, CNA has studied the impact of changes in the active duty obligation of aviators [13-15]. As we might expect based on what we learned in the LCC study, the optimal active duty obligation for aviators depends on the grade composition of the billet structure [13]. In the vernacular of the LCC study, the optimum is sensitive to the required experience profile.

We expect that by increasing the AFHPSP ADO there may be some negative effect on the applicant pool in terms of quantity and/or

quality. In considering this issue with the aviator community, the impact on its applicant pool is mixed. First, CNA found that the average quality of aviator students declined, but this may simply be because the Navy expanded accession requirements, requiring the Navy to dig deeper into its applicant pool [15]. Second, the study found that, although the ADO increased, the aviation community continues to attract top Naval Academy students. In other words, the best candidates are not increasingly opting for other communities because of the aviation ADO; they want to be pilots, and the increased ADO isn't detouring them.

Approach

With this research as a foundation, we present our approach to answering the question of whether DoD should increase the AFHPSP ADO from 4 to up to 7 years for 4 years of subsidization. Increasing the AFHPSP ADO has two main effects. First, it will improve continuation and retention. The typical AFHPSP accession will provide more years of practice as a fully trained specialist, meaning total AFHPSP accession requirements will fall. Second, it may reduce the size and potentially the quality of the AFHPSP applicant pool. By combining the results of these effects, we estimate whether the smaller AFHPSP applicant pool can support the accessions the Services need from the program.

Impact on retention

Our goal in this section is to estimate how much AFHPSP accession requirements would decrease as a result of an increase in the AFHPSP ADO. To do this, we first estimate what continuation and retention would be with a longer active duty obligation. We do this using a probit model to estimate the impact of various factors on whether physicians stay in or leave the military following the completion of their ADO. Specifically, this model controls for years remaining until retirement, time elapsed since they completed their ADO, relationship between military and civilian pay, gender, race, and family characteristics.

Given this model and the predominant career paths of physicians in each Service, we then estimate what the survival curve looks like with

a 5-, 6-, or 7-year ADO. By comparing this to the survival curve with a 4-year ADO, we can see how much continuation and retention may improve. In addition, we can estimate how many accessions it takes with a 7-year ADO, for example, to provide the same number of years of practice that are provided by accessions with a 4-year ADO.

One way we can do this is to simply extrapolate how accession requirements will change under the assumption that the mix of AFHPSP direct and deferred will not change as the AFHPSP ADO increases. Although this provides a rough estimate of how accession requirements may change, the assumption that the AFHPSP accession mix will remain the same is unlikely given how the ADO increase would change the accession requirements.

To solve this problem, we estimate the impact of an AFHPSP ADO increase on accession requirements using the LCC model that we developed in our LCC study. This model finds the most cost-effective accession mix (given the constraints placed on the system) and is flexible enough to allow the mix of AFHPSP accessions to vary from what they are currently. In addition, we use this model to show how accession AFHPSP requirements depend on the assumptions we make regarding in-house GME.

Impact on the applicant pool

The goal in this part of the study is to see how changes in the AFHPSP ADO may affect the pool of potential AFHPSP accessions. Specifically, we need to determine whether the AFHPSP applicant pool will still be able to provide the needed accessions if DoD increases the AFHPSP ADO. We approached this question in four parts.[10]

First, we looked at the national medical school applicant pool as well as the applicant pool of the Uniformed Services University of the Health Sciences. We observed the trends in quantity and quality. In general, we examined quality as proxied by undergraduate grade

10. We gratefully acknowledge the assistance of numerous representatives of the Services, USUHS, TMA, and Health Affairs who gave us invaluable support in acquiring available data throughout this study.

point averages (GPAs) and Medical College Admissions Test (MCAT) scores. We did this separately for those associated with allopathic and osteopathic medical schools.

Second, we studied the Services' applicant pools in the context of national and USUHS data. We gathered available historical data from each of the Services on their applicants and matriculants. Unfortunately, the Services are not required to collect, retain, and track many of the data that are needed for this type of analysis. To the maximum extent possible, we also tried to glean the MCAT scores, undergraduate GPAs, the allopathic/osteopathic split, and medical school rankings of AFHPSP applicants and matriculants so that DoD can begin to establish a valid baseline of what the current student AFHPSP applicant pool looks like before it considers any changes to the AFHPSP ADO.

Third, we culled the perceptions of recruiters from each Service on the impact an increase in the AFHPSP ADO might have on their ability to get AFHPSP recruits. We felt it was essential to our analysis to talk with frontline recruiters and program managers firsthand to understand the current recruiting market and environment, incentive programs (point system) being used to recruit AFHPSP student accessions (and their relevance to other officer communities), and their perceptions of the degree of difficulty they would face getting AFHPSP accessions if the ADO were increased.

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Impact on retention

In this section, we focus on estimating the impact of an increase in the AFHPSP active duty obligation on the AFHPSP retention. Specifically, we want to know by how much does a longer AFHPSP ADO reduce the total AFHPSP accession requirements.

In general, people use the word *retention* to refer to the percentage of personnel who remain in the military following their first stay-leave decision. Furthermore, people typically use the term *continuation* to describe the rate at which personnel stay in or leave the military. We usually think of an additional year of obligated service as an improvement in continuation because retention describes the behavior of those who are unobligated. But, as previous research shows, the closer a physician is to retirement eligibility at the first stay-leave decision, the better their retention will be [2]. Hence, an increase in obligated service improves retention in addition to continuation.

For the purpose of estimating how much accession requirements will decrease as a result of a longer AFHPSP ADO, we assume that there are a sufficient number of qualified AFHPSP candidates to meet whatever the AFHPSP requirements are under the various ADO assumptions. Our goal in this section is not to determine the feasibility of a potential ADO increase, but to determine how much the AFHPSP requirements will change as a result of the increase. We will look at feasibility—in terms of there being enough AFHPSP candidates to meet the requirements—in subsequent sections. And, we will compare the estimated requirements given an ADO change with the estimated applicant pool before making a recommendation.

Estimation retention

Our approach to estimating the impact of an ADO increase on continuation and retention has two parts. First, we use historical medical corps personnel data to statistically estimate the impact that various

factors have on retention. Then, using these statistical estimates, we project what retention would be if DoD increased the ADO. Second, we input our statistical estimates of retention into the LCC model we developed in previous research [4] to see how AFHPSP accession requirements change as the ADO increases. Here we focus on the first of these issues—estimating the impact of an ADO increase on retention. We begin with a discussion of the data.

Personnel data

Ideally, we would like to have the historical physician personnel tapes for each Service to estimate the impact of increasing the ADO on retention in the medical corps. Unfortunately, the level of granularity required and many relevant fields of information (initial active duty obligation, fellowship training, etc.) are not historically maintained in the Defense Manpower Data Center (DMDC) tapes.

The good news is that CNA has a robust 15-year panel (FY 1987-2002) of Navy medical corps data maintained by the Bureau of Medicine and Surgery (BUMED).[11] We feel confident using the Navy's personnel data because the variation in career paths in the Navy data provides a solid basis for extrapolating results to the other Services than vice versa. The reason for this has to do with career path differences between the Services.

In the Army and Air Force, the predominant career path is to go directly from an internship into a residency. In the Navy, about one-quarter of its AFHPSP direct accessions follow this career path while the remaining three-quarters serve a 2-year GMO tour in between an internship and a residency [9]. This GMO tour elongates the career path of these physicians and, as a by-product, adds variation in the data in terms of when physicians reach their first stay-leave decision. We would not have this variability from Army or Air Force data.

Because the Navy has physicians whose career paths are very similar to those of Army and Air Force physicians, it provides a basis from

11. We gratefully acknowledge the assistance of CDR Kevin Magnusson and CDR Scott Jones in providing us these data known as BUMIS.

which to estimate their retention behavior without having to make out-of-the-sample predictions. If we used Army or Air Force data to predict retention in the Navy, we would be forced to make out-of-the-sample predictions because the 2-year GMO tour would place the initial stay-leave decision outside the Army or Air Force data. Hence, if you are going to use one Service's data to estimate retention behavior, using Navy data is the best choice statistically.

We are confident that extrapolating the results to the Army and Air Force gives reasonable estimates of their retention. Historically, the Air Force has the lowest retention and the Navy the highest with the Army in between. Although there may be some retention differences between the Services that are attributable to the Service itself, the differences are largely due to the fact that the Air Force relies more heavily on AFHPSP deferred accessions, which have much lower retention that AFHPSP direct accessions. The Navy's retention is the highest because of its GMO tours, which effectively delay the stay-leave decision.

Probit model

This section focuses on using these BUMIS data to estimate the effect on retention of various demographic and other factors, such as pay and years of service. Because this study asks what would be the impact of increasing the ADO for AFHPSP accessions, we limit our sample to physicians accessed through AFHPSP. Obviously, using USUHS, direct procurement, FAP, and other accession sources would broaden the database, but we would introduce systematic variation in retention due to factors associated with the accession source and not the active duty obligation.

Because BUMIS data allow us to identify the time when physicians become unobligated, we are able to further focus our sample to the period when physicians can choose to stay or leave the military. Also, because BUMIS data allow us to clearly identify those physicians in initial residencies versus those in fellowships, we partitioned the sample accordingly. We expect the attrition behavior of residents and fellows to differ because some of the fellows may have already passed their first-stay leave decision. By focusing on each group separately,

we are able to get a more accurate estimate of how the various factors affect retention.

If, however, we commingled the two groups, our estimates of retention for those with residency but not fellowship training would be too high. This bias would stem from the fact that those in fellowship training may have passed the initial obligation point for their residency, but they are still in the military—not necessarily because they have decided to stay, but because they have further obligated themselves for fellowship training. By focusing only on those physicians with residency training, we are able to more accurately model the retention behavior of those who don't choose to undergo fellowship training.

Statistically, we use a probit model to estimate the effect of an increase in the active duty obligation on retention. A probit model enables us to estimate how such factors as gender affect a binary decision, such as staying in or leaving the military.[12] From this model, we were able estimate what the survival curve looks like given the current ADO and what it would look like if DoD increased the ADO.

To make our estimates as accurate as possible, we controlled for several variables that may be correlated with attrition. These variables include years remaining until retirement, time since ADO was completed, military-to-civilian pay ratio, gender, race, marital status, dependents, board certification, and specialty.

Table 3 shows whether these factors have a significant effect on attrition. Specifically, we estimate that the more years a person has until they are eligible for retirement (meaning fewer years of service), the higher the attrition.[13] Not unrelated, the more time that has elapsed since the person passed the first stay-leave decision, the less likely it is that he or she will attrite. This result is logical because, if you are

12. We also explored using various hazard models. Hazard models are either accelerated failure-time or proportional hazard models. We found that regardless of the function form we applied, these models underpredicted attrition, meaning that none of the functional forms were a good fit for these data. We tried using a Cox proportional hazards model (which does not impose a survival function), but the proportional hazards assumption was soundly rejected.

13. This is consistent with the impact we found in HPRAIS [2].

going to attrite, it is a better economic decision to leave at your first opportunity rather than waiting for another few years. This variable also indicates high attrition at the decision point (or shortly thereafter) and very low attrition once the person is a few years removed from the initial stay-leave decision. As for pay, the model shows that, the larger the military-to-civilian pay ratio (meaning military pay is increasing relative to civilian pay), the lower the attrition.

Table 3. Effects of explanatory variables on attrition

Variable	Significant effect on attrition
Years remaining until retirement eligibility	Positive[a]
Time elapsed since completing the ADO	Negative[a]
Military-to-civilian pay ratio	Negative[a]
Males relative to females	None
Race (comparison group: whites)	
Black	None
Other race	Negative[b]
Not married relative to married	Negative[b]
Dependent children relative to no dependent children	None
Married and dependent children relative to otherwise	None
Board certified relative to not board certified	None

a. Significant at the 99-percent level.
b. Significant at the 95-percent level.

The model also controls for gender and race, but we didn't have an expectation about whether these variables would have a positive or negative impact on retention. That is, we didn't really have an expectation that attrition should be better or worse for men compared to women. Statistically, we found no significant impact of gender on attrition, which is consistent with previous research [2]. Similarly, we didn't have strong expectations about how race should affect retention. As the results show, we found no significant difference between whites and blacks, but we did find that those of other races have lower attrition than whites.

We also controlled for whether someone was married and if they had dependent children. The results show that those who are not married have significantly lower attrition than those who are married. Clearly,

marital status is an important factor for physicians making stay-leave decisions. However, we found no significant relationship between having dependent children and attrition. Similarly, we found no significant relationship between attrition for those who were married with dependent children compared to those who were not married and/or didn't have dependent children.

Impact on the effective ADO and retention

In this section, we project by how much increasing the AFHPSP ADO from 4 to 5, 6, or 7 years will improve continuation and retention. We do this using the results of the probit model and keeping in mind that once AFHPSP direct accessions come on active duty they incur an active duty obligation for in-house graduate medical education (GME). Because the AFHPSP and in-house GME obligations are served concurrently rather than consecutively, their effective ADO—the number of years they are obligated to remain in the military following completion of GME—may be the same as or more than their AFHPSP ADO.

For example, suppose a physician has a 4-year ADO for AFHPSP and goes through an in-house OB/GYN residency, which gives him/her a 3-year ADO for GME. Because the AFHPSP and GME obligations are discharged or burned concurrently, this physician effectively owes 4 years following his/her residency. However, if this physician did an otorhinolaryngology or urology residency (5-year GME ADO), this physician would effectively owe 5 years following his/her residency.

Tours as general medical officers (GMOs) influence the effective ADO. A 2-year GMO tour after an internship but before residency training is the predominant career path in the Navy. To see how a GMO tour affects the effective obligation, consider how this would change our OB/GYN example. These physicians would owe 3 years for GME, but, because they were GMOs for 2 years, they would have discharged one-half of their 4-year AFHPSP ADO, leaving 2 years of obligation. Because this remaining AFHPSP ADO and the GME ADO are served concurrently, the effective obligation is 3 years, or 1 year less than without the GMO tour.

What this means is that if DoD increases the AFHPSP ADO, it may or may not translate into an increase in the effective ADO for AFHPSP direct accessions depending on the specialty and career path.[14] To see what this means in terms of going from a 4-year AFHPSP ADO to a 5-, 6-, or 7-year ADO, see table 4. We observe that, because the AFHPSP and GME ADOs are served concurrently, it takes a large increase in the AFHPSP ADO before the effective ADO increases for those with long residencies.

Table 4. Impact on effective ADO due to an increase in the AFHPSP ADO

	Effective ADO by length of in-house residency (excluding internship)				
AFHPSP ADO	2 years	3 years	4 years	5 years	6 years
Percent of specialty billets[a]	42	28	22	3	1
Without GMO tour					
4 years	4	4	4	5	6
5 years	5	5	5	5	6
6 years	6	6	6	6	6
7 years	7	7	7	7	7
With 2-year GMO tour					
4 years	2	3	4	5	6
5 years	3	3	4	5	6
6 years	4	4	4	5	6
7 years	5	5	5	5	6

a. Total does not add to 100 percent of specialty billets because we have not shown in this table specialties requiring a fellowship.

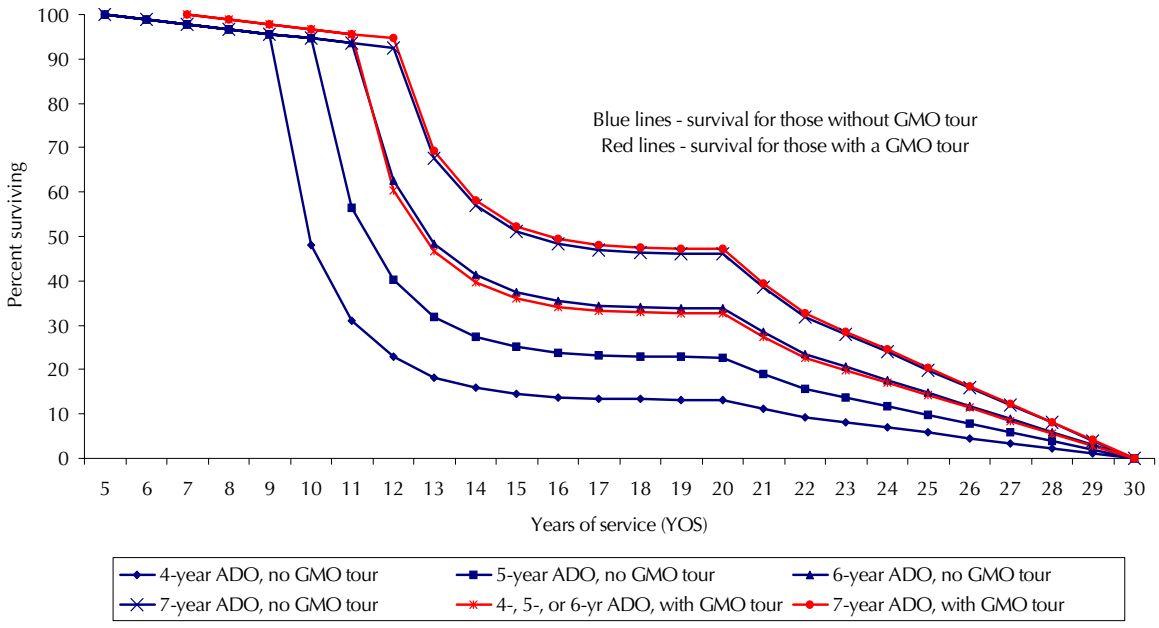
For example, increasing the AFHPSP ADO from 4 to 5 years does not increase the effective ADO for those with 5-year residencies (otorhinolaryngology or urology) because these physicians already owe 5 years for GME. This means that about 4 percent of specialty billets would not be affected by a 5-year AFHPSP ADO. Furthermore, if physicians serve a 2-year GMO tour—which burns 2 years of their AFHPSP ADO before residency training— increasing the AFHPSP ADO from 4 to 5 years will not increase the effective ADO for physicians with residen-

14. For those who have their AFHPSP ADO deferred while they complete a civilian residency program, any increase in the effective ADO is straightforward because they do not incur additional obligation while they are in a civilian residency.

cies that are 3 years or longer, so only 42 percent of specialty billets would be affected. This occurs because the GME ADO is at least as large as the remaining AFHPSP ADO even if DoD increases that ADO from 4 to 5 years.

As an example of how survival curves would change if DoD increased the AFHPSP active duty obligation, figure 1 shows the estimated survival curves for AFHPSP-direct general surgeons (which have a 4-year residency) given ADOs from 4 to 7 years both with and without a GMO tour. We estimated the survival curves using the results of our probit regression analysis. Notice that, because of the GMO tour and the concurrency of the AFHPSP and GME obligations, increasing the AFHPSP ADO from 4 to even 6 years does not increase the effective ADO for those general surgeons who served a GMO tour. Only when the AFHPSP ADO is increased to 7 years does the effective ADO increase by 1 year. In comparison, those without GMO tours would experience an increase in the AFHPSP ADO starting with the increase from 4 to 5 years.

Figure 1. Estimated survival of AFHPSP direct general surgeons by ADO and career path[a]



a. We estimated attrition before completion of the ADO at 1.1 percent—the average attrite rate in the BUMIS data for those that have yet to complete their ADO. We computed the survival curves for the period after the ADO is complete but before retirement using the estimates of our probit model. Similarly, we computed survival rates for the first two years of retirement eligibility using a probit model of the behavior of those eligible for retirement. We estimated survival beyond this point by computing an attrition rate that will result in all physicians leaving by 30 YOS.

Let's look at this in more detail. For physicians without a GMO tour, the general surgeons will complete their residency at 5 years of service. If their AFHPSP ADO is 4 years, they will become unobligated after 9 years of service, at which point the model indicates that 50 percent would leave the military. In addition, the model indicates that 36 percent of those remaining would leave the next year and 13 percent of those completing the general surgery residency would eventually reach retirement eligibility.

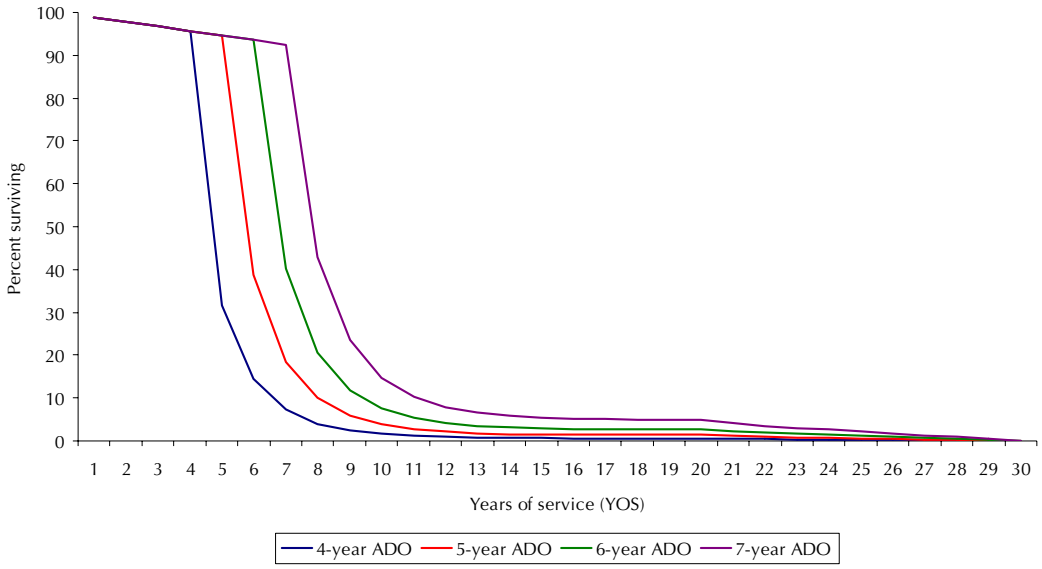
If DoD increased the ADO from 4 to 5 years, these physicians would not become unobligated until 10 years of service. And, because they are one year closer to retirement eligibility, their attrition rate decreases. Specifically, 40 percent would leave the year their ADO is complete, 29 percent of those remaining would leave the next year, and 23 percent of those completing general surgery residencies would reach retirement eligibility. The point is that each additional year of service that physicians have toward retirement when they complete their ADO makes a sizable difference in retention.

If we look at those who have served a GMO tour before going into a general surgery residency, we observe that serving as GMOs makes a large difference in their retention—not simply because they were GMOs—but because it delays their first stay-leave decision until 11 years of service, compared with 9 years of service if they didn't serve as GMOs. The model shows that 37 percent of these physicians leave the military the year their ADO is complete, and 23 percent of those remaining leave in the next year. Furthermore, 33 percent of these physicians would stay in the military long enough to reach retirement eligibility.

Taking this example of general surgeons further, we estimate that increasing the ADO for AFHPSP deferred accessions would also have a significant impact on retention, as figure 2 shows. The driving force behind the differences between the AFHPSP direct and deferred accessions is that the deferred accessions don't accumulate years of service while in a civilian internship, residency, and/or fellowship program. Consequently, an AFHPSP deferred general surgeon with a 4-year ADO becomes unobligated after 4 years of service compared with the 9 years (without GMO tour) or 11 years (with GMO tour)

that AFHPSP direct accessions have when they become unobligated. And, as we've discussed, the closer physicians are to retirement when they become unobligated, the better their retention will be.

Figure 2. Estimated survival of AFHPSP deferred general surgeons by length of ADO



With a 4-year ADO, the model indicates that 67 percent of AFHPSP deferred general surgeons will leave the year they complete their ADO, and 54 percent of those remaining will leave the next year. And, after 10 years of service, only 2 percent of these accessions would remain. Obviously, as DoD increases the ADO, continuation and retention improve for these accessions but not as quickly as they did for their AFHPSP direct counterparts because retirement eligibility is still relatively far off. Specifically, if DoD increased the AFHPSP ADO to 7 years, 54 percent would leave the year they complete their ADO, and 45 percent of those remaining would leave the next year. We estimate that 15 percent of these accessions would be remaining after 10 years of service. This is substantially higher than the 2 percent remaining with the 4-year ADO, but far less than the retention of AFHPSP direct accessions.

Impact on AFHPSP requirements

As examples, figures 1 and 2 show the how the survival patterns of general surgeons would change if DoD increased the ADO for AFHPSP direct and deferred accessions, respectively. We have computed similar survival curves for 22 other physician specialties. These survival curves take into account the concurrency of AFHPSP and GME ADOs to see if an increase in the AFHPSP ADO would increase the effective ADO. We saw this with general surgeons who serve GMO tours. Increasing their AFHPSP ADO from 4 to 6 years does not change their effective ADO. This means the survival curve is unaffected by the ADO increase. Only when their ADO increases to 7 years does the effective ADO increase and change their survival curve. As we stated previously, the question we are addressing in this section is: by reducing attrition, how much do accession requirements fall?

In the next section, we use a variant of our life-cycle-cost model [4] to see how the accession mix would change with increases in the AFHPSP ADO. Here we present a simpler illustration of how direct versus deferred AFHPSP accessions and career path (with and without a GMO tour) affects AFHPSP accession requirements. We use general surgery to illustrate how these factors affect AFHPSP accession requirements.

AFHPSP deferred accessions

Let's first consider AFHPSP deferred accessions. Because these accessions do not have any obligation for in-house GME, every 1-year increase in the AFHPSP ADO will increase the effective ADO by 1 year. Our probit model indicates that the average years of practice (YOP) as a fully trained general surgeon are 4.6 with a 4-year ADO for AFHPSP deferred accessions.[15] Another way to think of this is that we expect 460 years of practice for every 100 AFHPSP deferred accessions who are trained as general surgeons.

15. This means that, on average, these accessions remain in the military for six-tenths of a year beyond their stay-leave decision point. This is just an average, however. Most leave at the first opportunity, whereas a few remain in the military for several more years.

If DoD increased the AFHPSP ADO to 5 years, the average years of practice would be 5.8 years—an increase of 1.2 years. This means that it would take 79 accessions with a 5-year ADO to provide the 460 (79*5.8) years of practice that 100 accessions would provide with a 4-year ADO. If the ADO were 6 years, the average years of practice would be 7.0 years and 66 of these could provide a total of 460 years of practice. If the ADO were 7 years, the average years of practice would increase to 8.3 years and 55 accessions could provide 460 years of practice. These reduced accession requirements for general surgeons are comparable to what they would be for deferred accessions in other specialties, as table 5 shows. On average, 80, 66, and 56 deferred accessions with a 5-, 6-, and 7-year ADO, respectively, could replace the years of practice provided by 100 deferred accessions with a 4-year ADO.

Table 5. Number of accessions needed to replace the years of practice (as fully trained specialists) provided by 100 AFHPSP accessions with a 4-year ADO by residency length

Accession source and AFHPSP ADO	Needed accessions by residency length (excluding internship)[a]							
	2-year	3-year	4-year	5-year	6-year	IM-SSP[b]	GS-SSP[c]	WAVG
AFHPSP deferred								
5-year ADO	79	80	79	81	81	80	80	80
6-year ADO	66	66	66	67	68	67	67	66
7-year ADO	56	56	56	57	58	57	57	56
AFHPSP direct without GMO tour								
5-year ADO	78	77	76	87	100	95	82	79
6-year ADO	66	63	62	69	82	86	74	65
7-year ADO	57	53	52	57	72	74	67	55
AFHPSP direct with GMO tour								
5-year ADO	74	100	100	100	100	100	100	90
6-year ADO	60	75	100	100	100	100	100	77
7-year ADO	51	60	78	100	100	100	87	64

a. Figures for each residency length are a weighted average of the specialties in the group. We weighted by the number of billets in each specialty across the three Services.
b. We estimated this based on cardiology, gastroenterology, and hematology/oncology.
c. We estimated this based on plastic surgery.

AFHPSP direct accessions without a GMO tour

Now consider AFHPSP direct accessions who do not serve a GMO tour. Because these accessions have in-house GME training, we must consider what their effective ADO is. For general surgeons, the ADO is 4 years for both AFHPSP and GME. Because these obligations are served concurrently, the effective ADO is 4 years. Increasing the AFHPSP ADO from 4 to 5, 6, or 7 years would increase the effective ADO by the same amount.

The difference between AFHPSP deferred and direct accessions is that direct accessions have more years of service than their deferred counterparts when they reach their first stay-leave decision. Specifically, an AFHPSP direct accession would have 9 years of service at their first stay-leave decision compared to 4 years of service for deferred accessions. And, as we've discussed previously, the more years of service that people have toward retirement, the greater the impact that potential retirement benefits have on retention decisions.

The probit model indicates that the average years of practice for general surgeons who are AFHPSP direct accessions is 6.6 years with a 4-year ADO. Recall that for their deferred counterparts, the average years of practice was 4.6, or 2.0 years less than for AFHPSP direct accessions. We attribute these two additional years of practice to the additional 5 years of service that AFHPSP direct accessions have at their first stay-leave decision.

If the ADO were 5 years, the average years of practice would increase to 8.7 years compared to 6.6 years with a 4-year ADO. Hence, the years of practice that could be provided by 100 AFHPSP direct accessions with a 4-year ADO who are general surgeons could be provided by 76 of these accessions with a 5-year ADO. Furthermore, these years of practice could be provided by 61 of these accessions with a 6-year ADO; if the ADO were 7 years, these years of practice could be provided by 52 of these accessions. Looking at all AFHPSP direct accessions (not just general surgeons), 79, 65, and 55 AFHPSP direct accessions with a 5-, 6-, and 7-year ADO, respectively, could replace the years of practice provided by 100 of these accessions with a 4-year ADO, as table 5 shows.

AFHPSP direct accessions with a GMO tour

Now consider AFHPSP direct accessions who serve a 2-year GMO tour. As discussed previously, the impact of the GMO tour is that it discharges 2 years of the AFHPSP ADO before residency training. For general surgeons with a 4-year GME ADO, the effective ADO is 4 years. If the AFHPSP were increased to 5 or 6 years, the effective ADO would still be 4 years. This means that the ADO increase has not increased their effective ADO, but it has likely decreased the pool of potential applicants. Hence, it would still take the same number of accessions with a 5- or 6-year AFHPSP ADO to get the years of practice as it would with a 4-year ADO.

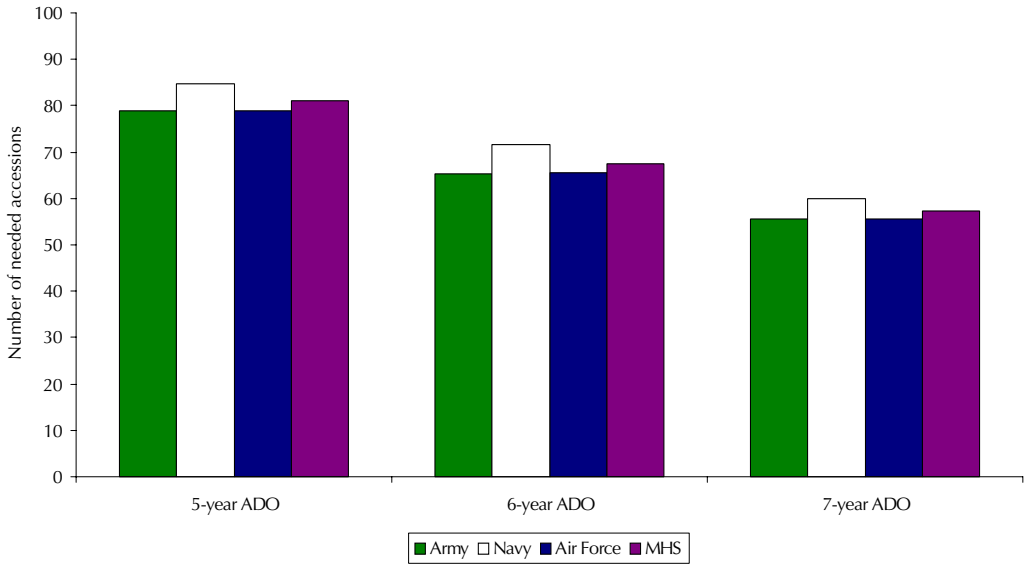
In terms of years of practice as fully trained general surgeons, if the AFHPSP ADO is 4 to 6 years, the average would be 8.7 years. If the AFHPSP ADO were 7 years, the effective ADO would increase to 5 years and the average years of practice would be 10.9 years for an increase of 2.2 years. This means that 80 general surgeons with a 7-year AFHPSP ADO could replace the years of practice provided by 100 AFHPSP direct accessions with an ADO of 6 years or fewer. In total, whether physicians serve a GMO tour has a substantial impact on how much accession requirements fall as the AFHPSP ADO increases. Looking across all specialties and assuming that physicians serve a 2-year GMO tour, it would take 90, 77, and 64 AFHPSP direct accessions with a 5-, 6-, and 7-year ADO, respectively, to replace the years of practice provided by 100 of these accessions with a 4-year ADO.

Figure 3 shows how an increase in the AFHPSP accessions would change the AFHPSP accession needs overall. We find that going from a 4- to a 5-year AFHPSP ADO would reduce the MHS's accession needs by 19 percent. This means that the years of practice provided by 100 accessions with a 4-year AFHPSP could be provided by 81 of these accessions with a 5-year ADO. Similarly, increasing the AFHPSP ADO to 6 or 7 years would reduce accession needs by 32 and 43 percent, respectively.

In general, the percentage changes in the accession needs are quite similar for the Army and Air Force but lower in the Navy than in the Army or Air Force. Part of the reason is that the Navy sends about 73 percent of its AFHPSP direct accessions on GMO tours before going

into a residency [9]. And, as we've discuss previously, this means that, on average, the Navy gets fewer additional years of obligated service from an AFHPSP ADO increase than do the Army or Air Force.

Figure 3. Number of AFHPSP accessions needed to replace the years of practice (as fully trained specialists) provided by 100 AFHPSP accessions with a 4-year ADO by Service[a]



a. We computed needed accessions by Service using a weighted average of the accession needs of AFHPSP direct and deferred accessions. We used each Service's average mix of AFHPSP direct versus deferred accessions (FY 1998-2001) as weights. In addition, we weighted the needs of AFHPSP direct accessions with and without a GMO tour using the percentage of Navy AFHPSP direct accessions that served a GMO tour [9].

Accession requirements from the life-cycle-cost model

This section uses the LCC model to examine how an increase in the AFHPSP ADO changes the accession mix and AFHPSP and total accession needs. Before we present the results, we provide a description of the LCC model. For a more comprehensive description of the model and the impact the various constraints have on the model, see the LCC study [4].

Basic model

The basic model we used to examine the optimal mix of accessions is a cost minimization model. A simple description of this model is that we are *minimizing the total cost (over a long time horizon) of meeting all of the active duty requirements given the constraints the Services and DoD place on the medical corps.*

Steady-state solution

We use a long time horizon to obtain the steady-state solution to the model. What is meant by the optimal accession mix in the *steady state?* If we ran the model with a 1-year time horizon, the output of the model would tell us the optimal mix of accessions given that time horizon. Assuming that the model is currently out of equilibrium, if we ran it over a 2-year time horizon, the optimal mix of accessions would be different in the second year than in the first. This would occur because the model has 2 years to move the given corps toward its long-term optimal mix of accessions. Essentially, the steady state is a solution in which the optimal mix of accessions is the same year after year.

To find the optimal mix of accessions in the steady state, we ran the model for 80 years. This long time horizon ensures that the solution is not affected by the personnel currently in the medical corps or in one of its accession pipelines.

By looking at the steady state, we are modeling what the Services should do in the long term—not what they should do next year. The reason is that the model allows us to see the long-term consequences of various policies, constraints, and business practices. Hence, a model that is applicable only to next year's accessions has a one-time usefulness, whereas policy-makers can use the steady-state model to focus on the policies, constraints, and business practices that have a substantial impact on the system.

