INSTITUTE FOR DEFENSE ANALYSES

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About this Publication

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Executive Summary

Total force mix, defined as the choice between military, civilian, and contractor performance of Department of Defense (DoD) activities, has long been an important area of defense management. The wrong total force mix puts mission accomplishment at risk and inefficiently consumes scarce defense resources. The fiscal crisis confronting DoD has added to the urgency of improving force mix decisions—saving money through more efficient total force decisions is essential to minimize cuts in warfighting capability. DoD is also adjusting to a new strategy and incorporating the lessons learned from Iraq and Afghanistan, which demonstrate fundamental changes to the way the United States fights wars. With these factors in mind, the Director of Total Force Planning and Requirements within the Office of the Under Secretary of Defense for Personnel and Readiness (OUSD(P&R)) tasked the Institute for Defense Analyses (IDA) to examine total force mix issues within the DoD medical community, provide specific recommendations for improvement, and to draw lessons from this community that may provide insights for the improvement of force mix across the DoD.

The DoD medical community has achieved incredible results in the recent wars in Iraq and Afghanistan—the survival rate from combat injuries has reached unprecedented heights. And it has done this while reducing its footprint in theater, easing the burden it places on commanders for logistical and security support. But the medical community also has long-standing force mix challenges, which contribute to the Defense Health Program (DHP) being one of the fastest growing items in the defense budget. Over a 20-year series of studies that includes "The Economics of Sizing the Military Medical Establishment" (known as the Section 733 Study),[1] the 733 Update Study, and the Medical Readiness Review, the Office of the Secretary of Defense (OSD) has consistently identified force mix challenges that include:

- **Specialty mix of military force**: The medical community supports two missions: the operational mission of providing care in combat theaters and the beneficiary mission of providing high quality peacetime health care to Service members, their families, and retirees. The first is military essential, the latter a commercial activity. However, the military medical force has historically understaffed operationally required specialties like surgery while overstaffing beneficiary care specialties like pediatrics and obstetrics.

[1] Office of Program Analysis and Evaluation, "The Economics of Sizing the Military Medical Establishment: Executive Report of the Comprehensive Study of the Military Medical Care System" (Washington, DC: Department of Defense, April 1994).

- **Military-civilian personnel mix in military hospitals**: A little less than half of all beneficiary care is produced in Military Treatment Facilities (MTFs). For specialties that are common in civilian labor markets, civilian providers generally cost less than military providers. While the Army does make extensive use of civilians in MTFs, the Navy and Air Force rely primarily on higher cost military providers for this commercial activity.

Although these challenges have been consistently found and documented, OSD has had little success in resolving them. One reason for this lack of progress has been that estimating medical force requirements is a large and contentious analytic effort, and by the time this effort was completed in each of the previous studies, there was little time, energy, or political capital left to deal effectively with the identified challenges. Therefore, OUSD(P&R) tasked IDA to avoid independent estimation of medical force requirements, but instead to review existing requirements and usage data, and then focus on any inconsistencies found and on meeting requirements efficiently. IDA was specifically asked to:

- Review existing measures of medical force demand or requirements and identify the degree to which the historic force-mix inefficiencies currently remain,
- Assess the causes and consequences of these inefficiencies, and
- Develop recommendations for actions that may be taken by DoD to improve the medical force mix.

To conduct the review of requirements, IDA researchers used three primary sources of data: (a) Service medical department force-sizing models; (b) the OSD Current Forces Database (CFDB), which includes unit manning requirements; and (c) deployment data from 2001 to 2012. We found the following:

- Medical personnel constitute a substantial portion of total military end strength, particularly at higher ranks.[2]
  - The approximately 120,000 active duty medical personnel in Fiscal Year (FY) 2011 constituted about 8 percent of total active duty end strength.
  - The approximately 38,000 active duty medical officers in FY 2011 constituted about 18 percent of the total active duty officer end strength.
  - The approximately 3,000 active duty medical O-6 personnel constitute about 25 percent of all active duty O-6 end strength.

[2] Military medical end strength values are from the FY 2011 Health Manpower Personnel Data System (HMPDS) report produced by the Defense Manpower Data Center (DMDC). Total active duty end strength values are from Military Personnel Statistics reports produced by DMDC.

- Lessons from Operation Enduring Freedom/Operation Iraqi Freedom (OEF/OIF) have prompted a shift toward a smaller medical footprint in operational theaters with more specialized capability.
  - This reduces total medical requirements, but may increase requirements for selected specialties.
  - The changes in Army and Air Force requirements estimates from 2004 to 2011 reflect this; Navy estimates do not.
- The active duty military medical force still understaffs operationally required specialties, but the level of this understaffing has generally fallen from 2004 to 2011.
- The active duty military medical force still overstaffs beneficiary care specialties and this overstaffing has increased in some areas from 2004 to 2011.
- The total active duty medical force generally exceeds the Service-identified military essential requirement.
- Service medical department estimates of requirements significantly exceed historic deployment levels and staffing requirements for deployable units.
  - Service-identified active duty medical force military essential requirements can be divided into direct operational requirements (e.g., requirements to staff deployable units) and non-operational requirements. The non-operational requirements constitute a substantial portion of total requirements and vary significantly by specialty.
  - Examples of these non-operational requirements include beneficiary care in isolated and overseas MTFs, Graduate Medical Education (GME), and similar activities that are likely not military essential according to DoD guidance.
- Medical specialties deploy less than non-medical specialties, averaging one-fifth to one-third the deployment level of the primary combat arms specialties.
  - Significant variation exists for deployment experience across specialties and Services.
- Military medical departments differ in the rigor and discipline of their estimates of requirements.
  - Some have incorporated the lessons learned described above from OEF/OIF and some have not.
  - Some are removing non-military essential categories from requirements estimates; some do not appear to be doing so.

  - Some have extensive active Service line involvement in their requirements determination process; some have relatively little line involvement.
  - These variations raise concerns about the value of the current Service estimates.
  - In short, the Air Force appears to be aggressively managing its force requirements and trying to improve efficiency. The Navy estimates are moving in the opposite direction and have become outliers across the medical community; IDA was not able to validate these estimates.
- The military-to-civilian ratio of the medical force differs significantly across Services.[3]
  - For the total full-time medical force, it ranges from 66:34 (Army) to 89:11 (Air Force).[4]
  - For the DHP-designated portion of the full-time force, the Army is over 50 percent civilian. The other Services are not.

IDA researchers assessed the causes of these findings by (a) reviewing existing studies of the medical force, (b) interviewing medical and line personnel, and (c) analyzing force and cost data. The primary cause of understaffing of operational requirements was identified in Service interviews to be insufficient beneficiary care workload to support clinical skill maintenance. But we also found little operational risk from this understaffing, raising questions about the usefulness of these requirements estimates. To the extent the requirements are valid, risk taken with operational medical force requirements is generally not considered holistically across a Service and balanced with risk taken to operational requirements in other force areas. Instead, operational medical force requirements are balanced against beneficiary care requirements, which are not military essential. If there is not sufficient beneficiary care workload to support the operational requirement, risk is taken against the operational requirement. The primary exception to this was the Army Total Army Analysis process. In that process, operational requirements (medical and non-medical) are considered Service-wide (although execution of manpower requirements is left to the individual communities).

The IDA team has three recommendations for dealing with understaffing of operationally required specialties:

- **Improve Requirements Determination**: Although improving in recent years, Service medical departments have understaffed operationally required specialties for at least 20 years, despite engagement in two wars and major OSD

[3] Military and civilian medical end strength values are from the FY 2011 HMPDS report produced by DMDC.

[4] These data are for FY 2011. The Air Force provided programmed end strength data from FY 2014–18 that showed this ratio shifting to a more efficient force mix.

reform efforts to improve the alignment of forces with requirements. An obvious question becomes whether these are true requirements. In addition, we identified several categories included in some Service requirements estimates that are not consistent with guidance for military essentiality, as well as inconsistencies across the Services in how requirements were estimated. The IDA team recommends that USD(P&R), working with the Director of Cost Assessment and Program Evaluation (CAPE), direct the Assistant Secretary of Defense for Health Affairs (ASD(HA)) to lead a systematic evaluation with the Services to reform medical force requirements determination to include ensuring compliance with DoD policies (e.g., on military essentiality) and Service line participation and validation for use in the FY 2016–20 Program Review. Only then can USD(P&R) determine if there are true understaffed requirements.

- **Reconsider Active Component (AC) to Reserve Component (RC) Balance**: If understaffing of true military essential medical force requirements is identified, it leads to the question as to whether personnel are required to be on active duty. Because the skills and training for medical personnel are commercially available, maintaining medical forces in the Reserves with civilian health care employment may be a more efficient alternative than maintaining the personnel on active duty. We recommend that USD(P&R) direct ASD(HA), working with the Services and the Assistant Secretary of Defense for Reserve Affairs (ASD(RA)), to lead a review of AC/RC balance in the medical force and to develop programmatic options for transfer of additional medical force requirements to the RC for consideration in the FY 2016–20 Program Review.
- **Consider Alternative Methods of Clinical Skill Maintenance:** If true understaffing is identified by USD(P&R) and AC performance is required but there is not sufficient workload in MTFs to maintain clinical currency, DoD should consider using civilian and Veterans' Affairs (VA) facilities for skill maintenance. We recommend that USD(P&R) direct ASD(HA), working with the Services, to develop and implement a pilot project placing active duty medical personnel required for the operational mission for which there is insufficient clinical workload in DoD MTFs in civilian and/or VA facilities, for execution in 2014.

IDA researchers identified two primary causes of overstaffing of military personnel for beneficiary health care: (a) specific legislative and policy constraints to improving the efficiency of force mix, and (b) the underpricing of military personnel compared to civilians and contractors. The statutory prohibition on military-to-civilian conversions in the medical force is an unnecessary obstacle for efficient total force management. We recommend that USD(P&R) lead an effort to remove this prohibition and restore

flexibility to the Services for managing the medical force in the FY 2015–19 Unified Legislation and Budgeting process.

With regard to the second primary cause of overstaffing, local MTF commanders generally receive military personnel at no budgetary cost and, at the Service medical department level, military personnel are either similarly considered free or evaluated using the composite rates focused on military personnel accounts costs. Both of these costs (zero and the composite rate) significantly understate the true cost to the taxpayer of military medical personnel. By contrast, civilian and contractor personnel are usually reflected in the budget at all levels (MTF and Surgeon General) at a cost that more accurately reflects their full cost. This leads to a systemic bias in favor of military performance of non-military essential activities. Local decision makers are behaving rationally, given the incentives they face, but are making inefficient decisions from the perspective of DoD and the taxpayer.

Department of Defense Instruction (DoDI) 7041.04 directs DoD Components to estimate the full cost of personnel to inform total force-mix decisions. We followed this guidance to develop estimates of medical force costs, finding that:

- The composite rate substantially understates the full cost of military personnel.
  - For the average Army medical enlisted soldier, the composite rate is about $72,000 while the full cost to the taxpayer is about $125,000.
  - For the average Navy physician, the average composite rate is about $183,000 while the full cost to the taxpayer is about $435,000.
  - For the average Air Force nurse, the average composite rate is about $144,000 while the full cost to the taxpayer is about $230,000.
- Civilian personnel generally cost less than military personnel.
  - For the average Army medical enlisted soldier, the full cost to the taxpayer of the equivalent civilian personnel is about $75,000 (compared to $125,000 from above).
  - For the average Navy physician, the full cost to the taxpayer of the equivalent civilian personnel is about $329,000 (compared to $435,000 from above).
  - For the average Air Force nurse, the full cost to the taxpayer of the equivalent civilian personnel is about $142,000 (compared to $230,000 from above).
- To illustrate the impacts of these cost differences in a total force mix decision-making context, IDA researchers conducted a number of analyses on hypothetical alternative force mix scenarios. For example, if the Navy and Air

Force military-to-civilian force ratios were adjusted to match the ratio of the more civilian-intensive Army force, the savings would be about $500 million per year from a DoD short-run cash flow perspective, and grow to over one billion dollars per year as fixed costs, deferred costs, and non-DoD costs adjusted.

The IDA team has four recommendations (in addition to the abovementioned military-to-civilian conversion ban repeal) for dealing with overstaffing of non-military essential military medical personnel:

- **Improve the Visibility into Full Cost of Personnel**: DoDI 7041.04 directs estimation of the full cost of personnel for consideration in force-mix decision making. CAPE is also developing a software application that will assist organizations in estimating full cost. Two gaps remaining in this development are that (a) the precise applicability and required level of consideration of DoDI 7041.04 in decision making is vague and should be clarified; and (b) some important costs (e.g., training costs) are specific to individual specialties, difficult to develop, and not included in the CAPE software application at present. We recommend that (a) USD(P&R) work with CAPE to improve the guidance contained in DoDI 7041.04 in time for its next reissuance date; and (b) USD(P&R) direct ASD(HA) to develop annual estimates of training costs by specialty for all medical specialties included in the Defense Manpower Data Center (DMDC) occupation codes in the spring of each year (in time for Program Objective Memorandum development), starting in 2014.
- **Include More Military Personnel Costs in the Military Personnel Budgetary Accounts**: Estimating full cost in an analytical display to inform decision making is valuable, but exposing decision makers directly to the full cost will likely have an even greater impact on the efficiency of decision making. We recommend that USD(P&R) begin a systematic effort, working with CAPE and the Office of the Under Secretary of Defense (Comptroller) (OUSD(C)), to move more of the costs of military manpower into the MILPERS budget accounts. We recommend beginning with identifiable costs that have a precedent for being in MILPERS, such as the non-Medicare eligible retiree health care benefit and the active duty family member health care benefit (the precedent is the Medicare-eligible retiree health care benefit) for the FY 2016–20 Future Years Defense Program (FYDP). USD(P&R), working with CAPE and OUSD(C), may also want to consider community-specific composite rates.
- **Improve the Trade Space Local Decision Makers Face:** Exposing decision makers to accurate prices will improve decisions only if they have authority to make decisions over the full trade space of performance options for force-mix decisions. In most arrangements outside of the Military Departments, e.g.,

medical personnel assigned to the DHP, decision makers are assigned authorizations for military personnel in a separate process from their decisions over how many civilians and contractors to fund out of their budget. We recommend USD(P&R), working with CAPE and OUSD(C), develop pilot projects for use in the FY 2016–20 programming cycle that give decision makers outside the Military Departments a more direct, efficient, and transparent trade space between military, civilian, and contractor personnel in both programming/budgeting and execution. Options for pilots include DHP and the Combatant Commands.

- **Devote Sufficient Resources to Civilian Hiring:** The Services spend large amounts on centralized recruitment of military medical personnel, including large expenditures on recruiters as well as significant cash and in-kind benefits to recruits. The hiring of civilians, however, is often left to local commanders to fund out of existing resources. This disparity in emphasis was a cause of concern in the 2000s effort to reform medical force mix. We recommend USD(P&R) direct ASD(HA) and the Deputy Assistant Secretary of Defense for Civilian Personnel Policy (DASD(CPP)) conduct a review of civilian medical hiring practices within DoD to provide recommendations for the FY 2016–20 Program Review, to ensure adequacy of civilian hiring infrastructure and support to the Services.

In summary, the IDA team found that some force-mix challenges have improved (e.g., understaffing of operationally required specialties) while others have grown worse (e.g., use of military for non-military essential functions). This report has focused, more explicitly than previous OSD studies, on the underlying causes of these force-mix challenges, in order to develop specific recommendations for USD(P&R) that address causes rather than symptoms. If implemented, these recommendations should lead to better decision making by DoD Components.

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1. Introduction

A. Motivation

Total force mix is defined as the choice between military (active and reserve), civilian, and contractor performance of Department of Defense (DoD) activities. Obtaining the correct mix has long been an important area of defense management. The wrong total force mix puts mission accomplishment at risk and inefficiently consumes scarce defense resources. Perhaps the most striking example of total force mix challenges putting mission accomplishment at risk emerged in the mid-2000s as Operation Enduring Freedom/Operation Iraqi Freedom (OEF/OIF) continued and rotation policies were being established. Then Secretary of Defense Donald Rumsfeld commented in a radio interview at the time:

> Now think of that. The force is stressed and we're only sustaining 200,000-plus in the Central Command region out of a total of 2 million. So the question is, well, why is that … [O]ne of the folks here, General Schoomaker, puts it this way. He says, think of [a] rain barrel. And you've got a rain barrel filled with water. And you turn the spigot on and you can only access 10 percent of it because the spigot's up at the top of the rain barrel. See, you're only accessing a very small portion of that water.
>
> Now the choice you have is to get a bigger barrel – increase the size of the armed forces in this case – or move the spigot down and figure out ways that you can have access to more of those people. And that's what we're doing.[1]

In other words, a portion of the military force was engaged in non-military essential activities, reducing force levels available for military missions and causing force stress. Part of the solution to this force stress problem was to rebalance force mix, e.g., make greater use of civilians and contractors for non-military essential activities, so that the military force would be available for military missions.

The fiscal crisis confronting DoD has added to the urgency of improving force mix decisions. DoD is experiencing significant cuts to its top-line funding level. There are only two ways DoD can make these cuts—improve efficiency or cut capability. Any savings that cannot be achieved through improving efficiency will instead have to be taken as cuts to brigades, ships, air squadrons, and other capabilities. It will be essential

[1] Secretary Rumsfeld interview with Roger Hedgecock, June 30, 2004.

in the coming years to improve the efficiency of total force decisions in order to minimize cuts in warfighting capability. Civilian personnel are generally cheaper than military personnel. To the extent DoD is using military personnel in positions that can be effectively accomplished by civilians, it is behaving inefficiently.

DoD is also adjusting to a new strategy and incorporating the lessons learned from Iraq and Afghanistan, which demonstrate fundamental changes to the way the United States fights wars. The emergence of cyber warfare and unmanned systems are creating new challenges in making efficient force mix decisions. The movement to a more mobile and decentralized battle field in OEF/OIF has caused changes in theater requirements, including what is (and is not) considered military essential and what can (and cannot) be sourced from reserve forces.

The DoD medical community demonstrates all of these force mix issues and challenges. The medical community has achieved incredible results in the recent wars in Iraq and Afghanistan—the survival rate from combat injuries has reached unprecedented heights. And it has done this while reducing its footprint in theater, easing the burden it places on commanders for logistical and security support. But the medical community also has long-standing force mix challenges, which contribute to the Defense Health Program (DHP) being one of the fastest growing items in the defense budget. Over a 20-year series of studies that includes "The Economics of Sizing the Military Medical Establishment" (known as the Section 733 Study (early 1990s), the 733 Update Study (late 1990s), and the Medical Readiness Review (MRR) (mid-2000s), the Office of the Secretary of Defense (OSD) has consistently identified force mix challenges that include:

- **Specialty mix of military force**. The medical community supports two missions: the operational mission of providing care in combat theaters and the beneficiary mission of providing high quality peacetime health care to Service members, their families, and retirees. The first is military essential, the latter a commercial activity. However, the military medical force has historically understaffed operationally required specialties like surgery while overstaffing beneficiary care specialties like pediatrics and obstetrics.
- **Military-civilian personnel mix in military hospitals**. A little less than half of all beneficiary care is produced in Military Treatment Facilities (MTFs). For specialties that are common in civilian labor markets, civilian providers generally cost less than military providers. While the Army does make extensive use of civilians in MTFs, the Navy and Air Force rely primarily on higher cost military providers for this commercial activity.

In 2004, at the start of the MRR, the Service-identified active duty medical requirements data illustrated this specialty mix challenge. Table 1 provides the Service-identified requirement and executed end strength for four physician specialties, two

(pediatrics and obstetrics) with large beneficiary care demand and two (anesthesiology and general surgery) with large operational mission demand, i.e., large readiness requirements. In 2004, there was significant overstaffing of the beneficiary care specialties and understaffing of the operational specialties.

Table 1. FY 2004 Specialty Mix Imbalance

	Readiness Requirement	FY 2004 Executed End Strength	End Strength Minus Requirement
Pediatrics	286	645	359
Obstetrics	208	387	179
Anesthesiology	318	259	−59
General Surgery	685	443	−242

Source: MRR final report "DoD Force Health Protection and Readiness—A Summary of the Medical Readiness Review, 2004–2007" dated June 2008.

The FY 2004 requirement is for fully trained providers. The total requirements, including training, transients, prisoners, etc., were pediatrics 484, Obstetrics 351, Anesthesiology 444, and General Surgery 947.

It is not surprising that during the peak of OEF/OIF the medical community also began to claim it was experiencing force stress within its operationally required specialties, even though it had large numbers of personnel in specialties more related to beneficiary care with little or no deployments.

Although these challenges have been consistently found and documented, OSD has had little success in resolving them. One reason for this lack of progress has been that estimating medical force requirements is a large and contentious analytic effort, and by the time this effort was completed in each of the previous studies, there was little time, energy, or political capital left to deal effectively with the identified challenges. But, as with force mix issues across DoD, the budget crisis is adding to the urgency in resolving them. Medical force mix inefficiency increases DHP costs in a number of ways, including (a) raising the cost of producing care in MTFs by having a more expensive work force (that is growing in cost), and (b) by causing more care to be delivered in-house (MTFs) where inefficient benefit design leads to higher utilization of services. Improving medical force mix would save DoD resources, reducing the level of required cuts to warfighting capability that will have to be made, without compromising—possibly actually improving—the quality of care patients receive (at MTFs).

With this background in mind, the Director of Total Force Planning and Requirements within the Office of the Under Secretary of Defense for Personnel and Readiness (OUSD(P&R)) tasked the Institute for Defense Analyses (IDA) to examine total force mix issues within the DoD medical community.

B. Research Objectives

The objectives of this report are to develop specific recommendations to improve the total force mix within the medical community and to draw lessons from this community that may provide insights for the improvement of force mix across the DoD.

OUSD(P&R) tasked IDA to avoid independent estimation of medical force requirements and instead focus on causes, consequences, and recommendations for reform. IDA was specifically asked to:

- Review existing measures of medical force demand or requirements and identify the degree to which the historic force-mix inefficiencies currently remain,
- Assess the causes and consequences of these inefficiencies, and
- Develop recommendations for actions that may be taken by DoD to improve medical force mix.

C. Introduction to the Medical Force

The medical force is a major element of DoD. Each year the Defense Manpower Data Center (DMDC), in its Health Manpower Personnel Data System (HMPDS) report, describes in detail the active duty, reserve, and civilian medical force—the focus of this IDA report. It does not contain data on personal services contracts or contracts for medical services, which we largely excluded from consideration. It includes medical personnel—personnel trained in a medical specialty—and does not distinguish between medical personnel within the DHP or Service lines. Table 2 summarizes this data by Service and Component.

Table 2. FY 2011 Medical Force

Military Service	Active Duty End Strength	Guard/Reserve End Strength	Civilian End Strength	Mil.+Civ. Medical Force
Army	52,400	48,715	27,228	128,343
Navy	34,886	11,713	7,444	54,043
Air Force	32,235	19,064	3,981	55,280
Total	119,180	79,492	38,653	237,325

Source: HMPDS for 2011, FY 2011 DMDC HMPDS report.

The report also indicated that there are 341 Air Force active duty Transients, Patients, Prisoners, and Holdees (TPPH) and 3,662 DoD civilians that are not included in this table. Guard and Reserve end strength includes Ready Reserves (Selected Reserves, Individual Ready Reserves, and Inactive National Guard) and Standby.

This medical force is used to support two primary missions. The operational or readiness mission is to provide medical care to operational forces during wartime or contingencies. This mission is military essential and, thus, is performed with military

personnel. The medical force also supports the beneficiary care mission, providing high quality care to military family members, retirees, and retiree family members. This mission is a commercial activity, and just over half of this mission is performed by contracts for medical services. Almost half of the beneficiary care mission is performed in house, however, because it has historically been used as the training venue for the military medical personnel supporting the operational mission. These personnel have had dual assignments; they are assigned to an MTF to provide beneficiary health care in-house and are also assigned (directly in their assignment orders or indirectly by forming a pool of available personnel) to an operational platform such as a theater hospital or a surgical company. A challenge with this dual-mission framework is that, although there is overlap, the specialties required for the operational mission are generally not the same as those required for the beneficiary care mission. In other words, the workload available from beneficiary care is not the optimal workload for the training (i.e., maintaining the clinical skills) of the operational force. Figure 1 illustrates the dual-mission framework.

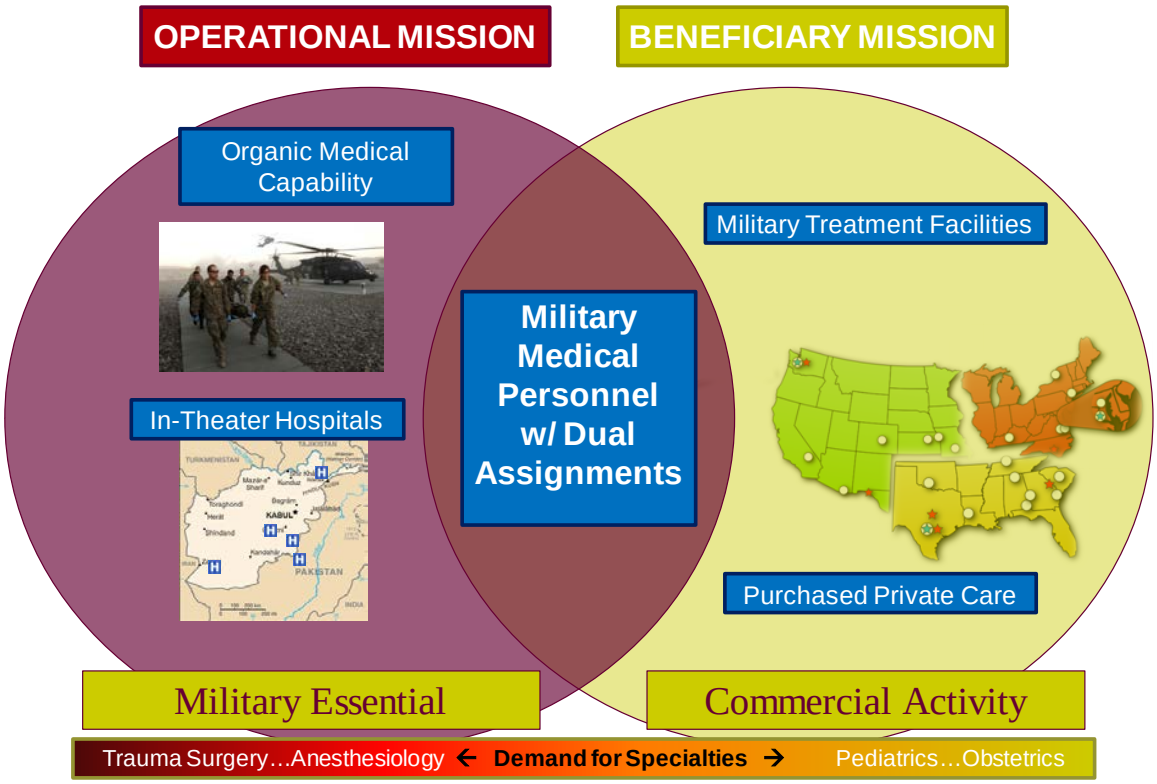

Figure 1. Dual-Mission Framework of Medical Force

The HMPDS report further describes the Active Duty medical force by specialty and rank. HMPDS crosswalks the Service-specific specialty designators (e.g., Army Military Occupational Specialty) into approximately 130 DoD Occupation Codes. The specialties can be grouped into corps. The primary officer corps are Medical (physicians),

Dental, Nursing, and Medical Service. Some of the Services have additional officer corps (e.g., Veterinarians for the Army and Biomedical Sciences for the Air Force)—these are included in a composite medical services corps for display in this report. Enlisted personnel are generally divided into medical- or dental-related specialties—all enlisted specialties are combined into a composite enlisted corps in this report. Table 3 displays the size of each of the five corps the IDA research team considers, by Service.

Table 3. FY 2011 Active Duty Medical End Strength by Corps and Service

Corps	Army End Strength	Navy End Strength	Air Force End Strength*	Total End Strength
Medical	4,369	3,819	3,474	11,662
Dental	990	1,058	1,040	3,088
Nurse	4,120	2,895	3,312	10,327
Medical Service**	7,120	2,492	3,350	12,962
Enlisted	35,801	24,622	20,718	81,141

Source: HMPDS for 2011.

* In addition to the 11,176 total officer end strength, there are 126 Air Force Medical Officer TPPH. In addition to the 20,718 total enlisted end strength, there are 215 Air Force Medical Enlisted TPPH.

** Some of the Services have additional officer corps (e.g., Veterinarians for the Army and Biomedical Sciences for the Air Force)—these are included in a composite medical services corps for display in this table.

The active duty medical force is more concentrated at higher ranks than the military force in general. The HMPDS report provides the rank breakdown of the active duty medical force and DMDC provides the rank breakdown of the total active duty force in other reports. The active duty medical force is about 8 percent of the total active duty force, but, as Table 4 and Table 5 show, it is about 20 percent of O-4 to O-6 end strength and 25 percent of all O-6s.

Table 4. FY 2011 Active Duty Medical Force O-4–O-6 End Strength vs. Total Force

Service Component	Military Rank	Medical End Strength	Total End Strength	% Medical
Army Active	O-4/5/6	6,856	31,538	22%
Navy Active	O-4/5/6	5,179	27,645	19%
Air Force Active	O-4/5/6	5,726	27,996	20%
Total Active	O-4/5/6	17,761	87,179	20%

Source: HMPDS for 2011. The medical force end strength data are from the FY 2011 DMDC HMPDS report. The total active duty force end strength data are from the DMDC Military Personnel Statistics report. Navy data include the Marine Corps.

Table 5. Active Duty Medical Force O-6 End Strength vs. Total Force

Service Component	Military Rank	Medical End Strength	Total End Strength	% Medical
Army Active	O-6	1,195	4,434	27%
Navy Active	O-6	1,005	4,143	24%
Air Force Active	O-6	809	3,556	23%
Total Active	O-6	3,009	12,133	25%

Source: HMPDS for 2011. The medical force end strength data are from the FY 2011 DMDC HMPDS report. The total active duty force end strength data are from the DMDC Military Personnel Statistics report. Navy data include the Marine Corps.

In summary, the medical force is large, high-ranking, and distributed across all elements of the total force.

D. Past Medical Force Studies

As was discussed above, the medical force has been the subject of a number of comprehensive OSD studies in the last 20 years. The three primary studies have been the Section 733 Study, the 733 Update study, and the MRR. A review of these studies and several others is provided in the MRR final report.[2] This section provides a brief overview of them.

The end of the Cold War required DoD to re-think and revise the country's defense strategy and the impacts on the medical force. In particular, in 1991, the Congress required DoD to reassess its medical personnel requirements based on a post-Cold War scenario. Specifically, Section 733 of the National Defense Authorization Act (NDAA) for Fiscal Years (FY) 1992 and 1993 (P. L. 102-190, December 5, 1991) directed DoD to determine the size and composition of the military medical system needed to support US forces during a war or other conflict. DoD was also required to identify ways of improving the cost-effectiveness of medical care delivered during peacetime.

The DoD task group completed the required study, known as the "733 Study" in April 1994. The 733 Study primarily focused on physicians to illustrate key points, although it also addressed other types of medical personnel (e.g., nurses and administrative personnel). Using current US military strategy (two nearly simultaneous Major Regional Conflicts (2MRC)), the 733 Study determined that an estimated 50 percent of the 12,600 active duty physicians projected for FY 1999, as determined by the Services, were needed to treat casualties resulting from 2MRCs. The study concluded that the 19,100 physicians—which included 6,500 physicians in the reserve forces—projected

[2] "Final Report: DoD Force Health Protection and Readiness—A summary of the Medical Readiness Review, 2004–2007," June 2008.

for FY 1999 could be reduced by 24 percent. Because of the timing of the peak demands in the scenarios, the 733 Study determined that the majority of the reductions could be taken from the active duty force.

In August 1995, Program Decision Memorandum (PDM) 1 directed the Director of Program Analysis and Evaluation to lead an effort to update the 733 Study, to take into account changes in the national security environment. A criticism of the 733 Study had been that it did not take adequate account of the requirement for training and maintaining the medical forces; therefore, the new 733 Update Study included a particular emphasis on these requirements. The 733 Update Study results were published in 1999 and provided for a larger physician requirement than the original 733 Study. It concluded that 72 percent of active duty physician strength was required to meet military, peacetime, and training requirements. Again, the timing within the campaigns for medical support was a major factor in determining whether medical requirements would be met by Active or Reserve Component forces. Like the 733 Study, the 733 Update Study determined the majority of the reductions would be made within the Active Component.

By 2004, force stress from the wars in Iraq and Afghanistan and significant changes to how combat casualty care was being conducted in theater led to renewed interest in the medical force. In a memorandum dated August 2, 2004, the Under Secretary of Defense for Personnel and Readiness (USD(P&R)) directed the MRR. The MRR conducted a systematic evaluation of medical force requirements, including all medical specialties. A major focus on the MRR was updating the wartime modeling assumptions to take into account the significant changes in warfighting and combat casualty care that had occurred since the end of the Cold War. The MRR final report was published in June 2008, concluding that perhaps 80 percent of the then programmed (FY 2011) medical end strength were likely a military essential requirement.

E. Outline of Report

Following this introductory chapter, this report conducts a systematic examination of existing data on medical demands and requirements. Chapter 2 reviews the data sources available to measure demand and requirements and what those data show. Chapter 3 then examines the understaffing of operationally required specialties. This chapter examines the contributing causes of these imbalances, their consequences, and recommendations for actions that can be taken to improve them in the future.

Chapters 4 through 6 address the overstaffing of specialties used predominantly for beneficiary care. The first of these three chapters identifies the contributing causes of this overstaffing. The second then focuses specifically on the costs and trade-space faced by decision makers and how these can drive inefficient force mix decisions. The third considers legislative and institutional impediments. Chapter 7 offers concluding remarks

that provide a summary of the IDA team's recommendations. A series of detailed appendices provide data and descriptions of specific analyses.

2. Medical Force Requirements

The medical force is a particularly appropriate candidate for total force analysis because it contains military (active and reserve), civilians, personal services contracts (e.g., a contracted physician working in a government hospital), and contracts for medical services (e.g., the purchase of a medical procedure from a private hospital). This chapter presents the research question on force requirements we addressed, reviews the data sources examined, provides a brief discussion of the implications of OEF/OIF for medical force requirements, and examines the military medical force requirements identified by Service medical departments. The chapter then reviews additional measures of medical force demand. It concludes with a summary of the IDA team's observations. This chapter focuses primarily on the active duty force; Appendix A examines Guard and Reserve forces.

A. Research Question and Data Sources

Despite the findings of persistent force mix imbalances in the medical force, reform has been difficult to achieve. As was stated in Chapter 1, a reason for this lack of progress has been that estimating medical force requirements is a large and contentious analytic effort, and by the time this effort was completed in each of the previous studies, there was little time, energy, or political capital left to deal effectively with the identified challenges. With this background in mind, OUSD(P&R) tasked IDA to review, and not independently estimate, medical force requirements. Given the consistency of these force mix imbalance findings through time, it was expected that the problems would largely remain and a time-consuming and contentious effort to redo the previous results would be counterproductive. Instead, after a review of existing requirements and usage data, IDA researchers were able to concentrate, in more detail than the previous studies, on the underlying root causes of these imbalances and what actions OSD could take to begin effectively resolving them.

The IDA team's task with respect to requirements was to use existing data to examine medical force requirements and to specifically examine:

- The degree to which historic force mix imbalances remain in the current medical force;
- How recent changes in warfighting and medical practices have influenced or will shape military essential medical requirements; and

- The consistency of Service-estimated requirements with guidance, e.g., military essentiality guidance.

To answer these questions, we collected data from a variety of sources. The major sources of data include:

- **Medical sizing models Estimates**: The Service medical departments produce annually (or nearly annually) formal requirements estimates using Medical sizing models developed at about the time of the 733 Update Study. The Service-specific names for these models and estimates are the Army's Total Army Assessment (TAA) estimate, the Navy's Medical Manpower All Corps Requirements Estimator (MedMACRE) estimate (formerly Total Health Care Support Readiness Requirement (THCSRR)), and the Air Force's Critical Operational Readiness Requirements (CORR) estimate. IDA researchers obtained these estimates from the Services for 2011 (2012 for the Navy). We also obtained the 2004 Service estimates of these models from records maintained by the OSD office of Cost Assessment and Program Evaluation (CAPE).
- **MRR Estimates**: IDA obtained from CAPE the requirements estimates from the MRR.
- **Current Forces Database (CFDB)**: IDA researchers also obtained unit manning files, provided by the Services to CAPE and aggregated into the CFDB. This data source provided requirements, authorizations, and on-board staffing for every unit in the DoD.
- **Contingency Tracking System (CTS) Deployment Data**: IDA researchers obtained data on individual deployments from the DMDC's CTS database. The CTS database used includes all individual deployments to named contingencies (OEF, OIF, and Operation New Dawn) from October 2001 through December 2012.

The IDA team also conducted extensive interviews with Service and OSD personnel,[3] obtained other data from DMDC (e.g., non-medical end strength), and reviewed past studies.

[3] Interviews were conducted with, among others, the three Service medical departments, Service programming and manpower offices, the Marine Corps Combat Development Command, CAPE, the Assistant Secretary of Defense for Health Affairs (ASD(HA)), and OUSD(P&R).

B. OEF/OIF Lessons Learned

The last decade has brought to the forefront many changes in warfighting and medical practice that have been occurring over several decades. At a high level, these include:

- Moving to a more decentralized, mobile battlefield—which drives a smaller medical footprint in operational theaters;
- Evacuating casualties early—which is better for the casualties and reduces risk to forces in theater;
- Greater specialization in the profession of medicine; and
- Shifts in medical workload on the modern battlefield, e.g., more immediate and less definitive care, different wound and injury patterns as body armor and weapons evolve, and earlier transportation of patients than would have occurred in earlier conflicts.

The IDA team examined the impacts of these change on medical force requirements by interviewing Service and OSD personnel, reviewing a limited number of lessons learned reports and articles, and examining the MRR wartime modeling results. Our discussions with the Services suggested that changes in warfighting have significant implications for medical force requirements. The shift to more mobile operational forces with a lighter theater footprint produced a shift in the required operational medical capabilities—medical forces are now more often forward-deployed with operational units and provide more immediate technical medical care. There is also less definitive care, as the historic model of extensive in-theater care, practiced in World War II and Korea, has been replaced with rapid evacuation to hospitals outside the operational theater. Lower in-theater holding times decrease the deployable medical requirement. An example of this practice can be seen through the Navy's shift away from 500-bed fleet hospitals to 150-bed and smaller Expeditionary Medical Facility (EMF) platforms.

However, a lower theater medical requirement that is deployed further forward and provides more immediate care limits the opportunities for substitution across specialties and may increase demand for highly specialized medical personnel. As described in discussions with Navy and Marine Corps representatives, a hospital with a requirement for ten surgeons can more readily substitute two obstetricians alongside eight surgeons than a forward-deployed surgical team with a requirement for two surgeons; there is not enough overlap in staff for the requirement to be met with one surgeon and one obstetrician. The Navy offered similar reasons for their ongoing transition from generalist specialties—like General Medical Officers—to an all-specialist medical force. The smaller the unit, the less ability it has to employ substitutions across specialties.

The major conclusions, provided consistently across the interviews the IDA team conducted, were that the OEF/OIF lessons learned included:

- Total military essential medical requirements are decreasing, but
- Requirements for some individual specialties may have increased.

The Services did not provide any written studies or reports on these changes in response to the IDA team's requests. The Army provided an information paper describing the Army Medical Department (AMEDD) Lessons Learned program, and the Air Force described its lessons learned capturing process. But many of the lessons learned through these processes appeared to focus on the tactical and clinical levels, without providing systematic study or documentation on strategic level implications such as required force size. We conducted a limited review of publicly available documents and found a similar pattern—a focus on clinical and tactical lessons learned with limited examination of the implications for medical force requirements. The one existing study that attempted to systematically analyze the impact of some of the changes, i.e., rapid evacuation and reduced extent of in-theater care, on wartime medical requirements was the MRR.

The MRR final report provides a detailed description of medical wartime modeling parameters. Important elements include the evacuation policy (i.e., what severity of injuries will be evacuated versus maintained in-theater for treatment), evacuation delay (i.e., for those patients being evacuated, how long will the evacuation take), and en route hospital admission policy (i.e., for those patients being evacuated, where will they be evacuated to and how many stops will they make en route). Historic Cold War planning assumptions had included extensive treatment of casualties in theater (a large value for evacuation policy indicating that even severe injuries may be retained in theater for the full range of treatment), long holding periods awaiting transportation for patients to be evacuated (large values for evacuation delay), and frequent stops en route to the final destination of evacuated patients (e.g., a patient being evacuated from the battlefield of Iraq to a CONUS hospital would be expected to stop and be held for a number of days at a hospital within Iraq, another hospital in Kuwait, and a hospital in Europe, before arriving in the United States). The MRR estimated excursions with a range of parameters that brought these values closer to modern practice to evaluate the change in requirements. The specific wartime MRR results were classified, but the unclassified overall MRR result was that 20 percent of the then programmed active duty medical end strength was not required.

There are other changes occurring in national security strategy, warfighting, and medicine, e.g., the shift of emphasis to the Pacific. These types of changes could affect medical requirements, but assessing the effects of future changes was beyond the scope of this report.

C. Service Sizing Models

Service medical departments produce formal requirements estimates based on a standardized Medical sizing model developed at about the time of the 733 Update Study. As mentioned above, the Service-specific versions of this Medical sizing model are the Army's TAA estimate, the Navy's MedMACRE estimate, and Air Force's CORR estimate. These estimates are intended to identify military essential active duty (and, usually, Guard and Reserve) requirements for the operational mission. These sizing models have historically included a few basic categories of requirements.

The starting point and first category of medical requirements is the wartime requirement, which includes deployable medical capabilities as well as ancillary functions such as Command and Control, research and development, and casualty reception and replacement. Supporting this wartime requirement is a day-to-day requirement for items such as a force rotation base. The Services also traditionally have included medical billets at MTFs outside the continental United States (OCONUS) and in isolated areas inside the continental United States (ICONUS) as part of the day-to-day requirement. Finally, the Services estimate a sustainment requirement of medical trainers and trainees and an individual account of TPPH to generate the required supply of fully-trained clinicians to fill wartime and day-to-day demands.

The Services use varying methodologies to estimate military essential medical requirements. All the Services, however, start with a wartime deployable requirement that is based on casualty estimates for specific scenarios. This casualty stream translates into a bed demand for operational medical care. From this demand signal, the Services develop an estimate of the number of personnel in line and medical units needed to meet the wartime bed requirement. After these wartime or deployable requirements are identified, non-deployable "tails," such as rotation bases and training pipelines, are estimated in order to generate and sustain wartime deployable capabilities. In summary, the total requirement can be loosely divided into a deployable requirement and a non-deployable (tail or overhead) requirement.

Although the general components of the military medical requirement are fairly consistent, each of the Services has a different process for estimating its medical requirement. The Army's TAA process estimates a deployable medical requirement alongside the deployable requirements for line specialties. These estimates are produced by Army G-3, not the Army Surgeon General. Non-deployable Army "tails" are estimated separately but approved within the TAA process. The Navy's MedMACRE estimate and the Air Force's CORR estimate are made within the Surgeons General offices with varying degrees of Service line involvement.

This section describes the Service requirements estimates provided to IDA researchers, examines the trends in over- and understaffing of individual specialties, and examines some of the specific elements of the Service estimates.

1. Service Estimates of Medical Requirements

At the beginning of our research, we requested each Service provide its estimate of force requirements. These data are shown in Table 6.

Table 6. Service Medical Requirement Estimates for 2011/12

Military Service	2011/12 Requirement
Army (2011)	50,068
Navy (2012)	41,342
Air Force (2011)	25,175

Source: TAA 2011, MedMACRE 2012, CORR 2011.

CAPE also provided 2004 Service estimates from the same sizing models.[4] Table 7 compares the estimates of requirements from 2004 and 2011 (2012 for the Navy) and executed end strength from 2004 and 2011. The Army and Air Force show consistent movements in requirements and end strength; Army increased in both areas and the Air Forced decreased in both areas. The Navy shows a large increase in requirements while end strength declined, and this divergence will be examined in more detail below.

Table 7. Service Medical Requirement Estimates for 2004 and 2011/12

Military Service	2004 Requirement	2011/12 Requirement	% Change	2004 End Strength	2011 End Strength	% Change
Army	44,004	50,068	+14%	46,679	52,400	+12%
Navy	32,169	41,342	+29%	36,997	34,886	−5.7%
Air Force	30,802	25,175	−18%	34,756	31,894	−8.2%

Sources: TAA 2004 and 2011, THCSRR 2004, MedMACRE 2012, CORR 2004 and 2011, and HMPDS 2004 and 2011.

Much of the change in the Air Force and, after deeper examination, the Army can be explained as reflecting the lessons learned in OEF/OIF. From these lessons learned, we expected to find: (1) reduced medical requirements, and (2) increased requirements (or smaller reductions in requirements) for operationally demanded specialties offsetting diminished requirements for generalists and substitutable beneficiary care specialties.

[4] The Navy switched from THCSRR to MedMACRE during this interval.

The Air Force medical requirement most clearly displays these trends. In the seven years of war between 2004 and 2011, Air Force medical requirements declined roughly 18 percent, to approximately the level estimated by the 2006 MRR which, as described above, incorporated changes to wartime evacuation parameters more consistent with OEF/OIF practice. During this period of time, requirements for generalists or substitutable specialties, like internal medicine and obstetrics, declined while requirements for more operationally related specialists, like anesthesiologists and orthopedic surgeons, increased. In short, the changes in Air Force estimates of requirements match the expected changes from OEF/OIF very closely.

The lessons from OEF/OIF also appear to have shaped the Army's 2011 medical requirements, but in a less consistent and straightforward manner. Unlike the Air Force, the Army's total medical requirements rose nearly 14 percent since 2004. Two factors explain this increase. Increased enlisted medical requirements within deployable line units comprise the principal component of this increase, which is consistent with the overall Army end strength increase conducted in support of OEF/OIF. When Army end strength reduces to (or below) its pre-OEF/OIF level, much of this increase in enlisted medical requirements should also decline. In contrast to enlisted gains, Army deployable medical officer requirements have remained relatively stable (increasing only 313 billets) despite the increase in size of the Army, consistent with limiting the size of the theater medical footprint. Also consistent with OEF/OIF lessons learned, changes in Army deployable medical officer requirements have varied across specialties with declines to generalist and substitutable specialties like general medicine and general nursing offset by gains to operationally demanded specialties like anesthesiology and medical and surgical nursing. In short, changes in the deployable portion of the Army total requirement are generally consistent with the expectations from OEF/OIF lessons learned, but this effect is masked by the increase in the size of the Army since 2004, which drove a concomitant rise in organic medical requirements.

The secondary contributor to Army requirements growth is an increase of 2,808 billets in requirements for non-deployable medical officers. This increase in non-deployable requirements is not consistent with the expected OEF/OIF lessons learned (and is not mirrored in non-deployable requirements for enlisted personnel, which decreased five percent or 854 billets between 2004 and 2011). Meetings with representatives from the Army explained roughly one-third of this increase as attributable to the increase in total Army size (approximately 600 billets) and statutorily required increases in end strength for mental health professionals (approximately 200 billets). OUSD(P&R) may want to work with the Army to further scrutinize the remainder of this non-deployable requirement increase.

Whereas the changes in the Air Force and Army's requirements estimates appear to be largely explained by the OEF/OIF lessons learned, the Navy requirement is an outlier.

The Navy's 2012 MedMACRE estimate of 41,342 billets is an increase of 29 percent over the 2004 THCSRR requirement estimate of 32,169 billets. This increase is difficult to reconcile with recent Service-suggested trends in operational medical practice and independent assessments of Navy medical requirements. In 2006, the OSD MRR estimated that the 32,169-billet 2004 THCSRR estimate overstated the military essential medical requirement by 5,769, making the 41,342 billet 2012 MedMACRE an even larger increase. And, as will be shown later in this chapter, during the wars in Iraq and Afghanistan medical was one of the lowest deploying specialties in the Navy (four of the five lowest deploying officer corps and the second lowest deploying enlisted category). Dramatically increasing requirements for one of their lowest deploying categories of personnel is another reason this increase is an outlier.

In 2012, the Navy transitioned from its longstanding THCSRR model to its new MedMACRE model. MedMACRE allows the Navy to automatically estimate medical requirements under adjustable platform, rotation, training, and scenario-based assumptions. The different assumptions behind the MedMACRE model and its predecessors may explain some of the divergence in requirements estimates. IDA researchers requested but were not provided the baseline assumptions for the 2012 MedMACRE estimate. However, upon request, CAPE provided the team with an independent estimate of the Navy's requirements for 2010 that replicated the publicly documented methodology and assumptions of the MedMACRE model circa 2010. Although not an official OSD or Navy estimate of requirements, the 2010 estimate closely matched the MRR estimate of Navy requirements (26,484 billets). The IDA team's attempts to recreate the 2012 MedMACRE estimate using the 2010 CAPE-provided data required substantial changes in baseline assumptions governing rotation bases, dwell times, and unit composition.[5] In summary, the Army- and Air Force-

[5] The Navy provided several explanations for the discrepancy between its 2012 MedMACRE estimate and the requirements generated by its THCSRR model in 2004 (and, similarly, OSD's MRR in 2006 and the informal estimate from OSD for 2010). First, the Navy highlighted the shift from large in-theater fleet hospitals and 150-bed EMFs to the smaller and more numerous 50-, 15-, and 10-bed EMF platforms. However, in its comments, the Navy did not link this move to smaller platforms (which is consistent with OEF/OIF lessons learned) to a substantial increase in total medical requirements (which is not). Second, the Navy suggested that the Marine Corps' transition to the concept of forward-deployed medical personnel embedded in line units (which is consistent with OEF/OIF lessons learned) has increased overall medical requirements. Because the Navy did not provide a breakout of its requirements by Navy and Marine Corps units, IDA could not assess this explanation. The Navy attributed some of the increase in medical requirements to the newly programmed class of eleven LPD 17 amphibious transport ships, which have a 24-bed hospital configuration and can accommodate an augmentation of approximately 50 medical personnel each during full mobilization. These new units account for 550 of the 9,089 billet requirements increase over 2004. Finally, the Navy stated that the new MedMACRE model accounted for rotational bases more completely than THSCSRR had. IDA was not able to reconcile the conflicting estimates and adequately understand the large change in Navy requirements.

provided requirements data were generally consistent with expected trends and the Navy data were outliers.

2. Under- and Overstaffing to Service Requirements

Misalignment of medical end strength with medical requirements has been a persistent challenge with the medical force. Understaffing of operationally demanded specialties may create risk to the wartime medical mission. Overstaffing of beneficiary care specialties is inefficient, consuming scarce DoD resources. The changes in under- and overstaffing of specific specialties between 2004 and 2011 follows a similar pattern to the incorporation of OEF/OIF lessons learned: the Air Force provides a clear case of improvement (for understaffing), the Army generally shows improvement (but it is masked in the aggregate data by the increase in the size of the Army), and the Navy data are outliers.

Table 8 shows the changes in understaffing between 2004 and 2011. For each Service, the table provides the number of specialties reported in each year's HMPDS report, the number of specialties that were understaffed by at least 20 percent of the requirement, and the number of personnel that were understaffed in those specialties. For example, the Army used 90 of the DMDC medical occupation codes in 2004 and 106 in 2011. It had executed end strength at least 20 percent less than the requirement in 21 of those specialties in 2004 and 38 of those specialties in 2011. The Army had executed end strength below the requirement by 3,720 personnel in those specialties in 2004 and 2,708 personnel understaffed in those specialties in 2011.

Table 8. Understaffing of Specialties for 2004 and 2011

Military Service	Total Specialties 2004/2011(12)	2004 Understaffed Specialties	2011 Understaffed Specialties	2004 Personnel Shortfall	2011 Personnel Shortfall
Army	90/106	21	38	3,720	2,708
Navy	92/91	16	25	1,601	4,404
Air Force	91/92	24	15	3,762	1,905

Sources: TAA 2004 and 2011, THCSRR 2004, MedMACRE 2012, CORR 2004 and 2011, HMPDS 2004 and 2011.

Note: Specialties are considered understaffed if end strength in that specialty is at least 20 percent below total specialty requirements.

The Air Force requirements and end strength data present the clearest case of improvement. Since 2004, the Air Force has reduced its number of understaffed specialties from 24 to 15, nearly halving its total personnel shortfall. The primary cause of the Air Force's improvement was an over 200 percent increase in end strength for 2004 understaffed specialties. This increase in understaffed specialties is notable given

that the Air Force reduced overall medical end strength since 2004 and indicates significant progress in directing force structure toward readiness requirements.

Interpreting the Army requirements and end strength data is more complicated. The number of understaffed specialties nearly doubled from 21 to 38, but the total personnel shortfalls declined by roughly a quarter. This is the result of two factors. First, the Army experienced a large decrease in requirements, concentrated in deployable requirements, for its understaffed specialties in 2004. This decrease in deployable requirements is consistent with lessons learned from OEF/OIF and reduced the number of personnel shortfalls by 1,173. Second, non-deployable requirements for new understaffed specialties grew, partially offsetting these improvements. Because many of these requirement gains occurred in small specialties (and requirements for several large specialties were also redistributed among smaller specialties), the number of understaffed specialties also increased. Among both specialty groups, end strength remained relatively constant.

The large increase in Navy requirements, discussed earlier in this section, makes it more difficult to evaluate Navy understaffing. Like the Air Force, the Navy increased end strength for its 2004 understaffed specialties while reducing total end strength. Requirements for those 2004 understaffed specialties remained constant over this period. However, requirements for a set of new 2012 understaffed Navy specialties grew substantially (64 percent) over the same period, completely offsetting the improvements in the old 2004 understaffed specialties and more than doubling the 2004 total shortfall. Unlike the Army, whose 2011 requirements growth was divisible into deployable and non-deployable components, the components of the Navy's requirement growth and its relationship to medical readiness were not provided to the IDA research team. Accordingly, while the Navy has mitigated its understaffing with respect to the 2004 understaffed specialties, further exploration is needed into its unmet requirements growth for new understaffed specialties in 2012.

Table 9 provides similar data on overstaffing of specialties between 2004 and 2011. As with Table 8, the table provides the number of specialties reported in each year's HMPDS report, the number of specialties that were overstaffed by at least 20 percent of the requirement, and the number of personnel that were overstaffed in those specialties. For example, the Army used 90 of the DMDC medical occupation codes in 2004 and 106 in 2011. It had executed end strength at least 20 percent greater than its requirement in 40 of those specialties in 2004 and 11 of those specialties in 2011. The Army had executed end strength above the requirement by 4,594 personnel in those specialties in 2004 and was overstaffed by 1,514 personnel in those specialties in 2011.

Table 9. Overstaffed Specialties for 2004 and 2011

Military Service	Total Specialties 2004/2011(12)	2004 Overstaffed Specialties	2011 Overstaffed Specialties	2004 Personnel Excess	2011 Personnel Excess
Army	90/106	40	11	4,594	1,514
Navy	92/91	38	24	3,512	853
Air Force	91/92	45	53	4,284	7,080

Sources: TAA 2004 and 2011, THCSRR 2004, MedMACRE 2012, CORR 2004 and 2011.

The progress demonstrated above in mitigating 2004 understaffing does not appear to be replicated in overstaffed specialties. Once again, the Air Force data provide the most transparent trends. Whereas Air Force understaffing diminished by nearly 2,000 personnel since 2004, overages increased by nearly 3,000 personnel over the same period. The majority of this increase is attributable to reductions in requirements for new overstaffed specialties while end strength remained constant or slightly increased. In short, the Air Force has been aggressively adjusting its requirements estimate, but the adjustments to end strength are taking more time.

As with Army understaffing, the seemingly large (roughly 3,000 personnel) improvement in Army overages is the product of two factors. First, end strength for Army overstaffed specialties in 2004 declined by 16 percent. Second, non-deployable requirements for overstaffed specialties in 2004 grew by 65 percent (roughly 2,700 personnel). Over the same period of time, deployable requirements for these specialties only grew 10 percent (roughly 200 personnel). Total requirements growth accounts for about 90 percent of the net overage improvement; however, as discussed earlier, some of that total requirements growth was not fully explained to our team. In short, the Army shows a large improvement but when examined in more detail, some of that improvement becomes less clear.

Finally, the Navy appears to demonstrate progress on its 2004 overstaffing but this is driven in part by the outlier 2012 requirements estimate. The Navy has reduced end strength (27 percent) in the 38 overstaffed specialties from 2004. An 18 percent increase in requirements for 2004 overstaffed specialties generates an additional 1,095 reduction of the overage gap. As with the Army, the causes of this requirement growth is unknown; however, unlike the Army, the growth cannot be decomposed into categories like deployable and non-deployable. Accordingly, while Navy overages are shown to decrease, this requires acceptance of the Navy's 2012 requirement as entirely military essential.

In conclusion, the IDA team found:

- Understaffing by the Air Force and the Army (when examined in more detail) improving.

- Overstaffing by the Air Force and the Army (when examined in more detail) remaining a force mix challenge.
- The 2012 Navy outlier requirements estimate preventing the development of sound conclusions for its changes to under and overstaffing.

3. Components of Medical Requirements

The Service applications of the Medical sizing model are intended to estimate military essential force requirements. The major elements of the Service sizing models were identified above. To be justified for inclusion, they must be military essential, which is governed by Department of Defense Directive (DoDD) 1100.4 and Department of Defense Instruction (DoDI) 1100.22. Table 10 provides the five criteria for military essentiality identified in DoDI 1100.22. Any manpower requirements and authorizations that do not meet these criteria shall be designated for civilian performance if inherently governmental or critical (as defined by the Federal Activities Inventory Reform Act), or subject to least-cost contractor or civilian performance if the manpower fulfills a non-governmental commercial activity.

Table 10. Military Essentiality Criteria from DoDI 1100.22

DoDI 1100.22 Criteria	Military Essentiality Criteria Description
(1)	Military-unique knowledge and skills are required for performance of the duties
(2)	Military incumbency is required by law, Executive Order, treaty, or international agreement
(3)	Military performance is required for command and control, risk mitigation, or esprit de corps
(4)	Military manpower is needed to provide for overseas and sea-to-shore rotation, career development, or wartime assignments
(5)	Unusual working conditions or costs are not conducive to civilian employment

As noted above, the medical force supports two missions—the operational mission and the beneficiary care mission. Because only the operational mission is military essential, only activities supporting the first mission should drive the development of military medical requirements. A comparison of the components of Service medical requirements with the criteria of DoDI 1100.22 identifies areas of greater and lesser consistency with guidance on military essentiality. Deployable wartime requirements are covered by Criterion (4) of DoDI 1100.22. This includes requirements such as the Army's Combat Support Hospitals (CSHs), the Navy's EMFs, and the Air Force's Expeditionary Medical Support units and the medical personnel embedded with

deployable line units. Certain medical staff and leadership billets are consistent with command and control justifications found in Criterion (3).

However, several elements of the Service-estimated military requirements may not be consistent with DoDI 1100.22's guidance on military essentiality. The MRR identified several categories of military requirements for military essentiality scrutiny. First was medical personnel assigned to OCONUS and ICONUS MTFs. Beneficiary care is a commercial activity and not a justification for an additive military essential requirement. The MRR identified a substantial portion (5,101 of 12,732) of these ICONUS and OCONUS billets as non-military essential. The AF has subsequently removed OCONUS as an additive category of requirement from its CORR estimate and the Army has eliminated ICONUS MTF requirements for all but one facility (Fort Irwin), but the Navy appears to include OCONUS as an additive MTF requirement.

Graduate Medical and Dental Education (GME/GDE) is another area that does not appear to meet the criteria for military essentiality. Producing commercial training (e.g., medical school and residency programs) in-house and maintaining the personnel on active duty during the training is a choice made by the medical community. In fact, the Services access medical personnel at various stages of the medical education process. Trainees may join active duty during medical school (through the Uniformed Services University of Health Sciences (USUHS)), during postgraduate education at military GME programs (through the Armed Forces Health Professions Scholarship Program (AFHPSP)), and as fully trained providers (through the Armed Forces Financial Assistance Program (FAP)). Furthermore, because medical training is a commercially available service, instructors who staff GME programs in MTFs do not meet the criteria of military essentiality.[6] The Services continue to include USUHS and GME/GDE students and trainers as additive military essential requirements in their sizing model estimates.

The IDA researchers did not review the remaining categories of non-deployable requirements, e.g., Research and Development and executive agencies. These categories cannot be reviewed in aggregate like OCONUS and ICONUS. Instead, a review of specific billets within the functions would be required, and this was beyond the scope of this report. Based on our review, however, it is clear that the Service sizing models do include some likely non-military essential functions as requirements and that there is inconsistency across the Services in the rigor of their review for military essentiality. The uneven inclusion of OEF/OIF lessons learned, the outlier value of the Navy estimate, and

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[6] IDA interviewed the GME program chairs at Walter Reed National Military Medical Center as part of the task. All chairs (except the mental health program chair) agreed that the instructors in their program were not engaged in military essential activities.

the heterogeneous inclusion of various non-deployable categories raise serious questions about the value of the current Service sizing models in providing an estimate of military essential requirements.

D. Unit Requirements and Deployment History

Given the inconsistencies and challenges with Services' estimates of requirements and the direction from the sponsor to consider alternative sources of data on military force demands, we examined two additional sources of data—unit manning data and deployment data.

1. Unit Requirements

As discussed above, the requirement for deployable medical capabilities is the foundation of the requirement generation process. Deployable medical billets are also consistent with military essentiality guidance under DoDI 1100.22. There is generally an "overhead" requirement for non-deployable billets to support deployable billets. Specialties with similar training and other generating requirements should have a consistent relationship between the deployable portion of the Service-estimated requirement and the remaining, non-deployable portion of the requirement. In other words, for every deployable medical billet requirement there would be a reasonably consistent number of required non-deployable billets across specialties with similar skills and training. The consistency of this relationship between deployable and "overhead" requirements can be measured through comparing tail-to-tooth ratios for medical specialties.

Some variation between deployable and non-deployable requirements can be expected between different medical capabilities. For example, less-skilled enlisted medical occupations would be able to support a relatively larger deployable requirement (as a proportion of total requirements) than highly-skilled physician specialties due to the greater training and proficiency rotation demands of medical officers. However, among specialties within the five medical corps (medical, dental, nursing, medical service, and enlisted medical), there should be similarities in the relationship between deployable and non-deployable requirements. Large divergences among similarly skilled occupations would indicate differences in estimation of the "overhead" requirement.

The IDA team was able to measure the relationship between deployable and non-deployable requirements by examining the total requirement estimates and unit manning documents of the Services. The Army's 2011 TAA medical requirement estimate provides the clearest comparison. In the Army TAA, medical billet requirements are assigned to specific Army units whose deployability status is clearly identified in the unit identification code (UIC). Deployable billets in the TAA include medical units, such as CSHs, as well as line units, such as the 101st Airborne, with medical billet requirements.

Non-deployable billets include medical units such as MTFs as well as non-clinical units such as the Office of the Surgeon General.

For a total Army requirement of 50,068 medical personnel, 22,608 billets reside in deployable units. Enlisted requirements comprise 18,282 billets of the deployable requirement and 14,815 of the non-deployable requirement. A ratio between the non-deployable and deployable billet requirement from the Army data shows that for every one deployable enlisted billet, the Army requires an additional 0.7 non-deployable billets. Hereafter, these ratios are referred to as tail-to-tooth ratios.[7] Consistent with differences in training and proficiency pipelines, officers have higher ratios of non-deployable to deployable requirements. Army medical officers (physicians, dentists, nurses, and medical service corps) are roughly 2.8 times less likely, and Army physicians are 5.5 times less likely to be assigned to deployable units than are Army enlisted medical personnel.

While tail-to-tooth discrepancies are expected across differently skilled medical corps, divergences between deployable and non-deployable unit requirements across specialties in the same corps raise questions about the process of requirements estimation. Certain Army specialties, such as cardiac/thoracic surgery and aerospace medicine, derive nearly a third of their total requirement from deployable units. Other Army specialties, such as pediatrics and pathology, derive less than five percent of their requirement from deployable units. Still others, such as dermatology or hematology and oncology, have no deployable billet requirement. Differences in proficiency or training pipelines do not explain these divergent ratios, but differences in utilization do. As with specialty understaffing in 2004, specialties demanded in the operational mission tend to have relatively higher deployable requirements and lower tail-to-tooth ratios. As with specialty overstaffing in 2004, specialties demanded for beneficiary care tend to have lower (or zero) deployable requirements and higher (or infinite) tail-to-tooth ratios. Table 11 provides the Army tail-to-tooth ratios for all specialties with a requirement of at least 30 personnel in the medical corps.

[7] All tail-to-tooth ratios are adjusted for Professional Filler System (PROFIS) or similar arrangements where staffing for deployable requirements resides at non-deployable units. Specifically, requirements in non-deployable units are adjusted downward to account for personnel that are required for deployable units but resident in a non-deployable unit during peacetime. This reduces the estimated tail-to-tooth ratios.

Table 11. Army TAA Medical Corps Specialty Requirements and Tail-to-Tooth Ratios

Medical Specialty	Total Requirement	Deployable Requirement	Tail-to-Tooth Ratio
HEMATOLOGY AND ONCOLOGY	41	0	N/A
DERMATOLOGY	80	0	N/A
GASTROENTEROLOGY	57	0	N/A
PULMONARY DISEASE	51	0	N/A
CARDIOLOGY	69	0	N/A
NEUROLOGY	73	0	N/A
PHYSICAL/REHABILITATION MEDICINE	45	0	N/A
ALLERGY AND IMMUNOLOGY	32	0	N/A
PEDIATRICS, SUBSPECIALTIES	93	0	N/A
PEDIATRICS, GENERAL	196	1	195
PATHOLOGY	126	2	61.0
INFECTIOUS DISEASE	65	2	30.5
OTORHINOLARYNGOLOGY	86	3	26.7
RADIOLOGY, DIAGNOSTIC	209	9	21.3
FAMILY PRACTICE	567	30	17.1
INTERNAL MEDICINE	349	21	14.8
OPHTHALMOLOGY	96	6	14.0
OCCUPATION MEDICINE	42	3	12.7
OBSTETRICS/GYNECOLOGY	227	20	9.6
ANESTHESIOLOGY	182	19	7.7
UROLOGY	85	9	7.6
PSYCHIATRY	279	37	6.0
PREVENTIVE MEDICINE	142	20	5.8
ORTHOPEDIC SURGERY	260	35	5.6
EMERGENCY MEDICINE	245	38	4.6
NEUROLOGICAL SURGERY	33	6	3.5
EXECUTIVE MEDICINE	164	42	2.9
GENERAL SURGERY	347	99	1.8
AVIATION/AEROSPACE MEDICINE	214	120	0.8
GENERAL MEDICINE	383	378	0

Source: TAA estimate for 2011.

