The Defense Women's Health Research Program

The Demographic Profile of U.S. Army Active Duty Women 1980-1994
Using the Total Army Injury and Health Outcomes Database

Prepared by
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This report details demographic trends for active duty Army soldiers from 1980-1994 with a particular focus on the changing demographics of women in the Army. Specific breakouts for gender, race, age, pay grade, marital status, number of dependents, geographic origin, occupation, education, hazardous duty pay, and time in service are provided. The Total Army Injury and Health Outcomes Database (TAIHOD), created in 1995 under a grant from the Defense Women's Health Research Program (DWHRP), was the source of the data. This ARIEM database links demographic information from personnel records to a variety of health outcomes including death, disability, hospitalization, lost time injury, and self-reported health habits. The information in this report is critical to provide a context for continued evaluation and study of the health issues of women in the military. In general, the proportion of women on active duty is increasing, average age is rising, both men and women are more likely to be married, educational levels have increased, men still have longer service careers, but women are staying in the Army longer than in the 80's. The southern states still account for the greatest percentage of Army members. Charts and tables provided will provide denominators for calculation of rates for many health outcomes.
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BACKGROUND

The Defense Women's Health Research Program (DWHRP) was initiated in 1994 when Congress provided $40 million to research women's health in the military and its impact on readiness.

In August 1994, the DWHRP Triservice Review Panel approved funding for USARIEM's protocol The Impact of Injuries on the Health and Readiness of Women in the Army from 1980-1994 (OMD95001-AP-H001). The protocol was designed to investigate injuries among women in the Army over a 15-year period (1980 to 1994). This investigation combined existing data from various Army and Defense Department sources into a relational database. The intent was to provide policy makers, commanders, and researchers with vital information for the prevention of the injuries that cause the greatest morbidity and mortality for women in the Army. In December 1994, the protocol received final approval.

The first step in this research effort was the creation of the Total Army Injury and Health Outcomes Database (TAIHOD). This relational database, maintained at the U.S. Army Research Institute of Environmental Medicine (USARIEM), initially linked personnel records for the total active duty Army population from 1980 to 1994 to the following outcome measures: hospitalizations, lost-time injuries, permanent disabilities, and fatalities. An amendment to the protocol, approved in July 1995, provided for the addition of Health Risk Assessment (HRA) survey data.

Currently, the TAIHOD is a compilation of six unique databases (Amoroso et al, 1997):

- The Defense Manpower Data Center (DMDC) contains extensive demographic and occupational data on all active duty personnel.

- The Individual Patient Data System (IPDS) contains hospitalization data.

- The Army Safety Management Information System (ASMIS) contains lost-time injury and fatality data.

- The U.S. Army Disability Database contains disability data.

- The Army Casualty Information Processing System (ACIPS) contains fatality data.

- The HRA System contains soldier self-reported health profiles.
All of the data for this technical report came from the DMDC component of the TAIHOD database. The DMDC provides extensive population data including race, age, marital status, education, occupation, personnel rank, time in service, and home of record. Each of these demographic variables is analyzed in this report.
ACKNOWLEDGMENTS

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<td>Army Casualty Information Processing System</td>
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<td>ASMIS</td>
<td>Army Safety Management Information System</td>
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<td>DMDC</td>
<td>Defense Manpower Data Center</td>
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<td>DoD</td>
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<td>DWHRP</td>
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EXECUTIVE SUMMARY

Changes in the demographics of the U.S. Army from 1980 to 1994 may be associated with corresponding demographic shifts in the U.S. civilian society. Demographic shifts evident in this population are graphically displayed and include age group, marital status, number of dependents, highest level of education, occupational status, hazardous duty exposure, enlisted and officer rank status, and home of record. The purpose of this report is to describe the Army population over the 1980-1994 time period.

The overall size of the Army decreased from approximately 767,000 in 1980 to 528,000 in 1994. Women now represent a larger proportion of the total Army population. In 1994, women comprised 13% of the Army population, compared to 9% in 1980. The number of minority women in the Army has also increased over this 15-year period.

The increasing average age of Army personnel is reflected in a larger proportion of soldiers ages 35 and older. Most Army personnel are still in the 20-24 age group; however, this group represents a smaller proportion of the Army than it did in 1980.

The marital status of Army personnel has shifted during the research period. The majority of women in the Army were single in 1980, but in 1994 the majority of women were married. The proportion of married men has also increased. Parallel to the increase in married personnel is an increase in the proportion of people with one or more dependents.

The highest level of education attained has increased; the proportion of personnel with a college education has increased almost every year from 1980 to 1994. In 1994, 19% of women and 16% of men had a Bachelor's degree or higher. In comparison, 10% of women and 11% of men had college degrees in 1980.

Men and women have different military occupational specialties. Approximately 40% of enlisted women are employed in the Functional Support and Administration fields, and 30% of enlisted men are in the Infantry field. Approximately 50% of female officers are employed as Health Care Officers, and 50% of male officers are employed as Tactical Operations Officers.

The proportion of Army personnel who are officers has increased. Approximately 16% of both women and men are officers in 1994, compared to 11% of women and 13% of men in 1980. Men spend longer periods of time in the Army than women, and officers remain in the Army longer than enlisted personnel. In 1994, the
average time in service for female officers was 100 months, and for male officers, 136 months. The average time in service for enlisted men was 87 months in 1994, while for enlisted women, 71 months.

The home of record of Army personnel changed little over the 15 year time period. Home of record defines where a person lives when they join the Army, or where a person would be living if they were not in the Army. Approximately 42% of personnel were from Southern states, 22% from the Midwest, 15% from the West, 11% from the North, and 10% from other areas.
INTRODUCTION

Health issues for military women differ from those of military men; however, since men have traditionally comprised the majority of the U.S. military population, women's health issues have never been comprehensively studied. Today, the full participation of women in all aspects of military service (Army, Air Force, Navy, and Marine Corps) requires systematic investigation of relevant women's health and performance issues.

