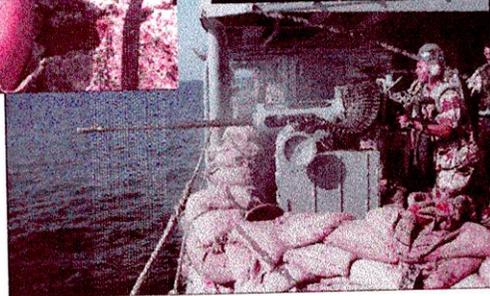
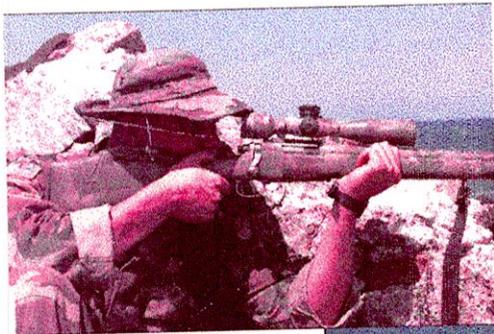
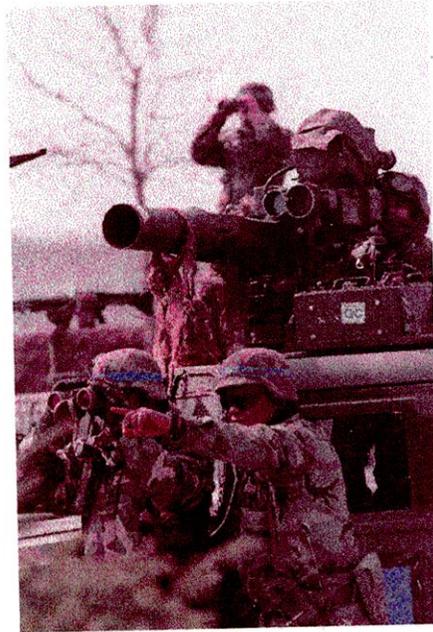


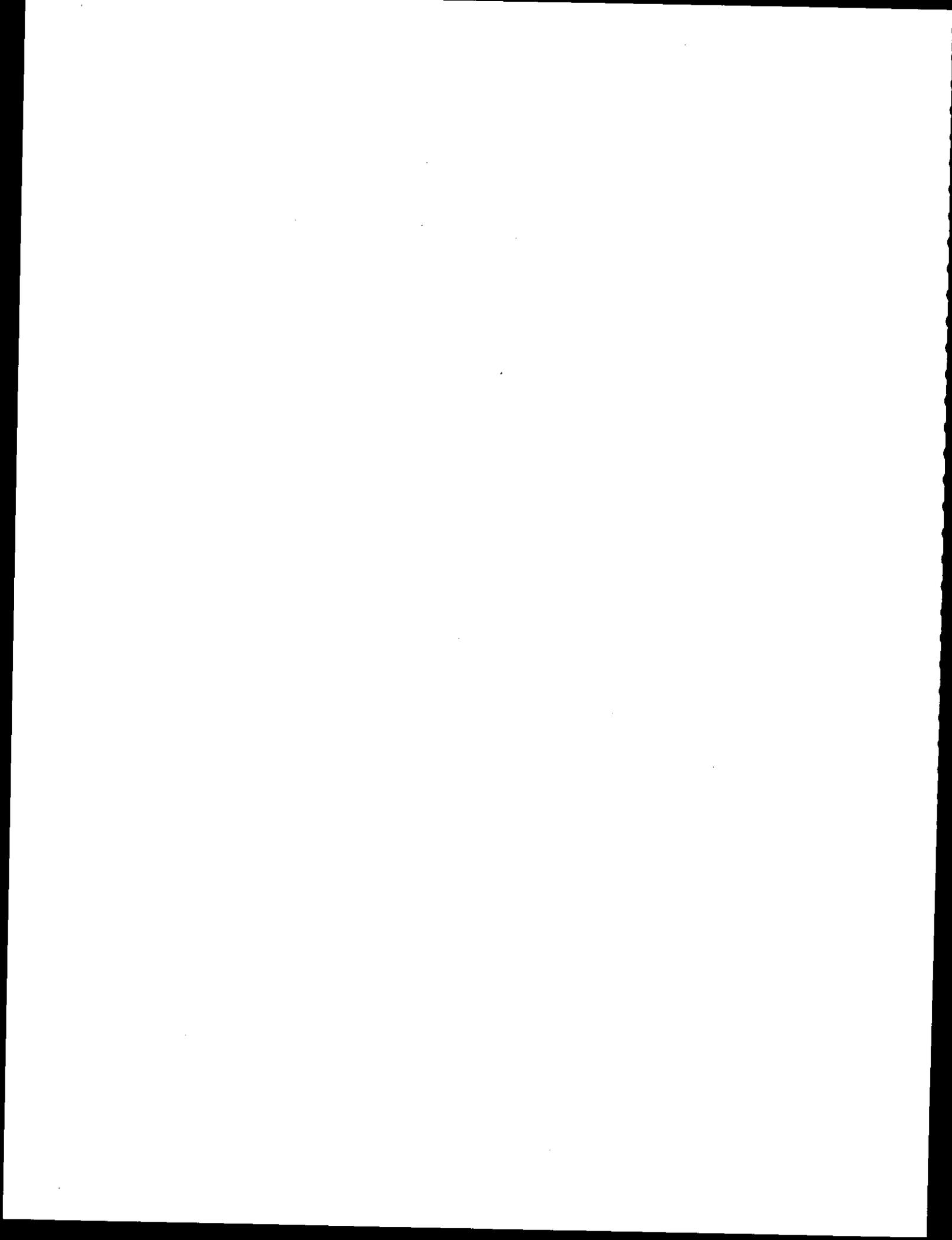
# AMSARA

Accession  
Medical  
Standards  
Analysis &  
Research  
Activity



Annual Report

1998



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The Accession Medical Standards Analysis and Research Activity is housed within the Division of Preventive Medicine, Walter Reed Army Institute of Research, U.S. Army Medical Research and Materiel Command.

## EXECUTIVE SUMMARY

The Accession Medical Standards Analysis and Research Activity (AMSARA) has completed its second year of providing DoD with evidence-based evaluations of accession standards. AMSARA's unique blend of expertise and experience makes it crucial in developing the scientific basis for these standards. AMSARA has improved medical and administrative databases, conducted epidemiologic analyses, and integrated results into policy recommendation.

Because the United States has adopted a power projection strategy relying on agility, flexibility, and advanced technology and because our power projection capability will be increasingly limited in space for personnel and medical resources, DoD will depend on the delivery of qualified and healthy recruits. AMSARA is essential for fulfilling the **first strategic objective** in the Joint Vision 2010 document from the Chairman of the Joint Chiefs of Staff to **deliver on demand a healthy and medically ready force to the warfighting commanders-in-chief.**

In pursuit of this objective, several epidemiologic studies were completed in 1998, and many others were planned, begun or continued:

AMSARA completed a study, based on a retrospective review of three years of data, confirming that **attrition is not unusually high among those waived for asthma.** Within the Army, Navy, and Marines the process of waiving individuals for asthma does not increase hospitalizations and discharges. The Air Force does not waive for asthma, and recommendations regarding loosening their practices will be reserved until after a current study utilizing outpatient information is completed. A questionnaire study to describe the 70% of people receiving an EPTS discharge for asthma not identified at the MEPS is underway; this will yield useful information to prevent the more than 1,000 asthma-related EPTS discharges per year across the services.

Another completed study compared cases waived for orthopedic knee conditions to matched controls. Based on this study, **it is unlikely to be cost-effective to change the current mass screening or waiver process for military recruit applicants with a prior knee ligament or meniscus injury.** Stricter standards would do little to prevent attrition, and would perhaps screen out many recruits who would do well on active duty. Further research is warranted, however, to examine the reasons for the differences found with respect to knee-related medical outcomes between those with a knee waiver and those without such a waiver. Such research might suggest strategies during training and military duty to limit knee-related morbidity in the military.

The preliminary Attention Deficit Hyperactivity Disorder ADHD study presented in AMSARA's 1997 Annual Report was extended in 1998. It was demonstrated that **those waived for a history of ADHD had similar overall discharge rates when compared with matched controls who did not have a history of ADHD.**

As evidence builds that most premature discharges are for individuals who were not disqualified and waived, **AMSARA is expanding its focus to include people with**

**disqualifying conditions that are not detected at the MEPS.** Our developed questionnaire and telephone interviews are expected to yield tremendous insight into the causes of and preventive measures for premature medical attrition.

AMSARA is also examining medical complications occurring during service that might be reduced through screening. In a study of hospitalizations, **AMSARA found hospitalization rates to vary considerably by service, by gender, by age, and by academic background.** Further study is needed to determine why these disparities exist, and how these costly hospitalizations might be reduced through medical screening of applicants.

Because of AMSARA's findings and policy recommendations last year, the **screening test for syphilis has been stopped at the MEPSs** as of June 1998 and is **expected to save DoD \$2 million per year.** AMSARA will track syphilis-related discharges and hospitalizations in the future.

**Preliminary results examining flat feet EPTS discharges revealed a lack of correlation with disqualification rates for foot problems at the MEPSs** and unfolded another area for ongoing study and policy change that will save money and increase the applicant pool.

AMSARA has significantly increased its capability to perform diverse analyses by increasing the accessible and useable data. In addition to increasing the available MEPS, hospitalization, disability, and EPTS information, AMSARA can now examine officer data from ROTC and the service academies. Studies on the waiving of officers and subsequent attrition are ongoing. AMSARA is also working with the Coast Guard, with plans for data exchanges in the coming year.

Studies of data quality, current accession and discharge policies, and primary research are being conducted. These include studies of **orthopedic back conditions, drug and alcohol problems, psychiatric disorders, and overall attrition modeling.** As a result of the asthma study, AMSARA was able to identify the need for **research and development of improved asthma screening tools with successful granting of two small business initiative contracts.** In the future, we will continue to identify research needs and work towards their development. AMSARA is well equipped to conduct this necessary research, collaborating with other agencies within MRMC and outside, to develop improved screening tools and processes. Through continued funding and support, AMSARA will further reduce medical attrition, save the DoD money, and improve military medical readiness through **facilitation of an optimally fit force from the start.**

# CHARTER AND SUPPORTING DOCUMENTS



HEALTH AFFAIRS

THE ASSISTANT SECRETARY OF DEFENSE

WASHINGTON, D. C. 20301-1200

DEC 06 1995

MEMORANDUM FOR SURGEON GENERAL OF THE ARMY

SUBJECT: Military Medical Standards Analysis and Evaluation Data Set

The personnel community has asked OASD/HA to develop a fact based accessions policy to minimize medical attrition, quantitate risk in medical waivers, and to defend accession decisions when challenged.

The offices of Clinical Services and Military Personnel Policy have worked closely with epidemiologists at Walter Reed Army Institute of Research on the concept of a Military Medical Standard Analysis and Evaluation Data Set (MMSABDS) to apply quantitative analysis to a longitudinal data base.

The Army Center for Health Promotion and Preventive Medicine (CHPPM) maintains a data base of personnel, hospitalization, deployment and separation information for all Services. I would like WRAIR, in coordination with CHPPM, to serve as consultants to the Accession Medical Standard Steering Committee, modify and maintain the data base, and coordinate field research to answer specific questions germane to accession policy.

Therefore, I request that, by the end of December 1995, a proposal be submitted through you from WRAIR, outlining the consultant role and modifications needed to the data base. This should include funding requirements.

*Edward D. Martin /bn*  
Stephen C. Joseph, M.D., M.P.H.

cc:  
Commander WRAIR

HA Control #: NONE  
Due Date: NONE

#4446  
3/16/50

February 28, 1995

ASSISTANT SECRETARY OF DEFENSE  
(HEALTH AFFAIRS)  
EXECUTIVE SUMMARY/COVER BRIEF

MEMORANDUM FOR THE ASSISTANT SECRETARY OF DEFENSE  
(HEALTH AFFAIRS)

THROUGH: *Jm* Dr. Sue Bailey, DASD (CS)  
FROM: Action Officer, Colonel Ed Miller  
SUBJECT: Accession Medical Standards Analysis and Research  
Activity (AMSARA)

PURPOSE: SIGNATURE--on request that the Assistant Surgeon  
General of the Army (Research and Development)  
establish an Accession Medical Standards Analysis  
and Research Activity (AMSARA).

DISCUSSION:

The Accessions Medical Standards Working Group  
which met over the summer sponsored through MFIM  
funding completed a functional economic analysis  
of the medical accessions examination process.  
One of the critical recommendations made by the  
Group was to establish a research activity to  
provide the Medical Accessions Standards Council  
(also recommended) with an evidence-based analysis  
of DoD accessions medical standards. The  
memorandum tasks the Army with the responsibility  
of establishing the activity resourced under the  
Defense Health Program. This has already been  
staffed with the Assistant Surgeon General of the  
Army (Research and Development)

RECOMMENDATION:

Sign tasking memorandum to Army Surgeon General.

COORDINATION:

- ✓ Mr. Conte, PDUSD(P&R) \_\_\_\_\_
- ✓ Mr. Maddy, HB&P: See attached memo
- ✓ Mr. Richards, EO: \_\_\_\_\_
- 6 Dr. Martin, PDASD: \_\_\_\_\_

**DEPARTMENT OF DEFENSE**  
**ACCESSION MEDICAL STANDARDS**  
**STEERING COMMITTEE**

**CHARTER**

**I. ESTABLISHMENT, PURPOSE AND SCOPE**

**A. ESTABLISHMENT**

The Under Secretary of Defense (Personnel and Readiness) establishes a Department of Defense Accession Medical Standards Steering Committee (hereafter referred to as the "Committee".) The Committee shall operate under the joint guidance of the Assistant Secretaries of Defense (Force Management Policy and Health Affairs [FMP & HA].)

**B. PURPOSE**

The Committee's main objective is to ensure the appropriate use of military members with regard to medical/physical characteristics, assuring a cost-efficient force of healthy members in military service capable of completing initial training and maintaining worldwide deployability. The primary purposes of the Committee are: (1) integrating the medical and personnel communities in providing policy guidance and establishing standards for accession medical/physical requirements, and (2) establishing accession medical standards and policy based on evidence-based information provided by analysis and research.

**C. SCOPE OF ACTIVITY**

1. The Committee's responsibility involves:

- a. Providing policy oversight and guidance to the accession medical/physical standards setting process.
- b. Directing research and studies necessary to produce evidenced-based accession standards making the best use of resources.
- c. Ensuring medical and personnel coordination when formulating accession policy changes.
- d. Overseeing the common application of the accession medical standards as outlined in DoD Directive 6130.3, "Physical Standards for Appointment, Enlistment, and Induction."

e. Interfacing with other relevant Department of Defense and Department of Transportation organizations.

f. Recommending promulgation of new DoD directives as well as revisions to existing directives.

g. Recommending legislative proposals concerning accession medical/physical processing.

h. Reviewing, analyzing, formulating and implementing policy concerning the accession physical examination.

i. Issuing policy letters or memoranda providing interpretation of provisions of DoD directives.

j. Resolving conflicts of application of accession medical/physical standards and policies among the Military Services and other authorized agents.

k. Maintaining records and minutes of Committee meetings.

## **II. ORGANIZATION**

A. The Committee will be co-chaired by the Deputy Assistant Secretary of Defense (Military Personnel Policy) and the Deputy Assistant Secretary of Defense (Clinical Services). This will facilitate tasking the Deputy Chiefs of Staff for Personnel and the Surgeons General to assign staffers to relevant working groups, and to ensure DCS/Personnel and Surgeon General personal involvement with the various issues. The Committee will convene semiannually, at a minimum, and at the discretion of the Chairpersons.

B. Committee members are appointed by the Under Secretary of Defense (Personnel and Readiness) and provide ongoing liaison with their respective organizations concerning matters of medical/physical accession policy.

C. The Committee shall be composed of representatives from the following:

Office of the Assistant Secretary of Defense (Force Management Policy)

Office of the Assistant Secretary of Defense (Health Affairs)

Office of the Assistant Secretary of Defense (Reserve Affairs)

Office of Service Surgeons General

Office of Service Deputy Chiefs of Staff for Personnel, and Chief of Personnel and Training, HQ U.S. Coast Guard.

D. Representatives from the Office of the Assistant Secretary of Defense (Force Management Policy) and the Office of the Assistant Secretary of Defense (Health Affairs) shall serve as executive secretaries for the Committee, and maintain a working group, composed of representatives from each of the offices mentioned above, to receive and review issues pertinent to accession policy.

E. The Commander, U.S. Military Entrance Processing Command, and the Director, DoD Medical Examination Review Board shall serve as advisors to the Committee.

F. The Committee may invite consultants (i.e., training, recruiting, epidemiology) at the discretion of the Chairpersons.

Approved: JAN 16 1996  
Date

A handwritten signature in black ink, appearing to read 'EDWIN DORN', with a large, stylized flourish extending to the right.

EDWIN DORN

## INTRODUCTION

The Accession Medical Standards Steering Committee was established by the Undersecretary of Defense (Personnel and Readiness) to integrate the medical and personnel communities so they could provide policy guidance and establish standards for accession requirements. These standards will stem from evidence-based information provided by analysis and research. The committee is co-chaired by the Deputy Assistant Secretary of Defense (Military Personnel Policy) and the Deputy Assistant Secretary of Defense (Clinical and Program Review). Its members include representatives from the Office of the Assistant Secretary of Defense (Force Management Policy), Office of the Assistant Secretary of Defense (Health Affairs), Office of the Assistant Secretary of Defense (Reserve Affairs), Offices of the Service Surgeons General, Offices of Service Deputy Chiefs of Staff for Personnel, and Chief of Personnel and Training (headquarters U.S. Coast Guard).

The Accession Medical Standards Working Group is a subordinate working group that reviews accession policy issues. This group is comprised of representatives from each of the offices listed above.

AMSARA was established in 1996 within the Division of Preventive Medicine at WRAIR to support the efforts of the Accession Medical Standards Working Group. AMSARA's mission is to support the development of evidence-based accession standards by guiding the improvement of medical and administrative databases, conducting epidemiologic analyses, and integrating relevant operational, clinical, and economic considerations into policy recommendations. AMSARA has the following six main objectives.

- Validate current and proposed standards (e.g., should flat feet be disqualifying?)
- Validate assessment techniques (e.g., improve current screening tools)
- Perform quality assurance (e.g., monitor geographic variation)
- Optimize assessment techniques (e.g., develop attrition prediction model)
- Track impact of policies, procedures, and waivers
- Recommend changes to enhance readiness, protect health, and save money

Military staffing to support this effort includes the Director of the Division of Preventive Medicine, COL Patrick W. Kelley; Chief of the Department of Epidemiology, LTC Margot Krauss; and staff physician epidemiologist, MAJ Kathryn L. Clark.

AMSARA is augmented with contract support through Allied Technology Group. The current staff includes the following: Project Manager, James Onaitis; Senior Biostatistician, Dr. Yuanzhang Li; Senior Analyst, Timothy Powers; Data Manager, Janice Gary; Health Economist, Rene Howell; Programmer and System Analyst, Igor Pototski; Editor, Therese Grundl.

## **1. AMSARA DATA SOURCES**

AMSARA requests and receives data from various sources, most of which are the primary collection agencies for the data they provide to AMSARA. Because the data are seldom collected with the goal of epidemiologic study, AMSARA interacts with points of contact to ensure that data are in an appropriate form for epidemiologic work. AMSARA staff visited many points of contact within the past year and plan to continue these visits as new data sources and contacts evolve.

### ***1.1. MEPS***

AMSARA uses data on all applicants receiving a medical examination at one of the 65 U.S. Military Entrance Processing Stations (MEPS). These data, provided by the U.S. Military Entrance Processing Command (MEPCOM), contain approximately 235 demographic, medical, and administrative elements on recruit applicants for each applicable branch (regular enlisted, reserve, National Guard) of each service (Army, Navy, Air Force, and Coast Guard) as well as for other government departments such as the Department of State and the Public Health Service. These data also include a small number of officer recruit applicants and other nonapplicants receiving periodic physical exams.

From the data provided by MEPCOM, AMSARA extracts 81 key personal, medical, and administrative variables. These variables include personal identifiers (name, SSN) for linking with other data, demographic variables (gender, race, age), and extensive medical exam information (medical failure codes, waiver decision, dates of examination, hearing-vision and alcohol-drug tests, height, weight, and blood pressure). Data also include a wide range of miscellaneous useful information (service, AFQT scores, education level, and MEPS identification).

MEPS data are the primary source of demographic information and a secondary source of medical information on new accessions into the armed forces. These data are linked to DMDC gain files to verify new accession into the military and to provide benchmark descriptive statistics. These linked data are also used for analysis purposes, such as to select and match subjects for case/control studies on asthma, knee injury, and other medical conditions.

Problem areas identified in the MEPS data include imprecise coding categories for medical disqualifications and missing and/or inaccurate data for some fields. Medical disqualifications are described only as broad categories, such as "Chest and Lungs" and "Feet." It would be useful to AMSARA if these categories were made more specific through the use of ICD9 codes so that waivers for more specific conditions can be confirmed and tracked for survival in the military. These changes are planned. An example of missing data is the field for basic training unit. Because the codes found in the data do not match those shown in the accompanying documentation, it appears that these data are misplaced. AMSARA is working with contacts at MEPCOM to address these difficulties.

### *1.2. DMDC Gain/Loss*

DMDC provides data on individuals entering military service ("gain" data) and on individuals exiting military service ("loss" data). Gain/loss data are AMSARA's primary sources of information on who is, or has been, in the military. They include data on when an individual began duty (gain date) and when/if an individual exited the military (loss date). From this information the length of service can be determined for any individual entering and leaving during the times studied by AMSARA. This information is vital to survival analysis studies such as those presented in Section 3.

The gain data include approximately 50 variables; of these, AMSARA has identified 25 variables of primary interest. These include personal identifiers (name, SSN) for linking with other data, demographics (gender, age, etc.) as a secondary source to MEPS, and service information (date of entry, training unit zip code, etc.). These data are combined with MEPS data to determine accession percentages by demographic and other variables.

The loss data also include approximately 50 variables, many of which are the same as those found in the gain file. Those of primary interest to AMSARA are personal identifiers for linking with other data, the loss date for computing length of service, and the interservice separation code (ISC) as a secondary source of the reason for leaving the military.

A large problem in the gain data is incompleteness, particularly for the Army from August to December, 1997. AMSARA has found fewer than 800 records of new Army accessions for this time period. This compares with an average of approximately 50,000 such records during the same months of 1995 and 1996. AMSARA is working with contacts at DMDC to address this problem.

A problem with the loss data lies in the broad nature of the ISC that characterizes the cause of the loss. Many categories have overlapping definitions, making it difficult to determine the real cause for the loss. For example, a discharge for pregnancy that existed before service might be coded as being for "pregnancy," a "condition existing prior to service," or "fraudulent enlistment." Such apparent inconsistencies have been encountered in comparing other sources of loss information (EPTS, disability discharge data) with the DMDC loss data.

### *1.3. Waiver*

AMSARA tracks all recruit applicants who require a medical waiver for entry into the service. Each service is responsible for defining the medical condition and for making a waiver determination (approved or disapproved). These data are generated by each service's waiver authority and contain identifiers (name and SSN), demographics (date of birth, race, and gender), and other specialty codes (ICD9 or DoD directive codes) that define the disqualifying medical conditions. Waived individuals are matched to the DMDC gain file to determine their date of entry, if any, into the service. These individuals constitute the pool from which cases, and sometimes controls, are drawn for AMSARA epidemiologic studies of the waiver process. Follow-up medical information during military service is appended to these records, including all hospitalizations, EPTS

discharges, and disability actions. Below are details of the data provided by each service's waiver authority.

### **Army**

The U.S. Army Recruiting Command, Fort Knox, Kentucky has electronic waiver data since January 1997. These data contain SSN, name, action (approved or disapproved), date, ICD9 codes, and waiver decisions, and include waivers for the Health Service Command, Army Guard and Reserve, and the Chaplain Corps.

Army hard copy waiver data exist for January 1995 through March 1996.

Medical disqualifying conditions for CYs 95 and 96 are coded according to DoD Directive 6130.3 and have narrative diagnoses, whereas the electronic data for CYs 97 and 98 are coded using the more specific ICD9 but do not have narrative diagnoses.

### **Air Force**

The Air Force Directorate of Medical Services and Training has transmitted, upon request, data on all officers and enlisted waivers from January 1995 through September 1997. We do not have an historic data dictionary since the Air Force waiver office does not have a complete written record definition for the database. AMSARA has, through discussion with the Air Force, gained an understanding of the coding methods and meanings that they used. They are now processing an AMSARA request for data covering September 1997 to September 1998. The waiver data include identifiers, demographics, action (approved or disapproved), date, and ICD9 coded medical diagnoses with no narrative.

### **Navy**

The U.S. Navy Bureau of Medicine and Surgery has data on enlisted personnel and officers along with data from special programs such as ROTC and the Naval Academy. Data are from January 1995 through September 1997 and include identifiers, demographics, dates and actions, and medical diagnoses with DoD directive codes. Diagnosis narratives are included for CYs 95 and 96 but not for CY 97. Access to data for the remainder of 1997 and 1998 has been requested.

### **Coast Guard**

In June 1998 a meeting was held with the Coast Guard at their headquarters to discuss the study of Coast Guard accessions, waivers, and attrition by AMSARA. Meeting participants were enthusiastic about AMSARA's work and potential contribution to the Coast Guard. AMSARA does not yet have access to Coast Guard data.

### **ROTC/Academies**

A summary of the waiver data collected from the ROTC programs and service academies is contained in Section 2.

#### ***1.4. Ambulatory Data System (Outpatient Medical Visits)***

AMSARA has accessed data from the Standard Ambulatory Data Record Extract and is assessing the potential applicability to future studies. Among the considerations are the data capture rates at the various recording sites and the specificity of medical coding.

#### ***1.5. Hospitalization***

The Patient Administration Systems and Biostatistical Activities (PASBA) provides hospitalization data on a yearly basis for all services except Coast Guard. These data contain information on admissions by active duty officers and enlisted personnel to a military or civilian hospital. Information on each visit includes SSN for linking with other data, demographic information (date of birth, gender, etc.), and the nature of the hospitalization (medical reason(s) for admission, date of admission, date of disposition, sick days, bed days, outcome, etc.).

Hospitalization data have been used primarily as endpoint data in military survival analysis studies. For example, in a study to assess the influence of prior knee problems on military retention, hospitalization rates among recruits waived for knee problems were compared with rates among a sample not waived (see Section 3.2 for further details).

AMSARA has access to hospitalization data for January 1995 through December 1997, with access to data for CY 1998 due in April 1999. The 1995 and 1996 data files contained combined service information. Beginning in 1997, files are provided by service, with slight differences in coding from past years and with respect to one another; this has resulted in several different data dictionaries.

One concern with the current data is completeness. In particular, there was a clear drop-off in the numbers of records, both total and cause-specific, beginning in March 1997. From January 1995 to February 1997, there was an average of 12,000 records per month on active duty enlisted hospitalizations compared with approximately 6,500 such records per month from March 1997 to December 1997. This difference is larger than would reasonably be expected because of regular month-to-month variation. AMSARA is working closely with PASBA officials to determine the effects of TRICARE and other possible causes for this sudden and sustained drop in records.

#### ***1.6. EPTS Discharges***

Discharge data for EPTS medical conditions are generated by MEPCOM. The Army, Navy, Air Force, and Coast Guard record discharges that occurred during basic training because of medical conditions believed to have existed before accession. The discharge paperwork is collected at the basic training sites and provided to MEPCOM. MEPCOM records certain information about the discharge, including a rough medical categorization (20 categories) and a judgment on each individual as to why the person was not rejected for service because of that preexisting condition (concealment, waiver, unaware, etc.).

AMSARA records more specific medical data needed for epidemiologic studies. Most importantly the medical conditions, provided in narrative form, are coded according to

DoD Directive 6130.3. With the more detailed recording, AMSARA can examine various combinations of medical endpoints in military survival analysis studies. For example, in a study to assess the influence of prior knee problems on military retention, EPTS discharge patterns among recruits waived for knee problems were compared with patterns among a sample not waived. Both knee-specific and all causes were examined through use of the DoD codes (see Section 3.2 for further details on this study).

Unfortunately, for discharges occurring before September 1996, AMSARA has only the information recorded at MEPCOM. That information includes SSN, name, gender, EPTS type, medical category, service, EPTS date, and training center. It does not contain specific diagnosis codes or narrative descriptions, and copies of the original paperwork are unavailable. This limits AMSARA's ability to examine specific endpoints for that period.

Currently, the EPTS data cannot be considered complete for two reasons: 1) not all basic training EPTS forms are provided to MEPCOM and 2) MEPCOM data do not include EPTS discharges that occurred after basic training (i.e., at advanced individual training). MEPCOM estimated that in 1997 about 30% of the EPTS discharges processed at the basic training sites were *not* forwarded to MEPCOM. The compliance rate varied by service, with the Army and the Marines providing virtually all records and the Navy and Air Force providing less than 40%. The Navy has since begun to provide more complete records, and efforts are underway to improve Air Force reporting.

AMSARA has examined the possibility of augmenting these data, particularly by comparing with DMDC loss records. As discussed above, the DMDC loss data include a code (ISC) indicating the reason for the loss, including a code of "010" for medical "conditions existing prior to service." The idea was that any records found in the DMDC loss file with ISC code 010 should appear also in the MEPCOM EPTS file. Those that did not appear would be due to the underreporting and advanced individual training issues mentioned above. It was found, however, that the two data sets are not comparable in such a manner. Many records in the MEPCOM EPTS data were coded in the DMDC loss file as something other than 010. For example, the largest portion were coded "074," meaning fraudulent entry. AMSARA will be investigating other avenues for making the EPTS data more complete, and for reconciling divergent coding between databases.