Tail-to-tooth ratios are calculated with adjustment for PROFIS substitution for deployable requirements without authorizations. Excludes Medical Corps specialties with total requirements of less than 30 billets.

Service requirement estimates and unit manning documents for the Navy and Air Force display similar patterns to the Army. Unlike the Army, the Navy and Air Force did not break out their requirements estimates according to specific units. The Air Force

provided IDA with an estimate of their 2013 CORR requirements broken out into "operational" and "non-operational" categories but did not further assign billets to deployable or non-deployable units in the data provided.[8] From this breakout, IDA constructed tail-to-tooth ratios for the Air Force's "operational" requirement. The Navy provided neither a breakout of their MedMACRE requirement by deployable status nor the units assignments of the required billets.

However, OSD-CAPE provided the IDA team with the CFDB, consisting of unit manning documents for each unit currently in the inventory for each of the three services. Just like the TAA, the CFDB reports the number of required, authorized, and on-hand medical personnel for each unit. For the Army, the CFDB data aligns almost completely with the requirements and end strength from the 2011 TAA and the HMPDS report. Although Air Force and (especially) Navy alignment between requirements and manning documents is less strong, the CFDB data provides insights on the assignment of medical forces to military essential deployable units. This allows the IDA team to construct and compare similar ratios of non-deployable to deployable requirements to assess the process through which "overhead" requirements are estimated. Because each of the Services uses a different methodology to identify deployable units and/or requirements, comparisons within the Services are expected to be more reliable than comparisons across Services.[9]

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[8] The Air Force "operational" requirement in CORR consists of the following three categories: Expeditionary Force Packages (EFP), Global Health (GH), and Commitments in Place (CIP). For 2013, the EFP requirement is 9,166 billets, the GH requirement is 238 billets, and the CIP requirement is 2,866 billets.

CORR describes the EFP requirement as "force packages that support the Aerospace Expeditionary Forces (AEF) deployable." CORR describes the GH requirement as "forces designated for global engagement missions in support of air component campaign plans." These two categories are clearly analogous to the Army's concept of deployable requirements.

CORR describes the remaining category—CIP—as consisting of "in place, nuclear, global reach, space, C4ISP, en route [and] COCOM staffs." Arguably, some or all of this requirement differs from the Army's definition of requirements for deployable units (which, by their definition, are not "in place"). However, for consistency with the Air Force's CORR requirement estimate, the tail-to-tooth ratios provided include CIP as part of the "tooth" rather than the "tail." For this reason, direct comparisons between the Army and Air Force tail-to-tooth ratios should not be made. A version of the table presented in the main paper that incorporates CIP as part of the "tail" can be found in Appendix B.

[9] The Army TAA and CFDB account for all deployable units in the inventory, even where no authorizations or end strengths fill billet requirements. These deployable units form the entire rotation base for operational medicine (i.e., units rotate rather than personnel). This results in an overall higher deployable requirement for the Army.

The Navy CFDB accounts for only peacetime requirements with authorizations in deployable units. Wartime mobilization requirements are designated as "augmentation" requirements and sourced from non-deployable units. Because the Navy CFDB did not identify which specialty billets would meet, these augmentation-source units were excluded from the "tooth" component of the tooth-to-tail ratios. This results in lower estimated deployable requirements. The Air Force CFDB accounts for only

As seen in Table 12 and Table 13, the Air Force CORR for 2013 and the Navy CFDB for 2011 display the same discrepancies between tail-to-tooth ratios among specialties found in the Army's 2011 TAA. Like the Army, 32 Navy and 14 Air Force specialties lack a deployable unit requirement. As such, the 918 (Navy) and 234 (Air Force) required billets for these specialties come entirely from non-deployable or non-operational (for the Air Force) requirements.[10] The Navy and Air Force also tend to show high tail-to-tooth ratios for beneficiary care specialties and low ratios for operational specialties.

peacetime units but assigns a Unit Type Code (UTC) for each billet, which identifies whether the billet maps to deployable or non-deployable units during wartime. This obscures the identification of deployable units and their rotation bases and has the effect of lowering deployable requirement estimates, especially when compared with the "operational" requirements from the Air Force's 2013 CORR. Because of the divergence between the official "operational" requirement from the 2013 CORR and the derived deployable requirement from the CFDB, this report only uses the 2013 CORR when constructing tail-to-tooth ratios for the Air Force.

For these reasons, IDA avoided comparisons in deployable unit requirements between the Army, Navy, and Air Force and focused only on variation in unit requirements across specialties within a Service.

[10] Subject to the definition of "deployable" units found in the previous footnote.

Table 12. Air Force CORR Medical Corps Specialty Requirements and Tail-to-Tooth Ratios

Medical Specialty	Total Requirement	Operational Requirement	Tail-to-Tooth Ratio
CARDIOLOGY	31	0	N/A
PATHOLOGY	57	2	28.5
EXECUTIVE MEDICINE	94	5	18.8
DERMATOLOGY	33	3	11.0
PSYCHIATRY	122	17	7.2
OPHTHALMOLOGY	50	10	5.0
PREVENTIVE MEDICINE	35	7	5.0
PEDIATRICS, GENERAL	234	62	3.8
RADIOLOGY, DIAGNOSTIC	111	30	3.7
OTORHINOLARYNGOLOGY	36	11	3.3
FAMILY PRACTICE	531	191	2.8
AVIATION/AEROSPACE MEDICINE, RESIDENCY TRAINED AEROSPACE	192	71	2.7
OBSTETRICS/GYNECOLOGY	124	48	2.6
INTERNAL MEDICINE	234	96	2.4
AVIATION/AEROSPACE MEDICINE, RESIDENCY TRAINEDOTHER THAN AEROSPACE	436	179	2.4
EMERGENCY MEDICINE	149	66	2.3
GENERAL SURGERY	243	117	2.1
ANESTHESIOLOGY	111	58	1.9
AVIATION/AEROSPACE MEDICINE, NON-RESIDENCY TRAINED	202	112	1.8
ORTHOPEDIC SURGERY	98	56	1.8
CRITICAL CARE/TRAUMA, MEDICINE	105	75	1.4
CARDIOLOGY	31	0	N/A

Source: CORR for 2013.

Operational Requirement is the sum of requirements for Expeditionary Force Packages (EFP), Global Health (GH) forces, and Commitments in Place. Excludes Medical Corps specialties with total requirements of less than 30 billets.

Table 13. Navy CFDB Medical Corps Specialty Requirements and Tail-to-Tooth Ratios

Medical Corps	Total Requirement	Deployable Requirement	Tail-to-Tooth Ratio
CARDIOLOGY	30	0	N/A
DERMATOLOGY	32	0	N/A
INFECTIOUS DISEASE	31	0	N/A
OBSTETRICS/GYNECOLOGY	101	0	N/A
OPTHALMOLOGY	40	0	N/A
ORTHOPEDIC SURGERY	118	0	N/A
OTORHINOLARYNGOLOGY	43	0	N/A
PATHOLOGY	59	0	N/A
PEDIATRICS	120	0	N/A
RADIOLOGY, DIAGNOSTIC	87	0	N/A
INTERNAL MEDICINE	74	2	36.0
ANESTHESIOLOGY	125	4	30.2
PREVENTATIVE/OCC MEDICINE	92	7	12.1
PSYCHIATRY	110	11	9.0
EMERGENCY MEDICINE	136	21	5.5
FAMILY PRACTICE	374	65	4.7
UNDERSEA MEDICINE	105	22	3.8
GENERAL SURGERY	119	28	3.2
AVIATION/AEROSPACE MEDICINE	306	152	1.0
GENERAL MEDICINE	158	128	0.2

Source: Current Forces Database for 2011.

Tail to tooth ratios calculated with adjustment for substitution for deployable requirements without authorizations. Excludes Medical Corps specialties with total requirements of less than 30 billets. Excludes Deployable Augmentation requirements.

These discrepancies add additional concerns to the Service sizing model estimates of requirements. The divergence in tail-to-tooth ratios for comparably skilled specialties raises questions about the consistency of the overhead requirements determination. A portion of these divergences can be explained by substitutions across specialties, e.g., a requirement for a general medicine physician or a general surgeon may be met by a specialist. But the divergences in tail-to-tooth ratios are far larger than can be explained by substitutions, e.g., the requirement for over 540 physicians in the Army with no deployable requirement is more than any substitution requirement that can be identified in the Army TAA data.

2. Deployment History

Although the unit manning documents provided some insights into the degree to which non-deployable "tails" make up a specialty's total requirement, the data in the

CFDB (and similar TAA and CORR data) have limitations. As already discussed, each manning document and Service estimate considers deployability in a different manner, reducing the value of comparisons across Services. Furthermore, the manning documents represent point estimates of medical requirements that may not be representative of the experience of medical personnel during OEF/OIF or their deployment expectations in future years. Assignment to an OCONUS MTF in 2011, for example, did not preclude a general surgeon from deploying multiple times over the past decade. Finally, because we only had manning documents for medical units and billets, comparisons between the medical and non-medical communities were not possible.

To address these concerns, we also analyzed individual military deployment data. Deployments provide a common measure of demand for military manpower across Services, occupational groups, medical specialties, and time. Because wartime assignments are recognized as military essential and are the core function of the military force, deployment rates inform the assessment of how well the military forces meet the criteria of DoDI 1100.22. The more frequently an individual, specialty, or occupational group deploys, the greater its need to be staffed with military (rather than civilian) personnel. The less frequently specialists or specialties deploy, the greater the opportunity for developing a lower-cost force mix of military, civilian, and contractor personnel.

As indicated in Chapter 2, Section A, we obtained data on individual deployments from the DMDC CTS. The data includes all deployments in support of named contingencies (OEF/OIF/Operation New Dawn) from 2001 to 2012 for both medical and non-medical personnel. Deployments other than to named contingencies, as well as Navy ship deployments not in support of OEF/OIF, are not included in the CTS.

In evaluating deployments by occupational corps and specialty, IDA researchers replicated commonly-used deployment measures from prior studies. These measures include the number of years in which an individual experiences at least one day of deployment, the number of deployments an individual experiences, and the average length of individual deployments. In analyzing these measures, the higher the number of years, number of deployments, or length of deployment per individual, the greater is the revealed demand for military personnel to deliver operational medicine capabilities. The CTS also identifies the country to which an individual deploys. Medical deployments to hostile areas satisfy military essentiality criteria, while deployments to MTFs outside the combat theater (e.g., Landstuhl, Germany) may more closely represent non-military essential OCONUS MTF assignments.

Figure 2 through Figure 4 provide a sample of the deployment rates for a representative range of medical corps. Figure 2 displays the Army medical corps, Figure 3 displays the Navy nursing corps, and Figure 4 displays the Air Force enlisted personnel. The size of the data points represents the size of the specialty, and the dashed

lines provide Service-average deployment rates (medical and non-medical personnel combined) and the Service average for medical personnel only (all corps, officer and enlisted).

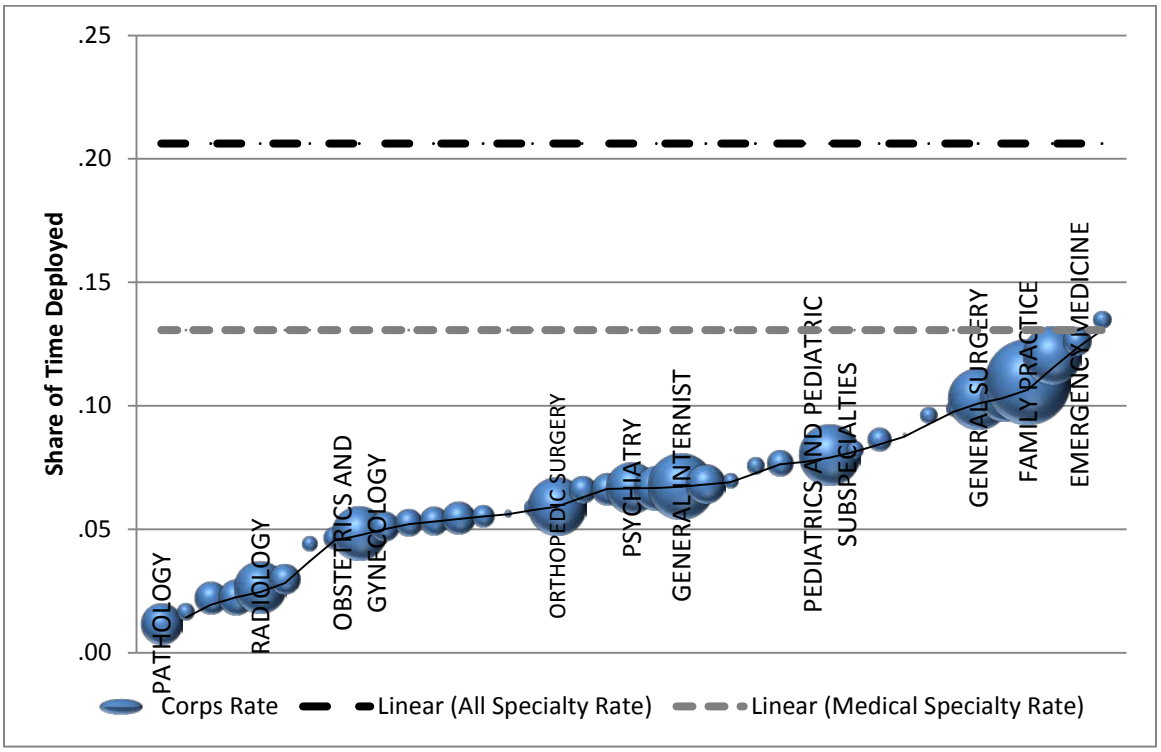

Figure 2. Army Medical Corps Distribution of Share of Time Deployed by Specialty

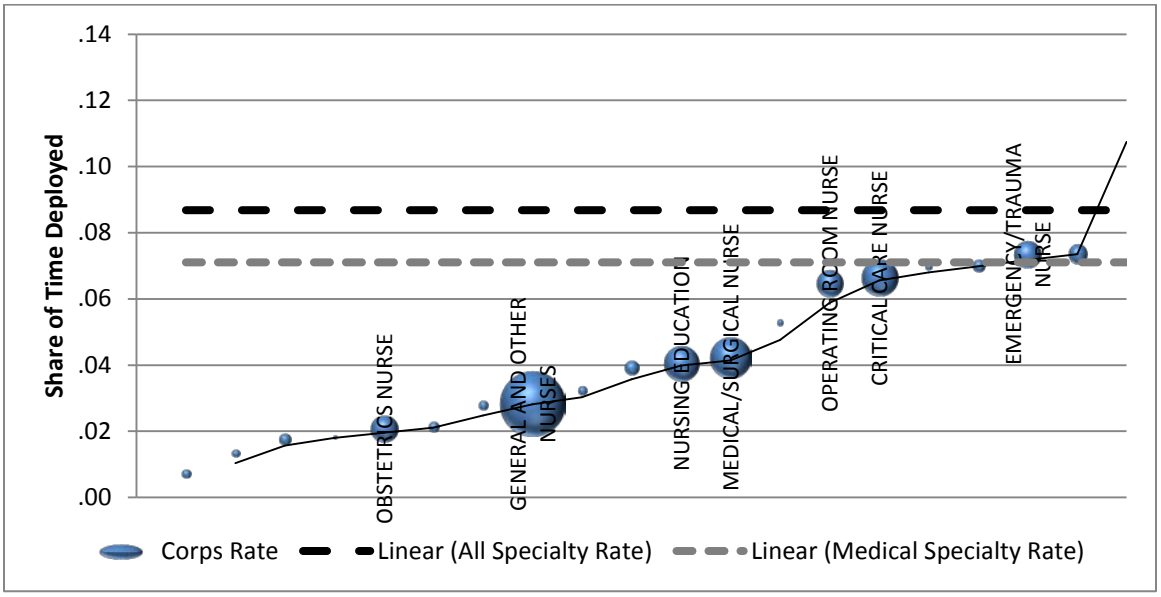

Figure 3. Navy Nurse Corps Distribution of Share of Time Deployed by Specialty

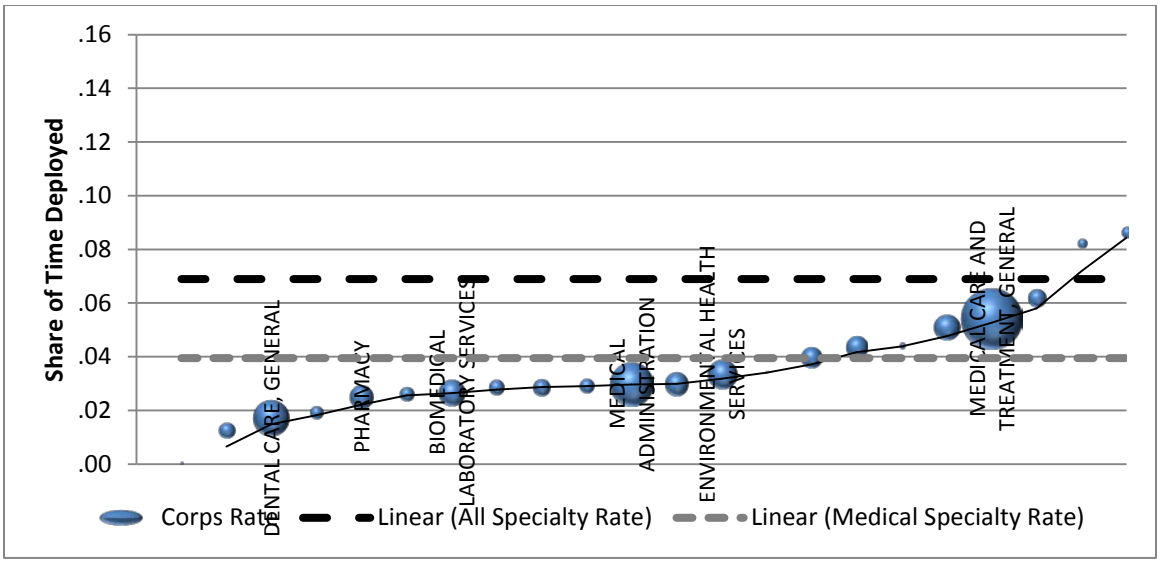

Figure 4. Air Force Enlisted Medical Corps Distribution of Share of Time Deployed by Specialty

One observation from these figures is that the dispersion of deployment rates within a corps is smaller than the dispersion of the tail-to-tooth ratio. This provides evidence that some substitution is occurring in the staffing of deployable requirements, but significant dispersion still remains. For Army physicians (Figure 2), the higher deploying specialties have deployment rates five to 10 times higher than low deploying specialties. Significant variations in the use of specialties remain, and there is added concern about the consistency of overhead requirements determination from the Service sizing models.

A second observation is that medical personnel deploy at lower rates than non-medical personnel. For example, nearly every nurse specialty included in Figure 3 had a lower deployment rate than the average Navy-wide deployment rate for medical and non-medical personnel. Yet the Navy sizing model estimate showed an increase in nurse requirements of 559 between 2004 and 2012. To further examine this issue, we compared deployment rates between medical and non-medical personnel by organizing military specialties into occupational groups based on their six-digit DoD Occupation Codes. Table 14 lists the occupational groups used and their corresponding DoD Occupation Codes. Figure 5 through Figure 7 provide these "corps"-level deployment rates for the Army, Navy, and Air Force, highlighting the five medical corps (with boxes around their names) for comparison with the remaining non-medical groups. (Note that the names of most of the occupational groups are truncated on the figures.)

Table 14. Occupational Groups and DoD Occupation Codes

Occupational Group	Grade	DoD Occupation Code
Infantry, Gun Crews, and Seamanship Specialists	Enlisted	100000
Electronic Equipment Repairers	Enlisted	110000
Communications & Intelligence Specialists	Enlisted	120000
Medical Enlisted	Enlisted	130000
Other Technical & Allied Specialists	Enlisted	140000
Functional Support & Administration	Enlisted	150000
Electrical/Mechanical Equipment Repairers	Enlisted	160000
Craftsmen	Enlisted	170000
Service & Supply Handlers	Enlisted	180000
General Officers & Executives	Officer	210000
Tactical Operations Officers	Officer	220000
Intelligence Officers	Officer	230000
Engineering & Maintenance Officers	Officer	240000
Scientists & Professionals	Officer	250000
Medical	Officer	260100
Dental	Officer	260300
Nursing	Officer	260500
Medical Service	Officer	260700
Administrators	Officer	270000
Supply, Procurement, and Allied Officers	Officer	280000

Figure 5. Army Share of Time Deployed by Occupational Group

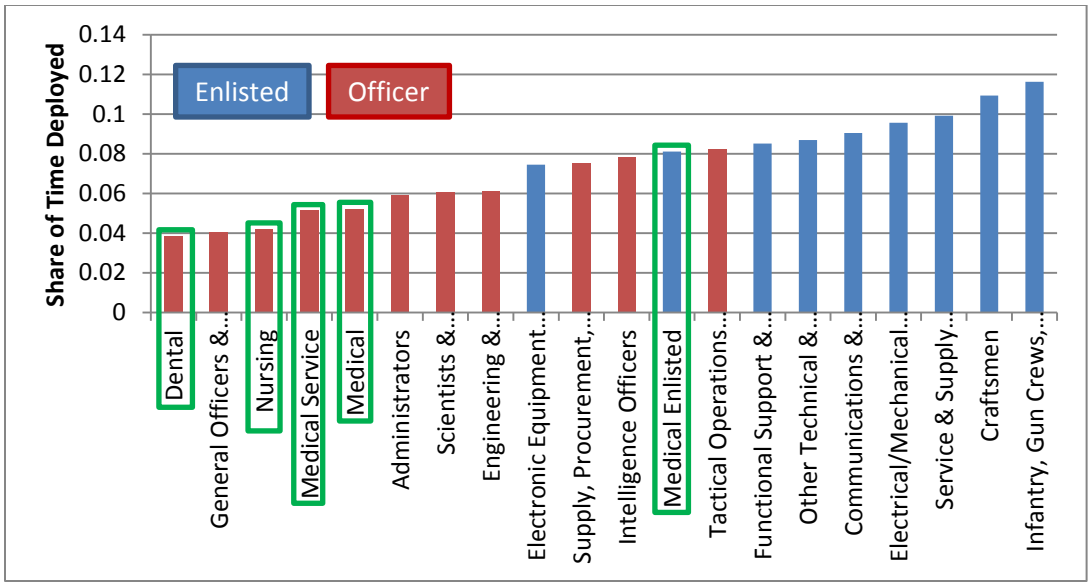

Figure 6. Navy Share of Time Deployed by Occupational Group

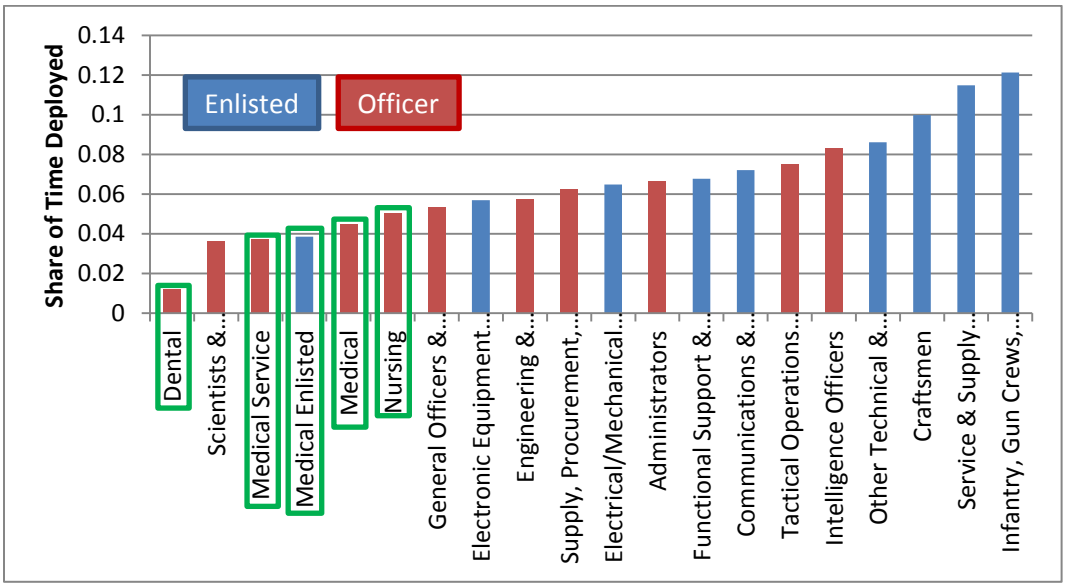

Figure 7. Air Force Share of Time Deployed by Occupational Group

When ranking medical and non-medical groups by average deployment rate, medical occupation groups are consistently among the lowest-deploying occupations in the entire military. By all measures of deployment rate that we examined,[11] this trend holds across all Services and in the Active, Reserve, and Guard Components. The Services' medical departments provided a number of explanations for low deployment rates among military medical personnel, including the need to maintain clinical skills. Clinical skill maintenance may explain a somewhat lower deployment rate for highly specialized physicians, but the explanation is less powerful for nursing, medical service, and enlisted corps. Each of these corps consistently deploys less than comparable occupational groups and often less than physicians themselves. The case of dentists, which stands as the lowest-ranked occupational group in all three Services (most prominently in the Air Force), is also difficult to explain through a need to maintain clinical skills.

The presence of non-deployable and potentially non-military essential components within the military medical requirements and end strength offers another possible cause of depressed levels of medical deployments. As discussed earlier, OCONUS, ICONUS, GME, and GDE constitute substantial elements of military medical requirements and manpower authorizations that are generally ineligible for deployment. The extent to which these and other non-deploying elements of the medical force must be filled by uniformed medical personnel constrains end strength available for deployable non-medical personnel, and, in some instances, Defense Officer Personnel Management Act (DOPMA) control-grade officers.[12]

These sustained low medical deployment rates over a decade of war raise additional questions about the Service-generated estimates of medical requirements. A conclusion from this analysis is that the Service sizing model estimates may not be sufficiently reliable for use in programmatic decision making at this point in time.

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[11] Measures include number of deployments, number of years with at least one day deployed, share of time deployed. Figure 5 through Figure 7 display the share of time deployed for the Active Component. Additional charts of other measures and Guard and Reserve deployments may be found in Appendix C.

[12] Physicians and dentists are exempted from DOPMA constraints, but high-ranking nurses and medical service corps officers can occupy control-grade billets (10 U.S.C. Sec. 523).

E. Conclusions

The IDA team found the following results:

- Medical personnel constitute a substantial portion of total military end strength, particularly at higher ranks.[13]
  - The approximately 120,000 active duty medical personnel in Fiscal Year 2011 constituted about 8 percent of total active duty end strength.
  - The approximately 38,000 active duty medical officers in FY 2011 constituted about 18 percent of the total active duty officer end strength.
  - The approximately 3,000 active duty medical O-6 personnel constituted about 25 percent of all active duty O-6 end strength.
- Lessons from OEF/OIF have prompted a shift toward a smaller medical footprint in operational theaters with more specialized capability.
  - This reduces total medical requirements, but may increase requirements for selected specialties.
  - Comparisons of Army and Air Force requirements estimates from 2004 and 2011 reflect this; Navy estimates do not.
- The active duty military medical force still understaffs operationally required specialties compared to stated requirements, but the level of this under-execution has fallen between 2004 and 2011 for the Air Force and, likely, for the Army.
- The active duty military medical force still overstaffs beneficiary care specialties and this overstaffing has increased in some areas between 2004 and 2011.
- The total active duty medical force generally exceeds the Service-identified military essential requirement.
- Service medical department estimates of requirements significantly exceed historic deployment levels and staffing requirements for deployable units.
  - Many medical specialties have no deployable requirement, yet are reported to have large total requirements.
  - Medical specialties deploy less than non-medical specialties and are generally the lowest deploying set of specialties within DoD.

[13] Military medical end strength values are from the FY 2011 HMPDS report produced by DMDC. Total active duty end strength values are from Military Personnel Statistics reports produced by DMDC.

- Military medical departments differ in the rigor and discipline of their estimates of requirements.
  - Some have incorporated the lessons learned from OEF/OIF; some contradict those lessons.
  - Some are removing non-military essential categories from requirements estimates; some are not.
  - Some have active Service line involvement in their requirements determination; some do not.
- Service sizing model estimates may not be sufficiently reliable for use in programmatic decision making at this point in time.

3. Understaffing of Operationally Required Specialties

The Service medical departments have historically understaffed operationally required specialties such as surgeons and anesthesiologists—as measured by Service-reported requirements estimates. Chapter 2 examined the current level of this understaffing and found that it has improved significantly for the Air Force, has likely improved for the Army, and has gotten worse for the Navy (using the requirement estimate provided by the Navy). Given the general improvement (and that the one example of worsening is driven by an outlier requirement estimate), this issue was de-emphasized during task execution and the IDA researchers spent less time examining this force mix challenge. This chapter reviews the analysis we did perform and provides recommendations for how this historic under-execution may be reduced even further.

A. Causes

The IDA team interviewed multiple Service and OSD officials to ask about the causes of the historic understaffing of operationally required specialties. Two primary reasons were provided by Service officials in these interviews:

- **Insufficient beneficiary care workload**. In the dual-mission framework, operational force requirements are maintained during peacetime using the beneficiary care mission. But beneficiary care clinical workload is different from operational mission clinical workload and does not require the same medical specialties. The MTF system does not provide enough workload to fully employ and maintain the clinical skills of some operationally required specialties.
- **Inability to recruit and retain**. Highly skilled trauma specialists may be difficult to recruit and retain in the peacetime military with little relevant workload for them in the MTF system.

Some interview participants argued, however, that these are actually only proximate causes, and not root causes, of the problem. These individuals pointed out that it has historically been OSD that was most concerned about this failure to meet requirements (and was exerting pressure to resolve the problem) while the Services allowed the understaffing to continue. These officials believed that this calls into question the validity of the requirement, i.e., if the Services believed these were true requirements, they would be figuring out ways to meet them. Stating this more bluntly, these officials asked “if the

requirement hasn't been met for 20 years, is it really a requirement?" As seen in Chapter 2, analysis of unit manning and deployment data supports this argument.

The IDA team did not further analyze these different views or try to differentiate between them. We were not tasked to develop an independent estimate of requirements and, during the execution of the report, the challenge of understaffing was de-emphasized because it has been improving. But we were tasked with analyzing the consequences of understaffing and developing recommendations for its improvement. This report does, therefore, consider all three potential causes (insufficient workload, recruitment and retention challenges, and identification of true requirements) in its recommendations.

B. Consequences

The primary consequence of failing to staff an operational requirement is the inability to accomplish the wartime mission. In the most extreme case, this would mean not being able to fully staff combat hospitals and organic operational medical support. In less extreme cases, this would mean that understaffed operationally required specialties would experience more repeated deployments and be subjected to force stress. We examined both of these potential consequences.

To examine the risk of not being able to fully staff all operational platforms in a total war situation, the IDA researchers used the unit manning requirements data from the CFDB. The CFDB provides the required, authorized, and on-hand billet structure for all units—both deployable and non-deployable—in each of the Services' inventories. The full wartime requirement is to staff all deployable units, so comparing the total deployable unit requirement from the CFDB to specialty end strength measures whether a Service is able to fully staff its operational units.

Table 15 through Table 17 provide this comparison for active duty physicians by specialty. The tables highlight in bold the four specialties for which end strength is insufficient to fully staff all deployable units (General Medicine, Executive Medicine, Critical Care/Trauma Medicine, and Aviation/Aerospace Medicine), all of which exist in the Army. These three specialties are three of the most general specialties with a wide range of substitution possibilities, particularly cross-Service. Thus, the conclusion is that the Services are generally able to staff their full deployable requirements, even though they are understaffing their analytically derived total requirement for some specialties.

Table 15. Army Deployable Unit Requirement and End Strength

Army Medical Corps	CFDB Deployable Requirement	2011 End Strength
GENERAL MEDICINE	**378**	**126**
AVIATION/AEROSPACE MEDICINE	**123**	**38**
GENERAL SURGERY	99	168
EXECUTIVE MEDICINE	**43**	**0**
EMERGENCY MEDICINE	38	199
PSYCHIATRY	37	129
ORTHOPEDIC SURGERY	35	146
FAMILY PRACTICE	30	413
PREVENTATIVE/OCC MEDICINE	23	110
INTERNAL MEDICINE	21	159
OBSTETRICS/GYNECOLOGY	20	157
ANESTHESIOLOGY	19	110
RADIOLOGY	9	149
UROLOGY	9	39
NEUROLOGICAL SURGERY	6	8
OPHTHALMOLOGY	6	71
INFECTIOUS DISEASE	3	58
OTORHINOLARYNGOLOGY	3	51
PATHOLOGY	2	92
PEDIATRICS	1	232

Source: CFDB for 2011.

Excludes Medical Corps specialties with total requirements of less than 30 billets.

Table 16. Air Force Deployable Unit Requirement and End Strength

Air Force Medical Specialty	CORR Operational Requirement	2011 End Strength
AVIATION/AEROSPACE MEDICINE	**362**	**348**
FAMILY PRACTICE	191	481
GENERAL SURGERY	117	173
INTERNAL MEDICINE	96	143
CRITICAL CARE/TRAUMA	**75**	**3**
EMERGENCY MEDICINE	66	135
PEDIATRICS, GENERAL	62	241
ANESTHESIOLOGY	58	100
ORTHOPEDIC SURGERY	56	105
OBSTETRICS/GYNECOLOGY	48	96
RADIOLOGY, DIAGNOSTIC	30	117
PSYCHIATRY	17	98
OTORHINOLARYNGOLOGY	11	41
OPHTHALMOLOGY	10	40
PREVENTIVE MEDICINE	7	23
EXECUTIVE MEDICINE	**5**	**0**
DERMATOLOGY	3	29
PATHOLOGY	2	64

Source: CORR for 2013, HMPDS for 2011.

Excludes Medical Corps specialties with total requirements of less than 30 billets. General Surgery also includes end strength for surgical subspecialties which are not separately reported in CORR

Table 17. Navy Deployable Unit Requirement and End Strength

Navy Medical Specialty	CFDB Deployable Requirement	2011 End Strength
AVIATION/AEROSPACE MEDICINE	**152**	**257**
GENERAL MEDICINE	**128**	**258**
FAMILY PRACTICE	65	365
GENERAL SURGERY	28	110
UNDERSEA MEDICINE	22	86
EMERGENCY MEDICINE	21	161
PSYCHIATRY	11	100
PREVENTATIVE & OCC MEDICINE	7	84
ANESTHESIOLOGY	4	165
INTERNAL MEDICINE	2	121

Source: CFDB for 2011, HMPDS for 2011.

Excludes Medical Corps specialties with total requirements of less than 30 billets. Excludes Deployable Augmentation billets.

To examine whether understaffing of operationally required specialties leads to force stress, IDA researchers used the CTS data to examine deployment rates for these specialties and compare them to other high deploying specialties.

Over the past eleven years, the medical community has been less likely to experience high deployment rates or repeat deployments than non-medical personnel. Figure 8 through Figure 10 provide the rates of no deployment, deploying once, deploying twice, and deploying three or more times between 2001 and 2012 for each Service and category of personnel. About 55-65 percent of medical personnel have never deployed, whereas the rate for non-medical personnel is generally well below 50 percent. Repeat deployments, a measure of force stress, are also significantly less common among the medical than non-medical communities. Adjusting for individual years of service does not change the results.

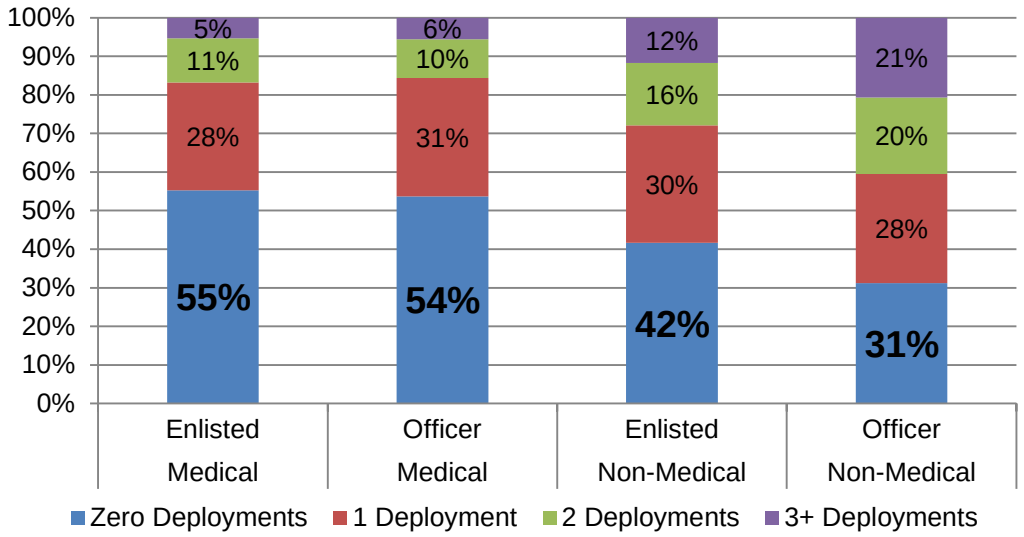

Figure 8. Army Individual Deployment Frequency 2001–2012

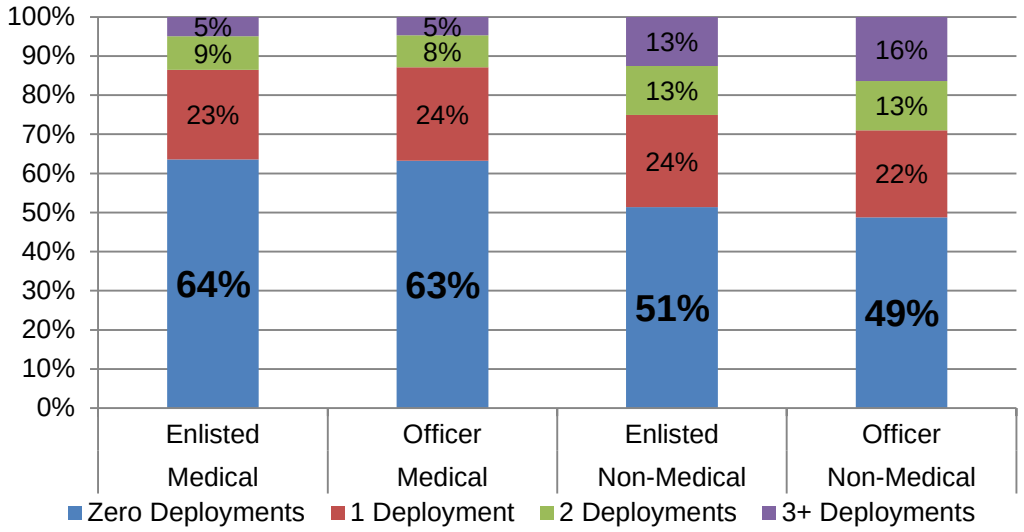

Figure 9. Air Force Individual Deployment Frequency 2001–2012

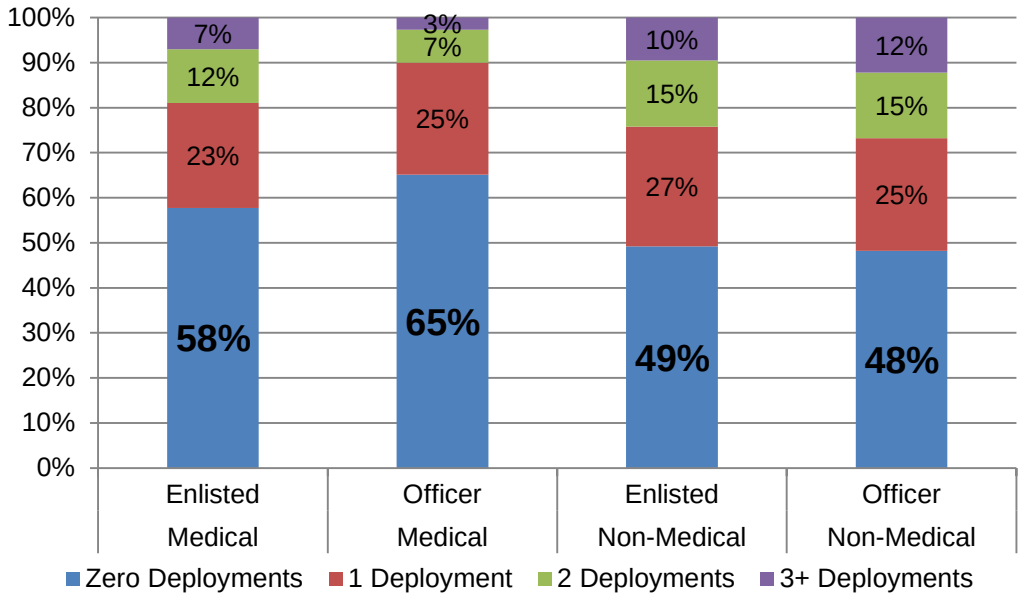

Figure 10. Navy Individual Deployment Frequency 2001–2012

The trend of low medical deployment rates holds both for medical corps (see Appendix A) and individual specialties. Although misalignment of end strength with operational requirements has the potential to produce wide differences in force stress between low-deploying beneficiary care-oriented specialties (like obstetrics and pediatrics) and highly-utilized operationally-demanded specialties (like surgeons and anesthesiologists), deployment rates for even the most highly utilized operational specialties tend to be lower than that of high-deploying non-medical specialties in other occupational groups.

Figure 11 through Figure 13 illustrate this point using histograms. The histograms measure the number of specialties within a particular deployment rate range. The histograms for medical specialties and for non-medical specialties are provided separately with color coding.[14] As can be seen, even though certain medical specialties deploy more frequently than others, there does not appear to be disproportionately high deployment stress on the medical corps than on other military occupational groups.

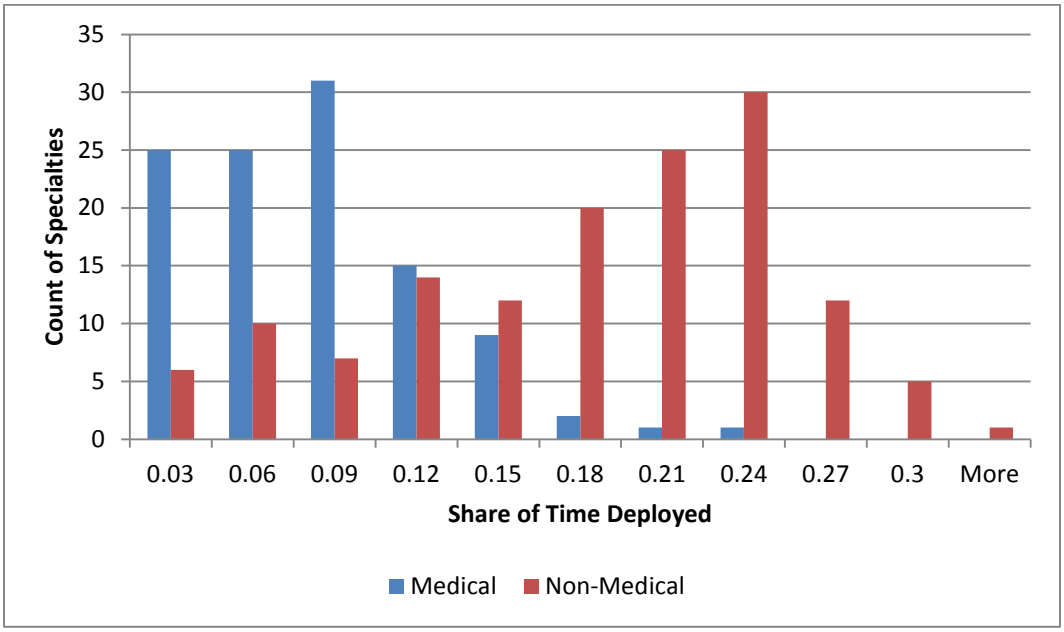

Figure 11. Specialty Count of Army Share of Time Deployed

[14] The medical corps have a greater proportion of officer occupations (as opposed to enlisted occupations) than the non-medical force. Furthermore, officers tend to deploy less frequently. Restricting the histogram specialty comparison to officers or enlisted specialties does not eliminate this divergence between medical and non-medical specialties.

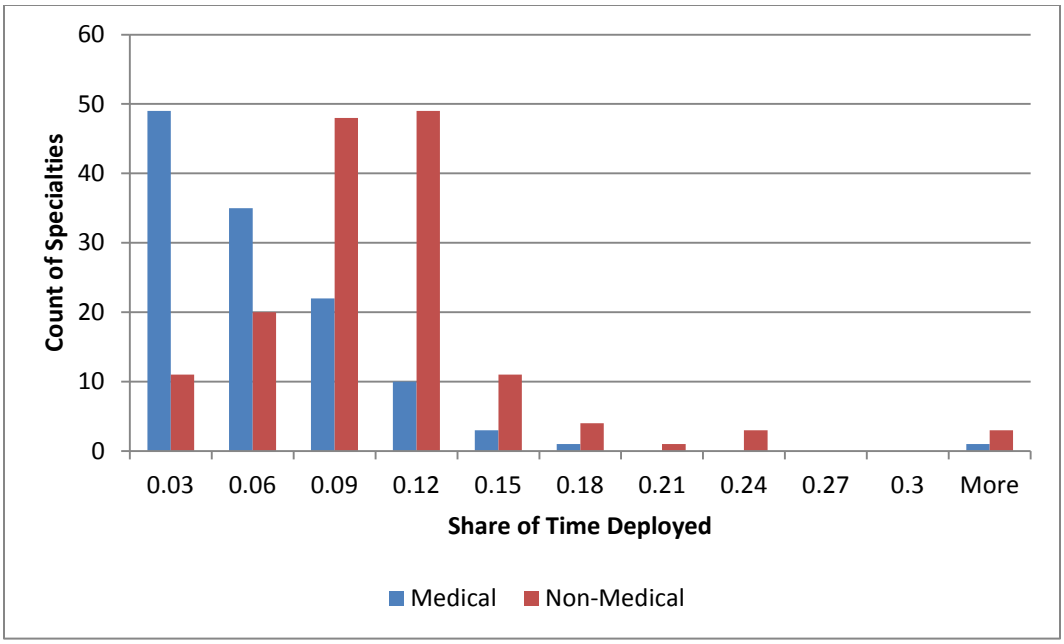

Figure 12. Specialty Count of Navy Share of Time Deployed

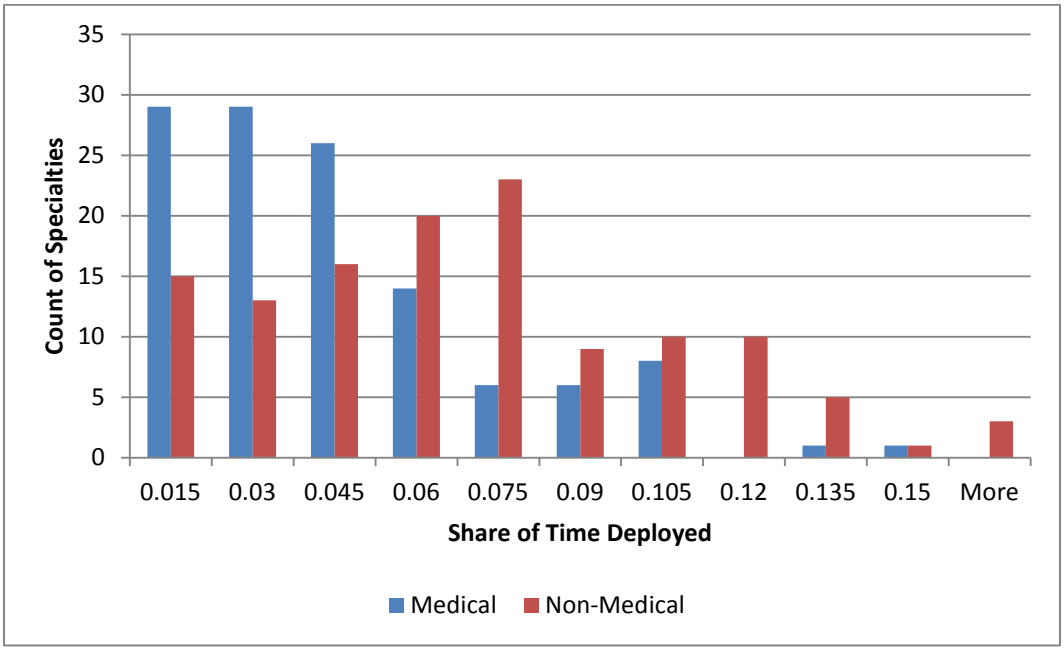

Figure 13. Specialty Count of Air Force Share of Time Deployed

There may be valid reasons why a one-to-one comparison between medical and non-medical deployments is less than optimal. First, for highly trained specialists, deployments may provide insufficient medical workload to maintain clinical skill

proficiency.[15] Without adequate deployment workloads, specialists require longer dwell times to maintain clinical skills. Proficiency rotations may explain lower deployment rates within a readiness context.

Second, deployment experiences and expectations may have a negative impact on retention and accession of skilled medical personnel. Especially among the Reserve and Guard Components, deployments may disrupt private medical or dental practices or interfere with continuity of high-quality care for patients. Results showing positive or neutral retention effects from deployments from 1987 to 1998 on medical officers from a 2002 RAND study dispute this hypothesis.[16] An extension of the present analysis would be to empirically examine the impacts of these deployment rates on retention, but this was beyond the scope of the current report.

In conclusion, it does not appear that there are substantial cases where operational platforms cannot be staffed and the medical community experienced lower deployment rates during OEF/OIF than most other communities, providing evidence of low levels of medical force stress. Ten years of war have provided essentially no evidence of a shortage of deployable medical personnel in any specialty.

C. Recommendations

It does not appear that there are serious risks driven by the understaffing of currently stated operational requirements for medical specialties. Also, as stated in Chapter 2, the Services have begun to significantly diverge in their application of the sizing model methodology that arose from the 733 Update Study. The Army process is tightly engrained in Army line requirements determination and the Air Force has been rigorously screening for military essentiality. The Navy has generated a large increase in its stated requirement for military medical personnel.

Because of uncertainty about the validity of currently stated requirements in specialties that appear to be understaffed, we recommend that USD(P&R), working with the Director of CAPE, direct the Assistant Secretary of Defense for Health Affairs

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[15] Robert A. Levy, Shing-Lai Cheng, and Patricia Netzer, "Attracting, Deploying, and Keeping Navy General Surgeons and Other Critical Wartime Specialists" (Alexandria, VA: CNA, 2011).

[16] Ronald D. Fricker, "The Effects of Perstempo on Officer Retention in the U.S. Military" (Santa Monica, CA: RAND Corporation, 2002). Enlisted personnel experienced similarly positive effects of deployment on reenlistment during the time period. See James Hosek and Mark Totten, "Serving Away from Home: How Deployments Influence Reenlistment" (Santa Monica, CA: RAND Corporation, 2002). Other studies have indicated that any positive effect of deployment, at least for enlisted personnel, has been eroded or reversed for deployments during OEF/OIF. See James Hosek and Francisco Martorell, "Have Deployments During the War on Terrorism Affected Reenlistment?" (Santa Monica, CA: RAND Corporation, 2009).

(ASD(HA)) to lead a systematic evaluation with the Services to reform medical force requirements determination for use in the FY 2016–20 Program Review.

As noted above, such an analytic exercise has been conducted at least three times in the last 20 or so years (the Section 733 Study, the 733 Update, and the MRR) and, although they all found similar results, they were largely unsuccessful in focusing the military force on the operational medical mission. To prevent a repeat of these earlier experiences, we recommend some specific criteria and areas of emphasis in this review:

1. USD(P&R) ensure strict adherence to DoD policies (e.g., on military essentiality). Perceived requirements for military personnel that are not consistent with DoD policy should not be allowed to be added in the analysis.
2. USD(P&R) should ensure Service line involvement. The Service medical communities should not be placed in charge of setting their own requirements. In addition, the review should include development of mechanisms to ensure Service line leadership accountability for failure to meet operational requirements. If the Service lines agree that something is a requirement in the review, they should be held accountable for funding and staffing to that requirement.
3. The review should ensure that changes in warfighting (e.g., less care provided in theater and smaller medical footprints) and changes in medicine (e.g., greater specialization and reduced ability to substitute among physicians of different specialties) are incorporated. The review should also ensure the results are consistent with actual data, e.g., the lowest deploying communities during war would be expected to have decreasing requirements and not increasing requirements.

For true requirements, the Services should staff the medical force to meet them. If there is insufficient workload in the beneficiary care mission to support the clinical skills of these personnel, then alternative methods of clinical skill maintenance should be developed. To deal with this challenge, we recommend the following:

- USD(P&R) direct ASD(HA), working with the Services and Assistant Secretary of Defense for Reserve Affairs (ASD(RA)), to lead a review of AC/RC balance in the medical force and the development of programmatic options for transfer of medical force requirements to the RC for consideration in the FY 2016–20 Program Review.
- USD(P&R) direct ASD(HA), working with the Services, to develop and implement a pilot project placing active duty medical personnel required for the operational mission for whom there is insufficient clinical workload in DoD MTFs in civilian and/or VA facilities, for execution in 2014.

Finally, with respect to challenges in recruiting and retaining operationally required specialties, we note the implementation of the Critically Short Wartime Specialties Accession Bonus program. In the policy memorandum dated November 29, 2010, implementing this program, an accession bonus of $180,000 to $400,000 is described for specialties ranging from anesthesia to pediatrics (along with four dental specialties). Given this relatively new program and the lack of identified force stress within the medical force, the IDA team did not develop a separate recommendation for recruitment and retention challenges but does recommend that OUSD(P&R) monitor the implementation of the new bonus to evaluate its effect on understaffing of required medical personnel.

4. Overstaffing of Beneficiary Care Specialties

The Service medical departments have historically overstaffed specialties used more extensively in the beneficiary care mission. Chapter 2 examined the current level of this overstaffing and found that it generally persists and has gotten worse in some areas. There are actually two kinds of overstaffing. First, measured overstaffing occurs when executed end strength exceeds identified requirements. Second, overstaffing occurs when stated requirements exceed the true requirement for military-personnel, as when wartime demands for deployed personnel in a specialty are less than implied by the requirements determination process. Chapter 2 provided evidence for both types of overstaffing. This chapter introduces the causes of overstaffing and Chapters 5 and 6 discuss these causes further.

A. Causes

The IDA team interviewed multiple Service and OSD officials to ask about the causes of the historic overstaffing of beneficiary care specialties. Two primary reasons were provided by DoD officials in these interviews:

- **Lack of Exposure to Full Cost of Personnel**. The costs of military personnel are distributed across the DoD budget, the budgets of other agencies, and time. Local and Service-level decision makers do not experience the full cost of military personnel. The costs of civilian and contractor personnel are much less distributed, however, and local and Service-level decision makers do experience most of the cost of these performance options. This skews decision making in favor of military personnel.
- **Legal, Policy, and Other Constraints**. A series of legislative and policy constraints placed on the medical community limits its ability to efficiently manage force mix. The most obvious example is the statutory prohibition on medical military-to-civilian conversions. In addition, recruitment and hiring are handled very differently for military and civilian personnel. Military recruitment is generally centralized and has significant resources and infrastructure supporting it. Civilian hiring is generally left to local hiring authorities with few resources and little support.

These causes are examined in detail in the following two chapters. Chapter 5 provides a detailed estimation of the costs of military and civilian personnel and examines the effect of cost exposure on decision incentives. Legal, policy, and other

constraints are examined in detail in Chapter 6. The remainder of this chapter discusses why these issues are important and how they affect force mix.

B. Incentives

When a decision maker is only exposed to part of the cost for one option and almost the full cost for the alternative options, it can have a significant effect on the choice made. In this case, when a personnel manager views military personnel as free or only costing a portion of their full cost and has to pay nearly the full cost for civilians and contractors, it can skew the decision towards military personnel. Understanding this incentive issue was an important motivation of the sponsor in directing this task and is explored in detail in the next chapter.

The earlier OSD studies described in previous chapters (Section 733 Study, 733 Update Study, and MRR) generally found force mix inefficiencies and led to contentious debates within DoD on how to resolve them; OSD attempted to direct more efficient force mix decisions and the Services resisted. After 20 years, many of the force mix imbalances remain in place.

Given the skewed incentives facing local and Service decision makers over force mix, the decisions they are making (e.g., using military personnel for commercial activities) may be rational from their perspective. Even though they are inefficient from the perspective of the Secretary and the taxpayer, the responsible decision maker may be making the most "efficient" decision given the prices he or she believes are valid.[17] This could explain why progress has been so hard to make, from OSD's perspective—the Services perceived OSD's directions as *decreasing* efficiency. When the legal, policy, and other impediments to improving force mix discussed in Chapter 6 are added to these skewed incentives, one can understand why such large force mix inefficiencies can persist for extended periods of time.

In directing this analysis, the sponsor was aware of this history and wanted to try an alternative approach that might be more likely to succeed. The sponsor directed the IDA researchers not to focus on developing recommendations on specific force mix outcomes but instead to focus on analyzing the incentives for and constraints on efficient force mix decision making and develop recommendations that would lead to more efficient decisions by the local and Service-level decision makers themselves. This is the approach taken in Chapters 5 and 6.

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[17] This would be similar to an externality in economics; private marginal cost diverges from social marginal cost causing an inefficient decision.

C. The Trade Space Faced by Decision Makers

Getting price signals set at the proper level and removing direct impediments to efficient decision making are necessary conditions for improvement, but they are not sufficient—decision makers must also have the authority to actually make force mix decisions. In MTFs today, the local commander generally does have some authority to make hiring decisions for civilian and contractor personnel, but generally receives an authorization for military personnel from headquarters. The commanders generally are not able to directly make trade-off decisions between military and civilian/contractor performance of MTF activities.

This is a challenge seen across DoD in areas beyond the medical force. It may be most apparent in DoD offices outside of the Military Departments, e.g., Combatant Commands, Joint Staff, OSD, and Agencies and Field Activities. Achieving an efficient total force mix for these organizations is challenging when some performance types are administratively allocated to them and others are purchased directly from their operating budgets. Giving these organizations a more direct trade space in this regard would aid in improving force mix.

D. Recommendations

Exposing decision makers to accurate prices will only improve decisions if the decision maker has the authority to decide over the full trade space of performance options for force mix decisions. In most arrangements outside of the military departments, e.g., medical personnel assigned to the DHP, and in some relationships within military departments, decision makers are assigned authorizations for military personnel in a separate process from their decisions over how many civilians and contractors to fund out of their budget. We recommend USD(P&R), working with CAPE and OUSD(C), develop pilot projects for use in the FY 2016–20 programming cycle that give decision makers outside the military departments a more direct, efficient, and transparent trade space between military, civilian, and contractor personnel in both programming/budgeting and execution. Options for pilots include DHP and the Combatant Commands.

5. Medical Force Costs and the Incentives for Inefficient Force Mix Management

A. Cost Views and Elements of Cost

Military and civilian personnel costs are distributed across the DoD and Federal budgets, making it a challenge to accurately estimate the costs of alternative medical force mixes. To address this challenge, CAPE issued Directive-Type Memorandum (DTM) 09-007 in 2010, which was replaced in July 2013 with DoDI 7041.04. This DoDI directs DoD Components to estimate the full cost of military and civilian personnel to inform total force mix decisions and provides guidance on how to estimate the full costs of military and civilian personnel so that analysts and decision makers can correctly compare active duty and civilian personnel.[18]

Drawing on the guidance of DoDI 7041.04, we consider four views of military and civilian medical costs:

- **Composite Rate.** OUSD(C)-issued composite rates average the entire annual military personnel (MILPERS) budget account across all military personnel by grade.
- **Cash Flow DoD Costs.** This cost includes all costs in the composite rate and adds additional variable costs to DoD, such as active duty health benefits and training costs. It also incorporates specialty-specific special pays, an important consideration for medical personnel who generally receive larger special pays than the average amounts calculated in the composite rates.
- **DoD Cost.** This cost incorporates all major short-run and long-run personnel costs to DoD, including notional accrual estimates of future costs and costs that are fixed in the short run.
- **Full Cost.** This cost reflects the total cost of personnel paid by tax payers, including both DoD and non-DoD costs and both near-term and future costs (on a notional accrual basis).

[18] In support of DoDI 7041.04, CAPE is also developing the Full Cost of Manpower (FCoM), a software tool designed to display alternative cost views for military and civilian employees with given specialties, grades, and years of service. CAPE provided IDA access to the test version of FCoM for use in this report.

Table 18 and Table 19 list all the components considered in each cost view for military and civilian personnel, respectively, as well as the IDA team's sources for these cost components. Careful consideration of these four cost views is important for understanding the incentives that cause inefficient force mixes in the medical community. In particular, the composite rate significantly understates the cost of military medical personnel. In spite of its inaccurate pricing of military medical personnel, the composite rate is frequently used for pricing in manpower transfer agreements.

Table 18. Military Medical Personnel Cost Components and Sources

Cost Component	Source	Composite Rate	DoD Cash Flow Costs	DoD Cost	Full Cost
Basic Pay, Allowances, Social Security and Medicare, Retired Pay (accrual), Travel/PCS/Transportation subsidy, Health Benefit, retiree (>65 MERHCF accrual)	Composite Rate	✓	✓	✓	✓
Incentive and Special Pays	Service Data	Partial	✓	✓	✓
Health Benefit (Active Duty and Dependents)	DoD Comptroller		✓	✓	✓
Training Costs, Recruitment and Advertising, and Education Assistance	"Life-Cycle Costs of Selected Uniformed Health Professions" Eric Christensen et al. 2009, Medical Readiness Review 2006, 2011 Full Cost of Manpower Tool (FCoM)		✓	✓	✓
Child Development, Family Support Services, Discount Groceries	2011 Full Cost of Manpower Tool (FCoM)			✓	✓
Health benefit, retiree (<65 retiree and family), >65 Plus Up	DoD Actuary			✓	✓
Health Benefit, other (TAMP and CHCBP), Discount Groceries, Retiree, Separation Pay and Travel, Unemployment Benefits, Death Gratuities and Survivor Benefits	Medical Readiness Review 2006	Partial		✓	✓
Tax Shortfall Payment (Treasury)	Medical Readiness Review 2006				✓
Concurrent Receipt (Treasury)	DoD Actuary				✓
Child Education (Education)	2011 Full Cost of Manpower Tool (FCoM)				✓
VA Benefits (Veterans' Affairs)	Congressional Budget Office Report 2002/ Budget Report 2000				✓
Employment Training (Labor)	Medical Readiness Review 2006				✓

Table 19. Civilian Medical Personnel Cost Components and Sources

Cost Component	Source	DoD Cash Flow Costs	DoD Cost	Full Cost
Annual Pay, Basic Pay, Locality Pay	VA Pay Tables (Medical and Dental Corps), Medical Readiness Review (MRR) 2006 (all other corps)	✓	✓	✓
OC11 (other) Load Factor: Overtime/Holiday/Other Pays, Incentive/Performance Awards	2012 Full Cost of Manpower Tool (FCoM)	✓	✓	✓
OC12 load factor: Health Benefit (government share of FEHBP), Social Security and Medicare, Retired Pay (government share), Travel/PCS/transportation subsidy/relocation bonus, Life insurance/worker's compensation benefits	"DoD Civilian Personnel Fringe Benefits Rates" memo, http://www.dod.mil/comptroller/rates/	✓	✓	✓
Education Assistance	Medical Readiness Review 2006	✓	✓	✓
Recruiting, Advertising, etc. (Amortized)	Medical Readiness Review 2006	✓	✓	✓
OC 13 load factor: Severance Pay/ Separation Incentive, Severance Health Benefit	2012 Full Cost of Manpower Tool (FCoM)		✓	✓
Child Development	Medical Readiness Review 2006		✓	✓
Retirement Benefits: Civilian Retirement, Post-Retirement Health Care, Post-Retirement Life Insurance	"DoD Civilian Personnel Fringe Benefits Rates" memo, http://www.dod.mil/comptroller/rates/			✓

Note: IDA researchers do not examine civilian contractors in this analysis due to the DoD conversion to using VA physician and dentist pay tables in 2010, which increased the average pay of government physicians and dentists. See Appendix D for additional discussion on contractor costs.

B. Estimates of Military and Civilian Medical Personnel Costs

Following the guidance provided by DoDI 7041.04, the IDA team estimated the average annual cost of military and civilian personnel in 121 specialties for five medical-related corps.[19] Appendix D provides a detailed explanation of the IDA team's costing methodology. Table 20 shows our estimates of the average annual cost of a military or civilian medical provider in each corps according to each of the four cost views. Our cost estimates reveal three main findings:

- The composite rate substantially understates the full cost of military medical personnel.
- Civilian medical personnel generally cost less than military medical personnel across all four cost views.
- Comparisons of military composite rates to civilian DoD cash flow costs for physicians and dentists cause uniformed providers to appear to be artificially less expensive than civilians.

[19] The five corps include the Medical Corps (physicians), Dentist Corps, Nurse Corps, Medical Services Corps, and Enlisted Corps. The Medical Services Corps includes all officer medical specialties that were not physician, dentist, or nursing specialties. The Enlisted Corps includes both Enlisted Medical and Enlisted Dental specialties. The 121 specialties comprise 41 medical (physician) specialties, 11 dental specialties, 14 nursing specialties, 32 medical services specialties, and 23 enlisted specialties.

