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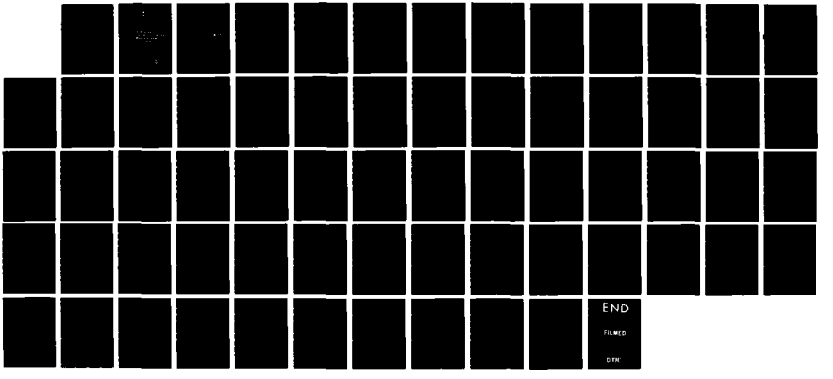

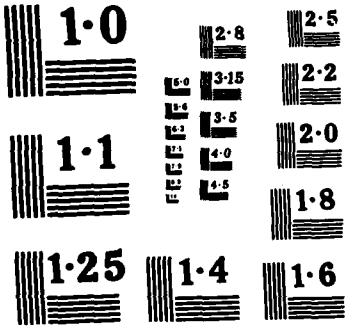

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MICROCOPY RESOLUTION TEST CHART

AD-A157 802

March 1985

United States Air Force
Personnel Force Composition Study:

An Analysis of the Effects of Varying Male and Female Force Levels

ANNEX TWO:

A Dynamic Model to Estimate Availability for Military Service of American Youth, Age 18 to 23, Through the Year 2000

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prepared for the

USAF Special Study Team
Headquarters,
United States Air Force

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FINAL REPORT - VOLUME II

A DYNAMIC MODEL TO ESTIMATE THE AVAILABILITY FOR MILITARY SERVICE OF AMERICAN YOUTH, AGE 18 TO 23, THROUGH THE YEAR 2000

FEBRUARY 11, 1985

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PREFACE

This report, A Dynamic Model to Estimate the Availability for Military Service of American Youth, Age 18 to 23, Through the Year 2000, constitutes the second of three volumes, and was prepared in partial fulfillment of Air Force Contract No. F49642-84-D0038, by Syllogistics, Inc. Captain Daniel L. Burkett II, USAF, AF/MPZ Special Study Team, monitored this endeavor.

Thanks are extended to Captain Daniel L. Burkett II, and to Colonel Douglas A. Patterson for providing their professional support and guidance to this effort. Special thanks are also extended to Dr. Brian Waters, Human Resources Research Organization, for expert performance and input as subcontractor to Syllogistics. A final note of appreciation is extended to the Syllogistics secretarial staff for superior word-processing support; Ms. Dottie Norton, Ms. Teresa Hunter, and Ms. Donna Schoonover.

The views and opinions expressed in this report are those of the authors and should in no way be interpreted as an official position, policy, or decision of any Government Agency, unless so designated by other official documentation.

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EXECUTIVE SUMMARY

An objective of the USAF Special Study Team is to document the changing number of enlistment age youth through the year 2000. In support of this objective Syllogistics was tasked to define, develop and execute a dynamic model that estimates the availability (for military service) of American youth, age 18 to 23, through Fiscal Year (FY) 2000. This Volume presents that model and its results. The model is designed to forecast future streams of qualified and available youth, in each year-of-age from 18 to 23, given planned total Department of Defense active duty, Reserve and Guard non-prior service (NPS) accession needs.

The model uses Bureau of the Census data to estimate the number of 18 to 23 year olds for each year through FY 2000. These numbers are adjusted to take account of forecast rates of institutionalization in order to determine base population estimates for each year of age. Persons qualified and available for military service are, for the purpose of this report, defined to be all NPS persons fully qualified -- mentally, physically, and morally -- for enlistment in at least one of the four services. Physical and moral qualification rates were derived by combining the best available data sources, and we believe the resulting rates represent the best approximation available.

In sum, the model documents a decline of about 22% in the 18 to 23 year old qualified military available population between FYs 1984 and 1996. The percentage of qualified non-prior service 18 to 23 year old males required to access in order to meet NPS accession needs peaks in 1996 at 7.5%. A more precise measure of cohort participation is constructed by year-of-birth cohorts.

Birth year cohort military participation rates -- as measured by the percentage of qualified individuals that access at any time after their eighteenth birthday -- are lowest as measured in FYs 1980 through 1985, and highest as estimated in FYs 1995 through 1998.

It is important to note that population decreases are not exactly correlated with increases in recruiting difficulty. Volume III of this study, The Prospects for Military Enlistments: An Assessment demonstrates that other factors, such as increased female participation in the labor market, will offset the effects on military recruiting of decreasing availability of qualified persons aged 18 to 23.

TABLE OF CONTENTS

		PAGE
EXECUTIVE SUMMARY		i
1	INTRODUCTION	1-1
2	CONCEPTUAL FRAMEWORK	2-1
3	MATHEMATICAL SPECIFICATION	3-1
4	THE DATA	4-1
	4.1 Overview	4-1
	4.2 Projection of Total Population	4-1
	4.3 Institutionalized Population	4-7
	4.4 Qualification Rates for Military Service	4-8
	4.4.1 Aptitude and Education	4-9
	4.4.2 Medical Standards	4-10
	4.4.3 Moral Standards	4-17
	4.4.4 Overall Military Qualification Rates	4-21
	4.5 Accession Requirements	4-22
5	THE RESULTS	5-1
6	CONCLUSIONS/RECOMMENDATIONS	6-1
APPENDIX A - DATA TABLES		A-1

SECTION 1

INTRODUCTION

Our primary objective in this Volume is to define, develop, and execute a model which forecasts future streams of qualified age 18 to 23 military-available populations given planned accession needs. Qualified military available persons are, for the purposes of this report, defined to be all non-prior service (NPS) individuals fully qualified -- mentally, physically, and morally -- for enlistment in at least one of the four services. Prior service includes any prior duty in any branch of the Service -- active and/or reserve. Maximum availability is predominantly affected by natality, mortality, and immigration rates. The model, therefore, uses Bureau of the Census population projections of these rates as a key input.

The model is unique in the sense that it forecasts availability from 1974 through the year 2000. Although historical data are available for the 1974 to 1984 time period these outcomes cannot be considered nationally representative. The paradox lies in the fact that, as historical observers, we can only observe what has happened, not what could happen or even what might be expected to happen. The model does, however, use actual 1974 to 1983 accession data to establish a baseline period as a point of departure.

The model and its results are discussed in subsequent sections. Sections 2 and 3 define the model's conceptual framework and specify the model mathematically. Section 4 discusses how the model's parameter estimates and input data were derived. The projections of qualified and available youth population are presented in Section 5, Results. Finally, our conclusions and recommendations are presented in Section 6.

SECTION 2

THE MODEL - A CONCEPTUAL FRAMEWORK

Because our model is designed to forecast future streams of qualified military-available populations given planned accession requirements, it must be dynamic in the sense that an estimate derived in one time period must account for events occurring in other time periods. For example, an 18 year-old who is accessed into the service in one year cannot be considered available for NPS accession in future years. This dynamic underpinning should become increasingly clear as the model is specified in subsequent sections.

In general, for any given year, we want to project the number of persons qualified for at least one military Service. The absolute number of persons available at any one time is predominantly determined by natality, mortality, and immigration rates. Qualification is determined by evaluating a time period's population with respect to prevailing enlistment standards. These standards are known to include separate age, educational, mental, physical and moral requirements.

Since we are primarily concerned with the availability of NPS accessions, persons who are or were previously serving must be removed from future consideration. Since a person may come into any service either as an active duty or reserve enlistee, the model must consider total Department of Defense NPS enlistee accession requirements.

SECTION 3

MATHEMATICAL SPECIFICATION

The model is required to estimate the number of persons aged 18 to 23 qualified for NPS enlistment for given time periods (QMA_t). For purposes of this study we have restricted the time periods (t) to the years from 1974 to 2000. The population of interest is restricted to ages 18 to 23 because this age group accounts for about 90% of all NPS enlistments, as will be shown later.

To solve QMA for any time period (t) requires two inputs -- the number of qualified persons in time (Q_t) and the number of persons qualified, but not available for that same time period (NA_t). Therefore:

1) $QMA_t = Q_t - NA_t$.

To solve for Q_t, the number of persons qualified in year t, requires the evaluation of persons in year t with respect to service accession standards. These standards consist of mental (MENTAL), physical (PHYS), and moral (MORAL) requirements (the specific standards are explained in Section 4.) Assuming independence of variables MENTAL, PHYS, and MORAL, qualification rates can be applied to the total population (P_t).

