AMSARA

Accession
Medical
Standards
Analysis &
Research
Activity

Annual Report
1999
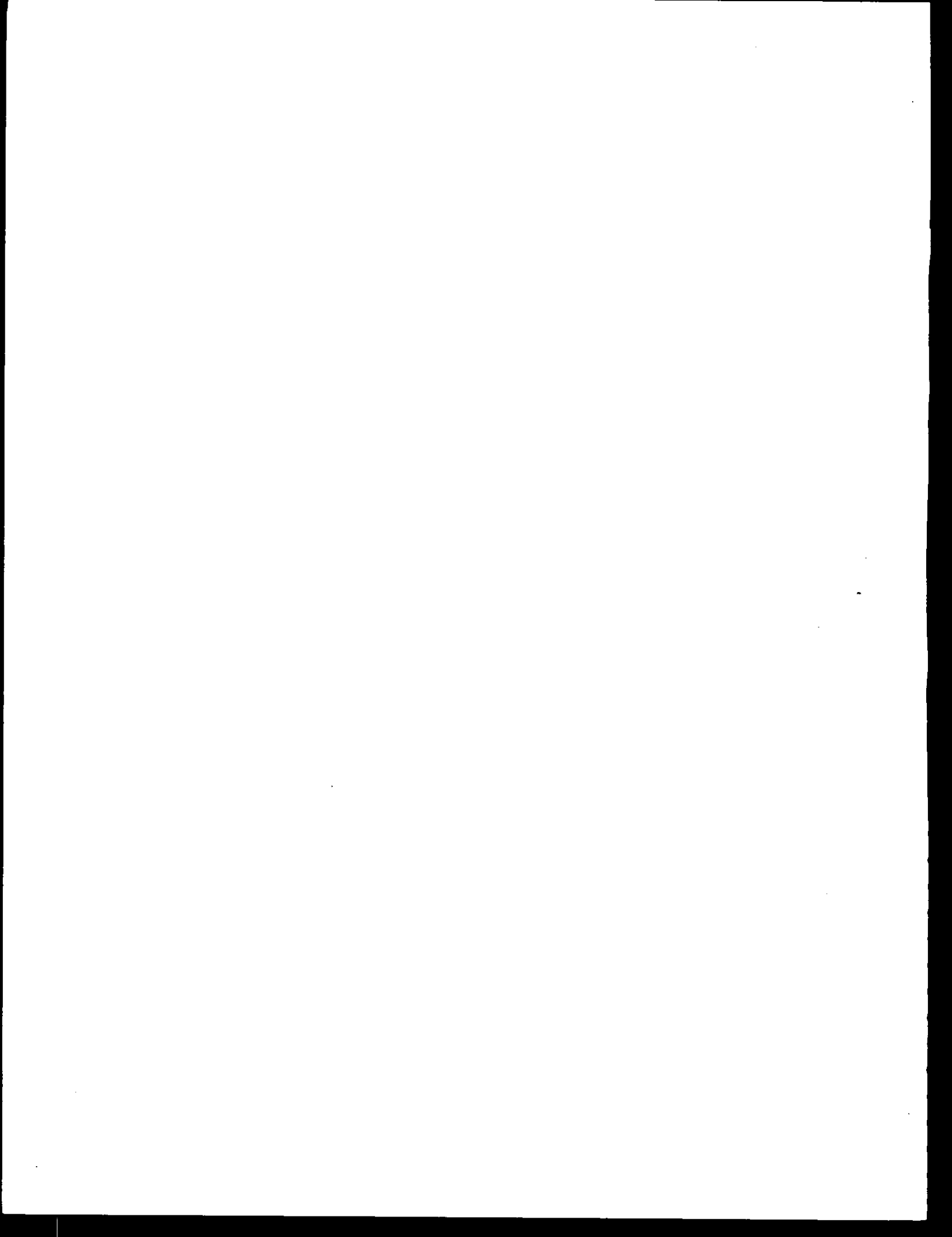
Contents

Executive Summary

The Accession Medical Standards and Research Activity **(AMSARA) has completed its third year of providing DoD with evidence-based evaluations of accession standards.** Assessing healthy recruits is the foundation of a successful military basic training program and ultimately is a key contributor to readiness. Approximately 10-15% of the more than 150,000 enlisted accessions to the armed forces each year are discharged within the first 6 months. Many of these discharges are for medical reasons. In fact, there are more than 7,000 medical discharges per year due to medical conditions that existed prior to service.

AMSARA completed a study, based on a retrospective review of three years of data examining the impact of waiving for a variety of back conditions. **Attrition from all causes is not unusually high for individuals waived for back conditions entering the Navy and Marines.** The Army did experience a higher loss among those waived for back conditions but only 20 back related events (EPTS and hospitalizations) occurred among those waived. **Over 70% of those receiving EPTS discharge for back conditions had concealed their condition** at the MEPS physical. Improved screening techniques are needed to decrease these EPTS discharges.

Another completed **study comparing recruits waived for skin conditions to matched controls demonstrated these recruits are statistically more likely to experience some medical event.** Although medical events were more common among those waived with skin conditions, the relative impact of these events remain small (4.4% more outcomes in those with waivers). Any skin-related event was rare during the 9 to 45 months of follow-up; five skin-related events occurred among cases and two among controls. Co-morbid conditions may have been more prevalent among the cases, resulting in the increase in the medical events. The difference in survival rates may have been due to these conditions and not to the skin condition which was waived. The true impact of these skin and cellular tissue conditions may be better ascertained by using outpatient data to determine the impact on the healthcare system of allowing individuals with known skin-related conditions to enter the military

Additional **studies on early hospitalizations revealed enlisted females have 15% more hospitalizations (excluding childbirth and its complications) during the first 12 months of duty.** The category of neurotic and personality disorders accounted for the largest percentage (20%) of admissions during the first year of service and for females is two times more common than any other discharge diagnostic subcategory. This finding has prompted AMSARA to seek collaborative studies with the Division of Neuropsychiatry at WRAIR during this next year.

The **first phase of attrition modeling among enlisted personnel (identification of some explanatory variables to be included in the final attrition model) began this year.** This preliminary analysis suggest that being female is independently associated with a significantly higher rate of loss within the first 6 months of duty as well as long term loss. Whites, individuals with dependents, medical disqualification at MEPS and

marital status are all independent risk factors for attrition. Attrition modeling will continue during this coming year, with model estimates being updated as new data is gathered.

This past year AMSARA expanded the types of studies it conducts to include a **telephone interview study comparing those with EPTS discharge for asthma to recruits receiving other types of EPTS discharges**. Of interest was the report from the majority of respondents that they were told to seek medical attention by an officer in charge. Furthermore, 41.6 percent of cases and 45 percent of controls felt their condition had no impact on their basic training performance, and most felt that basic training was a positive experience. **This study suggests that many (perhaps up to 40 percent) of those discharged with "asthma" may be able to perform their duties.** Inability to locate the majority of those receiving EPTS discharges and not having the ability to validate the respondent's performance is reason to reserve judgement on the true meaning of these findings. This study prompted AMSARA to seek collaboration with basic training sites to gather additional information at the time of EPTS discharge during this upcoming year.

For the first time **AMSARA has evaluated the impact of a proposed screening program in the military.** This one-year follow-up of women screened for *Chlamydia trachomatis* at Fort Jackson revealed that their subsequent risk for hospitalizations related to *C. trachomatis* infections was not different than the rates of hospitalization among those women who were not screened. An unexpected finding among those screened was the statistically lower pregnancy rate over the study period when compared to women not screened and educated in this program.

AMSARA is currently completing a study to evaluate an existing program designed to rehabilitate injured recruits at Fort Jackson. The goal is to determine whether these rehabilitated recruits finish basic training or receive EPTS discharges at the same rate as matched controls. The evaluation of those receiving waivers for disqualifying conditions (asthma and attention deficient hyperactivity disorder) will continue in the next year as we will be able to provide 5 year follow-up of those recruits entering active duty in 1995.

AMSARA will be conducting a study at Great Lakes Navy Training Center to evaluate the impact of retaining recruits diagnosed with mild asthma. AMSARA will be using existing databases to evaluate outpatient and inpatient outcomes. In addition, AMSARA is collaborating with Navy personnel to collect additional clinical data, occupational exposure data and self-reported symptoms over the three-year study period. These data will be used to determine whether a change in current policy on mild asthmatics is warranted.

When the need for a better screening tool for asthma was identified in 1997 as crucial to reducing EPTS discharges, the need for basic research could only be met by seeking a phase I SBIR contract. **A simple, inexpensive screening device has now been developed to detect nitric oxide (NO), a proven marker of airway inflammation.** The successful completion of this contract has led to the funding of a phase II SBIR to enable

the military to use this screening tool for asthma in mass screening programs. AMSARA anticipates being involved in field testing this screening tool near the end of 2000 or early in 2001.

THE ASSISTANT SECRETARY OF DEFENSE

WASHINGTON, D. C. 20301-1200

HEALTH AFFAIRS

DEC 0 6 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 /jr

Stephen C. Joseph, M.D., M.P.H.

cc:
Commander WRAIR

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February 28, 1995

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

MEMORANDUM FOR THE ASSISTANT SECRETARY OF DEFENSE
(HEALTH AFFAIRS)

THROUGH: 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:_____
Dr. Martin, PDASD:_____

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DEPARTMENT OF DEFENSE
ACCESSION MEDICAL STANDARDS
STEERING COMMITTEE

CHARTER

L 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: <u>JAN 16 1996</u>
Date

EDWIN DORN

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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 Walter Reed Army Institute of Research 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, and Chief of the Department of Epidemiology, LTC Margot Krauss.

AMSARA is augmented with contract support through Allied Technology Group. Current staff includes Project Manager, James Onaitis; Senior Biostatistician, Dr. Yuanzhang Li; Senior Analyst, Timothy Powers; Statistician, Lily Trofimovich; Data Manager, Janice Gary; Data Technician, Tracie Floyd; Health Economist, Rene Howell; 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 plans 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 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). 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 examination information (medical failure codes, waiver requirements, 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 on new accessions into the armed forces and of initial medical conditions and qualification status. These data are linked by AMSARA to DMDC gain files (see Section 1.3) to verify new accessions 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 back injuries, skin conditions, and other relevant topics.

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.

1.2. DoDMERB

The DoD Medical Evaluation Review Board (DoDMERB) performs a role similar to that of the MEPS for officer programs. Specifically, DoDMERB reviews physical examinations on applicants to officer programs and may disqualify on the basis of those reviews. Although historic data are not accessible, a new data collection system is being

implemented. AMSARA is maintaining contact with DoDMERB officials to discuss the possibility of future data provision.

1.3. 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 Sections 3 and 4.

Gain data include approximately 50 variables; of these, AMSARA has identified 25 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.

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 lack of completeness, particularly for the Army from August 1997 to December 1997. AMSARA has found fewer than 800 records of new Army accessions for this period. This compares with an average of approximately 50,000 such records during the same months of 1995 and 1996. AMSARA has thus far not been able to rectify 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 "pregnancy," "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.

1.4. WAIVER

AMSARA tracks all recruit applicants who require a medical waiver for entry into the service, i.e., those who were medically disqualified at the MEPS. Each service is responsible for making waiver decisions (approved or disapproved) for its applicants. 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 often

controls, are drawn for AMSARA epidemiologic studies. 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 Army Recruiting Command (Fort Knox, Kentucky) has provided monthly electronic waiver data since January 1997. These data contain SSN, name, action (approved, disapproved, other), date, and ICD9 codes to define the waived conditions.

Air Force

The Air Force Directorate of Medical Services and Training transmits, upon request, data on all officer and enlisted waivers. These data include identifiers, demographics, action (approved, disapproved, other), date, and ICD9 coded medical diagnoses with no narrative.

Navy

The Navy Bureau of Medicine and Surgery provides, on request, data on enlisted personnel and officers along with data from special programs such as ROTC and the Naval Academy. Data include identifiers, demographics, dates, action (approved, disapproved, other), and medical diagnoses coded according to the draft DoD Directive 6130.3.

ROTC/Academies

A summary of the type of data collected from the ROTC programs is contained in Section 2 of the 1998 AMSARA Annual Report. As initial medical examination and other data become available from DoDMERB, further examination of these programs is expected.

1.5. AMBULATORY DATA SYSTEM (OUTPATIENT MEDICAL VISITS)

AMSARA continues to monitor 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.

1.6. HOSPITALIZATION

The Patient Administration Systems and Biostatistical Activities (PASBA) provides hospitalization data on a yearly basis for all services except the 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 nature of the hospitalization (medical reason(s) for admission, date of admission, date of disposition, sick days, bed days, outcome, etc.).

One concern with the current data has been the 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 averages of approximately 6,500 from March 1997 to

December 1997, and 5,200 from January 1998 to December 1998. These differences are larger than would reasonably be expected due to regular month-to-month variation. AMSARA is trying to determine the effects of TRICARE and other possible causes for this sudden and sustained drop in records.

1.7. EXISTED PRIOR TO SERVICE (EPTS) DISCHARGES

Official paperwork on discharges for medical conditions that existed prior to service (EPTS) are collected from each service's basic training sites by MEPCOM. MEPCOM records certain information about the discharge, including a rough medical categorization (20 categories) and a judgment on each individual regarding why (concealment, waiver, unaware, etc.) the person was not rejected for service on the basis of that preexisting condition.

Beginning in August 1996, this paperwork is regularly forwarded to AMSARA for additional data extraction, including more specific coding of medical conditions leading to discharge. For EPTS discharges prior to late 1996, AMSARA uses the data collected by MEPCOM. Therefore, any analyses of EPTS by medical reason will be less detailed for those discharges prior to 1997.

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 back problems on military retention, EPTS discharge patterns among recruits waived for back problems were compared with patterns among a sample not waived (see Section 4.1 for further details).

The primary concern with these data is completeness. Although record counts indicate that data submission by the training sites has been more complete, current estimates of compliance rates are unavailable.

1.8. DISABILITY

Disability discharge data are compiled separately for each service at its disability agency. The Army and the Air Force disability diagnoses are coded using the Veterans Administration Schedule for Rating Disabilities (VASRD) codes. The Navy provides data on a diagnosis-specific request basis only rather than for all disability discharges. It is hoped that, as the services begin to collect data through the Joint Disability Evaluation and Tracking System (JDETS), data will be provided for all services in a standard format including ICD9 codes for disabling conditions. Below are service-specific descriptions of data collected.

Army
The Army Physical Disability Agency provides information on all disability cases. These data include personal identifiers (name, SSN), program (regular enlisted, academy, officer, etc.), and discharge information (date of discharge and medical condition codes). It is expected that the Army will collect data through the JDETS system within 6 months.

Air Force

The Air Force Physical Disability Division provides disability discharge for both officers and enlisted personnel. These data contain name, SSN, action date, and the primary medical condition code. There is no timeline known to AMSARA for the Air Force to begin using the JDETS system.

Navy

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. AMSARA has requested access to the full set of data now being collected through the JDETS system.

1.9. NAVY RTM/STASS

The Navy's Recruit Training Management (RTM) and Standard Training Activity Support System (STASS) data collection system contains a large volume of information of interest to AMSARA. For each individual entering the Navy, this system contains much of the background information contained in the MEPS data described above. The system also maintains dates of arrival at basic training, transfer dates and locations, indicators of any medical visits while in a training situation, and up-to-date information on duty locations of all Navy and Marines personnel. In addition to being a confirming source for MEPS and gain data on Navy personnel, this system could potentially allow for relatively easy prospective follow-up of study subjects, and examination of more detailed endpoints than is currently possible.

AMSARA staff members have met with RTM/STASS officials and received a thorough overview of the system. Based on this review, AMSARA has formally requested access to the data in this system.

2. DESCRIPTIVE STATISTICS

This section presents summary statistics on enlisted personnel data. The following conventions apply to all information presented.

- **All comparisons across services are tenuous, at best, due to differences in both procedures and data collection/reporting between the services.**
- All enlisted personnel statistics are for active duty only.
- 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 1998 who received a discharge, only those discharges with SSN matching a 1998 accession record SSN were included.
- All references to dates will refer to calendar year (CY). Those dates in Section 2.1 (MEPS/Gain) refer to the date of physical examination at the MEPS. For all other sections, dates refer to the time of accession onto active duty.
- 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 values are taken from the gain data, when available, and from MEPS otherwise. This should be particularly kept in mind when examining the MEPS/Gain tables in Section 2.1. Specifically, the percentages listed as having less than high school will be based on education at the time of MEPS application for those not accessed (i.e. those not having a gain record, but at the time of accession for those accessed).
- Age in Section 2.1 (MEPS/Gain tables) is from the time of application at MEPS. For all other sections, age is from the time of gain.
- The number of individuals accessed in Section 2.1 is different from Sections 2.3–2.5 because different populations were considered. In Table 2.1.1, the total of 542,228 refers to the number of new enlisted accessions who had a physical examination at a MEPS station in 1995–1998. In Sections 2.3–2.5, the total of 615,080 accessed applicants refers to all new enlisted accessions with a gain record in 1995–1998, regardless of their physical examination date.
- Results derived for CY 1998 may be inaccurate due to lack of complete follow-up data. For example, gain records for 1998 MEPS applicants were available only for the first quarter of 1999, resulting in an underestimate of accession percentages.

2.1. MEPS/Gain

There were more than 900,000 applicants for the enlisted services who were examined for medical fitness at MEPS in CYs 1995-1998. Data on these applicants were merged with gain data provided by DMDC to examine accession patterns. At least 58.3% of the applicants in 1995–1998 were admitted and subsequently gained onto active duty during the same time; 13.2% 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 1.3 for details).

In addition, some of those individuals receiving a medical exam at MEPS in 1998 would not be expected to begin active duty until sometime in 1999, thus reducing the calculated accession rates. At the time these analyses were performed, gain data were available through the first quarter of CY 1999.

TABLE 2.1.1. ENLISTED APPLICANTS AT MEPS WHO RECEIVED A MEDICAL EXAMINATION IN 1995–1998

	Total	Percentage
All applicants	929,904	100.0
Applicants who accessed	542,228	58.3*
Did not access, physically disqualified	122,523	13.2
Did not access, but physically qualified	265,153	28.5+

*May be an underestimate because DMDC gain data for Army in 1997 appear to be incomplete.
+May be an overestimate because DMDC gain data for Army in 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 1995–1998 are shown in Tables 2.1.2–2.1.4. The most common traits of applicants are male (80.0%), age 17–20 (71.4%), and white (70.7%). 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 81.9% of accessions versus 80% of applicants. Accession percentages differed slightly by race and AFQT score and more so by age group. The difference by AFQT score may be partly due to rules governing accession of applicants with lower scores. A large difference also occurred in education level percentages, probably reflecting the fact that many of the applicants are in high school at the time of application, but have completed high school by the time of accession.

TABLE 2.1.2. DEMOGRAPHIC CHARACTERISTICS OF ENLISTED APPLICANTS WHO RECEIVED A MEDICAL EXAMINATION IN 1995–1998: GENDER (IN %)

Gender	All applicants	Applicants who accessed	Did not access, physically disqualified	Did not access, but physically qualified
Male	80.0	81.9	76.1	77.7
Female	20.0	18.1	23.9	22.3

TABLE 2.1.3. DEMOGRAPHIC CHARACTERISTICS OF ENLISTED APPLICANTS WHO RECEIVED A MEDICAL EXAMINATION IN 1995–1998: 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	72.3	68.6	70.8
21–25 yr	22.7	23.2	23.8	21.2
26–30 yr	4.6	3.7	5.7	6.1
>30 yr	1.3	0.8	1.8	1.9

TABLE 2.1.4. DEMOGRAPHIC CHARACTERISTICS OF ENLISTED APPLICANTS
WHO RECEIVED A MEDICAL EXAMINATION IN 1995–1998: RACE (IN %)

Race	All applicants	Applicants who accessed	Did not access, physically disqualified	Did not access, but physically qualified
White	70.7	71.2	70.1	70.0
Black	19.5	18.8	21.0	20.1
Other	9.8	9.9	8.9	9.9

Table 2.1.5 shows that most applicants (75.2%) had a high school diploma with no college, although 20.3% of applicants had not completed high school at the time of application. A high percentage of the gained population (91.8%) had a high school education.

TABLE 2.1.5. DEMOGRAPHIC CHARACTERISTICS OF ENLISTED APPLICANTS
WHO RECEIVED A MEDICAL EXAMINATION IN 1995–1998: EDUCATION LEVEL
(IN %)

Education level	All applicants	Applicants who accessed	Did not access, physically disqualified	Did not access, but physically qualified
Less than HS	20.3	2.9	38.2	46.8
HS diploma	75.2	91.8	58.8	49.7
Some college	2.4	3.6	0.7	0.7
Bachelor	1.9	1.5	2.1	2.6
Graduate	0.1	0.1	0.2	0.2

Table 2.1.6 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 of applicants 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 2.1.6. DEMOGRAPHIC CHARACTERISTICS OF ENLISTED APPLICANTS WHO
RECEIVED A MEDICAL EXAMINATION IN 1995–1998: AFQT CATEGORY (IN %)

Percentile score	All applicants	Applicants who accessed	Did not access, physically disqualified	Did not access, but physically qualified
93–99	4.7	5.4	3.6	3.9
65–92	34.8	36.8	32.1	32.1
50–64	27.3	28.1	27.3	25.9
31–49	29.9	28.9	32.1	31.0
21–30	2.7	0.8	4.2	5.6
16–20	0.3	0.0	0.5	1.0
10–15	0.1	0.0	0.2	0.4
01–09	0.0	0.0	0.1	0.1

Tables 2.1.7–2.1.12 show results analogous to the above for each year in 1995–1998. As shown in Table 2.1.7, the accession percentage is considerably lower for 1998, which may be due to the fact that some individuals with medical examinations in 1998 may not have been gained onto active duty until sometime in 1999. At the time of this report, gain data were only available for the first quarter of CY 1999.

TABLE 2.1.7. ENLISTED APPLICANTS AT MEPS WHO RECEIVED A MEDICAL EXAMINATION

	1995		1996		1997		1998	
	Count	%	Count	%	Count	%	Count	%
All applicants	228,659	100.0	248,225	100.0	228,055	100.0	224,965	100.0
Applicants who accessed	151,581	66.3	160,393	64.6	129,662	56.9	100,592	44.7
Did not access, physically disqualified	27,376	12.0	30,168	12.2	30,240	13.3	34,739	15.4
Did not access, but physically qualified	49,702	21.8	57,664	23.2	68,153	29.9	89,634	39.8

Table 2.1.8 shows that the accession percentages by gender are not significantly different over 1995-1998.

TABLE 2.1.8. 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	79.7	82.1	74.7	75.1
	Female	20.3	17.9	25.3	24.9
1996	Male	79.7	81.9	75.3	75.8
	Female	20.3	18.1	24.7	24.2
1997	Male	80.6	82.9	76.3	78.3
	Female	19.4	17.1	23.7	21.8
1998	Male	79.9	80.6	77.7	80.0
	Female	20.1	19.4	22.4	20.0

Table 2.1.9 shows the age group distribution of applicant and accessed populations. Comparing accession percentages to applicant percentages, the older groups have increased accession rates over the 1995-1998 period.

TABLE 2.1.9. 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	70.5	72.7	67.5	65.3
	21–25 yr	24.3	23.3	25.8	26.7
	26–30 yr	4.1	3.3	5.1	6.1
	>30 yr	1.1	0.7	1.7	1.9
1996	17–20 yr	69.3	71.8	66.5	63.9
	21–25 yr	24.0	23.5	25.1	25.1
	26–30 yr	5.2	3.9	6.3	8.2
	>30 yr	1.5	0.9	2.1	2.8
1997	17–20 yr	71.4	74.8	66.7	67.1
	21–25 yr	22.0	20.9	24.5	23.1
	26–30 yr	5.2	3.6	6.6	7.5
	>30 yr	1.4	0.7	2.2	2.3
1998	17–20 yr	74.5	69.0	73.8	81.2
	21–25 yr	20.2	25.5	20.7	14.1
	26–30 yr	4.3	4.5	4.9	3.8
	>30 yr	1.1	1.0	1.3	1.0

Table 2.1.10 shows the distribution of applicant and accessed populations by race. The percentage of minority applicants and accessed population has increased over 1995-1998.

TABLE 2.1.10. 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
	White	73.1	73.5	72.2	72.4
1995	Black	18.8	18.2	20.4	19.8
	Other	8.1	8.3	7.4	7.9
	White	70.9	71.2	70.1	70.6
1996	Black	19.7	19.1	21.3	20.3
	Other	9.4	9.7	8.6	9.1
	White	69.7	70.8	69.1	67.9
1997	Black	19.9	18.3	21.9	21.9
	Other	10.5	10.9	9.1	10.2
	White	69.2	68.6	69.6	69.8
1998	Black	19.5	20.1	20.3	18.7
	Other	11.2	11.3	10.2	11.5

Table 2.1.11 shows the distribution of applicants and accessions over time. The percentage of applicants and accessions with less than a high school degree has increased over the period of 1995-1998.

TABLE 2.1.11. DEMOGRAPHIC CHARACTERISTICS OF ENLISTED APPLICANTS WHO RECEIVED A MEDICAL EXAMINATION: EDUCATION LEVEL (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	13.0	0.9	34.8	36.9
	HS diploma	81.8	93.2	62.1	58.8
	Some college	2.9	4.0	0.8	0.9
	Bachelor	2.2	1.9	2.2	3.2
	Graduate	0.1	0.1	0.1	0.2
1996	Less than HS	15.7	1.8	37.2	41.1
	HS diploma	79.7	93.0	59.9	55.1
	Some college	2.6	3.7	0.7	0.7
	Bachelor	1.9	1.5	2.1	2.9
	Graduate	0.1	0.1	0.1	0.2
1997	Less than HS	18.8	4.6	36.3	38.1
	HS diploma	77.1	91.1	60.5	58.1
	Some college	2.2	3.3	0.7	0.8
	Bachelor	1.7	1.0	2.4	2.8
	Graduate	0.1	0.1	0.2	0.3
1998	Less than HS	34.2	5.6	43.6	62.5**
	HS diploma	62.0	89.1	53.9	34.9
	Some college	1.9	3.5	0.7	0.6
	Bachelor	1.7	1.7	1.7	1.8
	Graduate	0.1	0.1	0.2	0.1

*The percentage of applicants not having graduated high school is high among the populations not accessed, as the data on these populations is only available at the time of application. Some of these may have completed high school after application for service.

**This percentage seems large compared to that of analogous percentages for years 1995-1997. A possible reason is that gain records were not available at the time of this report for all of those applying in 1998, and some of these individuals will have gone on to complete high school and enlist.

Table 2.1.12 shows the distribution of AFQT scores by year. The applicant population is increasingly made up of individuals with lower AFQT scores.

TABLE 2.1.12. 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	6.3	7.4	3.9	4.4
	65–92	35.8	37.2	33.4	33.1
	50–64	26.8	27.2	26.8	25.7
	31–49	28.7	27.6	32.2	30.0
	21–30	2.1	0.7	3.3	5.7
	16–20	0.2	0.0	0.3	0.8
	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	37.3	32.5	32.1
	50–64	26.9	27.8	26.6	24.4
	31–49	29.8	29.2	31.7	30.5
	21–30	2.9	0.9	4.8	7.4
	16–20	0.3	0.0	0.6	1.1
	10–15	0.1	0.0	0.3	0.4
	01–09	0.0	0.0	0.1	0.1
1997	93–99	4.2	4.4	3.6	4.0
	65–92	34.6	36.8	32.0	31.7
	50–64	28.2	29.1	28.0	26.6
	31–49	29.9	29.3	31.6	30.6
	21–30	2.6	0.6	4.0	5.7
	16–20	0.4	0.0	0.6	1.0
	10–15	0.1	0.0	0.2	0.4
	01–09	0.0	0.0	0.1	0.1
1998	93–99	4.0	4.8	3.4	3.5
	65–92	33.2	35.4	30.7	31.9
	50–64	27.5	28.3	27.7	26.4
	31–49	31.3	30.2	32.7	32.1
	21–30	3.2	1.3	4.5	4.8
	16–20	0.5	0.0	0.7	0.9
	10–15	0.2	0.0	0.3	0.4
	01–09	0.1	0.0	0.1	0.1

Table 2.1.13 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 1995–1998 was weight, followed by history of *Cannabis* use and lung/chest problems (including asthma). Percentages by year are also shown.

TABLE 2.1.13. PROPORTION OF MEPS MEDICAL DISQUALIFICATIONS BY CAUSE (IN %)

Cause	1995–1998	1995	1996	1997	1998
Weight	19.7	16.2	20.0	21.3	20.5
Cannabis	12.7	9.1	9.1	13.8	18.0
Lungs/chest	7.0	7.8	7.1	6.6	6.5
Lower extremities	6.5	7.7	7.0	6.3	5.4
Audiometer	6.0	6.9	6.0	5.2	5.9
Feet	4.6	5.9	4.5	4.1	4.3
Skin/lymphatics	4.4	4.2	4.8	4.4	4.1
Blood pressure	3.4	2.5	4.3	4.1	2.7
Upper extremities	3.3	4.0	3.5	3.3	2.6
Other psyhiatric failure	3.0	5.8	2.4	1.1	3.4
Refraction	2.8	3.3	2.9	2.7	2.5
Genitourinary system	2.4	2.6	2.6	2.3	2.2
Abdomen/viscera	2.3	2.5	2.4	2.1	2.1
Other tests (pregnancy)	2.3	2.6	2.4	2.2	2.1
Spine, other musculoskeletal	2.1	2.7	2.1	1.9	1.6
Psychiatric	2.0	0.5	3.0	3.4	0.8
Neurologic	1.7	2.0	1.8	1.5	1.6
Cocaine test positive	1.6	1.3	1.3	1.5	2.2
Pelvic (female only)	1.4	1.8	1.6	1.2	0.9
Heart	1.1	1.3	1.2	0.9	0.9
Pulse	1.1	0.4	1.1	0.8	0.7

2.2. Waiver

Those applicants medically disqualified at the MEPS may request an accession waiver for the disqualifying condition(s) from a service-specific waiver authority. Tables 2.2.1–2.2.12 show the counts of accession waivers granted in 1995–1998 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 2.2.1 shows the numbers of waivers granted, by service waiver authority, for 1995–1998. 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 compare the odds of accession according to which service granted the waiver. Relative to those waived by the Army, accession was more likely for those waived by the Air Force (odds ratio 2.59; 95% CI: 2.32-2.89) and less likely for those waived by the Navy (odds ratio 0.80; 95% CI: 0.75–0.86).

TABLE 2.2.1. ENLISTED APPLICANTS WHO RECEIVED A WAIVER IN 1995–1998*

	All applicants*		Applicants who accessed		Applicants who did not access		Odds ratio (vs Army)	95% CI
	Count	%	Count	%	Count	%		
Army	12,876	100	7,938	61.6	4,938	38.9	1.00	
Navy	5,539	100	3,119	56.3	2,420	43.7	0.80	0.75, 0.86
Air Force	2,166	100	1,746	80.6	420	19.4	2.59	2.32, 2.89
Total	20,497		12,744		7,753			

* One applicant may receive a waiver from more than one service, hence the sum 12,876 + 5,539 + 2,166 = 20,581 is larger than 20,497, the number of applicants receiving waiver.

Tables 2.2.2–2.2.6 show waiver counts, percent accessed, and odds ratios by demographic features for 1995–1998. Among those granted a waiver, females were significantly less likely to access than males (odds ratio 0.90; 95% CI: 0.84-0.97). There were no significant differences between age groups or races. Those with a high school education were more likely to access than those without, and accession likelihood decreased with decreasing categories of AFQT percentile score.