Table 20. Estimated Average Annual Medical Personnel Costs Per Person ($FY13)

Corps	Military/ Civilian	Composite Rate	DoD Cash Flow	DoD	Full Cost
		Army			
Medical	Military	$179,323	$403,604	$413,330	$460,838
	Civilian	—	$301,526	$307,347	$327,760
Dental	Military	$175,366	$297,525	$307,216	$354,154
	Civilian	—	$259,967	$265,113	$282,878
Nurse	Military	$141,965	$182,645	$192,006	$233,472
	Civilian	—	$132,538	$135,318	$143,821
Medical Services	Military	$140,759	$174,946	$184,296	$225,589
	Civilian	—	$131,684	$134,470	$142,995
Enlisted	Military	$71,587	$88,965	$97,633	$125,373
	Civilian	—	$68,492	$70,236	$74,679
		Navy			
Medical	Military	$183,354	$377,433	$387,116	$434,504
	Civilian	—	$302,685	$308,185	$328,561
Dental	Military	$182,860	$291,002	$300,685	$348,066
	Civilian	—	$261,588	$266,413	$284,143
Nurse	Military	$151,777	$186,540	$195,895	$237,849
	Civilian	—	$136,919	$139,479	$148,341
Medical Services	Military	$160,272	$188,996	$198,433	$241,725
	Civilian	—	$134,290	$136,822	$145,569
Enlisted	Military	$77,247	$96,468	$105,158	$133,805
	Civilian	—	$67,212	$68,612	$72,926
		Air Force			
Medical	Military	$166,796	$346,448	$356,038	$401,305
	Civilian	—	$291,954	$297,668	$317,760
Dental	Military	$170,545	$285,491	$295,129	$341,198
	Civilian	—	$253,781	$258,857	$276,455
Nurse	Military	$144,050	$179,384	$188,730	$229,965
	Civilian	—	$130,220	$132,998	$141,595
Medical Services	Military	$147,497	$176,019	$185,403	$227,260
	Civilian	—	$133,303	$136,155	$145,044
Enlisted	Military	$72,763	$90,219	$99,069	$130,141
	Civilian	—	$71,741	$73,531	$78,260

Note: Military and civilian average costs are weighted by the distribution of military end strength across specialties in each corps. Military end strength by specialty was collected from the FY 2011 HMPDS.

As Table 20 shows, the composite rate significantly undervalues the cost of military medical personnel:

- For the average Army medical enlisted soldier, the composite rate is about $72,000 while the full cost to the taxpayer is about $125,000.
- For the average Navy physician, the average composite rate is about $183,000 while the full cost to the taxpayer is about $435,000.
- For the average Air Force nurse, the average composite rate is about $144,000 while the full cost to the taxpayer is about $230,000.

This understatement of costs has two main causes. First, the composite rate undervalues medical personnel because it averages MILPERS costs across all specialties in a particular grade; for example, the special pays for an O-4 physician are much higher than the average special pays of all O-4s. Second, the composite rate understates the cost of military medical personnel because it omits personnel costs outside of the MILPERS account such as training costs and active duty health benefits. Figure 14 shows the extent of the shortfall between the composite rate and the other three cost views for an average Army physician: the composite rate understates average annual Army physician special pays by about $60,000, training costs by about $157,000, short run cash flow costs to DoD by about $224,000, and full cost to the taxpayer by $282,000. The results are similar for the Navy and the Air Force; see Figure 15 and Figure 16.

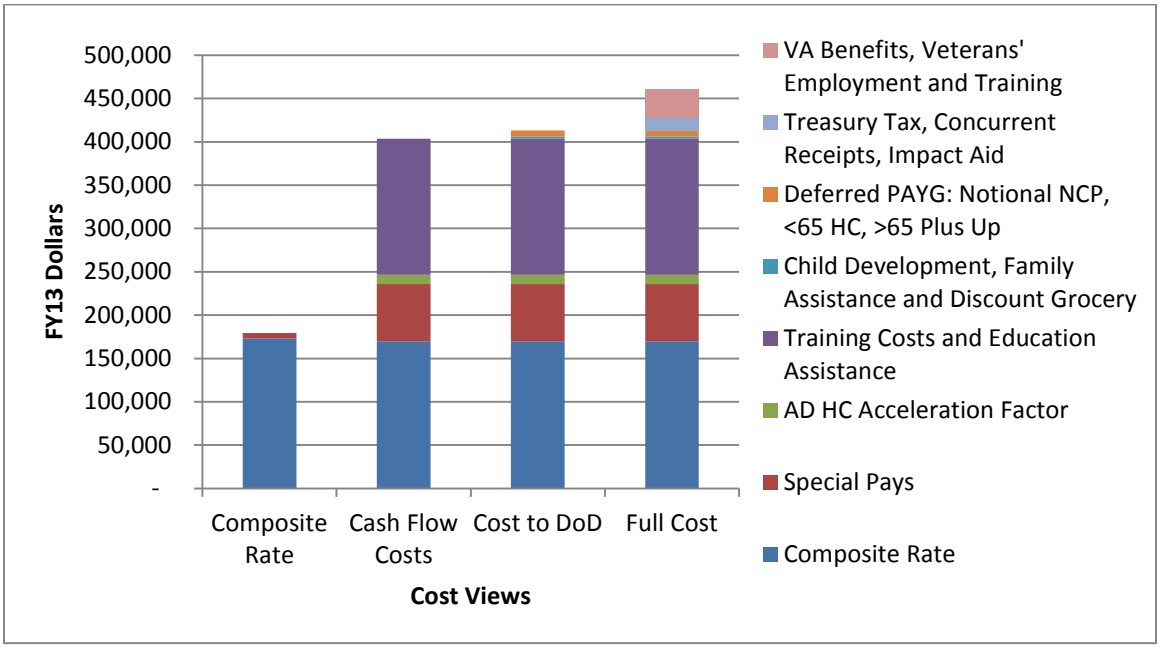

Figure 14. Cost View Comparison of an Average Army Physician in $FY13

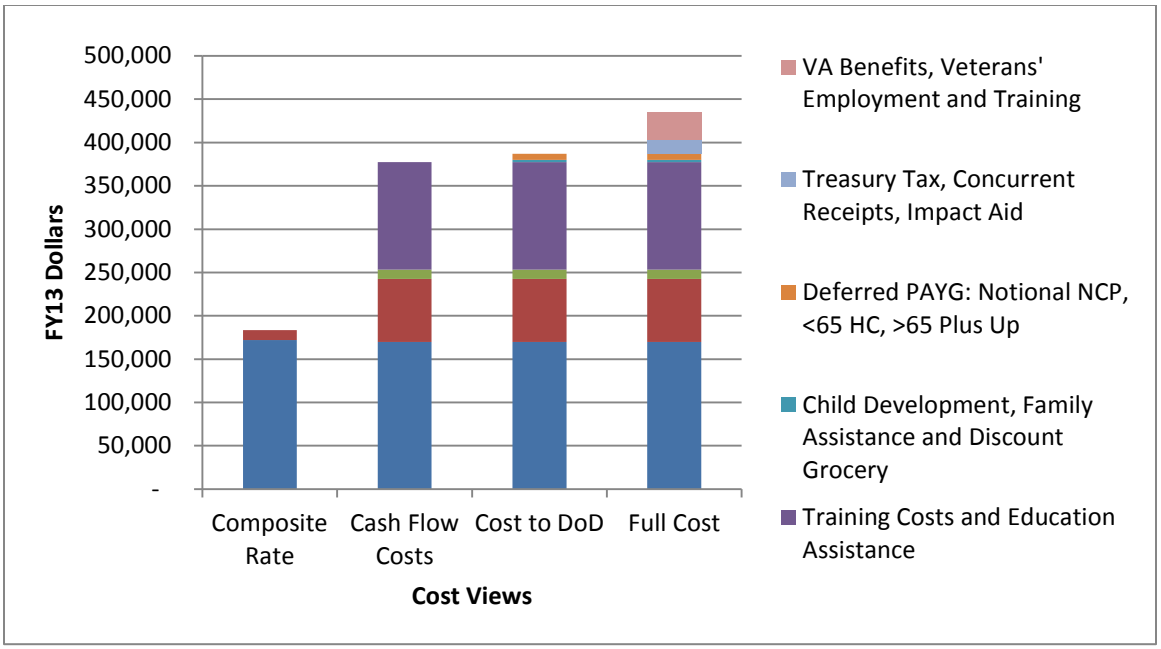

Figure 15. Cost View Comparison of an Average Navy Physician in $FY13

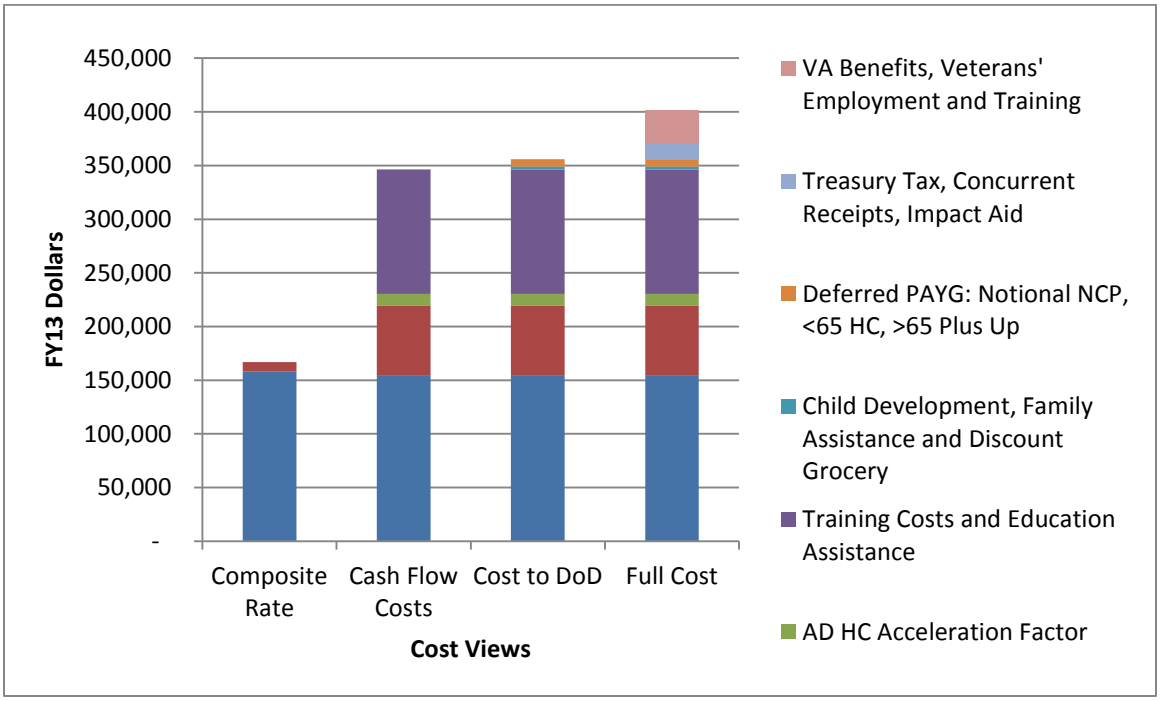

Figure 16. Cost View Comparison of an Average Air Force Physician in $FY13

In most cases, civilian providers cost less than military providers regardless of the cost view being considered. For example,

- For the average Army medical enlisted soldier, the full cost to the taxpayer of the equivalent civilian personnel is about $75,000.

- For the average Navy physician, the full cost to the taxpayer of the equivalent civilian personnel is about $329,000.
- For the average Air Force nurse, the full cost to the taxpayer of the equivalent civilian personnel is about $142,000.

From a short-run DoD cash flow perspective:

- The average Army medical enlisted soldier costs about $89,000, while the civilian equivalent costs about $68,000.
- The average Navy physician costs about $377,000, while the civilian equivalent costs about $303,000.
- The average Air Force nurse costs about $179,000 while the civilian equivalent costs about $130,000.

Hence, in most cases, it makes sense for non-military essential medical billets to be filled by civilian providers rather than their more expense military counterparts.

Even though the DoD cash flow cost of civilians is generally lower than the cash flow cost of uniformed providers, use of the composite rate to cost military providers for force mix decisions will likely lead to military-to-civilian ratio that is too high. This imbalance is especially apparent for the Medical and Dental Corps, where the composite rate causes civilians to appear *more* expensive. For example,

- For the average Army physician, the composite rate is about $179,000 while DoD's short-term cost of an equivalent civilian is about $302,000.
- For the average Navy dentist, the composite rate is about $183,000 while DoD's short-term cost of an equivalent civilian is about $262,000.
- For the average Air Force physician, the composite rate is about $167,000 while DoD's short-term cost of an equivalent civilian is about $292,000.

Table 21 provides an estimate of the total cost of the military and civilian portions of the medical force. The cost of total military and civilian end strength is estimated for the four views of cost. The table also provides the military-to-civilian ratio (end strength share) for each Service. This will be used in the next section to illustrate the consequences of inefficient force mix decisions.

Table 21. Estimated Annual Costs of the Total Medical Force ($FY13, billions)

	Army		Navy		Air Force	
	Military	**Civilian**	**Military**	**Civilian**	**Military**	**Civilian**
End Strength*	52,400	27,228	34,886	7,444	32,235	3,981
End Strength Share	66%	34%	82%	18%	89%	11%
Composite Rate	$5,106	-	$3,634	-	$3,270	-
DoD Cash Flow	$6,006	$2,863	$4,452	$815	$4,059	$455
	$8,870		$5,267		$4,514	
DoD Cost	$6,474	$2,928	$4,764	$831	$4,351	$465
	$9,402		$5,595		$4,816	
Full Cost	$8,186	$3,116	$5,930	$884	$5,489	$495
	$11,301		$6,814		$5,984	
Tri-Service Full Cost	**$24,099 billion per year**					

* Military and civilian total end strength and military end strength by medical specialty is from the 2011 HMPDS. Civilian end strength is allocated proportionally across specialties according to the military distribution.

C. Potential Cost-Saving Policies

We used this analysis to consider two ways in which the paradigm for managing the medical force could be changed to yield substantial savings. The first draws on the military-civilian cost comparisons just discussed. The second examines alternative policies regarding the accession of physicians and dentists.

1. Conversion to Army Military-to-Civilian Mix

We estimated the potential cost savings from realigning the medical force of the Navy and Air Force to have the same military-to-civilian ratio as the Army's 66:34 mix. (See Appendix D for additional information about our methodology.) Table 22 presents the results.

Table 22. Potential Savings from Conversion to Army Mil-to-Civ Mix ($FY13)

	Army		Navy		Air Force	
	Military	**Civilian**	**Military**	**Civilian**	**Military**	**Civilian**
End Strength	52,400	27,228	34,886	7,444	32,235	3,981
Number of Conversions	0	0	−7,603	6,733	−8,967	8,109
DoD Cash Flow	$6,006	$2,863	$3,468	$1,541	$2,907	$1,363
	$8,870		$5,009		$4,270	
Full Cost	$8,186	$3,116	$4,622	$1,672	$3,937	$1,485
	$11,301		$6,294		$5,422	
Tri-Service Full Cost	DoD Cash Flow Cost: $18,148 million per year Full Cost: $23,017 million per year					
Potential Annual Savings from Realigning Force Mix	**To DoD Cash Flow:** $18,650 − $18,148 **= $502 million per year** **To Taxpayer:** $24,099 − $23,017 = **$1,082 million per year**					

Note: Military reductions are greater than civilian increases because military reductions include reductions to the student tail and the TPPH tail, neither of which requires civilian replacement. Military reductions and civilian increases are distributed across specialties in proportion to their original military end strength.

Since the experiment is to adopt the Army's military-to-civilian ratio, the Army's end strength and costs remain unchanged from Table 21. The Navy's military medical force falls by about 7,600 personnel with a corresponding increase of about 6,700 civilian providers.[20] The Air Force has the highest military-to-civilian ratio initially, so it has the largest number of conversions in this example, with nearly 9,000 military billets converted to about 8,100 civilian billets. In this exercise, we found a potential savings of $502 million per year to DoD's short-term cash flow. Over the long run, as fixed costs adjust and long-run civilian retirement benefits replace more expensive military retirement benefits, the taxpayer could save more than $1 billion in FY 2013 dollars.

The Air Force also provided their FY 2014–18 programmed medical end strength. In the Air Force program, their military-to-civilian ratio shifts to 87:13 by FY14. Due to time and budget constraints, the IDA team did not run a separate costing exercise with the new (programmed) end strength data, but these data indicate that the Air Force is attempting to take advantage of these savings and improve the efficiency of its force mix.

This exercise is purely illustrative and no recommendation is provided in this report for any specific changes to military and civilian end strength. Any policy aimed at the "civilianization" of the medical force would need to consider that some billets are military essential (and thus cannot be converted), and the actual positions converted

[20] In the case of the Navy, only 6,733 of the military billets required replacement. Similarly, of the 8,967 military billets removed from the Air Force, only 8,109 required replacement.

might vary by specialty and location.[21] Still, there is a potential for large savings both immediately and over the long run from a more careful consideration of the military-civilian mix in the medical force.

2. Potential Savings from Modifying the Mix of Accession Sources

Since training costs were a very expensive cost element of military physicians and dentists, we also examined the cost of the various accessions methods the Services use and consider whether changing the mix could yield savings. Services currently access physicians primarily through three programs. The following discussion regarding accession methods and their costs is borrowed largely from a 2006 CNA paper entitled "Raising the Bonus and the Prospects for DoD's Attracting Fully Trained Medical Personnel," by Levy, Christensen, and Asamoah.[22] The largest accession source is the AFHPSP, which recruits physicians while they are still in a civilian medical school by providing a stipend, tuition, and fees. Following medical school, recruits in AFHPSP enter either a military residency program on active duty (AFHPSP direct) or a civilian residency program (AFHPSP deferred) after which the physician enters active duty. The second main source of accession is USUHS; physicians recruited through USUHS are on active duty throughout medical school and residency, so they receive active duty officer pay and benefits in addition to all education expenses. Finally, the Services access some physicians who have already completed medical school through the FAP, which provides salary above civilian pay while these physicians complete their civilian residency programs.

The AFHPSP and USUHS programs, which jointly accounted for 87 percent of historical accessions, make force planning difficult for several reasons. First, the training periods last from seven to ten years, requiring planners to project requirements far into the future and limiting Services' abilities to meet current unmet requirements. In addition, AFHPSP and USUHS make it hard to manage specialty mix because recruits in these programs do not decide their specialties until after training is already underway. Finally, military medical training programs generally cost more than equivalent training programs that are commercially provided by the civilian sector.

Building upon the work by Levy et al., the IDA team estimated the potential savings from accessing all physicians and dentists with a large accession bonus rather than

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[21] In addition, programmed end strength would need to be considered instead of executed end strength.

[22] Robert A. Levy, Eric W. Christensen, and Senanu Asamoah, "Raising the Bonus and the Prospects for DoD's Attracting Fully Trained Medical Personnel," CRM D0013237.A2 (Alexandria, VA: CNA Corporation, 2006).

accessing a large percentage through lengthy and expensive military medical school and residency programs. Table 23 summarizes the findings.

Table 23. Potential Savings from Accession Bonuses for Physicians and Dentists ($FY13)

	Army	Navy	Air Force
Current Estimated Accession Costs (per person)	$ 1,090,755	$ 888,946	$ 874,541
Accession Costs Using Bonus (per person)	249,932	258,572	231,891
Potential Savings (per person)	840,823	630,374	642,650
Tri-Service Average Potential Savings	**$706,598 per person**		
	$0.98 billion per year		

Note: Average (per person) costs are weighted across specialties by non-student end strength for Air Force and Navy, and by non-student/non-TPPH end strength for Army. Annual savings is based on the approximately 1,400 accessions in FY 2011 reported in the HMPDS. Per person training costs with accession bonuses are taken from the 2006 CNA report. These training values were multiplied by a retention bonus (reflecting the shorter average years of practice among direct accessions), increased by 10 percent, and then inflated to FY 2013 dollars.

Currently, the average estimated training cost (across all accession methods) ranges from about $889,000 for the Navy and $875,000 for the Air Force to around $1,091,000 for the Army.[23] Using CNA's method, the IDA team estimated potential savings around $841,000 for the Army, $630,000 for the Navy, and $643,000 for the Air Force, per accession, by accessing physicians and dentists directly. Overall, at the current force levels, a shift to less expensive accession methods has the potential to save DoD nearly $1 billion each year. Moreover, the 2006 CNA report suggests that additional advantages of using large accession bonuses to recruit physicians include the substantially shorter training pipeline (two to three years instead of seven to ten) and greater certainty about the specialty mix of recruits.

As with the Army military-to-civilian mix example, this analysis is purely illustrative. The accession bonus that is required to generate the desired quantity of physicians and dentists could be higher or lower than the bonus listed in Table 23. Still, the illustration reveals the potential for large savings from employing the services of the extant commercial market for physician and dentist training.

D. Recommendations

DoDI 7041.04 directs estimation of the full cost of personnel for consideration in force-mix decision making. CAPE is also developing a software application that will

[23] The analysis assumes that all AFHPSP recipients receive funding for four years. This might not be the case for everyone, so the average estimated training costs could be lower.

assist organizations in estimating full cost. Two gaps remaining in this development are that (a) the precise applicability and required level of consideration of DoDI 7041.04 in decision making is vague and should be clarified; and (b) some important costs (e.g., training costs) are specific to individual specialties, difficult to develop, and not included in the CAPE software application at present. We recommend that (a) USD(P&R) work with CAPE to improve the guidance contained in DoDI 7041.04 or its succeeding issuance in time for its next reissuance date; and (b) USD(P&R) direct ASD(HA) to develop annual estimates of training costs by specialty for all medical specialties included in the DMDC occupation codes in the spring of each year (in time for Program Objective Memorandum (POM) development), starting in 2014.

Estimating the full cost of personnel in an analytical display to inform decision making is valuable, but exposing decision makers directly to the full cost will likely have an even greater impact on the efficiency of decision making. We recommend that USD(P&R) begin a systematic effort, working with CAPE and OUSD(C), to move more of the costs of military manpower into the MILPERS budget accounts. We recommend beginning with identifiable costs that have a precedent for being in MILPERS, such as the non-Medicare eligible retiree health care fund (non-MERHCF) benefit and the active duty family member health care benefit (the precedent is the Medicare-eligible retiree health care fund (MERHCF) benefit) for the FY 2016–20 Future Years Defense Program (FYDP). USD(P&R), CAPE, and OUSD(C) should then expand into other areas of costs in the FY 2017–21 cycle. USD(P&R), working with CAPE and OUSD(C), may also want to consider community-specific composite rates.

6. Other Impediments to Efficient Total Force Management

Interviews with the Services and OSD also identified a series of legislative, policy, and other constraints on their ability to efficiently manage the total medical force. The most obvious example is the statutory prohibition on medical military-to-civilian conversions. In addition, recruitment and hiring are handled very differently for military and civilian personnel. Military recruitment is generally centralized and has significant resources and infrastructure supporting it. Civilian hiring is generally left to local hiring authorities with few resources and little support.

A. Legislative Impediments

Interviews with the Services identified three legislative impediments to total medical force management:

4. **Military-to-Civilian Prohibition Ban.** Enacted by the Congress in 2010, this ban precludes the conversion of military medical billets into civilian billets.
5. **Civilian Personnel Cap**. Included in the FY 2013 NDAA, this provision directs a reduction in civilian personnel.
6. **Specific Caps or Targets on Medical Personnel**. The Congress has enacted requirements to use military personnel without taking into account the military essentiality of the requirement and other factors—the most significant example being the direction to increase the number of mental health providers.

The statutory ban on medical military-to-civilian conversions began with a certification requirement in the FY 2007 NDAA and eventually progressed to a permanent ban in the FY 2010 NDAA. The language from each of these bills is provided in Appendix E.

B. Institutional Impediments

In addition to legal impediments, the Services also face institutional impediments to efficient total force management. For example, the Services have identified that their Human Resources (HR) departments are unfamiliar with recruiting challenges that are unique to civilian medical providers. Military medical recruiting is conducted by specialized personnel, and a large amount of resources is devoted to identifying and attracting recruits. This is generally not the case for civilian medical personnel. Typical comments in interviews with the Services included the following:

- HR has a poor understanding of health care markets.
  - When cuts to military personnel are made, they need to take these cuts in markets where civilians can be hired or the care can be provided through the network.
  - Given new health care legislation (e.g., Affordable Care Act), it is unclear which markets these are.
- Lack of funds and resources to recruit civilians.
  - HR has a poor understanding of medical recruiting.
  - HR officials do not always have or use the full range of tools required for successful medical recruiting, e.g., large recruitment bonuses.
  - A standardized hiring process for medical personnel (e.g., DoDI) would be helpful to manage HR expectations about valid recruiting options.
  - Costing models would also help: "Any data points are helpful".
- HR is not expedient.
  - End up overexecuting because they retain military personnel to mitigate risk of slow civilian hiring.
  - Can take two to three years to implement changes. In the meantime, it appears that they are not complying or are over- or under-executing.

C. Recommendations

To deal with these challenges, we recommend:

1. USD(P&R) lead an effort to remove the military-to-civilian conversion prohibition and restore flexibility to the Services for managing the medical force in the FY 2015–19 Unified Legislation and Budgeting Process.
2. USD(P&R) direct ASD(HA) and the Deputy Assistant Secretary of Defense for Civilian Personnel Policy (DASD(CPP)) conduct a review of civilian medical hiring practices within DoD to provide recommendations for the FY 2016–20 Program Review to ensure adequacy of civilian hiring infrastructure and support to the Services.

7. Conclusions

Total force mix is an important area of defense management and the medical force has a long history of force mix challenges. OUSD(P&R) tasked IDA to review these historic challenges and develop recommendations for improving management given the long history of limited success from previous efforts. The IDA team found that there has been some improvement in force mix management (e.g., in the understaffing of operationally required specialties), that some problems have gotten worse (e.g., in the overstaffing of some beneficiary care specialties), and the application of the Service sizing model that evolved around the time of the 733 Update Study has become inconsistent.

IDA researchers examined the causes of the problems. Some measured understaffing of requirements was present, but the inconsistency of the Service sizing models and the lack of identified consequences from understaffing (in both the ability to man all deployable units and the low deployment rates) make it unclear the degree to which this is a serious problem. If true understaffing is occurring, its likely causes include insufficient beneficiary care workload to maintain the clinical skills of personnel and insufficient force management tools. For overstaffing, we identified causes including an incomplete tradespace over total force elements (the ability to make trades between active and civilian personnel and the accuracy of prices across options) and legislative and institutional constraints. we identified a series of recommendations to begin systematically addressing these causes. These recommendations are summarized below.

A. Summary of Recommendations

Based on the analyses and conclusions described in this report, the IDA team makes the following recommendations to USD(P&R):

1. Work with the Director of CAPE to direct ASD(HA) to lead a systematic evaluation with the Services to reform medical force requirements determination to include (a) ensuring compliance with DoD policies (e.g., on military essentiality); and (b) Service line participation and validation for use in the FY 2016–20 Program Review.
2. If true understaffing is found, direct ASD(HA), working with the Services and ASD(RA), to lead a review of AC/RC balance in the medical force and the development of programmatic options for transfer of medical force requirements to the RC for consideration in the FY 2016–20 Program Review.

3. If true understaffing is found, direct ASD(HA), working with the Services, to develop and implement a pilot project placing active duty medical personnel required for the operational mission for which there is insufficient clinical workload in DoD MTFs in civilian and/or VA facilities, for execution in 2014.
4. Lead an effort to remove the military-to-civilian conversion prohibition and restore flexibility to the Services for managing the medical force in the FY 2015–19 Unified Legislation and Budgeting Process.
5. (a) Work with CAPE to improve the guidance contained in DoDI 7041.04 or its succeeding issuance in time for its next reissuance date; and (b) USD(P&R) direct ASD(HA) to develop annual estimates of training costs by specialty for all medical specialties included in the DMDC occupation codes in the spring of each year (in time for POM development), starting in 2014.
6. Begin a systematic effort, working with CAPE and OUSD(C), to move more of the costs of military manpower into the MILPERS budget accounts. We recommend beginning with identifiable costs that have a precedent for being in MILPERS, such as the non-MERHCF benefit and the active duty family member health care benefit (the precedent is the MERHCF benefit) for the FY 2016–20 FYDP. USD(P&R), working with CAPE and OUSD(C), may also want to consider community-specific composite rates.
7. Work with CAPE and OUSD(C) to develop pilot projects for use in the FY 2016–20 programming cycle that give decision makers outside the Military Departments a more direct, efficient, and transparent trade space between military, civilian, and contractor personnel in both programming/budgeting and execution. Options for pilots include DHP and the Combatant Commands.
8. Direct ASD(HA) and DASD(CPP) conduct a review of civilian medical hiring practices within DoD to provide recommendations for the FY 2016–20 Program Review to ensure adequacy of civilian hiring infrastructure and support to the Services.

Appendix A.
Reserve and Guard Requirements and Deployments

Across all three Services, the requirement for military medical manpower is generated from defense scenarios, which generate casualty streams. These casualty streams translate into a wartime bed demand, which, in turn, maps to a requirement for deployable medical platforms and personnel. When determining how to staff these unit and personnel requirements, the Services face a choice of whether to use Active, Reserve, or Guard Component forces. The choice of component entails a consideration of risk. Active Component forces are capable of mobilizing and deploying to theater the fastest. Medical personnel in the Reserves and Guard often require additional mobilization and training time before becoming available for deployment. Ultimately, the choice of component mix involves a Service-specific risk assessment independent of the generation of requirements for operational medical capabilities from casualty streams.

Because the choice of component mix is separate from the operational capability requirement, evaluations of risk against the operational mission should assess Active, Guard, and Reserve staffing patterns in concert, rather than in isolation. In Chapter 2, we found that the historical understaffing of operationally demanded specialties has improved since 2004. Assuming force alignment to requirements has remained constant in the Reserve Components, this represents a reduction in risk against required operational capabilities. However, if understaffing exists in the Reserve or Guard Components, the Services may still take significant risk against required operational capabilities.

The Army and Navy provided their Service sizing model estimates of Reserve and Guard (for the Army) requirements from 2011 (Army) or 2012 (Navy). Comparing Health Manpower Personnel Data System (HMPDS) end strength in 2011 with these Service estimates of requirements enables us to assess the degree of risk that exists outside of the Active Component. Because earlier estimates of Reserve and Guard requirements were not available, we cannot determine whether risk in the Reserves and Guard is improving over time, as it is with the Active Component. However, the 2011 Current Forces Database (CFDB), as described in Chapter 2 and Appendix B, contains an estimate of "requirements" for the Reserve and Guard Components for each Service. These are also compared to HMPDS end strength in Table A-1 through Table A-3.

To assess risk outside the Active Component, Reserve and Guard requirements were compared to end strength at the medical corps level. Unlike in the Active Component, specialty mix in the Reserves and Guard was not judged to be a significant concern. In the Active Component, the Services face incentives to understaff operationally required specialties (such as surgeons and anesthesiologists) for which there is little non-wartime workload in Military Treatment Facilities (MTFs). At the same time, incentives exist to overstaff beneficiary care specialties (such as pediatrics and obstetrics) demanded by beneficiary populations in the MTFs. In contrast, no such incentives exist for the Reserve and Guard components, as medical personnel are not utilized by the Military Health System when inactive. Misalignment may still occur due to transitions of a misaligned active force to the Reserves (or through a policy of "backfilling" the MTFs with Reservists), but in the absence of day-to-day incentives, specialty mix raises lesser concerns for the Reserves. Table A-1 through Table A-3 present the Service sizing model requirement, CFDB requirement, and 2011 end strength for the Reserve and Guard Components.

Table A-1. Army Corps Reserve and Guard Requirements and End Strength

Medical Specialty	Reserve+Guard Service Req.	Reserve+Guard CFDB Req.	Reserve+Guard End Strength
Medical Corps	2,010	2,219	1,749
Dental Corps	762	812	632
Nursing Corps	3,794	4,123	5,328
Medical Service Corps	5,878	5,988	5,953
Enlisted Corps	29,836	29,677	30,891
Total All Corps	42,280	42,819	44,553

Sources: CFDB, TAA, and HMPDS for 2011. Includes only Selected Reserve (excludes Individual Ready Reserve, Inactive National Guard, and Standby).

Table A-2. Navy Corps Reserve and Guard Requirements and End Strength

Medical Specialty	Reserve Service Req.	Reserve CFDB Req.	Reserve CFDB Auth.	Reserve End Strength
Medical Corps	740	2,657	675	545
Dental Corps	114	434	243	258
Nursing Corps	1,639	4,116	1,305	1,165
Medical Service Corps	418	1,598	372	360
Enlisted Corps	3,491	14,758	5,100	5,205
Total All Corps	6,402	23,563	7,695	7,533

Sources: Navy Medical Manpower All Corps Requirements Estimator (MedMACRE) for 2012, CFDB and HMPDS for 2011. Includes only Selected Reserve (excludes Individual Ready Reserve, Inactive National Guard, and Standby).

Table A-3. Air Force Corps Reserve and Guard Requirements and End Strength

Medical Specialty	Reserve+Guard Service Req.	Reserve+Guard CFDB Req.	Reserve+Guard End Strength
Medical Corps	*	1,449	1,024
Dental Corps	*	283	316
Nursing Corps	*	2,466	2,259
Medical Service Corps	*	1,863	1,656
Enlisted Corps	*	9,255	9,282
Total All Corps	*	15,316	14,537

Sources: CFDB and HMPDS Report for 2011. Includes only Selected Reserve (excludes Individual Ready Reserve, Inactive National Guard, and Standby).

*Air Force did not provide medical requirements for Guard and Reserve Components.

Table A-1 through Table A-3 demonstrate that all three Services meet or come close to meeting requirements for medical personnel in the Reserve and Guard Components. The Army is the most straightforward. For Nursing, Dental, and Enlisted Medical Corps, Army meets its Service sizing model's estimate of requirements, which closely approximates the Army's CFDB unit requirement. Army Dental and Medical Corps end strength fall slightly below their Service sizing model requirements, but the difference is within 20 percent. Using CFDB requirements as the baseline, the Air Force displays similar behavior. End strength for all Air Force corps is within 20 percent of CFDB requirements except for the Medical Corps. The Navy falls short by roughly 30 percent against MedMACRE requirements for Medical and Nursing Corps but exceeds its requirement for enlisted medical personnel by 50 percent. The Navy's CFDB Reserve requirements are out of line with both the MedMACRE estimate and 2011 end strength, although its authorizations are consistent with both sets of numbers.

The IDA team also examined deployment rates for Guard and Reserve personnel. Figure A-1 through Figure A-42 present deployment rates for medical Reservists, each of them combining Guard and Reserve Components where applicable. Note that figures with the names of occupational groups displayed have boxes around the medical group names to distinguish them from the non-medical groups.

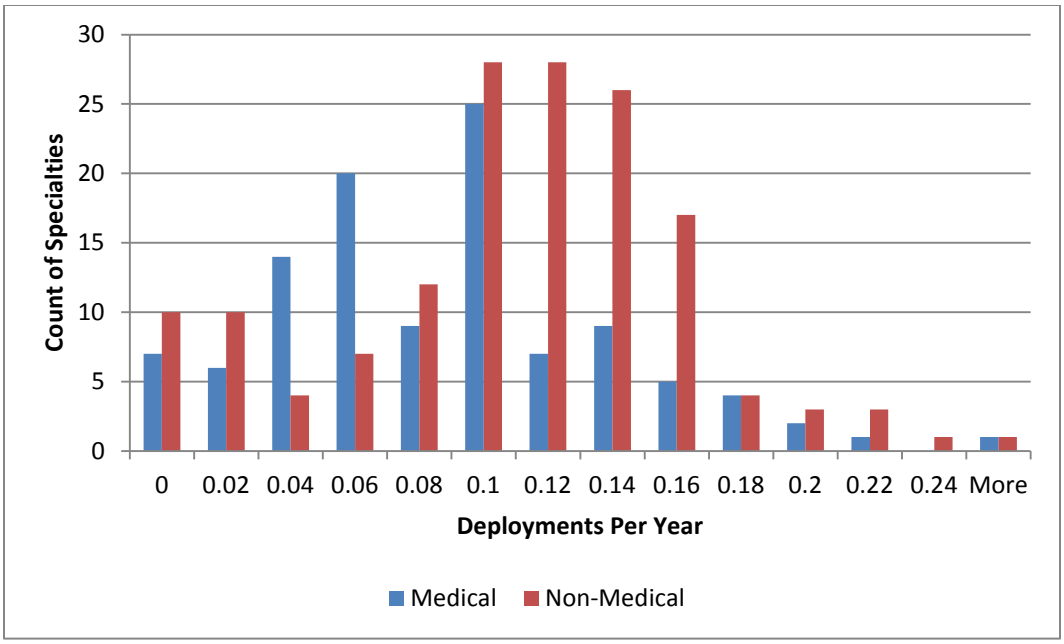

Figure A-1. Army Reserve and Guard Deployments per Year, Medical and Non-Medical Specialties, 2001–12

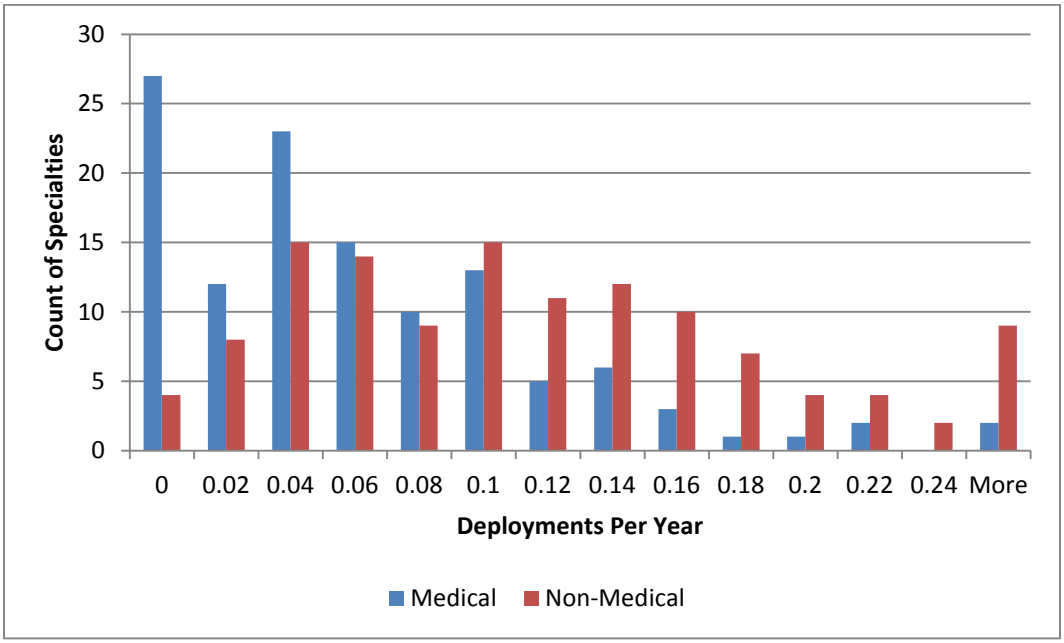

Figure A-2. Air Force Reserve and Guard Deployments per Year, Medical and Non-Medical Specialties, 2001–12

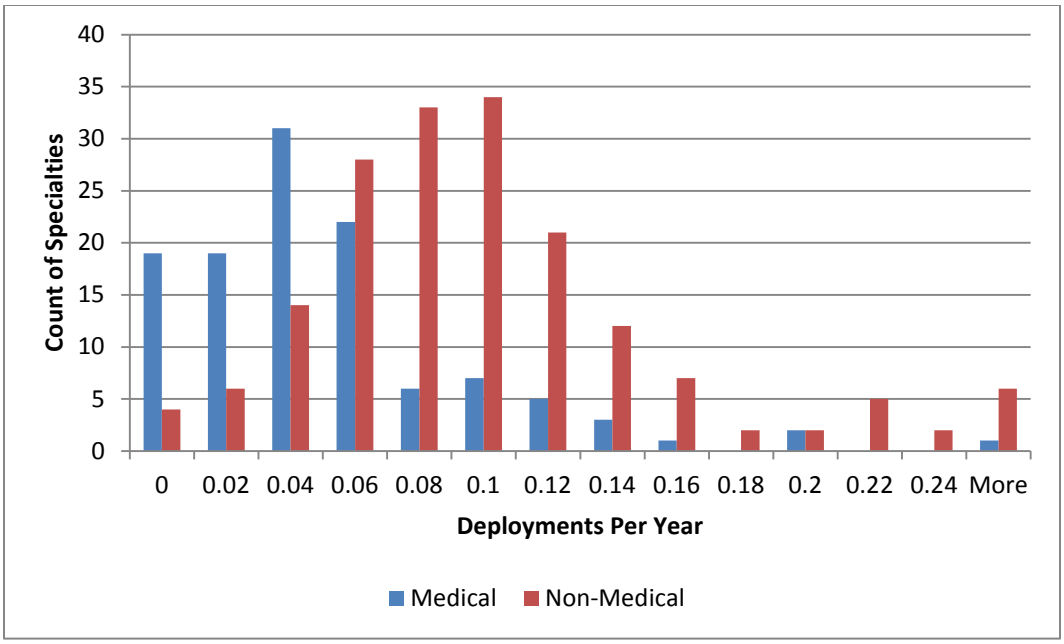

Figure A-3. Navy Reserve Deployments per Year, Medical and Non-Medical Specialties, 2001–12

The difference between medical and non-medical deployments for the Reserve and Guard Components is narrower than for the Active Component. However, across specialties and Services, medical reservists and guardsmen deploy less frequently than their non-medical counterparts. Additionally, there may be greater divergence between relatively high-deploying and low-deploying medical specialties for the Army and Air Force. This could reflect a divergence between deployment experiences for operationally demanded specialists and specialists occupying private sector civilian medical care fields. Given that the Services have no day-to-day incentive to maintain beneficiary care specialists in the Reserves, one would expect less substitution of these specialists for operationally demanded medical assignments.

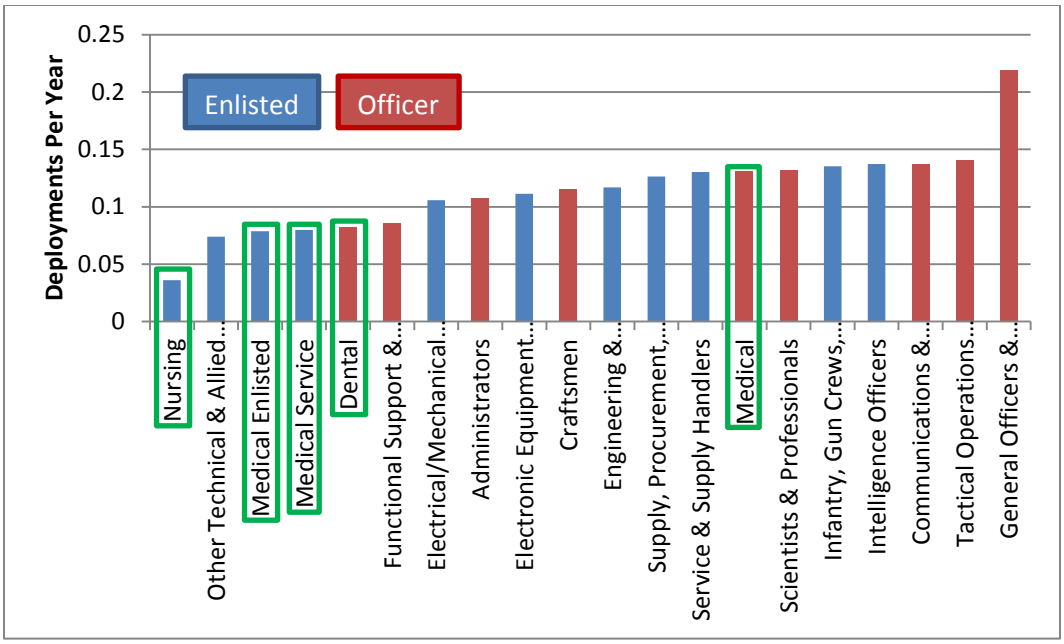

Figure A-4. Army Reserve and Guard Deployments per Year by Occupational Group, 2001–12

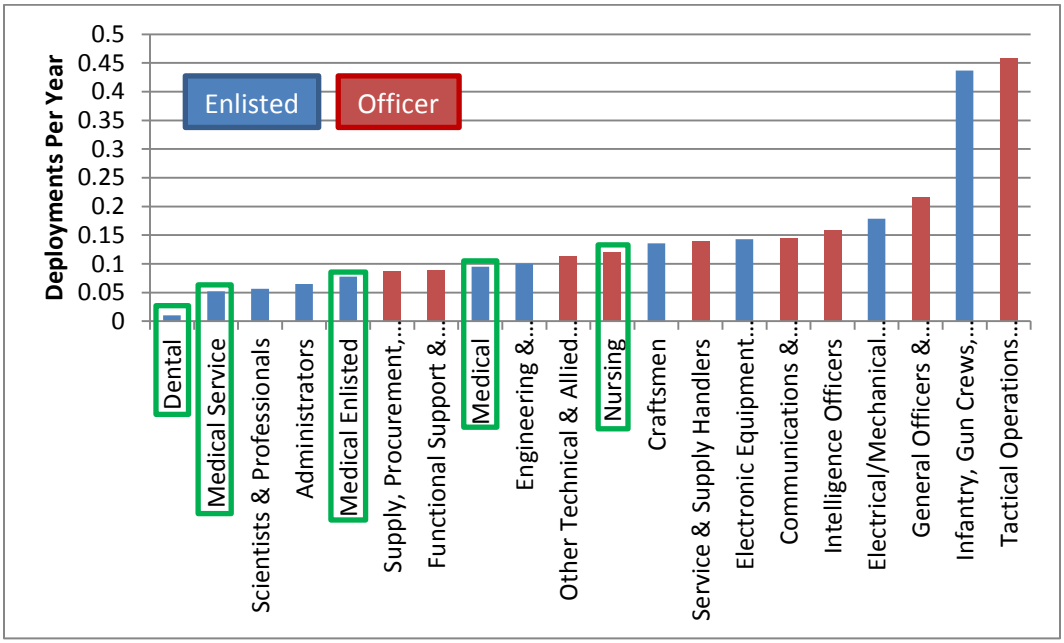

Figure A-5. Air Force Reserve and Guard Deployments per Year by Occupational Group, 2001–12

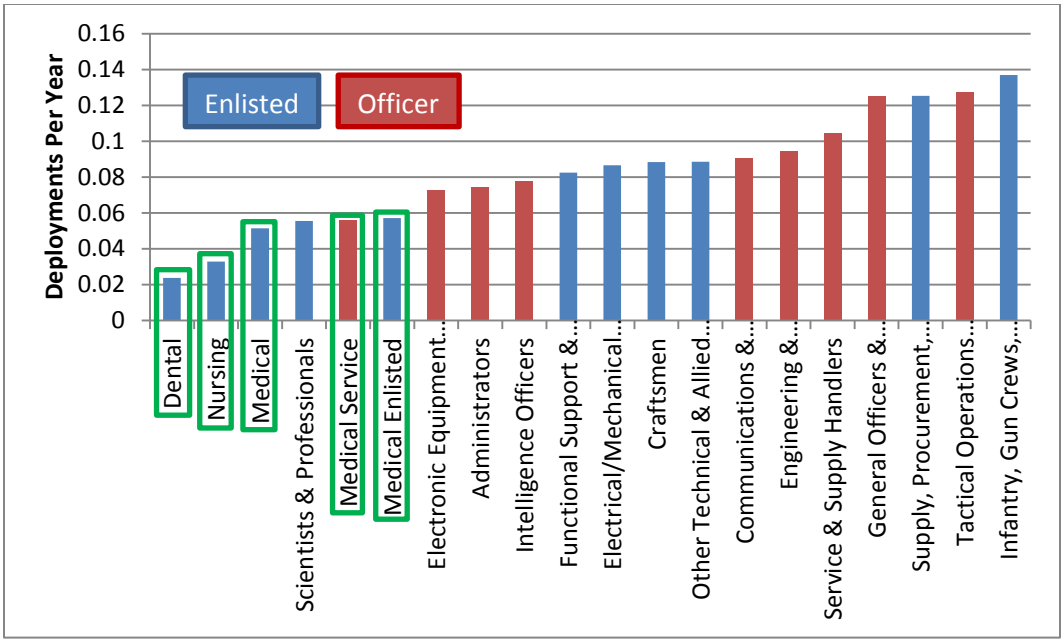

Figure A-6. Navy Reserve Deployments per Year by Occupational Group, 2001–12

For two of the three Services, the gap between deployment rates for medical and non-medical occupational groups is narrower in the Reserves and Guard than in the Active Component. The medically related corps in the Navy remain five of the six least deploying occupational groups despite the larger size of Naval corps understaffing against Service sizing model requirements. Furthermore, there is no evidence that Reserve understaffing has caused force stress during the past decade of war. Even higher-deploying occupational groups, like the Medical Corps in the Army and the Medical and Nursing Corps in the Air Force, deploy at rates similar to other comparable occupational groups. No medical corps is among the top-deploying occupational corps in the Reserves or Guard. Consequently, it is unlikely that the end strength divergences from sizing model requirements represent substantial risk to operational capabilities designated for Reserve or Guard performance.

Finally, there is some evidence of greater variation in medical deployment rates across specialties within a medical corps. Some of this may be due to the relatively small size of individual specialties within the Reserves and Guard and the associated effects of low and high-deploying outlier specialties. The weaker incentives to substitute beneficiary care specialties to meet operational demands may explain some of this divergence as well. The charts below identify deployment rates among medical specialties with each medical corps.

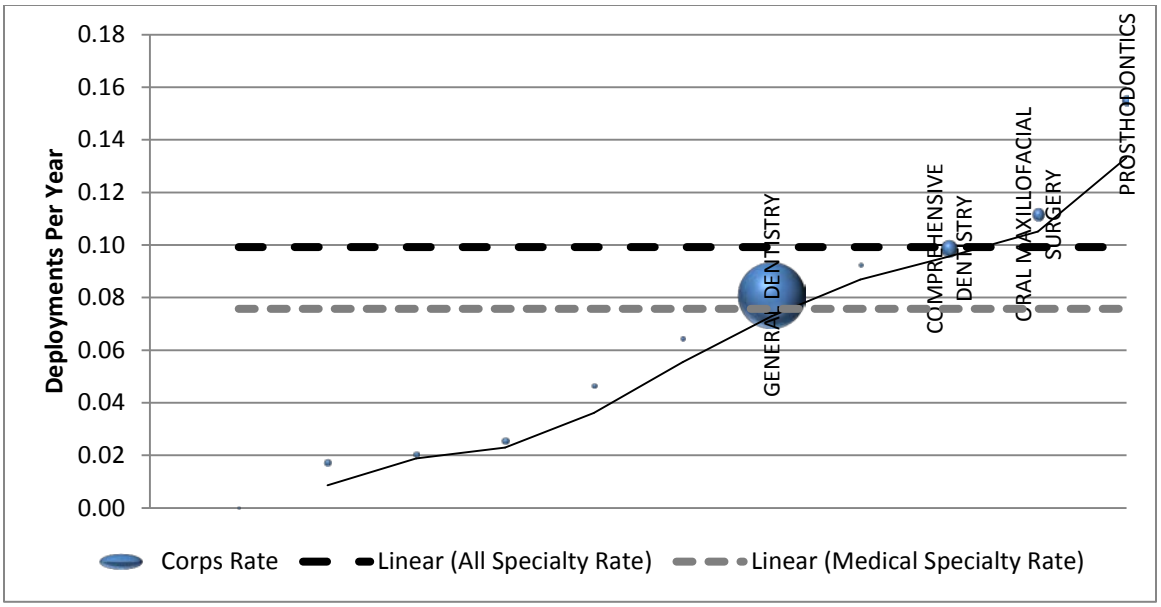

Figure A-7. Army Dental Corps Reserve and Guard Deployments per Year by Specialty, 2001–12

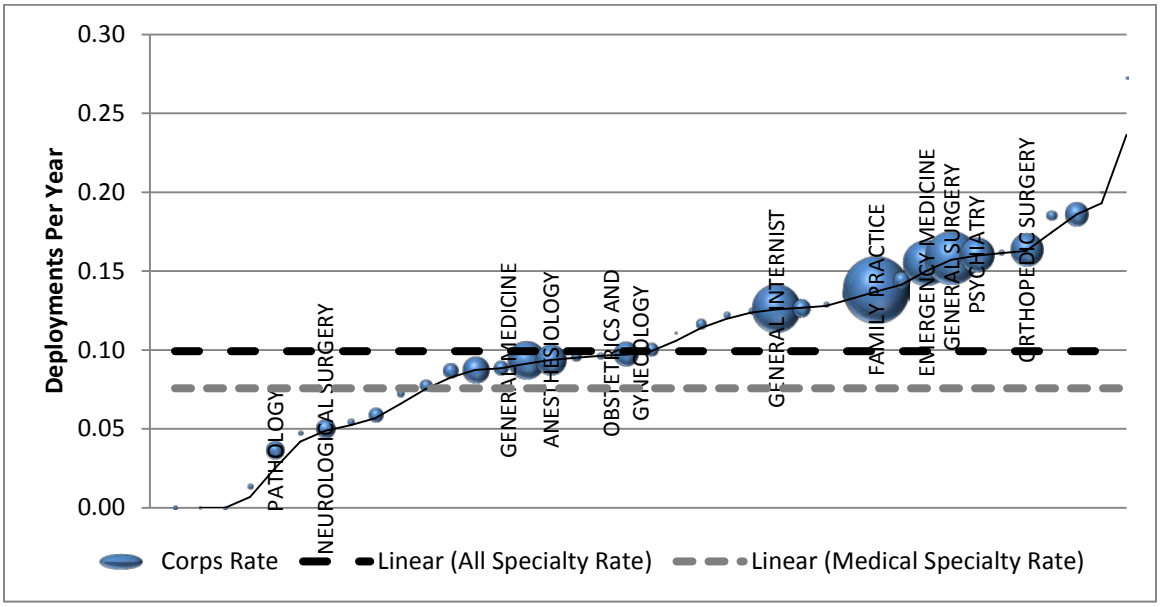

Figure A-8. Army Medical Corps Reserve and Guard Deployments per Year by Specialty, 2001–12

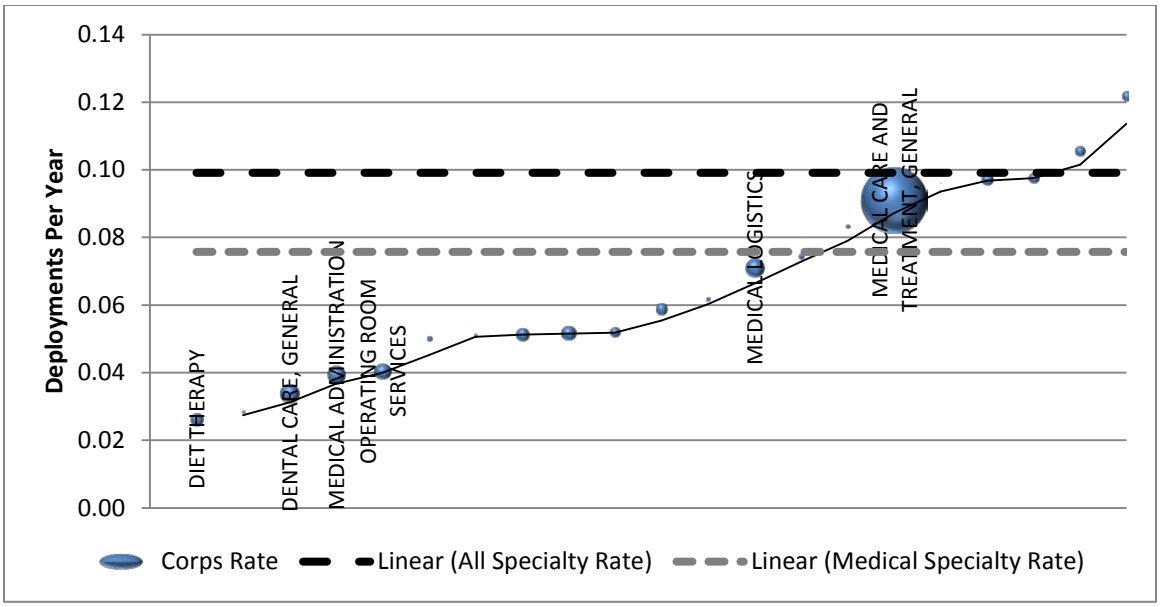

Figure A-9. Army Enlisted Medical Corps Reserve and Guard Deployments per Year by Specialty, 2001–12

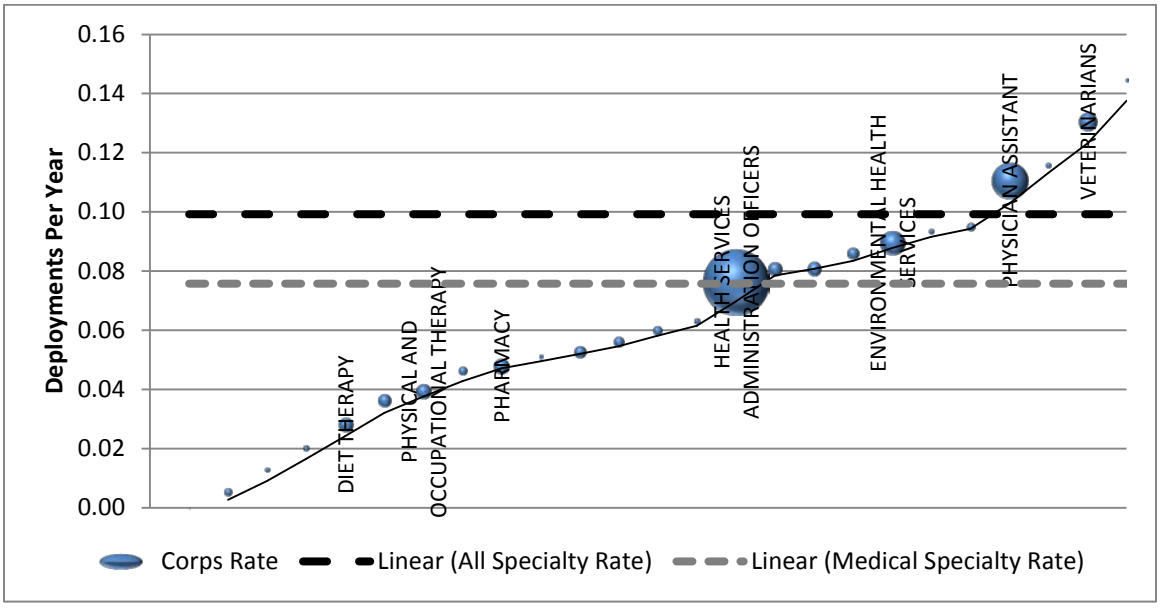

Figure A-10. Army Medical Service Corps Reserve and Guard Deployments per Year by Specialty, 2001–12

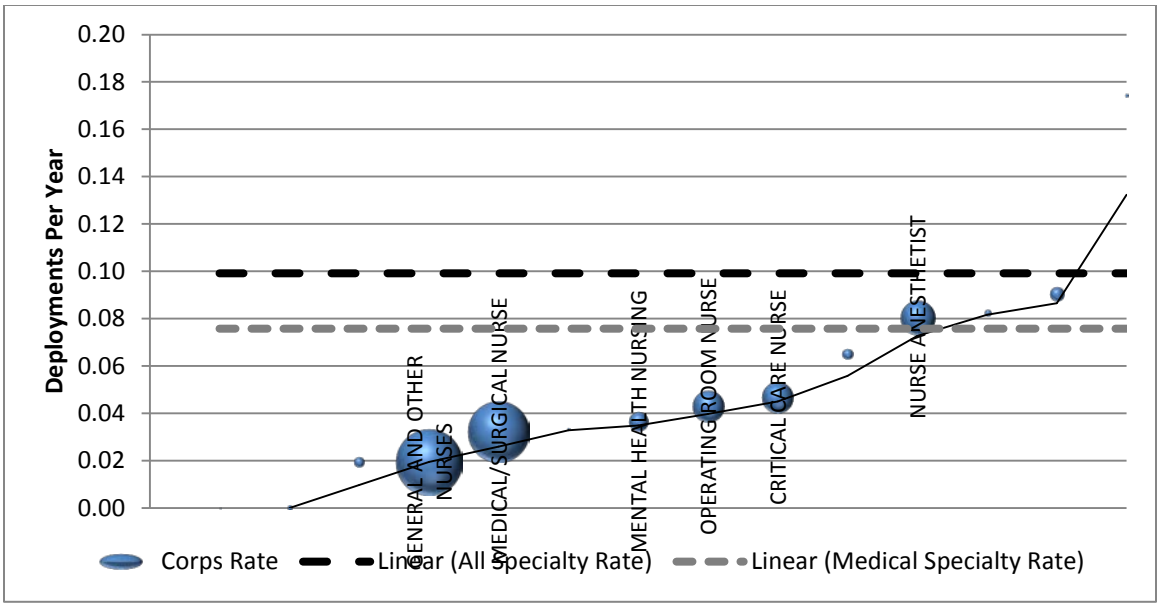

Figure A-11. Army Nursing Corps Reserve and Guard Deployments per Year by Specialty, 2001–12

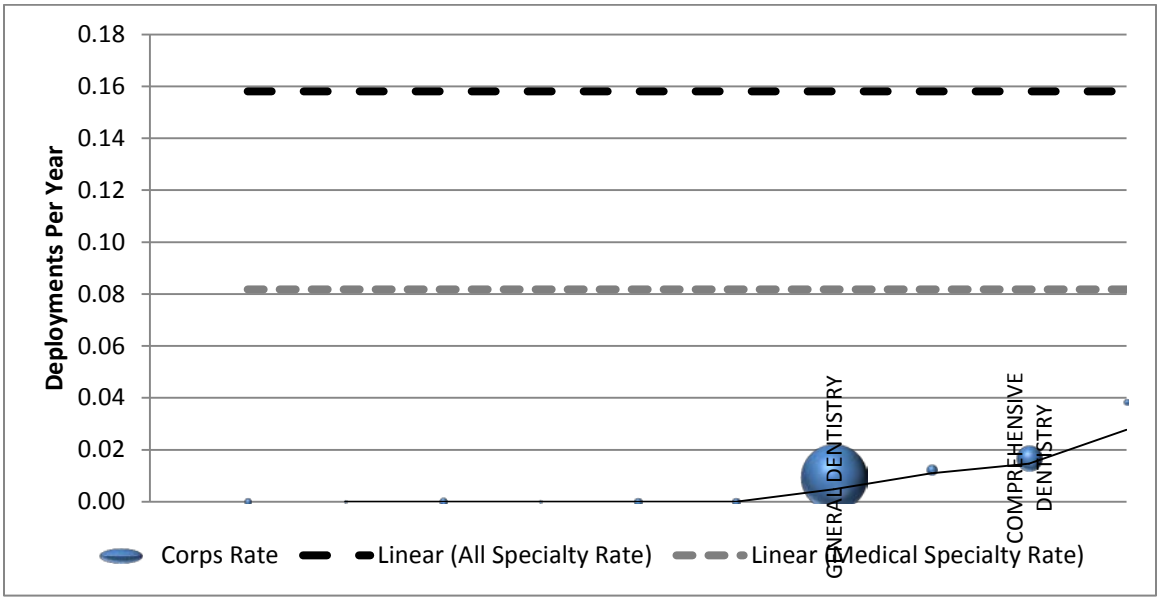

Figure A-12. Air Force Dental Corps Reserve and Guard Deployments per Year by Specialty, 2001–12

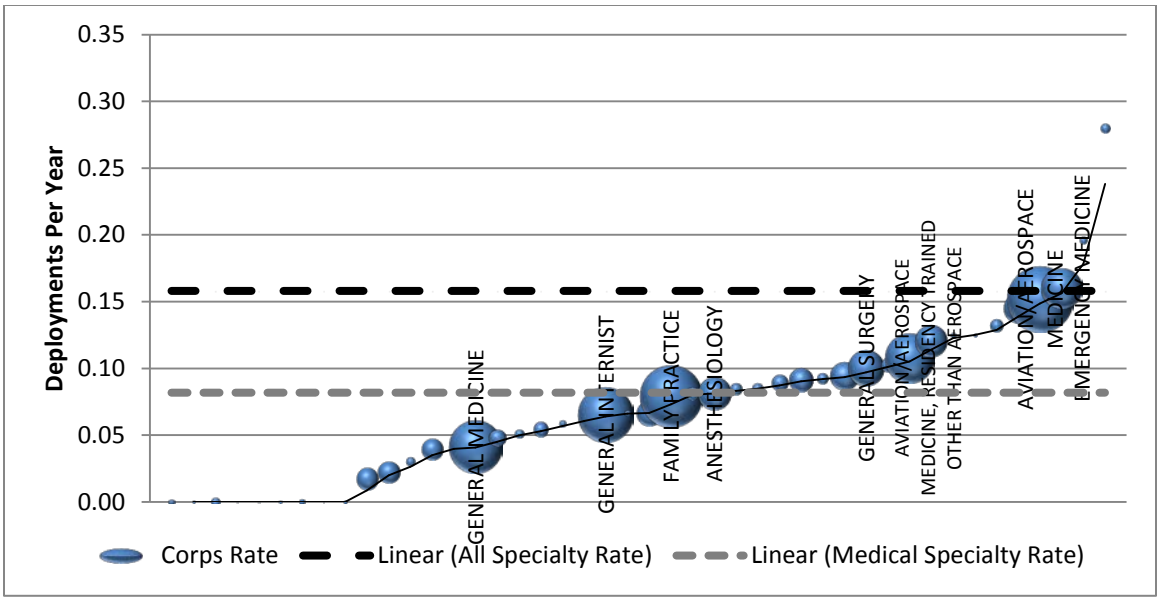

Figure A-13. Air Force Medical Corps Reserve and Guard Deployments per Year by Specialty, 2001–12

