

**TECHNICAL REPORT
T-97-**

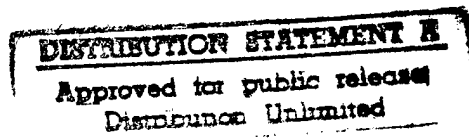
The Defense Women's Health Research Program

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

Prepared by

Michelle M. Yore, MSPH

Paul J. Amoroso, MD, MPH



U.S. Army Research Institute of Environmental Medicine
Military Performance Division
Natick, MA 01760-5007

[DTIC QUALITY INSPECTED 3]

19970923 052

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503.

1. AGENCY USE ONLY (Leave blank)		2. REPORT DATE 25 August 1997	3. REPORT TYPE AND DATES COVERED Technical Report	
4. TITLE AND SUBTITLE The Demographic Profile of U.S. Army Active Duty Women 1980-1994 Using the Total Army Injury and Health Outcomes Database			5. FUNDING NUMBERS	
6. AUTHOR(S) Michelle M. Yore and Paul J. Amoroso				
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) US Army Research Institute of Environmental Medicine Natick, MA 01760-5007			8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) US Army Medical Research & Materiel Command Ft. Detrick, Frederick, MD 21702-5012			10. SPONSORING/MONITORING AGENCY REPORT NUMBER	
11. SUPPLEMENTARY NOTES				
12a. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution is unlimited.			12b. DISTRIBUTION CODE	
13. ABSTRACT (Maximum 200 words) 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.				
14. SUBJECT TERMS demographics, women, military, Army, hazardous duty, occupation, race, gender			15. NUMBER OF PAGES	
			16. PRICE CODE	
17. SECURITY CLASSIFICATION OF REPORT UNCLASSIFIED	18. SECURITY CLASSIFICATION OF THIS PAGE UNCLASSIFIED	19. SECURITY CLASSIFICATION OF ABSTRACT UNCLASSIFIED	20. LIMITATION OF ABSTRACT UL	

TABLE OF CONTENTS

	Page
PREPARED BY	I
LIST OF FIGURES	V
LIST OF APPENDICES	VII
BACKGROUND	VIII
ACKNOWLEDGMENTS	X
LIST OF ACRONYMS	XI
EXECUTIVE SUMMARY	1
INTRODUCTION	3
METHODS	6
RESULTS	8
U.S. ARMY POPULATION DEMOGRAPHICS	8
RACIAL CHANGES IN THE U.S. ARMY	10
AGE COMPOSITION OF U.S. ARMY ACTIVE DUTY PERSONNEL	13
AGE COMPOSITION OF U.S. ARMY	13
<u>WOMEN</u>	15
<u>MEN</u>	18
MARITAL STATUS AND DEPENDENTS	23
EDUCATION	38
OCCUPATION	41
PERSONNEL RANK	53
TIME IN SERVICE	61
HOME OF RECORD	63
DISCUSSION	66
CONCLUSIONS	69
REFERENCES	70
GLOSSARY	71
APPENDICES	72
DISTRIBUTION LIST	77

LIST OF FIGURES

Page

Figure 1: U.S. Army Active Duty Population, 1980-1994	9
Figure 2: U.S. Army Active Duty Population by Race and Gender, 1980-1994	11
Figure 3: U.S. Army Active Duty Women by Race, 1980 to 1994	12
Figure 4: U.S. Army Active Duty Population by 5-Year Age Group, 1980-1994	14
Figure 5: U.S. Army Active Duty White Women by 5-Year Age Group, 1980-1994	16
Figure 6: U.S. Army Active Duty Black Women by 5-Year Age Group, 1980-1994	17
Figure 7: U.S. Army Active Duty White Men by 5-Year Age Group, 1980-1994	19
Figure 8: U.S. Army Active Duty Black Men by 5-Year Age Group, 1980-1994	20
Figure 9: U.S. Army Active Duty Personnel First Year of Service, 1980-1994	22
Figure 10: Marital Status of U.S. Army Active Duty Women, 1985-1994	24
Figure 11: Marital Status of U.S. Army Active Duty Men, 1985-1994	25
Figure 12: Percentage of U.S. Army Active Duty Women with Dependents, 1980-1994	27
Figure 13: Percentage of U.S. Army Active Duty Men with Dependents, 1980-1994 ..	28
Figure 14: Percentage of U.S. Army Active Duty Single Women with Dependents, 1980-1994	30
Figure 15: Percentage of U.S. Army Active Duty Single Men with Dependents, 1980- 1994	31
Figure 16: Percentage of U.S. Army Active Duty Married Women with Dependents, 1980-1994	33

Figure 17: Percentage of U.S. Army Active Duty Married Men with Dependents, 1980-1994	34
Figure 18: Percentage of U.S. Army Active Duty Previously Married Women with Dependents, 1985-1994	36
Figure 19: Percentage of U.S. Army Active Duty Previously Married Men with Dependents, 1985-1994	37
Figure 20: Educational Status of U.S. Army Active Duty Women, 1980-1994	39
Figure 21: Educational Status of U.S. Army Active Duty Men, 1980-1994	40
Figure 22: U.S. Army Active Duty Enlisted Women, Occupations by Percentage, 1980-1994	42
Figure 23: U.S. Army Active Duty Female Officers, Occupations by Percentage, 1985-1994	44
Figure 24: U.S. Army Active Duty Enlisted Men, Occupations by Percentage, 1980-1994	46
Figure 25: U.S. Army Active Duty Male Officers, Occupations by Percentage, 1985-1994	48
Figure 26: U.S. Army Active Duty Parachutists, Hazardous Duty, 1989-1994	50
Figure 27: U.S. Army Active Duty Flyers, Hazardous Duty Pay, 1989-1994	51
Figure 28: U.S. Army Active Duty Personnel, Other Hazardous Duty Pay, 1989-1994	52
Figure 29: U.S. Army Active Duty Women and Men by Rank, 1980-1994	54
Figure 30: U.S. Army Active Duty Enlisted Women by Pay Grade, 1980-1994	56
Figure 31: U.S. Army Active Duty Female Officers by Pay Grade, 1980-1994	57
Figure 32: U.S. Army Active Duty Enlisted Men by Pay Grade, 1980-1994	59

Figure 33: U.S. Army Active Duty Male Officers by Pay Grade, 1980-1994.....	60
Figure 34: U.S. Army Active Duty Personnel, Median Time in Service, 1980-1994	62
Figure 35: Percentage of U.S. Army Active Duty Women by Regional Home of Record, 1980-1994	64
Figure 36: Percentage of U.S. Army Active Duty Men by Regional Home of Record, 1980-1994	65

LIST OF APPENDICES

	Page
Appendix A-1: Denominator Comparisons.....	73
Appendix A-2: Frequencies of Gender, Racial-Ethnic Group and Rank for End-Year Denominator	74
Appendix A-3: Frequencies of Gender, Racial-Ethnic Group and Rank for Person-Time Denominator	75
Appendix A-4: Frequencies of Gender, Racial-Ethnic Group and Rank for Total Denominator	76

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

The authors would like to acknowledge the efforts and assistance of Mr. William Swartz, LT Frank Hoin, and Ms. Shari Hallas, U.S. Army Research Institute of Environmental Medicine; Ms. Zee Ferris, Defense Manpower Data Center; Ms. Jennifer Fice, Northeastern University; Ms. Sandra Sulsky, University of Massachusetts-Amherst. Without their contributions this report would not have been possible.

LIST OF ACRONYMS

ACIPS	Army Casualty Information Processing System
ASMIS	Army Safety Management Information System
DMDC	Defense Manpower Data Center
DoD	Department of Defense
DWHRP	Defense Women's Health Research Program
HRA	Health Risk Assessment
IPDS	Individual Patient Data System
MOS	Military Occupational Specialty
TAIHOD	Total Army Injury and Health Outcomes Database
USARIEM	U.S. Army Research Institute of Environmental Medicine

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).

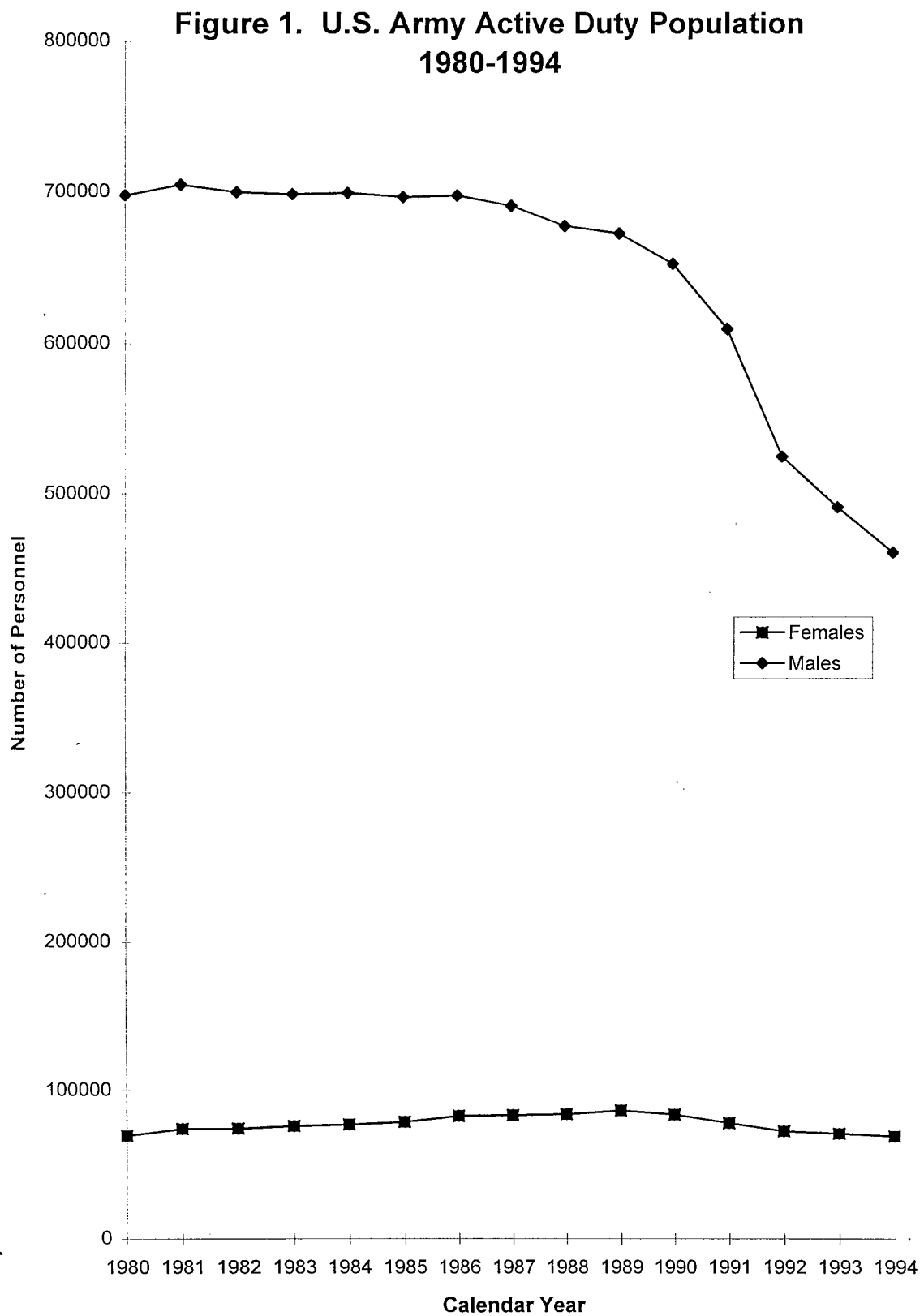
- The overall active duty Army population decreased from 767,363 in 1980 to 528,690 in 1994.
- A slight increase in total force occurred between 1980 (767,363) and 1986 (779,961).
- A 13% reduction in total force occurred between 1991 (686,950) and 1992 (596,663).

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%.

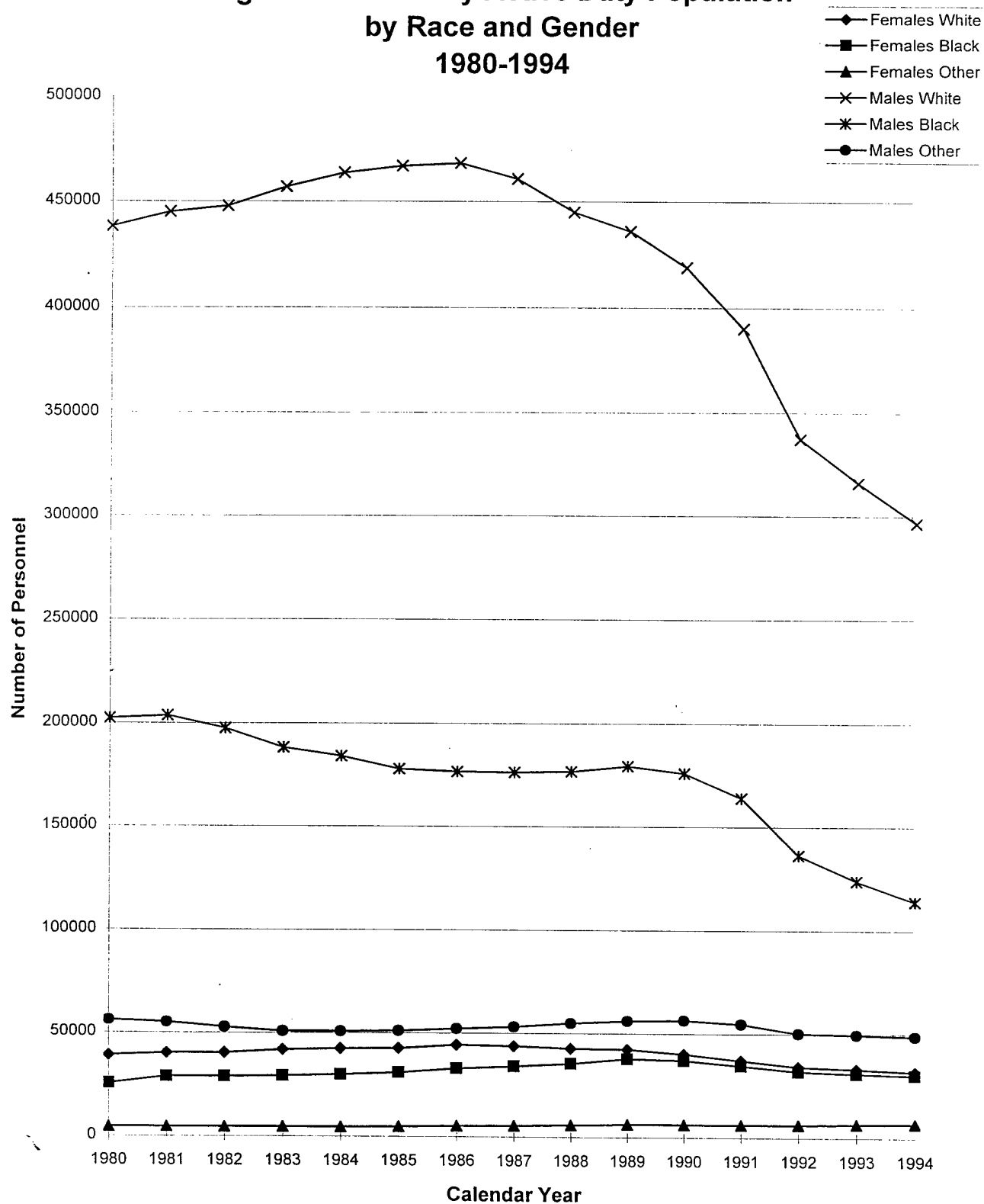


RACIAL CHANGES IN THE U.S. ARMY

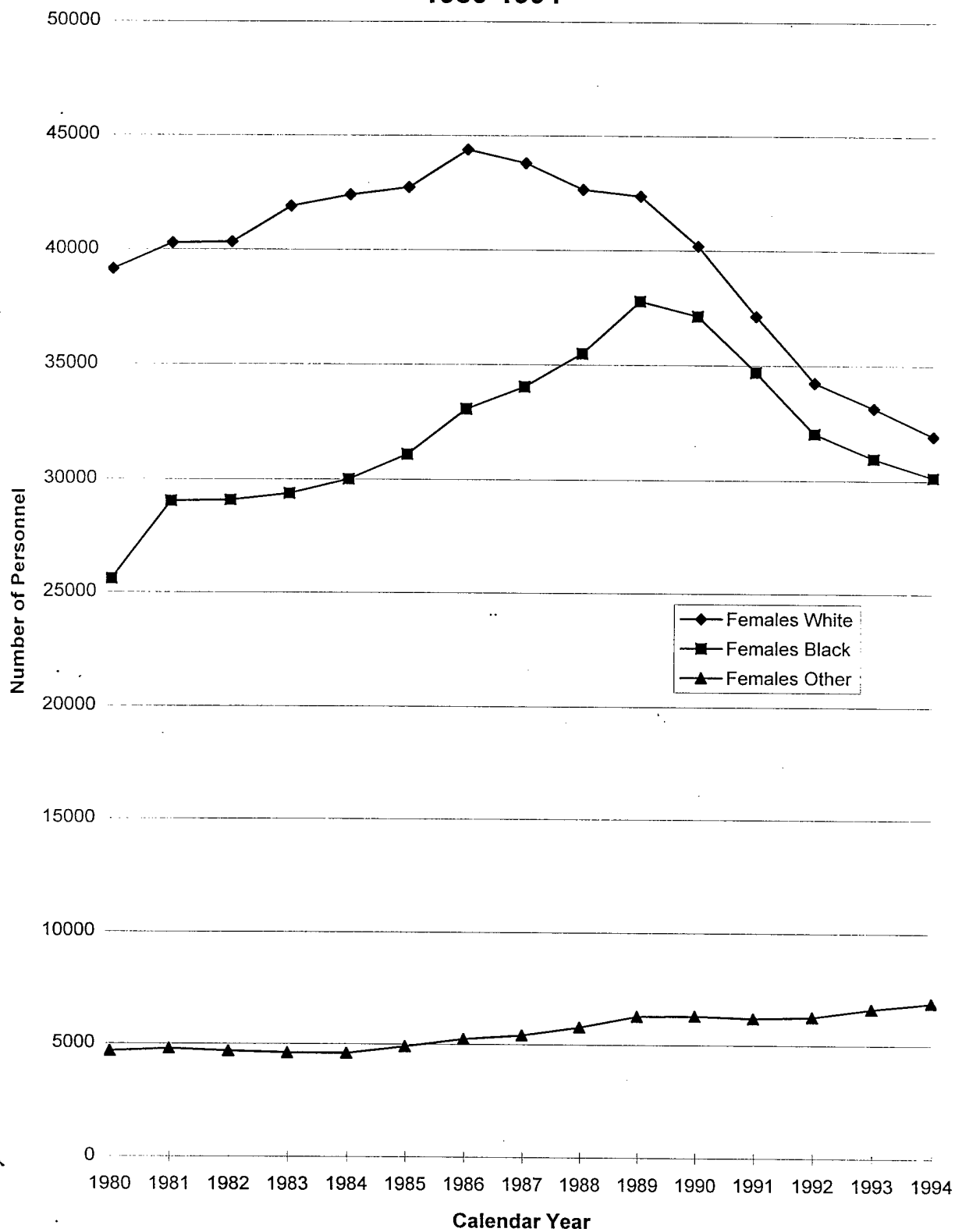
The annual population of active duty Army forces from 1980 to 1994 displayed by race and sex categories is shown in Figure 2 and Figure 3.