### ***1.7. Disability***

Disability discharge data are compiled separately for each service at its disability agency. The data vary somewhat by service. The Army and the Air Force disability diagnoses are coded using the Veterans Benefits Administration Department of Veterans Affairs VASRD codes. There is no translation table from VASRD to ICD9 codes, but in the future when the Joint Disability Evaluation Tracking System is operational ICD9 codes will be used. The Navy provides data on a diagnosis-specific basis only. The Coast Guard has been contacted, with access to data expected in the near future.

AMSARA uses the disability data as endpoints in military survival analysis studies. For example, in a study to assess the influence of prior knee problems on military retention,

disability discharge rates among recruits waived for knee problems were compared with rates among a sample not waived (see Section 3.2 for further details on this study). Below are service-specific descriptions of data collected.

### **Army**

The U.S. Army Physical Disability Agency has information on all disability cases processed from January 1995 through September 1998. These data include personal identifiers (name, SSN), program (regular enlisted, Academy, officer, etc.), and discharge information (date of discharge and medical condition codes).

### **Air Force**

The U.S. Air Force Physical Disability Division has disability discharge data from January 1995 through September 1997 for both officers and enlisted personnel. These data contain name, SSN, action date and the primary medical condition code. Extended codes (for those diagnoses not known with certainty but categorized by analogy) were not initially provided. AMSARA has requested these codes both for the data currently on file and for inclusion in future updates. With regard to updates, AMSARA has requested access to data to cover the remainder of 1997 and the first three quarters of 1998.

### **Navy**

The Department of the Navy Disability Evaluation System (NDES) has provided data in text files for asthma and knee conditions for January 1995 through June 1997 and for back conditions for January 1995 through August 1998. The data include discharge records of both officers and enlisted personnel and include the following fields: SSN, name, branch (Navy or Marines), rank, medical condition (narrative of the disability cause), and date of action.

NDES has recently converted from its previous data storage system to the JDETS system, and completeness of the older data transferred to the new system is suspect. For example, there were only 85 records for back-related conditions in 1995 and 78 in 1996 compared with 547 in 1997. According to conversations with NDES contacts, any data lost in the transfer between systems are irretrievable.

## 2. DESCRIPTIVE STATISTICS

This section presents summary statistics on both enlisted personnel (Section 2.1) and officer (Section 2.2) data. The following conventions apply to all information presented:

- All merging of data sets to derive percentages and rates was performed at an individual level by SSN. For example, in presenting the percentage of individuals accessed in 1997 who received a discharge, only those discharges with SSN matching a 1997 accession record SSN were included.
- All references to dates will refer to calendar year.
- Table totals may vary slightly among tables depending on the variable by which percentages or rates are presented. Records with a missing variable relevant to a given table are not included in that table.
- Education level is from the time of application at MEPS, the last time at which this information was available. For example, some individuals categorized as having less than a high school diploma may have completed high school before accession onto active duty.
- Age is from the time of application at MEPS for the MEPS/Gain tables in Section 2.1.1, but if from the time of accession onto active duty for all other tables.
- All enlisted personnel statistics are for active duty only.

### 2.1. Enlisted Personnel

#### 2.1.1. MEPS/Gain

There were more than 700,000 applicants for the enlisted services who were examined for medical fitness at MEPSs in CYs 1995–1997. Data on these applications were merged with gain data provided by DMDC to examine accession patterns. At least 59.5% of the applicants in 1995–1997 were admitted and subsequently gained onto active duty during the same time; 12.5% of all applicants were physically disqualified and did not access. The percentage of applicants who accessed may be underestimated, and the percent that did not access overestimated because gain data for 1997 appear to be incomplete (see Section 1.2 for details).

**TABLE 2.1.1.1. ENLISTED APPLICANTS AT MEPS WHO RECEIVED A MEDICAL EXAMINATION IN 1995–1997**

	Total	Percentage
All applicants	710,500	100.0
Applicants who accessed	422,459	59.5*
Did not access, physically disqualified	88,620	12.5
Did not access, but physically qualified	199,421	28.0 <sup>+</sup>

\*May be an underestimate because DMDC gain data for Army in 1997 appear to be incomplete.

<sup>+</sup>May be an overestimate because DMDC gain data for 1997 appear to be incomplete. Also, a few of these were gained into the reserves.

Demographic features of those who were gained into enlisted service in 1995–1997 are shown in Tables 2.1.1.2–2.1.1.4. The most common traits of applicants are male (80.4%), age 17–20 (71.4%), and white (71.0%). Accordingly these traits are also most common among those who accessed.

Males made up a somewhat greater percentage of the accessed population than the applicant population, accounting for 82.5% of accessions vs. only 80.4% of applications. Similarly, accession percentages differed somewhat from application percentages by age group, education level, and AFQT score. The difference by AFQT score may be partly due to rules governing accession of applicants with lower scores.

**TABLE 2.1.1.2. DEMOGRAPHIC CHARACTERISTICS OF ENLISTED APPLICANTS WHO RECEIVED A MEDICAL EXAMINATION IN 1995–1997: GENDER (IN %)**

Gender	All applicants	Applicants who accessed	Did not access, physically disqualified	Did not access, but physically qualified
Male	80.4	82.5	76.2	77.9
Female	19.6	17.5	23.8	22.1

**TABLE 2.1.1.3. DEMOGRAPHIC CHARACTERISTICS OF ENLISTED APPLICANTS WHO RECEIVED A MEDICAL EXAMINATION IN 1995–1997: AGE (IN %)**

Age at physical examination	All applicants	Applicants who accessed	Did not access, physically disqualified	Did not access, but physically qualified
17–20 yr	71.4	72.6	68.9	70.1
21–25 yr	21.6	21.7	22.6	20.7
26–30 yr	5.3	4.5	6.1	6.7
>30 yr	1.6	1.1	2.3	2.4

**TABLE 2.1.1.4. DEMOGRAPHIC CHARACTERISTICS OF ENLISTED APPLICANTS WHO RECEIVED A MEDICAL EXAMINATION IN 1995–1997: RACE (IN %)**

Race	All applicants	Applicants who accessed	Did not access, physically disqualified	Did not access, but physically qualified
White	71.0	71.3	70.2	70.9
Black	19.5	19.1	21.2	19.7
Other	9.4	9.6	8.6	9.4

Table 2.1.1.5 shows that most applicants (71.3%) had a high school diploma with no college, although a quarter of applicants (25.5%) had not completed high school at the time of application. Accordingly, a high percentage of the gained population had a high school education or less at the time of application.

**TABLE 2.1.1.5. DEMOGRAPHIC CHARACTERISTICS OF ENLISTED APPLICANTS WHO RECEIVED A MEDICAL EXAMINATION IN 1995-1997: EDUCATION LEVEL WHEN APPLYING (IN %)**

Education level	All applicants	Applicants who accessed	Did not access, physically disqualified	Did not access, but physically qualified
Less than HS	25.5	17.8	32.4	38.7
HS diploma	71.3	79.3	64.4	57.4
Some college	0.8	0.9	0.8	0.8
Bachelor	2.3	1.9	2.3	2.9
Graduate	0.1	0.1	0.1	0.2

Table 2.1.1.6 shows the AFQT scores, by percentile category, of all applicants who received a medical examination. Category 1 includes those in the 93-99 percentile range, category 2 is for the 65-92 percentile range, etc. The percentages in the lowest categories (21-30 and below) are very small, reflecting that a low AFQT score is often used as grounds for halting the application before the more expensive medical examination is performed (per MEPCOM).

**TABLE 2.1.1.6. DEMOGRAPHIC CHARACTERISTICS OF ENLISTED APPLICANTS WHO RECEIVED A MEDICAL EXAMINATION IN 1995-1997: AFQT CATEGORY (IN %)**

Percentile score	All applicants	Applicants who accessed	Did not access, physically disqualified	Did not access, but physically qualified
93-99	4.4	4.8	3.7	4.0
65-92	35.5	37.4	32.8	32.6
50-64	27.3	27.7	27.4	26.3
31-49	29.1	28.4	31.2	29.6
21-30	2.2	0.8	3.1	4.8
16-20	0.2	0.0	0.3	0.7
10-15	0.1	0.0	0.2	0.3
01-09	0.0	0.0	0.0	0.1

Tables 2.1.1.7–2.1.1.12 show results analogous to the above for 1995, 1996 and 1997, and then 1997 excluding the Army. Army data are excluded in 1997 to further examine the probable deficiency of Army gain records in the 1997 DMDC gain file. As shown in Table 2.1.1.7, the accession percentages in 1995 and 1996 were quite similar to one another (66.2 vs. 65.2%) but much higher than the 1997 percentage (43.8%). Excluding Army data for 1997 narrows the gap considerably, although the 1997 percentage is still somewhat lower than in 1995 and 1996. This may be partly due to the fact that some accessions occurring near the end of 1997 may not have been recorded in time for inclusion in the 1997 data files.

**TABLE 2.1.1.7. ENLISTED APPLICANTS AT MEPSs WHO RECEIVED A MEDICAL EXAMINATION**

	1995		1996		1997*		1997 (excluding Army)	
	Count	%	Count	%	Count	%	Count	%
All applicants	244,962	100.0	263,120	100.0	202,418	100.0	115,544	100.0
Applicants who accessed	162,158	66.2	171,679	65.2	88,622	43.8	63,144	54.6
Did not access, physically disqualified	28,275	11.5	31,209	11.9	29,136	14.4	14,027	12.1
Did not access, but physically qualified	54,529	22.3	60,232	22.9	84,660	41.8	38,373	33.2

\*Gain data for Army were incomplete for August to December 1997.

**TABLE 2.1.1.8. DEMOGRAPHIC CHARACTERISTICS OF ENLISTED APPLICANTS WHO RECEIVED A MEDICAL EXAMINATION: GENDER (IN %)**

	Gender	All applicants	Applicants who accessed	Did not access, physically disqualified	Did not access, but physically qualified
1995	Male	80.1	82.4	75.2	76.1
	Female	19.9	17.6	24.8	23.9
1996	Male	80.2	82.3	75.7	76.4
	Female	19.8	17.7	24.3	23.6
1997	Male	81.1	83.1	77.7	80.2
	Female	18.9	16.9	22.3	19.8
1997 (excluding Army)	Male	82.8	83.4	80.2	82.7
	Female	17.2	16.6	19.8	17.3

**TABLE 2.1.1.9. DEMOGRAPHIC CHARACTERISTICS OF ENLISTED APPLICANTS WHO RECEIVED A MEDICAL EXAMINATION: AGE (IN %)**

	Age	All applicants	Applicants who accessed	Did not access, physically disqualified	Did not access, but physically qualified
1995	17-20 yr	71.5	73.8	68.9	66.1
	21-25 yr	22.1	21.1	23.4	24.3
	26-30 yr	4.9	4.1	5.5	7.1
	>30 yr	1.4	1.0	2.1	2.5
1996	17-20 yr	71.8	73.1	69.8	69.0
	21-25 yr	21.4	21.3	22.0	21.5
	26-30 yr	5.2	4.4	5.9	6.9
	>30 yr	1.6	1.2	2.1	2.5
1997	17-20 yr	70.9	69.5	67.9	73.4
	21-25 yr	21.2	23.8	22.5	17.9
	26-30 yr	6.0	5.3	6.8	6.4
	>30 yr	1.9	1.4	2.6	2.3
1997 (excluding Army)	17-20 yr	77.1	75.8	73.2	80.8
	21-25 yr	18.5	20.5	20.7	14.3
	26-30 yr	3.5	3.1	4.7	3.9
	>30 yr	0.7	0.5	1.3	0.9

**TABLE 2.1.1.10. DEMOGRAPHIC CHARACTERISTICS OF ENLISTED APPLICANTS WHO RECEIVED A MEDICAL EXAMINATION: RACE (IN %)**

	Race	All applicants	Applicants who accessed	Did not access, physically disqualified	Did not access, but physically qualified
1995	White	72.8	72.9	72.1	72.8
	Black	18.8	18.6	20.3	18.8
	Other	8.4	8.6	7.6	8.3
1996	White	70.7	70.7	69.9	71.7
	Black	19.7	19.5	21.2	19.4
	Other	9.7	9.9	8.9	9.5
1997	White	69.3	69.5	68.7	69.4
	Black	20.2	19.3	21.9	20.6
	Other	10.4	11.2	9.3	10.0
1997 (excluding Army)	White	71.9	70.2	72.4	74.4
	Black	16.9	18.1	17.4	17.4
	Other	11.3	11.7	10.2	10.2

**TABLE 2.1.1.11. DEMOGRAPHIC CHARACTERISTICS OF ENLISTED APPLICANTS WHO RECEIVED A MEDICAL EXAMINATION: EDUCATION LEVEL WHEN APPLYING (IN %)**

	Education level when applying	All applicants	Applicants who accessed	Did not access, physically disqualified	Did not access, but physically qualified
1995	Less than HS	23.3	19.2	30.8	31.7
	HS diploma	73.4	78.0	65.9	63.6
	Some college	0.8	0.8	0.8	1.0
	Bachelor	2.3	1.8	2.3	3.5
	Graduate	0.1	0.1	0.1	0.2
1996	Less than HS	23.6	17.2	33.3	37.0
	HS diploma	73.1	79.8	63.6	59.1
	Some college	0.9	0.9	0.7	0.8
	Bachelor	2.3	2.0	2.2	3.0
	Graduate	0.1	0.1	0.1	0.2
1997	Less than HS	30.4	16.3	32.8	44.4
	HS diploma	66.4	80.9	63.8	52.2
	Some college	0.8	0.9	0.8	0.7
	Bachelor	2.3	1.9	2.5	2.6
	Graduate	0.2	0.1	0.1	0.2
1997 (excluding Army)	Less than HS	34.4	19.5	38.6	57.3
	HS diploma	63.3	78.3	58.6	40.3
	Some college	0.7	0.8	0.7	0.5
	Bachelor	1.5	1.3	2.0	1.8
	Graduate	0.1	0.1	0.1	0.1

**TABLE 2.1.1.12. DEMOGRAPHIC CHARACTERISTICS OF ENLISTED APPLICANTS WHO RECEIVED A MEDICAL EXAMINATION: AFQT CATEGORY (IN %)**

	Percentile score	All applicants	Applicants who accessed	Did not access, physically disqualified	Did not access, but physically qualified
1995	93-99	4.6	4.8	4.0	4.6
	65-92	36.2	37.6	33.2	33.4
	50-64	27.0	27.7	26.6	25.3
	31-49	28.4	27.9	31.2	28.2
	21-30	2.0	0.8	3.1	5.1
	16-20	0.2	0.0	0.2	0.7
	10-15	0.1	0.0	0.1	0.3
	01-09	0.0	0.0	0.0	0.1
1996	93-99	4.4	4.7	3.6	3.9
	65-92	35.5	37.2	32.5	32.0
	50-64	26.9	27.5	27.0	25.0
	31-49	29.2	28.8	31.4	29.3
	21-30	2.4	1.0	3.5	5.8
	16-20	0.3	0.0	0.4	0.9
	10-15	0.1	0.0	0.2	0.3
	01-09	0.0	0.0	0.0	0.1
1997	93-99	4.3	5.0	3.6	3.8
	65-92	34.7	37.6	32.6	32.2
	50-64	28.0	28.0	28.6	27.9
	31-49	29.7	28.3	31.2	30.6
	21-30	2.3	0.6	2.7	3.9
	16-20	0.2	0.0	0.3	0.5
	10-15	0.1	0.0	0.1	0.2
	01-09	0.0	0.0	0.0	0.0
1997 (excluding Army)	93-99	4.5	5.1	4.3	3.6
	65-92	36.8	38.9	34.6	34.2
	50-64	27.0	26.5	27.2	27.8
	31-49	28.9	28.6	30.3	28.9
	21-30	1.6	0.4	2.1	3.3
	16-20	0.2	0.0	0.3	0.6
	10-15	0.1	0.0	0.1	0.2
	01-09	0.0	0.0	0.0	0.0

Table 2.1.1.13 shows the MEPS medical disqualification percentages (number disqualified for a particular cause divided by total number of disqualifications) according to the primary disqualification cause. The most common cause for 1995–1997 was weight, followed by history of *Cannabis* use and lung/chest problems (including asthma). Percentages by year are also shown.

**TABLE 2.1.1.13. PROPORTION OF MEPS MEDICAL DISQUALIFICATIONS BY CAUSE (IN %)**

Cause	1995–1997	1995	1996	1997
Weight	19.3	16.4	20.2	21.0
<i>Cannabis</i>	10.4	8.6	8.8	14.1
Lungs/chest	7.2	7.8	7.3	6.6
Lower extremities	6.9	7.8	7.0	5.9
Audiometer	6.3	7.1	6.0	5.7
Feet	4.8	5.9	4.6	4.1
Skin/lymphatics	4.4	4.2	4.7	4.1
Blood pressure	3.9	2.6	4.3	4.6
Upper extremities	3.5	3.9	3.5	3.0
Psychiatric – drug abuse	3.0	5.8	2.4	1.0
Refraction	2.9	3.2	2.8	2.8
Psychological/psychomotor	2.5	0.7	3.0	3.6
Genitourinary system	2.4	2.6	2.6	2.2
Abdomen/viscera	2.3	2.5	2.4	2.0
Other tests	2.3	2.5	2.4	1.9
Spine/other musculature	2.2	2.7	2.1	1.8
Neurologic	1.7	2.0	1.8	1.4
Pelvic-female	1.5	1.7	1.6	1.2
Cocaine	1.4	1.4	1.3	1.7
Heart	1.1	1.3	1.2	0.9
Pulse	1.1	0.4	1.1	1.8

### 2.1.2. Waiver

Those applicants medically disqualified at the MEPS may receive an accession waiver for the disqualifying condition(s) from a service-specific waiver authority. Tables 2.1.2.1–2.1.2.12 show the counts of accession waivers granted in 1995–1997 and in each year individually. Odds ratios are used to compare the likelihood of accession among waived applicants by demographic and other variables.

The first column of Table 2.1.2.1 shows the numbers of waivers granted, by service waiver authority, for 1995–1997. Also shown are the accession percentages for waived individuals by waiver authority; some of these accessions may have been to a service other than the waiver source. The last two columns of the table compare the odds of accession according to which service granted the waiver. It is seen that relative to those waived by the Army, accession was more likely for those waived by the Air Force (odds ratio 2.63; 95% CI: 2.33–2.98) and those waived by the Navy (odds ratio 1.27; 95% CI: 1.17–1.39). This may be due in part to the apparent deficiency of Army gain records in 1997 that would artificially reduce calculated Army accession percentages.

**TABLE 2.1.2.1. ENLISTED APPLICANTS WHO RECEIVED A WAIVER IN 1995–1997**

	All applicants*		Applicants who accessed		Applicants who did not access		Odds ratio (vs. Army)	95% CI
	Count	%	Count	%	Count	%		
Army	10,898	100	6,375	58.5	4,523	41.5	1.00	
Air Force	1,668	100	1,314	78.8	354	21.2	2.63	2.33, 2.98
Navy	2,686	100	1,725	64.2	961	35.8	1.27	1.17, 1.39
Total	15,034	100	9,277	61.7	5,757	38.3		

\* One applicant may receive a waiver from more than one service, hence the sum 10,898 + 1,668 + 2,686 = 15,252 is larger than 15,034, the number of applicants receiving waiver.

Tables 2.1.2.2–2.1.2.6 show waiver counts, percent accessed, and odds ratios by demographic features for 1995–1997. Among those granted a waiver, females were significantly less likely to access than males (odds ratio 0.88; 95% CI: 0.81–0.95). Those aged 21–25 were significantly more likely to access than those in the 17-year to 20-year age group (odds ratio 1.20; 95% CI: 1.11–1.30), whereas those older than 30 were significantly less likely than those aged 17–20 (odds ratio 0.78; 95% CI: 0.63–0.98). There were no significant differences between races. Those with at least a high school education were more likely to access than those without, and those with AFQT scores below the 65<sup>th</sup> percentile were less likely to access than those at or above the 65<sup>th</sup> percentile.

**TABLE 2.1.2.2. DEMOGRAPHIC CHARACTERISTICS OF ENLISTED APPLICANTS WHO RECEIVED A WAIVER IN 1995–1997: GENDER**

Gender	All applicants		Applicants who accessed		Applicants who did not access		Odds ratio (vs. male)	95% CI
	Count	%	Count	%	Count	%		
Male	11,963	79.6	7,457	80.4	4,506	78.3	1.00	
Female	3,071	20.4	1,820	19.6	1,251	21.7	0.88	0.81, 0.95

**TABLE 2.1.2.3. DEMOGRAPHIC CHARACTERISTICS OF ENLISTED APPLICANTS WHO RECEIVED A WAIVER IN 1995-1997: AGE**

Age	All applicants		Applicants who accessed		Applicants who did not access		Odds ratio (vs. 17-20)	95% CI
	Count	%	Count	%	Count	%		
17-20 yr	10,104	67.2	6,156	66.4	3,948	68.6	1.00	
21-25 yr	3,613	24.0	2,355	25.4	1,258	21.9	1.20	1.11, 1.30
26-30 yr	985	6.6	585	6.3	400	6.9	0.94	0.82, 1.07
>30 yr	324	2.2	178	1.9	146	2.5	0.78	0.63, 0.98

**TABLE 2.1.2.4. DEMOGRAPHIC CHARACTERISTICS OF ENLISTED APPLICANTS WHO RECEIVED A WAIVER IN 1995-1997: RACE**

Race	All applicants		Applicants who accessed		Applicants who did not access		Odds ratio (vs. white)	95% CI
	Count	%	Count	%	Count	%		
White	10,900	72.5	6,736	72.6	4,164	72.3	1.00	
Black	2,906	19.3	1,776	19.1	1,130	19.6	0.97	0.89, 1.06
Other	1,228	8.2	765	8.2	463	8.0	1.02	0.90, 1.15

**TABLE 2.1.2.5. DEMOGRAPHIC CHARACTERISTICS OF ENLISTED APPLICANTS WHO RECEIVED A WAIVER IN 1995-1997: EDUCATION LEVEL WHEN APPLYING**

Education level	All applicants		Applicants who accessed		Applicants who did not access		Odds ratio (vs. less than HS)	95% CI
	Count	%	Count	%	Count	%		
Less than HS	3,161	21.0	1,226	13.2	1,935	33.6	1.00	
HS diploma	11,099	73.8	7,569	81.6	3,530	61.3	3.38	3.12, 3.67
Some college	186	1.2	120	1.3	66	1.1	2.87	2.11, 3.91
Bachelor	556	3.7	341	3.7	215	3.7	2.50	2.08, 3.01
Graduate	32	0.2	21	0.2	11	0.2	3.01	1.45, 6.27

**TABLE 2.1.2.6. DEMOGRAPHIC CHARACTERISTICS OF ENLISTED APPLICANTS WHO RECEIVED A WAIVER IN 1995-1997: AFQT CATEGORY**

Percentile score	All applicants		Applicants who accessed		Applicants who did not access		Odds ratio (vs. category 1)	95% CI
	Count	%	Count	%	Count	%		
93-99	896	6.0	560	6.0	336	5.8	1.00	
65-92	5,772	38.4	3,673	39.6	2,099	36.5	1.05	0.91, 1.21
50-64	4,239	28.2	2,629	28.3	1,610	28.0	0.93	0.80, 1.07
31-49	3,906	26.0	2,318	25.0	1,588	27.6		
21-30	155	1.0	62	0.7	93	1.6		
16-20	5	0.0	0	0.0	5	0.1		
10-15	3	0.0	0	0.0	3	0.1	0.36	0.26, 0.51
01-09	2	0.0	0	0.0	2	0.0		

Tables 2.1.2.7–2.1.2.12 show results analogous to the above separately by year. Note again that in 1997 the Army accession data appear to be deficient, so the 1997 results from table 2.1.2.8 forward are also shown with Army data excluded.

**TABLE 2.1.2.7. ENLISTED APPLICANTS WHO RECEIVED A WAIVER**

Year	Service	All applicants		Applicants who accessed		Applicants who did not access		Odds ratio (vs. Army)	95% CI
		Count	%	Count	%	Count	%		
1995	Army	3,905	100	2,607	66.8	1,298	33.2	1.00	
	Air Force	573	100	476	83.1	97	16.9	2.44	1.94, 3.07
	Navy	509	100	385	75.6	124	24.4	1.55	1.25, 1.91
	Total	4,937	100	3,429	69.5	1,508	30.5		
1996	Army	3,865	100	2,712	70.2	1,153	29.8	1.00	
	Air Force	573	100	473	82.6	100	17.5	2.01	1.60, 2.52
	Navy	856	100	619	72.3	237	27.7	1.11	0.94, 1.31
	Total	5,207	100	3,748	72.0	1,459	28.0		
1997	Army	3,128	100	1,056	33.8	2,072	66.2	1.00	
	Air Force	522	100	365	69.9	157	30.1	4.56	3.73, 5.58
	Navy	1,321	100	721	54.6	600	45.4	2.36	2.07, 2.69
	Total	4,890	100	2,100	43.0	2,790	57.0		

**TABLE 2.1.2.8. DEMOGRAPHIC CHARACTERISTICS OF ENLISTED APPLICANTS WHO RECEIVED A WAIVER: GENDER**

Year	Gender	All applicants		Applicants who accessed		Applicants who did not access		Odds ratio (vs. male)	95% CI
		Count	%	Count	%	Count	%		
1995	Male	3,883	78.7	2,726	79.5	1,157	76.7	1.00	
	Female	1,054	21.3	703	20.5	351	23.3	0.85	0.74, 0.98
1996	Male	4,105	78.8	2,991	79.8	1,114	76.4	1.00	
	Female	1,102	21.2	757	20.2	345	23.6	0.82	0.71, 0.94
1997	Male	3,975	81.3	1,740	82.9	2,235	80.1	1.00	
	Female	915	18.7	360	17.1	555	19.9	0.83	0.72, 0.96
1997 (excluding Army)	Male	1,572	80.9	883	81.1	689	80.8	1.00	
	Female	370	19.1	206	18.9	164	19.2	0.98	0.78, 1.23

**TABLE 2.1.2.9. DEMOGRAPHIC CHARACTERISTICS OF ENLISTED APPLICANTS WHO RECEIVED A WAIVER: AGE**

Year	Age	All applicants		Applicants who accessed		Applicants who did not access		Odds ratio (vs. 17-20)	95% CI
		Count	%	Count	%	Count	%		
1995	17-20 yr	3,361	68.1	2,393	69.8	968	64.2	1.00	
	21-25 yr	1,187	24.0	802	23.4	385	25.5	0.84	0.73, 0.97
	26-30 yr	298	6.0	184	5.4	114	7.6	0.65	0.51, 0.83
	>30 yr	89	1.8	48	1.4	41	2.7	0.47	0.31, 0.72
1996	17-20 yr	3,564	68.4	2,512	67.0	1,052	72.1	1.00	
	21-25 yr	1,218	23.4	935	24.9	283	19.4	1.38	1.19, 1.61
	26-30 yr	315	6.0	229	6.1	86	5.9	1.12	0.86, 1.44
	>30 yr	106	2.0	71	1.9	35	2.4	0.85	0.56, 1.28
1997	17-20 yr	3,179	65.0	1,251	59.6	1,928	69.1	1.00	
	21-25 yr	1,208	24.7	618	29.4	590	21.1	1.61	1.41, 1.84
	26-30 yr	372	7.6	172	8.2	200	7.2	1.33	1.07, 1.64
	>30 yr	129	2.6	59	2.8	70	2.5	1.30	0.91, 1.85
1997 (excluding Army)	17-20 yr	1,411	72.7	748	68.7	663	77.7	1.00	
	21-25 yr	422	21.7	270	24.8	152	17.8	1.57	1.26, 1.97
	26-30 yr	94	4.8	62	5.7	32	3.8	1.72	1.11, 2.66
	>30 yr	13	0.7	9	0.8	4	0.5	1.99	0.61, 6.51

**TABLE 2.1.2.10. DEMOGRAPHIC CHARACTERISTICS OF ENLISTED APPLICANTS WHO RECEIVED A WAIVER: RACE**

Year	Race	All applicants		Applicants who accessed		Applicants who did not access		Odds ratio (vs. white)	95% CI
		Count	%	Count	%	Count	%		
1995	White	3,670	74.3	2,548	74.3	1,122	74.4	1.00	
	Black	891	18.0	611	17.8	280	18.6	0.96	0.82, 1.13
	Other	376	7.6	270	7.9	106	7.0	1.12	0.89, 1.42
1996	White	3,760	72.2	2,700	72.0	1,060	72.7	1.00	
	Black	1,016	19.5	735	19.6	281	19.3	1.03	0.88, 1.20
	Other	431	8.3	313	8.4	118	8.1	1.04	0.83, 1.30
1997	White	3,470	71.0	1,488	70.9	1,982	71.0	1.00	
	Black	999	20.4	430	20.5	569	20.4	1.01	0.87, 1.16
	Other	421	8.6	182	8.7	239	8.6	1.01	0.83, 1.24
1997 (excluding Army)	White	1,424	73.3	772	70.9	652	76.4	1.00	
	Black	338	17.4	211	19.4	127	14.9	1.40	1.10, 1.79
	Other	180	9.3	106	9.7	74	8.7	1.21	0.88, 1.66