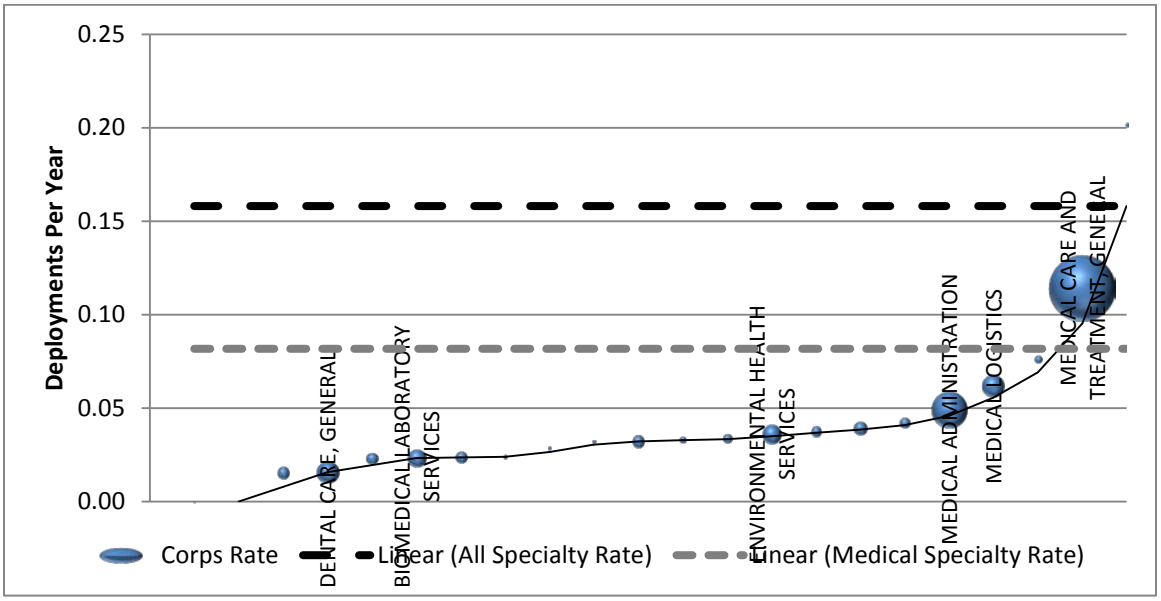

Figure A-14. Air Force Enlisted Medical Corps Reserve and Guard Deployments per Year by Specialty, 2001–12

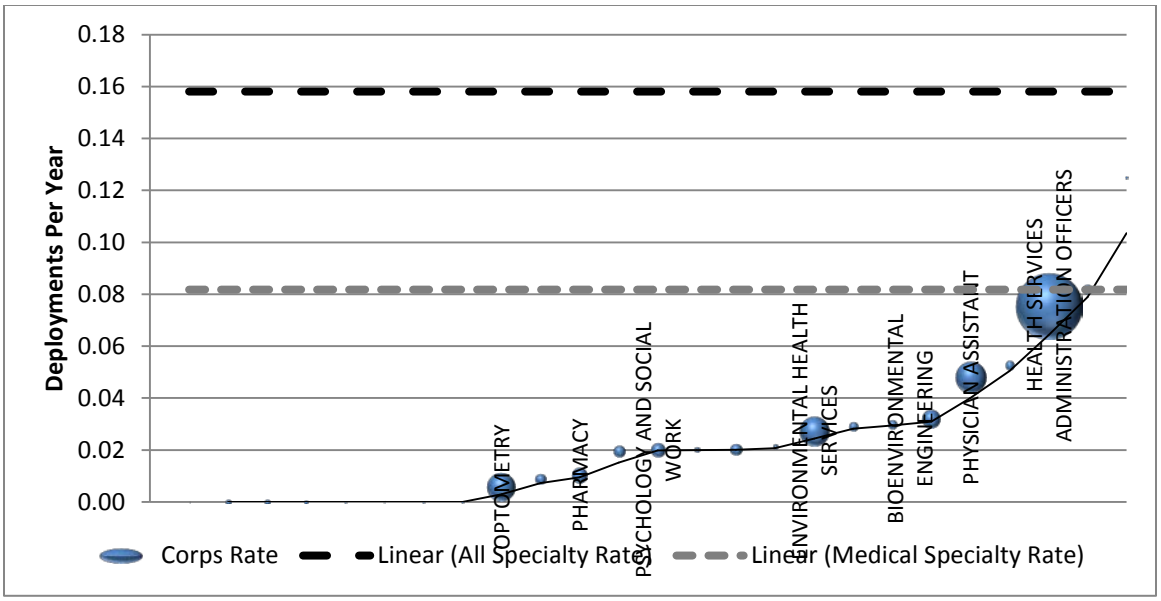

Figure A-15. Air Force Medical Service Corps Reserve and Guard Deployments per Year by Specialty, 2001–12

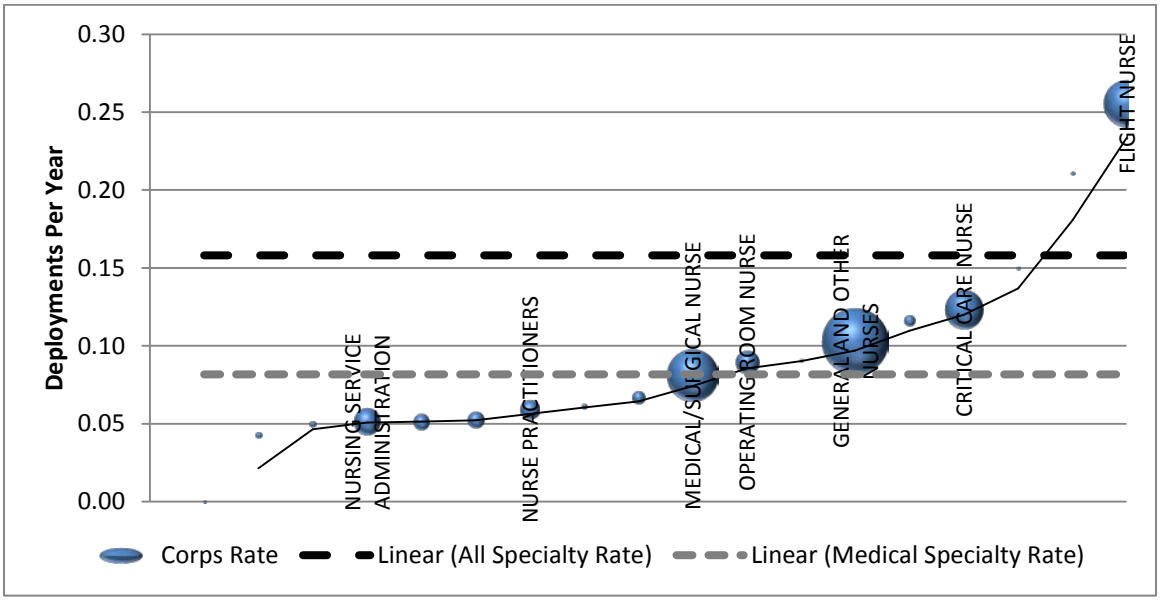

Figure A-16. Air Force Nursing Corps Reserve Deployments and Guard per Year by Specialty, 2001–12

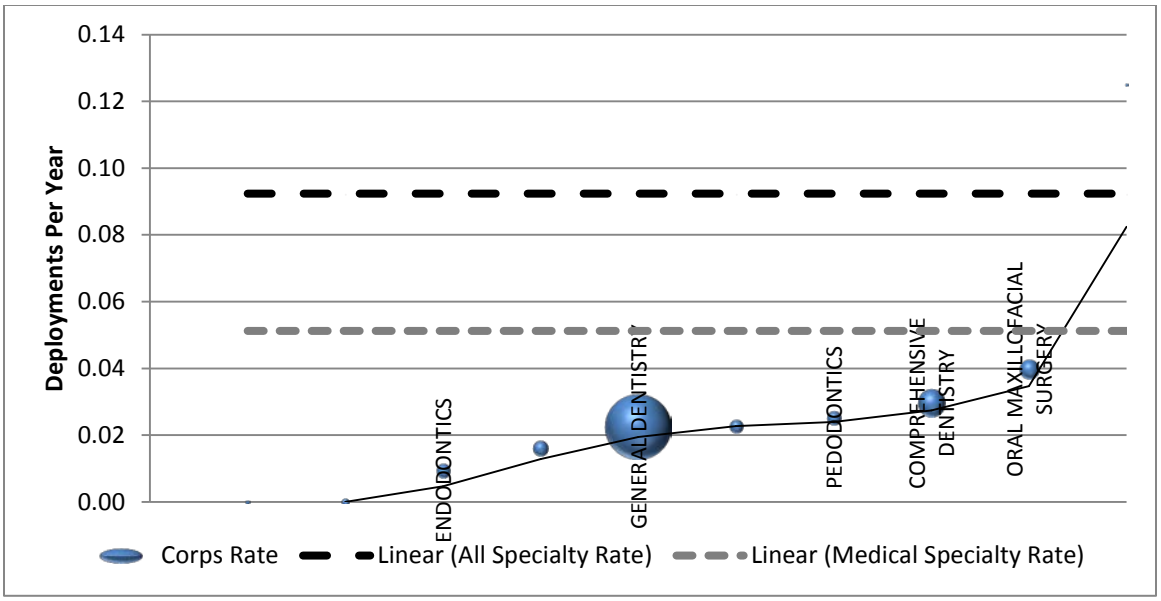

Figure A-17. Navy Dental Corps Reserve Deployments per Year by Specialty, 2001–12

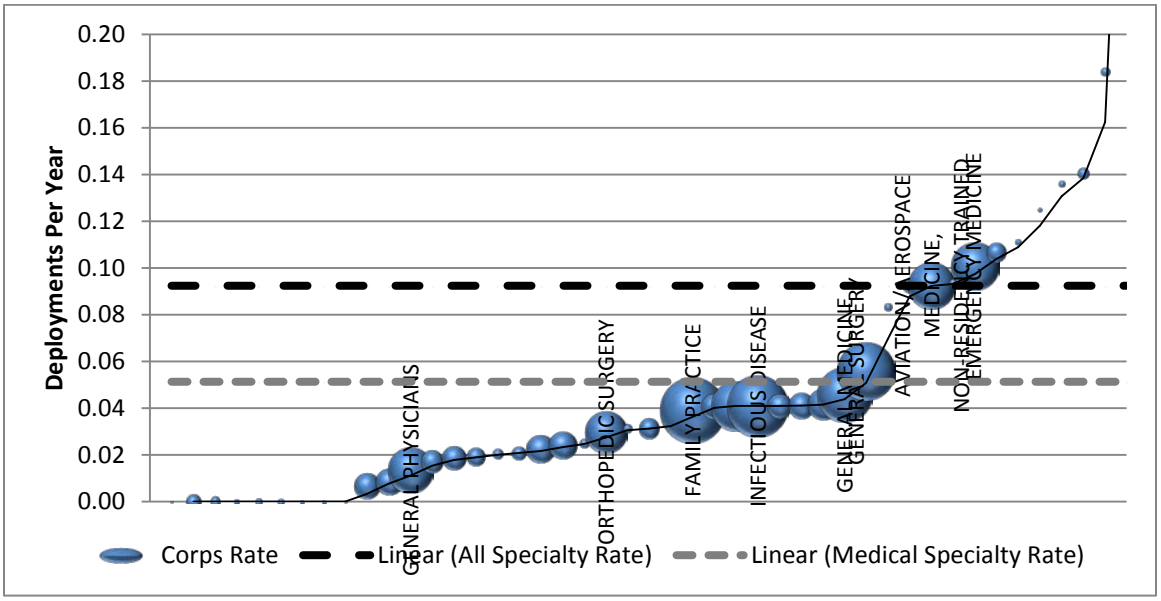

Figure A-18. Navy Medical Corps Reserve Deployments per Year by Specialty, 2001–12

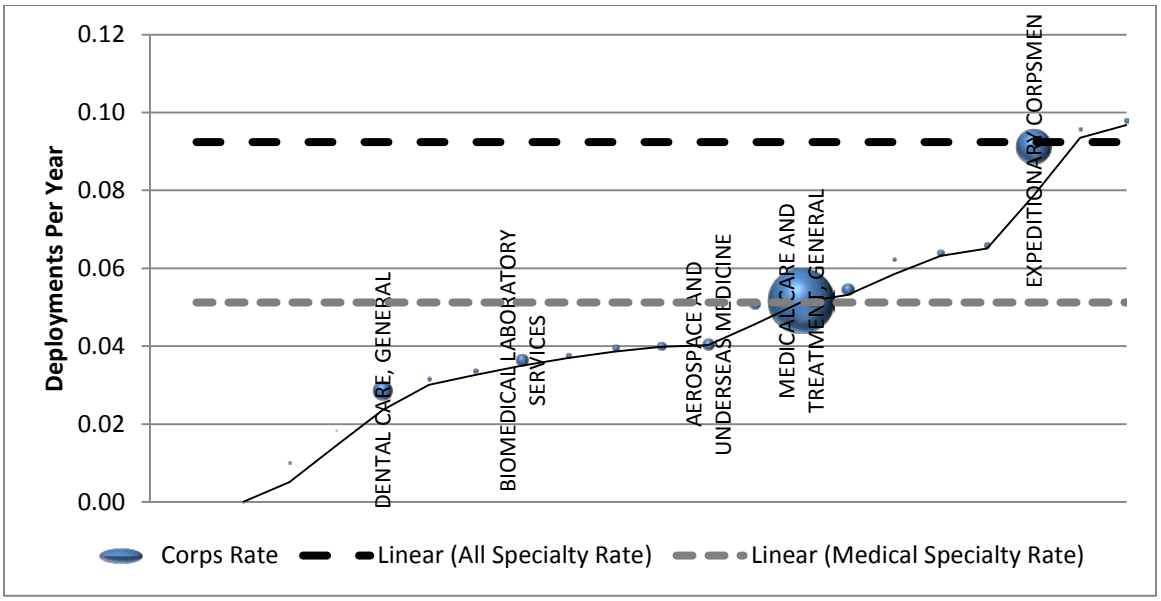

Figure A-19. Navy Enlisted Medical Corps Reserve Deployments per Year by Specialty, 2001–12

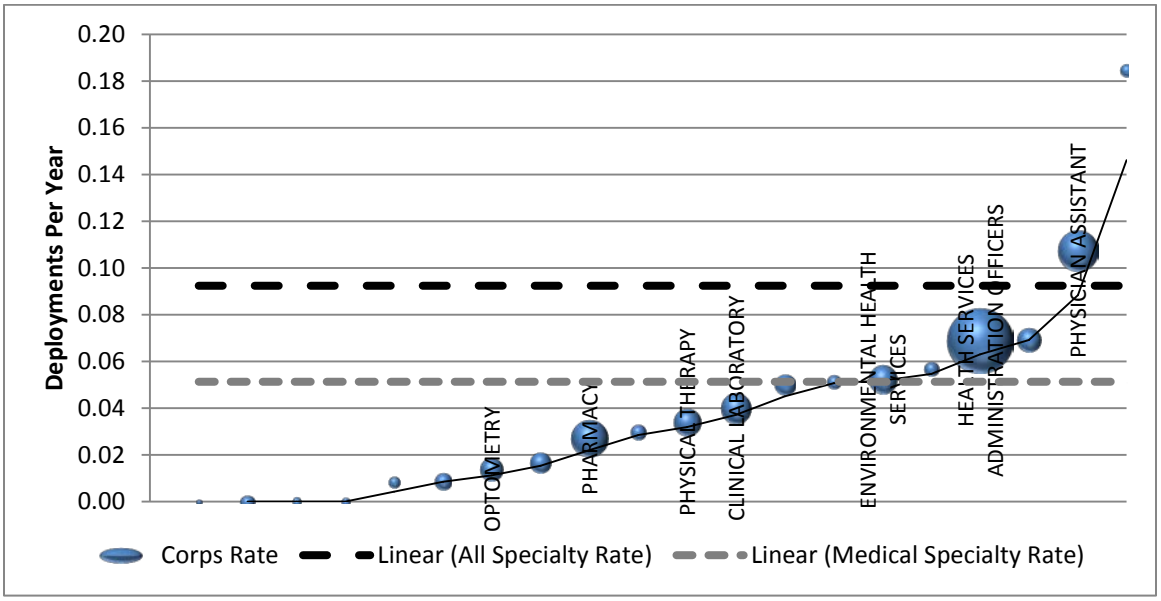

Figure A-20. Navy Medical Service Corps Reserve Deployments per Year by Specialty, 2001–12

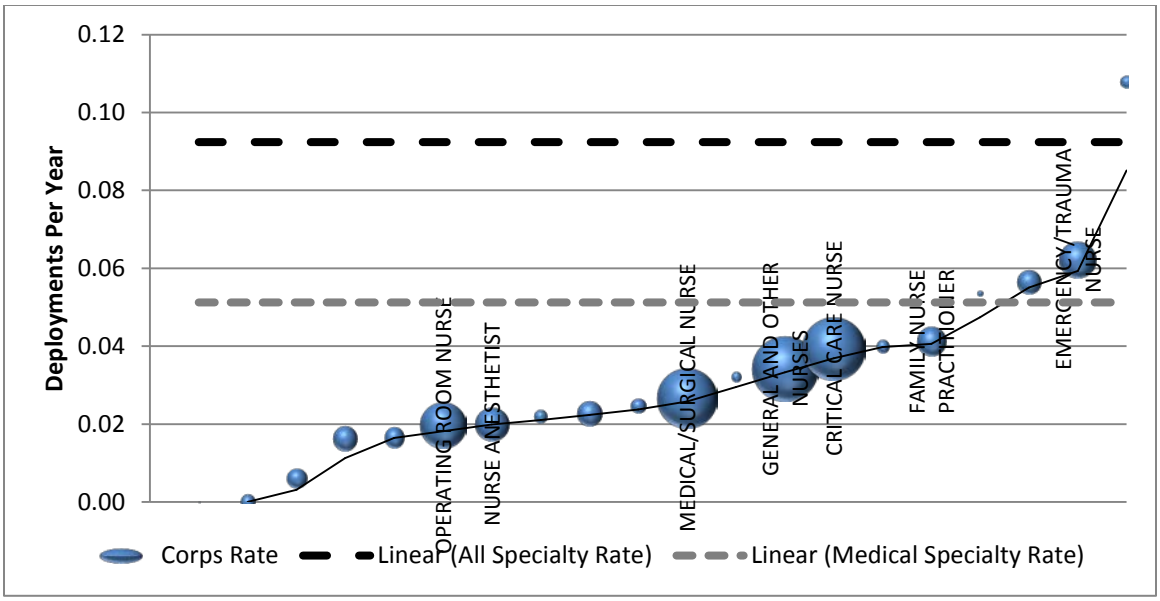

Figure A-21. Navy Nursing Corps Reserve Deployments per Year by Specialty, 2001–12

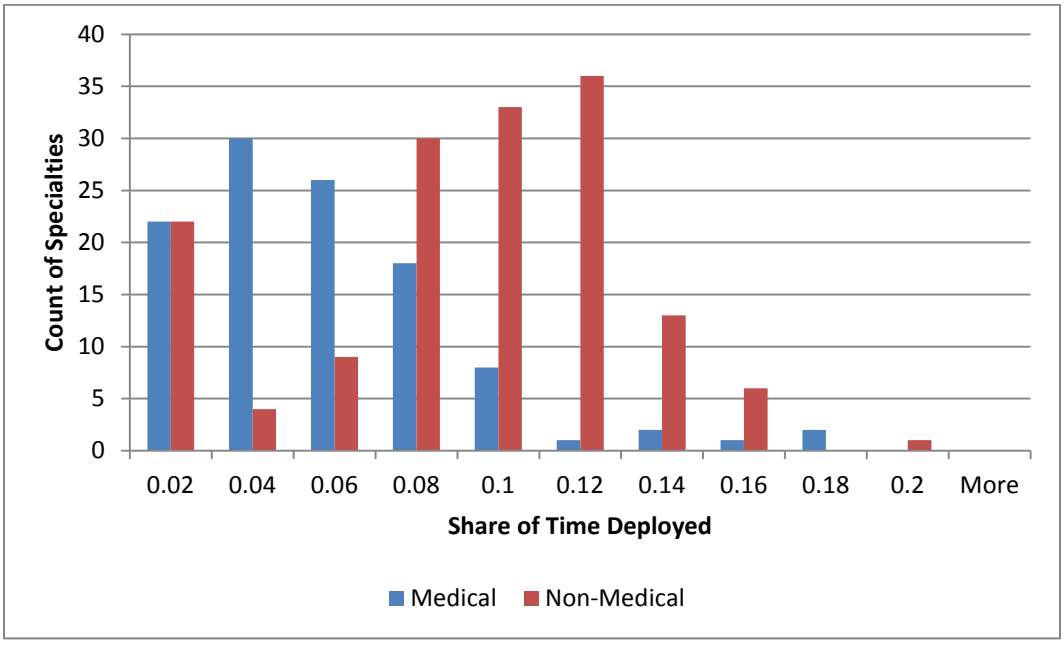

Figure A-22. Army Reserve and Guard Share of Time Deployed, Medical and Non-Medical Specialties, 2001–12

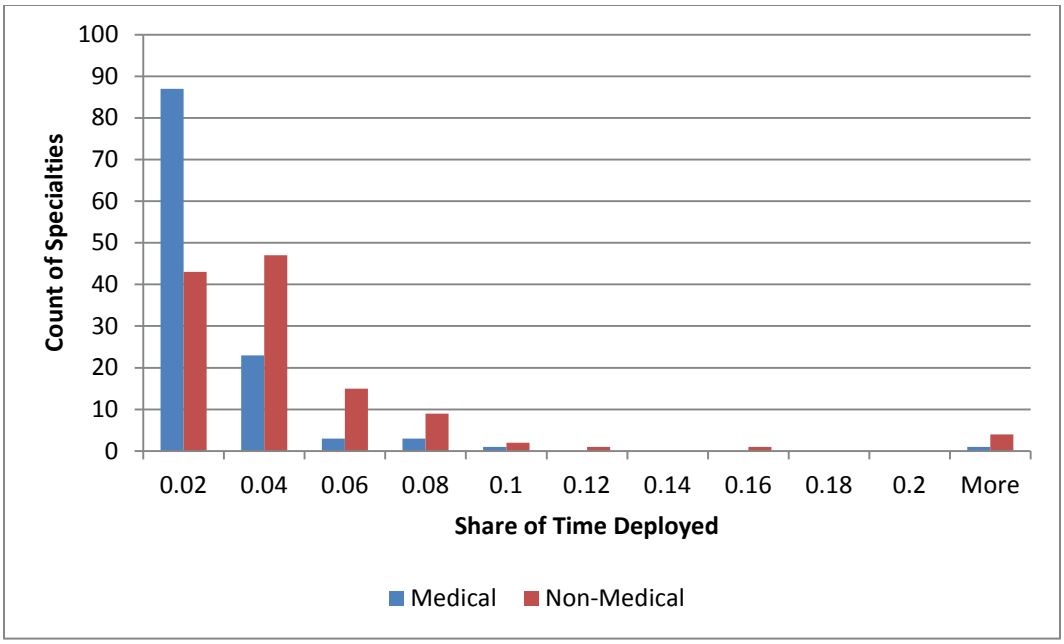

Figure A-23. Air Force Reserve and Guard Share of Time Deployed, Medical and Non-Medical Specialties, 2001–12

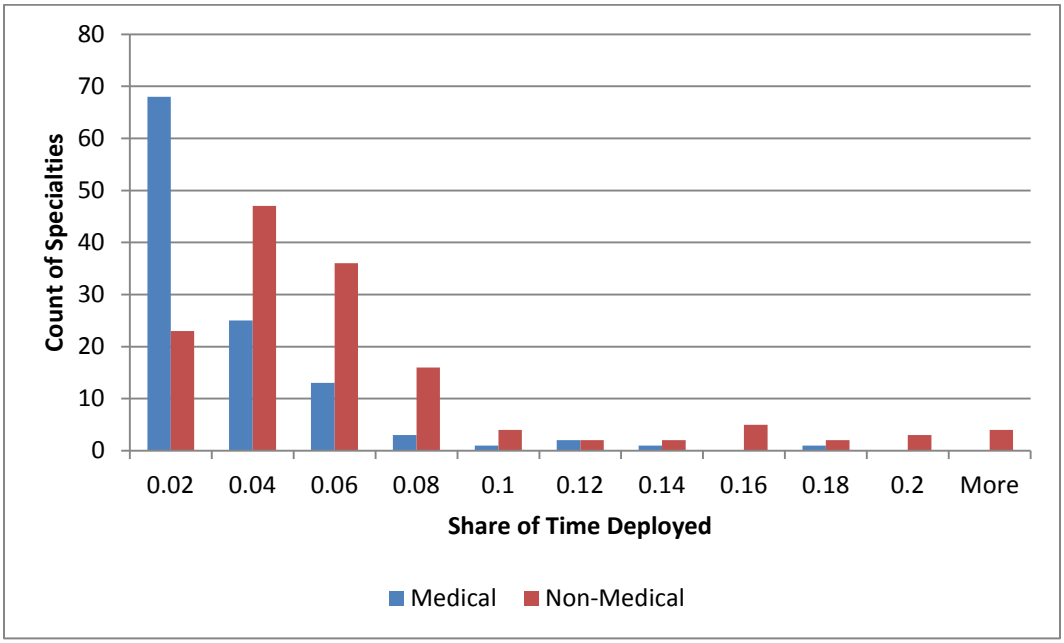

Figure A-24. Navy Reserve and Guard Share of Time, 2001–12

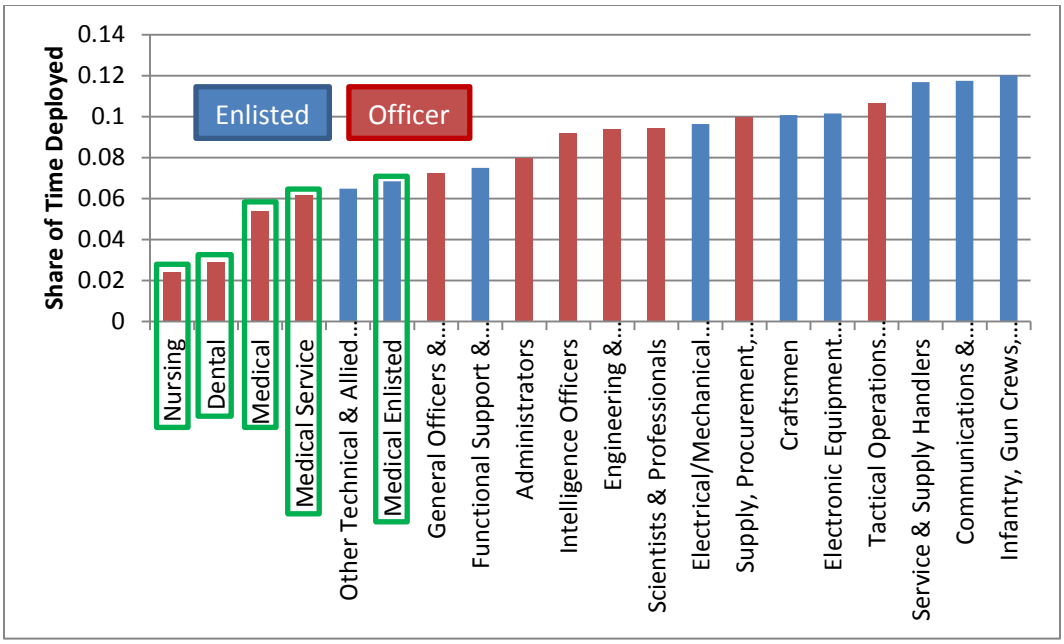

Figure A-25. Army Reserve and Guard Share of Time Deployed by Occupational Group, 2001–12

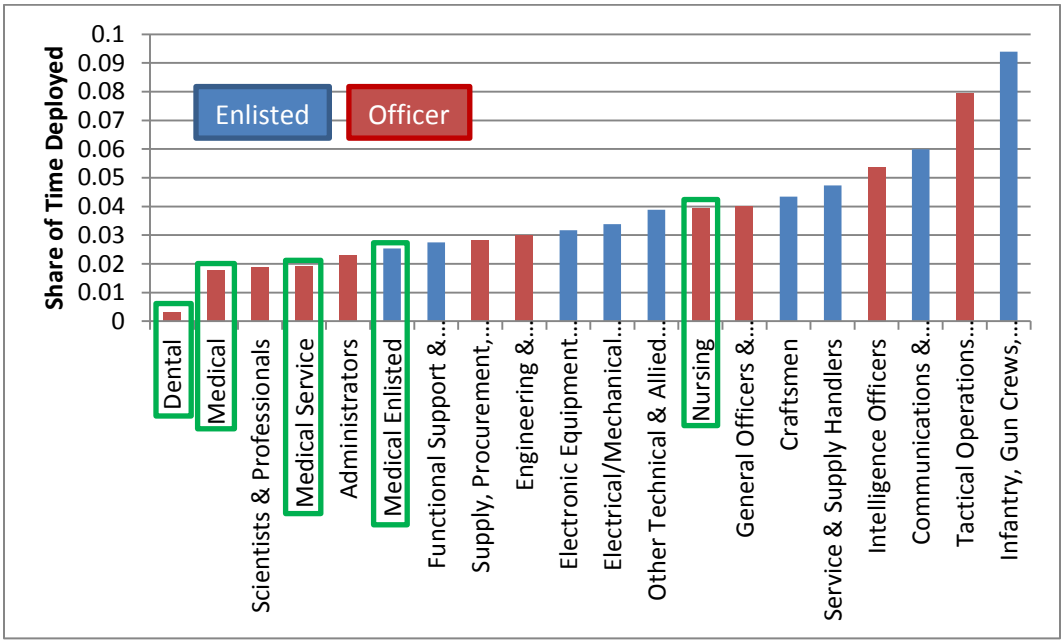

Figure A-26. Air Force Reserve and Guard Share of Time Deployed by Occupational Group, 2001–12

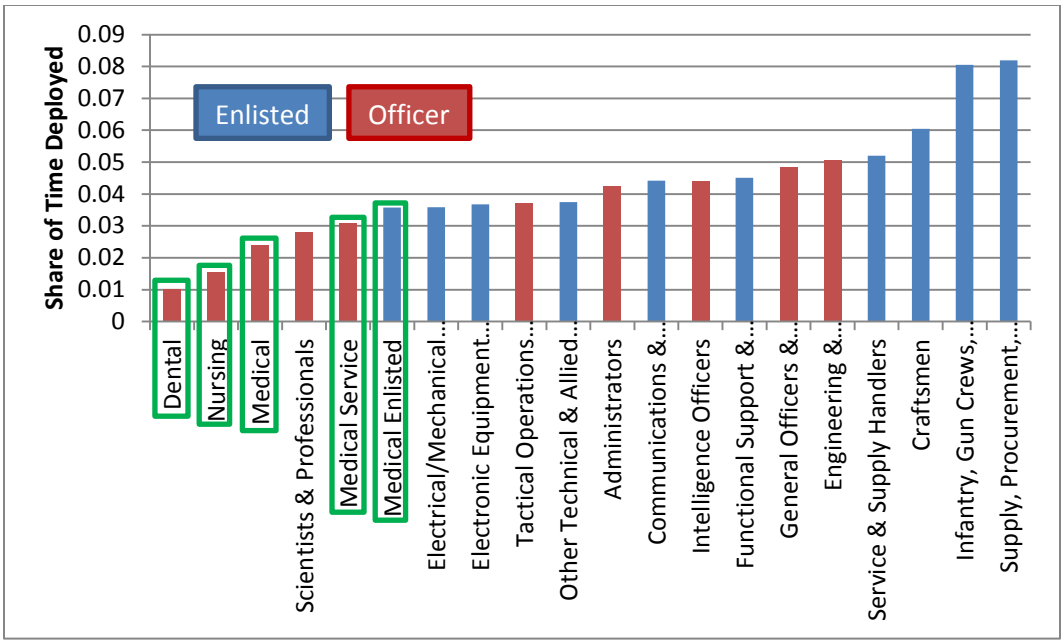

Figure A-27. Navy Reserve and Guard Share of Time Deployed by Occupational Group, 2001–12

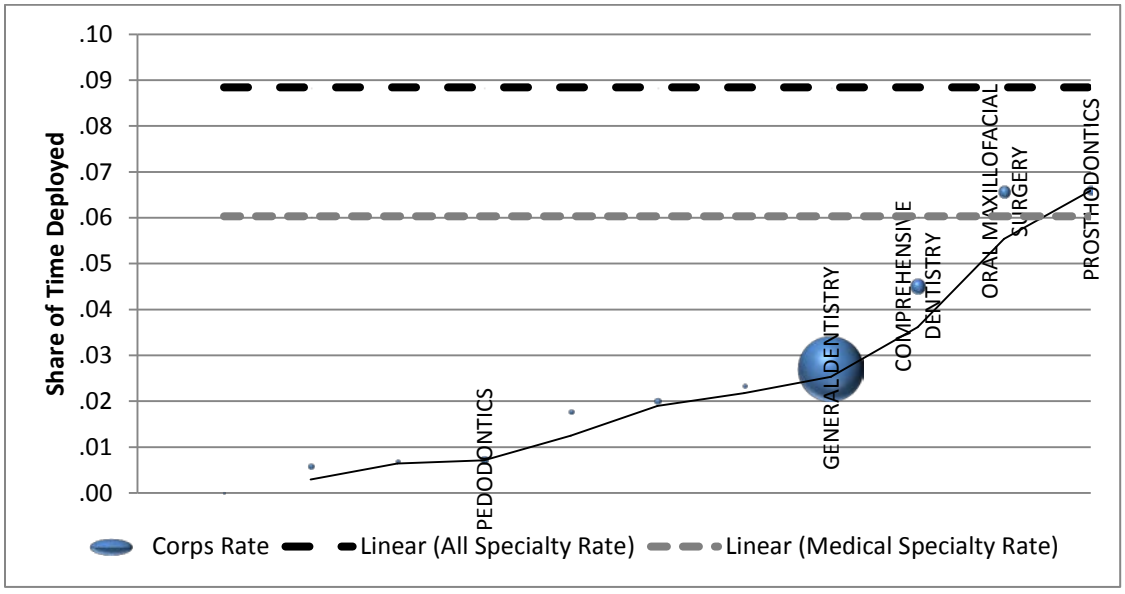

Figure A-28. Army Reserve and Guard Dental Corps Share of Time Deployed by Specialty, 2001–12

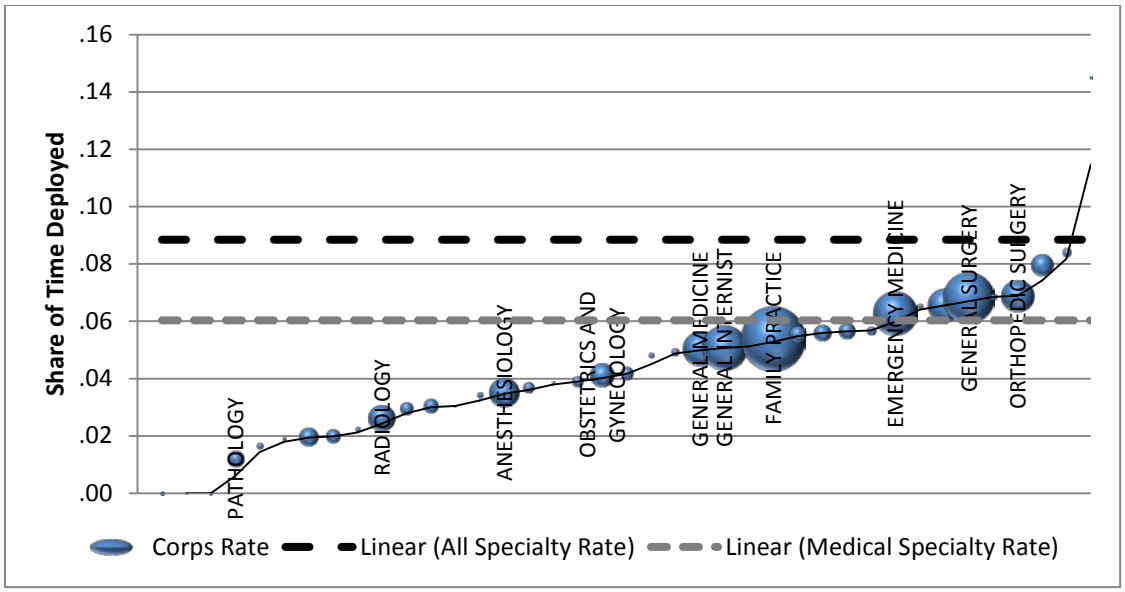

Figure A-29. Army Reserve and Guard Medical Corps Share of Time Deployed by Specialty, 2001–12

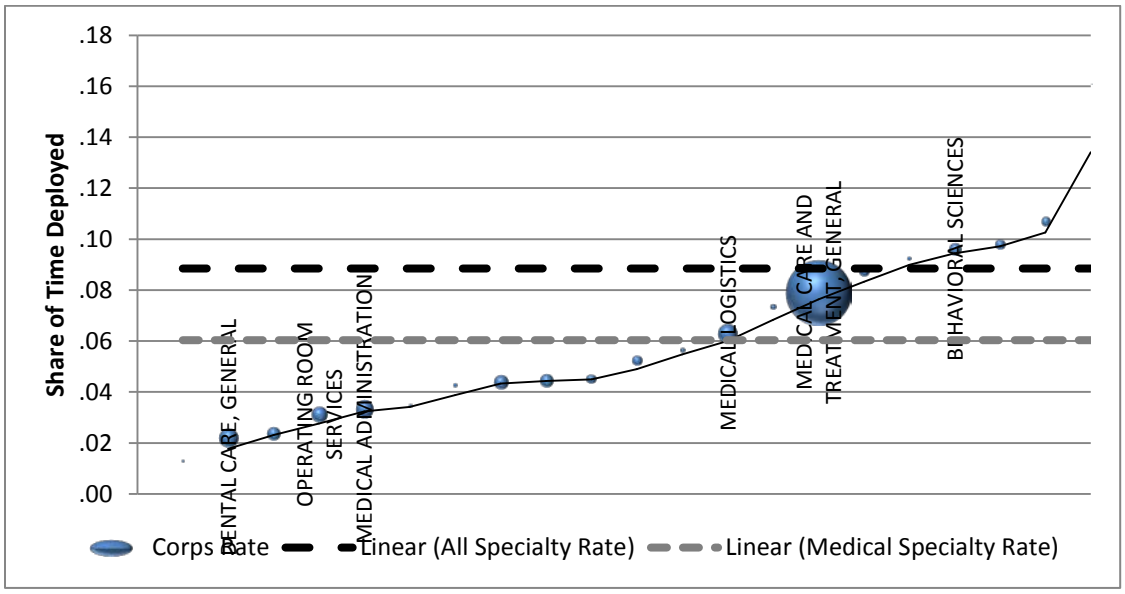

Figure A-30. Army Reserve and Guard Enlisted Medical Corps Share of Time Deployed by Specialty, 2001–12

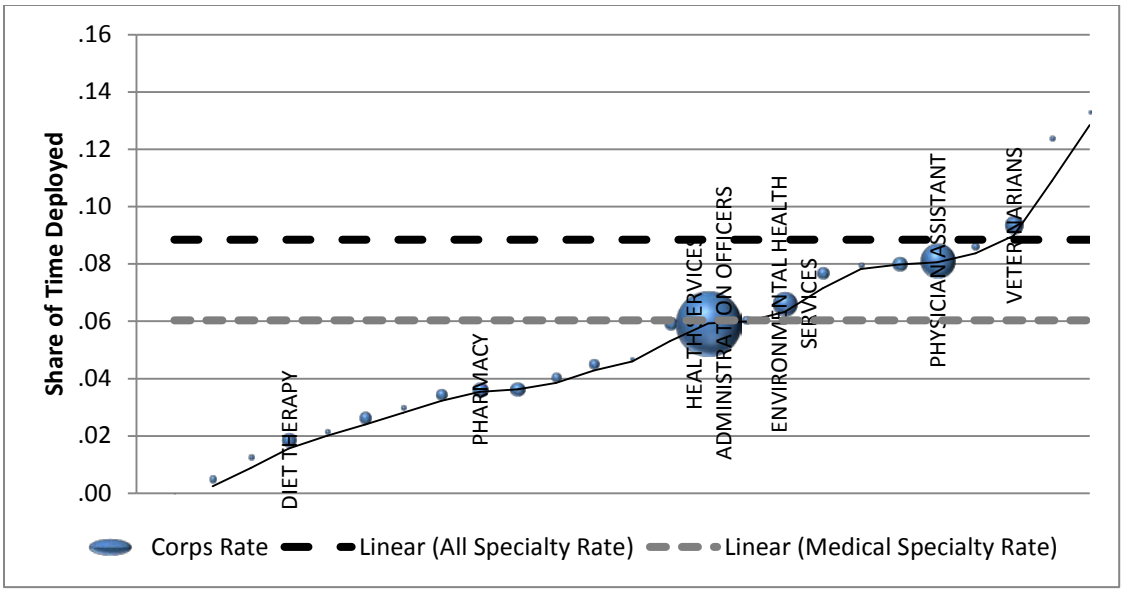

Figure A-31. Army Reserve and Guard Medical Service Corps Share of Time Deployed by Specialty, 2001–12

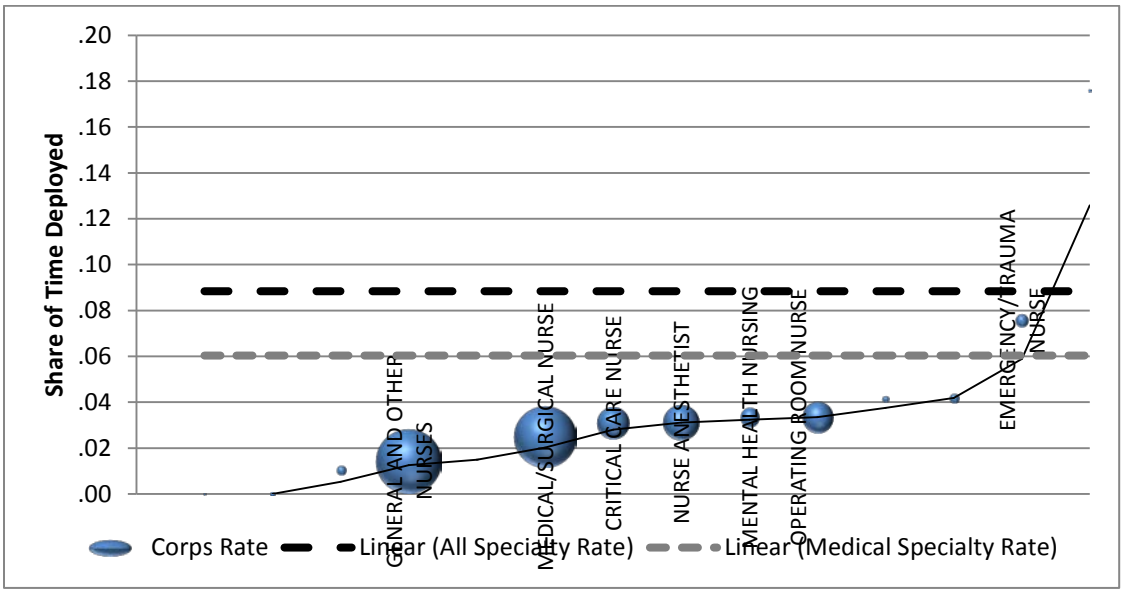

Figure A-32. Army Reserve and Guard Nursing, 2001–12

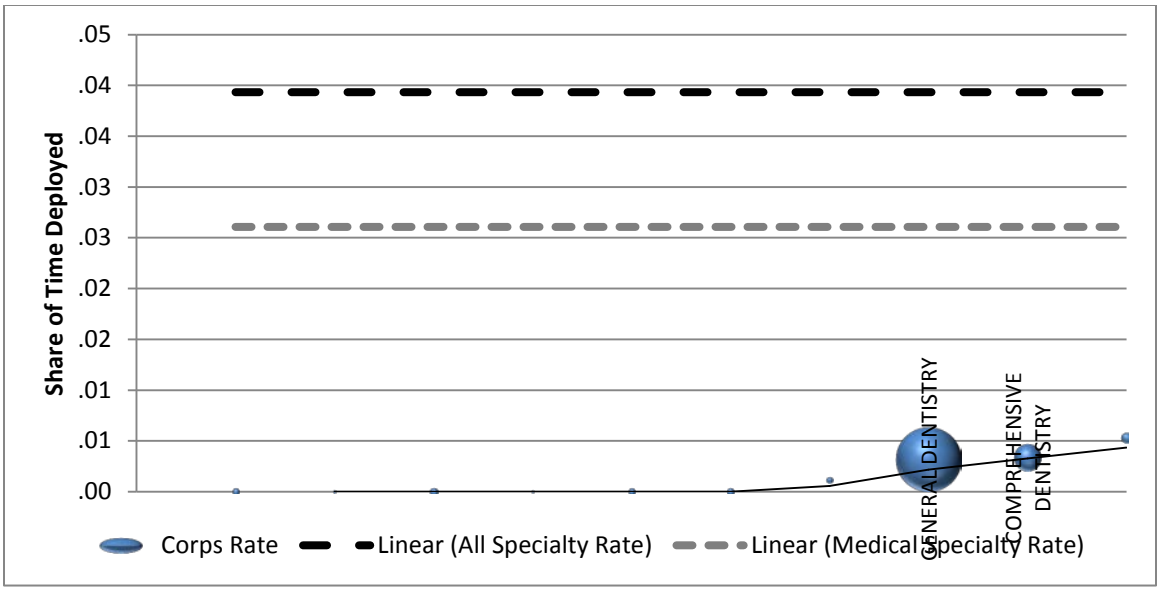

Figure A-33. Air Force Reserve and Guard Dental Corps Share of Time Deployed by Specialty, 2001–12

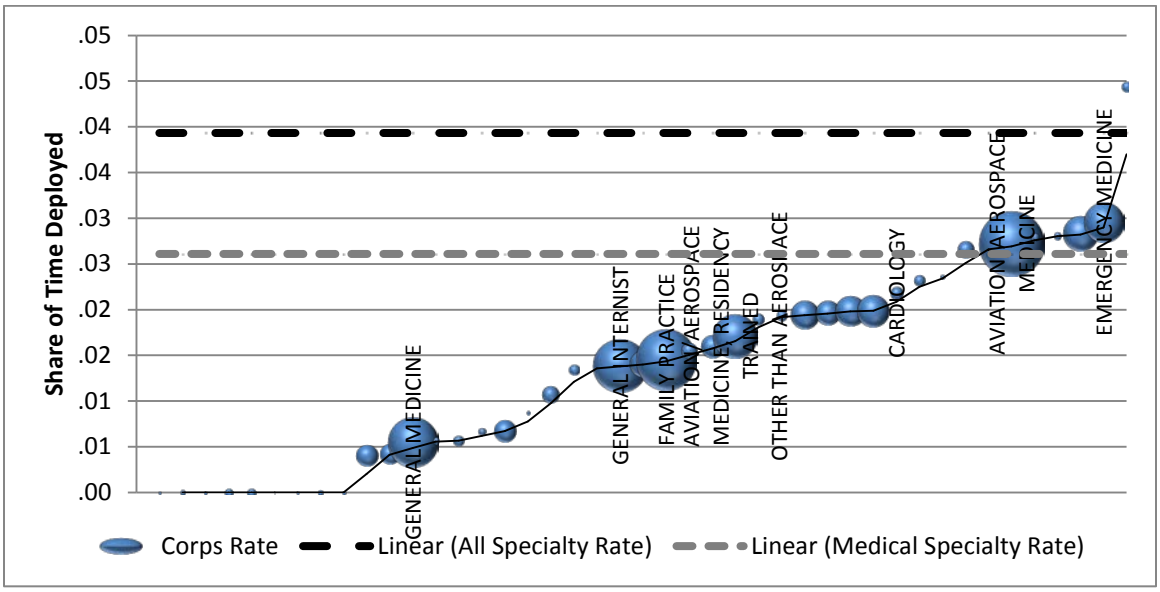

Figure A-34. Air Force Reserve and Guard Medical Corps Share of Time Deployed by Specialty, 2001–12

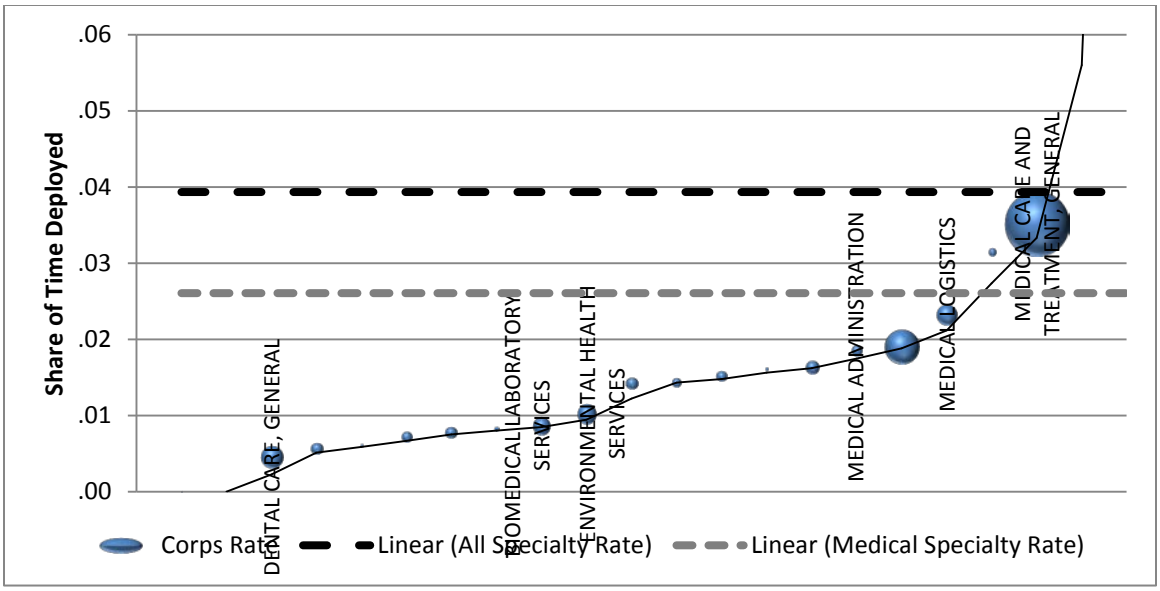

Figure A-35. Air Force Reserve and Guard Enlisted Medical Corps Share of Time Deployed by Specialty, 2001–12

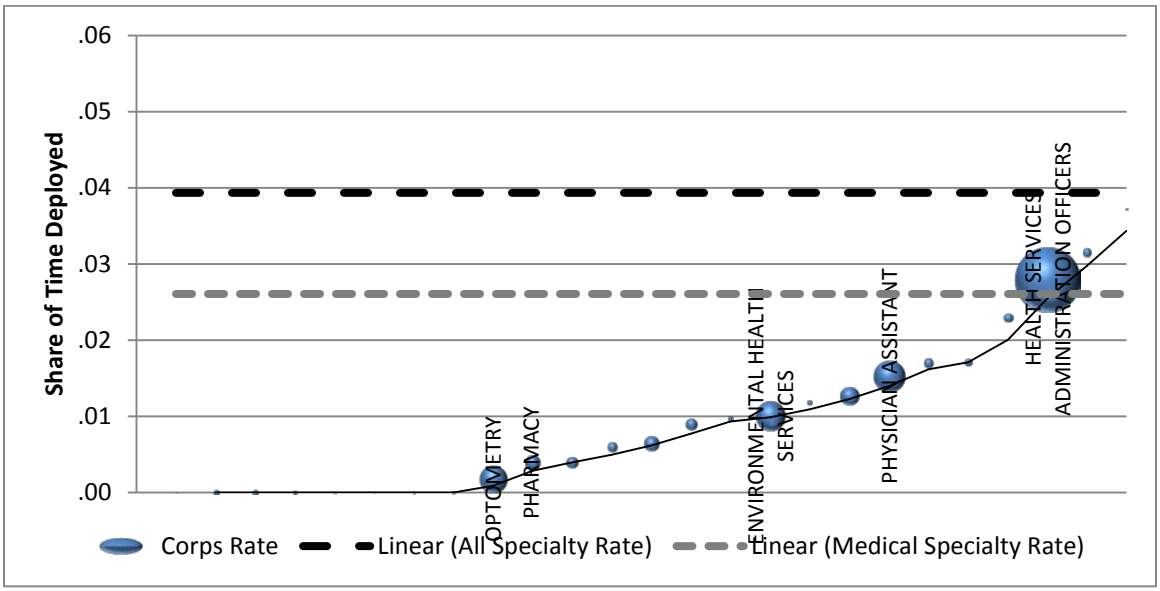

Figure A-36. Air Force Reserve and Guard Medical Service Corps Share of Time Deployed by Specialty, 2001–12

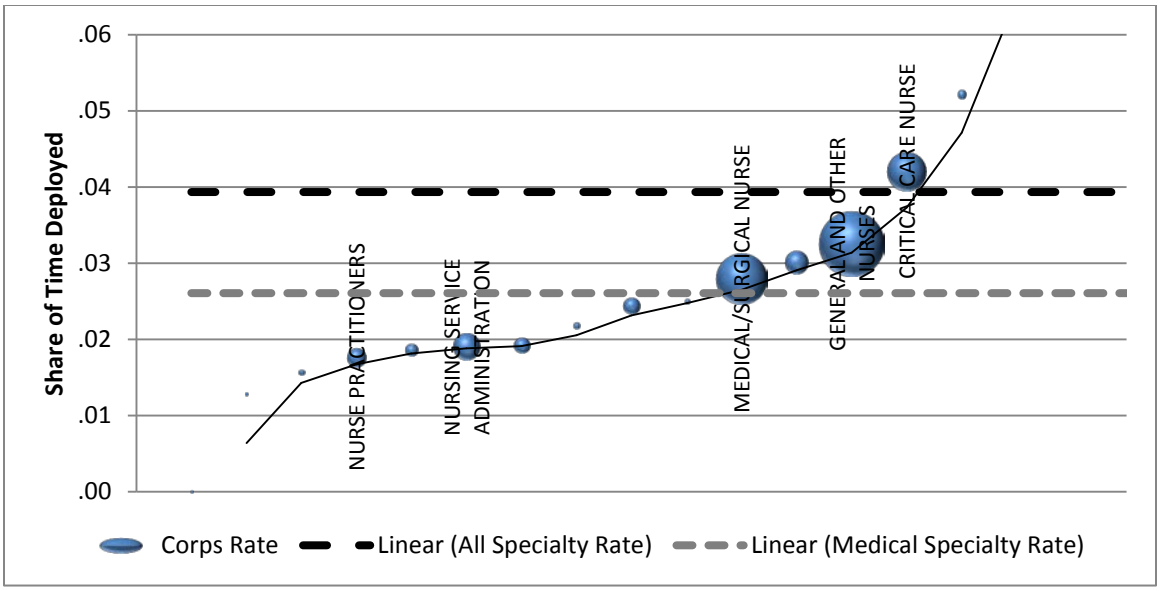

Figure A-37. Air Force Reserve and Guard Nursing Corps Share of Time Deployed by Specialty, 2001–12

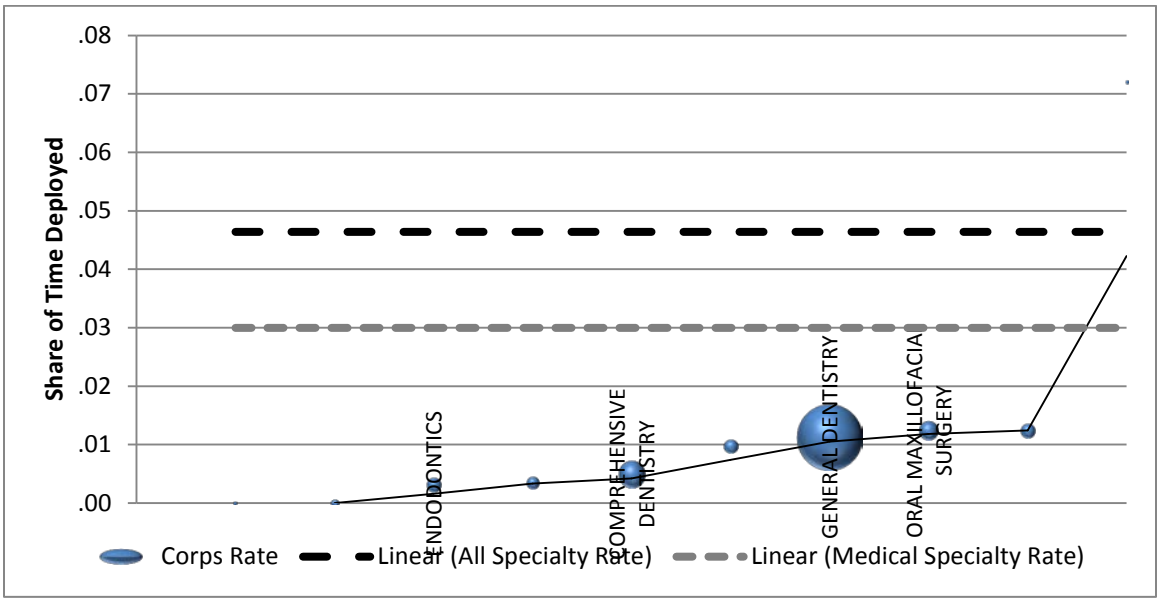

Figure A-38. Navy Reserve and Guard Dental Corps Share of Time Deployed by Specialty, 2001–12

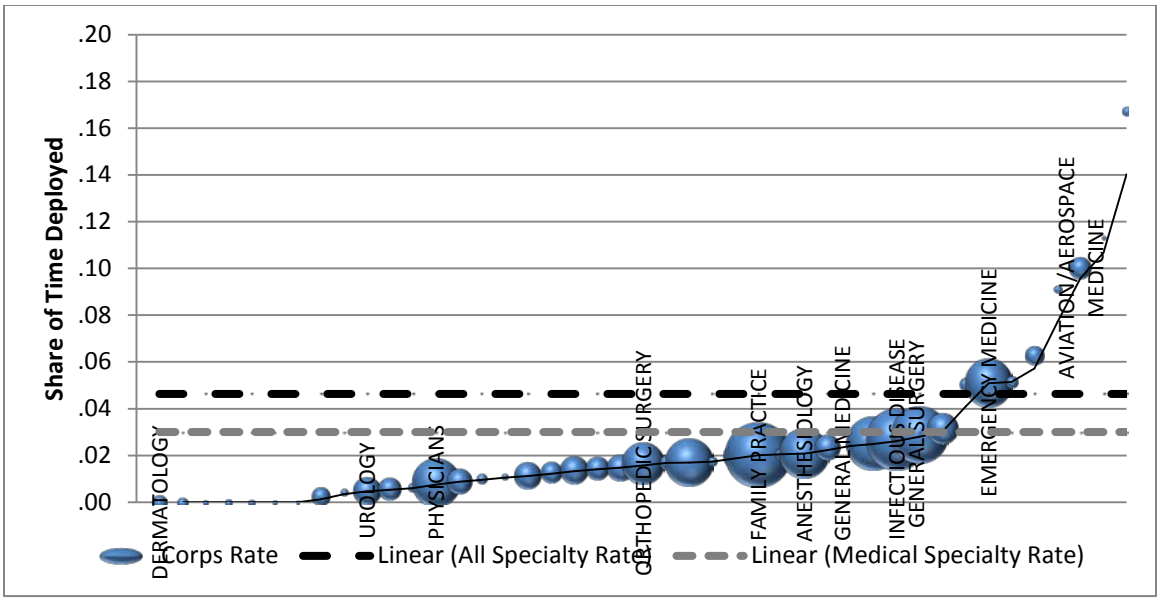

Figure A-39. Navy Reserve and Guard Medical Corps Share of Time Deployed by Specialty, 2001–12

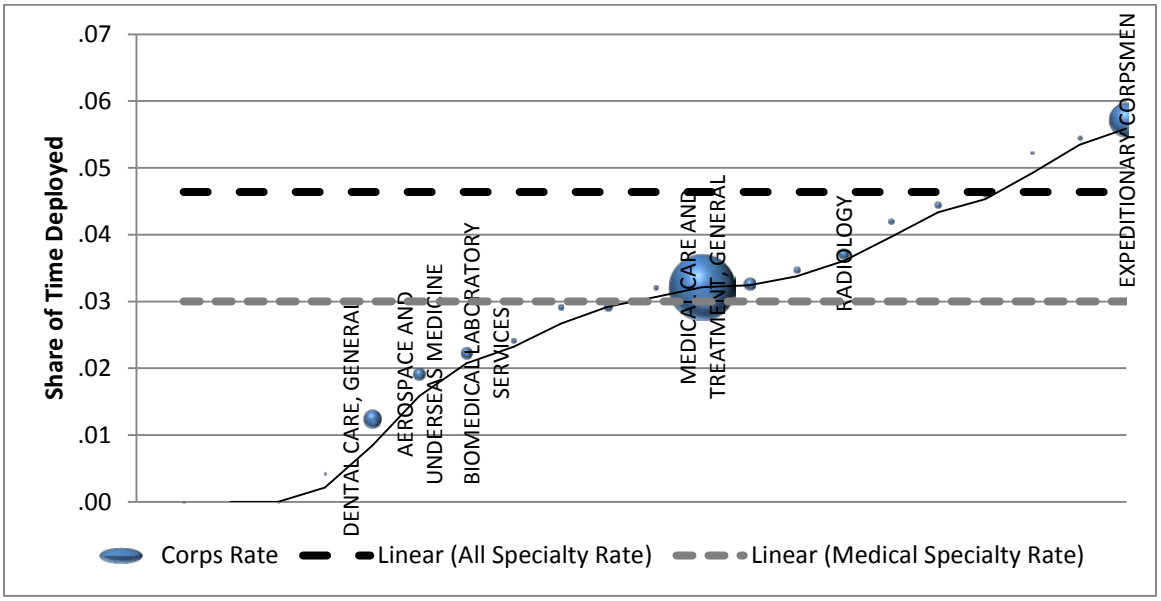

Figure A-40. Navy Reserve and Guard Enlisted Medical Corps Share of Time Deployed by Specialty, 2001–12

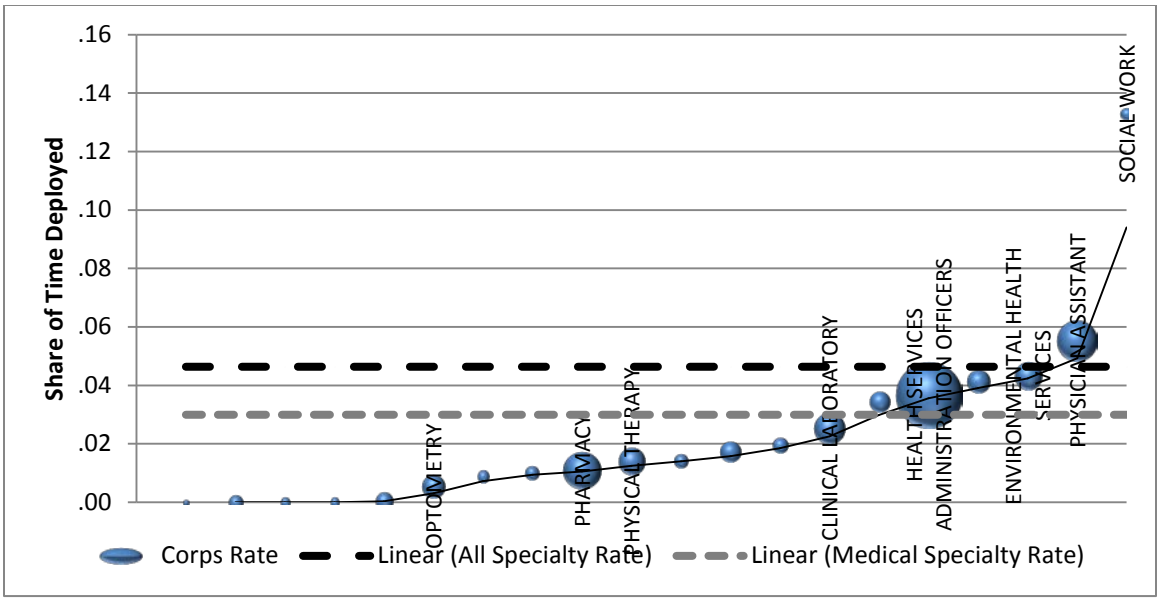

Figure A-41. Navy Reserve and Guard Medical Service Corps Share of Time Deployed by Specialty, 2001–12

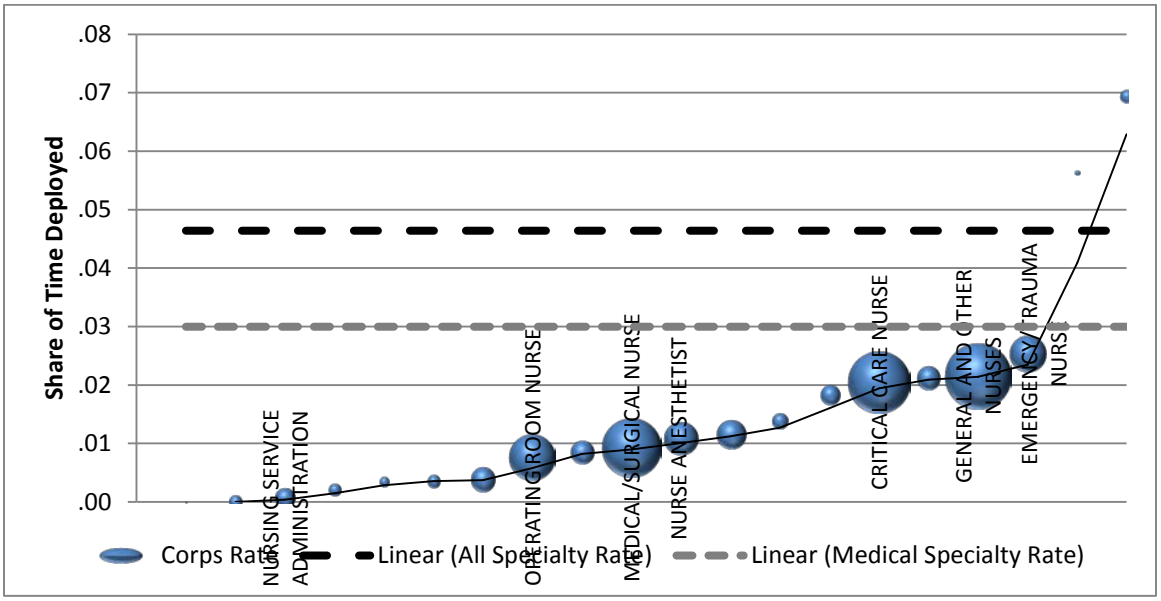

Figure A-42. Navy Reserve and Guard Nursing Corps Share of Time Deployed by Specialty, 2001–12

Appendix B.
CFDB Data Description and Detailed Results

To analyze medical requirements, the IDA team obtained a portion of the 2011 Current Forces Database (CFDB) from the Office of the Secretary of Defense (OSD) office of Cost Assessment and Program Evaluation (CAPE). The CFDB contains unit manning data for all units currently in the Department of Defense (DoD) inventory. This includes both deployable units, such as infantry battalions, as well as non-deployable training and staff units, such as the Service Academies or OSD. For each unit,[1] the CFDB reports the number of billets required, authorized, and currently on hand by occupation, rank, and other indicators. The portion of the CFDB that we received contains all billets for medical units (such as Military Treatment Facilities and Combat Support Hospitals (MTFs and CSHs)) and all medical billets in non-medical units (like line or staff units). Non-medical billets in non-medical units were excluded from the data we obtained.