Model costs and retention

The costs we modeled are the life-cycle costs from the LCC study [3]. Costs are largely driven by the career path—timing of promotions, training, and board certification. In conjunction with TMA and

representatives from each Service, we determined the predominant career path by specialty, accession source, and Service.

Given the predominant career paths, we computed the survival curves for AFHPSP direct and deferred accessions for each specialty using the probit model discussed previously. Because the focus of this study is on AFHPSP accessions, and not on USUHS or FAP accessions, we have not attempted to compute new survival curves for these accession sources. Instead, we use the survival curves that we developed in the LCC study.

Constraints

If we place no constraints on the model, the obvious solution to the optimal mix of accessions is to have all new accessions come from the least expensive source. Allowing the model to be unconstrained doesn't reflect the environment in which the Services operate (market supply and demand as well as unique military requirements). Consequently, we imposed the following constraints on the model:

- Billet (manning) requirements
- Experience profile requirements
- Accession source constraints
- In-house training requirements.

Billets. The first constraint is the number of billets that must be filled. From this point forward, we will use "billets" to describe the subset of billets considered for the selected specialists in our model and not the entire universe of billets (i.e., we modeled 23 physician specialties, not the entire medical corps billet file).

From a modeling standpoint, the number of billets is the *minimum* number of duty specialists the Services require—not the maximum they can have. For military personnel planners, authorized billets are more akin to the maximum number of bodies the Services can have on active duty at the end of any given fiscal year. To fill the billets with the exact same number of bodies, we would have to constrain bodies to be no less and no more than billets. Doing this, however, makes the

model infeasible because of other constraints on the model that may force bodies to exceed billets or may not allow them to reach billets.

That said, the model doesn't want more bodies than billets because it is trying to minimize cost and, obviously, each extra body is costly. In other words, modeling billets as the minimum number of bodies is akin to modeling a target number of billets; in the steady state, the number of bodies exceeds billets *only* if the model's other constraints force it to do so.

Experience profile. One of the more influential constraints in the model is the desired experience profile of the force. What percentage of the duty specialists should be O-6s, and what percentage should be at least O-5s? Though it will always be the case that it is most cost-effective to fill junior billets from the least expensive accession source, it may be more cost-effective to fill senior billets from more expensive accession sources if the retention rates of these accession sources are substantially higher than the least costly one.[16] The specific experience constraint we use is that at least 30 percent of duty billets should be filled with O-5s or O-6s and at least 10 percent should be filled with O-6s.[17]

Accession source constraints. Even when we impose a force structure constraint on the model, the model may find that the optimal mix of accessions consists of more of some accession sources than the Services could reasonably get. For this reason, another critical constraint is the maximum number of accessions the Services can expect from each source given the subsidization of the accession programs. Hence, though the Services may want more unsubsidized accessions, they may not be able to get more without increasing the subsidization of these programs. Accession source constraints are an acknowledgment of

16. We are not directly assigning new accessions to fill senior billets but "growing" them into senior billets. Differences in retention patterns across accession sources, therefore, can make it more or less costly to grow senior personnel from specific accession sources.

17. This constraint is based on a Health Affairs memorandum [16], which states a goal of 25 to 30 percent of physician endstrength with an experience level of 5 to 12 years beyond initial certification.

economic and political constraints on the number of specialists that can be assessed through each accession source.

In-house training requirements. The in-house training requirements are requirements for the size of the GME program. As a starting point, we modeled the GME requirement as a target that the model must fill. We did this by setting the minimum and maximum number of GME starts at the same level. In other excursions, we allowed the model to determine the "optimal" number of GME starts. Note that this optimal number of GME starts is optimal in that sense that it is the least costly choice given the costs, retention, and constraints imposed on the system. It is not necessarily the optimal solution in the global sense.

Penalties. Sometimes the model's constraints will not allow it to fill all of the requirements. For example, the constraints may not allow it to fill all of the billet requirements. When this occurs, the model has not technically met the minimum billet requirement. Again, if we imposed the billet requirement as a hard minimum, the model would be infeasible because the other constraints simply don't allow the model to meet the billet requirement. To overcome this problem, we've constructed the model to handle these cases by imposing an arbitrarily large financial penalty. In other words, we allow the model to meet the requirement by buying a civilian specialist—albeit at an unrealistically high cost.

In addition to a financial penalty for failing to meet billet requirements, the model includes a financial penalty if the constraints do not allow it to fill experience profile requirements. Note that the penalty costs for failing to fill requirements with military personnel or personnel of the right experience level *are not included in the cost figures that we report.* The cost figures represent only those costs associated with military personnel, which are the life-cycle costs. However, we did adjust cost for billet requirement shortages. We make this adjustment by adding in the average billet cost for each unfilled billet. The costs don't reflect any adjustment for unfilled experience requirements. Unfilled experience requirements don't mean that there is not a body for each billet, just that the body doesn't have the right experience level.

Other modeling issues. We modeled the process of filling billets using continuous variables rather than an integer programming approach. We allowed for fractions of personnel, such as accessing 4.5 in the steady state rather than forcing the model to always use a whole number. Because we are looking for a steady-state solution, all we really want is the average number of personnel that should be accessed each year. So, if the steady state is 4.5, we interpret the steady state as accessing 4 one year and 5 in the next. Integer programming would add substantially to the modeling complexity without meaningfully affecting the results.

Another modeling issue is the starting point—today's inventory of specialists and trainees in a given speciality as well as the inventory in the accession pipelines. The starting point is the driver for how and whether the Services will be able to meet near-term requirements. That said, the starting point we used for inventories *does not affect the optimal mix of accessions in the steady state* because, once enough time passes to let the current inventory work through the system, the model reaches the same steady state regardless of the starting point. What it affects is the time it takes to reach the steady state and the path used to reach it.

Baseline and excursions

As a starting point, we have a "baseline" set of constraints. Largely, we designed these constraints to reflect the constraints under which the Services currently operate. Then with the baseline as a reference point, we can change a constraint or parameter and see how these changes affect the model. For this study, we've developed two baselines—A and B.

Baseline A. Baseline A generally uses the same constraints and parameters as the one as we used in the LCC study, with two notable exceptions. First, in the LCC study, we estimated the survival curves by accession source, specialty, and career path using FY 1991-2000 data from the Defense Manpower Data Center (DMDC). In this study, we have estimated the survival curves for AFHPSP direct and deferred accessions by specialty and career path using the results of our probit model, discussed previously, which relies on Navy BUMIS data from FY 1987-2002. The reason for this substitution is that we need to be

able to model how increases in the AFHPSP ADO would affect survival. And, as we've already discussed, the DMDC data do not allow us to do this.

Second, in the LCC study, we set up the USUHS accession constraint with a minimum of zero and a maximum of 63 (Army) or 51 (Navy and Air Force). Because we were interested in determining the optimal mix of accessions under various constraints, we modeled USUHS accessions in this manner to allow the model the freedom to use USUHS accessions only if it needed them—only if it were optimal. We found that the higher the experience profile required and/or the smaller the GME program, the more USUHS accessions the model wanted.

In execution, USUHS is really an all-or-nothing proposition—either USUHS exists and produces about the same class size year after year or the school is closed. Because USUHS costs are largely fixed, the marginal savings of reducing USUHS accessions by a few is relatively small. Accordingly, for baseline A, we model USUHS accessions as having a minimum and maximum of 63 (Army) and 51 (Navy and Air Force). The reasons we've made this change in the model is that this study is not about maintaining or closing USUHS. This study is about potential changes in the AFHPSP ADO, which would have no effect on the number of graduates USUHS puts out each year.

In contrast to fixing the number of USUHS accessions, we allow FAP accessions to fluctuate in the model as the AFHPSP ADO increases. We did this because FAP accessions have always been and will likely continue to be a supplemental accession source, which the Services use to fill billet requirements not met by USUHS or AFHPSP accessions. In addition, if DoD increased the AFHPSP ADO, it would have some negative impact on the Services' ability to recruit AFHPSP. One foreseeable consequence is that a larger percentage of recruiting resources would need to be expended on AFHPSP recruiting efforts and, unless recruiting resources increased, this would require recruiting cuts in other areas, such as FAP recruiting.

Baseline B. Baseline B has the same assumptions, constraints, and parameters as baseline A, except that it allows the model to find the "economic-optimal" GME or, in other words, determine the optimal

size of the in-house GME program. One of the constraints in baseline A is that a certain number of physicians need to go into in-house GME training each year under the assumption that the size of the in-house GME program is fixed.

What we found in the life-cycle-cost study was that, next to USUHS, the most effective way to fill experience or seniority requirements was AFHPSP direct accessions—meaning in-house GME because it improves continuation and retention significantly compared to AFHPSP deferred accessions. If we increase the AFHPSP ADO, we increase retention, which helps the Services to fill experience requirements with fewer accessions. This also has the effect of reducing the need for in-house GME. By allowing baseline B to determine the optimal number of in-house GME starts given the other constraints and parameters, we allow the model to eliminate in-house GME positions that aren't necessary in terms of meeting the other constraints on the system.

Excursions. We have taken three excursions from both baselines A and B—namely, increasing the AFHPSP ADO from 4 to 5, 6, or 7 years. None of these excursions alter any of the constraints on the model, but they do affect the continuation and retention and cost parameters. The impact on continuation and retention is an obvious increase, as we've already shown. Costs change with increased retention because accessions are now more likely to reach retirement eligibility than they were previously. We have adjusted costs to account for this higher probability of receiving retirement benefits.

Results

Now that we have walked through our methodology and approach, this section discusses the output of the LCC model, which shows the effect that increases in the AFHPSP ADO may have on AFHPSP accession and total accession requirements and costs. Appendix A shows the output of the LCC model for both baselines and all of the excursions by Service.

Impact on AFHPSP accessions

As we showed with the probit analysis, an AFHPSP ADO increase improves retention, meaning that fewer accessions can provide the same number of years of practice. In the probit analysis section, we estimated that increasing the AFHPSP ADO from 4 to 5, 6, or 7 years would reduce AFHPSP accession needs by 19, 32, and 43 percent, respectively. We estimated these percentages on the assumption that the mix of AFHPSP direct and deferred accessions would remain unchanged and the number of accessions from other sources, such as FAP, would remain unchanged.

While these figures provide an initial estimate of the impact of any AFHPSP ADO increase, they do not account for the fact that any AFHPSP increase changes the relative cost and benefits of each accession source. This means that there would likely be a more efficient mix of AFHPSP direct, AFHPSP deferred, and FAP accessions that differs from what the Services have done historically. It is because of this dynamic that we used the LCC model to estimate how AFHPSP accession needs change as a result of an ADO increase.

Assuming the size of in-house GME program is fixed. Table 6 shows the optimal mix of accessions when the GME program is fixed with a 4-year AFHPSP ADO (baseline A) compared to a 5-, 6-, or 7-year ADO. In particular, the table shows the initial mix of accessions into the various accession pipelines as well as the accession mix at the first year of practice (YOP-1) as a fully trained specialist for the MHS as a whole.

By the mix of accessions into the various accession pipelines, we mean the number of people put into the program and not the number of people who come out. For example, each year 165 medical students start medical school at USUHS. Using historical averages, we know that not all 165 will graduate. The model accounts for attrition from each of the accession pipelines from the time people start the program until the time those who complete the program come on active duty and complete any additional training necessary for them to become fully trained specialists. We also study the accession mix at YOP-1 because we want to distinguish between AFHPSP direct and deferred accessions—a distinction we can't make at the time they start the AFHPSP program.

Table 6. Impact of an AFHPSP ADO increase on the number of accessions, assuming the size of the in-house GME program is fixed

Accession source	No. of accessions by ADO length				Percentage of baseline		
	4-yr (base)	5-yr	6-yr	7-yr	5-yr	6-yr	7-yr
Accession pipeline							
USUHS	165	165	165	165	100	100	100
AFHPSP	983	769	720	699	78	73	71
FAP	104	17	9	2	16	9	2
Total	1,251	950	893	866	76	71	69
Accessions at YOP-1[a]							
USUHS	158	158	158	158	100	100	100
AFHPSP direct	568	568	568	568	100	100	100
AFHPSP deferred	280	90	50	33	32	18	12
FAP	97	17	8	2	18	8	2
Total	1,103	832	784	761	75	71	69

a. The accessions at YOP-1 are less than the pipeline accessions because of attrition from the training pipeline.

The mix of accessions into the accession pipeline shows that the number of USUHS accessions is unchanged. We point this out simply to remind the reader that we made an assumption to not allow the model to alter the number of USUHS accessions. Therefore, we place no meaning on the fact that USUHS is the same in each excursion. What we do find is that increasing the AFHPSP ADO from 4 to 5 years reduces the number of AFHPSP accessions by 22 percent from 983 to 769. Similarly, if we increase the AFHPSP ADO to 6 or 7 years, the model indicates that AFHPSP accessions could fall by 27 and 29 percent from the baseline of a 4-year AFHPSP ADO, respectively. Similarly, total accessions could fall by 24, 29, and 31 percent if we increase the AFHPSP ADO to 5, 6, or 7 years, respectively.

While the accession requirements for AFHPSP fall, we need to look at the mix of AFHPSP direct versus deferred accessions for more insight. As table 6 shows, the number of AFHPSP direct accessions remains at 568 regardless of the AFHPSP ADO. The reason for this is our assumption that the size of the GME program could not change. Hence, the model requires AFHPSP direct accessions not to fill billets, but to fill GME positions. Furthermore, because AFHPSP direct accessions are

unchanged, all of the reductions in AFHPSP accessions are reductions in AFHPSP deferred accessions.

In the LCC study, we found that the experience constraint was the most influential constraint in the model [4]. In addition, because USUHS and AFHPSP direct accessions were the most cost-effective ways to fill seniority requirements (particularly O-6 requirements), the model generally used AFHPSP deferred and FAP accessions to fill seniority requirements that USUHS and AFHPSP direct accessions couldn't fill. Because the retention of AFHPSP deferred and FAP accessions is relatively low, many accessions are needed to get enough of them to stay in the medical corps long enough to fill seniority requirements.

When we increase the AFHPSP ADO, we improve the retention of AFHPSP direct accessions, which means these accessions fill more requirements than they would with a 4-year ADO, thus reducing the need for AFHPSP deferred and FAP accessions to fill in the gaps. Specifically, AFHPSP deferred and FAP accessions fall by 68 and 82 percent, respectively, when we increase the AFHPSP ADO from 4 to 5 years. Increasing the ADO to 7 years would reduce AFHPSP deferred and FAP accession requirements by 88 and 98 percent, respectively, compared to a 4-year ADO.

Assuming the in-house GME program is the economic optimum. As we've just discussed, if we assume that the size of the in-house GME program is fixed at a certain level, the model must maintain a certain number of AFHPSP direct accessions to fill GME positions even if these accessions aren't needed to fill billet requirements. We now explore what happens if we relax this assumption and let the model choose the "economic optimal" number of GME positions.

By the economic-optimal number of GME positions, *we mean the number of GME positions there should be from a cost or economic standpoint only*. We realize there are other factors—that we can't control for in the LCC model—that also determine how large or small a GME program can be. These factors include workload, patient demographics, and accreditation standards. For the Navy, there is also the operational issue of needing a certain number of GMOs. Because GMOs come from the group of accessions that go through in-house GME,

this may also affect the size of the GME program. If the model were able to control for these factors, the directional impact of the model on accessions and costs would be the same but the magnitude of the change may be different.

Before we discuss how the optimal mix of accessions changes when we increase the AFHPSP ADO with economic-optimal GME, we consider how the economic-optimal number of in-house GME starts compares to the fixed number of GME starts. Table 7 shows the number of in-house GME starts in the fixed and economic-optimal models by Service for eight specialties.[18]

Table 7. Number of in-house GME starts in the fixed and economic-optimal models (assuming a 4-year AFHPSP ADO)

	Army		Navy		Air Force		Total	
Specialty	Fixed	Econ. optimal	Fixed	Econ. optimal	Fixed	Econ. optimal	Fixed	Econ. optimal
Anesthesiology	16	18.7	18	11.4	8	9.8	42	39.9
Cardiology	7	4.8	4	1.0	5	4.0	16	9.8
Family practice	50	38.5	43	15.5	45	34.6	138	88.5
General IM	55	45.2	31	4.5	37	20.9	123	70.7
General surgery	24	31.4	9	10.1	13	17.3	46	58.7
OB/GYN	21	10.5	13	7.0	12	6.6	46	24.0
Orthopedic surgery	20	12.6	11	15.0	8	7.9	39	35.6
Radiology	16	17.4	14	12.1	16	15.5	46	45.1
Other specialties	135	108.1	78	38.2	74	65.0	287	211.3
Total	344	287.1	221	114.9	218	181.6	783	583.6
Percentage of fixed		83		52		83		75
Spec. with FAP	219	166.8	147	60.9	158	115.5	524	343.1
Spec. without FAP	125	120.4	74	54.0	60	66.1	259	240.5

Overall, the number of in-house GME starts in the economic-optimal GME model is 25 percent less than when GME is fixed. However, the reduction is not universal across the specialties. For example, the

18. These eight specialties were the specialties we focused on in the LCC study. The other specialty category includes the figures for the remaining 15 of the 23 specialties we included in the LCC model.

number of GME starts in 10 specialties in the Army is actually larger in the economic-optimal model than in the fixed model. General surgery is among these. The model shows that the optimal number of GME starts should be 31.4 rather than the 24 starts in the fixed model. Similarly, there are 4 specialties in the Navy and 9 in the Air Force where the number of GME starts is higher in the economic-optimal model than in the fixed model. The point is that when we say the economic-optimal number of GME starts is 25 percent less than the fixed model, we are not saying that the current size should be cut by 25 percent across the board. It is really specialty specific.

If we look at economic-optimal in-house GME starts by Service, the model indicates that they are 17 percent less overall than in the fixed model for both the Army and Air Force and 48 percent less in the Navy. The reason the Navy economic-optimal GME starts are so much less has to do with the Navy's policy to send its USUHS and AFHPSP direct accessions on a 2-year GMO tour before beginning residency training. The GMO tour elongates the career path of its USUHS and AFHPSP direct accessions, causing Navy retention to be relatively better than that in the Army and Air Force. This means that fewer AFHPSP direct accessions are needed to fill seniority requirements.

Note that the LCC model assumes that all USUHS and AFHPSP direct accessions in the Navy serve a GMO tour; however, historically only about 73 percent do [9]. While serving a GMO tour is by far the predominant career path, the fact that the LCC model assumes all USUHS and AFHPSP direct accessions do this exaggerates the change in the number of in-house GME starts. Navy USUHS and AFHPSP direct accessions without a GMO tour exhibit about the same retention behavior as their Army and Air Force counterparts. And, because of this difference, the reduction in in-house GME starts was only 17 percent in the Army and Air Force. On this basis, we estimate that, if 27 percent of Navy USUHS and AFHPSP direct accessions didn't serve as GMOs, the Navy GME starts would be 40 percent less in the economic-optimal GME model.

The FAP constraint also affects the economic-optimal number of in-house GME starts. When we developed the LCC model, we set the FAP constraint by specialty based on the Services' historical success in

bringing in FAP accessions. For some specialties—generally those with large military-civilian pay gaps—we assumed that the Services could not get any FAP accessions.[19] In contrast, primary care specialties can get some FAP accessions. For example, the FAP accession constraints are 25 for family practice, 10 for general internal medicine, and 8 for OB/GYN.[20]

As table 7 shows, the specialties with a FAP constraint of zero had economic-optimal GME starts of 241 compared to 259 in the fixed case. This is a decrease of only 7 percent. In fact, economic-optimal in-house GME starts for these specialties were 66 in the Air Force compared to 60 in the fixed model for an increase of 10 percent. The large differences between economic-optimal and fixed GME starts comes from those specialties for which FAP accessions are a viable option. Overall, economic-optimal in-house GME starts for these specialties are 343 compared to 524 in the fixed model. This is a decrease of 35 percent.

Because FAP is a viable accession source for these specialties and because these are specialties with relatively high retention, just a few in-house GME positions filled by USUHS or AFHPSP direct accessions supplemented with FAP and AFHPSP deferred accessions can fill the billets and seniority requirements. To see this more clearly, consider family practice in the Air Force. In the fixed in-house GME model, the Air Force has 45 family practice in-house GME starts and brings in 9.6 of the 25 allowed family practice FAP accessions. The combination of these accession sources enables it to just fill its billets. In addition, this accession mix results in a seniority mix with 16 percent O-6s, allowing it to easily meet its seniority requirement of 10 percent O-6s.

This means that the in-house GME program is providing more senior family practitioners than the model requires. So, when we find the

19. The FAP constraint is zero for anesthesiology, cardiology, dermatology, otolaryngology, gastroenterology, general surgery, hematology/oncology, neurology, neurosurgery, orthopedic surgery, pathology, physical medicine, plastic surgery, preventive medicine, and urology.

20. For more information on the FAP constraint, see the LCC study [4].

economic-optimal in-house GME, the cost-minimization model wants to reduce GME starts because not as many are needed to produce the required experience profile. This is where FAP comes into the picture. If there is no alternative to in-house GME in terms of filling billets, in-house GME starts will not change. FAP provides one such alternative. Another alternative is AFHPSP deferred accessions. Specifically, FAP accessions are 24.4 annually in the economic-optimal model compared to 9.6 in the fixed model. Hence, the fewer GME starts in concert with additional FAP accessions allow the model to fill the billets and meet the experience profile at a lower cost than with the larger in-house GME program.

The size of the GME program in the economic-optimal model depends on the length of the AFHPSP active duty obligation. The figures in table 7 show what the economic optimum of the in-house GME program should be with a 4-year AFHPSP ADO. For the excursions where we increase the AFHPSP ADO to 5, 6, or 7 years, the optimal size of the GME program will be less. Specifically, the optimal number of GME starts across the MHS would be 33, 53, and 64 percent less with a 5-, 6-, or 7-year ADO than in the economic-optimal case with a 4-year AFHPSP ADO, respectively.

Now that we have discussed the differences in the model due to the change in how we model in-house GME starts, we consider the optimal mix of accessions assuming the in-house GME program is the economic optimum with a 4-year AFHPSP ADO (baseline B) compared to a 5-, 6-, or 7-year AFHPSP ADO. As table 8 shows, the total number of AFHPSP accessions falls by 13, 26, and 36 percent as we increase the AFHPSP ADO from 4 to 5, 6, or 7 years, respectively.

These estimates in the reduction of accession requirements use the economic-optimal number of GME starts with a 4-year ADO as the reference point. However, comparing the economic-optimal AFHPSP accessions to the FY 1998-01 average of 811 AFHPSP accessions, the model shows a 13-percent decrease in AFHPSP accessions requirements just from using the economic-optimal number of GME positions and no change in the ADO. Again, many of the AFHPSP reductions are a result of increasing the number of GME starts in specialties where the in-house GME program doesn't provide a sufficient

number of specialists to fill the specialty's seniority requirements. By using the economic-optimal in-house GME, the model can reduce the large number of excess physicians that are a result of bringing in many more AFHPSP deferred accessions to fill seniority requirements than are necessary to fill billets.

Table 8. Impact of an AFHPSP ADO increase on the number of accessions when in-house GME program is economic-optimal

Service and accession source	No. of accessions by ADO length				Percentage of baseline		
	4-yr (base)	5-yr	6-yr	7-yr	5-yr	6-yr	7-yr
Accession pipeline							
USUHS	165	165	165	165	100	100	100
AFHPSP	707	618	523	454	87	74	64
FAP	164	109	154	165	66	94	101
Total	1,036	891	842	784	86	81	76
Accessions at YOP-1[a]							
USUHS	151	151	151	151	100	100	100
AFHPSP direct	393	211	104	41	54	26	10
AFHPSP deferred	213	322	338	347	151	159	163
FAP	155	105	145	156	68	94	101
Total	914	790	740	695	86	81	76

a. The accessions at YOP-1 are less than the pipeline accessions because of attrition from the training pipeline.

When we look separately at AFHPSP direct and deferred accessions, we find that AFHPSP direct accessions fall as the AFHPSP ADO increases, whereas the number of AFHPSP deferred accessions increase. Just as we discussed with FAP, the reason is that the improved retention of AFHPSP direct accessions due to the ADO increase enables the model to meet experience requirements with in-house GME (meaning USUHS and AFHPSP direct accessions) more easily and supplement these accessions with AFHPSP deferred accessions to fill the remaining billets not filled through in-house GME. In addition, as the AFHPSP ADO increases, the retention of AFHPSP deferred accessions increases, meaning these accessions contribute more to the filling of seniority requirements than they did previously.

Impact on cost

Now that we have studied the impact of AFHPSP ADO increases on AFHPSP accession and total accession requirements, we consider the impact on excesses and costs. Recall that the LCC model doesn't model billets as the maximum number of physicians the Services can have. It models billets as the minimum number of physicians it needs. If we modeled billets as a maximum, the model would not want to have any physicians because it is trying to minimize costs. Although the LCC model uses billets as a minimum constraint, the model will only cause bodies to exceed billets to the degree that it is necessary to meet other requirements, such as GME or experience constraints.

Assuming the size of the in-house GME program is fixed. Considering the case where we assume that the number of GME starts is fixed, we see that in the steady state there are enough physicians to fill 118 percent of billets, as table 9 shows. We realize that the MHS can't do this in execution, but this is the number of physicians the model requires to meet all of its constraints, including experience. The important point here is not that we have excesses in the baseline case, but how the excesses change as DoD increases the AFHPSP ADO.

Table 9. Impact of an AFHPSP ADO increases on bodies vs. billets and costs, assuming the size of the in-house GME program is fixed

	Physicians (bodies) as a percentage of billets by ADO length				Annual cost in millions of dollars by ADO length			
Service	4-yr (base)	5-yr	6-yr	7-yr	4-yr (base)	5-yr	6-yr	7-yr
Army	117	112	125	141	812	798	873	973
Navy	105	105	112	121	617	615	658	702
Air Force	133	116	122	134	592	540	566	618
MHS	118	111	120	133	2,021	1,953	2,097	2,293
Percentage of baseline						97	104	113
Annual costs without excesses					1,726	1,761	1,750	1,728

The model shows that if we increase the AFHPSP ADO to 5 years, excesses will fall from 18 to 11 percent of billets. This reduction in bodies allows costs to fall by 3 percent from $2.02 billion to $1.95

billion, for a cost savings of $68 million. As we discussed earlier, the drop in excesses is a result of the improved ability of AFHPSP direct accessions to fill seniority requirements, which reduces the need for large numbers of FAP and AFHPSP deferred to fill a few seniority requirements.

When we increase the AFHPSP ADO from 4 to 6 or 7 years, excesses increase from 18 percent to 20 and 33 percent of billets, respectively. The increase in excess occurs because the larger increases in the AFHPSP ADO cause the retention of AFHPSP direct accessions to improve substantially, but the fixed GME constraint forces the model to bring in the same number of AFHPSP direct accessions each year even though the Services need fewer accessions to fill billet requirements. As a result, the only option to reduce the number of bodies is to cut or eliminate the number of AFHPSP deferred and FAP accessions. The only problem with this is that the model eliminated most of these accessions when we increased the AFHPSP ADO from 4 to 5 years, so there just aren't that many left to cut. Looking at this in terms of costs, the benefits of increased retention are offset by the fact that the GME constraint forces the model to take in large numbers of AFHPSP direct accessions it doesn't need to fill billets. Specifically, increasing the AFHPSP ADO from 4 to 6 years causes costs to increase by 4 percent from $2.02 billion to $2.10 billion. Similarly, going to a 7-year AFHPSP ADO causes costs to increase by 13 percent to $2.29 billion.

Assuming the in-house GME program is the economic optimum. As we've discussed, fixing the size of the GME program causes the model to bring in a lot of AFHPSP direct accessions that the model doesn't need to fill billets. When we allow the model to determine the size of the GME program, the excesses we had in the fixed GME case largely go away. Specifically, in the baseline model with a 4-year ADO, excesses are 2.5 percent of billets, as table 10 shows. Excesses don't go away completely because retention rates in conjunction with the experience constraint force excesses in some specialties.

When we increase the AFHPSP ADO from 4 to 5 years, the improved retention makes filling experience requirements easier, and excesses drop to only 0.3 percent. Looking at costs, increasing the ADO to 5

years causes costs to fall by 7 percent, from $1.71 billion to $1.60 billion, for a cost savings of $113 million.

Table 10. Impact of an AFHPSP ADO increases on bodies vs. billets and costs when the in-house GME program is economic-optimal

	Physicians (bodies) as a percentage of billets by ADO length				Annual cost in millions of dollars by ADO length			
Service	4-yr (base)	5-yr	6-yr	7-yr	4-yr (base)	5-yr	6-yr	7-yr
Army	104.0	100.0	100.0	100.0	716	653	624	609
Navy	100.9	100.9	100.6	100.3	525	503	490	475
Air Force	102.0	100.0	100.0	100.0	467	440	429	423
MHS	102.5	100.3	100.2	100.1	1,708	1,595	1,543	1,507
Percentage of baseline						93	90	88
Annual costs without excesses					1,666	1,591	1,541	1,506

There are additional cost savings when we increase the AFHPSP ADO from 4 to 6 or 7 years. Specifically, costs are 10 and 12 percent less with a 6- or 7-year ADO than with a 4-year ADO, respectively. In comparison, going to a 6- or-7-year ADO results in cost increases in the fixed GME model.

Considering the cost savings on an incremental basis, going from a 4- to 5-year ADO decreases costs by $113 million. Increasing the ADO from 5 to 6 years saves an additional $52 million (1,595 - 1,543), and going from a 6- to 7-year ADO saves another $36 million. Hence, each 1-year increase in the AFHPSP ADO saves less than the preceding increase.

Comparing the results of the fixed and economic-optimal GME models, we observe that the costs assuming a 4-year ADO are $313 million less in the economic-optimal GME model than in the fixed GME model. The principal reason for this difference is that the economic-optimal GME reduces the excess physicians to 2.5 percent of billets from 18 percent of billets in the fixed GME case. This difference is an accurate reflection of the annual cost differences between the steady states of the two models.

To the degree that these excesses don't exist in execution, the model exaggerates the cost savings from using the economic-optimal GME. But, the excesses also mean that the Services are not currently meeting all of their requirements. To estimate the actual cost savings that would result from using the economic-optimal GME program, we have removed the costs of the excesses to make a comparison of cost in an environment that reflects more how the Services operate. Note that in doing this we are effectively *not* fixing GME or meeting all of the seniority requirements. To meet these requirements forced the model to have excesses; therefore, by removing the costs of the excesses, we are not meeting all requirements. That said, annual costs without excesses are $1.73 billion in the fixed GME model and $1.67 billion in the economic-optimal GME model. This means that using the economic-optimal GME would save about $61 million.

Costs also decrease because the model is less constrained in finding the mix of accessions that will most cost-effectively meet requirements. Again, we note that the economic-optimal GME model for the Navy exaggerates the reduction in the number of GME starts because it assumes that all USUHS and AFHPSP direct accessions serve a GMO tour. Historically, we know that not all do so. This means that the cost savings in the Navy model are exaggerated as well.

Comparing the cost results for the fixed and economic-optimal GME models, we've shown that in both models increasing the AFHPSP ADO to 5 years results in cost savings. However, these cost savings are greater when the model uses the economic-optimal GME ($113 million) than when we assume that the size of the GME program is fixed ($68 million). More can be saved when the model uses the economic-optimal GME because we allow it to eliminate AFHPSP direct accessions it doesn't need to fill billets and experience requirements.

Comparing the costs between the fixed and economic-optimal GME models when we increase the AFHPSP ADO to 6 or 7 years, we showed that costs increase in the fixed model and decrease in the economic-optimal model. We conclude that increasing the AFHPSP ADO to 6 or 7 years is a bad idea from a cost standpoint unless the Services are willing to reduce the size of the in-house GME program. The cost savings that DoD could realize by increasing the AFHPSP ADO result

largely from the elimination of some AFHPSP direct accessions it would no longer need to fill billets or experience requirements.

Timing of cost savings. The cost savings we've shown are annual cost savings in the steady state. Because of the time it takes to put physicians through the training pipeline—both medical school and GME—and to gain enough experience to fill seniority requirements, the steady state is many years off. That said, some cost savings would begin to accrue in the first year the AFHPSP ADO is changed because there would be fewer AFHPSP students, as table 11 shows. Historically (FY 1998-2001), the MHS had about 811 new AFHPSP matriculants each year. Assuming that all are 4-year scholarships, this would give a total student load of 3,244. By using the economic-optimal GME and a 5-year AFHPSP ADO, annual matriculants could be cut by 24 percent to 618 annually. This reduction in scholarships would save $9 million in the first year and $18 million in the second year because the student load would be reduced again by a second group of 618 matriculants. By the fourth year and beyond, the annual savings would be $36 million.

Table 11. Cost savings from decreased physician AFHPSP student load

	4-year ADO	Cost by year with a 5-year AFHPSP ADO			
		1st year	2nd year	3rd year	4th year
Annual AFHPSP matriculants	811	618	618	618	618
Total AFHPSP students	3,244	3,051	2,858	2,665	2,472
Cost per student ($K)	46	46	46	46	46
Total annual costs ($M)	151	142	133	124	115
Annual savings ($M)		9	18	27	36

In addition to the AFHPSP scholarship savings, savings in reduced GME costs would begin to accrue five years after the change in the AFHPSP obligation. At this point, the first group of AFHPSP accessions with the 5-year ADO would have completed medical school and their internship year and would now be starting a residency program. Because using the economic-optimal GME program means few GME positions in aggregate, there would be savings of $104,000 annually for every GME position that is no longer needed.[21]

21. The cost of GME training is from the life-cycle-cost study [3].

Long-term savings would come from two sources. First, savings would result from adjusting the accession mix to the most cost-effective accession mix to meet requirements. Second, savings result from the improved continuation and retention due to the ADO change. For example, as a result of an AFHPSP ADO increase from 4 to 5 years, we estimate that the expected years of practice for OB/GYN specialists in the Air Force would increase from 4.94 years to 6.45 years. As a result, the cost per year of practice would fall from $278,000 to $255,000.[22] The cost per year of practice falls because accession and training costs for medical school and GME are amortized over 6.45 years rather than 4.94 years.

Findings

We have drawn from our analysis the following findings in relation to the continuation and retention aspects of an AFHPSP ADO increase. First, increasing the AFHPSP ADO does not automatically translate into an increase in the effective ADO for all AFHPSP direct accessions. Whether it does depends on the specialty and the career path. Because the AFHPSP and GME ADOs are served concurrently, for those specialties with a 5- or 6-year ADO, increasing the AFHPSP ADO from 4 to 5 years doesn't increase the number of years they are obligated following GME. In addition, for physicians who serve a 2-year GMO tour before beginning a residency program that is 3 years or longer, increasing the AFHPSP ADO from 4 to 5 years doesn't increase the number of years they are obligated following GME.

Second, an additional year of obligated service increases the average years of practice as a fully trained specialist more for AFHPSP direct than for deferred accessions. For example, going from a 4- to a 5-year ADO for general surgeons who are AFHPSP direct accessions increases the average years of practice by 2.1 years. In comparison, this same ADO increase would be 1.2 years for AFHPSP deferred accessions. The reason AFHPSP direct accessions have a larger

22. The $255,000 figure includes an adjustment to retirement accrual costs to reflect the greater likelihood of reaching retirement eligibility.

increase is that they are closer to retirement eligibility than their deferred counterparts.

Third, assuming that the mix of AFHPSP direct and deferred accessions would remain the same as it has historically, if DoD increased the AFHPSP ADO to 5 years, it would reduce accession requirements by 19 percent. Similarly, going to a 6-year ADO would reduce accession requirements by 32 percent; going to a 7-year ADO would mean a 43-percent reduction. However, it is unlikely that this assumption would hold because the changing retention behavior would change the optimal mix of AFHPSP direct and deferred accessions.