Military directors recognized the need for medical and epidemiological research to support the expansion of the operational roles of women in performance of the military mission. Congress appropriated $40 million dollars of congressional funding in 1994 for the Defense Women's Health Research Program (DWHRP). Additional funding was appropriated in 1995 and may continue in subsequent years.

The Total Army Injury and Health Outcomes Database (TAIHOD) was created and demographic parameters assigned, as the initial action. This relational database, maintained at the U.S. Army Research Institute of Environmental Medicine (USARIEM), provides the ability to link personnel records on the total active duty Army population with one or more of the following outcome measures: hospitalizations, lost-time injuries, physical disabilities, and fatalities. Since data are not restricted to a specific gender, appropriate statistical comparisons and inferences with respect to populations can be made. An amendment to the protocol, approved in July 1995, allowed for the addition of Health Risk Appraisal (HRA) survey data.

During the early twentieth century, the U.S. Army population was predominately white and male. Minorities have been traditionally under represented in the Army; however, the racial makeup of the Army has changed considerably since World War II. For example, the percentage of blacks in the enlisted ranks increased during the 1970s from 17.5% in 1972 to 32.2% in 1979, possibly because the expanding number of black high school graduates increased the eligible pool of black applicants (Moskos, 1980).

The historical role of women in the Army has changed dramatically. The Women's Army Corps was established in 1943 enabling women with certain skills to join the Army. Most women who served during World War II were either nurses (Segal and Segal, 1983) or employed in administrative positions (Butler and Brewer, 1978). At that time, the law allowed only 2% of enlisted personnel to be female; consequently, the number of women in the military was small. The Women's Army Corps was abolished as a separate military unit in 1978.
The percentage of enlisted women rose from 1.3% of all enlisted soldiers in 1971 to 8.6% in 1980 (Segal and Segal, 1983). A number of factors contributed to the increase of women in the military (Segal and Segal, 1983):

- Society’s acceptance that women could successfully work outside the home and raise children.
- The realization that women provide a valuable contribution to both the civilian and the military workforce.
- A decline in the number of men applying for military service.
- Greater military job opportunities for women.

Twenty years ago, women and men differed in their motivations for joining the Army. The most common reasons women joined the Army were for self-advancement or to receive college benefits and job training, whereas men commonly joined to serve their country (Hicks, 1978). Women in the Army required more education because they were assigned to skilled administrative and technical positions, while men were often assigned to combat positions (Moore, 1991). Historically, the military jobs available to women were nursing and administrative positions which, by their nature, required a higher level of education than the combat positions frequently assigned to men.

Changing educational levels of Army personnel reflect who served in the Army. During World War II, most eligible men served in the Army, and there was a wide range of educational levels (Fligstein, 1980). The number of people in the Army with college degrees decreased when deferments for college students began during the Korean War; consequently, those with a high school diploma were more likely to serve in the Korean and Vietnam wars than people with a college degree.

Although the military population differs substantially from the general civilian population, in many ways it reflects influences of the civilian population as seen in the age, racial, and gender distribution of the Army. Military demographics have been influenced by political and social factors such as active warfare, peacetime national interests (Cold War threat), public opinion (Vietnam), national pride (President Reagan’s influence), and financial constraints (military portion of the national debt). Recent influences include Operation Desert Storm, the end of the Cold War era, and significant military budget restrictions of the early 1990s.

This technical report serves to provide information on Army demographics, particularly the demographics of women in the military force, from 1980 to 1994. The
report will be an important research benchmark for future studies of women in the military by providing demographic information on several aspects of women's careers in the Army. Through further research on factors that influence the health and careers of women in the military, USARIEM will provide policy makers, military leaders, and the scientific community with vital information about overall demographics, comparative injury rates, and descriptive morbidity and mortality information for women in the Army. Through careful epidemiologic analysis, USARIEM will provide scientific summarization of the morbidity and mortality data, provide recommendations to foster safety and health concerns, and stimulate proactive prevention and loss control programs among active duty women.
METHODS

The demographic profiles of all Army active duty members were derived by a comprehensive summation of personnel data obtained from the DMDC component of the TAIHOD database from 1980 to 1994. The DMDC provided population data including race, age, marital status, education, occupation, personnel rank, time in service, and home of record. In this demographic study, all social security numbers are encrypted and all names are eliminated to ensure confidentiality. This report provides a relatively detailed analysis of data for active duty Army members, with a specific focus on women.

Demographic files were assembled from several sub-files obtained from the DMDC. The main component of these files is comprised of 16 “year-end files” containing the personnel record of all Army soldiers on active duty as of the 31st of December for each year between 1979 and 1994. Since many soldiers come and go in a given year, a “loss file” is generated which contains a date in (start date) and date out (end date) from the active Army. Using these dates, each soldier’s actual time in service can be used in the computation of rates for various health outcomes.

For the factors studied in this report, it is sufficient to use year-end population figures. An example of year-end data use is the comparison between the number of officers and enlisted soldiers. In future reports when precise rates of illness or injury must be calculated, each individual’s actual time in service can be used. In epidemiological terms, this is known as “person-time.” Most advanced statistical techniques to be employed in the further use of this data require a person-time calculation. This is accomplished by counting the number of days an individual is on active duty in a given year by using the “date in” and “date out” data fields and summing each year. For example, in a given year, a person who left the Army on January 2 would have 2 days of service, and a person who was active from January 1 through December 31 would have 1 year of service (365 days).

A third denominator that can be used is an overall count of the Army personnel for a given year. This differs from the year-end count because the overall denominator is comprised of those present in the year-end file, plus people from the loss file who were on active duty during the year but not on December 31. For example, a person who left the Army on July 31 would not be in the year-end file, but would be in the loss file and would be included in this denominator. In this manner, the overall denominator is a count of the number of personnel active at any time during a year.

To illustrate the difference between the year-end (slice in time) and person-time denominators, these values were plotted against one another (Appendix A). A third line
represents the count of all individuals who spent even one day on active duty in a given year. For ease of interpretation and simplicity of reporting, all other figures in this report use only year-end denominators.