**TABLE 2.1.2.11. DEMOGRAPHIC CHARACTERISTICS OF ENLISTED APPLICANTS WHO RECEIVED A WAIVER: EDUCATION LEVEL WHEN APPLYING**

Year	Education level	All applicants		Applicants who accessed		Applicants who did not access		Odds ratio (vs. less than HS)	95% CI
		Count	%	Count	%	Count	%		
1995	Less than HS	836	16.9	447	13.0	389	25.8	1.00	
	HS diploma	3,844	77.9	2,812	82.0	1,032	68.4	2.37	2.03, 2.76
	Some college	71	1.4	51	1.5	20	1.3	2.22	1.30, 3.79
	Bachelor	176	3.6	113	3.3	63	4.2	1.56	1.11, 2.19
	Graduate	10	0.2	6	0.2	4	0.3	1.31	0.37, 4.66
1996	Less than HS	1,028	19.7	532	14.2	496	34.0	1.00	
	HS diploma	3,921	75.3	3,021	80.6	900	61.7	3.13	2.71, 3.61
	Some college	55	1.1	40	1.1	15	1.0	2.49	1.36, 4.56
	Bachelor	194	3.7	148	3.9	46	3.2	3.00	2.11, 4.27
	Graduate	9	0.2	7	0.2	2	0.1	3.26	0.67, 15.78
1997	Less than HS	1,297	26.5	247	11.8	1,050	37.6	1.00	
	HS diploma	3,334	68.2	1,736	82.7	1,598	57.3	4.62	3.96, 5.39
	Some college	60	1.2	29	1.4	31	1.1	3.98	2.35, 6.72
	Bachelor	186	3.8	80	3.8	106	3.8	3.21	2.33, 4.43
	Graduate	13	0.3	8	0.4	5	0.2	6.80	2.21, 20.97
1997 (excluding Army)	Less than HS	627	32.3	172	15.8	455	53.3	1.00	
	HS diploma	1,243	64.0	873	80.2	370	43.4	6.24	5.04, 7.73
	Some college	23	1.2	16	1.5	7	0.8	6.05	2.45, 14.95
	Bachelor	45	2.3	25	2.3	20	2.3	3.31	1.79, 6.11
	Graduate	4	0.2	3	0.3	1	0.1	7.94	0.82, 76.82

**TABLE 2.1.2.12. DEMOGRAPHIC CHARACTERISTICS OF ENLISTED APPLICANTS WHO RECEIVED A WAIVER: AFQT CATEGORY**

Year	Percentile score	All applicants		Applicants who accessed		Applicants who did not access		Odds ratio (vs. category 1)	95% CI
		Count	%	Count	%	Count	%		
1995	93-99	307	6.2	201	5.9	106	7.0	1.00	
	65-92	1,948	39.5	1,375	40.1	573	38.0	1.27	0.98, 1.63
	50-64	1,387	28.1	979	28.6	408	27.1	1.22	0.95, 1.57
	31-49	1,220	24.7	842	24.6	378	25.1		
	21-30	54	1.1	21	0.6	33	2.2	0.29	0.16, 0.52
	16-20	1	0.0	0	0.0	1	0.1		
	10-15	2	0.0	0	0.0	2	0.1		
	01-09	2	0.0	0	0.0	2	0.1		
1996	93-99	303	5.8	231	6.2	72	4.9	1.00	
	65-92	1,958	37.6	1,460	39.0	498	34.1	0.91	0.69, 1.21
	50-64	1,498	28.8	1,079	28.8	419	28.7	0.74	0.56, 0.98
	31-49	1,357	26.1	932	24.9	425	29.1		
	21-30	66	1.3	31	0.8	35	2.4	0.26	0.15, 0.45
	16-20	2	0.0	0	0.0	2	0.1		
	10-15	0	0.0	0	0.0	0	0.0		
	01-09	0	0.0	0	0.0	0	0.0		
1997	93-99	286	5.8	128	6.1	158	5.7	1.00	
	65-92	1,866	38.2	838	39.9	1,028	36.8	1.01	0.78, 1.29
	50-64	1,354	27.7	571	27.2	783	28.1	0.88	0.69, 1.12
	31-49	1,329	27.2	544	25.9	785	28.1		
	21-30	35	0.7	10	0.5	25	0.9	0.44	0.21, 0.94
	16-20	2	0.0	0	0.0	2	0.1		
	10-15	1	0.0	0	0.0	1	0.0		
	01-09	0	0.0	0	0.0	0	0.0		
1997 (excluding Army)	93-99	129	6.6	78	7.2	51	6.0	1.00	
	65-92	787	40.5	431	39.6	356	41.7	0.79	0.54, 1.16
	50-64	508	26.2	294	27.0	214	25.1	0.85	0.59, 1.24
	31-49	501	25.8	277	25.4	224	26.3		
	21-30	3	0.2	1	0.1	2	0.2	0.22	0.02, 2.15
	16-20	1	0.1	0	0.0	1	0.1		
	10-15	0	0.0	0	0.0	0	0.0		
	01-09	0	0.0	0	0.0	0	0.0		

### 2.1.3. Hospitalization

The following tables show hospitalization admissions per 1,000 person-years (for the unfamiliar reader, these rates can be loosely interpreted as the number of hospitalizations per 1,000 typical individuals over a full year). Counts of hospitalizations were used rather than counts of individuals experiencing at least one hospitalization. Thus multiple hospitalizations of an individual were counted as separate records.

Table 2.1.3.1 shows the rates of hospitalization during the first year of service for 1995–1997, by service. Relative risks are used to compare rates between services. The likelihood of hospitalization during the first year of service in the Navy, Marines, and Air Force was significantly lower than among the Army counterparts.

**TABLE 2.1.3.1. HOSPITAL ADMISSION RATES (PER 1,000 PERSON-YEARS) FOR ENLISTED PERSONNEL WITHIN 1 YEAR OF SERVICE IN 1995–1997**

Service	Total accessed	Admission rate	Standard error	Relative risk	95% CI
Army	156,871	98.28	0.81	1.00	
Navy	113,920	53.34	0.72	0.54	0.53, 0.56
Marines	92,609	46.38	0.75	0.47	0.46, 0.49
Air Force	91,560	65.70	0.89	0.67	0.65, 0.69

Tables 2.1.3.2–2.1.3.6 show hospital admissions by demographic and other factors for 1995–1997. Females had a significantly higher likelihood of hospitalization than males (addressed in detail in Section 3.5). Higher age groups had increasingly higher likelihood of hospital admissions relative to the 17-year to 20-year age group. Differences by race were statistically significant but small. Hospitalization rates among those with at least a high school education were significantly higher than among those with less than high school. Finally, those with lower AFQT scores had generally higher hospitalization rates.

**TABLE 2.1.3.2. HOSPITAL ADMISSION RATES (PER 1,000 PERSON-YEARS) FOR ENLISTED PERSONNEL WITHIN 1 YEAR OF SERVICE IN 1995–1997: GENDER**

Gender	Total accessed	Admission rate	Standard error	Relative risk	95% CI
Male	374,964	60.80	0.42	1.00	
Female	79,990	116.27	1.25	1.91	1.86, 1.96

**TABLE 2.1.3.3. HOSPITAL ADMISSION RATES (PER 1,000 PERSON-YEARS) FOR ENLISTED PERSONNEL WITHIN 1 YEAR OF SERVICE IN 1995–1997: AGE**

Age	Total accessed	Admission rate	Standard error	Relative risk	95% CI
17–20 yr	356,999	67.30	0.45	1.00	
21–25 yr	79,802	79.17	1.02	1.18	1.14, 1.21
26–30 yr	14,430	94.83	2.64	1.41	1.33, 1.49
>30 yr	3,729	98.74	5.28	1.47	1.32, 1.63

**TABLE 2.1.3.4. HOSPITAL ADMISSION RATES (PER 1,000 PERSON-YEARS) FOR ENLISTED PERSONNEL WITHIN 1 YEAR OF SERVICE IN 1995-1997: RACE**

Race	Total accessed	Admission rate	Standard error	Relative risk	95% CI
White	327,576	69.54	0.48	1.00	
Black	84,375	78.59	1.01	1.13	1.10, 1.16
Other	43,009	62.88	1.27	0.90	0.87, 0.94

**TABLE 2.1.3.5. HOSPITAL ADMISSION RATES (PER 1,000 PERSON-YEARS) FOR ENLISTED PERSONNEL WITHIN 1 YEAR OF SERVICE IN 1995-1997: EDUCATION LEVEL WHEN APPLYING**

Education level	Total accessed	Admission rate	Standard error	Relative risk	95% CI
Less than HS	89,304	59.38	0.87	1.00	
HS diploma	352,980	73.46	0.47	1.24	1.20, 1.28
Some college	3,730	73.09	4.55	1.23	1.09, 1.40
Bachelor's	8,477	62.93	2.79	1.12	1.04, 1.21
Graduate	464	77.26	13.26		

**TABLE 2.1.3.6. HOSPITAL ADMISSION RATES (PER 1,000 PERSON-YEARS) FOR ENLISTED PERSONNEL WITHIN 1 YEAR OF SERVICE IN 1995-1997: AFQT CATEGORY**

Percentile score	Total accessed	Admission rate	Standard error	Relative risk	95% CI
93-99	25,199	60.58	1.61	1.00	
65-92	176,940	68.38	0.65	1.13	1.07, 1.19
50-64	126,859	74.58	0.80	1.23	1.16, 1.30
31-49	121,271	71.59	0.80	1.18	1.12, 1.25
21-30	2,965	93.65	5.85	1.57	1.37, 1.79
16-20	65	168.40	60.21		
10-15	18	0.00	0.00		
01-09	9	287.03	207.21		

Tables 2.1.3.7-2.1.3.12 show hospitalization during the first year of service for 1995, 1996, and 1997 individually. As discussed in Section 1, the numbers of hospitalization records dropped off sharply beginning in March 1997, and this fact is reflected in the Tables 2.1.3.7-2.1.3.12. Hospitalization rates are noticeably lower in 1997 than in 1995 and 1996, whereas rates in 1996 are similar to those in 1995 by age, sex, and race.

**TABLE 2.1.3.7. HOSPITAL ADMISSION RATES (PER 1,000 PERSON-YEARS) FOR ENLISTED PERSONNEL WITHIN 1 YEAR OF SERVICE**

	Service	Total accessed	Admission rate	Standard error	Relative risk	95% CI
1995	Army	41,035	200.26	2.96	1.00	
	Navy	31,151	118.73	2.78	0.59	0.56, 0.63
	Marines	28,365	113.44	2.86	0.57	0.53, 0.60
	Air Force	30,317	168.33	3.34	0.84	0.80, 0.88
1996	Army	67,065	218.56	2.55	1.00	
	Navy	36,691	119.81	2.56	0.55	0.52, 0.57
	Marines	28,094	95.96	2.61	0.44	0.41, 0.47
	Air Force	30,493	135.45	2.99	0.62	0.59, 0.65
1997	Army	43,219	71.31	1.55	1.00	
	Navy	36,616	44.50	1.56	0.62	0.58, 0.68
	Marines	31,522	41.32	1.60	0.58	0.53, 0.63
	Air Force	30,695	47.81	1.75	0.67	0.62, 0.73

**TABLE 2.1.3.8. HOSPITAL ADMISSION RATES (PER 1,000 PERSON-YEARS) FOR ENLISTED PERSONNEL WITHIN 1 YEAR OF SERVICE: GENDER**

	Gender	Total accessed	Admission rate	Standard error	Relative risk	95% CI
1995	Male	108,155	134.17	1.56	1.00	
	Female	22,713	259.37	4.68	1.93	1.85, 2.02
1996	Male	132,750	136.98	1.44	1.00	
	Female	29,591	260.65	4.20	1.90	1.83, 1.98
1997	Male	117,092	48.20	0.86	1.00	
	Female	24,957	82.92	2.40	1.72	1.61, 1.84

**TABLE 2.1.3.9. HOSPITAL ADMISSION RATES (PER 1,000 PERSON-YEARS) FOR ENLISTED PERSONNEL WITHIN 1 YEAR OF SERVICE: AGE**

	Age	Total accessed	Admission rate	Standard error	Relative risk	95% CI
1995	17-20 yr	106,425	155.50	1.71	1.00	
	21-25 yr	20,480	153.37	3.58	0.99	0.94, 1.04
	26-30yr	3,154	201.46	10.50	1.30	1.17, 1.44
	>30 yr	809	186.54	19.79	1.20	0.97, 1.48
1996	17-20 yr	125,199	153.88	1.58	1.00	
	21-25 yr	30,072	171.19	3.25	1.11	1.07, 1.16
	26-30 yr	5,576	203.17	8.31	1.32	1.22, 1.43
	>30 yr	1,496	223.78	16.69	1.45	1.25, 1.69
1997	17-20 yr	112,920	52.87	0.93	1.00	
	21-25 yr	23,513	56.76	1.92	1.07	1.00, 1.16
	26-30 yr	4,528	75.70	5.01	1.43	1.25, 1.64
	>30 yr	1,091	50.85	8.27	0.96	0.70, 1.33

**TABLE 2.1.3.10. HOSPITAL ADMISSION RATES (PER 1,000 PERSON-YEARS) FOR ENLISTED PERSONNEL WITHIN 1 YEAR OF SERVICE: RACE**

	Race	Total accessed	Admission rate	Standard error	Relative risk	95% CI
1995	White	97,601	152.99	1.74	1.00	
	Black	22,684	176.18	3.91	1.15	1.10, 1.21
	Other	10,583	148.00	5.25	0.97	0.90, 1.04
1996	White	115,942	154.49	1.62	1.00	
	Black	31,158	187.38	3.51	1.21	1.16, 1.27
	Other	15,243	145.61	4.41	0.94	0.89, 1.00
1997	White	100,263	54.91	0.99	1.00	
	Black	26,644	55.81	1.92	1.02	0.94, 1.10
	Other	15,145	49.13	2.42	0.89	0.81, 0.99

**TABLE 2.1.3.11. HOSPITAL ADMISSION RATES (PER 1,000 PERSON-YEARS) FOR ENLISTED PERSONNEL WITHIN 1 YEAR OF SERVICE: EDUCATION LEVEL WHEN APPLYING**

	Education level	Total accessed	Admission rate	Standard error	Relative risk	95% CI
1995	Less than HS	29,869	155.50	3.48	1.00	
	HS diploma	97,591	157.45	1.73	1.01	0.96, 1.06
	Some college	987	152.50	16.06	0.98	0.79, 1.21
	Bachelor's	2,268	137.00	10.19		
	Graduate	153	124.04	37.72	0.91	0.80, 1.03
1996	Less than HS	28,521	147.70	3.35	1.00	
	HS diploma	128,765	163.07	1.58	1.10	1.05, 1.16
	Some college	1,496	155.56	13.97	1.05	0.88, 1.26
	Bachelor's	3,389	128.55	8.51		
	Graduate	170	238.21	52.83	0.95	0.85, 1.06
1997	Less than HS	27,998	47.66	1.97	1.00	
	HS diploma	110,392	56.10	0.93	1.18	1.08, 1.28
	Some college	1,085	50.45	8.55	1.06	0.75, 1.49
	Bachelor's	2,449	43.95	5.19		
	Graduate	125	13.05	13.06	0.94	0.77, 1.16

**TABLE 2.1.3.12. HOSPITAL ADMISSION RATES (PER 1,000 PERSON-YEARS) FOR ENLISTED PERSONNEL WITHIN 1 YEAR OF SERVICE: AFQT CATEGORY**

	Percentile score	Total accessed	Admission rate	Standard error	Relative risk	95% CI
1995	93-99	7,630	122.57	5.40	1.00	
	65-92	52,856	152.95	2.37	1.25	1.14, 1.37
	50-64	36,871	167.28	2.99	1.36	1.24, 1.50
	31-49	32,374	160.00	3.13	1.31	1.19, 1.43
	21-30	644	181.78	23.24	1.52	1.17, 1.97
	16-20	9	512.03	305.89		
	10-15	2	0.00	0.00		
	01-09	2	0.00	0.00		
1996	93-99	9,182	132.94	5.25	1.00	
	65-92	62,453	149.18	2.17	1.12	1.03, 1.22
	50-64	44,631	166.97	2.74	1.26	1.15, 1.37
	31-49	44,273	171.75	2.82	1.29	1.19, 1.40
	21-30	1,300	272.65	22.70	2.04	1.71, 2.44
	16-20	23	243.61	143.93		
	10-15	6	0.00	0.00		
	01-09	3	1,067.98	1,139.81		
1997	93-99	7,251	44.01	3.23	1.00	
	65-92	54,430	53.65	1.32	1.22	1.05, 1.42
	50-64	40,288	61.13	1.64	1.39	1.19, 1.62
	31-49	38,880	50.61	1.53	1.15	0.98, 1.34
	21-30	817	65.25	11.08	1.46	1.02, 2.10
	16-20	21	0.00	0.00		
	10-15	5	0.00	0.00		
	01-09	0	0.00	0.00		

Tables 2.1.3.13–2.1.3.18 show hospitalization rates in 1995–1997 that have been recalculated to exclude admissions related to female pelvic disease and childbirth. It can be seen in Table 2.1.3.14 that the rate for females is still significantly elevated relative to males, but the odds ratio is smaller. See Section 3.5 for a more detailed examination. Results by service, age, race, education, and AFQT score are largely unaffected by exclusion of these two categories.

**TABLE 2.1.3.13. HOSPITAL ADMISSION RATES (PER 1,000 PERSON-YEARS) EXCLUDING FEMALE PELVIC DISEASE AND CHILDBIRTH FOR ENLISTED PERSONNEL WITHIN 1 YEAR OF SERVICE IN 1995–1997**

Service	Total accessed	Admission rate	Standard error	Relative risk	95% CI
Army	156,871	96.42	0.80	1.00	
Navy	113,920	52.45	0.72	0.54	0.53, 0.56
Marines	92,609	45.97	0.74	0.48	0.46, 0.49
Air Force	91,560	63.90	0.88	0.66	0.64, 0.68

**TABLE 2.1.3.14. HOSPITAL ADMISSION RATES (PER 1,000 PERSON-YEARS)  
EXCLUDING FEMALE PELVIC DISEASE AND CHILDBIRTH FOR ENLISTED PERSONNEL  
WITHIN 1 YEAR OF SERVICE IN 1995-1997: GENDER**

	Total accessed	Admission rate	Standard error	Relative risk	95% CI
Male	374,964	60.80	0.42	1.00	
Female	79,990	108.78	1.21	1.79	1.74, 1.84

**TABLE 2.1.3.15. HOSPITAL ADMISSION RATES (PER 1,000 PERSON-YEARS)  
EXCLUDING FEMALE PELVIC DISEASE AND CHILDBIRTH FOR ENLISTED PERSONNEL  
WITHIN 1 YEAR OF SERVICE IN 1995-1997: AGE**

Year	Total accessed	Admission rate	Standard error	Relative risk	95% CI
17-20 yr	356,999	65.98	0.45	1.00	
21-25 yr	79,802	77.98	1.02	1.18	1.15, 1.22
26-30 yr	14,430	92.63	2.61	1.40	1.33, 1.49
>30 yr	3,729	97.62	5.24	1.48	1.33, 1.65

**TABLE 2.1.3.16. HOSPITAL ADMISSION RATES (PER 1,000 PERSON-YEARS)  
EXCLUDING FEMALE PELVIC DISEASE AND CHILDBIRTH FOR ENLISTED PERSONNEL  
WITHIN 1 YEAR OF SERVICE IN 1995-1997: RACE**

Race	Total accessed	Admission rate	Standard error	Relative risk	95% CI
White	327,576	68.61	0.48	1.00	
Black	84,375	75.70	0.99	1.10	1.07, 1.14
Other	43,009	61.65	1.26	0.90	0.86, 0.94

**TABLE 2.1.3.17. HOSPITAL ADMISSION RATES (PER 1,000 PERSON-YEARS)  
EXCLUDING FEMALE PELVIC DISEASE AND CHILDBIRTH FOR ENLISTED PERSONNEL  
WITHIN 1 YEAR OF SERVICE IN 1995-1997: EDUCATION LEVEL WHEN APPLYING**

Education level	Total accessed	Admission rate	Standard error	Relative risk	95% CI
Less than HS	89,304	58.11	0.86	1.00	
HS diploma	352,980	72.11	0.47	1.24	1.20, 1.28
Some college	3,730	71.39	4.50	1.23	1.08, 1.39
Bachelor's	8,477	62.19	2.78	1.13	1.04, 1.21
Graduate	464	77.26	13.26		

**TABLE 2.1.3.18. HOSPITAL ADMISSION RATES (PER 1,000 PERSON-YEARS)  
EXCLUDING FEMALE PELVIC DISEASE AND CHILDBIRTH FOR ENLISTED PERSONNEL  
WITHIN 1 YEAR OF SERVICE IN 1995–1997: AFQT CATEGORY**

Percentile score	Total accessed	Admission rate	Standard error	Relative risk	95% CI
93–99	25,199	60.37	1.60	1.00	
65–92	176,940	67.45	0.64	1.12	1.06, 1.18
50–64	126,859	72.88	0.79	1.21	1.14, 1.28
31–49	121,271	69.82	0.79	1.16	1.09, 1.22
21–30	2,965	92.92	5.83	1.56	1.37, 1.78
16–20	65	168.40	60.21		
10–15	18	0.00	0.00		
01–09	9	287.03	207.21		

Tables 2.1.3.19–2.1.3.24 show hospitalization rates separately by year for personnel during the first year of service, excluding cases of female pelvic disease and childbirth. Army has consistently higher rates than the other services; females have consistently higher rates than males; and those scoring lower on the AFQT generally have higher hospitalization rates than those scoring higher.

**TABLE 2.1.3.19. HOSPITAL ADMISSION RATES (PER 1,000 PERSON-YEARS)  
EXCLUDING FEMALE PELVIC DISEASE AND CHILDBIRTH FOR ENLISTED PERSONNEL  
WITHIN 1 YEAR OF SERVICE**

	Service	Total accessed	Admission rate	Standard error	Relative risk	95% CI
1995	Army	41,035	200.26	2.96	1.00	
	Navy	31,151	118.73	2.78	0.59	0.56, 0.63
	Marines	28,365	113.44	2.86	0.57	0.53, 0.60
	Air Force	30,317	168.33	3.34	0.84	0.80, 0.88
1996	Army	67,065	218.56	2.55	1.00	
	Navy	36,691	119.81	2.56	0.55	0.52, 0.57
	Marines	28,094	95.96	2.61	0.44	0.41, 0.47
	Air Force	30,493	135.45	2.99	0.62	0.59, 0.65
1997	Army	43,219	71.31	1.55	1.00	
	Navy	36,616	44.50	1.56	0.62	0.58, 0.68
	Marines	31,522	41.32	1.60	0.58	0.53, 0.63
	Air Force	30,695	47.81	1.75	0.67	0.62, 0.73

**TABLE 2.1.3.20. HOSPITAL ADMISSION RATES (PER 1,000 PERSON-YEARS)  
EXCLUDING FEMALE PELVIC DISEASE AND CHILDBIRTH FOR ENLISTED PERSONNEL  
WITHIN 1 YEAR OF SERVICE: GENDER**

	Gender	Total accessed	Admission rate	Standard error	Relative risk	95% CI
1995	Male	108,155	134.17	1.56	1.00	
	Female	22,713	259.37	4.68	1.93	1.85, 2.02
1996	Male	132,750	136.98	1.44	1.00	
	Female	29,591	260.65	4.20	1.90	1.83, 1.98
1997	Male	117,092	48.20	0.86	1.00	
	Female	24,957	82.92	2.40	1.72	1.61, 1.84

**TABLE 2.1.3.21. HOSPITAL ADMISSION RATES (PER 1,000 PERSON-YEARS)  
EXCLUDING FEMALE PELVIC DISEASE AND CHILDBIRTH FOR ENLISTED PERSONNEL  
WITHIN 1 YEAR OF SERVICE: AGE**

	Age	Total accessed	Admission rate	Standard error	Relative risk	95% CI
1995	17-20 yr	106,425	155.50	1.71	1.00	
	21-25 yr	20,480	153.37	3.58	0.99	0.94, 1.04
	26-30 yr	3,154	201.46	10.50	1.30	1.17, 1.44
	>30 yr	809	186.54	19.79	1.20	0.97, 1.48
1996	17-20 yr	125,199	153.88	1.58	1.00	
	21-25 yr	30,072	171.19	3.25	1.11	1.07, 1.16
	26-30 yr	5,576	203.17	8.31	1.32	1.22, 1.43
	>30 yr	1,496	223.78	16.69	1.45	1.25, 1.69
1997	17-20 yr	112,920	52.87	0.93	1.00	
	21-25 yr	23,513	56.76	1.92	1.07	1.00, 1.16
	26-30 yr	4,528	75.70	5.01	1.43	1.25, 1.64
	>30 yr	1,091	50.85	8.27	0.96	0.70, 1.33

**TABLE 2.1.3.22. HOSPITAL ADMISSION RATES (PER 1,000 PERSON-YEARS)  
EXCLUDING FEMALE PELVIC DISEASE AND CHILDBIRTH FOR ENLISTED PERSONNEL  
WITHIN 1 YEAR OF SERVICE: RACE**

	Race	Total accessed	Admission rate	Standard error	Relative risk	95% CI
1995	White	97,601	152.99	1.74	1.00	
	Black	22,684	176.18	3.91	1.15	1.10, 1.21
	Other	10,583	148.00	5.25	0.97	0.90, 1.04
1996	White	115,942	154.49	1.62	1.00	
	Black	31,158	187.38	3.51	1.21	1.16, 1.27
	Other	15,243	145.61	4.41	0.94	0.89, 1.00
1997	White	100,263	54.91	0.99	1.00	
	Black	26,644	55.81	1.92	1.02	0.94, 1.10
	Other	15,145	49.13	2.42	0.89	0.81, 0.99

**TABLE 2.1.3.23. HOSPITAL ADMISSION RATES (PER 1,000 PERSON-YEARS)  
EXCLUDING FEMALE PELVIC DISEASE AND CHILDBIRTH FOR ENLISTED PERSONNEL  
WITHIN 1 YEAR OF SERVICE: EDUCATION LEVEL WHEN APPLYING**

	Education level	Total accessed	Admission rate	Standard error	Relative risk	95% CI
1995	Less than HS	29,869	155.50	3.48	1.00	
	HS diploma	97,591	157.45	1.73	1.01	0.96, 1.06
	Some college	987	152.50	16.06	0.98	0.79, 1.21
	Bachelor's	2,268	137.00	10.19	0.91	0.80, 1.03
	Graduate	153	124.04	37.72		
1996	Less than HS	28,521	147.70	3.35	1.00	
	HS diploma	128,765	163.07	1.58	1.10	1.05, 1.16
	Some college	1,496	155.56	13.97	1.05	0.88, 1.26
	Bachelor's	3,389	128.55	8.51	0.95	0.85, 1.06
	Graduate	170	238.21	52.83		
1997	Less than HS	27,998	47.66	1.97	1.00	
	HS diploma	110,392	56.10	0.93	1.18	1.08, 1.28
	Some college	1,085	50.45	8.55	1.06	0.75, 1.49
	Bachelor's	2,449	43.95	5.19	0.94	0.77, 1.16
	Graduate	125	13.05	13.06		

**TABLE 2.1.3.24. HOSPITAL ADMISSION RATES (PER 1,000 PERSON-YEARS)  
EXCLUDING FEMALE PELVIC DISEASE AND CHILDBIRTH FOR ENLISTED PERSONNEL  
WITHIN 1 YEAR OF SERVICE: AFQT CATEGORY**

	Percentile score	Total accessed	Admission rate	Standard error	Relative risk	95% CI
1995	93-99	7,630	122.57	5.40	1.00	
	65-92	52,856	152.95	2.37	1.25	1.14, 1.37
	50-64	36,871	167.28	2.99	1.36	1.24, 1.50
	31-49	32,374	160.00	3.13	1.31	1.19, 1.43
	21-30	644	181.78	23.24	1.52	1.17, 1.97
	16-20	9	512.03	305.89		
	10-15	2	0.00	0.00		
	01-09	2	0.00	0.00		
1996	93-99	9,182	132.94	5.25	1.00	
	65-92	62,453	149.18	2.17	1.12	1.03, 1.22
	50-64	44,631	166.97	2.74	1.26	1.15, 1.37
	31-49	44,273	171.75	2.82	1.29	1.19, 1.40
	21-30	1,300	272.65	22.70	2.04	1.71, 2.44
	16-20	23	243.61	143.93		
	10-15	6	0.00	0.00		
	01-09	3	1,067.98	1,139.81		
1997	93-99	7,251	44.01	3.23	1.00	
	65-92	54,430	53.65	1.32	1.22	1.05, 1.42
	50-64	40,288	61.13	1.64	1.39	1.19, 1.62
	31-49	38,880	50.61	1.53	1.15	0.98, 1.34
	21-30	817	65.25	11.08	1.46	1.02, 2.10
	16-20	21	0.00	0.00		
	10-15	5	0.00	0.00		
	01-09	0	0.00	0.00		

Tables 2.1.3.25-2.1.3.30 show hospitalizations for 1995-1997 with data expanded to include admissions from the first year of service to within the first 2 years. As was the case for analysis of the first year only, the Army had higher rates than the other services, and females had higher rates than males. Hospitalization rates were higher by increasing age group. Black enlistees had higher rates than whites, and generally those scoring lower on the AFQT had higher hospitalization rates than those scoring higher.