2) $Q_t = P_t * MENTAL_t * PHYS_t * MORAL_t$.

Since the total population is restricted to include only the 18 to 23 year old non-institutional population, each of the qualification rates must be derived for this specific population.

The number of persons qualified but not available, NA_t, is derived by adding up the number of persons in the 18 to 23 year old age group who have entered service during previous time periods. Since the probability of accession varies with respect to age, we estimate NA_t for each year of age (y) separately, and sum the results across all ages. To do this also requires that we estimate, separately for each year of age, the number of qualified persons. We can re-specify equation 2) as:

$$3) \quad Q_{y,t} = P_{y,t} * MENTAL_{y,t} * PHYS_{y,t} * MORAL_{y,t}.$$

where $y = (18, 19, \ldots\ldots, 23)$

$t = (1974, 1975, \ldots\ldots\ldots\ldots, 2000)$

and all other variables have been previously defined.

The population qualified, yet not available, must also be revised to account for individual age probabilities of non-availability. The total number of persons age (y) in year (t) that are not available for accession is given below in equation 4):

$$4) \quad NA_{y,t} = Q_{y,t} - \sum_{y} (w_{y-1,t-1} * QMA_{y-1,t-y-18}).$$

where $w_{y,t}$ = the probability of persons age (y) accessing in year (t).

It might prove helpful here to verbalize equation 4) for a given time period and age cohort. For example, we can set the year to 1995 and the age cohort to 23 year olds ($t = 1995$, $y = 23$). Equation 4) is then read as:

The total number of 23 year olds not available for non-prior service accession in 1995 is equal to the total number of 23 year olds qualified for accession in 1995 less those persons who accessed in 1994 at age 22; less those persons who accessed in 1993 at age 21, less those persons who accessed in 1992 at age 20, less those persons who accessed in 1991 at age 19, less those persons who accessed in 1990 at age 18 and, finally, less those persons who accessed in 19890 at age 17 (seventeen is the lowest allowable accession age and usually accounts for less than two percent of total accessions).

The probability of person age (y) being in accession in year t, $w_{y,t}$, still remains to be derived.

Although there is no way of knowing what the real age distribution for a given year's accession cohort will be, the distribution can be estimated by making some reasonable assumptions regarding age cohort accession rates. For example, consider Table 3-1, (on the following page) which presents the historical age distribution of DoD NPS accessions.

It can be seen that each age group's representation varies slightly from year to year. There exist several explanations of this phenomenon. A policy decision to restrict entry of non-high school graduates will restrict the relative number of 17 year olds, since less than 25% of a given 17 year old cohort are high school graduates in a fiscal year. Because most school systems require students to be six by January 1 to start first grade for the previous fall term, it stands to reason that less than one-fourth of high school graduates will be 17 at the end of a fiscal year. It is beyond the scope of this modeling effort to project policy changes.

TABLE 3-1

AGE DISTRIBUTION OF TOTAL DOD NPS ACCESSIONS BY FISCAL YEAR

AGE	FISCAL YEAR 82	81	80	79	78	77	76	75	74	AVG	MIN	MAX
17	.0097	.0215	.0371	.0299	.0277	.0418	.025	.0189	.0359	.0275	.0097	.0359
18	.2194	.2377	.2559	.2767	.2776	.2839	.1792	.1833	.2111	.2361	.1792	.3206
19	.2758	.2753	.2815	.2928	.2876	.2755	.3206	.3169	.3190	.2939	.2755	.3206
20	.1756	.1788	.1702	.1592	.1591	.1592	.2028	.2057	.2050	.1792	.1572	.2051
21	.1033	.1023	.0902	.0843	.0880	.0834	.1027	.1129	.1010	.0965	.0834	.1129
22	.0662	.0576	.0557	.0517	.0527	.0521	.0625	.0636	.0510	.0569	.0510	.0662
23	.0455	.0399	.0379	.0343	.0345	.0357	.0396	.0381	.0330	.0376	.0330	.0455
24	.0319	.0280	.0257	.0235	.0250	.0238	.0247	.0251	.0181	.0251	.0181	.0319
25	.0248	.0189	.0174	.0160	.0170	.0168	.0165	.0139	.0095	.0168	.0095	.0248
26	)155	.0128	.0189	.0112	.0107	.0102	.0098	.0079	.0057	.0114	.0057	.0155
27*	.0346	.0268	.0234	.203	.0202	.0195	.0159	.0142	.0107	.0206	.0107	.0346
18-23	.8858	.8916	.8914	.8990	.8995	.8898	.9074	.9205	.9201	.9006	.8858	.9205

*Age 27 includes all NPS accessions of persons age 27 and greater.

Source: Defense Manpower Data Center, Accession Data Base, 1983.

reasons.[1] Nearly all youths in these age cohorts in 1964 had been evaluated under standards which had been in effect since August 1958, when the Congress had authorized an increase in the relatively low mental test standards previously used. The close correlation between the results of the Karpinos and the 1964 studies provides reasonable confirmation that they accurately reflected the impact of prevailing screening standards. The Karpinos results are summarized in Table 4-1.

TABLE 4-1

DISQUALIFICATION RATES FOR MILITARY SERVICE, BY CAUSE
AUGUST 1958 TO JUNE 1960

CAUSE OF DISQUALIFICATION	PERCENT DISQUALIFIED		
	ALL EXAMINEES	ENLISTMENT APPLICANTS	DRAFTEES
Total, All Causes	**31.7**	**7.3**	**51.2**
Mental Reasons Only	11.5	1.4	23.6
Medical Reasons Only	14.8	5.5	22.1
Medical and Mental Reasons	1.5	0.2	3.1
Administrative (Mainly Moral)	3.9	0.2	2.4

Source: B. Karpinos, Qualification of American Youths for Military Service, Office of The Surgeon General, Department of the Army, 1962, pp. 63-64.

Using the Karpinos estimates of the percentage of all male youth disqualified under the 1958-60 medical standards as our point of departure, the adjustments described in succeeding paragraphs were made to derive the percentages of all young men and women who would be disqualified under current Army medical standards.

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1 Albert D. Klassen, Jr., Military Service in American Life Since World War II, National Opinion Research Center, University of Chicago, September 1966. Since not all persons in this age group potentially liable for military service under the draft had been referred for preinduction examinations, it is possible that the true cohort disqualification rate for this age group (i.e., reflecting additional screening through age 25) was somewhat higher than 32.2%. This would however, be consistent with our assessment (beginning on page 4-13) of the effect of a more rigorous interpretation of height-weight standards after 1961.

Fortunately, for our purposes, medical qualification standards have undergone limited change since the era of large scale inductions in the 1950s and 1960s, when a more representative cross-section of young men was subjected to military screening. Present Army Regulation 40-501, "Standards of Medical Fitness", was originally issued in December 1960. Although over 40 amendments to this regulation have been issued since then, most of the revisions either were not applicable to initial enlistment standards, or were of a highly specialized nature and could not be expected to have a significant effect upon overall NPS medical qualification rates. One exception to this pattern, revised height-weight standards, is discussed separately below.

The most comprehensive analysis of post-World War II military examination experience is found in a study by Dr. Bernard Karpinos published in 1962.[1] Karpinos integrated data on screening of draftees and male enlistment applicants from a variety of sources, including local draft boards, pre-induction and final inspection examinations and processing of enlistment applicants for either active or reserve duty. The overall disqualification rate of 31.7 percent for the period August 1958 to June 1960 based on this analysis, is reasonably consistent with the findings of a subsequent sample survey of the military service experience of American youth conducted in 1964 for the Department of Defense. In the latter survey, 32.2 percent of youths age 16 to 23 who had been evaluated for military service (including those already in the armed services) reported that they had been found unfit for service for mental, medical or other

---

1 Bernard Karpinos, Qualification of American Youth for Military Service, Office of The Surgeon General, Department of the Army, 1962.

Education Development Certificate of Equivalency (GED), or a non-high school graduate who never received a GED. The specific standards which have been in effect in the Army since 1981 are:[1]

EDUCATIONAL LEVEL	MINIMUM AFQT SCORE	MINIMUM APTITUDE COMPONENT SCORE
High School Diploma Graduate	16	85 on any 1 area
GED	31	85 on any 1 area
Non-High School Graduate	31	85 on any 2 areas

Based on the results of the 1980 NORC survey, 76.3% of all young men age 18 to 23, and 78.3% of young women, would meet these Army aptitude and educational standards.

4.4.2 Medical Standards

In contrast to the availability of current population-based estimates of qualification on the military aptitude tests, no analogous data base is available with respect to medical standards. The results of medical examinations of enlistment applicants at the MEPS are manifestly inappropriate for this purpose. It seems plausible that most young persons who are aware that they have a significant medical impairment are unlikely to apply for enlistment. Others are screened out by military recruiters based on simple check lists of manifestly disqualifying conditions. Hence, medical rejection rates at MEPS for enlistment applicants have historically been below those to be expected for the youth population as a whole.