Demographic variables were analyzed using the year-end population for each year (1980-1994) to give an accurate picture of population changes over this time period. When evaluating specific variables, people with missing data for that variable were excluded from the analysis. Missing data ranged from approximately 0.02% to 1%, depending upon the year and the variable of interest.
RESULTS

U.S. ARMY POPULATION DEMOGRAPHICS

In general, the Army population decreased from 1980 until 1994. This decrease was not consistent across all gender and racial groups. For example, representation by black women and women in "other" non-white or black racial groups (e.g., Hispanic, Asian, Pacific Islander) have increased, while the number of white men has decreased.

The total Army active duty population increased slightly from 1980 to 1986 and then decreased until 1994 (Figure 1 and Appendix A).

- The overall active duty Army population decreased from 767,363 in 1980 to 528,690 in 1994.
- A slight increase in total force occurred between 1980 (767,363) and 1986 (779,961).
- A 13% reduction in total force occurred between 1991 (686,950) and 1992 (596,663).

The reduction in force has not been consistent across all gender and racial groups. The number of women in the Army has changed little, while the number of men has decreased substantially from 1980 to 1994.

- The number of women decreased from 69,577 in 1980 to 68,994 (-1%) in 1994.
- The number of men decreased from 697,786 in 1980 to 459,696 (-34%) in 1994.

However, the proportion of women in the total active Army population has increased from 1980 to 1994.

- In 1980, women represented 9% of the Army population, and in 1994 they represented 13%.
- In 1980, men comprised 91% of the Army population, and in 1994 they represented 87%.
Figure 1. U.S. Army Active Duty Population 1980-1994
The annual population of active duty Army forces from 1980 to 1994 displayed by race and sex categories is shown in Figure 2 and Figure 3.

- The number of men in each racial group decreased from 1980 to 1994 (Figure 2).
  - The proportion of white men in the total Army population decreased from 57.2% (438,083) in 1980 to 56.1% (296,620) in 1994.
  - The proportion of black men decreased from 26.4% (202,401) in 1980 to 22% (114,129) in 1994.
  - The proportion of men of other races increased from 7.4% (56,285) in 1980 to 9.3% in 1994 (48,872). Even though the absolute number of men of “other” races decreased, they represented a larger proportion of the total Army population in 1994.

- The number of black women and women of other races increased from 1980 to 1994, and the number of white women decreased (Figure 2 and Figure 3).
  - The proportion of white women in the active Army increased from 5.1% (39,162) in 1980 to 6% (31,952) in 1994 (Figure 3).
  - The proportion of black women increased from 3.3% (25,596) in 1980 to 5.7% (30,137) 1994 (Figure 3).
  - The number of black women has increased over the 15-year time period and was almost equal to the number of white women by 1994 (Figure 3).
  - The proportion of women of “other” races has increased from 0.6% (4,683) in 1980 to 1.3% (6,896) in 1994.
  - In comparison, the 1994 U.S. population had 97 million white women, 93 million white men, 17 million black women, and 15 million black men. Blacks comprised 12.7% of the total population (Bennett, 1996).
Figure 2. U.S. Army Active Duty Population by Race and Gender 1980-1994
Figure 3. U.S. Army Active Duty Women By Race 1980-1994

- Females White
- Females Black
- Females Other

Calendar Year

Number of Personnel
The distribution of Army personnel by age-specific groups from 1980-1994 is displayed in Figure 4.

- The age category 35-39 increased from 7.6% to 13.3%; 40-44 increased from 3.8% to 6.1%; and 45-49 increased from 1.3% to 2.3%, as a proportion of the total personnel.

- The number of personnel under age 35 decreased between 1980 and 1994. The largest changes occurred in the 20-24 year olds who comprised 39.7% of the population in 1980 and decreased to 32.4% in 1994, and in the 17-19 year olds who were 15.4% of the population in 1980 and 6.2% in 1994.
Figure 4. U.S. Army Active Duty Population by 5-Year Age Group 1980-1994
The distributions of women and men in the Army by both race and age from 1980-1994 are displayed in Figures 5 through 8.

WOMEN

- The number of white and black women increased in the 30-34, 35-39, 40-44, and 45-49 age groups (Figure 5 and Figure 6, respectively).
  - White women in the 35-39 age group increased from 1,281 in 1980 to 3,474 in 1994 (Figure 5).
  - Black women in the 40-44 age group increased from 67 in 1980 to 1,350 in 1994 (Figure 6).

- The number of women younger than age 30 decreased. The greatest proportional change occurred in women less than age 19 (third most common age group of seven in 1980 and fifth most common age group in 1994).
Figure 5. U.S. Army Active Duty White Women by 5-Year Age Groups 1980-1994
Figure 6. U.S. Army Active Duty Black Women by 5-Year Age Group 1980-1994
MEN

- White men decreased in every age category except ages 45-49 (Figure 7).

- The greatest proportional change occurred in men younger than age 19:
  
  - White males younger than age 19 were the third most common age group (66,073) in 1980 and the fifth most common age group (19,826) in 1994.

  - Black males younger than age 19 were the third most common age group (28,660) in 1980 and the sixth most common age group (5,024) in 1994.

- Black men increased in the 30-34, 35-39, and 40-44 age groups (Figure 8).
Figure 7. U.S. Army Active Duty White Men
By 5-Year Age Group
1980-1994
Figure 8. U.S. Army Active Duty Black Men by 5-Year Age Group 1980-1994
The number of active duty Army personnel in their first year of service is shown in Figure 9. There has been a steady decline in the number of first year Army personnel from 1980 to 1994. This decrease is reflected in both males and females.

- The number of females in their first year of service was 27,228 in 1980, and decreased to 12,979 in 1994.