**TABLE 2.1.3.25. HOSPITAL ADMISSION RATES (PER 1,000 PERSON-YEARS) FOR ENLISTED PERSONNEL WITHIN 2 YEARS OF SERVICE IN 1995-1997**

Service	Total accessed	Admission rate	Standard error	Relative risk	95% CI
Army	156,871	91.87	0.61	1.00	
Navy	113,920	53.55	0.57	0.58	0.57, 0.60
Marines	92,609	50.03	0.61	0.54	0.53, 0.56
Air Force	91,560	66.18	0.70	0.72	0.70, 0.74

**TABLE 2.1.3.26. HOSPITAL ADMISSION RATES (PER 1,000 PERSON-YEARS) FOR ENLISTED PERSONNEL WITHIN 2 YEARS OF SERVICE IN 1995-1997: GENDER**

Gender	Total accessed	Admission rate	Standard error	Relative risk	95% CI
Male	374,964	55.79	0.32	1.00	
Female	79,990	131.74	1.06	2.36	2.32, 2.41

**TABLE 2.1.3.27. HOSPITAL ADMISSION RATES (PER 1,000 PERSON-YEARS) FOR ENLISTED PERSONNEL WITHIN 2 YEARS OF SERVICE IN 1995-1997: AGE**

Age	Total accessed	Admission rate	Standard error	Relative risk	95% CI
17-20 yr	356,999	66.81	0.36	1.00	
21-25 yr	79,802	75.37	0.79	1.13	1.10, 1.15
26-30 yr	14,430	87.24	2.01	1.31	1.25, 1.37
>30 yr	3,729	90.56	4.00	1.36	1.24, 1.48

**TABLE 2.1.3.28. HOSPITAL ADMISSION RATES (PER 1,000 PERSON-YEARS) FOR ENLISTED PERSONNEL WITHIN 2 YEARS OF SERVICE IN 1995-1997: RACE**

Race	Total accessed	Admission rate	Standard error	Relative risk	95% CI
White	327,576	66.58	0.37	1.00	
Black	84,375	82.97	0.82	1.25	1.22, 1.27
Other	43,009	62.25	1.01	0.93	0.90, 0.97

**TABLE 2.1.3.29. HOSPITAL ADMISSION RATES (PER 1,000 PERSON-YEARS) FOR ENLISTED PERSONNEL WITHIN 2 YEARS OF SERVICE IN 1995-1997: EDUCATION LEVEL WHEN APPLYING**

Education level	Total accessed	Admission rate	Standard error	Relative risk	95% CI
Less than HS	89,304	60.79	0.69	1.00	
HS diploma	352,980	71.47	0.37	1.18	1.15, 1.20
Some college	3,730	70.85	3.52	1.17	1.05, 1.29
Bachelor's	8,477	60.97	2.16	1.05	0.99, 1.11
Graduate	464	54.42	8.64		

**TABLE 2.1.3.30. HOSPITAL ADMISSION RATES (PER 1,000 PERSON-YEARS) FOR ENLISTED PERSONNEL WITHIN 2 YEARS OF SERVICE IN 1995-1997: AFQT CATEGORY**

Percentile score	Total accessed	Admission rate	Standard error	Relative risk	95% CI
93-99	25,199	57.13	1.22	1.00	
65-92	176,940	65.69	0.50	1.15	1.10, 1.20
50-64	126,859	74.52	0.63	1.30	1.25, 1.36
31-49	121,271	71.50	0.63	1.25	1.20, 1.31
21-30	2,965	83.49	4.40		
16-20	65	143.76	44.75	1.48	1.32, 1.65
10-15	18	0.00	0.00		
01-09	9	171.80	126.04		

Tables 2.1.3.31–2.1.3.36 show results analogous to the above for hospitalizations within the first two years of service, again excluding those related to female pelvic disease and childbirth. These results mimic those seen above, with females, older recruits, and, generally, those scoring lower on the AFQT having higher hospitalization rates.

**TABLE 2.1.3.31. HOSPITAL ADMISSION RATES (PER 1,000 PERSON-YEARS)  
EXCLUDING FEMALE PELVIC DISEASE AND CHILDBIRTH FOR ENLISTED PERSONNEL  
WITHIN 2 YEARS OF SERVICE IN 1995–1997**

	Total accessed	Admission rate	Standard error	Relative risk	95% CI
Army	156,871	88.03	0.60	1.00	
Navy	113,920	51.12	0.56	0.58	0.57, 0.60
Marines	92,609	48.98	0.60	0.56	0.54, 0.57
Air Force	91,560	63.07	0.68	0.72	0.70, 0.73

**TABLE 2.1.3.32. HOSPITAL ADMISSION RATES (PER 1,000 PERSON-YEARS)  
EXCLUDING FEMALE PELVIC DISEASE AND CHILDBIRTH FOR ENLISTED PERSONNEL  
WITHIN 2 YEARS OF SERVICE IN 1995–1997: GENDER**

Gender	Total accessed	Admission rate	Standard error	Relative risk	95% CI
Male	374,964	55.79	0.32	1.00	
Female	79,990	115.92	0.99	2.08	2.04, 2.12

**TABLE 2.1.3.33. HOSPITAL ADMISSION RATES (PER 1,000 PERSON-YEARS)  
EXCLUDING FEMALE PELVIC DISEASE AND CHILDBIRTH FOR ENLISTED PERSONNEL  
WITHIN 2 YEARS OF SERVICE IN 1995–1997: AGE**

Age	Total accessed	Admission rate	Standard error	Relative risk	95% CI
17–20 yr	356,999	63.90	0.35	1.00	
21–25 yr	79,802	73.00	0.77	1.14	1.12, 1.17
26–30yr	14,430	84.33	1.97	1.32	1.26, 1.38
>30 yr	3,729	88.65	3.95	1.39	1.27, 1.51

**TABLE 2.1.3.34. HOSPITAL ADMISSION RATES (PER 1,000 PERSON-YEARS)  
EXCLUDING FEMALE PELVIC DISEASE AND CHILDBIRTH FOR ENLISTED PERSONNEL  
WITHIN 2 YEARS OF SERVICE IN 1995–1997: RACE**

Race	Total accessed	Admission rate	Standard error	Relative risk	95% CI
White	327,576	64.57	0.36	1.00	
Black	84,375	76.88	0.79	1.19	1.16, 1.22
Other	43,009	59.85	0.99	0.93	0.90, 0.96

**TABLE 2.1.3.35. HOSPITAL ADMISSION RATES (PER 1,000 PERSON-YEARS)  
EXCLUDING FEMALE PELVIC DISEASE AND CHILDBIRTH FOR ENLISTED PERSONNEL  
WITHIN 2 YEARS OF SERVICE IN 1995-1997: EDUCATION LEVEL WHEN APPLYING)**

Education level when applying	Total accessed	Admission rate	Standard error	Relative risk	95% CI
Less than HS	89,304	58.14	0.67	1.00	
HS diploma	352,980	68.61	0.36	1.18	1.15, 1.21
Some college	3,730	67.92	3.44	1.17	1.06, 1.29
Bachelor's	8,477	59.08	2.12	1.06	0.99, 1.12
Graduate	464	53.06	8.53		

**TABLE 2.1.3.36. HOSPITAL ADMISSION RATES (PER 1,000 PERSON-YEARS)  
EXCLUDING FEMALE PELVIC DISEASE AND CHILDBIRTH FOR ENLISTED PERSONNEL  
WITHIN 2 YEARS OF SERVICE IN 1995-1997: AFQT CATEGORY**

Percentile score	Total accessed	Admission rate	Standard error	Relative risk	95% CI
93-99	25,199	56.11	1.21	1.00	
65-92	176,940	63.48	0.49	1.13	1.08, 1.18
50-64	126,859	71.06	0.61	1.27	1.21, 1.33
31-49	121,271	68.07	0.62	1.21	1.16, 1.27
21-30	2,965	82.58	4.38	1.49	1.33, 1.66
16-20	65	143.76	44.75		
10-15	18	0.00	0.00		
01-09	9	171.80	126.04		

Table 2.1.3.37 shows hospitalization percentages, by diagnostic category, within the first year of service in 1995-1997 and in each year individually. Percentages (number of hospitalizations for a particular cause divided by total number of hospitalizations) do not add to 100% because not all causes are included. By far the most common cause was adjustment reaction, accounting for almost 14% of hospitalizations during the first year of service. Record counts differ noticeably by year, which is discussed in Section 3.

**TABLE 2.1.3.37. HOSPITALIZATION PERCENTAGES BY MEDICAL CATEGORY FOR ENLISTED PERSONNEL WITHIN 1 YEAR OF SERVICE: TOTAL, 1995, 1996, AND 1997**

Medical category*	Count				Percentage			
	1995-1997	1995	1996	1997	1995-1997	1995	1996	1997
Adjustment reaction	4,204	1,189	2,023	992	13.8	10.5	14.5	19.3
Respiratory system	2,395	887	1,176	332	7.9	7.8	8.4	6.5
Dental	1,672	985	595	92	5.5	8.7	4.3	1.8
Mental health	1,194	398	565	231	3.9	3.5	4.0	4.5
Pneumonia	1,132	460	483	189	3.7	4.1	3.5	3.7
Alcohol/substance-related disorders	997	420	451	126	3.3	3.7	3.2	2.5
Viral infection	975	374	495	106	3.2	3.3	3.5	2.1
Cellulitis	834	277	366	191	2.7	2.4	2.6	3.7
Parasitic disease	825	319	411	95	2.7	2.8	2.9	1.9
Hernia	647	278	276	93	2.1	2.5	2.0	1.8
Bronchitis, NOS	603	208	318	16	2.0	1.8	2.3	0.3
Childbirth/Pregnancy	573	221	259	93	1.9	2.0	1.9	1.8
Affective psychoses	557	182	263	112	1.8	1.6	1.9	2.2
Ill-defined conditions	488	176	215	97	1.6	1.6	1.5	1.9
Chickenpox	484	145	238	101	1.6	1.3	1.7	2.0
Neurotic disorder	356	116	163	77	1.2	1.0	1.2	1.5
Appendicitis	347	114	154	79	1.1	1.0	1.1	1.5
Pelvic	279	94	132	53	0.9	0.8	0.9	1.0
Sinusitis	267	91	146	30	0.9	0.8	1.0	0.6
Psychoses	255	75	125	55	0.8	0.7	0.9	1.1
Urinary system	250	87	128	35	0.8	0.8	0.9	0.7
Fracture of ankle	218	60	116	42	0.7	0.5	0.8	0.8
Poisoning	197	75	84	38	0.6	0.7	0.6	0.7
Endocrine, nutrition, metabolic and immunity disorders	174	65	65	44	0.6	0.6	0.5	0.9
Mononucleosis	154	48	78	28	0.5	0.4	0.6	0.5
Depression	146	46	63	37	0.5	0.4	0.5	0.7
Disorders: muscle, ligament, fascia	130	34	37	59	0.4	0.3	0.3	1.2
Asthma	117	49	49	19	0.4	0.4	0.4	0.4
Perineal trauma (unrelated to childbirth)	100	55	38	7	0.3	0.5	0.3	0.1
Pregnancy with vomiting	97	34	49	14	0.3	0.3	0.4	0.3
Bronchitis	89	35	38	77	0.3	0.3	0.3	1.5
Otitis media	71	31	31	9	0.2	0.3	0.2	0.2
Female pain genital organs	60	32	24	4	0.2	0.3	0.2	0.1
Benign breast tumor	36	11	20	5	0.1	0.1	0.1	0.1
Hemorrhoids	35	12	19	4	0.1	0.1	0.1	0.1

\* ICD9 codes comprising the medical categories can be found in Table 3.5.1 on page 92.

Table 2.1.3.38 shows hospitalization percentages within the first two years of service in 1995–97. Again, the most common cause was adjustment reaction.

**TABLE 2.1.3.38 HOSPITALIZATION PERCENTAGES BY MEDICAL CATEGORY FOR ENLISTED PERSONNEL WITHIN 2 YEARS OF SERVICE IN 1995–1997**

Medical category	Count	Percentage
Adjustment reaction	5,358	11.0
Respiratory system	2,838	5.8
Dental	2,736	5.6
Childbirth	1,996	4.1
Alcohol/substance-related disorders	1,986	4.1
Mental health	1,825	3.7
Pneumonia	1,218	2.5
Perineal trauma (unrelated to childbirth)	1,078	2.2
Viral infection	1,060	2.2
Parasitic disease	1,035	2.1
Cellulitis	1,013	2.1
Hernia	944	1.9
Affective psychoses	828	1.7
Ill-defined conditions	653	1.3
Bronchitis, NOS	620	1.3
Appendicitis	593	1.2
Chickenpox	565	1.2
Neurotic disorder	531	1.1
Pelvic	455	0.9
Fracture of ankle	364	0.7
Urinary system	356	0.7
Psychoses	306	0.6
Sinusitis	294	0.6
Poisoning	270	0.6
Depression	234	0.5
Endocrine, nutrition, metabolic and immunity disorders	219	0.4
Pregnancy with vomiting	201	0.4
Mononucleosis	196	0.4
Disorders: muscle, ligament, fascia	172	0.4
Asthma	167	0.3
Female pain genital organs	137	0.3
Bronchitis	106	0.2
Otitis media	74	0.2
Benign breast tumor	55	0.1
Hemorrhoids	48	0.1

### 2.1.4. EPTS

Tables 2.1.4.1–2.1.4.18 summarize discharges for EPTS conditions in 1995–1997 and in each of these years individually. EPTS percentages are shown by service, demographic characteristics, and academic variables. Percentages discharged are shown for each category, and odds ratios are used to compare categories.

Table 2.1.4.1 shows percentages of accessions ending in EPTS discharge, by service. From the odds ratios it can be seen that the percentage of accessions resulting in EPTS discharge was higher in the Navy than the Army, whereas the Marines and Air Force had significantly lower rates. Data completeness varies across services, preventing conclusions from the comparisons by service.

**TABLE 2.1.4.1. PERCENTAGE OF ENLISTED ACCESSIONS ENDING IN EPTS DISCHARGE IN 1995–1997**

	Total accessed	Discharged	Percent discharged	Odds ratio	95% CI
Army	172,894	7,482	4.3	1.00	
Navy	118,620	5,635	4.8	1.10	1.06, 1.14
Marines	94,020	3,558	3.8	0.87	0.83, 0.91
Air Force	91,965	3,183	3.5	0.79	0.76, 0.83

Tables 2.1.4.2–2.1.4.4 show the percentages by gender, race, and age at medical examination. From the odds ratios, females had a higher likelihood of EPTS than males, older recruits had a higher likelihood than those aged 17–20, and nonwhites had lower likelihood than whites.

**TABLE 2.1.4.2. PERCENTAGE OF ENLISTED ACCESSIONS ENDING IN EPTS DISCHARGE IN 1995–1997: GENDER**

Gender	Total accessed	Discharged	Percent discharged	Odds ratio	95% CI
Male	395,230	15,279	3.9	1.00	
Female	82,258	4,579	5.6	1.47	1.42, 1.52

**TABLE 2.1.4.3. PERCENTAGE OF ENLISTED ACCESSIONS ENDING IN EPTS DISCHARGE IN 1995–1997: AGE**

Age	Total accessed	Discharged	Percent discharged	Odds ratio	95% CI
17–20 yr	367,737	14,958	4.1	1.00	
21–25 yr	89,078	3,968	4.5	1.10	1.06, 1.14
26–30 yr	16,510	743	4.5	1.11	1.03, 1.20
>30 yr	4,174	189	4.5	1.12	0.97, 1.30

**TABLE 2.1.4.4. PERCENTAGE OF ENLISTED ACCESSIONS ENDING IN EPTS DISCHARGE IN 1995-1997: RACE**

Race	Total accessed	Discharged	Percent discharged	Odds ratio	95% CI
White	343,360	15,426	4.5	1.00	
Black	89,620	3,082	3.4	0.76	0.73, 0.79
Other	44,519	1,350	3.0	0.66	0.63, 0.70

Table 2.1.4.5 shows the percentages according to education level at the time of application. Those with at least some college had significantly lower odds, and those with a high school diploma had significantly higher odds, of EPTS discharge relative to those who had not finished high school at the time of application.

**TABLE 2.1.4.5. PERCENTAGE OF ENLISTED ACCESSIONS ENDING IN EPTS DISCHARGE IN 1995-1997: EDUCATION LEVEL WHEN APPLYING**

Education level	Total accessed	Discharged	Percent discharged	Odds ratio	95% CI
Less than HS	90,422	3,439	3.8	1.00	
HS diploma	373,475	16,051	4.3	1.14	1.09, 1.18
Some college	4,041	134	3.3	0.70	0.63, 0.78
Bachelor's	9,056	218	2.4		
Graduate	496	16	3.2		

Table 2.1.4.6 shows that those with lower AFQT scores had a higher likelihood of EPTS discharge than those scoring higher.

**TABLE 2.1.4.6. PERCENTAGE OF ENLISTED ACCESSIONS ENDING IN EPTS DISCHARGE IN 1995-1997: AFQT CATEGORY**

Percentile score	Total accessed	Discharged	Percent discharged	Odds ratio	95% CI
93-99	26,433	792	3.0	1.00	
65-92	184,307	7,022	3.8	1.28	1.19, 1.38
50-64	131,911	5,910	4.5	1.52	1.41, 1.64
31-49	126,927	5,932	4.7	1.59	1.47, 1.71
21-30	3,244	161	5.0	1.70	1.43, 2.01
16-20	77	4	5.2		
10-15	22	1	4.5		
01-09	10	1	10.0		

Tables 2.1.4.7–2.1.4.12 show the EPTS summaries separately by year. Again, comparisons by service are tenuous because of disparities in reporting compliance.

**TABLE 2.1.4.7. PERCENTAGE OF ENLISTED ACCESSIONS ENDING IN EPTS DISCHARGE**

		Total accessed	Discharged	Percent discharged	Odds ratio	95% CI
1995	Army	44,643	2,085	4.7	1.00	
	Navy	35,570	995	2.8	0.59	0.54, 0.63
	Marines	31,400	886	2.8	0.59	0.55, 0.64
	Air Force	30,490	1,375	4.5	0.96	0.90, 1.03
1996	Army	72,572	3,374	4.6	1.00	
	Navy	42,252	2,015	4.8	1.03	0.97, 1.09
	Marines	29,648	1,150	3.9	0.83	0.77, 0.89
	Air Force	30,666	874	2.9	0.60	0.56, 0.65
1997	Army	55,679	2,023	3.6	1.00	
	Navy	40,798	2,625	6.4	1.82	1.72, 1.94
	Marines	32,972	1,522	4.6	1.28	1.20, 1.37
	Air Force	30,809	934	3.0	0.83	0.77, 0.90

**TABLE 2.1.4.8. PERCENTAGE OF ENLISTED ACCESSIONS ENDING IN EPTS DISCHARGE:  
GENDER**

		Total accessed	Discharged	Percent discharged	Odds ratio	95% CI
1995	Male	118,083	4,101	3.5	1.00	
	Female	24,017	1,240	5.2	1.51	1.42, 1.61
1996	Male	144,055	5,669	3.9	1.00	
	Female	31,079	1,744	5.6	1.45	1.37, 1.53
1997	Male	133,092	5,509	4.1	1.00	
	Female	27,162	1,595	5.9	1.44	1.36, 1.53

**TABLE 2.1.4.9. PERCENTAGE OF ENLISTED ACCESSIONS ENDING IN EPTS DISCHARGE:  
AGE**

		Total accessed	Discharged	Percent discharged	Odds ratio	95% CI
1995	17–20 yr	113,103	4,209	3.7	1.00	
	21–25 yr	24,205	921	3.8	1.02	0.95, 1.10
	26–30 yr	3,826	167	4.4	1.18	1.01, 1.38
	>30 yr	969	44	4.5	1.23	0.91, 1.67
1996	17–20 yr	131,954	5,433	4.1	1.00	
	21–25 yr	34,814	1,599	4.6	1.12	1.06, 1.19
	26–30 yr	6,625	293	4.4	1.08	0.96, 1.22
	>30 yr	1,745	88	5.0	1.24	1.00, 1.54
1997	17–20 yr	122,680	5,316	4.3	1.00	
	21–25 yr	30,059	1,448	4.8	1.12	1.05, 1.19
	26–30 yr	6,059	283	4.7	1.08	0.96, 1.22
	>30 yr	1,460	57	3.9	0.90	0.69, 1.17

**TABLE 2.1.4.10. PERCENTAGE OF ENLISTED ACCESSIONS ENDING IN EPTS  
DISCHARGE: RACE**

		Total accessed	Discharged	Percent discharged	Odds ratio	95% CI
1995	White	105,733	4,208	4.0	1.00	
	Black	24,865	788	3.2	0.79	0.73, 0.85
	Other	11,505	345	3.0	0.75	0.67, 0.83
1996	White	125,004	5,696	4.6	1.00	
	Black	33,810	1,220	3.6	0.78	0.74, 0.84
	Other	16,324	497	3.0	0.66	0.60, 0.72
1997	White	112,623	5,522	4.9	1.00	
	Black	30,945	1,074	3.5	0.70	0.65, 0.75
	Other	16,690	508	3.0	0.61	0.56, 0.67

**TABLE 2.1.4.11. PERCENTAGE OF ENLISTED ACCESSIONS ENDING IN EPTS  
DISCHARGE: EDUCATION LEVEL WHEN APPLYING**

		Total accessed	Discharged	Percent discharged	Odds ratio	95% CI
1995	Less than HS	30,909	930	3.0	1.00	
	HS diploma	107,432	4,301	4.0	1.34	1.25, 1.44
	Some college	1,098	36	3.3	0.97	0.79, 1.19
	Bachelor's	2,497	70	2.8		
	Graduate	166	4	2.4		
1996	Less than HS	29,304	1,158	4.0	1.00	
	HS diploma	140,278	6,105	4.4	1.11	1.04, 1.18
	Some college	1,650	57	3.5	0.67	0.57, 0.80
	Bachelor's	3,713	85	2.3		
	Graduate	189	8	4.2		
1997	Less than HS	30,209	1,351	4.5	1.00	
	HS diploma	125,765	5,645	4.5	1.00	0.94, 1.07
	Some college	1,293	41	3.2	0.55	0.45, 0.67
	Bachelor's	2,846	63	2.2		
	Graduate	141	4	2.8		

**TABLE 2.1.4.12. PERCENTAGE OF ENLISTED ACCESSIONS ENDING IN EPTS  
DISCHARGE: AFQT CATEGORY**

	Percentile score	Total accessed	Discharged	Percent discharged	Odds ratio	95% CI
1995	93-99	8,286	238	2.9	1.00	
	65-92	56,700	1,949	3.4	1.20	1.05, 1.38
	50-64	39,366	1,579	4.0	1.41	1.23, 1.62
	31-49	35,155	1,512	4.3	1.52	1.32, 1.75
	21-30	724	49	6.8	2.43	1.77, 3.33
	16-20	16	0	0		
	10-15	3	0	0		
	01-09	3	1	33.3		
1996	93-99	9,885	276	2.8	1.00	
	65-92	66,993	2,537	3.8	1.37	1.21, 1.55
	50-64	47,675	2,219	4.7	1.70	1.50, 1.93
	31-49	47,442	2,288	4.8	1.76	1.55, 2.00
	21-30	1,375	80	5.8	2.12	1.64, 2.73
	16-20	27	0	0		
	10-15	7	1	14.3		
	01-09	3	0	0		
1997	93-99	8,262	278	3.4	1.00	
	65-92	60,614	2,536	4.2	1.25	1.11, 1.42
	50-64	44,870	2,112	4.7	1.42	1.25, 1.61
	31-49	44,330	2,132	4.8	1.45	1.28, 1.65
	21-30	1,145	32	2.8	0.89	0.63, 1.27
	16-20	34	4	11.8		
	10-15	12	0	0		
	01-09	4	0	0		

Table 2.1.4.13 summarizes the EPTS discharges by medical category. Orthopedic conditions were the most common, followed by psychiatric, then lungs/chest. These broad categories are used in this table because the EPTS data available in 1995 and most of 1996 are not delineated further.

**TABLE 2.1.4.13. EPTS DISCHARGE PERCENTAGES BY MEDICAL CATEGORY FOR ENLISTED PERSONNEL IN 1995-1997**

Medical category	Count				Percentage of all EPTS discharge			
	1995-1997	1995	1996	1997	1995-1997	1995	1996	1997
Psychiatric—other	4,118	233	1,518	2,367	20.7	4.4	20.5	33.3
Lungs/chest—asthma	2,624	711	1,011	902	13.2	13.3	13.6	12.7
Orthopedics—knee	2,238	801	837	600	11.3	15.0	11.3	8.4
Orthopedics—other	2,189	736	801	652	11.0	13.8	10.8	9.2
Orthopedics—feet	1,955	630	797	528	9.8	11.8	10.8	7.4
Orthopedics—back	1,615	535	619	461	8.1	10.0	8.4	6.5
Other	982	287	382	313	4.9	5.4	5.2	4.4
Neurology—other	702	281	200	221	3.5	5.3	2.7	3.1
Genitourinary system	667	240	235	192	3.4	4.5	3.2	2.7
Eyes—vision/refraction	601	166	252	183	3.0	3.1	3.4	2.6
Abdomen and viscera	532	164	189	179	2.7	3.1	2.5	2.5
Cardiovascular—other	337	106	117	114	1.7	2.0	1.6	1.6
Skin and lymphatic	300	99	103	98	1.5	1.9	1.4	1.4
Lungs/chest—other	265	132	85	48	1.3	2.5	1.1	0.7
Ears—hearing	210	66	71	73	1.1	1.2	1.0	1.0
Neurology—seizure disorder	161	49	53	59	0.8	0.9	0.7	0.8
Ears—other	159	48	69	42	0.8	0.9	0.9	0.6
Cardiovascular	129	44	46	39	0.6	0.8	0.6	0.5
Psychiatric—schizophrenia	38	6	19	13	0.2	0.1	0.3	0.2
Eyes—other	31	7	9	15	0.2	0.1	0.1	0.2

Table 2.1.4.14 shows the EPTS discharge percentages by more specific diagnostic categories in 1997. This is the first year for which AMSARA had access to the original EPTS data forms, which allowed AMSARA to determine and record medical codes according to DoD Directive 6130.3. Asthma was the most common cause, followed by emotional, personality, and behavioral disorders.

**TABLE 2.1.4.14. EPTS DISCHARGE PERCENTAGES BY DOD DIAGNOSIS FOR ENLISTED PERSONNEL IN 1997**

Condition	Number	% of all EPTS
Asthma	963	12.9
Neurotic, mood, somatoform, dissociative, or factitious disorders	591	7.9
Personality disorders	528	7.1
Behavior disorders	513	6.9
Chronic pain, disease of lower extremities	409	5.5
Injury, pain of spine or sacroiliac joints	314	4.2
Suicide attempted or suicidal behavior	261	3.5
Pes planus (acquired)	233	3.1
Headaches (including migraine and tension)	176	2.4
Substance abuse	157	2.1
Unstable or internally deranged joint	135	1.8
ASD	124	1.7
Retropatellar knee pain syndrome	120	1.6

Table 2.1.4.15 shows EPTS discharge percentages by categories grouped by DoD codes. Discharges for psychologic/psychiatric reasons were by far the most common; they were more than double the next cause, which was asthma.

**TABLE 2.1.4.15. EPTS DISCHARGE PERCENTAGES BY DIAGNOSIS FOR ENLISTED PERSONNEL IN 1997 (GROUPED DOD DIAGNOSIS CODES)**

Condition	Number	% of all EPTS
Psychologic/psychiatric	2050	27.5
Asthma	963	12.9
Chronic pain/disease of lower extremities	529	7.1
Injury, pain of spine or sacroiliac joints	314	4.2
Pes planus	233	3.1

### 2.1.5. Disability

Tables 2.1.5.1–2.1.5.28 summarize disability discharges in 1995–1997 and in each of these years individually. As outlined in Section 1, the Navy provides disability data for specific medical categories only; therefore the tables in this Section exclude the Navy. Also, Air Force data for 1997 are complete only through September, resulting in a probable underestimate in discharge percentages for that year. This might also affect the percentages by other demographic variables related to service, such as gender.

Females had a higher likelihood than males of disability discharge within the first year of service. The likelihood of disability discharge increased by increasing age groups. There was no significant difference by race. Those with a high school diploma had a higher likelihood of disability discharge than those without a high school diploma. Finally, there were no statistically significant differences according to AFQT score group.