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1 Eitelberg, et al., Op. Cit., Table 19, p. 66.

recruits, accounting -- for example -- for 45 percent of all non-prior service enlistments in FY 1983.[1] In addition, the Army's minimum enlistment standards have also tended to be slightly lower than those of the other Services.

4.4.1 Aptitude and Education Criteria

In the Spring and Summer of 1980, the National Opinion Research Center (NORC) administered the ASVAB to a nationally representative sample of nearly 12,000 young persons, aged 15 to 23, to provide current normative data for use in calibration of the scores on this test battery. Using this data base, estimates were developed of the proportions of young men and women in the prime enlistment ages (18 to 23 years) who would meet the prevailing minimum aptitude and education standards.

These minimum standards are based on several factors, including: (1) achieving a minimum percentile score on the Armed Forces Qualification Test (AFQT), which is a composite of certain verbal and quantitative subtests of the ASVAB, designed to provide a general measure of trainability for service; and (2) achieving a minimum standard score in one or more aptitude area composites designed to measure aptitude for training in particular military occupational areas. These standards vary, depending upon whether the applicant is a high school diploma graduate, a non-diploma graduate who has received a General

---

1 Based upon Department of Defense News Release on Fiscal Year 1983 Manpower End Strengths.

4.4 QUALIFICATION RATES FOR MILITARY SERVICE

In order to qualify for enlistment, potential recruits must meet the prevailing aptitude, educational, medical and moral standards of acceptability for military service. The basic standards are prescribed in the regulations of each of the Military Departments. With limited exceptions, notably with respect to height-weight standards, the medical standards (physical and psychiatric) have been the same for all services, and are administered through medical examinations conducted for all services at joint Military Entrance Processing Stations (MEPS). Although a common military aptitude test, the Armed Services Vocational Aptitude Battery (ASVAB), is also used by all services, each service has some discretion in setting its own minimum aptitude standards for enlistment, using various combinations of scores on subtests of the ASVAB, and related educational criteria (high school graduation status). The screening of applicants, based on moral standards, is separately administered by each Service based on its own procedures and regulations. For a detailed history and analysis of the military screening process, see Screening for Service, 1984.[1]

For the purpose of projecting the qualified population available for enlistment, estimates of the proportions of young men and women qualified for enlistment were based upon the current Army standards. These standards were adopted as the "norm" for our purposes for two reasons: first, among the four military services, the Army has been the largest single claimant for new

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1 Eitelberg, Lawrence, Waters and Perelman, Screening for Service: Aptitude and Education Criteria for Military Entry, Office of Assistant Secretary of Defense (Manpower, Installations and Logistics), September 1984.

For present purposes, we have therefore assumed that population projections based on the middle and high net immigration assumptions represent a realistic range for use in estimates of the total enlistment age population to the year 2000.

4.3 INSTITUTIONALIZED POPULATION

The institutionalized population includes persons confined to correctional institutions, mental hospitals, homes or schools for the mentally disabled, or similar facilities. Estimates of the percent of the 18 to 23 year old total population that were in such institutions as of April 1980 are given here as 1.5% (males) and .31% (females).[1]

The much higher proportion of young men in institutions, compared to women, is accounted for by the fact that a large proportion of all institutionalized persons in these ages are prisoners in correctional institutions and this population is predominantly male.

We have assumed that the relatively small number of institutionalized persons aged 18 to 23 years for the balance of the century will represent a constant proportion, based on the 1980 Census ratios, of the population in the corresponding age-sex groups.

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1 U.S. Bureau of the Census, Projections of the Population of the United States by Age, Sex and Race: 1983 to 2000, p. 173. (Based on prorated values of separate estimates of 15 to 19 and 20 to 24 year olds.)

However, this assumption implies that future control over illegal alien inflows will be much more effective than in the recent past. The legislative history of the Simpson-Mazzoli Bill, as well as of earlier attempts to inhibit illegal immigration through imposition of sanctions against employers of illegal aliens, does not provide a strong basis for optimism on this score. Moreover, as noted by the authors of a recent Urban Institute study of immigration in Southern California, illegal immigration tends to feed on itself:

> "Forces that encourage people to leave their countries of origin are rising in many parts of the world. These forces include economic and political difficulties, which create pressures on middle-class as well as unskilled workers to leave...Moreover, entry into the United States, and particularly California, is facilitated by the existence of a large network of immigrants, particularly Mexicans but also Asians, already in California. This network..., combined with easy travel across the southern border in both directions, makes it relatively easy for undocumented immigrants to enter Southern California. Immigrant entry since 1980 is already up compared to the 1970s".[1]

The Urban Institute study further concludes that "the employer sanctions in the Simpson-Mazzoli bill considered by the Congress appear too weak to affect those employers whose economic benefits from hiring these workers is substantial". These considerations suggest that the Census Bureau's "high immigration" assumption may be as realistic an assumption as that based on the "middle" series.

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1 Thomas Muller, The Fourth Wave: California's Newest Immigrants: A Summary, The Urban Institute, Washington, D.C., 1984, pp. 25-26.

enumeration -- has been that the latter total is not likely to exceed one to two million, thus implying a total of possibly three to four million illegal aliens.

In the face of the growing importance and volatility of recent legal immigration, and of the additional evidence concerning the volume of illegal immigration, the Census Bureau -- for the first time -- provided users with population projections incorporating a range of assumptions on the future levels of total net immigration, including illegals. These range from a "low" estimate of 250,000 net annual immigration, through a "middle" estimate of 450,000, to a "high" of 750,000. The "low" estimate, as described by the Census Bureau, would correspond to conditions which might be expected under depressed economic conditions here, combined with a more restrictive immigration policy. The "middle" estimate corresponds to the estimated rate of net immigration in 1983, which was considerably lower than in 1980-81; it makes no allowance for future large-scale refugee inflows similar to those of the recent past, or for any substantial volume of illegal immigration. The "high" estimate of 750,000, however, implies a combined inflow of refugees and illegal aliens at an annual rate of 424,000 more than assumed in the middle series, but is partially offset by an assumed higher rate of outmigration.

We do not consider any one of the above assumptions to be completely satisfactory for our purposes. We believe the "low" assumption of 250,000 net immigration to be the least probable, since it is predicated on a sustained period of depressed economic conditions and makes no explicit allowance for either refugee or illegal alien immigration. The "middle" assumption is somewhat more realistic, in that it conforms to the most recent legal immigration experience in the absence of any large scale refugee programs.

with the "cautious speculation" that "the total number of illegal residents in the United States for some recent year, such as 1978, is almost certainly below 6.0 million and may be substantially less, possibly only 3.5 to 5.0 million".[1]

Some confirmation for the lower range of the above estimates is provided by a subsequent analysis by Census Bureau demographers designed to estimate how many illegal aliens were actually counted in the 1980 United States Census of Population. The estimates were derived by comparing the Census counts of all aliens residing in this country, by age, sex, and period of entry, with the corresponding number of recorded resident aliens, based on data maintained by the Immigration and Naturalization Service (INS) under the Alien Registration Program.

After correction of the latter data for under-registration, it was found that the INS data estimating the number of legal resident aliens was about 2.0 million lower than the number enumerated in the 1980 Census.[2] This difference has been interpreted as the number of illegal aliens enumerated in the Census, thus providing a floor on the total number of illegal aliens. Although the authors of this paper did not hazard a guess as to the additional number of illegal residents here who were not counted in the Census, the prevailing judgment -- based on extensive experience with other aspects of Census under-

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1 Jacob S. Siegel, Jeffrey S. Passell and T. Gregory Robinson, Preliminary Review of Existing Studies of the Number of Illegal Residents in the United States. Released by U.S. Bureau of the Census, January 31, 1980.

2 Robert Warren and Jeffrey S. Passell, Estimates of Illegal Aliens from Mexico Counted in the 1980 United States Census. Paper presented at the annual meeting of the Population Association of America, Pittsburgh, Pa., April 14-16, 1983.

The gross volume of immigration has, of course, been larger than the net figures, since the latter allow for the outflow of United States residents to other countries. Thus, in the year 1980, gross immigration was reported at 808,000 -- the highest annual total since the establishment of numerical quotas on immigration in the early 1920s.[1] Of this total, only 290,000 were admitted under the annual quotas. An additional 151,000 included immediate relatives of U.S. citizens or resident aliens, who are exempt from these numerical limits under the law. The remainder, totaling 367,000, included various categories of refugees admitted under special refugee legislation, as well as Cuban and Haitian "boat people", who entered here illegally but who were permitted to continue in residence here under special administrative procedures.