- 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**

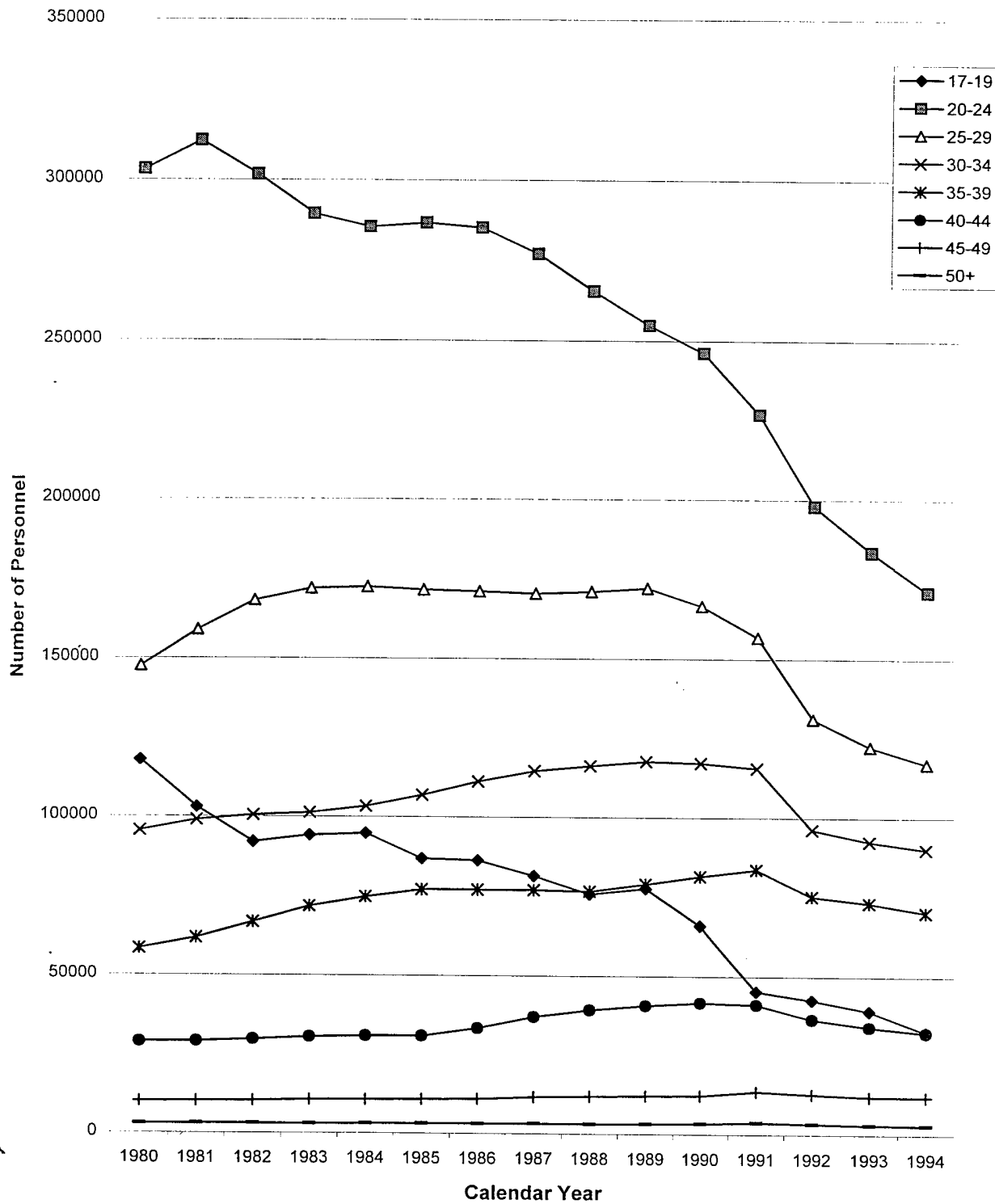


AGE COMPOSITION OF U.S. ARMY ACTIVE DUTY PERSONNEL

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**

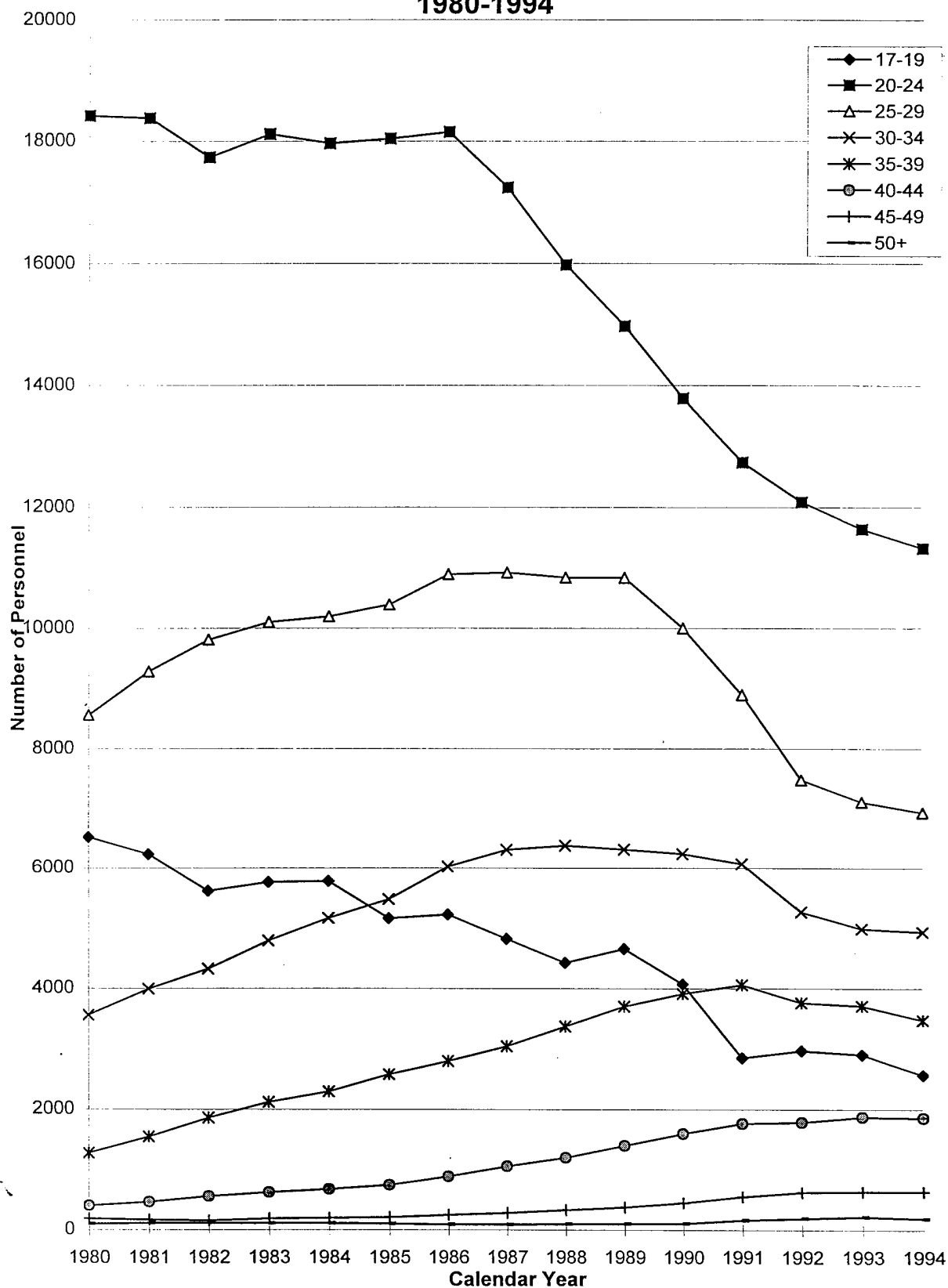


The distributions of women and men in the Army by both race and age from 1980-1994 are displayed in Figures 5 through 8.

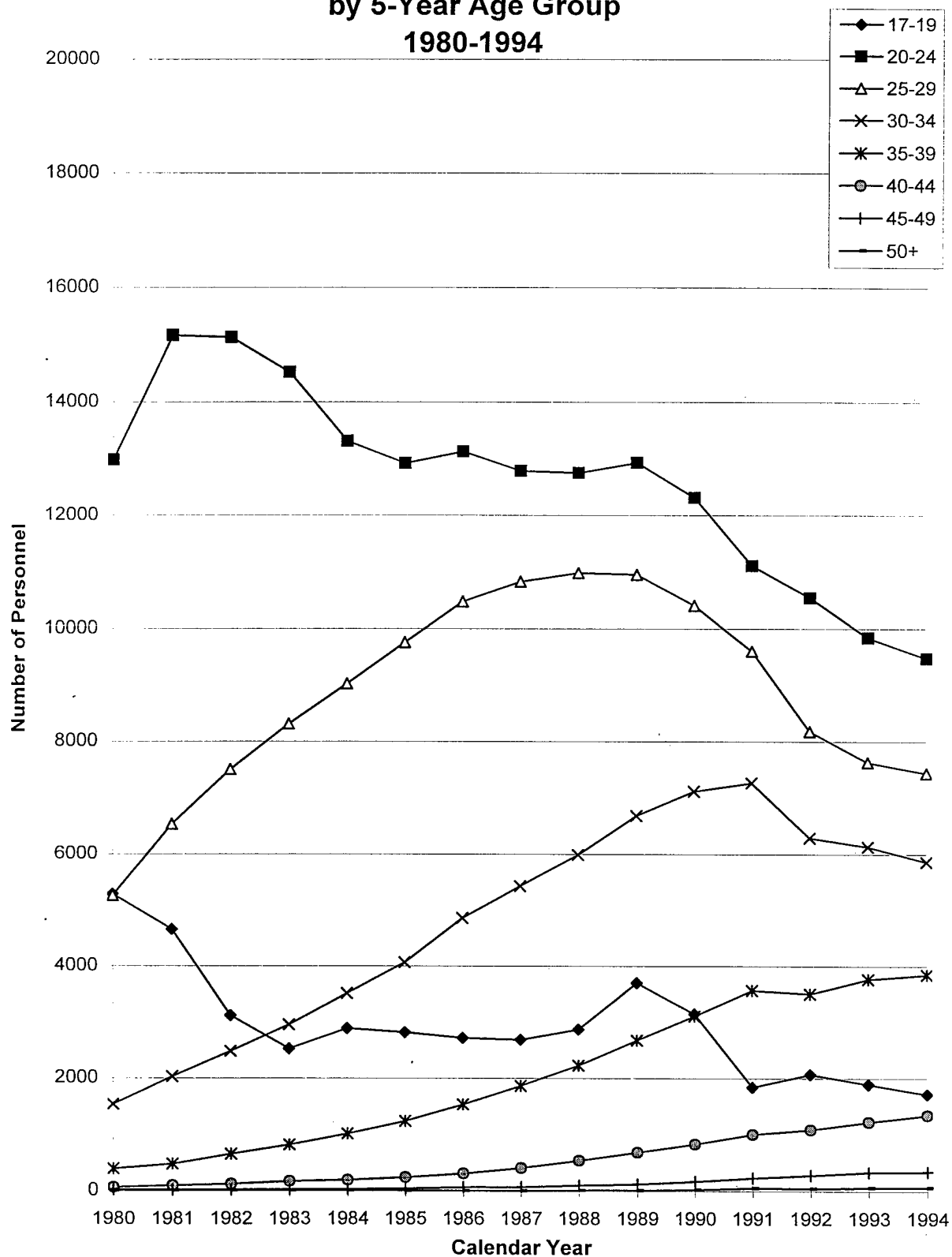
WOMEN

- 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**



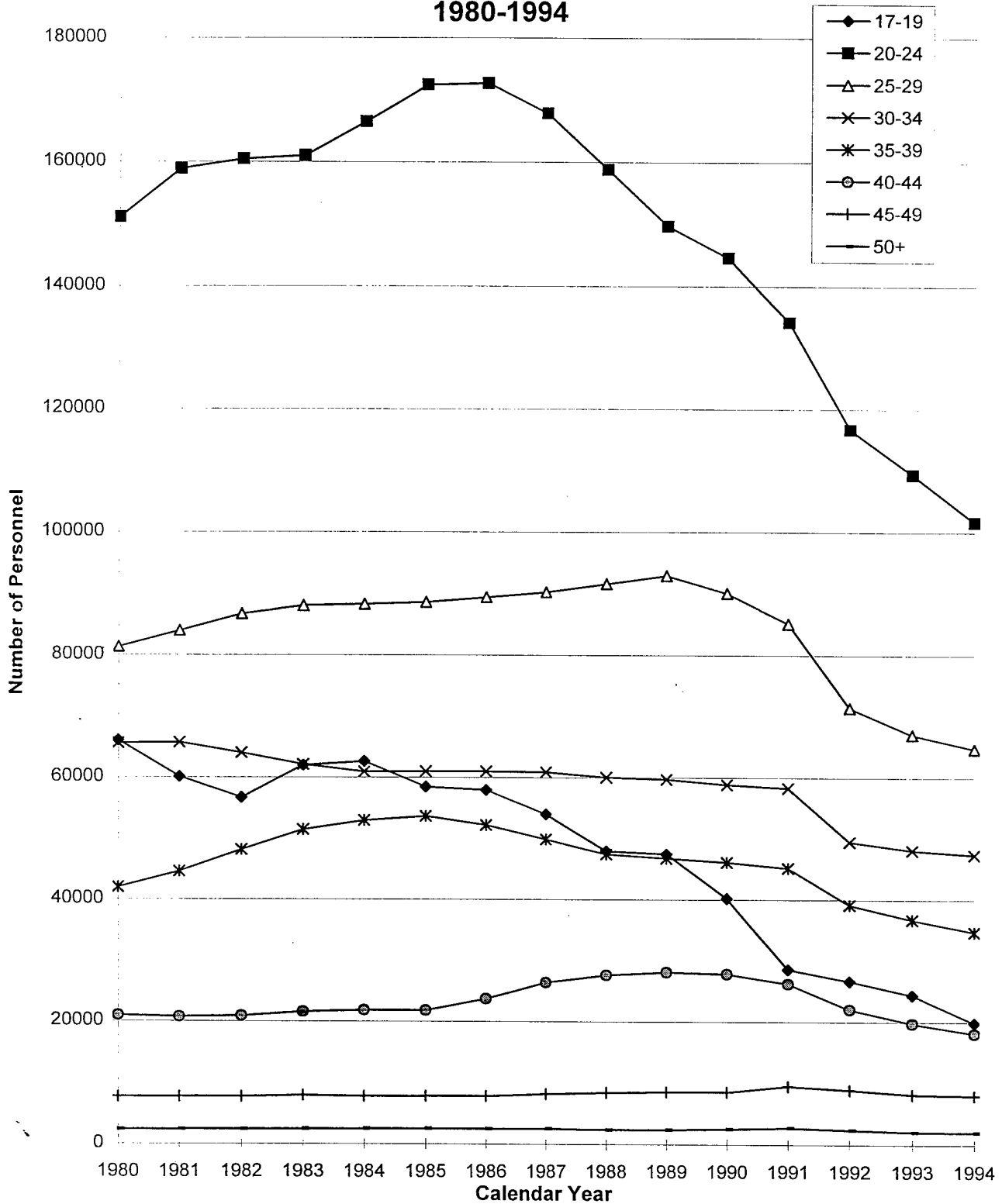
**Figure 6. U.S. Army Active Duty Black Women
by 5-Year Age Group
1980-1994**



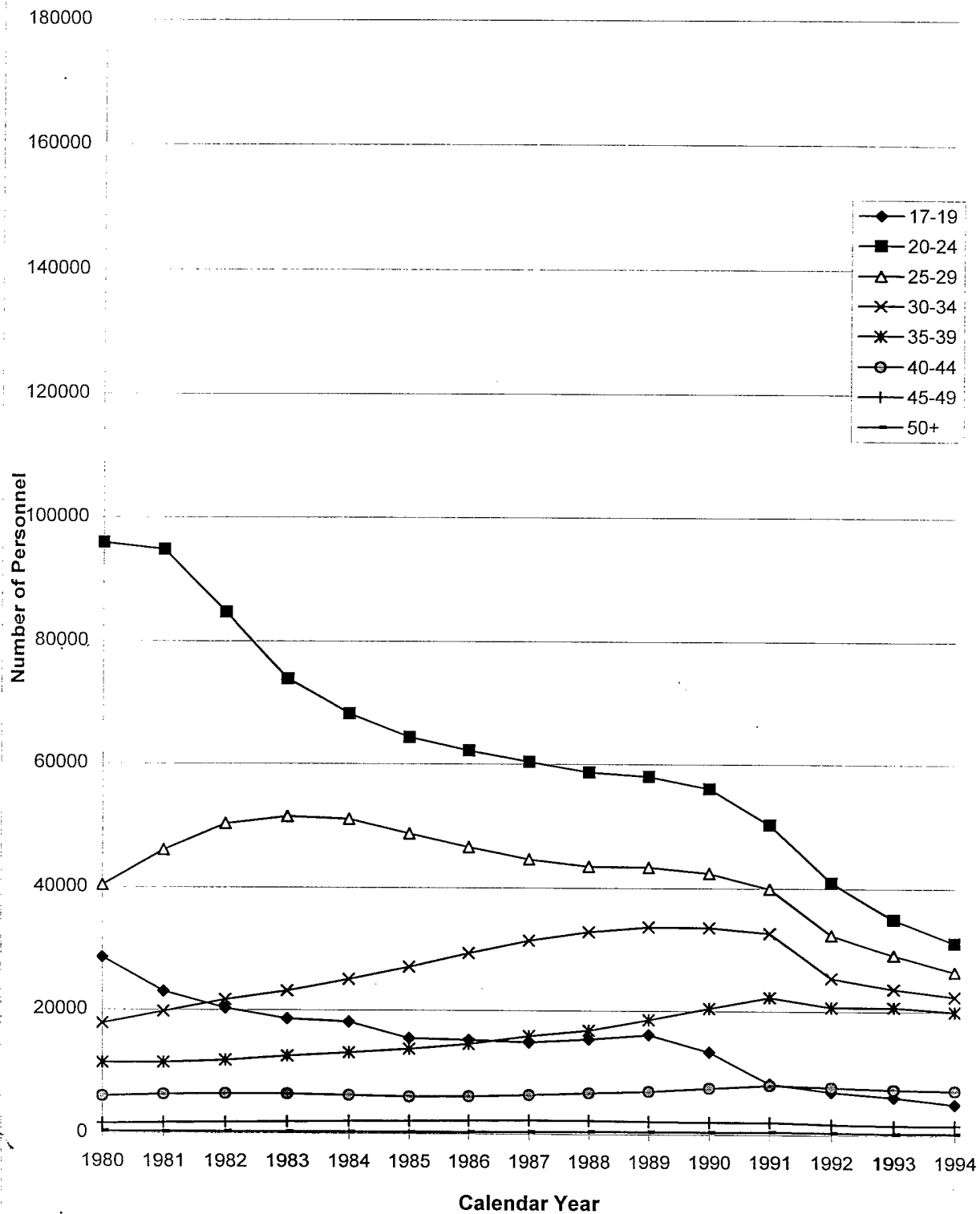
MEN

- 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**



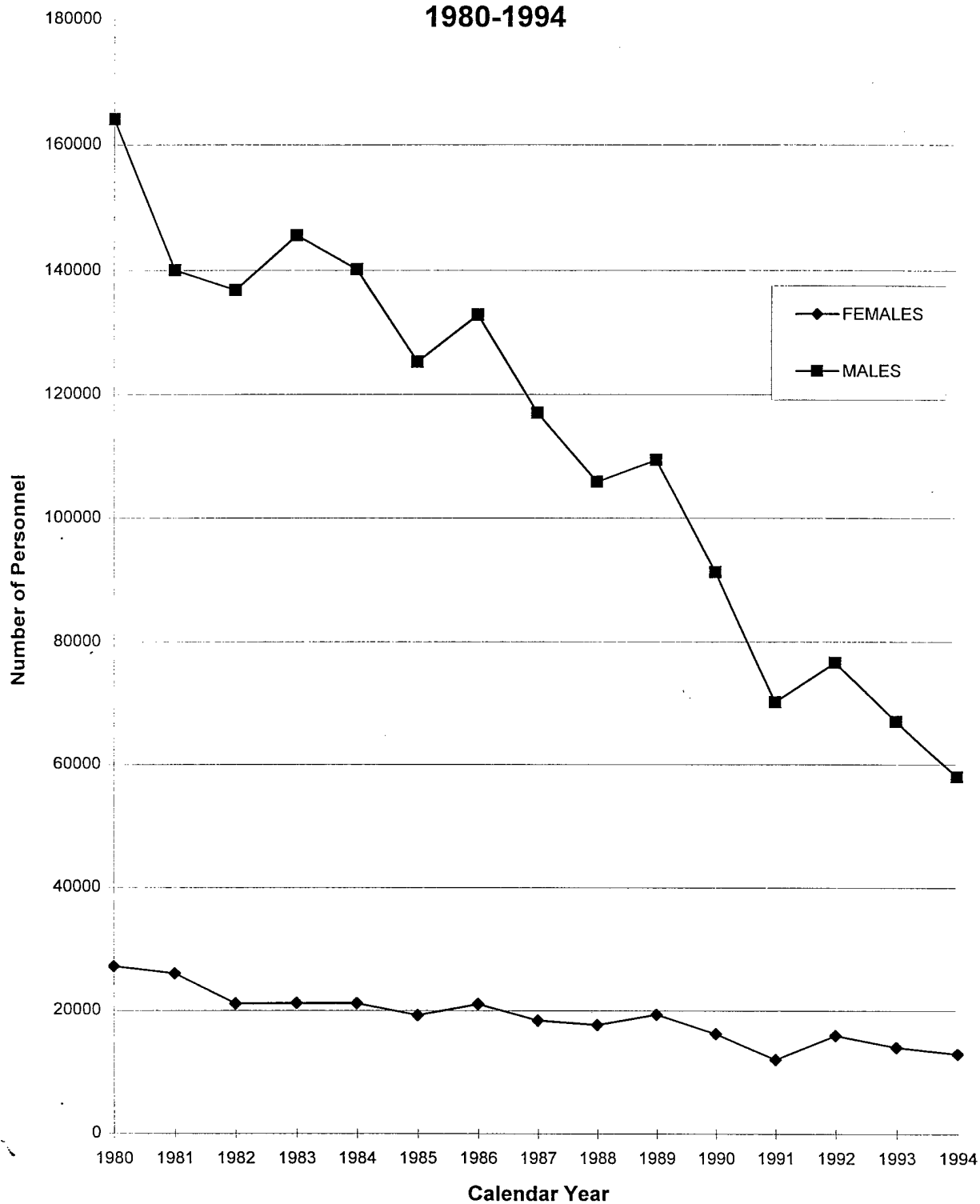
**Figure 8. U.S. Army Active Duty Black Men
by 5-Year Age Group
1980-1994**



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**



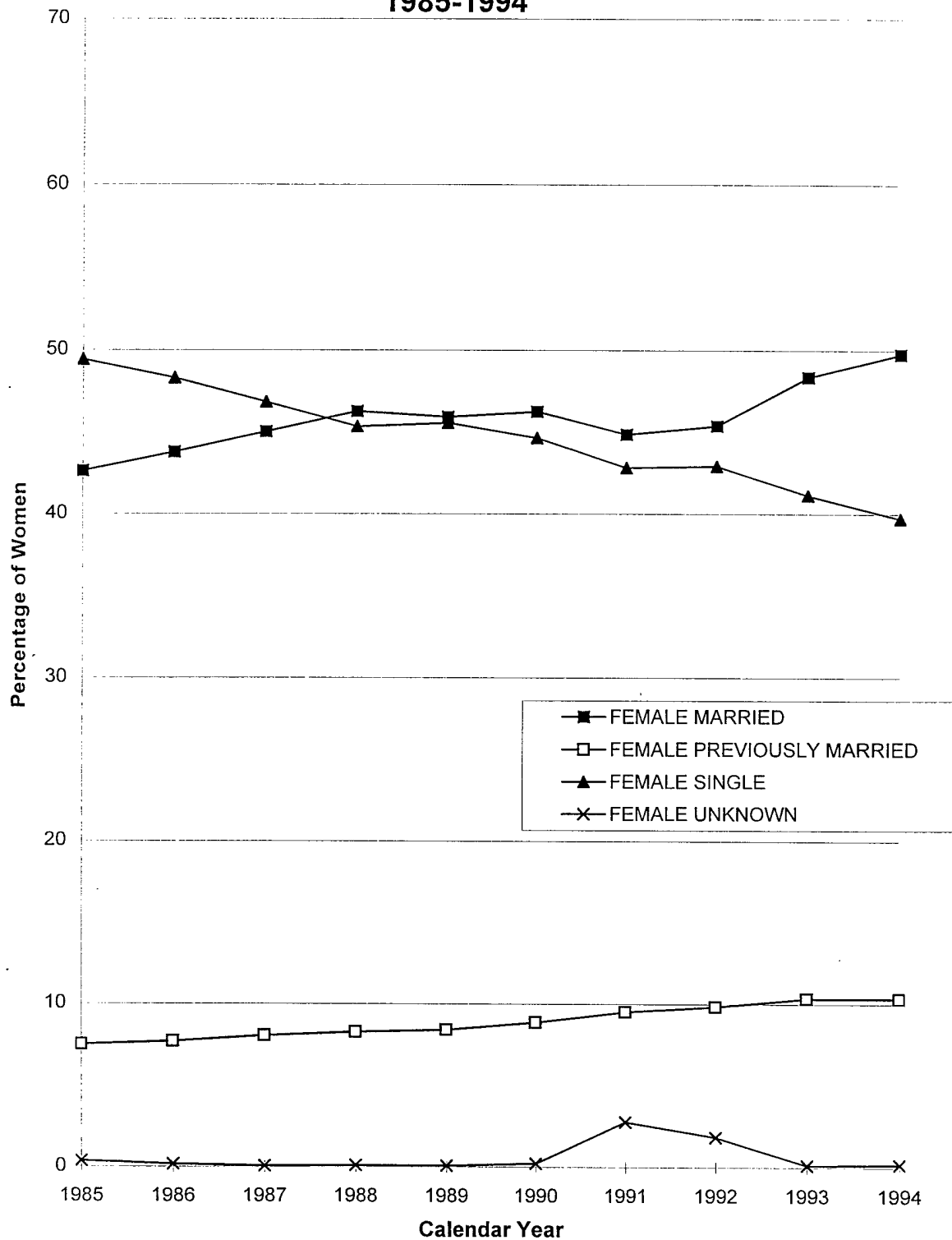
MARITAL STATUS AND DEPENDENTS

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.