TABLE 2.2.2. DEMOGRAPHIC CHARACTERISTICS OF ENLISTED APPLICANTS WHO RECEIVED A WAIVER IN 1995–1998: GENDER

Gender	All applicants		Applicants who accessed		Applicants who did not access		Odds ratio (vs male)	95% CI
	Count	%	Count	%	Count	%		
Male	16,394	80.1	10,263	80.7	6,131	79.1	1.00	
Female	4,069	19.9	2,447	19.3	1,622	20.9	0.90	0.84, 0.97

TABLE 2.2.3. DEMOGRAPHIC CHARACTERISTICS OF ENLISTED APPLICANTS WHO RECEIVED A WAIVER IN 1995–1998: 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	14,760	72.1	9,078	71.3	5,682	73.4	1.00	
21–25 yr	4,441	21.7	2,920	22.9	1,521	19.6	1.20	1.12, 1.29
26–30 yr	974	4.8	571	4.5	403	5.2	0.89	0.78, 1.01
>30 yr	301	1.5	162	1.3	139	1.8	0.73	0.58, 0.92

TABLE 2.2.4. DEMOGRAPHIC CHARACTERISTICS OF ENLISTED APPLICANTS WHO RECEIVED A WAIVER IN 1995–1998: RACE

Race	All applicants		Applicants who accessed		Applicants who did not access		Odds ratio (vs white)	95% CI
	Count	%	Count	%	Count	%		
White	14,864	72.7	9,212	72.5	5,652	72.9	1.00	
Black	3,793	18.5	2,359	18.6	1,434	18.5	1.01	0.94, 1.09
Other	1,791	8.8	1,128	8.9	663	8.6	1.04	0.94, 1.16

TABLE 2.2.5. DEMOGRAPHIC CHARACTERISTICS OF ENLISTED APPLICANTS WHO RECEIVED A WAIVER IN 1995–1998: EDUCATION LEVEL*

Education level	All applicants		Applicants who accessed		Applicants who did not access		Odds ratio (vs HS)	95% CI
	Count	%	Count	%	Count	%		
Less than HS	3,329	16.7	443	3.6	2,886	37.2	0.06	0.05, 0.07
HS diploma	15,489	77.6	10,979	90.0	4,510	58.2	1.00	
At least some college	1,137	5.7	783	6.4	354	4.6	0.91	0.80, 1.04

*For applicants who were accessed, the education level was obtained at gain, but for applicants who did not access, education level at the date of physical examination was used. Hence the results in tables 2.2.5 and 2.2.11 should be used with caution.

TABLE 2.2.6. DEMOGRAPHIC CHARACTERISTICS OF ENLISTED APPLICANTS WHO
RECEIVED A WAIVER IN 1995–1998: 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	1,194	5.8	756	5.9	438	5.7	1.00	
65–92	7,731	37.8	4,929	38.7	2,802	36.2	1.02	0.90, 1.16
50–64	5,843	28.5	3,704	29.1	2,139	27.7	1.00	0.88, 1.14
31–49	5,511	26.9	3,275	25.7	2,236	28.9	0.85	0.75, 0.97
21–30	178	0.9	68	0.5	110	1.4		
16–20	6	0.0	0	0.0	6	0.1	0.34	0.24, 0.45
10–15	3	0.0	0	0.0	3	0.0		
01–09	1	0.0	0	0.0	1	0.0		

Tables 2.2.7–2.2.12 show results analogous to the above, separately by year of physical examination, rather than by year waived, which is different from the 1998 Annual Report. The pattern of trend by year is complex, which may reflect a waiver policy change. Further investigation is needed for addressing this matter.

TABLE 2.2.7. 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	3,081	100	1,971	64.0	1,110	36.0	1.00	
	Navy	449	100	336	74.8	113	25.2	1.68	1.34, 2.09
	Air Force	523	100	437	83.6	86	16.4	2.86	2.26, 3.62
	Total	4,053		2,744		1,309			
1996	Army	3,315	100	2,324	70.1	991	29.9	1.00	
	Navy	833	100	597	71.7	236	28.3	1.08	0.91, 1.28
	Air Force	516	100	435	84.3	81	15.7	2.29	1.80, 2.92
	Total	4,656		3,351		1,305			
1997	Army	3,543	100	1,931	54.5	1,612	45.5	1.00	
	Navy	1,869	100	1,285	68.8	584	31.2	1.84	1.63, 2.07
	Air Force	633	100	527	83.3	106	16.7	4.15	3.38, 5.10
	Total	6,018		3,722		2,296			
1998	Army	2,937	100	1,712	58.3	1,225	41.7	1.00	
	Navy	2,388	100	901	37.7	1,487	62.3	0.43	0.34, 0.48
	Air Force	494	100	347	70.2	147	29.8	1.69	1.38, 2.07
	Total	5,770		2,927		2,843			

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TABLE 2.2.8. 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	3,107	77.2	2,123	78.1	984	75.2	1.00	
	Female	920	22.8	595	21.9	325	24.8	0.85	0.73, 0.99
1996	Male	3,634	78.2	2,646	79.1	988	75.7	1.00	
	Female	1,016	21.8	699	20.9	317	24.3	0.82	0.71, 0.96
1997	Male	4,932	82.0	3,108	83.6	1,824	79.4	1.00	
	Female	1,084	18.0	612	16.5	472	20.6	0.76	0.67, 0.87
1998	Male	4,721	81.8	2,386	81.5	2,335	82.1	1.00	
	Female	1,049	18.2	541	18.5	508	17.9	1.04	0.91, 1.19

TABLE 2.2.9. 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	2,897	71.6	2,011	73.4	886	67.7	1.00	
	21–25 yr	920	22.7	596	21.8	324	24.8	0.81	0.69, 0.95
	26–30 yr	179	4.4	106	3.9	73	5.6	3.97	2.92, 5.41
	>30 yr	51	1.3	26	0.9	25	1.9	2.84	1.65, 4.89
1996	17–20 yr	3,322	71.4	2,368	70.7	954	73.3	1.00	
	21–25 yr	1,033	22.2	783	23.4	250	19.2	1.26	1.07, 1.48
	26–30 yr	227	4.9	153	4.6	74	5.7	0.83	0.63, 1.11
	>30 yr	71	1.5	47	1.4	24	1.8	0.79	0.48, 1.30
1997	17–20 yr	4,320	71.9	2,738	73.7	1,582	69.0	1.00	
	21–25 yr	1,297	21.6	773	20.8	524	22.8	0.85	0.75, 0.97
	26–30 yr	302	5.0	161	4.3	141	6.2	0.66	0.52, 0.83
	>30 yr	89	1.5	42	1.1	47	2.1	0.52	0.34, 0.78
1998	17–20 yr	4,221	73.2	1,961	67.0	2,260	79.6	1.00	
	21–25 yr	1,191	20.7	768	26.2	423	14.9	2.09	1.83, 2.39
	26–30 yr	266	4.6	151	5.2	115	4.1	1.51	1.18, 1.94
	>30 yr	90	1.6	47	1.6	43	1.5	1.26	0.83, 1.91

TABLE 2.2.10. 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	3,050	75.8	2,073	76.4	977	74.6	1.00	
	Black	667	16.6	426	15.7	241	18.4	0.83	0.70, 1.00
	Other	307	7.6	216	7.9	91	7.0	1.12	0.87, 1.45
1996	White	3,386	72.9	2,433	72.8	953	73.1	1.00	
	Black	875	18.8	630	18.9	245	18.8	1.01	0.85, 1.19
	Other	383	8.25	277	8.3	106	8.1	1.02	0.81, 1.30
1997	White	4,261	70.9	2,647	71.2	1,614	70.4	1.00	
	Black	1,209	20.1	714	19.2	495	21.6	0.88	0.77, 1.00
	Other	541	9.0	357	9.6	184	8.0	1.18	0.98, 1.43
1998	White	4,167	72.2	2,059	70.4	2,108	74.2	1.00	
	Black	1,042	18.1	589	20.1	453	15.9	1.33	1.16, 1.53
	Other	560	9.7	278	9.5	282	9.9	1.01	0.85, 1.20

TABLE 2.2.11. DEMOGRAPHIC CHARACTERISTICS OF ENLISTED APPLICANTS WHO
RECEIVED A WAIVER: EDUCATION LEVEL

Year	Education level	All applicants		Applicants who accessed		Applicants who did not access		Odds ratio (vs HS)	95% CI
		Count	%	Count	%	Count	%		
1995	Less than HS	361	9.2	18	0.7	343	26.2	0.02	0.01, 0.03
	HS diploma	3,255	83.3	2,366	91.1	889	67.9	1.00	
	Some college	291	7.45	214	8.23	77	5.9	1.04	0.80, 1.37
1996	Less than HS	491	11.4	59	2.0	432	33.1	0.04	0.03, 0.05
	HS diploma	3,554	82.6	2,746	91.7	808	61.9	1.00	
	Some college	256	5.95	191	6.37	65	5.0	0.87	0.65, 1.16
1997	Less than HS	810	13.5	176	4.8	634	27.6	0.13	0.11, 0.15
	HS diploma	4,872	81.2	3,331	89.9	1,541	67.1	1.00	
	Some college	322	5.37	201	5.42	121	5.27	0.77	0.61, 0.97
1998	Less than HS	1,667	29.0	190	6.5	1,477	52.0	0.07	0.05, 0.08
	HS diploma	3,808	66.3	2,536	87.4	1,272	44.8	1.00	
	Some college	268	4.7	177	6.1	91	3.2	0.98	0.75, 1.27

TABLE 2.2.12. 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	258	6.4	166	6.1	92	7.0	1.00	
	65–92	1,618	39.9	1,117	40.7	501	38.3	1.24	0.94, 1.63
	50–64	1,146	28.3	794	28.9	352	26.9	1.25	0.94, 1.66
	31–49	976	24.1	651	23.7	325	25.5	1.11	0.83, 1.48
	21–30	49	1.2	16	0.6	1	0.1		
	16–20	1	0.0	0	0.0	2	0.1	0.24	0.13, 0.44
	10–15	2	0.0	0	0.0	1	0.1		
	01–09	1	0.0	0	0.0	0	0.0		
1996	93–99	271	5.8	204	6.1	67	5.2	1.00	
	65–92	1,783	38.4	1,327	39.7	456	35.2	0.96	0.71, 1.29
	50–64	1,333	28.7	962	28.8	371	28.6	0.85	0.63, 1.15
	31–49	1,199	25.8	825	24.7	374	28.8	0.72	0.54, 0.98
	21–30	52	1.1	26	0.8	26	2.0		
	16–20	3	0.0	0	0.0	3	0.2	0.29	0.17, 0.53
	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	338	5.6	202	5.4	136	5.9	1.00	
	65–92	2,237	37.2	1,421	38.2	816	35.7	1.17	0.93, 1.48
	50–64	1,732	28.8	1,093	29.4	639	27.9	1.15	0.91, 1.46
	31–49	1,659	27.6	990	26.6	669	29.2	1.00	0.79, 1.27
	21–30	41	0.7	13	0.4	28	1.2		
	16–20	0	0.0	0	0.0	0	0.0	0.30	0.16, 0.59
	10–15	1	0.0	0	0.0	1	0.0		
	01–09	0	0.0	0	0.0	0	0.0		
1998	93–99	327	5.7	184	6.3	143	5.0	1.00	
	65–92	2,093	36.3	1,064	36.4	1,029	36.2	0.80	0.64, 1.02
	50–64	1,632	28.3	855	29.2	777	27.3	0.86	0.67, 1.09
	31–49	1,677	29.1	809	27.7	868	30.5	0.72	0.57, 0.92
	21–30	36	0.6	13	0.4	23	0.8		
	16-20	2	0.0	0	0.0	2	0.1	0.40	0.20, 0.87
	10-15	0	0.0	0	0.0	0	0.0		
	01-09	0	0.0	0	0.0	0	0.0		

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2.3. 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.

The censoring procedure used for evaluating hospitalization rates is different from that used in last year's annual report. For this year, the censoring date is the gain date plus 365 days or December 31, 1998, whichever comes first. In last year's report the censor date was December 31 of the gain year.

Table 2.3.1 shows the rates of hospitalization during the first year of service for 1995–1998, by service. Relative risks are used to compare rates between services. The likelihoods of hospitalization during the first year of service in the Navy, Marines, and Air Force were significantly lower than in the Army. (Relative risk here is the ratio of the admission rates.)

TABLE 2.3.1. HOSPITAL ADMISSION RATES (PER 1,000 PERSON-YEARS) FOR ENLISTED PERSONNEL WITHIN 1 YEAR OF SERVICE IN 1995–1998

Service	Total accessed	Admission rate	Standard error	Relative risk (vs Army)	95% CI
Army	215,388	98.64	0.78	1.00	
Navy	152,384	56.94	0.71	0.58	0.56, 0.59
Marines	123,639	46.98	0.70	0.48	0.46, 0.49
Air Force	123,669	62.42	0.81	0.63	0.61, 0.65

Tables 2.3.2–2.3.6 show hospital admissions by demographic and other factors for 1995–1998. Females had a significantly higher likelihood of hospitalization than males (addressed in detail in Section 4.4). Higher age groups had increasingly higher likelihood of hospital admissions relative to the 17- to 20-year age group. Whites were less likely to be hospitalized than blacks and more likely than other races. No differences were found in hospitalization rates by education level. Finally, there were generally no significant differences in likelihood of hospitalization by AFQT scores. This surprising result may be due to low counts of enlistees with AFQT scores below 31.

TABLE 2.3.2. HOSPITAL ADMISSION RATES (PER 1,000 PERSON-YEARS) FOR ENLISTED PERSONNEL WITHIN 1 YEAR OF SERVICE IN 1995–1998: GENDER

Gender	Total accessed	Admission rate	Standard error	Relative risk (vs males)	95% CI
Male	506,426	61.18	0.40	1.00	
Female	108,530	116.15	1.22	1.90	1.85, 1.95

TABLE 2.3.3. HOSPITAL ADMISSION RATES (PER 1,000 PERSON-YEARS) FOR ENLISTED PERSONNEL WITHIN 1 YEAR OF SERVICE IN 1995–1998: AGE

Age	Total accessed	Admission rate	Standard error	Relative risk (vs 17–20)	95% CI
17–20 yr	455,900	66.68	0.44	1.00	
21–25 yr	131,915	78.03	0.88	1.17	1.14, 1.20
26–30 yr	21,825	95.89	2.46	1.44	1.37, 1.51
>30 yr	5,160	110.00	5.52	1.65	1.49, 1.82

TABLE 2.3.4. HOSPITAL ADMISSION RATES (PER 1,000 PERSON-YEARS) FOR ENLISTED PERSONNEL WITHIN 1 YEAR OF SERVICE IN 1995–1998: RACE

Race	Total accessed	Admission rate	Standard error	Relative risk (vs white)	95% CI
White	440,704	70.47	0.46	1.00	
Black	113,085	75.62	0.93	1.07	1.04, 1.10
Other	59,880	60.68	1.15	0.86	0.83, 0.90

TABLE 2.3.5. HOSPITAL ADMISSION RATES (PER 1,000 PERSON-YEARS) FOR ENLISTED PERSONNEL WITHIN 1 YEAR OF SERVICE IN 1995–1998: EDUCATION LEVEL WHEN APPLYING

Education level	Total accessed	Admission rate	Standard error	Relative risk (vs less than HS)	95% CI
Less than HS	16,448	70.34	2.71	1.01	0.94, 1.10
HS diploma	550,108	69.33	0.41	1.00	
Some college	21,362	58.50	1.83		
Bachelor's	9,343	67.15	3.06	0.88	0.73, 1.06
Graduate	531	58.31	12.50		

TABLE 2.3.6. HOSPITAL ADMISSION RATES (PER 1,000 PERSON-YEARS) FOR ENLISTED PERSONNEL WITHIN 1 YEAR OF SERVICE IN 1995–1998: AFQT CATEGORY

Percentile score	Total accessed	Admission rate	Standard error	Relative risk (vs 93–99)	95% CI
93–99	34,157	74.56	1.64	1.00	
65–92	220,302	67.17	0.63	0.90	0.86, 0.95
50–64	168,478	74.69	0.77	1.00	0.96, 1.05
31–49	171,068	70.82	0.75	0.95	0.91, 1.00
21–30	4,768	89.80	5.13		
16–20	77	101.05	45.67		
10–15	26	93.75	66.57	1.27	0.57, 2.86
01–09	0	0	0		

Tables 2.3.7–2.3.12 show hospitalization during the first year of service for 1995–1998 individually. For this year, the censoring date is the gain date plus 365 days or December 31, 1998, whichever comes first. In last year's report the censor date was December 31 of the gain year. The number of hospitalization records dropped sharply beginning in March 1997, and this fact is reflected in the Tables 2.3.7–2.3.12. Hospitalization rates are noticeably lower in 1997 and 1998 than in 1995 and 1996. Patterns in the yearly results are similar to those observed in the overall rates presented above. When broken down by year, admission rates are generally higher for those with lower AFQT scores.

TABLE 2.3.7. 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	48,291	129.07	1.78	1.00	
	Navy	35,968	65.81	1.32	0.51	0.49, 0.53
	Marines	31,858	58.67	1.43	0.45	0.43, 0.48
	Air Force	30,804	94.12	1.89	0.73	0.71, 0.75
1996	Army	65,955	134.45	1.54	1.00	
	Navy	41,486	71.62	1.37	0.53	0.51, 0.56
	Marines	28,778	56.15	1.49	0.42	0.39, 0.44
	Air Force	30,683	74.83	1.67	0.56	0.53, 0.58
1997	Army	40,439	63.86	1.32	1.00	
	Navy	40,814	40.77	1.06	0.64	0.60, 0.68
	Marines	32,930	37.38	1.16	0.59	0.54, 0.63
	Air Force	30,927	33.17	1.10	0.52	0.48, 0.56
1998	Army	60,703	53.49	1.42	1.00	
	Navy	34,116	44.26	1.73	0.83	0.74, 0.89
	Marines	30,073	36.16	1.69	0.68	0.60, 0.74
	Air Force	31,255	41.36	1.70	0.77	0.69, 0.84

TABLE 2.3.8. 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	122,194	78.62	0.84	1.00	
	Female	24,659	142.32	2.55	1.81	1.74, 1.89
1996	Male	136,993	82.13	0.82	1.00	
	Female	29,879	149.48	2.44	1.82	1.75, 1.89
1997	Male	119,677	40.07	0.62	1.00	
	Female	25,426	69.17	1.79	1.72	1.63, 1.83
1998	Male	127,562	41.40	0.86	1.00	
	Female	28,566	66.06	2.34	1.60	1.47, 1.63

TABLE 2.3.9. 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	109,147	84.79	0.89	1.00	
	21–25 yr	31,952	102.46	2.19	1.21	1.15, 1.27
	26–30yr	4,519	135.55	6.63	1.60	1.45, 1.76
	>30 yr	1,072	149.99	14.14	1.77	1.47, 2.13
1996	17–20 yr	120,415	87.20	0.87	1.00	
	21–25 yr	38,403	112.57	2.07	1.29	1.24, 1.34
	26–30 yr	6,432	132.79	5.39	1.52	1.40, 1.65
	>30 yr	1,615	160.90	11.55	1.85	1.60, 2.13
1997	17–20 yr	108,293	42.33	0.64	1.00	
	21–25 yr	30,573	53.62	1.63	1.27	1.19, 1.35
	26–30 yr	5,114	69.50	4.36	1.64	1.45, 1.86
	>30 yr	1,126	60.70	8.37	1.43	1.09, 1.88
1998	17–20 yr	118,045	44.06	0.89	1.00	
	21–25 yr	30,987	49.99	2.11	1.13	1.04, 1.24
	26–30 yr	5,760	59.53	5.30	1.35	1.13, 1.62
	>30 yr	1,347	73.94	11.79	1.68	1.22, 2.30

TABLE 2.3.10. 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	109,371	88.21	0.96	1.00	
	Black	25,985	94.32	1.96	1.07	1.02, 1.12
	Other	11,442	82.26	2.78	0.93	0.87, 1.00
1996	White	119,922	92.91	0.95	1.00	
	Black	31,669	100.54	1.87	1.08	1.04, 1.13
	Other	15,179	84.98	2.47	0.91	0.86, 0.97
1997	White	103,167	46.24	0.72	1.00	
	Black	25,581	43.39	1.34	0.94	0.88, 1.00
	Other	15,299	40.28	1.70	0.87	0.80, 0.95
1998	White	108,244	47.64	1.01	1.00	
	Black	29,850	44.35	1.83	0.93	0.85, 1.02
	Other	17,960	37.33	2.15	0.78	0.69, 0.88

TABLE 2.3.11. HOSPITAL ADMISSION RATES (PER 1,000 PERSON-YEARS) FOR
ENLISTED PERSONNEL WITHIN 1 YEAR OF SERVICE: EDUCATION LEVEL

		Total accessed	Admission rate	Standard error	Relative risk	95% CI
1995	Less than HS	868	80.66	10.40	0.91	0.70, 1.17
	HS diploma	133,462	89.06	0.85	1.00	
	Some college	5,932	85.08	3.99	0.96	0.87, 1.05
	Bachelor's	2,741	85.75	6.11		
	Graduate	133	68.53	26.05		
1996	Less than HS	1,423	82.47	8.34	0.90	0.74, 1.10
	HS diploma	144,513	91.19	0.84	1.00	
	Some college	5,917	70.92	3.46	0.78	0.71, 0.86
	Bachelor's	3,158	74.57	5.20		
	Graduate	137	115.44	33.62		
1997	Less than HS	4,723	85.50	4.71	1.93	1.73, 2.16
	HS diploma	133,674	44.30	0.61	1.00	
	Some college	4,794	32.90	2.74	0.74	0.63, 0.88
	Bachelor's	1,221	31.72	5.53		
	Graduate	120	0	0		
1998	Less than HS	9,434	54.93	3.73	0.97	0.81, 1.15
	HS diploma	138,459	45.46	0.87	1.00	
	Some college	4,719	39.86	4.13	0.88	0.71, 1.08
	Bachelor's	2,223	45.58	6.68		
	Graduate	141	43.78	25.37		

TABLE 2.3.12. 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	13,386	74.03	3.10	1.00	
	65–92	53,402	88.03	1.31	1.19	1.02, 1.32
	50–64	38,633	94.35	1.61	1.27	1.15, 1.41
	31–49	37,567	88.93	1.55	1.20	1.03, 1.41
	21–30	804	101.66	12.22		
	16–20	6	26.01	188.75		
	10–15	4	0	0	1.15	0.91, 1.46
	01–09	0	0	0		
1996	93–99	8,059	78.88	3.06	1.00	
	65–92	61,800	88.65	1.26	1.12	1.04, 1.22
	50–64	45,725	97.19	1.58	1.23	1.13, 1.34
	31–49	47,233	98.76	1.57	1.25	1.15, 1.36
	21–30	1,440	115.20	6.08		
	16–20	25	149.78	22.56		
	10–15	7	81.84	33.56	1.30	1.17, 1.45
	01–09	0	0	0		
1997	93–99	6,138	35.66	2.33	1.00	
	65–92	51,847	44.83	0.97	1.26	1.07, 1.47
	50–64	39,978	47.82	1.18	1.34	1.14, 1.57
	31–49	40,154	44.01	1.13	1.23	1.05, 1.45
	21–30	795	50.26	4.13		
	16–20	10	45.18	10.39		
	10–15	7	30.76	17.80	1.12	0.92, 1.36
	01–09	0	62.42	31.36		
1998	93–99	6,574	39.75	3.38	1.00	
	65–92	53,253	42.74	1.32	1.08	0.90, 1.28
	50–64	44,142	49.56	1.63	1.25	1.04, 1.49
	31–49	46,114	47.51	1.58	1.20	1.00, 1.43
	21–30	1,729	46.37	4.59		
	16–20	36	24.09	17.08		
	10–15	8	63.27	37.01	1.08	0.89, 1.33
	01–09	0	0	0		

Tables 2.3.13–2.3.18 show hospitalization rates in 1995–1998 that have been recalculated to exclude admissions related to pregnancy, childbirth and puerperium. It can be seen in Table 2.3.14 that the rate for females is still significantly elevated relative to males, but the relative risk is reduced (See Section 4.4 for a more detailed examination). Results by service, age, race, education, and AFQT score are largely unaffected by exclusion of these diagnostic categories.

TABLE 2.3.13. HOSPITAL ADMISSION RATES (PER 1,000 PERSON-YEARS)
EXCLUDING FEMALE PELVIC DISEASE AND CHILDBIRTH FOR ENLISTED
PERSONNEL WITHIN 1 YEAR OF SERVICE IN 1995–1998

Service	Total accessed	Admission rate	Standard error	Relative risk	95% CI
Army	215,388	96.72	0.78	1.00	
Navy	152,384	55.89	0.70	0.58	0.56, 0.59
Marines	123,639	46.45	0.70	0.48	0.46, 0.50
Air Force	123,669	60.50	0.80	0.63	0.61, 0.64

TABLE 2.3.14. HOSPITAL ADMISSION RATES (PER 1,000 PERSON-YEARS)
EXCLUDING FEMALE PELVIC DISEASE AND CHILDBIRTH FOR ENLISTED
PERSONNEL WITHIN 1 YEAR OF SERVICE IN 1995–1998: GENDER

	Total accessed	Admission rate	Standard error	Relative risk	95% CI
Male	506,426	61.12	0.40	1.00	
Female	108,530	107.97	1.18	1.77	1.72, 1.81

TABLE 2.3.15. HOSPITAL ADMISSION RATES (PER 1,000 PERSON-YEARS)
EXCLUDING FEMALE PELVIC DISEASE AND CHILDBIRTH FOR ENLISTED
PERSONNEL WITHIN 1 YEAR OF SERVICE IN 1995–1998: AGE

Year	Total accessed	Admission rate	Standard error	Relative risk	95% CI
17–20 yr	455,900	65.29	0.44	1.00	
21–25 yr	131,915	76.54	0.87	1.17	1.14, 1.20
26–30 yr	21,825	93.85	2.43	1.44	1.36, 1.51
>30 yr	5,160	108.92	5.49	1.67	1.51, 1.84

TABLE 2.3.16. HOSPITAL ADMISSION RATES (PER 1,000 PERSON-YEARS)
EXCLUDING FEMALE PELVIC DISEASE AND CHILDBIRTH FOR ENLISTED
PERSONNEL WITHIN 1 YEAR OF SERVICE IN 1995–1998: RACE

Race	Total accessed	Admission rate	Standard error	Relative risk	95% CI
White	440,704	69.51	0.46	1.00	
Black	113,085	72.26	0.91	1.04	1.00, 1.07
Other	59,880	59.55	1.14	0.86	0.82, 0.89

TABLE 2.3.17. HOSPITAL ADMISSION RATES (PER 1,000 PERSON-YEARS) EXCLUDING FEMALE PELVIC DISEASE AND CHILDBIRTH FOR ENLISTED PERSONNEL WITHIN 1 YEAR OF SERVICE IN 1995–1998: EDUCATION LEVEL

Education level	Total accessed	Admission rate	Standard error	Relative risk	95% CI
Less than HS	16,448	69.21	2.69	1.02	0.94, 1.10
HS diploma	550,108	67.87	0.40	1.00	
Some college	21,362	57.64	1.82		
Bachelor's	9,343	66.19	3.04	0.89	0.74, 1.08
Graduate	531	58.31	12.50		

TABLE 2.3.18. HOSPITAL ADMISSION RATES (PER 1,000 PERSON-YEARS) EXCLUDING FEMALE PELVIC DISEASE AND CHILDBIRTH FOR ENLISTED PERSONNEL WITHIN 1 YEAR OF SERVICE IN 1995–1998: AFQT CATEGORY

Percentile score	Total accessed	Admission rate	Standard error	Relative risk	95% CI
93–99	34,157	73.80	1.63	1.00	
65–92	220,302	66.24	0.62	0.90	0.86, 0.95
50–64	168,478	72.74	0.76	0.99	0.94, 1.03
31–49	171,068	69.05	0.74	0.94	0.89, 0.98
21–30	4,768	88.07	5.08		
16–20	77	101.05	45.67		
10–15	26	93.75	66.57	1.28	0.57, 2.88
01–09	0	0	0		

Tables 2.3.19–2.3.24 show hospitalizations for 1995–1998 with data expanded to include admissions from the first year of service to within the first 2 years. As was the case in the analysis of the first year only, Army had higher rates than the other services, and females had higher rates than males. Hospitalization rates were higher by increasing age group. White enlistees had lower rates than blacks, and higher rates than other races, and generally those with lower AFQT scores had higher hospitalization rates.

TABLE 2.3.19. HOSPITAL ADMISSION RATES (PER 1,000 PERSON-YEARS) FOR ENLISTED PERSONNEL WITHIN 2 YEARS OF SERVICE IN 1995–1998

Service	Total accessed	Admission rate	Standard error	Relative risk	95% CI
Army	215,388	96.22	0.61	1.00	
Navy	152,384	61.30	0.58	0.64	0.62, 0.65
Marines	124,639	53.20	0.58	0.55	0.54, 0.57
Air Force	123,669	67.18	0.66	0.70	0.68, 0.71

TABLE 2.3.20. HOSPITAL ADMISSION RATES (PER 1,000 PERSON-YEARS) FOR
ENLISTED PERSONNEL WITHIN 2 YEARS OF SERVICE IN 1995–1998: GENDER

Gender	Total accessed	Admission rate	Standard error	Relative risk	95% CI
Male	506,426	58.05	0.30	1.00	
Female	108,530	148.03	1.11	2.55	2.51, 2.60

TABLE 2.3.21. HOSPITAL ADMISSION RATES (PER 1,000 PERSON-YEARS) FOR
ENLISTED PERSONNEL WITHIN 2 YEARS OF SERVICE IN 1995–1998: AGE

Age	Total accessed	Admission rate	Standard error	Relative risk	95% CI
17–20 yr	455,900	70.20	0.36	1.00	
21–25 yr	131,915	78.81	0.69	1.12	1.10, 1.17
26–30 yr	21,825	92.82	1.91	1.32	1.27, 1.38
>30 yr	5,160	98.86	4.14	1.41	1.30, 1.53

TABLE 2.3.22. HOSPITAL ADMISSION RATES (PER 1,000 PERSON-YEARS) FOR
ENLISTED PERSONNEL WITHIN 2 YEARS OF SERVICE IN 1995–1998: RACE

Race	Total accessed	Admission rate	Standard error	Relative risk	95% CI
White	440,704	71.04	0.36	1.00	
Black	113,085	86.07	0.78	1.21	1.18, 1.24
Other	59,880	63.06	0.93	0.89	0.86, 0.92

TABLE 2.3.23. HOSPITAL ADMISSION RATES (PER 1,000 PERSON-YEARS) FOR
ENLISTED PERSONNEL WITHIN 2 YEARS OF SERVICE IN 1995–1998:
EDUCATION LEVEL WHEN APPLYING

Education level	Total accessed	Admission rate	Standard error	Relative risk	95% CI
Less than HS	16,448	75.21	2.42	1.04	0.97, 1.11
HS diploma	550,108	72.46	0.33	1.00	
Some college	21,362	66.72	1.51		
Bachelor's	9,343	62.62	2.28	0.87	0.76, 1.00
Graduate	531	59.98	10.15		

TABLE 2.3.24. HOSPITAL ADMISSION RATES (PER 1,000 PERSON-YEARS) FOR ENLISTED PERSONNEL WITHIN 2 YEARS OF SERVICE IN 1995–1998: AFQT CATEGORY

Percentile score	Total accessed	Admission rate	Standard error	Relative risk	95% CI
93–99	34,157	72.58	1.24	1.00	
65–92	220,302	67.65	0.49	0.93	0.90, 0.97
50–64	168,478	79.10	0.62	1.09	1.05, 1.13
31–49	171,068	75.39	0.61	1.04	1.00, 1.08
21–30	4,768	78.83	3.82		
16–20	77	68.48	31.23		
10–15	26	94.80	55.64	1.11	0.53, 2.32
01–09	0	0	0		

Tables 2.3.25–2.3.30 show results analogous to the above for hospitalizations within the first 2 years of service, but excluding admissions related to pregnancy, childbirth and puerperium. These results mimic those seen above, with females and older recruits having higher hospitalization rates.