- The number of males in their first year of service was 164,021 in 1980, and decreased to 57,952 in 1994.
Figure 9. U.S. Army Active Duty Personnel
First Year of Service
1980-1994
MARITAL STATUS AND DEPENDENTS

The marital status of women and men in the Army has changed dramatically over the 15-year period. Marital status was evaluated as single, married, previously married or unknown. Until 1985, previously married people were coded in the single category by the Defense Manpower Data Center (DMDC). Because of this, the graphs and statistics in this section reflect information about marital status and dependents from 1985 to 1994. Comparison of the 1980-1984 statistics to 1985 or later year statistics may be misleading because of the category changes in 1985.

The marital status of women in the Army is displayed in Figure 10; the marital status of men in the Army is displayed in Figure 11.

- In 1985, 49% of the women and 41% of the men were single. The percentage of single women and men decreased over time. By 1994, 40% of the women and 35% of the men were single. The decrease in single personnel corresponds to an increase in the percentage of married personnel.

- In 1985, 43% of the women and 56% of the men were married; by 1994, 50% of the women and 62% of the men were married.

- In 1985, 7.5% of women and 3% of the men had been previously married. In 1994, these numbers increased slightly to 10% of women and 3.4% of men.
Figure 10. Marital Status of U.S. Army Active Duty Women 1985-1994

Calendar Year

Percentage of Women

- FEMALE MARRIED
- FEMALE PREVIOUSLY MARRIED
- FEMALE SINGLE
- FEMALE UNKNOWN
Figure 11. Marital Status of U.S. Army Active Duty Men 1985-1994

- MALE MARRIED
- MALE PREVIOUSLY MARRIED
- MALE SINGLE
- MALE UNKNOWN

Calendar Year

Percentage of Men
The number of dependents a soldier has is an important demographic characteristic. The personnel data counted dependents on a scale from unknown, zero dependents (other than self), member and one dependent, to member and 8 or more dependents. The data did not further define a dependent as being a spouse or a child. Graphs display marital status and number of dependents. Therefore, if a married woman has one dependent, the dependent person may be her husband or a child (assuming a dual-income family). If a married woman has two dependents, they may be her husband and a child. Note: minor inconsistencies in these data for the “number of dependents” variable suggests extensive additional analysis will be required to ensure its accuracy.

The percentage of Army women with one or more dependents appears to have increased steadily from 1980-1994 (Figure 12), while the percentage of women without dependents has decreased.

- In 1980, 76% and in 1994, 51% of women had no dependents.
- In 1980, 15% and in 1994, 23% of women had one dependent.
- In 1980, 6% and in 1994, 14% of women had two dependents.
- In 1980, 2.5% and in 1994, 8% of women had three dependents.

The percentage of Army men with dependents appears to have increased slightly from 1980-1994 (Figure 13). The percentage of men without dependents appears to have decreased.

- In 1980, 47% and in 1994, 36% of men had no dependents.
- In 1980, 14% and in 1994, 18% of men had one dependent.
- In 1980, 14% and in 1994, 17% of men had two dependents.
- In 1980, 15% and in 1994, 18% of men had three dependents.
Figure 12. Percentage of U.S. Army Active Duty Women with Dependents
1980-1994
Figure 13. Percentage of U.S. Army Active Duty Men with Dependents 1980-1994

Legend:
- MALE 0 DEPS
- MALE 1 DEP
- MALE 2 DEPS
- MALE 3 DEPS
- MALE 4 DEPS
- MALE 5 DEPS

Calendar Year:

Percentage of Men:
80 70 60 50 40 30 20 10 0

Legend:
- MALE 0 DEPS
- MALE 1 DEP
- MALE 2 DEPS
- MALE 3 DEPS
- MALE 4 DEPS
- MALE 5 DEPS
The percentage of single Army women with dependents is displayed in Figure 14. The percentage of single Army men with dependents is displayed in Figure 15.

- Approximately 90% of single active duty Army women and men had no dependents.

- There was a larger percentage of single women with one dependent than single men with one dependent.

- In 1980, 2.7% of single women had two or more dependents, compared to 3% in 1994.

  In 1980, approximately 8% of single women had dependents. The percentage of single women with dependents increased until 1994, when approximately 14% of single women had dependents. The largest change over time was in the category of single women with one dependent (Figure 14).

- In 1980, 6% of single women had one dependent. In 1994, the percentage of single women with one dependent had almost doubled to 11%.

- In 1980, 1.6% and in 1994, 2.5% of single women had two dependents (data not shown).

In 1980, approximately 7% of single men had one or more dependents. The percentage of single men with one or more dependents in 1994 was approximately 6%. The largest change over time in numbers of single men with dependents occurred in the category of single men with one dependent (Figure 15).

- In 1980, 3.4% of single men had one dependent. In 1994, the number of single men with one dependent had only increased to 4%.

- In 1980, 1.7% of single men had two dependents. This increased to 2.2% in 1984, then decreased until 1994 when only 1% of single men had two dependents (data not shown).
Figure 14. Percentage of U.S. Army Active Duty Single Women with Dependents, 1980-1994

- FEMALE SINGLE 0 DEPS
- FEMALE SINGLE 1 DEP
- FEMALE SINGLE 2 DEPS
Figure 15. Percentage of U.S. Army Active Duty Single Men with Dependents, 1980-1994
The percentage of married Army personnel with dependents changed from 1980 to 1994. The percentage of married Army women with dependents is displayed in Figure 16. The percentage of married Army men with dependents is displayed in Figure 17.

- In 1980, 42% of married women had no dependents other than themselves. The percentage of women in this group decreased steadily to 27% in 1994.

- In 1980, 34% of married women had one dependent, 14% had two dependents, and 7% had three dependents. By 1994, 31% of married women had one dependent, 22% had two dependents, and 15% had three dependents.

- In 1980, 24% of married men had one dependent, 26% had two dependents, 28% had three dependents, and 12% had four dependents. These percentages remained relatively constant from 1980 to 1994.