In addition to these reported flows of immigrants, it is evident that large numbers of unreported and undocumented aliens have entered and established residence in the United States in recent decades. Efforts to quantify the numbers of such illegal aliens have met with limited success. In its 1981 report, the Select Commission on Immigration and Refugee Policy cited a range of 3.5 to 6.0 million as the most reasonable approximation of the number of undocumented aliens residing here at that time. That estimate was based on a careful review of a wide range of earlier estimates, conducted by a team of Census Bureau demographers led by Jacob S. Siegel. The Siegel report concluded that some of the publicized conjectures as to the number of illegal residents here, ranging to as high as 12 million, lacked any empirical foundation and that even the more empirically based estimates were seriously flawed. It concluded

---

1 U.S. Immigration Policy and the National Interest. Staff Report of the Select Commision on Immigration and Refugee Policy, April 30, 1981, p. 29.

Of the three variables affecting population growth, only the assumption concerning future immigration will have a significant effect upon trends in the size of the population aged 18 to 23 to the year 2000.

- The fertility assumption is completely irrelevant for our purposes, since persons attaining age 18 in the years 1983 to 2000 were already alive in 1982.

- The differences in mortality trends under the Census Bureau's three alternative assumptions are also found to be relatively small in their impact upon the 18 to 23 year old population during the period to 2000. To illustrate, the difference between the "high" and "low" mortality projection for the entire 15 to 24 year age group is only 1.4 percent in 1995.[1] For the present analysis, the Census Bureau's "middle" mortality assumption has, therefore, been used.

- In contrast, the assumption concerning future net immigration trends can be expected to have a significant impact. Since 1970, the volume of reported net immigration has grown substantially, from an annual average of 359,000 in 1970-74, to 551,000 per year in 1980-82. As a result of this growth, and of the leveling off in the rate of natural population increase, reported immigration has accounted for an increasing percentage of total population growth, rising from 16.9 percent to 24.2 percent of the total average annual net population increase between 1970-74 and 1980-83.[2]

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1 Ibid.

2 U.S. Bureau of the Census, Statistical Abstract of the United States, 1984, p. 9.

SECTION 4

THE DATA

4.1 OVERVIEW

This section contains detailed descriptions of data used in deriving the estimates of the qualified and available enlistment pool. Included are separate discussions of methodology and source data with respect to: (1) projections to the year 2000 of the age 18 to 23 population; (2) estimates and projections of the institutionalized population; and, (3) estimates of mental aptitude, physical, and moral disqualification rates. The detailed projections of the qualified and available enlistment pool by single years of age are separately presented in Appendix A to supplement the summary data appearing in the text of the report.

4.2 PROJECTIONS OF TOTAL POPULATION, AGES 18 TO 23

In its most recent set of population projections,[1] the Bureau of the Census has developed a series of projections for the years 1983-2080, based on actual population estimates as of July 1, 1982, and on alternative assumptions concerning future trends in fertility, mortality and net immigration levels. For each of these three components of population change, separate projections are presented based on "low", "middle", and "high" assumptions.

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1 U.S. Bureau of the Census, Projections of the Population of the United States by Age, Sex and Race: 1983-2080. Current Population Reports, Series P-25, No. 952, June 1984, p. 1.

6) $B_y = (\sum_t POPPERC_{yt})/n$

where $POPPERC_{yt}$ = Percent of total 18 to 23 year old population represented by age group (y) in year (5).

$t = (1974, 1975, \ldots, 1982)$.

7) $w_{yt} = A_y * B_y/POPPERC_{yt}$.

The model is not defined for years prior to 1974. Therefore, it cannot derive estimates of 18 to 23 year old prior service individuals for 1974. In order to "prime-the-pump", the actual 1973 number of total 18 to 23 year old prior service individuals was built into the model as a starting value.

Population shifts within the 18 to 23 year old age group are likely to affect the age cohort's representation in any one year. The number of youth by age in a specific year will vary as mortality, immigration and historic natality rates change. The net effect is that, as a particular age group becomes relatively smaller, a higher percentage of accessions must be drawn from other age groups.

In order to account for this phenomenon, a procedure was developed that estimates the percentage of accessions represented by each 18 to 23 year old age group. By using actual data from FY 1974 to FY 1982 on the average percentage of active duty NPS accessions (Table 3-1) by age (A_y) and census estimates of the average percent of 18 to 23 year olds, by age, by year from 1974 to 1982 (B_y), a baseline estimate is established. By adjusting each A_y by the ratio of the baseline B_y to the actual 18 to 23 population distribution in year (t), $POPPERC_{yt}$, the w_{yt} are derived. The baseline derivation is given in equations 5) and 6), while the adjustment procedure is given in equation 7).

$$5) \quad A_y = \left(\sum_t DISTPERC_{yt} \right)/n$$

where $DISTPERC_y$ = Percentage of total active duty NPS accessions represented by age group (y), as given in Table 3-1,

and $y = (18, 19, \ldots, 23)$

$t = (1974, 1975, \ldots, 1982)$.

$n = \left(\sum_t - (t-1) \right)$.

Our review of revisions in the Army medical standards for men since the late 1950s indicated that the most significant change affected administration of the maximum weight standard. The Army standard is based on a table specifying maximum (as well as minimum) weights for each height, from 60 inches up to 80 inches. Since 1959, these maximum weights have also varied by age groups 16 to 20 and 21 to 30. In 1961, these maximum weights were substantially increased. Thus, in the case of an 18-year-old youth 69 inches tall, the maximum weight was raised from 181 pounds to 208 pounds. Despite this apparent liberalization, Karpinos found that the draftee disqualification rate due to overweight had increased sharply between 1957/58 and 1969/70, and that by the latter period it had become the largest single cause of medical rejection of draftees. This has been attributed to the fact that: the Army regulation prior to 1961 gave considerable discretion to examining medical officers, particularly in qualifying examinees weighing in a range up to 15 percent above the stated maximums; after 1961, however, no discretion was permitted to examiners in the application of these standards.[1]

In order to estimate the proportion of all young men and women who would not meet the current maximum weight standards, we have used published data from the Health and Nutrition Examination Survey (HANES-I) conducted by the Public Health Service in 1971-74, based on comprehensive examinations of a representative sample of 20,749 persons aged 18 to 74 years. The available data permit

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1 Bernard D. Karpinos, Draftees: Disqualification for Military Service for Medical Reasons -- An Analysis of Trends Over Time, OASD (M&RA), Manpower Research Report No. MA72-1, June 1972, pp. 23-24.

estimation of the percentage of young men and women aged 18 to 23 who were overweight based on the current Army standards, with respect to a range of heights covering a substantial proportion of all persons in these ages.

As shown in Table 4-2, for young men in the height range 63 to 72 inches who represented 37.5 percent of the HANES-I sample in the 18 to 23 age group, 4.4 percent would not qualify for enlistment into the Army based on current standards.[1]

Based on these data, the current overall disqualification rates for men for all medical causes has been estimated as 19.1 percent using the Army standards. The detailed estimating procedure is described in Table 4-3.

Medical examination standards for enlistment are currently the same for men and women, with the exception of height-weight tables and certain sex-specific medical conditions. In arriving at estimates of the overall medical disqualification rate for women, the approach used was: (1) to develop data on the relative prevalence of certain major disqualifying conditions among young women, as compared to men, which could be used to modify for application to women the estimated overall rejection rate for men for causes other than overweight; and, (2) to add to this estimate the additional proportions of women who would be disqualified for either overweight or female disorders.

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[1] Estimates for heights above 69 inches could not be precisely derived from the published data, since the weight distribution grouped persons of all ages with weights of 210 pounds or more. However, our inspection of the distributions indicated that the proportions overweight at heights above 69 inches probably equalled or exceeded the 4.4 percent average.

TABLE 4-2

ESTIMATED PERCENT OF MEN AND WOMEN, AGED 18 TO 23, WHO ARE OVERWEIGHT BASED ON HEIGHT AND WEIGHT STANDARDS[1]

HEIGHT (INCHES)	STANDARDS[2] MAXIMUM WEIGHT	% OVERWEIGHT
MALES		
63	177	7.6
64	182	10.2
65	188	5.2
66	194	4.4
67	200	6.6
68	206	1.7
69	212	-
70	218	-
71	224	-
72	230	
WEIGHTED AVERAGE		4.4
FEMALES		
60	126	32.6
61	128	31.0
62	130	27.4
63	135	36.7
64	138	28.7
65	142	24.2
66	146	29.3
67	149	25.3
WEIGHTED AVERAGE		29.3

1. Adapted from distributions of weights by height for men and women aged 18 to 24 years, from the Health and Nutrition Examination Survey (HANES-I) conducted by the Public Health Survey in 1971-74. Estimates based on interpolations within 10-pound weight group. Data not available in the published tables, with respect to height/weight ranges, for height intervals not shown in this table. **Source:** Public Health Service, National Center for Health Statistics, Weight by Height and Age for Adults 18-74 Years, United States, 1971-74, Tables 8 and 15.

2. Army standards from AR 40-501, Medical Services: Standards of Medical Fitness, Appendix III, Tables 1 and 2 (27 May 1976). The maximum standards shown are a mean of the standards for ages 16 to 20 years and 21 to 30 years, rounded down to allow for the larger proportion of examinees below age 21.