TABLE 2.3.25. HOSPITAL ADMISSION RATES (PER 1,000 PERSON-YEARS) EXCLUDING FEMALE PELVIC DISEASE AND CHILDBIRTH FOR ENLISTED PERSONNEL WITHIN 2 YEARS OF SERVICE IN 1995–1998

	Total accessed	Admission rate	Standard error	Relative risk	95% CI
Army	215,388	85.28	0.57	1.00	
Navy	152,384	54.43	0.55	0.64	0.62, 0.65
Marines	123,639	49.88	0.56	0.58	0.57, 0.60
Air Force	123,669	57.62	0.61	0.68	0.66, 0.69

TABLE 2.3.26. HOSPITAL ADMISSION RATES (PER 1,000 PERSON-YEARS) EXCLUDING FEMALE PELVIC DISEASE AND CHILDBIRTH FOR ENLISTED PERSONNEL WITHIN 2 YEARS OF SERVICE IN 1995–1998: GENDER

Gender	Total accessed	Admission rate	Standard error	Relative risk	95% CI
Male	506,426	57.91	0.30	1.00	
Female	108,530	100.11	0.90	1.73	1.69, 1.76

TABLE 2.3.27. HOSPITAL ADMISSION RATES (PER 1,000 PERSON-YEARS) EXCLUDING FEMALE PELVIC DISEASE AND CHILDBIRTH FOR ENLISTED PERSONNEL WITHIN 2 YEARS OF SERVICE IN 1995–1998: AGE

Age	Total accessed	Admission rate	Standard error	Relative risk	95% CI
17–20 yr	455,900	61.91	0.33	1.00	
21–25 yr	131,915	70.96	0.66	1.15	1.12, 1.17
26–30yr	21,825	85.92	1.83	1.39	1.33, 1.45
>30 yr	5,160	94.90	4.05	1.53	1.41, 1.67

TABLE 2.3.28. HOSPITAL ADMISSION RATES (PER 1,000 PERSON-YEARS) EXCLUDING FEMALE PELVIC DISEASE AND CHILDBIRTH FOR ENLISTED PERSONNEL WITHIN 2 YEARS OF SERVICE IN 1995–1998: RACE

Race	Total accessed	Admission rate	Standard error	Relative risk	95% CI
White	440,704	65.30	0.35	1.00	
Black	113,085	68.45	0.70	1.05	1.02, 1.07
Other	59,880	55.75	0.87	0.85	0.83, 0.88

TABLE 2.3.29. HOSPITAL ADMISSION RATES (PER 1,000 PERSON-YEARS) EXCLUDING FEMALE PELVIC DISEASE AND CHILDBIRTH FOR ENLISTED PERSONNEL WITHIN 2 YEARS OF SERVICE IN 1995–1998: EDUCATION LEVEL WHEN APPLYING)

Education level when applying	Total accessed	Admission rate	Standard error	Relative risk	95% CI
Less than HS	16,448	70.57	2.34	1.10	1.03, 1.17
HS diploma	550,108	64.41	0.31	1.00	
Some college	21,362	56.73	1.39		
Bachelor's	9,343	57.07	2.17	0.86	0.73, 1.00
Graduate	531	51.65	9.40		

TABLE 2.3.30. HOSPITAL ADMISSION RATES (PER 1,000 PERSON-YEARS) EXCLUDING FEMALE PELVIC DISEASE AND CHILDBIRTH FOR ENLISTED PERSONNEL WITHIN 2 YEARS OF SERVICE IN 1995–1998: AFQT CATEGORY

Percentile score	Total accessed	Admission rate	Standard error	Relative risk	95% CI
93–99	34,157	67.60	1.20	1.00	
65–92	220,302	61.16	0.47	0.90	0.87, 0.95
50–64	168,478	69.08	0.58	1.02	0.98, 1.06
31–49	171,068	66.02	0.57	0.98	0.94, 1.02
21–30	4,768	75.26	3.73		
16–20	77	68.48	31.23	1.18	0.56, 2.48
10–15	26	94.80	55.64		
01–09	0	0	0		

Table 2.3.31 shows hospitalization percentages, by diagnostic category, within the first year of service in 1995–1998 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 all causes are not included. By far the most common cause was Neurotic and Personality Disorders, accounting for more than 20% of hospitalizations during the first year of service. Record counts differ noticeably by year, which is discussed in section 2.3.7-2.3.12.

TABLE 2.3.31. HOSPITALIZATION PERCENTAGES BY MEDICAL CATEGORY FOR ENLISTED PERSONNEL WITHIN 1 YEAR OF SERVICE: TOTAL, 1995–1998

Medical category*	Count					Percentage				
	1995–1998	1995	1996	1997	1998	1995–1998	1995	1996	1997	1998
Neurotic & personality disorders and other mental disorders	8,286	2,121	3,231	1,963	971	20.6	15.3	20.2	28.1	29.1
Injuries and posioning	4,516	1,516	1,738	881	381	11.2	10.9	10.9	12.6	11.4
Dysfunction of oral cavity, salivary glands and jaws	2,264	1,312	794	127	31	5.6	9.4	5.0	1.8	0.9
Acute respiratory infection	1,919	753	854	233	79	4.8	5.4	5.3	3.3	2.4
Alcohol and drug dependence	1,624	671	610	268	75	4.0	4.8	3.8	3.8	2.2
Pneumonia/Influenza	1,516	602	557	216	141	3.8	4.3	3.5	3.1	4.2
Other psychoses	1,491	350	582	335	224	3.7	2.5	3.6	4.8	6.7
Symptoms, signs, and other ill-defined conditions	1,472	459	564	282	167	3.7	3.3	3.5	4.0	5.0
Other diseases due to viruses and chlamydiae	1,338	438	624	124	52	3.3	3.9	3.9	1.8	1.6
Infections of skin and subcutaneous tissue	1,329	429	489	268	143	3.3	3.1	3.1	3.8	4.3
Complications of pregnancy, childbirth, and puerperium	1,217	397	500	283	37	3.0	2.9	3.1	4.0	1.1
Hernia of abdominal cavity	953	491	368	133	61	2.4	2.8	2.3	1.9	1.8
Other diseases of the respiratory tract	915	379	376	115	45	2.3	2.7	2.4	1.6	1.3
Noninfectious enteritis and colitis	853	304	349	94	106	2.1	2.2	2.2	1.3	3.2
Chronic obstructive pulmonary disease and allied conditions	766	283	374	98	11	1.9	2.0	2.3	1.4	0.3
Arthropathies and related disorders	699	275	260	133	31	1.7	2.0	1.6	1.9	0.9
Viral diseases accompanied by exanthem	655	198	287	109	61	1.6	1.4	1.8	1.6	1.8
Appendicitis	620	166	237	143	74	1.5	1.2	1.5	2.0	2.2
Other bacterial diseases	556	204	278	48	26	1.4	1.5	1.7	0.7	0.8
Other diseases of the urinary system	513	168	207	92	46	1.3	1.2	1.3	1.3	1.4

Table 2.3.32 shows hospitalization percentages by diagnostic category within the first 2 years of service in 1995–1998. Again, the most common cause was Neurotic and Personality Disorders.

TABLE 2.3.32. HOSPITALIZATION PERCENTAGES BY MEDICAL CATEGORY FOR
ENLISTED PERSONNEL WITHIN 2 YEARS OF SERVICE IN 1995–1998

Medical category	Count	Percentage
Neurotic & personality disorders and other mental disorders	10,873	16.4
Complications of pregnancy, childbirth, and puerperium	8,419	12.7
Injuries and poisoning	7,667	11.6
Dysfunction of oral cavity, salivary glands, and jaws	3,373	5.1
Alcohol and drug dependence	3,089	4.7
Other psychoses	2,128	3.2
Symptoms, signs, and other ill-defined conditions	2,121	3.2
Acute respiratory infection	2,090	3.2
Arthropathies and related disorders	1,938	2.9
Acute respiratory infection	2,090	3.2
Infections of skin and subcutaneous tissue	1,765	2.7
Pneumonia/influenza	1,644	2.5
Other diseases of the respiratory tract	1,561	2.4
Other diseases due to viruses and chlamydiae	1,508	2.3
Hernia of abdominal cavity	1,325	2.0
Noninfectious enteritis and colitis	1,104	1.7
Appendicitis	1,069	1.6
Chronic obstructive pulmonary disease and allied conditions	872	1.3
Other diseases of the urinary system	782	1.2
Viral diseases accompanied by exanthem	753	1.1
Other bacterial diseases	612	0.9

2.4. Existed Prior To Service (EPTS) Discharges

Tables 2.4.1–2.4.18 summarize discharges for medical conditions that existed prior to service (EPTS), in 1995–1998 and in each of these years individually. EPTS percentages are shown by service, demographic characteristics and academic variables. Discharge percentages are shown for each category, and relative risks are used to compare categories. While there are several instances of apparent upward trend in EPTS rates by year, these may be due in part to increased reporting compliance. Therefore, no conclusions are drawn regarding trends over time.

Table 2.4.1 shows percentages of accessions ending in EPTS discharge by service. From the relative risks it can be seen that the percentage of accessions resulting in EPTS discharge was significantly higher in the Navy than the Army, whereas the Marines and Air Force had significantly lower rates. However, no reliable conclusions may be drawn because EPTS data completeness, and even the definition of what is classified as an EPTS discharge, vary substantially across services.

TABLE 2.4.1. PERCENTAGE OF ENLISTED ACCESSIONS ENDING IN
EPTS DISCHARGE IN 1995–1998

	Total accessed	Discharged	Percent discharged	Relative risk	95% CI
Army	215,388	9,874	4.6	1.00	
Navy	152,384	9,732	6.4	1.39	1.37, 1.42
Marines	123,639	4,477	3.6	0.79	0.77, 0.81
Air Force	123,669	4,107	3.3	0.72	0.70, 0.75

Tables 2.4.2–2.4.4 show the percentages by gender, race, and age at accession. From the relative risks, females had a significantly 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 2.4.2. PERCENTAGE OF ENLISTED ACCESSIONS ENDING IN
EPTS DISCHARGE IN 1995–1998: GENDER

Gender	Total accessed	Discharged	Percent discharged	Relative risk	95% CI
Male	506,426	21,414	4.2	1.00	
Female	108,530	6,776	6.2	1.48	1.44, 1.51

TABLE 2.4.3. PERCENTAGE OF ENLISTED ACCESSIONS ENDING IN
EPTS DISCHARGE IN 1995–1998: AGE

Age	Total accessed	Discharged	Percent discharged	Relative risk	95% CI
17–20 yr	455,900	19,553	4.3	1.00	
21–25 yr	131,915	6,110	4.6	1.08	1.05, 1.11
26–30 yr	21,825	1,043	4.8	1.11	1.05, 1.18
>30 yr	5,160	264	5.2	1.19	1.06, 1.34

TABLE 2.4.4. PERCENTAGE OF ENLISTED ACCESSIONS ENDING IN
EPTS DISCHARGE IN 1995–1998: RACE

Race	Total accessed	Discharged	Percent discharged	Relative risk	95% CI
White	440,704	21,725	4.9	1.00	
Black	113,085	4,437	3.9	0.80	0.77, 0.82
Other	59,880	2,025	3.4	0.69	0.66, 0.72

Table 2.4.5 shows the EPTS percentages according to education level at the time of accession. Those with less than high school diploma had a significantly higher likelihood of EPTS discharge relative to those who had finished high school. Those with at least some college had a significantly lower likelihood of EPTS discharge than those with high school only.

TABLE 2.4.5. PERCENTAGE OF ENLISTED ACCESSIONS ENDING IN EPTS
DISCHARGE IN 1995–1998: EDUCATION LEVEL

Education level	Total accessed	Discharged	Percent discharged	Relative risk	95% CI
Less than HS	16,448	936	5.7	1.22	1.15, 1.30
HS diploma	550,108	25,585	4.6	1.00	
Some college	21,362	610	2.9		
Bachelor's	9,343	296	3.2	0.63	0.59, 0.67
Graduate	531	14	2.6		

Table 2.4.6 shows that those with lower AFQT scores had increasingly higher likelihood of EPTS discharge than those scoring higher.

TABLE 2.4.6. PERCENTAGE OF ENLISTED ACCESSIONS ENDING IN
EPTS DISCHARGE IN 1995–1998: AFQT CATEGORY

Percentile score	Total accessed	Discharged	Percent discharged	Relative risk	95% CI
93–99	34,157	1,173	3.4	1.00	
65–92	220,592	9,125	4.1	1.20	1.18, 1.23
50–64	168,701	8,202	4.9	1.42	1.38, 1.45
31–49	171,289	8,854	5.2	1.51	1.47, 1.54
21–30	4,768	271	5.7		
16–20	77	9	11.7	1.69	1.50, 1.89
10–15	26	2	7.7		
01–09	0	0	0		

Tables 2.4.7–2.4.12 show the EPTS summaries separately by year. Again, comparisons by service are tenuous because of disparities in reporting compliance and definitions of what is classified as an EPTS discharge. In addition, the apparent trend of increasing percent discharged by year (especially seen for Navy) may be due in large part to an increase in reporting compliance. Finally, the results for low AFQT scores in Table 2.4.12 are tenuous due to the small numbers of individuals falling into the lower score categories.

TABLE 2.4.7. PERCENTAGE OF ENLISTED ACCESSIONS ENDING IN EPTS DISCHARGE

		Total accessed	Discharged	Percent discharged	Relative risk	95% CI
1995	Army	48,291	1,917	4.0	1.00	
	Navy	35,968	935	2.6	0.65	0.61, 0.70
	Marines	31,858	865	2.7	0.68	0.64, 0.73
	Air Force	30,804	1,312	4.3	1.07	1.02, 1.13
1996	Army	65,955	3,066	4.6	1.00	
	Navy	41,486	1,912	4.6	0.99	0.95, 1.04
	Marines	28,778	998	3.5	0.75	0.70, 0.79
	Air Force	30,927	845	2.7	0.59	0.55, 0.63
1997	Army	40,439	2,012	5.0	1.00	
	Navy	40,814	3,254	8.0	1.60	1.55, 1.66
	Marine	32,930	1,540	4.7	0.94	0.89, 0.99
	Air Force	30,927	1,001	3.2	0.65	0.61, 0.69
1998	Army	60,703	2,879	4.7	1.00	
	Navy	34,116	3,631	10.6	2.24	2.17, 2.32
	Marines	30,073	1,074	3.6	0.75	0.71, 0.80
	Air Force	31,255	949	3.0	0.64	0.60, 0.68

TABLE 2.4.8. PERCENTAGE OF ENLISTED ACCESSIONS ENDING IN EPTS DISCHARGE: GENDER

		Total accessed	Discharged	Percent discharged	Relative risk	95% CI
1995	Male	122,194	3,839	3.1	1.00	
	Female	24,659	1,190	4.8	1.54	1.45, 1.62
1996	Male	136,993	5,194	3.8	1.00	
	Female	29,879	1,627	5.4	1.44	1.37, 1.51
1997	Male	119,677	6,053	5.0	1.00	
	Female	25,426	1,754	6.9	1.36	1.3, 1.43
1998	Male	127,562	6,328	5.0	1.00	
	Female	28,566	2,205	7.8	1.56	1.49, 1.62

TABLE 2.4.9. PERCENTAGE OF ENLISTED ACCESSIONS ENDING IN
EPTS DISCHARGE: AGE

		Total accessed	Discharged	Percent discharged	Relative risk	95% CI
1995	17–20 yr	109,147	3,670	3.4	1.00	
	21–25 yr	31,952	1,144	3.6	1.06	1.01, 1.13
	26–30 yr	4,519	171	3.8	1.13	0.97, 1.30
	>30 yr	1,072	44	4.1	1.22	0.91, 1.63
1996	17–20 yr	120,415	4,848	4.0	1.00	
	21–25 yr	38,403	1,628	4.2	1.05	1.00, 1.10
	26–30 yr	6,432	260	4.0	1.00	0.89, 1.13
	>30 yr	1,615	85	5.3	1.31	1.06, 1.61
1997	17-20 yr	108,293	4,683	4.3	1.00	
	21-25 yr	30,573	1,567	5.1	1.19	1.13, 1.24
	26-30 yr	5,114	286	5.6	1.29	1.16, 1.45
	>30 yr	1,126	54	4.8	1.11	0.85, 1.44
1998	17–20 yr	118,045	6,352	5.4	1.00	
	21–25 yr	30,987	1,771	5.7	1.06	1.01, 1.11
	26–30 yr	5,760	326	5.7	1.05	0.95, 1.17
	>30 yr	1,347	84	6.2	1.16	0.94, 1.43

TABLE 2.4.10. PERCENTAGE OF ENLISTED ACCESSIONS ENDING
IN EPTS DISCHARGE: RACE

		Total accessed	Discharged	Percent discharged	Relative risk	95% CI
1995	White	109,371	4,012	3.7	1.00	
	Black	25,985	709	2.7	0.74	0.69, 0.80
	Other	11,442	308	2.7	0.73	0.66, 0.82
1996	White	119,922	5,299	4.4	1.00	
	Black	31,669	1,091	3.4	0.78	0.74, 0.83
	Other	15,179	430	2.8	0.64	0.58, 0.70
1997	White	103,167	6,054	5.9	1.00	
	Black	25,581	1,199	4.7	0.80	0.76, 0.84
	Other	15,299	553	3.6	0.62	0.57, 0.67
1998	White	108,244	6,360	5.9	1.00	
	Black	29,850	1,438	4.8	0.82	0.78, 0.86
	Other	17,960	734	4.1	0.70	0.65, 0.75

TABLE 2.4.11. PERCENTAGE OF ENLISTED ACCESSIONS ENDING IN EPTS DISCHARGE: EDUCATION LEVEL

		Total accessed	Discharged	Percent discharged	Odds ratio	95% CI
1995	Less than HS	868	30	3.5	0.99	0.70, 1.41
	HS diploma	133,462	4,648	3.5	1.00	
	Some college	5,932	163	2.7		
	Bachelor's	2,741	71	2.6	0.77	0.68, 0.87
	Graduate	133	2	1.5		
1996	Less than HS	1,423	85	5.9	1.46	1.19, 1.79
	HS diploma	144,513	5,923	4.1	1.00	
	Some college	5,917	138	2.3		
	Bachelor's	3,158	77	2.4	0.58	0.51, 0.66
	Graduate	137	4	2.9		
1997	Less than HS	4,723	360	7.6	1.41	1.27, 1.55
	HS diploma	133,674	7,239	5.4	1.00	
	Some college	4,794	149	3.1		
	Bachelor's	1,221	39	3.2	0.58	0.5, 0.66
	Graduate	120	4	3.3		
1998	Less than HS	9,434	461	4.9	0.87	0.80, 0.95
	HS diploma	138,459	7,775	5.6	1.00	
	Some college	4,719	160	3.4		
	Bachelor's	2,223	109	4.9	0.69	0.61, 0.77
	Graduate	141	4	2.8		

TABLE 2.4.12. PERCENTAGE OF ENLISTED ACCESSIONS ENDING IN EPTS DISCHARGE
IN 1995-1998: AFQT CATEGORY

	Percentile score	Total accessed	Discharged	Percent discharged	Odds ratio	95% CI
	93–99	13,386	433	3.2	1.00	
	65–92	53,402	1,679	3.1	0.97	0.92, 1.02
	50–64	38,633	1,420	3.7	1.14	1.08, 1.20
1995	31–49	37,567	1,398	3.7	1.15	1.09, 1.22
	21–30	804	38	4.7		
	16–20	6	0	0	1.44	1.05, 1.98
	10–15	4	0	0		
	01–09	0	0	0		
	93–99	8,059	217	2.7	1.00	
	65–92	61,800	2,269	3.7	1.36	1.30, 1.43
	50–64	45,725	2,041	4.5	1.66	1.57, 1.74
1996	31–49	47,233	2,155	4.7	1.69	1.61, 1.78
	21–30	1,440	73	5.1		
	16–20	25	0	0	1.87	1.48, 2.35
	10–15	7	1	14.3		
	01–09	0	0	0		
	93–99	6,138	256	4.2	1.00	
	65-92	51,847	2596	5.0	1.20	1.15, 1.26
	50-64	39,978	2,286	5.7	1.37	1.31, 1.44
1997	31-49	40,154	2,511	6.2	1.50	1.43, 1.57
	21-30	795	63	7.9		
	16-20	10	2	20.0	1.95	1.54, 2.47
	10-15	7	1	14.3		
	01-09	0	0	0		
	93–99	6,574	267	4.1	1.00	
	65–92	53,253	2,581	4.8	1.19	1.14, 1.25
	50–64	44,142	2,455	5.6	1.37	1.31, 1.43
1998	31–49	46,114	2,790	6.1	1.49	1.43, 1.56
	21–30	1,729	97	5.6		
	16–20	36	7	19.4	1.44	1.19, 1.75
	10–15	8	0	0		
	01–09	0	0	0		

Table 2.4.13 summarizes the EPTS discharges by medical category. Psychiatric conditions were the most common, followed by lung/chest and then orthopedic conditions. These broad categories are used in Table 2.4.13 because the EPTS data available in 1995 and most of 1996 are not delineated further.

TABLE 2.4.13. EPTS DISCHARGE PERCENTAGES BY MEDICAL CATEGORY FOR ENLISTED PERSONNEL IN 1995–1998*

Medical Category	Count					Percentage of all EPTS discharge				
	1995–1998	1995	1996	1997	1998	1995–1998	1995	1996	1997	1998
Psychiatric—other	6,920	223	1,337	2,792	2,568	24.5	4.4	19.6	35.7	30.1
Lungs/chest—asthma	3,699	678	969	961	1,091	13.1	13.5	14.2	12.3	12.8
Orthopedics—knee	2,809	752	774	641	642	10.0	15.0	11.3	8.2	7.5
Orthopedics—other	2,732	690	734	680	628	9.7	13.7	10.8	8.7	7.4
Orthopedics—feet	2,663	594	740	554	775	9.4	11.8	10.8	7.1	9.1
Orthopedics—back	2,117	504	576	472	565	7.5	10.0	8.4	6.0	6.6
Neurology—other	979	267	203	261	248	3.5	5.3	3.0	3.3	2.9
Genitourinary system	823	218	224	201	180	2.9	4.3	3.3	2.6	2.1
Vision	728	152	230	195	151	2.6	3.0	3.4	2.5	1.8
Abdomen and viscera	622	149	177	190	106	2.2	3.0	2.6	2.4	1.2
Cardiovascular—other	478	102	115	126	135	1.7	2.0	1.7	1.6	1.6
Skin and lymphatic	378	93	96	103	86	1.3	1.8	1.4	1.3	1.0
Chest—other	363	125	81	48	109	1.3	2.5	1.2	0.6	1.3
Neurology—seizure disorder	233	47	50	67	69	0.8	0.9	0.7	0.9	0.8
Hearing	235	61	63	77	34	0.8	1.2	0.9	1.0	4.0
Ears—other	181	46	67	46	22	0.6	0.9	1.0	0.6	2.6
Hypertension	153	42	37	39	35	0.5	0.8	0.5	0.5	0.4
Eyes—others	100	6	7	16	71	0.4	0.1	0.1	0.2	0.8
Psychiatric—schizophrenia	67	8	21	16	22	0.2	0.2	0.3	0.2	0.3

*The difference in counts of EPTS discharges by medical categories may be due to increased reporting compliance.

Table 2.4.14 shows the EPTS discharge percentages by more specific diagnostic categories in 1998. This is the second year for which AMSARA had access to the original EPTS data forms, which allowed AMSARA to determine and record more specific medical causes. Asthma was the most common cause, followed by neurotic, behavioral, and personality disorders.

TABLE 2.4.14. EPTS DISCHARGE PERCENTAGES BY DoD DIAGNOSIS FOR ENLISTED PERSONNEL IN 1998

Condition	Number	% of all EPTS
Asthma	1,164	13.6
Neurotic, mood, somatoform, dissociative, or factitious disorders	750	8.8
Behavior disorders	613	7.2
Personality disorders	432	5.1
Chronic pain, disease of lower extremities	392	4.6
Injury, pain of spine or sacroiliac joints	367	4.3
Pes planus (acquired)	302	3.5
Headaches (including migraine and tension)	219	2.6
Alcohol dependence	210	2.5
Suicide attempted or suicidal behavior	200	2.3
Academic skill defect (ADHD)	170	2.0
Motion of hip limitation, upper extremities	160	1.9
Retropatellar knee pain syndrome	158	1.9
Lower extremities	121	1.4
Radiculopathy	114	1.3
Controlled substance use	113	1.3
Deviation or curviture of spine	111	1.3

Table 2.4.15 shows EPTS discharge percentages by diagnosis categories. Discharges for psychologic/psychiatric reasons were by far the most common; they were almost double the next cause, which was asthma.

TABLE 2.4.15. EPTS DISCHARGE PERCENTAGES BY DIAGNOSIS FOR ENLISTED PERSONNEL IN 1998 (GROUPED DoD DIAGNOSIS CODES)

Condition	Number	% of all EPTS
Psychologic/psychiatric	2,205	25.8
Asthma	1,164	13.6
Chronic pain/disease of lower extremities	392	4.6
Injury, pain of spine or sacroiliac joints	367	4.3
Pes planus	302	3.5

2.5. Disability Discharges

Tables 2.5.1–2.5.28 summarize disability discharges in 1995–1998 and in each of these years individually. As outlined in Section 1.8, the Navy provides disability data for specific medical categories only; therefore the tables in this Section exclude the Navy. In addition, at the time these analyses were performed, Army and Air Force data were complete only through September 1999. This resulted in incomplete follow-up for some of those gained in recent years. It might also affect the percentages by other demographic variables related to service, such as gender.

Tables 2.5.1-2.5.6 show results for 1995-1998 combined. Females had a higher likelihood of disability discharge than males within the first year of service. Ages 21-25 were more likely to be discharged than ages 17-20. Whites were more likely to be discharged than nonwhites. Those with a high school diploma had a lower likelihood of disability discharge than those with at least some college. Finally, there were no statistically significant differences according to AFQT score group.

TABLE 2.5.1. PERCENTAGE OF ACTIVE DUTY ARMY AND AIR FORCE ENLISTED ACCESSIONS ENDING IN DISABILITY DISCHARGE WITHIN 1 YEAR OF SERVICE IN 1995–1998

	Total accessed	Discharged	Percent discharged	Relative risk (vs Army)	95% CI
Army	215,388	720	0.3	1.00	
Air Force	123,699	479	0.4	1.16	1.06, 1.27

TABLE 2.5.2. PERCENTAGE OF ACTIVE DUTY ARMY AND AIR FORCE ENLISTED ACCESSIONS ENDING IN DISABILITY DISCHARGE WITHIN 1 YEAR OF SERVICE IN 1995–1998: GENDER

Gender	Total accessed	Discharged	Percent discharged	Relative risk (vs males)	95% CI
Male	264,307	749	0.3	1.00	
Female	74,626	450	0.6	2.13	1.94, 2.34

TABLE 2.5.3. PERCENTAGE OF ACTIVE DUTY ARMY AND AIR FORCE ENLISTED ACCESSIONS ENDING IN DISABILITY DISCHARGE WITHIN 1 YEAR OF SERVICE IN 1995–1998: AGE

Age	Total accessed	Discharged	Percent discharged	Relative risk (vs 17-20)	95% CI
17–20 yr	241,450	805	0.3	1.00	
21–25 yr	80,215	341	0.4	1.28	1.14, 1.42
26–30 yr	13,884	47	0.3	1.02	0.76, 1.35
>30 yr	3,237	5	0.2	0.46	0.19, 1.12

TABLE 2.5.4. PERCENTAGE OF ACTIVE DUTY ARMY AND AIR FORCE ENLISTED ACCESSIONS ENDING IN DISABILITY DISCHARGE WITHIN 1 YEAR OF SERVICE IN 1995–1998: RACE

Race	Total accessed	Discharged	Percent discharged	Relative risk (vs White)	95% CI
White	239,589	911	0.4	1.00	
Black	68,301	208	0.3	0.80	0.70, 0.92
Other	30,841	80	0.3	0.68	0.55, 0.85

TABLE 2.5.5. PERCENTAGE OF ACTIVE DUTY ARMY AND AIR FORCE ENLISTED ACCESSIONS ENDING IN DISABILITY DISCHARGE WITHIN 1 YEAR OF SERVICE IN 1995–1998: EDUCATION LEVEL

Education level	Total accessed	Discharged	Percent discharged	Relative risk (vs HS)	95% CI
Less than HS	12,678	22	0.2	0.48	0.32, 0.73
HS diploma	283,068	1,017	0.4	1.00	
Some college	19,812	91	0.5		
Bachelor's	6,729	28	0.4	1.23	1.02, 1.47
Graduate	445	0	0		

TABLE 2.5.6. PERCENTAGE OF ACTIVE DUTY ARMY AND AIR FORCE ENLISTED ACCESSIONS ENDING IN DISABILITY DISCHARGE WITHIN 1 YEAR OF SERVICE IN 1995–1998: AFQT CATEGORY

Percentile score	Total accessed	Discharged	Percent discharged	Relative risk (vs 93-99)	95% CI
93–99	21,750	79	0.4	1.00	
65–92	123,631	450	0.4	1.00	0.89, 1.13
50–64	99,088	372	0.4	1.03	0.91, 1.17
31–49	85,800	274	0.3	0.88	0.76, 1.01
21–30	2,692	12	0.4		
16–20	27	0	0.0	1.21	0.67, 2.19
10–15	5	0	0.0		
01–09	0	0	0		

Table 2.5.7 shows results by service for each year individually. The Air Force disability discharge rate is significantly higher than that of the Army for recruits entering in 1995 and 1996, not significantly different for those entering in 1997, and significantly lower for 1998. The Air Force disability discharge rate is significantly declining by year.

TABLE 2.5.7. 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	Relative risk (vs Army)	95% CI
1995	Army	48,291	206	0.4	1.00	
	Air Force	30,804	172	0.6	1.31	1.12, 1.53
1996	Army	65,955	245	0.4	1.00	
	Air Force	30,683	168	0.5	1.47	1.26, 1.73
1997	Army	40,439	149	0.4	1.00	
	Air Force	30,927	107	0.3	0.94	0.77, 1.15
1998*	Army	60,703	120	0.2	1.00	
	Air Force	31,255	32	0.1	0.52	0.36, 0.74

* Incomplete follow-up

Table 2.5.8 shows disability discharge percentages by gender for each year individually. Females have significantly higher discharge percentages than males in each year except 1997. However, the difference is getting smaller over the 1995-1998 time period.

TABLE 2.5.8. 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	Relative risk (vs Males)	95% CI
1995	Male	62,408	220	0.4	1.00	
	Female	16,619	158	1.0	2.70	2.29, 3.18
1996	Male	74,718	252	0.3	1.00	
	Female	21,890	161	0.7	2.18	1.86, 2.56
1997	Male	54,857	170	0.3	1.00	
	Female	16,502	86	0.5	1.68	1.35, 2.10
1998*	Male	72,324	107	0.1	1.00	
	Female	19,615	45	0.2	1.55	1.14, 2.11

* Incomplete follow-up

Table 2.5.9 shows disability discharge rates by age. In 1997 and 1998 there were no statistically significant differences by age. There is no trend by age.