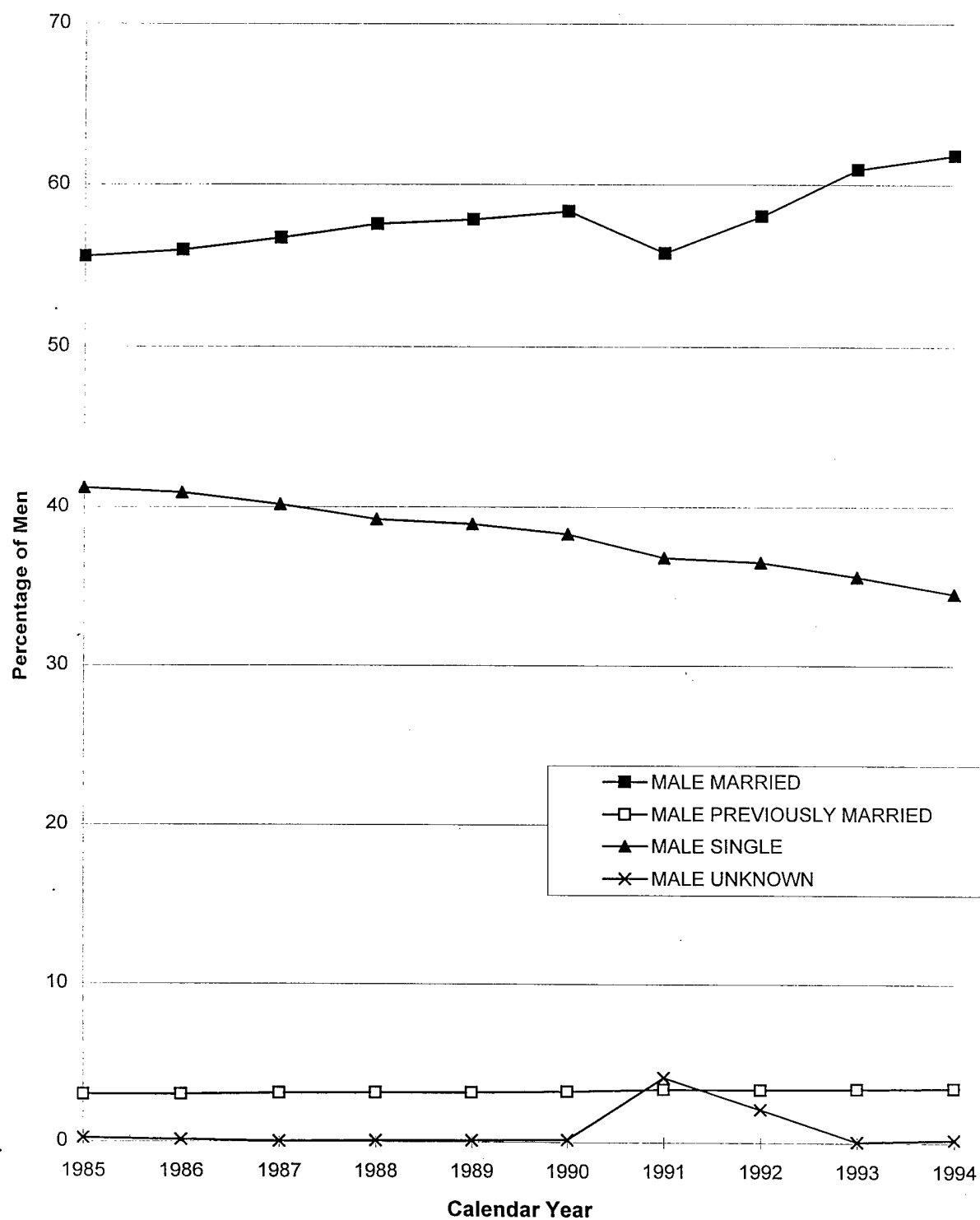
The marital status of women in the Army is displayed in Figure 10; the marital status of men in the Army is displayed in Figure 11.

- 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**



**Figure 11. Marital Status of U.S. Army
Active Duty Men
1985-1994**



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.

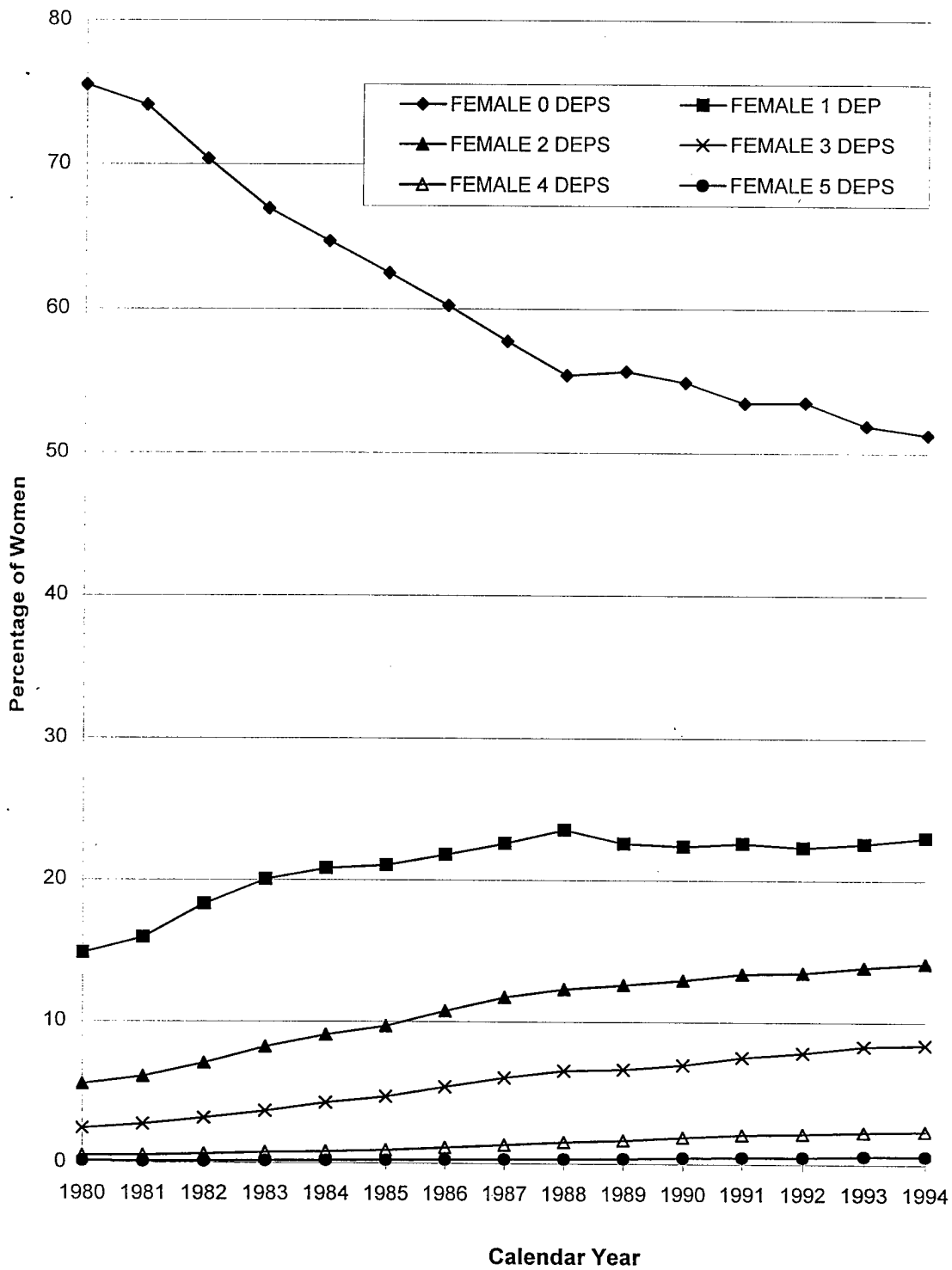
The percentage of Army women with one or more dependents appears to have increased steadily from 1980-1994 (Figure 12), while the percentage of women without dependents has decreased.

- 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.

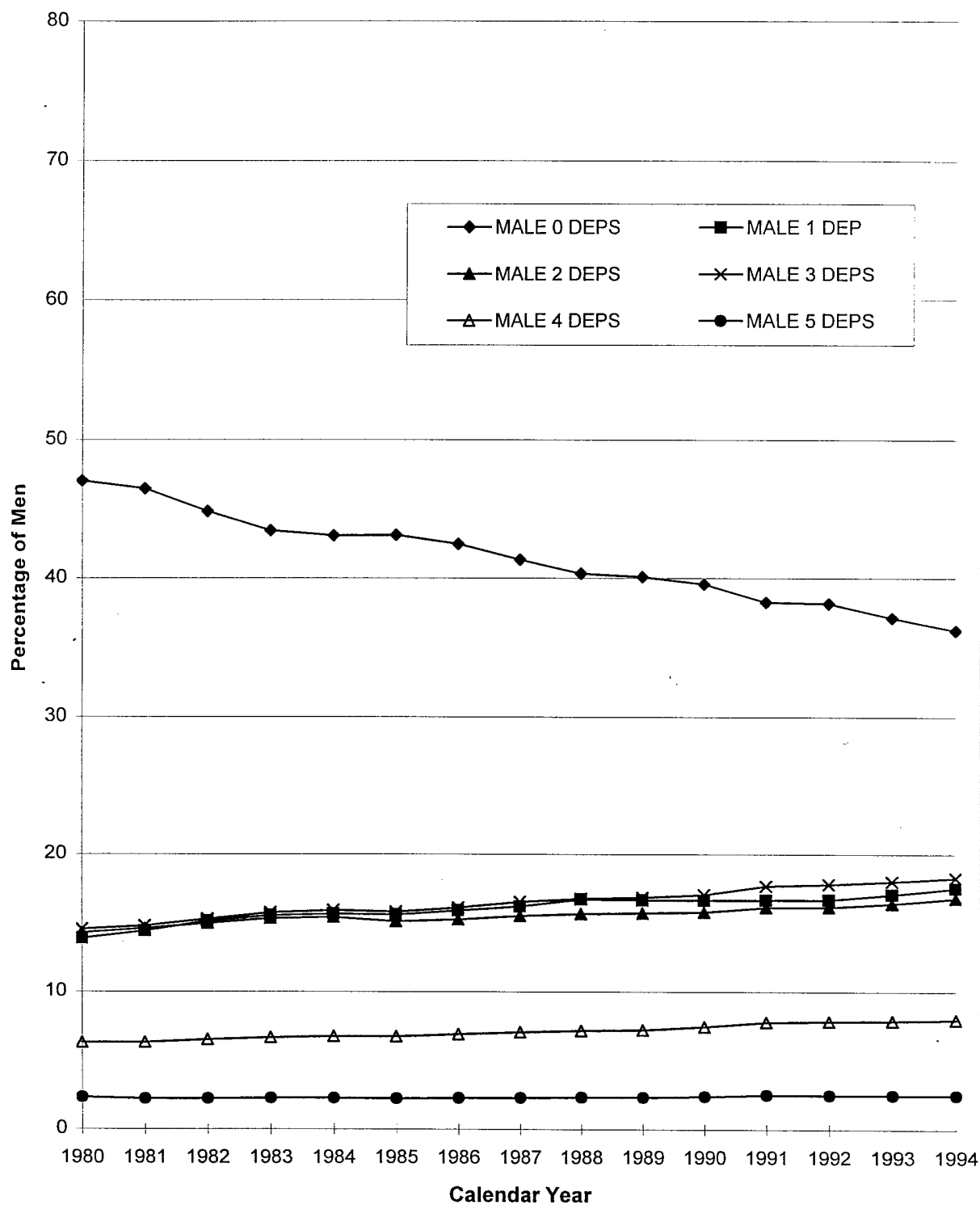
The percentage of Army men with dependents appears to have increased slightly from 1980-1994 (Figure 13). The percentage of men without dependents appears to have decreased.

- 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**



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

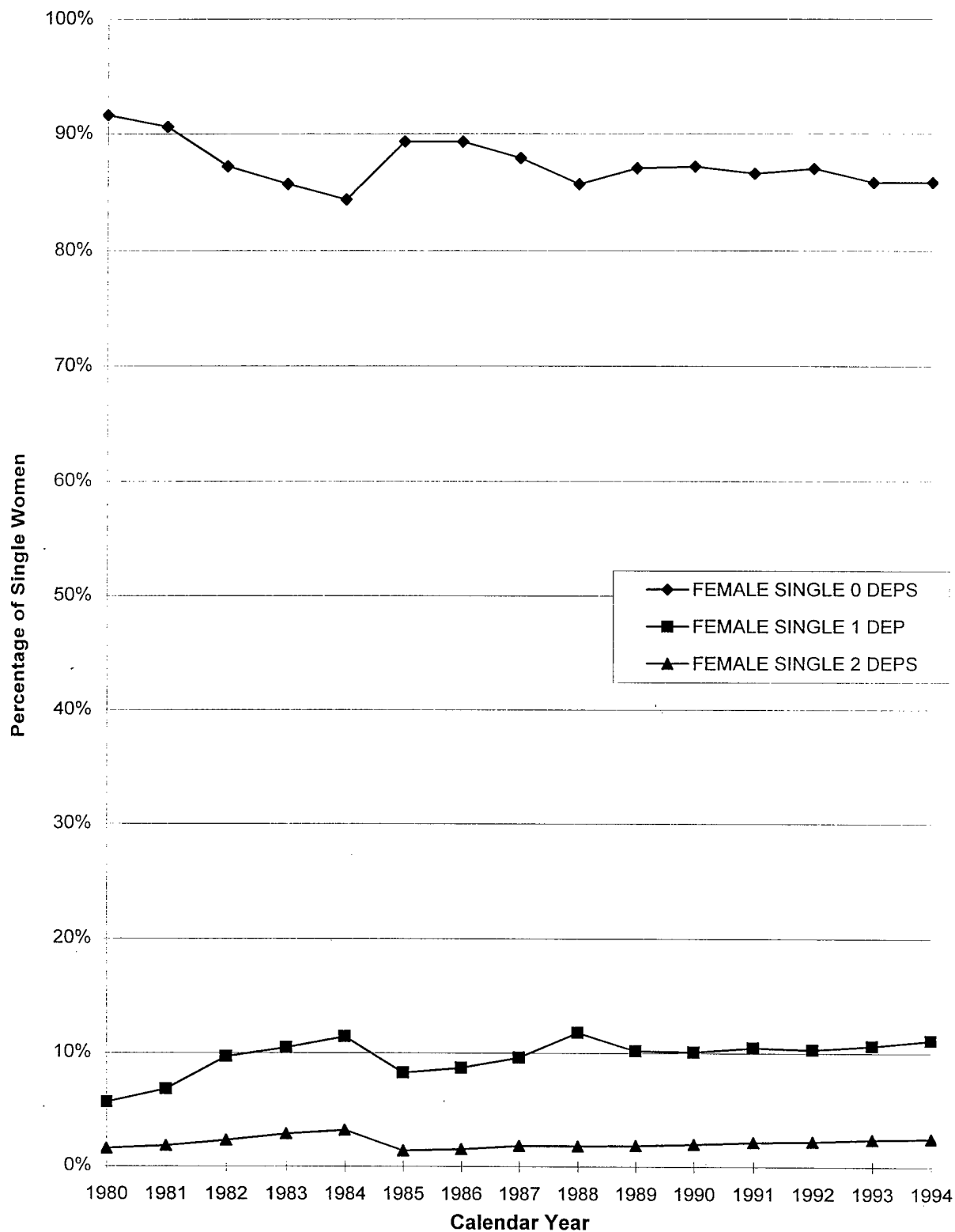
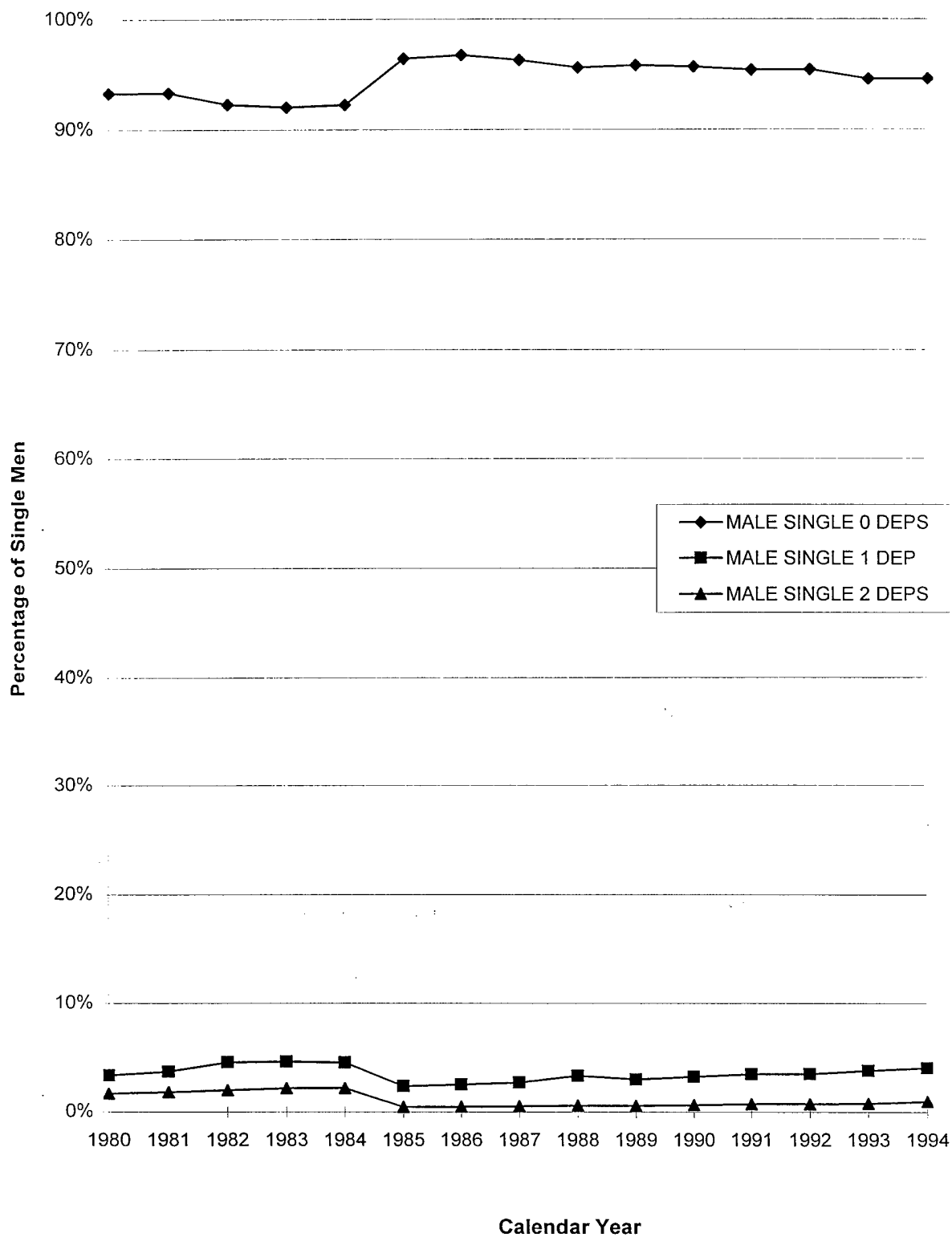