The IDA team used the CFDB to further examine military medical requirements. The CFDB is not a perfect match for the Service sizing models (Army's Total Army Assessment (TAA), Navy's Medical Manpower All Corps Requirements Estimator (MedMACRE), or Air Force's Critical Operational Readiness Requirements (CORR)). One limitation on comparisons between Service sizing models and CFDB "requirements" is their temporal perspective. Service sizing models provide programmatic requirements for medical manpower in future years while the CFDB describes billets required, authorized, and on-hand for units currently in the DoD inventory. If unit structures or quantities are expected to change substantially in future years, there will be a disconnect between the two measures.

Additionally, the CFDB unit manning documents are generated from a later stage in the force generation process which incorporates risk in the number of units actually funded. For example, if a Service medical sizing model estimated a requirement for ten combat hospitals, but the Service decided to fund nine, it is possible that a requirement for ten hospitals may appear in the sizing models as compared to nine hospitals in the CFDB.

Despite the differences in perspective between the sizing models and the CFDB, the two data sources report relatively similar estimates of requirements and end strength. As

[1] Units in the CFDB are uniquely identifiable by Unit Identification Codes (UICs) and unit names.

displayed in Table B-1, the Army's CFDB estimate of requirements is nearly identical, both by corps and specialty, to its TAA sizing model. The Air Force reports a slight divergence between the CFDB and the CORR sizing model, but is generally consistent by specialty requirements (Table B-2). The Navy's 2012 MedMACRE model (Table B-3) is the one exception to this consistency, but as discussed in Chapter 2, the MedMACRE estimate is also inconsistent with prior Navy requirements estimates, which are closer to CFDB requirements. For all three Services, the CFDB's "on hand" estimate matches almost perfectly the medical end strength numbers in the 2011 Health Manpower Personnel Data System (HMPDS) Report (Navy did not report on-hand data at the corps or specialty level in CFDB, but it matched in total).

Table B-1. Army Comparison in Requirements and End Strength with CFDB

Medical Corps	Service Sizing Requirement	CFDB Requirement	HMPDS End Strength	CFDB On Hand
Medical Corps	4,993	5,009	4,369	4,338
Dental Corps	1,158	1,093	990	980
Nursing Corps	4,240	4,161	4,120	4,104
Medical Service Corps	6,580	6,233	7,120	6,932
Enlisted Corps	33,097	32,396	35,801	35,664
Total All Corps	50,068	48,892	52,400	52,018

Source: CFDB, Army TAA, and HMPDS for 2001.

Table B-2. Air Force Comparison in Requirements and End Strength with CFDB

Medical Corps	Service Sizing Requirement	CFDB Requirement	HMPDS End Strength	CFDB On Hand
Medical Corps	3,319	3,635	3,474	3,424
Dental Corps	1,037	1,936	1,040	1,803
Nursing Corps	3,200	2,633	3,312	2,597
Medical Service Corps	2,580	3,563	3,350	3,339
Enlisted Corps	15,031	20,344	20,718	19,595
Total All Corps	25,169	32,111	31,894	30,758

Source: CFDB, Air Force CORR, and HMPDS for 2001.

Table B-3. Navy Comparison in Requirements and End Strength with CFDB

Medical Corps	Service Sizing Requirement	CFDB Requirement	HMPDS End Strength	CFDB On Hand*
Medical Corps	4,083	3,563	3,819	--
Dental Corps	1,215	1,114	1,058	--
Nursing Corps	3,553	2,824	2,895	--
Medical Service Corps	2,805	2,770	2,492	--
Enlisted Corps	29,686	26,892	24,622	--
Total All Corps	41,342	37,163	34,886	--

Source: CFDB and HMPDS for 2001; Navy MedMACRE for 2012.

* Navy CFDB does not report "On Hand" billets at Corps or Specialty level.

The CFDB provides a useful supplement to the Service sizing models because it allows assessment of the utilization of medical billets. Unlike the Service sizing models, the CFDB allows characterization of billet requirements according to the deployability status of the units to which they were assigned. Medical requirements for deployable units are generally consistent with the military essentiality criteria of DoDI 1100.22. To be consistent with DoDI 1100.22, billets in non-deployable units generally must generate, support, or sustain deployable medical capabilities.

The CFDB contains data that allowed IDA researchers to determine the deployability status for each unit reported in the inventory. Each unit in the CFDB is uniquely identifiable by its Unit Identification Code (UIC) and a Unit Type Code (UTC). From this data, we determined the deployability status of units, and thereby medical billet requirements, in the CFDB. However, each Service identified and accounted for deployable units in a different manner. Differing methodologies influenced the size of each Service's deployable requirements. Because of these differences, described below, we generally avoided making comparisons between Services using CFDB data, but rather focused on comparisons to unit requirements within a particular Service.

CFDB data for the Army provided the most straightforward assessment of deployable requirements. The Army codes a unit's deployability status in the second character of its UIC. Units with an alphabetic UIC second character are contained in the Table of Organization and Equipment and deployable. Units with a numeric UIC second character are contained in the Table of Distribution and Allowances and are not deployable. This division was also done for the Army's TAA data, which, unlike the other Services, was reported by UIC. The TAA and CFDB measures of deployable and non-deployable requirements were virtually identical. Table B-4 provides this data for the medical corps.

Table B-4. Army Medical Corps Specialty Comparison in Requirements with CFDB

Medical Corps Specialty	TAA Total Requirement	TAA Deployable Requirement	CFDB Total Requirement	CFDB Deployable Requirement
GENERAL MEDICINE	383	378	383	378
AVIATION/AEROSPACE MEDICINE	214	120	217	123
GENERAL SURGERY	347	99	348	99
EXECUTIVE MEDICINE	164	42	170	43
EMERGENCY MEDICINE	245	38	245	38
PSYCHIATRY	279	37	279	37
ORTHOPEDIC SURGERY	260	35	260	35
FAMILY PRACTICE	567	30	568	30
INTERNAL MEDICINE	349	21	348	21
OBSTETRICS/GYNECOLOGY	227	20	227	20
PREVENTIVE MEDICINE	142	20	141	19
ANESTHESIOLOGY	182	19	182	19
RADIOLOGY, DIAGNOSTIC	209	9	220	9
UROLOGY	85	9	85	9
OPHTHALMOLOGY	96	6	96	6
NEUROLOGICAL SURGERY	33	6	33	6
OTORHINOLARYNGOLOGY	86	3	86	3
OCCUPATION MEDICINE	42	3	44	4
PATHOLOGY	126	2	127	2
INFECTIOUS DISEASE	65	2	65	3
PEDIATRICS	289	1	293	1

Source: Army TAA and CFDB for 2011.

Excludes Medical Corps specialties with total requirements of less than 30 billets.

In addition to the ease with which the Army identifies deployable units, the Army also accounts for all deployable units in the CFDB, without regard to their current manning status. Even though, during peacetime, the Army does not authorize or staff many of its billets in large deployable medical units like CSHs, the Army CFDB still includes these units in the inventory. Each wartime unit has a full billet requirement even if the unit has zero authorizations and on-hand personnel. During mobilization, these personnel would be pulled from non-deployable units through the Professional Filler System (PROFIS) to fill these deployable billet requirements. Because the Army accounts for all of its wartime deployable units, the IDA team was able to get a reasonably accurate estimate of the Army's deployable requirements from the CFDB.

The other two Services identify and account for deployable units in different manners. The Navy does not encode unit deployability status in its UICs or other unit

identifiers contained in the CFDB. However, the IDA team requested and the Navy provided a list of deployable UICs to match with the CFDB. This list of deployable UICs contained three designations: "Deployable," "Non-Deployable," and "Deployable-Augmentation." Deployable and non-deployable UICs were consistent with Navy Sea/Shore Duty Type Codes with deployable units occupying Sea Duty 2, 3, and 4 duty codes (Table B-5).

Table B-5. Navy Sea/Shore Duty Type Codes

Duty Type Code	Duty Type Description
(1)	**Shore Duty:** Duty performed in United States land-based activities where members are not required to be absent from the corporate limits of their duty station in excess of 150 days per year, or long-term schooling of 18 or more months.
(2)	**Sea Duty:** Duty performed in commissioned vessels and deployable squadrons homeported in the U.S.; U.S. land-based activities and embarked staffs, which require members to operate away from their duty station in excess of 150 days per year.
(3)	**Overseas Remote Land-Based Sea Duty:** Duty performed in a land-based activity, which does not require members to be absent more than 150 days per year, but is credited as sea duty for rotational purposes only due to the relative undesirability of the geographic area.
(4)	**Overseas Sea Duty:** Duty performed in commissioned vessels and deployable squadrons homeported overseas; overseas land-based activities and embarked staffs, which require members to operate away from their duty station in excess of 150 days per year.
(6)	**Overseas Shore Duty:** Duty performed in overseas land-based activities, which are credited as shore duty for rotational purposes. Members are not required to be absent from corporate limits of their duty station in excess of 150 days per year.

Source: Navy Personnel Command.

Deployable-augmentation units, however, were not consistent with Navy Sea/Shore Duty Type Codes and complicated measurement of deployable requirements. Unlike the Army, which accounts for its entire mobilization requirement in its deployable units, the Navy assigns a baseline medical requirement to deployable units, like ships, then estimates an additional requirement to augment those ships during full mobilization. These augmentation requirements are sourced from non-deployable units, such as MTFs, and account for a portion of the requirement for non-deployable units. In their list of UICs, the Navy identified which non-deployable units provided augmentation billets to deployable units. However, the Navy did not identify which billets from these non-deployable units augmented deployable units during full mobilization. For example, the UIC for the Naval Medical Center at San Diego was listed as a Deployable-Augmentation unit. Although the Medical Center undoubtedly would send many

specialists to deployable units during full mobilization, it is unlikely that the entire staff of the facility, including GME residents and instructors and uniformed hospital administrators, would redeploy to wartime units. Because we cannot identify which billets would augment deployable units during full mobilization, Deployable-Augmentation units are generally not included in displays of deployable requirements. This may cause the estimate of Navy CFDB deployable requirements to be biased downward from their actual deployable requirement, inhibiting cross-Service comparisons.

The CFDB data for the Air Force is perhaps the most difficult to translate into deployable and non-deployable requirements. Unlike the Army and Navy, where UICs could be identified as deployable or non-deployable, the Air Force did not code or provide the deployability status of individual UICs. This is understandable given that the CFDB inventory does not contain UICs for its wartime deployable medical units such as Expeditionary Medical Support units. Instead, the Air Force accounts for billets in peacetime units and provides five-digit UTCs for billets that would be reassigned to newly created deployable units in the event of mobilization. According to Air Force policy, UTCs ending in "AAA," "AA," or "A" indicate assignment to non-deployable units. UTCs ending in "ZZZ," "ZZ," or "Z" are present in non-deployable units but dual-mapped to deployable units. Due to the dual missions of the Military Health System, the overwhelming majority of medical billet UTCs falls into one of these two groups. Other UTCs also have deployable assignments.

However, because CFDB billet deployability status is only determined through Air Force UTCs, we cannot fully capture the scope of Air Force deployable requirements from the CFDB. For example, we know that the Army rotates its deployable units, like CSHs, whereas the Navy rotates personnel to sustain medical capabilities on deployable ships. All of these units are observable in the CFDB. Whether the Air Force builds a rotation base in its units (like the Army) or its manpower (like the Navy) cannot be determined, in part because the Air Force deployable medical units (and their requirements) do not appear in the CFDB. Given the relatively small size of Air Force deployable UTC requirements, it is likely that personnel rotate into deploying UTCs rather than deploying UTCs rotating into deployments. If this is the case, the CFDB estimate understates the size of the Air Force's deployable requirement for medical personnel, inhibiting cross-Service comparisons.

Additionally, in meetings with our team, the Air Force stressed that their deployable requirement is far smaller than their operational requirement. Part of the reason for this discrepancy lies in the Air Force policy of considering CONUS-based medical personnel who treat Service members returning from combat zones as "deployed in place." In the absence of actual deployable unit assignments, however, whether such billets meet DoDI

1100.22's criteria for military essentiality is an open question that was beyond the scope of this report.

The Air Force did provide an alternative measure of deployable requirements in the form of their CORR requirements sizing model for 2013. The CORR classifies requirements as either "operational" or "non-operational." The Air Force "operational" requirement in CORR consists of the following three categories: Expeditionary Force Packages (EFP), Global Health (GH), and Commitments in Place (CIP). CORR describes the EFP requirement as "force packages that support the Aerospace Expeditionary Forces (AEF) deployable. CORR describes the GH requirement as "forces designated for global engagement missions in support of air component campaign plans." These two categories are clearly analogous to the Army's concept of deployable requirements.

CORR describes the remaining category—CIP—as consisting of "in place, nuclear, global reach, space, C4ISP, en route [and] COCOM staffs." Arguably, some or all of this requirement differs from the Army's definition of requirements for deployable units (which, by their definition, are not "in place"). However, for consistency with the Air Force's CORR requirement estimate, the tail-to-tooth ratios provided include CIP as part of the "tooth" rather than the "tail" for all analyses appearing in the main paper. A version of the tail-to-tooth ratio which excludes CIP requirements from the "tooth" and includes CIP in the "tail" is provided below. Due to the difficulties in reconstructing the Air Force deployable requirement from the CFDB, this report uses the "operational" requirement Air Force CORR for 2013 in place of the deployable requirement from the CFDB, unless otherwise indicated.

Table B-6. Air Force CORR Medical Corps Tail-to-Tooth Ratios Excluding CIP from Tooth

Medical Specialty	Total Requirement	Operational Requirement	Tail-to-Tooth Ratio
EXECUTIVE MEDICINE	94	0	N/A
PATHOLOGY	57	0	N/A
DERMATOLOGY	33	0	N/A
CARDIOLOGY	31	0	N/A
PSYCHIATRY	122	9	13.6
OPHTHALMOLOGY	50	6	8.3
RADIOLOGY, DIAGNOSTIC	111	18	6.2
OTORHINOLARYNGOLOGY	36	6	6.0
PREVENTIVE MEDICINE	35	7	5.0
AVIATION/AEROSPACE MEDICINE, RESIDENCY TRAINED AEROSPACE	192	39	4.9
PEDIATRICS, GENERAL	234	52	4.5
FAMILY PRACTICE	531	135	3.9
OBSTETRICS/GYNECOLOGY	124	39	3.2
INTERNAL MEDICINE	234	84	2.8
AVIATION/AEROSPACE MEDICINE, RESIDENCY TRAINED OTHER THAN AEROSPACE	436	168	2.6
EMERGENCY MEDICINE	149	60	2.5
GENERAL SURGERY	243	99	2.5
ANESTHESIOLOGY	111	51	2.2
ORTHOPEDIC SURGERY	98	48	2.0
AVIATION/AEROSPACE MEDICINE, NON-RESIDENCY TRAINED	202	105	1.9
CRITICAL CARE/TRAUMA, MEDICINE	105	74	1.4

Source: Air Force Critical Operational Readiness Requirement for 2013

The Deployable Requirement is the sum of requirements for Expeditionary Force Packages (EFP) and Global Health (GH) forces.

Excludes Medical Corps specialties with total requirements of less than 30 billets.

After estimating the deployable requirements from the CFDB, the IDA team constructed "tail-to-tooth" ratios to compare the relationship between deployable and non-deployable requirements across specialties. Due to the differences in which the Services identified and accounted for deployable units, these comparisons were made between specialties within a single Service, not across Services. Tail-to-tooth ratios were constructed by taking the total CFDB requirement, subtracting the deployable requirement, adjusting for PROFIS-like substitutions, then dividing the result by the deployable requirement.

The substitution factor controls for deployable requirements without authorizations that are ultimately sourced by required manpower in non-deployable units. This factor is calculated by subtracting deployable authorizations from deployable requirements. This gap is then subtracted from the non-deployable requirement in the numerator, lowering the calculated tail-to-tooth ratio. Because the Army frequently uses PROFIS substitutions to fill unmet deployable requirements, this adjustment substantially alters Army tail-to-tooth estimates. However, the adjustment has only a minor impact on Navy and Air Force tail-to-tooth ratios for two reasons. First, the Navy and Air Force do not report substantial gaps between deployable unit authorizations and deployable unit requirements. Second and relatedly, the Navy and Air Force solely account for any unmet wartime deployable unit requirements in their non-deployable units (either through Deployable-Augmentation requirements or billet rotations into deployable UTCs). Consequently, because we are not likely able to capture the full extent of the Air Force and Navy's deployable unit requirements, actual tail-to-tooth ratios may be lower than those estimated from the CFDB.

$$\frac{R_{\text{total}} - R_{\text{deployable}} - (R_{\text{deployable}} - A_{\text{deployable}})}{R_{\text{deployable}}}$$

Appendix C.
Deployment Data Description and Detailed Results

To analyze the utilization of the medical force, the IDA research team obtained data on individual deployments from the DMDC Contingency Tracking System (CTS). The CTS data include all individual deployments of any length to a named contingency (primarily Operation Enduring Freedom (OEF)/Operation Iraqi Freedom (OIF)/Operation New Dawn) between 2001 and 2012. CTS covers all contingency-related deployments for all four Services including Active, Guard, and Reserve Components. The CTS excludes data on deployments other than to named contingencies or shipboard deployments not in support of a named contingency. Other data sources, such as the Navy's ITEMPO dataset, may contain some of these deployments, but they were not provided to the IDA team when requested. Because there may be systematic differences across Services in the completeness of CTS data as a measure of deployment level (e.g., the exclusion of Navy afloat deployments not in support of named contingencies), we focused primarily on intra-Service comparisons with the CTS data.

The CTS data contains three relevant fields: deployment start and end dates, deployment country codes, and a unique individual identifier. To obtain data on individual characteristics and because the CTS data only contain individuals who deployed, we also obtained from DMDC an annual time series of DMDC's Military Personnel files for the Active, Guard, and Reserve Components. The Personnel files contained information on occupational specialty, grade and years of service, a consistent unique identifier and other demographic information for each individual present in the force at the end of each calendar year. Where necessary, individual occupational data was standardized according to DoD Occupational Codes from Service-specific crosswalks provided by the HMPDS report. Conditional upon unique identifier and year, we merged the CTS deployment data with DMDC's Personnel files. Unmatched records from the Personnel file were preserved.[1] This allowed for identification of years in which an individual was deployed as well as those years in which the individual did not deploy.

[1] Additionally, where an individual had a deployment the year following his last appearance in the Personnel data file (i.e., he deployed, then separated prior to December of that year), the Personnel data from the prior year were populated to match the deployment record.

Table C-1 through Table C-3 compare the obtained DMDC Personnel file to the HMPDS data.

Table C-1. Army Average Annual Personnel and End Strength, Active Component 2001–12

Medical Corps	HMPDS End Strength	Average Personnel (DMDC Personnel File)
Medical Corps	4,260	4,282
Dental Corps	958	970
Nursing Corps	3,389	3,481
Medical Service Corps	6,055	6,221
Enlisted Corps	33,734	34,151
Total All Corps	48,379	49,103

Source: DMDC Personnel Data File and HMPDS for 2001–11.

Table C-2. Navy Average Annual Personnel and End Strength, Active Component 2001–12

Medical Corps	HMPDS End Strength	Average Personnel (DMDC Personnel File)
Medical Corps	3,880	3,823
Dental Corps	1,125	1,105
Nursing Corps	2,941	3,134
Medical Service Corps	2,474	2,569
Enlisted Corps	24,959	25,290
Total All Corps	35,380	35,921

Source: DMDC Personnel Data File and HMPDS for 2001–11.

Table C-3. Air Force Average Annual Personnel and End Strength, Active Component 2001–12

Medical Corps	HMPDS End Strength	Average Personnel (DMDC Personnel File)
Medical Corps	3,535	3,451
Dental Corps	968	967
Nursing Corps	3,497	3,486
Medical Service Corps	3,513	3,436
Enlisted Corps	21,819	21,028
Total All Corps	33,331	32,367

Source: DMDC Personnel Data File and HMPDS for 2001–11.

To analyze deployment rates by specialty and occupational group, the IDA team constructed a number of statistical measures. Each of these measures had advantages and

drawbacks, but they all reached the same conclusion: medical personnel deploy less frequently than non-medical personnel.

For each of the measures used, we developed the following series of charts: histograms of deployment rate by medical and non-medical specialties, ranked distributions of deployment rate by medical specialties within a medical corps, and bar charts of deployment rate by occupational group. These charts were generated for each Service's Active, Guard, and Reserve Components. The histograms of deployment rate by medical and non-medical specialties were created by establishing bins of deployment rates and separating binned counts of medical specialties from non-medical occupations. Medical specialties were defined as those with DoD occupational codes reported within the HMPDS annual reports. If medical and non-medical personnel deploy at similar rates, one would expect the distribution of deployment rates by specialties to approximate a normal distribution centered on the same mean. If medical and non-medical personnel deploy at different rates, one would expect to see two normal distributions centered on different means. If beneficiary care specialties deploy substantially less than operationally demanded medical specialties, one might expect to see a bimodal distribution for medical personnel, perhaps with operationally demanded specialties matching or exceeding non-medical deployment rates.

The charts displaying ranked distributions of medical specialty deployment rates measure differences in deployment experiences within a medical corps. The corps presented are the Medical, Dental, Nursing, and Enlisted Medical (including enlisted dental personnel) Corps as identified by the HMPDS report and a composite "Medical Service" corps consisting of the Medical Service Corps of all three Services as well as the Army's Medical Specialist, Veterinary, and Warrant Officer Corps, the Navy's Warrant Officer Corps, and the Air Force's Biomedical Sciences Corps, as identified in the HMPDS report. The ranked specialty distribution charts differences between specialties. If certain specialties (such as those used for beneficiary care) deploy far less than other specialties (such as those demanded for the operational mission), the slope of the curve will be steeper. Substitution of beneficiary care specialties for operationally demanded specialties would flatten the observed curve. For perspective, the charts also contain the relevant (i.e. same metric, Service, and Component) average deployment rate across the entire medical force and the total military force. This provides an estimate of force stress for the high-deploying medical specialties.

Finally, the bar charts of deployment rate by occupational group measure deployment experiences across internally similar groupings of medical and non-medical specialties. Occupational groups were defined by the DoD Occupational Conversion Index (DoD 1312.1-1) and are listed, along with the initial digits of their DoD Occupation Codes, in Table C-4. Deployment data from specialties within these groups were aggregated to form a weighted average metric across the category. This allows

examination of aggregate differences in deployment experiences between individuals supplying medical and non-medical military capabilities.

Table C-4. Occupational Groups and DoD Occupation Codes

Occupational Group	Grade	DoD Occupation Code
Infantry, Gun Crews, and Seamanship Specialists	Enlisted	100000
Electronic Equipment Repairers	Enlisted	110000
Communications & Intelligence Specialists	Enlisted	120000
Medical Enlisted	Enlisted	130000
Other Technical & Allied Specialists	Enlisted	140000
Functional Support & Administration	Enlisted	150000
Electrical/Mechanical Equipment Repairers	Enlisted	160000
Craftsmen	Enlisted	170000
Service & Supply Handlers	Enlisted	180000
General Officers & Executives	Officer	210000
Tactical Operations Officers	Officer	220000
Intelligence Officers	Officer	230000
Engineering & Maintenance Officers	Officer	240000
Scientists & Professionals	Officer	250000
Medical	Officer	260100
Dental	Officer	260300
Nursing	Officer	260500
Medical Service	Officer	260700
Administrators	Officer	270000
Supply, Procurement, and Allied Officers	Officer	280000

Share of Time Deployed

The first measure, presented in the charts in Chapter 2. Section 2.D.2, measures the share of time an individual was deployed. Because the Personnel dataset did not track an individual's specific day of accession or separation, some assumptions were required to construct the ratio of time deployed to time in the force. Possessing annual snapshots of individuals in the force, we could identify the year in which an individual joined the military and the year in which he/she departed, identifiable by no longer appearing in the dataset. For individuals entering the Personnel dataset during or after 2002 (the second year of data) and/or leaving the data set before or during 2011 (the penultimate year of data), an individual was assumed to be present in the force for half of his/her initial and final year of service. This is consistent with an assumption that accessions and

separations are distributed over the calendar year. This assumption was inappropriate for the first (2001) and last (2012) year of the dataset as individuals could have joined the force prior to 2001 or continued their service after 2012. Because we could not assume a share of time in the force for those years, the initial and final years of data were dropped from calculating the ratio of time deployed to time in the force. This metric has the advantage of standardizing individual deployments by the length of time deployed but the drawbacks of discounting deployment frequency and discarding roughly one sixth of the relevant data. Charts using this metric can be found in Chapter 2, Section 2.D.2; the remaining charts not presented can be found below.

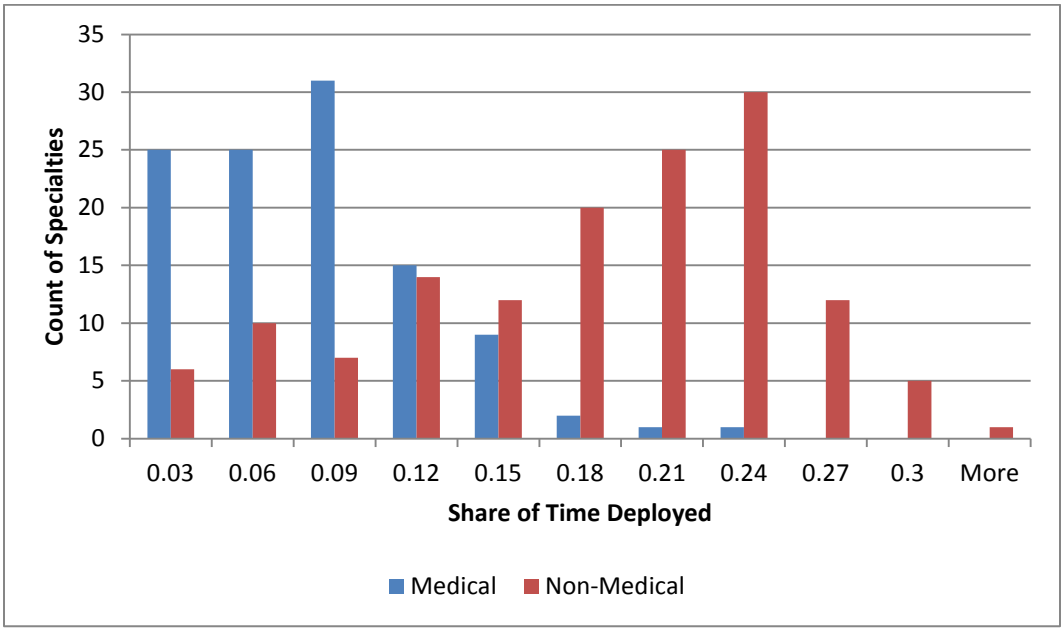

Figure C-1. Army Share of Time Deployed, Medical and Non-Medical Specialties, 2001–12

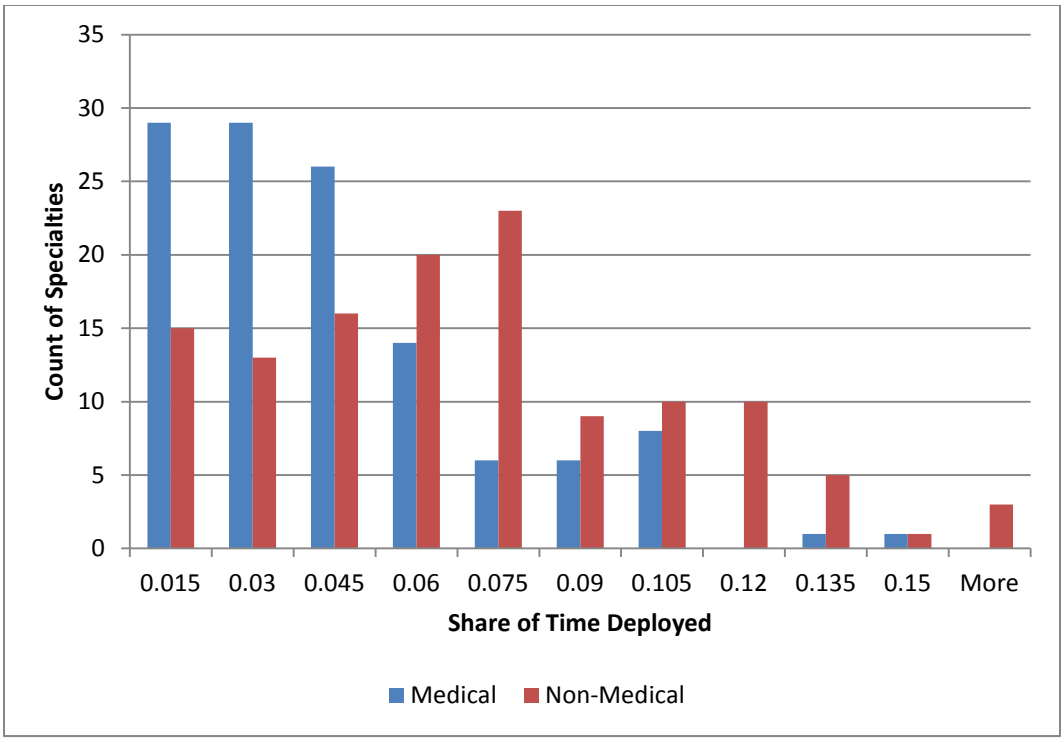

Figure C-2. Air Force Share of Time Deployed, Medical and Non-Medical Specialties, 2001–12

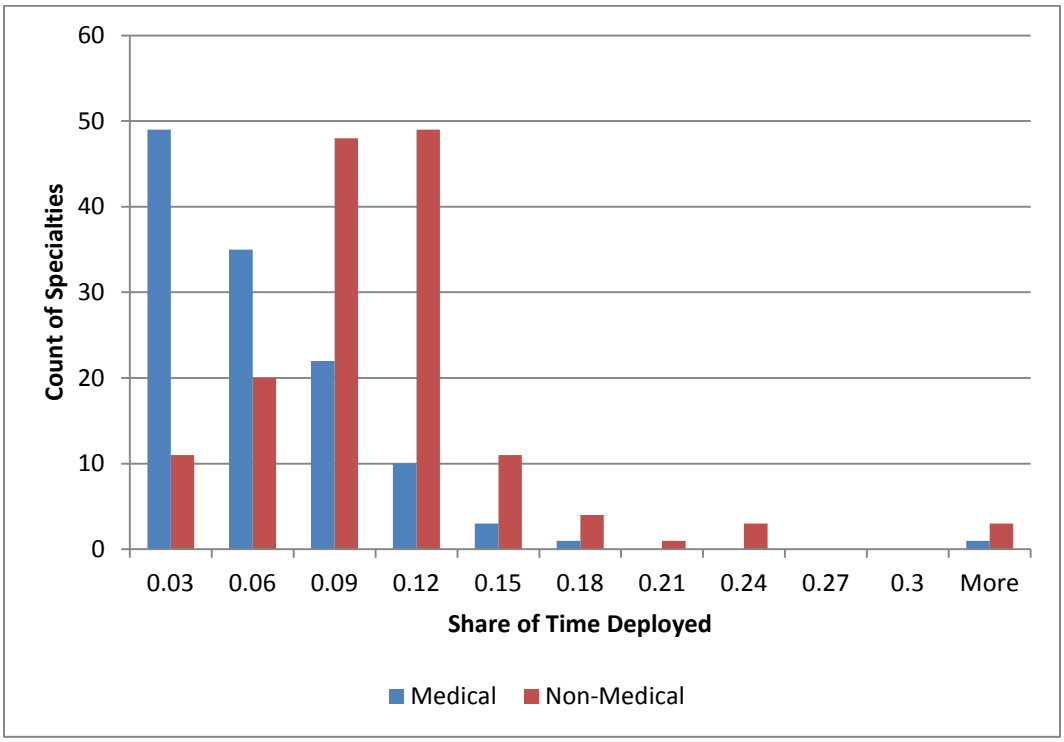

Figure C-3. Navy Share of Time Deployed, Medical and Non-Medical Specialties, 2001–12

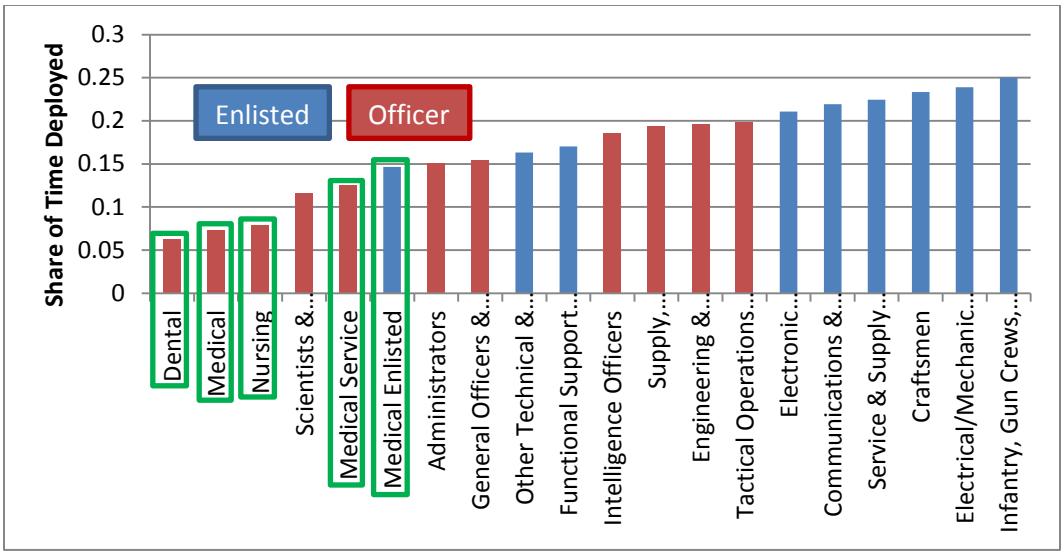

Figure C-4. Army Share of Time Deployed by Occupational Group, 2001–12

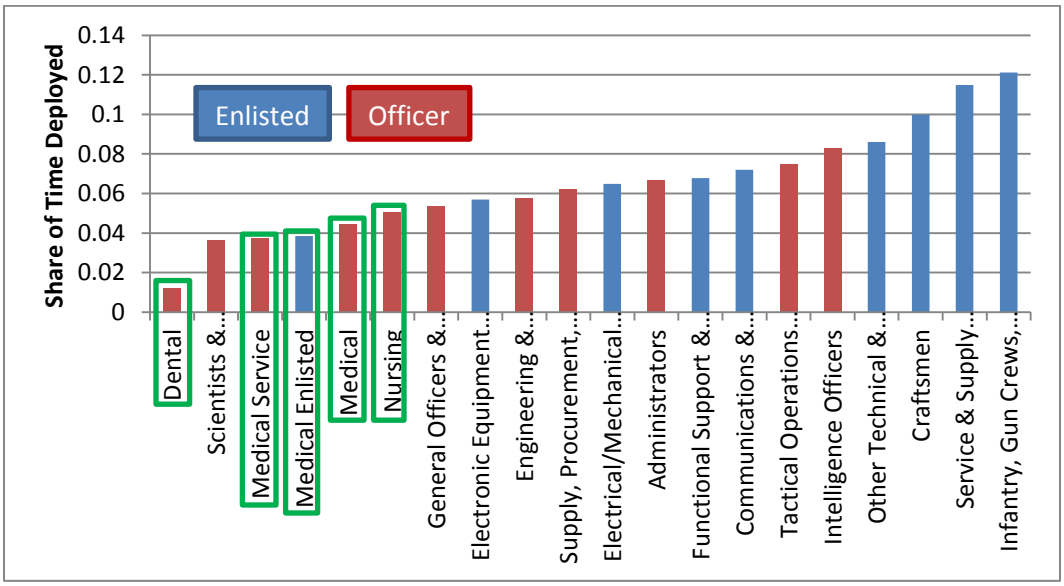

Figure C-5. Air Force Share of Time Deployed by Occupational Group, 2001–12

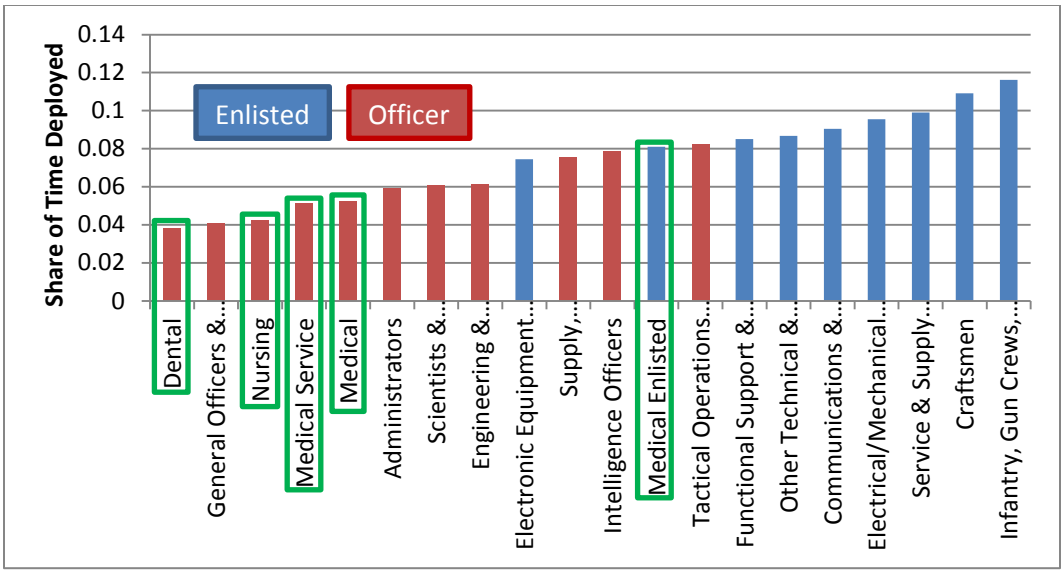

Figure C-6. Navy Share of Time Deployed by Occupational Group, 2001–12

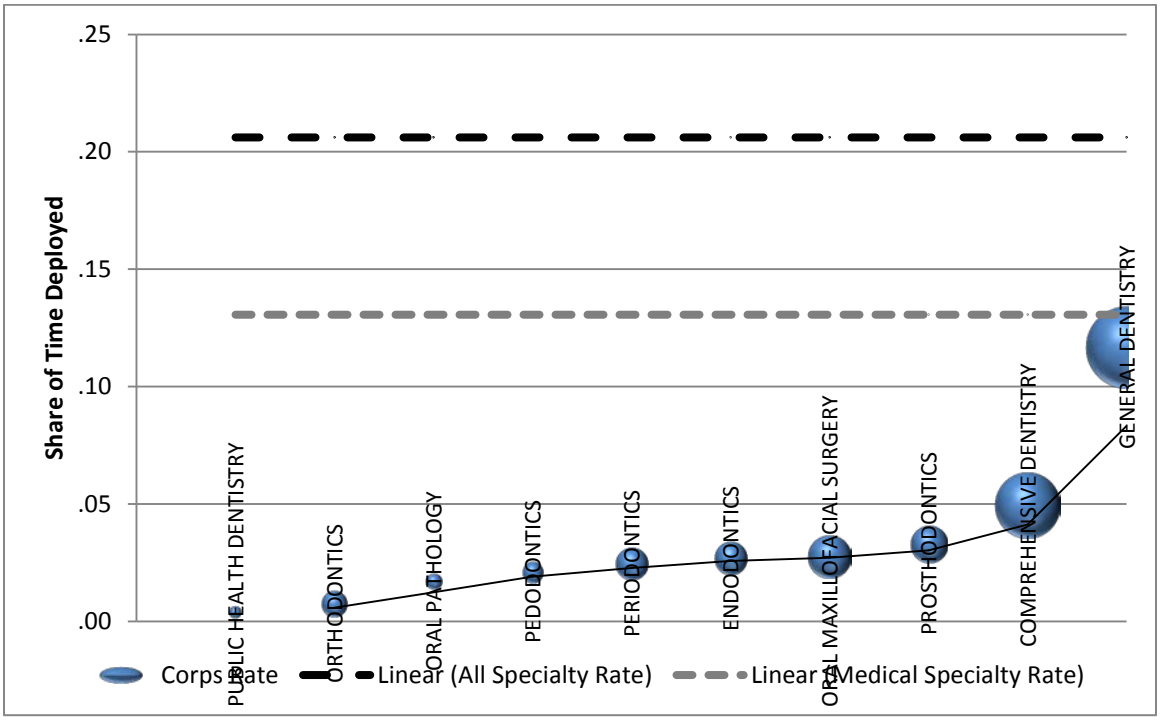

Figure C-7. Army Dental Corps Share of Time Deployed by Specialty, 2001–12

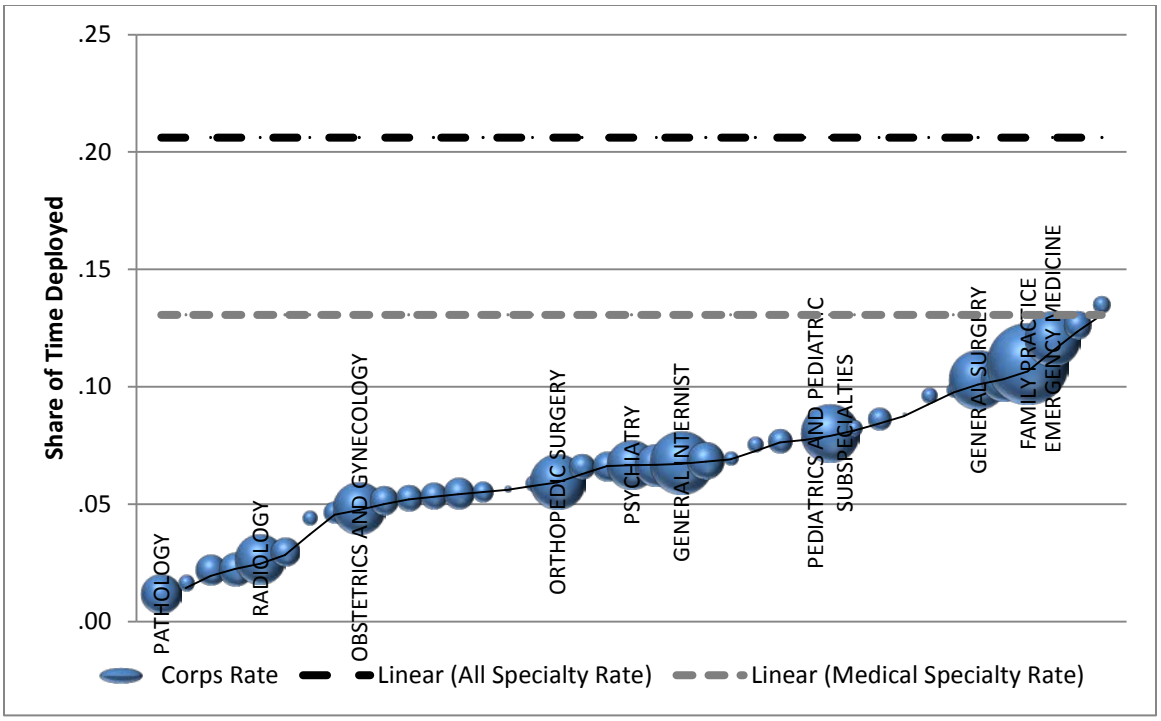

Figure C-8. Army Medical Corps Share of Time Deployed by Specialty, 2001–12

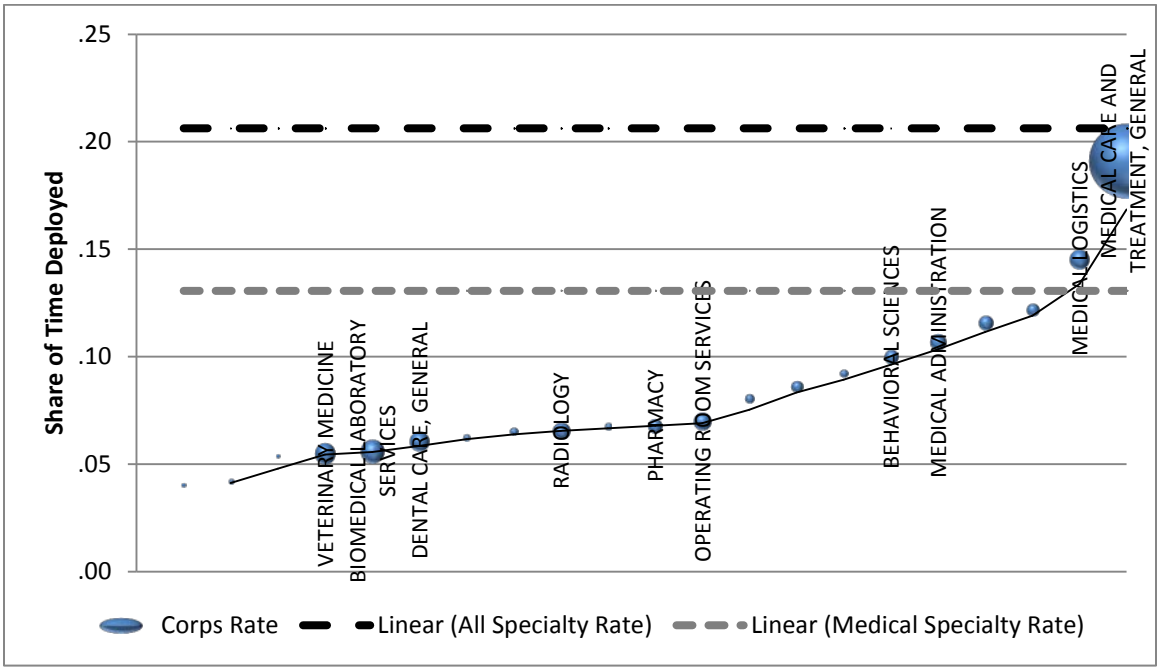

Figure C-9. Army Enlisted Medical Corps Share of Time Deployed by Specialty, 2001–12

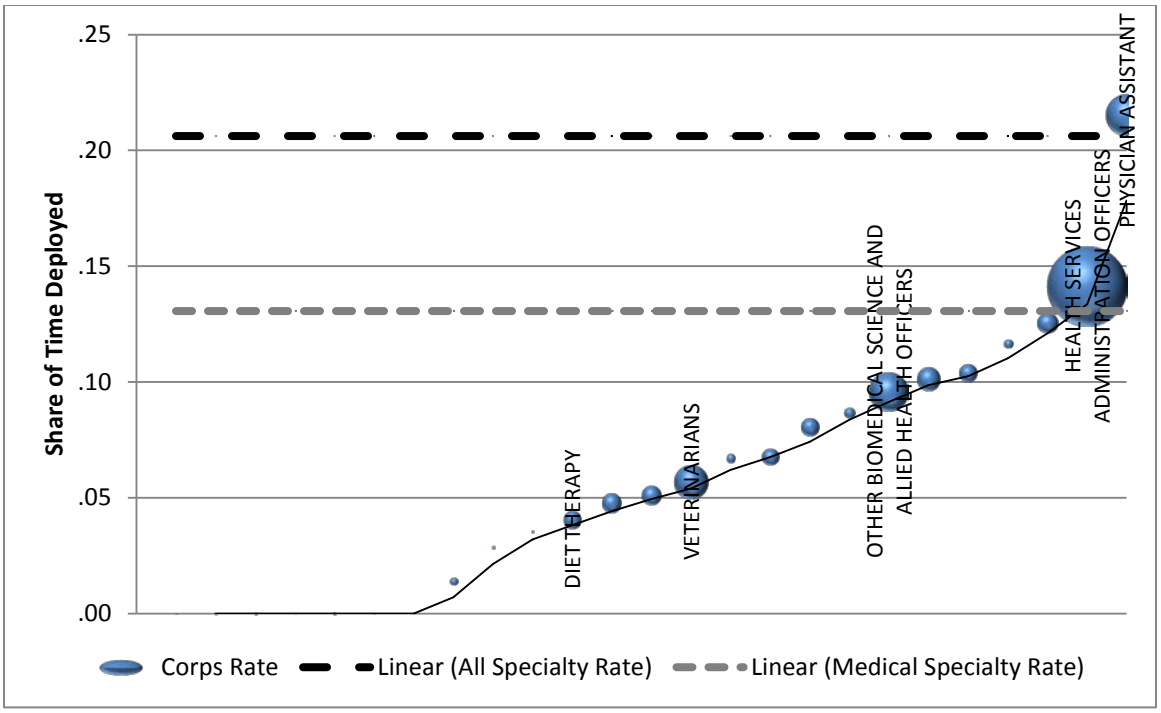

Figure C-10. Army Medical Service Corps Share of Time Deployed by Specialty, 2001–12

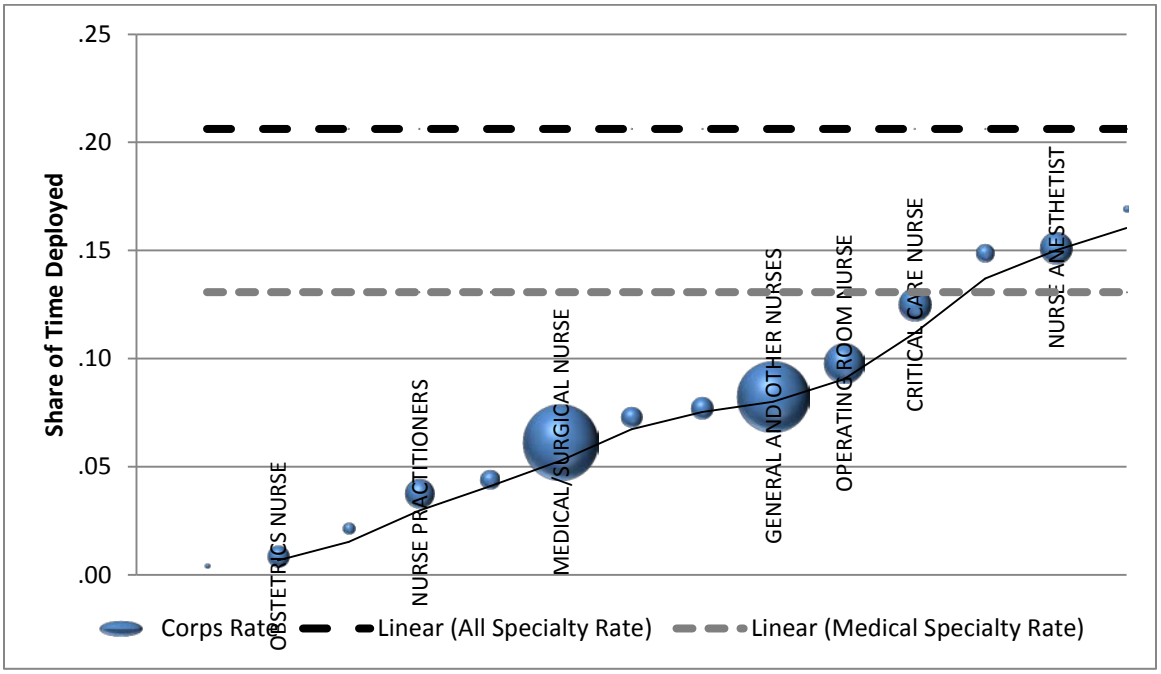

Figure C-11. Army Nursing Corps Share of Time Deployed by Specialty, 2001–12

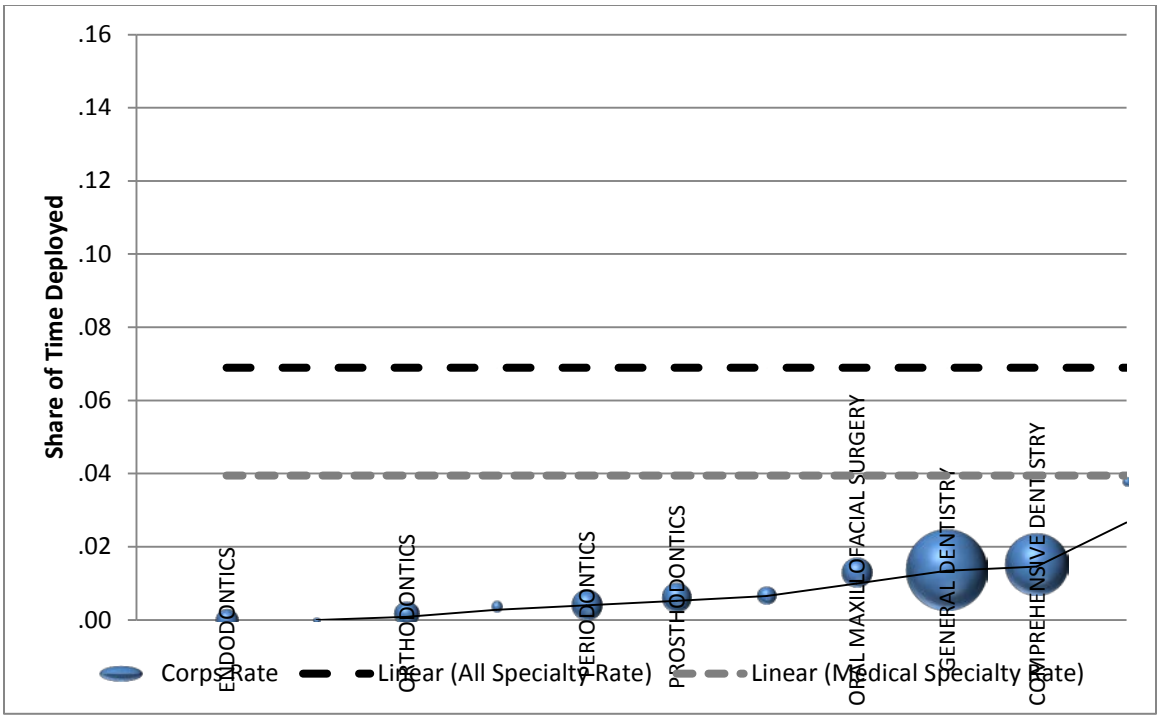

Figure C-12. Air Force Dental Corps Share of Time Deployed by Specialty, 2001–12

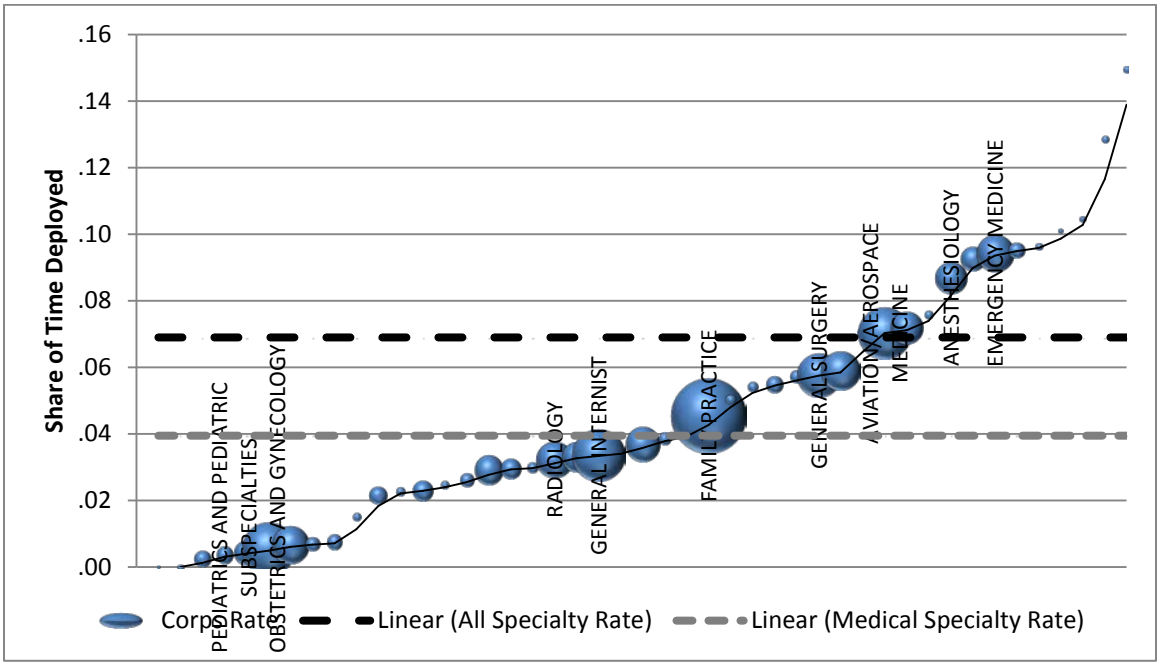

Figure C-13. Air Force Medical Corps Share of Time Deployed by Specialty, 2001–12

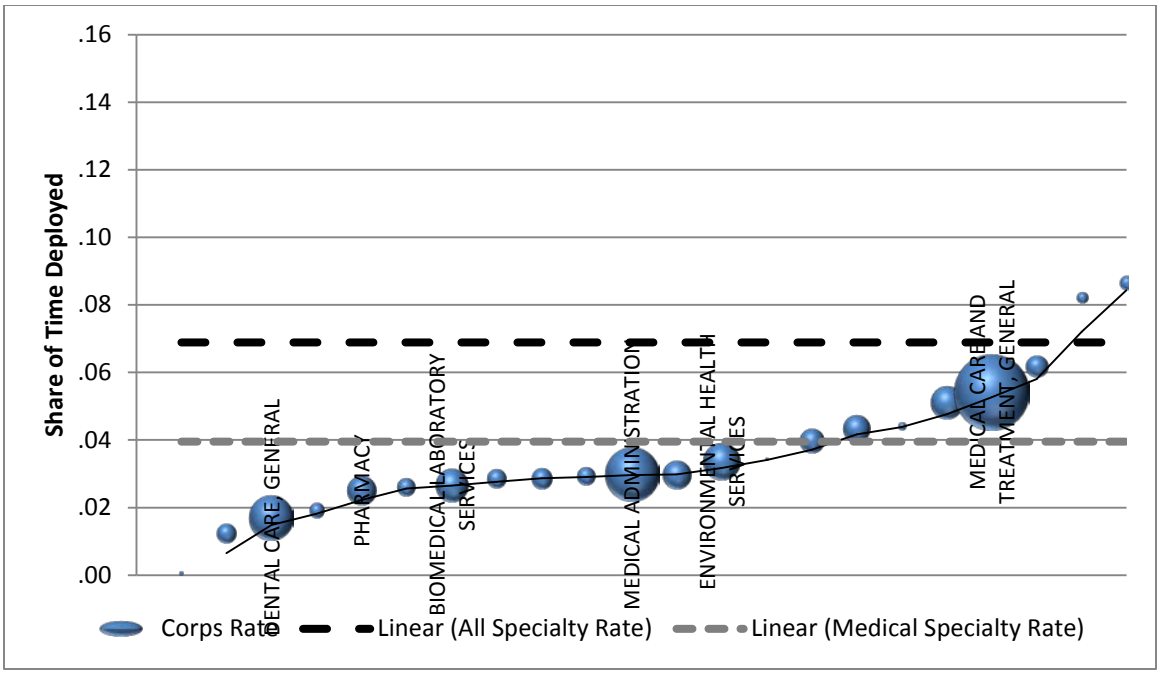

Figure C-14. Air Force Enlisted Medical Corps Share of Time Deployed by Specialty, 2001–12

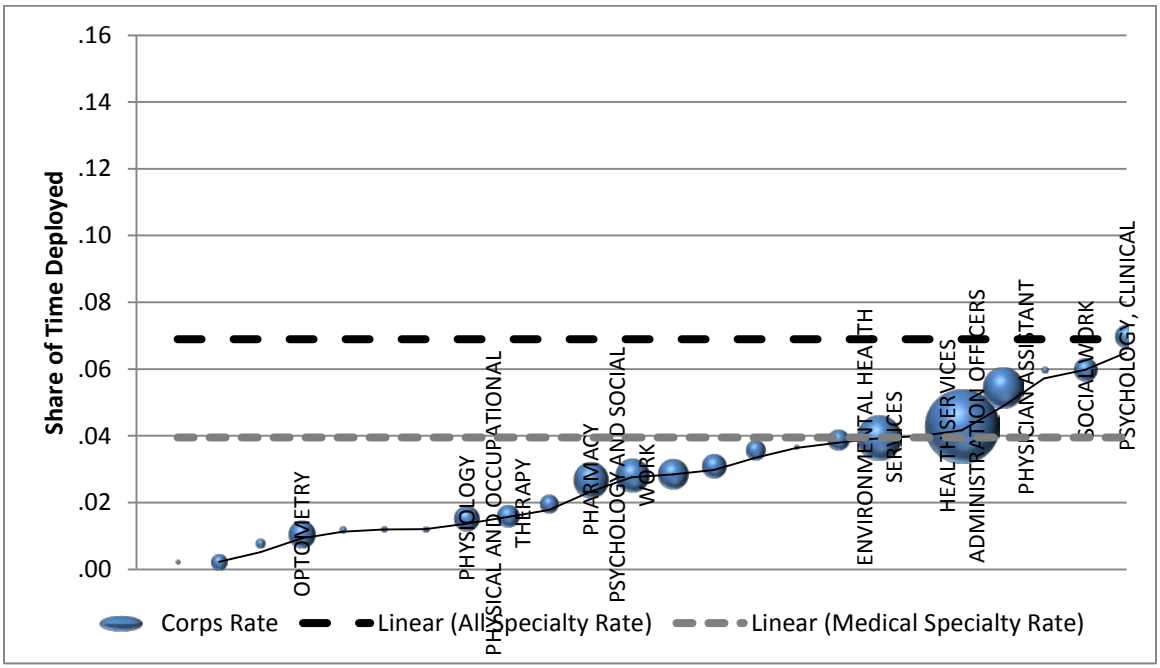

Figure C-15. Air Force Medical Service Corps Share of Time Deployed by Specialty, 2001–12

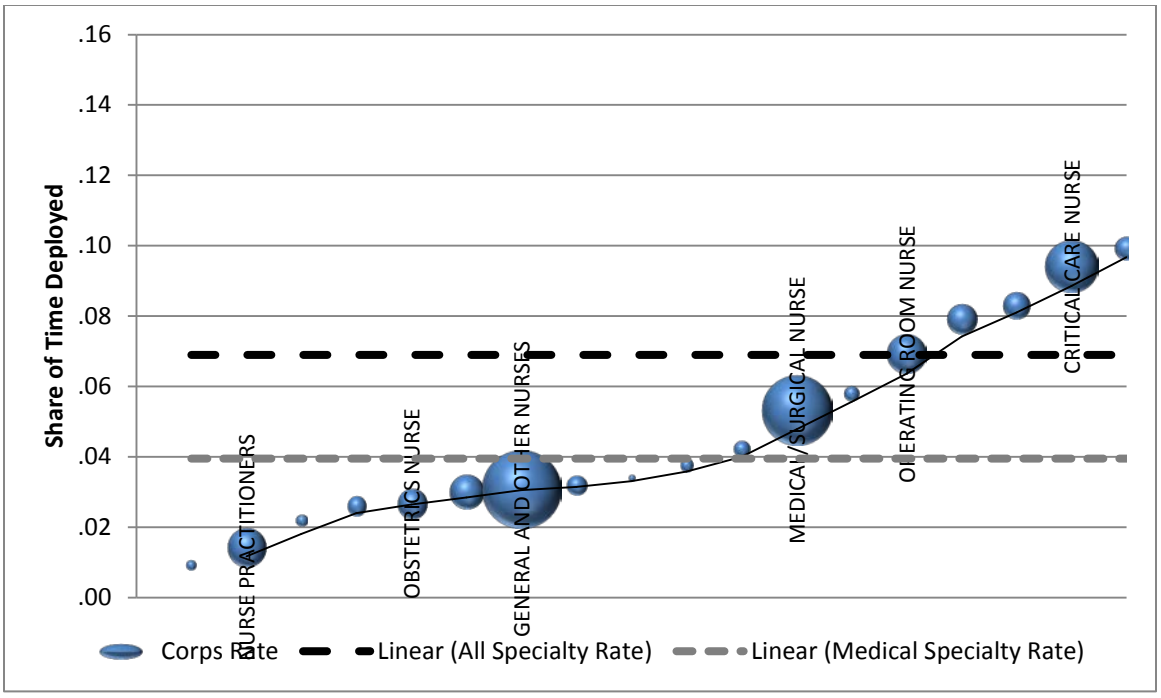

Figure C-16. Air Force Nursing Corps Share of Time Deployed by Specialty, 2001–12