- From 1980 to 1994, the percentage of married men with no dependents remained relatively stable at approximately 3%.
Figure 16. Percentage of U.S. Army Active Duty Married Women with Dependents 1980-1994

- FEMALE MARRIED 0 DEPS
- FEMALE MARRIED 1 DEP
- FEMALE MARRIED 2 DEPS
- FEMALE MARRIED 3 DEPS
- FEMALE MARRIED 4 DEPS
Figure 17. Percentage of U.S. Army Active Duty Married Men with Dependents
1980-1994
Data on previously married women with dependents are displayed in Figure 18.

- The percentage of previously married women with no dependents other than themselves decreased from 44% in 1985 to 35% in 1994.

- The percentage of previously married women with one dependent has remained relatively constant between 1985 and 1994 at approximately 32%.

- The percentage of previously married women with two dependents increased from 18% in 1985 to 23% in 1994.

- The percentage of previously married women with three dependents increased slightly from 5% in 1985 to 7% in 1994.

Data on previously married men with dependents are displayed in Figure 19.

- The percentage of previously married men with no dependents increased slightly from 30% in 1985 to approximately 32% in 1994.

- The percentage of previously married men with one dependent has remained relatively constant between 1985 and 1994 at approximately 32%.

- The percentage of previously married men with two dependents decreased slightly from 25% in 1985 to 24% in 1994.

- The percentage of previously married men with three dependents increased slightly from 8.5% in 1985 to 9.3% in 1994.
Figure 18. Percentage of U.S. Army Active Duty Previously Married Women with Dependents 1985-1994

- Female Previously Married 0 Deps
- Female Previously Married 1 Dep
- Female Previously Married 2 Deps
- Female Previously Married 3 Deps

Calendar Year

Figure 19. Percentage of U.S. Army Active Duty Previously Married Men with Dependents 1985-1994

- MALE PREVIOUSLY MARRIED 0 DEPS
- MALE PREVIOUSLY MARRIED 1 DEP
- MALE PREVIOUSLY MARRIED 2 DEPS
- MALE PREVIOUSLY MARRIED 3 DEPS

Calendar Year

EDUCATION

Overall, U.S. Army active duty personnel were better educated in 1994 than in 1980. Education is reported as the highest level of education obtained as of the end of the year (Figures 20 and 21).

- A high school diploma was the highest level of education attained for 60% to 80% of men and women during 1980-1994. From 1980 to 1983, a larger percentage of women than men had a high school diploma as their highest level of education. However, from 1984 to 1994, the situation reversed and a larger percentage of men than women had a high school diploma as their highest level of education.

- The percentage of women with high school graduation as the highest level of education decreased from 73% in 1980 to 66% in 1986, then increased to 73% in 1994.

- The percentage of men with high school graduation as the highest level of education increased from 63% in 1980 to 77% in 1994.

- From 1981 to 1994, a greater percentage of women compared to men had a Bachelor's degree or higher college degree as their highest level of education.

- The percentage of women with a college degree increased from 10% in 1980 to 19% in 1994.

- The percentage of men with a college degree increased from 11% in 1980 to 16% in 1994.

- In 1980, 3% of women and 15% of men reported their highest level of education attained was less than a high school education. By 1994, the percentage of active duty personnel in this group decreased to 0.2% of women and 0.3% of men.

- From 1980 to 1994 there has been a marked decrease in the number of men who have not completed a high school education, from more than 107,000 to 1,400.
Figure 21. Educational Status of U.S. Army Active Duty Men 1980-1994
The occupational categories for active duty enlisted women from 1980 to 1994 are shown in Figure 22.

The occupational categories were identified from the Military Occupation Specialty (MOS) codes in the yearly DMDC personnel files. The Department of Defense (DoD) occupational conversion codes (Department of Defense, 1997) were used to further classify the MOS codes into broad occupational groups.

- The majority of enlisted women were assigned in the Functional Support and Administration, Health Care Specialist, Service and Supply, and Communications and Intelligence occupational categories (Figure 22).
  - The percentage of enlisted women in the Functional Support and Administration field increased from 37.5% in 1980 to 39% (+1.5%) in 1994.
  - The percentage of enlisted women in the Health Care Specialist field remained approximately 17% throughout the 15-year time period.
  - The percentage of enlisted women in the Communications and Intelligence field decreased from 16.5% in 1980 to 11% (-5.5%) in 1994.
  - The percentage of enlisted women in the Service and Supply field increased from 13% in 1980 to 15% (+2%) in 1994.
- Approximately 1% of enlisted women were classified in the Infantry, Gun Crews, & Seamanship category. This is erroneous because these occupational groups are closed to women. These errors could be men coded as women, people with an incorrect MOS code, or another unknown error.
Figure 22. U.S. Army Active Duty Enlisted Women Occupations by Percentage 1980-1994
The occupational categories of female officers are shown in Figure 23. Warrant Officers have the same DoD Occupation Conversion Codes as officers, and are therefore grouped in the same categories. There was a coding change for Warrant Officers in 1985; therefore prior to 1985, the Warrant Officers could not be completely categorized using the DoD Conversion Codes. In order to make valid comparisons, the statistics displayed compare rates from 1985 to 1994. Graphs of officers' occupations are for 1985-1994. Comparison of 1980 to 1994 statistics may be misleading because of the category changes in 1985.

- The Health Care Officer field contained the largest percentage of women. The percentage of female officers in Health Care has remained approximately 47% throughout the time period under study.

- There was a decrease in the percentage of female officers in the Administration field from 14% in 1985 to 11% in 1994.

- Females in the Supply, Procurement, and Allied Officers field increased from 10% in 1985 to 12% in 1994, and women Scientists and Professionals increased from 1.8% in 1980 to 2.8% in 1994.

- The percentage of female Engineering and Maintenance Officers (11%), Tactical Operations Officers (6.5%), and Intelligence Officers (7%) changed little over time.
Figure 23. U.S. Army Active Duty Female Officers
Occupations by Percentage
1985-1994

- Health Care
- Administrators
- Supply, Procurement, Allied
- Engineering & Maintenance
- Scientists & Professionals
- Tactical Operations
- Intelligence
The occupational categories for active duty enlisted men from 1980 to 1994 are shown in Figure 24.