**TABLE 2.1.5.1. PERCENTAGE OF ACTIVE DUTY ARMY AND AIR FORCE ENLISTED ACCESSIONS ENDING IN DISABILITY DISCHARGE WITHIN 1 YEAR OF SERVICE IN 1995–1997**

	Total accessed	Discharged	Percent discharged	Odds ratio	95% CI
Army	172,894	667	0.4	1.00	
Air Force	91,965	388	0.4	1.09	0.97, 1.24

**TABLE 2.1.5.2. PERCENTAGE OF ACTIVE DUTY ARMY AND AIR FORCE ENLISTED ACCESSIONS ENDING IN DISABILITY DISCHARGE WITHIN 1 YEAR OF SERVICE IN 1995–1997: GENDER**

Gender	Total accessed	Discharged	Percent discharged	Odds ratio	95% CI
Male	207,147	668	0.3	1.00	
Female	57,706	387	0.7	2.09	1.84, 2.37

**TABLE 2.1.5.3. PERCENTAGE OF ACTIVE DUTY ARMY AND AIR FORCE ENLISTED ACCESSIONS ENDING IN DISABILITY DISCHARGE WITHIN 1 YEAR OF SERVICE IN 1995–1997: AGE**

Age	Total accessed	Discharged	Percent discharged	Odds ratio	95% CI
17–20 yr	204,253	769	0.4	1.00	
21–25 yr	47,295	206	0.4	1.16	0.99, 1.35
26–30 yr	10,475	62	0.6	1.58	1.22, 2.04
>30 yr	2,836	18	0.6	1.69	1.06, 2.70

**TABLE 2.1.5.4. PERCENTAGE OF ACTIVE DUTY ARMY AND AIR FORCE ENLISTED ACCESSIONS ENDING IN DISABILITY DISCHARGE WITHIN 1 YEAR OF SERVICE IN 1995–1997: RACE**

Race	Total accessed	Discharged	Percent discharged	Odds ratio	95% CI
White	188,039	780	0.4	1.00	
Black	54,234	194	0.4	0.86	0.74, 1.01
Other	22,586	81	0.4	0.86	0.69, 1.09

**TABLE 2.1.5.5. PERCENTAGE OF ACTIVE DUTY ARMY AND AIR FORCE ENLISTED ACCESSIONS ENDING IN DISABILITY DISCHARGE WITHIN 1 YEAR OF SERVICE IN 1995-1997: EDUCATION LEVEL WHEN APPLYING**

Education level	Total accessed	Discharged	Percent discharged	Odds ratio	95% CI
Less than HS	36,820	112	0.3	1.00	
HS diploma	217,789	900	0.4	1.36	1.12, 1.66
Some college	2,948	18	0.6	1.38	0.97, 1.96
Bachelor's	6,886	24	0.3		
Graduate	411	1	0.2		

**TABLE 2.1.5.6. PERCENTAGE OF ACTIVE DUTY ARMY AND AIR FORCE ENLISTED ACCESSIONS ENDING IN DISABILITY DISCHARGE WITHIN 1 YEAR OF SERVICE IN 1995-1997: AFQT CATEGORY**

Percentile score	Total accessed	Discharged	Percent discharged	Odds ratio	95% CI
93-99	14,792	45	0.3	1.00	
65-92	103,837	408	0.4	1.29	0.95, 1.76
50-64	77,909	321	0.4	1.36	0.99, 1.85
31-49	64,231	252	0.4	1.29	0.94, 1.77
21-30	2,573	8	0.3	1.00	0.47, 2.13
16-20	32	0	0		
10-15	9	0	0		
01-09	3	0	0		

Table 2.1.5.7 shows results by service for each year individually. The Air Force disability discharge rate is significantly higher than that of the Army in 1995 and 1996 but significantly lower in 1997. This is likely due, at least in part, to the incomplete Air Force disability data for late 1997, and may be affected by discharges occurring in 1998 for which data were not available.

**TABLE 2.1.5.7. PERCENTAGE OF ACTIVE DUTY ARMY AND AIR FORCE ENLISTED ACCESSIONS ENDING IN DISABILITY DISCHARGE WITHIN 1 YEAR OF SERVICE**

	Service	Total accessed	Discharged	Percent discharged	Odds ratio	95% CI
1995	Army	44,643	173	0.4	1.00	
	Air Force	30,490	175	0.6	1.48	1.20, 1.83
1996	Army	72,572	276	0.4	1.00	
	Air Force	30,666	168	0.5	1.44	1.19, 1.75
1997	Army	55,679	218	0.4	1.00	
	Air Force	30,809	45	0.1	0.37	0.27, 0.51

Table 2.1.5.8 shows disability discharge percentages by gender for each year individually. Females have significantly higher discharge percentages than males in each year. However, there is a statistically significant downward trend in the odds ratios over these 3 years, indicating that the difference by gender is shrinking.

**TABLE 2.1.5.8. PERCENTAGE OF ACTIVE DUTY ARMY AND AIR FORCE ENLISTED  
ACCESSIONS ENDING IN DISABILITY DISCHARGE WITHIN 1 YEAR OF SERVICE: GENDER**

	Gender	Total accessed	Discharged	Percent discharged	Odds ratio	95% CI
1995	Male	58,941	202	0.3	1.00	
	Female	16,192	146	0.9	2.65	2.14, 3.28
1996	Male	80,164	283	0.4	1.00	
	Female	23,071	161	0.7	1.98	1.63, 2.41
1997	Male	68,042	183	0.3	1.00	
	Female	18,443	80	0.4	1.62	1.24, 2.10

Table 2.1.5.9 shows disability discharge rates by age. In 1995 and 1996 there were no statistically significant differences by age.

**TABLE 2.1.5.9. PERCENTAGE OF ACTIVE DUTY ARMY AND AIR FORCE ENLISTED  
ACCESSIONS ENDING IN DISABILITY DISCHARGE WITHIN 1 YEAR OF SERVICE: AGE**

	Age	Total accessed	Discharged	Percent discharged	Odds ratio	95% CI
1995	17-20 yr	60,961	290	0.5	1.00	
	21-25 yr	11,425	39	0.3	0.72	0.51, 1.00
	26-30 yr	2,160	16	0.7	1.56	0.94, 2.59
	>30 yr	587	3	0.5	1.07	0.34, 3.36
1996	17-20 yr	77,747	316	0.4	1.00	
	21-25 yr	19,878	99	0.5	1.23	0.98, 1.54
	26-30 yr	4,398	22	0.5	1.23	0.80, 1.90
	>30 yr	1,215	7	0.6	1.42	0.67, 3.01
1997	17-20 yr	65,545	163	0.2	1.00	
	21-25 yr	15,992	68	0.4	1.71	1.29, 2.27
	26-30 yr	3,917	24	0.6	2.47	1.61, 3.80
	>30 yr	1,034	8	0.8	3.13	1.53, 6.38

Table 2.1.5.10 shows disability discharge rates by race. There were no statistically significant differences.

**TABLE 2.1.5.10. PERCENTAGE OF ACTIVE DUTY ARMY AND AIR FORCE ENLISTED  
ACCESSIONS ENDING IN DISABILITY DISCHARGE WITHIN 1 YEAR OF SERVICE: RACE**

	Race	Total accessed	Discharged	Percent discharged	Odds ratio	95% CI
1995	White	55,556	267	0.5	1.00	
	Black	13,994	61	0.4	0.91	0.69, 1.20
	Other	5,583	20	0.4	0.74	0.47, 1.17
1996	White	72,593	328	0.5	1.00	
	Black	21,728	81	0.4	0.82	0.65, 1.05
	Other	8,917	35	0.4	0.87	0.61, 1.23
1997	White	59,890	185	0.3	1.00	
	Black	18,512	52	0.3	0.91	0.67, 1.24
	Other	8,086	26	0.3	1.04	0.69, 1.57

Table 2.1.5.11 shows the disability discharge percentages according to education level at the time of applying for military service. No significant differences were found in 1995 or 1996.

**TABLE 2.1.5.11. PERCENTAGE OF ACTIVE DUTY ARMY AND AIR FORCE ENLISTED ACCESSIONS ENDING IN DISABILITY DISCHARGE WITHIN 1 YEAR OF SERVICE: EDUCATION LEVEL WHEN APPLYING**

	Education level	Total accessed	Discharged	Percent discharged	Odds ratio	95% CI
1995	Less than HS	12,381	50	0.4	1.00	
	HS diploma	60,025	286	0.5	1.18	0.87, 1.60
	Some college	774	3	0.4	1.09	0.58, 2.05
	Bachelor's	1,815	8	0.4		
	Graduate	138	1	0.7		
1996	Less than HS	12,939	43	0.3	1.00	
	HS diploma	85,961	380	0.4	1.33	0.97, 1.83
	Some college	1,248	12	1.0	1.46	0.87, 2.46
	Bachelor's	2,920	9	0.3		
	Graduate	167	0	0		
1997	Less than HS	11,500	19	0.2	1.00	
	HS diploma	71,803	234	0.3	1.98	1.24, 3.15
	Some college	926	3	0.3	1.90	0.88, 4.10
	Bachelor's	2,151	7	0.3		
	Graduate	106	0	0		

Table 2.1.5.12 shows disability discharge percentages according to AFQT score. Odds ratios for lower score groups compared with the highest group (93–99 percentile) were not statistically significant.

**TABLE 2.1.5.12. PERCENTAGE OF ACTIVE DUTY ARMY AND AIR FORCE ENLISTED ACCESSIONS ENDING IN DISABILITY DISCHARGE WITHIN 1 YEAR OF SERVICE: AFQT CATEGORY**

	Percentile score	Total accessed	Discharged	Percent discharged	Odds ratio	95% CI
1995	93–99	4,650	16	0.3	1.00	
	65–92	31,058	132	0.4	1.24	0.74, 2.08
	50–64	22,341	126	0.6	1.64	0.98, 2.77
	31–49	16,009	71	0.4	1.29	0.75, 2.22
	21–30	595	2	0.3	1.28	0.74, 2.20
	16–20	8	0	0		
	10–15	1	0	0		
	01–09	0	0	0		
1996	93–99	5,843	21	0.4	1.00	
	65–92	39,768	182	0.5	1.27	0.81, 2.00
	50–64	29,706	114	0.4	1.07	0.67, 1.70
	31–49	26,191	110	0.4	1.17	0.73, 1.87
	21–30	1,195	5	0.4	1.14	0.43, 3.04
	16–20	17	0	0		
	10–15	4	0	0		
	01–09	2	0	0		
1997	93–99	4,299	8	0.2	1.00	
	65–92	33,011	94	0.3	1.53	0.74, 3.15
	50–64	25,862	81	0.3	1.69	0.81, 3.49
	31–49	22,031	71	0.3	1.73	0.83, 3.60
	21–30	783	1	0.1	0.68	0.08, 5.41
	16–20	7	0	0		
	10–15	4	0	0		
	01–09	1	0	0		

Tables 2.1.5.13–2.1.5.18 show the percentages of accessions that resulted in disability discharge within the first two years of service among Army and Air Force enlisted personnel for 1995–1997. Again, the lack of complete Air Force disability data in 1997 probably causes an underestimate of discharge percentages for that service and may affect percentages for other factors.

Female accessions had a higher likelihood of disability discharge than males, and older recruits have a higher likelihood than the 17- to 20-year group. There was no significant difference between blacks and whites, although other nonwhites were significantly less likely than whites to receive a disability discharge. Likelihood of discharge was higher at higher levels of education. Finally, there were no significant differences between AFQT score categories.

**TABLE 2.1.5.13. PERCENTAGE OF ACTIVE DUTY ARMY AND AIR FORCE ENLISTED ACCESSIONS ENDING IN DISABILITY DISCHARGE WITHIN 2 YEARS OF SERVICE IN 1995-1997**

Service	Total accessed	Discharged	Percent discharged	Odds ratio	95% CI
Army	172,894	1,887	1.1	1.00	
Air Force	91,965	529	0.6	0.52	0.48, 0.58

**TABLE 2.1.5.14. PERCENTAGE OF ACTIVE DUTY ARMY AND AIR FORCE ENLISTED ACCESSIONS ENDING IN DISABILITY DISCHARGE WITHIN 2 YEARS OF SERVICE IN 1995-1997: GENDER**

Gender	Total accessed	Discharged	Percent discharged	Odds ratio	95% CI
Male	207,147	1,617	0.8	1.00	
Female	57,706	799	1.4	1.78	1.64, 1.94

**TABLE 2.1.5.15. PERCENTAGE OF ACTIVE DUTY ARMY AND AIR FORCE ENLISTED ACCESSIONS ENDING IN DISABILITY DISCHARGE WITHIN 2 YEARS OF SERVICE IN 1995-1997: AGE**

Age	Total accessed	Discharged	Percent discharged	Odds ratio	95% CI
17-20 yr	204,253	1,589	0.8	1.00	
21-25 yr	47,295	596	1.3	1.63	1.48, 1.79
26-30 yr	10,475	180	1.7	2.23	1.91, 2.60
>30 yr	2,836	51	1.8	2.34	1.76, 3.09

**TABLE 2.1.5.16. PERCENTAGE OF ACTIVE DUTY ARMY AND AIR FORCE ENLISTED ACCESSIONS ENDING IN DISABILITY DISCHARGE WITHIN 2 YEARS OF SERVICE IN 1995-1997: RACE**

Race	Total accessed	Discharged	Percent discharged	Odds ratio	95% CI
White	188,039	1,777	0.9	1.00	
Black	54,234	474	0.9	0.92	0.83, 1.02
Other	22,586	165	0.7	0.77	0.66, 0.91

**TABLE 2.1.5.17. PERCENTAGE OF ACTIVE DUTY ARMY AND AIR FORCE ENLISTED ACCESSIONS ENDING IN DISABILITY DISCHARGE WITHIN 2 YEARS OF SERVICE IN 1995-1997: EDUCATION LEVEL WHEN APPLYING**

Education level	Total accessed	Discharged	Percent discharged	Odds ratio	95% CI
Less than HS	36,820	247	0.7	1.00	
HS diploma	217,789	2,044	0.9	1.40	1.23, 1.60
Some college	2,948	43	1.5		
Bachelor's	6,886	75	1.1	1.83	1.47, 2.27
Graduate	411	7	1.7		

**TABLE 2.1.5.18. PERCENTAGE OF ACTIVE DUTY ARMY AND AIR FORCE ENLISTED ACCESSIONS ENDING IN DISABILITY DISCHARGE WITHIN 2 YEARS OF SERVICE IN 1995-1997: AFQT CATEGORY**

Percentile score	Total accessed	Discharged	Percent discharged	Odds ratio	95% CI
93-99	14,792	116	0.8	1.00	
65-92	103,837	927	0.9	1.14	0.94, 1.38
50-64	77,909	716	0.9	1.17	0.96, 1.43
31-49	64,231	594	0.9	1.18	0.97, 1.44
21-30	2,573	29	1.1		
16-20	32	0	0		
10-15	9	0	0	1.42	0.94, 2.13
01-09	3	0	0		

Table 2.1.5.19 shows disability discharge percentages by year and service. The 1996 and 1997 Air Force percentages are probably underestimates owing to the lack of complete 1997 data.

**TABLE 2.1.5.19. PERCENTAGE OF ACTIVE DUTY ARMY AND AIR FORCE ENLISTED ACCESSIONS ENDING IN DISABILITY DISCHARGE WITHIN 2 YEARS OF SERVICE**

	Service	Total accessed	Discharged	Percent discharged	Odds ratio	95% CI
1995	Army	44,643	585	1.3	1.00	
	Air Force	30,490	285	0.9	0.71	0.62, 0.82
1996	Army	72,572	901	1.2	1.00	
	Air Force	30,666	199	0.6	0.52	0.45, 0.61
1997	Army	55,679	401	0.7	1.00	
	Air Force	30,809	45	0.1	0.20	0.15, 0.27

Table 2.1.5.20 shows the disability discharge percentages by gender. Females had significantly higher discharge percentages in each year.

**TABLE 2.1.5.20. PERCENTAGE OF ACTIVE DUTY ARMY AND AIR FORCE ENLISTED ACCESSIONS ENDING IN DISABILITY DISCHARGE WITHIN 2 YEARS OF SERVICE: GENDER**

	Gender	Total accessed	Discharged	Percent discharged	Odds ratio	95% CI
1995	Male	58,941	556	0.9	1.00	
	Female	16,192	314	1.9	2.08	1.81, 2.39
1996	Male	80,164	750	0.9	1.00	
	Female	23,071	350	1.5	1.63	1.44, 1.85
1997	Male	68,042	311	0.5	1.00	
	Female	18,443	135	0.7	1.61	1.31, 1.97

Table 2.1.5.21 shows disability discharge rates by age. In general, older individuals entering the service were more likely to receive disability discharge than younger.

**TABLE 2.1.5.21. PERCENTAGE OF ACTIVE DUTY ARMY AND AIR FORCE ENLISTED ACCESSIONS ENDING IN DISABILITY DISCHARGE WITHIN 2 YEARS OF SERVICE: AGE**

	Age	Total accessed	Discharged	Percent discharged	Odds ratio	95% CI
1995	17-20 yr	60,961	642	1.1	1.00	
	21-25 yr	11,425	160	1.4	1.33	1.12, 1.59
	26-30 yr	2,160	56	2.6	2.50	1.90, 3.30
	>30 yr	587	12	2	1.96	1.10, 3.49
1996	17-20 yr	77,747	704	0.9	1.00	
	21-25 yr	19,878	295	1.5	1.65	1.44, 1.89
	26-30 yr	4,398	76	1.7	1.92	1.52, 2.44
	>30 yr	1,215	25	2.1	2.30	1.54, 3.44
1997	17-20 yr	65,545	243	0.4	1.00	
	21-25yr	15,992	141	0.9	2.39	1.94, 2.94
	26-30 yr	3,917	48	1.2	3.33	2.44, 4.55
	>30 yr	1,034	14	1.4	3.69	2.14, 6.34

Table 2.1.5.22 shows disability discharge percentages by race. There was little indication of a difference in discharge rates by this factor.

**TABLE 2.1.5.22. PERCENTAGE OF ACTIVE DUTY ARMY AND AIR FORCE ENLISTED ACCESSIONS ENDING IN DISABILITY DISCHARGE WITHIN 2 YEARS OF SERVICE: RACE**

	Race	Total accessed	Discharged	Percent discharged	Odds ratio	95% CI
1995	White	55,556	656	1.2	1.00	
	Black	13,994	164	1.2	0.99	0.84, 1.18
	Other	5,583	50	0.9	0.76	0.57, 1.01
1996	White	72,593	803	1.1	1.00	
	Black	21,728	222	1.0	0.92	0.79, 1.07
	Other	8,917	75	0.8	0.76	0.60, 0.96
1997	White	59,890	318	0.5	1.00	
	Black	18,512	88	0.5	0.89	0.71, 1.13
	Other	8,086	40	0.5	0.93	0.67, 1.29

Table 2.1.5.23 shows disability discharge rates by education level at the time of applying for military service. Discharge rates were higher for those with at least a high school education than for those without a high school education at the time of application.

**TABLE 2.1.5.23. PERCENTAGE OF ACTIVE DUTY ARMY AND AIR FORCE ENLISTED  
ACCESSIONS ENDING IN DISABILITY DISCHARGE WITHIN 2 YEARS OF SERVICE:  
EDUCATION LEVEL WHEN APPLYING**

	Education level	Total accessed	Discharged	Percent discharged	Odds ratio	95% CI
1995	Less than HS	12,381	99	0.8	1.00	
	HS diploma	60,025	724	1.2	1.51	1.23, 1.87
	Some college	774	15	1.9	2.18	1.53, 3.09
	Bachelor's	1,815	27	1.5		
	Graduate	138	5	3.6		
1996	Less than HS	12,939	110	0.9	1.00	
	HS diploma	85,961	935	1.1	1.28	1.05, 1.56
	Some college	1,248	21	1.7	1.50	1.08, 2.08
	Bachelor's	2,920	32	1.1		
	Graduate	167	2	1.2		
1997	Less than HS	11,500	38	0.3	1.00	
	HS diploma	71,803	385	0.5	1.63	1.16, 2.27
	Some college	926	7	0.8	2.20	1.31, 3.69
	Bachelor's	2,151	16	0.7		
	Graduate	106	0	0		

Table 2.1.5.24 shows the disability discharge percentages by AFQT performance. In general, higher scores were associated with lower disability discharge rates.

**TABLE 2.1.5.24. PERCENTAGE OF ACTIVE DUTY ARMY AND AIR FORCE ENLISTED ACCESSIONS ENDING IN DISABILITY DISCHARGE WITHIN 2 YEARS OF SERVICE: AFQT CATEGORY**

	Percentile score	Total accessed	Discharged	Percent discharged	Odds ratio	95% CI
1995	93-99	4,650	42	0.9	1.00	
	65-92	31,058	339	1.1	1.21	0.88, 1.67
	50-64	22,341	281	1.3	1.40	1.01, 1.94
	31-49	16,009	192	1.2	1.33	0.95, 1.86
	21-30	595	8	1.3	1.34	0.96, 1.87
	16-20	8	0	0		
	10-15	1	0	0		
	01-09	0	0	0		
1996	93-99	5,843	59	1.0	1.00	
	65-92	39,768	428	1.1	1.07	0.81, 1.40
	50-64	29,706	293	1.0	0.98	0.74, 1.29
	31-49	26,191	287	1.1	1.09	0.82, 1.44
	21-30	1,195	16	1.3	1.30	0.75, 2.28
	16-20	17	0	0		
	10-15	4	0	0		
	01-09	2	0	0		
1997	93-99	4,299	15	0.3	1.00	
	65-92	33,011	160	0.5	1.39	0.82, 2.36
	50-64	25,862	142	0.5	1.58	0.93, 2.69
	31-49	22,031	115	0.5	1.50	0.87, 2.57
	21-30	783	5	0.6	1.81	0.66, 4.99
	16-20	7	0	0		
	10-15	4	0	0		
	01-09	1	0	0		

Table 2.1.5.25 shows disability discharge percentages by diagnosis within the first year of service in the Army. Musculoskeletal, psychiatric, and trachea/bronchi problems were common reasons for disability. Within the musculoskeletal category the two most prevalent conditions were degenerative arthritis and periostitis. The most common in the psychiatric category was paranoid schizophrenia, and all trachea/bronchi conditions were due to asthma.

**TABLES 2.1.5.25. PERCENTAGE OF ENLISTED ACCESSIONS ENDING IN DISABILITY DISCHARGE WITHIN 1 YEAR OF SERVICE: ARMY**

Category	1995-1997		1995		1996		1997	
	Count	% of all disability	Count	% of all disability	Count	% of all disability	Count	% of all disability
Musculoskeletal	205	30.7	82	43.4	87	31.5	36	16.5
Psychiatric	43	6.4	9	5.2	24	8.7	10	4.6
Trachea/bronchi	13	1.9	3	1.7	5	1.8	5	2.3
Epilepsies	7	1.0	3	1.7	1	0.4	3	1.4
Central nervous system	6	0.9	1	0.6	1	0.4	4	1.8
Endocrine	4	0.6			3	1.1	1	0.5
Eye/vision	3	0.4	2	1.2			1	0.5
Genitourinary system	3	0.4	1	0.6	1	0.4	1	0.5

Table 2.1.5.26 shows disability discharge percentages by diagnosis within the first year of service in the Air Force. As in the Army, musculoskeletal, psychiatric, and trachea/bronchi problems were common reasons for disability discharge. For 1995-1997, the two most prevalent conditions within the musculoskeletal category were tibia/fibula impairment and knee impairment. The two most common in the psychiatric category were atypical psychosis and adjustment disorder, and virtually all trachea/bronchi conditions were due to asthma.

**TABLE 2.1.5.26. PERCENTAGE OF ENLISTED ACCESSIONS ENDING IN DISABILITY DISCHARGE WITHIN 1 YEAR OF SERVICE: AIR FORCE**

Category	1995-1997		1995		1996		1997	
	Count	% of all disability	Count	% of all disability	Count	% of all disability	Count	% of all disability
Musculoskeletal	197	50.8	93	53.1	84	50.0	20	44.4
Psychiatric	63	16.2	26	21.9	23	13.7	14	31.1
Trachea/bronchi	23	5.9	11	6.3	11	6.5	1	2.2
Epilepsies	16	4.1	6	3.4	10	6.0	0	0.0
Digestive	13	3.4	4	2.3	6	3.6	3	6.7
Endocrine	13	3.4	7	4.0	5	3.0	1	2.2

Table 2.1.5.27 shows disability discharge percentages by diagnosis within the first or second year of service in the Army. As with the first-year personnel data shown in Table 2.1.5.25, musculoskeletal, psychiatric, and trachea/bronchi problems were common reasons for disability. The two most prevalent musculoskeletal conditions were degenerative arthritis and lumbosacral strain.

**TABLE 2.1.5.27. PERCENTAGE OF ENLISTED ACCESSIONS ENDING IN DISABILITY DISCHARGE WITHIN 2 YEARS OF SERVICE: ARMY**

Category	1995-1997		1995		1996		1997	
	Count	% of all disability	Count	% of all disability	Count	% of all disability	Count	% of all disability
Musculoskeletal	428	22.6	191	32.6	176	19.5	61	15.2
Psychiatric	116	6.1	28	4.8	66	7.3	22	5.5
Trachea/bronchi	95	5.0	34	5.8	47	5.2	14	3.5
Central nervous system	25	1.3	6	1.0	14	1.5	5	1.2
Digestive	14	0.7	4	0.7	6	0.7	4	1.0
Epilepsies	13	0.7	5	0.9	4	0.4	4	1.0
Peripheral nerves	11	0.6	4	0.7	3	0.3	4	1.0

Table 2.1.5.28 shows disability discharge percentages by diagnosis within the first or second year of service in the Air Force. As with the first-year data shown in Table 2.1.5.26, musculoskeletal, psychiatric, and trachea/bronchi problems were common reasons for disability. The two most prevalent musculoskeletal conditions were tibia/fibula impairment and knee impairment.

**TABLE 2.1.5.28. PERCENTAGE OF ENLISTED ACCESSIONS ENDING IN DISABILITY DISCHARGE WITHIN 2 YEARS OF SERVICE: AIR FORCE**

Category	1995-1997		1995		1996		1997	
	Count	% of all disability	Count	% of all disability	Count	% of all disability	Count	% of all disability
Musculoskeletal	226	42.7	116	40.7	90	45.2	20	44.4
Psychiatric	98	18.5	55	19.3	29	14.6	14	31.1
Trachea/bronchi	41	7.8	26	9.1	14	7.0	1	2.2
Epilepsies	28	5.3	13	4.6	15	7.5	0	0.0
Digestive	23	4.3	11	3.9	9	4.5	3	6.7
Endocrine	16	3.0	9	3.2	6	3.0	1	2.2

## 2.2. Officers

AMSARA is in the process of collecting medical data from the officer recruitment programs. The objective is to conduct studies similar to those performed on enlisted personnel (see Section 2) for newly accessed officers. AMSARA expects to conduct in-depth studies in the near future as data are collected and made more useable.

AMSARA has collected accession waiver data from the various officer training programs (ROTC and academies for each service). Some outcome data have also been collected, including medical boards, academic and behavioral discharges, etc. Weaknesses in these data for epidemiologic study purposes generally include lack of demographic variables, absence of waiver denial data, and lack of distinction between accession and commissioning waivers. AMSARA is in the process of working with the data sources to improve the utility of the data for epidemiologic study.

### 2.2.1. DoDMERB

Data are unavailable. These data would be the primary source of information on medical disqualifications, a vital need for any study of accession medical standards.

### 2.2.2. ROTC

Table 2.2.2.1 shows the number of ROTC waiver records held by AMSARA for 1995–1996 by service. Army data for waiver denials were unavailable in the past but are now being recorded. Decision fields are blank in many Navy/Marines data, meaning that approval or denial was unknown. Unfortunately, the completeness of these data cannot be verified because the medical disqualifications data from DoDMERB are unavailable.

TABLE 2.2.2.1. NUMBER OF ROTC WAIVER RECORDS HELD BY AMSARA FOR 1995–1996

Service	Number of records	Waivers approved	Approval rate
Army (approved only)	709	709	Unavailable
Navy/Marines	2,210	487	22.0%
Air Force	631	281	44.5%

Table 2.2.2.2 shows the Air Force ROTC waiver approvals by gender and age group. Tables 2.2.2.3 and 2.2.2.4 show that these variables were not included in the Army or Navy data. AMSARA has been involved in making these demographics available in electronic records.

**TABLE 2.2.2.2. ROTC WAIVERS: APPROVAL RATE FOR AIR FORCE**

Age	1995	1996
17 yr and younger	33.9%	43.2%
18-21 yr	43.8%	41.3%
22-25 yr	60.8%	51.0%
26-29yr	42.9%	57.9%
>30 yr	57.1%	71.4%
Male	42.1%	45.4%
Female	50.0%	43.1%
Total approved	171	110
Total denied	214	136

**TABLE 2.2.2.3. ROTC WAIVERS: APPROVAL RATE FOR ARMY  
(ACCESSION WAIVERS ONLY)**

Age	1995	1996
17 yr and younger	Data unavailable	
18-21 yr		
22-25 yr		
26-29 yr		
>30 yr		
Male	Data unavailable	
Female		
Total approved	709*	
Total denied	Data unavailable	

\*Exact year of waiver cannot be determined.

**TABLE 2.2.2.4. ROTC WAIVERS: APPROVAL RATE FOR NAVY AND MARINES  
(COMMISSIONING WAIVERS ONLY)**

Age	1995	1996
17 yr and younger	Data unavailable	
18-21 yr		
22-25 yr		
26-29 yr		
>30 yr		
Male	Data unavailable	
Female		
Total approved	174	363
Total denied	92	130

Table 3.2.2.5 show the most common conditions for which waivers were granted for the Air Force, Army, and Navy/Marines, respectively. Asthma, knee/lower extremity, and impaired vision are among the four most common conditions waived by each service.

**TABLE 2.2.2.5. FOUR MOST COMMON MEDICAL CONDITIONS AMONG GRANTED WAIVERS**

Service	Rank	Condition
Air Force*	1	Injuries of lower extremities
	2	Impaired vision
	3	Asthma
	4	Hearing loss
Army**	1	Impaired vision
	2	Knee surgery
	3	Asthma
	4	Dental malocclusion
Navy and Marines***	1	Knee surgery
	2	Asthma
	3	Impaired vision
	4	Hypertension

\*Conditions were reported in ICD9 code.

\*\*Conditions were reported in narrative form.

\*\*\*Conditions were reported in DoD directive code.

Much additional data are needed for AMSARA to conduct meaningful studies of ROTC accession medical standards. In particular, standardized and complete information on cadet demographics, medical waivers, and records of losses before commissioning are necessary. Many of these needs will likely be met by data from DoDMERB when they are available.

### 2.2.3. Academy

AMSARA staff visited all three U.S. military academies during CY 1998. The goals of these visits were to collect available data and to help refine future data collection and recording methods. Significant progress was made. AMSARA now has collected waiver, admissions, and departure data from each academy (covering various times) and has provided technical assistance relevant to future data collection efforts. Reviews of the data collected are underway, and some simple initial findings are shown below.