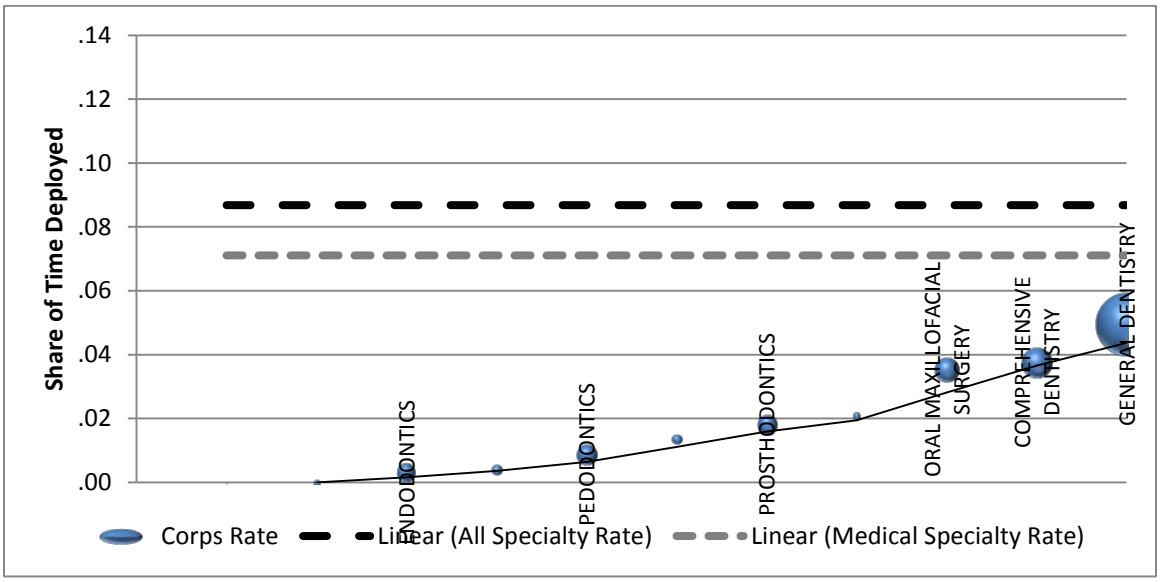

Figure C-17. Navy Dental Corps Share of Time Deployed by Specialty, 2001–12

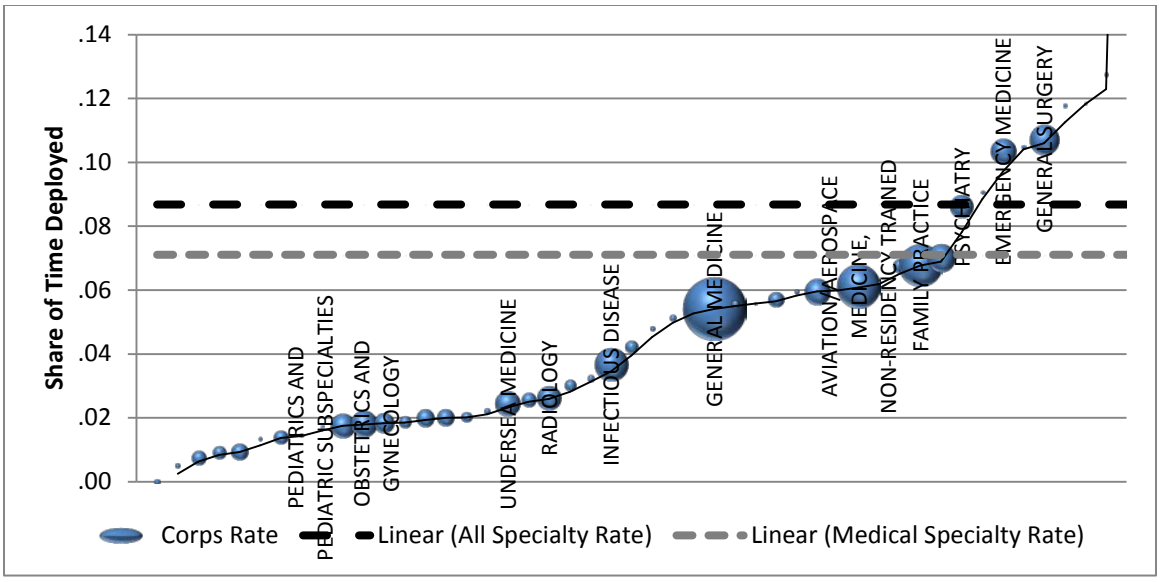

Figure C-18. Navy Medical Corps Share of Time Deployed by Specialty, 2001–12

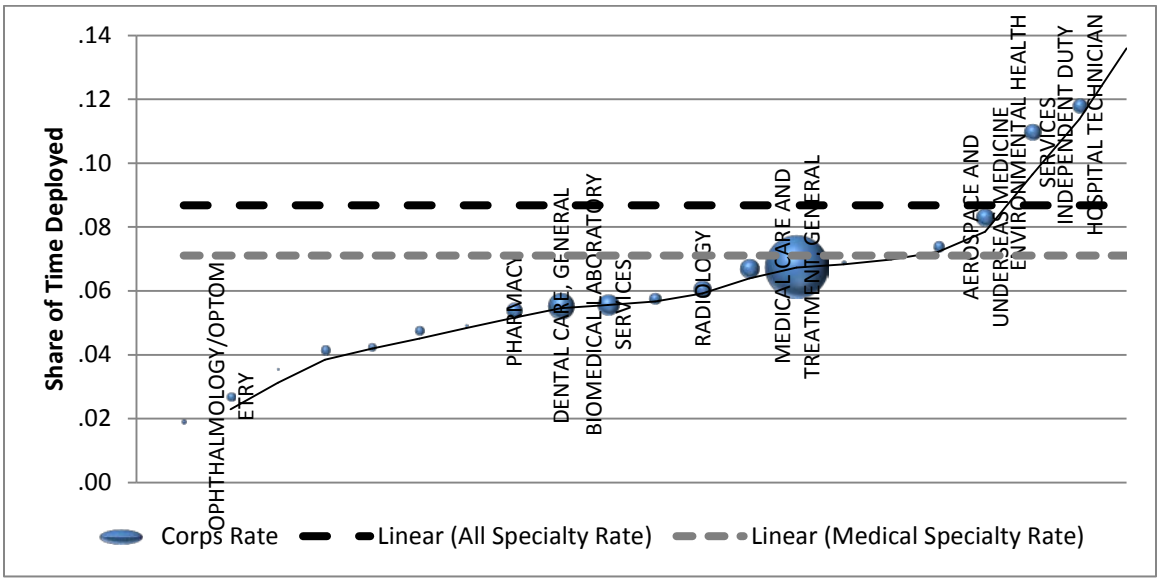

Figure C-19. Navy Enlisted Medical Corps Share of Time Deployed by Specialty, 2001–12

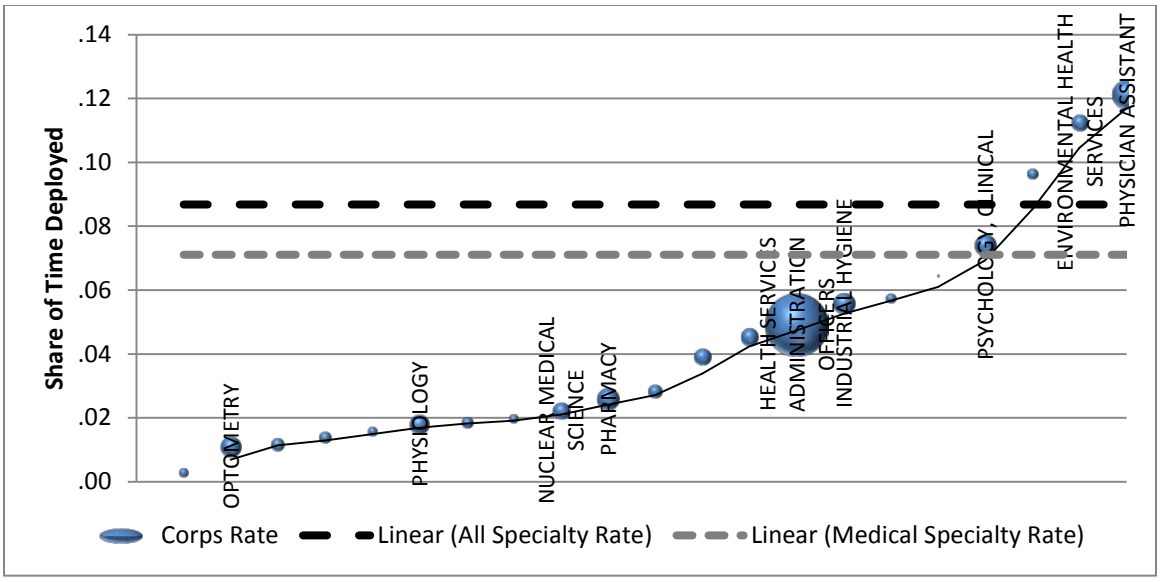

Figure C-20. Navy Medical Service Corps Share of Time Deployed by Specialty, 2001–12

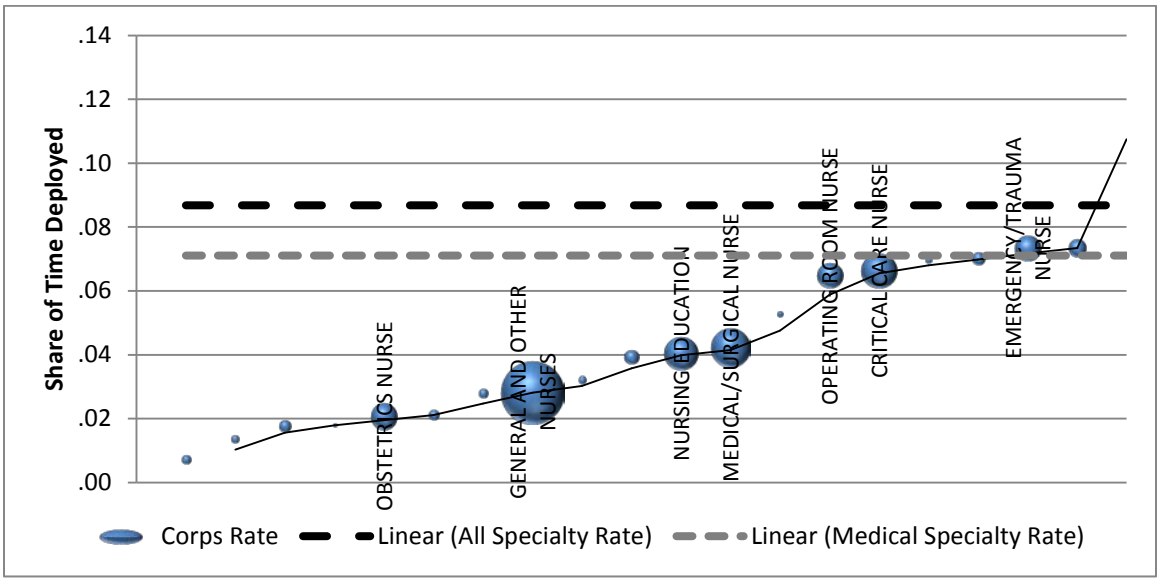

Figure C-21. Navy Nursing Corps Share of Time Deployed by Specialty, 2001–12

Number of Days Deployed Per Year

The second measure, presented in the charts below, measures the average number of days per year that an individual deploys. Because the CTS deployment data were comprehensive of all deployments to named contingencies between 2001 and 2012, no adjustments or omissions were made to the data. As such, this metric has the advantage of being the most complete measure of deployment rates. However, because it measures the total number of days deployed, regardless of how those days are distributed across

deployments, the metric may obscure the incidence of multiple short deployments versus single long deployments.

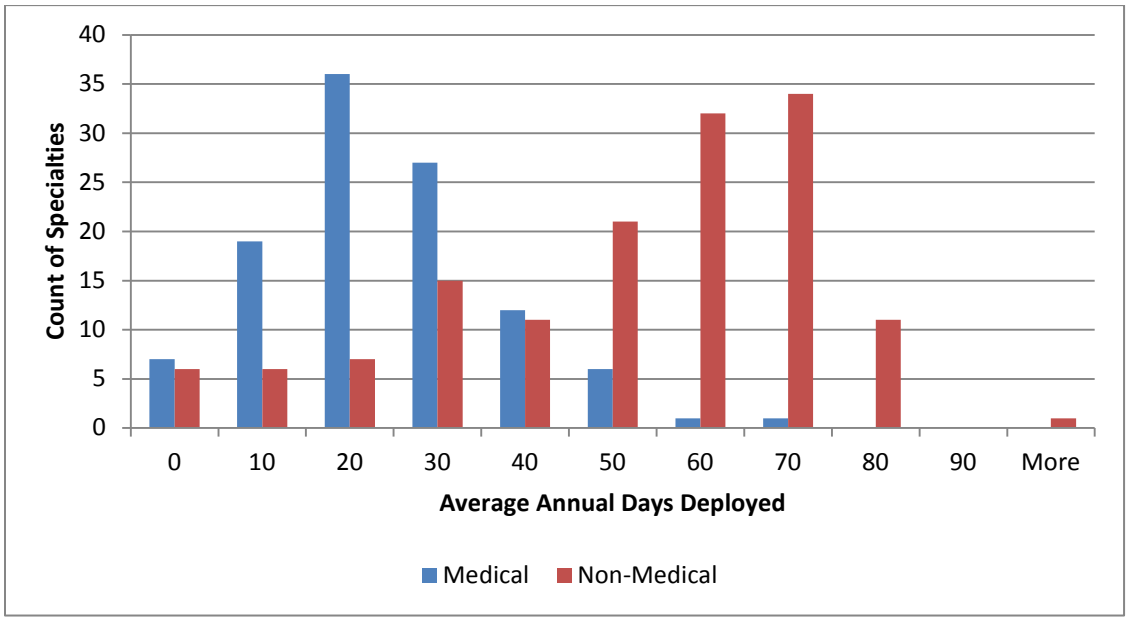

Figure C-22. Army Days Deployed Per Year, Medical and Non-Medical Specialties, 2001–12

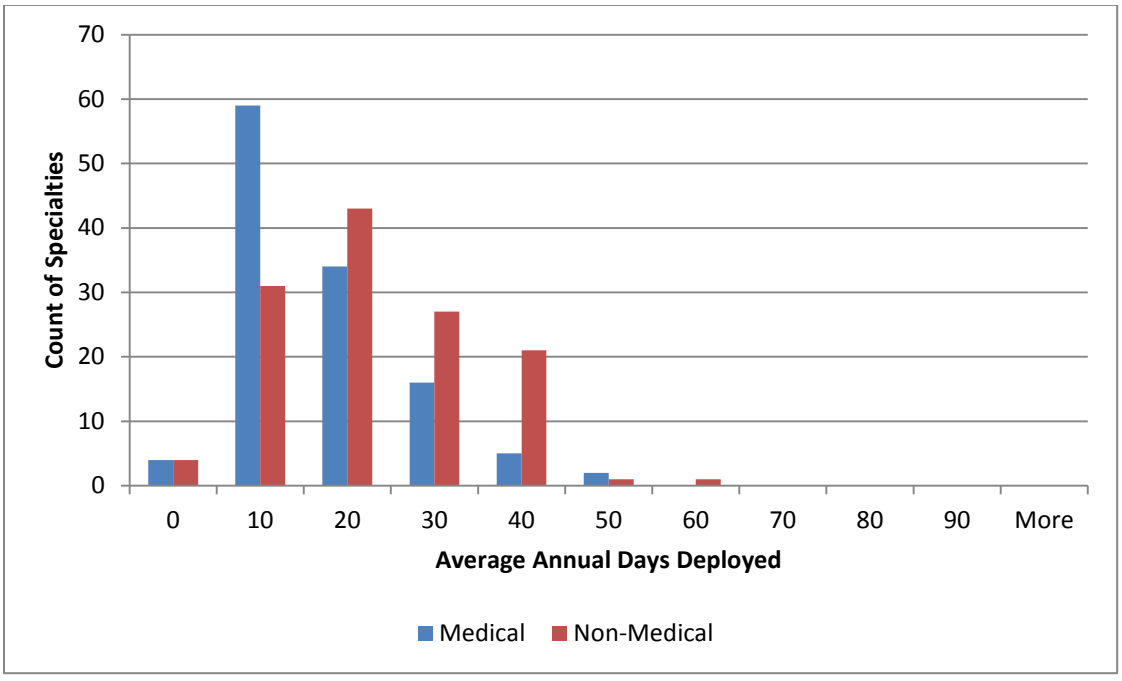

Figure C-23. Air Force Days Deployed Per Year, Medical and Non-Medical Specialties, 2001–12

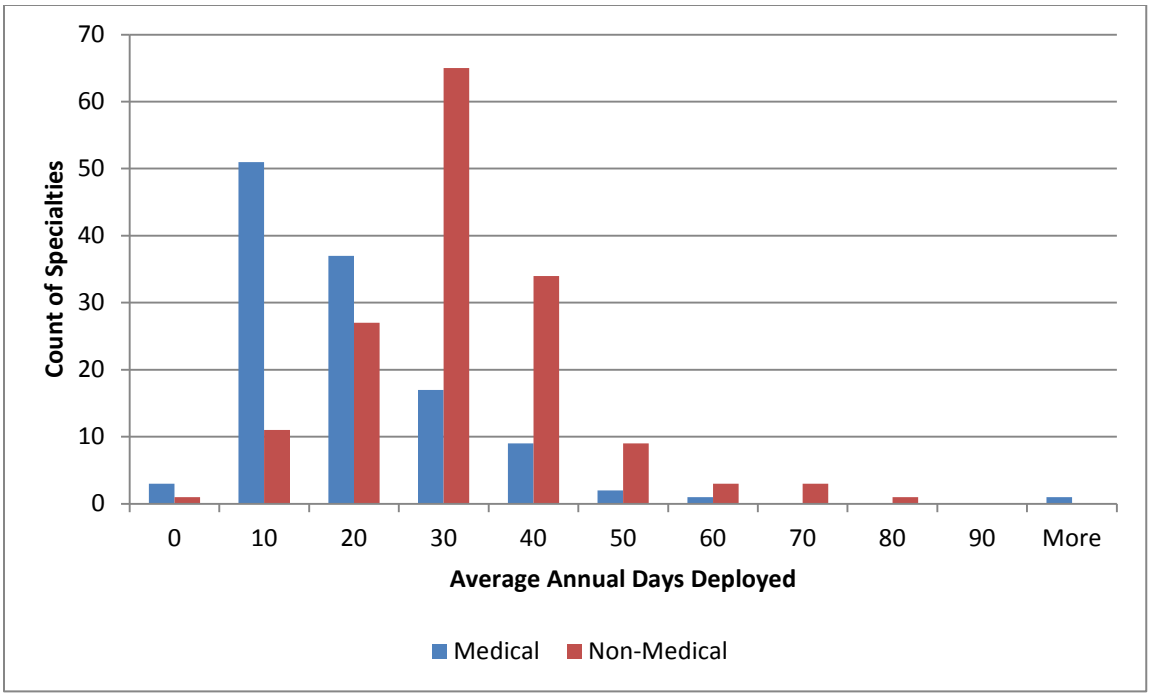

Figure C-24. Navy Days Deployed Per Year, Medical and Non-Medical Specialties, 2001–12

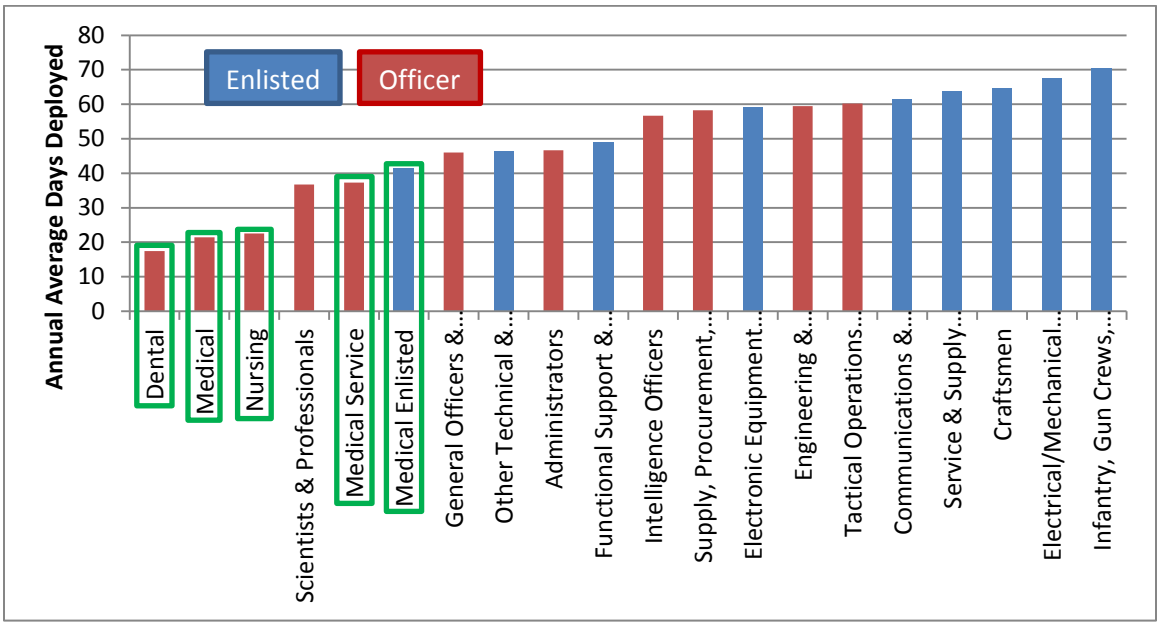

Figure C-25. Army Days Deployed Per Year by Occupational Group, 2001–12

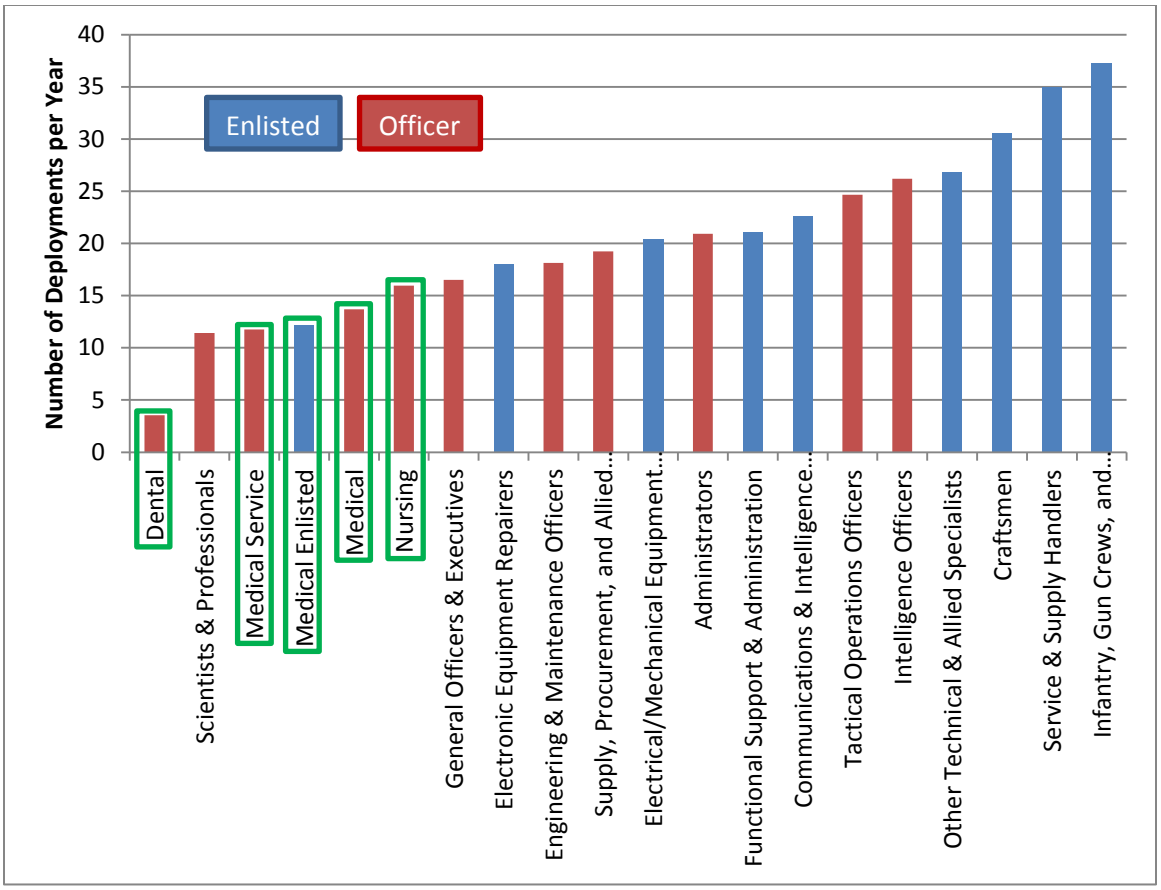

Figure C-26. Air Force Days Deployed Per Year by Occupational Group, 2001–12

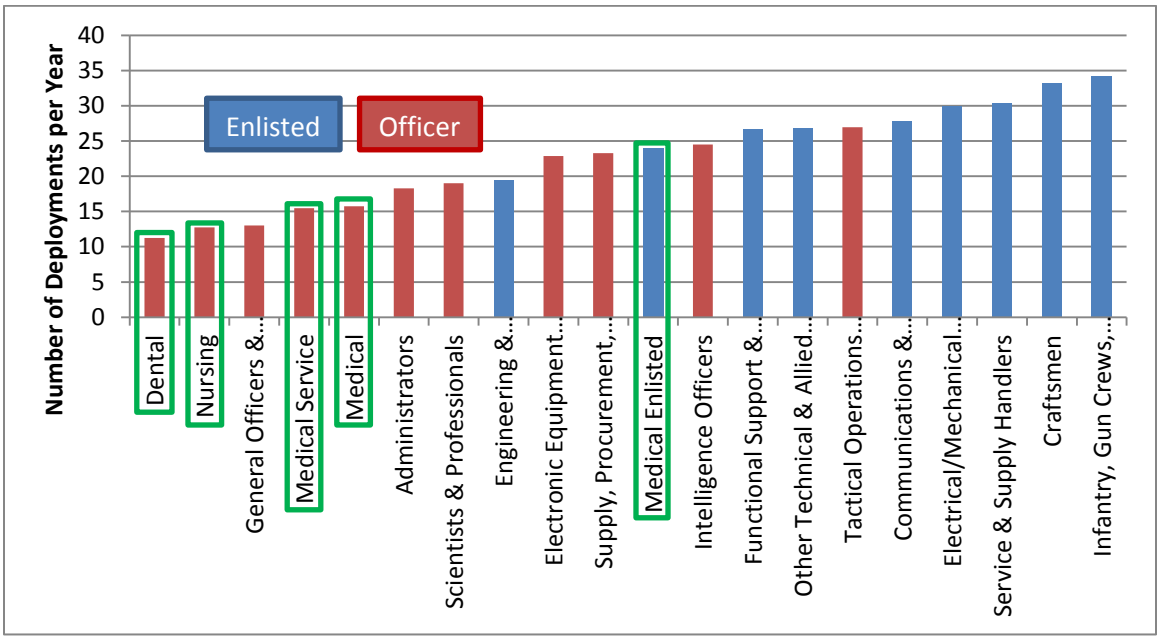

Figure C-27. Navy Days Deployed Per Year by Occupational Group, 2001–12

Number of Deployments Per Year

The third measure, presented in the charts below, measures the number of deployments an individual experiences per year in the military. Although no adjustments or omissions were made to the CTS source data, assumptions were made regarding the counting of individual deployments that spanned more than one calendar year. The algorithm that matched the CTS deployment data with the Personnel data file populated multi-calendar year deployments alongside each year of demographic data from the Personnel data file. For example, if an individual deployed for thirteen months between December 16, 2006 and January 15, 2008, deployment records of 15, 365, and 15 days would be recorded for 2006, 2007, and 2008, respectively (assuming the individual did not deploy again in 2006 or 2008). When constructing the first two measures for those years, the days deployed for that individual would remain linked to the years over which the deployment spanned.[2] To measure the number of deployments per year, the IDA team faced the question of whether to count such a deployment as a single deployment over three years (yielding a value of 1/3) or a deployment in each of the years in which the individual was deployed (yielding a value of 3/3). The first approach maintains a count of deployments that treats deployments consistently regardless of when the deployment occurred in the calendar year but does not distinguish between long and short deployments. The second approach treats individual deployments differently based upon their timing, but adds greater weight to longer deployments which are more likely to span across calendar years. The first metric was maintained and is presented in the charts below. The second metric tends to show higher deployment rates for the Army, which has a longer average deployment length, and lower deployment rates for the Air Force, which has the shortest average deployment length, but does not significantly change the comparisons between and among medical and non-medical specialties and occupational groups.

In addition to counting deployments spanning multiple calendar years, this third measure also accounted for the incidence of multiple deployments within the same calendar year. If an individual deployed in January of 2004 for 15 days, June for 30 days, and November for a week, the previous two metrics (*Share of Time Deployed* and *Number of Days Deployed per Year*) would aggregate each deployment into an annual total of 52 days. For this measure, each deployment is counted separately for a total of three deployments. As shown in Figure C-5 below, the phenomenon of multiple deployments within a single calendar year is not unusual, occurring in approximately 5.4 percent of the person-years of the data with a maximum number of 22 deployments in a

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[2] Assuming the individual was neither accessed nor separated in 2006 or 2008, the first metric (*Share of Time Deployed*) would produce a value of (15+365+15)/(365+365+365) = 0.36. The second metric (*Number of Days Deployed per Year*) would yield a value of (15+365+15)/3 = 131.67.

single year. This measure has the advantage of capturing multiple, frequent deployments, which may be particularly stressful for individual service members, but the disadvantage of more heavily weighing short duration deployments than prolonged periods of deployment. In practice, this has the effect of increasing deployment rates for the Air Force, which is the Service most likely to send its members on frequent short-duration, repeated deployments.

Table C-5. Number of Individual Deployments in a Calendar Person-Year, Active Component

Service	One Deployment	Two Deployments	3-5 Deployments	6-10 Deployments	11+ Deployments
Army	2,080,045	83,225	5,432	4	0
Air Force	784,834	55,611	5,973	10	0
Marine Corps	562,558	22,185	361	0	0
Navy	807,857	46,996	7,613	1,475	158
Total	4,235,294	208,017	19,379	1,489	158

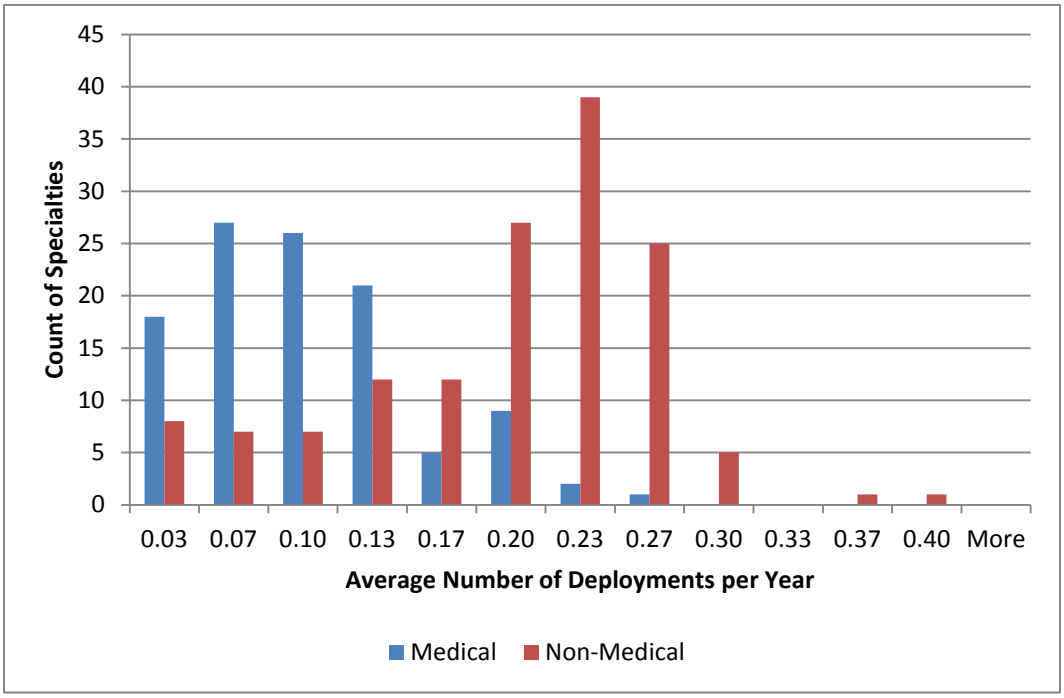

Figure C-28. Army Deployments per Year, Medical and Non-Medical Specialties, 2001–12

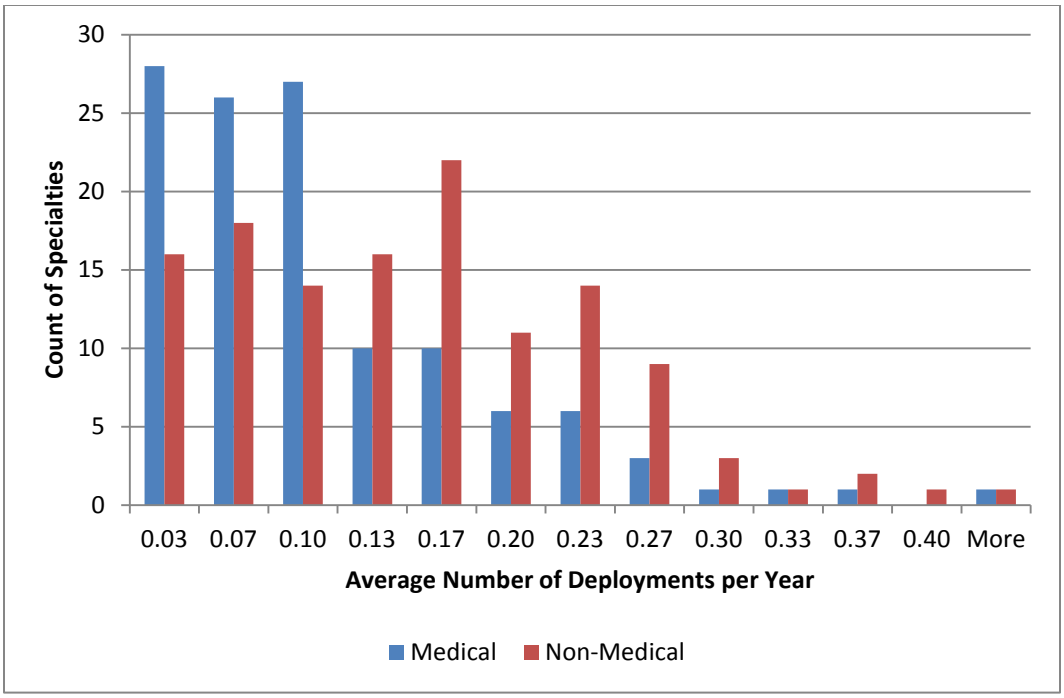

Figure C-29. Air Force Deployments per Year, Medical and Non-Medical Specialties, 2001–12

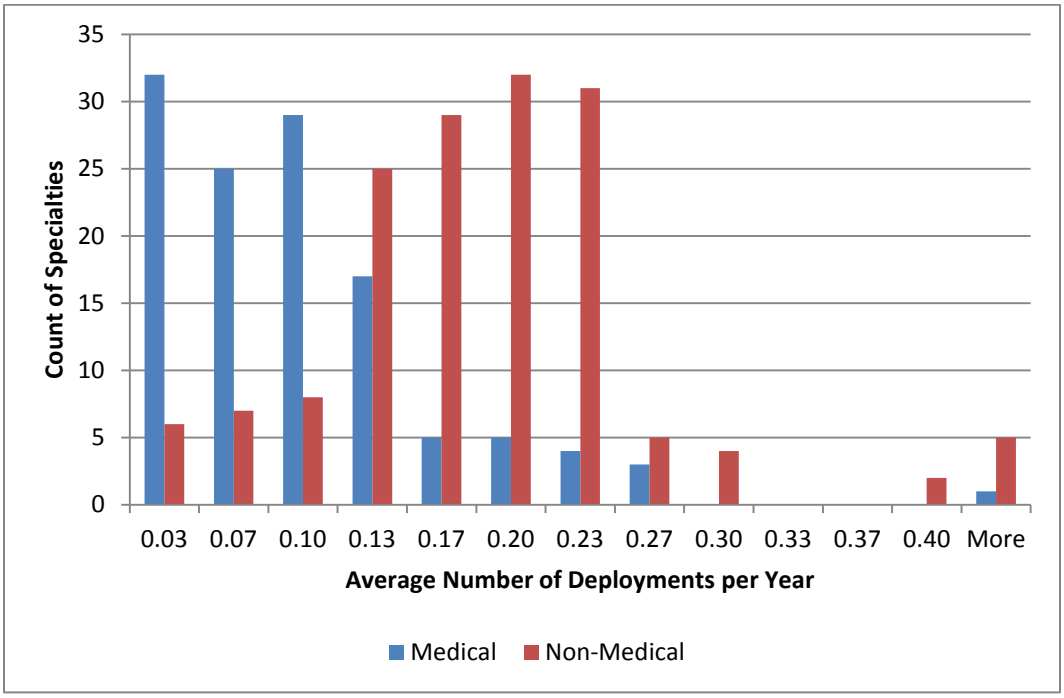

Figure C-30. Navy Deployments per Year, Medical and Non-Medical Specialties, 2001–12

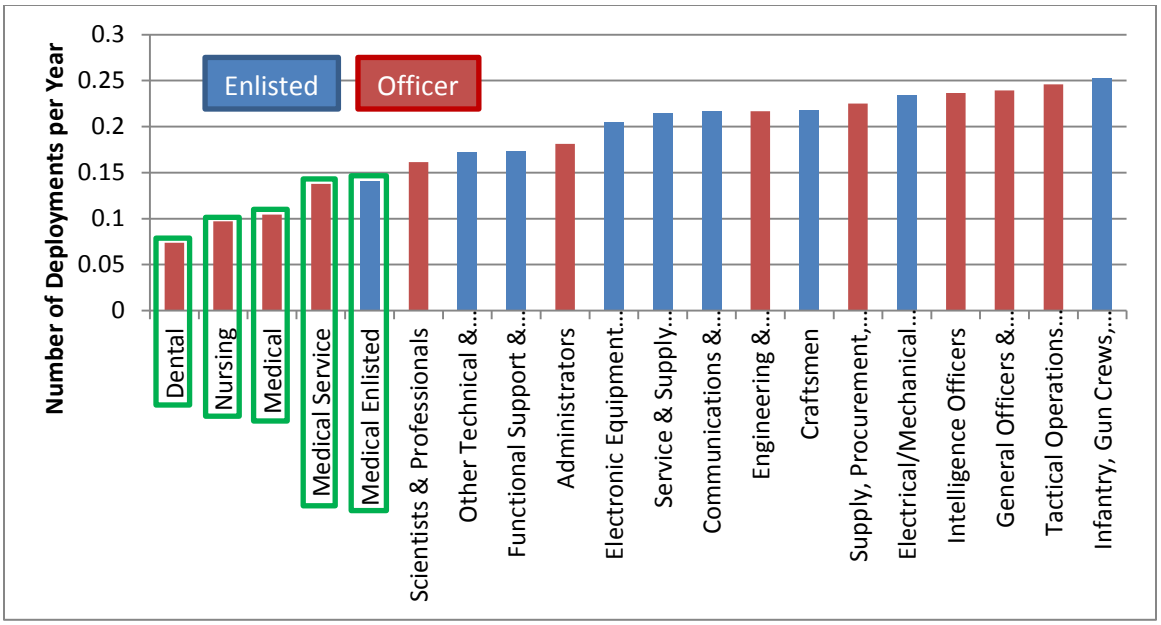

Figure C-31. Army Deployments per Year by Occupational Group, 2001–12

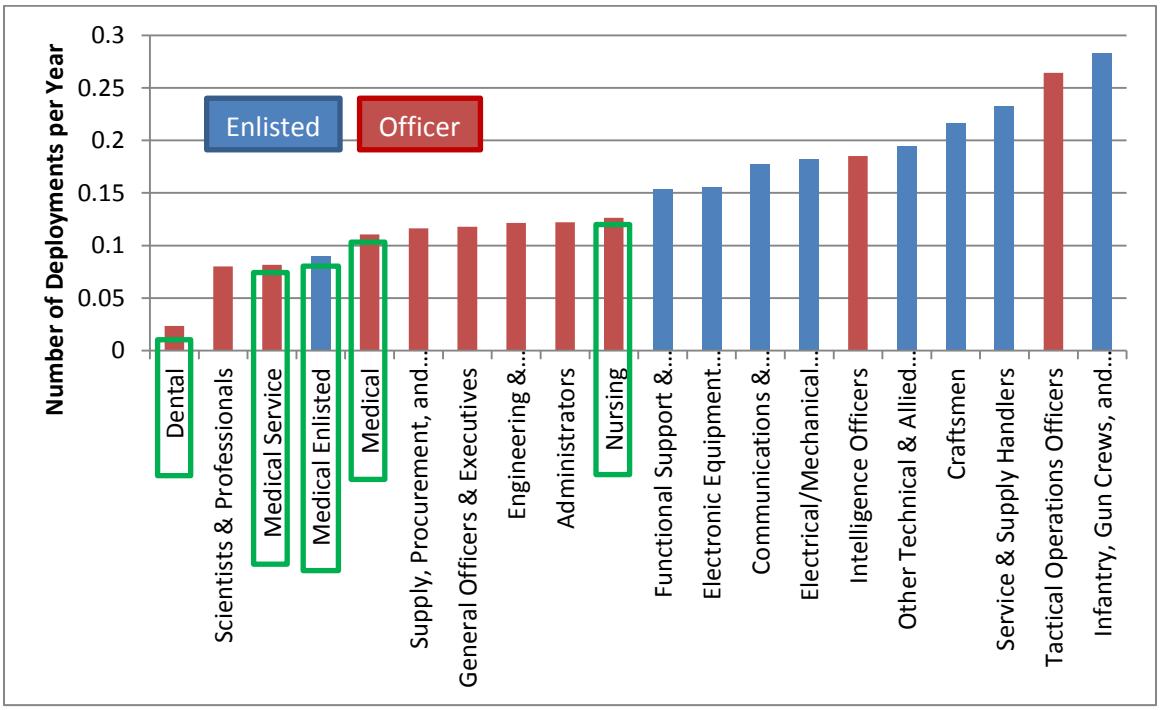

Figure C-32. Air Force Deployments per Year by Occupational Group, 2001–12

Figure C-33. Navy Deployments per Year by Occupational Group, 2001–12

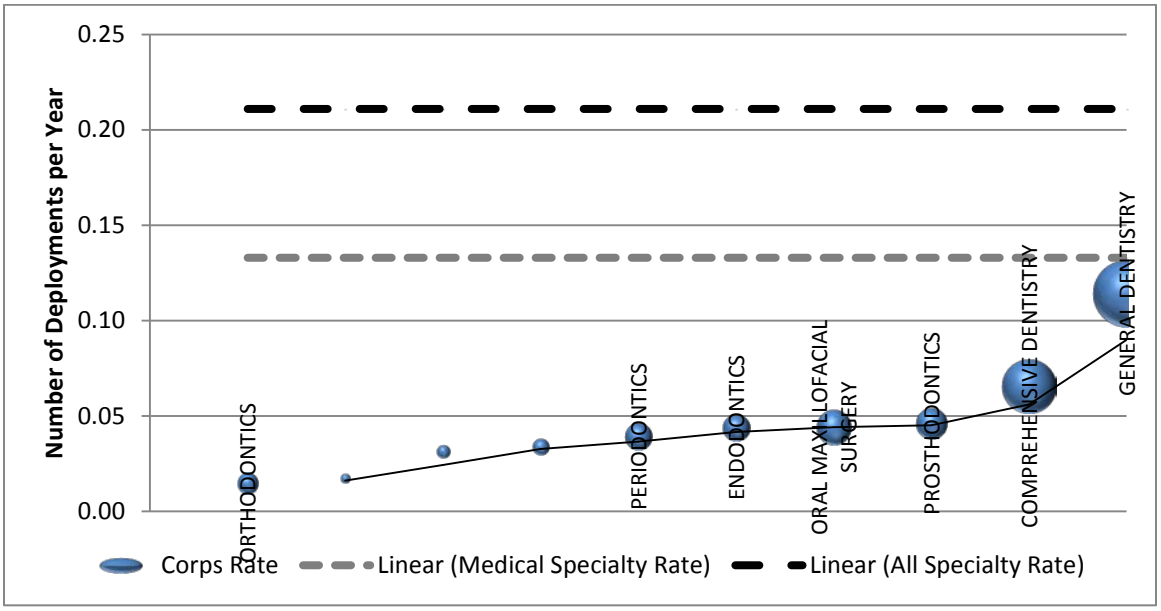

Figure C-34. Army Dental Corps Deployments per Year by Specialty, 2001–12

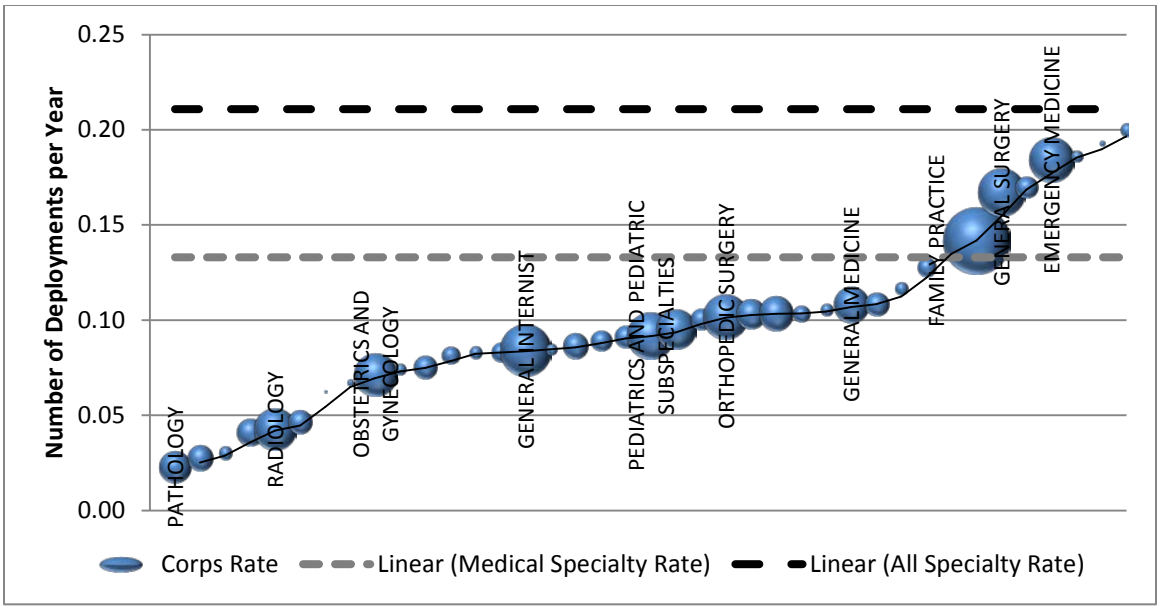

Figure C-35. Army Medical Corps Deployments per Year by Specialty, 2001–12

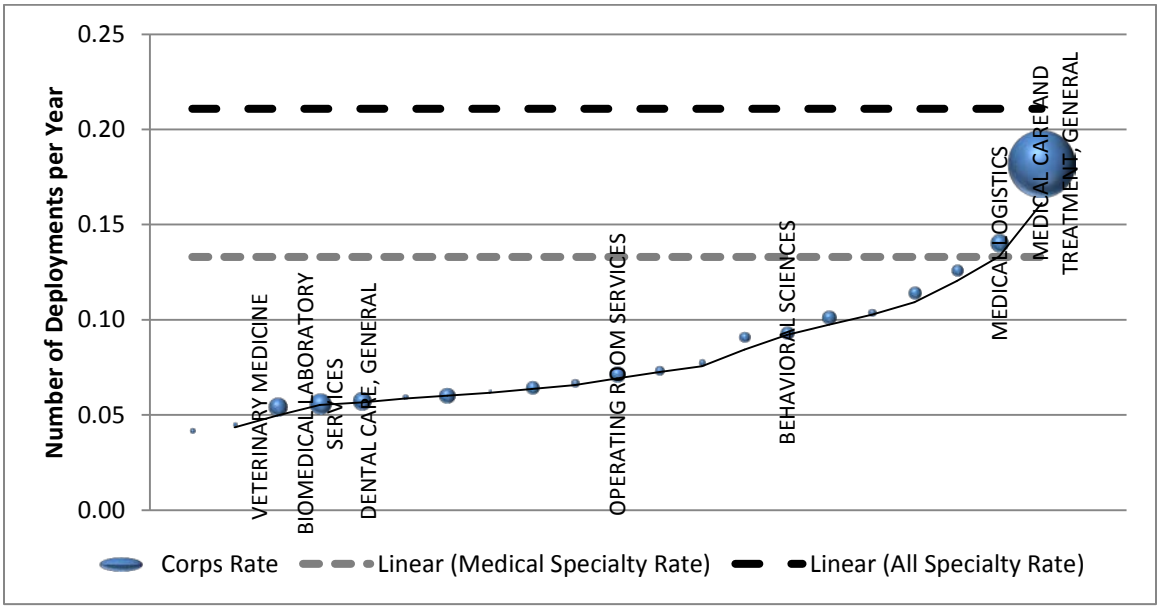

Figure C-36. Army Enlisted Medical Corps Deployments per Year by Specialty, 2001–12

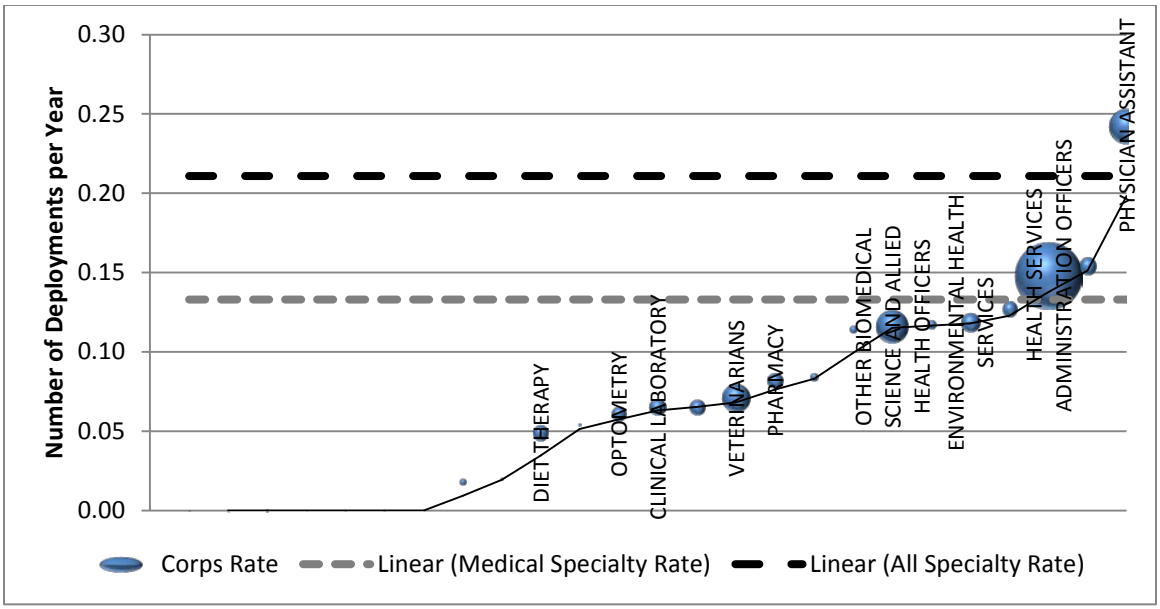

Figure C-37. Army Medical Service Corps Deployments per Year by Specialty, 2001–12

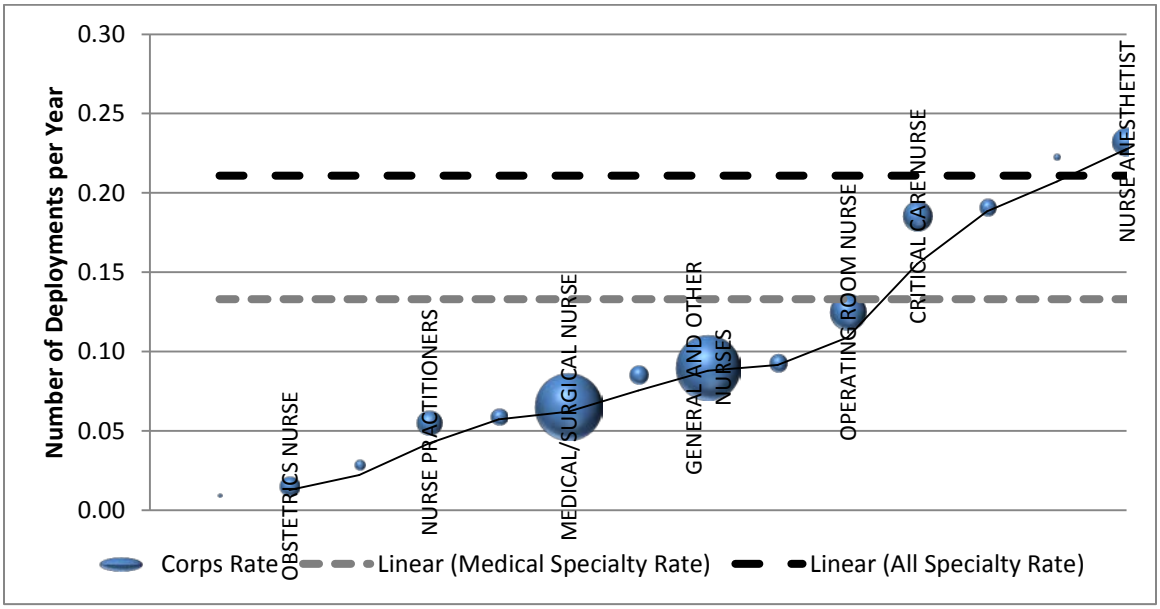

Figure C-38. Army Nursing Corps Deployments per Year by Specialty, 2001–12

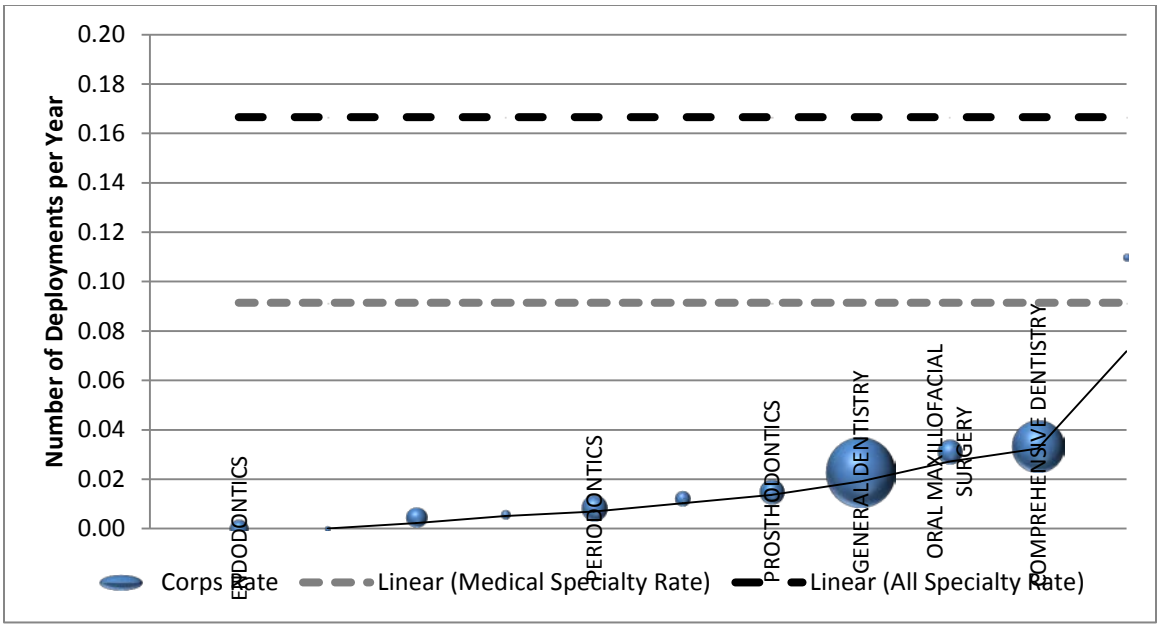

Figure C-39. Air Force Dental Corps Deployments per Year by Specialty, 2001–12

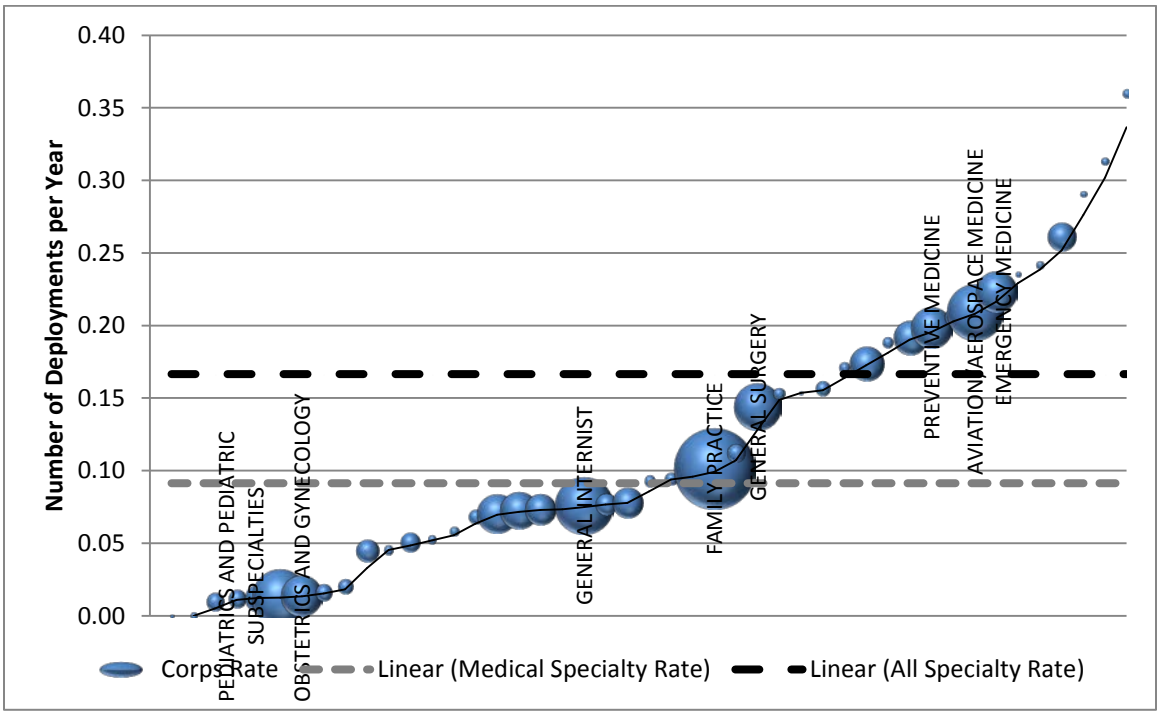

Figure C-40. Air Force Medical Corps Deployments per Year by Specialty, 2001–12

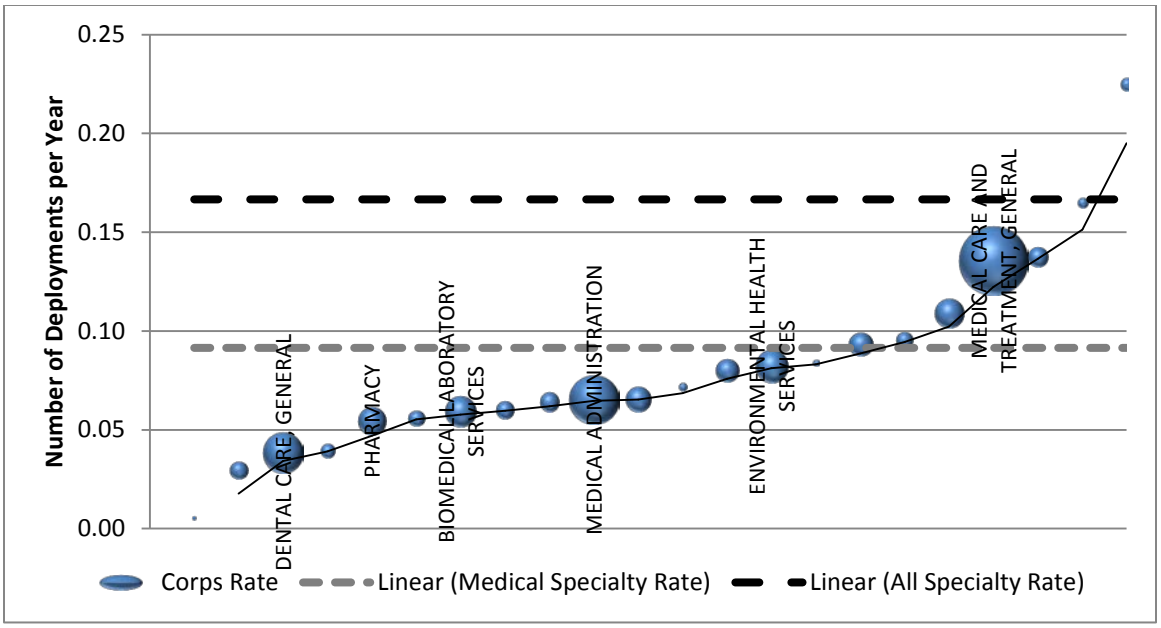

Figure C-41. Air Force Enlisted Medical Corps Deployments per Year by Specialty, 2001–12

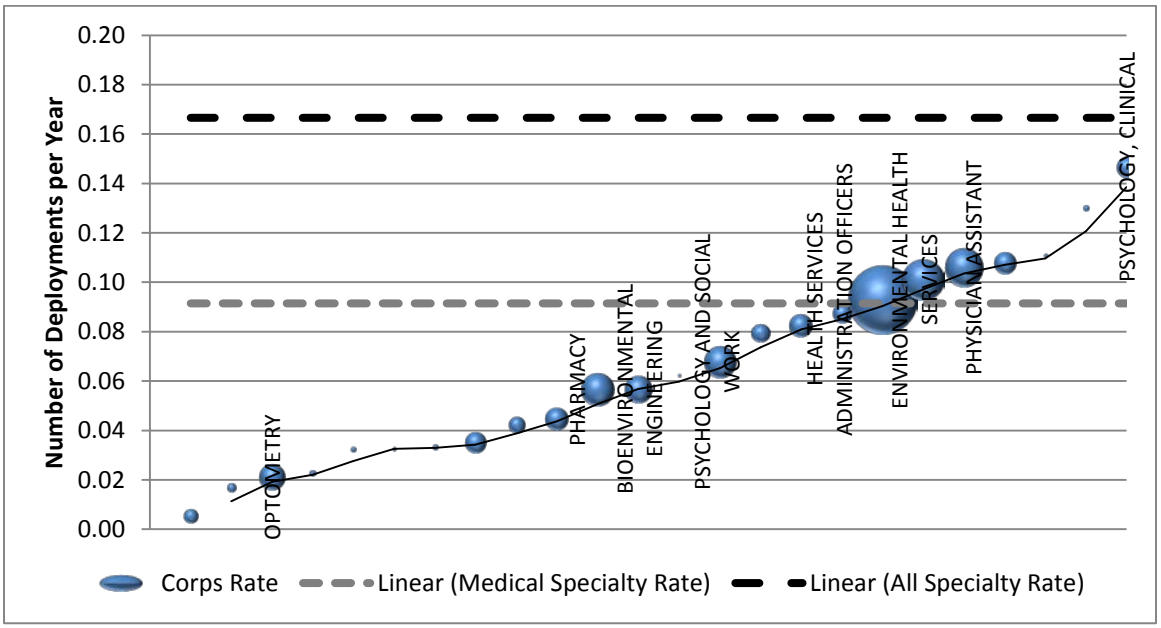

Figure C-42. Air Force Medical Service Corps Deployments per Year by Specialty, 2001–12