Fourth, using the LCC model to find the optimal mix of accessions, we found that the degree to which AFHPSP accession requirements can decrease as a result of an ADO increase depends on whether the size of the in-house GME programs can be changed. If the size cannot be changed, increasing the AFHPSP ADO from 4 to 5 years reduces the AFHPSP accession requirements by 22 percent and would save about $68 million annually. In our model with economic-optimal GME, by increasing the AFHPSP ADO from 4 to 5 years, AFHPSP accession requirements fall 24 percent and would save $113 million.

Fifth, using the economic-optimal GME would result in substantial reductions in AFHPSP requirements and cost savings without any ADO increase. Using the LCC model, we estimate that if the size of the in-house GME programs is the economic optimum, AFHPSP accession requirements could fall 13 percent and save $61 million compared with a 4-year ADO when GME is fixed.

Sixth, using the economic-optimal GME results in more GME positions in some specialties and fewer in others. In general, GME starts increase in specialties where the size of the GME program is insufficient to meet experience requirements. On an MHS level, these specialties include general surgery, neurology, neurosurgery, ophthalmology, pathology, and preventive medicine. Also, the number of GME starts was generally less in the economic optimum case compared with the fixed case for specialties where FAP is a feasible accession source. These specialties include family practice, internal medicine, and pediatrics.

Seventh, increasing the AFHPSP ADO further to 6 or 7 years would further cut AFHPSP accession requirements whether GME is fixed or is the economic optimum. But, accession requirements would decrease more if the number of GME positions were the economic optimum.

Eighth, increasing the AFHPSP ADO to 6 or 7 years would reduce costs in the economic-optimal case and increase costs in the fixed case. Costs would increase in the fixed case because the model is forced to bring in many AFHPSP direct accessions to fill GME positions, although it doesn't need these accessions to fill billets.

Finally, when we assume that GME is fixed, increasing the AFHPSP ADO does not change the number of AFHPSP direct accessions because the model must have the same number to fill GME positions. All of the cuts in AFHPSP accessions are cuts in deferred accessions. In comparison, as we increase the AFHPSP ADO, the number of AFHPSP direct accessions falls, whereas the number of deferred accessions rises when we find the economic-optimal GME. This occurs because increased retention means that fewer GME positions are needed to fill seniority requirements, which allows the model to rely more on AFHPSP deferred accessions to fill the remaining billets.

Impact on applicant pool

Up to now, we have focused on estimating the impact on an AFHPSP ADO increase in terms of continuation and retention, AFHPSP accession requirements, and costs. The result is that increasing the AFHPSP ADO from 4 to 5, 6, to 7 years will lower AFHPSP accession requirements by 24, 36, and 44 percent, respectively, when we assume that the size of the GME program is the economic optimum. This section focuses on whether changing the ADO for AFHPSP is feasible in terms of having a sufficient applicant pool—both in quantity and quality—to support the reduced AFHPSP accession requirement.

Given a change in the AFHPSP ADO from 4 to 7 years, if the applicant pool were to remain constant in terms of the number and quality of applicants, the Services would have no problem filling reduced AFHPSP accession requirements. The difficulty is that, if DoD increases active duty commitment without any increase in the benefit to the AFHPSP recipient, we assume that the number of medical students willing to consider and accept an AFHPSP scholarship will decrease. The crucial question here is whether a reduced applicant pool would still be sufficient in quantity and quality to support the lower accession requirement.

Because there is no history of changes in the AFHPSP ADO from which to estimate the impact on the applicant pool, we approached this question of feasibility in two parts. First, we looked at the Services' historical applicant pool in terms of size and quality. To put these findings in context, we present similar information for the national medical school applicant pool and for the Uniformed Services University of the Health Sciences (USUHS). This allows us to assess any significant trends in size or quality, but it doesn't tell us how the applicant pool will change.

Second, to estimate how the applicant pool might change, we have culled the perceptions of both medical recruiters and current

AFHPSP medical students on the impact an increase in the AFHPSP ADO would likely have on the ability to recruit AFHPSP accessions and the willingness of medical students to consider and accept an AFHPSP scholarship.

Throughout this section, we report various distinctions between the allopathic and osteopathic applicants. Allopathic physicians are the traditional doctors of medicine (MDs), and osteopathic physicians are doctors of osteopathy (DOs). Both may prescribe medication and perform surgery. The difference between the two lies in the philosophy of these branches of medicine. Allopathic medicine has been around for several centuries; osteopathic medicine was founded in 1874 by Andrew Taylor Still, who focused on treating the whole person. There are 125 allopathic medical schools and 20 osteopathic medical schools in the United States [17-18].

National applicant pool

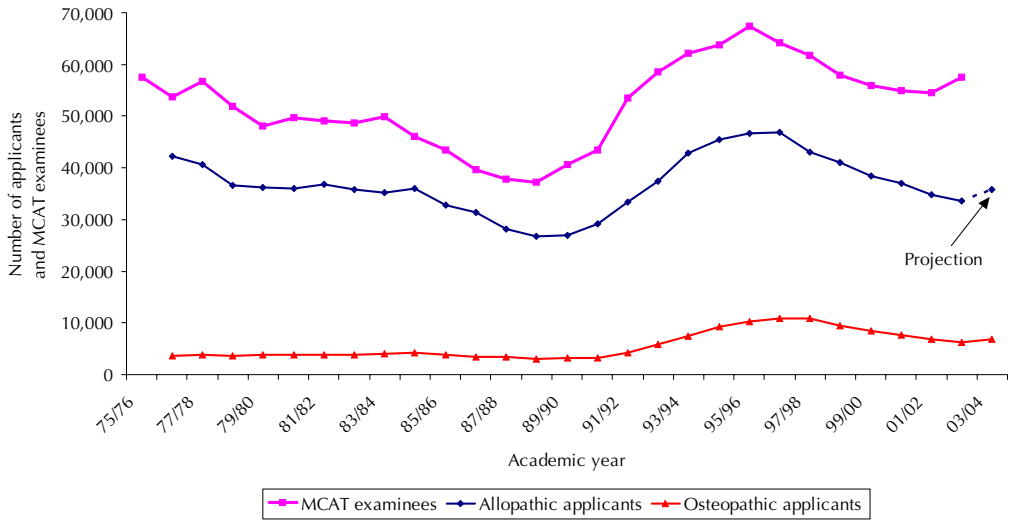
Nationally, the number of applicants to both allopathic and osteopathic medical schools has fallen substantially between the 96/97 and 02/03 academic years. Specifically, applicants to allopathic schools fell 28 percent over this period from 46,965 to 33,625 [19]. At the same time, applicants to osteopathic schools fell 41 percent from 10,781 to 6,324 [18]. Although the trend over this period may be alarming, when we look at it over a larger time frame, it seems to be a normal cyclical fluctuation in applicants, as figure 4 shows.

Reference [20] indicates that medical school applicants are strongly influenced by government policies and socioeconomic trends. In particular, draft deferment policies during the Vietnam War influenced many students toward graduate and professional degrees. This trend in increased medical school enrollment reversed with the start of the all-volunteer force. Similarly, the 1991 changes to the MCAT began another trend of increasing medical school applicants [21].

It may be difficult to say definitively why there has been the drop in medical school applications since 1996, recent research conjectures that it may be the result of changes in labor market conditions that have affected many professional and graduate programs, not just

medical schools [21]. This research points out that "the declining numbers may be a reflection of a very strong labor market which has created attractive career opportunities for college graduates in many fields who otherwise might have considered entering medicine." We can extend this reasoning further to provide an explanation for the projected 4- to 6-percent increase in medical school applications for the 03/04 academic year [23].[23] This seems a reasonable explanation because poor job markets for new college graduates tend to increase the number of applicants to professional and graduate schools.

Figure 4. MCAT examinees and applicants to allopathic and osteopathic medical schools[a]

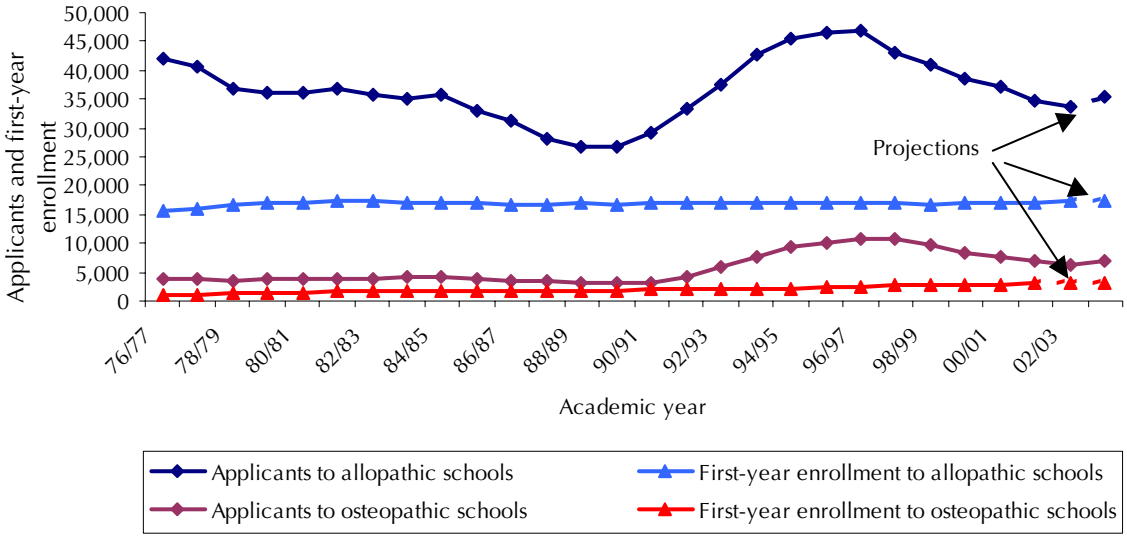


a. Data are for the Association of American Medical Colleges (AAMC) [17, 19, and 22] and the American Association of Colleges of Osteopathic Medicine [18]. The projected number of allopathic medical school applicants for 03/04 is our projection based on the historical relationship between MCAT examinees and applicants since 1991.

23. Another factor is that the number of applicants to both allopathic and osteopathic medical schools in a given year is clearly linked to the number of MCAT examinees from the previous year [21]. The projected increase in medical school applicants for 03/04 is based on the fact that the number of MCAT examinees increased by 5.6 percent from 54,503 in 01/02 to 57,573 in 02/03.

In contrast to the cyclical nature of the number of applicants to medical school, the number of first-year enrollees in allopathic medical schools has been very stable since 1980 at about 17,000 each year, as figure 5 shows.[24] Over the same period, however, the number of first-year enrollees to osteopathic medical schools has doubled from about 1,500 in 1980 to about 3,000 in 2001.

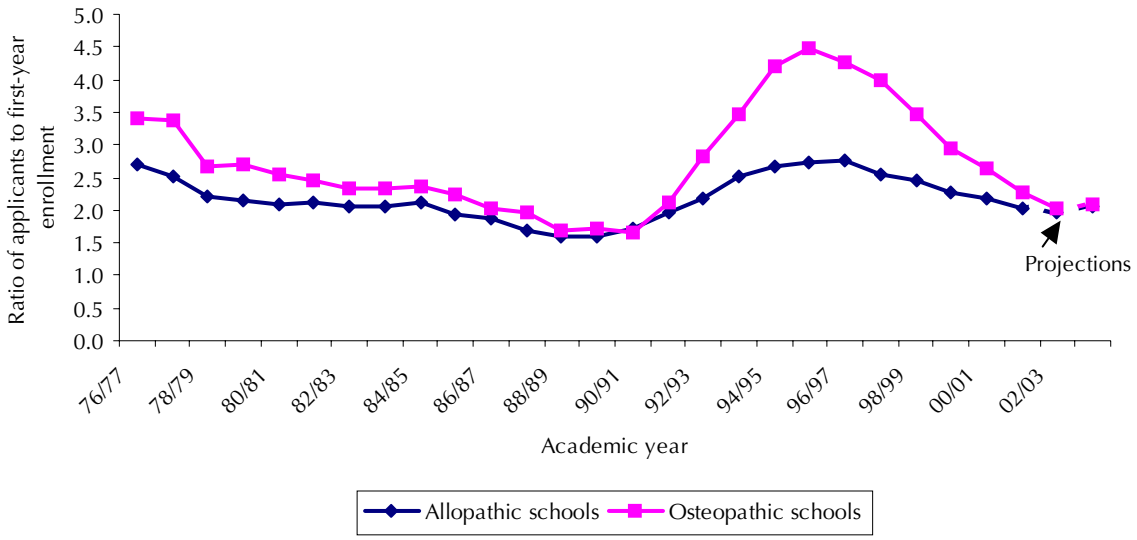
Figure 5. Applicants to and first-year enrollment of allopathic and osteopathic medical schools



Another important measure is the ratio of applicants to matriculants. A high applicant-to-matriculant ratio indicates high demand for medical schools, which allows medical schools to be more selective in admissions. Presumably, this means that the average quality of those selected for medical school will be higher than when the applicant-to-matriculant ratio is small. As we've already noted, the number of applicants to both allopathic and osteopathic medical schools fluctuates substantially over time, but the first-year enrollment is much more stable. Consequently, the ratio of applicants to first-year enrollment has varied substantially over time, as figure 6 shows.

24. See reference [24] for a discussion of medical school capacity over time.

Figure 6. Ratio of applicants to first-year enrollment for allopathic and osteopathic medical schools



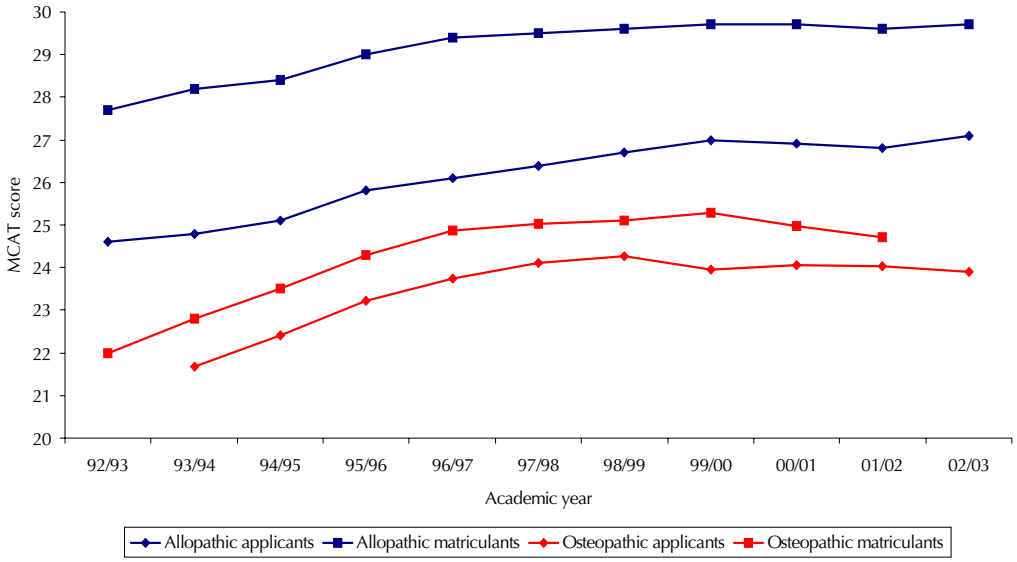
In general, this ratio follows the same pattern for both allopathic and osteopathic medical schools; however, the surge in applicants during the 1990s was disproportionately larger in osteopathic schools than in allopathic schools, as the applicants to first-year enrollment ratio reflects. For allopathic schools, this ratio has ranged between a low of 1.6 in 88/89 and a high of 2.8 in 96/97. The 02/03 ratio of 2.0 is comparable to the ratio throughout the 1980s. Also, if the projections for a high number of applicants in the 03/04 school year are correct, the ratio of applicants to first-year enrollment will increase for both allopathic and osteopathic medical schools.

Up to this point, we discussed the size of the national medical school applicant pool. We now focus on the quality of the pool in terms of MCAT scores and GPAs. These are important quality indicates for success in medical school and on the United States Medical Licensing Exam (USMLE). Research by the Association of the American Medical Colleges shows that medical school grades are best predicted by a combination of undergraduate GPAs and MCAT scores. However, MCAT scores predict USMLE scores far better than undergraduate GPAs. Furthermore, MCAT scores alone predict USMLE scores

nearly as well as undergraduate GPAs and MCAT scores combined [25]. Hence, although both quality measures are important, MCAT scores seem to be the better of the two.

Figure 7 shows the average MCAT scores for applicants and matriculants for both allopathic and osteopathic medical schools. The average MCAT scores have increased throughout the early 1990s for both applicants and matriculants to both allopathic and osteopathic medical schools. And, since 98/99, MCAT scores have been fairly stable from year to year.

Figure 7. MCAT scores of applicants and matriculants to allopathic and osteopathic medical schools

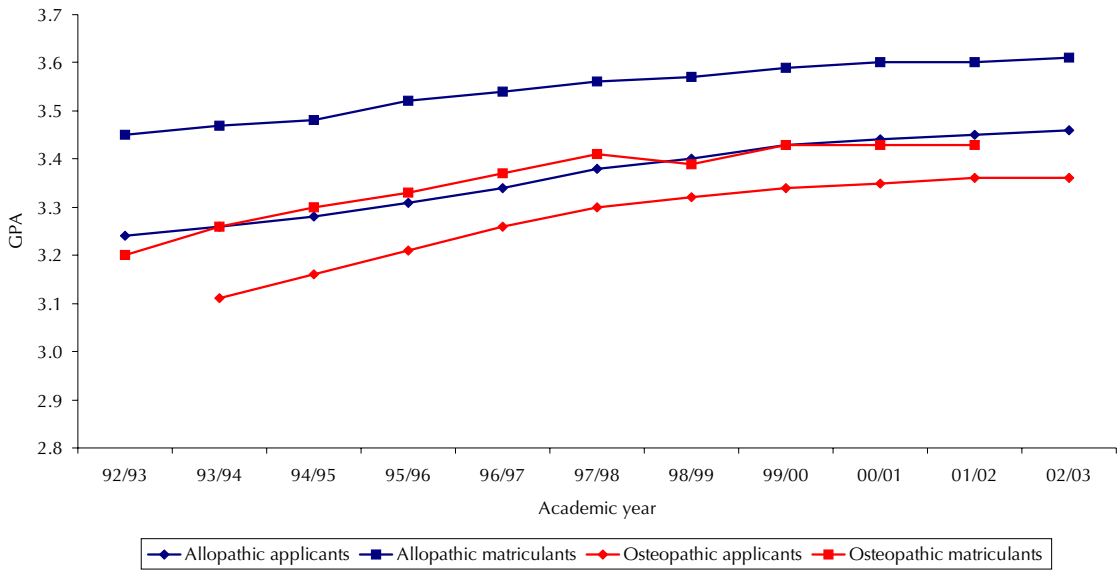


The most striking difference this figure illustrates is that MCAT scores are significantly higher for applicants and matriculants to allopathic medical schools compared to osteopathic medical schools. For example, the average MCAT scores for applicants and matriculants to allopathic medical schools was 26.8 and 29.6 in 01/02, respectively. These figures are substantially higher than the MCAT scores of 24.0 and 24.7 for applicants and matriculants to osteopathic medical schools for the same period. Also, the difference between applicant and matriculant MCAT scores throughout the 1990s is systematically

higher for allopathic medical schools (3 points) than for osteopathic medical schools (1 point).

The patterns for GPAs are similar to those for MCAT scores, as figure 8 shows. Specifically, GPAs for applicants and matriculants to allopathic and osteopathic medical schools trend upward throughout the 1990s. GPAs for allopathic applicants are systematically higher than for their osteopathic counterparts, and the same pattern holds for matriculants. As with MCAT scores, we observe that the difference in GPAs for applicants and matriculants is systematically higher for allopathic (0.18) than for osteopathic (0.10) schools.

Figure 8. GPAs of applicants and matriculants to allopathic and osteopathic medical schools



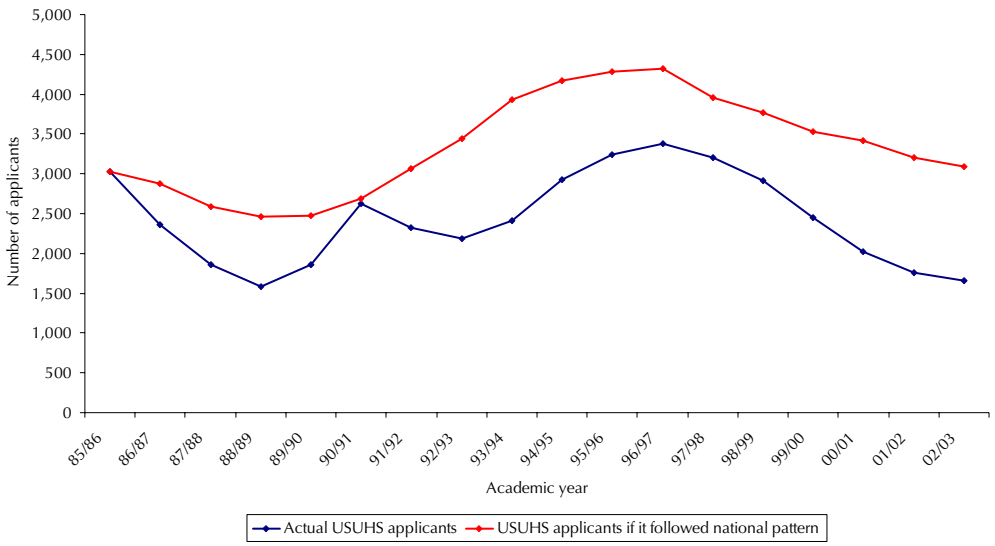
Although MCAT scores and GPAs have trended upward throughout the 1990s, we don't automatically conclude that the quality of the medical school applicants and students is better now than a decade ago. One could certainly argue that a gradual rise in MCAT scores could be expected for a few years after the 1991 changes in the exam as examinees and those who help them prepare becoming more familiar with the exam. Similarly, rising GPAs could be a function of grade inflation that many believe has occurred in recent years. What

is clear is that these data don't point to a decline in the quality of medical school applicants nationally over the last decade.

USUHS's applicant pool

The number of USUHS applicants has fallen by 51 percent from 3,380 for the 96/97 academic year to 1,658 in 02/03. Though this downward trend is unmistakable, it is a reflection of the national downward trend. Figure 9 shows the number of USUHS applicants by year since 85/86 compared with the number of USUHS applicants there would have been if the number of USUHS applicants paralleled the trends in the number of national applicants since 85/86. By doing this, we observe that USUHS applicants have not been as high as they would have been if they mirrored the national trend perfectly. But, it is equally clear that the cyclical pattern of USUHS applicants is very similar to the national pattern.

Figure 9. Actual USUHS applicants and estimated USUHS applicants if the number of USUHS applicants followed the national trend



Just as the national number of allopathic medical school matriculants has been about 17,000 since 1980, USUHS's matriculants have also

been stable at about 165 each year since 1985. This means that the fluctuation in USUHS's ratio of applicants to matriculants follows the same trend as the number of applicants. Specifically, the ratio was 18.7 in 85/86 and fell to a low of 9.5 in 88/89. From there it rose to 20.5 when both the national and USUHS applicants peaked in 96/97. Since then, it has declined to 9.9 in 02/03. If USUHS applicants follow the expected national increase in the number of applicants, the ratio of applicants to matriculants should increase in 03/04.

Table 12 lists the average MCAT scores and GPAs of USUHS applicants and matriculants from FY 1997-2001. The average MCAT score of applicants was fairly stable, ranging between 26.5 and 27.1. However, the average MCAT scores of matriculants has declined somewhat from 30.3 in FY 1998 to 28.8 in FY 2001. This decline in the average MCAT score is significant at the 1-percent level.

Table 12. Average MCAT scores and GPAs of USUHS applicants and matriculants

	Applicants			Matriculants		
Fiscal year	Number	Average MCAT	Average GPA	Number	Average MCAT	Average GPA
1997	3,205	26.7	3.31	165	29.9	3.55
1998	2,916	26.8	3.33	165	30.3	3.55
1999	2,449	26.8	3.33	165	29.7	3.52
2000	2,021	27.1	3.38	167	29.8	3.55
2001	1,766	26.5	3.38	167	28.8	3.55
2002[a]	1,667			167		

a. We have not reported the average MCAT scores and GPAs for FY 2002 because of the high percentage of missing data. Specifically, these data were missing for 55 percent of matriculants and 80 percent of nonmatriculants. Because the percentages of missing data are not the same between these groups, we are not confident that computing averages from the remaining observations will be representative of the whole.

Looking at average GPAs, we do not see a significant trend for matriculants. These GPAs range between 3.52 and 3.55 during the FY 1997-2001 period. The average GPAs of applicants rose from 3.31 in FY 1997 to 3.38 in FY 2001, but this trend is not significant. We are also interested in the distribution of the MCAT scores and GPA of matriculants and nonmatriculants. Averages convey important information about the trends over time, but they don't provide information about how broad or narrow the distribution is. To this end, figures 10 and 11

present the distribution of MCAT scores and GPAs of matriculants and nonmatriculants over the FY 1997-2001 period.

Figure 10. Distribution of MCAT scores of USUHS matriculants and nonmatriculants

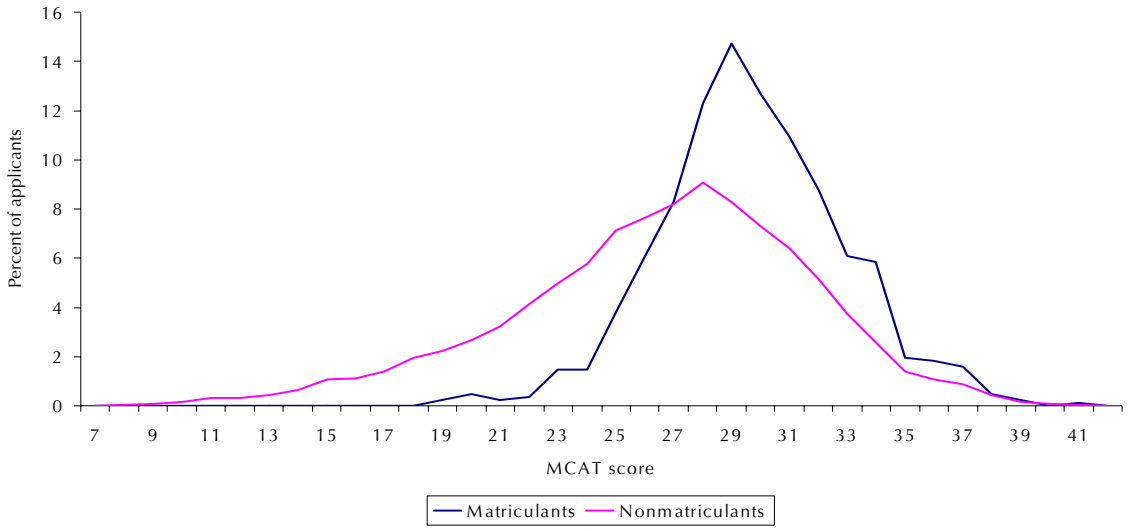
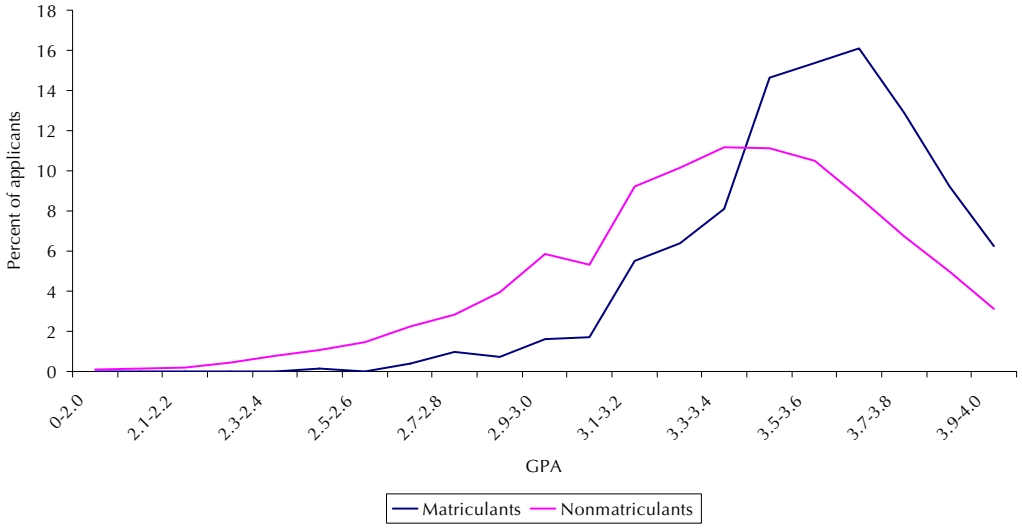


Figure 11. Distribution of GPAs of USUHS matriculants and nonmatriculants



These distributions show that variance of the matriculants' MCAT scores is considerably narrower than that of nonmatriculants with a higher average, as we've already discussed. Most interesting is the fact that many nonmatriculants have high MCAT scores as well. However, we need to point out that a nonmatriculant is not synonymous with a nonselect. For example, in FY 2000, USUHS had 2,021 applicants. It invited 546 of these for an interview, and 495 of these accepted the interview invitation. USUHS eventually offered 279 applicants an acceptance, and 167 of these accepted. The point of all of this is that nonmatriculant group has many candidates of good quality.

We see similar patterns in the distribution of matriculant and nonmatriculant GPAs. As with MCAT scores, the matriculant distribution has a smaller variance and is concentrated in the higher GPAs. Another similarity is that the nonmatriculant GPAs include many applicants with high GPAs.

Services' applicant pools

To the degree it is possible, this section examines the Services' applicant pools using the indicators we used in looking at the national medical school applicant pool and the USUHS applicant pool. Specifically, we compare the quantity and quality of the applicant pool with national and USUHS figures where possible.

Applicants, selectees, and matriculants

Table 13 shows the number of applicants, selectees, and matriculants by Service for FY 1998-2002.[25] The fact that there does appear to be a slight downward trend over the last 4 or 5 years is consistent with the national trend. The numbers of applicants and matriculants fluctuate somewhat from year to year. These fluctuations may be driven by var-

25. These figures are from the applicant data the Services provided us and don't necessarily match the attainment figures we obtained from each Service's recruiting command. Though the numbers may be somewhat higher or lower than actual, it is the best representation we have of the applicant pool, and we assume that the trends we derive from these figures are accurate representations.

ious market factors, recruiting incentives, and goals, as we discuss in a later section. One of the key indicators of the Services' ability to fill scholarship positions is the ratio of applicants to matriculants. Based on the data the Services provided, we estimate that this ratio is 1.52 in the Army, 1.56 in the Navy, and 1.93 in the Air Force.[26] It seems logical that the applicant-to-matriculant ratio is highest in the Air Force because its number of matriculants each year is usually lower than that of the Army or Navy.

Table 13. Applicants, selectees, and matriculants by Service (FY 1998-2002)

Category	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	Average
Army						
Applicants	505	461	448	440	473	
Matriculants	330	282	293	299	325	
Ratio of app. to mat.	1.53	1.63	1.53	1.47	1.46	1.52
Navy						
Applicants	692	528	424	556		
Selectees	644	486	390	494		
Percentage selected	93	92	92	89		92
Matriculants	455	297	281	380		
Percentage matriculating	71	61	72	77		70
Ratio of app. to mat.	1.52	1.78	1.51	1.46		1.56
Air Force						
Applicants	483	747	457	419	389	
Matriculants	251	252	258	282	247	
Ratio of app. to mat.	1.92	2.96	1.77	1.49	1.57	1.93

26. Obviously, a higher applicant-to-matriculant ratio means that the Services can be more discriminating, but it is not clear to us what the Services consider the minimum ratio to ensure they will be able to pick quality candidates. What is clear is that using the ratio of national medical school applicants to matriculants to compare the AFHPSP applicant-to-matriculant ratio is not an apples-to-apples comparison. The national applicant-to-matriculant ratio is for medical school admission, whereas the AFHPSP applicant-to-matriculant ratio is for medical school matriculants who are applying for a scholarship.

The acceptance process has three phases or pools. First, there is the pool of applicants—all those who applied for a scholarship. These applications then go before a selection board to determine if the Service will offer them a scholarship. Selectees are the ones who pass the selection board process. For example, in the Navy (the only Service for which we have selection board data), about 92 percent of those considered by the selection board were selected for a scholarship. In addition, the Service may classify its selectees into first selects and alternates or wait-list selects. This second group would be offered a scholarship only if not all of the first selects fill all of the available scholarships. The Army also uses an automatic acceptance criteria (AAC). These are candidates, who by virtue of meeting or exceeding an established quality level, bypass the selection board and are automatically selected and offered a scholarship.

Obviously, not all those who are offered a scholarship accept. According to the Navy data, about 70 percent of selectees matriculate into the scholarship program. Although we don't have data on why selectees don't matriculate, some perceptions are that (1) they accepted a USUHS position, (2) they accepted a scholarship from another Service, and (3) they got "cold feet" about the active duty commitment.

GPAs

Table 14 shows the average GPAs of applicants and matriculants for each Service compared with USUHS and national applicants. Specifically, the average GPA for Army applicants was about 3.51, which was only slightly less than the average of 3.53 for matriculants. The figures in the Navy are quite comparable to the Army. As for the Air Force, the data we have are limited to matriculants in FY 1998 and FY 2000, which had an average GPA of about 3.66.

Comparing the average GPAs for the Services with USUHS matriculants, we observe that the USUHS average of about 3.54 is essentially the same as the Army (3.53) and Navy (3.54). These figures are also quite similar to the national average for allopathic and osteopathic medical students of 3.56. It is apparent that the average GPA has been relatively constant over the FY 1998-2002 period nationally as well as for the Services and USUHS.

Table 14. GPAs of applicants and matriculants by Service

Category	FY98	FY99	FY00	FY01	FY02
Applicants					
Army	3.51	3.49	3.52	3.53	3.50
Navy	3.49	3.49	3.51	3.50	
USUHS	3.33	3.33	3.38	3.38	3.37
National					
Allopathic	3.40	3.43	3.44	3.45	3.46
Allo. and osteo.	3.38	3.41	3.42	3.44	3.44
Matriculants					
Army	3.52	3.54	3.53	3.56	3.51
Navy[a]	3.54	3.53	3.54	3.53	
Air Force	3.64	3.69	3.64		
USUHS	3.55	3.52	3.55	3.55	3.44
National					
Allopathic	3.57	3.59	3.60	3.60	3.61
Allo. and osteo.	3.54	3.57	3.57	3.57	

a. The average GPAs for Navy selectees for FY 1998-2001 were 3.52, 3.53, 3.55, and 3.54, respectively, which are very similar to the Navy matriculant averages.

MCAT scores

Table 15 shows the average MCAT scores of applicants and matriculants by Service compared with USUHS and national averages. Unlike what we saw with GPAs, average MCAT scores for matriculants has declined for the Army and Navy. Specifically, the average MCAT score for Army matriculants fell from 28.0 in FY 1998 to 27.0 in FY 2002. Similarly, the average MCAT score for Navy matriculants fell from 29.2 to 28.1 between FY 1998 and FY 2001. We observed a similar pattern for USUHS matriculants, which had an average MCAT score of 30.3 in FY 1998 compared with 28.8 in FY 2001. In contrast, average MCAT scores of medical school matriculants nationally have remained stable over this period at about 29.0.

In addition to this downward trend, we observe that the average MCAT score of matriculants in the Army and Navy are less than the average for medical school matriculants nationally. Specifically, Army matriculants' MCAT scores averaged 27.9 for the FY 1998-2002 period, or 1.1 points less than the national average of 29.0. Similarly, the Navy's average of 28.5 was 0.5 points less than the national average.