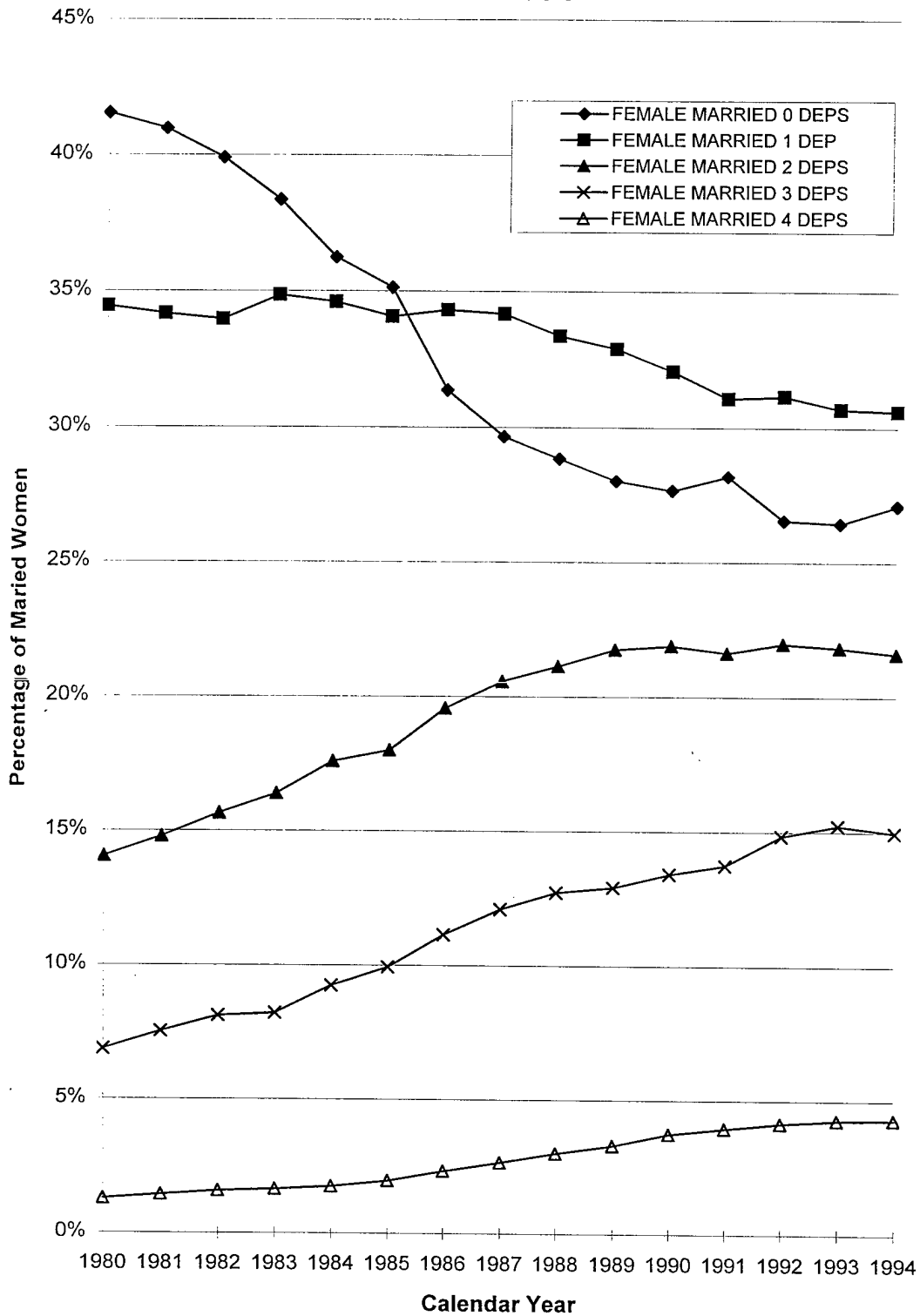
Figure 15. Percentage of U.S. Army Active Duty Single Men with Dependents, 1980-1994



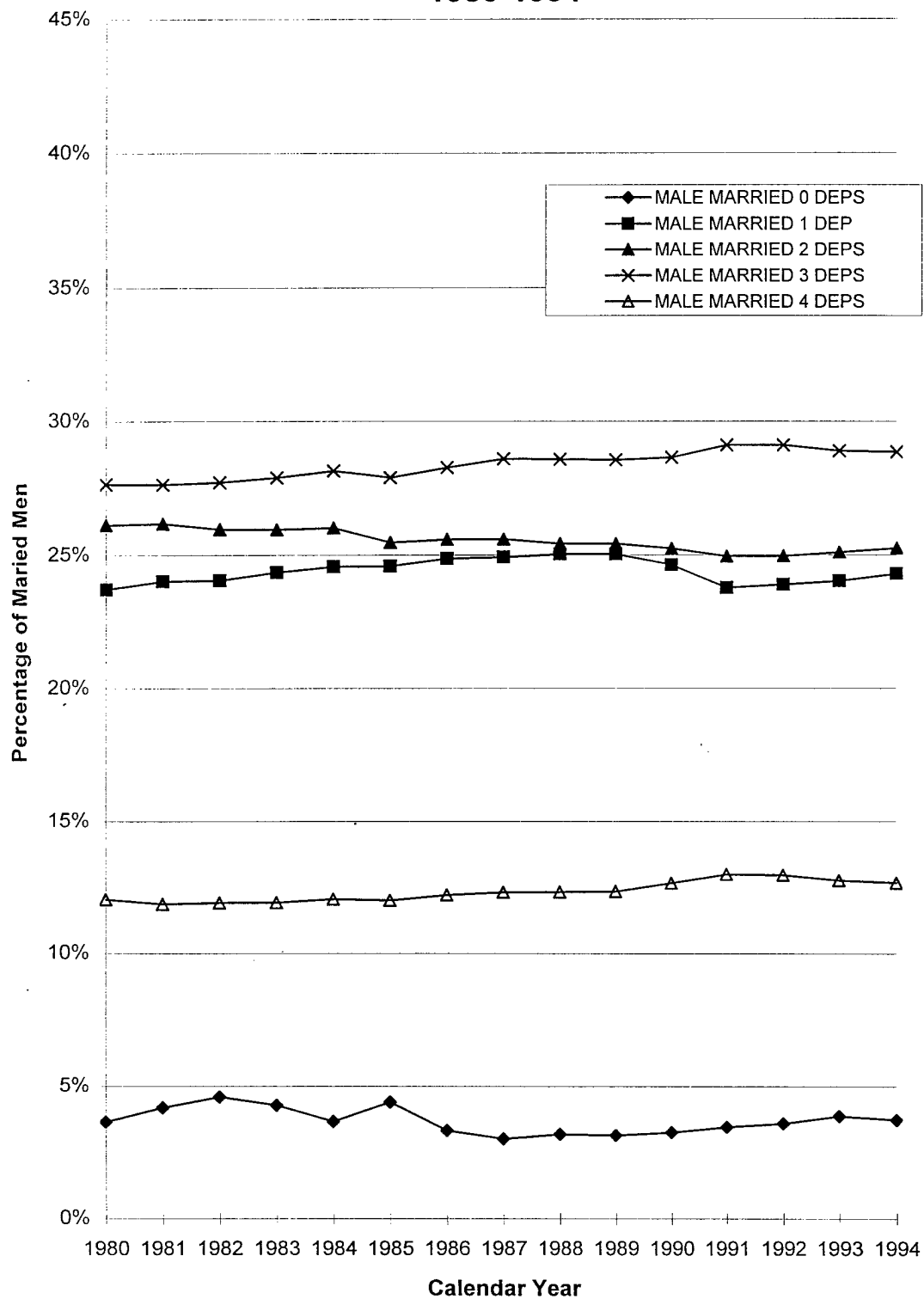
The percentage of married Army personnel with dependents changed from 1980 to 1994. The percentage of married Army women with dependents is displayed in Figure 16. The percentage of married Army men with dependents is displayed in Figure 17.

- 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**



**Figure 17. Percentage of U.S. Army Active Duty
Married Men with Dependents
1980-1994**



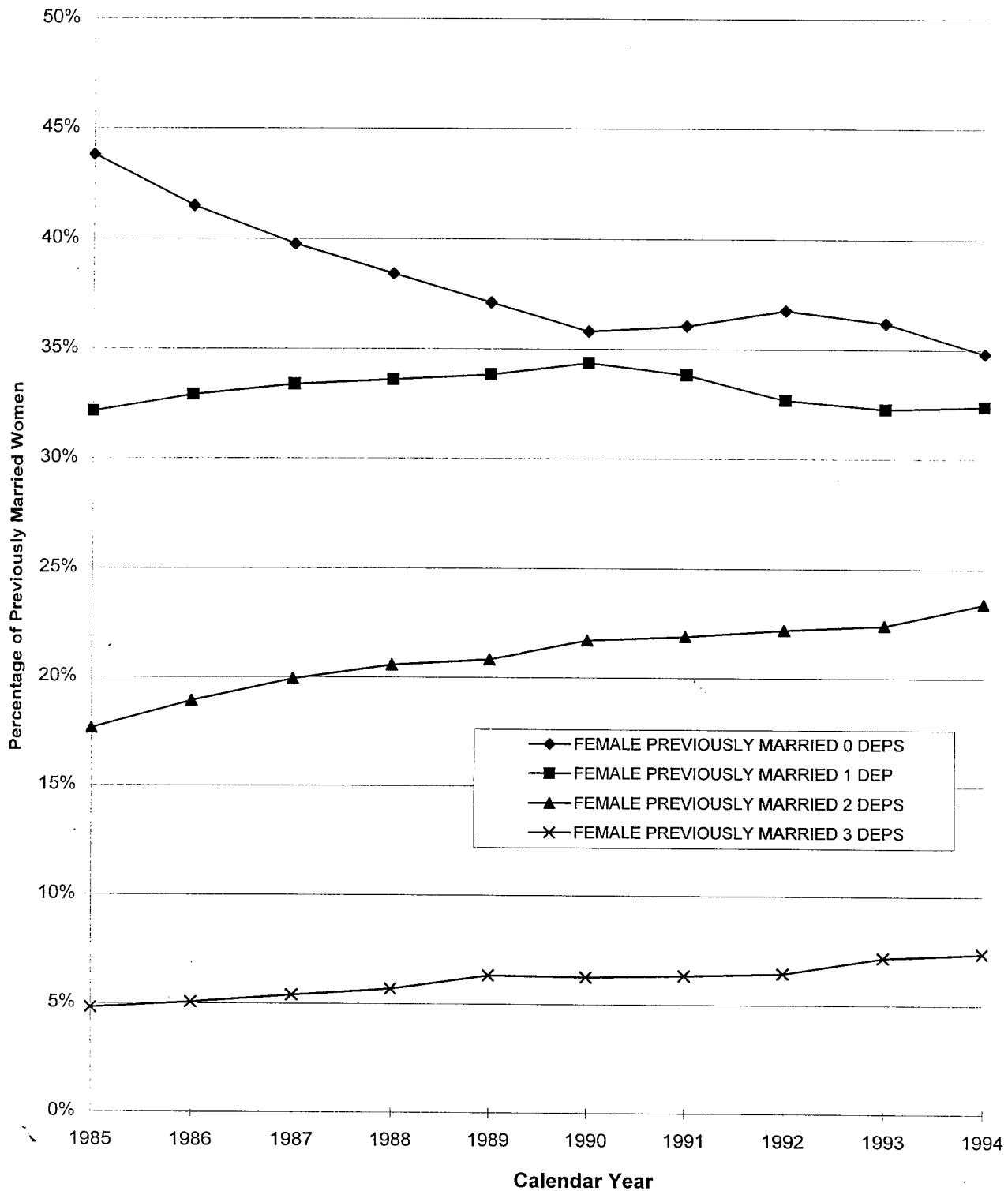
Data on previously married women with dependents are displayed in Figure 18.

- 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.

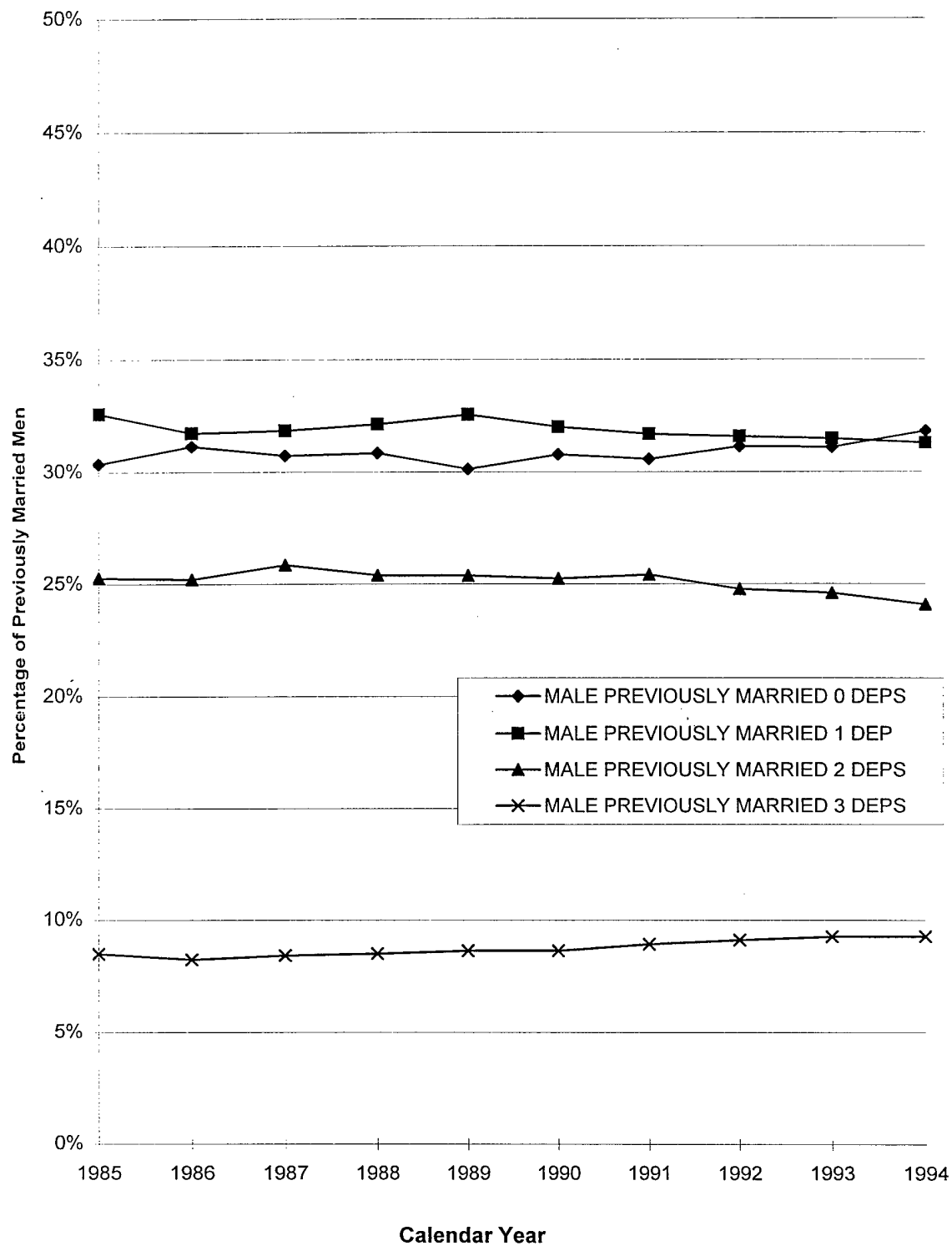
Data on previously married men with dependents are displayed in Figure 19.

- 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**



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

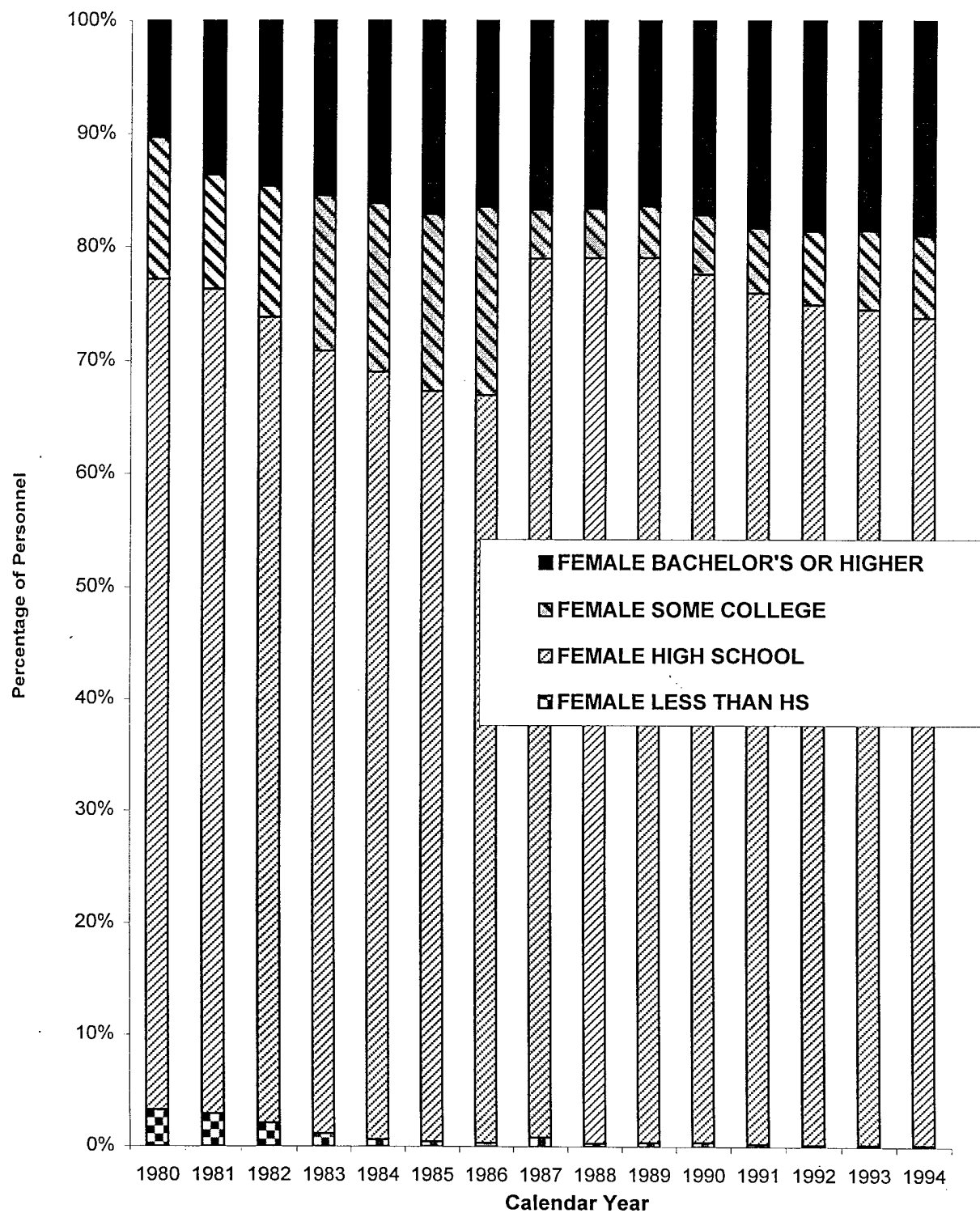


EDUCATION

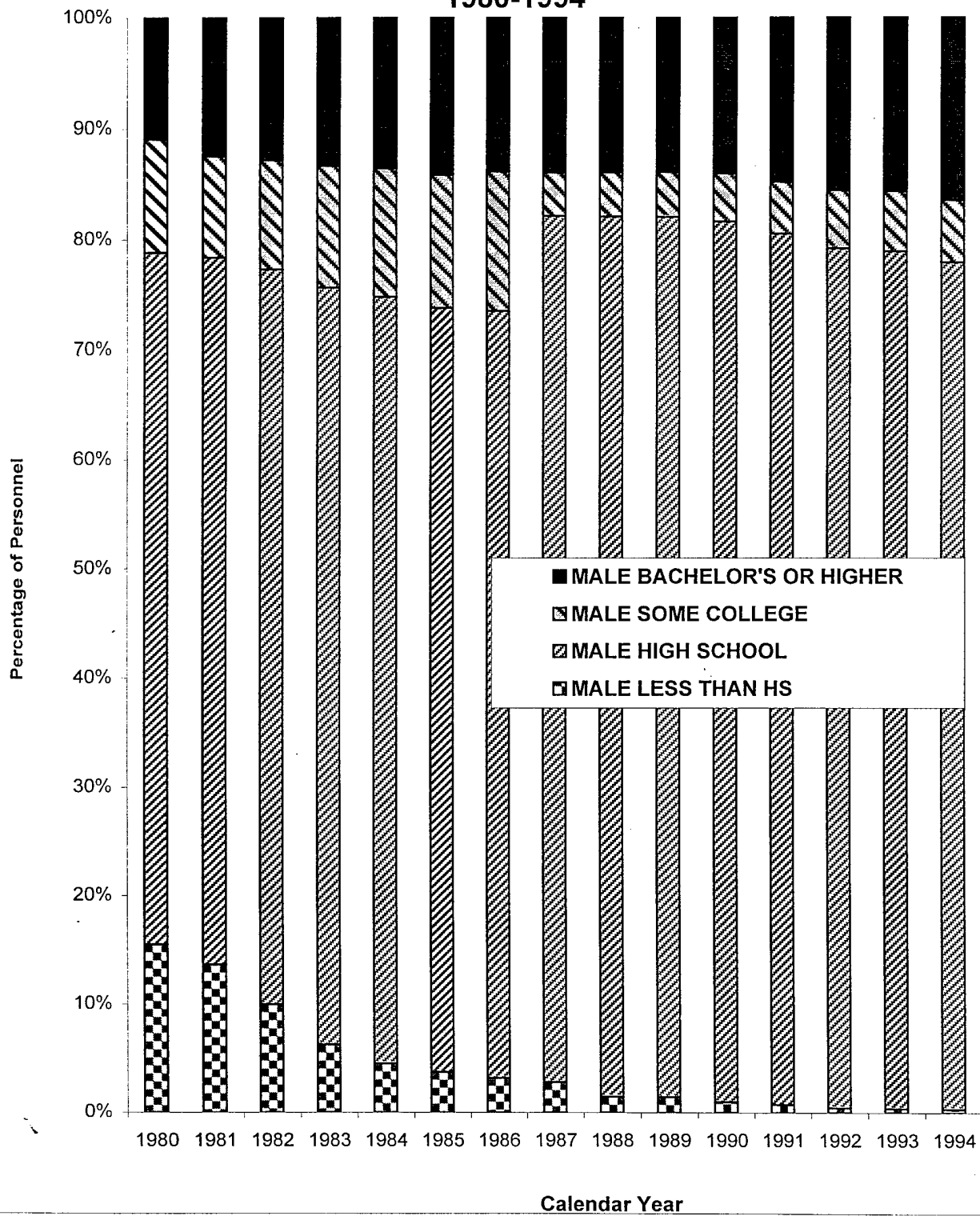
Overall, U.S. Army active duty personnel were better educated in 1994 than in 1980. Education is reported as the highest level of education obtained as of the end of the year (Figures 20 and 21).