- The highest percentages of enlisted men were assigned to the Infantry and Electrical/Mechanical Equipment Repair occupational specialties.
- Approximately 28% of enlisted men were assigned to the Infantry, Gun Crews, and Seamanship occupational category from 1980 to 1994.
- The percentage of enlisted men in the Service and Supply (11%), Communications and Intelligence (11%) and Craftworkers (2%) occupational specialties remained constant throughout the time period under study.
- The percentage of enlisted men in the Functional Support and Administration field decreased from 15% in 1980 to 13% in 1994, and Electrical/Mechanical Equipment Repairers decreased from 17% in 1980 to 16% in 1994.
- The percentage of enlisted men in the Health Care Specialist field increased from 5.6% in 1980 to 7% in 1994, and men in the Electronic Equipment Repair increased from 5.3% in 1980 to 6% in 1994.
Figure 24. U.S. Army Active Duty Enlisted Men Occupations by Percentage 1980-1994

- • Infantry, Gun Crews, Seamanship
- • Support/Administration
- ■ Elect/Mech Equip Repair
- ▲ Service & Supply
- □ Communications/Intelligence
- ✗ Technical/Allied
- ○ Health Care Specialists
- • Electronic Equip Repair
- ◼ Craftworkers

Calendar Year

Percentage of Enlisted Males

0% 10% 20% 30% 40% 50%

Male officers were most frequently assigned to the Tactical Operations, Health Care, and Engineering and Maintenance fields. The occupational specialties of male officers from 1980 to 1994 are shown in Figure 25. As noted previously, the discrepancy of coding for Warrant Officers also affects these data. The graphs display data from 1985 to 1994.

- The percentages of male Tactical Operations Officers decreased from 51% in 1985 to 46% in 1994.

- The percentage of male Engineering and Maintenance Officers (12%) and Scientists and Professionals (3%) changed little from 1985 to 1994.

- The percentage of male Supply, Procurement, and Allied Officers increased from 6% in 1985 to 9% in 1994, Intelligence Officers increased from 5% in 1985 to 7% in 1994, and Health Care Officers increased from 14% in 1980 to 15% in 1994.

- Male Administration Officers decreased from 7% in 1985 to 5.5% in 1994.
Figure 25. U.S. Army Active Duty Male Officers
Occupations by Percentage
1985-1994

- Tactical Operations
- Health Care
- Administrators
- Supply, Procurement, Allied
- Engineering & Maintenance
- Scientists & Professionals
- Intelligence
- General Officers

Calendar Year


Percentage of Male Officers

0% 10% 20% 30% 40% 50% 60%
Hazardous duty pay records were only available from 1989 forward. The total number of women and men on active duty in the U.S. Army who received hazardous duty pay increased from 1989 to 1994. The total number of men receiving hazardous duty parachute pay increased, but the percentages of men and women receiving hazardous duty parachute pay have remained the same. Hazardous duty pay was evaluated as parachute duty pay, flying pay (crew member or non-crew member), and all other hazardous duty pay (air weapons controller crew member, flight deck duty, demolition duty, experimental stress duty, leprosarium duty, toxic fuels or propellants duty, dangerous viruses or bacteria lab duty, toxic pesticides duty, high altitude low opening, and chemical munitions duty).

- Female parachutists increased from 809 in 1989 (2% of all parachutists) to 1159 in 1994 (2.4% of all parachutists), while the number of male parachutists increased from 38,898 (98%) in 1989 to 47,160 (97.6%) in 1994 (Figure 26).

- Female flyers increased from 181 in 1989 (2.3% of all flyers) to 278 in 1994 (2.6% of all flyers), while male flyers increased from 7,873 (97.7%) to 10,500 (97.4%) (Figure 27).

- Women who received hazardous duty pay for other duties increased from 74 in 1989 to 105 in 1994. The number of men receiving other hazardous duty pay increased from 1,249 in 1989 to 2,650 in 1994. However, the relative proportion of women receiving other hazardous duty pay decreased from 5.6% to 3.8% (Figure 28).
Figure 26. U.S. Army Active Duty Parachutists
Hazardous Duty
1989-1994
Figure 27. U.S. Army Active Duty Flyers
Hazardous Duty Pay
1989-1994
Figure 28. U.S. Army Active Duty Personnel
Other Hazardous Duty Pay
1989-1994

Calendar Year


Number of Personnel

FEMALE
MALE

1989
1990
1991
1992
1993
1994

1249
1444
1908
2592
2594
2650

105
133
127
117
81
74
PERSONNEL RANK

The relative percentages of enlisted and officer personnel are compared graphically in Figure 29. The relative numbers of officers increased for both women and men between 1980 and 1994.

- The percentage of enlisted women decreased slightly from 89% in 1980 to 84% in 1994, while the percentage of women officers increased from 11% to 16% in the same time period. As a result, the ratio of enlisted women to officers changed from 8.1 to 1 in 1980 to 5.3 to 1 in 1994.

- The percentage of enlisted men also decreased slightly from 87% in 1980 to 84% in 1994, while the percentage of men serving as officers increased from 13% in 1980 to 16% in 1994. For men, the ratio of 6.7 enlisted for each officer in 1980 changed to 5.3 to 1 in 1994.
Figure 29: U.S. Army Active Duty Women and Men by Rank 1980-1994
Comparisons of the numbers of individuals by military pay grade for active duty women and men from 1980 to 1994 are shown in Figures 30 through 33. Separate comparisons by gender are provided for enlisted and officer personnel.

In 1980, 68% of women and 52% of men were junior enlisted personnel (E1-E4), 21% of women and 35% of men were non-commissioned officers (E5-E9), and 11% of women and 13% of men were officers (O1-O10). By 1994, these gaps were closing and 51% of women and 43% of men were junior enlisted personnel; 33% of women and 41% of men were non-commissioned officers; and 16% of women and 16% of men were officers.

- Between 1980 and 1994, the numbers of junior enlisted women on active duty gradually decreased, while the numbers of women serving as non-commissioned officers, warrant officers, and officers gradually increased (Figures 30 and 31).