Table 15. MCAT scores of applicants and matriculants by Service

Category	FY98	FY99	FY00	FY01	FY02
Applicants					
Navy	28.8	28.0	28.0	27.5	
USUHS	26.8	26.8	27.1	26.5	
National					
Allopathic	26.7	27.0	26.9	26.8	27.1
Allo. and osteo.	26.2	26.5	26.4	26.3	26.6
Matriculants					
Army	28.0	28.5	28.1	27.7	27.0
Navy[a]	29.2	28.3	28.3	28.1	
USUHS	30.3	29.7	29.8	28.8	
National					
Allopathic	29.6	29.7	29.7	29.6	29.7
Allo. and osteo.	28.9	29.0	29.0	28.8	

a. The average MCAT scores for Navy selectees for FY 1998-2001 were 29.1, 28.4, 28.4, and 28.1, respectively, which are very similar to the Navy matriculant averages.

Comparing USUHS matriculants average MCAT scores with the national average for allopathic matriculants, we see that they are about the same for the FY 1998-2001 period. The USUHS average over this period was 29.6 compared with 29.7 nationally.

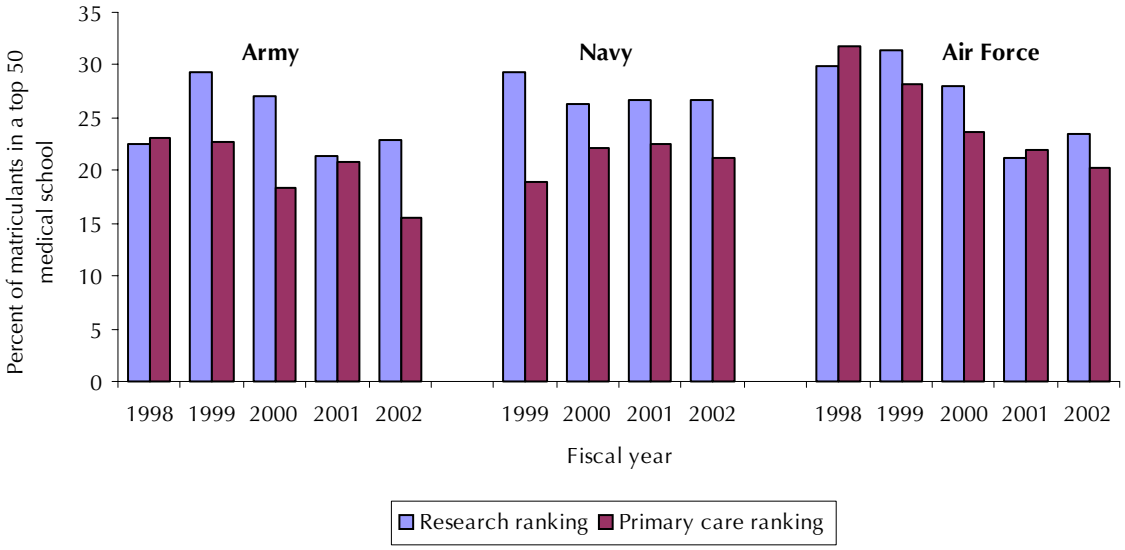
Medical school rankings

In addition to GPAs and MCAT scores, another measure of the quality of AFHPSP medical students is the distribution of medical schools they attend. To analyze this issue, the Services provided us with the name of the medical school for each of their AFHPSP students. Using this information, we determined the ranking of each person's medical school using the 2002 ranking of the top 50 medical schools from *U.S. News and World Report* [26], which publishes two rankings for schools of medicine—one for research and the other for primary care. Although many schools are in the top 50 in both categories, several schools are in the top 50 in one but not the other.

As a first measure, we have estimated the percentage of AFHPSP medical students who are in one of the top 50 medical schools, as figure 12 shows. For the FY 1998-2002 period, usually between 20 and 30 percent of AFHPSP medical students were in one of the top 50 medical

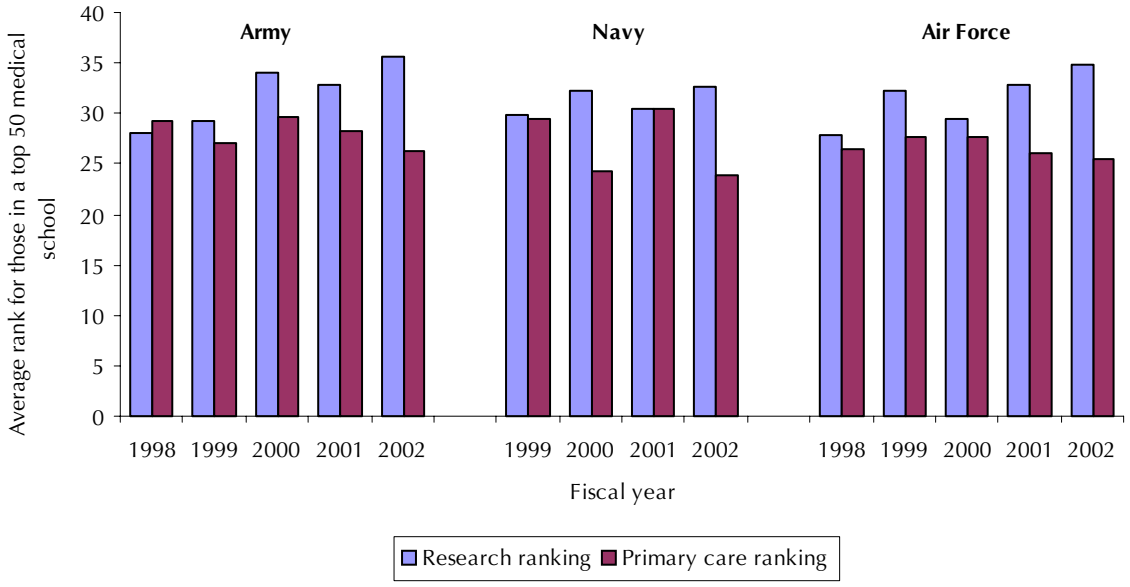
schools—both research and primary care. For the Army and Navy, there isn't a definite downward trend in the percentage of AFHPSP students that are ranked in the top 50 for research, but there is a downward trend for the Air Force. Looking at the primary care rankings, the percentage of AFHPSP students ranked in the top 50 is trending downward in the Air Force and Army, but not in the Navy.

Figure 12. Percentage of AFHPSP matriculants in a top 50 medical school by ranking type



In addition to the percentage in a top 50 medical school, we examined the average numerical ranking of those who are in a top 50 medical school. As figure 13 shows, the average research ranking is generally between 30 and 35 for the FY 1998-2002 period. For the primary care rankings, the average rank is typically between 25 and 30 for this period. There appears to be an upward trend—*meaning a poorer ranking*—in the research rankings for each Service. In contrast, there doesn't appear to be a definite trend up or down in the primary care ranking.

Figure 13. Average ranking for those in a top 50 medical school by ranking type

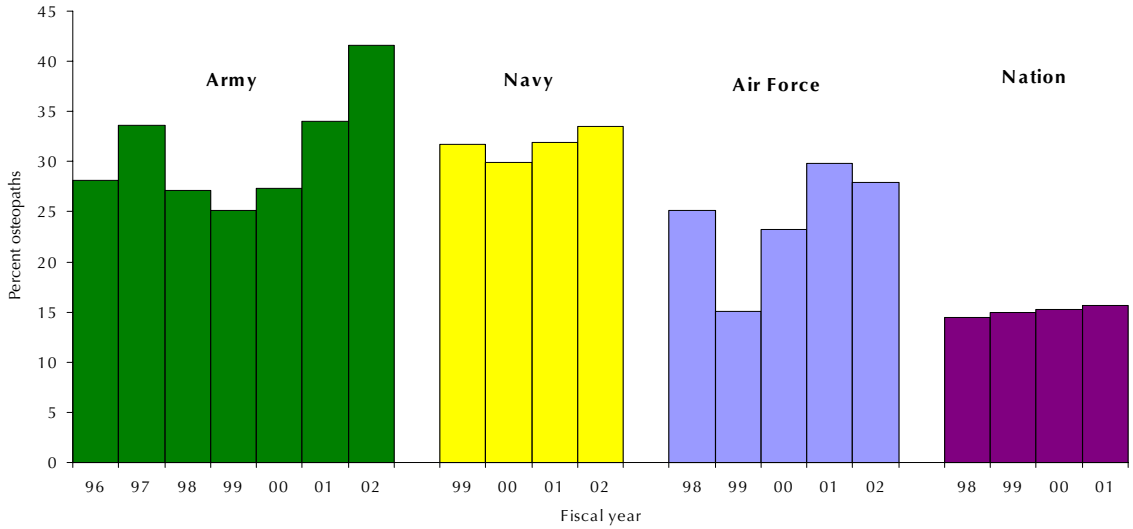


Allopathic and osteopathic mix

As previous sections show, allopaths and osteopaths differ in terms of GPAs and MCAT scores. Because of these differences, we explored whether the Services give scholarships to a disproportionate share of osteopathic medical students. As figure 14 shows, osteopathic medical students make up about 15 percent of all medical students. This percentage has increased slightly between 1998 and 2001 because, although first-year enrollment to allopathic schools has remained stable at about 17,000 each year, the first-year enrollment in osteopathic medical schools has increased from 2,745 in 1998 to 3,043 in 2001 [18]. In contrast, osteopathic medical students account for about 30 percent of those with an AFHPSP scholarship, or double the national average.[27]

27. One potential reason why osteopathic medical students make up a higher percentage of AFHPSP students than medical students nationally is that, according to some recruiters, the osteopathic schools place more emphasis on AFHPSP scholarships as a way to pay for medical school more than allopathic schools do.

Figure 14. Percentage of matriculants who are osteopaths by Service



The mix of osteopathic and allopathic students in AFHPSP is important in explaining why the AFHPSP students have lower MCAT scores than the national average. As discussed previously, the difference in the average MCAT scores of allopathic and osteopathic medical students was 4.8 between 92/93 and 01/02. Hence, even if the average MCAT of allopathic (osteopathic) students in AFHPSP have the same average as allopathic (osteopathic) students nationally, the average MCAT score in the Services will be less because of the disproportionate number of osteopathic students.

Recall that the average MCAT scores for Army and Navy matriculants were 27.9 and 28.5, respectively, for the FY 1998-2002 period. The national average for this period was 29.0. This average is based on a mix of about 85 percent allopathic students and 15 percent osteopathic students. If, however, we compute a national average using a mix of 70 percent allopathic students and 30 percent osteopathic students (which is about the mix in AFHPSP), the average national MCAT score would be 28.3. This notional average is about the same as the Army (27.9) and Navy (28.5) averages. Hence, it doesn't appear that allopathic or osteopathic AFHPSP students have lower MCAT scores compared with their counterparts nationally. But, the average

for all AFHPSP students is lower than the national average because it has a disproportionate share of osteopathic medical students.

Overlap of USUHS and AFHPSP applicant pools

Service and USUHS representatives believe that there is some overlap in the AFHPSP and USUHS applicant pools and also between the Services' AFHPSP applicant pools, but the evidence is only anecdotal. We make a first attempt in this section to quantify the overlap. In a later section, we again look at this issue.

For this study, USUHS and the Services supplied us with data, including Social Security Numbers (SSNs) for matriculants and nonmatriculants of their programs. The data enabled us to match the various applicant pools and determine how much overlap there is. As table 16 shows, about 20 percent of each Service's AFHPSP applicant pool also applied to USUHS. From USUHS's perspective, about 12 percent of its applicants also applied to AFHPSP. Comparing USUHS nonmatriculants with AFHPSP matriculants, about 18 percent of each Service's AFHPSP matriculants applied to USUHS. From USUHS's perspective, about 8 percent of its nonmatriculants received an AFHPSP scholarship.

Table 16. Overlap between USUHS and Services' AFHPSP applicant pools (FY 1998-2001)

Groups		Percentage of each Services' AFHPSP also in USUHS			Percentage of USUHS also in AFHPSP[a]
USUHS	AFHPSP	Army	Navy	Air Force	
Applicants	Applicants	19.5	21.7		11.5
Nonmatriculants	Applicants	16.4	18.6		12.4
Nonmatriculants	Matriculants	17.0	19.1	18.1	8.0
Nonmatriculants	Nonmatriculants	15.4	17.7		4.5

a. The Air Force data for non-matriculants did not have SSNs. Consequently, we could not directly match USUHS applicants to Air Force non-matriculants or applicants. The percentage of USUHS applicants in the AFHPSP applicant pool, we estimated the Air Force-USUHS overlap using the average of the Army and Navy percentages.

Looking at the overlap between the Services applicant pools, we were limited to comparing the Army and Navy pools because we don't have SSNs for the Air Force nonmatriculants. We found that between FY 1998 and FY 2001, there were 3,843 people who applied to one or

both Services. Specifically, 212, or 5.5 percent, applied to both the Army and the Navy.

Recruiting

This section presents the results of a series of telephone interviews conducted with representatives of the medical recruiting components of the Army, Navy, and Air Force. The purpose of these interviews was to understand how the Services recruit AFHPSP medical school students, factors that affect recruiting, and recruiters' perceptions of how increases in the ADO might influence their ability to recruit AFHPSP medical students. In addition, we requested historical data during the interviews relative to goals, attainment, and competition/incentive models. We conducted the interviews with personnel at the respective headquarters, geographical area command, and individual field recruiter levels. We intend for the following synthesis of the interviews we conducted to augment the quantitative aspects of this report and garner the perceptions of those frontline personnel directly involved in the recruitment of medical professionals.

Recruiting costs

Before we discuss these interviews, we want to point out that each of the Services uses a significant amount of resources to recruit health professionals into the military. In the LCC study [3], we estimated the average cost of recruiting health professionals for each of the Services (see table 17). Specifically, we estimated recruiting costs per health professional at $34,492 (Army), $25,738 (Navy), and $26,745 (Air Force). Note that these recruiting costs are for all health professions—not just physicians—and for all accessions sources (except for USUHS)—AFHPSP, direct procurement, FAP, and others.[28]

28. These recruiting costs cover all health professional accession sources except for USUHS accessions. USUHS does its own recruiting, and these costs are embedded USUHS's budget, not in each Service's recruiting costs.

Table 17. Average health professions recruiting costs (in 2002 dollars)

Item	Army[a]	Navy	Air Force
Personnel costs	15,659,000	12,376,000	14,382,000
Advertising	2,117,000	1,905,000	5,187,000
Other[b]	6,196,000	4,919,000	6,667,000
Total costs	23,972,000	19,200,000	26,236,000
Cost per recruit	34,492	25,738	26,745

a. Army health professions' recruiting costs are FY 2001 costs updated to 2002 dollars.
b. Other costs include communications, training, computer support, travel, supplies, equipment, and leased facilities. We do not have these data for the Navy. For the Army and Air Force, "other" costs account for 25.8 and 25.4 percent of total costs, respectively. Based on these figures, we estimated "other" costs for the Navy at 25.6 percent of total costs.

Breaking down recruiting costs by the type of health profession and specific accession sources is not feasible because recruiters aren't allowed to focus on one accession source, such as AFHPSP medical school students. Consequently, we cannot determine how recruiters allocate their time to the various programs or how to allocate advertising and other support costs to the various programs. However, if we were able to make this allocation, we would likely find that recruiting costs were higher for physicians than for dentists or other health professions because civilian alternatives are more lucrative for physicians. Similarly, recruiting costs would likely be higher for fully trained or FAP than they are for AFHPSP contracts because potential FAP accessions are closer to high-paying civilian employment than potential AFHPSP accessions and because FAP accessions would likely be faced with significant amounts of educational debt that AFHPSP accessions, by design, avoid.

As one might expect, personnel costs account for a majority of recruiting costs in each Service. Specifically, personnel costs account for 65, 64, and 55 percent of total recruiting costs in the Army, Navy, and Air Force, respectively. It is interesting to note that the Air Force spends $5.2 million on recruiting advertising each year, which is more than the Army and Navy combined ($4.0 million). This shows that the Services employ different allocations of resources to achieve their recruiting goals; however, we make no judgment on whether one

method is better than the others. We simply present the information for comparison.

Recruiter profile

Just as recruiting resource allocation varies across the Services, we observe that the Services differ in terms of the personnel each assigns to medical recruiting. Looking first at the Navy, they employ a blend of officers and enlisted personnel. Personnel with medical backgrounds (i.e., nurse corps officers, medical service corps (MSC) officers, and hospital corpsmen) perform the majority of the AFHPSP recruiting. However, some Navy recruiting districts (NRDs) use line officers to recruit AFHPSP as well as other medical accessions. Within medical recruiting, personnel usually spend only one tour recruiting before returning to their primary occupational field and are not considered career recruiters. Occasionally, a person will return for a second recruiting tour at the area or headquarters level.

The Army also uses a mixture of officers and enlisted members for medical recruiting, including AFHPSP. The majority of the enlisted recruiters carry the designation of "79R," indicating that they are career recruiters. Selected personnel, who have a proven record recruiting for the enlisted ranks, are given additional training and placed in medical recruiting assignments. They are usually at the E-6 or E-7 level and will spend the remainder of their Army career as recruiters. The officers assigned to medical recruiting are primarily nurses and MSCs who will spend 2 or 3 years in an assignment. On completion of their recruiting tour, they return to their primary occupation and then serve as subject matter experts for the field recruiters.

Field medical recruiting within the Air Force is performed solely by enlisted career recruiters. Similar to the Army, those selected for medical recruiting must have a proven record of success in recruiting members for the enlisted ranks. These people are then provided advanced and detailed medical recruiting training. On assignment to the medical areas, they will continue as recruiters for the remainder of their career.

Table 18 compares the types of personnel the Services assign for medical recruiting. It is interesting how each of the Services use groups

with different backgrounds and skill sets for the same job. Again, we make no judgment on which of these recruiting methods is best. We simply note that the Services' use different business practices to achieve their medical recruiting objectives.

Table 18. Cross-Service comparison of field medical recruit profiles

Recruiter characteristic	Army	Navy	Air Force
Officer or enlisted	Officer and enlisted	Officer and enlisted	Enlisted
Medical or nonmedical	NC and MSC officers and nonmed. enlisted	NC and MSC officers and hospital corpsmen	Nonmedical
1-tour or career recruiter	Officers (1 tour) and enlisted (career)	1-tour recruiters	Career recruiters

Recruiter incentives

The Army, Navy, and Air Force all have some form of competition or incentive program designed to reflect the given and competing priorities for their recruiters. The Air Force and Navy use a system of weighted points and averages scaled to reflect the importance and/or difficulty of recruiting in a given category. The Army uses a combination of incentive systems at the national and regional level. The following sections discuss each of these systems in more detail.

Navy

The Navy's officer competition system covers all officer programs, including the medical fields. The competition model is based on a system that awards points in 14 categories with a notional base of 1,000 points. Table 19 provides an overview of the categories or competitive areas. Points are awarded based on new contracts for each category coupled with bonus points for diversity, exceeding a goal, and seasonality (contracts awarded before 1 April of a fiscal year are worth more than those signed after 1 April).

Table 19 presents the relative scale of points for the average recruiting district. However, the national goal for a given category is ultimately distributed across the 31 NRDs. When the goal is distributed, the competition model adjusts the points awarded for each of the areas based on factors that include the following: market size, educational

institutions in the area, enrollment in various professional schools, historical attainment, and recruiting manpower. As the goaled amount for a given district increases, the relative number of points awarded for that category decreases. In FY 2003, for example, there are 115 base points available for medical corps AFHPSP. NRD Richmond has a goal of 13 AFHPSP medical students, meaning they are awarded 8.8 (115/13) points per new contract. NRD New England has an AFHPSP medical student goal of 16 and is awarded 7.2 (115/16) points per new contract. The difference between the points per recruit between NRD Richmond and NRD New England reflect differences in the difficulty of recruiting between these NRDs due to differences in market size, educational institutions in the area, enrollment in various professional schools, historical attainment, recruiting manpower.

Table 19. Navy recruiting point system across competitive areas

Competitive area	Notional base points	Average points per contract[a]
Critical medical programs[b]	205	45.7
Nurse fully trained and NCP	50	12.1
Medical corps AFHPSP	115	11.9
Medical service corps fully trained	60	43.3
Medical service corps AFHPSP/HSCP	30	22.1
Out-year dentist AFHPSP/HSCP/1925s	35	10.3
NROTC nurse	30	4.2
In-year nuclear	100	44.9
Out-year nuclear	170	34.9
Aviation	5	3.4
Other officer candidate school	30	3.8
Chaplain fully trained	65	44.8
Chaplain student	5	3.9
NROTC four year	100	0.7
Total	1,000	

a. On average, physician AFHPSPs are worth 11.9 points per contract, whereas medical service corps scholarships are worth 22.1 points and dental school AFHPSPs are worth 10.3 points. These are the average points per contract for the "average" NRD.
b. Critical medical programs includes fully trained physicians, physicians in FAP, fully trained dentists, and dentists in FAP.

Of the 14 competitive areas in the Navy officer competition model, 50 percent are medical programs. Using the average points per recruit for the competition system, the highest point area is "critical medical programs." The average new contract is worth 45.7 points and includes fully trained physicians, physicians in FAP, fully trained dentists, and dentists in FAP. Specifically, looking at AFHPSP medical students, the average new contract is worth 11.9 points, or 26 percent of the points per new contract in the critical medical programs category. Again, this point difference reflects differences in importance and/or difficulty in recruiting fully trained or FAP physicians versus AFHPSP medical students. The AFHPSP medical student new contracts are scaled very competitively with other medical fields that include nurses and out-year dental students.

Overall, the individual NRDs compete with each other and are ranked on a monthly basis with quarterly and year-end standings being of importance. The competition model strives to focus the efforts of the entire NRD officer recruiting team to maximize the acquisition of points and thus increase the NRD's relative standing. The top NRD for each geographical area is recognized, as is the top NRD for the nation.

Air Force

The Air Force Recruiting Services competition is designed to spur production to achieve the services' accession requirements. It also is intended to provide an analytical indicator for the national and regional level commanders to evaluate production shortfalls and provide a mechanism to recognize the organizations that excel in meeting or exceeding their objectives.

The Officer Accessions Competition (OAC) model assigns points based on 10 distinct competitive categories outlined in table 20. The points for each category are awarded on a linear scale as a percentage of the goal until the target is achieved. After reaching the assigned goal, additional contracts, or overproduction, are awarded bonus points. For example, if a given recruiting squadron has a goal for 4 HPSP (physicians) and recruiters meet the goal, they will receive 4 points for that category. For each person they bring in above the goal, the points increase incrementally until the maximum of 6 points for

the category is reached. Only certain categories have a limit on the amount of overproduction that will count for the OAC. Within the medical area there is no limit for physicians (fully qualified and FAP), dentists (fully qualified and FAP), nurses, and biomedical services corps (BSC) (fully qualified, FAP and AFHPSP).

Table 20. Air Force recruiting point system across competitive areas

Competitive area	Points upon reaching goal	Maximum (points/category)
Physicians (fully qualified and FAP)	25	No limit
Dentists (fully qualified and FAP)	20	No limit
Nurses	12	No limit
Specialists	5	10 points
BSC (fully qualified, FAP, and AFHPSP)	12	No limit
AFHPSP (physician)	4	6
AFHPSP (dentist)	4	6
Medical service corps	2	4
Technical line officer	10	No limit
Rated line officer	3	6
Non-technical line officer	3	6

Within the OAC, 7 of the 10 categories are tied to medical programs. In terms of relative points, the top category (25 points) is for fully qualified physicians or an individual in residency training (FAP). Recruiting squadrons are awarded 4 points for reaching the goal for medical school AFHPSP contracts. Hence, the points for reaching the AFHPSP goal are worth 16 percent of the points that are awarded for reaching the goal for fully trained physicians. As with the Navy, the point differences reflect differences in the importance and/or difficulty in recruiting fully qualified or FAP physicians versus medical AFHPSP.

The competition model is intended to focus the efforts of the recruiters and align priorities across the recruiting areas. The OAC is one component that is used to select the top overall recruiting squadron as well as various commanders' awards for excellence.

Army

The information provided relative to the Army's competition and incentive system was limited. In general, the Army focuses more on personal awards than the Navy or Air Force does. At the headquarters level, the Army's competition model consists of 80 "areas of concentration." Each of these areas of concentration represents a specialty or group. Specifically, medical AFHPSP is one of the areas of concentration. Currently, the 80 categories are all equally weighted. However, it is understood that this policy is being evaluated and that future versions of the model may apply a weighting mechanism to reflect relative priorities and degree of difficulty in recruiting. Using the competition model, the five Medical Recruiting Detachments compete with each other and the top Army Medical Department (AMEDD) detachment is recognized each year.

At the detachment level, individual recruiters are also recognized for their efforts in the 80 areas of concentration. Recruiters also earn individual points in a tier level system that is linked to the awarding of the Recruiter Badge, sapphires for the badge, recruiter rings, and the Morrell Award.

On an individual basis, the Army focuses the efforts of its recruiters by assigning an individual "mission" that specifies the category and number of applicants. The recruiter's task is to provide this mix of recruits by specified dates throughout the fiscal year.

Cross-Service comparison

Table 21 provides a synopsis of the incentive systems and the relative weight placed on the notional AFHPSP medical student category relative to other selected medical areas. Particularly of note, within the Navy model, meeting the goal for FAP or fully trained physicians is worth 1.78 times the points for meeting the goal for the physician AFHPSP category. The difference is even greater in the Air Force system where meeting the goal for FAP or fully trained physicians is worth 6.25 times the points for meeting the goal for the physician AFHPSP.

Table 21. Cross-Service incentive system comparison by competitive category

Competitive area	Points per competitive area			Ratio of points per area to the AFHPSP area		
	Army[a]	Navy	Air Force	Army	Navy	Air Force
Fully trained and FAP physicians		205	25	1	1.78	6.25
Medical AFHPSP students		115	4	1	1.00	1.00
MSC students (Army and Navy) or BSC fully trained, FAP, & students (AF)[b]		30	12	1	0.26	3.00
Dental AFHPSP students[c]		35	4	1	0.30	1.00

a. The Army weights all categories equally as the ratio of points per contract to AFHPSP points per contract reflects.
b. MSC students include AFHPSP students for both the Army and Navy. In addition, Navy MSC students include Health Service Collegiate Program (HSCP) students.
c. Dental students include AFHPSP and HSCP students.

For the Air Force, meeting the goal for dental scholarship students is worth the same as meeting the goal for medical school students. In the Navy, meeting the goal for dental AFHPSP students is worth 30 percent of the points for meeting the goal for physician AFHPSP students. Hence, the Navy puts more weight on the medical AFHPSP accessions compared with dental AFHPSP accessions than does the Air Force. Under the Army's model, all of the various categories are currently weighted the same.

Table 22 presents the competition model on a per-contract basis in comparison with the categories discussed in table 21. By looking at the model on a per-contract level, the number of recruiting squadrons or districts and the average goal can be integrated into the evaluation. As expected, fully trained and FAP physicians are worth more than AFHPSP students for both the Air Force and the Navy. However, on a per-contract level, the difference is more pronounced within the Air Force competition model. Specifically, a fully trained or resident physician is worth 10 times that of a medical school scholarship in the Air Force and only 4.3 times in the Navy's model. This difference in the relative weights of fully trained and FAP contacts compared with AFHPSP may partially explain why the Air Force is more successful than the other Services at acquiring FAP accessions.

Table 22. Cross-Service incentive system comparison by competitive category

Competitive area	Points per average contract		Ratio of points per contract to the AFHPSP contracts	
	Navy	Air Force	Navy	Air Force
Fully trained and FAP physicians	45.7	5.6	3.84	10.00
Medical AFHPSP students	11.9	.56	1.00	1.00
MSC students (Army and Navy) or BSC fully trained, FAP, & students (AF)[a]	22.1	2.42	1.86	4.32
Dental AFHPSP students[b]	10.3	1.70	0.87	3.04

a. MSC students include AFHPSP students for both the Army and Navy. In addition, Navy MSC students include Health Service Collegiate Program (HSCP) students.
b. Dental students include AFHPSP and HSCP students.

Current market/environment for AFHPSP recruiting

The larger workforce and geopolitical environments affect the current market for AFHPSP recruiting both positively and negatively. The positive aspects that influence the ability to recruit for the scholarship program include the financial as well as the perceived administrative burdens of medicine. Foremost, the rising costs of medical school are forcing students to explore and consider multiple methods of funding their professional education.[29] The robust benefit of the AFHPSP makes the program a viable option.[30]

Furthermore, the growing concerns over malpractice suits and the associated increases in coverage premiums are disgruntling factors in civilian medical practice. Thus, some medical students see the military as a vehicle to practice without some of the administrative burdens coupled with financial assistance to pay for their education. In addition to the malpractice issues, there are the growing pressures of managed care and the reduced freedom in the practice of medicine. Recruiters

29. Specifically, the Association of American Medical Colleges (AAMC) reports that the mean education debt of allopathic medical graduates was $99,268 in 2001 [17]. Similarly, the mean education debt of osteopathic medical graduates was $128,700 [27].

30. The average AFHPSP benefit (including tuition, fees, stipend, and benefits) is $45,418 per year, or $181,673 for 4 years of medical school [3].

also believe that the events of 9/11 have helped recent recruiting efforts, but the influence of this factor is likely to wane with time.

In contrast to these factors that help AFHPSP recruiting, ongoing world events can negatively affect recruiting. For example, because of Operation Enduring Freedom and other world conflicts, they see the possibility of being forward deployed as a significant concern. Obviously, the risk of forward deployment has always existed, but the recent deployments highlight that risk for potential recruits.

From a broader perspective, the number of applicants for medical schools nationally has declined in recent years and, in the process, created more competition for the high-caliber student that the Services desire for AFHPSP. Specifically, there were 46,965 applicants to allopathic medical schools in 1996 compared with 33,625 in 2002 [19]. Similarly, there were 10,781 applicants to osteopathic medical schools in 1996 compared with 6,324 in 2002 [18]. However, we anticipate more applicants in 2003 than in 2002 because the number of MCAT examinees, which is the key predictor of medical school applicants, increased by 5.6 percent from 54,503 in 2001 to 57,573 in 2002 [18].

Factors affecting AFHPSP recruiting

We questioned the recruiting forces with regard to their perceptions as to why people accept scholarships or choose different methods of financing their medical school. The perceptions appear to be fairly consistent across the Services and are likely relevant with regard to changes in the obligation period.

Considering the motivating factors for accepting a scholarship, the overarching incentive is the financial freedom from educational loans. Other factors focus on the ability to obtain significant experience within the military health care system coupled with "guaranteed" employment at graduation. Individual scholarship recipients cite the ability to focus on the practice of medicine without significant insurance, managed care, malpractice, or other legal issues as key determinants in their decision process. Intangible factors—sense of adventure, patriotism, and a desire to serve one's country and provide for a greater good—also motivate a segment of the scholarship pool.

Recruiters perceive that students are not interested in the AFHPSP for three reasons. First, the service commitment that is incurred with the scholarship is the most significant reason for not opting for a military scholarship. The perceived loss of choice, coupled with "lower pay" during their military service weighs heavily in the decision-making process. Also, particularly for the Navy, the general medical officer (GMO) tour is seen as delaying the inevitable specialty-training pipeline.

Second, though perceived by some as an advantage, others clearly view the possibility of serving in a forward-deployed environment during a conflict as a negative factor. Directly serving and providing medical care in an operational environment (including sea service for the Navy) limits the desirability of AFHPSP.

Third, students express the perception of reduced flexibility in selecting a specialty following medical school. There is also a perception that one's career path is clearly delineated by the military with little opportunity for deviation.

AFHPSP selection board process

Obviously, not every person who expresses interest in AFHPSP will qualify for the program. Consequently, before we go on and look at historical recruiting goals and attainment, we want to briefly describe the selection board process each Service uses to assess scholarship candidates and ultimately select qualified AFHPSP medical school students.

After the Service recruiters have prepared application packages (commonly referred to as "kits") for prospective AFHPSP students, the kits are usually forwarded to a headquarters organization. An administrative selection board of senior military medical department officers evaluates the kits and screens, evaluates, ranks, and ultimately recommends people for scholarships. Table 23 summarizes the key criteria driving the scoring criteria used by these selection boards. As we can see, the Army and Navy use similar factors—such as academic performance, leadership, moral character, and motivation for military medicine—to evaluate and score applicants.

Table 23. AFHPSP selection board criteria (Army and Navy)[a]

Criteria	Army	Navy
Academic performance (GPA, MCAT, class standing, rigor of program)	X	X
Leadership	X	X
Moral character/values/officer skills	X	X
Experience (prior military or health-related)	X	X
Motivation for military medical career	X	X
Specific achievements (athletic, scholastic, societies, clubs, awards, etc.)	X	

a. The Air Force has three O-6 officers who evaluate and rank all AFHPSP applicants based on the "whole person concept" versus using any individual criteria.

Army

The Army selection board process screens the kits based on the criteria in table 23 and then scores applicants from 1 to 24 to determine the "best qualified" student using the scoring system outlined in table 24.

Table 24. Army AFHPSP selection board scoring criteria

Score	Description
21-24	Top few—absolutely must select
17-20	Above contemporaries—clearly select
13-16	Solid performer—deserves selection
9-12	Qualified—select if there is room
5-8	Not qualified—too many weaknesses
1-4	Absolutely not—do not select

Navy

In the Navy, each applicant is independently evaluated and scored. Points are awarded for an applicant's GPA and MCAT scores, as table 25 shows. Further, the Navy awards applicants with prior *active* service 6 points, whereas those with prior *inactive* service get 3 points. Board members then rate the applicant based on four criteria: leadership, moral character, academic potential, and motivation for a military medical career. For each of these four criteria, the applicant is rated and assigned points as follows:

- Highly desirable—9 points
- Good candidate—6 points
- Less desirable—1 point.

Table 25. Navy AFHPSP selection board GPA and MCAT point system

GPA				MCAT			
GPA	Points	GPA	Points	Score	Points	Score	Points
2.70	0	3.40	16	18	2	30	9
2.75	3	3.45	17	19	2	31	11
2.80	5	3.50	17	20	3	32	11
2.85	6	3.55	17	21	4	33	11
2.90	7	3.60	17	22	4	34	11
2.95	8	3.65	18	23	5	35	11
3.00	10	3.70	18	24	6	36	12
3.05	11	3.75	18	25	6	37	12
3.10	12	3.80	19	26	6	38	12
3.15	13	3.85	19	27	7	39	12
3.20	15	3.90	19	28	8	40	12
3.25	15	3.95	20	29	8		
3.30	16	4.00	20				
3.35	16						

The maximum score a candidate can get using this system is 74. The candidate's final score is an average of the three individual board member scores. Historically, candidates with a score of 45 or above are recommended for selection; those with a score of 39 or below are not recommended for selection. Candidates with a score of 40-44 are usually placed on a waiting list. If the AFHPSP recruiting goals are met by candidates scoring 45 or more, wait-list candidates are then notified of nonselection.

Air Force

The Air Force also uses an administrative selection board process made up of three O-6 officers who evaluate and rank all applicants based on the "whole person concept" versus awarding points for certain criteria. Specific weight is not given to GPA or MCAT. Ratings are from 6 to 10, in half-point increments. Aggregate scores are sequenced, and the top candidates are selected according to the number of scholarships available in any given fiscal year. In other words, the cut off is based on numerical aggregate scores.

Recruiting trends

Table 26 provides an overview of the AFHPSP recruiting goal versus attainment for FY 1999-2003. This table addresses the AFHPSP medical students only and does not include other professional programs, such as dental or allied sciences.