Table 2.2.3.1 summarizes the waiver status of the 1991–1998 graduating classes at the U.S. military academy at West Point. These classes include more than 10,000 individuals, approximately 10% of whom received a medical waiver to be eligible.

**TABLE 2.2.3.1. MEDICAL WAIVERS AMONG PERSONS ENTERING THE U.S. MILITARY ACADEMY AT WEST POINT: CLASSES OF 1991–1998**

Year	Waived	Nonwaived	Total	% Waived
1991	119	1,240	1,359	8.8%
1992	148	1,168	1,316	11.2%
1993	126	1,224	1,350	9.3%
1994	127	1,206	1,333	9.5%
1995	105	1,135	1,240	8.5%
1996	133	1,056	1,189	11.2%
1997	117	1,095	1,212	9.7%
1998	127	1,020	1,147	11.1%
Total	1,002	9,144	10,146	9.9%

Table 2.2.3.2 shows discharge rates by cause (medical, nonmedical, and total) for all class years combined. The percentage of individuals discharged for medical reasons was statistically significantly higher (0.9% vs. 0.3%) among the nonwaived group compared with the waived group. In contrast, discharges for nonmedical reasons and for total (medical + nonmedical) were statistically significantly higher among the waived group than among the nonwaived, although the differences in practical terms were not large. The statistical significance here may simply be owing to the large sample sizes.

**TABLE 2.2.3.2. DISCHARGE RATES BY WAIVER STATUS\***

	Waived	Nonwaived
Medical	0.3%	0.9%
Nonmedical	26.7%	23.2%
Total	27.0%	24.1%

\*All comparisons (nonwaived vs. waived) were statistically significant at the 0.05 level.

Table 2.2.3.3 gives a summary of the Air Force Academy waivers (for all waiver applications regardless of eventual admission) for the classes of 1999 and 2000. The most common medical conditions for which waivers were granted and for which they were denied are shown.

**TABLE 2.2.3.3. MOST COMMON DIAGNOSES AMONG WAIVERS GRANTED BY THE AIR FORCE ACADEMY**

Rank	Waivers granted	Waivers denied
1	Asthma	Asthma
2	Body fat	Refractive error
3	Dental malocclusion	History of migraines
4	History of ACL injury	History of allergies

AMSARA has begun a preliminary study to compare the retention rate among those entering with a waiver with the rate among those not needing a waiver. Table 2.2.3.4 gives subject counts. Cases represent individuals waived for any medical condition in the

classes of 1999 and 2000. Controls represent all others admitted without a waiver (from administrative data) starting in the same years. Subjects were followed through 1997 for attrition due to any cause.

**TABLE 2.2.3.4. AIR FORCE ACADEMY STUDY POPULATION**

	Waived	Not waived
Class of 1999	82	1,301
Class of 2000	64	1,200
Total	146 cases	2,501

Table 2.2.3.5 shows numbers of medical board actions on these subjects. Although the rate of any such action was higher in the nonwaived population than in the waived (3.3% vs. 1.4%), the difference was not statistically significant.

**TABLE 2.2.3.5. MEDICAL BOARD ACTIONS ON AIR FORCE ACADEMY STUDY POPULATION**

	Waived	Not waived
Medical disenrollment	1(0.7%)	31(1.2%)
Turnback	1(0.7%)	42(1.7%)
Return and commission	0(0.0%)	10(0.4%)
Graduation without commission	0(0.0%)	0(0.0%)
Reboard	0(0.0%)	0(0.0%)
Any action	2(1.4%)	83(3.3%)

Table 2.2.3.6 shows the numbers of departures from the Air Force Academy for all reasons in these populations. The rate of attrition was significantly higher among those not waived than among the waived group. AMSARA hopes to continue this study and to conduct similar examinations at the other academies.

**TABLE 2.2.3.6. DISCHARGES AMONG AIR FORCE ACADEMY STUDY POPULATION**

	Waived	Not waived
Medical—character	1(0.7%)	3(0.1%)
Medical—physical	0(0.0%)	21(0.8%)
Fail physical education class	0(0.0%)	1(0.0%)
Change in physical condition	0(0.0%)	16(0.6%)
Other	1(0.7%)	626(25.0%)
Any attrition*	2(1.4%)	667(26.7%)

\*Statistically significant.

AMSARA is reviewing data from the Naval Academy to assess their suitability for similar analyses. As with the ROTC data, a more complete analysis of the academy data would require additional demographic information and medical disqualification codes from DoDMERB.

## 3.4. SPECIFIC STUDIES

### *3.1. Asthma Accession Standard: Survival Analysis of Military Recruits 1995–1997*

#### **3.1.1. Introduction**

Asthma is common and affects approximately 2–6% of the American population at any time [1–3]. There has been a rise in the hospitalization rate, death rate, and overall prevalence of asthma in the United States over the last 20 years [2]. Although civilians with asthma may experience immense success in organized sports, they have the opportunity to maintain fine-tuned medication regimens in a controlled environment. However, asthmatics in the military can easily find themselves deploying after short notice to diverse geographic areas, some of which are remote and often have no adequate, reliable access to necessary medication. Asthma is especially problematic to the military because active duty persons are exposed to various factors that may exacerbate asthma, such as exercise, cold, dust, stress, smoke, fumes, pyridostigmine, and possibly unknown environmental factors. One study found higher asthma-related hospitalization rates and mortality for U.S. Army soldiers in Europe than for those in the United States [4].

Asthma has been a documented military readiness issue since the 1940s. In World War II, of the 30% of applicants who were disqualified for military service, 2% were for asthma [2]. In a 1988 British study it was predicted that of United Kingdom Army enlistees with a history of childhood asthma and remission in their teens, 40% would flourish, but 25% would require downgrading of their duties and 35% would be discharged because of asthma [5]. In Operation Desert Storm, 500 Army soldiers could not deploy because of asthma, and 200 who did deploy were then evacuated because of asthma [3]. Extensive costs and loss of readiness associated with illness, disability, and discharge are related to asthma.

The DoD once allowed individuals with a history of asthma symptoms that ceased by age 12 to enter the military [6]. This directive changed (effective 30 August 1995) to disqualify for asthma reliably diagnosed at any age. The ideal would be for the DoD to accept no one medically disqualified into the service. Unfortunately there is a finite number of qualified volunteers from which to choose and denying entry into the military to everyone with any history of asthma leaves a substantially smaller applicant pool from which to choose recruits.

This analysis was performed to evaluate the impact of waiving some individuals with asthma and allowing them to enter active duty. The waiver authorities may grant a medical waiver on an individual basis for persons disqualified for asthma if they have had no symptoms since age 12 and if other factors, such as participation in high school athletics without asthma symptoms and markers of high motivation, are also present.

#### **3.1.2. Methods**

A survival analysis of those receiving asthma waivers compared with those not disqualified for asthma was performed to evaluate the probability of staying on active duty or remaining free of an asthma-related hospitalization or discharge.

Cases were enlisted recruit applicants (Air Force, Army, Marines, and Navy) disqualified by initial medical examination (given at the MEPSs) who received a waiver for asthma and started training in 1995, 1996, or 1997. They were verified to have started basic training by DMDC data. Controls were chosen from DMDC records from the same years. Controls were matched with cases in a 1:3 ratio on age within 1 year, service, gender, month started basic training, and race (black, white, and other).

In the analysis the first endpoint was defined as discharge from the service for any reason, including nonmedical conditions. These discharges were obtained from the active duty loss files at DMDC. The second endpoint used was an asthma-related discharge for an EPTS condition, a disability discharge for asthma (Veterans Benefits Administration Department of Veterans Affairs code 6602), or hospitalization for asthma (ICD9 codes 493.0, 493.1, 493.2, and 493.9). A recruit with a disqualifying illness that was preexisting and that manifested during the first 6 months of service most likely will be given an EPTS discharge; however, individuals are discharged on a case-by-case basis. All losses were weighted equally in this analysis. Variable follow-up times were accounted for in the analysis. SAS software (SAS Institute, Cary, NC) was used. Significance was based on the log rank, Wilcoxon, and log-likelihood ratio tests.

### 3.1.3. Results

A total of 672 individuals were waived for asthma during the study; 33 Air Force cases were excluded because of incomplete information. Of the remaining 32 individuals in the Air Force, six were discharged during the study, four for nonmedical reasons. Consequently, Air Force cases were excluded because of small numbers. An additional 20 cases (17 Army, 1 Marine, and 2 Navy) were excluded because of incomplete information on length of service. The 587 remaining cases and 1,761 matched controls did not differ significantly with regard to age, service, gender, race, and month started training. The median age of cases and controls was 19 with 23% older than 20 years. Cases and controls were mostly white (73%) and male (89%); 54% of cases and controls were in the Army, 28% in the Navy, and 18% in the Marines.

Figure 3.1.1 shows the probability of survival for cases and controls using the first endpoint, any discharge from the service. Rate of discharge in 3 years for cases, 22.0% (129/587), was not significantly different from controls, 24.6% (434/1761). Each service has a separate waiver authority that evaluates the records of those disqualified and grants a waiver where they deem appropriate. Waiver practices across the services are not uniform, and to determine whether the individual services might differ, separate analyses were performed. There were no significant differences in survival found between cases and controls in the Army, Marines, or Navy.

When the second endpoint was used (an asthma-related failure such as EPTS discharge, hospitalization, or disability discharge), a statistical difference was found between survival of cases as compared to controls. The probability of an asthma-related failure for cases was 4.3% (25/587) vs. 0.3% (6/1,761) for controls, as depicted in Figure 3.1.2. The asthma-related hospitalizations and discharges occurred earlier than the overall

discharges seen in the previous graphs, which were spread more evenly over the 3-year time period. In graph 3, pertaining to the second endpoint, only 300 days are shown as most failures occurred in less than 100 days and none occurred after 300 days. Despite the statistical difference, the model predicts only 25 cases hospitalized or discharged for asthma over 3 years.

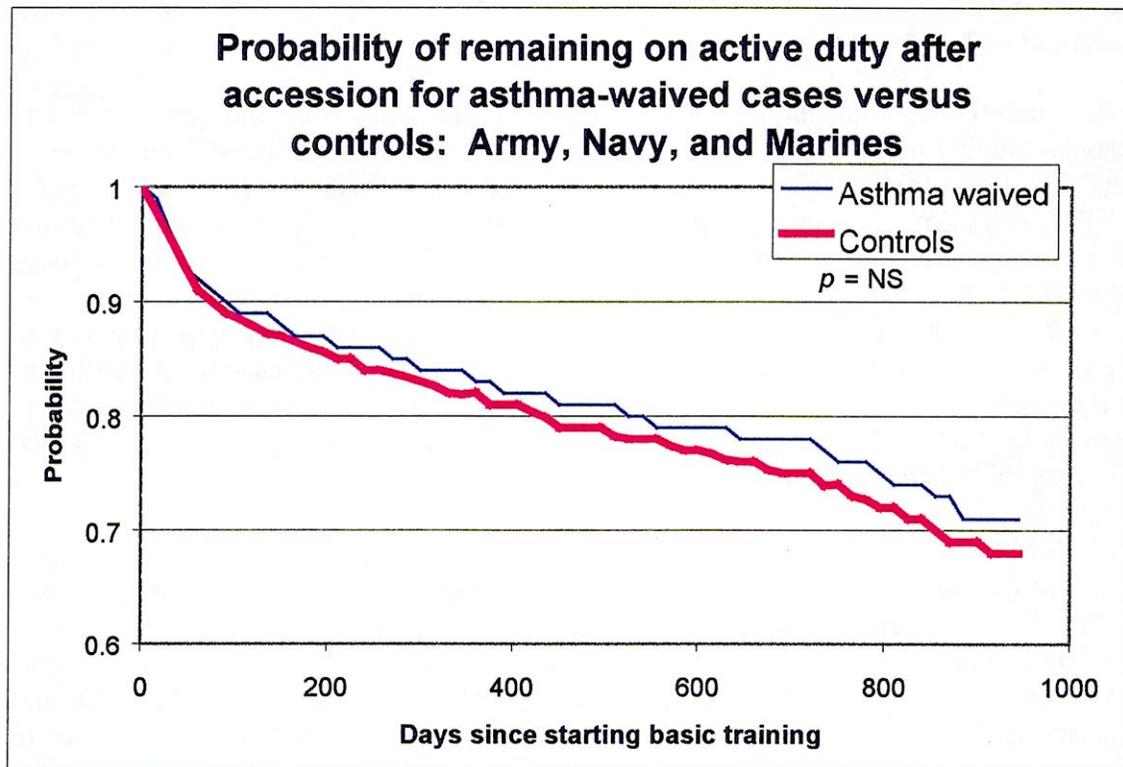


FIGURE 3.1.1.

Analysis by service was also significant for the Army and Navy but not the Marines because of small numbers (a single discharge). Again the overall impact of asthma-related hospitalization or discharge was small (18 Army cases and 6 Navy cases).

Those waived for asthma and subsequently receiving an EPTS discharge for asthma represent a small portion of all EPTS discharges for asthma. According to the coding done at MEPSs when EPTS paperwork is returned from the units, 72.8% of the 1,014 with asthma EPTS discharges in 1995 did not reveal their asthma (and thus were not waived) before entering basic training (Fig. 3.1.3).

### 3.1.4. Discussion

Individuals waived for asthma are not more likely to be discharged than matched controls. Those waived for asthma may be more likely to experience an asthma-related outcome specifically, but this did not translate into a practical difference. This study was undertaken to analyze the waiver process with respect to asthma. Some 72.8% of people receiving asthma EPTS discharges were never part of the waiver process being evaluated in this study. Therefore a perfected waiver process would not prevent most premature asthma failures.

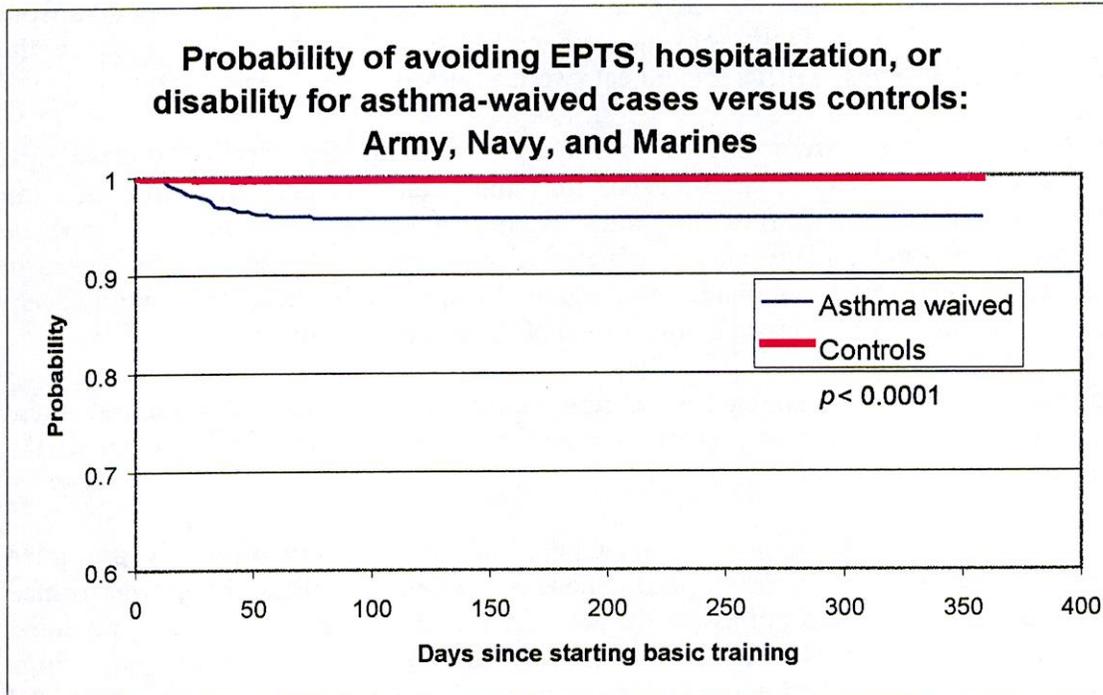


FIGURE 3.1.2.

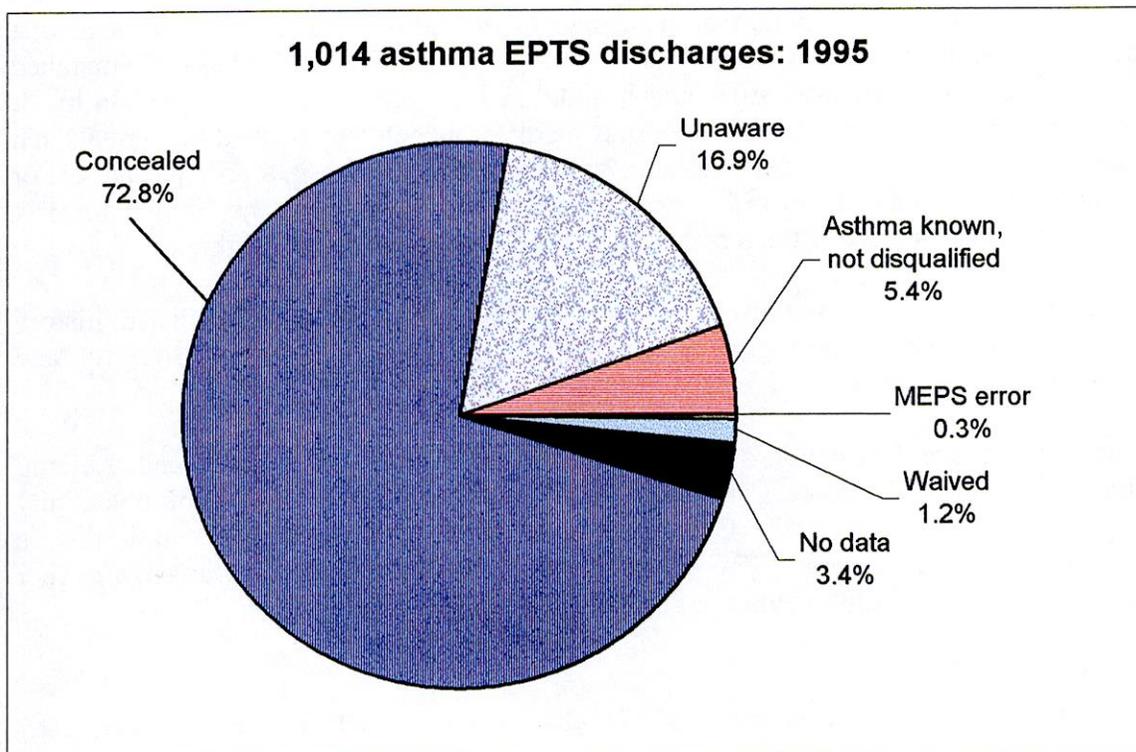


FIGURE 3.1.3.

In this study, it was assumed that the data had been properly recorded and that data from the sources were valid. Only waivers with complete information were used in the analysis. Survival times of different subjects were assumed to be independent.

Diagnoses of asthma were not independently validated. Severity of disease was unavailable in the data sources used for this analysis, and the difference in hospitalizations and discharges for mild, moderate, or severe asthma cannot be investigated separately. There may be differences with respect to the endpoints used in this study between severe asthmatics and matched controls. However, those with severe asthma are unlikely to be waived by one of the physician waiver authorities.

Ambulatory data was unavailable for the period covered in this study. Asthma outpatient morbidity has a significant impact on cost and military readiness, and a study of the impact of asthma in that venue is planned.

The impact of presumed asthma during Operation Desert Storm originally prompted making the DoD asthma accession policy more conservative. This study was performed during peacetime and could not assess the contribution of wartime factors (e.g., potential increased anxiety and more frequent wearing of the protective gas mask) on asthma waiver recipients or matched controls. However, approximately 20% of those evacuated did not truly have asthma upon more complete evaluation (Gregory J. Argyros, personal communication, 1997) and may not have been waived for asthma.

In conclusion, AMSARA found that the chance of remaining on active duty for someone entering the military with a waiver for asthma is comparable with that of a matched control. Asthma-related discharges and hospitalizations occur early. The probability of remaining free of asthma-related failure may be different between waived individuals and controls, but the small practical difference would not likely result in a policy change. For example, the Navy would probably not choose to deny entry into the service for 164 persons to avoid only six of them being hospitalized or discharged for asthma.

This study may provide some insight into how civilian young adults with a distant history of asthma may fare with regard to hospitalization when placed in a stressful and physically demanding environment.

Future studies should include assessing the impact of job classification and utilizing outpatient data on the success of asthma waiver recipients. Discussion of potentially loosening the Air Force asthma waiver guidelines should be reserved until this is complete. Since most asthma EPTS discharges occur in individuals not waived, a further evaluation of the accession medical examination should be conducted.

### *References*

1. O'Donnell AE, Fling J. Exercise-induced airflow obstruction in a healthy military population. *Chest* 1993;103:742-744.
2. Connolly JP, Baez SA. Asthma in the Navy and Marines. *Mil Med* 1991;156:461-465.

3. Phillips YY. Recommendations for modification of accession and retention standards for asthma. Office of the Surgeon General. Memorandum. 1991.
4. Ward DL. An international comparison of asthma morbidity and mortality in US soldiers 1984–1988. *Chest* 1992;101:613–620.
5. Dickinson JG. Asthma in the Army: a retrospective study and review of the natural history of asthma and its implications for recruitment. *J R Army Med Corps* 1988;143:65–73.
6. Department of Defense. Physical Standards for Appointment, Enlistment, and Induction. Washington DC, 1994. Directive 6130.3.

## ***3.2. Knee Waivers and Military Retention***

### **3.2.1. Introduction**

In 1995 there were approximately 160,000 recruit accessions for the combined services, each costing DoD at least \$25,000 (personal communication, Larsen, J. Training and Doctrine Command, Deputy Chief of Staff Recruiting Office, January 1998); 5% of these (about 7,600) resulted in an EPTS discharge, amounting to a loss of nearly \$200,000,000.

Orthopedic conditions are among the more common medical causes for an EPTS discharge, and knee conditions represent 14% of all EPTS discharges. Preexisting knee conditions in the recruit population can be divided into those related to trauma and those unrelated to trauma.

A history of knee trauma often involves injury to the menisci or the major joint ligaments. Some require surgical correction, and some result in incomplete healing. Conditions related to the anterior cruciate ligament are the most common. Differing opinions exist among medical specialists regarding whether there can ever be full recovery of the joint without sequelae, regardless of the reexamination and functional assessment results of the joint after rehabilitation.

This study examines whether military recruits who obtained a waiver for a prior knee ligament or meniscus condition were more likely than recruits without such a waiver to have a significant medical outcome (hospitalization, EPTS discharge, or disability discharge) or to be discharged for any reason.

### **3.2.2. Materials and Methods**

We conducted a case-control study. Cases were 281 enlisted recruits in the Army, Air Force, and Navy who, based on individual service waiver authority data, obtained a ligament/meniscus knee waiver in 1995 (see "Appendix" for codes). They entered active duty between January 1995 and December 1996 as verified through the DMDC. Only initial enlistments were used. Excluded were individuals with waivers for anterior knee or patellar pathology, Osgood-Schlatter disease, congenital abnormalities, infections, rheumatic conditions, and nonspecific knee symptomatology (i.e., unspecified knee pain). Eight hundred forty-three controls were randomly selected from DMDC and matched in a 1:3 ratio in order of the following criteria: service (Army, Air Force, Marines, Navy), gender, race (white, black, other), age within 1 year, and year and month of entry into training.

Cases and controls were followed from entry into military training through June 1997 for outcomes of hospitalization or EPTS, disability, or any discharge resulting in follow-up times up to 30 months, depending on the date of entry. All outcomes were weighted equally.

Medical endpoints were analyzed separately by knee and non-knee-related outcome (see "Appendix" for codes). Knee hospitalizations, knee EPTS discharges, and knee disability

discharges included all knee diagnoses, ipsilateral and contralateral, without restrictions. Obstetrical and dental hospital admissions were excluded. Time to hospitalization was calculated in days from DMDC entry date to first relevant hospitalization date. Time to discharge was calculated in days from DMDC entry date to DMDC loss date.

Arthroscopic knee procedures in 1995 and 1996 were considered inpatient procedures. In 1997 only those with >1 day admission were counted as inpatient procedures. Hospitalization records contain several diagnoses for most individuals. Only the first knee hospitalization was counted when multiple admissions for knee pathology were listed. For overall hospitalizations, the first admission was used as the endpoint. No specific breakdown of knee diagnoses is possible for the first 18 months of the study, so all knee-related EPTS discharges were counted as outcomes. Because disability data were coded using less specific VASRD codes, all knee-related disability discharges were included.

We used the nonparametric Kaplan-Meier (product limit) method to estimate the survival function with respect to the outcomes already mentioned. Log-rank, Wilcoxon, and log likelihood ratio tests were used to compare the probability of survival between cases and controls. Frequency analysis and chi-square analysis were used to evaluate the outcomes of overall discharges, hospitalizations, EPTS discharges, disability discharges, and combined outcomes;  $p < 0.05$  was considered statistically significant. Relative risks with 95% confidence intervals were calculated for hospitalization, EPTS, and combined outcome results as well.

### 3.2.3. Results

Cases and controls were very similar to the overall recruit population; 14%, 40%, and 46% were in the Air Force, Army and Navy/Marines, respectively. This compared with 18%, 36%, and 46%, respectively, for all recruits in 1995. Gender and race distributions were similar for cases and controls. The study population was 85%, and over 80% were white. Average age for cases was 20.8 years; for controls it was 20.5 years. In addition to being waived for a knee condition, 95% of cases had evidence of prior invasive knee procedures in the waiver data.

Any discharge was the endpoint used for overall survival. No difference was found between cases and controls ( $p \geq 0.50$ ) (Fig. 3.2.1). The absence of a difference held in the Air Force and Navy ( $p \geq 0.61$  and  $0.31$ , respectively). Analysis by gender and race revealed no difference between cases and controls.

A significant difference was found between Army cases and controls ( $p \leq 0.03$ ). Army cases had a higher and earlier probability of attrition within the first 90 days. The probability of discharge in the study was 0.32 for Army cases and 0.23 for controls (Fig. 3.2.2). Army data were then analyzed for possible demographic determinants of the difference in overall survival. Although we found no difference between Army male cases and controls ( $p = 0.09$  to  $0.21$ ), there was a significant difference between Army female cases and controls ( $p \leq 0.02$ ) (Fig. 3.2.3). White Army cases also differed from white Army controls ( $p \leq 0.03$ ). No differences were noted for other race categories or for age groups.