TABLE 2.5.9. 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	Relative risk (vs 17-20)	95% CI
1995	17–20 yr	56,084	255	0.5	1.00	
	21–25 yr	19,357	94	0.5	1.07	0.87, 1.32
	26–30 yr	2,807	24	0.9	1.88	1.25, 2.82
	>30 yr	620	4	0.6	1.42	0.53, 3.80
1996	17–20 yr	66,768	263	0.4	1.00	
	21–25 yr	24,501	139	0.6	1.44	1.21, 1.71
	26–30 yr	4,282	10	0.2	0.59	0.32, 1.11
	>30 yr	1,055	1	0.1	0.24	0.03, 1.72
1997	17–20 yr	50,935	181	0.4	1.00	
	21–25 yr	16,841	69	0.4	1.15	0.90, 1.47
	26–30 yr	2,944	6	0.2	0.57	0.26, 1.29
	>30 yr	642	0	0		
1998*	17–20 yr	67,663	106	0.2	1.00	
	21–25 yr	19,516	39	0.2	1.28	0.92, 1.78
	26–30 yr	3,851	7	0.2	1.16	0.54, 2.48
	>30 yr	920	0	0		

* Incomplete follow-up

Table 2.5.10 shows disability discharge rates by race. There were no statistically significant differences except for year 1995 for white versus other and year 1997 for white versus black.

TABLE 2.5.10. 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	Relative risk (vs White)	95% CI
1995	White	58,253	295	0.5	1.00	
	Black	15,073	69	0.5	0.90	0.71, 1.15
	Other	5,658	14	0.2	0.49	0.29, 0.83
1996	White	68,296	311	0.5	1.00	
	Black	19,775	71	0.4	0.79	0.62, 1.00
	Other	8,452	31	0.4	0.81	0.56, 1.15
1997	White	50,156	193	0.4	1.00	
	Black	14,186	39	0.3	0.71	0.52, 0.99
	Other	6,988	24	0.3	0.89	0.59, 1.34
1998*	White	62,884	112	0.2	1.00	
	Black	19,267	29	0.2	0.85	0.58, 1.24
	Other	9,743	11	0.1	0.63	0.35, 1.16

* Incomplete follow-up

Table 2.5.11 shows the disability discharge percentages according to education level. No significant differences were found.

TABLE 2.5.11. PERCENTAGE OF ACTIVE DUTY ARMY AND AIR FORCE ENLISTED ACCESSIONS ENDING IN DISABILITY DISCHARGE WITHIN 1 YEAR OF SERVICE: EDUCATION LEVEL

	Education level	Total accessed	Discharged	Percent discharged	Relative risk (vs HS)	95% CI
1995	Less than HS	139	1	0.7	1.52	0.21, 10.76
	HS diploma	67,670	321	0.5	1.00	
	Some college	5,580	37	0.7		
	Bachelor's	2,042	6	0.3	1.17	0.86, 1.59
	Graduate	111	0	0		
1996	Less than HS	396	0	0	0	N/A
	HS diploma	76,627	337	0.4	1.00	
	Some college	5,498	32	0.6		
	Bachelor's	2,476	7	0.3	1.10	0.80, 1.51
	Graduate	120	0	0		
1997	Less than HS	3,823	14	0.4	1.00	0.59, 1.71
	HS diploma	62,147	227	0.4	1.00	
	Some college	4,393	13	0.3		
	Bachelor's	531	2	0.4	0.82	0.49, 1.37
	Graduate	89	0	0		
1998*	Less than HS	8,320	7	0.1	0.49	0.23, 1.04
	HS diploma	76,624	132	0.2	1.00	
	Some college	4,341	9	0.2		
	Bachelor's	1,680	2	0.1	1.04	0.57, 1.90
	Graduate	125	0	0		

* Incomplete follow-up

Table 2.5.12 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 2.5.12. 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	Relative risk (vs 93-99)	95% CI
1995	93–99	10,010	48	0.5	1.00	
	65–92	27,896	130	0.5	0.97	0.79, 1.20
	50–64	21,008	125	0.6	1.24	1.00, 1.54
	31–49	17,064	66	0.4	0.81	0.61, 1.07
	21–30	720	2	0.3		
	16–20	2	0	0		
	10–15	0	0	0	0.58	0.14, 2.40
	01–09	0	0	0		
1996	93–99	4,655	17	0.4	1.00	
	65–92	36,120	169	0.5	1.28	0.98, 1.67
	50–64	27,862	110	0.4	1.08	0.80, 1.46
	31–49	25,107	106	0.4	1.16	0.85, 1.57
	21–30	1,283	8	0.6		
	16–20	18	0	0		
	10–15	3	0	0	1.68	0.75, 3.76
	01–09	0	0	0		
1997	93–99	3,129	9	0.3	1.00	
	65–92	27,096	100	0.4	1.28	0.85, 1.94
	50–64	22,008	85	0.4	1.34	0.87, 2.06
	31–49	18,088	60	0.3	1.15	0.72, 1.84
	21–30	560	1	0.2		
	16–20	3	0	0		
	10–15	1	0	0	0.62	0.07, 5.43
	01–09	0	0	0		
1998*	93–99	3,956	5	0.1	1.00	
	65–92	32,519	51	0.2	1.24	0.64, 2.41
	50–64	28,210	52	0.2	1.46	0.75, 2.83
	31–49	25,541	42	0.2	1.30	0.65, 2.60
	21–30	1,129	1	0.1		
	16–20	4	0	0		
	10–15	.1	0	0	0.70	0.07, 7.32
	01–09	0	0	0		

* Incomplete follow-up

Tables 2.5.13–2.5.18 show the percentages of accessions that resulted in disability discharge within the first two years of service among Army and Air Force enlisted personnel accessed in 1995–1998.

Female enlistees had a higher likelihood of disability discharge than males, and recruits aged 21-25 had a higher likelihood and 26 or older had lower likelihood of discharge 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. Those with just a high school diploma were as likely to be discharged as recruits with at least some college education, although the results for those categorized as not having a high school diploma should be viewed with caution because some of the individuals in this category may be misclassified due to missing education data in their gain records. Finally, there were no notable significant differences between AFQT score categories.

TABLE 2.5.13. PERCENTAGE OF ACTIVE DUTY ARMY AND AIR FORCE ENLISTED ACCESSIONS ENDING IN DISABILITY DISCHARGE WITHIN 2 YEARS OF SERVICE IN 1995–1998

Service	Total accessed	Discharged	Percent discharged	Relative risk	95% CI
Army	215,388	1,661	0.8	1.00	
Air Force	123,669	740	0.6	0.78	0.72, 0.83

TABLE 2.5.14. PERCENTAGE OF ACTIVE DUTY ARMY AND AIR FORCE ENLISTED ACCESSIONS ENDING IN DISABILITY DISCHARGE WITHIN 2 YEARS OF SERVICE IN 1995–1998: GENDER

Gender	Total accessed	Discharged	Percent discharged	Relative risk	95% CI
Male	264,307	1,605	0.6	1.00	
Female	74,626	796	1.1	1.76	1.64, 1.88

TABLE 2.5.15. PERCENTAGE OF ACTIVE DUTY ARMY AND AIR FORCE ENLISTED ACCESSIONS ENDING IN DISABILITY DISCHARGE WITHIN 2 YEARS OF SERVICE IN 1995–1998: AGE

Age	Total accessed	Discharged	Percent discharged	Relative risk	95% CI
17–20 yr	241,450	1,609	0.7	1.00	
21–25 yr	80,215	715	0.9	1.34	1.24, 1.44
26–30 yr	13,884	70	0.5	0.76	0.60, 0.96
>30 yr	3,237	7	0.2	0.32	0.15, 0.68

TABLE 2.5.16. PERCENTAGE OF ACTIVE DUTY ARMY AND AIR FORCE ENLISTED ACCESSIONS ENDING IN DISABILITY DISCHARGE WITHIN 2 YEARS OF SERVICE IN 1995–1998: RACE

Race	Total accessed	Discharged	Percent discharged	Relative risk	95% CI
White	239,589	1,783	0.7	1.00	
Black	68,301	463	0.7	0.91	0.83, 1.00
Other	30,841	156	0.5	0.68	0.58, 0.80

TABLE 2.5.17. PERCENTAGE OF ACTIVE DUTY ARMY AND AIR FORCE ENLISTED ACCESSIONS ENDING IN DISABILITY DISCHARGE WITHIN 2 YEARS OF SERVICE IN 1995–1998: EDUCATION LEVEL WHEN APPLYING

Education level	Total accessed	Discharged	Percent discharged	Relative risk	95% CI
Less than HS	12,678	44	0.3	0.49	0.37, 0.66
HS diploma	283,068	1,998	0.7	1.00	
Some college	19,812	162	0.8		
Bachelor's	6,729	44	0.7	1.09	0.95, 1.25
Graduate	445	2	0.4		

TABLE 2.5.18. PERCENTAGE OF ACTIVE DUTY ARMY AND AIR FORCE ENLISTED ACCESSIONS ENDING IN DISABILITY DISCHARGE WITHIN 2 YEARS OF SERVICE IN 1995–1998: AFQT CATEGORY

Percentile score	Total accessed	Discharged	Percent discharged	Relative risk	95% CI
93–99	21,750	159	0.7	1.00	
65–92	123,631	871	0.7	0.96	0.89, 1.04
50–64	99,088	753	0.8	1.04	0.96, 1.13
31–49	85,800	561	0.7	0.89	0.81, 0.98
21–30	2,692	28	1.0		
16–20	27	0	0		
10–15	5	0	0	1.41	0.96, 2.06
01–09	0	0	0		

Tables 2.5.19-2.5.24 show disability discharges within the first two years of service. There is no mention of time trends in these results because the decreasing rates are likely due to the lack of complete follow-up data on recruits accessing in 1997 and 1998.

Table 2.5.19 shows disability discharge percentages by year and service. In general, those in the Air Force were significantly less likely to receive a disability discharge.

TABLE 2.5.19. 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	Relative risk	95% CI
1995	Army	48,291	520	1.1	1.00	
	Air Force	30,804	272	0.9	0.82	0.73, 0.93
1996	Army	65,955	658	1.0	1.00	
	Air Force	30,683	272	0.9	0.89	0.79, 1.00
1997*	Army	40,439	363	0.9	1.00	
	Air Force	30,927	163	0.5	0.59	0.50, 0.69
1998*	Army	60,703	120	0.2	1.00	
	Air Force	31,255	33	0.1	0.53	0.37, 0.76

* Incomplete follow-up

Table 2.5.20 shows the disability discharge percentages by gender. Females had significantly higher discharge percentages in each year.

TABLE 2.5.20. 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	Relative risk	95% CI
1995	Male	62,408	496	0.8	1.00	
	Female	16,619	296	1.8	2.24	1.99, 2.52
1996	Male	74,718	658	0.9	1.00	
	Female	21,890	272	1.2	1.41	1.25, 1.59
1997*	Male	54,857	343	0.6	1.00	
	Female	16,502	183	1.1	1.77	1.53, 2.06
1998*	Male	72,324	108	0.1	1.00	
	Female	19,615	45	0.2	1.54	1.13, 2.09

* Incomplete follow-up

Table 2.5.21 shows disability discharge rates by age. In general, individuals aged 21-25 were more likely to receive disability discharge than those aged 17-20.

TABLE 2.5.21. 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	Relative risk	95% CI
1995	17–20 yr	56,084	518	0.9	1.00	
	21–25 yr	19,357	222	1.1	1.24	1.09, 1.42
	26–30 yr	2,807	45	1.6	1.74	1.29, 2.33
	>30 yr	620	6	1.0	1.05	0.47, 2.33
1996	17–20 yr	66,768	628	0.9	1.00	
	21–25 yr	24,501	290	1.2	1.26	1.12, 1.42
	26–30 yr	4,282	11	0.3	0.27	0.15, 0.49
	>30 yr	1,055	1	0.1	0.10	0.01, 0.72
1997*	17–20 yr	50,935	355	0.7	1.00	
	21–25yr	16,841	164	1.0	1.40	1.19, 1.64
	26–30 yr	2,944	7	0.2	0.34	0.16, 0.72
	>30 yr	642	0	0		
1998*	17–20 yr	67,663	107	0.2	1.00	
	21–25yr	19,516	39	0.2	1.26	0.91, 1.76
	26–30 yr	3,851	7	0.2	1.15	0.54, 2.45
	>30 yr	920	0	0		

* Incomplete follow-up

Table 2.5.22 shows disability discharge percentages by race. In general, whites were just as likely to be discharged as other races.

TABLE 2.5.22. 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	Relative risk	95% CI
1995	White	58,253	589	1.0	1.00	
	Black	15,073	160	1.1	1.05	0.90, 1.23
	Other	5,658	42	0.7	0.73	0.54, 1.00
1996	White	68,296	682	1.0	1.00	
	Black	19,775	181	0.9	0.92	0.79, 1.06
	Other	8,452	67	0.8	0.79	0.62, 1.01
1997*	White	50,156	397	0.8	1.00	
	Black	14,186	93	0.7	0.83	0.67, 1.02
	Other	6,988	36	0.5	0.65	0.47, 0.91
1998*	White	62,884	113	0.2	1.00	
	Black	19,267	29	0.2	0.84	0.57, 1.23
	Other	9,743	11	0.1	0.63	0.34, 1.15

* Incomplete follow-up

Table 2.5.23 shows disability discharge rates by education level at the time of accession. There were no differences in discharge rates by year.

TABLE 2.5.23. 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	Relative risk	95% CI
1995	Less than HS	139	3	2.2	2.17	0.71, 6.68
	HS diploma	67,670	672	1.0	1.00	
	Some college	5,580	68	1.2	1.17	0.95, 1.44
	Bachelor's	2,042	21	1.0		
	Graduate	111	1	0.9		
1996	Less than HS	396	3	0.8	0.80	0.26, 2.46
	HS diploma	76,627	730	1.0	1.00	
	Some college	5,498	56	1.0	0.99	0.79, 1.24
	Bachelor's	2,476	19	0.8		
	Graduate	120	1	0.8		
1997*	Less than HS	3,823	31	0.8	1.09	0.76, 1.55
	HS diploma	62,147	463	0.7	1.00	
	Some college	4,393	29	0.7	0.83	0.58, 1.18
	Bachelor's	531	2	0.4		
	Graduate	89	0	0		
1998*	Less than HS	8,320	7	0.1	0.48	0.23, 1.03
	HS diploma	76,624	133	0.2	1.00	
	Some college	4,341	9	0.2	1.03	0.56, 1.89
	Bachelor's	1,680	2	0.1		
	Graduate	125	0	0		

* Incomplete follow-up

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Table 2.5.24 shows the disability discharge percentages by AFQT performance. In general, there were no differences in discharge rates among AFQT categories except for accession year 1997.

TABLE 2.5.24. 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	Relative risk	95% CI
1995	93–99	10,010	99	1.0	1.00	
	65–92	27,896	274	1.0	0.99	0.87, 1.14
	50–64	21,008	232	1.1	1.12	0.96, 1.29
	31–49	17,064	162	0.9	0.96	0.81, 1.14
	21–30	720	7	1.0		
	16–20	2	0	0		
	10–15	0	0	0	0.98	0.46, 2.09
	01–09	0	0	0		
1996	93–99	4,655	42	0.9	1.00	
	65–92	36,120	356	1.0	1.09	0.94, 1.27
	50–64	27,862	285	1.0	1.13	0.96, 1.33
	31–49	25,107	220	0.9	0.97	0.81, 1.16
	21–30	1,283	18	1.4		
	16–20	18	0	0		
	10–15	3	0	0	1.53	0.92, 2.54
	01–09	0	0	0		
1997*	93–99	3,129	13	0.4	1.00	
	65–92	27,096	190	0.7	1.69	1.26, 2.26
	50–64	22,008	183	0.8	2.00	1.49, 2.69
	31–49	18,088	137	0.8	1.82	1.33, 2.50
	21–30	560	2	0.4		
	16–20	3	0	0		
	10–15	1	0	0	0.85	0.18, 3.96
	01–09	0	0	0		
1998*	93–99	3,956	5	0.1	1.00	
	65–92	32,519	51	0.2	1.24	0.64, 2.41
	50–64	28,210	53	0.2	1.49	0.77, 2.88
	31–49	25,541	42	0.2	1.30	0.65, 2.60
	21–30	1,129	1	0.1		
	16–20	4	0	0		
	10–15	1	0	0	0.70	0.07, 7.32
	01–09	0	0	0		

* Incomplete follow-up

Table 2.5.25 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.

TABLES 2.5.25. PERCENTAGE OF ENLISTED ACCESSIONS ENDING IN DISABILITY DISCHARGE WITHIN 1 YEAR OF SERVICE: ARMY

Category	1995–1998		1995		1996		1997		1998	
	Count	% of all disability	Count	% of all disability	Count	% of all disability	Count	% of all disability	Count	% of all disability
Musculoskeletal	561	74.9	152	73.8	192	78.4	116	77.9	101	84.2
Psychiatric	33	4.6	11	5.3	12	4.8	4	2.7	6	5.0
Trachea/bronchi	16	2.2	6	3.0	8	3.2	2	1.3		
Central nervous system	6	0.8	2	1.0	1	0.4	2	1.3	1	0.8
Endocrine	4	0.5	0		3	1.2	1	0.7	0	
Eye/vision	2	0.3	2	1.0	0		0		0	
Genitourinary system	1	0.1	0		0		1	0.7	0	

Table 2.5.26 shows disability discharge percentages by diagnosis within the first year of service in the Air Force. As with the Army, musculoskeletal, psychiatric, and trachea/bronchi problems were common reasons for disability discharge.

TABLE 2.5.26. PERCENTAGE OF ENLISTED ACCESSIONS ENDING IN DISABILITY DISCHARGE WITHIN 1 YEAR OF SERVICE: AIR FORCE

Category	1995–1998		1995		1996		1997		1998	
	Count	% of all disability	Count	% of all disability	Count	% of all disability	Count	% of all disability	Count	% of all disability
Musculoskeletal	219	46	91	53	84	50	43	40.2	1	3.1
Psychiatric	64	13	26	15.1	20	11.9	12	4.9	6	18.7
Trachea/bronchi	25	5.2	8	4.7	6	3.6	10	9.3	1	3.1
Epilepsies	6	1.0	2	1.2	2	1.2	2	1.9	0	
Digestive	16	3.3	4	2.3	6	3.6	5	4.7	1	3.1
Endocrine	14	2.9	7	4.1	5	3.0	2	1.9	0	

Table 2.5.27 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 2.5.25, musculoskeletal, psychiatric, and trachea/bronchi problems were common reasons for disability discharge.

TABLE 2.5.27. PERCENTAGE OF ENLISTED ACCESSIONS ENDING IN DISABILITY DISCHARGE WITHIN 2 YEARS OF SERVICE: ARMY

Category	1995–1998		1995		1996		1997		1998	
	Count	% of all disability	Count	% of all disability	Count	% of all disability	Count	% of all disability	Count	% of all disability
Musculoskeletal	1,180	71.0	365	70.2	457	69.4	256	70.5	101	84.2
Psychiatric	51	3.1	18	3.5	21	3.2	6	1.7	6	5.0
Trachea/bronchi	86	4.0	34	6.5	35	5.3	17	4.7	0	
Central nervous system	23	1.4	6	1.2	9	1.4	7	1.9	1	0.8
Digestive	9	0.5	3	0.6	2	0.3	4	1.1	0	
Peripheral nerves	11	0.7	0		2	0.3	3	0.8	6	5.0

Table 2.5.28 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 2.5.26 above, musculoskeletal, psychiatric, and trachea/bronchi problems were common reasons for disability discharge.

TABLE 2.5.28. PERCENTAGE OF ENLISTED ACCESSIONS ENDING IN DISABILITY DISCHARGE WITHIN 2 YEARS OF SERVICE: AIR FORCE

Category	1995–1998		1995		1996		1997		1998	
	Count	% of all disability	Count	% of all disability	Count	% of all disability	Count	% of all disability	Count	% of all disability
Musculoskeletal	271	36.6	110	40.4	109	40.1	51	31.3	1	3.0
Psychiatric	98	13.2	48	17.6	28	10.3	16	9.8	6	18.2
Trachea/bronchi	56	7.6	20	7.4	20	7.4	15	9.2	1	3.0
Digestive	23	3.1	7	2.6	10	3.7	5	3.1	1	3.0
Endocrine	20	2.7	10	3.7	8	2.9	2	1.2	0	0
Epilepsies	6	0.8	3	1.1	2	0.7	1	0.6	0	0

3. ANALYSIS OF EARLY ATTRITION OF ACTIVE DUTY ENLISTEES

3.1. Introduction

Each year more than 200,000 individuals apply for military service, of which 50–60% are admitted and subsequently begin active duty. Of those who begin duty, fully one-third fail to complete their initial enlistment terms. The highest attrition rate occurs in the first 6 months of service, when over 10% of the entering cohort are lost. Based on 1993 cost estimates from the Office of the Undersecretary of Defense for Personnel and Readiness, the services' annual investment in enlistees who separate before they complete 6 months exceeds $350 million[1].

The purpose of this pilot study is to begin to examine attrition as a whole, rather than as a set of issues to be considered separately (e.g., back attrition, skin attrition, etc.). Recent data on the background and subsequent early attrition (both medical and nonmedical) of all first-term enlistees are examined. Although the available data are not yet sufficiently detailed and complete to make reliable conclusions, the procedures discussed are demonstrated as a means toward making reliable conclusions.

Attrition modeling will help answer some of the main questions related to the military's early attrition problem, such as

- What are some factors that are predictive of military attrition?
- What groups of individuals are prone to attrition?
- Are the current accession medical standards fulfilling the needs of the military?

As discussed earlier in this report, the services differ considerably with regard to how attrition is categorized. For this reason, all analyses are presented by service, and comparisons across services are discouraged.

3.2. Data

Information on new accessions comes from the DMDC gain data, and demographic and medical background information comes from the MEPS data. Both of these data sources are described in Section 2.1. Gain and MEPS data include hundreds of variables. For this pilot study, we have identified nine of those variables to be of primary interest. These include personal demographics (gender, age, married status, education level, etc.) and service information (date of entry, service branch, separation date and reason, etc.). A listing and brief description of these variables is given in Section 3.5.2.

Information on attrition from any cause comes from the DMDC loss data. In addition, early medical attrition for conditions that existed prior to service is specifically examined as an outcome using the EPTS data. Attrition specific to the cohort is determined by matching the loss and EPTS data to the gain and MEPS data, using social security

number as the matching field. It is from these merged data that the length of service can be determined for any individual entering and leaving during the period studied.

It should be noted that the gain data for CY 1997 is incomplete, particularly for the Army. This data shortcoming will affect the attrition modeling results and prevents drawing firm conclusions from them.

3.3. Analysis Methods

The first phase of the analysis is exploratory, with the goal of determining which, and in what form, variables are to be included in the final attrition models. We use frequency analysis and chi-square tests to assess loss rates in relation to each of the 9 factors considered. The outcome for this analysis is whether an individual is lost within a certain time after enlistment (6 months, 1 year, etc.). Losses will be measured both as rates (i.e. per person) and as loss counts per person-year (LCPY) and will be adjusted for those subjects whose status becomes unknown prior to the end of the time period. For ordinal variables, such as year and education level, we use the Cochran-Armitage trend test to determine if there is a significant linear trend. When discussing significance in this section, if the p-value is not given, then highly significant means $p < 0.01$, significant means $0.01 \leq p < 0.05$ and marginally significant means $0.05 \leq p < 0.10$.

The second phase is to use rate analysis to examine the influence of the nine factors over time. This is related not only to how many enlistees are lost, as examined in the first phase, but also to timing patterns of the losses. This is first performed by modeling each factor individually against attrition while controlling for the year of enlistment. We then simultaneously examine the factors in relation to attrition over time.

In all of the multivariate modeling we use Cox proportional hazards models (SAS procedure PHREG)[2]. This technique involves certain assumptions regarding the parametric form of effects of the variables on attrition, allowing estimation of adjusted effects for these factors. Risk ratios (i.e., hazard ratios) are reported.

In addition to the attrition modeling, we present several tables regarding the reasons for early losses. These analyses include both overall attrition, and attrition specifically related to medical conditions that existed prior to service.

Finally, we discuss differences in attrition likelihood according to the MEP station at which an individual was processed. This factor is examined separately due to the large number (65) of MEP stations – some consolidation of this factor is needed prior to inclusion in a multifactorial model. The discussion in this section begins the consolidation process.

3.4. Attrition by Individual Factors

3.4.1. YEAR OF ENTRY EFFECT

Table 3.4.1 shows the loss rates and counts per person-year, at 6 months and 1 year of service, according to the year of entry into military service. Conclusions based on the rates or the counts per person-year are similar. Losses are increasing by year for the Marines, Army, and Navy, and the time trend for each is highly significant. Conversely, losses for the Air Force are decreasing, and this trend is highly significant. Overall, about one-fifth of new enlistees were lost within 1 year; and 75% of these were lost within 6 months. Because this study is more interested in early attrition, the censor time for the remaining rate analyses is selected to be 6 months.

TABLE 3.4.1. LOSS RATES AND COUNTS PER PERSON-YEAR WITHIN 6 MONTHS
AND WITHIN 1 YEAR, BY SERVICE AND YEAR

Service	Enlistment year	Number of enlistees	Within 1 year				Within 6 months			
			Loss rate		Count/PY		Loss rate		Count/PY	
			Rate	SE	LCPY	SE	Rate	SE	LCPY	SE
Army	1995	47,282	0.19	0.0018	0.22	0.0021	0.14	0.0016	0.32	0.0036
	1996	66,128	0.20	0.0015	0.23	0.0018	0.15	0.0014	0.34	0.0031
	1997	40,864	0.17	0.0018	0.19	0.0021	0.12	0.0016	0.27	0.0036
	1998*	26,039					0.20	0.0025	0.45	0.0056
Navy	1995	45,191	0.22	0.0019	0.26	0.0023	0.16	0.0017	0.37	0.0040
	1996	45,558	0.22	0.0019	0.26	0.0023	0.15	0.0017	0.34	0.0038
	1997	42,685	0.21	0.0020	0.24	0.0023	0.16	0.0018	0.36	0.0040
	1998*	16,065					0.18	0.0030	0.41	0.0070
Marines	1995	30,381	0.11	0.0018	0.12	0.0019	0.07	0.0015	0.15	0.0031
	1996	28,922	0.17	0.0022	0.19	0.0025	0.13	0.0020	0.29	0.0044
	1997	32,683	0.20	0.0022	0.23	0.0026	0.16	0.0020	0.36	0.0046
	1998*	11,986					0.18	0.0035	0.42	0.0082
Air Force	1995	30,456	0.16	0.0021	0.18	0.0024	0.13	0.0019	0.29	0.0043
	1996	30,512	0.15	0.0020	0.16	0.0023	0.12	0.0018	0.26	0.0040
	1997	30,746	0.15	0.0020	0.17	0.0023	0.12	0.0019	0.26	0.0041
	1998*	15,542					0.12	0.0026	0.26	0.0057

*Follow-up data not available for entire year. For the "Within 6 months" analysis, only the enlistees who began active duty before 6/30/98 were considered.

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3.4.2. GENDER EFFECT

Table 3.4.2 shows a gender difference in early attrition. It can be seen that gender effect varies by service. Army females have the highest loss rate (22% compared with 13% for Army males), followed by Marine females (20% compared with 12% for Marine males) and Air Force females (14% compared with 12% for Air Force males). All these gender differences are highly significant, with $p < 0.001$ in each case. In the Navy, the loss rate is higher among males (16%) than females (15%), although the difference is only marginally significant ($p = 0.06$).

The gender effect on the loss counts per person-year (LCPY) is a little larger than that on the loss rate. For example, the LCPY is 0.53 for female Army enlistees compared with 0.29 for Army males, yielding a ratio of 1.83 for LCPY. By comparison, the ratio of the loss rate is $0.22/0.13 = 1.69$. This means, among the enlistees lost, that females are likely to be lost earlier than males in the Army. Similar results are seen in both the Marines and the Air Force.

TABLE 3.4.2. LOSS RATES AND COUNTS PER PERSON-YEAR CENSORED AT 6 MONTHS BY SERVICE AND GENDER

Service	Gender	Number of enlistees	Discharge rate		Loss count per person-year	
			Loss rate	SE	Loss/person-year	SE
Army	Female	35,778	0.22	0.0022	0.53	0.0052
	Male	144,535	0.13	0.0009	0.29	0.0019
Navy	Female	24,311	0.15	0.0023	0.35	0.0053
	Male	125,188	0.16	0.0010	0.36	0.0024
Marines	Female	7,701	0.20	0.0046	0.47	0.0106
	Male	96,271	0.12	0.0011	0.27	0.0023
Air Force	Female	28,430	0.14	0.0021	0.31	0.0046
	Male	78,826	0.12	0.0011	0.25	0.0025

3.4.3. AGE EFFECT

Table 3.4.3 shows the effect of age at enlistment on likelihood of attrition. By either the loss rate or the LCPY, it is apparent that the likelihood of attrition increases with increasing age. This trend is highly significant for each service.

TABLE 3.4.3. LOSS RATES AND COUNTS PER PERSON-YEAR CENSORED AT 6 MONTHS BY SERVICE AND AGE

Service	Age	Number of enlistees	Discharge rate		Loss count per person-year	
			Loss rate	SE	Loss/person-year	SE
Army	17–20	123,957	0.15	0.0010	0.32	0.0022
	21–25	44,764	0.16	0.0017	0.34	0.0038
	26–30	9,094	0.16	0.0038	0.35	0.0085
	31+	2,498	0.18	0.0077	0.40	0.0173
Navy	17–20	111,857	0.15	0.0011	0.35	0.0024
	21–25	31,279	0.17	0.0021	0.40	0.0050
	26–30	4,853	0.18	0.0055	0.42	0.0128
	31+	1,510	0.22	0.0107	0.53	0.0256
Marines	17–20	84,950	0.12	0.0011	0.25	0.0024
	21–25	16,951	0.17	0.0029	0.39	0.0066
	26–30	2,001	0.23	0.0093	0.55	0.0227
	31+*	70	0.26	0.0525	0.64	0.1317
Air Force	17–20	106,581	0.12	0.0010	0.27	0.0022
	21–25	466	0.36	0.0153	0.76	0.0688
	26–30	202	0.39	0.0242	0.86	0.1087
	31+*	7	0.54	0.1616	2.01	0.9461

*The number of subjects is small, so rates are less reliable.

3.4.4. EDUCATION EFFECT

Table 3.4.4 shows the effect of education level on likelihood of attrition. Generally, the loss rate and LCPY are higher for enlistees with lower education level for all services. For example, high school graduates have markedly lower attrition than nongraduates. Early attrition rates of enlistees without a high school diploma are 5 to 8 percentage points higher than the rates of high school graduates across the services. This trend is statistically significant in each service.