Table 26. AFHPSP recruiting goal versus attainment (FY1999-2002)

Service and year	Goal	Attainment	Percent attained
Army			
FY 1999	237	237	100.0
FY 2000	268	267	99.6
FY 2001	270	272	100.7
FY 2002	318	327	102.8
FY 2003	284		
Navy			
FY 1999	242	207	85.5
FY 2000	209	209	100.0
FY 2001	300	295	98.3
FY 2002	362	346	95.6
FY 2003	290	290 proj.[a]	
Air Force			
FY 1999	193	228	118.1
FY 2000	232	238	102.6
FY 2001	226	247	109.3
FY 2002	201	232	115.4
FY 2003	201	221	110.0

a. The Navy projects that it will meet its recruiting goal for FY 2003.

Over the FY 2000-2002 period, the Navy has essentially met the goal for medical school scholarships. During FY 1999, the Navy achieved 86 percent of its goal. In FY 2000, the Navy met 100 percent of its AFHPSP (physician) goal of 209. The goal was increased in FY 2001 to 300, and 295 people (98 percent) were attained. It was again increased in FY 2002, and the Navy was able to attain 346, or 96 percent, of the goal.

During the same time period, the Air Force consistently met or exceeded its goal. In FY 1999, the Air Force attained 228 people,

surpassing its goal of 193. In FY 2000, the Air Force had a goal of 232 and was able to attain 238, or 103 percent of the goal. For FY 2001 and 2002, it attained 109 percent and 115 percent of the goal, respectively.

The Army has also experienced success in meetings its mission or goal for the same time period. With a mission of 237 in FY 1999, the Army attained 100 percent for is AFHPSP (physician) program. During FY 2000, the mission increased to 268 and the Army attained 267, or 99.6 percent of the goal. In FY 2001 the mission was increased slightly to 270, and 272 people were attained. For FY 2002, the mission was raised by 48 to 318. The Army was able to exceed this mission and attained 327, or 103 percent, of the target.

It is interesting to note that all of the Services have had such success in meeting their AFHPSP recruiting goals even though the requirements varied substantially from year to year. For example, the Army had a goal to recruit 237 AFHPSP medical school students in FY 1999. It achieved this goal. In FY 2002, the goal was 318, and it recruited 327. Similarly, the Navy achieved its goal of 209 in FY 2000. In FY 2002, its goal was 362 and it achieved 346, or 96 percent of this goal. The Air Force's AFHPSP goal has not fluctuated as much as the other Services, and it has had success in achieving its goals. We infer from the Services' ability to meet fluctuating recruiting goals that the Services have not exhausted the market for AFHPSP medical students.

The ability to recruit AFHPSP students can also be analyzed on a regional basis. Our purpose in doing this is to see if the Services' success in AFHPSP recruiting comes from the same areas. We summarized attainment statistics provided by the Navy and Air Force and grouped them in four geographical regions, as table 27 shows: Northeast, Southeast, Central, and the West. We geographically matched the Navy recruiting districts and Air Force recruiting squadrons as closely as possible. The intent was to determine if there were similarities in the production across the services within a given area.[31]

31. See appendix B for a detailed listing of the matching and associated maps.

Table 27. Percentage of AFHPSP recruiting attainment by region

Region and FY	Navy	Air Force
Northeast		
FY 1999	45.9	NA
FY 2000	43.6	36.5
FY 2001	36.3	34.0
FY 2002	36.1	32.3
Southeast		
FY 1999	14.0	NA
FY 2000	14.8	14.7
FY 2001	17.3	13.0
FY 2002	13.0	13.8
Central		
FY 1999	17.4	NA
FY 2000	22.5	28.2
FY 2001	24.0	33.6
FY 2002	23.4	24.6
West		
FY 1999	22.7	NA
FY 2000	19.1	20.6
FY 2001	22.4	19.4
FY 2002	27.5	29.3

The historical trends are fairly consistent—the Northeast being the area with the greatest attainment. Across the same time period, the Southeast was the least productive area. The Central region and the West tended to oscillate in the middle, ranking second and third across the time frame.

For FY 2002, 36 percent of the total medical school AFHPSP production for the Navy came from the Northeast region of the United States. The Air Force's largest attainment was also focused in the Northeast with 32 percent of the total production. The next highest region for both the Navy and Air Force was the West with 28 percent and 29 percent, respectively. The Central region accounted for 23 percent of the Navy's attainment and 25 percent of the Air Force's. The Southeast had the smallest percentage of the production for both Services with 13 percent for the Navy and 14 percent for the Air Force. This shows that the Navy and Air Force are drawing their AFHPSP medical contracts from the same regions. This is as we would

expect because the Service models to allocate goals across the regions are similar.[32]

Recruiter perceptions of impact of an ADO change

Field recruiters were queried as to their perceptions of the impact of extending the current obligation of 4 years to 5, 6, or 7 years. Consistently, across all three Services, the impression was that extending the obligation would have a negative impact on the ability to recruit AFHPSP medical school students. There was a general perception by Air Force and Navy recruiters that the total applicant pool would be reduced by as much as 50 percent if the obligation were extended to 5 years. Specifically, the perception in the Air Force was that a 5-year AFHPSP ADO would reduce the applicant pool by 20 to 30 percent. In the Navy, the perception was that the 5-year AFHPSP ADO would reduce the applicant pool by 0 to 50 percent. The midpoint for either of these ranges suggests an applicant pool reduction of 25 percent. Army recruiters also felt that the applicant pool would decline and that the quality of the applicants would also diminish. The Army recruiters stated that the best students have multiple options and that incurring an additional obligation of any length would tend to steer them to their alternatives.

There is a general, though not universal, perception that recruiters could absorb extending the obligation to 5 years. Field recruiters conveyed that, given that the number of qualified applications submitted has exceeded the goal, there is a high probability that they could meet the mission level if the payback were extended to 5 years. The recruiters interviewed felt that an obligation beyond 5 years would significantly reduce their success as well as the quality of the applicant pool.

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32. AFHPSP medical recruiting attainment by region is similar for the Navy and Air Force, so attainment must be mostly a function of the market. There may be a benefit to combining the AFHPSP recruiting efforts of the three Services to reduce redundancies in the allocation of recruiting resources, especially if the Services' applicant pools are combined. USUHS is in talks with the Services about combining the AFHPSP applicant pools to streamline the application and selection process.

In summary, recruiters from all three Services felt that any change to the obligation must be consistent for all branches in order to remain. competitive. Clearly, as the length of obligation increases, the recruiting power decreases—given level quality requirements.

Perceptions of current AFHPSP students

Thus far we've discussed the medical school applicant pool nationally as well as the pool for USUHS and each of the Services. And, the previous section discussed recruiters' perceptions of the impact an ADO increase would have on their ability to recruit medical students into the AFHPSP. In this section, we discuss the results of an e-mail questionnaire in which current AFHPSP students said what they would have done if the AFHPSP ADO were longer than their current ADO.

Currently, the active duty commitment for AFHPSP is year for year with a 2-year minimum. This means that the ratio of the active duty commitment to years of subsidization is 1:1. The specific tasking of this study is to look at the impact of increasing the AFHPSP obligation from 4 to 7 years for 4 years of subsidization, which is equivalent to increasing the obligation-to-subsidization ratio to 1.75:1. This would make the AFHPSP ADO equivalent to USUHS's ADO, but it wouldn't increase the compensation of AFHPSP accessions to match their USUHS counterparts on the assumption that any ADO increase is not tied to an increase in the AFHPSP stipend.

In percentage terms, increasing the AFHPSP ADO from 4 to 7 years is a substantial increase. Consequently, we also looked at the impact of increasing the ADO from 4 years to either 5 or 6 years to determine the impact of more marginal increases.

Questionnaire design

Appendix C shows the complete AFHPSP questionnaire and average response to each question.

Objectives

In designing this questionnaire, we had three principal objectives. First, we wanted the questionnaire to be short, simple, and easy to

complete. Second, we wanted to identify some basic demographic and other factors that might affect AFHPSP students' willingness to accept a longer active duty obligation. Third, because there is no upside for any of the respondents to say they would have accepted a longer AFHPSP obligation, we wanted to design the questions to encourage respondents to be honest in their responses.

We did not want responding to the questionnaire to be onerous because our goal was a reasonable response rate. This meant making a trade-off between asking additional questions that might shed light on why people said they would or would not accept a longer AFHPSP ADO and getting more responses. Also, the questions needed to be straightforward to reduce confusion and make the responses more accurate.

To accomplish these objectives, we settled on 14 multiple-choice questions and a 15th question that gave respondents an opportunity to provide comments.[33] The questions were designed to take less than five minutes to answer.

Because there was no incentive for respondents to say that they would have accepted a longer active duty obligation, we wanted to make them really think about what they would have done to pay for medical school if they had not taken an AFHPSP scholarship. By doing this, we hoped that respondents would be more honest when they answered the question about how they would have responded to a longer active duty obligation.

Although we wanted to estimate the willingness of AFHPSP students to accept active duty obligations of different durations—5, 6, or 7 years—we were concerned that if we asked every respondent about all three of these ADOs, the questions might "lead the witness" to say that he or she would accept a 5-year obligation but not a 6- or 7-year obligation. Essentially, we feared respondents might treat it as a multiple-choice between these options rather than considering each one individually.

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33. We gratefully acknowledge the representatives from each Service and TMA/HA who kindly gave us input on the questionnaire.

To avoid this problem, we produced three versions of the questionnaire. All questions in each version were identical with the exception of the question about their willingness to accept a longer AFHPSP ADO. The first version asked about a 5-year ADO, the second about a 6-year ADO, and the third about a 7-year ADO. Thus, each person had only one ADO length to think about, allowing them to consider it in isolation without the biasing influence of other ADO questions.

Also to gain a more honest response to the willingness to accept a longer ADO, we wanted to ask a question about a longer active duty obligation in a more subtle way. To this end, we asked about their interest and success in being accepted to the Uniformed Services University of the Health Sciences, which carries a 7-year ADO. It is our assumption that those who expressed interest in USUHS would likely be willing to consider a longer AFHPSP ADO.

Sample

We sent this e-mail questionnaire to 2,503 current AFHPSP students across the three Services. This figure does not represent all current AFHPSP students, but it represents all of the AFHPSP students for whom the Services have e-mail addresses. As table 28 shows, we sent 30 percent version 1 of the questionnaire, 30 percent version 2, and 40 percent version 3. We felt it prudent to send a higher percentage version 3 (which asked about a 7-year AFHPSP ADO) for two reasons. First, the tasking of this study was specifically to look at increasing the AFHPSP ADO from 4 to 7 years. Second, we expected the affirmative response to the 7-year AFHPSP ADO question to be low. Hence, we wanted to ensure a large enough sample so that a single response would not substantially change the average response.

Overall, the response rate was about 37 percent, giving us a sample of 846 for the three versions combined. The response rate was about the same for each version of the survey. We conclude from this that the questions about the differing ADO lengths did not cause recipients of one version to (1) fail to respond or (2) respond in greater numbers in a way that was systematically different from the recipients of one of the other versions.

Table 28. Questionnaire response rate

	Questionnaire version[a]			
	1	2	3	Total
Questionnaires e-mailed	752	751	1,000	2,503
Questionnaires returned (bad e-mail address)	56	40	68	164
Net number of questionnaires e-mailed	696	711	932	2,339
Percentage of total questionnaires e-mailed	29.8	30.4	39.8	100.0
Number of respondents	263	269	334	866
Percentage response rate	37.8	37.8	35.8	37.0

a. Versions 1, 2, and 3 ask about respondents' willingness to accept a 5-, 6-, and 7-year AFHPSP ADO, respectively. All other questions are identical.

Results

This section presents the results from the questionnaire. The reader should refer to appendix C for specifics about the questions we asked as well as the average responses. We begin by presenting the results to the principal question of interest: Would current AFHPSP students still have applied for and accepted an AFHPSP scholarship if the active duty obligation were longer than their current obligation? Then we present the impact that demographics and other factors have on AFHPSP students' willingness to accept a longer active duty obligation.

Willingness to accept a longer ADO

We found the responses to our question on whether an increased ADO would alter a medical student's acceptance of a scholarship reasonable and mostly consistent across each of the Services. As table 29 shows, as the commitment increases, the likelihood of medical students accepting the AFHPSP declines. Specifically, 44 percent of total respondents would have accepted the scholarship if the ADO were increased by only 1 year. For most, this would mean going from a 4- to a 5-year commitment. The Air Force students had the highest acceptance rate (53 percent), followed by the Army (40 percent), and the Navy (38 percent).

Table 29. Respondents' willingness to accept a longer AFHPSP ADO (5,6, or 7 years) by Service

	Army		Navy		Air Force		Total	
Response by ADO	Number	Percent	Number	Percent	Number	Percent	Number	Percent
5-year ADO								
Yes	30	40.0	37	37.8	47	53.4	115	43.7
No	31	41.3	51	52.0	30	34.1	112	42.6
No response	14	18.7	10	10.2	11	12.5	36	13.7
6-year ADO								
Yes	17	22.7	29	30.9	25	25.0	71	26.4
No	43	57.3	47	50.0	64	64.0	154	57.2
No response	15	20.0	18	19.1	11	11.0	44	16.4
7-year ADO								
Yes	15	17.2	22	17.3	22	18.3	59	17.7
No	58	66.7	82	64.6	72	60.0	212	63.5
No response	14	16.1	23	18.1	26	21.7	63	18.9

About 14 percent of respondents didn't answer this question. Hence, if we consider only those answering this question, 51 percent said they would have accepted the scholarship if the ADO were 1 year longer. For the respondents that we asked about a 2-year increase in the ADO (i.e., going from a 4- to 6-year commitment), almost 26 percent of total respondents said they would have accepted the scholarship. Looking at the response of those we asked about their willingness to accept a scholarship if their ADO were 3 years longer, about 18 percent of the respondents from each Service indicated that they would take the scholarship. Hence, if DoD increased the AFHPSP ADO from 4 to 7 years, the respondents clearly indicate that most of them would turn away from the AFHPSP program.

Impact of demographics on willingness to accept a longer ADO

In this section, we look at the impact of gender, age, and martial status and dependents on an AFHPSP student's willingness to accept a longer AFHPSP active duty obligation.

Gender. Approximately 30 percent of the total AFHPSP respondents are female. As table 30 shows, gender does not seem to systematically alter a scholarship student's willingness to accept an increased

obligation. Specifically, 43 percent of men said they would have accepted an additional year of obligation compared with 48 percent of women. Similarly, 26 percent of men said they would have accepted two additional years of obligation compared with 28 percent of women. But, when we asked about two additional years of obligation, a higher percentage of men (18 percent) said they would have accepted the extra obligation compared with women (16 percent).

Table 30. Respondents' willingness to accept a longer AFHPSP ADO (5, 6, or 7 years) by gender

	Men		Women	
Response by ADO	Number	Percent	Number	Percent
5-year ADO				
Yes	79	42.5	36	48.0
No	86	46.2	25	33.3
No response	21	11.3	14	18.7
6-year ADO				
Yes	46	25.7	25	27.8
No	101	56.4	53	58.9
No response	32	17.9	12	13.3
7-year ADO				
Yes	43	18.1	15	15.6
No	149	62.9	63	65.6
No response	45	19.0	18	18.8

Age. As with gender, age does not seem to have a consistent impact on a medical student's willingness to accept a longer obligation. If it did, we would expect that willingness to accept a longer commitment would increase with age (or vice versa), but this is not what we observe. As table 31 shows, 42 percent of those age 24 or younger would have accepted an additional year of commitment compared with 49 percent of those who are 25 to 26 years of age. However, only 42 percent of those aged 27 to 29 would have accepted the additional year. Hence, there is not a consistent upward or downward trend by age.

Table 31. Respondents' willingness to accept a longer AFHPSP ADO (5,6, or 7 years) by age

	Response by age							
	24 or less		25 to 26		27 to 29		30 or more	
Response by ADO	Number	Percent	Number	Percent	Number	Percent	Number	Percent
5-year ADO								
Yes	39	41.5	36	49.3	22	41.5	17	45.9
No	46	48.9	27	37.0	19	35.8	20	54.1
No response	9	9.6	10	13.7	12	22.6	0	0.0
6-year ADO								
Yes	34	29.1	16	22.9	10	17.9	11	47.8
No	70	59.8	37	52.9	40	71.4	7	30.4
No response	13	11.1	17	24.3	6	10.7	5	21.7
7-year ADO								
Yes	23	18.7	14	14.0	10	16.1	12	27.3
No	78	63.4	68	68.0	37	59.7	29	65.9
No response	22	17.9	18	18.0	15	24.2	3	6.8

Marital status and dependents. Unmarried AFHPSP students appear more willing than their married peers to accept the scholarship if the ADO were increased by 1 year. Specifically, 48 percent of total unmarried respondents would have accepted the scholarship if the ADO were increased by only 1 year contrasted with 37 percent of the total married respondents (see table 32). The difference in these response rates is statistically significant at the 1-percent level. However, we don't find statistically significant differences between the response rates of those asked about a 2- or 3-year increase in the AFHPSP ADO.

We also see in table 32 that current AFHPSP students with no dependent children were more willing than those with children to accept a 5-year ADO. Specifically, 46 percent of total respondents without dependent children were willing to accept an additional year of commitment compared with 34 percent of those with dependent children. Conversely, students without dependent children were less likely to accept a 6- or 7-year ADO than those with dependent children. Hence, having dependent children does not seem to have a consistent impact on willingness to accept a longer obligation.

Table 32. Respondents' willingness to accept a longer AFHPSP ADO (5, 6, or 7 years) by family status

	Married		Not married		Dependent child		No dependent child	
Response by ADO	Number	Percent	Number	Percent	Number	Percent	Number	Percent
5-year ADO								
Yes	37	37.0	76	47.5	17	34.0	98	46.2
No	50	50.0	62	38.8	28	56.0	84	39.6
No response	13	13.0	22	13.8	5	10.0	30	14.2
6-year ADO								
Yes	29	29.3	42	24.7	17	35.4	54	24.4
No	56	56.6	98	57.6	24	50.0	130	58.8
No response	14	14.1	30	17.6	7	14.6	37	16.7
7-year ADO								
Yes	23	18.0	36	17.6	11	19.0	48	17.5
No	80	62.5	131	63.9	38	65.5	173	62.9
No response	25	19.5	38	18.5	9	15.5	54	19.6

In general, the results of the questionnaire indicate that the demographic factors of gender, age, and dependent status have no consistent impact on willingness to accept a longer obligation.

Impact of other factors on willingness to accept longer ADO

Let's now consider the impact of "other" factors, such as prior military service, allopathic versus osteopathic medical students, and number of Services applied to for a scholarship, on an AFHPSP student's willingness to accept a longer AFHPSP active duty obligation.

Prior military service. Some AFHPSP students have already served on active duty—as officers, enlisted, or both—before commencing medical school. Our questionnaire asked respondents to report if they had prior military service to determine if this affected their willingness accept additional obligation. Table 33 shows that the majority of students who responded, both those with (and without) prior military service, were willing to accept a 5-year ADO. However, if we make the assumption that those who did not respond to this question had no prior service, 39 percent of these were willing to accept the 5-year ADO compared with 64 percent of those with prior service.

Table 33. Respondents' willingness to accept a longer AFHPSP ADO (5, 6, or 7 years) by prior military service

	Prior service		No prior service		No response	
Response by ADO	Number	Percent	Number	Percent	Number	Percent
5-year ADO						
Yes	30	63.8	16	64.0	69	36.1
No	12	25.5	9	36.0	91	47.6
No response	5	10.6	0	0.0	31	16.2
6-year ADO						
Yes	14	53.8	55	26.1	2	6.3
No	10	38.5	143	67.8	1	3.1
No response	2	7.7	13	6.2	29	90.6
7-year ADO						
Yes	12	28.6	47	18.7	0	0.0
No	24	57.1	187	74.5	1	2.4
No response	6	14.3	17	6.8	40	97.6

Allopathic vs. osteopathic medical students. We received a total of 866 responses for all three questionnaires. Of those who responded to the questionnaire, 13 percent didn't indicate whether they were allopathic or osteopathic students. For those who did, 73 percent classified themselves as allopathic students and 27 percent as osteopathic students. This percentage is similar to our finding that about 30 percent of AFHPSP matriculants are osteopaths (see figure 14).

As table 34 shows, osteopathic students are more willing than their allopathic peers to accept an increase in obligation for the 5-, 6-, and 7-year ADO proposal. About 60 percent of the osteopathic students were willing to accept an additional year of obligation compared with 43 percent of allopathic students. Although osteopathic students are more likely to accept an additional commitment than their allopathic peers, as the ADO increases to 6 and 7 years, their willingness to accept the scholarship begins to wane as well.

Table 34. Respondents' willingness to accept a longer AFHPSP ADO (5,6, or 7 years) by school type

	Allopathic		Osteopathic		No response	
Response by ADO	Number	Percent	Number	Percent	Number	Percent
5-year ADO						
Yes	76	43.2	35	60.3	4	13.8
No	82	46.6	21	36.9	9	31.0
No response	18	10.2	2	3.4	16	55.2
6-year ADO						
Yes	45	25.6	23	35.9	3	10.3
No	111	63.1	40	62.5	3	10.3
No response	20	11.4	1	1.6	23	79.3
7-year ADO						
Yes	34	17.0	23	27.7	2	3.9
No	142	71.0	54	65.1	16	31.4
No response	24	12.0	6	7.2	33	64.7

It is also entirely possible that the apparent greater willingness of osteopathic students to accept a longer obligation compared with allopathic students has nothing to do at all with the differences between allopaths and osteopaths. It may simply be a reflection of the fact that 19 of the 20 osteopathic medical schools are private schools. Hence, any potential AFHPSP scholarship is more valuable to the average osteopathic student than the average allopathic student because the tuition costs are significantly higher in private schools compared with public schools.

Nonresponsiveness to the ADO increase was more common for allopathic students than osteopathic students. For example, 10 percent of allopathic students did not indicate their willingness to accept a 5-year ADO compared with only 3 percent of osteopathic students.

The differences between allopathic and osteopathic medical students in their willingness to accept a longer ADO are important because of inherent differences between allopathic and osteopathic medical students. First, as national data show, the average MCAT scores and undergraduate GPAs of allopathic medical students are higher than for osteopathic students. Such differences are important to the

degree that these measures predict success in medical school and on medical licensing exams.

Second, there are fundamental differences in the propensity of allopathic and osteopathic medical students to go into the various specialties. In general, osteopaths are more likely to go into a primary care specialty and less likely to go into a surgery specialty than allopaths. In 2001, for example, 26.1 percent of osteopathic seniors were planning on a family practice specialty compared with 2.4 percent in general surgery [27]. In comparison, 9.8 and 4.9 percent of allopathic graduates were planning on specialties in family practice and general surgery, respectively [28].

Similarly, 28.3 and 3.3 percent of osteopaths participating in the National Residency Matching Program (NRMP) in 2001 matched to internships (PGY-1) in family practice and general surgery, respectively. In comparison, 13.1 percent of allopaths matched to family practice internships and 9.2 percent to general surgery internships [29].[34]

Given that there are systematic differences between the specialty choices of allopaths and osteopaths, DoD and the Services need to consider the mix of specialties they require. If the Services require more family practitioners, the specialty propensity of osteopaths to go into family practice may be helpful in shaping the force. However, if the Services need more surgeons, the lower propensity of osteopaths to go in that direction will make shaping the force difficult.

Number of applications. Anecdotal information we received from some service representatives when we began this study was that AFHPSP students "gunshot out" their applications to all three Services instead of banking on one particular service. To quantify this perception, we asked current AFHPSP students the number of Services they applied to for an AFHPSP scholarship. We were surprised that the vast majority

34. We will further explore the propensity of allopaths and osteopaths to go into the various specialties by studying the impact of increasing the ADO for graduate medical education. We will focus on the historical differences in specialty choice between Navy allopaths and osteopaths.

of the current AFHPSP students applied only to one Service for AFHPSP. Specifically, 86 percent applied only to one Service, 12 percent applied to two Services, and 2 percent applied to three Services.

Overall, those who applied to more than one Service seem to be more willing to accept a longer commitment, as table 35 shows. For example, 53 percent of those who applied to multiple Services were willing to accept an additional year of commitment compared with 46 percent of those who applied to just one Service. This pattern also holds for those asked about a 7-year ADO, with 23 percent of those who applied to more than one Service being willing to accept a longer commitment compared with 19 percent of those who only applied to one Service.[35] One potential explanation is that these people have more of a taste for the military. Another possibility is that they had fewer options to fund their medical school so they cast a broader net for an AFHPSP scholarship.

Table 35. Respondents' willingness to accept a longer AFHPSP ADO (5, 6, or 7 years) by number of applications

	Applied to one Service		Applied to two or more Services	
Response by ADO	Number	Percent	Number	Percent
5-year ADO				
Yes	95	45.9	19	52.8
No	96	46.4	16	44.4
No response	16	7.7	1	2.8
6-year ADO				
Yes	62	29.0	8	30.8
No	140	65.4	14	53.8
No response	12	5.6	4	15.4
7-year ADO				
Yes	48	19.3	11	22.9
No	175	70.3	35	72.9
No response	26	10.4	2	4.2

35. This pattern does not hold for those asked about a 6-year commitment. This is likely a result of the small number of respondents (15) to this question who had applied to more than one Service.

Interest of AFHPSP students in USUHS

In a similar vein, we wanted to know how many of the current scholarship students had applied to and were aware of USUHS. As we can see in table 36, of the 772 students responding to this question, about 61 percent were aware of USUHS. Of the 474 student respondents that were aware of USUHS:

- About 10 percent had been accepted to USUHS but chose AFHPSP instead
- 16 percent had applied to USUHS but were not accepted
- 15 percent did not apply to USUHS because of its longer ADO
- 58 percent did not apply to USUHS for "other" reasons.

Table 36. Respondents' willingness to accept a longer AFHPSP ADO (5,6, or 7 years) by interest in USUHS

Response by ADO	Accepted by USUHS but declined offer		Applied to, but was not accepted by USUHS		Did not apply because of USUHS ADO		Did not apply for other reasons	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
5-year ADO								
Yes	8	57.1	15	57.7	6	25.0	49	53.8
No	5	35.7	8	30.8	15	62.5	35	38.5
No response	1	7.1	3	11.5	3	12.5	7	7.7
6-year ADO								
Yes	4	50.0	8	34.8	3	16.7	27	28.4
No	3	37.5	12	52.2	15	83.3	61	64.2
No response	1	12.5	3	13.0	0	0	7	7.4
7-year ADO								
Yes	7	26.9	14	48.3	1	3.4	18	19.8
No	15	57.7	10	34.5	28	96.6	61	67.0
No response	4	15.4	5	17.2	0	0	12	13.2

Based on these figures, 16 percent of AFHPSP medical students applied to USUHS. This is similar to the 20 percent we estimated by matching the SSNs of AFHPSP matriculants and USUHS nonmatriculants. As we expected, those who applied to USUHS are more willing to accept a longer ADO than those that didn't apply to USUHS (see table 35). The differences are more striking when we compare those

who applied to USUHS with those that didn't apply to USUHS because of its ADO.

Alternatives to longer ADO

Table 37 examines the perceptions of current AFHPSP students in terms of what medical school funding options they could have pursued and realistically attained in place of their current scholarship. Student loans were the number one option for 26 percent of the respondents, followed by 13 percent reporting school scholarships, and about 11 percent pursuing other scholarships (without Service commitment) or personal or family resources.

Table 37. Alternatives that AFHPSP students would have pursued if they were not willing to accept a longer ADO

Response	Number	Percent
National Health Service Corps	167	10.4
State or local scholarship with commitment to underserved areas	3	0.2
Other scholarships with Service commitment	125	7.8
Medical Scientist Training Program (scholarship)	109	6.8
Exceptional Financial Need (scholarship)	104	6.5
School Scholarships	212	13.2
Financial Aid for Disadvantaged Health Professions Students (scholarships)	102	6.3
Other scholarships without Service commitment	184	11.4
Loans	419	26.1
Personal or family resources	182	11.3
No response	0	0.0
Total	1,607	100.0

Current AFHPSP students comments

As we discussed earlier, the questionnaire we sent the AFHPSP students had a small section at the end for writing in relevant comments. Overall, the remarks were driven by concern in possibly increasing the AFHPSP active duty obligation.[36] We reviewed these remarks and placed the comments in four broad categories for policy-makers.

36. Several current AFHPSP students commented on their enthusiasm for serving their country and gratefulness for being awarded a scholarship.

First, respondents indicate there may be increased reluctance for medical students to accept the scholarship if the ADO is significantly increased because AFHPSP students already feel they have lost some of their autonomy in possibly acquiring the residency of their choice by joining the military. Some students voice concern that they will be forced to take a residency program—based on the needs of the Service—and the longer ADO may make the choice to accept the scholarship more difficult.

Second, several respondents feel that the local recruiters aren't well informed about the GME and career paths for military physicians, and the ultimate ADO the AFHPSP student might incur. Some current AFHPSP students would like to be kept better informed and have more communication with by their respective Service while in medical school.

Third, those respondents who have prior obligation from another accession program (Service academy or ROTC) seem to realize that the increased ADO won't significantly affect them because they will have accrued several years of service before their first stay-leave military decision.

Fourth, some students felt that the additional ADO would be unfair if the military-civilian physician pay gap were not closed.

Findings

We have drawn from our analysis the following findings in relation to the AFHPSP applicant pool:

1. The size of the Services' AFHPSP applicant pools seems to follow the trend in the national medical school applicant pool, as does USUHS's applicant pool.
2. Quality, as measured by undergraduate GPAs, is roughly constant nationally and for the AFHPSP since FY 1998. However, the quality of AFHPSP matriculants, as measured by MCAT scores, has fallen by about 1 point since FY 1998 while remaining constant nationally. Currently, the average MCAT is about 1 point below the national average. However, this difference can

be explained by the disproportionate share of osteopathic medical students in AFHPSP compared with the national average.

3. Quality, as measured by medical school rankings for research and primary care from *U.S. News & World Report,* is on the decline for the Air Force. The percentage of AFHPSP matriculants in a top 50 medical school has fallen for the Air Force since FY 1998. No definitive trend is apparent for the Army and Navy. For those matriculants in a top 50 medical school, the average research ranking is increasing (meaning a poorer ranking), but there is no definite trend in the average primary care ranking over the same period.

4. About 15 percent of medical students nationally are in osteopathic medical schools. In comparison, about 30 percent of AFHPSP matriculants are in osteopathic medical schools. This is important because there are significant differences in undergraduate GPAs and MCAT scores between allopaths and osteopaths. In addition, osteopaths have a different propensity to matriculate into the various specialties compared with allopaths.

5. Much of the data regarding the AFHPSP applicant pool are not available or are incomplete. These data are fragmented, that is, pieces are tracked by those who (a) set the initial goals, (b) do the recruiting, and (c) manage the AFHPSP program. These groups have interests in different types of information and may only track the information that is useful to that command.

6. It is commonly believed that overlap is substantial between USUHS's and the Services' applicant pools. We estimate that about 20 percent of AFHPSP applicants also applied to USUHS. From USUHS's perspective, about 12 percent of its applicants also applied to AFHPSP.

7. We found that each Service uses different types of personnel and incentive systems to achieve its required AFHPSP medical student accessions. The Services differ in their mix of officer and enlisted recruiters, medical versus nonmedical backgrounds, and one tour versus career recruiters. The Navy and Air Force both use "point" systems to incentivize recruiting production in certain programs. The point systems are designed to

reflect the importance and difficulty of recruiting for the various programs. The Army does not use a point system but gives recruiters a mission to recruit a certain number of people for the various programs.

8. Each Service has had success in meeting its AFHPSP recruiting goals, even though the requirements varied substantially from year to year. For example, the Army had a goal to recruit 237 AFHPSP medical school students in FY 1999. It achieved this goal. In FY 2002, the goal was 318, and it recruited 327. Similarly, the Navy achieved its goal of 209 in FY 2000. In FY 2002, its goal was 362 and it achieved 346, or 96 percent of this goal. We infer from the Services' ability to meet fluctuating recruiting goals that they have not exhausted the market for AFHPSP.
9. The general (although not universal) perception was that any increase in the AFHPSP ADO would make recruiting harder but that the recruiting mission could still be achieved if DoD increased the ADO to 5 years. Furthermore, the recruiters indicated that any increase beyond 5 years would not be feasible from a recruiting standpoint without increasing the student stipend or making the scholarships more lucrative.
10. Of the medical students responding to our question about their willingness to accept a 5-year ADO, about 51 percent said they would have accepted it. Similarly, 32 percent would have accepted a 6-year ADO and 22 percent a 7-year ADO.
11. Gender and age do not seem to have a significant impact on willingness to accept a longer AFHPSP ADO. However, those with prior military service were more willing to accept a longer ADO. Similarly, those who applied to USUHS or applied to more than one Service for an AFHPSP scholarship were more willing to accept a longer ADO than those who didn't apply to USUHS or applied to only one Service. We also found that osteopathic medical students were more willing to accept a longer ADO than allopathic students, but this may simply be a reflection of the fact that all but one of the osteopathic medical schools is private.

Findings and recommendations

Findings

Our analysis of the impact of increasing the AFHPSP active duty obligation has several important findings. We present them here in terms of the impact on retention and on the applicant pool.

Impact on retention

We found that the degree to which AFHPSP accession requirements can decrease as a result of an ADO increase depends on whether the size of the in-house GME programs can be changed. If it cannot be changed, increasing the AFHPSP ADO from 4 to 5 years reduces the AFHPSP accession requirements by 22 percent and would save about $68 million annually, as table 38 shows. Further increasing the AFHPSP ADO to 6 or 7 years would cut AFHPSP accession requirements by 27 and 29, respectively, but does not result in cost savings. There are no cost savings because the fixed GME requirement forces the Services to bring in many AFHPSP accessions—which it doesn't need to fill billet requirements—simply to fill GME positions.

If the size of the in-house GME programs can vary to the point where GME is used only if it is the most cost-effective solution, AFHPSP accession requirements can be substantially reduced, resulting in additional cost savings. Specifically, the model indicates that, by using the economic-optimal GME with a 4-year ADO, AFHPSP accession requirements could fall by 13 percent—compared with the historical (FY 98-01) average of 811—and costs would fall $61 million. Note that using the economic-optimal GME programs results in more GME positions in some specialties and fewer in others.

When we increase the AFHPSP ADO from 4 to 5 years and use the economic-optimal GME, AFHPSP accession requirements fall 24 percent and would save $113 million. Increasing the ADO to 6 or 7 years

would reduce AFHPSP accession requirements by 36 and 44 percent and save $165 and $201 million, respectively.

Table 38. Impact of AFHPSP ADO increase on total costs and AFHPSP accession requirements

Annual AFHPSP accessions and costs by GME modeling assumption	AFHPSP active duty obligation length			
	4 yrs (current)	5 years	6 years	7 years
Fixed GME				
Number of AFHPSP accessions	983	769	720	699
Percentage of current accessions		78	73	71
Annual medical corps costs ($M)	2,021	1,953	2,097	2,293
Percentage of current costs		97	104	113
Bodies as a percentage of billets	118	111	120	133
Annual med. corps costs without excesses ($M)	1,726	1,761	1,750	1,728
Economic-optimal GME				
Number of AFHPSP accessions	707	618	523	454
Percentage of current accessions		87	74	64
Percentage of FY98-01 accessions (811)	87	76	64	56
Annual medical corps costs ($M)	1,708	1,595	1,543	1,507
Percentage of current costs		93	90	88
Bodies as a percentage of billets	102.5	100.0	100.2	100.1
Annual med. corps costs without excesses ($M)	1,666	1,591	1,541	1,506

Hence, we estimate cost savings from increasing the AFHPSP ADO from 4 to 5 years whether or not we leave in-house GME alone or let the model determine the size of in-house GME. What is clear is that accession requirements are smaller, and more can be saved if the Services are willing to make changes to certain in-house GME programs. This is logical because, with a longer AFHPSP ADO, fewer accessions are needed to get enough physicians to remain in the medical corps long enough to fill seniority requirements. Hence, the need for GME to increase longevity decreases as the AFHPSP ADO increases.