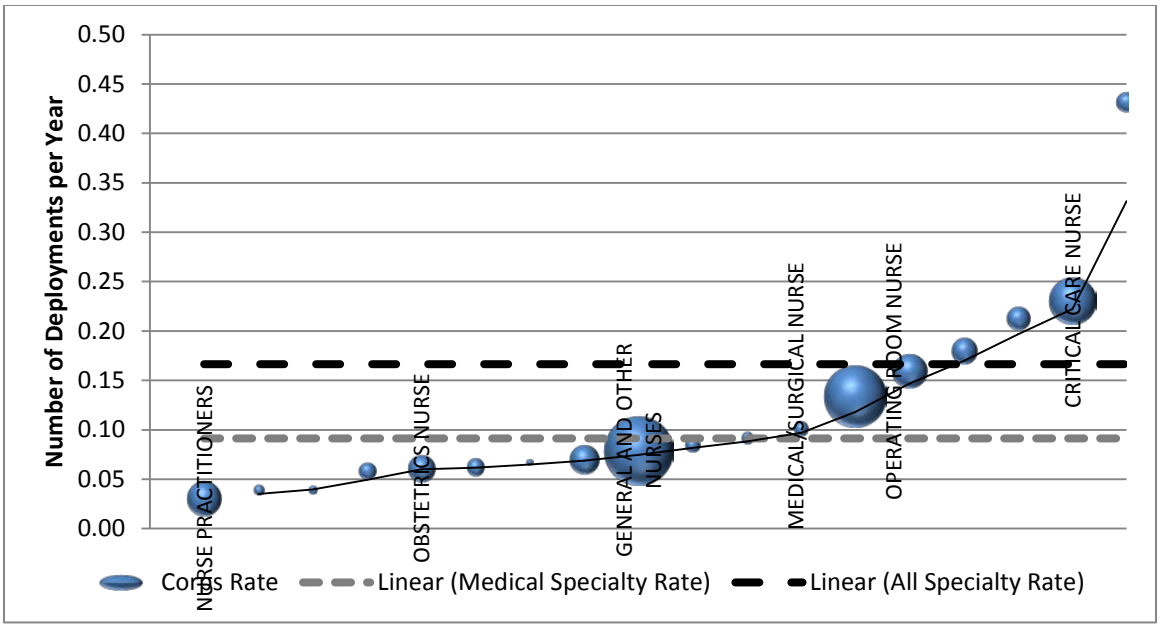

Figure C-43. Air Force Nursing Corps Deployments per Year by Specialty, 2001–12

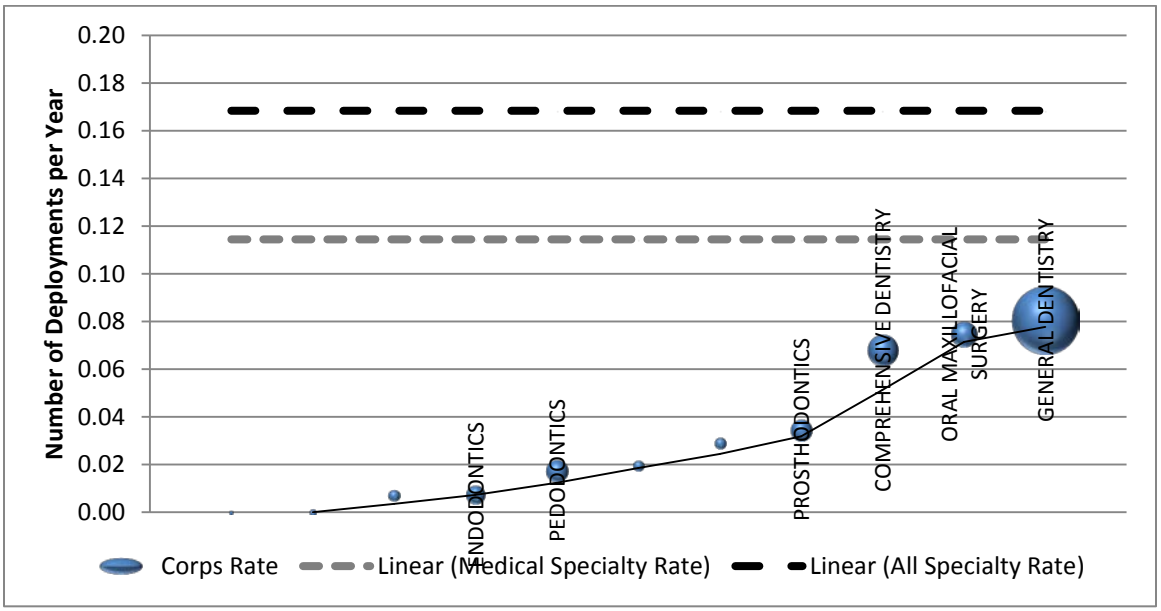

Figure C-44. Navy Dental Corps Deployments per Year by Specialty, 2001–12

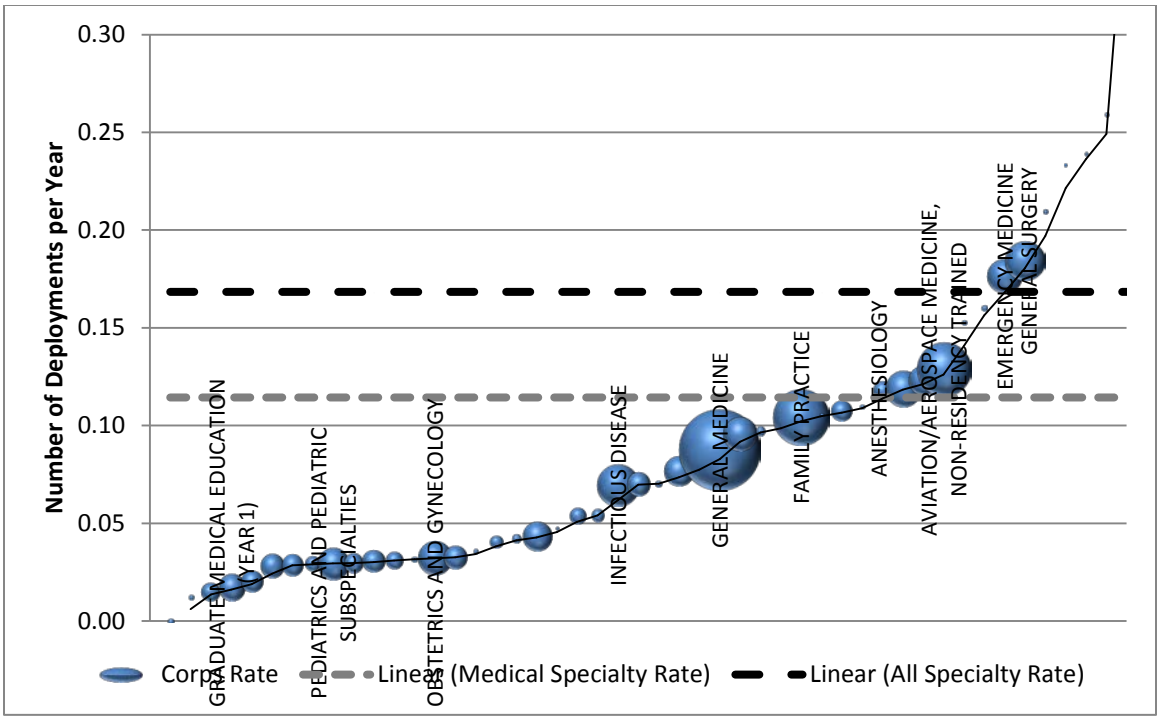

Figure C-45. Navy Medical Corps Deployments per Year by Specialty, 2001–12

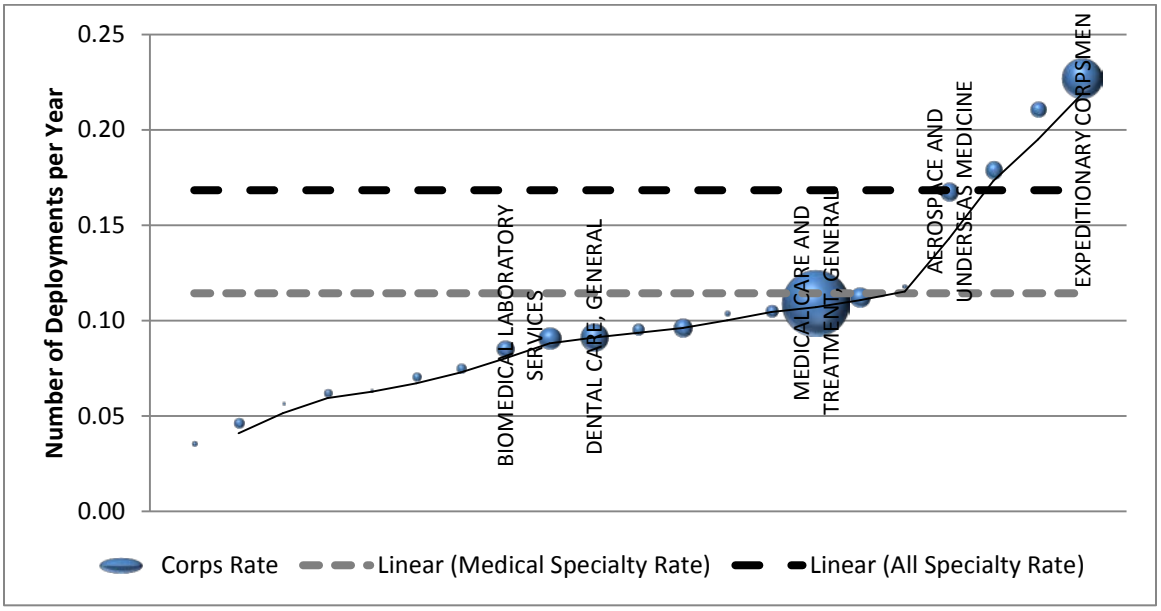

Figure C-46. Navy Enlisted Medical Corps Deployments per Year by Specialty, 2001–12

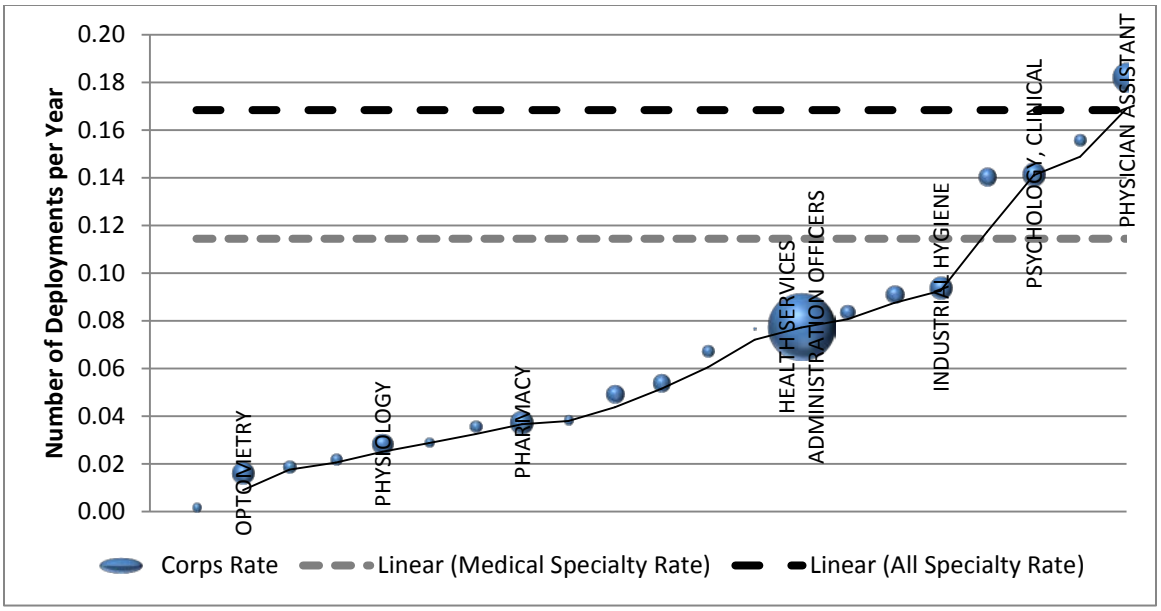

Figure C-47. Navy Medical Service Corps Deployments per Year by Specialty, 2001–12

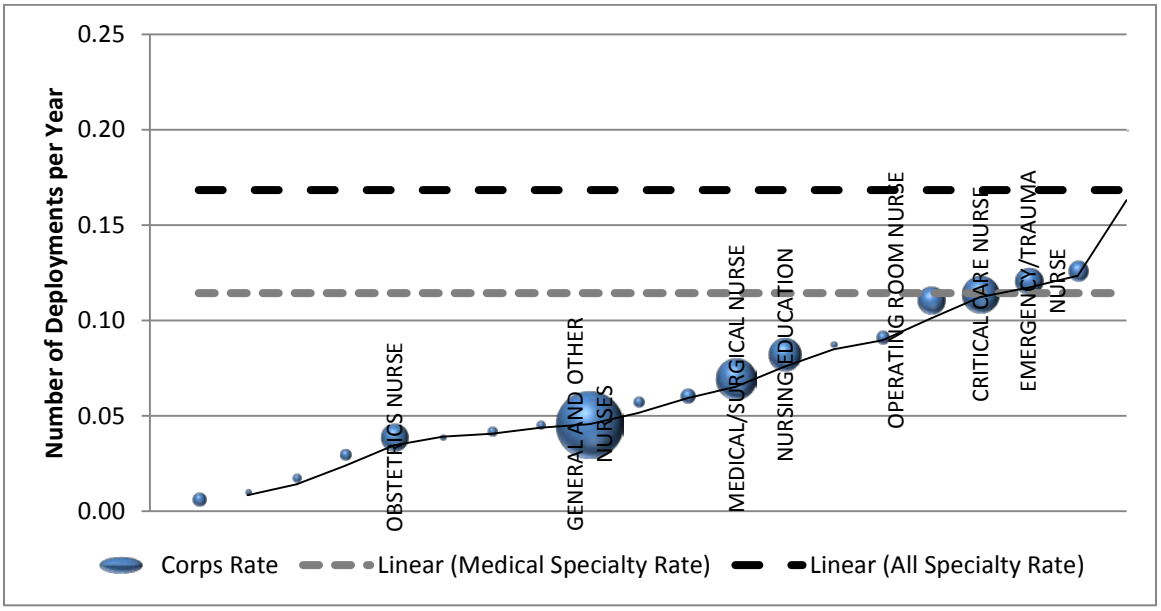

Figure C-48. Navy Nursing Corps Deployments per Year by Specialty, 2001–12

Share of Years with at Least One Day Deployed

The fourth measure, presented in the charts below, measures the share of person-years that experienced at least one day deployed. Unlike the first two measures (*Share of Time Deployed* and *Number of Days Deployed per Year*), this measure does not account for the length of the deployment, but unlike the third metric (*Number of Deployments per Year*), it does not accentuate the influence of multiple, short deployments within a single

year. Deployments that span multiple calendar years are counted in each calendar year in which they occur, increasing the influence of longer deployments.

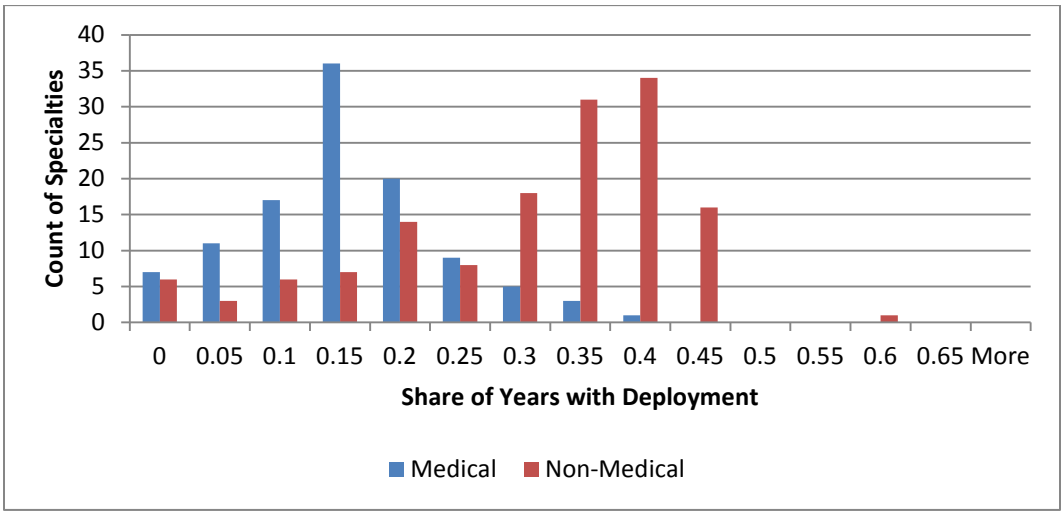

Figure C-49. Army Share of Years with Deployment, Medical and Non-Medical Specialties, 2001–12

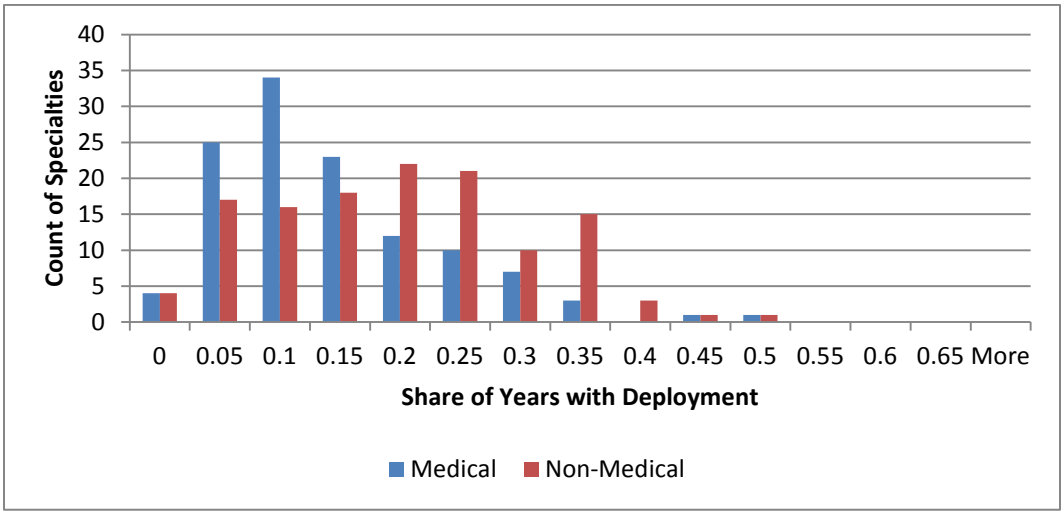

Figure C-50. Air Force Share of Years with Deployment, Medical and Non-Medical Specialties, 2001–12

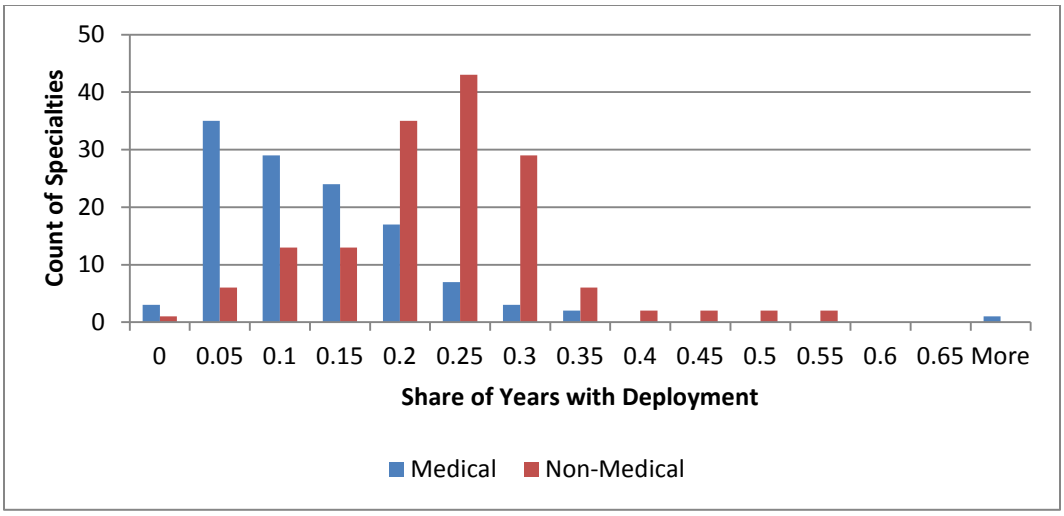

Figure C-51. Navy Share of Years with Deployment, Medical and Non-Medical Specialties, 2001–12

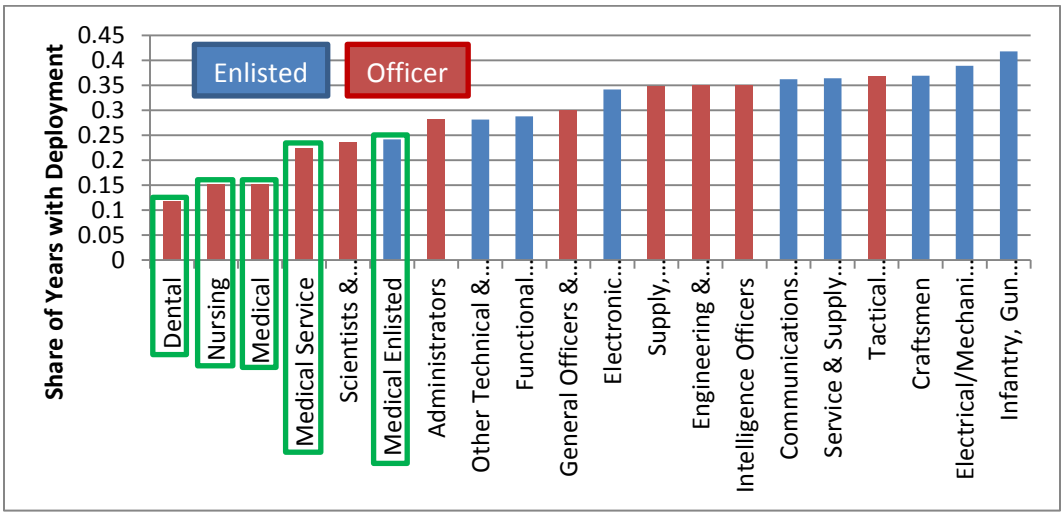

Figure C-52. Army Share of Years with Deployment by Occupational Group, 2001–12

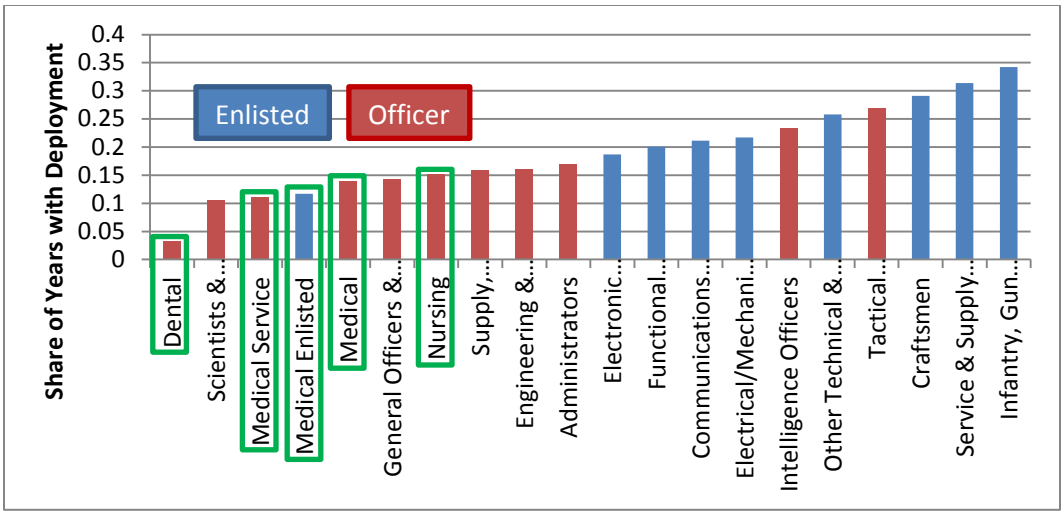

Figure C-53. Air Force Share of Years with Deployment by Occupational Group, 2001–12

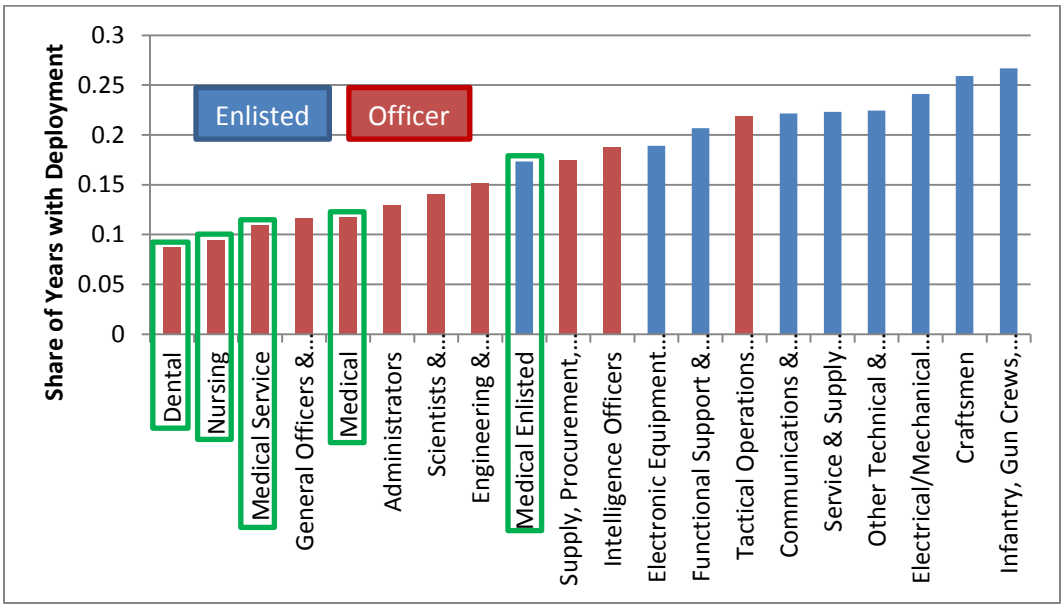

Figure C-54. Navy Share of Years with Deployment by Occupational Group, 2001–12

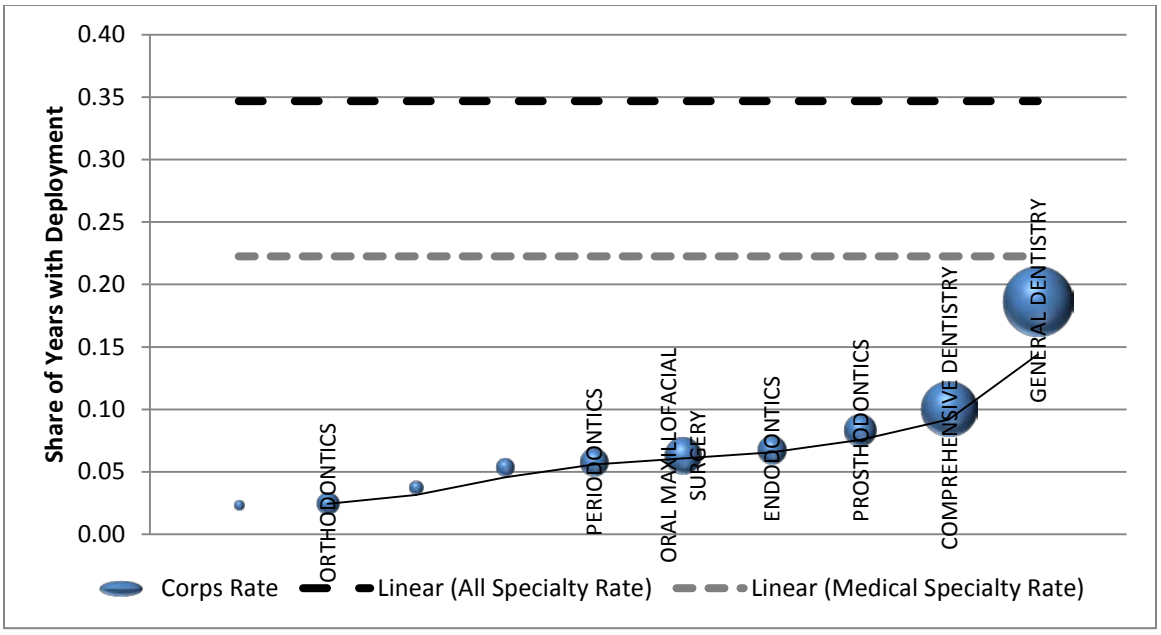

Figure C-55. Army Dental Corps Share of Years with Deployment by Specialty, 2001–12

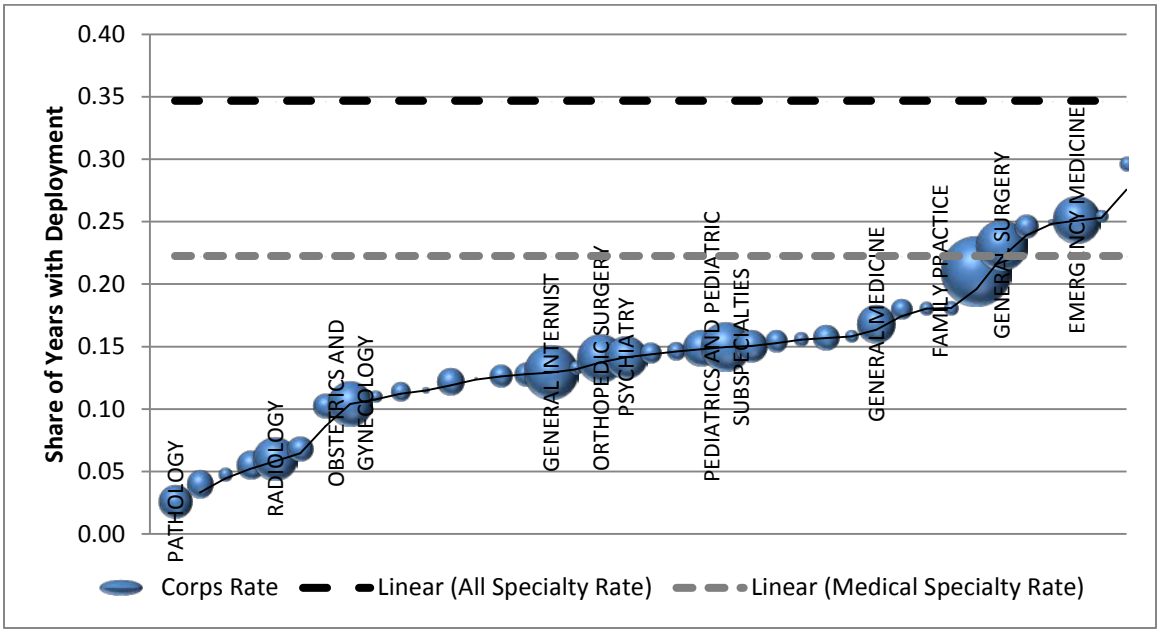

Figure C-56. Army Medical Corps Share of Years with Deployment by Specialty, 2001–12

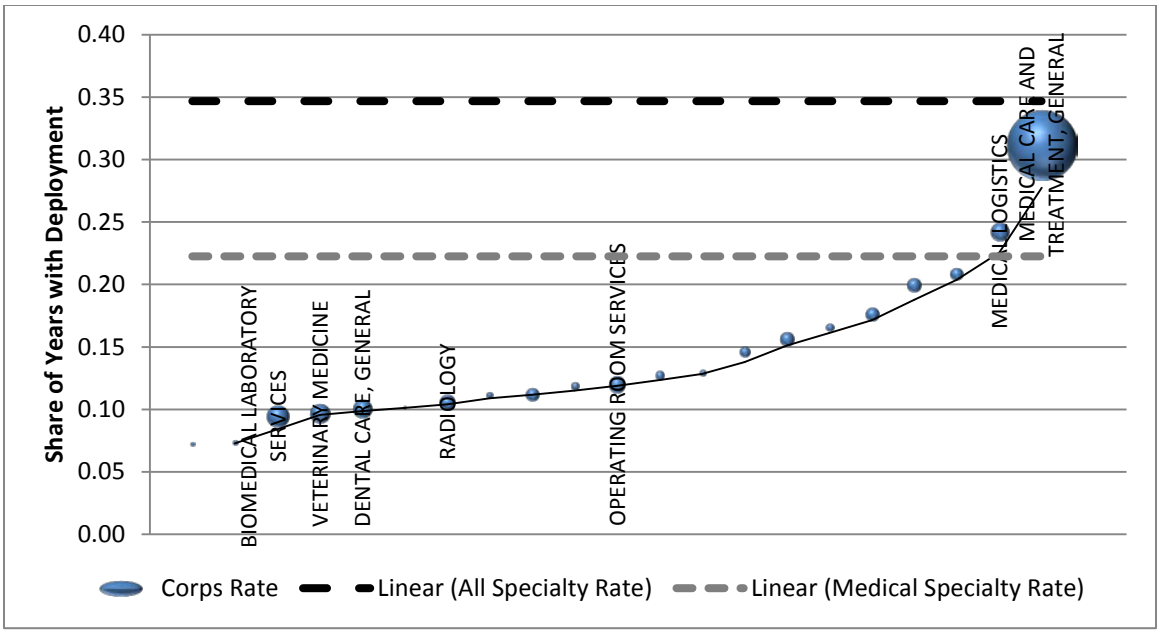

Figure C-57. Army Enlisted Medical Corps Share of Years with Deployment by Specialty, 2001–12

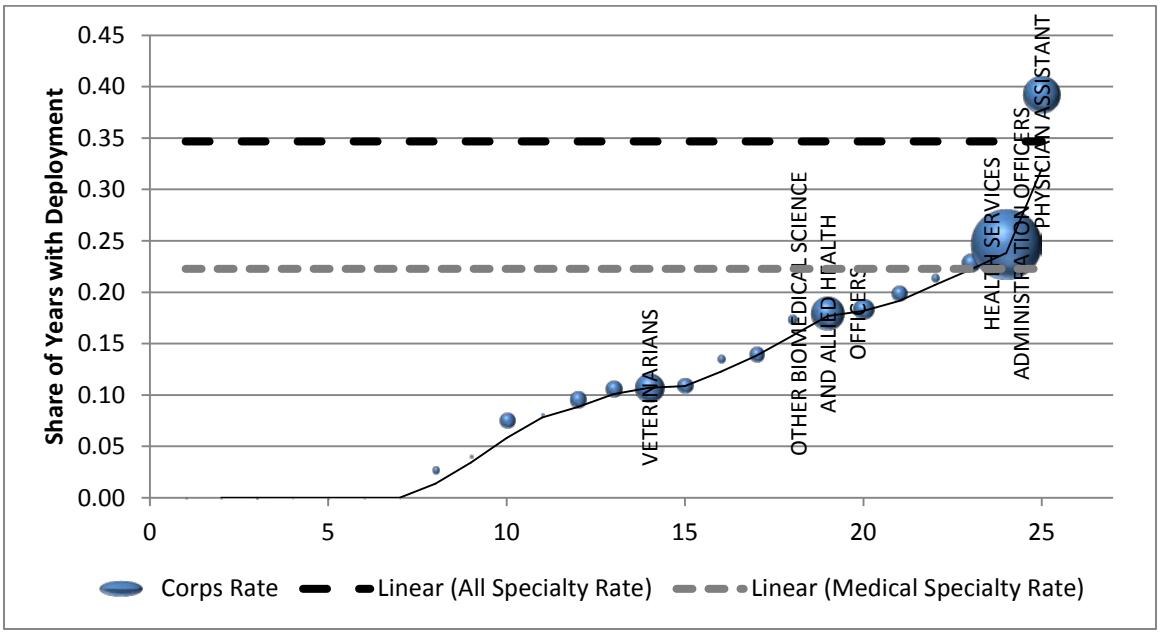

Figure C-58. Army Medical Service Corps Share of Years with Deployment by Specialty, 2001–12

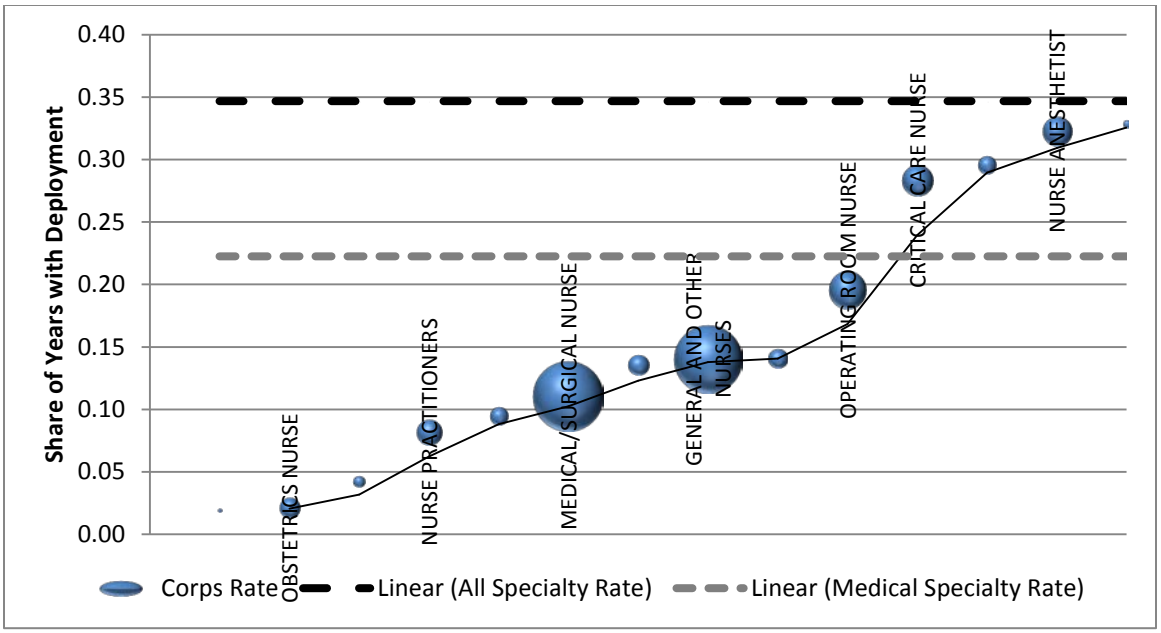

Figure C-59. Army Nursing Corps Share of Years with Deployment by Specialty, 2001–12

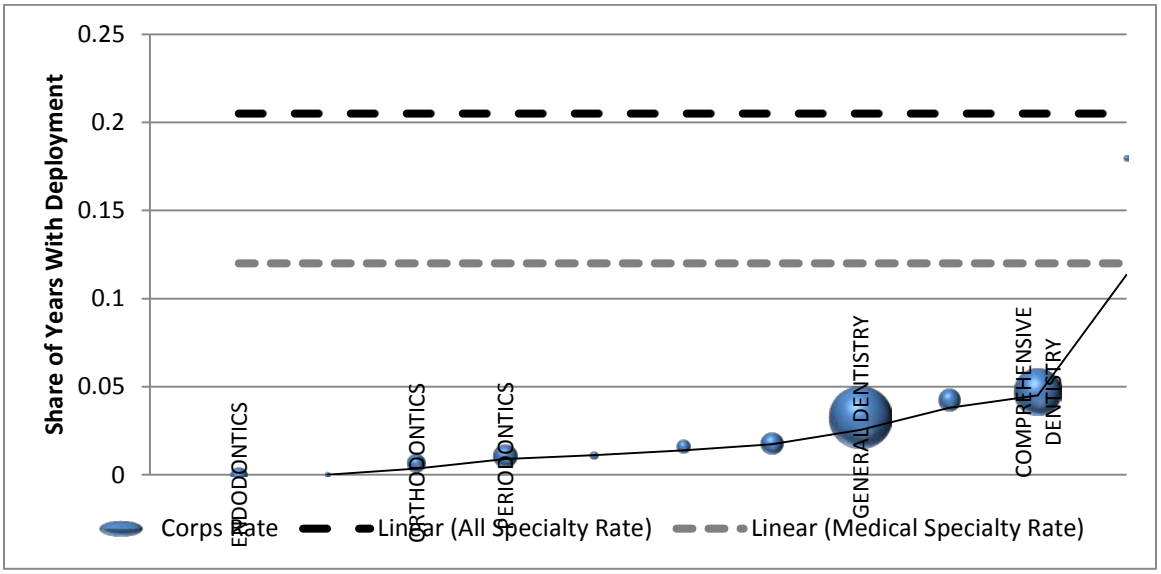

Figure C-60. Air Force Dental Corps Share of Years with Deployment by Specialty, 2001–12

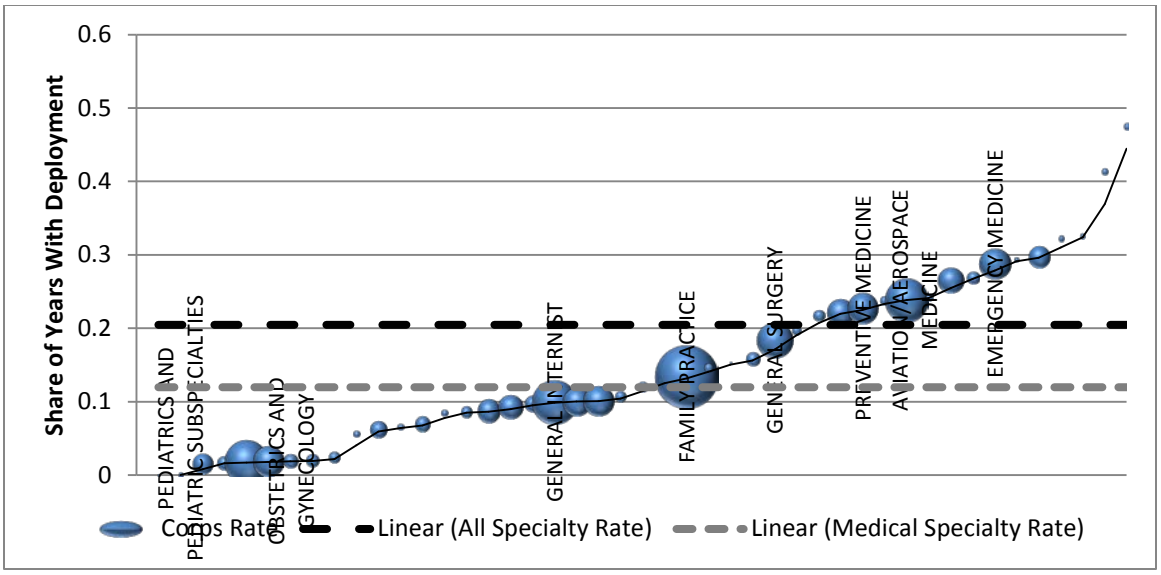

Figure C-61. Air Force Medical Corps Share of Years with Deployment by Specialty, 2001–12

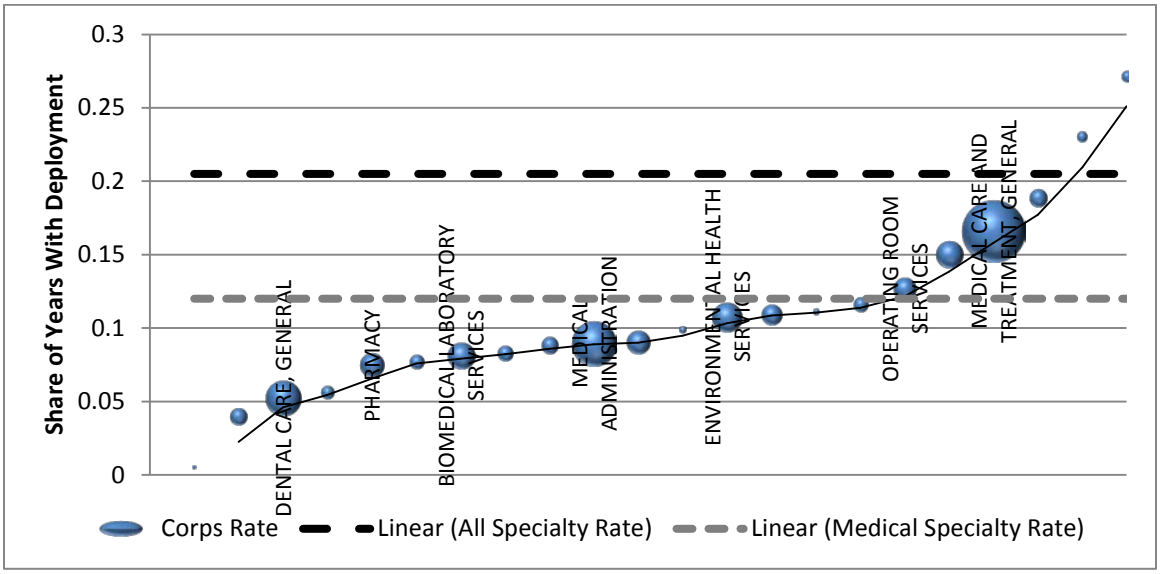

Figure C-62. Air Force Enlisted Medical Corps Share of Years with Deployment by Specialty, 2001–12

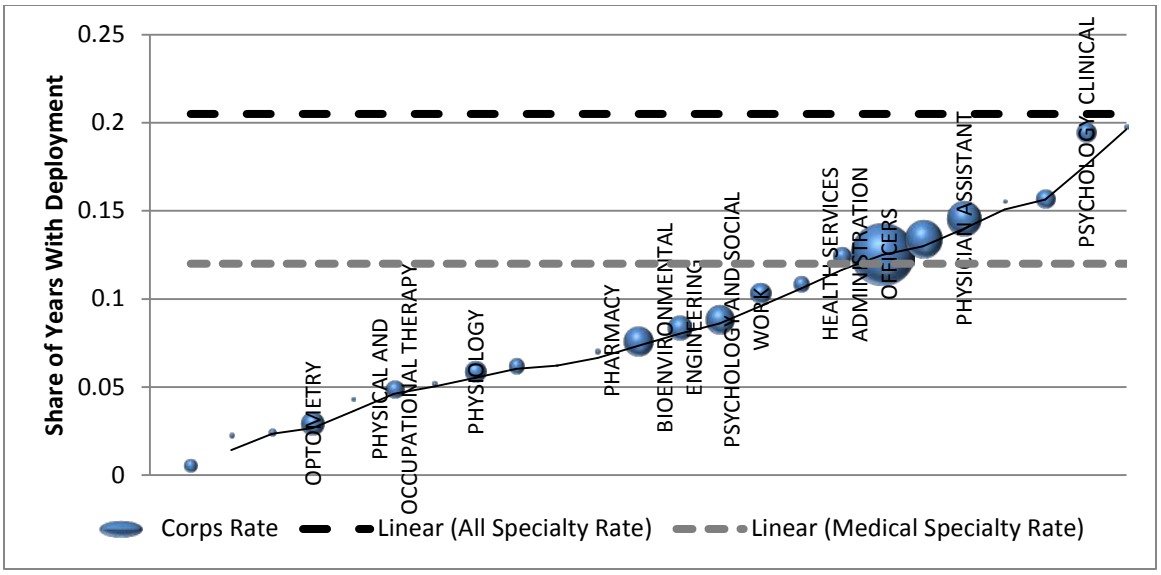

Figure C-63. Air Force Medical Service Corps Share of Years with Deployment by Specialty, 2001–12

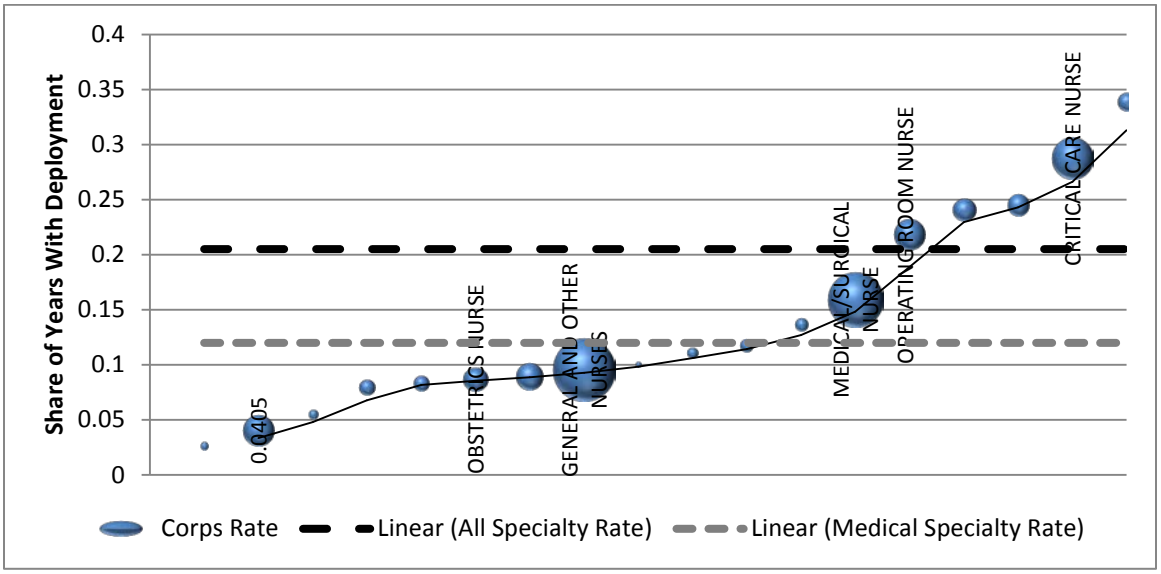

Figure C-64. Air Force Nursing Corps Share of Years with Deployment by Specialty, 2001–12

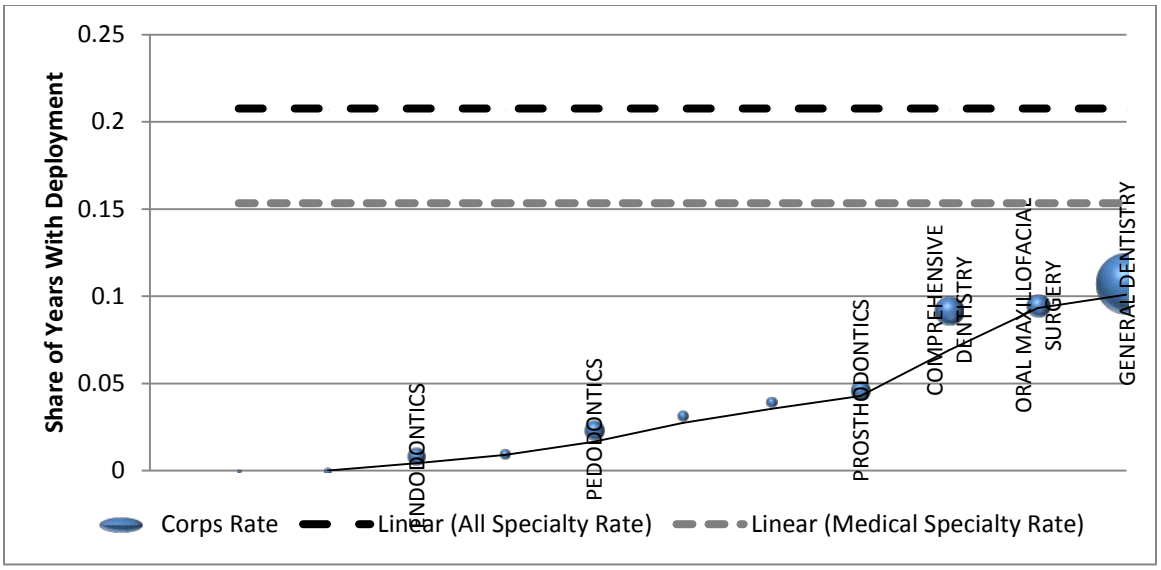

Figure C-65. Navy Dental Corps Share of Years with Deployment by Specialty, 2001–12

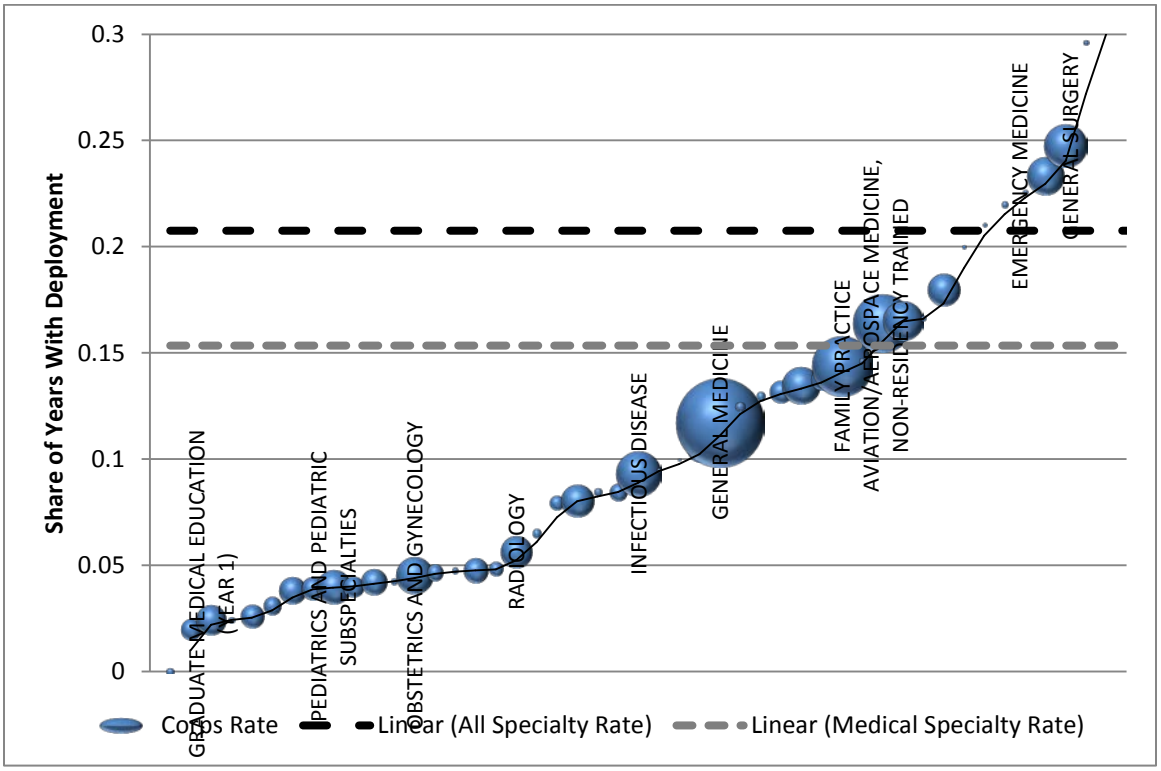

Figure C-66. Navy Medical Corps Share of Years with Deployment by Specialty, 2001–12

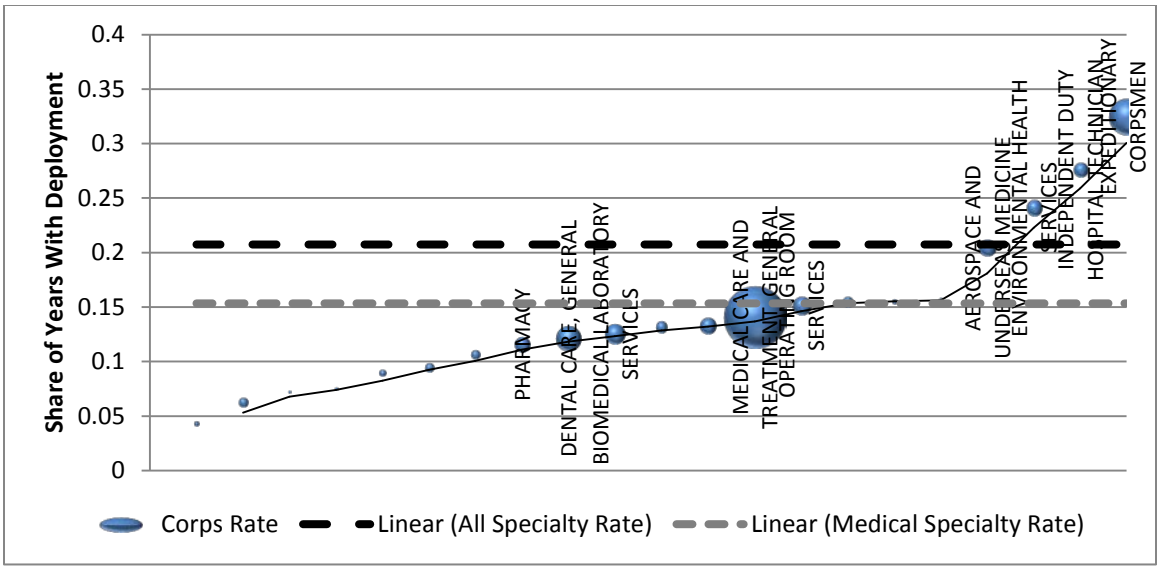

Figure C-67. Navy Enlisted Medical Corps Share of Years with Deployment by Specialty, 2001–12

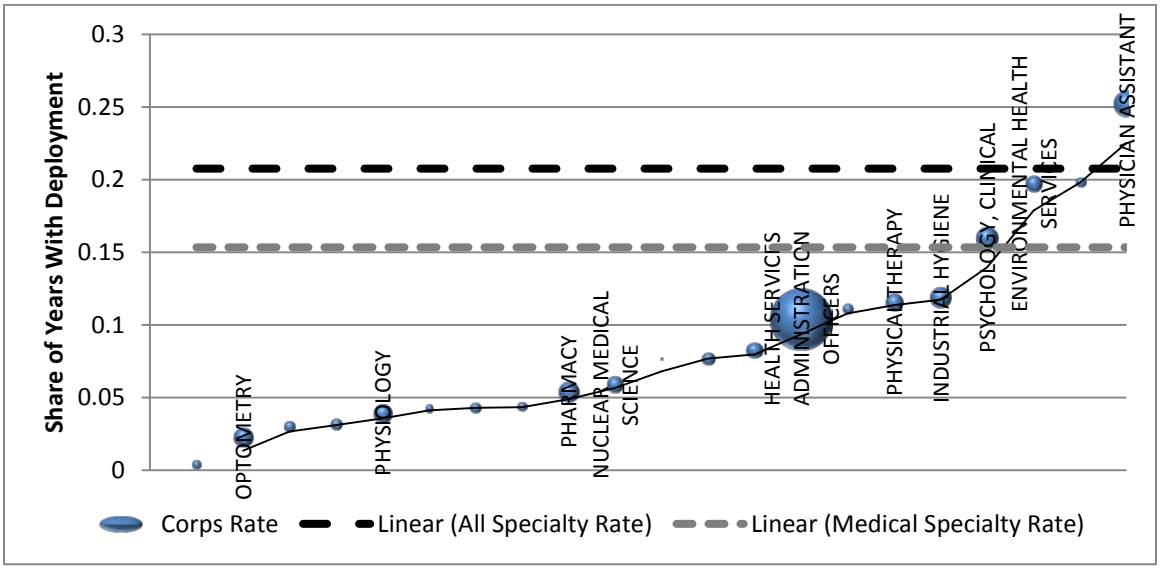

Figure C-68. Navy Medical Service Corps Share of Years with Deployment by Specialty, 2001–12

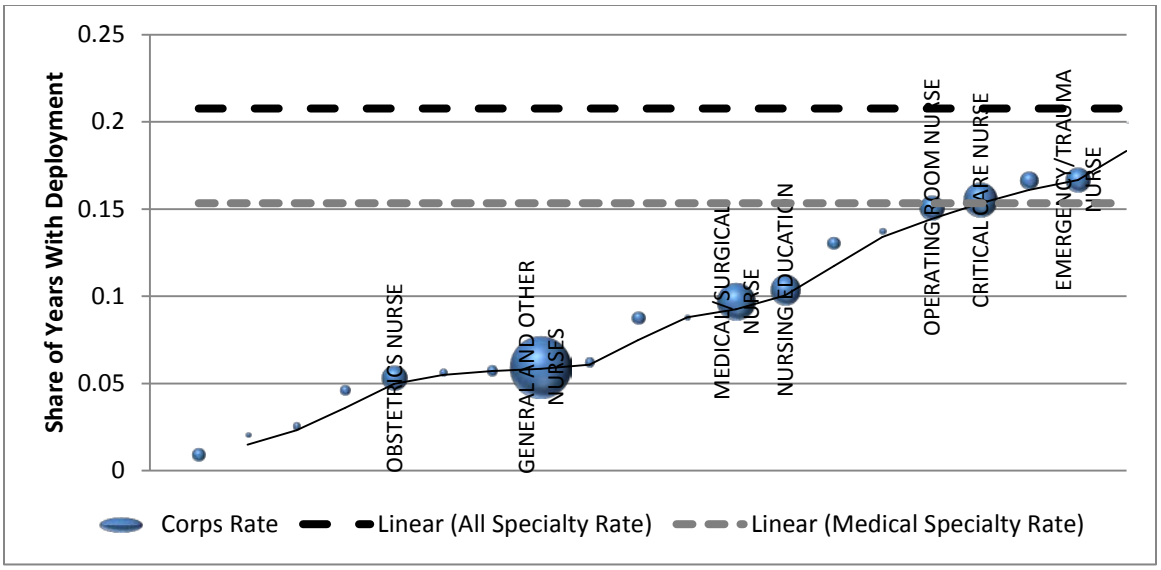

Figure C-69. Navy Nursing Corps Share of Years with Deployment by Specialty, 2001–12

Average Deployment Length

The fifth measure, presented in Figure C-70 through Figure C-73, measures the average length of deployments by specialty or corps. The measure calculates the total number of days deployed, by specialty, then divides by the total number of deployments. Because this metric only uses CTS deployment data as inputs, it does not provide insight into differential deployment rates among specialties and occupational groups. It can, however, reveal differences in deployment length between Services. A version of these charts also adds Marine Corps non-medical deployments to the Navy data because many Navy medical personnel deploy embedded in Marine Corps units. Across all specialties, the Army tends to have the longest deployment lengths and the Air Force has the shortest. However, deployment lengths for medical personnel across the three Services tend to converge to a greater extent than deployment lengths for non-medical personnel. This convergence may provide evidence of joint sourcing of medical capabilities.

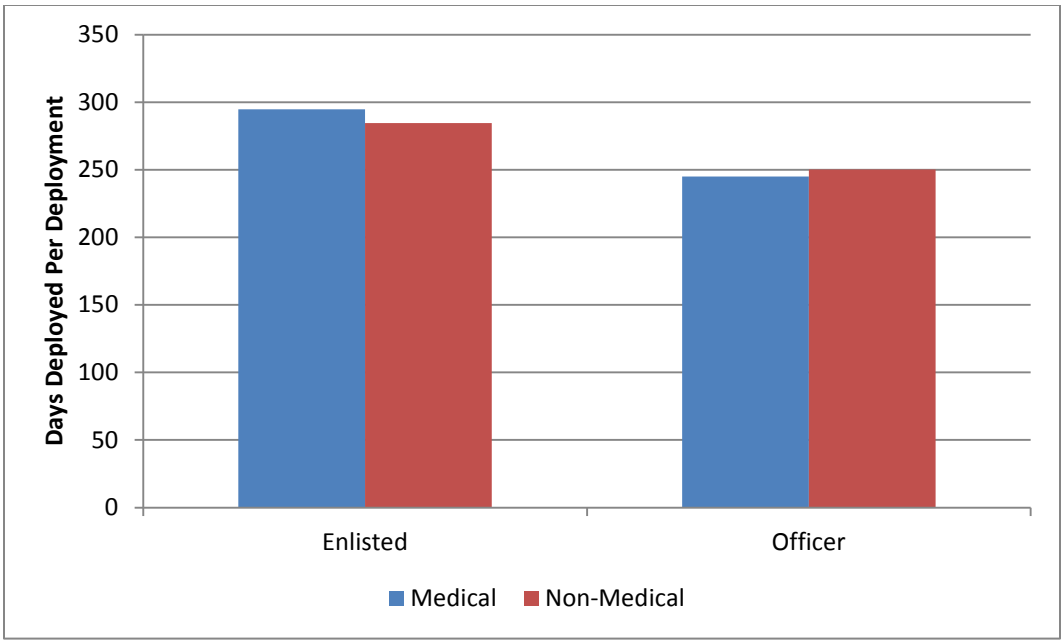

Figure C-70. Army Average Deployment Length, Medical and Non-Medical Specialties, 2001–12

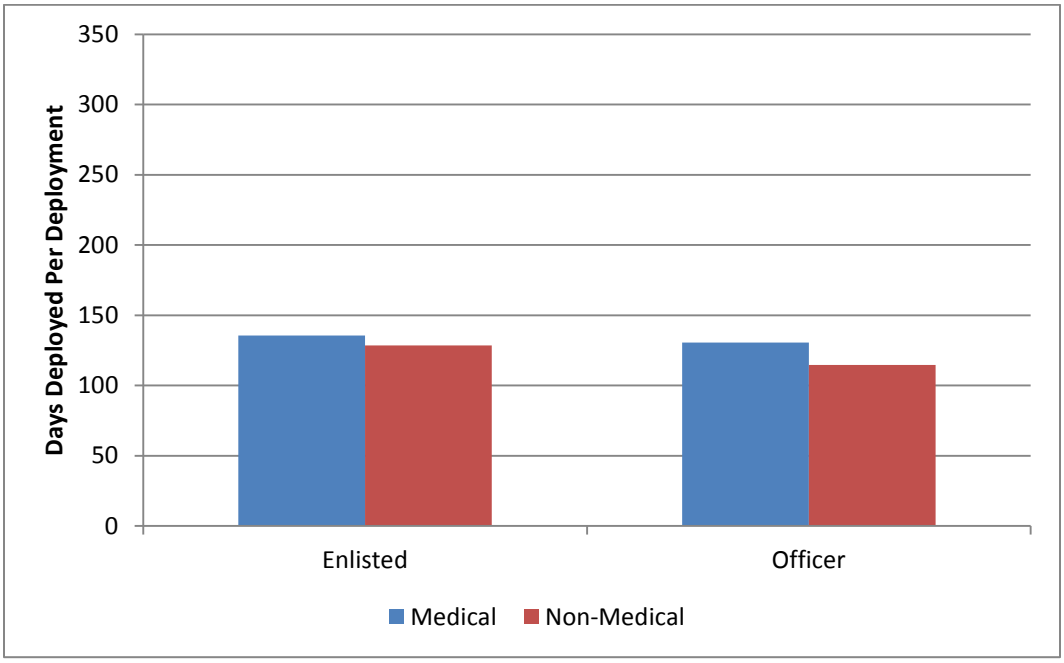

Figure C-71. Air Force Average Deployment Length, Medical and Non-Medical Specialties, 2001–12

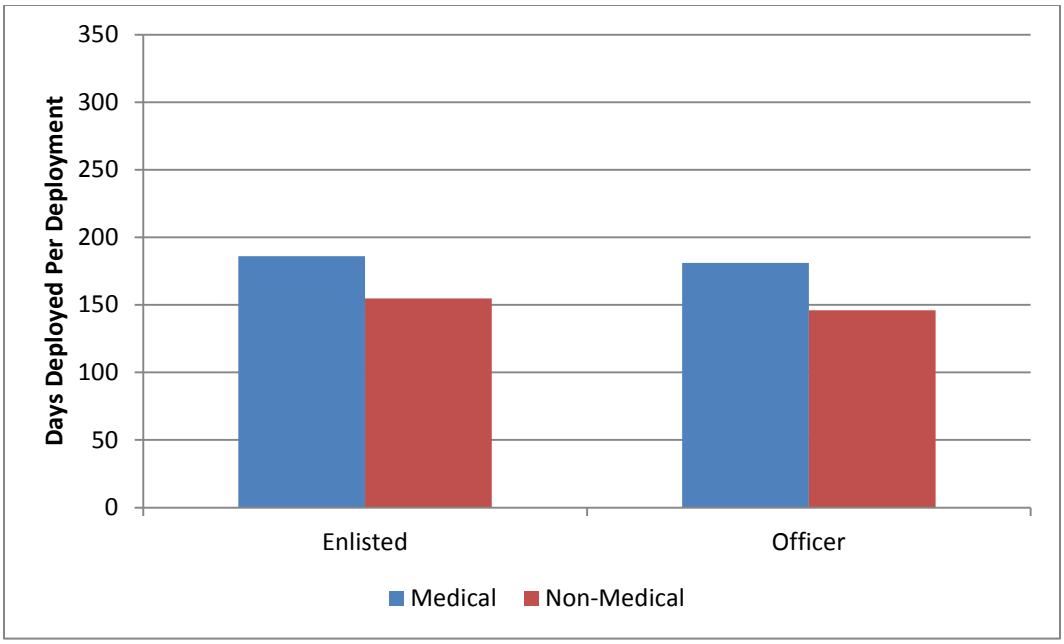

Figure C-72. Navy Average Deployment Length, Medical and Non-Medical Specialties, 2001–12

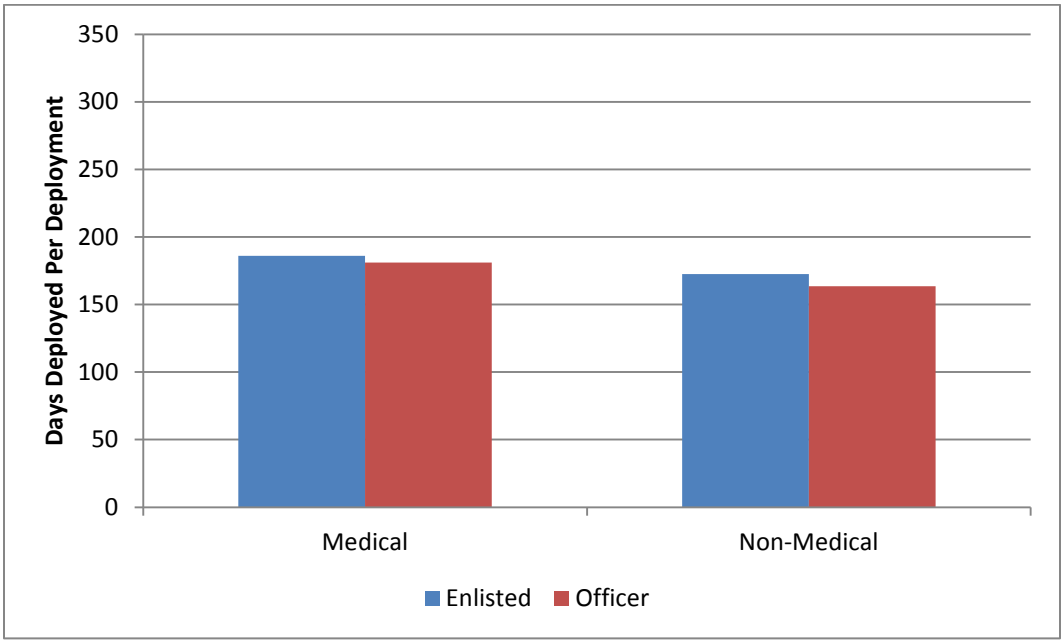

Figure C-73. Navy and Marine Corps Average Deployment Length, Medical and Non-Medical Specialties, 2001–12

Number of Deployments by Individual

The sixth measure, presented in the charts in Chapter 3, measures the number of deployments an individual experiences in the military. Repeat individual deployments

may signal force stress. The absence of individual deployments may raise questions of military essentiality. For this measure, deployment experiences were divided into four categories: individuals experiencing zero deployments, one deployment, two deployments, or three or more deployments. Counting of individual deployments followed the first methodology described for the *Number of Deployments per Year* metric. Deployments spanning more than one calendar year were counted as a single deployment. Multiple deployments within a single year were counted as multiple deployments. No adjustment was made for an individual's length of service within the dataset. Raw data by occupational group are presented below, and charts depicting this data can be found in Chapter 2, Section 2.D.2.