TABLE 3.4.4. LOSS RATES AND COUNTS PER PERSON-YEAR CENSORED AT 6 MONTHS BY SERVICE AND EDUCATION AT ENTRY

Service	MEPS education	Number of enlistees	Discharge rate		Loss count per person year	
			Loss rate	SE	Loss/person-year	SE
Army	Less than high school	9,565	0.21	0.0041	0.48	0.0096
	High school	149,598	0.15	0.0009	0.32	0.0020
	Some college	2,546	0.12	0.0064	0.26	0.0138
	Bachelor's and above	4,106	0.10	0.0047	0.22	0.0101
Navy	Less than high school	3,279	0.24	0.0075	0.60	0.0186
	High school	136,799	0.16	0.0010	0.35	0.0022
	Some college	1,059	0.11	0.0096	0.24	0.0209
	Bachelor's and above	1,811	0.10	0.0071	0.22	0.0153
Marines	Less than high school*	261	0.18	0.0238	0.42	0.0551
	High school	10,012	0.13	0.0010	0.28	0.0023
	Some college	324	0.12	0.0179	0.26	0.0389
	Bachelor's and above	605	0.08	0.0110	0.17	0.0234
Air Force	Less than high school*	103	0.20	0.0399	0.47	0.0926
	High school	88,805	0.13	0.0011	0.28	0.0025
	Some college	15,384	0.09	0.0023	0.20	0.0050
	Bachelor's and above	2,010	0.15	0.0070	0.27	0.0167

*The number of subjects is small, so rates are less reliable.

3.4.5. AFQT EFFECT

Table 3.4.5 shows the effect of AFQT performance category on likelihood of attrition. Early attrition rates of recruits with AFQT score less than 31 are almost double the rates of recruits with score 93 or above across the services. More generally, in each service the enlistees with lower scores are more likely to be lost than those with higher scores. This trend is highly significant in each service.

TABLE 3.4.5. LOSS RATES AND COUNTS PER PERSON-YEAR CENSORED AT 6 MONTHS BY SERVICE AND MEPS AFQT SCORE

Service	AFQT score	Number of enlistees	Discharge rate		Loss count per person year	
			Loss rate	SE	Loss/person-year	SE
Army	93-99	8,953	0.11	0.0032	0.23	0.0070
	65-92	62,596	0.14	0.0014	0.30	0.0030
	31-64	102,224	0.16	0.0011	0.36	0.0026
	01-30	6,132	0.16	0.0046	0.35	0.0103
Navy	93-99	8,821	0.11	0.0033	0.24	0.0072
	65-92	53,949	0.14	0.0015	0.31	0.0034
	31-64	83,445	0.17	0.0013	0.41	0.0030
	01-30	2,882	0.18	0.0071	0.41	0.0166
Marines	93-99	4,169	0.10	0.0047	0.23	0.0102
	65-92	36,292	0.11	0.0017	0.24	0.0036
	31-64	60,583	0.13	0.0014	0.30	0.0031
	01-30	2,536	0.19	0.0078	0.44	0.0182
Air Force	93-99	6,773	0.09	0.0034	0.19	0.0074
	65-92	48,488	0.11	0.0014	0.24	0.0031
	31-64	50,716	0.14	0.0015	0.30	0.0034
	01-30	613	0.16	0.0148	0.36	0.0333

3.4.6. RACE EFFECT

Table 3.4.6 shows the effect of race on early attrition. It can be seen that the rate difference by race is quite similar across the services. Whites are more likely to be lost than blacks, and blacks are more likely to be lost than those in the "other" category. Overall, loss rates by race are highly significantly different; $p = 0.001$ for each service.

TABLE 3.4.6. LOSS RATES AND COUNTS PER PERSON-YEAR CENSORED AT 6 MONTHS BY SERVICE AND RACE

Service	Race	Number of enlistees	Discharge rate		Loss count per person-year	
			Loss rate	SE	Loss/person-year	SE
Army	Other	15,483	0.11	0.0025	0.24	0.0054
	Black	40,047	0.12	0.0016	0.26	0.0035
	White	121,859	0.17	0.0011	0.37	0.0024
Navy	Other	12,507	0.12	0.0029	0.27	0.0065
	Black	30,484	0.15	0.0021	0.35	0.0047
	White	106,449	0.16	0.0011	0.38	0.0026
Marines	Other	12,814	0.10	0.0026	0.21	0.0057
	Black	13,918	0.13	0.0029	0.29	0.0063
	White	77,226	0.13	0.0012	0.29	0.0027
Air Force	Other	9,689	0.08	0.0028	0.18	0.0060
	Black	16,891	0.10	0.0023	0.22	0.0050
	White	80,671	0.13	0.0012	0.29	0.0026

3.4.7. MARITAL STATUS EFFECT

Table 3.4.7 shows the effect of marital status on early attrition. It can be seen that this effect varies across the services. The difference between the married and single enlistees is highest in the Marines (7%), followed by the Army (5%) and the Navy (3%). In each service, however, single enlistees have lower attrition rates than those who are married. These differences are statistically significant in all but the Air Force.

TABLE 3.4.7. LOSS RATES AND COUNTS PER PERSON-YEAR CENSORED AT 6 MONTHS BY SERVICE AND MARITAL STATUS

Service	Married status	Number of enlistees	Discharge rate		Loss count per person year	
			Loss rate	SE	Loss/person-year	SE
Army	Married	21,821	0.19	0.0026	0.42	0.0060
	Other	1,917	0.21	0.0093	0.49	0.0216
	Single	156,575	0.14	0.0009	0.32	0.0020
Navy	Married	5,912	0.19	0.0051	0.44	0.0119
	Other	1,196	0.20	0.0117	0.48	0.0276
	Single	142,391	0.16	0.0010	0.36	0.0022
Marines	Married	3,590	0.19	0.0065	0.44	0.0152
	Other	512	0.22	0.0185	0.54	0.0440
	Single	99,870	0.12	0.0010	0.27	0.0023
Air Force	Married	9,327	0.12	0.0034	0.27	0.0075
	Other	552	0.14	0.0146	0.30	0.0327
	Single	97,377	0.12	0.0011	0.27	0.0023

3.4.8. MEDICAL STATUS EFFECT

Table 3.4.8 shows the effect of initial medical qualification on likelihood of attrition. It is interesting to see that, in each service, the recruits who were medically disqualified at MEPS are more likely to be lost than those who were not. The difference in loss rates between the two groups is 6% in the Marines, 4% in the Army, and 2% in the Navy and the Air Force. All differences are highly significant.

TABLE 3.4.8. LOSS RATES AND COUNTS PER PERSON-YEAR CENSORED AT 6 MONTHS BY SERVICE AND WAIVER FOR MEDICAL FAILURE

Service	Disqualified and waived	Number of enlistees	Discharge rate		Loss count per person-year	
			Loss rate	SE	Loss/person-year	SE
Army	No	161,826	0.15	0.0009	0.32	0.0019
	Yes	18,487	0.19	0.0029	0.43	0.0065
Navy	No	135,882	0.16	0.0010	0.35	0.0022
	Yes	13,617	0.18	0.0033	0.43	0.0078
Marines	No	95,809	0.12	0.0011	0.27	0.0023
	Yes	8,163	0.18	0.0043	0.43	0.0099
Air Force	No	101,100	0.12	0.0010	0.27	0.0023
	Yes	6,156	0.14	0.0044	0.30	0.0097

3.4.9. CONTRACTED YEARS EFFECT

Table 3.4.9 shows the effect of the length of initial contract on likelihood of attrition. First note that only in the Army is there much variability in contract lengths—more than 80% of enlistees are in the same category in the Navy, Marines, and Air Force. No clear pattern in attrition exists across the services for this factor.

TABLE 3.4.9. LOSS RATES AND COUNTS PER PERSON-YEAR CENSORED AT 6 MONTHS BY SERVICE AND YEARS CONTRACTED

Service	Years contract	Number of enlistees	Discharge rate		Loss count per person-year	
			Loss rate	SE	Loss/person-year	SE
Army	<2	8,371	0.12	0.0036	0.26	0.0078
	2	2,049	0.19	0.0087	0.44	0.0198
	3	71,714	0.15	0.0013	0.34	0.0030
	4	74,529	0.15	0.0013	0.33	0.0029
	5	11,081	0.18	0.0036	0.40	0.0083
	6	12,569	0.13	0.0030	0.29	0.0066
Navy	<4	10,837	0.16	0.0035	0.36	0.0080
	4	118,571	0.16	0.0011	0.36	0.0024
	5	20,091	0.17	0.0026	0.38	0.0060
Marines	<4	7,715	0.20	0.0046	0.48	0.0109
	4	83,779	0.12	0.0011	0.27	0.0025
	5	12,478	0.12	0.0029	0.26	0.0063
Air Force	<4	8,211	0.12	0.0035	0.25	0.0077
	4	93,560	0.12	0.0011	0.27	0.0024
	5	5,485	0.14	0.0045	0.29	0.0102

3.5. Attrition Over Time

3.5.1. BIVARIATE MODELS

Section 3.5 presents attrition results for several variables, including those examined in detail above, while controlling for the effect of the year of entry onto active duty. Results are shown for both short-term (6 months) and long-term (3 years) attrition. The effect on attrition of an individual factor may be complex. Some effects, such as gender, vary across the services. Some effects, such as AFQT score, are similar in all services.

Table 3.5.1 shows the results of modeling several factors separately against attrition, while controlling in each case for the year of beginning service. In the Army, the most significant factor for early attrition is gender, with a risk ratio for females relative to males of 1.82. Other significant factors include white race relative to black (relative risk 1.40), married relative to single (relative risk 1.32), and medical disqualification at MEPS relative to qualified (relative risk 1.29). The years contracted by enlistees to the Army are not a significant predictor for the early attrition.

Similarly, the following significant factors can be seen for the other services:

- Navy—AFQT score, number of dependents, marital status, if medically disqualified at MEPS, and race;
- Marines—gender, marital status, if medically disqualified at MEPS, AFQT score, race, number of dependents, and age;
- Air Force—gender, race, if medically disqualified at MEPS, and AFQT score.

The results for censoring times of 6 months and of 3 years are quite similar.

TABLE 3.5.1. RISK RATIOS FROM THE BIVARIATE COX MODEL (CONTROLLED BY GAIN YEAR)

	Army		Navy		Marines		Air Force	
	Risk ratio	*p* value	Risk ratio	*p* value	Risk ratio	*p* value	Risk ratio	*p* value
Within 3 years service controlled by year only								
Female (male)	1.68	0.0001	1.03	0.0115	1.51	0.0001	1.23	0.0001
Black (white)	0.83	0.0001	0.96	0.0001	1.05	0.0033	0.92	0.0001
Other (white)	0.68	0.0001	0.71	0.0001	0.69	0.0001	0.68	0.0001
Age (5 years)	1.02	0.0001	1.08	0.0001	1.40	0.0001	1.21	0.0001
Education in years	1.02	0.0001	1.06	0.0001	1.07	0.0001	0.97	0.0002
AFQT score at MEPS (5 point increase)	0.98	0.0001	0.97	0.0001	0.96	0.0001	0.95	0.0001
AFQT score at gain	0.85	0.0001	0.93	0.0001	0.84	0.0001	0.89	0.0001
Number of dependents	1.11	0.0001	2.44	0.0056	1.15	0.0001	0.96	0.0026
Waived at MEPS	1.24	0.0001	1.14	0.0001	1.30	0.0001	1.08	0.0035
Years contracted	1.00	0.3214	1.01	0.0013	0.89	0.0001	1.08	0.0001
Weight (5 pounds)*	1.000	0.7632	1.002	0.0207	1.003	0.0258	0.989	0.0001
Height (5 inches)	0.88	0.0001	1.03	0.0001	0.97	0.0005	0.93	0.0001
Other (single)	1.46	0.0001	1.35	0.0001	1.78	0.0001	1.21	0.0158
Married (single)	1.25	0.0001	1.13	0.0001	1.37	0.0001	0.91	0.0001
Within 6 months service controlled by year only								
Female (male)	1.82	0.0001	0.97	0.0521	1.65	0.0001	1.24	0.0001
Black (white)	0.71	0.0001	0.92	0.0001	1.00	0.9016	0.75	0.0001
Other (white)	0.64	0.0001	0.73	0.0001	0.74	0.0001	0.62	0.0001
Age (5 years)	1.04	0.0001	1.17	0.0001	1.58	0.0001	1.18	0.0001
Education in year	1.01	0.0004	1.05	0.0001	1.07	0.0001	1.00	0.8362
AFQT score at MEPS (5 point increase)	0.98	0.0001	0.96	0.0001	0.96	0.0001	0.95	0.0001
AFQT score at gain	0.83	0.0001	0.93	0.0001	0.82	0.0001	0.89	0.0001
Number of dependents	1.14	0.0001	2.71	0.0178	1.17	0.0001	1.00	0.796
Waived at MEPS	1.29	0.0001	1.19	0.0001	1.38	0.0001	1.15	0.0001
Years contracted	1.00	0.4253	1.02	0.0007	0.94	0.0012	1.04	0.0207
Weight (5 pounds)*	0.996	0.0014	1.005	0.0002	1.008	0.0001	0.990	0.0001
Height (5 inches)	0.87	0.0001	1.04	0.0001	0.95	0.0001	0.94	0.0001
Other(single)	1.52	0.0001	1.34	0.0001	1.92	0.0001	1.12	0.3378
Married (single)	1.32	0.0001	1.21	0.0001	1.58	0.0001	0.99	0.8485

*Weight in this table is extended to three decimals in order to show direction of significance, i.e. to avoid significance at 1.00 rounded value.

3.5.2. MULTIVARIATE MODELING

Finally, we use multivariate Cox modeling to simultaneously examine effects of the explanatory factors considered in this study. Again, modeling was performed to examine both short-term (6 months) and long-term (3 years) attrition.

The variables and their effects estimates are listed in Table 3.5.2. As might be expected based on the univariate and bivariate analyses above, several significant findings emerge when all factors are considered together.

- *Gender.* The effect is highly significant on short-term attrition after controlling for the other factors. Females are more likely to be lost within the first 6 months than males in the Army, Marines, and Air Force. In the Navy, males and females are equally likely to have a loss within 6 months, although females are more likely to be lost in the long term.
- *Race.* Loss rate difference is significant, with whites the most likely to be lost in both the short term and long term.
- *Age.* Effect is significant in all services other than the Army, with the older enlistees more likely to be lost. Effect in the Army is weak, with no readily apparent trend.
- *Education, AFQT score.* Because these factors are highly correlated to one another, it is improper to make a conclusion on them individually. Overall, however, it can be seen that the enlistees with lower score are more likely to be lost.
- *Number of dependents.* An unexpected finding is that the effect of the number of dependents is highly significant in the Army and the Navy. With each additional dependent, the loss rate for a member in the Army will increase at least 10%. Such an effect is not significant in the Marines and Air Force. Further study might be warranted to gain insight into this phenomenon. Since few enlistees in the Navy and Marines have dependents, any conclusion for these two services might be unreliable.
- *Medical disqualification at MEPS.* This factor is highly significant for all services. The risk of loss for those disqualified at MEPS is 15–38% higher than those without medical problems. We also included a variable to indicate if the disqualification was labeled "permanent." This is correlated with the variable "if medically disqualified at MEPS"; hence the risk ratio for the medical disqualification factor might be affected. Regardless, the analysis shows that medical disqualification at MEPS is a strong predictor of early attrition in military service.
- *Marital status.* This is a significant predictor for attrition in all services except the Air Force. Those married and those with "other" marital status are more likely to be lost than the single enlistees in both the short term and long term.
- *Year of enlistment.* For early attrition, the time trend is significant in the Army and Marines, with early attrition rates increasing in more recent years. Risk rate is also increasing in the Navy, but there is not a significant trend. Conversely, there is a downward trend in the Air Force, implying that attrition has become less prevalent over time when controlling for the other factors.

TABLE 3.5.2. ADJUSTED RISK RATIOS FROM THE MULTIVARIATE COX MODEL

	Army		Navy		Marines		Air Force	
	Risk ratio	p value	Risk ratio	p value	Risk ratio	p value	Risk ratio	p value
Within 3 years service								
Female (male)	1.97	0.0001	1.08	0.0001	1.60	0.0001	1.23	0.0001
Black (white)	0.70	0.0001	0.87	0.0001	0.94	0.0007	0.81	0.0001
Other (white)	0.64	0.0001	0.69	0.0001	0.66	0.0001	0.65	0.0001
Age (5 years)	0.95	0.0001	1.07	0.0001	1.28	0.0001	1.37	0.0001
Education in year	1.03	0.0001	1.05	0.0001	1.07	0.0001	1.00	0.7305
AFQT score at MEPS (5 point increase)	0.97	0.0001	0.96	0.0001	0.969	0.0001	0.95	0.0001
Number of dependents	1.08	0.0001	2.41	0.0064	1.00	0.9452	1.02	0.4828
If medical disqualification	1.17	0.0001	1.20	0.0001	1.31	0.0001	1.14	0.0008
Years contracted	0.99	0.0553	0.99	0.002	0.96	0.0035	1.11	0.0001
Height (5 inches)	0.98	0.0252	1.06	0.0001	1.01	0.5021	1.02	0.2062
Weight (5 pounds)	1.02	0.0001	1.00	0.1442	1.01	0.0001	1.00	0.4582
If permanent disqualification	1.02	0.4705	0.90	0.0003	0.90	0.0167	0.93	0.1913
Other (single)	1.23	0.0001	1.21	0.0001	1.35	0.0001	1.13	0.1327
Married (single)	1.06	0.0011	1.09	0.0003	1.18	0.0001	0.90	0.0046
Year gained	1.12	0.0001	1.05	0.0001	1.22	0.0001	1.00	0.8425
Within 6 months service								
Female (male)	2.26	0.0001	1.00	0.9041	1.82	0.0001	1.26	0.0001
Black (white)	0.58	0.0001	0.81	0.0001	0.87	0.0001	0.64	0.0001
Other (white)	0.60	0.0001	0.70	0.0001	0.69	0.0001	0.59	0.0001
Age (5 years)	0.98	0.0139	1.18	0.0001	1.40	0.0001	1.31	0.0001
Education in year	1.01	0.0001	1.04	0.0001	1.06	0.0001	1.01	0.3279
AFQT score at MEPS (5 point increase)	0.96	0.0001	0.95	0.0001	0.95	0.0001	0.94	0.0001
Number of dependents	1.10	0.0001	2.49	0.0315	0.97	0.2989	1.03	0.3183
If medical disqualification	1.15	0.0001	1.24	0.0001	1.38	0.0001	1.19	0.0005
Years contracted	0.97	0.0001	0.99	0.0849	1.01	0.665	1.08	0.0001
Height (5 inches)	1.03	0.0114	1.06	0.0001	0.99	0.524	1.03	0.1543
Weight (5 pounds)	1.02	0.0001	1.00	0.6529	1.02	0.0001	1.00	0.6699
If permanent disqualification	1.11	0.0022	0.90	0.0121	0.88	0.0288	0.98	0.8252
Other (single)	1.19	0.0009	1.07	0.3238	1.32	0.0057	1.01	0.9067
Married (single)	1.07	0.0127	1.10	0.0063	1.31	0.0001	0.95	0.3175
Year gained	1.06	0.0001	1.01	0.2037	1.33	0.0001	0.96	0.0001

3.5.3. IDENTIFYING ATTRITION-PRONE PERSONNEL

We can use the Cox model and other statistical models to identify who is likely to be prone to attrition. More sophisticated accession screens could help predict attrition. Although disqualification at MEPS remains the best single predictor of early attrition in all services, other variables such as age, sex, and AFQT score taken together have comparable predictive value.

For example, suppose that two applicants for military service have the following features:

- Applicant A has a medical disqualification at MEPS, has an AFQT score of 60, has one dependent, and is female;
- Applicant B has no medical failure, has an AFQT score of 70, has no dependents, and is male.

Assuming all other factors to be equal, we can predict from the preliminary attrition modeling presented below that applicant A would be approximately 3.5 times as likely to leave during the first 6 months in the Army as applicant B, 3.4 times as likely in the Navy, 2.7 times as likely in the Marines, and 1.8 times as likely in the Air Force.

Furthermore, if the survival distribution for a basic group is estimated from the data, we can predict how long, on average, such an individual will serve in the armed forces. **Because this is a pilot study with incomplete data, the predictions may be inaccurate and are primarily for illustration. AMSARA is working toward development of more complete data collection and hence more reliable modeling efforts.**

3.6. Reasons for Loss

Section 3.6 examines the reasons given for the early losses among newly enlisted recruits. Section 3.6.1 considers the medical categories of those losses for EPTS medical condition(s). Section 3.6.2 considers loss reasons for all early attrition. Table 3.6.1 shows that about 30% of all attrition in the first 6 months of service consists of EPTS discharges.

TABLE 3.6.1. NUMBERS OF LOSSES WITHIN 6 MONTHS BY SERVICES

Service	Total loss	Loss count by EPTS	Percentage loss due to EPTS
Army	26,983	8477	31.4
Navy	23,642	7969	33.7
Marines	13,190	3665	27.8
Air Force	13,133	3671	28.0

3.6.1. MAJOR CAUSES FOR EPTS LOSS

The primary medical reason for each EPTS discharge is assigned by MEPCOM to one of 20 categories (Table 3.6.2). Table 3.6.3 shows frequency counts of the most common reasons for EPTS discharge among enlistees beginning service in 1995–1998. The cause of the EPTS discharge varies across the services, probably reflecting differences in the way the services categorize certain conditions. For example, psychiatric conditions account for at least 44% of EPTS discharges in the Navy and 37% in the Marines but only 7% in the Army and less than 1% in the Air Force. The orthopedics and chest and lung hypertension problems (1A, 1B, 1C, 1D, and 2A) are the main reasons of EPTS discharges in the Army (56%) and in the Air Force (77%). A few of these are also large causes of EPTS discharge in all services. For example, the chest and lung hypertension (2A) is found to be essential for the EPTS discharges in all services: 14% in the Army, 14% in the Navy, 7% in the Marines, and 17% in the Air Force.

TABLE 3.6.2. EPTS CATEGORIES

EPTS code	Definition
1A	Orthopedics - feet
1B	Orthopedics - back
1C	Orthopedics - knee
1D	Orthopedics - other
2A	Chest and lung - hypertension
2B	Chest and lung - other
3A	Cardiovascular hypertension
3B	Cardiovascular - other
4	Genitourinary system
5A	Neurology – seizure disorder
5B	Neurology other
6	Abdomen and viscera (includes hernia)
7A	Eyes vision/refraction
7B	Eyes - other
8A	Psychiatric schizophrenia
8B	Psychiatric - other
9A	Ears - hearing
9B	Ears - other
10	Skin and lymphatics
11	Other

TABLE 3.6.3. EPTS CODES WITH HIGHER DISCHARGE RATES BY SERVICE

	EPTS definition	Count	Percent
Army	Orthopedics - feet	1,295	15.28
	Chest and lung - hypertension	1,206	14.23
	Orthopedics - knee	1,120	13.21
	Orthopedics - other	1,039	12.26
	Orthopedics - back	999	11.78
	Psychiatric - other	594	7.01
	Genitourinary system	413	4.87
	Other	403	4.75
Navy	Psychiatric - other	3,527	44.26
	Chest and lung - hypertension	1,121	14.07
	Orthopedics - other	388	4.87
	Other	371	4.66
	Eyes vision/refraction	352	4.42
	Orthopedics - knee	314	3.94
	Neurology - other	314	3.94
Marines	Psychiatric - other	1,366	37.27
	Orthopedics - other	524	14.30
	Orthopedics - knee	355	9.69
	Chest and lung - hypertension	264	7.20
	Orthopedics - feet	243	6.63
	Orthopedics - back	163	4.45
	Other	153	4.17
Air Force	Orthopedics - knee	714	19.45
	Chest and lung - hypertension	635	17.30
	Orthopedics - feet	508	13.84
	Orthopedics - other	498	13.57
	Orthopedics - back	473	12.88
	Neurology - other	274	7.46
	Other	171	4.66

3.6.2. MAJOR CAUSES FOR EARLY ATTRITION USING LOSS DATA

The primary source of all attrition (i.e. including both medical and nonmedical) is the loss data from DMDC. This loss file contains an interservice separation code (ISC) to describe the reason for the loss. Table 3.6.4 lists the codes for separation that are the most common (>1% for at least one service) in this study.

Few solid conclusions can be reached on the basis of these data. The categories of the ISC are not sufficiently specific, and a review of the loss reasons by service indicates a probable coding disparity. A more detailed coding system uniformly applied by the services would allow better understanding of early overall attrition.

TABLE 3.6.4. MOST COMMON LOSS REASONS FOR LOSS

ISC	Definition
	Medical Disqualifications
010	EPTS condition
011	Disability—severance pay
014	Disability (non-EPTS)—no pay
016	Unqualified for active duty
017	Failure to meet weight/body fat standard
	Dependency or Hardship
022	Dependency or hardship
	Failure to meet minimum Behavioral and Performance Criteria
060	Character or behavior disorder
064	Alcoholism
067	Drugs
074	Fraudulent entry
075	AWOL, desertion
076	Homosexuality
078	Good of the service (in lieu of court martial)
084	Commission of a serious offense
087	Trainee discharge/entry level performance and conduct
	Other Separations or Discharges
091	Erroneous enlistment or induction
094	Pregnancy
098	Breach of contract
099	Other
	Transactions
101	Dropped from strength for desertion

Table 3.6.5 shows the major reasons of separation for different services. It can be seen that the reason of separation varies by service, again probably reflecting differences in the way that the services classify losses. In the Army, almost 50% of the enlistees are separated owing to unsatisfactory performance (087). However, the major reason is fraudulent entry (074) in the Navy and Marines: 25% and 35%, respectively. The major reason in the Air Force is medically unqualified for active duty (016): 32%.

TABLE 3.6.5. MOST COMMON LOSS REASONS BY SERVICE

	Reason (ISC)	Loss count	Percent of Losses
Army	Trainee discharge (087)	12,959	49.23
	Unqualified for active duty (016)	8,307	31.56
	EPTS condition (010)	1,725	6.55
	Desertion (101)	1,061	4.03
	Character/behavior disorder (060)	393	1.49
	Fraudulent entry (074)	360	1.37
Navy	Fraudulent entry (074)	5,799	25.13
	Character/behavior disorder (060)	4,694	20.35
	Unqualified for active duty (016)	4,505	19.53
	Erroneous enlistment/induction (091)	3,860	16.73
	Trainee discharge (087)	962	4.17
	Drugs (067)	950	4.12
	Alcoholism (064)	826	3.58
	Desertion (101)	518	2.25
Marines	Fraudulent entry (074)	4,429	34.66
	Trainee discharge (087)	3,698	28.94
	Erroneous enlistment/induction (091)	2,334	18.26
	Desertion (101)	762	5.96
	Unqualified for active duty (016)	466	3.65
	EPTS condition (010)	386	3.02
	Disability-severance pay (011)	184	1.44
	Character/behavior disorder (060)	152	1.19
Air Force	Unqualified for active duty (016)	4,145	31.70
	Character/behavior disorder (060)	2,809	21.48
	Trainee discharge (087)	2,247	17.18
	Fraudulent entry (074)	1,716	13.12
	Homosexuality (076)	829	6.34
	Other (099)	321	2.45
	Breach of contract (098)	249	1.90
	Commission of a serious offense (084)	243	1.86
	Disability-severance pay (011)	144	1.10

Table 3.6.6 shows that the reasons for separation are consistent within each service by year. A minor difference is found between males and females in Table 3.6.7. A minor difference is also found for marital status (Table 3.6.8), race (Table 3.6.10), and age (Table 3.6.11). A moderate difference exists between enlistees with and without medical disqualification at MEPS (Table 3.6.9). The percentage of codes that might be related to medical reasons [EPTS condition (010) and unqualified for active duty (016)] is a little higher for the members who had been medically disqualified at MEPS than for those who hadn't.