We also found that increasing the AFHPSP ADO does not automatically translate into an increase in the effective ADO for all AFHPSP direct accessions. Whether it does depends on the specialty and the career path. Because the AFHPSP and GME ADOs are served concurrently, for those specialties with a 5- or 6-year ADO, increasing the AFHPSP ADO from 4 to 5 years doesn't increase the number of years they are obligated following GME. In addition, for physicians who

serve a 2-year GMO tour before beginning a residency program that is 3 years or longer, increasing the AFHPSP ADO from 4 to 5 years doesn't increase the number of years they are obligated following GME.

Impact on the applicant pool

We found that the number of applicants in the national medical school applicant pool has declined each year since the 96/97 academic year, but we estimate that the number of applicants in the national medical school applicant pool will increase in 03/04. Despite this drop, the average quality of national applicants seems to be unchanged since 1998, as measured by MCAT scores and undergraduate GPAs. In addition, USUHS's applicant pool seems to follow national trends in both quantity and quality.

Considering the applicant pools by Service, we found that the data on applicants, selectees, and matriculants were very limited in terms of quality measures, such as MCAT and GPA information. Also, data sources from the Services indicating the number of applicants and matriculants are not always consistent. Specifically, the files providing information on AFHPSP matriculants often do not match the attainment figures provided by recruiters. Notwithstanding these discrepancies, we assumed that the trends in quantity and quality we derived from these files accurately reflect the Services' experience.

The Services' applicant pools appear to follow national trends—that is, they have declined somewhat over the last few years. Presumably, we have no reason to assume that they won't increase next year with the national applicant pool. Quality in terms of GPAs is about the same since FY 1998; however, quality as measured by MCAT scores has dropped about 1 point for the Army and Navy over this period.[37]

Furthermore, quality in terms of the ranking of the medical school that AFHPSP medical students are attending seems to have changed some since FY 1998 based on the available data from the Services. Specifically, the percentage of AFHPSP medical students attending a top

37. MCAT information for the Air Force is not available.

50 medical school (as ranked by *U.S. News & World Report* in terms of research and primary care) has decreased in the Air Force, yet there is no definite downward trend in the Army or Navy. Moreover, for those AFHPSP students in a top 50 medical school, their average ranking in terms of research appears to have increased—meaning a lower ranking—since FY 1998. At the same time, we do not detect a trend in the average ranking in terms of primary care.

The AFHPSP matriculants differ from the first-year medical school students nationally in the mix between allopathic and osteopathic students. Nationally, about 15 percent of first-year students are in osteopathic schools, and about 30 percent of AFHPSP matriculants are osteopathic students. This is noteworthy because osteopathic students have lower MCAT scores and undergraduate GPAs than allopathic students. Also, there is a difference in the propensity of osteopathic students to go into the various specialties compared with allopathic students. For example, osteopaths have a higher propensity to go into family practice and a lower propensity to go into surgery than allopaths. This difference is not necessarily good or bad, but accessing a disproportionate share of osteopathic medical students compared with the national average may make it more difficult for the Services to "grow" their required procedure-based specialists given the readiness mission of the MHS.

In terms of recruiting AFHPSP medical students, we found that each Service uses different types of personnel and incentive systems to achieve its required accessions. The Services differ in their mix of officer and enlisted recruiters, medical versus nonmedical backgrounds, and one tour versus career recruiters. The Navy and Air Force both use "point" systems to incentivize recruiting production in certain programs. The point systems are designed to reflect the importance and difficulty of recruiting for the various programs. The Army currently does not use a point system but gives recruiters a mission to recruit a certain number of people for the various programs.

Historically, each of the Services has had much success in meeting its AFHPSP recruiting goals, even though the requirements varied substantially from year to year. For example, the Army had a goal to recruit 237 AFHPSP medical school students in FY 1999, and it

achieved that goal. In FY 2002, the goal was 318, and it recruited 327. Similarly, the Navy achieved its goal of 209 in FY 2000. In FY 2002, its goal was 362, and it achieved 346, which is 96 percent of this goal. The Air Force's AFHPSP goal has not fluctuated as much as the other Services, and it has had success in achieving its goals. We infer from the Services' ability to meet fluctuating recruiting goals that they have not exhausted the market for AFHPSP.

Overall, the recruiters we spoke with felt that increasing the AFHPSP active duty obligation to 5 years would cut the applicant pool by about 25 percent and cause some reduction in quality. The general perception (although not a universal one) was that, although any increase in the AFHPSP ADO would make recruiting harder, they could still achieve the recruiting mission if DoD increased the ADO to 5 years. Furthermore, the recruiters indicated that any increase beyond 5 years would not be feasible from a recruiting standpoint without increasing the student stipend or making the scholarships more lucrative.

When we asked current AFHPSP medical students about their willingness to consider AFHPSP and accept it if the obligation were 7 years rather than 4, only 18 percent said they would have accepted it (see table 39). Similarly, 26 percent would have accepted a 6-year ADO and 44 percent a 5-year ADO. If we considered only the responses of those who answered yes or no to these questions (not counting those who did not respond), 51, 32, and 22 percent would have accepted a 5-, 6-, or 7-year ADO, respectively. Moreover, it is likely that these estimates are low because there was no incentive for respondents to say they would have accepted a longer obligation. If anything, the incentives were to "game" the system by not indicating their willingness to incur additional obligation.

We found that gender and age do not seem to have a significant impact on willingness to accept a longer AFHPSP ADO. However, those with prior military service were more willing to accept a longer ADO. Similarly, those who applied to USUHS or applied to more than one Service for an AFHPSP scholarship were more willing to accept a longer ADO than those who didn't apply to USUHS or applied to only one Service. We also found that osteopathic medical students were more willing to accept a longer ADO than allopathic

students, but this may simply be a reflection that most osteopathic medical schools are private.

Table 39. Percentage of respondents willing to accept a longer AFHPSP ADO (5, 6, or 7 years)

Response	5 years	6 years	7 years
All respondents			
Yes	43.7	26.4	17.7
No	42.6	57.2	63.5
No response	13.7	16.4	18.9
Respondents (excluding no response)			
Yes	50.7	31.6	21.8
No	49.3	68.4	78.2

Recommendations

The specific tasking CNA received for this study was to determine whether the AFHPSP ADO should be increased from 4 to 7 years for 4 years of subsidization. Based on our findings regarding the impact this change would have on accession requirements and the applicant pool, we do not recommend increasing the AFHPSP to 7 years. Without increasing the subsidization of AFHPSP, we do not think that the reduced applicant pool could support the required number of accessions.

Because potentially going to a 7-year AFHPSP ADO is a large increase in percentage terms, we also looked at more marginal increases in the ADO—going to a 5- or 6-year ADO. As with a 7-year ADO, we do not recommend increasing the ADO to 6 years, because the reduced applicant pool could not support the required number of accessions. In addition, if the Services are not willing to alter the size of the in-house GME program, going to a 6- or 7-year ADO would increase costs because of the need to bring in accessions simply to fill GME positions accessions that aren't needed to fill billets.

As for increasing the AFHPSP ADO from 4 to 5 years for 4 years of subsidization, the analysis indicates that this is a supportable option and will result in cost savings. The amount of savings this change would make depends on the Services' willingness to alter the number

of in-house GME positions, decreasing them in most specialties while increasing them in others. In particular, the largest GME decreases could come from those specialties where FAP is a reasonable accession option for such specialties as family practice, internal medicine, and pediatrics.

Increasing the AFHPSP ADO to 5 years is a supportable option for the following reasons:

1. Increasing the AFHPSP ADO reduces accession requirements substantially.
2. Service recruiters think they believe they could still successfully acquire the required accessions.
3. The Services' ability to meet fluctuating recruiting targets leads us to believe that the Services have not totally exhausted the AFHPSP market.
4. The Services could alter current business practices and allocate more recruiting resources to AFHPSP recruiting by assigning additional points that currently are allocated to FAP or fully trained physicians. The results of the LCC model show that if the Services are not willing to alter the size of the in-house GME program, not as many FAP accessions would be needed.
5. The current environment is one in which medical corps billets are more likely to be decreased than increased because billets substantially exceed readiness requirements in many specialties [2]. Any billet reductions would decrease total AFHPSP accession requirements.
6. The current downward trend of decreasing medical school applicants nationally is projected to change. To the degree that the number of AHFPSP applicants mirror the national trends, the AFHPSP applicant pool should increase.

Along with these reasons why the data support an increase in the AFHPSP ADO, we offer a few notes of caution:

1. The average MCAT scores of Army and Navy matriculants have fallen by 1 point since FY 1998 and are currently about 1 point

below the national average. Similarly, there appears to be a slight decrease in quality of medical schools' AFHPSP applicants as measured by the medical school rankings.

2. Thirty percent of AFHPSP matriculants are osteopathic medical school students compared with 15 percent nationally. We include this as a cautionary note because of the differences between allopathic and osteopathic medical students in terms of MCAT scores and undergraduate GPAs. These differences are important to the degree that these measures are useful predictors of success in medical school and medical licensing exams (USMLE/COMLEX). Also, the differences between allopaths and osteopaths in terms of propensity to go into the various specialties should be considered relative to the specialty mix the Services need to fill their billet and readiness requirements.

3. About 51 percent of current AFHPSP students indicated a willingness to still accept a 5-year obligation. We believe that this is an underestimate of the percentage who would still be willing to accept the obligation because there was no benefit to answering the question affirmatively. That said, this finding should be considered as a cautionary factor for increasing the AFHPSP ADO. If this finding is not an underestimate, the reduction in the applicant pool would make increasing the AFHPSP obligation difficult.

Having considered the pros and cons of an AFHPSP ADO increase, we think that the data and analysis support increasing the AFHPSP from 4 to 5 years for 4 years of subsidization. The data and analysis do not, however, support increasing the AFHPSP ADO beyond 5 years. In addition, because not all AFHPSP accessions are subsidized for 4 years, we recommend structuring the obligation as follows:

- 4-year scholarship—5-year obligation
- 3-year scholarship—4-year obligation
- 2-year scholarship—3-year obligation
- 1-year scholarship—2-year obligation.

Before implementing this AFHPSP obligation, we strongly recommend that DoD consider its other principal alternative for increasing obligated service—altering the graduate medical education (GME) obligation. We believe that the data support the 5-year AFHPSP obligation, but it is not DoD's only alternative; therefore, it may or may not be DoD's best option. In a parallel study for TRICARE Management Activity/Health Affairs (TMA/HA), we are looking at the viability and consequences of increasing the GME obligation. The final results of this study will be published in December 2003.

We strongly recommend that the Services clearly define and closely track the desired retention rate goals for their major physician specialties. The Services currently report "overages" for some physician specialties. If force management tools are not developed and monitored—in concert with an increased AFHPSP ADO—DoD may create further speciality surpluses. In terms of addressing shortages in some specialties in the short run, we recommend that the current accession bonus authority be further evaluated to help DoD more quickly increase required inventories.

We recommend that the Services begin centrally tracking data—both quantity and quality—of the applicants, selectees, and matriculants. In conducting this study, we found that much of these data are not available or are incomplete. These data are fragmented; pieces are tracked by those who (1) set the initial goals, (2) do the recruiting, and (3) manage the AFHPSP program. These groups have interests in different types of information and may track only the information that is useful to that command. As already noted, these sources don't necessarily agree.

As for quality, we recommend that the Services actively track GPAs, MCAT scores, and USMLE/COMLEX scores. Doing this will enable the Services to have a clear picture of who their applicants are, who the select are for the program, and who actually matriculates into the program. Having these data readily available will enable the Services to set a baseline and quickly observe trends.

Impact on other health professions

This study is clearly limited to assessing the impact of potential AFHPSP increases on the medical corps. However, the Services use AFHPSP to access other health professions, such as dentists, optometrists, pharmacists, clinical psychologists, and certified registered nurse anesthetists. It seems reasonable that, because civilian opportunities are more lucrative for physicians than these health professions, these other professions could absorb an increase in the AFHPSP ADO more easily than physicians could.

In addition, we concur with recruiters who pointed out that an AFHPSP ADO increase for medical students would work only if it were tri-Service. That does not mean, however, that the increase in the AFHPSP ADO for other health professions would need to be the same as for the medical corps. Though we don't recommend increasing the AFHPSP ADO to 6 or 7 years for physicians, these may be feasible options for other communities with substantially smaller civilian-to-military pay gaps. We recommend that these options be further explored in a separate study.

Appendix A: Life-cycle-cost model results

Tables A-1 through A-3 show the results of life-cycle cost model under the assumption that the size of the GME program is fixed. These tables show the model's results when we assume an AFHPSP ADO of 5, 6, or 7 years relative to the baseline of a 4-year ADO (baseline A), respectively.

Tables A-4 through A-6 show the results of life-cycle cost model when we allow the model to find the economic-optimal GME program. These tables show the model's results when we assume an AFHPSP ADO of 5, 6, or 7 years relative to the baseline of a 4-year ADO (baseline B), respectively. All tables show the results for each Service separately.

Table A-1 (Army): fixed GME and 5-year AFHPSP ADO

Steady-state accessions and accession and training inventories

	Baseline		Excursion	
Accession mix	Number	Percent	Number	Percent
Accession pipeline mix[a]				
USUHS (63/63)	63	13	63	18
AFHPSP (200/400)	376	78	295	82
FAP (0/60)	42	9	2	0
Total	481	100	359	100
Accession mix at YOP-1				
USUHS	59	14	59	19
AFHPSP direct	254	60	255	80
AFHPSP deferred	72	17	4	1
FAP	39	9	2	0
Total	425	100	319	100

a. Annual accession source constraints are in parentheses (minimum/maximum).

Inventory	Baseline	Excursion
Accession pipepline		
USUHS students	252	252
AFHPSP students	1,464	1,143
AFHPSP deferred	323	19
FAP	122	5
Total	2,162	1,419
Training pipeline		
Interns	328	328
Residents/fellows	881	881
Total	1,210	1,210

Steady-state annual life-cycle cost

	Baseline	Excursion
Total cost of medical corps ($M)	810	795
Cost per fully trained duty physician ($)	254,534	261,206
Shortage of fully trained duty physicians	11.3	11.6
Cost adjusted for shortages ($M)	812	798
Cost as a percentage of baseline		98.2

Steady-state annual experience profile shortages

Experience group	Baseline	Excursion
O-5/6 shortage	1.1	1.1
O-6 shortage	0.0	0.0

Steady-state annual inventory by specialty and paygrade

		Baseline				Excursion				Excess (shortage)		GME starts	
Specialty	Billets	O-3/4	O-5	O-6	Total	O-3/4	O-5	O-6	Total	Baseline	Excursion	Baseline	Excursion
Anesthesiology	121	88	23	13	124	93	22	14	130	3.0	8.7	16.0	16.0
Cardio	50	33	12	10	55	32	12	7	52	4.9	2.1	7.0	7.0
Family practice	491	335	79	78	491	335	102	104	541	0.0	49.6	50.0	50.0
General IM	309	246	48	45	339	250	58	57	366	29.5	56.9	55.0	55.0
General surgery	185	129	34	21	185	126	34	30	189	0.0	4.4	24.0	24.0
OB/GYN	170	149	31	20	200	125	30	21	176	30.2	5.6	21.0	21.0
Orthopedic surgery	145	103	38	14	155	111	35	14	160	10.3	15.0	20.0	20.0
Radiology	140	98	28	14	140	98	27	16	140	0.0	0.1	16.0	16.0
Other specialties	1104	1095	218	179	1492	832	250	207	1289	387.5	184.9	135.0	135.0
Overall	2,715	2,276	511	394	3,180	2,002	570	471	3,042	465.3	327.2	344.0	344.0

Steady-state annual percentage paygrade distribution and FAP accessions by specialty

	FY 2000			Baseline			Excursion			FAP constraint		FAP accessions	
Specialty	O-3/4	O-5	O-6	O-3/4	O-5	O-6	O-3/4	O-5	O-6	Baseline	Excursion	Baseline	Excursion
Anesthesiology	71	20	8	71	19	10	72	17	11	0	0	0.0	0.0
Cardio	57	28	15	61	21	18	62	24	14	0	0	0.0	0.0
Family practice	68	15	17	68	16	16	62	19	19	25	25	11.4	0.0
General IM	64	16	20	73	14	13	68	16	16	10	10	7.1	0.0
General surgery	49	28	22	70	19	11	67	18	16	0	0	0.0	0.0
OB/GYN	73	16	11	75	15	10	71	17	12	8	8	8.0	0.0
Orthopedic surgery	55	36	10	66	24	9	69	22	9	0	0	0.0	0.0
Radiology	68	18	15	70	20	10	70	19	11	2	2	2.0	1.6
Other specialties	52	25	23	73	15	12	65	19	16	15	15	13.0	0.1
Overall	59	22	19	72	16	12	66	19	15	60	60	41.6	1.7

Table A-1 (Navy): fixed GME and 5-year AFHPSP ADO

Steady-state accessions and accession and training inventories

	Baseline		Excursion	
Accession mix	Number	Percent	Number	Percent
Accession pipeline mix[a]				
USUHS (51/51)	51	14	51	15
AFHPSP (200/400)	297	79	271	81
FAP (0/60)	29	8	11	3
Total	377	100	333	100
Accession mix at YOP-1				
USUHS	51	16	51	18
AFHPSP direct	163	51	163	58
AFHPSP deferred	80	25	59	21
FAP	27	9	11	4
Total	321	100	284	100

a. Annual accession source constraints are in parentheses (minimum/maximum).

Inventory	Baseline	Excursion
Accession pipepline		
USUHS students	204	204
AFHPSP students	1,151	1,053
AFHPSP deferred	379	284
FAP	85	33
Total	1,820	1,573
Training pipeline		
Interns	235	234
GMOs	454	453
Residents/fellows	615	616
Total	1,303	1,303

Steady-state annual life-cycle cost

	Baseline	Excursion
Total cost of medical corps ($M)	617	615
Cost per fully trained duty physician ($)	291,310	289,320
Shortage of fully trained duty physicians	0.0	0.0
Cost adjusted for shortages ($M)	617	615
Cost as a percentage of baseline		99.6

Steady-state annual experience profile shortages

Experience group	Baseline	Excursion
O-5/6 shortage	0.0	0.0
O-6 shortage	0.0	0.0

Steady-state annual inventory by specialty and paygrade

		Baseline				Excursion				Excess (shortage)		GME starts	
Specialty	Billets	O-3/4	O-5	O-6	Total	O-3/4	O-5	O-6	Total	Baseline	Excursion	Baseline	Excursion
Anesthesiology	138	97	25	16	138	97	25	16	138	0.0	0.0	18.0	18.0
Cardio	25	8	14	8	29	8	14	8	29	4.4	4.4	4.0	4.0
Family practice	403	252	77	74	403	220	91	92	403	0.0	0.0	43.0	43.0
General IM	135	105	23	22	150	119	34	33	187	15.5	51.5	31.0	31.0
General surgery	139	114	26	15	156	114	25	17	156	17.1	17.2	9.0	9.0
OB/GYN	124	87	22	15	124	87	22	15	124	0.0	0.0	13.0	13.0
Orthopedic surgery	133	84	36	13	133	84	36	13	133	0.0	0.0	11.0	11.0
Radiology	112	73	22	17	112	73	22	17	112	0.0	0.0	14.0	14.0
Other specialties	806	549	180	144	872	517	184	142	843	66.4	37.0	78.0	78.0
Overall	2,015	1,369	424	325	2,118	1,319	453	354	2,125	103.4	110.0	221.0	221.0

Steady-state annual percentage paygrade distribution and FAP accessions by specialty

	FY 2000			Baseline			Excursion			FAP constraint		FAP accessions	
Specialty	O-3/4	O-5	O-6	O-3/4	O-5	O-6	O-3/4	O-5	O-6	Baseline	Excursion	Baseline	Excursion
Anesthesiology	64	24	12	70	18	12	70	18	12	0	0	0.0	0.0
Cardio	52	30	19	26	48	27	26	48	27	0	0	0.0	0.0
Family practice	65	20	15	62	19	18	55	23	23	25	25	18.9	1.6
General IM	73	14	13	70	15	15	64	18	18	10	10	0.0	0.0
General surgery	48	30	22	73	17	10	73	16	11	0	0	0.0	0.0
OB/GYN	83	12	5	70	18	12	70	18	12	8	8	0.0	0.0
Orthopedic surgery	69	19	13	63	27	10	63	27	10	0	0	0.0	0.0
Radiology	48	40	12	66	19	15	65	19	15	2	2	0.0	0.0
Other specialties	42	36	22	63	21	16	61	22	17	15	15	10.0	9.5
Overall	55	28	17	65	20	15	62	21	17	60	60	28.9	11.1

Table A-1 (Air Force): fixed GME and 5-year AFHPSP ADO

Steady-state accessions and accession and training inventories

	Baseline		Excursion	
Accession mix	Number	Percent	Number	Percent
Accession pipeline mix[a]				
USUHS (51/51)	51	13	51	20
AFHPSP (150/400)	310	79	203	79
FAP (0/60)	33	8	4	2
Total	393	100	258	100
Accession mix at YOP-1				
USUHS	48	14	48	21
AFHPSP direct	150	42	150	65
AFHPSP deferred	128	36	27	12
FAP	31	9	4	2
Total	357	100	229	100

a. Annual accession source constraints are in parentheses (minimum/maximum).

Inventory	Baseline	Excursion
Accession pipepline		
USUHS students	204	204
AFHPSP students	1,208	786
AFHPSP deferred	579	135
FAP	65	8
Total	2,056	1,133
Training pipeline		
Interns	202	203
Residents/fellows	588	589
Total	791	791

Steady-state annual life-cycle cost

	Baseline	Excursion
Total cost of medical corps ($M)	592	540
Cost per fully trained duty physician ($)	240,283	251,097
Shortage of fully trained duty physicians	1.9	1.2
Cost adjusted for shortages ($M)	592	540
Cost as a percentage of baseline		91.2

Steady-state annual experience profile shortages

Experience group	Baseline	Excursion
O-5/6 shortage	0.0	0.0
O-6 shortage	0.0	0.0

Steady-state annual inventory by specialty and paygrade

		Baseline				Excursion				Excess (shortage)		GME starts	
Specialty	Billets	O-3/4	O-5	O-6	Total	O-3/4	O-5	O-6	Total	Baseline	Excursion	Baseline	Excursion
Anesthesiology	78	55	15	8	78	55	15	8	78	0.0	0.0	8.0	8.0
Cardio	31	24	8	7	39	27	12	10	48	8.2	17.3	5.0	5.0
Family practice	439	297	71	72	439	301	92	93	486	0.0	47.5	45.0	45.0
General IM	162	141	26	25	191	167	39	38	244	29.5	82.1	37.0	37.0
General surgery	111	68	29	14	111	70	25	16	111	0.0	0.0	13.0	13.0
OB/GYN	116	103	21	14	138	81	21	14	116	22.1	0.0	12.0	12.0
Orthopedic surgery	91	57	25	9	91	57	25	9	91	0.0	0.0	8.0	8.0
Radiology	124	89	24	13	126	88	23	14	125	2.0	0.9	16.0	16.0
Other specialties	701	1010	132	107	1249	592	146	113	851	548.4	150.0	74.0	74.0
Overall	1,853	1,843	352	268	2,463	1,437	398	316	2,151	610.1	297.8	218.0	218.0

Steady-state annual percentage paygrade distribution and FAP accessions by specialty

	FY 2000			Baseline			Excursion			FAP constraint		FAP accessions	
Specialty	O-3/4	O-5	O-6	O-3/4	O-5	O-6	O-3/4	O-5	O-6	Baseline	Excursion	Baseline	Excursion
Anesthesiology	81	10	9	70	20	10	70	19	11	0	0	0.0	0.0
Cardio	71	11	18	61	21	18	55	24	21	0	0	0.0	0.0
Family practice	84	11	5	68	16	16	62	19	19	25	25	9.6	0.0
General IM	80	13	7	73	13	13	68	16	16	10	10	0.0	0.0
General surgery	73	13	15	61	26	13	63	23	15	0	0	0.0	0.0
OB/GYN	83	11	6	75	15	10	70	18	12	8	8	8.0	1.8
Orthopedic surgery	75	19	6	63	27	10	63	27	10	0	0	0.0	0.0
Radiology	71	21	8	71	19	10	70	18	11	2	2	2.0	0.0
Other specialties	69	20	11	81	11	9	70	17	13	15	15	13.0	2.4
Overall	76	15	9	75	14	11	67	18	15	60	60	32.6	4.2

Table A-2 (Army): fixed GME and 6-year AFHPSP ADO

Steady-state accessions and accession and training inventories

	Baseline		Excursion	
Accession mix	Number	Percent	Number	Percent
Accession pipeline mix[a]				
USUHS (63/63)	63	13	63	18
AFHPSP (200/400)	376	78	290	82
FAP (0/60)	42	9	0	0
Total	481	100	353	100
Accession mix at YOP-1				
USUHS	59	14	59	19
AFHPSP direct	254	60	255	81
AFHPSP deferred	72	17	0	0
FAP	39	9	0	0
Total	425	100	314	100

a. Annual accession source constraints are in parentheses (minimum/maximum).

Inventory	Baseline	Excursion
Accession pipepline		
USUHS students	252	252
AFHPSP students	1,464	1,126
AFHPSP deferred	323	2
FAP	122	0
Total	2,162	1,380
Training pipeline		
Interns	328	328
Residents/fellows	881	882
Total	1,210	1,210

Steady-state annual life-cycle cost

	Baseline	Excursion
Total cost of medical corps ($M)	810	870
Cost per fully trained duty physician ($)	254,534	256,971
Shortage of fully trained duty physicians	11.3	11.3
Cost adjusted for shortages ($M)	812	873
Cost as a percentage of baseline		107.5

Steady-state annual experience profile shortages

Experience group	Baseline	Excursion
O-5/6 shortage	1.1	1.1
O-6 shortage	0.0	0.0

Steady-state annual inventory by specialty and paygrade

		Baseline				Excursion				Excess (shortage)		GME starts	
Specialty	Billets	O-3/4	O-5	O-6	Total	O-3/4	O-5	O-6	Total	Baseline	Excursion	Baseline	Excursion
Anesthesiology	121	88	23	13	124	103	23	20	146	3.0	25.0	16.0	16.0
Cardio	50	33	12	10	55	32	12	7	52	4.9	2.1	7.0	7.0
Family practice	491	335	79	78	491	368	131	134	633	0.0	142.4	50.0	50.0
General IM	309	246	48	45	339	280	81	79	440	29.5	130.6	55.0	55.0
General surgery	185	129	34	21	185	139	50	44	233	0.0	48.4	24.0	24.0
OB/GYN	170	149	31	20	200	133	30	21	184	30.2	14.2	21.0	21.0
Orthopedic surgery	145	103	38	14	155	121	28	15	165	10.3	19.6	20.0	20.0
Radiology	140	98	28	14	140	100	26	21	147	0.0	6.7	16.0	16.0
Other specialties	1104	1095	218	179	1492	878	313	196	1387	387.5	282.8	135.0	135.0
Overall	2,715	2,276	511	394	3,180	2,155	695	537	3,387	465.3	671.9	344.0	344.0

Steady-state annual percentage paygrade distribution and FAP accessions by specialty

	FY 2000			Baseline			Excursion			FAP constraint		FAP accessions	
Specialty	O-3/4	O-5	O-6	O-3/4	O-5	O-6	O-3/4	O-5	O-6	Baseline	Excursion	Baseline	Excursion
Anesthesiology	71	20	8	71	19	10	71	16	14	0	0	0.0	0.0
Cardio	57	28	15	61	21	18	62	24	14	0	0	0.0	0.0
Family practice	68	15	17	68	16	16	58	21	21	25	25	11.4	0.0
General IM	64	16	20	73	14	13	64	18	18	10	10	7.1	0.0
General surgery	49	28	22	70	19	11	60	22	19	0	0	0.0	0.0
OB/GYN	73	16	11	75	15	10	72	16	12	8	8	8.0	0.0
Orthopedic surgery	55	36	10	66	24	9	74	17	9	0	0	0.0	0.0
Radiology	68	18	15	70	20	10	68	18	14	2	2	2.0	0.0
Other specialties	52	25	23	73	15	12	63	23	14	15	15	13.0	0.0
Overall	59	22	19	72	16	12	64	21	16	60	60	41.6	0.0

Table A-2 (Navy): fixed GME and 6-year AFHPSP ADO

Steady-state accessions and accession and training inventories

	Baseline		Excursion	
Accession mix	Number	Percent	Number	Percent
Accession pipeline mix[a]				
USUHS (51/51)	51	14	51	17
AFHPSP (200/400)	297	79	247	81
FAP (0/60)	29	8	6	2
Total	377	100	303	100
Accession mix at YOP-1				
USUHS	51	16	51	20
AFHPSP direct	163	51	163	63
AFHPSP deferred	80	25	39	15
FAP	27	9	5	2
Total	321	100	258	100

a. Annual accession source constraints are in parentheses (minimum/maximum).

Inventory	Baseline	Excursion
Accession pipepline		
USUHS students	204	204
AFHPSP students	1,151	958
AFHPSP deferred	379	190
FAP	85	17
Total	1,820	1,369
Training pipeline		
Interns	235	235
GMOs	454	453
Residents/fellows	615	615
Total	1,303	1,303

Steady-state annual life-cycle cost

	Baseline	Excursion
Total cost of medical corps ($M)	617	658
Cost per fully trained duty physician ($)	291,310	291,870
Shortage of fully trained duty physicians	0.0	0.0
Cost adjusted for shortages ($M)	617	658
Cost as a percentage of baseline		106.6

Steady-state annual experience profile shortages

Experience group	Baseline	Excursion
O-5/6 shortage	0.0	0.0
O-6 shortage	0.0	0.0

Steady-state annual inventory by specialty and paygrade

		Baseline				Excursion				Excess (shortage)		GME starts	
Specialty	Billets	O-3/4	O-5	O-6	Total	O-3/4	O-5	O-6	Total	Baseline	Excursion	Baseline	Excursion
Anesthesiology	138	97	25	16	138	88	27	23	138	0.0	0.0	18.0	18.0
Cardio	25	8	14	8	29	8	14	8	29	4.4	4.4	4.0	4.0
Family practice	403	252	77	74	403	243	117	117	477	0.0	74.3	43.0	43.0
General IM	135	105	23	22	150	137	47	46	229	15.5	94.4	31.0	31.0
General surgery	139	114	26	15	156	106	32	18	156	17.1	17.1	9.0	9.0
OB/GYN	124	87	22	15	124	87	22	15	124	0.0	0.0	13.0	13.0
Orthopedic surgery	133	84	36	13	133	84	36	13	133	0.0	0.0	11.0	11.0
Radiology	112	73	22	17	112	73	22	17	112	0.0	0.0	14.0	14.0
Other specialties	806	549	180	144	872	490	215	149	854	66.4	47.8	78.0	78.0
Overall	2,015	1,369	424	325	2,118	1,314	532	407	2,253	103.4	237.9	221.0	221.0

Steady-state annual percentage paygrade distribution and FAP accessions by specialty

	FY 2000			Baseline			Excursion			FAP constraint		FAP accessions	
Specialty	O-3/4	O-5	O-6	O-3/4	O-5	O-6	O-3/4	O-5	O-6	Baseline	Excursion	Baseline	Excursion
Anesthesiology	64	24	12	70	18	12	64	19	17	0	0	0.0	0.0
Cardio	52	30	19	26	48	27	26	48	27	0	0	0.0	0.0
Family practice	65	20	15	62	19	18	51	25	25	25	25	18.9	0.0
General IM	73	14	13	70	15	15	60	20	20	10	10	0.0	0.0
General surgery	48	30	22	73	17	10	68	21	11	0	0	0.0	0.0
OB/GYN	83	12	5	70	18	12	70	18	12	8	8	0.0	0.0
Orthopedic surgery	69	19	13	63	27	10	63	27	10	0	0	0.0	0.0
Radiology	48	40	12	66	19	15	65	20	15	2	2	0.0	0.0
Other specialties	42	36	22	63	21	16	57	25	17	15	15	10.0	5.7
Overall	55	28	17	65	20	15	58	24	18	60	60	28.9	5.7

Table A-2 (Air Force): fixed GME and 6-year AFHPSP ADO

Steady-state accessions and accession and training inventories

	Baseline		Excursion	
Accession mix	Number	Percent	Number	Percent
Accession pipeline mix[a]				
USUHS (51/51)	51	13	51	21
AFHPSP (150/400)	310	79	183	77
FAP (0/60)	33	8	3	1
Total	393	100	237	100
Accession mix at YOP-1				
USUHS	48	14	48	23
AFHPSP direct	150	42	150	71
AFHPSP deferred	128	36	11	5
FAP	31	9	3	1
Total	357	100	212	100

a. Annual accession source constraints are in parentheses (minimum/maximum).

Inventory	Baseline	Excursion
Accession pipepline		
USUHS students	204	204
AFHPSP students	1,208	712
AFHPSP deferred	579	53
FAP	65	6
Total	2,056	975
Training pipeline		
Interns	202	203
Residents/fellows	588	589
Total	791	791

Steady-state annual life-cycle cost

	Baseline	Excursion
Total cost of medical corps ($M)	592	566
Cost per fully trained duty physician ($)	240,283	250,414
Shortage of fully trained duty physicians	1.9	0.0
Cost adjusted for shortages ($M)	592	566
Cost as a percentage of baseline		95.5

Steady-state annual experience profile shortages

Experience group	Baseline	Excursion
O-5/6 shortage	0.0	0.0
O-6 shortage	0.0	0.0

Steady-state annual inventory by specialty and paygrade

		Baseline				Excursion				Excess (shortage)		GME starts	
Specialty	Billets	O-3/4	O-5	O-6	Total	O-3/4	O-5	O-6	Total	Baseline	Excursion	Baseline	Excursion
Anesthesiology	78	55	15	8	78	54	15	10	78	0.0	0.0	8.0	8.0
Cardio	31	24	8	7	39	23	9	5	37	8.2	6.2	5.0	5.0
Family practice	439	297	71	72	439	332	118	120	570	0.0	131.0	45.0	45.0
General IM	162	141	26	25	191	187	54	53	293	29.5	131.3	37.0	37.0
General surgery	111	68	29	14	111	74	27	23	124	0.0	13.3	13.0	13.0
OB/GYN	116	103	21	14	138	81	21	14	116	22.1	0.0	12.0	12.0
Orthopedic surgery	91	57	25	9	91	57	24	9	91	0.0	0.0	8.0	8.0
Radiology	124	89	24	13	126	96	25	20	141	2.0	16.9	16.0	16.0
Other specialties	701	1010	132	107	1249	543	160	106	809	548.4	107.9	74.0	74.0
Overall	1,853	1,843	352	268	2,463	1,447	452	360	2,260	610.1	406.6	218.0	218.0

Steady-state annual percentage paygrade distribution and FAP accessions by specialty

	FY 2000			Baseline			Excursion			FAP constraint		FAP accessions	
Specialty	O-3/4	O-5	O-6	O-3/4	O-5	O-6	O-3/4	O-5	O-6	Baseline	Excursion	Baseline	Excursion
Anesthesiology	81	10	9	70	20	10	69	19	12	0	0	0.0	0.0
Cardio	71	11	18	61	21	18	62	24	14	0	0	0.0	0.0
Family practice	84	11	5	68	16	16	58	21	21	25	25	9.6	0.0
General IM	80	13	7	73	13	13	64	18	18	10	10	0.0	0.0
General surgery	73	13	15	61	26	13	60	22	19	0	0	0.0	0.0
OB/GYN	83	11	6	75	15	10	70	18	12	8	8	8.0	1.0
Orthopedic surgery	75	19	6	63	27	10	63	27	10	0	0	0.0	0.0
Radiology	71	21	8	71	19	10	68	18	14	2	2	2.0	0.0
Other specialties	69	20	11	81	11	9	67	20	13	15	15	13.0	2.0
Overall	76	15	9	75	14	11	64	20	16	60	60	32.6	3.0

Table A-3 (Army): fixed GME and 7-year AFHPSP ADO

Steady-state accessions and accession and training inventories

	Baseline		Excursion	
Accession mix	Number	Percent	Number	Percent
Accession pipeline mix[a]				
USUHS (63/63)	63	13	63	18
AFHPSP (200/400)	376	78	290	82
FAP (0/60)	42	9	0	0
Total	481	100	353	100
Accession mix at YOP-1				
USUHS	59	14	59	19
AFHPSP direct	254	60	255	81
AFHPSP deferred	72	17	0	0
FAP	39	9	0	0
Total	425	100	314	100

a. Annual accession source constraints are in parentheses (minimum/maximum).