Table C-6, Army Number of Deployments by Individual, Active Component, 2001–12

Medical Corps or Group	Zero Deployments	One Deployment	Two Deployments	Three or More Deployments
Medical Corps	3,931	2,340	704	342
Dental Corps	1,328	652	71	22
Nursing Corps	3,224	1,740	516	192
Medical Service Corps	4,466	2,659	1,130	790
Enlisted Corps	40,130	20,362	8,299	3,883
Non-Medical Officer	27,775	25,098	17,647	18,393
Non-Medical Enlisted	355,618	260,161	137,807	100,298

Table C-7. Air Force Number of Deployments by Individual, Active Component, 2001–12

Medical Corps or Group	Zero Deployments	One Deployment	Two Deployments	Three or More Deployments
Medical Corps	3,732	1,551	571	309
Dental Corps	1,778	201	19	3
Nursing Corps	3,208	1,421	521	412
Medical Service Corps	3,028	1,254	408	155
Enlisted Corps	17,473	6,311	2,368	1,352
Non-Medical Officer	41,240	18,881	10,618	13,886
Non-Medical Enlisted	265,669	121,468	64,890	64,854

Table C-8. Navy Number of Deployments by Individual, Active Component, 2001–12

Medical Corps or Group	Zero Deployments	One Deployment	Two Deployments	Three or More Deployments
Medical Corps	3,800	1,740	530	193
Dental Corps	1,543	452	104	29
Nursing Corps	2,812	1,070	312	84
Medical Service Corps	2,813	932	283	151
Enlisted Corps	25,074	10,131	5,198	3,047
Non-Medical Officer	29,219	15,133	8,842	7,389
Non-Medical Enlisted	294,811	159,007	88,221	57,055

Country Deployed To

The seventh measure is the location of deployments for medical and non-medical personnel. The CTS deployment dataset provides two-digit country codes for each country to which a Servicemember deploys. Deployments to countries with open hostilities, such as Iraq and Afghanistan, are presumed to be less amenable to civilian personnel than deployments to relatively safer combat support areas, such as Bahrain and Kuwait, or non-hostile areas, such as Germany or Japan. The *Country Deployed To* measure divides individual deployments into these three categories—Iraq/Afghanistan, combat support areas, and non-hostile "green zones"—as well as an additional category in which an individual's deployment location is unknown or unreported. The combat support area category is defined by those countries or bodies of water in which Servicemembers were eligible for Hostile Fire/Imminent Danger Pay (HF/IDP) or a Combat Zone Tax Exclusion (CZTE) through OEF, OIF, or Operation New Dawn at any time between 2001 and 2012. Other areas eligible for HF/IDP or CZTE, such as Balkan nations under the statutory Qualified Hazardous Duty Area (P.L. 104-117; P.L. 106-21) were not counted as combat support areas. Table C-9 lists the countries that fell within the combat support area category as well as the number of deployments to each of those countries. The remaining countries were assigned to the "green zone" category.

Table C-9. List of Combat Support Areas and Number of Deployments

Country or Body of Water	Area Designation	Number of Deployments
Afghanistan	Combat Area	1,301,536
Iraq	Combat Area	2,075,439
Gulf of Aden	Combat Support	9,832
Red Sea	Combat Support	145,559
Gulf of Oman	Combat Support	12,123
Persian Gulf	Combat Support	190,456
Arabian Sea	Combat Support	156,904
Eastern Mediterranean Sea	Combat Support	3
United Arab Emirates	Combat Support	1,703
Bahrain	Combat Support	121,126
Djibouti	Combat Support	41,858
Egypt	Combat Support	10,852
Iran	Combat Support	38
Israel	Combat Support	1,637
Jordan	Combat Support	5,410
Kyrgyzstan	Combat Support	61,048
Kuwait	Combat Support	1,052,995
Lebanon	Combat Support	35
Libya	Combat Support	22
Oman	Combat Support	23,355
Pakistan	Combat Support	10,397
Qatar	Combat Support	249,929
Saudi Arabia	Combat Support	56,637
Somalia	Combat Support	3,189
Syria	Combat Support	41
Tajikistan	Combat Support	343
Turkey	Combat Support	28,142
Uzbekistan	Combat Support	17,202
Yemen	Combat Support	951

Within a single deployment, a Servicemember may actually deploy to multiple countries for varying lengths of time. The CTS records each of these deployment locations separately. For the purpose of this measure, only one country from the list of multiple locations per deployment was chosen. The following describes the methodology for selecting the country deployed to for a given deployment. First, consistent with the assumption that deployments to openly hostile areas were the most stressful, any deployment during which an individual spent at least one day in Iraq and Afghanistan was coded as a deployment to Iraq or Afghanistan. Second, if an individual did not

deploy to Iraq or Afghanistan, the country in which the individual spent the greatest length of time during the deployment was chosen as the deployment location. For example, if an individual spent 40 days in Kuwait, 30 days in Iraq, and an additional 20 days in Kuwait, the deployment would have been coded as a deployment to Iraq. However, if the individual spent 30 days in Germany instead of Iraq, the deployment would have been coded as a deployment to Kuwait.

Figure C-74 through Figure C-76 illustrate this measure in bar charts. Nearly all deployments to known locations supporting named contingencies were either to Iraq, Afghanistan, or combat support areas. Furthermore, medical personnel in the Air Force and the Navy were much more likely than non-medical personnel to deploy to the most hazardous areas—Iraq and Afghanistan—than to remain in comparably safer combat support areas. The incidence of Air Force and Navy medical deployments to Iraq and Afghanistan are consistent with joint sourcing, suggesting that these Services delivered medical personnel to ground forces deployed in Iraq and Afghanistan, rather than reserving all medical capabilities for Service-specific utilization in combat support areas. Table C-10 through Table C-12 provide the data for medical personnel broken out by corps.

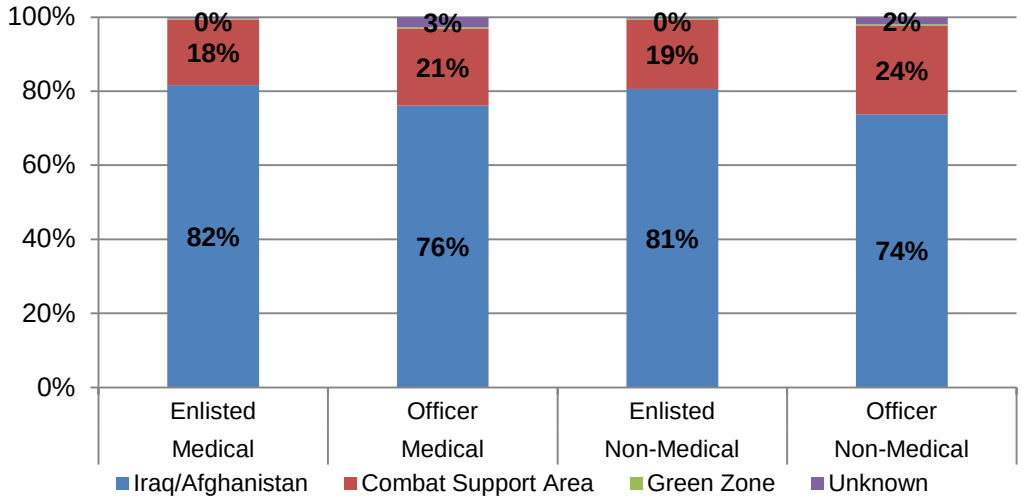

Figure C-74. Army Deployments by Location

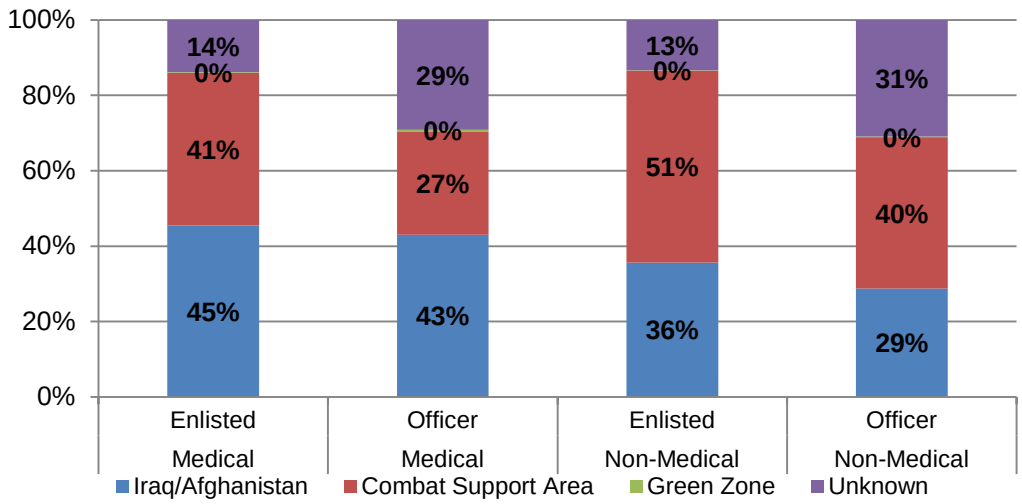

Figure C-75. Navy Deployments by Location

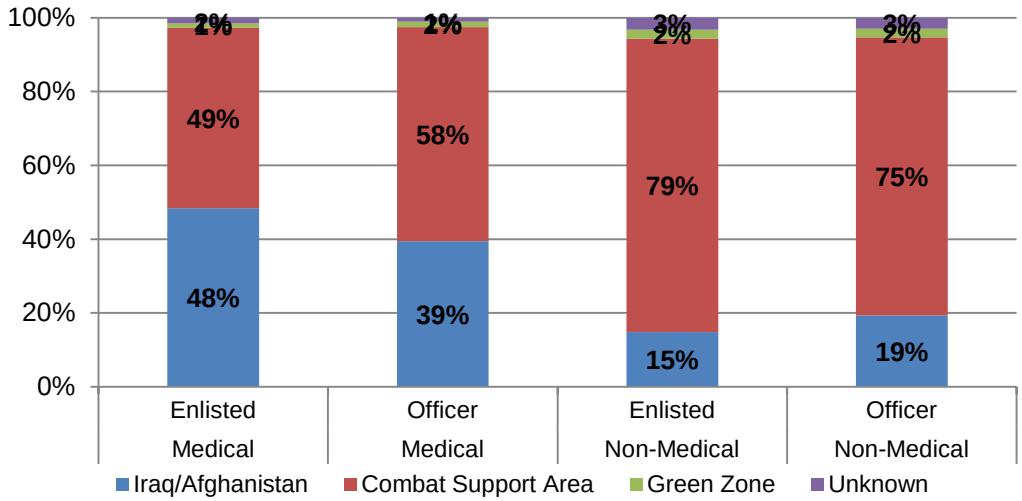

Figure C-76. Air Force Deployments by Location

Table C-10. Army Number of Deployments by Individual, Active Component, 2001–12

Medical Corps or Group	Iraq or Afghanistan	Combat Support Area	Green Zone	Unknown Location
Medical Corps	4,027	1,125	23	123
Dental Corps	664	157	3	23
Nursing Corps	2,941	900	19	135
Medical Service Corps	7,823	2,052	33	269
Enlisted Corps	46,836	10,180	156	196
Non-Medical Officer	137,564	44,592	938	3,559
Non-Medical Enlisted	838,208	193,756	3,895	3,680

Table C-11. Navy Number of Deployments by Individual, Active Component, 2001–12

Medical Corps or Group	Iraq or Afghanistan	Combat Support Area	Green Zone	Unknown Location
Medical Corps	1,739	2,096	66	39
Dental Corps	200	611	12	23
Nursing Corps	911	1,635	52	10
Medical Service Corps	1,063	1,399	21	33
Enlisted Corps	18,701	18,912	442	598
Non-Medical Officer	14,873	58,035	1,770	2,297
Non-Medical Enlisted	82,577	441,890	13,803	17,809

Table C-12. Air Force Number of Deployments by Individual, Active Component, 2001–12

Medical Corps or Group	Iraq or Afghanistan	Combat Support Area	Green Zone	Unknown Location
Medical Corps	1,986	1,284	39	1,142
Dental Corps	95	122	0	45
Nursing Corps	2,122	1,253	9	1,830
Medical Service Corps	1,501	969	11	844
Enlisted Corps	10,236	9,124	34	3,117
Non-Medical Officer	33,866	47,166	197	36,437
Non-Medical Enlisted	187,960	268,910	326	70,681

Appendix D.
Cost Analysis Data Sources and Detailed Results

IDA researchers estimated the costs of civilian and military medical manpower in accordance with the guidance and cost elements laid out in DoDI 7041.04. We divided medical personnel costs into four broad categories:

1. **Variable DoD costs in the short run**. These costs include elements such as basic pay and health benefits and adjust immediately with changes in the force mix.
2. **Fixed DoD costs in the short run**. These costs include elements such as child development and discount groceries. Short-run fixed costs may require many years to adjust to changes in force mix.
3. **Deferred pay-as-you-go DoD costs**. These costs include elements such as the non- MERHCF benefit and separation pay. Even though the liability for these costs is incurred when an individual is employed by DoD, the costs are not paid by DoD until a future date when a triggering event occurs, e.g., when an employee retires.
4. **Costs borne by non-DoD government agencies**. These costs may occur at any time and include elements such as child education (paid by the Department of Education) and deferred veterans' benefits (paid by the Department of Veterans Affairs). While not paid by DoD, these costs are a significant part of the fully burdened cost of medical personnel that is ultimately borne by taxpayers.

With the exception of OUSD(C)-issued composite rates, these cost categories map directly into the cost views described in Chapter 5. DoD cash flow costs are composed exclusively of variable DoD costs in the short run; DoD costs are the sum of the first three categories; and the full cost includes all four cost categories. The composite rate averages the entire annual military personnel (MILPERS) budget account across all military personnel by grade and includes short-run variable cost elements as well as some deferred pay-as-you-go costs.

The IDA team generated cost estimates for each cost view for 121 medical specialties for both military and civilian personnel. Table D-1 lists all of the medical specialties that we considered, by corps.

Table D-1. List of Medical Specialties by Corps

Medical Corps

Allergy/Immunology
Anesthesiology
Aviation/Aerospace
Aviation/Aerospace
Cardiology
Colon/Rectal Surgery
Dermatology
Emergency Medicine
Endocrinology
Executive Medicine
Family Practice
Gastroenterology
General Internist
General Medicine
General Surgery
Hematology/Oncology
Infectious Disease
Nephrology
Neurological Surgery
Neurology
Nuclear Medicine
Obstetrics/Gynecology
Oncology Surgery
Ophthalmology
Orthopedic Surgery
Otorhinolaryngology
Pathology
Pediatrics
Pediatric Surgery
Peripheral Vascular Surgery
Physical Medicine And Rehab
Plastic Surgery
Preventive Medicine
Psychiatry
Pulmonary Disease
Radiology
Rheumatology
Thoracic And Cardiac Surgery
Tropical Medicine
Undersea Medicine
Urology

Dental Corps

Comprehensive
Endodontics
Executive Dentistry
General Dentistry
Pedodontics
Periodontics
Prosthodontics
Public Health
Oral Maxillofacial Surgery
Oral Pathology
Orthodontics

Medical Services Corps

Audiology And Speech
Biochemist
Bioenvironmental Engineer
Biomedical Equipment Maintenance
Biomedical Scientist
Clinical Laboratory
Diet Therapy
Entomologist
Environmental Science Officer
Immunologist
Health Physicist
Health Services Administration Officer
Industrial Hygiene
Microbiologist
Nuclear Medical Science Officer
Occupational Therapist
Optometry
Other Biomedical Science
Pharmacy
Physical Therapist
Physician Assistant
Physiology
Podiatry
Psychology
Radiation Health Officer
Radiation Specialist
Sanitary Engineer
Social Work
Parasitologist
Speech
Veterinarian
Veterinarian Food Technician

Nurse Corps

Critical Care Nurse
Family Nurse Practitioner
Flight Nurse
General Nursing
Mental Health Nurse
Neonatal ICU Nurse
Nurse Anesthetist
Nurse Education
Nurse Midwife
Nurse Service Administration
Obstetrics Nurse
Operating Room Nurse
Pediatric Nurse Practitioner
Women's Health Nurse Practitioner

Enlisted Corps

Aerospace/Undersea Medicine
Behavioral Sciences
Bioenvironmental Engineering Technician
Biomedical Equipment Maintenance And Repair
Biomedical Laboratory Services
Diet Therapy
Environmental Health Science
Medical Administration
Medical Care And Treatment, General
Medical Logistics
Occupational And Physical Therapy
Ophthalmology/Optometry
Orthopedics
Other Biomedical Science And Allied Health
Pharmacy
Physiology
Radiology
Respiratory Therapy Services
Surgery
Veterinary Medicine
Dental Care, General
Dental Hygiene
Dental Laboratory

The remainder of Appendix D first discusses the IDA team's methodology for calculating each of the cost elements and then describes our methodology for estimating the two cost exercises described in Chapter 5.

A. Military Personnel Costs

The IDA team used pay rate assumptions from the DoD National Defense Budget Estimates document to inflate all values to $FY13.

1. Variable Costs in the Short Run

a. Composite Rate Elements

The average composite rate is one of the four cost views. A modified version of this number was used as the base of the other cost views. To compute the average composite rate for each specialty, we applied the pay grade distribution for each specialty to Service-specific composite rates from the Full Cost of Manpower (FCoM) tool. Contained in this composite rate are many of the cost elements required by DoDI 7041.04 to compute cost estimates of military manpower. These elements are *basic pay, allowances and special pays, incentive pays, Social Security and Medicare, retired pay (accrual), travel/PCS/transportation subsidy, and the health benefit for retirees (>65 MERHCF accrual).*

We used a modified composite rate as the base of the other cost views. This modified composite has various cost elements taken out of it: *incentive and special pays, operational travel, separation pay and travel, death gratuities, survivor benefits, and unemployment benefits*.

b. Incentive and Special Pays

The composite rate reports the average special pays received by all military and civilian personnel, but the average specialty pays for military and civilian medical personnel are significantly different. Hence, studies on medical personnel generally compute medical specialty-specific special pays instead of using the Service-wide average contained in the Comptroller Composite rates. IDA researchers followed the same path, reducing the composite rate by the Service-wide average of special pays and adding in a medical specialty-specific average of special pays.

We received special pay data from the Services and used these to compute the Service-specific special pay costs. The Army provided FY 2014 programming data for selected specialties in the medical corps, dental corps, nursing corps, and medical services corps. The data included number of takers, amount of incentive pays taken, amount of retention bonus taken, and amount of board-certified pay taken. The IDA team

used these data to create a weighted average of incentive and specialty pays for each specialty. The Navy provided FY 2012 data. The data include the weighted averages of incentive, special, and board-certified pays for selected specialties in the medical corps, dental corps, nursing corps, and medical services corps. The Air Force provided FY 2013 data for selected specialties in the medical and dental corps, but they did not provide the number of takers to create weighted average special pays. Consequently, we used Army weighted average special pays in place of the absent Air Force weighted average special pays.

All three Services provided data for selected specialties of various officer corps. For specialties missing data, we imputed the missing values using the Service data and the Medical Readiness Review (MRR) data. First, researchers calculated the corps mean from the Service data and the corps mean from the MRR data (over a sample of specialties reported in Service data). Then we calculated the percent difference between the MRR value and the MRR subsample mean for specialties not reported in Services data. Lastly, we multiplied the corps mean (from the Service data) by 1 plus the percent difference for each missing specialty.

c. Health Benefit, Active Duty and Dependents

An acceleration factor of $10,563 is included into cost to cover the medical health care costs of active duty personnel and their dependents. This factor comes from the Office of the Under Secretary of Defense's FY 2013 Department of Defense Military Personnel Composite Standard Pay and Reimbursement Rates document.

d. Recruitment and Training Costs

Training costs are an important factor in understanding the full cost of military medical personnel and have been examined by other cost studies in recent years. In 2003 and 2006 reports, CNA estimated an annualized per person training cost for each medical specialty to be added to the cost of a fully trained provider for full cost estimates. We used 2009 updated values from CNA as well as all values from the 2006 report. After discussion with the Services on the various options for calculating the training costs, a consensus was reached to use existing values over estimating new values because accession and training policies have remained relatively unchanged.

In the 2003 "Life-Cycle Costs of Selected Uniformed Health Professions," Eric W. Christensen and his colleagues calculated the life-cycle cost of a selected group of military medical personnel by accession method.[1] The four accession methods are

[1] Eric W. Christensen et al., "Life-Cycle Costs of Selected Uniformed Health Professions," CRM D0006686.A3 (Alexandria, VA: CNA, April 2003).

Uniformed Services University of Health Sciences (USUHS), Health Professions Scholarship Program (HPSP) direct, HPSP deferred, and Financial Assistance Program (FAP). The researchers first calculated the yearly salary, allowances, and incentive and special pays specific to each accession method. To these salary calculations, they added on yearly medical training costs, benefits, recruiting and moving costs, temporary duty costs, and retirement benefits specific to each accession method. Cumulative recruiting and training costs were computed by summing up the costs incurred before the first year of practice. The 2006 report employed a similar methodology for computing training costs. The IDA team took these cumulative costs by accession method and applied a Service-specific accession distribution to create a single weighted cumulative recruiting and training cost for each of the selected specialties. We then grew the 2009 values at inflation to 2013, and imputed the values for specialties not included in the 2009 update using the values from the 2006 report.

The estimates developed by the IDA team (based on the CNA work) were provided to the Services, who then provided some updates and adjustments (the Air Force and the Army). The final estimates used for this report were then developed incorporating the Service adjustments.

2. Fixed Costs in Short Run

a. Child Development

Child development cost data represent the cost of day care facilities. The source of this data is the FCoM tool.

b. Family Support Services

The term *Family Support Services* refers to a set of programs and outreach services supporting military members and their families. Examples of these services include family counseling, spouse employment and career opportunities training, and financial outreach and counseling. The source of this data is the FCoM tool.

c. Discount Groceries

Discount Groceries cost data represent the cost of commissaries, distribution centers, and one meat processing plant. The data come from the FCoM tool.

3. Deferred Pay-As-You-Go Costs

a. Health Benefit, Retiree (<65 retiree and family) and >65 Plus Up

The DoD Office of the Actuary is the source of the FY 2014 data for the retiree health benefit (the notional pre-Medicare piece plus the notional incremental accrual cost

piece for direct care not paid from the non-MERHCF (non-Medicare-eligible)). The office is also the source of the FY 2014 data for the >65 Plus up (notional incremental accrual cost piece for direct care not paid from the MERHCF (Medicare-eligible)).

b. Other Deferred Pay-As-You-Go Costs

Several deferred pay-as-you-go cost elements are included in the composite rate: *separation pay and travel, unemployment benefits, death gratuities, and survivor benefits*. These elements are taken out of the composite rate for the DoD Cash Flow calculations. They are added back in, along with the *other health benefit (Transitional Assistance Management Program (TAMP) and Continued Health Care Benefit Program (CHCBP))* and *retiree discount groceries*, for DoD Cost and Full Cost calculations. For the last two calculations, the MRR combined the aforementioned elements and calculated a notional accrual rate for the sum of these elements to be 1.73 percent of average basic pay. We used the same rate in our cost computations.

4. Other Federal Agency Costs

a. Concurrent Receipt (Department of the Treasury)

Concurrent receipt means to receive both military retirement benefits and VA disability compensation. The Department of the Treasury is responsible for paying this cost. The cost for concurrent receipt is calculated as 11.20 percent of average base pay. This value comes from the DoD Office of the Actuary.

b. Tax Benefit (Department of the Treasury)

Since military compensation is generally exempt from taxation, the Department of the Treasury makes a payment to cover the shortfall in tax revenue from military Servicemembers. This data comes from the 2006 MRR. DoDI 7041.04 excludes this cost element from cost computations.

c. Child Education/Impact Aid (Department of Education)

The Department of Education's Impact Aid program provides financial support to school districts affected by federal activities, such as the operation of military installations. Since the property on which a military family lives is exempt from local property taxes, districts are not able to access the primary local source of revenue used by most communities to finance education. Impact Aid helps replace the lost local revenue to pay for the education of children from military families. The source of this data is the FCoM tool.

d. Deferred Veterans' Benefits (Department of Veterans Affairs)

Veterans receive a range of benefits which can be divided into two broad categories: veterans' health benefits and non-medical benefits. (Non-medical veterans' benefits include disability compensation, education and training, rehabilitation and employment, mortgage and other loan assistance, pensions, and burials.) These costs are not accounted for in the DoD budget. Instead, the Department of Veterans' Affairs (VA) pays for these costs when the benefits are provided, i.e., after the employee has retired from military service. A 2004 Congressional Budget Office (CBO) report on DoD compensation[2] provides an accrual estimate of veterans' health benefits equal to $11,000 in 2002. We inflated this value to FY 2013 dollars using the DoD medical accrual deflator provided in the Green Book,[3] bringing the accrual estimate of veterans' health benefits to $16,514.56. Accrual estimates of non-medical veterans' benefits are taken from *The Budget of the United States Government, Fiscal Year 2000* (page 172) which reports notional costs equal to 17.3 percent of base pay.[4]

e. Employment Training (Department of Labor)

The Department of Labor provides career services and employment training for veterans. The data for this cost element comes from the 2006 MRR.

The DoDI 7041.04 calls for the inclusion of the following cost elements in the cost computations: the Department of the Treasury's contributions into MERHCF and contributions for military retirement. However, the IDA team does not believe that these costs are appropriate for inclusion into the full cost of an active duty Service member today. Consequently, we leave these costs out of our cost computations.

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2 Congressional Budget Office. "Military Compensation: Balancing Cash and Noncash Benefits" (Washington, DC: U.S. Government Printing Office, 2004), Figure 2. Retrieved from http://www.cbo.gov/publication/15172.

3 The Green Book only provides medical accrual deflators back to 2003. To estimate the 2002 deflator, we assumed the inflation rate between 2002 and 2003 was equal to the inflation rate between 2003 and 2004.

4 This 17.3 percent load factor is the summation of six smaller load factors: VA compensation (11.6%), active duty education (2.0%), VA loans (0.2%), vocational rehabilitation and counseling (0.9%), VA pensions (2.5%) and VA burial (0.1%). This FY 2000 estimate does not include later adjustments to veterans' benefits such as the Post-9/11 G.I. bill which expanded the education benefits available to Service members serving on or after September 11, 2011 and allows those with more than ten years of service to transfer their education benefits to a spouse or child. This option to transfer benefits to a spouse or dependent is particularly relevant for medical providers who already possess graduate degrees.

B. Civilian Personnel Costs

1. Variable Costs in Short Run

a. Annual Pay/Basic Pay/Locality Pay

In DoDI 1400.25-V543, authorization is provided to establish an alternative pay plan for physicians and dentists. The new pay plan combines base pay, market pay, and performance pay into one type of pay called *annual pay*. The base pay component is set by statute. Market pay is intended to reflect the recruitment and retention needs for the specialty or assignment of a particular physician or dentist at a facility. Performance pay is intended to recognize the achievement of specific goals and performance objectives prescribed annually.

According to the same DoDI, DoD is to use the pay tables and tier structure, with minimum and maximum amounts of annual pay, established by the VA to the extent the VA compensation system is considered appropriate. However, DoD is allowed to tailor the tables and tier structure to accommodate unique mission requirements. There are up to four tiers for each specialty for which VA has approved a separate range of pay within a pay table. Physicians or dentists are assigned to a tier based on their level of responsibility and level of experience. The rates are published in the FY 2009 Federal Register. CAPE recommended to the IDA team to use the 75th percentile of Tier 2 since most physicians in MTFs would be in this tier.

Table D-2. Tier 2 of Pay Tables for Physicians and Dentists of the Veterans Health Administration

Pay Table	Minimum	Maximum	75th Percentile	Examples of Covered Specialties
1	$110,000	$210,000	185,000	Allergy and Immunology, Family Practice, Neurology, Preventive Medicine, General Practice – Dentistry, and Assignments that do not require a specific specialty
2	115,000	230,000	201,250	Critical Care, Emergency Medicine, Gynecology
3	120,000	275,000	236,250	Cardiology, Dermatology, Nuclear Medicine, Ophthalmology, Oral Surgery
4	125,000	305,000	260,000	Anesthesiology, General Surgery, Plastic Surgery, Radiology, Urology

IDA researchers used the VA pay tables to determine civilian salaries for selected Medical and Dental Corps specialties. For specialties not in the pay tables, we assigned them to tables of comparable specialties. For example, salaries for practitioners of neurological surgery, oncological surgery, pediatric surgery, and peripheral vascular surgery were all reported at Table 4 rates (with most other surgical specialties). Another example is salaries for practitioners of tropical medicine, executive medicine, general medicine, and all missing dentist specialties reported at Table 1 rates (as indicated by the Table 1 miscellaneous category). Although DoDI 1400.25-V543 states that the Secretary of the VA establishes pay tables and prescribes minimum and maximum amounts of annual pay at least once every two years, the pay tables and tiers published in the FY 2009 Federal Register have not been updated. According to an article in *Federal Physician* XXVIII, No 2, "VA has not changed nationwide rates because of the federal employee pay freeze."[5] Therefore, we did not inflate the FY 2009 pay data to FY 2013.

Salary data for specialties in the other corps (Medical Service Corps, Nurse Corps, and enlisted corps) was taken from the 2006 MRR and inflated to $FY13.

b. Load Factors

Other components of civilian compensation were rolled up into load factors. To calculate the cost of these Components, we multiplied these load factors, which were in the form of rates, by annual pay. DoDI 1400.25-V543 defines annual pay of physicians and dentists as follows:

> The sum of the employee's base pay rate and market pay. Annual pay is basic pay for the purposes of computing civil service retirement benefits; lump sum annual leave payments; life insurance; thrift savings plan; workers' compensation claims; severance pay; foreign and non-foreign cost-of-living allowances and differentials; danger pay; recruitment, relocation, and retention incentives; continuation of pay; and authorized advances in pay.

There are two load factors containing the majority of the variable costs in the short run. A third load factor is discussed in the deferred pay-as you-go cost section of civilian costs.

i. OC11 Load Factor

The OC11 load factor contains Title 38 Medical Premium Pay, overtime/holiday/ other pays, and incentive/performance awards. The source of the OC11 load factor rate is

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5 "Understanding the Rules Governing Federal Physician Pay is No Easy Task," *Federal Physician* XXVIII, No. 2 (3rd Quarter 2012): 5.

the OUSD(C) document entitled "Operation and Maintenance Overview Fiscal Year 2013 Budget Estimates."[6]

ii. OC12 Load Factor

The OC12 load factor contains retention allowance, Social Security and Medicare (employer's contribution), recruitment/relocation bonuses, health care (employer's share of Federal Employees Health Benefits Program (FEHBP)), Permanent Change of Station (PCS), Federal Employee Group Life Insurance, transportation subsidies, worker's compensation payments, retirement accrual (employer's contribution), Federal Retirement Thrift Investment Board payments (Thrift Savings Plan (TSP) matching), and Unemployment Insurance Payments (Federal Unemployment Tax Act). The source of the OC12 load factor rates is the OUSD(C) memorandum entitled "Fiscal Year (FY) 2012 Department of Defense (DoD) Civilian Personnel Fringe Benefits Rates."[7]

c. Education Assistance

The source of this data is the 2006 MRR.

d. Recruiting, advertising, etc.

The source of this data is the 2006 MRR.

2. Fixed Costs in Short Run

a. Child Development

Child development cost data represent the cost of day care facilities. The source of this data is the 2006 MRR.

3. Deferred Pay-As-You-Go Costs

a. OC13 Load Factor

The OC13 load factor contains severance pay/separation incentive and the severance health benefit. The source of the OC13 load factor is the OUSD(C) document entitled "Operation and Maintenance Overview Fiscal Year 2013 Budget Estimates."

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6 OUSD(C)/CFO, "Operation and Maintenance Overview: Fiscal Year 2013 Budget Estimates," Department of Defense, February 2012.

7 OUSD(C), "Fiscal Year (FY) 2012 Department of Defense (DoD) Civilian Personnel Fringe Benefits Rates," Memorandum, October 5, 2011.

b. Retirement Benefits

This cost element includes the unfunded portion of retirement benefits, post-retirement health care and post-retirement life insurance. The source of this cost element is the OUSD(C) memorandum entitled "Fiscal Year (FY) 2013 Department of Defense (DoD) Civilian Personnel Fringe Benefits Rates."[8]

4. Comparing Civilian Cost Estimates to 2006 MRR

This report's estimates of civilian costs deviate from the 2006 MRR in two primary areas. First, due to a change in DoD policy, we estimated government civilian cash compensation for physicians and dentists using the VA pay scales. When the MRR was published in 2006, government civilians' pay was restricted to the General Schedule (GS) scale, hindering the ability of MTF managers to recruit and retain highly specialized physicians. Recognizing this problem, in 2010 DoD issued DoDI 1400.25-V543, requiring the adoption of the VA pay tables for physicians and dentists—otherwise known as the Physician and Dentists Pay Plan. As a consequence, the average pay of physicians and dentists employed directly by the federal government has increased in real terms since 2006. The top section of Table D-3 shows the comparison between estimated cash compensation for government civilian physicians and dentists in 2006 (as estimated by the MRR) and in 2013 (as estimated in this report): on average, cash compensation has increased around $47,000 for physicians and around $44,000 for dentists.

The second main way this report diverges from the MRR in estimating civilian costs is the treatment of contractors. As a consequence of the difficulty recruiting and retaining physicians and dentists in 2006, many of the higher-earning specialties (e.g., anesthesiology) were employed as contractors. The MRR dealt with this practice by evaluating the Services' experience with hiring. For specialties with predominantly government civilian performance, the price of a government civilian for the replacement was assumed. For specialties with predominantly contractor performance, the price of a contractor was used. For the subset of specialties the MRR treated as contractors in 2006, the MRR estimated average cash compensation available on the GS scale was $172,000 (in FY 2013 dollars) versus an average contractor salary of $297,000 for physicians and $226,000 for dentists (exclusive of benefits and overhead). We estimate the VA pay scales have increased the average cash compensation of these specialties to $243,000 for physicians and $236,000 for dentists in 2013. As a result, we assume the VA pay scales provide sufficient flexibility for MTF managers to hire civilian physicians and dentists as government employees, and so we do not consider contractors in our estimates of civilian

[8] OUSD(C), "Fiscal Year (FY) 2013 Department of Defense (DoD) Civilian Personnel Fringe Benefits Rates," Memorandum, August 30, 2012.

costs. The bottom section of Table D-3 compares the IDA team's estimates of civilian cash flow costs using the VA pay tables and the MRR's estimates for civilian cash flow costs including contractors' overhead costs in selected specialties.

Table D-3. Comparison of Government Civilian Physician and Dentist Costs between this Report and the 2006 MRR (inflated to FY 2013 dollars)

Report	Average Annual Physician Cost	Average Annual Dentist Cost
Comparing Cash Compensation		
This study—*GS only*	$216,649	$188,633
2006 MRR—*GS only*	$169,240	$145,080
Difference	**$47,409**	**$43,553**
Comparing Cash Flow Costs		
This study—*GS only*	$300,616	$259,465
2006 MRR—*GS and contractors*	$381,129	$206,098
Difference	**-$80,513**	**$53,367**

Note: All reported costs are in FY 2013 dollars. Average annual costs are weighted by FY 2011 civilian end strength (as calculated in the next section). Cash compensation includes base pay, market pay, and performance pay in this study and base pay, locality pay, Title 38 pay, and the Physicians' Comparability Allowance in the 2006 MRR. Cash flow costs for government civilians in both studies include cash compensation plus OC11 and OC12 load factors, education assistance, and recruitment costs.

C. Estimating Savings from Mil-to-Civ Conversions (Army Mix)

As described in Chapter 5, Section 5.C, we explored the potential cost savings that could arise from arbitrarily applying the Army's 66:34 military-to-civilian force mix to the Navy and Air Force. The following sections describe our's methodology, first for allocating civilian end strength, military students, and military TPPH across specialties; and second for realigning the Navy and Air Force while maintaining an equivalent number of medical providers in each Service after conversion.

D. Allocating Civilian End Strength and Student/TPPH Tails across Specialties

The IDA team's data on end strength came from the FY 2011 HMPDS, which provides military end strength by specialty. HMPDS data on civilian end strength, students, and TPPH tails were less detailed. As a result, we made the following assumptions in order to allocate these individuals across specialties:

- Total civilian end strength was allocated proportionally across specialties so that each specialty had the same military-to-civilian ratio (inclusive of student and TPPH tails) as the whole Service did.[9]
- Where specialty-specific student end strength counts were available (such as with nurse anesthetists in the footnote on the previous page), we applied that student end strength to that specialty. In some cases, the FY2011 HMPDS only provided student end strength at the corps level (e.g., GME for the Medical Corps). In these instances, we distributed student end strength across specialties in the corps proportional to the reported non-student/non-TPPH military end strength in those specialties.
- TPPH tails were similarly allocated according to non-student military end strength. In the case of the Army, students and TPPH were reported together, so both personnel tails were allocated together. In the case of the Navy, the HMPDS reported no TPPH in any corps. Consequently, we assumed the military end strength reported for the Navy in the HMPDS report included TPPH, and then used the corps-level MRR values for Navy TPPH to identify what fraction of that end strength was TPPH.[10] Air Force TPPH was reported for all officers as a group and for all enlisted as a group. We allocated Air Force TPPH accordingly.

E. Converting to Army Mil-to-Civ Mix

After students and TPPH were allocated, IDA researchers defined the number of military personnel providing care as all military medical providers that were not in the following groups: students, trainees, or TPPH. The sum of the military personnel providing care and the civilian personnel then equaled the total number of medical personnel providing care in each service. Table D-4 shows the number of military and

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[9] For example, the 2011 HMPDS reports 192 military nurse anesthetists in the Navy (53 of which are students). The Navy's reported military-to-civilian ratio in the 2011 HMPDS is 34,886:7,444 (or 17.6 percent civilian). Hence, IDA assumes the Navy has $\frac{7444}{34886} \times 192 = 41$ civilian nurse anesthetists.

[10] The MRR recorded no TPPH for Navy officers, 1.12 percent TPPH tail for the enlisted medical corps and 4.62 percent TPPH tail for the enlisted dental corps.

civilian care providers by Service. (Compare to total end strength with students and TPPH reported in Table 21.)

Table D-4. Comparison of Medical Care Provider End Strength Before and After Conversion to Army Mix

	Pre-Conversion Care Providers			Post-Conversion Care Providers		
Service	**Military**	**Civilian**	**Total**	**Military**	**Civilian**	**Total**
Army	45,845	27,228	**73,073**	45,845	27,228	**73,073**
Navy	31,021	7,444	**38,465**	24,288	14,177	**38,465**
Air Force	29,285	3,981	**33,266**	21,176	12,090	**33,266**

To preserve the number of individuals actively providing care after conversion, we solved the following system of equations to calculate the post-conversion military and civilian end strengths by specialty for the Navy and Air Force:

$$C_1 + M_1 = C_0 + M_0$$

and

$$\frac{\mathrm{C}_1}{(1+\beta)\mathrm{M}_1} = \frac{34}{66},$$

where C_0 and M_0 are the number of civilian and military care providers in a Service before conversion; $C_1$and M_1 are the number of civilian and military care providers in a Service after conversion; β is the share of total military end strength that is made up of students and TPPH; and $(1+\beta)M_1$ is total military end strength (including tails) after conversion. The first equation constrains the total number of care providers to be equal before and after conversion. The second equation requires that the total military-to-civilian mix (with tails) equal the Army's 66:34 military-to-civilian ratio.

Solving for C_1 and M_1 yields the following equations defining the number of care providers after conversion:

$$M_1 = \frac{C_0 + M_0}{1 + \frac{34}{66}(1+\beta)}$$

and

$$C_1 = \frac{34}{66}(1+\beta)M_1.$$

F. Estimating Savings from Employing Accession Bonuses

In the 2006 CNA paper entitled "Raising the Bonus and the Prospects for DoD's Attracting Fully Trained Medical Personnel," Levy et al. estimate the size of the parity accession bonus needed to compensate medical recruits so that, all else equal, military employment (entering through the FAP) and civilian employment are equally attractive.[11] This parity bonus is calculated by subtracting the discounted present value of military pay from the discounted present value of civilian pay over the entire FAP training period as well as over the following active duty obligation period (usually equal to training time plus one year), assuming the bonus is paid out in the first year of active duty obligation. Levy et al. provide estimates of the parity bonus for 23 physician specialties and eight dentist specialties in 2006.

As described in Chapter 5, Section 5.C.2, the IDA team explores the potential cost savings that could arise from accessing all physicians and dentists through FAP with an accession bonus. To do so, we compare the estimated average training costs per person weighted across current accession methods (shown in Table 23 on page 67) to a modified value of the parity bonus provided in the Levy et al. 2006 CNA report.[12] We modified CNA's parity bonus first by inflating it to 2013 dollars. Since the parity bonus is supposed to represent a value at which recruits are *indifferent* to military or civilian employment, we conservatively increased the parity bonus by 10 percent. Finally, the CNA report acknowledges that FAP accessions do not provide as many years of practice as accessions by other methods, so it estimates a *retention factor* equal to the number of FAP accessions required to provide the same years of practice as an AFHPSP direct accession for each medical specialty.[13] We multiply the inflated parity bonus by this retention factor to yield an accession bonus that accounts for the fewer years of service provided by FAP accessions.

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[11] Levy et al. acknowledge that other considerations besides pay (such as deployments in the military or the requirement to purchase medical malpractice insurance in the civilian industry) could affect preferences between the two.

[12] IDA uses the parity bonus with benefits shown in Table 18 on page 50 of the CNA report. Physician and dentist specialties for which CNA did not provide a parity bonus estimate were assigned a parity bonus equal to the corps average.

[13] IDA uses the retention factor shown in Table 22 on page 58 of the CNA report. Physician and dentist specialties for which CNA did not provide a retention factor were assigned a retention factor equal to the corps average.

Appendix E.
Military-to-Civilian Prohibition Ban

A military-to-civilian conversion ban was enacted by the Congress through provisions over a series of NDAAs. We recommend that DoD seek repeal of this ban. This appendix lists the relevant provisions from the series of NDAAs and legislative reports implementing the ban and concludes with draft language that could be used to support a legislative change proposal as part of the Unified Legislative and Budget process.

Fiscal Year 2007 National Defense Authorization Act

SEC. 742. REQUIREMENT TO CERTIFY AND REPORT ON CONVERSION OF MILITARY MEDICAL AND DENTAL POSITIONS TO CIVILIAN MEDICAL AND DENTAL POSITIONS.

PROHIBITION ON CONVERSIONS.—

(1) SUBMISSION OF CERTIFICATION.— The Secretary of a military department may not convert any military medical or dental position to a civilian medical or dental position in a fiscal year until the Secretary submits to the congressional defense committees with respect to that fiscal year a certification that the conversions within that department will not increase cost or decrease quality of care or access to care.

(2) REPORT ON CERTIFICATION.— Each certification under paragraph (1) shall include a written report setting forth the following:

(A) The methodology used by the Secretary in making the determinations necessary for the certification.
(B) The number of military medical or dental positions, by grade or band and specialty, planned for conversion to civilian medical or dental positions.
(C) The results of a market survey in each affected area of the availability of civilian medical and dental care providers in such area in order to determine whether the civilian medical and dental care providers available in such area are adequate to fill the civilian positions created by the conversion of military medical and dental positions to civilian positions in such area.
(D) An analysis, by affected area, showing the extent to which access to health care and cost of health care will be affected in both the direct care and purchased care systems, including an assessment of the effect of any increased shifts in patient load from the direct care to the purchased care system, or any delays in receipt of

care in either the direct or purchased care system because of the planned conversions.

(E) The extent to which military medical and dental positions planned for conversion to civilian medical ordental positions will affect recruiting and retention of uniformed medical and dental personnel.

(F) A comparison of the full costs for the military medical and dental positions planned for conversion withthe estimated full costs for civilian medical and dental positions, including expenses such as recruiting, salary, benefits, training, and any other costs the Department identifies.

(G) An assessment showing that the military medical or dental positions planned for conversion are in excess of the military medical and dental positions needed to meet medical and dental readiness requirements of the uniformed services, as determined jointly by all the uniformed services.

(H) An identification of each medical and dental position scheduled to be converted to a civilian position in the subsequent fiscal year, including the location of each position scheduled for conversion, the estimated cost of such conversion, and whether or not civilian personnel are available in the location for filling a converted military medical or dental position.

(3) SUBMISSION DEADLINE.—A certification and report with respect to any fiscal year after fiscal year 2007 shall be submitted at the same time the budget of the President for such fiscal year is submitted to Congress pursuant to section 1105(a) of title 31, United States Code.

(b) REQUIREMENT FOR COMPTROLLER GENERAL REVIEW.—Not later than 120 days after the submission of the budget of the President for a fiscal year, the Comptroller General shall submit to the congressional defense committees a report on any certifications and reports submitted with respect to that fiscal year under subsection (a).

(c) REQUIREMENT TO RESUBMIT CERTIFICATION AND REPORT REQUIRED BY PUBLIC LAW 109–163.—The Secretary of each military department shall resubmit the certification and report required by section 744(a) of the National Defense Authorization Act for Fiscal Year 2006 (Public Law 109–163; 119 Stat. 3360; 10 U.S.C. 129c note). Such resubmissions shall address in their entirety the elements required by section 744(a)(2) of such Act.

(d) SPECIAL REQUIREMENTS FOR FISCAL YEAR 2007 CERTIFICATION.—

(1) LIST OF 2007 PLANNED CONVERSIONS.—The report required by paragraph (2) of subsection (a) with respect to fiscal year 2007 shall contain, in addition to the elements required by that paragraph, a list of each military medical or dental position scheduled to be converted to a civilian medical or dental position in fiscal year 2007.

(2) RESUBMISSION REQUIRED FIRST.—The certification and report required by subsection (a) with respect to fiscal year 2007 may not be submitted prior to the resubmission required by subsection (c).

(3) PROHIBITION ON CONVERSIONS DURING FISCAL YEAR 2007.—No conversions of a military medical or dental position may occur during fiscal year 2007 prior to both the resubmission required by subsection (c) and the submission of the certification and report required by subsection (a).

(e) REPORT ON FISCAL YEAR 2008 CONVERSION.—Not later than 90 days after the date of the enactment of this Act, the Secretary of Defense shall submit to the Committees on Armed Services of the Senate and House of Representatives a report that identifies the military medical or dental positions scheduled to be converted to civilian medical or dental positions in fiscal year 2008. Such report shall include the location of the positions scheduled for conversion, the estimated cost of such conversion, and whether or not civilian personnel are available in the location for filling the proposed converted military medical or dental position.

(f) DEFINITIONS.—In this section:

(1) The term ‘‘military medical or dental position’’ means a position for the performance of health care functions within the Armed Forces held by a member of the Armed Forces.

(2) The term ‘‘civilian medical or dental position’’ means a position for the performance of health care functions within the Department of Defense held by an employee of the Department or of a contractor of the Department.

(3) The term ‘‘affected area’’ means an area in which military medical or dental positions were converted to civilian medical or dental positions before October 1, 2004, or in which such conversions are scheduled to occur in the future.

(4) The term ‘‘uniformed services’’ has the meaning given that term in section 1072(1) of title 10, United States Code.

(5) The term ‘‘conversion’’, with respect to a military medical or dental position, means a change, effective as of the date of the documentation by the Department of Defense making the change, of the position to a civilian medical or dental position.

Fiscal Year 2008 National Defense Authorization Act

SEC. 721. <<NOTE: 10 USC 129c note.>> PROHIBITION ON CONVERSION OF MILITARY MEDICAL AND DENTAL POSITIONS TO CIVILIAN MEDICAL AND DENTAL POSITIONS.

(a) Prohibition.--The Secretary of a military department may not convert any military medical or dental position to a civilian medical or dental position during the period beginning on October 1, 2007, and ending on September 30, 2012.

(b) Restoration of Certain Positions to Military Positions.--In the case of any military medical or dental position that is converted to a civilian medical or dental position during the period beginning on October 1, 2004, and ending on September 30, 2008, if the position is not filled by a civilian by September 30, 2008, the Secretary of the military department concerned shall restore the position to a military medical or dental position that can be filled only by a member of the Armed Forces who is a health professional.

(c) Report.–

(1) Requirement.--The Secretary of Defense shall submit to the congressional defense committees a report on conversions made during fiscal year 2007 not later than 180 days after the enactment of this Act.

(2) Matters covered.--The report shall include the following:

(A) The number of military medical or dental positions, by grade or band and specialty, converted to civilian medical or dental positions.

(B) The results of a market survey in each affected area of the availability of civilian medical and dental care providers in such area in order to determine whether there were civilian medical and dental care providers available in such area adequate to fill the civilian positions created by the conversion of military medical and dental positions to civilian positions in such area.

(C) An analysis, by affected area, showing the extent to which access to health care and cost of health care was affected in both the direct care and purchased care systems, including an assessment of the effect of any increased shifts in patient load from the direct care to the purchased care system, or any delays in receipt of care in either the direct or purchased care system because of the conversions.

(D) The extent to which military medical and dental positions converted to civilian medical or dental positions affected recruiting and retention of uniformed medical and dental personnel.

(E) A comparison of the full costs for the military medical and dental positions converted with the full costs for civilian medical and dental positions, including expenses such as recruiting, salary, benefits, training, and any other costs the Department identifies.

(F) An assessment showing that the military medical or dental positions converted were in excess of the military medical and dental positions needed to meet medical and dental readiness requirements of the uniformed services, as determined jointly by all the uniformed services.

(d) Definitions.--In this section:

(1) The term ``military medical or dental position'' means a position for the performance of health care functions within the Armed Forces held by a member of the Armed Forces.

(2) The term ``civilian medical or dental position'' means a position for the performance of health care functions within the Department of Defense held by an employee of the Department or of a contractor of the Department.
(3) The term ``uniformed services'' has the meaning given that term in section 1072(1) of title 10, United States Code.
(4) The term ``conversion'', with respect to a military medical or dental position, means a change of the position to a civilian medical or dental position, effective as of the date of the manning authorization document of the military department making the change (through a change in designation from military to civilian in the document, the elimination of the listing of the position as a military position in the document, or through any other means indicating the change in the document or otherwise).

(e) Repeal.--Section 742 of the John Warner National Defense Authorization Act for Fiscal Year 2007 (Public Law 109-364; 120 Stat. 2306) is repealed.

FY 2008 National Defense Authorization Act
House of Representatives Committee Report

TITLE IV—MILITARY PERSONNEL

AUTHORIZATIONS OVERVIEW

The committee commends the Secretary of Defense for proposing to permanently increase the authorized end strength for the active Army to 547,000, and to 202,000 for the active Marine Corps by fiscal year 2012. However, the President's request only contained funding for an increase of 7,000 for the Army and an increase of 5,000 for the Marine Corps in fiscal year 2008. The committee remains concerned that the budget request for the Active Components of the Army and the Marine Corps is too low for the current requirements placed on those services by the national security strategy. The committee continues to recommend active end strength levels greater than those requested. The committee's recommendation for fiscal year 2008 would increase the active Army end strength by 36,000 and the Marine Corps end strength by 9,000 above the budget request.

The committee is concerned that continued military-to-civilian conversions, particularly within the military medical community, are having an adverse impact on access and quality-of-care being provided to service members and their families. The committee heard directly from military families facing difficulties in accessing care at military treatment facilities during a hearing on total force readiness. In addition, the treatment of wounded warriors at Walter Reed Army Medical Center and at other military medical treatment facilities requires a review of the assumptions and evaluations that were previously made in support of these conversions. Therefore, the committee proposes to prohibit further military-to-civilian conversions in the military medical community in

section 703 of this Act, and proposes to restore the end strength and associated funding for the conversions, as well as restore the proposed manpower reductions as directed in program decision memorandum four for Navy medicine for fiscal year 2008.

FY 2008 National Defense Authorization Act
Conference Report

TITLE VII—HEALTH CARE PROVISIONS

Subtitle C—Other Matters

Prohibition on conversion of military medical and dental positions to civilian medical and dental positions (sec. 721)

The House bill contained a provision (sec. 704) that would establish a permanent prohibition on the secretaries of the military departments from converting any military medical or dental position to a civilian medical or dental position on or after October 1, 2007. This provision would also require a report to the congressional defense committees on such conversions made during fiscal year 2007.

The Senate amendment contained no similar provision. The Senate recedes with an amendment that would require the prohibition to end on September 30, 2012. The amendment would also require that any military medical or dental position that has been converted to a civilian medical or dental position from October 1, 2004 through September 30, 2008 be restored to a military medical or dental position if the position is not filled by a civilian by September 30, 2008.

The conferees are concerned that the military departments have not fully addressed the certification requirements contained in section 724 of the John Warner National Defense Authorization Act for Fiscal Year 2007 (Public Law 109–364), and thus lack assurance that planned conversions will not increase costs, decrease access to care, decrease quality of care, or negatively impact recruitment and retention of military personnel.

In addition, the conferees have learned that military to civilian conversions have had a negative impact on the ability of the military health system to provide health care to service members and their families, have compounded the impact of multiple deployments on military medical personnel, and could impact adequate staffing of wounded warrior transition units. The conferees are concerned that, despite these concerns, the military departments have continued to convert military medical positions to civilian medical positions. Therefore, the conferees prohibit the conversion of military medical positions to civilian positions until September 30, 2012.

FY 2009 National Defense Authorization Act
Senate Committee Report

TITLE VII—HEALTH CARE PROVISIONS

Subtitle C—Other Health Care Matters

Repeal of prohibition on conversion of military medical and dental positions to civilian medical and dental positions (sec. 721)

The committee recommends a provision that would repeal subsection (a) of section 721 of the National Defense Authorization Act for Fiscal Year 2008 (Public Law 110–181), which prohibits the military departments from converting any military medical or dental position to a civilian medical or dental position through September 30, 2012. The provision would also restore subsections (a) and (b) of section 742 of the John Warner National Defense Authorization Act for Fiscal Year 2007 (Public Law 109–364), which require certification by the secretary of a military department that any planned conversion will not increase the cost or decrease the quality of care or access to military health care, and requires a review by the Comptroller General of these certifications.

The Department of Defense has informed the committee that the prohibition ‘‘. . . has created chaos in planned personnel actions in FY 2008, essentially guaranteeing a detrimental impact on medical staffing levels and access to care . . .’’ The provision recommended by the committee would repeal this prohibition.

However, the committee continues to believe that the military departments did not adequately address the certification requirements contained in section 742 of Public Law 109–364 when it was in effect. The committee remains concerned that planned conversions may increase costs, decrease access to care, decrease quality of care, or negatively impact recruitment and retention of military personnel. Therefore, the provision would restore this certification requirement.

In planning any future conversions of military medical or dental positions to civilian medical or dental positions, the committee expects the military departments to fully assess all aspects of the conversions, including those concerns listed above. The committee also expects the departments to supply these certifications to the committee in accordance with applicable deadlines.

The language in subsection (b) of section 721 of Public Law 110– 181 requiring the military departments to restore any positions converted between October 1, 2004, and September 30, 2008 that have not yet been filled by a civilian back to military positions remains in effect.

FY 2009 National Defense Authorization Act
House of Representatives Committee Report

TITLE IV—MILITARY PERSONNEL AUTHORIZATIONS

OVERVIEW

The committee commends the Secretary of Defense for proposing to permanently increase the authorized end strength for the active Army to 547,000, and to 202,000 for the active Marine Corps by fiscal year 2012, and to accelerate efforts to increase the permanent end strength for the Army in fiscal year 2009 by 5,100. The committee also recognizes the Secretary for his efforts to include the cost of the permanent end strength increase within the base budget in fiscal year 2009. The committee is pleased that the Department of Defense finally recognizes the importance of increasing the end strength of the Army and the Marine Corps to meet current operational requirements placed on these services. The increase in end strength for the Army and the Marine Corps will help reduce the pressure on the current forces and will hopefully reduce the deployment lengths for the Army as well as reduce the number of deployments for service members.

The committee remains concerned that, despite the requirement in section 721 of the National Defense Authorization Act for Fiscal Year 2008 (Public Law 110–181) that prohibited further military-to-civilian conversions within the military health care system, the President's budget request included further conversions and failed to provide funds to support the restoration of military positions that are required by law. Congress took this vital action because of the concerns that such conversions are having an adverse impact on access and quality of care being provided to service members and their families. The committee continues to hear directly from military families who face difficulties accessing care at military treatment facilities. The committee expects the services to meet both the intent and spirit of the law, and restore the military medical positions that are proposed for conversion in fiscal year 2009, restore positions that were converted in earlier years that have not been filled as of October 1, 2008, and plan and budget accordingly to restore military positions that were proposed for conversion beginning in October 1, 2007, through September 30, 2012, as required by law. In order to ensure that the intent of the law is met, the committee extends the current prohibition of conversion within title VII of this Act.

…

TITLE VII—HEALTH CARE PROVISIONS

OVERVIEW

The committee remains profoundly concerned about the ability of the Defense Health Program to support operational requirements, accessibility, and quality of health care provided to service members, retirees, and family members. After over six years of conflict, the military health system appears to be unable to keep up with current demands, as evidenced by the continuing shift of care from the direct care system to the purchased care system. The committee has learned that in the past year, entire clinical Departments and graduate medical education programs of military treatment facilities have had to close for extended periods due to deploying staff. The committee is also concerned with

the Department's ability to retain the exceptional military health care providers in the face of the strains placed upon the system. The committee urges the Department to ensure that the Defense Health Program is fully funded to meet the demands placed on the system.

The committee is encouraged that the Department appears to have adopted a more responsible method of budgeting for the Defense Health Program by significantly reducing the mandated efficiencies levied on military treatment facilities. However, the committee remains troubled that the Department continues to pursue some form of converting military medical and dental positions to civilian medical and dental positions despite indications that such conversions have had an adverse effect on the military health system.

The committee is disappointed that the Department has been slow to develop a thoughtful and comprehensive strategy to control the growing cost of health care. This year, the Department once again proposed their Sustain the Benefit plan, and cut [$1.2 billion] from the budget based on anticipated savings from the proposal. The committee rejects the philosophical underpinning of Sustain the Benefit that the only way to control cost growth is to dramatically raise fees to discourage beneficiaries from seeking care or even participating in TRICARE. As such, the committee proposes a series of demonstration projects for the purpose of fundamentally elevating the role of preventive care. The committee seeks to enhance the medical readiness of military forces and improve the health status of all beneficiaries. This may reduce the amount of care required by the beneficiary population, which the committee finds preferable to the Department's proposal to reduce both the amount of care available to the beneficiary population and the size of the beneficiary population itself. In addition, given the GAO report that found the Department is collecting more revenue in premiums than it is paying out in care, the committee believes that it is time for the Department to recalculate the TRICARE Reserve Select premium.

The committee remains concerned about the care, rehabilitation, and support provided our wounded warriors. The committee will continue to provide vigilant oversight as the Department implements the requirements of the Wounded Warrior Act, contained in title 16 of the National Defense Authorization Act for Fiscal Year 2008 (Public Law 110–181).

…

Section 703—Prohibition on Conversion of Military Medical and Dental Positions to Civilian Medical and Dental Positions

This section would indefinitely extend the prohibition on conversions of military medical and dental positions to civilian medical and dental positions by a secretary of a military

department by removing the end date of section 721 of the National Defense Authorization Act for Fiscal Year 2008 (Public Law 110–181).

Fiscal Year 2010 National Defense Authorization Act

SEC. 701. PROHIBITION ON CONVERSION OF MILITARY MEDICAL AND DENTAL POSITIONS TO CIVILIAN MEDICAL AND DENTAL POSITIONS.

Subsection (a) of section 721 of the National Defense Authorization Act for Fiscal Year 2008 (Public Law 110–181; 122 Stat. 198; 10 U.S.C. 129c note) is amended—

(1) by striking ‘‘during the period beginning on’’ and inserting ‘‘on or after’’; and

(2) by striking ‘‘, and ending on September 30, 2012’’.

Illustrations

Figures

Tables

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Abbreviations

2MRC	Two Major Regional Conflicts
AC	Active Component
AEF	Aerospace Expeditionary Forces
AF	Air Force
AFHPSP	Armed Forces Health Professions Scholarship Program
AMEDD	Army Medical Department
ASD(HA)	Assistant Secretary of Defense for Health Affairs
ASD(RA)	Assistant Secretary of Defense for Reserve Affairs
C4ISP	Command, Control, Communications, Computers, and Intelligence Support Plan
CAPE	Cost Assessment and Program Evaluation
CBO	Congressional Budget Office
CFDB	Current Forces Database
CHCBP	Continued Health Care Benefit Program
CIP	Commitment in Place
CONUS	Continental United States
CORR	Critical Operational Readiness Requirements
CSH	Combat Support Hospital
CTS	Contingency Tracking System
CZTE	Combat Zone Tax Exclusion
DASD(CPP)	Deputy Assistant Secretary of Defense for Civilian Personnel Policy
DHP	Defense Health Program
DMDC	Defense Manpower Data Center
DoD	Department of Defense
DoDI	Department of Defense Instruction
DOPMA	Defense Officer Personnel Management Act
DTM	Directive-Type Memorandum
EFP	Expeditionary Force Package
EMF	Expeditionary Medical Facility
FAP	Financial Assistance Program
FCoM	Full Cost of Manpower

FEHBP	Federal Employees Health Benefits Program
FY	Fiscal Year
FYDP	Future Years Defense Program
GDE	Graduate Dental Education
GH	Global Health
GME	Graduate Medical Education
GS	General Schedule
HF/IDP	Hostile Fire/Imminent Danger Pay
HMPDS	Health Manpower Personnel Data System
HPSP	Health Professions Scholarship Program
HR	Human Resources
ICONUS	Isolated areas inside the Continental United States
IDA	Institute for Defense Analyses
MedMACRE	Medical Manpower All Corps Requirements Estimator
MERHCF	Medicare Eligible Retiree Health Care Fund
MILPERS	Military Personnel System
MRR	Medical Readiness Review
MTF	Military Treatment Facility
NDAA	National Defense Authorization Act
OCONUS	Outside the Continental United States
OEF	Operation Enduring Freedom
OIF	Operation Iraqi Freedom
OSD	Office of the Secretary of Defense
OUSD(C)	Office of the Under Secretary of Defense (Comptroller)
OUSD(P&R)	Office of the Under Secretary of Defense for Personnel and Readiness
PCS	Permanent Change of Station
PDM	Program Decision Memorandum
POM	Program Objective Memorandum
PROFIS	Professional Filler System
RC	Reserve Component
TAA	Total Army Assessment
TAMP	Transitional Assistance Management Program
THCSRR	Total Health Care Support Readiness Requirement
TPPH	Transients, Patients, Prisoners, and Holdees
TSP	Thrift Savings Plan

UIC	Unit Identification Code
US	United States
USUHS	Uniformed Services University of Health Sciences
UTC	Unit Type Code
VA	Veterans' Affairs

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14. ABSTRACT

This report identifies inconsistencies and challenges in total medical force management and develops recommendations for improvements to management practices that would allow for and promote more efficient total medical force management. The research team found that some force mix challenges have improved (e.g., understaffing of operationally required specialties) while others have grown worse (e.g., use of military for non-military essential functions). The team developed a number of recommendations for changing the incentives faced by local and Service-level decision makers that would lead to improved force mix management within the medical community.

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