TABLE 3.6.6. MOST COMMON LOSS REASONS BY SERVICE AND YEAR

Service	1995			1996			1997			1998		
	ISC	Count	Percent	ISC	Count	Percent	ISC	Count	Percent	ISC	Count	Percent
Army	087	3,313	49.78	087	4,783	48.08	087	1,955	41.88	087	2,908	57.55
	016	2,186	32.85	016	3,310	33.27	016	1,545	33.10	016	1,266	25.05
	010	545	8.19	010	662	6.65	101	434	9.30	010	281	5.56
	060	111	1.67	101	340	3.42	010	237	5.08	101	200	3.96
	101	87	1.31	060	156	1.57	074	95	2.04	074	55	1.09
	076	78	1.17	074	135	1.36	060	90	1.93	076	53	1.05
	074	75	1.13	078	106	1.07	017	66	1.41			
Navy	074	1,928	26.57	074	1,845	26.91	091	1,868	28.13	016	542	23.36
	016	1,816	25.03	016	1,439	20.99	074	1,659	24.98	060	511	22.03
	060	1,800	24.81	060	1,413	20.61	060	970	14.61	091	473	20.39
	091	556	7.66	091	963	14.04	016	708	10.66	074	367	15.82
	064	308	4.25	067	322	4.70	087	465	7.00	087	99	4.27
	067	300	4.14	064	231	3.37	067	240	3.61	067	88	3.79
	087	217	2.99	087	181	2.64	101	210	3.16	064	85	3.66
	101	108	1.49	101	143	2.09	064	202	3.04	101	57	2.46
				084	73	1.06	076	81	1.22	014	28	1.21
				076	69	1.01	084	67	1.01			
Marines	087	448	25.90	074	1,147	30.58	074	2,127	41.33	074	781	36.28
	091	417	24.10	087	1,077	28.71	087	1,415	27.50	087	758	35.21
	074	374	21.62	091	812	21.65	091	832	16.17	091	273	12.68
	075	266	15.38	075	184	4.91	075	242	4.70	010	91	4.23
	016	66	3.82	016	177	4.72	016	140	2.72	016	83	3.86
	011	58	3.35	010	144	3.84	010	132	2.57	075	70	3.25
	010	19	1.10	011	71	1.89	064	73	1.42	060	34	1.58
	060	19	1.10	060	60	1.60						
	016	1,460	36.64	016	971	27.21	016	1,141	30.97	016	573	31.16
Air Force	060	819	20.55	060	907	25.41	060	771	20.93	060	312	16.97
	087	652	16.36	087	637	17.85	087	690	18.73	087	268	14.57
	074	515	12.92	074	509	14.26	074	465	12.62	074	227	12.34
	076	195	4.89	076	200	5.60	076	212	5.75	076	222	12.07
	099	110	2.76	099	83	2.33	084	117	3.18	084	66	3.59
	011	73	1.83	098	78	2.19	098	76	2.06	099	55	2.99
	098	54	1.36	011	54	1.51	099	73	1.98	098	41	2.23
				010	37	1.04	010	41	1.11	022	21	1.14
										010	20	1.09

TABLE 3.6.7. MOST COMMON LOSS REASONS BY SERVICE AND GENDER

Service	Female			Male		
	ISC	Count	Percent	ISC	Count	Percent
Army	087	3,893	49.57	087	9,066	49.09
	016	2,375	30.24	016	5,932	32.12
	010	813	10.35	101	961	5.20
	060	134	1.71	010	912	4.94
	101	100	1.27	074	292	1.58
	017	94	1.20	060	259	1.40
	022	92	1.17			
Navy	060	997	27.80	074	5,416	27.79
	016	845	23.56	060	3,697	18.97
	091	684	19.07	016	3,660	18.78
	074	383	10.68	091	3,176	16.30
	087	177	4.94	067	869	4.46
	094	124	3.46	087	785	4.03
	064	85	2.37	064	741	3.80
	067	81	2.26	101	470	2.41
	101	48	1.34			
	014	40	1.12			
Marines	087	740	47.87	074	4,050	36.05
	074	379	24.51	087	2,958	26.33
	091	171	11.06	091	2,163	19.25
	010	135	8.73	075	741	6.60
	016	40	2.59	016	426	3.79
	011	29	1.88	010	251	2.23
	075	21	1.36	011	155	1.38
				060	143	1.27
	016	1,564	39.41	016	2,581	28.34
Air Force	060	1,016	25.60	087	1,805	19.82
	087	442	11.14	060	1,793	19.69
	074	376	9.47	074	1,340	14.71
	076	189	4.76	076	640	7.03
	099	85	2.14	099	236	2.59
	011	72	1.81	098	205	2.25
	084	52	1.31	084	191	2.10
	098	44	1.11			
	010	42	1.06			

TABLE 3.6.8. MOST COMMON LOSS REASONS BY SERVICE AND MARITAL STATUS

Service	Married			Others			Single		
	ISC	Count	Percent	ISC	Count	Percent	ISC	Count	Percent
Army	087	1,787	45.22	087	176	44.44	087	10,996	50.04
	016	1,209	30.59	016	131	33.08	016	6,967	31.70
	010	290	7.34	010	28	7.07	010	1,407	6.40
	101	213	5.39	101	17	4.29	101	831	3.78
	074	91	2.30	060	7	1.77	060	323	1.47
	022	89	2.25	078	7	1.77	074	264	1.20
	060	63	1.59	022	5	1.26	076	231	1.05
				074	5	1.26			
				017	4	1.01			
Navy	060	247	22.98	016	58	24.07	074	5,579	25.64
	016	246	22.88	074	49	20.33	060	4,400	20.22
	091	202	18.79	060	47	19.50	016	4,201	19.31
	074	171	15.91	091	33	13.69	091	3,625	16.66
	064	55	5.12	101	16	6.64	087	924	4.25
	067	35	3.26	064	11	4.56	067	904	4.16
	087	33	3.07	067	11	4.56	064	760	3.49
	101	30	2.79	087	5	2.07	101	472	2.17
	022	13	1.21	014	3	1.24	074	4,172	34.66
Marines	074	219	34.54	074	38	35.19	087	3,489	28.98
	087	178	28.08	087	31	28.70	091	2,187	18.17
	091	128	20.19	091	19	17.59	075	715	5.94
	075	37	5.84	075	10	9.26	016	449	3.73
	010	33	5.21	011	4	3.70	010	352	2.92
	016	14	2.21	016	3	2.78	011	173	1.44
	011	7	1.10				060	149	1.24
Air Force	016	396	35.17	060	26	34.67	016	3,733	31.43
	060	271	24.07	016	16	21.33	060	2,512	21.15
	074	185	16.43	074	11	14.67	087	2,158	18.17
	087	83	7.37	087	6	8.00	074	1,520	12.80
	076	56	4.97	076	5	6.67	076	768	6.47
	099	44	3.91	010	2	2.67	099	276	2.32
	022	26	2.31	011	2	2.67	084	232	1.95
	011	16	1.42	022	2	2.67	098	232	1.95
	098	16	1.42	091	2	2.67	011	126	1.06
				084	1	1.33			

TABLE 3.6.9. MOST COMMON LOSS REASONS SERVICE AND IF MEDICALLY DISQUALIFIED AT MEPS

Service	No MEPS Medical DQ			MEPS Medical DQ		
	ISC	Count	Percent	ISC	Count	Percent
Army	087	11,527	50.17	087	1,432	42.77
	016	7,022	30.56	016	1,285	38.38
	010	1,472	6.41	010	253	7.56
	101	952	4.14	101	109	3.26
	060	339	1.48	060	54	1.61
	074	314	1.37	074	46	1.37
	076	232	1.01	074	559	23.44
Navy	074	5,240	25.33	091	530	22.22
	060	4,319	20.88	016	526	22.05
	016	3,979	19.23	060	375	15.72
	091	3,330	16.10	087	114	4.78
	067	868	4.20	067	82	3.44
	087	848	4.10	064	62	2.60
	064	764	3.69	101	43	1.80
	101	475	2.30			
Marines	074	4,010	35.43	087	438	29.96
	087	3,260	28.80	074	419	28.66
	091	1,974	17.44	091	360	24.62
	075	719	6.35	010	78	5.34
	016	409	3.61	016	57	3.90
	010	308	2.72	075	43	2.94
	011	158	1.40	011	26	1.78
	060	142	1.25			
Air Force	016	3,831	31.28	016	314	37.79
	060	2,638	21.54	060	171	20.58
	087	2,108	17.21	087	139	16.73
	074	1,629	13.30	074	87	10.47
	076	786	6.42	076	43	5.17
	099	303	2.47	099	18	2.17
	098	235	1.92	084	15	1.81
	084	228	1.86	098	14	1.68
	011	134	1.09	011	10	1.20
				010	9	1.08

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TABLE 3.6.10. MOST COMMON LOSS REASONS BY SERVICE AND RACE

Service	Others			Black			White		
	ISC	Count	Percent	ISC	Count	Percent	ISC	Count	Percent
Army	087	849	51.33	087	2,165	46.25	087	9,773	49.81
	016	454	27.45	016	1,548	33.07	016	6,178	31.49
	010	101	6.11	010	414	8.84	010	1,187	6.05
	101	90	5.44	101	150	3.20	101	814	4.15
	060	19	1.15	074	94	2.01	060	298	1.52
	022	17	1.03	060	69	1.47	074	245	1.25
	074	17	1.03				076	211	1.08
Navy	074	317	21.56	074	1,587	34.95	074	3,894	22.83
	060	301	20.48	016	862	18.98	060	3,602	21.12
	016	299	20.34	060	791	17.42	016	3,343	19.60
	091	267	18.16	091	560	12.33	091	3,033	17.78
	087	72	4.90	087	261	5.75	067	782	4.58
	067	64	4.35	101	115	2.53	064	707	4.14
	064	53	3.61	067	104	2.29	087	629	3.69
	101	38	2.59	064	65	1.43	101	365	2.14
	076	15	1.02	094	54	1.19			
Marines	074	362	29.55	087	672	37.97	074	3,549	36.28
	087	303	24.73	074	518	29.27	087	2,723	27.83
	091	251	20.49	091	258	14.58	091	1,824	18.64
	075	137	11.18	016	109	6.16	075	548	5.60
	010	69	5.63	075	77	4.35	016	313	3.20
	016	44	3.59	010	70	3.95	010	246	2.51
	011	18	1.47	011	20	1.13	011	146	1.49
							060	133	1.36
Air Force	016	235	29.08	016	512	30.30	016	3,398	32.12
	087	170	21.04	087	477	28.22	060	2,409	22.77
	060	167	20.67	060	233	13.79	087	1,600	15.12
	074	84	10.40	099	137	8.11	074	1,505	14.23
	076	49	6.06	074	127	7.51	076	727	6.87
	084	23	2.85	084	60	3.55	098	216	2.04
	010	18	2.23	076	53	3.14	099	166	1.57
	099	18	2.23	011	20	1.18	084	160	1.51
	098	15	1.86	010	19	1.12	011	116	1.10
	022	9	1.11	098	18	1.07			

TABLE 3.6.11. MOST COMMON LOSS REASONS BY SERVICE AND AGE

Service	17–20 years			21–25 years			26–30 years			Older than 30 years		
	ISC	Count	Percent	ISC	Count	Percent	ISC	Count	Percent	ISC	Count	Percent
Army	087	8,942	50.62	087	3,191	46.85	087	612	43.25	087	214	49.31
	016	5,539	31.36	016	2,180	32.01	016	471	33.29	016	117	26.96
	010	1,198	6.78	010	405	5.95	010	82	5.80	010	40	9.22
	101	630	3.57	101	340	4.99	101	78	5.51	101	13	3.00
	060	259	1.47	074	145	2.13	074	45	3.18	074	12	2.77
				060	97	1.42	060	28	1.98	060	9	2.07
				022	78	1.15	022	23	1.63	022	7	1.61
				076	77	1.13						
Navy	074	4,003	24.14	074	1,468	27.61	074	244	28.67	074	84	25.93
	060	3,457	20.85	016	1,028	19.34	060	159	18.68	016	70	21.60
	016	3,257	19.64	060	1,021	19.21	016	150	17.63	060	57	17.59
	091	2,873	17.33	091	818	15.39	091	127	14.92	091	42	12.96
	087	733	4.42	064	233	4.38	064	38	4.47	087	24	7.41
	067	692	4.17	067	209	3.93	067	37	4.35	067	12	3.70
	064	545	3.29	087	170	3.20	087	35	4.11	064	10	3.09
	101	358	2.16	101	135	2.54	101	20	2.35	076	7	2.16
				076	59	1.11	098	9	1.06	101	5	1.54
Marines	074	3,352	35.18	074	943	33.74	074	131	29.77	087	7	38.89
	087	2,866	30.08	087	726	25.98	010	100	22.73	010	5	27.78
	091	1,738	18.24	091	522	18.68	087	99	22.50	074	3	16.67
	075	599	6.29	010	228	8.16	091	74	16.82	011	1	5.56
	016	363	3.81	075	147	5.26	075	16	3.64	016	1	5.56
	011	141	1.48	016	97	3.47	011	8	1.82	076	1	5.56
	060	128	1.34	011	34	1.22	016	5	1.14			
Air Force	016	4,145	32.06	099	93	96.88	099	46	95.83	099	3	100.00
	060	2,809	21.72	000	1	1.04	011	1	2.08			
	087	2,247	17.38	076	1	1.04	098	1	2.08			
	074	1,716	13.27	098	1	1.04						
	076	828	6.40									
	098	247	1.91									
	084	243	1.88									
	099	179	1.38									
	011	143	1.11									

3.7. Initial Examination of MEPS Effect

As discussed earlier, the above analyses consider only a small subset of the potential factors for attrition. AMSARA intends to examine many more factors, particularly the effects of the MEPS through which an individual is processed. However, with so many (65) MEP stations, some preliminary analyses are needed to help consolidate this variable.

Generally, each applicant for any branch of enlisted service is sent to one of the 65 MEPS located throughout the country. The following two steps are part of the process

undertaken at the MEPS to detect any disqualifying problems before an individual is actually enlisted.

1. Each applicant takes the AFQT to determine whether he or she is qualified for enlistment;
2. Each applicant who performs acceptably on the AFQT undergoes a medical examination to determine whether he or she meets physical entrance standards.

This process involves many different military personnel and considerable subjective judgment. It is nearly impossible for each MEPS to perform its function in the same manner. For that matter, variation must be expected within any given MEPS.

Results in Tables 3.7.1 and 3.7.2 indicate that the likelihood of attrition is related to the MEPS at which an individual was processed. Specifically, when loss rates are computed by grouping the enlistees according to the MEPS at which they were processed, the following are seen:

- Generally, the loss rate in a given station is consistent across the services;
- Highest loss rates are almost double those of the lowest rates;
- Stations 73 and 81 have the lowest loss rates (about 8–10%) for most services;
- Station 26 has the highest loss rate (about 20%) for almost all services.

Further study is needed to assess the reasons for these differences in attrition according to the MEPS.

TABLE 3.7.1. MEPS WITH HIGHEST AND LOWEST LOSS RATE CENSORED AT 6 MONTHS BY SERVICE

Service	Rank		MEPS number	Number of gained enlists	Percentage loss		Loss counts	
					Loss rate	SE	Loss per person-years	SE
Army	High	1	26	1,425	0.19	0.0104	0.44	0.0238
		2	27	1,790	0.19	0.0093	0.43	0.0212
		3	21	1,838	0.19	0.0091	0.43	0.0208
		4	45	1,366	0.18	0.0105	0.42	0.0238
		5	57	3,980	0.18	0.0061	0.41	0.0138
	Low	61	5	6,664	0.12	0.0040	0.26	0.0086
		62	40	1,333	0.12	0.0088	0.26	0.0191
		63	30	2,212	0.11	0.0066	0.23	0.0141
		64	81	481	0.09	0.0133	0.20	0.0283
		65	73	880	0.09	0.0097	0.19	0.0204
Navy	High	1	47	2,611	0.21	0.0079	0.49	0.0189
		2	26	1,211	0.20	0.0116	0.48	0.0275
		3	45	1,407	0.20	0.0107	0.48	0.0254
		4	43	2,767	0.20	0.0076	0.47	0.0181
		5	22	2,050	0.20	0.0088	0.47	0.0209
	Low	61	72	2,071	0.13	0.0073	0.28	0.0162
		62	30	549	0.12	0.0139	0.27	0.0307
		63	67	6,855	0.11	0.0038	0.25	0.0084
		64	73	848	0.10	0.0104	0.22	0.0228
		65	81	358	0.10	0.0159	0.22	0.0346
Marines	High	1	26	778	0.19	0.0139	0.43	0.0322
		2	27	1,768	0.18	0.0091	0.41	0.0208
		3	22	1,335	0.17	0.0102	0.38	0.0231
		4	45	567	0.17	0.0156	0.38	0.0356
		5	21	1,564	0.16	0.0092	0.36	0.0207
	Low	61	75	2,987	0.09	0.0053	0.20	0.0115
		62	74	4,573	0.09	0.0043	0.20	0.0092
		63	73	223	0.09	0.0187	0.18	0.0397
		64	67	2,233	0.08	0.0058	0.17	0.0123
		65	60	255	0.07	0.0161	0.15	0.0338
Air Force	High	1	26	1,136	0.17	0.0111	0.38	0.0252
		2	27	1,086	0.17	0.0113	0.38	0.0259
		3	59	1,440	0.16	0.0096	0.35	0.0215
		4	21	1,056	0.16	0.0112	0.35	0.0253
		5	42	819	0.16	0.0126	0.35	0.0284
	Low	61	72	1,486	0.09	0.0075	0.20	0.0161
		62	79	1,537	0.09	0.0072	0.19	0.0154
		63	48	3,200	0.09	0.0050	0.18	0.0106
		64	81	363	0.08	0.0140	0.16	0.0297
		65	73	865	0.06	0.0080	0.12	0.0167

TABLE 3.7.2. MEPS WITH THE HIGHEST AND LOWEST LOSS RATE CENSORED
AT 6 MONTHS BY SERVICE AND OVERALL

	Order	MEPS ID number (loss rate from high to low)						Comparing by rank	
		Army	Navy	Marines	Air Force	All (rate)	All service	All	Sum of ranks
High	1	26	47	26	26	26	0.19	26	5
	2	27	26	27	27	45	0.18	21	19
	3	21	45	22	59	27	0.18	45	20
	4	45	43	45	21	22	0.18	57	27
	5	57	22	21	42	21	0.17	22	28
	6	22	57	57	3	57	0.17	27	33
	7	56	21	29	61	61	0.17	29	41
	8	61	59	49	6	29	0.17	59	49
	9	6	64	31	45	59	0.17	61	49
	10	12	70	44	57	47	0.16	44	57
Low	61	5	72	75	72	40	0.11	40	232
	62	40	30	74	79	30	0.11	74	233
	63	30	67	73	48	67	0.11	81	239
	64	81	73	67	81	81	0.10	67	244
	65	73	81	60	73	73	0.08	73	257

TABLE 3.7.3. LIST OF MEPS ID NUMBERS AND NAMES

ID	MEPS name	ID	MEPS name
01	Albany NY	43	Kansas City MO
02	Baltimore MD	44	Little Rock AR
03	Boston MA	45	Memphis TN
04	Buffalo NY	46	New Orleans LA
05	New York NY	47	Oklahoma City OK
06	Harrisburg PA	48	San Antonio TX
07	Manchester NH	49	Shreveport LA
08	Newark NJ	50	Lansing MI
09	New Haven CT	54	Chicago IL
10	Philadelphia PA	55	Cincinnati OH
11	Pittsburgh PA	56	Cleveland OH
12	Portland ME	57	Columbus OH
13	Springfield MA	58	Des Moines IA
14	Syracuse NY	59	Detroit MI
15	Wilkes-Barre PA	60	Fargo ND
16	European	61	Indianapolis IN
17	Tampa FL	62	Milwaukee WI
20	Atlanta GA	63	Minneapolis MN
21	Berkley WV	64	Omaha NE
22	Charlotte NC	65	Sioux Falls SD
23	Miami FL	66	Saint Louis MO
24	Ft. Jackson SC	67	San Diego CA
25	Jacksonville FL	68	Pacific Enlistments
26	Knoxville TN	70	Boise ID
27	Louisville KY	71	Butte MT
28	Montgomery AL	72	Sacramento CA (formerly Fresno)
29	Nashville TN	73	Honolulu HI
30	San Juan PR	74	Los Angeles CA
31	Raleigh NC	75	Oakland CA
32	Richmond VA	76	Phoenix AR
36	Albuquerque NM	77	Portland OR
37	Amarillo TX	78	Salt Lake City UT
38	Dallas TX	79	Seattle WA
39	Denver CO	80	Spokane WA
40	El Paso TX	81	Anchorage AK
41	Houston TX	82	Guam GQ
42	Jackson MS		

3.8. Discussion

This study indicates that myriad factors are related to early attrition. In the absence of complete data on why early attrition is occurring, we examined several pre-enlistment status variables that correspond to attrition. The results indicate many special topics that merit further examination.

For example, it is seen that at least one-third of early attrition is due to pre-existing medical conditions. More generally, fraudulent entry appears to be a sizable problem, although coding uncertainties prevent quantifying the extent or nature of this problem.

Further study and policy might focus on recruiting and medical examining processes that are intended to detect problems before applicants are enlisted.

Attrition rates among females are higher than those among males. Early female attrition rates are almost double those for males in the Army (22% vs. 13%). Reducing female attrition rate to match that for males in the Army, Marines, and Air Force could save money for the armed services.

AFQT score and education level are also valuable predictors of military attrition. A strong economy, however, makes attraction of more academically desirable applicants easier said than done.

Early attrition is highly linked with race and with age. Further study of these phenomena may be warranted.

Although attrition is seen to be higher among married enlistees and those with children, further study may not provide much benefit because the great majority of enlistees are single and have no dependents.

Finally, a separate examination found that loss rates are significantly different among the MEPS, with attrition rates at some stations more than double those in other stations. Further examination of the reasons for these differences is needed.

This pilot study has examined some of the factors that may be related to early attrition in the military. Additional factors, such as the MEPS station through which recruits are processed, the recruits' occupational preferences and histories, family history of military service, and others will be examined and incorporated into future attrition modeling.

References

1. Clark K, et al. Reducing medical attrition: the role of the accession medical standard analysis and research activity. *Mil Med* 1999; 164:7; 485-487.

2. *SAS/STAT User's Guide*, 7.0, 1998, SAS Institute Inc, Cary, NC.

4. SPECIFIC STUDIES

4.1. BACK DISORDERS IN MILITARY RECRUITS: WAIVERS AND ATTRITION 1995–1997

4.1.1. Background

Back problems are the single most expensive musculoskeletal problem in industrialized countries, and low back pain is the leading cause of disability in persons younger than 45 [1]. Back symptoms are the leading cause of all visits to orthopedic surgeons and neurosurgeons and the second leading symptom among all physician visits. "Medical back problems" comprised the second most common medical diagnosis-related group for all hospital discharges in 1987, following normal childbirth [2]. The cost for occupational low back pain in the United States is estimated to be about $100 billion per year and continues to rise [3, 4].

Most back pain (90–95%) resolves within 4–6 weeks, and only 5–10% of those affected become chronically disabled, i.e., pain prevents them from performing their normal activities for longer than 6 months [5]. But it is this group that is estimated to account for 70–90% of the total costs of low back pain.

Several studies in juvenile populations have shown that back pain in these age groups is extremely common and, fortunately, mild. Multiple studies have shown that by age 17, the cumulative prevalence of low back pain is 20–36% [7], and the point prevalence for the 15- to 24-year-old age group is 18% [8]. Age groups having the highest rates of compensable back pain are the 20- to 34-year-old age group for males and the 30- to 34-year-old age group for females [9].

Military populations are at no less risk from back pain. In addition to the exorbitant direct medical costs, disability costs, and lost time from work owing to back disorders, soldiers who cannot perform their jobs because of back pain incur losses in training time, reduced combat readiness, and decreased physical performance owing to inactivity. This study attempts to characterize incoming recruits with a prior history of back conditions and determine if current practices are effective in identifying and waiving only those with a history of back pain who are at low risk of failure.

4.1.2. Methods

Cases were defined as enlisted personnel in any branch of service who were disqualified at the MEPS for a back condition, received a waiver, and initiated training in calendar years 1995–1997. DMDC gain files were used to verify all accessions.

Controls were a random sample of all enlisted personnel who began basic training in calendar years 1995–1997. They were matched to cases in a 1:4 ratio on branch of service and month/year of entry into training.

Chi-square tests were used to compare weight and BMI between cases and controls. A survival analysis was used to compare recruits receiving waivers for back disorders with those not disqualified for back disorders to evaluate the recruit attrition patterns. In the analyses, the endpoint was defined as discharge from the service for any reason, including nonmedical reasons. Survival curves were generated using the Kaplan-Meier method, and significance was assessed using the log rank test.

4.1.3. Results

There were 248 individuals waived for back disorders during this study. The categories for which applicants were waived are listed in Figure 4.1.1.

FIGURE 4.1.1. CATEGORIES OF BACK WAIVERS GRANTED, ALL SERVICES
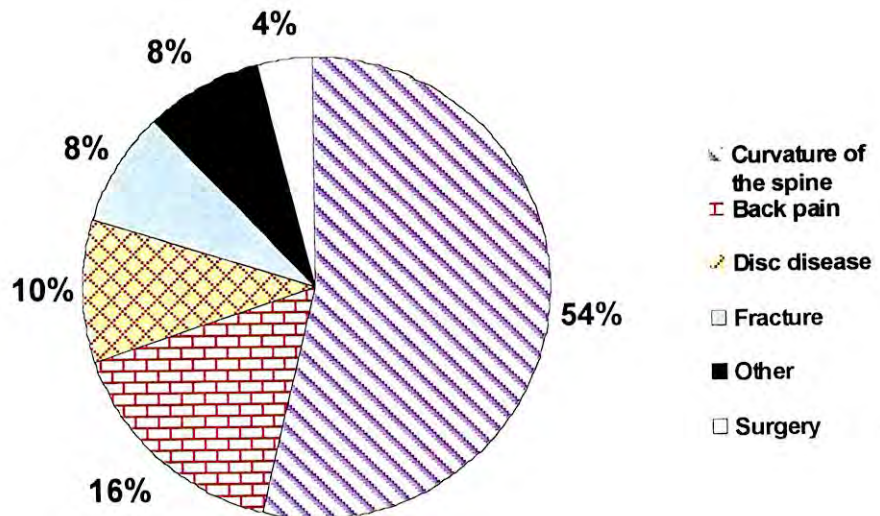
The mean ages of cases (20.4 years) and controls (20.0 years) were comparable. Males accounted for approximately 80% of the cases and controls. The case group had a slightly higher percentage of whites (79%) than the control group (70%). Cases had an average of 12.2 years of education compared with 11.9 years for the controls. Cases had an average AFQT score of 63.3, compared to an average of 59.9 among controls. Cases tended to weigh less than controls as seen in Table 4.1.1.

TABLE 4.1.1. WEIGHT AND BMI OF CASES AND CONTROLS

	Male cases	Male controls	p value
Weight (lb)± SE	161.7± 1.79	165.8 ± 1.00	0.06
BMI (kg/m^2) ± SE	23.7 ± 0.23	24.3 ± 0.13	0.03
	Female cases	Female controls	p value
Weight (lb) ± SE	127.5 ± 2.56	134.2 ± 1.41	0.02
BMI (kg/m^2) ± SE	22.3 ± 0.34	23.0 ± 0.20	0.09

Army soldiers with a back waiver had a lower probability of successfully staying on active duty over time (Figure 4.1.2). The steep slope of the "back waivers" curve in the first 90 days and the relatively constant difference between the curves after 1 year indicate that the increased probability of attrition due to any cause for those granted back waivers is an early phenomenon. No significant differences were seen between those with back waivers and controls in the Marines and Navy. Too few Air Force personnel (12) were granted waivers for back conditions to study attrition in this group.

FIGURE 4.1.2. PROBABILITY OF REMAINING ON ACTIVE DUTY AMONG SUBJECTS WITH BACK PROBLEMS HISTORY COMPARED TO CONTROLS, ARMY (1995–1998)
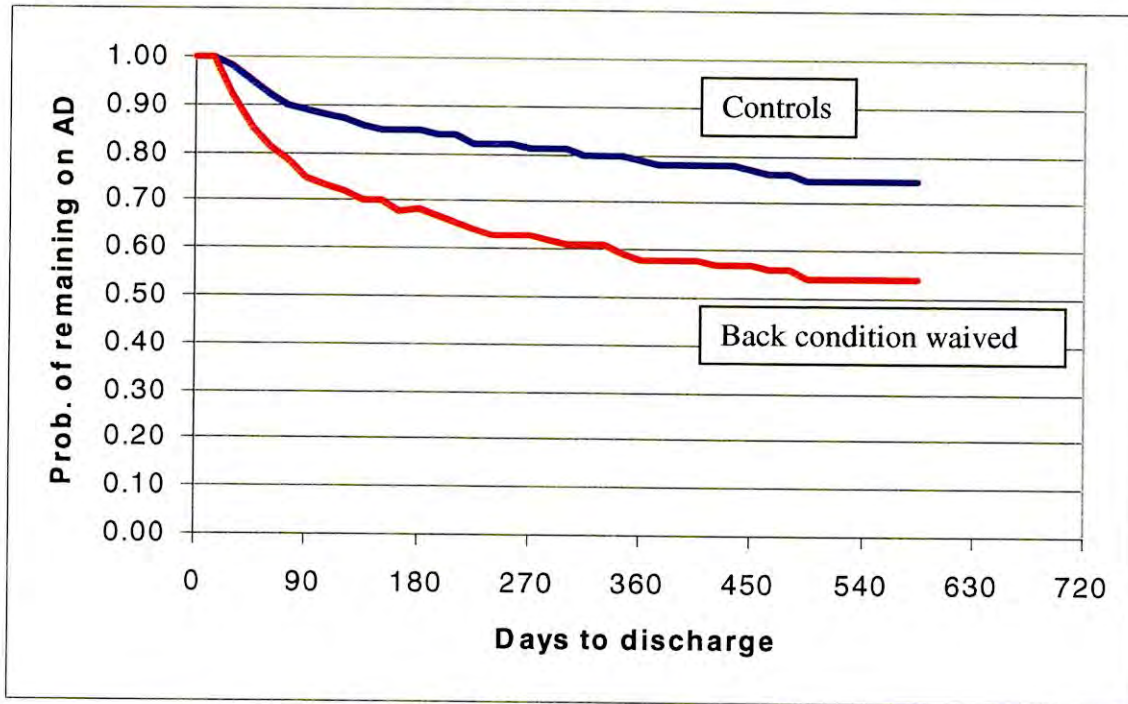
Survival analyses using the endpoint of specifically back-related outcomes were not performed because of the small number of EPTS discharges (18), hospitalizations (2), or disability discharges (0) owing to back conditions.

4.1.4. Discussion

Individuals receiving a back waiver were more likely to have a higher aptitude score, lower weight, and higher education level than the general recruit population. These factors most likely influence the decision to grant a waiver for a back condition.

Army soldiers given back waivers had a significantly higher probability of leaving active service than their matched controls. This difference was not seen in the other services. The explanation for this difference in the Army is likely multifactorial.

The physical fitness of the recruit at the start of basic training and the characteristics of training are two possibilities. The Army also had the largest number of applicants who received waivers for back conditions, thereby increasing the power to detect a difference.

A more focused study of the experience of those waived for back conditions in the Army is warranted. Focus on the differences among the services with regard to the waiver process, quality of enlistee, and other factors may provide insight into whether the difference in the experience of those waived for back conditions is unique to the Army, and why such a difference exists.

This study was limited by the broad use of all discharges from the military as the major endpoint analyzed. Back-related outcomes were so rare that a survival analysis on this endpoint alone could not be conducted. Future studies of all the services should be performed using outpatient data because lost time from these visits can be substantial without hospitalization or discharge.

Screening for a history of back problems at the MEPS is largely reliant on self-report. Figure 4.1.3 illustrates that concealment among those who later receive an EPTS discharge for a back condition is a major problem. Improved screening techniques for identifying those with significant back problems must be developed to decrease these EPTS discharges.

Figure 4.1.3 Types of EPTS Discharges for Back Conditions, All Services, 1995-1997

- 4%
- 2%
- 9%
- 14%
- 71%

- Concealment
- Recruit unaware
- Known, not DQ'd
- Insuff. Data
- Waiver

100
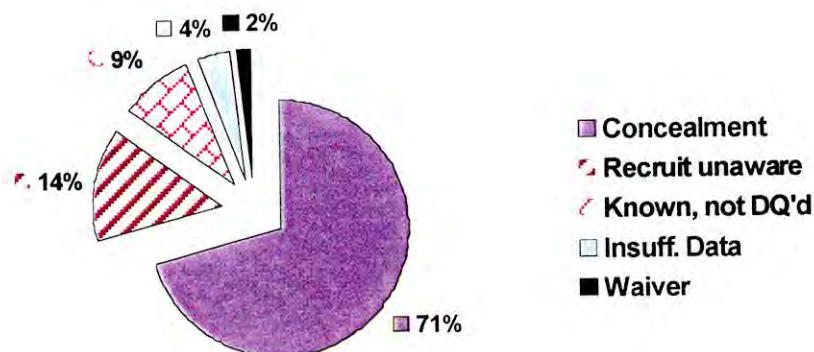
References

1. Shelerud, R. Epidemiology of occupational low back pain. *Occup Med State Art Rev* 1998;13:1–22.

2. Deyo RA, Cherkin D, Conrad D, Volinn E. Cost, controversy, crisis: low back pain and the health of the public. *Annu Rev Pub Health* 1991;12:141–156.

3. Frymoyer JW. Cost and control of industrial musculoskeletal injuries. In Nordin M, Andersson GB, Pope MH (eds): *Musculoskeletal Disorders in the Workplace: Principles and Practice*. Chicago, Mosby, 1997, pp 62–71.

4. Kaplansky BD, Wei FY, Reecer MV. Prevention strategies for occupational low back pain. *Occup Med State Art Rev* 1998;13:33–45.

5. Kelsey JL, Golden AL. Occupational and workplace factors associated with low back pain. *Occup Med State Art Rev* 1998;3:7–16.

6. Frymoyer JW. Predicting disability from low back pain. *Clin Orthop* 1992;279:101–109.

7. Duggleby T, Kumar S. Epidemiology of juvenile low back pain: a review. *Disabil Rehab* 1997;19:505–512.

8. Andersson GB, Pope MH (eds). *Occupational Low Back Pain: Assessment, Treatment and Prevention*. Chicago, Mosby, 1991, pp 132–147.

9. Hales TR, Bernard BP. Epidemiology of work-related musculoskeletal disorders. *Orthop Clin North Am* 1996;27:679–709

4.2. Skin and Cellular Tissue Waivers and Medical Outcomes

4.2.1. Introduction

Occupational skin diseases in the civilian community account for the largest percentage of all work-related illnesses [1] and cost hundreds of millions of dollars per year [2]. Dermatoses may result from several job-related factors including wet work, irritating chemicals, heat, cold, humidity, vibration, radiation, biologic agents, and trauma.

Skin diseases also have a negative impact on military operations. Skin disease resulted in 126,365 hospitalizations and nearly 2 million days of lost service during World War I [3]. During World War II (1944–1945), approximately 15% of all patient evacuations from the Southwest Pacific to the United States were due to disease of the skin [4]. During the Vietnam conflict, more than 1.4 million visits were recorded for skin disease, nearly twice as many as for any other category of disease [4].

DoD Directive 6130.3 currently lists 26 skin and cellular tissue conditions that are cause for rejection from military service [5]. However, recruits disqualified for a skin-related condition at the MEPS can receive a waiver and enter the military. The purpose of this study was to characterize the cohort of recruits with waivers for disqualifying skin conditions and to determine whether military recruits who received waivers for prior skin conditions experienced more medical events than recruits who did not require any medical waiver.