TABLE 4-3

DERIVATION OF MEDICAL DISQUALIFICATION RATES FOR MEN

		RATE
A.	Overall male medical disqualification rate, 1958-60.[1]	16.3
B.	Less percent of examinees disqualified as overweight based on 1958-60 standards.[2]	0.9
C.	Male disqualification rate, 1958 to 1960, other than overweight. Line (A) minus line (B).	15.4
D.	Estimated prevalence of overweight based on current standards and HANES-I.[3]	4.4
E.	Estimated current net overweight disqualification rate, allowing for multiple causes of disqualification. Line (D) times .835.[4]	3.7
F.	Estimated current overall male disqualification rate. Line (C) plus line (E).	19.1

1. See Table 4.1. Includes failures on both medical and mental examinations.

2. In 1957/1958, 5.65% of all draftees failing the medical examination were disqualified due to overweight, according to Karpinos 1972 Study (Op. Cit., Table 6). This percentage applied to the overall medical rejection rate of 16.3% for 1958 to 1960 resulted in the estimated rate of 0.9%.

3. See HANES-I (Op. Cit., Table 2).

4. Based on ratio of disqualification rate (primary diagnosis) to prevalence rate of .835 for draftees examined in 1969 to 1972. See Karpinos 1972 Study, (Op. Cit., Table 5).

Our review of the HANES-I publications and of related epidemiological literature identified five major categories of disqualifying conditions, with respect to which estimates could be made of the female/male prevalence ratio. These included (1) hypertension, (2) psychiatric disorders, (3) defects of joints, (4) ear defects and diseases, and (5) eye defects and diseases. The specific diagnostic conditions, or measures, on which the female/male ratios were based are identified in the footnotes to Table 4-4. It should be noted that -- unlike height-weight data -- the available published data on prevalence of these five categories of diagnosis could not be directly matched with the criteria specified in the Army qualification standards. To illustrate, the Army Regulation 40-501 (paragraph 2-13) qualification standard for distant visual acuity is a corrected vision of at least one of the following: (1) 20/40 in one eye and 20/70 in the other eye; or (2) 20/30 in one eye and 20/100 in the other eye; or (3) 20/20 in one eye and 20/400 in the other eye. Since the precise standards could not be directly matched in the HANES-I data for the specific age group of 18 to 24 years, an estimate of the female-male prevalence ratio of vision defects for this age group was derived on the basis of the relative proportion of persons with corrected vision of 20/50, or more, in the better eye, averaging ratios for two age groups (ages 12 to 17 and 18 to 44). The composite female physical qualification rate is derived in Table 4-5.

4.4.3 Moral Standards

Under existing service policies, enlistment applicants may be morally disqualified as a result of: records indicating frequent and/or serious difficulties with law enforcement agencies; significant drug or alcohol abuse problems; homosexuality or sexual perversion; or for similar reasons indicating that the applicant would likely become a serious disciplinary problem or

TABLE 4-4

DERIVATION OF FEMALE/MALE DISQUALIFICATION RATIO
FOR CONDITIONS OTHER THAN OVERWEIGHT AND FEMALE DISORDERS

DIAGNOSTIC CONDITION	DRAFTEE DISQUALIFICATIONS PER 10,000 EXAMINED 1969-70[1]	FEMALE-MALE PREVALENCE RATIO
Hypertension	308	.439[2]
Psychiatric Disorders	233	1.010[3]
Defects of Joints	213	.912[4]
Ear Diseases and Defects	209	.570[5]
Eye Diseases and Defects	187	1.425[6]
Total/Average	1,150	.826[7]

1. Karpinos 1972 Study (Op. Cit., Table 5).

2. National Health Survey (HANES-I), Series 11, No. 203. Based on diastolic and systolic readings about Army standards, for persons aged 18 to 24.

3. Jerome K. Myers, et al., "Six-Month Prevalence of Psychiatric Disorders in Three Communities", in Archives of General Psychiatry, October 1984, Vol. 41, No. 10, Table 10. Based on prevalence among 18 to 24 year olds of any of the surveyed DIS-DIM-III disorders or severe cognitive impairments in three communities (New Haven, Baltimore, St. Louis), surveyed in 1980-82.

4. National Health Survey (HANES-I), Series 11, No. 213. Based on reports of significant, persistent pain in knees for at least one month, among persons aged 25 to 34.

5. National Health Survey (HANES-I), Series 11, No. 215. Based on average of female/male prevalence ratios of audiometer readings for right ear, in excess of 31 and 51 d.b., for persons aged 25 to 34, at 500, 1,000, 2,000, and 4,000 cycles.

6. National Health Survey (HANES-I), Series 11, No. 201. Based on 20/50 vision or worse in better eye, using average of female/male prevalence ratios for persons aged 12 to 17 and 18 to 44.

7. Weighted average.

TABLE 4-5

DERIVATION OF MEDICAL DISQUALIFICATION RATES FOR WOMEN

		RATE
A.	Male disqualification rate, 1958 to 1960, excluding overweight (See Table 4-3)	15.4%
B.	Female/male disqualification ratio, selected conditions (See Table 4-4)	(.826)
C.	Female disqualification rate, excluding overweight and female disorders	12.7%
D.	Percentage of women overweight (See Table 4-2)	29.3%
E.	Net disqualification rate due to overweight[1]	24.5%
F.	Estimated disqualification rate due to female disorders[2]	1.0%
G.	**Estimated female disqualification rate for all medical conditions — lines (C) plus (E) plus (F)**	38.2

1. Based on ratio of .835 prevalence rate of overweight among draftees examined in 1969/1970 to disqualification rate for overweight, as the primary disqualifying factor. Karpinos 1972 Study (Op. Cit., Table 5).

2. In FY 1983, 0.35 percent of female applicants at MEPS were disqualified as a result of the pelvic examination, according to DMDC data. This percentage was adjusted upward by the ratio of the estimated female disqualification (excluding overweight and female disorders) of 12.7% to the corresponding female enlistment applicant rejection rate of 4.4%.

threaten unit morale. Evidence of repeated minor offenses, or of one or more serious offenses, can be grounds for moral disqualification unless a waiver is obtained. The authority to approve moral waiver requests is delegated to varying levels in the Service heirarchy, depending upon the seriousness of the offense.[1]

For this report, we have used as a point of departure the Karpinos data which indicated that 3.9 percent of all youths screened for service were disqualified for "administrative" or moral reasons, based on 1958 to 1960 examining experience (Table 4-1). In order to update this estimate, we have used as a guide the trends indicated by the results of two sets of community-based cohort studies of juvenile delinquency conducted in Philadelphia, Pennsylvania, and Racine, Wisconsin. In the time available for our study, these were the only two communities for which relevant data of this type were immediately available.

The Philadelphia surveys compared the experience of male youth reaching age 18 in 1963 and 1976. They found that between these two years, the percentage of male delinquent youth age 18 with records of five or more police contacts had increased from 6.3 percent to 7.5 percent, or by 19 percent.[2] A similar set of surveys in Racine, Wisconsin, found that the proportion of male 18 year-old

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1 A detailed description of current moral standards and waiver procedures is included in: Barbara Means, Moral Standards for Military Enlistment: Screening Procedures and Impact, HumRRO, Final Report 83-26, November 1983.

2 Marvin E. Wolfgang and Paul E. Tracy, The 1945 and 1958 Birth Cohorts: A Comparison of the Prevalence, Incidence and Severity of Delinquent Behavior, paper presented at Conference on Public Danger, Dangerous Offenders and the Criminal Justice System, Boston, February 11-12, 1982. Data adapted from Tables 6a and 6b of that Paper.

youth with five or more police contacts had risen by 26.6 percent between 1960 and 1973.[1]

In the absence of comparable data since the mid-1970's, the average of the percentage increases from these two sets of surveys -- 23.8 percent -- has been applied to the 1958 to 1960 benchmark estimate, providing an estimated current moral disqualification rate for men of 4.8 percent. The corresponding disqualification rate for women is based on the Philadelphia survey for 1976, which found that the percentage of 18 year old women with an arrest record for a serious crime was one-third that for men, resulting in an estimated female moral disqualification rate of 1.8 percent.

4.4.4 Overall Military Qualification Rates

Table 4-6 on the following page consolidates the data from the preceding sub-sections of this analysis. The net results are that disqualification rates for women are higher than for men.

It is important to note that, in deriving the combined qualification rates in Table 4-6, we have assumed that the different qualification factors are not correlated. For example, it is assumed that the distribution of medical qualification rates is substantially the same among persons either passing or failing the aptitude tests. This assumption was adopted following inspection of data on medical disqualification rates of enlistment applicants by AFQT mental group, which indicated very little relationship between the two variables.

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1 Unpublished data provided by Lyle W. Shannon, Iowa Urban Community Research Center, October 1984.