- 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 20. Educational Status of
U.S. Army Active Duty Women
1980-1994**



**Figure 21. Educational Status of
U.S. Army Active Duty Men
1980-1994**



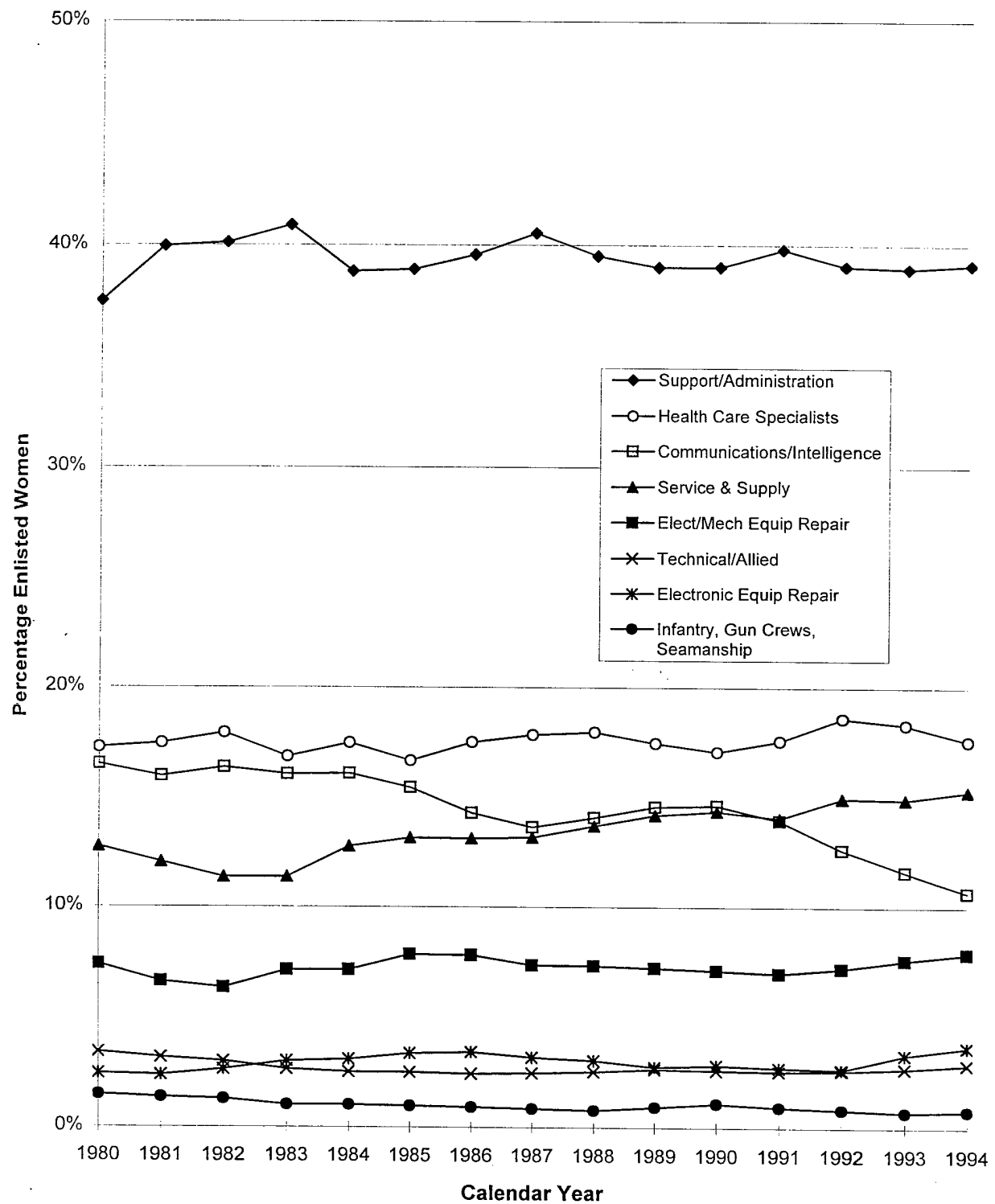
OCCUPATION

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.

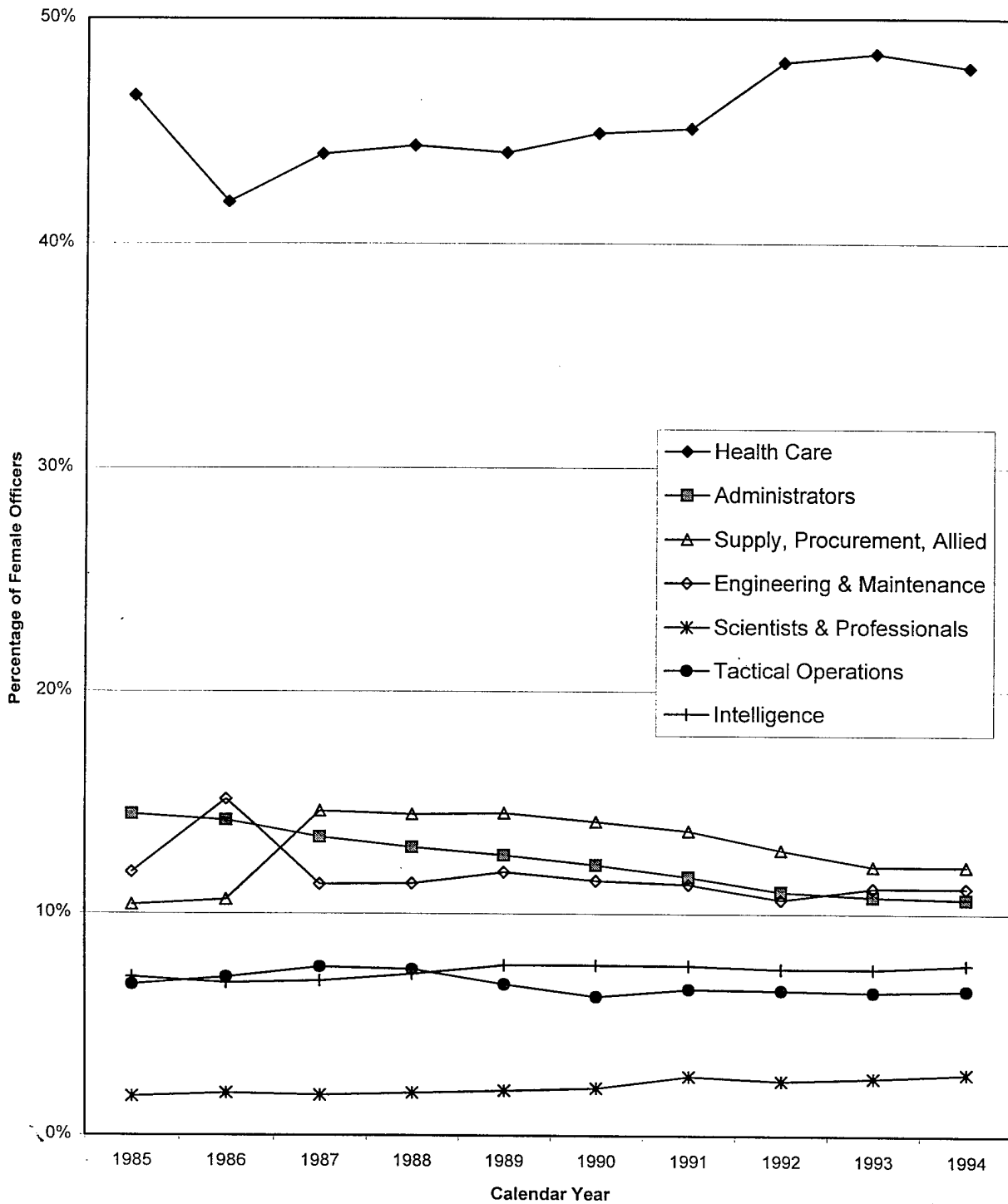
**Figure 22. U.S. Army Active Duty Enlisted Women
Occupations by Percentage
1980-1994**



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.

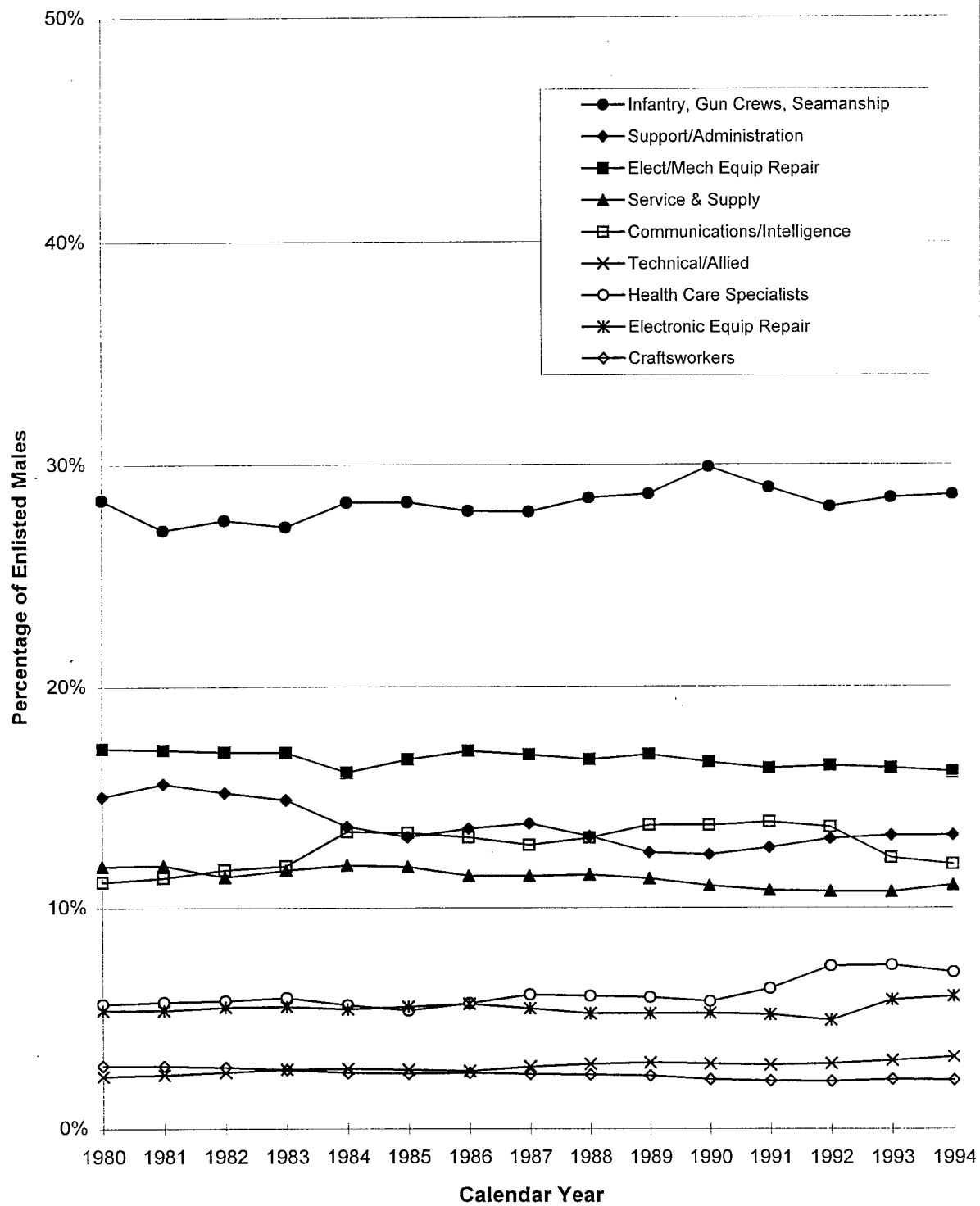
**Figure 23. U.S. Army Active Duty Female Officers
Occupations by Percentage
1985-1994**



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.

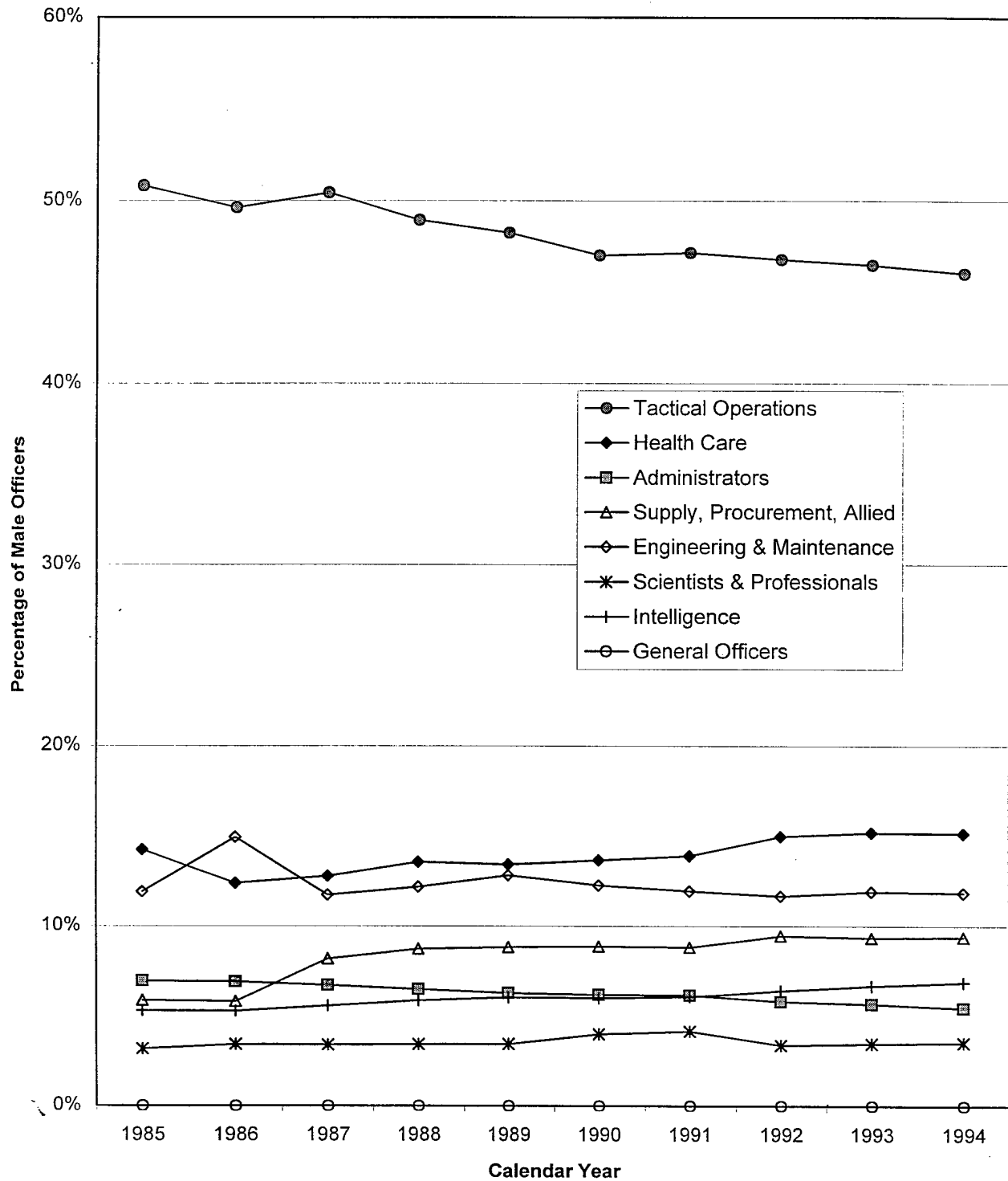
**Figure 24. U.S. Army Active Duty Enlisted Men
Occupations by Percentage
1980-1994**



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.

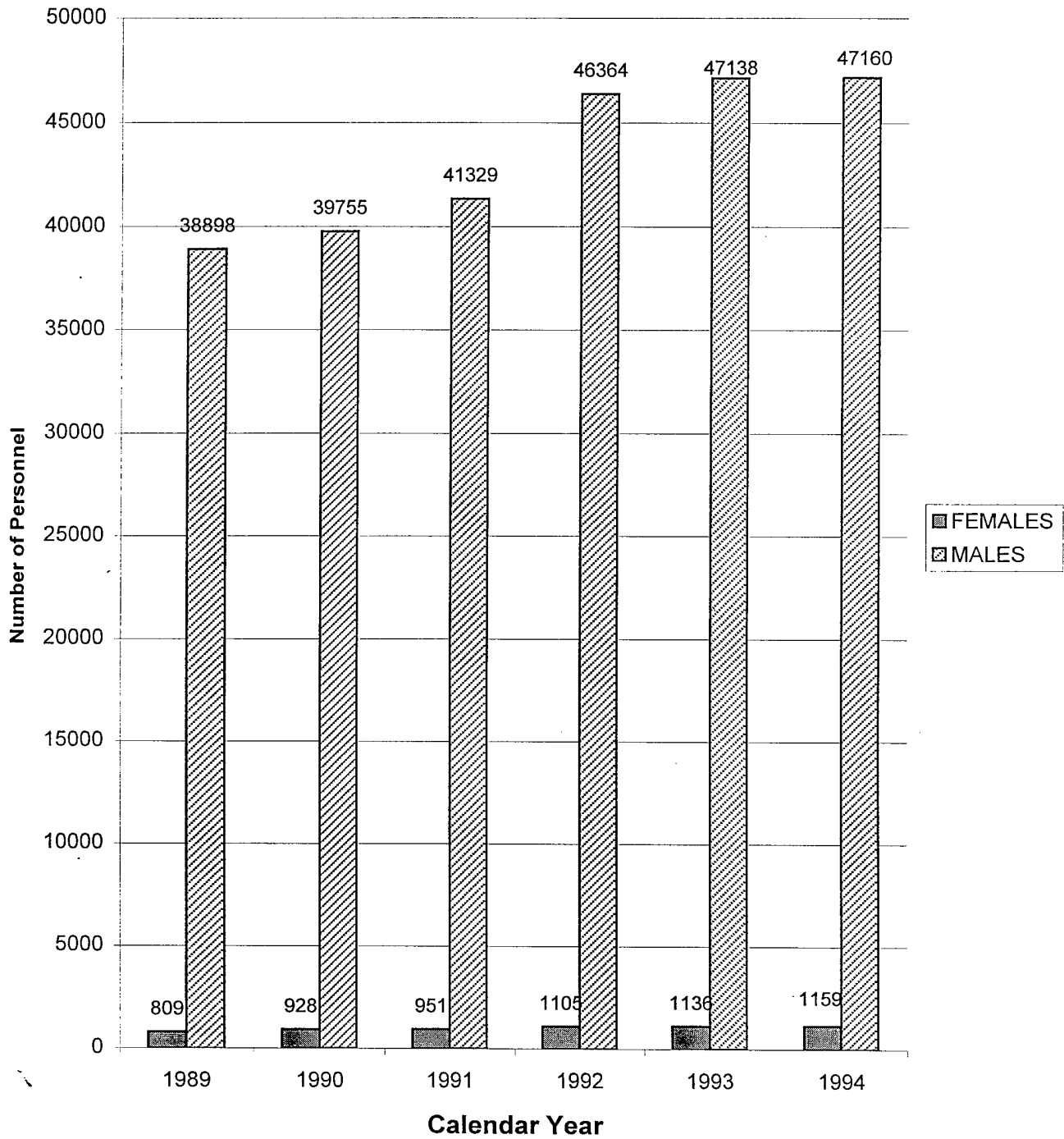
**Figure 25. U.S. Army Active Duty Male Officers
Occupations by Percentage
1985-1994**