4.2.2. Methods

A retrospective cohort study was conducted. Cases were defined as enlisted personnel in any branch of service who were disqualified at the MEPS and received a subsequent waiver for any skin condition listed in DoD Directive 6130.3 (see Table 4.2.1), and who initiated training between January 1995 and December 1997. Controls were enlisted recruits who initiated training during this period and did not require a medical waiver. Controls were randomly selected from DMDC and matched in a 1:3 ratio according to service (Army, Air Force, Marines, Navy), gender, race (white, black, other), age within 1 year, and year of entry into the service within 1 year. Cases and controls were followed from entry into military training through September 1998.

TABLE 4.2.1. SKIN AND CELLULAR TISSUE CONDITIONS WITH ICD9 CODES THAT MAY BE CAUSE FOR REJECTION OF AN ENLISTMENT INTO THE ARMED FORCES (DoD DIRECTIVE 6130.3 CODE)

Acne (706)	Atopic dermatitis (691)
Eczema (692)	Contact dermatitis (692.4)
Cysts (706.2), pilonidal cysts (685)	Dermatitis factitia (698.4)
Bullous dermatoses (694)	Chronic lymphedema (457)
Fungus infections (117)	Furunculosis (680)
Hyperhidrosis hand or feet (780.8)	Ichthyosis or other congenital (757) or acquired anomalies of the skin (216)
Keloid formation (701.4)	Leprosy (030.9)
Lichen planus (697)	Neurofibromatosis (237.7)
Photosensitivity (692.72)	Psoriasis (696.1)
Radiodermatitis (692.82)	Scars (709.2)
Scleroderma (710.1)	Tattoos (709.9)
Urticaria, chronic (708.8)	Warts, plantar (078.19) symptomatic
Xanthoma (272.2)	Other chronic skin conditions such as dysplastic nevi syndrome (448.1) requiring frequent outpatient visits

Those who received waivers for a skin condition are characterized by the condition waived. In the survival analyses, the endpoint used was hospitalization or EPTS or disability discharge for any medical reason. The Kaplan-Meier method was used to estimate the survival function with respect to these outcomes. The log-rank test was used to test for significant differences in survival patterns between cases and controls. Frequency statistics were used to evaluate the outcomes of overall discharges, hospitalizations, EPTS discharges, and disability discharges.

4.2.3. Results

There were 334 cases and 1,002 controls in this study. Cases and controls were comparable with regard to service, age, and sex, although the controls had a higher percentage of Caucasian individuals (81% vs. 63%).

The categories of skin conditions for which applicants were waived, in order of frequency, follow: contact dermatitis, atopic dermatitis, nevus, keloid/scar, sebaceous gland disease, dermatitis owing to ingested substances, and other (Fig. 4.2.1). Females had a greater percentage of waivers for contact and atopic dermatitis combined (60%) than males (42%) ($p < 0.01$). Blacks were granted a greater portion of waivers for atopic dermatitis (38%) than whites (16%) ($p < 0.001$).

Figure 4.2.1. Categories of Dermatologic Conditions Waived

Legend:
- Contact Derm
- Atopic Derm
- Nevus
- Keloid/Scar
- Seb. Gland
- Food Allergy
- Other
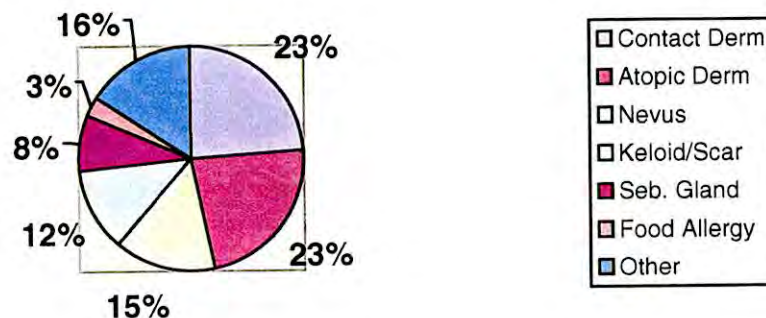
The actual number of medical events are depicted in Table 4.2.2. There were only a few skin events in both groups. The disability, hospitalizations, and EPTS discharges are the number of actual events, whereas the total represents the number of people. Some individuals had more than one medical event, so the sum of events does not necessarily equal the total.

TABLE 4.2.2. MEDICAL AND DERMATOLOGIC OUTCOMES BY CASES AND CONTROLS

Outcome	Any medical event		Dermatologic event	
	Waived	Control	Waived	Control
Hospitalization	32	87	2	2
EPTS discharge	32	50	4	0
Disability discharge	1	12	1	0
Total	63	140	5	2

The chronologically first medical outcome was used as the endpoint for the survival analysis to include hospitalization, disability, or EPTS discharge. Those waived for skin conditions were more likely to experience a medical outcome than those without waivers (Fig. 4.2.2). Among DoD personnel with a skin waiver, 18.8% had at least one medical event within 2 years of entering active duty compared with 14.0% in the no waiver group. The survival comparison for Army personnel (Fig. 4.2.3) also demonstrates a difference between the two curves ($p < 0.05$) within the first 6 months of entering active duty. Navy personnel survival curves were not statistically different. However, Marine personnel curves were statistically different, with the greatest difference in the curves occurring 1 year after entering active duty (Fig. 4.2.4).

Figure 4.2.2. Probability of Remaining Free of a
Medical Outcome for DOD personnel
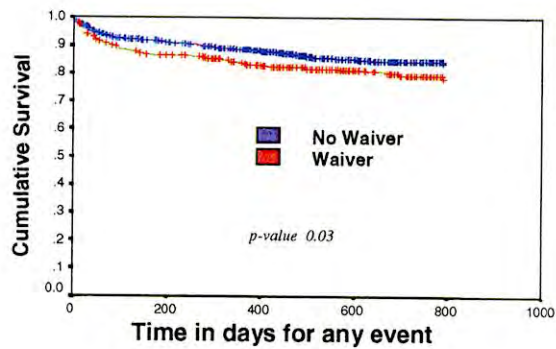
Figure 4.2.3. Probability of Remaining Free of a
Medical Outcome for Army personnel
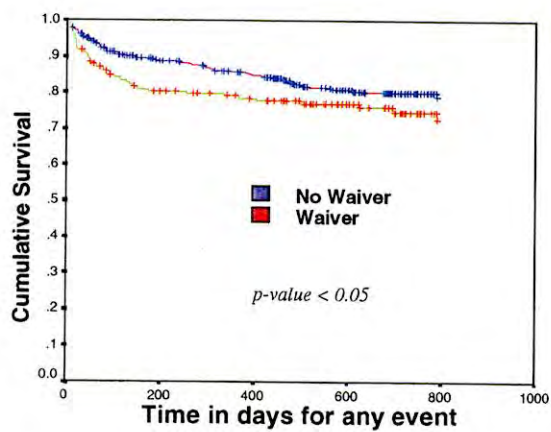
Figure 4.2.4. Survival comparison of Marine personnel
by dermatological waiver status.
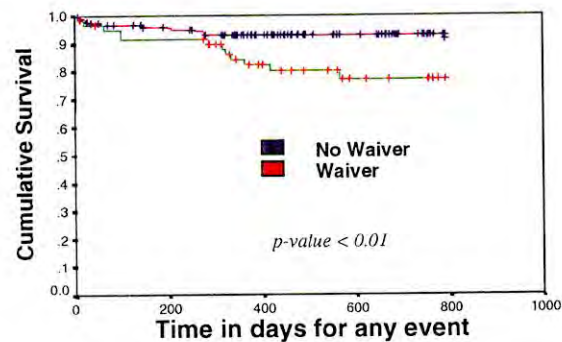
4.2.4. Discussion

Those recruits who received a waiver for skin conditions were statistically more likely to experience some medical event compared with matched controls. This difference was seen in the Army and Marines but not the Navy. The Air Force differed from the other services because no medical events were in the waiver group, although this is probably due to the fact that few received a waiver for a skin condition (13).

Marines waived for a skin condition were at increased risk of having a medical event within 1 year on active duty. This may be related to medical exams received in preparation for their deployment. Army individuals waived for skin conditions appear to be at increased risk of a medical outcome in the first 6 months.

There were several limitations to this study. Follow-up time was relatively short for some individuals, not allowing sufficient time for exposures that could exacerbate the skin condition. Co-morbid conditions may have been more prevalent among the cases, resulting in the increase in the medical events that occurred. The difference in survival rates may have been due, at least in part, to these conditions and not to the skin condition that was waived.

Although medical events were more common among those waived with skin conditions, the relative impact of these events remains small (4.4% more outcomes in those with waivers). As mentioned previously, any skin-related event was rare during the 9 to 45

month follow-up; five skin-related events occurred among cases and two among controls. The true impact of allowing individuals with known skin-related conditions to enter the military may be better ascertained by using outpatient data to determine the impact on the healthcare system.

References
1. Rosenstock L, Cullen MR. *Clinical Occupational Medicine*. Philadelphia: Saunders, 1986.

2. Marks JG, DeLeo VA. *Contact and Occupational Dermatology*. St. Louis: Mosby Year Book, 1992.

3. Shmunes E. Predisposing factors in occupational skin diseases. *Dermatol Clin* 988:6:7–13.

4. Military dermatology. In: James WD, ed. *Textbook of Military Medicine, Part III, Disease and the Environment*. Walter Reed Army Medical Center, Washington DC, 1994.

5. Department of Defense. Physical Standards for Appointment, Enlistment, and Induction. Washington, DC, 1994, Directive 6130.3.

4.3. Hospitalization Rates in Female U.S. Army Recruits Associated with a Screening Program for *Chlamydia trachomatis*

4.3.1. Introduction

Chlamydia trachomatis (Ct) causes more than 4 million genital infections annually in the U.S. [1]. In most women, symptoms associated with genital infection are few to none [1, 2]. However, this infection places females at risk for pelvic inflammatory disease (PID) [1]. Women with PID can experience vague symptoms and may often not seek treatment [1, 3]. Therefore, identification and treatment of women infected with Ct but not seeking treatment is crucial to preventing PID and the sequelae of ectopic pregnancy, infertility, and chronic pelvic pain.

Economic evaluations of preventive services for sexually transmitted disease are limited. An Institute of Medicine study group recommended that economic evaluations be conducted to improve prevention services for sexually transmitted disease in managed care organizations [4]. These evaluations require data on the effectiveness of different screening approaches in various populations. For Ct, once an individual is screened and found to be infected, antibiotic treatment is curative [3]. However, the rate at which reinfection occurs may reduce the impact of a single screening effort. Large-scale screening and treatment programs in public health service region X (Wisconsin and Ohio) have reduced chlamydia infection [3]. Additionally, Howell et al. [5] found that age-based screening for Ct is cost-saving compared with universal screening. However, in that study, the occurrence of subsequent PID was estimated using prevalence of infection [5]. A study by Burstein et al. [6] found that in Baltimore, Maryland, approximately half of female adolescents treated for chlamydia infection were re-infected within 6–7 months. This resulted in debate over the frequency with which screening should be conducted. A 1996 study reported that women in a health maintenance organization Ct screening program were protected against the subsequent development of PID for 1 year [7].

The results of screening 13,204 Army female recruits for Ct infections using DNA amplification testing of urine at Fort Jackson, South Carolina, were reported [8]. An overall prevalence of infection of 9.2% was found. Women exposed to this screening initiative participated in an education program on sexually transmitted diseases and were tested if they volunteered; those found to be positive for Ct were notified and treated with 1g azithromycin.

The purpose of this study was to determine whether this Ct screening program in a non–healthcare-seeking, young population at the Army's largest basic training center was associated with subsequent lower hospitalization rates for sequelae in those tested and to compare subsequent hospitalizations in those testing positive with those testing negative. It is a goal of the accession process not to admit persons with contagious diseases and to prevent morbidity associated with conditions that existed prior to service. *Chlamydia trachomatis* may be a condition that should be screened for during the accession examination, as it is a common disease in the recruit age group.

4.3.2. Methods

The method of screening 13,204 Army female recruits for Ct has been published [8]. Our study cohort consisted of two groups. The "screened" group consisted of only those among the original 13,204 women that entered full-time military duty from January 1, 1996, through December 31, 1997. Those going from basic training at Fort Jackson into the Army Reserves or National Guard were excluded because they would not be hospitalized in the military healthcare system unless serving on temporary active duty. All other women entering the Army as enlisted soldiers during the same period were verified through DMDC (Monterey, California) and comprised the "unscreened" group.

The entire cohort was followed for hospitalizations from entry into military service, as early as January 1996 through December 1998 or until they left the service, for a maximum possible follow-up of 3 years. Hospitalization data were obtained from the PASBA (Fort Sam Houston, Texas). Study outcomes were hospitalizations for PID (ICD9 codes 614 and 615); ectopic pregnancy (ICD9 code 633); infertility (ICD9 code 628); and PID, ectopic pregnancy, and infertility (combined sequelae) for any reason. Statistical analyses were performed using SAS (SAS Institute, Cary, NC). Poisson regression was used to determine relative risk for hospitalization and to control for age (<25 years old, 25 years old, or older), race (black, white, other), education (<high school, high school, and >high school), and military aptitude score (<30, 30–63, 64–91, and 92–99). These factors have been found by AMSARA to be associated with risk of hospitalization [9].

4.3.3. Results

Of the 13,204 females "screened" at Fort Jackson, 7,053 (53.4%) entered full-time active duty, and comprised the "screened group". The remaining 6,145 went into the Army Reserves or National Guard. The prevalence of Ct in the "screened" group was 9.1%. The "unscreened" group was comprised of 21,021 females entering the Army on full-time active duty during the same period. Cohort demographics can be found in Table 4.3.1. The "unscreened" group was significantly older than the "screened" group and had fewer individuals scoring 64 or more on the aptitude test. A small percentage of the entire cohort had some education beyond high school.

TABLE 4.3.1. AGE AND RACE DISTRIBUTION OF STUDY COHORT

	"Screened" group n (%)	"Unscreened" group n (%)	p value
<25 years old	5,960 (85)	16,704 (80)	0.001
Black race	2,501 (35)	7,657 (36)	0.350
Education >HS	400 (5.7)	1,439 (6.9)	0.001
Aptitude score ≤64	2,780 (39.4)	7,449 (35.4)	0.001

Hospitalization rates for the cohort are listed in Table 4.3.2. The "screened" group had a significantly lower rate of subsequent hospitalization for any reason compared with the "unscreened" group. Table 4.3.3 lists the most common reasons for hospitalization and the corresponding hospitalization rate for each. The most common reasons for hospitalization in both groups were pregnancy and pregnancy-related conditions. There were no differences in the rates between the two groups for any of the common specific diagnoses, except for pregnancy-related conditions. Relative risks of hospitalization adjusted for age, race, education, and aptitude score when recruited into the service are in Table 4.3.4. The adjusted relative risk for hospitalization for any reason was 0.94 (95% CI 0.90–0.99) in those tested.

TABLE 4.3.2. RATES OF SUBSEQUENT HOSPITALIZATIONS PER 1,000 PY

Reason for hospitalization	"Screened" group rate (count)	"Unscreened" group rate (count)
PID	4.6 (50)	5.1 (175)
Ectopic pregnancy	2.6 (28)	1.9 (70)
Infertility	<0.01 (2)	<0.01(9)
Combined sequelae	7.2 (78)	6.8 (232)
Any reason	199 (2,163)	224 (7,598)*

*$p < 0.01$.

Within the "screened" group, seven of the 643 individuals were found positive for Ct, were treated, and were hospitalized for PID (rate of 7.1/1,000 PY); 43 of the 6,410 testing negative in the original study (rate of 4.4/1,000 PY) ($p = 0.23$) were also hospitalized for PID. Also within the "screened" group, one person found to be Ct positive was hospitalized for ectopic pregnancy (rate of 1.0/1,000 PY), as were 27 of those testing negative (rate of 2.7/1,000 PY) ($p = 0.31$). Within the "screened" group, no one found to be Ct positive was hospitalized for infertility, but two of those testing negative were.

TABLE 4.3.3. COMMON REASONS FOR HOSPITALIZATION

Reason for hospitalization (ICD9 codes)	"Screened" % of all hospitalizations (rate*)[§]	"Unscreened" % of all hospitalizations (rate*)[§]
Pregnancy and pregnancy-related conditions (630-677)[†]	41.4 (82.3)	42.6 (95.3)
Adjustment reaction (309)	9.5 (19.0)	6.4 (14.4)
Injuries (800-959.9)	4.9 (9.7)	5.4 (12.1)
Unspecified viral infection (079.99)	3.7 (7.4)	2.6 (5.8)
Combined sequelae	3.6 (7.2)	3.1 (6.8)
Acute pharyngitis and acute tonsillitis (462-463)	2.9 (5.8)	2.5 (5.7)
Gastroenteritis (558 and 001-009)	2.0 (4.0)	2.0 (4.4)
Depression (296)	2.0 (4.0)	1.7(3.8)
Noninflammatory disorders of ovary, uterine tubes, cervix, vagina, vulva, and menstruation (620-626)	1.9 (3.9)	1.8 (4.1)
Dental disorders (520-525)	1.8 (3.5)	2.3 (5.2)
Pneumonia (484-486)	1.5 (3.0)	1.3 (2.9)
Bronchitis (490-491)	1.4 (2.9)	1.6 (3.6)
Dermatologic conditions (680-709.9)	1.3 (2.5)	1.2 (2.7)
Acute upper respiratory infection (465)	1.0 (2.1)	1.0 (2.2)
Other[§]	23.7 (47.1)	26.7 (59.9)

*Rates per 1,000 PY.
[†]$p < 0.01$.
[§]Percentages may not equal 100 because of minor overlap between "pregnancy and pregnancy-related conditions" and "combined sequelae."

TABLE 4.3.4. ADJUSTED RELATIVE RISK OF HOSPITALIZATION FOR STUDY COHORT*[†]

Reason for hospitalization	Relative risk	95% CI	p value
PID	0.94	0.69–1.29	0.72
Ectopic pregnancy	1.39	0.89–2.17	0.15
Combined sequelae	1.10	0.85–1.43	0.46
Any reason	0.94	0.90–0.99	0.02

*"Unscreened" group as referent.
[†]Adjusted for age, race, education, and aptitude score.

The number of times an individual in the "screened" group was hospitalized ranged from 0 to 10, and the number of times an individual in the "unscreened" group was hospitalized ranged from 0 to 15. Among those hospitalized, the mean number of times an individual in the "screened" group was hospitalized was 1.4 and the mean number of time an individual in the "unscreened" group was hospitalized was 1.6 ($p = 0.001$). However, most were hospitalized only once. Of the 1,499 women hospitalized in the "screened" group, 606 (40.4%) left the service during the study. Of the 4,859 "unscreened" individuals hospitalized, 2,267 (46.7%) left the service during the study ($p < 0.0001$).

4.3.4. Discussion

Non–healthcare-seeking women participating in the screening program, testing positive for Ct, and receiving treatment had the same PID and ectopic pregnancy hospitalization experience as those testing negative.

We cannot know if any differences would have been present given a longer follow-up. Behavioral risk factors for infection in the "unscreened" group were unknown. An earlier study found that female Army recruits receiving sexually transmitted disease counseling, but not volunteering to be tested, may have been at decreased risk for Ct sequelae because they reported less high-risk behavior (having had vaginal sex, having had more than one sexual partner in the previous 90 days, and having had a new sexual partner in the previous 90 days) than the volunteers [8]. Women at low risk, who would have been negative when screened, but elected not to be screened, were placed in the "unscreened" group. This misclassification would be expected to bias our results toward the null. However, 80% of those not screened were not given the opportunity to participate. The higher rate of pregnancy among unscreened females suggests the control group was at higher risk of STD.

Being screened for Ct was associated with a subsequent decrease in overall hospitalizations. Distribution of discharge diagnoses between the two groups appears similar, and the effect of screening is not limited to a single diagnosis. Additionally, among those hospitalized, the number of hospitalizations per person was lower in the "screened" group. We could not find a reason for this.

Misclassifications could have occurred for other reasons also. Hospitalization discharge diagnoses were based on reported ICD9 codes but were not verified by chart review because of money and time constraints. Army outpatient data were considered incomplete for the period studied and were not analyzed. However, outpatient data may be important.

The new diagnostic tools available for urine and the efficacy of one-dose antibiotic therapy should prompt consideration of systematic, high-quality chlamydia screening. Primary prevention of chlamydia infection should still remain an integral part of controlling Ct. A one time intervention of education and treatment of those testing positive for Ct is not likely to have a lasting impact on Ct sequelae as it would not change behavior. Future studies should focus on the effect of multiple interventions, treatment, and the effect of contact tracing.

References

1. Recommendations for the prevention and management of *Chlamydia trachomatis* infections, 1993. *MMWR* 1993;42:1–39.

2. Stamm W, Holmes K. *Chlamydia trachomatis* infections of the adult. In: Holmes KK, et al., eds. *Sexually Transmitted Diseases*. New York: McGraw-Hill, 1990:181–193.

3. Hillis S, Black C, Newhall J, Walsh C, Groseclose S. New opportunities for chlamydia prevention: applications of science to public health practice. *Sexually Transm Dis* 1995;22:197–202.

4. Eng J, Discussion Leaders of IOM Workshop on the Role of Health Plans in STD Prevention. Prevention of sexually transmitted diseases: a model for overcoming barriers between managed care and public health. *Am J Prev Med* 1999;16:60–69.

5. Howell, M, Wuinn T, Gaydos C. Screening for *Chlamydia trachomatis* in asymptomatic women attending family planning clinics. *Ann Intern Med* 1998;128:277–284.

6. Burstein G, Gaydos C, Diener-West M, Howell M, Zenilman J, Quinn T. Incident *Chlamydia trachomatis* infections among inner-city adolescent females. *JAMA* 1998;280:521–526.

7. Scholes D, Stergachis A, Heidrich F, Andrilla H, Holmes K, Stamm W. Prevention of pelvic inflammatory disease by screening for cervical chlamydial infection. *N Engl J Med* 1996;334:1362–1366.

8. Gaydos C, Howell R, Pare B, Clark K, Ellis D, Hendrix R, Gaydos J, McKee K, Quinn T. *Chlamydia trachomatis* infections in female military recruits. *N Engl J Med* 1998;339:739–744.

9. Clark K, Mahmoud R, Krauss M, Kelley P, Grubb L, Ostroski M. Reducing medical attrition: the role of the accession medical standards analysis and research activity. *Mil Med* 1999;164:485–487.

4.4. RISK OF HOSPITALIZATION DURING THE FIRST YEAR OF SERVICE AMONG ENLISTED PERSONNEL: 1995–1998

4.4.1. Introduction

Healthy and physically fit service people are necessary for the U.S. military to perform at its maximum capacity. New military recruits are young and are expected to be healthy. Baseline physical and mental health is a necessity in the strenuous and taxing basic training environment. Illness requiring hospitalization robs the DoD of training time and dollars. Hospitalizations during the first year of active service may indicate failures in the medical screening process or correctable practices during early training.

Many previous studies have determined that women are at higher risk for hospitalization for certain specific diagnoses such as carpal tunnel syndrome and injuries [1]. The objectives of this study are to describe overall hospitalization rates and common diagnoses among enlisted personnel during the first year of military service, determine whether hospitalization rates and common diagnoses differ by gender, and identify additional risk factors for hospitalization.

4.4.2. Subjects and Methods

The study population was comprised of all Air Force, Army, Marine, and Navy enlisted individuals starting active duty from January 1, 1995, to December 31, 1998. The population was followed prospectively for any hospitalization during the first 12 months of military service or until December 31, 1998, whichever came first. Dates of service were obtained from Defense Manpower Data Center (DMDC). Demographic information was obtained from DMDC and military entrance processing station data. Individuals with prior military service were excluded.

Hospitalization data were obtained from the Patient Administration Systems and Biostatistics Activity. Diagnostic categories were derived by combining the primary ICD9 diagnostic code assigned to each hospitalization record. All hospitalizations related to childbirth (ICD9 codes 630-677) were excluded.

Hospitalization rates were calculated per person-year. Univariate assessment of risk factors for hospitalization consisted of standard relative risk computations. Because hospitalization counts can be considered as subject to Poisson distribution, the Poisson regression was used to derive adjusted risk estimates [2]. All analyses were performed using SAS statistical software [3].

4.4.3. Results

There were 629,911 enlisted recruits starting active military service for the first time during the study. The overall hospitalization rate was 67.8/1,000 person-years (excluding the 1,313 admissions related to childbirth, which were not included in this analysis). Four percent (27,191) of enlisted individuals were hospitalized within the first year of service and accounted for 34,268 actual hospital admissions. Seventy-eight percent (21,216) of

the individuals hospitalized were hospitalized only once. Of those starting training, 17.9% (112,481) were discharged during the first year.

The study population was 82% male and 18% female, whereas the hospitalized population was 74% male and 26% female ($p < 0.0001$). The study population was 34.2% Army, 19.5% Air Force, 19.4% Marine, and 26.9% Navy. The hospitalized population was 45.5% Army, 18.2% Air Force, 13.8% Marine, and 22.5% Navy. Hospitalization was most common in the first month of service, with the first month accounting for 22.7% (7,776) of hospitalizations.

Hospitalization rates and unadjusted relative risks (RR) are shown in Table 4.4.1. Univariate analyses indicated elevated risk associated with being female (RR 1.75, 99% C.I. 1.70–1.81); married (RR 1.21, 99%CI 1.16–1.26); in the Air Force (RR 1.33, 99% C.I. 1.27–1.39) or in the Army (RR 2.03, 99% C.I. 1.95–2.12); and in any of the older age groups. Higher education and lower Armed Forces Qualification Test (AFQT) performance were also associated with higher risk in the univariate analysis.

TABLE 4.4.1. UNADJUSTED RELATIVE RISKS FOR HOSPITALIZATION BY DEMOGRAPHIC CHARACTERISTICS

Variable	Characteristic	Hospitalization rate per 1,000 person-years	RR	99% CI
Gender	Male	60.01	1.00	
	Female	105.25	1.75	1.70–1.81
Age*	17–20	64.05	1.00	
	21–25	75.81	1.18	1.15–1.22
	26–30	87.76	1.37	1.29–1.46
	>30	102.98	1.61	1.43–1.81
Marital status	Single	66.23	1.00	
	Married	80.21	1.21	1.16-1.26
	Other	111.36	1.68	1.50-1.88
Education	Less than HS	56.16	1.00	
	HS	71.16	1.27	1.22-1.31
	College	62.55	1.11	1.02-1.21
Race	White	68.39	1.00	
	Black	69.75	1.02	0.99-1.05
	Other	58.02	0.85	0.81-0.89
Service	Marine	47.70	1.00	
	Navy	51.38	1.08	1.03-1.13
	Air Force	63.38	1.33	1.27-1.39
	Army	96.98	2.03	1.95-2.12
AFQT score*	<31	93.41	1.00	
	31–64	69.36	0.74	0.65-0.85
	65–92	66.65	0.71	0.62-0.82
	93–99	59.16	0.63	0.55-0.73

*Test for trend $p < 0.02$

Adjusted relative risks derived by Poisson regression are shown in Table 4.4.2. When considering age, gender, race, marital status, service, AFQT, and education simultaneously, elevated risks were found for being female (RR 1.15, 99% C.I. 1.14–1.16), in the Army (RR 1.16, 99% C.I. 1.15–1.17), in any of the older age groups and in any of lower AFQT performance groups.

TABLE 4.4.2. ADJUSTED RELATIVE RISKS FOR HOSPITALIZATION BY DEMOGRAPHIC CHARACTERISTICS*

Variable		Characteristic	RR	99% CI
Gender		Male	1.00	
		Female	1.15	1.14–1.16
Age		17–20	1.00	
		21–25	1.01	1.00–1.02
		26–30	1.05	1.03–1.07
		Over 30	1.08	1.03–1.12
Race		White	1.00	
		Black	0.99	0.97-1.01
		Other	0.98	0.97–0.99
Aptitude score		<31	1.00	
		31–64	0.98	0.96–1.00
		65–92	0.97	0.94–0.99
		93–99	0.93	0.91–0.96
Education		Less than HS	1.00	
		HS	1.02	1.01-1.03
		College	0.96	0.94-0.98
Service		Marine	1.00	
		Navy	0.98	0.97–0.99
		Air Force	0.99	0.98–1.00
		Army	1.16	1.15–1.17

*Adjusted for age, gender, race, service, education, aptitude test, marital status, weight, and season.

Gender comparisons by diagnostic category are shown in Table 4.4.3. The five most common discharge diagnostic categories were neurotic and personality disorders (ICD9 codes 300-302, 306-316, and V7109) (20.9%), injuries (ICD9 codes 800-959) (10.6%), diseases of the oral cavity and salivary glands (ICD9 codes 520-529) (5.4%), acute respiratory infections (ICD9 codes 460-466) (5.1%), as well as pneumonia and influenza (ICD9 codes 480-487) (4.1%). Overall, females were at increased risk for all categories except pneumonia and influenza.

TABLE 4.4.3. UNADJUSTED RELATIVE RISKS OF HOSPITALIZATION BY DIAGNOSIS AND GENDER

Diagnosis	Gender	Hospitalization rate per 1,000 person-years	RR	99% CI
Neurotic and personality disorder	Male	13.76	1.00	
	Female	25.44	1.85	1.74–1.96
Injuries	Male	7.73	1.00	
	Female	9.16	1.18	1.08–1.30
Diseases of the oral cavity and salivary glands	Male	3.41	1.00	
	Female	7.08	2.08	1.85–2.32
Acute respiratory infections	Male	3.13	1.00	
	Female	7.20	2.31	2.05–2.58
Pneumonia and influenza	Male	3.09	1.00	
	Female	2.88	0.93	0.79–1.09

Gender comparisons by service are shown in Table 4.4.4. It can be seen that females in each service are at increased risk of hospitalization in the first 12 months of duty. The elevation in risk was most pronounced among Army females.

TABLE 4.4.4. GENDER DIFFERENCES IN HOSPITALIZATION BY SERVICES*

Service	Gender	Hospitalization rate per 1,000 person-years	Raw RR	Adjusted RR	Adjusted 99% CI
Navy	Male	48.18	1.00	1.00	
	Female	67.40	1.40	1.08	1.06–1.10
Marine	Male	46.81	1.00	1.00	
	Female	60.00	1.28	1.09	1.05–1.12
Air Force	Male	55.71	1.00	1.00	
	Female	85.25	1.53	1.07	1.05–1.09
Army	Male	82.15	1.00	1.00	
	Female	160.69	1.96	1.25	1.23–1.28

*Adjusted for age, gender, race, service, education, aptitude test, and marital status.

4.4.4. Discussion

Enlisted females have 15% more non–childbirth-related hospitalizations per capita during their first year of military service than their male counterparts after controlling for age, race, service, marital status, AFQT score, and education. The increased risk for females over males is even larger in the Army, which had the highest overall hospitalization rate

among the services. The category of neurotic and personality disorders accounted for the largest percentage (20%) of hospital admissions during the first year of service and, for females, is two times more common than any other discharge diagnostic subcategory. The first month of service should be a focus of preventive efforts given the disproportionately high number of hospitalizations. Additional research should be conducted to determine how to decrease the risk of hospitalization for females during their first year of service and how to prevent adjustment disorders.

References

1. Bijur PE, Horodyski , Egerton W, Kurzon M, Lifrak S, Friedman S. Comparison of injury during cadet basic training by gender. *Arch Pediatr Adolesc Med* 1997;151:456–461.

2. Greenland S. Quantitative methods in the review of epidemiologic literature. *Epidemiol Rev* 1987;9:1–30.

3. *SAS/STAT User's Guide Version 6*, 1990, SAS Institute, Cary, NC.