TABLE 4-6

ESTIMATED MILITARY QUALIFICATION RATES FOR MEN AND WOMEN

STANDARD CATEGORY	MEN	WOMEN
Aptitude and educational criteria only[1]	76.3%	78.3%
Medical qualification only[2]	80.9	61.8
Moral qualification only[3]	95.2	98.4
Combined qualification[4]	58.8	47.6

1. Eitelberg, et al, Op. Cit., Tables 21 and 24.
2. From Tables 4-3 and 4-4, of this report.
3. See Table 4-1 of this report.
4. Determined by multiplication of the three qualification rates. This assumes that the underlying probability distributions of the three rates are independent of each other.

4.5 ACCESSION REQUIREMENTS

The accession data used for input for the model were provided to us by the Air Force. The annual numbers include all NPS enlistment accessions to any Military Department, including reserve and guard NPS accessions. Separate estimates were provided for males and females. Table 4-7 displays the actual and estimated total NPS accession need from 1974 through 2000.

Accession requirements by age group are not preestablished. Therefore, only total NPS accession requirements are available. NPS accession requirements were simulated for each age group by the procedure developed in Section 3.

Table 4-7

TOTAL ACCESSION REQUIREMENT
MALE AND FEMALE

YEAR	TOTAL FEMALE ACCESSION 1/ 3/	TOTAL MALE ACCESSION 2/ 3/
1974	46,000	446,000
1975	51,000	460,000
1976	46,000	451,000
1977	45,000	434,000
1978	53,000	357,000
1979	56,000	357,000
1980	64,000	395,000
1981	56,000	370,000
1982	48,000	353,000
1983	50,000	352,000
1984	51,000	362,000
1985	53,000	415,000
1986	55,000	431,000
1987	54,000	421,000
1988	53,000	411,000
1989	53,000	416,000
1990	52,000	408,000
1991	52,000	408,000
1992	52,000	408,000
1993	52,000	408,000
1994	52,000	408,000
1995	52,000	408,000
1996	52,000	408,000
1997	52,000	408,000
1998	52,000	408,000
1999	52,000	408,000
2000	52,000	408,000

1/ FEMALE NON-RESERVE/GUARD ACCESSIONS ARE FROM DEFENSE MANPOWER DATA CENTER, AGE DISTRIBUTION OF WOMEN IN MILITARY FY74-FY83 (PROJECT NO. 84F8440). ACCESSIONS FOR FY84-FY89 ARE FROM FIVE-YEAR DEFENSE PLAN. ACCESSIONS FOR 1990-2000 REPRESENT REASONABLE APPROXIMATIONS ONLY.

2/ MALE NON-RESERVE/GUARD ACCESSIONS ARE FROM 1983 SELECTED MANPOWER STATISITICS FY83, TABLE 2-17 FOR FY74-FY83. ACCESSIONS FOR FY84-FY89 ARE FROM FIVE-YEAR DEFENSE PLAN. ACCESSIONS FOR 1990-2000 REPRESENT REASONABLE APPROXIMATIONS ONLY.

3/ RESERVE/GUARD COMPONENT IS A CONSTANT 15,000 FOR FEMALES AND 88,000 FOR MALES. THESE ARE BASED ON AN AVERAGE OF 103,000 GUARD/RESERVE ACCESSIONS FOR 1982-1984, 14.5% OF THEM FEMALE AND 85.5% MALE.

SECTION 5

RESULTS

The model was executed given the two alternative census immigration assumptions. Only the male "high" immigration results are presented since there were only slight quantitative differences between results obtained under the two immigration assumptions. Furthermore, the "high" immigration assumption represents the most optimistic with respect to Department of Defense future accession requirements, since it represents higher raw availability. Lastly, no difference in trends was found to exist between the output of the two immigration cases.

Model results for both males and females are contained in Appendix A. Only the results for males are discussed in detail in subsequent paragraphs, since while they are quantitatively different than those for females, there exist virtually no differences in their qualitative interpretation.

The male 18 to 23 year old population as estimated by the Bureau of the Census, are presented for fiscal years 1974 through 2000 in Table 5-1. The total male 18 to 23 year old population can be seen to increase from 1974 through 1981, and subsequently decrease through 1996. Figure 5-1 displays these same data graphically by age. Overall, this population decreases by less than 7% from FY 1974 to FY 1996 but, there is a marked decline from FY 1984 to FY 1996 (22%).

TABLE 5-1

TOTAL UNITED STATES POPULATION, INCLUDING ARMED FORCES, MALES
AGES 18-23, FISCAL YEARS 1974 THROUGH 2000
(THOUSANDS)

	AGE							
YEAR	18	19	20	21	22	23	TOTAL	% CHANGE
1974	2,078	2,104	2,079	1,978	1,892	1,819	11,950	-
1975	2,159	2,139	2,126	2,030	1,944	1,876	12,274	2.71%
1976	2,164	2,229	2,153	2,075	1,996	1,930	12,547	2.22%
1977	2,159	2,242	2,236	2,103	2,041	1,985	12,766	1.75%
1978	2,157	2,247	2,244	2,186	2,072	2,043	12,949	1.43%
1979	2,196	2,254	2,243	2,197	2,158	2,070	13,118	1.31%
1980	2,166	2,270	2,243	2,208	2,183	2,166	13,236	0.90%
1981	2,168	2,172	2,275	2,248	2,213	2,189	13,265	0.22%
1982	2,142	2,173	2,176	2,280	2,253	2,218	13,242	-0.17%
1983	1,992	2,085	2,115	2,118	2,217	2,190	12,717	-3.96%
1984	1,932	2,053	2,147	2,176	2,178	2,282	12,768	0.40%
1985	1,872	1,937	2,057	2,150	2,179	2,182	12,377	-3.06%
1986	1,835	1,877	1,940	2,060	2,153	2,183	12,048	-2.66%
1987	1,885	1,840	1,881	1,944	2,063	2,157	11,770	-2.31%
1988	1,945	1,890	1,844	1,884	1,947	2,067	11,577	-1.64%
1989	1,950	1,950	1,894	1,847	1,887	1,951	11,479	-0.85%
1990	1,775	1,955	1,954	1,897	1,851	1,892	11,324	-1.35%
1991	1,719	1,780	1,959	1,957	1,901	1,855	11,171	-1.35%
1992	1,663	1,724	1,784	1,962	1,960	1,905	10,998	-1.55%
1993	1,705	1,667	1,728	1,788	1,965	1,965	10,818	-1.64%
1994	1,679	1,710	1,672	1,732	1,791	1,970	10,554	-2.44%
1995	1,739	1,684	1,715	1,676	1,735	1,796	10,345	-1.98%
1996	1,736	1,744	1,688	1,718	1,679	1,740	10,305	-0.39%
1997	1,809	1,741	1,748	1,692	1,722	1,684	10,396	0.88%
1998	1,916	1,813	1,745	1,752	1,696	1,727	10,649	2.43%
1999	1,937	1,920	1,818	1,749	1,756	1,701	10,881	2.18%
2000	1,966	1,942	1,925	1,821	1,752	1,761	11,167	2.63%

SOURCE: UNITED STATES BUREAU OF THE CENSUS, CURRENT POPULATION REPORTS
(SERIES P-25, NUMBERS 917, 949 AND 952), JULY 1982 - MAY 1984.

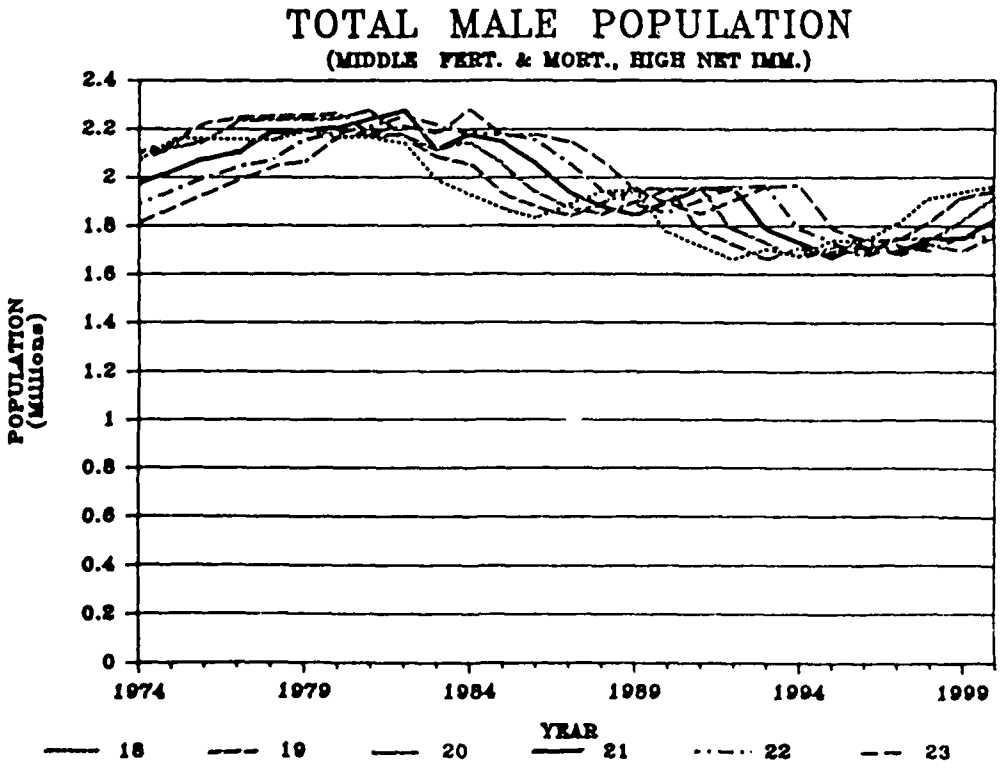

FIGURE 5-1

More important than total male 18 to 23 year old population is the estimated number of male 18 to 23 year olds qualified and available for at least one Military Service. Table 5-2 presents these data for males. The table shows that the qualified and available 18 to 23 year old age group, as a whole, increases in size from FY 1974 to 1985 and decreases in size from FYs 1985 through 1996. Figure 5-2 display these trends graphically.