FIGURE 3.2.1. OVERALL SURVIVAL FOR CASES AND CONTROLS

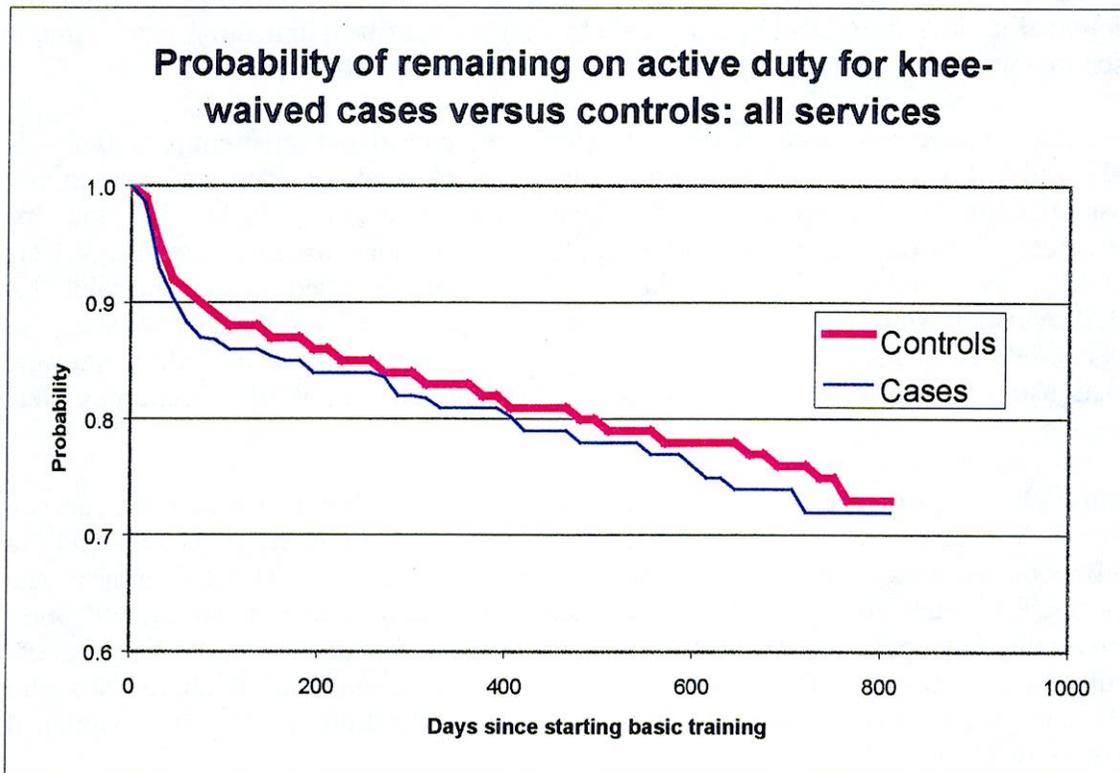


FIGURE 3.2.2. OVERALL SURVIVAL FOR ARMY CASES AND CONTROLS

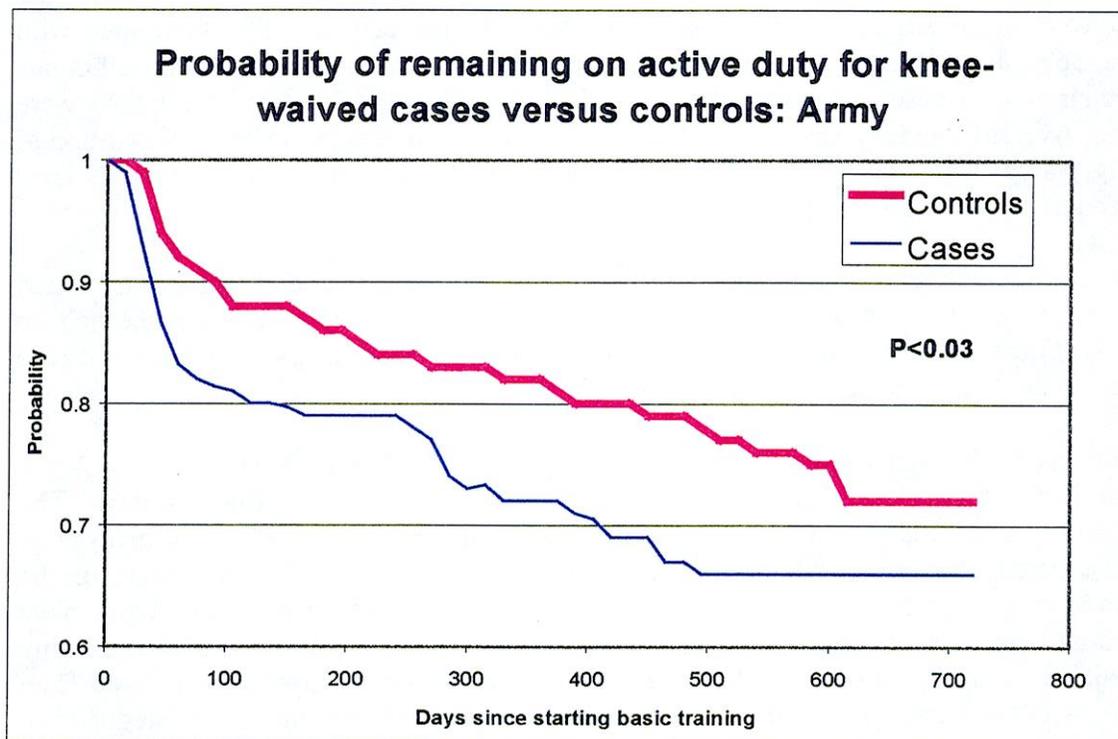
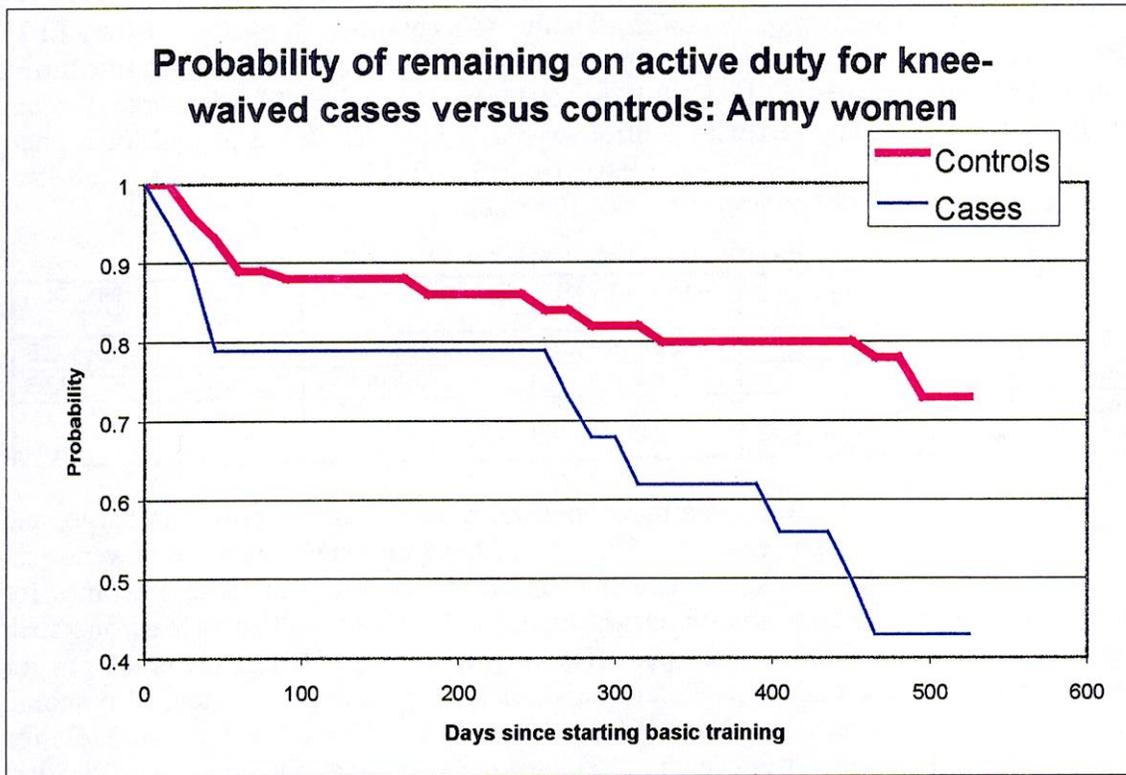


FIGURE 3.2.3. OVERALL SURVIVAL FOR ARMY FEMALE CASES AND CONTROLS



Medical endpoint analysis was only performed for the total study group because data were insufficient for analysis by service. The first medical endpoint examined was hospitalization. Of the 281 cases, 35 (12.5%) were hospitalized for any cause. Eight (2.9%) were admitted with a knee diagnosis. Eight of 35 (22%) hospitalized cases had a knee diagnosis. Of the 843 controls, 73 (8.7%) were hospitalized, and 3 (0.4%) were admitted with a knee diagnosis; 4% of hospitalized controls had a knee diagnosis. The relative risk of admission for cases compared with controls for any diagnosis was 1.4 (95% CI: 1.0, 2.1) and for a knee-related admission was 8.0 (95% CI: 2.1, 29.9) (Table 3.2.1). Hospitalization rates for non-knee-related diagnoses were similar for both groups, 9.6% of cases and 8.3% controls.

TABLE 3.2.1. HOSPITALIZATION OF CASES AND CONTROLS

	Cases (n = 281)	Controls (n = 843)	Relative risk	95% CI
Hospitalizations	12.5% (n = 35)	8.7% (n = 73)	1.4	1.0, 2.1
Knee hospitalizations	2.9% (n = 8)	0.4% (n = 3)	8	2.1, 29.9
Proportion of all hospitalizations with a knee diagnosis	22.0	4.0		

The second medical endpoint was disability discharge. There were only 4 disability discharges identified, all of them white Army controls. None had a knee diagnosis.

The third medical endpoint was EPTS discharge. Of the 281 cases, 25 (8.9%) resulted in such a discharge, 18 (6.4%) for a knee-related condition. The proportion of EPTS cases with a knee diagnosis was 72% (18/25). Of the 843 controls, 35 (4.2%) had an EPTS discharge, 4 (0.5%) for a knee diagnosis. The proportion of EPTS discharges in controls with a knee diagnosis was 11.4% (4/35). Relative risk of EPTS discharge for any diagnosis for cases compared with controls was 2.1 (95% CI: 1.3, 3.5) and for a knee-related EPTS was 14.0 (95% CI: 4.6, 39.6) (Table 3.2.2). EPTS discharges for non-knee diagnoses were 3.70% for controls vs. 2.5% for cases.

**TABLE 3.2.2. EPTS DISCHARGES FOR CASES AND CONTROLS**

	Cases (n = 281)	Controls (n = 843)	Relative risk	95% CI
EPTS discharge	8.9% (n = 25)	4.2% (n = 35)	2.1	1.3, 3.5
Knee EPTS	6.4% (n = 18)	0.5% (n = 4)	13.5	4.6, 39.6
Proportion of all EPTS discharges with a knee diagnosis	72.0	11.4		

The last medical endpoint was a combination of hospitalization, disability discharge, and EPTS discharge. Fifty-eight cases (20.6%) had at least one such outcome. Twenty-six cases (9.3%) were related to knees, which results in 45% (26/58) of these outcomes for cases being due to a knee diagnosis. Of the controls, 110 (13.1%) had at least one such outcome. Six (0.7%) controls were knee-related. Only 5.5% (6/110) of the outcomes for controls were for knee diagnoses. Relative risk of having a combined medical outcome for any diagnosis for cases was 1.6 (95% CI: 1.2, 2.1) and 13.0 (95% CI: 5.4, 31.3) for knee-related medical outcomes (Table 3.2.3). Non-knee medical outcomes were similar: 11.4% for cases and 12.3% for controls.

**TABLE 3.2.3. COMBINED MEDICAL OUTCOME OF CASES AND CONTROLS**

	Cases (n = 281)	Controls (n = 843)	Relative risk	95% CI
Combined medical outcome	20.6 (n = 58)	13.1% (n = 110)	1.6	1.2, 2.1
Combined medical outcome with knee diagnosis	9.3 (n = 26)	0.7% (n = 6)	13.0	5.4, 31.3
Proportion of all medical outcomes with knee diagnosis	45.0	5.5		

### 3.2.4. Discussion

In this triservice study we found no difference between enlisted personnel with and without a knee waiver for a ligament or meniscus injury with respect to retention on active duty in their first military training and assignment. The Army, when analyzed separately, showed a difference in overall survival between cases and controls. Most of this appears to be due to the high discharge rate of Army female cases. It is unclear what factors may influence this discrepancy, because we found no difference between female cases in all services combined and controls. However, the numbers involved were small. It could be that these women had differences from the controls that were not controlled for in this study, such as duration since initial injury before entry, degree of rehabilitation, level of fitness, body mass index, or other orthopedic conditions.

Medical outcomes of any type, and knee-related outcomes in particular, were more frequent for cases than controls. Perhaps not all waived cases had fully recovered from their initial injuries, or overuse of the contralateral knee resulting from trying to compensate for a weaker knee led to higher injury rates. Medical personnel may have treated those with a prior injury differently, resulting in faster discharge. It could also be that cases differed in health awareness or behavior toward seeking health care, leading to higher use of medical evaluations and interventions.

Of the controls, 4.2% received an EPTS discharge compared with 8.9% of cases and 5% for all recruits. Among the controls we found 11.4% of all EPTS discharges were for knee diagnoses. This percentage is much higher (72%) among cases. Cases contribute a disproportionately large number of individuals to the knee-related EPTS discharges, yet the numbers are small.

We assumed that cases and controls did not differ in life style, body composition, sport participation rates, comorbidity, and health care seeking behavior. We also assumed that cases had all recovered equally well from their waived knee conditions before beginning military training. No significant differences between MEPS and military treatment facilities within each military service, with respect to diagnosing, treating, and processing service members with a recurring or new knee condition, were also assumed.

There are several limitations to this study. The coding of waiver data does not reliably separate all anterior cruciate ligament pathology from other entities, and some cases were potentially missed. Only about 65% of waivers contain detailed waiver diagnoses in their records, precluding a specific diagnosis in nearly one-third of approved and disapproved waivers. Recruits were not matched for MEPSs. Differences in disqualification and waiver submission patterns may exist among different MEPSs.

The medical fitness standards for each service differ somewhat. This may cause a shift of recruits less physically fit toward some services. Susceptibility to an adverse outcome may depend on physical fitness and body habitus before entry, which was not evaluated in this study.

Waiver decisions are made separately for each service and are granted on an individual basis. It is unlikely, though, that the Army waiver authority would have applied different waiver standards to female and male recruits. Waiver data vary among services in the information contained. Coding of medical conditions shows great variability: some are specific, whereas others are general. Cases may have been missed. Any undetected cases analyzed as controls may have contributed to the discharge rates for the controls, biasing the results toward the null. There was a high proportion of cases who had undergone a surgical procedure. Without surgical scars, such a history may be easily hidden. There is likely some concealment of prior knee injuries by recruits and further misclassification of cases as controls.

The results of this study do not support a change in either the MEPS screening process or the waiver process for military recruits with prior knee ligament or meniscus injury.

Although there are statistical differences with respect to medical outcomes between cases and controls, and for overall survival of Army female recruits who have been waived for a knee meniscus/ligament injury, the actual predicted outcomes are small. Most cases did not differ from controls with respect to survival. A formal cost analysis to identify the few cases that may be lost would not be financially beneficial because many recruits who would do well on active duty would be screened out.

Future studies may include an extension of the current study with follow-up time to include 30 months for all study subjects. This would allow capture of more outcomes and strengthen the study findings. Also, a complementary study evaluating recruits with anterior knee pathology and Osgood-Schlatter disease, given the high outpatient utilization for these problems, is planned.

### **3.3. ADHD (Academic Skills Defect 1995–1997: Preliminary Results)**

ADHD is not directly addressed in DoD Directive 6130.3 for medical accessions. It falls into the category of ASD. This is an update to the study described in the 1997 *AMSARA Annual Report* to examine discharge rates from the military for those with ASD compared with all enlisted individuals accessed.

Cases were 135 enlisted service members who were waived for ASD in 1995, 1996, or 1997. 15 were Army, 12 Air Force, 15 Navy, and 10 Marines. The control population was 492,270 enlisted individuals that accessed in that time period. 22% of the cases had been discharged from the service at the end of 1997, while 26% of the comparison population had been discharged. The significant difference found when comparing the mean AFPT scores in cases and control population in last year's study was diminished in the 1998 study that had more participants. An additional survival analysis where the cases were matched to 405 controls showed no difference in overall discharge over the period. In this expanded study those waived for ASD appear to have the same overall discharge rate as matched controls.

#### **3.3.1. Introduction**

ADHD is the most common childhood psychiatric disorder, affecting 4–6% of children; in 10–60% of children with ADHD, it persists into adulthood [1, 2]. It is diagnosed by observing a pattern of inattention, with or without hyperactivity or impulsivity, that is worse and more frequent than that observed in other children of comparable age and development [3]. This pattern must interfere with functioning in two of these three settings: social, academic, or occupational [3].

Many feel that the core problems are due to an underresponsive behavioral inhibition system, with genetics being an important contributor [2, 4, 5]. About two-thirds of children with ADHD have concurrent psychiatric disorders, such as oppositional and conduct disorders, anxiety, or mood disorders [1]. ADHD as an accession qualifier is not directly addressed in DoD Directive 6130.3, but it falls under what is termed ASD, which are problems that interfere with work or school after age 12 or the current use of medication to improve or maintain academic skills [6].

#### **3.3.2. Methods**

Cases were enlisted servicemembers in the Army, Air Force, Navy, and Marines who were waived for ASD in 1995, 1996, or 1997 and started active duty in 1995, 1996, or 1997. The date they started active duty was verified using DMDC gain files.

The comparison population used was the entire enlisted pool that started active duty, again verified by DMDC gain files, in 1995, 1996, or 1997. Comparison population controls were not matched with the cases. Percent discharged for any reason at the end of 1997 were compared.

Additionally, a survival analysis was performed. Cases were additionally matched in a 1:3 ratio on service, gender, race (black, white, and other), age within 1 year, and year and month of entry to controls.

### 3.3.3. Results

There were 135 cases; 28 began active duty in 1995, 64 in 1996, and 43 in 1997. There were 85 Army cases, 6 Air Force cases, 24 Navy cases, and 21 Marine cases. Some 130 were male and 5 were female; 126 were white, 5 were black, and 4 were other races. The comparison population consisted of 492,270 individuals.

Of the 135 individuals waived for ASD, 22% had left active duty by the end of 1997; 26% of the comparison population had been discharged by the end of 1997. This difference was not statistically significant. Table 3.3.1 illustrates the cumulative percent discharged for the different services.

**TABLE 3.3.1. CUMULATIVE PERCENT DISCHARGED**

	%Discharged	<i>p</i> value
Army		
ASD cases	19	0.02
Gained population	29	
Air Force		
ASD cases	17	0.35
Gained population	20	
Navy		
ASD cases	33	0.34
Gained population	29	
Marines		
ASD cases	24	0.33
Gained population	20	

The average AFQT score for the gained population (subjects with unknown score were excluded) was 60.5, whereas the average AFQT score for those waived for ASD and gained was 62.2 (not a statistically significant difference). The average AFQT for those waived for ASD and then discharged was 58.4, which was lower than the population mean of 60.5. It implies that, on the average, the discharged individuals that had been waived for ASD had lower AFQT scores than others. Individuals waived for ASD and not discharged had a mean AFQT score of 63.3, which was higher than the population average. However, these findings were not statistically significant.

When examining the cases and 405 matched controls followed for discharge for any reason, no significant overall difference was found. Cases waived for ASD survived as well as controls on active duty (Fig. 3.3.1).

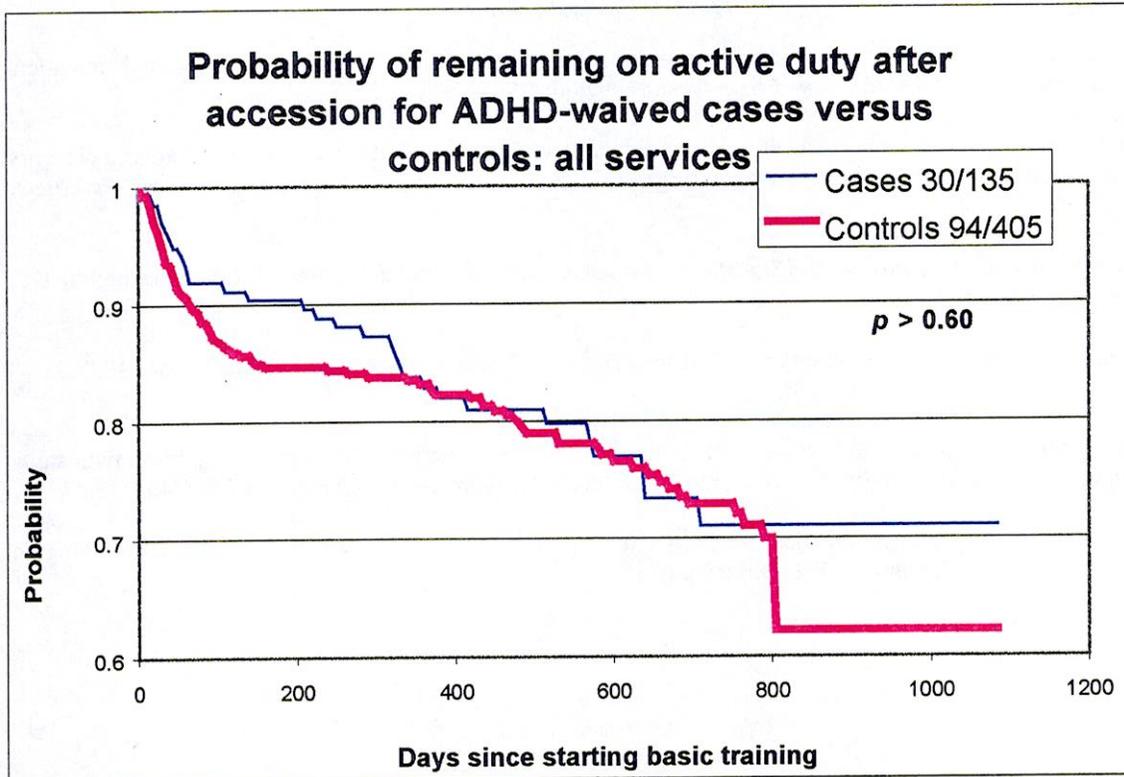


FIGURE 3.3.1. PROBABILITY OF REMAINING ON ACTIVE DUTY AFTER ACCESSION: ALL SERVICES

### 3.3.4. Discussion

Because the initial study did not control for length of time on active duty, some had short follow-up times, and cases may not have been evenly distributed over the 3 years. It did not incorporate the severity of the ASD nor other demographics not controlled in the preliminary analysis.

The survival analysis, when we did control for service, gender, race, age, and length of service through matching, illustrated that individuals waived for ASD have similar experiences of overall discharge when compared with matched controls. The initial finding that ASD cases in the Army were discharged significantly less often than the comparison population was likely due to differences in gender, race, and length of service of the Army cases and general accessing pool. This initial difference was not found in any individual services in the more comprehensive survival analysis

AFQT scores should be considered when deciding waivers for ASD. This study shows that the current criteria used by the waiver authorities are sufficient for preventing premature discharges above what would be expected in the general enlisted accessing population. AMSARA will continue this investigation and incorporate more cases and other parameters (e.g., occupation).

## References

1. Smalley SL. Genetic influences in childhood-onset psychiatric disorders: autism and attention-deficit/hyperactivity disorder. *Am J Hum Genet* 1997;60:1276-1282.
2. Levy F, Hay D, McStephen M, Wood C, Waldman I. Attention-deficit hyperactivity disorder: a category or a continuum? Genetic analysis of a large-scale twin study. *J Am Acad Child Adolesc Psychiatry* 1997;36:737-744.
3. First MB, ed. *Diagnostic and Statistical Manual of Mental Disorders*, 4th Edition. Washington DC: American Psychiatric Association, 1994.
4. Quay HC. Inhibition and attention deficit hyperactivity disorder. *J Abnormal Child Psychol* 1997;25:7-13.
5. Sherman DK, Iacono WG, McGue MK. Attention-deficit hyperactivity disorder dimensions: a twin study of inattention and impulsivity-hyperactivity. *J Am Acad Child Adolesc Psychiatry* 1997;36:745-753.
6. Department of Defense. Physical Standards for Appointment, Enlistment, and Induction. Washington DC: Department of Defense. 1994. Directive 6130.3.

### ***3.4. Disqualifying Recruit Applicants for Flat Feet***

#### **3.4.1. Introduction**

One of AMSARA's six objectives (see "Introduction") is to perform medical and administrative quality assurance. Assuring quality in information gathering involves monitoring the geographic variation in diagnoses across the 65 MEPSs. Studying these variations may reveal insensitive examiners or irrelevant standards.

Pes planus, or flat feet, is caused when the talar head of the foot displaces medially and planterward, stretching ligaments and resulting in loss of the medial longitudinal arch. It is a disqualifying condition according to the current DoD standards regarding appointment, enlistment, and induction [1]. Pes planus has been a military recruit issue for a long time. It was noted in 1920 that "a broad, flat foot is common in laboring classes and is no way disabling" [2].

This study was performed to test the following null hypothesis: assuming there is no geographic discrepancy regarding the prevalence of pes planus, one would expect individuals accessing from MEPSs with a significantly high disqualification rate for foot problems (where individuals with foot problems were essentially extracted) would experience significantly lower EPTS rates for foot problems.

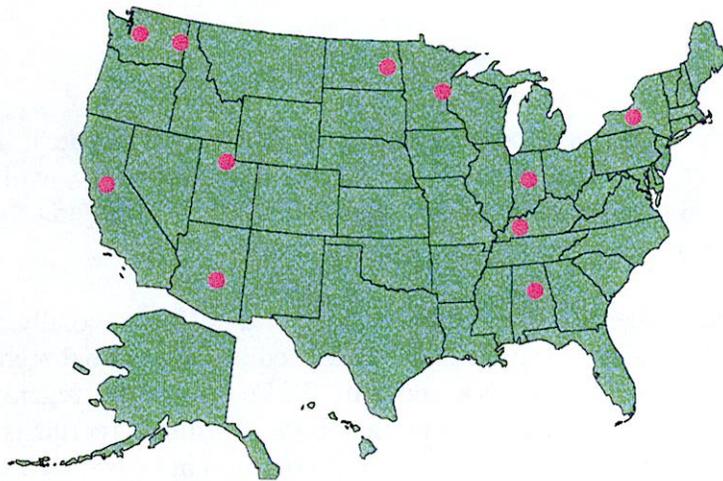
#### **3.4.2. Methods**

We examined the scope of the impact of pes planus using foot-related disqualifications at MEPSs and EPTS discharges. Geographic distribution of MEPSs with high disqualification rates for foot conditions was examined to roughly detect any geographic variation in the prevalence of foot problems. Foot-related EPTS discharge rates in recruits from MEPSs with outlying disqualification rates for foot conditions was described. The correlation between foot-related disqualification rates and subsequent EPTS rates for all MEPSs was examined and then investigated while controlling for other factors.

#### **3.4.3. Results**

Disqualifications for pes planus are not recorded at the MEPSs but are grouped with disqualifications for any reason relating to the feet. In 1997 there were more than 2,600 recruit applicants (0.87% of all recruit applicants) disqualified and turned away from active service for a foot-related problem. (MEPCOM estimates show that 60% of these were for pes planus.)

MEPSs with the 11 highest disqualification rates for foot-related problems consistently over 3 years are not segregated in one particular geographic area but are spread around the country (Fig. 3.4.1). This lends some validation to the assumption that there is no geographic discrepancy regarding the prevalence of pes planus.



**FIGURE 3.4.1. GEOGRAPHIC DISTRIBUTION OF MEPSs WITH HIGHEST FOOT-RELATED DISQUALIFICATION RATES**

Also in 1997, there were 375 individuals (0.18% of enlisted individuals starting active duty) prematurely discharged for EPTS foot-related problems. More than 80%, 317 individuals, listed preexisting pes planus as the reason for discharge.

When combining 3 years of MEPS foot-related disqualifications, the Memphis, Jackson, and Indianapolis MEPSs had rates approximately 10 times that of the rates at the Montgomery, Amarillo, and Richmond MEPSs. Yet the basic training discharge rates for foot problems were not significantly lower for recruits that successfully passed through Memphis, Jackson, and Indianapolis (Table 3.4.1).

**TABLE 3.4.1. DISQUALIFICATION AND EPTS DISCHARGE RATES FOR FOOT-RELATED PROBLEMS, 1995-1997**

MEPS	Foot-related disqualification rate (%)	Foot-related EPTS discharge rate (%)*
Montgomery, AL	0.22	0.34
Amarillo, TX	0.23	0.39
Richmond, VA	0.25	0.40
Memphis, TN	3.44	0.28
Jackson, MS	2.44	0.56
Indianapolis, IN	2.39	0.40

\*NS, chi-square.

After examination of MEPSs with outlying foot-related disqualification rates, all MEPSs were studied to determine whether a linear correlation existed between foot-related MEPS disqualification rate and foot-related EPTS discharge rate in those successfully passing the medical examination from that MEPS. No correlation exists (Fig. 3.4.2). The absence of a correlation persisted when controlling for the year, proportion of females at the MEPS, and proportion of individuals moving to a particular service through linear regression.



regarding their current athletic ability and functioning. The influence of job classification on discharge rate should also be investigated.

### *References*

1. Department of Defense. Physical Standards for Appointment, Enlistment, and Induction. Washington DC: Department of Defense, 1994. Directive 6130.3.
2. Regulations Governing Physical Examinations Under the Selective Service Act of May 18, 1917 in Defects Found in Drafted Men. Washington DC: War Department, 1920.

### ***3.5. Risk of Hospitalization for Individuals Enlisted in the Military: 1995–1997***

#### **3.5.1. Introduction**

Women have served in the U.S. military since formation of the United States. Since the 1970s women's roles in the military began to expand greatly. From 1973 to 1976, all services trained women as noncombat pilots. In 1970, an Army nurse became the first female general officer. In 1973, the first female made major general. In 1989, the first woman completed the Air Force Test Pilot School and the first woman qualified as a female fighter pilot. During Desert Storm the issue of women in combat was heightened even more than in World War II because the use of advanced technology obscured areas of combat and noncombat for the approximately 41,000 female troops who participated. In 1994, the Army opened 32,000 ground jobs to women and 48,000 were opened in the Marines [1]. Since 1994, approximately 18% of new recruits are women in each year.

The 1997 *AMSARA Annual Report* identified that the rate of hospitalization is higher for women than for men. This study was conducted to investigate the cause of this difference so that more targeted efforts could be made to identify individuals at risk and decrease preventable hospitalizations.

#### **3.5.2. Methods**

Hospitalization data from January 1995 through December 1998 were obtained from the Patient Administration Systems and Biostatistics Activity (Fort Sam Houston, TX). In the analysis, IDC9 coded discharge diagnoses were categorized (Table 3.5.1). Because we wanted to compare gender-specific rates in the absence of childbirth, those admissions were excluded. Hospital admission is a rare event, and Poisson regression was used [2–4]. Owing to the large sample size, a 99% confidence level or  $p = 0.01$  was used to judge significance. The censor date for those without hospitalization was March 31, 1998.

**TABLE 3.5.1. HOSPITAL ADMISSION CATEGORIES USING ICD9 CODES**

Category	ICD9 code
Adjustment reaction	309
Affective psychoses	296
Alcohol/substance-related disorder	305, 303
Appendicitis	540
Asthma	493
Benign breast tumor	217
Bronchitis	466,490
Chickenpox	052
Childbirth	620, 632, 634, 644, 646, 650, 651, 652, 656, 664, 669
Depression	311
Digestive system	520, 524
Disorders: muscle, ligament, and fascia	728
Endocrine, nutrition, metabolic and immunity disorders	276
Female pain genital organs	625
Fracture of ankle	824
Hemorrhoids	455
Hernia	550
Ill-defined conditions	780
Mental disorder	301, V7109, V7101
Mononucleosis	075
Neurotic disorder	300
Others	all others
Otitis media	382
Parasitic disease	008, 558
Pelvic	614
Perineal trauma (unrelated to childbirth)	First diagnosis in 664, 656 but second and third is not childbirth
Pneumonia	486
Poisoning	965
Pregnancy with vomiting	643
Psychoses	298
Respiratory system	034.0, 034.1, 462, 463, 465, 474, 475
Sinusitis	473
Skin/subcutaneous tissue	682
Symptoms abdominal and pelvic	789
Urinary system	590, 599
Viral infection	079

### 3.5.3. Results

Approximately 480,000 enlisted individuals were accessed into the Air Force, Army, Marines, and Navy from 1995 to 1997. Some 24,432 were excluded for incomplete data, and 454,954 individuals were examined in our study; 82% were male and 18% were

female. The hospitalized population, excluding childbirth, were 33% female and 67% male (Table 3.5.2). This difference is significantly higher for females ( $p < 0.0001$ ). The Army had the highest percent of individuals accessed being hospitalized, and Marines had the lowest.