Inventory	Baseline	Excursion
Accession pipepline		
USUHS students	252	252
AFHPSP students	1,464	1,125
AFHPSP deferred	323	0
FAP	122	0
Total	2,162	1,377
Training pipeline		
Interns	328	328
Residents/fellows	881	882
Total	1,210	1,211

Steady-state annual life-cycle cost

	Baseline	Excursion
Total cost of medical corps ($M)	810	970
Cost per fully trained duty physician ($)	254,534	253,673
Shortage of fully trained duty physicians	11.3	9.7
Cost adjusted for shortages ($M)	812	973
Cost as a percentage of baseline		119.7

Steady-state annual experience profile shortages

Experience group	Baseline	Excursion
O-5/6 shortage	1.1	0.0
O-6 shortage	0.0	0.0

Steady-state annual inventory by specialty and paygrade

		Baseline				Excursion				Excess (shortage)		GME starts	
Specialty	Billets	O-3/4	O-5	O-6	Total	O-3/4	O-5	O-6	Total	Baseline	Excursion	Baseline	Excursion
Anesthesiology	121	88	23	13	124	112	35	30	177	3.0	55.6	16.0	16.0
Cardio	50	33	12	10	55	32	12	7	52	4.9	2.1	7.0	7.0
Family practice	491	335	79	78	491	393	162	164	719	0.0	227.8	50.0	50.0
General IM	309	246	48	45	339	303	106	103	512	29.5	202.7	55.0	55.0
General surgery	185	129	34	21	185	146	69	60	275	0.0	89.6	24.0	24.0
OB/GYN	170	149	31	20	200	146	31	24	201	30.2	30.5	21.0	21.0
Orthopedic surgery	145	103	38	14	155	132	36	24	192	10.3	46.9	20.0	20.0
Radiology	140	98	28	14	140	106	40	32	177	0.0	37.5	16.0	16.0
Other specialties	1104	1095	218	179	1492	916	372	234	1521	387.5	417.4	135.0	135.0
Overall	2,715	2,276	511	394	3,180	2,285	862	677	3,825	465.3	1110.1	344.0	344.0

Steady-state annual percentage paygrade distribution and FAP accessions by specialty

	FY 2000			Baseline			Excursion			FAP constraint		FAP accessions	
Specialty	O-3/4	O-5	O-6	O-3/4	O-5	O-6	O-3/4	O-5	O-6	Baseline	Excursion	Baseline	Excursion
Anesthesiology	71	20	8	71	19	10	64	20	17	0	0	0.0	0.0
Cardio	57	28	15	61	21	18	62	24	14	0	0	0.0	0.0
Family practice	68	15	17	68	16	16	55	23	23	25	25	11.4	0.0
General IM	64	16	20	73	14	13	59	21	20	10	10	7.1	0.0
General surgery	49	28	22	70	19	11	53	25	22	0	0	0.0	0.0
OB/GYN	73	16	11	75	15	10	73	15	12	8	8	8.0	0.0
Orthopedic surgery	55	36	10	66	24	9	69	19	12	0	0	0.0	0.0
Radiology	68	18	15	70	20	10	60	23	18	2	2	2.0	0.0
Other specialties	52	25	23	73	15	12	60	24	15	15	15	13.0	0.0
Overall	59	22	19	72	16	12	60	23	18	60	60	41.6	0.0

Table A-3 (Navy): fixed GME and 7-year AFHPSP ADO

Steady-state accessions and accession and training inventories

	Baseline		Excursion	
Accession mix	Number	Percent	Number	Percent
Accession pipeline mix[a]				
USUHS (51/51)	51	14	51	18
AFHPSP (200/400)	297	79	232	82
FAP (0/60)	29	8	0	0
Total	377	100	283	100
Accession mix at YOP-1				
USUHS	51	16	51	21
AFHPSP direct	163	51	163	67
AFHPSP deferred	80	25	27	11
FAP	27	9	0	0
Total	321	100	241	100

a. Annual accession source constraints are in parentheses (minimum/maximum).

Inventory	Baseline	Excursion
Accession pipepline		
USUHS students	204	204
AFHPSP students	1,151	906
AFHPSP deferred	379	136
FAP	85	0
Total	1,820	1,245
Training pipeline		
Interns	235	235
GMOs	454	454
Residents/fellows	615	615
Total	1,303	1,304

Steady-state annual life-cycle cost

	Baseline	Excursion
Total cost of medical corps ($M)	617	702
Cost per fully trained duty physician ($)	291,310	287,170
Shortage of fully trained duty physicians	0.0	0.0
Cost adjusted for shortages ($M)	617	702
Cost as a percentage of baseline		113.8

Steady-state annual experience profile shortages

Experience group	Baseline	Excursion
O-5/6 shortage	0.0	0.0
O-6 shortage	0.0	0.0

Steady-state annual inventory by specialty and paygrade

		Baseline				Excursion				Excess (shortage)		GME starts	
Specialty	Billets	O-3/4	O-5	O-6	Total	O-3/4	O-5	O-6	Total	Baseline	Excursion	Baseline	Excursion
Anesthesiology	138	97	25	16	138	92	47	22	160	0.0	22.5	18.0	18.0
Cardio	25	8	14	8	29	8	14	8	29	4.4	4.4	4.0	4.0
Family practice	403	252	77	74	403	264	146	141	551	0.0	147.6	43.0	43.0
General IM	135	105	23	22	150	150	62	60	271	15.5	136.4	31.0	31.0
General surgery	139	114	26	15	156	96	34	27	156	17.1	17.2	9.0	9.0
OB/GYN	124	87	22	15	124	87	21	16	124	0.0	0.0	13.0	13.0
Orthopedic surgery	133	84	36	13	133	93	27	13	133	0.0	0.0	11.0	11.0
Radiology	112	73	22	17	112	65	35	27	127	0.0	15.5	14.0	14.0
Other specialties	806	549	180	144	872	464	245	184	893	66.4	87.3	78.0	78.0
Overall	2,015	1,369	424	325	2,118	1,318	630	498	2,446	103.4	430.8	221.0	221.0

Steady-state annual percentage paygrade distribution and FAP accessions by specialty

	FY 2000			Baseline			Excursion			FAP constraint		FAP accessions	
Specialty	O-3/4	O-5	O-6	O-3/4	O-5	O-6	O-3/4	O-5	O-6	Baseline	Excursion	Baseline	Excursion
Anesthesiology	64	24	12	70	18	12	57	29	14	0	0	0.0	0.0
Cardio	52	30	19	26	48	27	26	48	27	0	0	0.0	0.0
Family practice	65	20	15	62	19	18	48	26	26	25	25	18.9	0.0
General IM	73	14	13	70	15	15	55	23	22	10	10	0.0	0.0
General surgery	48	30	22	73	17	10	61	22	17	0	0	0.0	0.0
OB/GYN	83	12	5	70	18	12	70	17	13	8	8	0.0	0.0
Orthopedic surgery	69	19	13	63	27	10	70	20	10	0	0	0.0	0.0
Radiology	48	40	12	66	19	15	51	27	22	2	2	0.0	0.0
Other specialties	42	36	22	63	21	16	52	27	21	15	15	10.0	0.0
Overall	55	28	17	65	20	15	54	26	20	60	60	28.9	0.0

Table A-3 (Air Force): fixed GME and 7-year AFHPSP ADO

Steady-state accessions and accession and training inventories

	Baseline		Excursion	
Accession mix	Number	Percent	Number	Percent
Accession pipeline mix[a]				
USUHS (51/51)	51	13	51	22
AFHPSP (150/400)	310	79	177	77
FAP (0/60)	33	8	2	1
Total	393	100	230	100
Accession mix at YOP-1				
USUHS	48	14	48	23
AFHPSP direct	150	42	150	73
AFHPSP deferred	128	36	6	3
FAP	31	9	2	1
Total	357	100	206	100

a. Annual accession source constraints are in parentheses (minimum/maximum).

The USUHS constraint for the excursion is 58.65.

Inventory	Baseline	Excursion
Accession pipepline		
USUHS students	204	204
AFHPSP students	1,208	688
AFHPSP deferred	579	30
FAP	65	4
Total	2,056	925
Training pipeline		
Interns	202	202
Residents/fellows	588	587
Total	791	789

Steady-state annual life-cycle cost

	Baseline	Excursion
Total cost of medical corps ($M)	592	618
Cost per fully trained duty physician ($)	240,283	248,485
Shortage of fully trained duty physicians	1.9	0.0
Cost adjusted for shortages ($M)	592	618
Cost as a percentage of baseline		104.3

Steady-state annual experience profile shortages

Experience group	Baseline	Excursion
O-5/6 shortage	0.0	0.0
O-6 shortage	0.0	0.0

Steady-state annual inventory by specialty and paygrade

		Baseline				Excursion				Excess (shortage)		GME starts	
Specialty	Billets	O-3/4	O-5	O-6	Total	O-3/4	O-5	O-6	Total	Baseline	Excursion	Baseline	Excursion
Anesthesiology	78	55	15	8	78	51	18	9	78	0.0	0.0	8.0	8.0
Cardio	31	24	8	7	39	23	9	5	37	8.2	6.2	5.0	5.0
Family practice	439	297	71	72	439	353	146	148	647	0.0	207.9	45.0	45.0
General IM	162	141	26	25	191	202	71	69	341	29.5	179.4	37.0	37.0
General surgery	111	68	29	14	111	74	41	17	132	0.0	21.4	13.0	13.0
OB/GYN	116	103	21	14	138	82	20	15	117	22.1	0.9	12.0	12.0
Orthopedic surgery	91	57	25	9	91	64	17	9	91	0.0	0.0	8.0	8.0
Radiology	124	89	24	13	126	102	39	30	170	2.0	46.4	16.0	16.0
Other specialties	701	1010	132	107	1249	544	190	137	871	548.4	169.9	74.0	74.0
Overall	1,853	1,843	352	268	2,463	1,495	550	440	2,485	610.1	632.2	218.0	218.0

Steady-state annual percentage paygrade distribution and FAP accessions by specialty

	FY 2000			Baseline			Excursion			FAP constraint		FAP accessions	
Specialty	O-3/4	O-5	O-6	O-3/4	O-5	O-6	O-3/4	O-5	O-6	Baseline	Excursion	Baseline	Excursion
Anesthesiology	81	10	9	70	20	10	65	23	12	0	0	0.0	0.0
Cardio	71	11	18	61	21	18	62	24	14	0	0	0.0	0.0
Family practice	84	11	5	68	16	16	55	23	23	25	25	9.6	0.0
General IM	80	13	7	73	13	13	59	21	20	10	10	0.0	0.0
General surgery	73	13	15	61	26	13	56	31	13	0	0	0.0	0.0
OB/GYN	83	11	6	75	15	10	70	17	13	8	8	8.0	0.0
Orthopedic surgery	75	19	6	63	27	10	71	19	10	0	0	0.0	0.0
Radiology	71	21	8	71	19	10	60	23	18	2	2	2.0	0.0
Other specialties	69	20	11	81	11	9	62	22	16	15	15	13.0	1.9
Overall	76	15	9	75	14	11	60	22	18	60	60	32.6	1.9

Table A-4 (Army): economic-optimal GME and 5-year AFHPSP ADO

Steady-state accessions and accession and training inventories

	Baseline		Excursion	
Accession mix	Number	Percent	Number	Percent
Accession pipeline mix[a]				
USUHS (63/63)	63	15	63	18
AFHPSP (50/400)	291	70	251	72
FAP (0/60)	60	15	35	10
Total	414	100	349	100
Accession mix at YOP-1				
USUHS	59	16	59	19
AFHPSP direct	209	57	105	34
AFHPSP deferred	44	12	114	37
FAP	56	15	33	11
Total	369	100	311	100

a. Annual accession source constraints are in parentheses (minimum/maximum).

Inventory	Baseline	Excursion
Accession pipepline		
USUHS students	252	252
AFHPSP students	1,128	973
AFHPSP deferred	225	467
FAP	176	103
Total	1,781	1,794
Training pipeline		
Interns	280	172
Residents/fellows	749	492
Total	1,029	664

Steady-state annual life-cycle cost

	Baseline	Excursion
Total cost of medical corps ($M)	716	652
Cost per fully trained duty physician ($)	253,644	240,061
Shortage of fully trained duty physicians	0.0	0.0
Cost adjusted for shortages ($M)	716	652
Cost as a percentage of baseline		91.0

Steady-state annual experience profile shortages

Experience group	Baseline	Excursion
O-5/6 shortage	0.0	0.0
O-6 shortage	0.0	0.0

Steady-state annual inventory by specialty and paygrade

		Baseline				Excursion				Excess (shortage)		GME starts	
Specialty	Billets	O-3/4	O-5	O-6	Total	O-3/4	O-5	O-6	Total	Baseline	Excursion	Baseline	Excursion
Anesthesiology	121	99	23	13	135	85	23	13	121	14.5	0.0	18.7	14.2
Cardio	50	35	8	7	50	35	8	7	50	0.0	0.0	4.8	3.2
Family practice	491	344	74	73	491	344	65	82	491	0.3	0.0	38.5	8.9
General IM	309	242	48	45	334	216	48	45	309	25.2	0.0	45.2	27.6
General surgery	185	151	31	25	207	129	30	26	185	21.6	0.0	31.4	19.3
OB/GYN	170	119	31	20	170	119	31	20	170	0.0	0.0	10.5	10.5
Orthopedic surgery	145	91	39	15	145	91	39	14	145	0.0	0.0	12.6	12.6
Radiology	140	98	28	14	140	98	28	14	140	0.0	0.0	17.4	11.5
Other specialties	1104	813	189	150	1151	766	189	149	1104	47.0	0.2	108.1	69.4
Overall	2,715	1,992	471	361	2,824	1,883	462	370	2,715	108.5	0.3	287.1	177.1

Steady-state annual percentage paygrade distribution and FAP accessions by specialty

	FY 2000			Baseline			Excursion			FAP constraint		FAP accessions	
Specialty	O-3/4	O-5	O-6	O-3/4	O-5	O-6	O-3/4	O-5	O-6	Baseline	Excursion	Baseline	Excursion
Anesthesiology	71	20	8	73	17	10	70	19	11	0	0	0.0	0.0
Cardio	57	28	15	70	16	14	70	17	13	0	0	0.0	0.0
Family practice	68	15	17	70	15	15	70	13	17	25	25	25.0	0.0
General IM	64	16	20	72	14	13	70	16	14	10	10	10.0	10.0
General surgery	49	28	22	73	15	12	70	16	14	0	0	0.0	0.0
OB/GYN	73	16	11	70	18	12	70	18	12	8	8	8.0	8.0
Orthopedic surgery	55	36	10	63	27	10	63	27	10	0	0	0.0	0.0
Radiology	68	18	15	70	20	10	70	20	10	2	2	2.0	2.0
Other specialties	52	25	23	71	16	13	69	17	14	15	15	15.0	15.0
Overall	59	22	19	71	17	13	69	17	14	60	60	60.0	35.0

Table A-4 (Navy): economic-optimal GME and 5-year AFHPSP ADO

Steady-state accessions and accession and training inventories

	Baseline		Excursion	
Accession mix	Number	Percent	Number	Percent
Accession pipeline mix[a]				
USUHS (51/51)	51	14	51	17
AFHPSP (50/400)	258	73	232	76
FAP (0/60)	45	13	23	7
Total	354	100	305	100
Accession mix at YOP-1				
USUHS	44	15	44	17
AFHPSP direct	67	22	45	17
AFHPSP deferred	149	49	155	59
FAP	42	14	19	7
Total	303	100	263	100

a. Annual accession source constraints are in parentheses (minimum/maximum).

Inventory	Baseline	Excursion
Accession pipepline		
USUHS students	204	204
AFHPSP students	1,001	899
AFHPSP deferred	679	670
FAP	132	61
Total	2,017	1,835
Training pipeline		
Interns	125	99
GMOs	241	190
Residents/fellows	359	294
Total	725	583

Steady-state annual life-cycle cost

	Baseline	Excursion
Total cost of medical corps ($M)	525	503
Cost per fully trained duty physician ($)	257,998	247,367
Shortage of fully trained duty physicians	0.0	0.0
Cost adjusted for shortages ($M)	525	503
Cost as a percentage of baseline		95.8

Steady-state annual experience profile shortages

Experience group	Baseline	Excursion
O-5/6 shortage	0.0	0.0
O-6 shortage	0.0	0.0

Steady-state annual inventory by specialty and paygrade

		Baseline				Excursion				Excess (shortage)		GME starts	
Specialty	Billets	O-3/4	O-5	O-6	Total	O-3/4	O-5	O-6	Total	Baseline	Excursion	Baseline	Excursion
Anesthesiology	138	97	28	14	138	97	28	14	138	0.0	0.0	11.4	10.7
Cardio	25	17	4	3	25	18	4	3	25	0.0	0.0	1.0	0.9
Family practice	403	282	62	59	403	282	52	69	403	0.0	0.0	15.5	4.2
General IM	135	94	23	18	135	94	22	18	135	0.0	0.0	4.5	3.9
General surgery	139	116	23	19	158	115	23	19	156	19.0	17.4	10.1	9.2
OB/GYN	124	87	23	15	124	87	23	15	124	0.0	0.0	7.0	6.9
Orthopedic surgery	133	90	30	13	133	83	36	13	133	0.0	0.0	15.0	10.7
Radiology	112	78	19	15	112	78	19	15	112	0.0	0.0	12.1	11.8
Other specialties	806	564	134	108	806	564	135	107	806	0.0	0.0	38.2	32.6
Overall	2,015	1,427	344	264	2,034	1,418	342	273	2,032	19.0	17.4	114.9	91.0

Steady-state annual percentage paygrade distribution and FAP accessions by specialty

	FY 2000			Baseline			Excursion			FAP constraint		FAP accessions	
Specialty	O-3/4	O-5	O-6	O-3/4	O-5	O-6	O-3/4	O-5	O-6	Baseline	Excursion	Baseline	Excursion
Anesthesiology	64	24	12	70	20	10	70	20	10	0	0	0.0	0.0
Cardio	52	30	19	70	17	13	70	18	12	0	0	0.0	0.0
Family practice	65	20	15	70	15	15	70	13	17	25	25	25.0	2.5
General IM	73	14	13	70	17	13	70	17	13	10	10	10.0	10.0
General surgery	48	30	22	74	14	12	73	15	12	0	0	0.0	0.0
OB/GYN	83	12	5	70	18	12	70	18	12	8	8	0.0	0.0
Orthopedic surgery	69	19	13	68	22	10	63	27	10	0	0	0.0	0.0
Radiology	48	40	12	70	17	13	70	17	13	2	2	0.0	0.0
Other specialties	42	36	22	70	17	13	70	17	13	15	15	10.0	10.0
Overall	55	28	17	70	17	13	70	17	13	60	60	45.0	22.5

Table A-4 (Air Force): economic-optimal GME and 5-year AFHPSP ADO

Steady-state accessions and accession and training inventories

	Baseline		Excursion	
Accession mix	Number	Percent	Number	Percent
Accession pipeline mix[a]				
USUHS (51/51)	51	19	51	22
AFHPSP (50/400)	158	59	135	57
FAP (0/60)	59	22	51	22
Total	268	100	237	100
Accession mix at YOP-1				
USUHS	48	20	48	22
AFHPSP direct	117	48	61	28
AFHPSP deferred	20	8	53	25
FAP	57	23	53	24
Total	242	100	216	100

a. Annual accession source constraints are in parentheses (minimum/maximum).

Inventory	Baseline	Excursion
Accession pipepline		
USUHS students	204	204
AFHPSP students	611	521
AFHPSP deferred	90	212
FAP	117	102
Total	1,023	1,039
Training pipeline		
Interns	166	111
Residents/fellows	524	369
Total	690	480

Steady-state annual life-cycle cost

	Baseline	Excursion
Total cost of medical corps ($M)	467	440
Cost per fully trained duty physician ($)	246,909	237,686
Shortage of fully trained duty physicians	0.0	0.0
Cost adjusted for shortages ($M)	467	440
Cost as a percentage of baseline		94.3

Steady-state annual experience profile shortages

Experience group	Baseline	Excursion
O-5/6 shortage	0.0	0.0
O-6 shortage	0.0	0.0

Steady-state annual inventory by specialty and paygrade

		Baseline				Excursion				Excess (shortage)		GME starts	
Specialty	Billets	O-3/4	O-5	O-6	Total	O-3/4	O-5	O-6	Total	Baseline	Excursion	Baseline	Excursion
Anesthesiology	78	55	15	8	78	55	16	8	78	0.0	0.0	9.8	6.7
Cardio	31	19	7	6	31	17	8	6	31	0.0	0.0	4.0	3.2
Family practice	439	303	69	67	439	299	67	73	439	0.1	0.0	34.6	14.7
General IM	162	116	27	24	167	107	28	26	162	5.3	0.0	20.9	16.1
General surgery	111	79	20	14	112	74	20	17	111	1.4	0.0	17.3	14.5
OB/GYN	116	81	21	14	116	81	21	14	116	0.0	0.0	6.6	6.6
Orthopedic surgery	91	57	25	9	91	57	25	9	91	0.0	0.0	7.9	7.9
Radiology	124	87	24	12	124	85	27	12	124	0.0	0.0	15.5	8.5
Other specialties	701	508	129	95	732	477	129	95	701	30.8	0.0	65.0	45.6
Overall	1,853	1,305	336	250	1,891	1,252	340	261	1,853	37.7	0.0	181.6	123.8

Steady-state annual percentage paygrade distribution and FAP accessions by specialty

	FY 2000			Baseline			Excursion			FAP constraint		FAP accessions	
Specialty	O-3/4	O-5	O-6	O-3/4	O-5	O-6	O-3/4	O-5	O-6	Baseline	Excursion	Baseline	Excursion
Anesthesiology	81	10	9	70	20	10	70	20	10	0	0	0.0	0.0
Cardio	71	11	18	60	21	18	55	24	21	0	0	0.0	0.0
Family practice	84	11	5	69	16	15	68	15	17	25	25	24.4	16.1
General IM	80	13	7	69	16	15	66	18	16	10	10	10.0	10.0
General surgery	73	13	15	70	17	12	67	18	16	0	0	0.0	0.0
OB/GYN	83	11	6	70	18	12	70	18	12	8	8	8.0	8.0
Orthopedic surgery	75	19	6	63	27	10	63	27	10	0	0	0.0	0.0
Radiology	71	21	8	70	20	10	69	21	10	2	2	2.0	2.0
Other specialties	69	20	11	69	18	13	68	18	14	15	15	15.0	15.0
Overall	76	15	9	69	18	13	68	18	14	60	60	59.4	51.1

Table A-5 (Army): economic-optimal GME and 6-year AFHPSP ADO

Steady-state accessions and accession and training inventories

	Baseline		Excursion	
Accession mix	Number	Percent	Number	Percent
Accession pipeline mix[a]				
USUHS (63/63)	63	15	63	19
AFHPSP (50/400)	291	70	214	64
FAP (0/60)	60	15	58	17
Total	414	100	335	100
Accession mix at YOP-1				
USUHS	59	16	60	20
AFHPSP direct	209	57	47	16
AFHPSP deferred	44	12	135	46
FAP	56	15	54	18
Total	369	100	296	100

a. Annual accession source constraints are in parentheses (minimum/maximum).

Inventory	Baseline	Excursion
Accession pipepline		
USUHS students	252	252
AFHPSP students	1,128	832
AFHPSP deferred	225	562
FAP	176	170
Total	1,781	1,816
Training pipeline		
Interns	280	111
Residents/fellows	749	350
Total	1,029	461

Steady-state annual life-cycle cost

	Baseline	Excursion
Total cost of medical corps ($M)	716	624
Cost per fully trained duty physician ($)	253,644	229,967
Shortage of fully trained duty physicians	0.0	0.0
Cost adjusted for shortages ($M)	716	624
Cost as a percentage of baseline		87.2

Steady-state annual experience profile shortages

Experience group	Baseline	Excursion
O-5/6 shortage	0.0	0.0
O-6 shortage	0.0	0.0

Steady-state annual inventory by specialty and paygrade

		Baseline				Excursion				Excess (shortage)		GME starts	
Specialty	Billets	O-3/4	O-5	O-6	Total	O-3/4	O-5	O-6	Total	Baseline	Excursion	Baseline	Excursion
Anesthesiology	121	99	23	13	135	85	24	12	121	14.5	0.0	18.7	10.0
Cardio	50	35	8	7	50	35	9	6	50	0.0	0.0	4.8	2.1
Family practice	491	344	74	73	491	344	67	81	491	0.3	0.0	38.5	0.0
General IM	309	242	48	45	334	216	50	43	309	25.2	0.0	45.2	11.1
General surgery	185	151	31	25	207	130	31	24	185	21.6	0.0	31.4	11.4
OB/GYN	170	119	31	20	170	119	31	20	170	0.0	0.0	10.5	10.4
Orthopedic surgery	145	91	39	15	145	91	39	14	145	0.0	0.0	12.6	12.6
Radiology	140	98	28	14	140	98	28	14	140	0.0	0.0	17.4	9.4
Other specialties	1104	813	189	150	1151	754	192	158	1104	47.0	0.0	108.1	48.6
Overall	2,715	1,992	471	361	2,824	1,870	471	373	2,715	108.5	0.0	287.1	115.7

Steady-state annual percentage paygrade distribution and FAP accessions by specialty

	FY 2000			Baseline			Excursion			FAP constraint		FAP accessions	
Specialty	O-3/4	O-5	O-6	O-3/4	O-5	O-6	O-3/4	O-5	O-6	Baseline	Excursion	Baseline	Excursion
Anesthesiology	71	20	8	73	17	10	70	20	10	0	0	0.0	0.0
Cardio	57	28	15	70	16	14	70	18	12	0	0	0.0	0.0
Family practice	68	15	17	70	15	15	70	14	16	25	25	25.0	22.5
General IM	64	16	20	72	14	13	70	16	14	10	10	10.0	10.0
General surgery	49	28	22	73	15	12	70	17	13	0	0	0.0	0.0
OB/GYN	73	16	11	70	18	12	70	18	12	8	8	8.0	8.0
Orthopedic surgery	55	36	10	63	27	10	63	27	10	0	0	0.0	0.0
Radiology	68	18	15	70	20	10	70	20	10	2	2	2.0	2.0
Other specialties	52	25	23	71	16	13	68	17	14	15	15	15.0	15.0
Overall	59	22	19	71	17	13	69	17	14	60	60	60.0	57.5

Table A-5 (Navy): economic-optimal GME and 6-year AFHPSP ADO

Steady-state accessions and accession and training inventories

	Baseline		Excursion	
Accession mix	Number	Percent	Number	Percent
Accession pipeline mix[a]				
USUHS (51/51)	51	14	51	18
AFHPSP (50/400)	258	73	191	68
FAP (0/60)	45	13	40	14
Total	354	100	282	100
Accession mix at YOP-1				
USUHS	44	15	44	18
AFHPSP direct	67	22	24	10
AFHPSP deferred	149	49	137	56
FAP	42	14	38	16
Total	303	100	243	100

a. Annual accession source constraints are in parentheses (minimum/maximum).

Inventory	Baseline	Excursion
Accession pipepline		
USUHS students	204	204
AFHPSP students	1,001	740
AFHPSP deferred	679	609
FAP	132	117
Total	2,017	1,671
Training pipeline		
Interns	125	74
GMOs	241	144
Residents/fellows	359	228
Total	725	446

Steady-state annual life-cycle cost

	Baseline	Excursion
Total cost of medical corps ($M)	525	490
Cost per fully trained duty physician ($)	257,998	241,986
Shortage of fully trained duty physicians	0.0	0.0
Cost adjusted for shortages ($M)	525	490
Cost as a percentage of baseline		93.4

Steady-state annual experience profile shortages

Experience group	Baseline	Excursion
O-5/6 shortage	0.0	0.0
O-6 shortage	0.0	0.0

Steady-state annual inventory by specialty and paygrade

		Baseline				Excursion				Excess (shortage)		GME starts	
Specialty	Billets	O-3/4	O-5	O-6	Total	O-3/4	O-5	O-6	Total	Baseline	Excursion	Baseline	Excursion
Anesthesiology	138	97	28	14	138	97	26	16	138	0.0	0.0	11.4	11.3
Cardio	25	17	4	3	25	18	5	3	25	0.0	0.0	1.0	0.8
Family practice	403	282	62	59	403	282	55	66	403	0.0	0.0	15.5	0.0
General IM	135	94	23	18	135	95	21	19	135	0.0	0.0	4.5	3.2
General surgery	139	116	23	19	158	109	28	14	150	19.0	11.3	10.1	5.8
OB/GYN	124	87	23	15	124	87	23	15	124	0.0	0.0	7.0	6.7
Orthopedic surgery	133	90	30	13	133	83	37	13	133	0.0	0.0	15.0	10.6
Radiology	112	78	19	15	112	78	22	11	112	0.0	0.0	12.1	7.4
Other specialties	806	564	134	108	806	560	135	111	806	0.0	0.0	38.2	23.6
Overall	2,015	1,427	344	264	2,034	1,408	351	268	2,026	19.0	11.3	114.9	69.4

Steady-state annual percentage paygrade distribution and FAP accessions by specialty

	FY 2000			Baseline			Excursion			FAP constraint		FAP accessions	
Specialty	O-3/4	O-5	O-6	O-3/4	O-5	O-6	O-3/4	O-5	O-6	Baseline	Excursion	Baseline	Excursion
Anesthesiology	64	24	12	70	20	10	70	19	11	0	0	0.0	0.0
Cardio	52	30	19	70	17	13	70	19	11	0	0	0.0	0.0
Family practice	65	20	15	70	15	15	70	14	16	25	25	25.0	19.9
General IM	73	14	13	70	17	13	70	16	14	10	10	10.0	10.0
General surgery	48	30	22	74	14	12	72	18	9	0	0	0.0	0.0
OB/GYN	83	12	5	70	18	12	70	18	12	8	8	0.0	0.0
Orthopedic surgery	69	19	13	68	22	10	62	28	10	0	0	0.0	0.0
Radiology	48	40	12	70	17	13	70	20	10	2	2	0.0	0.0
Other specialties	42	36	22	70	17	13	69	17	14	15	15	10.0	10.0
Overall	55	28	17	70	17	13	69	17	13	60	60	45.0	39.9

Table A-5 (Air Force): economic-optimal GME and 6-year AFHPSP ADO

Steady-state accessions and accession and training inventories

	Baseline		Excursion	
Accession mix	Number	Percent	Number	Percent
Accession pipeline mix[a]				
USUHS (51/51)	51	19	51	23
AFHPSP (50/400)	158	59	118	53
FAP (0/60)	59	22	56	25
Total	268	100	225	100
Accession mix at YOP-1				
USUHS	48	20	49	24
AFHPSP direct	117	48	33	16
AFHPSP deferred	20	8	66	33
FAP	57	23	53	27
Total	242	100	201	100

a. Annual accession source constraints are in parentheses (minimum/maximum).

Inventory	Baseline	Excursion
Accession pipepline		
USUHS students	204	204
AFHPSP students	611	457
AFHPSP deferred	90	262
FAP	117	110
Total	1,023	1,033
Training pipeline		
Interns	166	81
Residents/fellows	524	284
Total	690	365

Steady-state annual life-cycle cost

	Baseline	Excursion
Total cost of medical corps ($M)	467	429
Cost per fully trained duty physician ($)	246,909	231,740
Shortage of fully trained duty physicians	0.0	0.0
Cost adjusted for shortages ($M)	467	429
Cost as a percentage of baseline		92.0

Steady-state annual experience profile shortages

Experience group	Baseline	Excursion
O-5/6 shortage	0.0	0.0
O-6 shortage	0.0	0.0

Steady-state annual inventory by specialty and paygrade

		Baseline				Excursion				Excess (shortage)		GME starts	
Specialty	Billets	O-3/4	O-5	O-6	Total	O-3/4	O-5	O-6	Total	Baseline	Excursion	Baseline	Excursion
Anesthesiology	78	55	15	8	78	55	16	8	78	0.0	0.0	9.8	6.5
Cardio	31	19	7	6	31	15	9	7	31	0.0	0.0	4.0	2.7
Family practice	439	303	69	67	439	293	65	81	439	0.1	0.0	34.6	0.0
General IM	162	116	27	24	167	103	30	29	162	5.3	0.0	20.9	13.5
General surgery	111	79	20	14	112	66	24	21	111	1.4	0.0	17.3	11.9
OB/GYN	116	81	21	14	116	81	21	14	116	0.0	0.0	6.6	6.6
Orthopedic surgery	91	57	25	9	91	57	25	9	91	0.0	0.0	7.9	7.9
Radiology	124	87	24	12	124	88	24	12	124	0.0	0.0	15.5	8.3
Other specialties	701	508	129	95	732	471	132	97	701	30.8	0.0	65.0	33.3
Overall	1,853	1,305	336	250	1,891	1,229	346	278	1,853	37.7	0.0	181.6	90.7

Steady-state annual percentage paygrade distribution and FAP accessions by specialty

	FY 2000			Baseline			Excursion			FAP constraint		FAP accessions	
Specialty	O-3/4	O-5	O-6	O-3/4	O-5	O-6	O-3/4	O-5	O-6	Baseline	Excursion	Baseline	Excursion
Anesthesiology	81	10	9	70	20	10	70	20	10	0	0	0.0	0.0
Cardio	71	11	18	60	21	18	49	28	23	0	0	0.0	0.0
Family practice	84	11	5	69	16	15	67	15	18	25	25	24.4	20.7
General IM	80	13	7	69	16	15	63	19	18	10	10	10.0	10.0
General surgery	73	13	15	70	17	12	59	21	19	0	0	0.0	0.0
OB/GYN	83	11	6	70	18	12	70	18	12	8	8	8.0	8.0
Orthopedic surgery	75	19	6	63	27	10	63	27	10	0	0	0.0	0.0
Radiology	71	21	8	70	20	10	71	19	10	2	2	2.0	2.0
Other specialties	69	20	11	69	18	13	67	19	14	15	15	15.0	15.0
Overall	76	15	9	69	18	13	66	19	15	60	60	59.4	55.7

Table A-6 (Army): economic-optimal GME and 7-year AFHPSP ADO

Steady-state accessions and accession and training inventories

	Baseline		Excursion	
Accession mix	Number	Percent	Number	Percent
Accession pipeline mix[a]				
USUHS (63/63)	63	15	63	20
AFHPSP (50/400)	291	70	193	61
FAP (0/60)	60	15	60	19
Total	414	100	316	100
Accession mix at YOP-1				
USUHS	59	16	59	21
AFHPSP direct	209	57	17	6
AFHPSP deferred	44	12	148	53
FAP	56	15	56	20
Total	369	100	280	100

a. Annual accession source constraints are in parentheses (minimum/maximum).