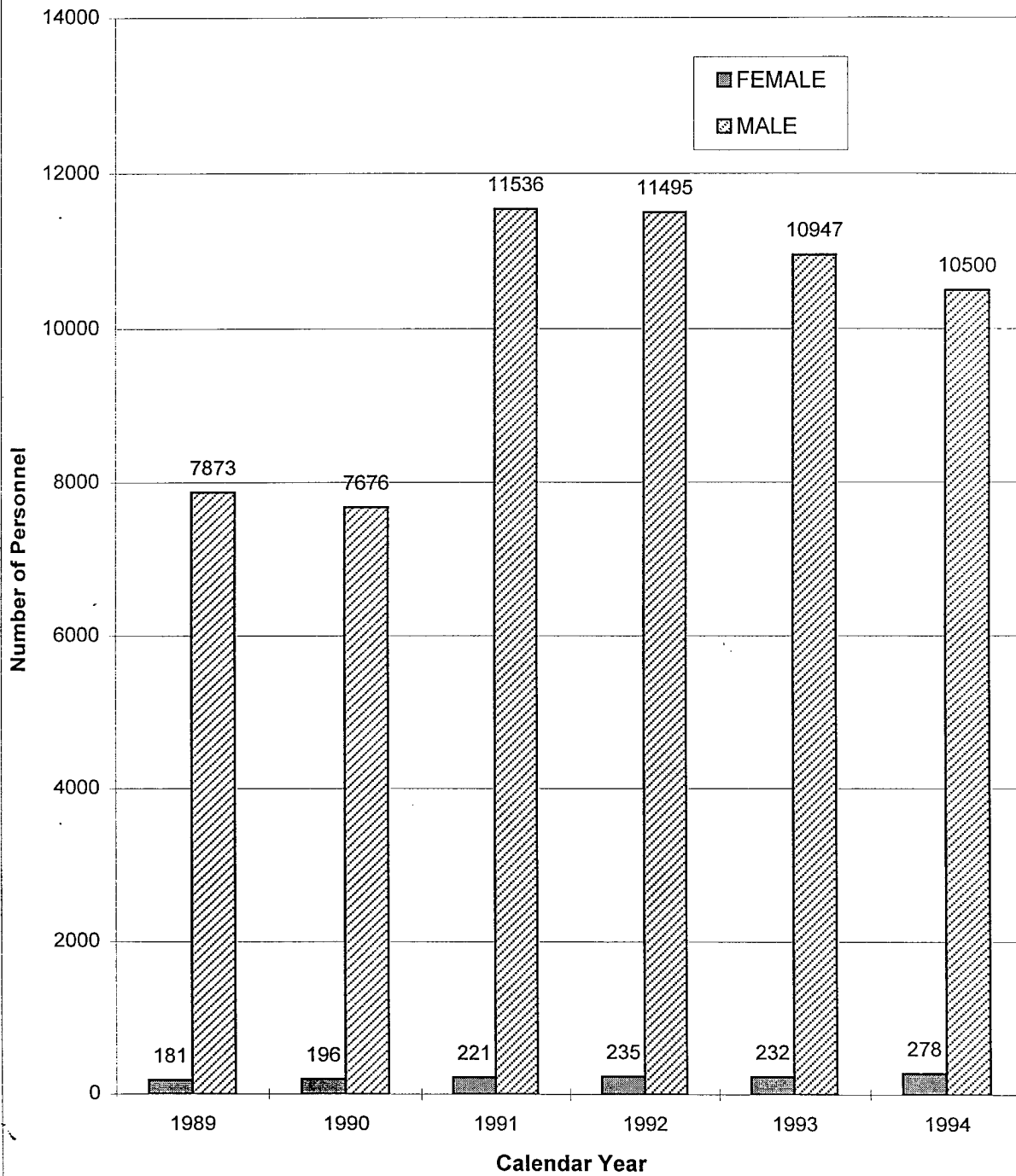
Hazardous duty pay records were only available from 1989 forward. The total number of women and men on active duty in the U.S. Army who received hazardous duty pay increased from 1989 to 1994. The total number of men receiving hazardous duty parachute pay increased, but the percentages of men and women 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).

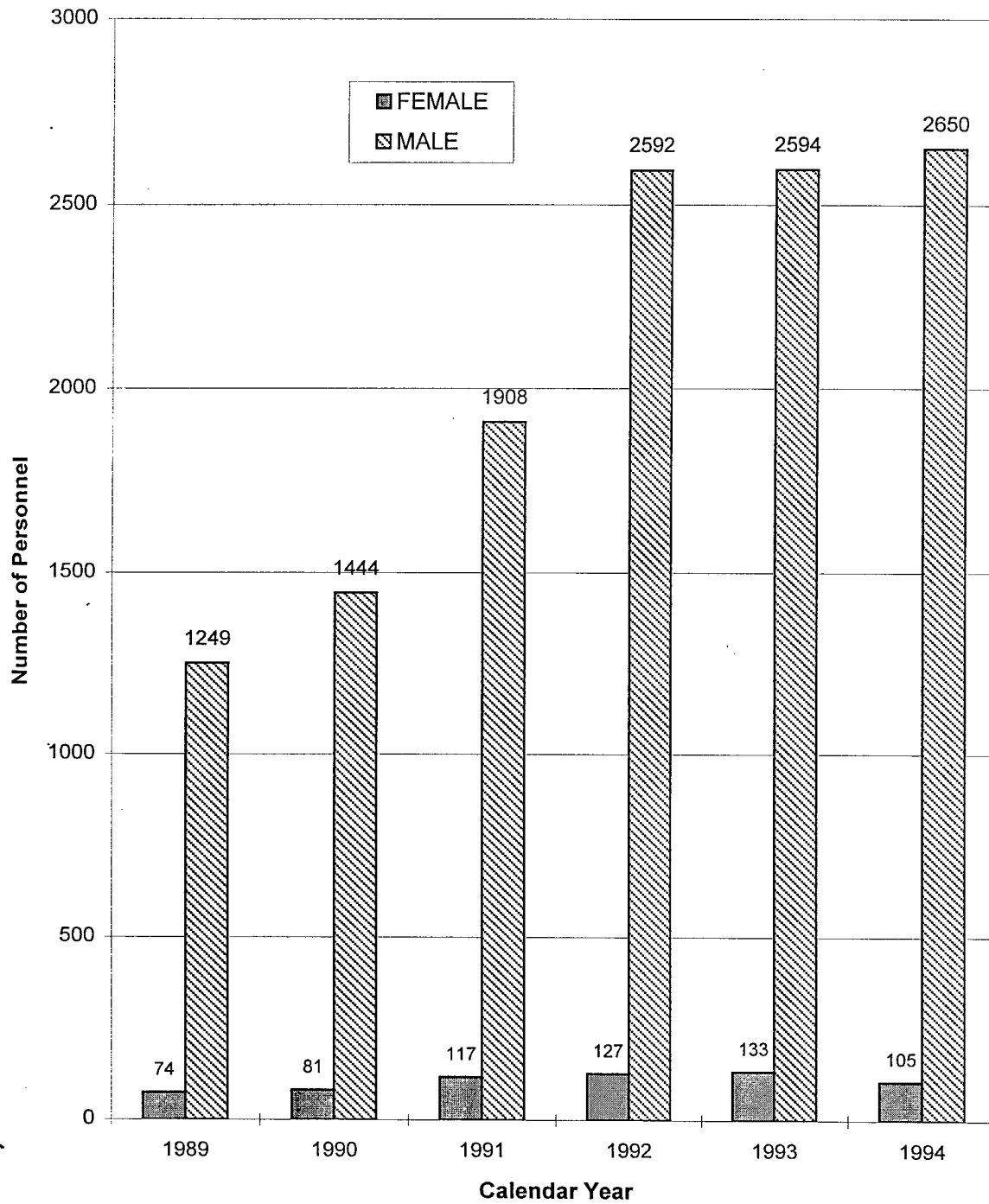
**Figure 26. U.S. Army Active Duty Parachutists
Hazardous Duty
1989-1994**



**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**

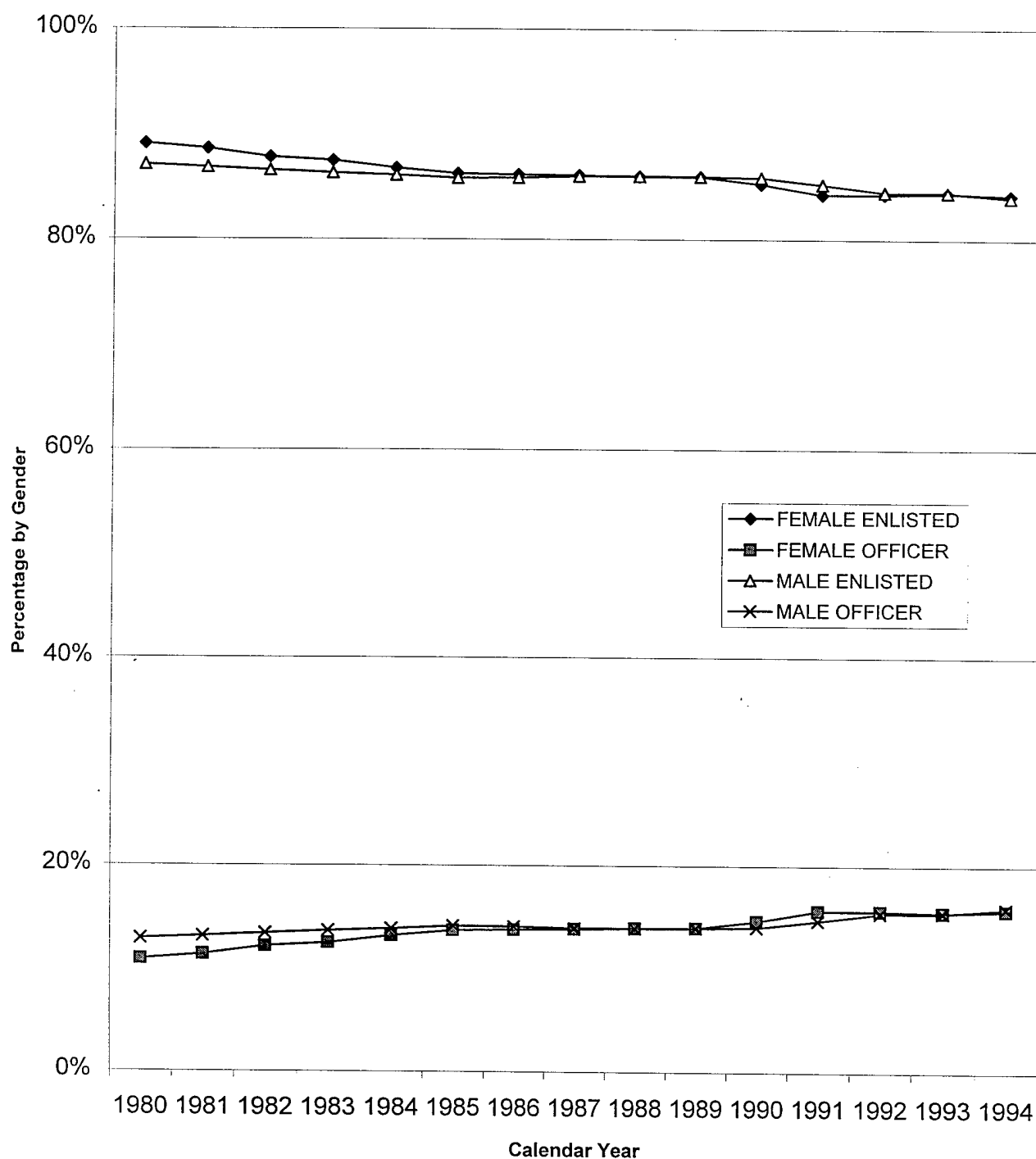


PERSONNEL RANK

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

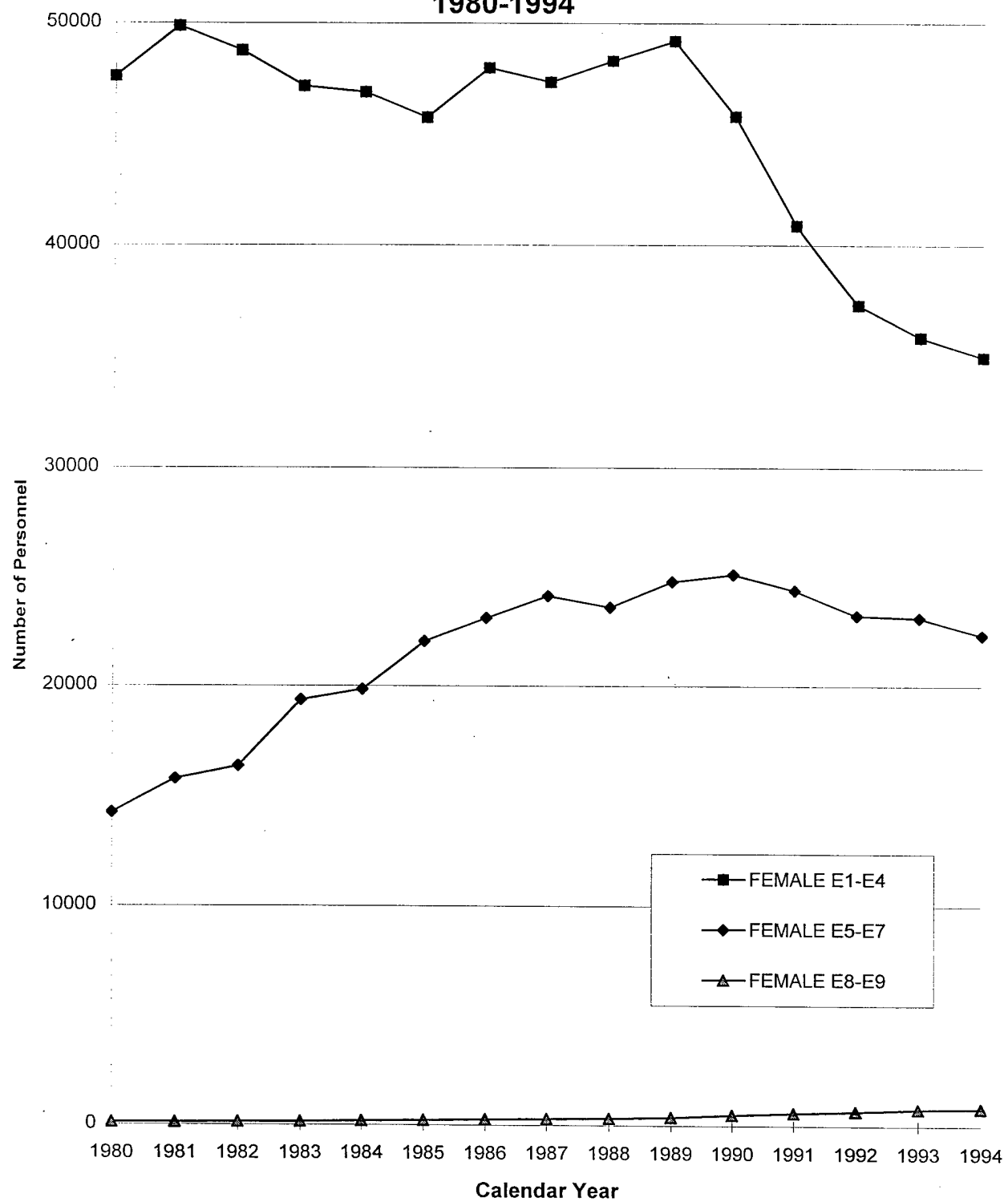


Comparisons of the numbers of individuals by military pay grade for active duty women and men from 1980 to 1994 are shown in Figures 30 through 33. Separate comparisons by gender are provided for enlisted and officer personnel.

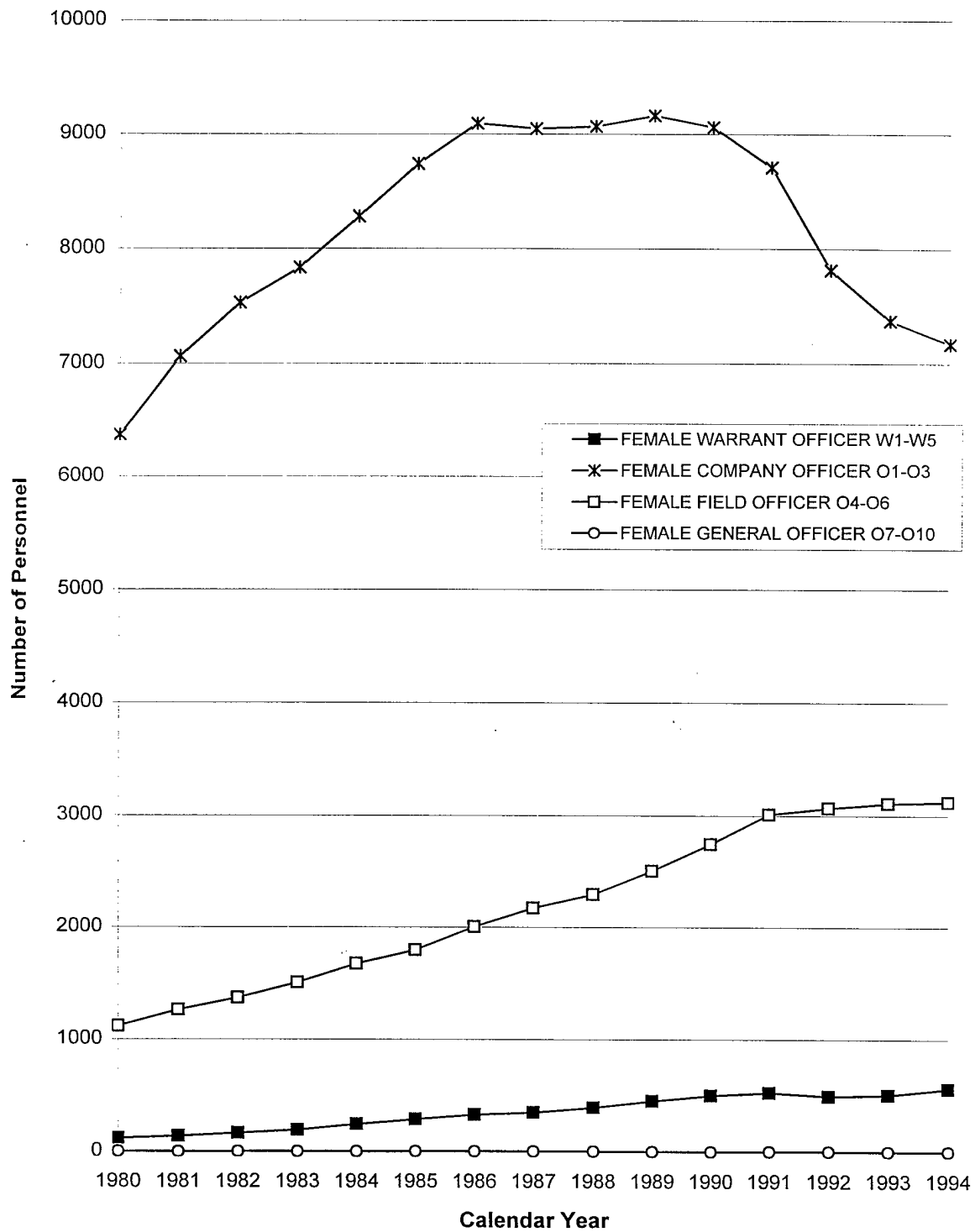
In 1980, 68% of women and 52% of men were junior enlisted personnel (E1-E4), 21% of women and 35% of men were non-commissioned officers (E5-E9), and 11% of women and 13% of men were officers (O1-O10). By 1994, these gaps were closing and 51% of women and 43% of men were junior enlisted personnel; 33%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