**TABLE 3.5.2. DISTRIBUTION OF ENLISTED INDIVIDUALS IN 1995–1997 BY HOSPITALIZATION**

Demographic factor	Category	Total		Hospitalized		Nonhospitalized	
		Count	%	Count	%	Count	%
Service	Army	156,867	34.48	18,985	45.71	137,882	33.35
	Navy	113,919	25.04	8,130	19.57	105,789	25.59
	Marines	92,608	20.36	6,257	15.06	86,351	20.89
	Air force	91,560	20.13	8,165	19.66	83,395	20.17
Gender	Male	374,964	82.42	27,900	67.17	347,064	83.95
	Female	79,990	17.58	13,637	32.83	66,353	16.05
Race	White	327,576	72	29,246	70.41	298,330	72.16
	Black	84,375	18.55	8,862	21.34	75,513	18.27
	Other	43,009	9.45	3,429	8.26	39,580	9.57
Age	17–20 yr	356,993	78.47	31,218	75.16	325,775	78.8
	21–25 yr	79,802	17.54	8,216	19.78	71,586	17.32
	26–30 yr	14,430	3.17	1,648	3.97	12,782	3.09
	>30 yr	3,729	0.82	455	1.1	3,274	0.79
Marital status	Married	42,434	9.33	4,763	11.47	37,671	9.11
	Other	4,228	0.93	577	1.39	3,651	0.88
	Single	408,292	89.74	36,197	87.14	372,095	90
AFQT	1 (92–100)	25,199	5.56	2,007	4.85	23,192	5.63
	2 (64–91)	176,940	39.03	15,819	38.23	161,121	39.11
	3a (49–63)	126,859	27.98	12,216	29.52	114,643	27.83
	3b (30–48)	121,271	26.75	11,035	26.67	110,236	26.76
	4+5 (0–29)	3,057	0.67	299	0.72	2,758	0.67
Education	College or higher	12,671	2.79	1,170	2.82	11,501	2.78
	HiS diploma	352,979	77.59	33,378	80.36	319,601	77.31
	Senior HS	81,272	17.86	6,292	15.15	74,980	18.14
	Less than HS	8,031	1.77	697	1.68	7,334	1.77

The relative risk of hospitalization for females vs. males was 2.2 (99% CI: 2.15, 2.25). Risk of hospitalization increased with age. In general, individuals with higher AFQT scores had lower hospitalization rates than those with low AFQT scores.

To determine the effects of certain variables independent of other demographics, regression analysis was performed. Females had an elevated unadjusted risk of hospitalization that was statistically significant (Table 3.5.3). The hospitalization rate for females was more than double that for males when no other factors were considered. After controlling other variables such as education, age, race, and season, the gender differences remained (Table 3.5.4). Compared with males the relative risk of hospitalization for females was 1.85 (99% CI: 1.81, 1.90).

Differences in hospitalization rates across services had been suggested in the unadjusted analysis (Table 3.5.3). The hospitalization rate in Army was the highest, and that in Marines was the lowest when no other factors were considered. After controlling other variables, service differences remained. Compared with the Navy, the relative risk of hospitalization for an Army individual was 1.33 (99% CI: 1.30, 1.36) and for the Air Force was 1.12 (99% CI: 1.09, 1.15). Compared with the Air Force, the relative risk for an Army individual to be hospitalized was 1.19 (99% CI: 1.16, 1.21).

**TABLE 3.5.3. HOSPITALIZATIONS (PER 1,000 PERSON-YEARS) AND RELATIVE RISKS BY DEMOGRAPHICS**

Demographic factor	Category	Hospitalizations per 1,000 person-years	Standard error	Relative risk	99% CI
Service	Navy	51.54	0.53	1.00	
	Army	88.67	0.57	1.72	1.67, 1.77
	Marines	49.04	0.56	0.95	0.91, 0.99
	Air Force	61.98	0.63	1.20	1.16, 1.25
Gender	Male	54.82	0.29	1.00	
	Female	120.59	0.95	2.20	2.15, 2.25
Race	White	64.16	0.34	1.00	
	Black	78.58	0.75	1.22	1.19, 1.26
	Others	60.22	0.93	0.94	0.90, 0.98
Age	17-20 yr	63.89	0.33	1.00	
	21-25 yr	73.11	0.72	1.14	1.11, 1.18
	26-30 yr	85.23	1.87	1.33	1.26, 1.41
	>30 yr	90.26	3.76	1.41	1.27, 1.57
Marital status	Single	65.23	0.31	1.00	
	Married	74.95	1.00	1.15	1.11, 1.19
	Others	93.13	3.54	1.43	1.29, 1.58
AFQT	1	54.78	1.11	1.00	
	2	63.43	0.46	1.16	1.10, 1.22
	3a	70.96	0.57	1.30	1.22, 1.37
	3b	68.67	0.58	1.25	1.18, 1.33
	4+5	84.13	4.13	1.54	1.34, 1.74
Education	Senior HS	68.69	0.34	1.00	
	Less than HS	57.95	0.63	0.84	0.82, 0.87
	College and higher	61.93	1.66	0.90	0.84, 0.97

Gender and service were the most significant predictors of hospital admissions (Table 3.5.4). The percent of females is higher in Air Force and in the Army (26.4% and 20.2%) than the Navy or Marines (15.6% and 6.9%, respectively). We examined whether gender influenced risks of hospitalization yielded the same difference in each individual service. The elevated risk for females of hospitalization existed in all four services to different degrees. Risk of hospitalization for females had the greatest magnitude in the Army with an adjusted relative risk of 2.05 (99% CI: 1.96, 2.14), whereas risk for females in the Air Force was lowest at 1.61 (99% CI: 1.53, 1.69) (Table 3.5.5).

**TABLE 3.5.4. ADJUSTED RELATIVE RISKS AND ASSOCIATED 99% CI FOR HOSPITALIZATION**

Demographic factor*	Level	Regression coefficient	Standard error	Relative risk	99% CI
Gender (male)	Female	0.617	0.009	1.85	1.81, 1.90
Race (white)	Black	0.017	0.008	1.02	1.00, 1.04
	Other	-0.050	0.010	0.95	0.93, 0.98
Service** (Navy)	Army	0.285	0.008	1.33	1.30, 1.36
	Marines	0.041	0.009	1.04	1.02, 1.07
	Air Force	0.113	0.009	1.12	1.09, 1.15
Season (Winter)	Autumn	-0.384	0.008	0.68	0.67, 0.70
	Spring	-0.281	0.008	0.75	0.74, 0.77
	Summer	-0.225	0.008	0.80	0.78, 0.81
Education (HS diploma)	College and higher	-0.143	0.018	0.87	0.83, 0.91
	Less than HS	-0.020	0.008	0.98	0.96, 1.00
Marital status (single)	Married	-0.047	0.010	0.95	0.93, 0.98
	Other	0.067	0.030	1.07	0.99, 1.16
Age (17-20 yr)	21-25 yr	0.044	0.008	1.04	1.02, 1.07
	26-30 yr	0.066	0.018	1.07	1.02, 1.12
	>30 yr	0.089	0.033	1.09	1.00, 1.07

\*Base level in parentheses.

\*\*Relative risk of Army vs. Air Force: 1.19 (1.16, 1.21).

**TABLE 3.5.5. FEMALE RELATIVE RISK OF HOSPITALIZATION COMPARED WITH MALE BY SERVICES**

Service	Hospitalizations per 1,000 person-years		Relative risk	Regression coefficient	Standard error	Adjusted relative risk	99% CI	Unique model with interaction*
	Female	Male						
Army	153.85	72.04	2.14	0.717	0.017	2.05	1.96, 2.14	2.08
Marines	93.00	45.87	2.03	0.560	0.025	1.75	1.64, 1.87	1.69
Air Force	99.19	48.91	2.03	0.476	0.019	1.61	1.53, 1.69	1.66
Navy	96.23	43.14	2.23	0.593	0.017	1.81	1.73, 1.89	1.79

\*Including interaction between service and gender in the multiple Poisson regression.

To understand gender and service differences in hospital admission, we also examined the adjusted difference of other factors by using different models. Education level, AFQT score, marital status, age, and season were all significant in evaluating the risk of hospitalization (Table 3.5.4). However, except for season, compared with the effect of service or gender, the significant levels from the above variables were much lower.

In addition to studying rates of hospital admissions, we also examined the various explanatory factors in relation to the number of hospital days among a fixed number of people over a fixed time. Specifically, we computed the "hospital stay ratio" as the ratio of the average number of hospitalization days per 1,000 person-years in one category to that in another (Table 3.5.6). For example, the average number of hospitalization days per 1,000 person-years among females (154 days) was divided by that among males (72 days) to determine the hospital stay ratio of females relative to males, 2.14. Adjusted ratios were also computed where the adjustment included those factors shown in Table 3.5.2.

Combining all services, the unadjusted hospital stay ratio of females relative to males was 1.72 (99% CI: 1.79, 1.89) when adjusted for the key demographic factors shown in Table 3.5.2. Significant differences in stay ratio were also found between services. Comparing to the Navy, the adjusted hospital stay ratio for Army personnel was 1.72 (99% CI: 1.62,1.83), for the Marines was 1.03 (99% CI: 1.64, 1.89) and in the Air Force was 1.61 (99% CI: 1.52, 1.70).

When examining the effects of gender separately by service, it was found that females in each service have significantly more hospitalization days than their male counterparts. The adjusted hospital stay ratio of females to males in the Army was 2.00 (99% CI: 1.91, 2.10), in the Navy was 1.82 (99% CI: 1.73, 1.91), in the Marines was 1.76 (99% CI: 1.64, 1.89), and in the Air Force was 1.61 (99% CI: 1.52, 1.70). The hospital stay ratio for this same comparison 1.76 (99% CI: 1.64, 1.89), and in the Air Force was 1.61 (99% CI: 1.52, 1.70).

**TABLE 3.5.6. RELATIVE RISKS FOR HOSPITAL STAYS (PER 1,000 PERSON-YEARS) BY SERVICES**

Factor	Unadjusted data analysis				Adjusted regression analysis*			
	Stays per 1,000 person-years	Standard error	Relative risk	99% CI	Regular coefficient	Standard error	Relative risk	99% CI
Female	519	10	1.72	1.62, 1.83	0.609	0.010	1.84	1.79, 1.89
Male	302	4	1.00		Base		1.00	
Army**	487	8	1.80	1.68, 1.92	0.283	0.009	1.33	1.30, 1.36
Marines	255	6	0.94	0.87, 1.02	0.032	0.010	1.03	1.01, 1.06
Air Force	245	5	0.90	0.84, 0.97	0.101	0.010	1.11	1.08, 1.14
Navy	271	5	1.00		Base		1.00	
Age 17-20	307	4	1.00		Base		1.00	
Age 21-25	424	10	1.38	1.29, 1.48	0.053	0.009	1.05	1.03, 1.08
Age 26-30	579	33	1.88	1.62, 2.18	0.092	0.019	1.10	1.04, 1.15
>30 yr	687	64	2.24	1.76, 2.85	0.109	0.036	1.11	1.02, 1.22
<b>Analysis by service respectively</b>								
Factor	Unadjusted data analysis				Adjusted regression analysis*			
	Stays per 1,000 person-years	Standard error	Relative risk	99% CI	Regular coefficient	Standard error	Relative risk	99% CI
F: Army	710	20	1.65	1.50, 1.81	0.693	0.019	2.00	1.91, 2.10
M: Army	431	9	1.00		Base		1.00	
F: Navy	408	14	1.66	1.49, 1.85	0.598	0.020	1.82	1.73, 1.91
M: Navy	246	5	1.00		Base		1.00	
F: Marines	418	31	1.72	1.41, 2.10	0.564	0.028	1.76	1.64, 1.89
M: Marines	244	6	1.00		Base		1.00	
F: Air Force	360	12	1.76	1.58, 1.96	0.476	0.021	1.61	1.52, 1.70
M: Air Force	204	5	1.00		Base		1.00	

\*Gender, race, age, service, AFQT, education, if waived, and season were included in the analysis.

\*\*Adjusted relative risk of Army vs. Air Force: 1.20 (1.17, 1.23).

Table 3.5.7 shows the most common reasons for hospitalization. The most common causes for males were adjustment reaction (11.1%), respiratory disease (5.6%), digestive disease (5.6%), alcohol/substance-related disorder problem (5.6%), and mental disorder (4.4%). The most common causes for females were childbirth (not included in earlier analyses) (12.4%), adjustment reaction (8.6%), perineal trauma unrelated to childbirth (8.2%), respiratory disease (4.8%), and digestive disease (4.6%).

**TABLE 3.5.7. COMMON CAUSES FOR HOSPITALIZATION (JANUARY 1995 TO MARCH 1998)**

Male (n = 37,199)		Female (n = 19,965)	
Cause	%	Cause	%
Adjustment reaction	11.10	Childbirth	12.34
Respiratory system	5.62	Adjustment reaction	8.55
Digestive system	5.59	Perineal trauma unrelated to childbirth	8.17
Alcohol/substance-related disorder	5.58	Respiratory system	4.78
Mental disorder	4.43	Digestive system	4.60
Pneumonia	2.84	Viral infection	2.22
Hernia	2.70	Parasitic disease	2.01
Skin/subcutaneous tissue	2.58	Mental disorder	1.93
Parasitic disease	1.99	Urinary system	1.77
Affective psychoses	1.83	Alcohol/substance-related disorder	1.45
Viral infection	1.73	Affective psychoses	1.35
Appendicitis	1.63	Symptoms abdominal and pelvic	1.32
Ill-defined conditions	1.44	Bronchitis	1.18
Chickenpox	1.37	Pregnancy with vomiting	1.17
Bronchitis	1.36	Pelvic	1.04
Neurotic disorder	1.18	Pneumonia	1.02
Fracture of ankle	1.00	Ill-defined conditions	1.01

Hospital admissions per 1,000 person-years were evaluated for the following causes: adjustment reaction, respiratory system, viral infection, parasitic disease, bronchitis, urinary system, mental disorder, pneumonia, digestive system, skin and subcutaneous tissue, chickenpox, and alcohol/ substance-related disorder. Being female and serving in the Army appeared to be the strongest risk factors for hospitalization. Table 3.5.8 shows that the risk of being female varies among diagnoses. For most diseases, the hospital admission rate per 1,000 person-years for females was higher than that for males. However, for alcohol/substance-related problems, the higher hospitalization rate was found in males, and the relative risk of being female was 0.67 (99% CI: 0.57, 0.78). For chickenpox and hernia, relative risks of hospitalization for females were 0.79 (99% CI: 0.58, 1.08) and 0.19 (99% CI: 0.12, 0.29), respectively. For these diagnoses, though, the actual number of hospital admissions was small.

**TABLE 3.5.8. HOSPITAL ADMISSIONS (PER 1,000 PERSON-YEARS) AND RELATIVE RISKS BY CAUSE AND GENDER**

Causes	Gender	Admissions per 1,000 person-years	Standard error	Relative risk	99% CI
Adjustment reaction	Female	12.07	0.29	1.96	1.81, 2.11
	Male	6.17	0.10	1.00	
Respiratory system	Female	6.62	0.22	2.17	1.96, 2.40
	Male	3.05	0.07	1.00	
Digestive system	Female	6.38	0.21	2.08	1.87, 2.30
	Male	3.07	0.07	1.00	
Viral infection	Female	3.03	0.15	3.30	2.80, 3.89
	Male	0.92	0.04	1.00	
Parasitic disease	Female	2.78	0.14	2.57	2.19, 3.03
	Male	1.08	0.04	1.00	
Mental disorder	Female	2.71	0.14	1.10	0.95, 1.28
	Male	2.46	0.06	1.00	
Urinary	Female	2.46	0.13	22.71	16.23, 31.79
	Male	0.11	0.01	1.00	
Alcohol/substance-related	Female	2.04	0.12	0.67	0.57, 0.78
	Male	3.07	0.07	1.00	
Bronchitis	Female	1.45	0.10	2.34	1.87, 2.91
	Male	0.62	0.03	1.00	
Pneumonia	Female	1.41	0.10	0.91	0.74, 1.11
	Male	1.56	0.05	1.00	
Skin/subcutaneous tissue	Female	0.87	0.08	0.61	0.48, 0.78
	Male	1.43	0.05	1.00	
Chickenpox	Female	0.59	0.06	0.79	0.58, 1.08
	Male	0.74	0.03	1.00	
Hernia	Female	0.28	0.04	0.19	0.12, 0.29
	Male	1.47	0.05	1.00	

Table 3.5.9 shows the different disease specific rates for each service. For adjustment reaction, the admission rate was higher in the Army and Air Force (8.9 and 8.6 visits per 1,000 person-year) and was much lower in the Marines (3.4 visits per 1,000 person-year). For respiratory disease, the rate was 7.4 in the Army and <2 in the other services. For digestive system, the rate was 11.2 in the Air Force, which was much higher than 3 in the Army, 0.9 in the Navy, and 0.5 in the Marines. For mental disorder, the rate was 5.6 in the Navy, 2.2 in the Marines, 1.5 in the Army, and 0.8 in Air Force. In general, the hospitalization rate was higher in the Army than the other services.

**TABLE 3.5.9 HOSPITAL ADMISSIONS (PER 1,000 PERSON-YEARS) AND RELATIVE RISKS BY CAUSE AND SERVICE**

Causes	Service	Admissions per 1,000 person-years	Standard error	Relative risk	99% CI
Adjustment reaction	Army	8.88	0.18	1.32	1.21, 1.45
	Marines	3.43	0.15	0.51	0.45, 0.58
	Air Force	8.60	0.23	1.28	1.16, 1.42
	Navy	6.71	0.19	1.00	
Respiratory system	Army	7.44	0.16	5.47	4.62, 6.48
	Marines	1.58	0.10	1.16	0.93, 1.46
	Air Force	1.86	0.11	1.36	1.10, 1.70
	Navy	1.36	0.08	1.00	
Viral infection	Army	3.19	0.11	17.44	11.18, 27.15
	Marines	0.22	0.04	1.20	0.65, 2.23
	Air Force	0.29	0.04	1.56	0.88, 2.79
	Navy	0.18	0.03	1.00	
Digestive system	Army	3.02	0.10	3.21	2.60, 3.96
	Marines	0.45	0.05	0.47	0.33, 0.68
	Air Force	11.19	0.26	11.88	9.71, 14.54
	Navy	0.94	0.07	1.00	
Pneumonia	Army	2.70	0.10	4.86	3.72, 6.35
	Marines	1.67	0.10	3.01	2.24, 4.05
	Air Force	0.48	0.05	0.86	0.59, 1.27
	Navy	0.55	0.05	1.00	
Parasitic disease	Army	2.50	0.09	5.19	3.90, 6.90
	Marines	0.63	0.06	1.31	0.90, 1.90
	Air Force	1.22	0.09	2.54	1.83, 3.51
	Navy	0.48	0.05	1.00	
Bronchitis	Army	2.01	0.08	64.02	22.20, 183.86
	Marines	0.13	0.03	4.22	1.28, 13.92
	Air Force	0.07	0.02	2.38	0.66, 8.65
	Navy	0.03	0.01	1.00	
Skin/subcutaneous tissue	Army	1.77	0.08	1.65	1.33, 2.04
	Marines	1.52	0.10	1.42	1.11, 1.81
	Air Force	0.65	0.06	0.61	0.45, 0.83
	Navy	1.07	0.07	1.00	
Mental disorder	Army	1.48	0.07	0.26	0.23, 0.31
	Marines	2.29	0.12	0.41	0.35, 0.48
	Air Force	0.82	0.07	0.15	0.11, 0.18
	Navy	5.61	0.17	1.00	
Alcohol/substance-related	Army	2.16	0.09	0.53	0.46, 0.61
	Marines	3.77	0.15	0.92	0.80, 1.06
	Air Force	1.91	0.11	0.47	0.39, 0.56
	Navy	4.08	0.15	1.00	

**TABLE 3.5.9 (CONTINUED) HOSPITAL ADMISSIONS (PER 1,000 PERSON-YEARS) AND RELATIVE RISKS BY CAUSE AND SERVICE**

Hernia	Army	1.39	0.07	1.72	1.34, 2.19
	Marines	2.18	0.12	2.69	2.09, 3.45
	Air Force	0.67	0.06	0.82	0.59, 1.14
	Navy	0.81	0.07	1.00	
Chickenpox	Army	1.01	0.06	1.24	0.96, 1.60
	Marines	0.45	0.05	0.55	0.38, 0.79
	Air Force	0.35	0.05	0.43	0.29, 0.64
	Navy	0.82	0.07	1.00	
Urinary	Army	0.76	0.05	2.07	1.45, 2.95
	Marines	0.25	0.04	0.69	0.41, 1.15
	Air Force	0.57	0.06	1.55	1.03, 2.33
	Navy	0.37	0.04	1.00	

### 3.5.5. Discussion

Service differences may be at least partly due to differences in admission processes across the services. Outpatient information would augment understanding of the occurrence of disease during the first term service.

The hospitalization rate of females is much higher than males, even after excluding childbirth and controlling for other demographic factors. The magnitude of the difference in risk between genders varies among the services, with the highest rate in the Army and lowest in the Air Force. The overall hospitalization rate is higher in the Army than the other services, and hospital admissions are likely higher in winter than in the other seasons. The hospitalization rate was higher for those with lower education level and lower AFQT scores and also increased with age.

Methods of preventing hospitalization and length of hospital stays in females and in the Army should be investigated further.

### References

1. Gruhitz-Hoyt O. *They Also Served: American Women in World War II*. New York: Birch Lane Press Book, 1995.
2. Agresti A. *Categorical Data Analysis*. New York: John Wiley & Sons, 1990;37.
3. Mood AM and Graybill FA. *Introduction to the Theory of Statistics*. New York: McGraw-Hill, 1974;93.
4. Greenland S. Quantitative methods in the review of epidemiologic literature. *Epidemiol Rev* 1987, Vol 9: pp. 1-30.

## 4. FUTURE DELIVERABLES

### 4.1. *Future Direction of AMSARA*

Decreasing numbers of the active force and shrinking budgets have promoted the concept of "force protection", an effort to keep the active force "healthy and fit" to fight. Force protection needs to start with the accession process, be in place through training and on to the battlefield.

Early medical attrition, particularly that occurring within the first six months on active duty is a complicated issue involving a mix of medical and non-medical issues. AMSARA has targeted early on asthma, flat feet, and knee conditions that significantly contribute to attrition. However, AMSARA is funded through operational money, which poses challenges when basic research should be conducted. Some studies require development of assays or procedures that must be conducted as human use research.

There are natural research spin-offs from the work that AMSARA has already accomplished. The research community could be mobilized to address these research needs such as developing a better screening tool for mental disorders (this project might be addressed by the Division of Neuropsychiatry, WRAIR), developing a more sensitive and specific screening test for asthma (Division of Medicine, WRAIR) or evaluating the functional recovery following knee surgery (Division of Surgery, WRAIR or USARIEM). However, these projects are not formally programmed areas of research. Recruit medicine should be identified as a critical area of research with dedicated research funding. Once targeted, recruit medicine (including accession standards) can be improved with a variety of collaborative efforts between Divisions, Institutes, services and civilian partners with the goal of improving accession standards, training and maintaining the health of the active duty force.

AMSARA has already shown a \$2 million potential savings by recommending RPR testing not be conducted at MEPS. Additional savings may reach over \$12 million if we are successful in reducing the 6-month attrition rate by 10%.

A small part of these saved resources should be dedicated to further research directed to accessing healthy recruits so that the concept of "deploying a fit & healthy force", one of the three pillars of the AMEDD, might be better realized.

### 4.2. *Asthma EPTS Survey Study*

AMSARA will be conducting a survey study of former enlisted personnel recently given an EPTS discharge for asthma who did not receive an asthma disqualification on entry. The primary objectives are 1) to determine whether conditions other than asthma were involved in the discharge and 2) to better understand the reasons why no waiver was given (e.g., condition was concealed, condition was examined but not deemed disqualifying). Work on a pilot study has begun, with a random sample of 200 asthma

EPTS cases having been selected and tracked for most recent addresses and phone numbers

#### ***4.3. Case-control Study of Skin Conditions***

AMSARA is conducting a survival study of enlisted personnel waived for skin conditions, comparing attrition and hospitalization experiences with those of a control group. This will provide evidence-based insight into whether individuals with certain dermatological conditions do well on active duty.

#### ***4.4. Case-control Study of Back Conditions***

AMSARA is conducting a survival study of enlisted personnel waived for orthopedic conditions, comparing attrition and hospitalization experiences with those of a control group. This will provide evidence-based insight into whether individuals with orthopedic back conditions do well on active duty.

#### ***4.5. Study of Discharges for Psychological Reasons***

AMSARA is comparing enlisted personnel receiving an EPTS discharge for a psychological reason to individuals receiving an EPTS discharge for other reasons, and to individuals successfully completing basic training. The findings will assist in uncovering predictive factors for psychological attrition.

#### ***4.6. Chlamydia Study***

*Chlamydia trachomatis* infection left untreated can result in serious sequelae such as pelvic inflammatory disease, ectopic pregnancy, and infertility. Some 13,204 female military recruits were surveyed for *Chlamydia trachomatis* infections using DNA amplification testing of urine. An overall prevalence of 9.2% was found [1]. It is crucial to examine subsequent development of costly sequelae in those offered screening. AMSARA is examining whether chlamydia screening in this population of young military females who do not seek health care decreases hospitalization for chlamydia sequelae.

The 13,204 Army recruits screened in the Gaydos study [1] are being followed for hospitalization for pelvic inflammatory disease (ICD9 codes 614 and 615), infertility (ICD9 code 628), and ectopic pregnancy (ICD9 code 633). Cases comprised only those original 13,204 that entered full-time active duty and excluded those going from basic training at Fort Jackson into the reserves who would not be hospitalized in the military health care system unless on temporary active duty. The remaining females (minus the cases) entering the Army as enlisted soldiers during the same period in which the cases were gained (as per DMDC) comprised the remainder of the cohort. The cohort is being followed for hospitalization for *Chlamydia trachomatis* sequelae through their first year of service.

## Reference

1. Gaydos C, et al. High prevalence of *Chlamydia trachomatis* infections in a national survey of female military recruits: epidemiological correlates and utility of urine-based screening for a chlamydia control program. *N Engl J Med* 1998;339:739-744.

### **4.7. Attrition Model of Enlisted Data**

The goals of attrition modeling are to determine which factors most affect the likelihood of attrition in new recruits, and to be able to predict attrition patterns based on these factors. Typical questions that can be addressed by attrition modeling include 1) "What explanatory variable would be more likely to affect discharges than others?"; 2) "Which group of enlisted soldiers would be more likely discharged than others?"; and 3) "How soon will they be discharged?" Any modeling with such ambitious goals requires extensive and thorough underlying analyses.

Broadly, attrition modeling can be viewed as having two phases. The first is exploratory in nature, with the goal of determining which, and in what form, explanatory variables are to be included in the final attrition models. The Life-test models conducted to date will provide some information needed in this regard. Explanatory variables are also examined in relation to one another; explanatory variables may be grouped or reconstructed based on the results of these examinations. For example, explanatory variables found to be highly correlated with one another might be consolidated.

The second phase is the attrition modeling itself. Many different models will be performed on the data, then suitable models will be selected for further testing and application.

A major issue in the development of attrition modeling is the completeness and accuracy of the data to be used. In particular, attrition may be selectively related to outcome variables of interest (such as actual gain date, actual loss, EPTS loss, or hospitalization) if those variables are not consistently and correctly recorded. In addition to quality assurance efforts before modeling, methods to control for and minimize the damage from incomplete data must be considered as a major part of attrition modeling.

Attrition modeling will be an ongoing project. Model estimates and predictions will be updated as additional data become available.

## Abbreviations

ACL	anterior cruciate ligament
ADHD	attention deficit hyperactivity disorder
AFQT	armed forces qualifying test
AMSARA	accession medical standards analysis and research activity
ASD	academic skills defect
CI	confidence interval
CY	calendar year
DMDC	Defense Manpower Data Center
DoD	Department of Defense
DoDMERB	DoD medical evaluation board
EPTS	existed prior to service
HS	high school
ICD9	international classification of diseases, 9 <sup>th</sup> revision
ISC	interservice separation code
JDETS	Joint Disability Evaluation Tracking System
MEPCOM	Military Entrance Processing Command
MEPS	Military Entrance Processing Station
NDES	Navy Disability Evaluation System
NS	not significant
NOS	not otherwise specified
PASBA	Patient Administration Systems and Biostatistical Activities
PCL	posterior cruciate ligament
ROTC	Reserve Officers Training Corp
SSN	social security number
VASRD	Veterans Administration System for Rating Disability
WRAIR	Walter Reed Army Institute of Research

the first of these is the fact that the system is not a simple one. It is a complex system, and the behavior of the system is not linear. The second is that the system is not a simple one. It is a complex system, and the behavior of the system is not linear.

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