Table 5-3 presents the simulated number of both 18 to 23 year old and total NPS accessions by fiscal year and the percentage distribution of 18 to 23 year old NPS accessions by age. Figure 5-3 is a ribbon chart showing these same results. Notice that, as cohort availability decreases, a higher percentage of persons other than 18 to 23 year olds are accessed in order to meet requirements. The simulated accessions in any one year for a single year age group can be seen to be sensitive to changes in the relative size of the qualified and available population in that same year.

Table 5-4 presents the simulated 18-23 male accession requirement as a percentage of qualified and available males, by age; by fiscal year. Figure 5-4 displays the same data in graph form. These percentages represent the required accession participation of each age cohort in a given fiscal year. For example, in FY 1974, 9.3% of the 18 year old qualified and available male population are expected to access in order to meet the FY 1974 accession needs. The figure clearly demonstrates the year-to-year changes in required cohort participation as cohort sizes change.

APPENDIX A

Table of Contents

TABLE	TITLE	PAGE
A-1	TOTAL UNITED STATES POPULATION, INCLUDING ARMED FORCES, FEMALES AGES 18-23, FISCAL YEARS 1974 THROUGH 2000.	A-3
A-2	QUALIFIED AND AVAILABLE FEMALE POPULATION (EXCLUDING CURRENT YEAR FORECASTED ACCESSIONS) FISCAL YEARS 1974-2000.	A-4
A-3	FORECASTED FEMALE ENLISTMENT BY AGES 18-23 FISCAL YEARS 1974-2000	A-5
A-4	TOTAL DOD ACTIVE DUTY AND RESERVE NPS ACCESSIONS BY AGE AS A PERCENTAGE OF TOTAL, FEMALES.	A-6
A-5	18-23 FEMALE ACCESSION MANPOWER REQUIREMENT AS A PERCENTAGE OF QUALIFIED AND AVAILABLE FEMALES, BY AGES 18-23, FISCAL YEARS 1974-2000 1/.	A-7
A-6	PERCENTAGE OF NPS FEMALES REQUIRED TO ACCESS IN ORDER TO MEET ACCESSION NEEDS, BY YEAR OF BIRTH	A-8
FIGURE		
A-1	TOTAL 18 - 23 QUALIFIED AND AVAILABLE	A-9
A-2	TOTAL ACCESSIONS, 18-23	A-9
A-3	ACCESSIONS AS A % OF TOTAL.	A-10
A-4	QUALIFIED & AVAILABLE FEMALES	A-10
A-5	NPS FEMALE 18-23 ACCESSIONS AS A % OF ACCESSIONS.	A-11
A-6	NPS FEMALE 18-23 ACCESSIONS AS A % OF QUALIFIED & AVAILABLE .	A-11
A-7	PERCENTAGE OF NPS FEMALES REQUIRED.	A-12

APPENDIX A

DATA TABLES

in the current moral waiver process; resulting data tabulations and disqualification estimates might, thus, be based on a more realistic simulation of the military decision criteria currently employed.

survey. With respect to female disorders, more intensive evaluation of available medical examination records of current enlistment applicants could allow corrections for "restriction of range" and could also be used as a supplemental data source on other aspects of female qualifications (that technique has been employed in the current report to the extent of the immediate availability of medical examination summary data).

- Research on Moral Fitness for Military Service. As previously noted, our review of available data on the proportions of young men and women who have records of either serious offenses or repeated minor offenses of a nature which would disqualify them for military service, identified only two sets of "cohort" or longitudinal surveys performed in Philadelphia and Racine which appeared relevant for our needs. Further, only limited data from these surveys were available at the time of preparation of this report. Because of the high priority given by the Department of Justice to the tracking of "career criminals", we understand that considerable research in this area is currently underway. That research includes a major study being conducted by the FBI (preliminary results are expected to be available later this year), as well as longitudinal surveys in Los Angeles, Chicago, and Oklahoma City, which are similar to those previously conducted in Philadelphia and Racine. The results of these surveys should provide an up-to-date and more extensive data base in coming months. Review and analysis of the new data would permit the development of more reliable current estimates of moral fitness for service. That analytic assessment could benefit from coordination with representatives of each of the several military departments involved

detailed to permit precise computation of the numbers of young men and women who meet current Army or Air Force weight standards over the full range of acceptable heights. This was due to truncation of the analytic data tables at the upper and lower weight extremes, and the fact that table weight data do not conform to current military weight standards which vary by age group. Review and analysis of the HANES-II tape would permit tabulation of accurate current data on height/weight disqualification rates, by age, under either current or alternative military standards. Similarly, data on other types of diagnostic measures included in HANES-II such as corrected and uncorrected vision, audiometer, and blood pressure readings, could be tabulated from the new data tapes to either match, or simulate as closely as possible, the prescribed military standards. Finally, these revised current tabulations would permit accurate adjustment for the potential "double counting" resulting when examinees are found to have more than one disqualifying condition. Adjustments for this factor in the current report were based on draftee examination data accumulated in 1969-70.

It should be noted that although HANES surveys provide the most comprehensive available data base on the health status of the U.S. population, not all causes of military medical disqualification are included in the HANES survey. For example, the last survey does not attempt to measure the extent of psychiatric or related behavioral disorders, nor does it include a pelvic examination for women. With respect to psychiatric and related conditions, a series of recent intensive surveys sponsored by the National Institute of Mental Health in three cities appears to provide a useful supplement to the HANES

subject to further possible statistical error, to the extent that the sex differentials for selected medically disqualifying conditions were not representative of the full range of such disqualifying conditions.

- Finally, the moral disqualification rate estimates are potentially subject to error because: they are based on the assumption that the moral qualification standards applied in Philadelphia and Racine studies over a decade ago conform to current enlistment standards; and they further assume that data evident in the Philadelphia and Racine studies are representative of current national data.

We believe that the data base and methodology for estimating physical and moral qualification rates can be significantly improved using the following research approaches.

- Analysis of HANES-II Data Base. In the period 1976-1980, the National Center for Health Statistics, Public Health Service, conducted a second comprehensive Health and National Examination Survey of the U.S. population (HANES-II). Although detailed results of this survey have not yet been published, a public-use data tape has been produced, for use by the health research community. The availability of this tape may, subject to thorough review and analysis of data content, allow the development of a more comprehensive, current and accurate assessment of the proportion of American youth who meet current Air Force medical fitness standards than was possible using published analytic data based on the earlier HANES-I survey. To illustrate, analytic data from the earlier HANES-I survey were not sufficiently

the development of more current data bases for use in estimating percentages of young men and women meeting medical and moral standards for enlistment. Of the three general categories of qualification standards -- aptitude, medical, moral -- reliable and current youth population-based data exist only with respect to aptitude and related educational screening standards. These data were initially compiled in the Profile of American Youth Survey conducted in 1980 for the Department of Defense by the National Opinion Research Center. No analagous profile exists with respect to medical and moral qualifications.

In our judgement, the methodology employed provides reasonable "order-of-magnitude" approximations of rates of medical and moral disqualification, by sex, recognizing the limitations of currently available data. The primary limitations are discussed below.

- First, the historical data base with respect to male medical/moral disqualification still derives mainly from a 25-year old study -- the Karpinos analysis of examining experience during the period August 1958 through June 1960.