Inventory	Baseline	Excursion
Accession pipepline		
USUHS students	252	252
AFHPSP students	1,128	751
AFHPSP deferred	225	621
FAP	176	176
Total	1,781	1,801
Training pipeline		
Interns	280	79
Residents/fellows	749	262
Total	1,029	341

Steady-state annual life-cycle cost

	Baseline	Excursion
Total cost of medical corps ($M)	716	609
Cost per fully trained duty physician ($)	253,644	224,374
Shortage of fully trained duty physicians	0.0	0.0
Cost adjusted for shortages ($M)	716	609
Cost as a percentage of baseline		85.1

Steady-state annual experience profile shortages

Experience group	Baseline	Excursion
O-5/6 shortage	0.0	0.0
O-6 shortage	0.0	0.0

Steady-state annual inventory by specialty and paygrade

		Baseline				Excursion				Excess (shortage)		GME starts	
Specialty	Billets	O-3/4	O-5	O-6	Total	O-3/4	O-5	O-6	Total	Baseline	Excursion	Baseline	Excursion
Anesthesiology	121	99	23	13	135	84	24	13	121	14.5	0.0	18.7	9.4
Cardio	50	35	8	7	50	33	12	5	50	0.0	0.0	4.8	1.3
Family practice	491	344	74	73	491	328	74	89	491	0.3	0.0	38.5	0.0
General IM	309	242	48	45	334	216	47	46	309	25.2	0.0	45.2	2.5
General surgery	185	151	31	25	207	129	37	19	185	21.6	0.0	31.4	7.3
OB/GYN	170	119	31	20	170	119	31	20	170	0.0	0.0	10.5	10.1
Orthopedic surgery	145	91	39	15	145	90	40	15	145	0.0	0.0	12.6	12.5
Radiology	140	98	28	14	140	98	28	14	140	0.0	0.0	17.4	7.4
Other specialties	1104	813	189	150	1151	734	207	163	1104	47.0	0.0	108.1	31.2
Overall	2,715	1,992	471	361	2,824	1,833	500	382	2,715	108.5	0.0	287.1	81.7

Steady-state annual percentage paygrade distribution and FAP accessions by specialty

	FY 2000			Baseline			Excursion			FAP constraint		FAP accessions	
Specialty	O-3/4	O-5	O-6	O-3/4	O-5	O-6	O-3/4	O-5	O-6	Baseline	Excursion	Baseline	Excursion
Anesthesiology	71	20	8	73	17	10	70	20	11	0	0	0.0	0.0
Cardio	57	28	15	70	16	14	66	24	10	0	0	0.0	0.0
Family practice	68	15	17	70	15	15	67	15	18	25	25	25.0	25.0
General IM	64	16	20	72	14	13	70	15	15	10	10	10.0	10.0
General surgery	49	28	22	73	15	12	70	20	10	0	0	0.0	0.0
OB/GYN	73	16	11	70	18	12	70	18	12	8	8	8.0	8.0
Orthopedic surgery	55	36	10	63	27	10	62	28	10	0	0	0.0	0.0
Radiology	68	18	15	70	20	10	70	20	10	2	2	2.0	2.0
Other specialties	52	25	23	71	16	13	67	19	15	15	15	15.0	15.0
Overall	59	22	19	71	17	13	68	18	14	60	60	60.0	60.0

Table A-6 (Navy): economic-optimal GME and 7-year AFHPSP ADO

Steady-state accessions and accession and training inventories

	Baseline		Excursion	
Accession mix	Number	Percent	Number	Percent
Accession pipeline mix[a]				
USUHS (51/51)	51	14	51	20
AFHPSP (50/400)	258	73	160	62
FAP (0/60)	45	13	45	18
Total	354	100	256	100
Accession mix at YOP-1				
USUHS	44	15	44	20
AFHPSP direct	67	22	6	3
AFHPSP deferred	149	49	131	58
FAP	42	14	42	19
Total	303	100	223	100

a. Annual accession source constraints are in parentheses (minimum/maximum).

Inventory	Baseline	Excursion
Accession pipepline		
USUHS students	204	204
AFHPSP students	1,001	621
AFHPSP deferred	679	583
FAP	132	132
Total	2,017	1,541
Training pipeline		
Interns	125	55
GMOs	241	107
Residents/fellows	359	171
Total	725	333

Steady-state annual life-cycle cost

	Baseline	Excursion
Total cost of medical corps ($M)	525	475
Cost per fully trained duty physician ($)	257,998	234,851
Shortage of fully trained duty physicians	0.0	0.0
Cost adjusted for shortages ($M)	525	475
Cost as a percentage of baseline		90.5

Steady-state annual experience profile shortages

Experience group	Baseline	Excursion
O-5/6 shortage	0.0	0.0
O-6 shortage	0.0	0.0

Steady-state annual inventory by specialty and paygrade

		Baseline				Excursion				Excess (shortage)		GME starts	
Specialty	Billets	O-3/4	O-5	O-6	Total	O-3/4	O-5	O-6	Total	Baseline	Excursion	Baseline	Excursion
Anesthesiology	138	97	28	14	138	97	27	14	138	0.0	0.0	11.4	8.3
Cardio	25	17	4	3	25	16	7	2	25	0.0	0.0	1.0	0.6
Family practice	403	282	62	59	403	273	57	73	403	0.0	0.0	15.5	0.0
General IM	135	94	23	18	135	94	21	20	135	0.0	0.0	4.5	1.2
General surgery	139	116	23	19	158	104	28	14	146	19.0	7.0	10.1	3.6
OB/GYN	124	87	23	15	124	87	23	14	124	0.0	0.0	7.0	6.2
Orthopedic surgery	133	90	30	13	133	82	38	13	133	0.0	0.0	15.0	10.5
Radiology	112	78	19	15	112	76	25	11	112	0.0	0.0	12.1	6.0
Other specialties	806	564	134	108	806	544	148	114	806	0.0	0.0	38.2	14.9
Overall	2,015	1,427	344	264	2,034	1,372	374	276	2,022	19.0	7.0	114.9	51.3

Steady-state annual percentage paygrade distribution and FAP accessions by specialty

	FY 2000			Baseline			Excursion			FAP constraint		FAP accessions	
Specialty	O-3/4	O-5	O-6	O-3/4	O-5	O-6	O-3/4	O-5	O-6	Baseline	Excursion	Baseline	Excursion
Anesthesiology	64	24	12	70	20	10	70	20	10	0	0	0.0	0.0
Cardio	52	30	19	70	17	13	64	26	10	0	0	0.0	0.0
Family practice	65	20	15	70	15	15	68	14	18	25	25	25.0	25.0
General IM	73	14	13	70	17	13	69	16	15	10	10	10.0	10.0
General surgery	48	30	22	74	14	12	71	19	10	0	0	0.0	0.0
OB/GYN	83	12	5	70	18	12	70	18	12	8	8	0.0	0.0
Orthopedic surgery	69	19	13	68	22	10	62	28	10	0	0	0.0	0.0
Radiology	48	40	12	70	17	13	68	22	10	2	2	0.0	0.0
Other specialties	42	36	22	70	17	13	67	18	14	15	15	10.0	10.0
Overall	55	28	17	70	17	13	68	18	14	60	60	45.0	45.0

Table A-6 (Air Force): economic-optimal GME and 7-year AFHPSP ADO

Steady-state accessions and accession and training inventories

	Baseline		Excursion	
Accession mix	Number	Percent	Number	Percent
Accession pipeline mix[a]				
USUHS (51/51)	51	19	51	24
AFHPSP (50/400)	158	59	101	48
FAP (0/60)	59	22	60	28
Total	268	100	212	100
Accession mix at YOP-1				
USUHS	48	20	48	25
AFHPSP direct	117	48	18	10
AFHPSP deferred	20	8	68	36
FAP	57	23	58	30
Total	242	100	192	100

a. Annual accession source constraints are in parentheses (minimum/maximum).

Inventory	Baseline	Excursion
Accession pipepline		
USUHS students	204	204
AFHPSP students	611	392
AFHPSP deferred	90	274
FAP	117	119
Total	1,023	989
Training pipeline		
Interns	166	67
Residents/fellows	524	231
Total	690	298

Steady-state annual life-cycle cost

	Baseline	Excursion
Total cost of medical corps ($M)	467	423
Cost per fully trained duty physician ($)	246,909	228,344
Shortage of fully trained duty physicians	0.0	0.0
Cost adjusted for shortages ($M)	467	423
Cost as a percentage of baseline		90.6

Steady-state annual experience profile shortages

Experience group	Baseline	Excursion
O-5/6 shortage	0.0	0.0
O-6 shortage	0.0	0.0

Steady-state annual inventory by specialty and paygrade

		Baseline				Excursion				Excess (shortage)		GME starts	
Specialty	Billets	O-3/4	O-5	O-6	Total	O-3/4	O-5	O-6	Total	Baseline	Excursion	Baseline	Excursion
Anesthesiology	78	55	15	8	78	55	15	8	78	0.0	0.0	9.8	5.8
Cardio	31	19	7	6	31	14	9	8	31	0.0	0.0	4.0	2.5
Family practice	439	303	69	67	439	278	73	88	439	0.1	0.0	34.6	0.0
General IM	162	116	27	24	167	101	36	25	162	5.3	0.0	20.9	12.1
General surgery	111	79	20	14	112	63	33	15	111	1.4	0.0	17.3	10.7
OB/GYN	116	81	21	14	116	81	21	13	116	0.0	0.0	6.6	6.6
Orthopedic surgery	91	57	25	9	91	57	25	9	91	0.0	0.0	7.9	7.9
Radiology	124	87	24	12	124	89	23	12	124	0.0	0.0	15.5	6.6
Other specialties	701	508	129	95	732	467	129	105	701	30.8	0.0	65.0	23.3
Overall	1,853	1,305	336	250	1,891	1,204	364	284	1,853	37.7	0.0	181.6	75.6

Steady-state annual percentage paygrade distribution and FAP accessions by specialty

	FY 2000			Baseline			Excursion			FAP constraint		FAP accessions	
Specialty	O-3/4	O-5	O-6	O-3/4	O-5	O-6	O-3/4	O-5	O-6	Baseline	Excursion	Baseline	Excursion
Anesthesiology	81	10	9	70	20	10	70	19	11	0	0	0.0	0.0
Cardio	71	11	18	60	21	18	45	30	25	0	0	0.0	0.0
Family practice	84	11	5	69	16	15	63	17	20	25	25	24.4	25.0
General IM	80	13	7	69	16	15	62	22	15	10	10	10.0	10.0
General surgery	73	13	15	70	17	12	57	30	14	0	0	0.0	0.0
OB/GYN	83	11	6	70	18	12	70	18	12	8	8	8.0	8.0
Orthopedic surgery	75	19	6	63	27	10	63	27	10	0	0	0.0	0.0
Radiology	71	21	8	70	20	10	72	18	10	2	2	2.0	2.0
Other specialties	69	20	11	69	18	13	67	18	15	15	15	15.0	15.0
Overall	76	15	9	69	18	13	65	20	15	60	60	59.4	60.0

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Appendix B: Recruiting

Table 27 (in the recruiting section) shows the precentage of the Navy and Air Force's AFHPSP recruiting attainment by geographic region for FY 1999-2002. These figures show that the percentage of AFHPSP recruits coming from each region is consistent over time and that the percentage attainment by region is similar for the Navy and Air Force.

Note that the geographic regions are not exactly the same for each Service because the Army recruiting stations, Navy recruiting districts, and Air Force recruiting squadrons do not cover exactly the same geograph area. Table B-1 shows how we grouped these stations, districts, and squadrons into the various regions and figures B-1 through B-3 show the geographic areas that each covers.

Table B-1. Mapping of recruiting stations, districts, and squadrons into geographic regions

Region	Army	Navy	Air Force
Northeast	All 1Z, 5Z2, 5Z4, and 5Z6 stations	All 100 level districts except 115 plus 318, 322, and 542	All 310 level squadrons plus 330, 338, and 339
Southeast	All 3Z stations except 3Z2A	Districts 115, 310, 312, 313, 314, and 348	Squadrons 331, 332, 333, 336, and 337
Central	All 4Z, 5Z1, and 5Z3 stations and 3Z2A	All 500 level districts except 542 plus 334 and 846	All 340 level squadrons
West	All 6Z stations	All 800 level districts except 846	All 360 level squadrons

Figure B-1. Army recruiting stations

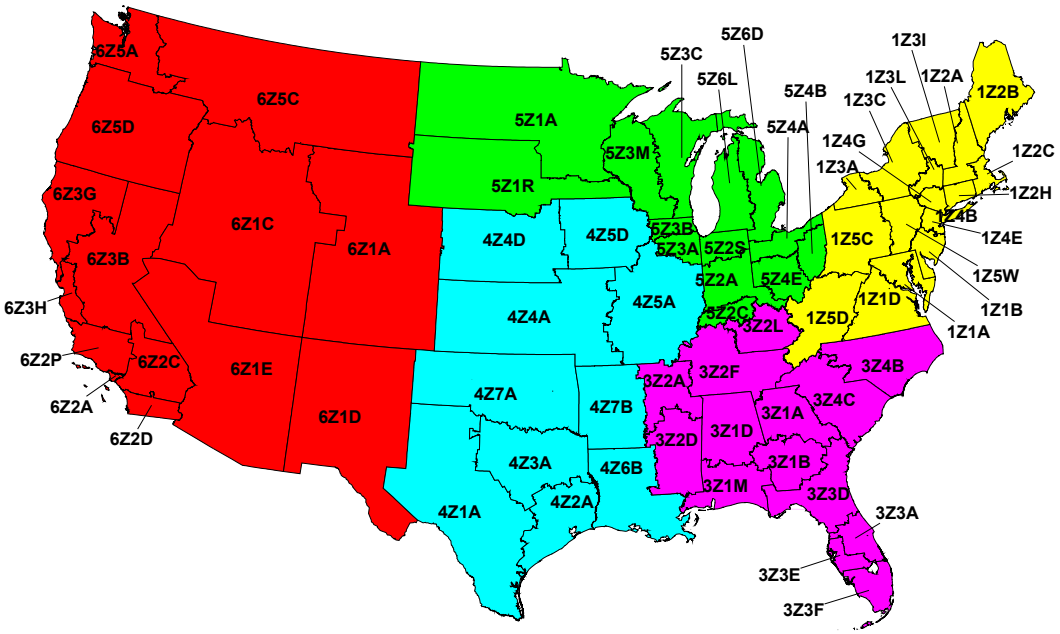


Figure B-2. Navy recruiting districts

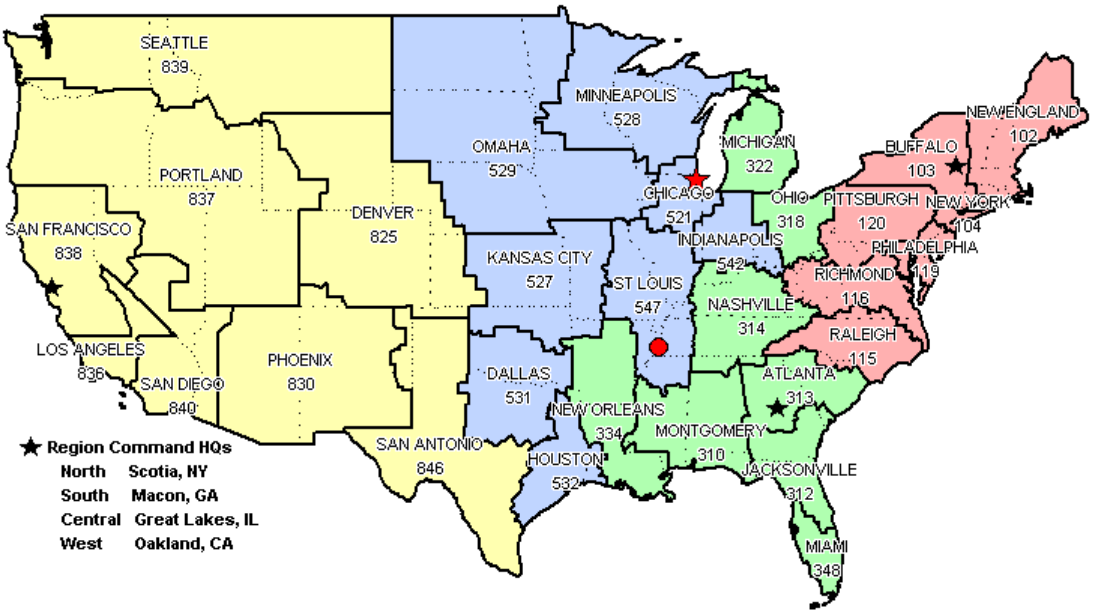
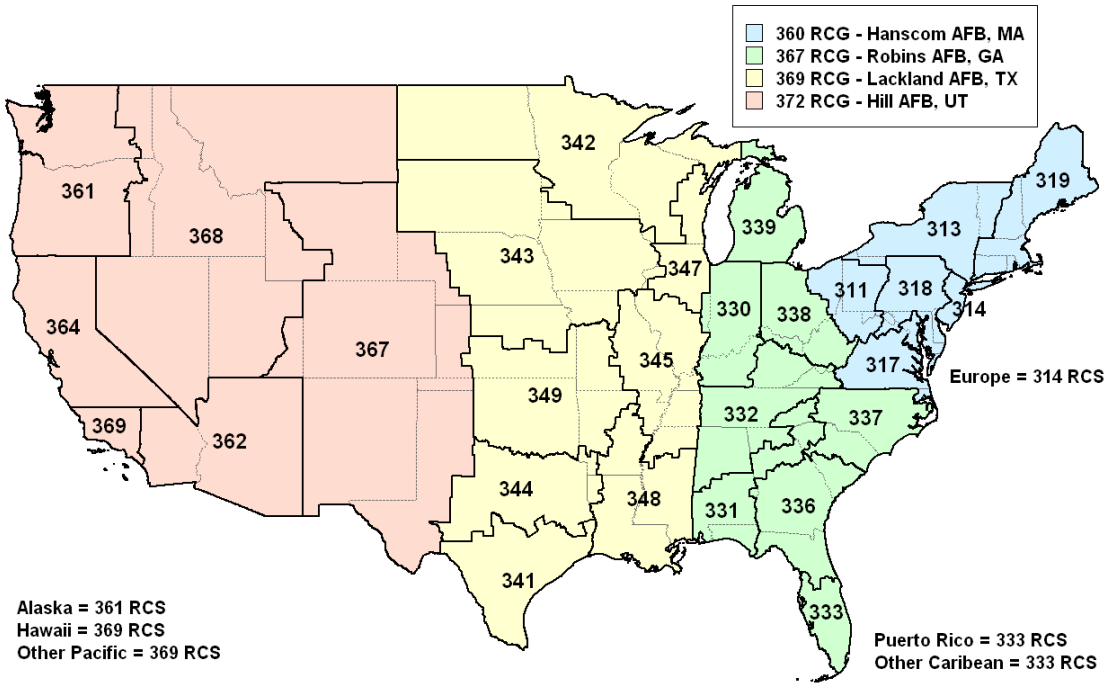


Figure B-3. Air Force recruiting squadrons



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Appendix C: AFHPSP questionnaire

This appendix shows the questionnaire that we administered to current AFHPSP medical students. It consists of 14 multiple choice questions.[1] We administered three versions of the questionnaire. All versions of the questionnaire were identical with the exception of question 13, which dealt with the length of the active duty obligation. As discussed in the text, we did not want to ask any individual about more than one ADO length because we felt doing so may bias the results. We present these results as questions 13A, 13B, and 13C. Note that we asked each person only one version of question 13 not all three.

We prefaced the questionnaire with the following information about why we were conducting the questionnaire and its impact on them:

This questionnaire is part of a study that is being conducted for the Office of the Under Secretary of Defense for Personnel and Readiness. We are seeking your opinion about the active duty obligation associated with the Armed Forces Health Professionals Scholarship Program. This questionnaire provides an important source of information for decision-makers at all levels within the Department of Defense. We respectfully request that you respond to this questionnaire in a timely fashion.

Your answers will not be shared with anyone, and your name will not be associated with your answers. All information that would identify you will be kept private, and your responses will in no way affect your current active duty obligation.

The actual questions and responses follow:

1. As a fifteenth question, we gave respondents an opportunity to provide comments in relation to subject matter of the questionnaire. We don't present the responses in this appendix.

1. What Service are you in? (See table C-1 for responses.)

Table C-1. Respondents' Service

Service	Number	Percent
Army	237	27.1
Navy	319	37.3
Air Force	308	35.4
No answer	2	0.2
Total	866	100.0

2. What is your age? (See table C-2 for responses.)

Table C-2. Respondents' age group by Service

	Army		Navy		Air Force		Total	
Age group	Number	Percent	Number	Percent	Number	Percent	Number	Percent
24 or less	85	35.9	135	42.3	114	37.0	334	38.7
25-26	66	27.8	84	26.3	93	30.2	243	28.1
27-29	46	19.4	67	21.0	58	18.8	171	19.8
30 or more	37	15.6	29	9.1	38	12.3	104	12.0
No answer	3	1.3	4	1.3	5	1.6	12	1.4
Total	237	100.0	319	100.0	308	100.0	864	100.0

3. What is your gender? (See table C-3 for responses.)

Table C-3. Respondents' gender by Service

	Army		Navy		Air Force		Total	
Gender	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Male	168	70.9	219	68.6	214	69.5	601	69.6
Female	69	29.1	98	30.7	94	30.5	261	30.2
No answer	0	0.0	2	0.6	0	0.0	2	0.2
Total	237	100.0	319	100	308	100	864	100

4. Are you married? (See table C-4 for responses.)

Table C-4. Respondents' marital status by Service

Marital status	Army		Navy		Air Force		Total	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Yes	82	34.6	102	32.0	142	46.1	326	37.7
No	154	65.0	217	68.0	164	53.2	535	61.9
No answer	1	0.4	0	0.0	2	0.7	3	0.3
Total	237	100.0	319	100.0	308	100	864	100

5. Do you have dependent children? (See table C-5 for responses.)

Table C-5. Respondents with dependent children by Service

Dependent status	Army		Navy		Air Force		Total	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Yes	46	19.4	45	14.1	65	21.1	156	18.1
No	190	80.2	274	85.9	243	78.9	707	81.8
No answer	1	0.2	0	0.0	0	0.0	1	0.1
Total	237	100.0	319	100.0	308	100	864	100

6. Are you in allopathic or osteopathic medical school? (See table C-6 for responses.)

Table C-6. Respondents's medical school type by Service

Medical school type	Army		Navy		Air Force		Total	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Allopathic	159	67.1	175	54.9	217	70.5	551	63.8
Osteopathic	54	22.8	80	25.1	71	23.0	205	23.7
No answer	24	10.1	64	20.0	20	6.5	108	12.5
Total	237	100.0	319	100.0	308	100	864	100

7. Please indicate all of the Services to which you applied for an Armed Forces Health Professionals Scholarship Program (AFHPSP) scholarship. (See table C-7 for responses.)

Table C-7. Services to which respondents applied by respondents' Service

	Army		Navy		Air Force		Total	
Service	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Applications by Service								
Army	211	78.1	30	7.9	20	5.7	261	26.2
Navy	17	6.3	283	74.9	18	5.2	318	31.9
Air Force	16	5.9	28	7.4	279	80.2	323	32.4
Public Health	1	0.4	4	10.1	5	1.4	10	1.0
No answer	25	9.3	33	8.7	26	7.5	84	8.4
Total	270	100.0	378	100.0	348	100	996	100
Number of Services applied to								
Four	0	0.0	0	0.0	0	0.0	0	0.0
Three	4	1.7	10	3.1	3	1.0	17	2.0
Two	25	10.5	39	12.2	34	11.0	98	11.3
One	183	77.3	237	74.3	245	79.6	665	77.0
No Response	25	10.5	33	10.3	26	8.4	84	9.7
Total	237	100.0	319	100	308	100	864	100

8. Before going into AFHPSP, did you have prior military service? (See table C-8 for responses.)

Table C-8. Respondents' prior military status by Service

Type of service	Army		Navy		Air Force		Total	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Officer	22	9.3	12	3.8	24	7.8	58	6.7
Enlisted	16	6.8	18	5.6	12	3.9	46	5.3
Both	6	2.5	3	0.9	1	0.3	10	1.2
None	122	51.5	177	55.5	188	61.0	487	56.4
No answer	71	30.0	109	34.2	83	26.9	263	30.4
Total	237	100.0	319	100.0	308	100	864	100

9. If you had military service prior to AFHPSP, how many years? (See table C-9 for responses.)

Table C-9. Respondents' years of military service prior to AFHPSP by Service

Years of service	Army		Navy		Air Force		Total	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
None	133	56.1	190	59.6	195	63.3	518	60.0
1 year	2	0.8	1	0.3	2	0.6	5	0.6
2 years	6	2.5	5	1.6	2	0.6	13	1.5
3 years	4	1.7	3	0.9	4	1.3	11	1.3
4 years	11	4.6	10	3.1	6	1.9	27	3.1
5 years	7	3.0	4	1.3	4	1.3	15	1.7
6 years	4	1.7	4	1.3	7	2.3	15	1.7
7 years	0	0.0	1	0.3	2	0.6	3	0.3
8 yrs or more	7	3.0	7	2.2	10	3.2	24	2.8
No answer	63	26.6	94	29.5	76	24.7	233	27.0
Total	237	100.0	319	100.0	308	100	864	100

10. For how many years of medical school will you receive AFHPSP funding? (See table C-10 for responses.)

Table C-10. Respondents' years of medical school funded by AFHPSP by Service

Years of funding	Army		Navy		Air Force		Total	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
1 year	0	0.0	1	0.3	1	0.3	2	0.2
2 years	3	1.3	4	1.3	0	0.0	7	0.8
3 years	46	19.4	56	17.6	61	19.8	163	18.9
4 years	159	67.1	218	68.3	211	68.5	588	68.1
No answer	29	12.2	40	12.5	35	11.4	104	12.0
Total	237	100.0	319	100.0	308	100	864	100

11. When you complete medical school, what will be your active duty obligation (i.e., AFHPSP plus any other commitment, such as ROTC or Service academy)? (See table C-11 for responses.)

Table C-11. Respondents' active duty obligation following medical school by Service

ADO in years	Army		Navy		Air Force		Total	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
2	2	0.8	0	0.0	1	0.3	3	0.3
3	44	18.6	61	19.1	57	18.5	162	18.8
4	129	54.4	199	62.4	184	59.7	512	59.3
5	3	1.3	6	1.9	2	0.6	11	1.3
6	3	1.3	0	0.0	4	1.3	7	0.8
7	3	1.3	0	0.0	1	0.3	4	0.5
8 or more	13	5.5	9	2.8	15	4.8	37	4.3
No answer	40	16.9	44	13.8	44	1.6	128	14.8
Total	237	100.0	319	100.0	308	100	864	100

12. Did you consider the Uniformed Services University of the Health Sciences (UHUHS) when applying to medical school? (See table C-12 for responses.)

Table C-12. Respondents' consideration given to USUHS by Service

Consideration given to USUHS	Army		Navy		Air Force		Total	
	No.	Percent	No.	Percent	No.	Percent	No.	Percent
Applied to and accepted by USUHS, but declined the offer.	15	6.3	17	5.3	16	5.2	48	5.6
Applied to but was not accepted by USUHS.	23	9.7	29	9.1	26	8.4	78	9.0
Did not apply to USUHS because of the associated active duty obligation.	28	11.8	18	5.6	25	8.1	71	8.2
Did not apply to USUHS for other reasons.	68	28.7	101	31.7	107	34.7	276	31.9
Was not aware of USUHS.	78	32.9	118	37.0	102	33.1	298	34.5
No answer	25	10.5	36	11.3	32	10.4	93	10.8
Total	237	100.0	319	100.0	308	100	364	100

13. (Version A) Would you have applied to the AFHPSP program and accepted a scholarship if your active duty obligation was 1 year longer than your current obligation (for example, a 5-year commitment for 4 years of subsidization rather than a 4-year commitment for 4 years of subsidization)?[2] (See table C-13 for responses.)

Table C-13. Respondents willingness to accept a 5-year ADO by Service

Would accept	Army		Navy		Air Force		Total	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Yes	30	40.0	37	37.8	47	53.4	114	42.5
No.	31	41.3	51	52.0	30	34.1	112	42.9
No answer	14	18.7	10	10.2	11	12.5	35	13.4
Total	75	100.0	98	100.0	88	100	261	100

(Version B) Would you have applied to the AFHPSP program and accepted a scholarship if your active duty obligation was 2 years longer than your current obligation (for example, a 6-year commitment for 4 years of subsidization rather than a 4-year commitment for 4 years of subsidization)? (See table C-14 for responses.)

Table C-14. Respondents willingness to accept a 6-year ADO by Service

Would accept	Army		Navy		Air Force		Total	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Yes	17	22.7	29	30.9	25	25.0	71	26.4
No.	43	57.3	47	50.0	64	64.0	154	57.2
No answer	15	20.0	18	19.1	11	11.0	44	16.4
Total	75	100.0	94	100.0	100	100	269	100

2. We asked 30 percent of the questionnaire population version A. Similarly, we ased 30 percent version B and 40 percent version C.

Version C) Would you have applied to the AFHPSP program and accepted a scholarship if your active duty obligation was 3 years longer than your current obligation (for example, a 7-year commitment for 4 years of subsidization rather than a 4-year commitment for 4 years of subsidization)? (See table C-15 for responses.)

Table C-15. Respondents willingness to accept a 7-year ADO by Service

Would accept	Army		Navy		Air Force		Total	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Yes	15	17.2	22	17.3	22	18.3	59	17.7
No.	58	66.7	82	64.6	72	60.0	212	63.5
No answer	14	16.1	23	18.1	26	21.7	63	18.9
Total	87	100.0	127	100.0	120	100	334	100

14. If you answered "no" to question 13, what medical school funding options would you have pursued and realistically been able to attain in place of AFHPSP? (See table C-16 for responses.)

Table C-16. Respondents' medical school funding options in place of AFHPSP by Service

Medical school funding options	Army		Navy		Air Force		Total	
	No.	Percent	No.	Percent	No.	Percent	No.	Percent
National Health Service Corps	44	10.6	68	10.5	55	10.0	167	10.4
State or local scholarship with commitment to underserved areas.	1	0.2	1	0.2	1	0.2	3	0.2
Other scholarship w/ service commitment	31	7.5	51	7.9	43	7.8	125	7.8
Medical Scientist Training Program (scholarship)	24	5.8	48	7.4	37	6.8	109	6.8
Exceptional Financial Need (scholarship)	24	5.8	45	7.0	35	6.4	104	6.5
School scholarships	59	14.3	82	12.7	71	13.0	212	13.2
Financial Aid for Disadvantaged Health Professions Students (scholarship)	23	5.6	43	6.7	36	6.6	102	6.3
Other scholarships without service commitment	54	13.0	68	10.5	62	11.3	184	11.44
Loans	112	27.1	164	25.4	143	26.1	419	26.1
Personal or family resources	42	10.1	75	11.6	65	11.9	182	11.3
Total	414	100.0	645	100.0	548	100.0	1607	100.0

References

[1] S. Brannman et al. *HPRAIS Report to Congress (Phase I: Compensation Comparison of Selected Uniform and Private-Sector Health Care Professionals),* Feb 2001 (CNA Research Memorandum D0003360.A1)

[2] S. Brannman et al. *Health Professions' Retention-Accession Incentives Study (Phases II & III: Adequacy of Special Pays and Bonuses for Medical Officers and Selected Other Health Care Professionals),* Mar 2002 (CNA Research Memorandum D0004460.A5)

[3] E. Christensen et al. *Life-Cycle Costs of Selected Uniformed Health Professions (Phase I: Cost Model Methodology),* Apr 2003 (CNA Research Memorandum D0006686.A3)

[4] S. Brannman et al. *Life-Cycle Costs of Selected Uniformed Health Professions (Phase II: The Impact of Constraints and Policies on the Optimal-Mix-of-Accession Model),* Apr 2003 (CNA Research Memorandum D0007887.A2)

[5] U.S. Department of Defense, *Military Compensation Background Papers*, 5th ed., Sep 1996 (p. 379)

[6] U.S. General Accounting Office. *Military Physicians: DOD's Medical School and Scholarship Program.* (GAO/HEHS-95-244, Sep 1995)

[7] Office of the Assistant Secretary of Defense (Health Affairs), Memorandum on the Cost of Physician Accessions, 1988

[8] DoD Directive 6000.12 (Policy for Scholarship Allocations under F. Edward Hebert Armed Forces Health Professions Scholarship and Financial Assistance Program), Apr 1996

[9] E. Christensen et al. *Navy Specialty Physician Study: Historical Overview, Retention Analysis, and Synopsis of Current Civilian-Sector Practices,* Jan 2002 (CNA Research Memorandum D0004916.A2)

[10] J. McMahon et al. *Pay and Retention of Navy Physicians*, May 1989 (CNA Research Memorandum 88-266)

[11] L. May et al. *Initial Effectiveness of the FY 1989 Medical Officer Retention Bonus*, Jan 1990 (CNA Research Memorandum 89-304)

[12] M. Lane et al. "The Impact of Pay on Navy Physician Retention in a Health Care Reform Environment," Naval Postgraduate School, Mar 1998

[13] D. Cymrot. *An Analysis of the ADSO for Marine Corps Aviators*, May 1988 (CNA Research Memorandum 88-54)

[14] D. Cymrot et al. *An Analysis of the Active Duty Service Obligation (ADSO) for Navy Pilots*, Oct 1988 (CNA Research Memorandum 88-173)

[15] C. Moore. *Are Aviation Obligations Driving Students Away?* Oct 2000 (CNA Annotated Briefing D0002644.A1)

[16] Office of the Assistant Secretary of Defense (Health Affairs) Memorandum. *Medical Program Guidance, FY 1998-2003*, 14 Feb 1996

[17] *Minority Students in Medical Education: Facts and Figures XII.* Association of American Medical Colleges, 2002

[18] A. Singer. *2002 Annual Report on Osteopathic Medical Education.* American Association of Colleges of Osteopathic Medicine, Jun 2003

[19] Association of American Medical Colleges (AAMC). http://www.aamc.org/data/facts/famg62002a.htm

[20] A. Singer. "The Effect of the Vietman War on Numbers of Medical School Applicants." *Academic Medicine*, 64, Oct 1989 (pp. 567-573)

[21] A. Singer. "The Ups and Downs of Medical School Applicants." *Journal of the American Osteopathic Association*, 101(12), Dec 2001

[22] *AAMC Data Book: Statistical Information Related to Medical Schools and Teaching Hospitals*. Association of American Medical Colleges, various years

[23] "Decline of Medical School Applicants Continues in 2002." Association of American Medical Colleges, Press Release, 30 Oct 2002

[24] R. Cooper. "Medical Schools and Their Applicants: An Analysis." *Health Affairs*, 22(4), Jul/Aug 2003, 71-83

[25] Association of American Medical Colleges (AAMC). Fact Sheet, 4(4), Aug 2000

[26] "Schools of Medicine Rankings," *U.S. News & World Report*, 14 Apr 2003 (pp. 76-78)

[27] A. Singer. *Debts, Career Plans and Opinions of Osteopathic Medical Students in 2001*. American Association of Colleges of Osteopathic Medicine, Aug 2002

[28] *Medical School Graduation Questionnaire*, Association of American Medical Colleges, 2002

[29] NRMP Data Warehouse, National Residency Matching Program, unpublished data as of 30 Jul 2003

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