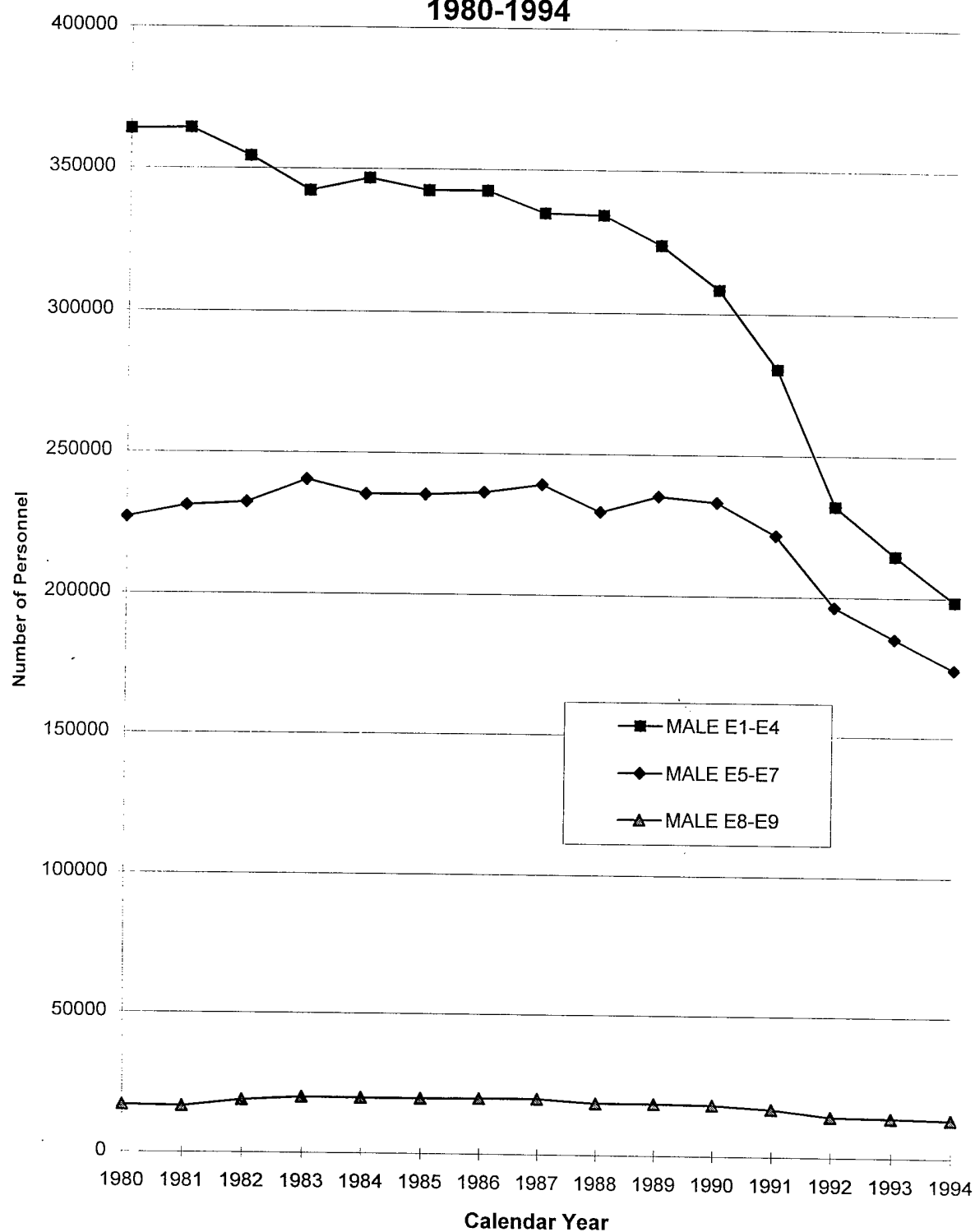


**Figure 31. U.S. Army Active Duty Female Officers
by Pay Grade
1980-1994**

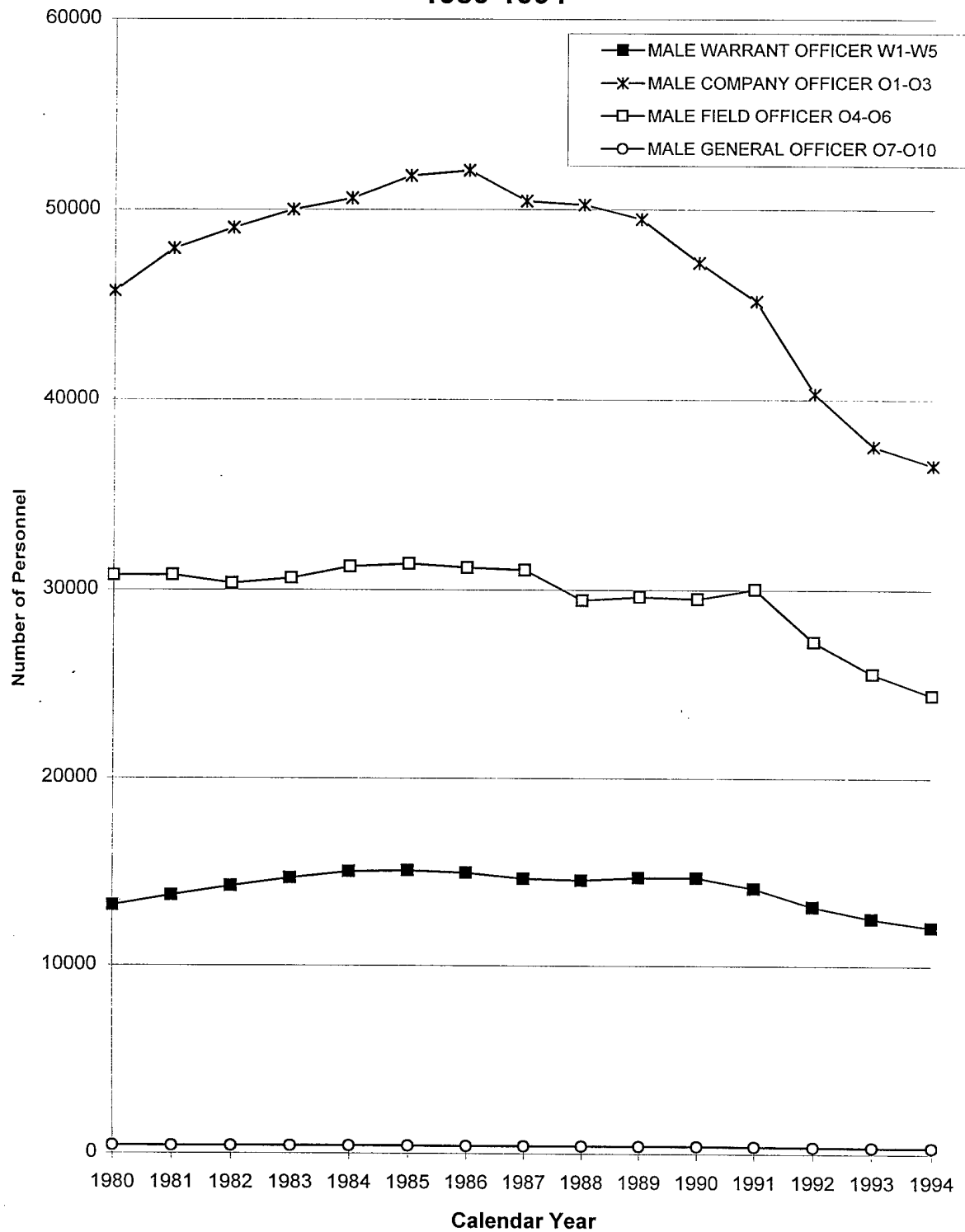


- Between 1980 and 1994, the number of junior enlisted men decreased from 363,922 to 198,493 (Figure 32). There was also a decrease in the number of men serving as non-commissioned officers.
- From 1980 until 1986, there was an increase in the number of male senior, non-commissioned officers from 16,849 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**



**Figure 33. U.S. Army Active Duty Male Officers
by Pay Grade
1980-1994**



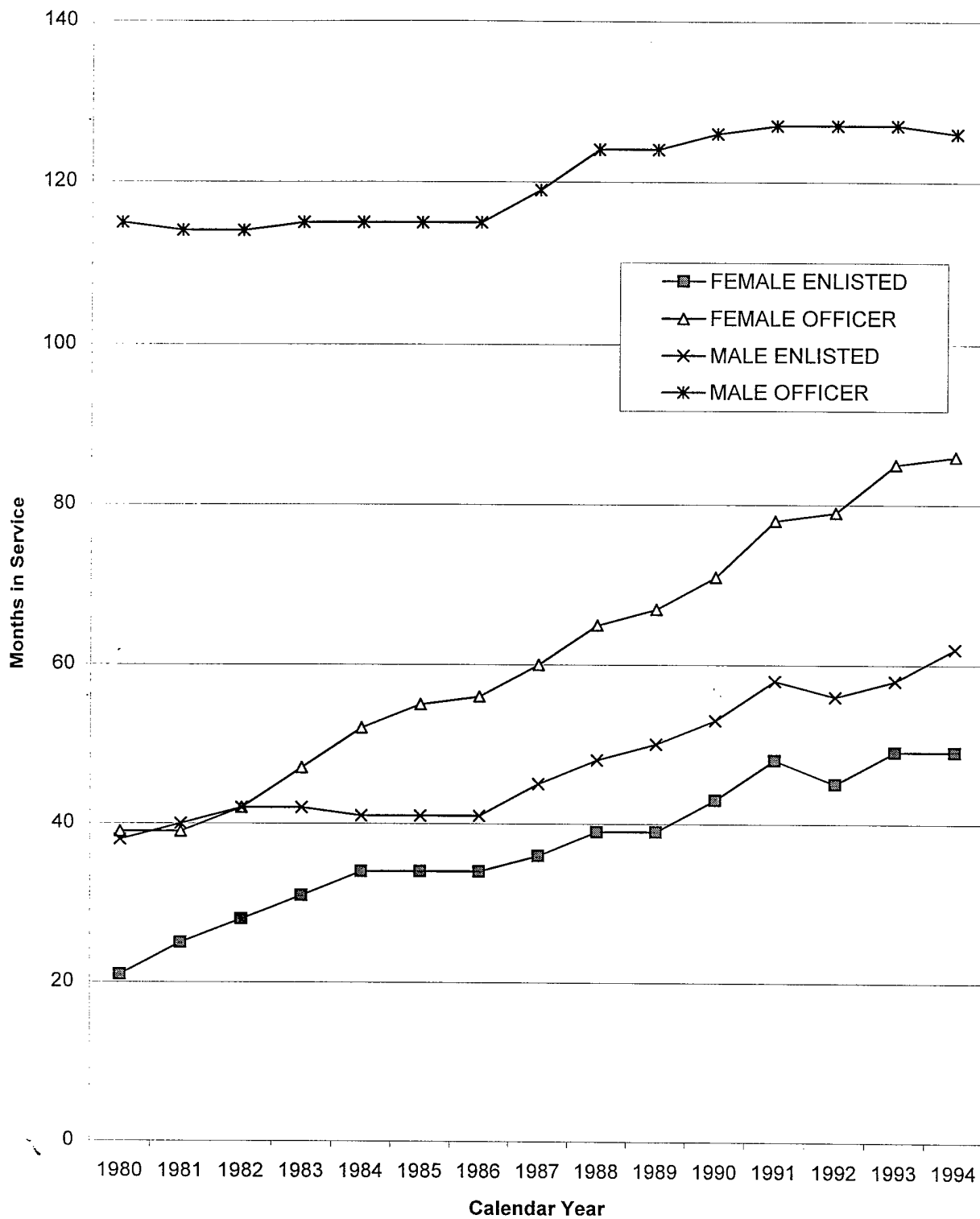
TIME IN SERVICE

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**



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.

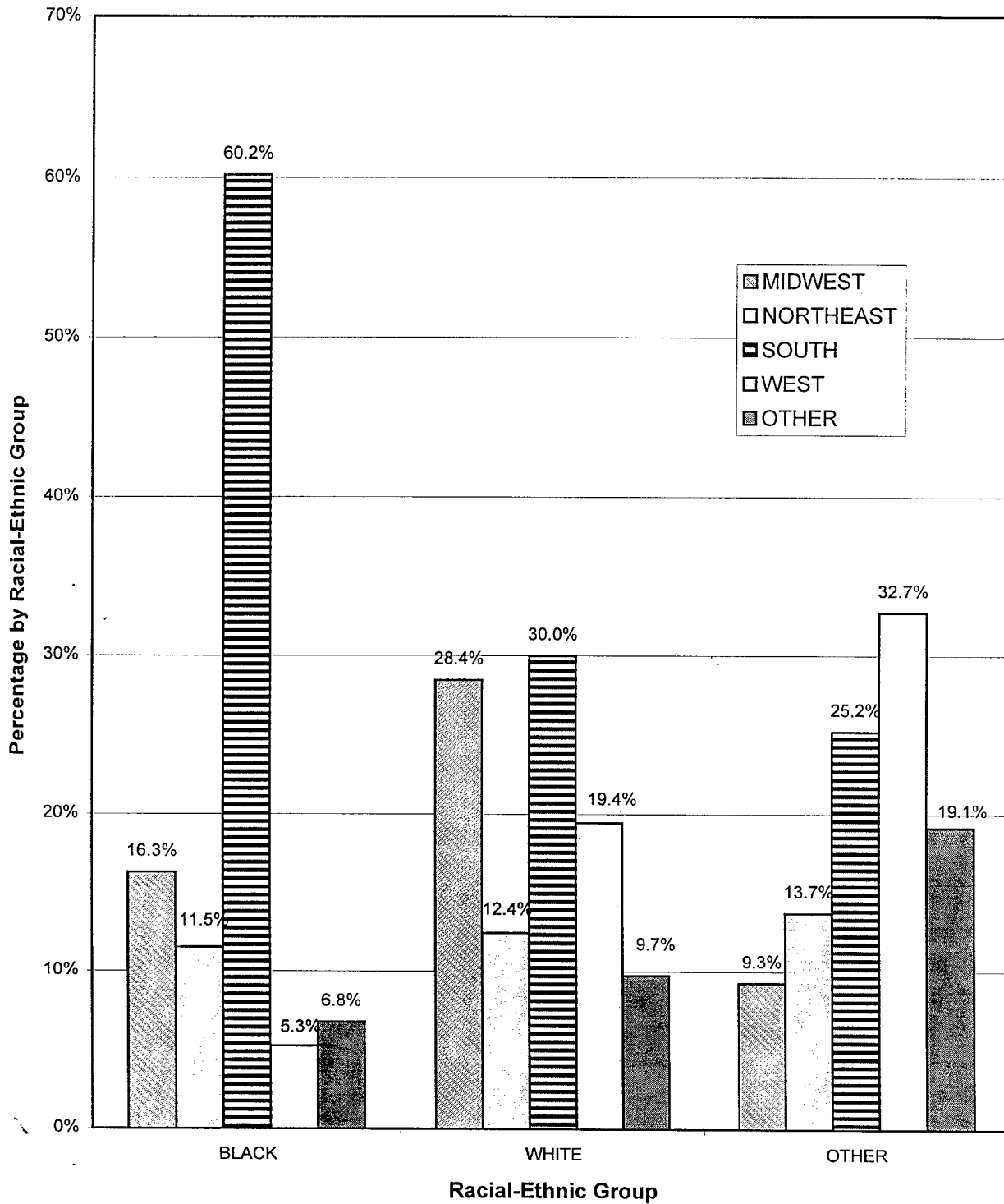
During the period between 1980 and 1994, approximately 42% of Army personnel were from the South, 22% were from the Midwest, 15% were from the West, 11% were from the North, and 9% were from other areas (Figure 35 and Figure 36). Patterns were similar for women and men.

- 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).

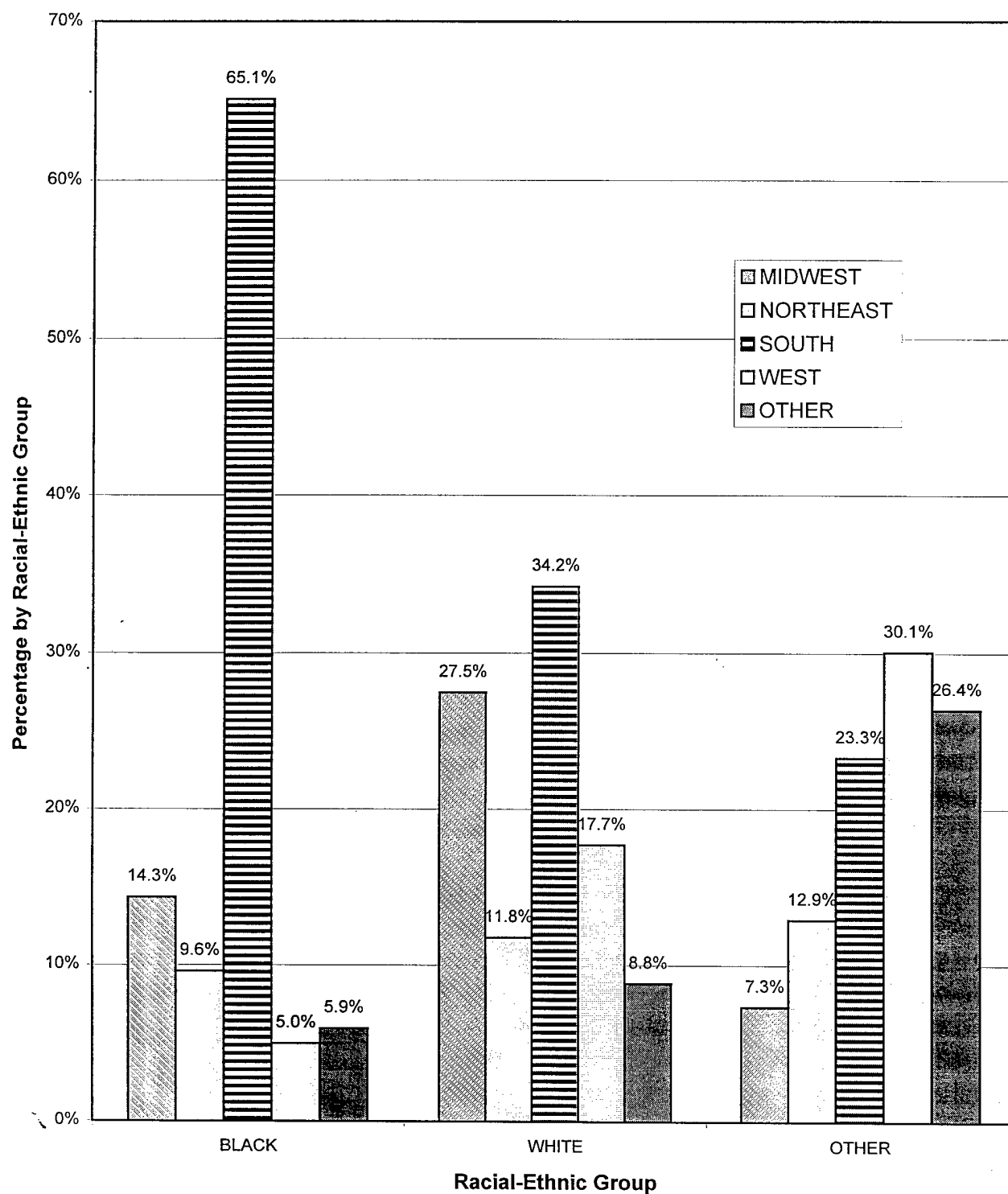
A comparison between the years 1980 and 1994 revealed the following:

- 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**



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

Amoroso, P.J., W.G. Swartz, F.A. Hoin, and M.M. Yore. Total Army Injury and Health Outcomes Database: Description and capabilities. USARIEM Technical Note TN97-2, February 21, 1997.

Bennett, C.E. and K.A. DeBarros. "The Black Population." [Http://www.census.gov/population/pop-profile/blackpop.html](http://www.census.gov/population/pop-profile/blackpop.html). September, 1996.

Butler, J.S. and R.M. Brewer. The promotion of enlisted women in the military. Armed Forces and Society, 4(4):679-688, 1978.

Department of Defense. "DMDC PC-Based Occupational Conversion Index Data as of 31 January 1997". Draft reissuance of DoD 1312.1-I, DoD Occupational Conversion Index. Washington, D.C. 1997.

Fligstein, N.D. Who served in the military, 1940-73. Armed Forces and Society, 6(2):297-312, 1980.

Hicks, J.M. Women in the U.S. Army. Armed Forces and Society, 4(4):647-657, 1978.

Hoover's company profiles. "General Motors Corporation." <http://pathfinder.com/@@mPy3aAYAmu9rzjzM/money/hooovers/corpdirectory/g/gm/html>. July, 1997.

Hoover's company profiles. "Wal-Mart Stores, Inc." <http://pathfinder.com/@@mPy3aAYAmu9rzjzM/money/hooovers/corpdirectory/w/wmt/html>. July, 1997.

Last, J.M. A Dictionary of Epidemiology. Oxford University Press, New York, 1988.

Moore, B.L.. African-American women in the U.S. Military. Armed Forces and Society, 17(3):363-384, 1991.

Moskos, C.C. Jr. Symposium: Race in the United States Military. Armed Forces and Society, 6(4):586-613, 1980.

Segal, M.W. and D.R. Segal. Social change and the participation of women in the american military. Research in Social Movements, Conflicts and Change, 5:235-258, 1983.