4.5. SURVEY OF NEW ENLISTEES DISCHARGED FOR PREEXISTING ASTHMA

4.5.1. INTRODUCTION

There are more than 1,000 premature discharges in the military for asthma every year (approximately 14% of the more than 7,000 total premature medical discharges per year). Seventy percent of these individuals are accessed without revealing their disease during the initial screening medical examination at the MEPS. An additional 17% report being unaware of having asthma before basic training. Only 1.2% of those receiving an EPTS discharge had received a waiver for asthma before entry onto active duty. These EPTS discharges inhibit military readiness and cost the DoD more than $10 million per year. AMSARA has been performing analyses of individuals who receive waivers for their asthma and found that these individuals perform as well as those not waived for any medical condition. The overwhelming number of recruits who receive an EPTS discharge for asthma not disclosed (therefore not waived) at the MEPS physical prompted this survey.

The purpose of the survey is to characterize individuals receiving an EPTS discharge for asthma and identify screening criteria that would potentially decrease accession of persons likely to be discharged during the first 6 months of active service for asthma. Variables under study included self-reported level of fitness before basic training, medical symptoms before service, and attitude toward basic training experience. These factors were measured among recruits discharged with asthma and compared with those among recruits discharged with other objective medical conditions.

The survey was conducted in two phases. Phase I was a small pilot study conducted to field test the telephone questionnaire and to determine the likelihood of success in locating subjects. Phase II was a case-control study comparing those who received an EPTS discharge for asthma with those receiving an EPTS discharge for other medical conditions and those who remained on active duty.

4.5.2. PHASE I PILOT STUDY

4.5.2.1. Methods

Cases were chosen from persons who received an EPTS discharge for asthma from any service between September 1996 and October 1997 and who were not disqualified at the MEPS. Of the 1,415 persons meeting this case definition, a stratified random sample ($n = 200$) reflective of the service distribution (Air Force, Army, Marine Corps, and Navy) was selected for the pilot study.

Triservice EPTS records already acquired by AMSARA were the source of cases. MEPS data and administrative data from DMDC provided demographic and entrance medical condition information. MEPS data and the Internet were used to obtain subject phone numbers. Self-reported data on physical fitness, medical symptoms, and basic training experience were collected via a standardized telephone interview.

Attempts were made to contact subjects between December 1998 and February 1999. In most cases at least 12 attempts to contact each subject were made: three during the morning hours, three during the afternoon hours, three during the evening hours, and three on a Saturday.

4.5.2.2. Results

Of the 200 cases, 42 (21%) completed interviews. Only 5 (2.5%) cases refused participation, and the remaining 153 (76.5%) cases were unreachable or could not be located. Response rate among contacted cases was 89% (42/47). Of the 42 completed interviews, 37 (88%) subjects reported engaging in some form of exercise more than one to two times a week (Fig. 4.5.1).

Figure 4.5.1 Reported Level of Fitness Prior to Basic Training (Phase I Pilot Study)

Activity Performed >= 1-2 Times Per Week
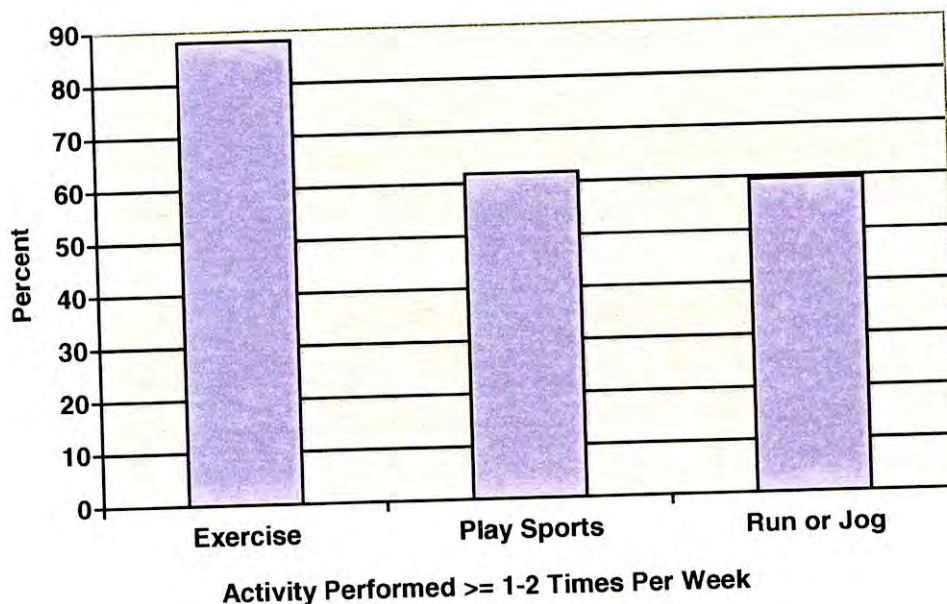
Twenty-seven (64%) of the respondents reported having asthma before enlistment (Fig. 4.5.2), and 18 (43%) reported being advised by a friend or recruiter not to reveal information to the MEPS physician or to conceal a medical condition. Of interest was the 33 respondents (78.5%) who rated basic training as a positive experience (i.e., a 6 or higher on a scale of 1 to 10) (Fig. 4.5.3).

Figure 4.5.2 Reported Medical Symptoms Prior to Enlistment
(Phase I Pilot Study)

Percent of Respondents

Categories (x-axis):
- Hospital stay for breathing problems
- Emergency Room Visit for breathing problems
- Asthma
- Inhaler Use
- Shortness of breath
- Persistent cough
- Allergies
- Over-the-Counter medication for breathing problems
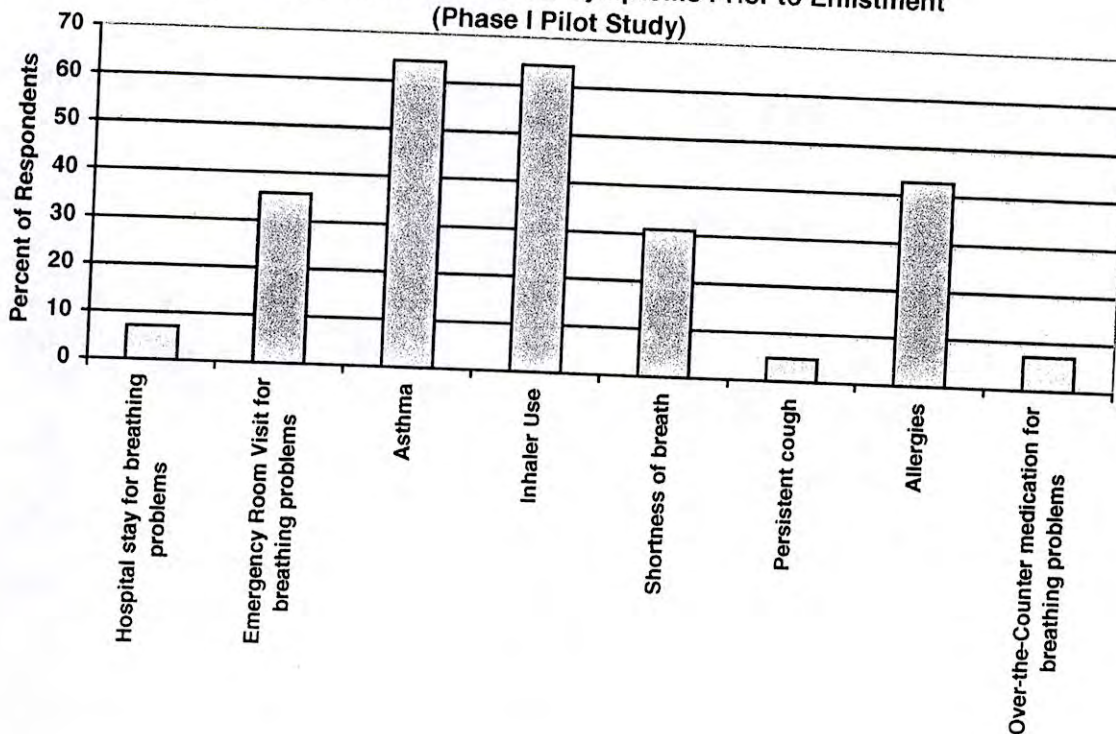
Figure 4.5.3 Subject Rating of Basic Training Experience
(Phase I Pilot Study)

Percent

Rating (1=horrible, 10=great)
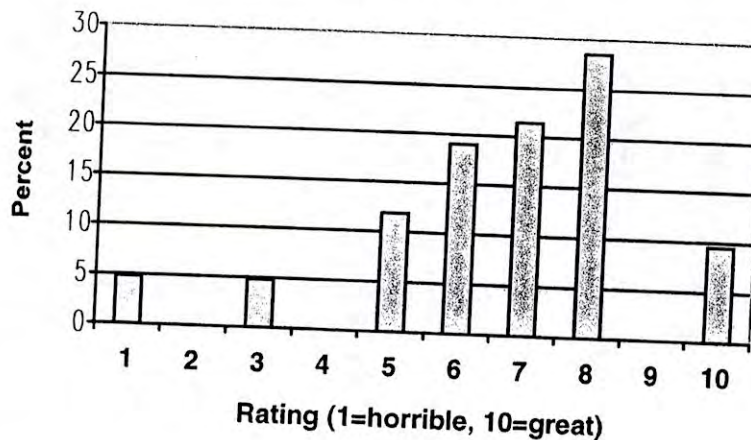
4.5.2.3 Discussion

The subject location/contact rate was low (23.5%), but the response rate among those located was excellent. The low location/contact rate was likely due to the fact that this young adult population is very mobile, and attempts to locate these subjects started 14 to 26 months after they had been discharged from the military. Thus we decided to proceed with the case-control study using a study population of recruits more recently discharged.

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We hypothesized that these recruits would be easier to locate because they might return to the address from which they came, at least temporarily.

4.5.3. PHASE II: CASE-CONTROL STUDY

4.5.3.1. Methods

Cases ($n = 336$) were chosen from persons who received an EPTS discharge for asthma from any service between July 1998 and September 1998 who were not disqualified at the MEPS. Two groups were used as controls. A stratified random sample ($n = 336$) of those successfully completing basic training comprised the "gain control" group. The gain control group was matched on service, sex, and month and year of accession. The second control group ("EPTS controls") consisted of recruits who were not disqualified a' MEPS and later received EPTS discharges for any condition that could be objectively diagnosed ($n = 238$). The conditions chosen were curvature of spine, hearing deficiency, congenital valvular heart disease, or keratoconus (all conditions). All EPTS controls with these conditions were selected without matching to the cases.

Self-reported data on physical fitness, medical symptoms, and basic training experience were collected via a standardized telephone interview. The interviewer was blinded to the subject's group. In most cases at least 12 attempts to contact each subject were made: three during the morning hours, three during the afternoon hours, three during the evening hours, and three on a Saturday.

Like the pilot study, triservice EPTS records available to AMSARA were the source of cases and controls. MEPS data and administrative data from the DMDC provided demographic and entrance medical condition information. MEPS data and the Internet were used to acquire subjects' phone numbers. In addition, credit bureau searches (for address and phone information only) were conducted on subjects who could not be contacted.

4.5.3.2. Results

One hundred fifty-eight interviews were completed: 78 cases, 20 gain controls, and 60 EPTS controls. Because of the small number of completed gain control interviews, these data were excluded from further analyses.

Despite the fact that the study population was comprised of recruits more recently discharged, only 78 (23%) cases (n=336) and 60 (25%) EPTS controls (n=238) completed telephone interviews. Most subjects could not be located (73% and 72% for cases and controls, respectively). Of those who could be contacted, the response rate was 90% for cases and 94% for EPTS controls (87 and 64 respectively).

Cases and controls were similar with regard to reported physical activity before enlistment. Among the respondents, 68 (87%) of cases and 53 (88%) of EPTS controls reported exercising at least one to two times per week. Furthermore, 56 (72%) of cases and 51 (85%) of controls reported running or jogging at least one to two times per week (Fig. 4.5.4). When asked to rate their level of physical fitness before basic training as

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poor, fair, good, very good, or excellent, 51 (65%) of cases and 42 (70%) of controls reported being in good, very good, or excellent physical condition (Fig. 4.5.5).

Figure 4.5.4 Reported Physical Activity Prior to Basic Training
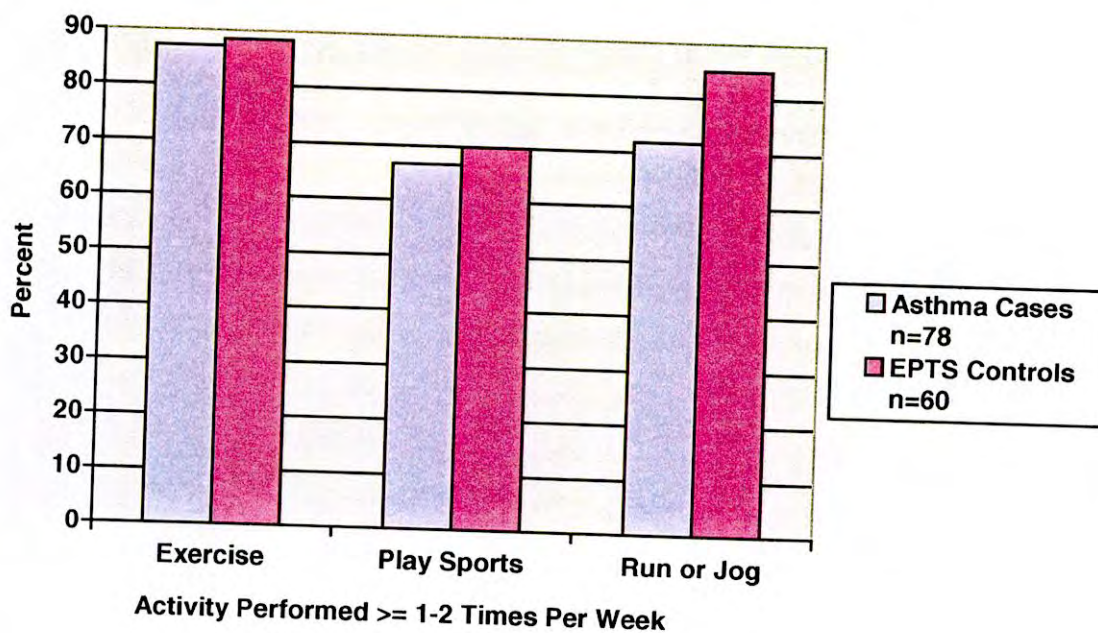

Activity Performed >= 1-2 Times Per Week

Figure 4.5.5 Reported Physical Fitness Level Prior to Basic Training

As expected, cases and controls differed greatly in their reports of prior medical symptoms. Thirty-three (42%) of cases reported a prior history of asthma compared with 1 (1.7%) of controls. Similarly, 37 (48%) of cases had experienced prior wheezing, but only 1 (1.7%) of controls had. Other reported medical symptoms before enlistment can be seen in (Fig. 4.5.6). Twenty-six of all cases (34%)* and 17 (28%) of EPTS controls reported that they were advised to withhold medical information or conceal a medical condition from the MEPS physician.

Figure 4.5.6 Reported Medical Symptoms Prior to Enlistment
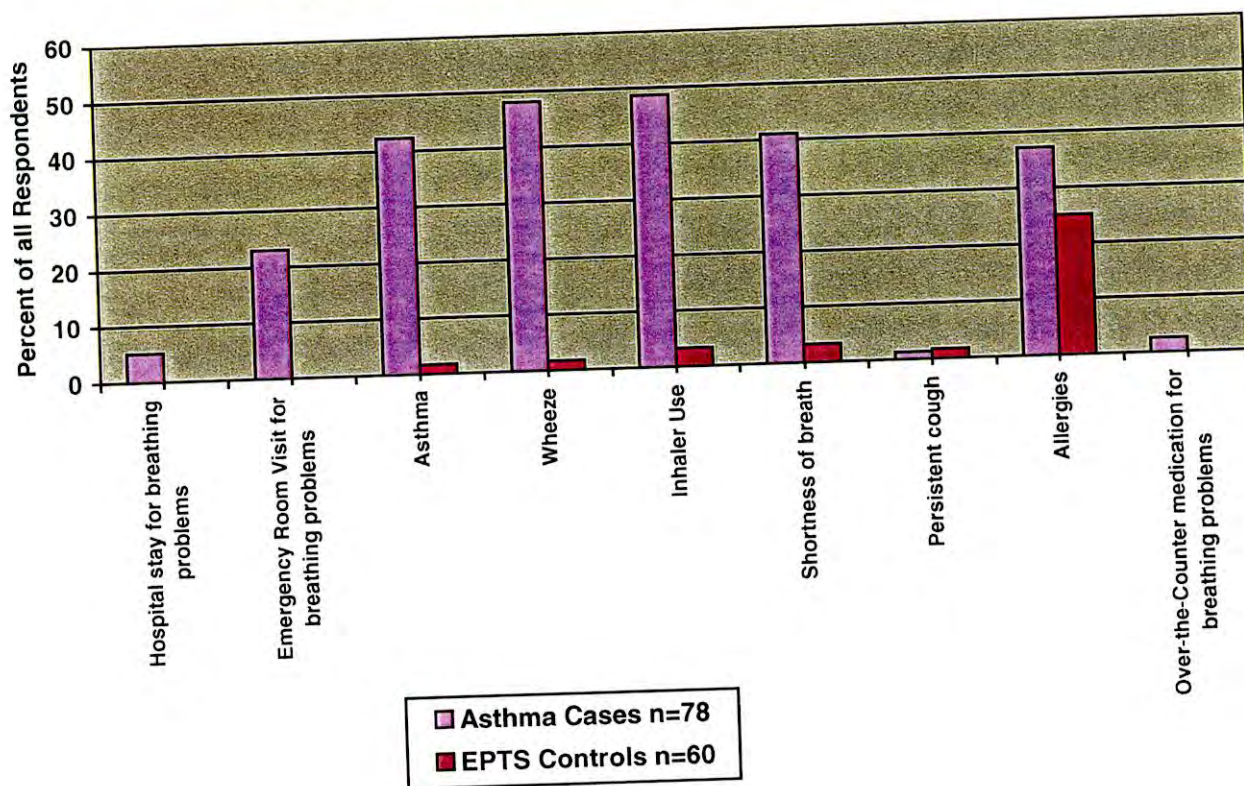
Forty-four cases (57%)* and 33 (55%) controls reported that they did not seek medical attention for these symptoms on their own. Most respondents were forced to seek medical attention by an officer in charge. Furthermore, 32 (42%)* of cases and 27 (45%) of controls felt their symptoms had no impact on their basic training performance. When subjects were asked to rate their basic training experience on a scale of 1 to 10 (1 = horrible, 10 = great), 63 (82%)* of cases and 39 (66%)* of EPTS controls rated the experience as a 6 or higher (Fig. 4.5.7).

*One respondent did not answer this question.

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Figure 4.5.7 Subject Rating of Basic Training

Rating Scale (1=horrible, 10=great)

Asthma Cases n=78
EPTS Controls n=60
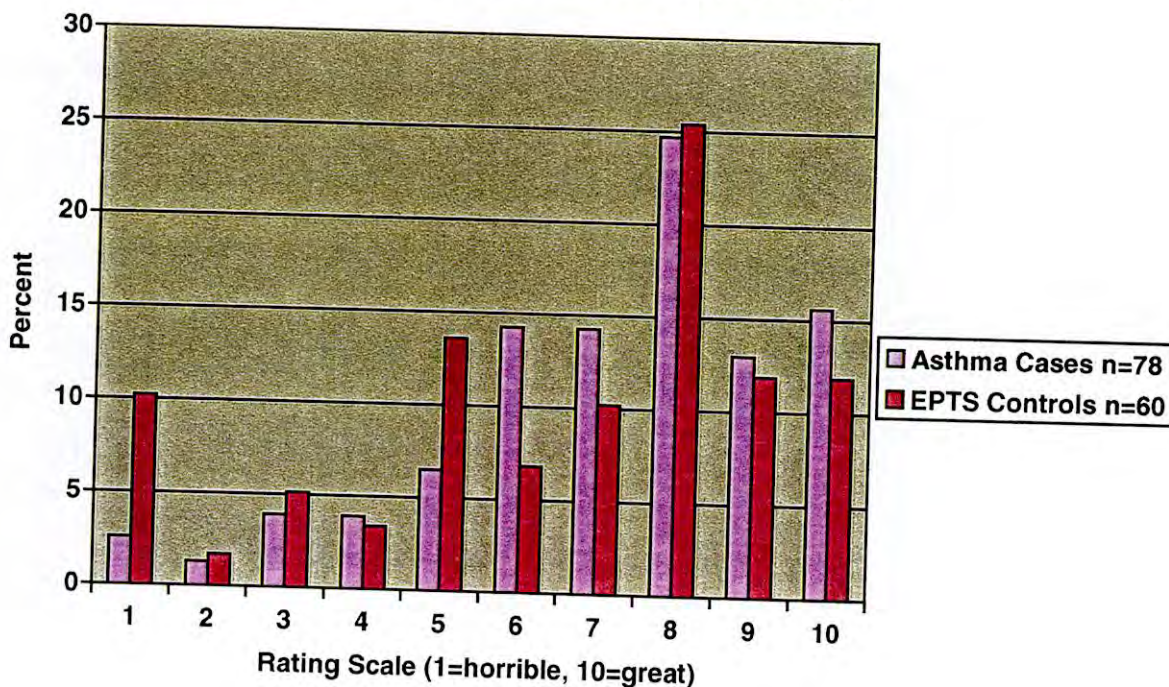
4.5.3.3. Discussion

In this small case-control study, less than half of the cases and controls sought medical attention on their own or thought that they were having difficulty in their training. In addition, only 42% reported having been diagnosed with asthma before basic training. There is little reason to suspect that these individuals would continue to conceal their medical condition after being discharged from the military, so this may reflect an over-diagnosis of asthma during basic training. Clinical data and performance reports would be necessary to confirm the diagnosis of asthma and determine the impact of asthma on their training.

Among all those receiving an EPTS discharge, most reported being in good physical condition before basic training. This finding is limited by being self-reported. Again, performance records would better indicate their true state of physical fitness. The finding that most cases and controls rated their basic training as a positive experience was surprising. This suggests that they were not using their medical condition as a reason to get out of the military.

Unfortunately, this study was hampered by the inability to locate subjects, likely owing to the increased mobility in this young population. It is possible that those who were located were not representative of all cases or controls who received an EPTS discharge, so the reported findings must be viewed with caution.

The questionnaire has been modified so that it can be administered to recruits as they are being discharged for any EPTS condition. Through a collaborative effort with personnel at Fort Jackson, a pilot study is being conducted, with recruits completing a computerized version of the questionnaire as part of the EPTS discharge process. The information

gathered at the time of discharge should provide more complete and accurate data that may provide insight into whether some EPTS discharges for asthma might be avoided.

5. FUTURE DELIVERABLES

5.1. FUTURE DIRECTION OF AMSARA

The early studies conducted by AMSARA have demonstrated the need for recruit medicine to be a programmed area of research. The goal of defining recruit medicine as a critical area of research will be actively pursued in the next year. Once targeted, recruit medicine (including accession standards) can be improved with a variety of collaborative efforts between Institutes, services and civilian partners with the goal of improving accession standards, training, and maintaining the health of the active duty force.

With this vision in mind, AMSARA is now embarking on several collaborative efforts that could have significant impact on early attrition. AMSARA has begun collaborative efforts with basic training sites (Fort Jackson and Great Lakes) and the Center for Health Promotion and Preventive Medicine (CHPPM) to evaluate the effectiveness of retention programs and their potential impact on accession standards. AMSARA is working with the Great Lakes Navy Training Center and the Division of Medicine (WRAIR) to evaluate the success of retaining recruits with mild asthma. Plans are currently being discussed to collaborate with the Division of Neuropsychiatry at WRAIR to develop a better screening tool for mental disorders, the number one cause for EPTS discharge. AMSARA looks forward to further collaborative efforts with other training sites and programs where early attrition is at issue.

Studies currently being conducted, planned, or anticipated are outlined below:

5.2. INJURY REHABILITATION

This historical cohort study will assess the effectiveness of volunteer participation in the Physical Training Rehabilitation Program at Fort Jackson, South Carolina. Subjects will include recruits injured during basic combat training (BCT) and referred to the program during the first 9 months of CY 1998 and subsequently returned to BCT, along with matched controls. Endpoints examined may include rates of BCT graduation, hospitalization, and long-term military retention. Evaluation of similar programs at other basic training facilities would be a natural spin off from this study.

5.3. COMMUNITY MEDICAL PROFILES

AMSARA will assemble information on the rates of disqualifying medical conditions among the general population of enlistment-aged people in the United States. The purpose is to give MEPS physical examination staff a better idea of the degree to which they might expect to see the various conditions. It is also intended to help estimate the degree to which these conditions go unreported and undetected at the MEPS.

5.4. ASTHMA ACCESSION STANDARD: SURVIVAL ANALYSIS OF MILITARY RECRUITS 1995-1999

AMSARA will expand, to a full 5 years (1995–1999), the survival analysis of enlisted personnel initially disqualified for asthma compared with those not disqualified for asthma. A description and results of this study at the three year follow-up time are presented in the 1998 AMSARA Annual Report. The purpose of including additional follow-up is to further evaluate the likelihood of asthma-related hospitalization or premature discharge in this population.

5.5. ACADEMIC SKILLS DEFECT 1995-1999: 5-YEAR FOLLOW-UP RESULTS

AMSARA will expand the study initially described in the 1997 AMSARA Annual Report to allow 5 years of follow-up. The study will examine discharge rates from the military for those with ASD compared with all enlisted individuals accessed.

5.6. ATTRITION ANALYSES

In addition to studies of specific medical conditions related to attrition, AMSARA will continue to examine attrition as a whole (see Section 3). The objective is to develop prediction models that will estimate retention times and probabilities from factors known at the time of application for service. This is expected to be an ongoing project, with refinement of estimates as future data become available.

5.7. PRK AND LASIK TRACKING

In coordination with each service's waiver authorities, AMSARA will attempt to collect information on all individuals receiving an accession waiver for laser vision corrective surgery. Databases on medical visits and losses will be reviewed periodically to find any related complications and to assess the implications of waiving for history of corrective surgery. This is expected to be an ongoing, long-term project.

5.8. RETENTION OF MILD ASTHMATICS

The purpose of the study will be to provide outcome-based evidence to validate a proposed change in standards for asthma in the Navy. It will address the impact to the Navy of retaining recruits diagnosed with mild/intermittent and mild/persistent asthma during basic training. The major focus of the study will be to examine the utilization of Navy medical resources for acute episodic care among those retained with mild asthma and to measure their overall attrition.

Abbreviations

ADHD	attention deficit hyperactivity disorder
AFQT	Armed Forces Qualification Test
AMEDD	Army Medical Department
AMSARA	Accession Medical Standards Analysis and Research Activity
ASD	academic skills defect
BMI	body mass index
CI	confidence interval
CY	calendar year
LCPY	loss count per person year
DMDC	Defense Manpower Data Center
DoD	Department of Defense
DoDMERB	DoD Medical Evaluation Review Board
EPTS	existed prior to service
FY	fiscal year
HS	high school
ICD9	International Classification of Diseases, 9th Revision
ISC	interservice separation code
JDETS	Joint Disability Evaluation and Tracking System
LASIK	laser in situ keratomileusis
MEPCOM	Military Entrance Processing Command
MEPS	military entrance processing station
NS	not significant
PASBA	Patient Administration Systems and Biostatistical Activities
PID	pelvic inflammatory disease
PRK	photorefractive keratectomy

PY	person-year
ROTC	Reserve Officer Training Corps
RPR	rapid plasma reagin test
RR	relative risk
RTM	Recruit Training Management
SE	standard error
SSN	social security number
STASS	Standard Training Activity Support System
WRAIR	Walter Reed Army Institute of Research
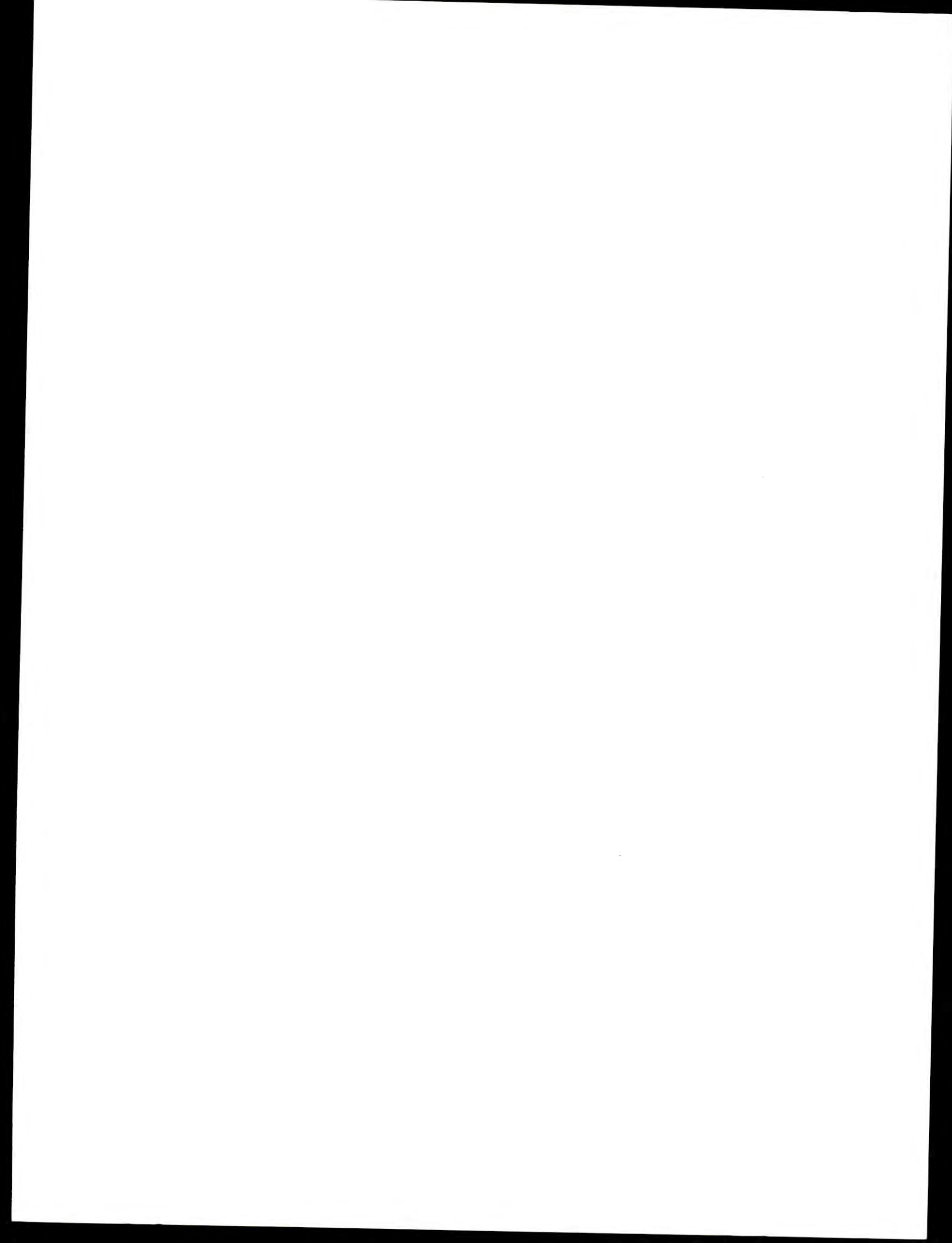
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