- There were approximately 800 more women serving as company grade officers in 1994 than in 1980 (Figure 31).
Figure 30. U.S. Army Active Duty Enlisted Women by Pay Grade
1980-1994
Figure 31. U.S. Army Active Duty Female Officers by Pay Grade 1980-1994
• Between 1980 and 1994, the number of junior enlisted men decreased from 363,922 to 198,493 (Figure 32). There was also a decrease in the number of men serving as non-commissioned officers.

• From 1980 until 1986, there was an increase in the number of male senior, non-commissioned officers from 16,849 in 1980 to 19,797 in 1986. Since that time, there has been a steady decline to 13,521 in 1994 (Figure 32).

• From 1980 until 1985, there was a slight increase in the number of men serving as warrant officers from 13,214 in 1980 to 15,071 in 1985. After 1985, there has been a decline in the number of warrant officers to 12,051 in 1994 (Figure 33).

• From 1980 until 1986, there was an increase in the number of men serving as company grade officers from 45,764 in 1980 to 52,029 in 1986. After the peak of 1986, there has been a steady decline in this category to 36,534 in 1994 (Figure 33).

• From 1980 until 1994, there has been a steady decline in the number of men serving on active duty as field grade officers. During the same time, the number of junior warrant officers increased minimally, then declined to lower than in 1980 (Figure 33).
Figure 32. U.S. Army Active Duty Enlisted Men by Pay Grade 1980-1994

Number of Personnel

Calendar Year


- MALE E1-E4
- MALE E5-E7
- MALE E8-E9
Figure 33. U.S. Army Active Duty Male Officers by Pay Grade 1980-1994

- MALE WARRANT OFFICER W1-W5
- MALE COMPANY OFFICER O1-O3
- MALE FIELD OFFICER O4-O6
- MALE GENERAL OFFICER O7-O10

Calendar Year

Number of Personnel

TIME IN SERVICE

The median time in service has steadily increased for men and women, for both enlisted and officer personnel (Figure 34). Overall, officers remained in service for longer time periods than enlisted personnel, and men remained in the service for longer time periods than women.

- The median time in service for enlisted women was 21 months in 1980 and 49 months in 1994.
- The median time in service for enlisted men was 38 months in 1980 and 62 months in 1994.
- The median time in service for female officers was 39 months in 1980 and 86 months in 1994.
- The median time in service for male officers was higher than for women: 115 months in 1980 compared to 39 months for women, and 126 months in 1994 compared to 86 months for women.

The median time in service was used because the median is the midpoint of a series of numbers and is not influenced by unusually high or low numbers (e.g., a person in the service for 1 month or 30 years).
Figure 34. U.S. Army Active Duty Personnel
Median Time in Service
1980-1994

Calendar Year

Months in Service

- FEMALE ENLISTED
- FEMALE OFFICER
- MALE ENLISTED
- MALE OFFICER
HOME OF RECORD

Data on active duty Army personnel were also analyzed by regional home of record. The United States was arbitrarily divided into four regions: West, South, Northeast and Midwest. A separate category for “other” was generated for those who did not live in the United States.

During the period between 1980 and 1994, approximately 42% of Army personnel were from the South, 22% were from the Midwest, 15% were from the West, 11% were from the North, and 9% were from other areas (Figure 35 and Figure 36). Patterns were similar for women and men.

- White women were more likely to come from the South (30%) or Midwest (28%), and black women were much more likely to be from the South (60%) (Figure 35).

- The patterns for black and white men are similar to the women; white men come predominantly from the South (34%) or Midwest (27%), and relatively more black men are from the South (65%) (Figure 36).

A comparison between the years 1980 and 1994 revealed the following:

- The percentage of women from the South increased over the study period. In 1980, 38% of women were from the South, and in 1994, 46% of women were from the South.

- The percentage of men remained the same in each regional category: 21% from the Midwest, 12% from the North, 41% from the South, 15% from the West, and 10% from other areas.
Figure 35. Percentage of U.S. Army Active Duty Women by Regional Home of Record 1980-1994
Figure 36. Percentage of U.S. Army Active Duty Men by Regional Home of Record 1980-1994

Racial-Ethnic Group

- BLACK
  - MIDWEST: 14.3%
  - NORTHEAST: 9.6%
  - SOUTH: 5.0%
  - WEST: 5.9%
  - OTHER: 5.9%

- WHITE
  - MIDWEST: 34.2%
  - NORTHEAST: 27.5%
  - SOUTH: 11.8%
  - WEST: 17.7%
  - OTHER: 8.8%

- OTHER
  - MIDWEST: 23.3%
  - NORTHEAST: 8.8%
  - SOUTH: 7.3%
  - WEST: 7.3%
  - OTHER: 12.9%
DISCUSSION

The TAIHOD database was used to describe the demographic distribution of the U.S. Army active duty population and to explain the shifting pattern of certain demographic characteristics from 1980 to 1994. This database contains detailed information on each person who was on active duty in the Army during this time period.

The U.S. Army is a highly dynamic population that has changed dramatically from 1980 to 1994. Changes in the active duty Army personnel were influenced by significant force reductions imposed by Congress, and directed force structure redistribution of occupational specialties among active members under the influence of the military leadership. Other reasons for demographic change are the following: defense spending cutbacks, recruiting decreases, downsizing the number of active personnel, decreases in ROTC programs, end of the Cold War, budget crises, development of advanced weaponry, reliance on air power, better career opportunities for women, and a tendency for both male and female soldiers to remain on active duty longer. Overall, the active duty U.S. Army population decreased approximately 30% (from 767,363 to 528,690) between 1980 and 1994.

Currently, the U.S. Army has more than 500,000 active duty soldiers. The total Army workforce of civilians and active duty personnel is approximately 950,000. In comparison, two of the largest publicly traded corporations, General Motors and Wal-Mart Stores, had 647,000 and 728,000 employees, respectively, as of July 1997 (Hoover's Company Profiles, 1997).