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

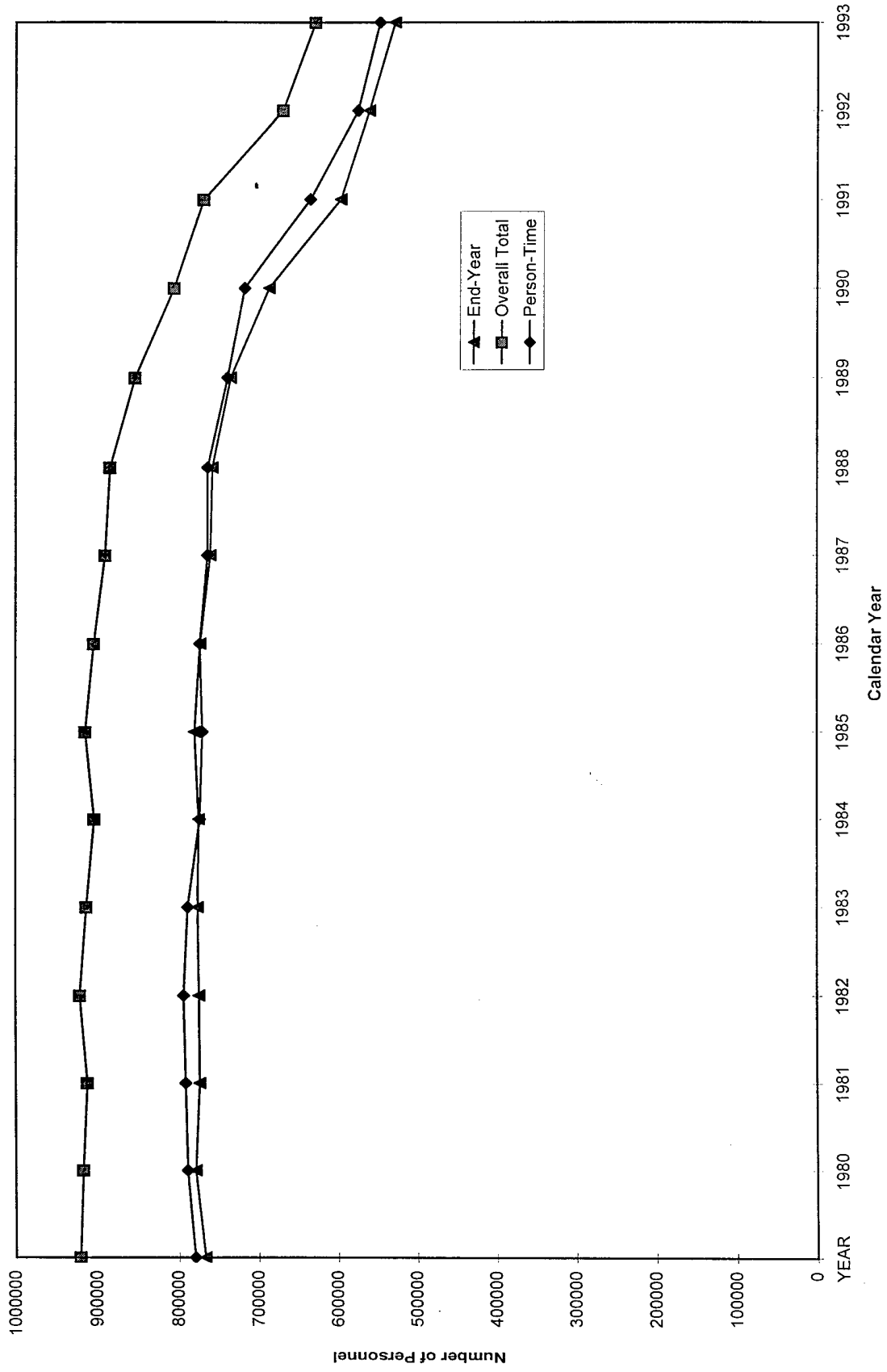
Health promotion: enabling a population to increase control over and improve their health

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)

APPENDICES

Appendix A-1 Denominator Comparisons



Appendix A-2
Frequencies of Gender, Racial-Ethnic Group, and Rank for End-Year Denominator

GENDER	YEAR																TOTAL
	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994		
FEMALE	69,577	74,242	74,355	76,211	77,111	78,812	82,778	83,292	83,968	86,463	83,676	78,061	72,598	70,775	68,994	1,160,913	
MALE	697,786	704,785	699,606	698,320	699,145	696,201	697,183	690,171	676,752	671,744	651,710	608,889	524,065	489,989	459,696	9,666,042	
TOTAL DENOMINATOR	767,363	779,027	773,961	774,531	776,256	775,013	779,961	773,463	760,720	758,207	735,386	686,950	596,663	560,764	528,690	10,826,955	
RACIAL-ETHNIC																	
FEMALE	39,162	40,296	40,340	41,910	42,425	42,749	44,375	43,788	42,667	42,384	40,200	37,137	34,284	33,173	31,952	596,822	
WHITE	25,596	29,028	29,070	29,363	30,008	31,112	33,105	34,073	35,493	37,783	37,135	34,714	32,063	30,978	30,137	479,658	
BLACK	1,992	2,174	2,087	2,040	1,900	1,897	2,075	2,161	2,273	2,507	2,472	2,392	2,517	2,727	2,838	34,052	
HISPANIC	319	350	342	375	414	446	497	538	578	687	638	578	532	534	536	7,364	
AMERICAN INDIAN/ALASKAN	641	768	796	856	945	1,084	1,178	1,198	1,273	1,385	1,467	1,453	1,477	1,617	1,680	17,818	
ASIAN/PACIFIC ISLANDER	1,867	1,626	1,720	1,667	1,419	1,524	1,548	1,534	1,684	1,717	1,764	1,787	1,745	1,746	1,851	25,199	
OTHER	69,577	74,242	74,355	76,211	77,111	78,812	82,778	83,292	83,968	86,463	83,676	78,061	72,598	70,775	68,994	1,160,913	
FEMALE TOTAL	438,083	445,025	447,717	456,894	463,716	466,905	468,214	460,637	444,831	435,869	419,007	390,060	337,346	316,314	296,620	6,287,238	
MALE	202,401	203,681	197,543	188,278	184,081	177,793	176,495	176,204	176,602	179,298	175,884	163,912	136,293	123,957	114,129	2,576,551	
WHITE	28,633	29,139	28,579	27,021	26,141	25,483	26,160	26,564	26,736	27,063	27,495	26,174	24,028	24,038	23,550	396,804	
BLACK	2,684	2,597	2,532	2,594	2,756	2,934	3,103	3,085	3,153	3,383	3,273	3,052	2,652	2,503	2,442	42,743	
HISPANIC	7,478	8,109	8,605	9,040	9,388	9,701	10,185	10,470	10,590	10,839	10,879	10,461	9,785	9,654	9,555	144,739	
AMERICAN INDIAN/ALASKAN	18,507	16,234	14,630	14,493	13,063	13,385	13,026	13,211	14,840	15,292	15,172	15,230	13,961	13,523	13,400	217,967	
ASIAN/PACIFIC ISLANDER	697,786	704,785	699,606	698,320	699,145	696,201	697,183	690,171	676,752	671,744	651,710	608,889	524,065	489,989	459,696	9,666,042	
OTHER																	
MALE TOTAL	2	17	1	14	172				2	1	1	7	53	13	22	305	
MILITARY RANK																	
E0	411,511	414,144	403,194	389,514	393,618	388,333	390,504	382,105	382,437	372,995	354,225	321,452	269,458	250,566	233,500	5,357,556	
E1-E4	241,110	246,898	248,694	259,742	255,185	257,410	259,403	263,225	253,121	260,043	258,312	245,999	219,611	208,423	196,658	3,673,834	
E5-E7	16,959	16,577	18,948	20,034	19,862	19,825	20,062	20,030	18,759	18,791	18,864	17,460	15,063	14,791	14,324	270,149	
E8-E9	11,918	12,390	12,906	13,320	13,438	13,353	13,194	12,746	12,852	13,002	13,108	12,637	11,753	11,170	10,699	188,486	
W1-W3	1,415	1,501	1,509	1,554	1,822	2,009	2,092	2,233	2,086	2,150	2,081	2,020	1,884	1,849	1,915	28,120	
W4-W5							4	16	7	16	21	18	26	9	9	126	
O0	52,133	55,044	56,591	57,827	58,861	60,499	61,123	59,482	59,303	58,661	56,298	53,919	48,121	44,918	43,705	826,485	
O1-O3	31,884	32,044	31,706	32,114	32,886	33,172	33,169	33,219	31,746	32,141	32,269	33,052	30,329	28,674	27,531	475,936	
O4-O6	431	412	412	412	412	412	410	407	407	407	407	386	365	351	327	5,958	
O7-O11																	

Appendix A-3
Frequencies of Gender, Race, and Rank for Person-Time Denominator

GENDER	YEAR	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	TOTAL
		1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	TOTAL
RACIAL-ETHNIC FEMALE	FEMALE	68,981	75,021	76,647	78,245	78,047	77,678	79,720	82,860	83,407	85,551	84,230	80,857	85,094	71,255	70,501	1,168,094
	MALE	711,262	714,236	714,763	715,274	710,351	695,933	690,737	690,871	680,777	678,297	654,849	637,043	580,151	503,874	477,184	9,835,602
	TOTAL DENOMINATOR	780,243	789,257	791,410	793,519	788,398	773,611	770,457	773,731	764,184	763,848	739,079	717,899	635,245	575,129	547,685	11,003,696
	WHITE	40,482	41,649	41,871	43,181	43,242	42,363	42,886	43,966	43,073	42,845	40,810	38,743	35,390	33,482	32,839	606,624
	BLACK	24,160	28,453	29,786	30,127	30,097	30,510	31,785	33,546	34,716	36,806	37,203	35,767	33,410	31,298	30,774	478,438
RACIAL-ETHNIC MALE	HISPANIC	1,915	2,202	2,208	2,138	1,969	1,889	1,943	2,084	2,183	2,382	2,406	2,405	2,426	2,594	2,785	33,529
	AMERICAN INDIAN/ALASKAN	310	368	360	396	419	444	474	518	530	640	649	611	566	526	538	7,349
	ASIAN/PACIFIC ISLANDER	605	756	830	877	931	1,021	1,126	1,188	1,228	1,353	1,414	1,478	1,453	1,539	1,643	17,442
	OTHER	1,509	1,593	1,590	1,526	1,389	1,450	1,506	1,559	1,677	1,725	1,749	1,852	1,849	1,816	1,921	24,712
	FEMALE TOTAL	68,981	75,021	76,647	78,245	78,047	77,678	79,720	82,860	83,407	85,551	84,230	80,857	75,094	71,255	70,501	1,168,094
RACIAL-ETHNIC MALE	WHITE	450,957	452,651	456,631	465,898	470,098	464,058	463,586	462,034	450,564	443,203	422,536	409,896	358,121	324,713	308,178	6,403,124
	BLACK	205,414	206,310	203,307	195,856	188,132	180,444	175,736	173,967	175,599	178,908	176,288	170,435	149,134	128,835	119,017	2,629,382
	HISPANIC	28,785	29,297	29,472	28,143	26,865	25,685	25,520	26,090	26,317	26,755	26,897	26,794	24,748	23,837	23,673	398,878
	AMERICAN INDIAN/ALASKAN	2,757	2,896	2,664	2,691	2,748	2,891	3,008	3,099	3,113	3,315	3,304	3,222	2,821	2,594	2,545	43,467
	ASIAN/PACIFIC ISLANDER	7,608	8,112	8,717	9,131	9,431	9,882	9,891	10,283	10,428	10,816	10,776	10,785	10,125	9,884	9,659	145,128
	OTHER	15,740	15,170	13,972	13,566	13,079	13,173	12,997	13,396	14,758	15,299	15,048	15,911	15,201	14,211	14,112	215,822
	MALE TOTAL	711,262	714,236	714,763	715,274	710,351	695,933	690,737	690,871	680,777	678,297	654,849	637,043	580,151	503,874	477,184	9,835,602
MILITARY RANK	E0	2	48	11	13	179	9	9	2	2	1	1	1	50	13	21	351
	E1-E4	410,077	412,792	409,039	396,029	392,574	373,801	369,036	369,990	372,009	366,225	344,831	335,494	278,618	250,861	238,245	5,319,422
	E5-E7	254,429	258,776	259,883	271,537	267,565	269,822	270,726	273,787	263,894	270,594	268,731	259,793	243,004	219,932	208,638	3,861,112
	E8-E9	18,519	18,156	20,437	21,458	21,543	21,609	21,593	21,406	20,504	20,407	20,203	19,396	17,343	16,362	15,772	294,709
	W1-W3	11,789	11,934	12,588	13,069	13,279	13,113	13,031	12,650	12,753	12,604	12,731	12,446	11,513	10,938	10,326	184,745
	W4-W5	1,549	1,629	1,628	1,694	1,954	2,122	2,184	2,338	2,274	2,302	2,235	2,222	2,024	2,005	2,050	30,210
	O0	50,049	52,311	54,599	56,019	56,663	58,320	59,011	58,593	58,911	57,712	56,225	53,661	49,167	44,586	42,903	808,729
	O1-O3	33,393	33,170	32,792	33,266	34,203	34,377	34,437	34,521	33,396	33,538	33,675	34,435	33,107	30,238	29,368	497,918
	O4-O6	456	441	433	436	440	438	435	439	434	448	429	435	392	382	353	6,391
	O7-O11																

Appendix A-4
Frequencies of Gender, Racial-Ethnic Group, and Rank for Total Denominator

GENDER	YEAR																TOTAL
	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994		
FEMALE	86731	92080	91130	92530	93725	93571	97581	98694	99258	101868	99894	93086	92532	84677	82822	1400179	
MALE	834217	825090	828230	819082	809586	816422	805055	791031	782242	753810	712831	676468	584926	546280	11405961	1400179	
TOTAL DENOMINATOR	920948	917170	911821	920760	912807	903157	914003	903749	890289	884110	853704	805917	769000	669603	629102	12806140	
RACIAL-ETHNIC																	
FEMALE WHITE	51137	52310	51314	52376	53170	52535	54219	53905	52537	51969	50056	46136	45197	41185	39748	747794	
BLACK	29796	33578	33790	34196	34867	35261	37180	38433	40016	42577	42425	39673	39601	35788	35077	552258	
HISPANIC	2415	2685	2577	2467	2322	2230	2431	2501	2591	2910	2919	2814	3089	3182	3319	40452	
AMERICAN INDIAN/ALASKAN	388	452	423	468	526	544	582	647	704	819	769	714	724	664	649	9073	
ASIAN/PACIFIC ISLANDER	761	884	936	1012	1108	1214	1352	1405	1463	1567	1657	1677	1794	1815	1908	20553	
OTHER	2234	2171	2090	2011	1732	1787	1817	1803	1947	2026	2068	2072	2127	2043	2121	30049	
FEMALE TOTAL	86731	92080	91130	92530	93725	93571	97581	98694	99258	101868	99894	93086	92532	84677	82822	1400179	
MALE																	
WHITE	530207	525086	527182	542926	545907	545729	554708	544725	529037	516294	493063	464948	437885	380807	355591	7494095	
BLACK	236131	233478	229911	222713	213551	204839	201520	199418	199231	201350	196834	185024	175362	148435	133807	2879604	
HISPANIC	33737	33716	33405	32184	30523	29253	29850	30165	30207	30723	30797	29724	30057	27775	27339	459455	
AMERICAN INDIAN/ALASKAN	3257	3200	3098	3167	3271	3493	3716	3751	3800	4102	3892	3675	3558	3102	2945	52027	
ASIAN/PACIFIC ISLANDER	8538	9017	9617	10197	10573	10920	11422	11744	11985	12342	12210	11913	12059	11227	11082	164846	
OTHER	22347	20593	17478	17043	15257	15352	15206	15252	16771	17431	17014	17547	17547	15580	15516	255934	
MALE TOTAL	834217	825090	820691	828230	819082	809586	816422	805055	791031	782242	753810	712831	676468	584926	546280	11405961	
MILITARY RANK																	
E0	3	80	40	16	198	23			2	2	1	7	90	21	28	511	
E1-E4	524784	516103	508229	501499	493589	479562	488263	476718	474073	465430	436647	405118	376674	323314	297377	6767380	
E5-E7	269528	272576	271480	284261	280608	283433	285293	287917	278045	282372	281844	270661	267353	232102	222124	4069597	
E8-E9	20132	19769	22061	23080	23243	23472	23338	22930	22192	22232	21863	20921	19754	18647	17228	320862	
W1-W3	12917	13256	13574	13907	14001	13934	13686	13180	13882	13341	13628	13126	12201	11612	10958	197203	
W4-W5	1704	1781	1771	1853	2081	2245	2307	2453	2449	2515	2439	2414	2172	2184	2223	32591	
O0							4	16	7	16	21	18	26	12	10	130	
O1-O3	56278	58667	60118	61263	63051	64436	64845	64130	64327	62679	61630	57527	55047	48676	47611	890285	
O4-O6	35119	34465	34091	34418	35568	35585	35806	35937	34849	35044	35180	35650	35266	32627	31166	520771	
O7-O11	483	473	457	463	468	467	461	468	463	479	451	475	417	408	377	6810	

DISTRIBUTION LIST

2 Copies to:

Defense Technical Information Center
8725 John J. Kingman Road STE 0944
Fort Belvoir VA 22060-6218

Office of the Assistant Secretary of Defense
(Health Affairs)
ATTN: Medical Readiness, Pentagon
Washington DC 20310-0103

Commander
U.S. Army Medical Research and Materiel Command
ATTN: MCMR-OP
Fort Detrick MD 21702-5012

Commander
U.S. Army Medical Research and Materiel Command
ATTN: MCMR-PLC
Fort Detrick MD 21702-5012

Commander
U.S. Army Medical Research and Materiel Command
ATTN: MCMR-PLE
Fort Detrick MD 21702-5012

Commandant
Army Medical Department Center and School
ATTN: HSMC-FR, Bldg. 2840
Fort Sam Houston TX 78236

1 Copy to:

Deputy Director for Medical Readiness
The Joint Staff, J-4
ATTN: J4-MRD
4000 Joint Staff Pentagon
Washington DC 20318-4000

HQDA, Assistant Secretary of the Army
(Research, Development and Acquisition)
ATTN: SARD-TM, Pentagon
Washington DC 20316-0103

HQDA, Office of The Surgeon General
ATTN: DASG-RDZ/Executive Assistant Surgeon General
Room 3E368, Pentagon
Washington DC 20310-2300

HQDA, Office of The Surgeon General
ATTN: DASG-ZA
5109 Leesburg Pike
Falls Church VA 22041-3258

HQDA, Office of The Surgeon General
ATTN: DASG-DB
5109 Leesburg Pike
Falls Church VA 22041-3258

HQDA, Office of The Surgeon General
ATTN: DASG-MS
5109 Leesburg Pike
Falls Church VA 22041-3258

HQDA, Office of The Surgeon General
ATTN: SGPS-PSP, Preventive Medicine Consultant
5109 Leesburg Pike
Falls Church VA 22041-3258

Uniformed Services University of the Health Sciences
ATTN: Dean, School of Medicine
4301 Jones Bridge Road
Bethesda MD 20814-4799

Uniformed Services University of the Health Sciences
ATTN: Chair, Department of Preventive Medicine
4301 Jones Bridge Road
Bethesda MD 20814-4799

Commandant
Army Medical Department Center & School
ATTN: Chief Librarian Stimson Library
Bldg 2840, Room 106
Fort Sam Houston TX 78234-6100

Commandant
Army Medical Department Center & School
ATTN: Director of Combat Development
Fort Sam Houston TX 78234-6100

Commander
U.S. Army Aeromedical Research Laboratory
ATTN: MCMR-UAX-SI
Fort Rucker AL 36362-5292

Commander
U.S. Army Medical Research Institute of Chemical
Defense
ATTN: MCMR-UVZ
Aberdeen Proving Ground MD 21010-5425

Commander
U.S. Army Medical Materiel Development Activity
ATTN: MCMR-UMZ
Fort Detrick MD 21702-5009

Commander
U.S. Army Institute of Surgical Research
ATTN: MCMR-USZ
3400 Rayley E. Chambers Avenue
Fort Sam Houston TX 78234-5012

Commander
U.S. Army Medical Research Institute of
Infectious Diseases
ATTN: MCMR-UIZ-A
Fort Detrick MD 21702-5011

Director
Walter Reed Army Institute of Research
ATTN: MCMR-UWZ-C (Director for Research Management)
Washington DC 20307-5100

Commander
U.S. Army Soldier Systems Command
ATTN: AMSSC-CG
Natick MA 01760-5000

Commander
U.S. Army Natick Research, Development & Engineering
Center
ATTN: SSCNC-Z
Natick MA 01760-5000

Commander
U.S. Army Natick Research, Development & Engineering
Center
ATTN: SSCNC-T
Natick MA 01760-5002

Commander
U.S. Army Natick Research, Development & Engineering
Center
ATTN: SSCNC-S-IMI
Natick MA 01760-5040

Commander
U.S. Army Natick Research, Development and
Engineering Center
ATTN: SSCNC-TM (U.S. Marine Corps Representative)
Natick MA 01760-5004

Director
U.S. Army Research Institute for Behavioral Sciences
5001 Eisenhower Avenue
Alexandria VA 22333-5600

Commander
U.S. Army Training and Doctrine Command
Office of the Surgeon
ATTN: ATMD
Fort Monroe VA 23651-5000

Commander
U.S. Army Center for Health Promotion and Preventive Medicine
Aberdeen Proving Ground MD 21010-5422

Director, Biological Sciences Division
Office of Naval Research - Code 141
800 N. Quincy Street
Arlington VA 22217

Commanding Officer
Naval Medical Research & Development Command
NNMC/Bldg 1
Bethesda MD 20889-5044

Commanding Officer
U.S. Navy Clothing & Textile Research Facility
ATTN: NCTRF-01, Bldg 86
Natick MA 01760-5053

Commanding Officer
Navy Environmental Health Center
2510 Walmer Avenue
Norfolk VA 23513-2617

Commanding Officer
Naval Aerospace Medical Institute (Code 32)
Naval Air Station, Pensacola FL 32508-5600

Commanding Officer
Naval Medical Research Institute
Bethesda MD 20889

Commanding Officer
Naval Health Research Center
P.O. Box 85122
San Diego CA 92138-9174

Commander
Armstrong Medical Research Laboratory
Wright-Patterson Air Force Base OH 45433

U.S. Air Force Aeromedical Library
Document Services Section
2511 Kennedy Circle
Brooks Air Force Base TX 78235-5122

Commander
US Air Force School of Aerospace Medicine
Brooks Air Force Base TX 78235-5000

Director
US Army Research Laboratory
Human Research and Engineering Directorate
Aberdeen Proving Ground MD 21005-5001

Commander
U.S. Army Military History Institute
ATTN: Chief, Historical Reference Branch
Carlisle Barracks PA 17013-5008

U.S. Army Biomedical R&D Representative for Science
And Technology Center, Far East
ATTN: AMC-S&T, FE, Unit 45015
APO 96343-5015

National Defence Headquarters, CANADA
Attention: Research and Development Branch
Human Performance Directorate
305 Rideau Street
Ottawa Ontario CANADA K1A 0K2

Département of National Defence, CANADA
Defence Research Establishment Ottawa
Attention: Head, Physiology Group
Environmental Protection Section
Protective Sciences Division
Ottawa Ontario CANADA K1A 0Z4

Director
Defence and Civil Institute of Environmental Medicine
1133 Sheppard Avenue W, P.O. Box 200
Downsview Ontario CANADA M3M 3B9

Defence and Civil Institute of Environmental Medicine
Attention: Head, Environmental Physiology Section
1133 Sheppard Avenue W, P.O. Box 200
Downsview Ontario CANADA M3M 3B9