Overall, the proportion of men in the Army has decreased, while the proportion of women in the Army increased. Specifically, the numbers of white women and men of all races on active duty in the U.S. Army declined from 1980 to 1994. The numbers of black women and women of other races increased, and these groups represent a larger proportion of Army personnel in 1994 than in 1980.

Changes in the racial and gender structure of the U.S. Army active force may be a reflection of improved opportunities for promotion in the Army for minorities and women. It is also possible that women in their twenties see the Army as a valuable source of education and opportunity. Women may benefit from joining the Army because the Army provides the opportunity to learn practical job skills, offers tuition reimbursement programs, and provides an alternative career path for those starting second careers. Furthermore, the Army is an equal opportunity employer that offers a progressive maternity leave policy and comprehensive medical and dental benefits.
Although the number of women and men under age 30 in the Army decreased, the number of personnel above 30 increased. Factors contributing to the shifts in the age distribution of the active duty population include a decrease in the recruitment of younger people, a decrease in ROTC programs in high schools and colleges, and an increase in the number of personnel making a career of Army service.

Marital status of Army personnel has shifted from a preponderance of single people in the early 1980s to a greater number of married personnel in the 1990s. Changes in the military coding of marital status may have affected these comparisons. Persons previously married were coded as single from 1980 through 1984; a separate code was added in 1985.

The highest level of education achieved by Army personnel has increased for both women and men. The numbers of active personnel with college degrees have increased since 1980. The percentage of people without a high school diploma has decreased, and this group comprised less than 0.5% of the population in 1994. Women tend to have a higher level of education than men, and a larger percentage of women have college degrees. The increase in educational levels may reflect the contributions of the ROTC and other programs that provide college tuition reimbursement for people who join the Army.

Army women and men have demonstrated selective patterns of service in occupational specialties. Very few women were identified in the infantry and artillery fields, as these areas are closed to women. The presence of women in combat fields probably reflects the baseline error rate in the coding of MOS and gender in the DMDC data. Women remain concentrated in the administrative and medical areas; both job categories have traditionally had a large proportion of female service members. In 1994, the proportion of enlisted men and women is similar in Communications and Intelligence, Service and Supply, and the Technical and Allied Specialists fields. The proportions of male and female officers are similar in the Engineering and Maintenance, Scientists and Professionals, Intelligence, and Supply, Procurement and Allied fields.

The percentage of women and men in hazardous and demanding jobs increased from 1980 to 1994. Although the number of women receiving hazardous duty pay has increased, the percentage of women out of the total number of people receiving hazardous duty pay has only slightly increased. The number of women performing hazardous duty jobs is expected to continue to increase as women are admitted to previously male-only combat support or combat roles.

The percentage of officers increased slightly, while the percentage of enlisted personnel decreased slightly from 1980 to 1994. This relative increase in officers
resulted in a noticeable change in the ratio of enlisted personnel to officers. In 1994, the ratio of enlisted personnel to officers is approximately equal with respect to gender. With further definition of pay grades, the percentage of female noncommissioned officers and field grade officers was similar to the percentage of male officers in these positions in the 1990s. This shift may reflect an increasing equality in job positions between the genders, and an increasing trend for women to make the Army a career.

The length of time spent in the Army varied greatly for women and men. Based on the median time in service, officers remained in the Army longer than enlisted personnel did, and men remained in the Army longer than women did. These variables were probably strongly influenced by the force reductions and selective retentions of highly qualified professional soldiers.

The southern United States produced the largest number of Army personnel during this time period; over 40% of the Army population was from the South. The South is the most common region of origin for both blacks and whites, accounting for 60% of black women, 65% of black men, 28% of white women, and 27% of white men. While the precise reason(s) for this regional concentration is unknown, this finding probably will come as no surprise to the Army leadership, since it has historically been quite difficult to recruit an active duty force that mirrors the U.S. population at large.
CONCLUSIONS

This technical report describes and defines the total U.S. Army population over a 15-year period. Analysis of trends in the population demographics will be most useful for research purposes, but may have value for recruitment and budgetary purposes as well. The typical Army soldier is older, better-educated, and more likely to have a family. Women and men still work in different occupational areas, but are proportionally represented in the officer and enlisted ranks.

The TAIHOD database presents a unique opportunity for epidemiological research on a large population of women and men. This population has thus far been under-studied.

This report is intended to serve as an essential first step in analyzing the epidemiology of injury and illness among women and men in the U.S. Army, and to provide a foundation for understanding the characteristics of this dynamic population. Only with this information in hand can we begin to truly understand all the forces influencing the health, well-being, and readiness of our military forces, and our female soldiers in particular.
REFERENCES


GLOSSARY

Demography: the study of populations, especially with regard to size, race, age

Demographic variables: population size, age, race, gender, occupation, time in service, marital status

Disease Prevention: protecting health by community-wide efforts

Encrypted: coded numbers or letters that cannot be interpreted

End-of-year counts: the number of Army personnel who were on active duty on December 31 of a particular year

Epidemiology: the study of disease distribution and determinants in human populations

Health outcomes: identified changes in health status as a result of responding to a health problem

Health promotion: enabling a population to increase control over and improve their health

Injury epidemiology: the study of injuries and their causes in a population

Relational databases: databases linked by a specific identifier (e.g., social security number)
Appendix A-1
Denominator Comparisons

Calendar Year

Number of Personnel


End-Year
Overall Total
Person-Time
<table>
<thead>
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<th>Year</th>
<th>Male Total</th>
<th>Female Total</th>
<th>Male Racial-Ethnic Group</th>
<th>Female Racial-Ethnic Group</th>
<th>Military Rank</th>
<th>Total</th>
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Note: The table shows the frequencies of gender, racial-ethnic group, and rank for end-year denominator.
## Appendix A-3

### Frequencies of Gender, Race, and Rank for Person-Time Denominator

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## Appendix A-4

### Frequencies of Gender, Racial-Ethnic Group, and Rank for Total Denominator

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