- Second, the corresponding estimates of female medical disqualification were indirectly derived, primarily by use of published National Health Survey data from the HANES-I survey conducted in the period 1971 through 1974. That Survey provided a means of adjusting the Karpinos male disqualification rates to derive a female disqualification rate based upon sex differentials in the prevalence of certain major types of medically disqualifying factors. Thus, in addition to the limitations resulting from the use of a 25-year old data base for male disqualifications, the female disqualification rate estimates are

SECTION 6

CONCLUSIONS/RECOMMENDATIONS

A dynamic model that estimates the availability for military service of American youth, age 18 to 23, through FY 2000 was defined, developed and successfully executed. Model results were derived using the best available data. In order to put the population trends into proper historical perspective, the model simulates a dynamic accession process from the first full year of all volunteer service (FY 1974) through FY 2000. In brief, the results demonstrate that the size of the military qualified and available population increases from FY 1974 through FY 1985, thereafter decreases through FY 1996, and then begins to increase through FY 2000.

In order to sustain planned accession levels, an increasing percentage of each birth year cohort is required to access between now and FYs 1995 through 1998. The net impact on the recruiting market can beassessed by taking account of the future impact of other factors discussed in succeeding Volume III of this Study.[1]

Although there is some potential for methodological refinement in developing many components of the estimates contained in this Volume, perhaps the most critical need in terms of potential qualitative and quantitative importance is

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1 The Prospects for Military Enlistments: An Assessment, Syllogistics, Inc., and Unicon Research Corporation, February 11, 1985.

About 26% of the total qualified and available males born in 1962 are required to access into any active duty or reserve service over years 1980 to 1985 (their 18th to 23rd year). The required participation rate for those born in 1976 and 1977 is about 36%. On average, one-third of the qualified and available males must be accessed in order to meet total DOD NPS accession requirements.

TABLE 5-5

PERCENTAGE OF MALES REQUIRED TO ACCESS IN ORDER TO MEET NPS ACCESSION NEEDS, BY YEAR OF BIRTH 1/

YEAR OF BIRTH	YEAR TURNING 18	TOTAL ACCESSIONS FOR YEAR OF BIRTH	QUALIFIED 18 YEAR OLDS FOR YEAR OF BIRTH	% OF AGE GROUP WHO MUST ACCESS
1956	1974	400,605	1,218,401	32.9%
1957	1975	399,820	1,265,894	31.6%
1958	1976	375,146	1,268,826	29.6%
1959	1977	345,584	1,265,894	27.3%
1960	1978	329,066	1,264,721	26.0%
1961	1979	337,075	1,287,588	26.2%
1962	1980	326,808	1,269,998	25.7%
1963	1981	323,817	1,271,171	25.5%
1964	1982	328,286	1,255,926	26.1%
1965	1983	333,765	1,167,976	28.6%
1966	1984	340,603	1,132,796	30.1%
1967	1985	351,018	1,097,616	32.0%
1968	1986	350,222	1,075,922	32.6%
1969	1987	360,663	1,105,239	32.6%
1970	1988	374,617	1,140,419	32.8%
1971	1989	379,399	1,143,350	33.2%
1972	1990	349,100	1,040,742	33.5%
1973	1991	343,600	1,007,907	34.1%
1974	1992	337,844	975,073	34.6%
1975	1993	351,682	999,699	35.2%
1976	1994	349,837	984,454	35.5%
1977	1995	362,195	1,019,634	35.5%
1978	1996	357,466	1,017,875	35.1%*
1979	1997	365,159	1,060,677	34.4%*
1980	1998	377,771	1,123,415	33.6%*
1981	1999	373,313	1,135,728	32.9%*
1982	2000	370,386	1,152,732	32.1%*

* Demand for these birth years is calculated by extending the the model to the year 2005.

1/ Accession can be into either active duty or reserves.

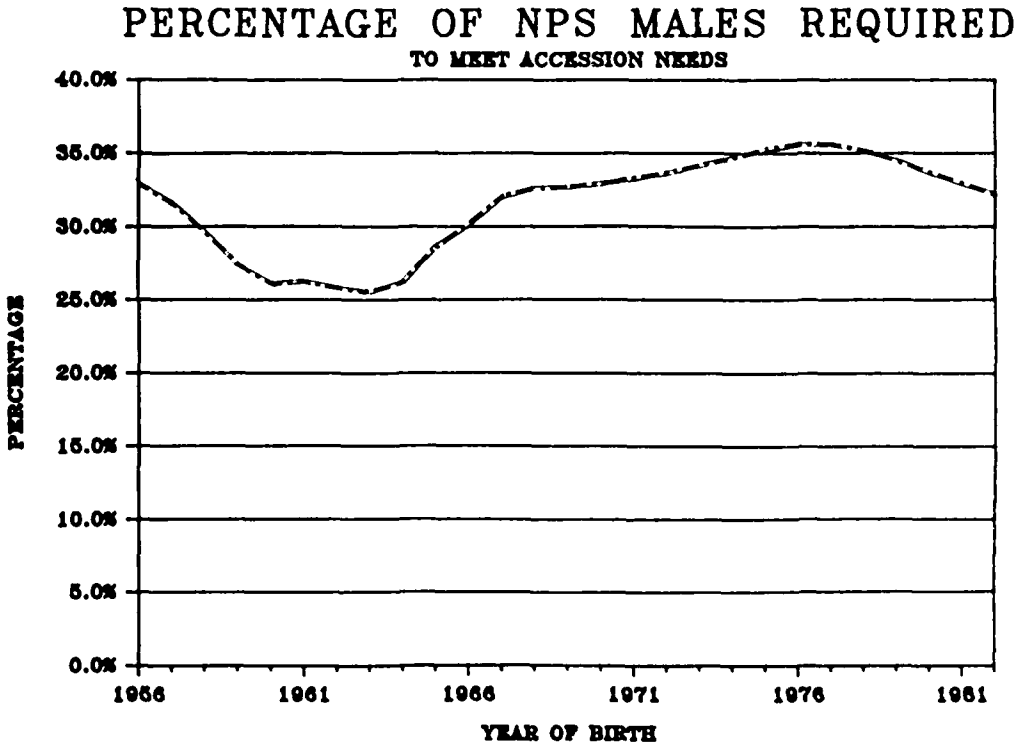


FIGURE 5-5

A more precise measure of cohort participation is constructed by examining year of birth cohort participation rates. Table 5-5 presents a measure of required cohort participation by year of birth. The percentage of qualified and available non-prior service males required to meet accession needs was calculated by summing the simulated enlistments for year of birth (X) and dividing that by the total qualified and available population for year of birth (X) as measured at their 18th year. Note that these participation rates take into account full qualification (physical, mental and moral) and total DOD NPS accession requirements (both active duty, Guard and Reserve). Figure 5-5 presents the data from Table 5-5 in graphic form.

A decrease in required cohort participation rates can be seen from year of birth (YOB) 1956 through YOB 1963, with YOB 1963 being the global minimum. Lower cohort accession requirements, relative to higher cohort qualified and available populations, can be correlated with improved recruiting years. Persons born in 1956 reach their prime enlistment-eligible ages in FYs 1974 to 1978, and persons born in 1963 reach their prime enlistment-eligible ages in FYs 1981 to 1985. Figure 5-5, depicts the decrease in required participation rates through FY 1985. This trend will begin to reverse itself in Fiscal Year 1985, with increasing participation ratee required over the next ten years, reaching a global maximum for YOB 1976 and 1977. The higher the required participation rate, the leaner the qualified and available population with respect to accession requirements.

TABLE 5-4

18-23 MALE ACCESSION MANPOWER REQUIREMENT AS A PERCENTAGE OF QUALIFIED AND AVAILABLE MALES, BY AGES 18-23, FISCAL YEARS 1974-2000 1/

YEAR	18	19	20	21	22	23	18-23
1974	9.3%	12.5%	7.6%	5.0%	3.2%	2.1%	7.1%
1975	9.3%	12.4%	8.7%	4.5%	3.2%	2.1%	7.3%
1976	8.8%	11.9%	8.3%	5.1%	2.8%	2.1%	7.0%
1977	8.4%	11.1%	7.8%	4.8%	3.1%	1.8%	6.6%
1978	6.8%	9.0%	6.2%	3.8%	2.5%	1.7%	5.4%
1979	6.6%	8.7%	6.0%	3.6%	2.4%	1.6%	5.2%
1980	7.3%	9.4%	6.4%	3.8%	2.5%	1.7%	5.6%
1981	6.8%	8.9%	5.9%	3.5%	2.3%	1.6%	5.1%
1982	6.5%	8.5%	5.7%	3.3%	2.1%	1.4%	4.8%
1983	6.7%	8.7%	5.9%	3.5%	2.2%	1.5%	4.9%
1984	6.8%	8.9%	6.0%	3.5%	2.2%	1.5%	5.0%
1985	8.0%	10.6%	7.1%	4.1%	2.6%	1.7%	5.8%
1986	8.6%	11.3%	7.7%	4.5%	2.8%	1.9%	6.2%
1987	8.6%	11.4%	7.8%	4.6%	2.8%	1.9%	6.3%
1988	8.5%	11.3%	7.8%	4.6%	2.9%	1.9%	6.4%
1989	8.7%	11.5%	8.0%	4.7%	3.0%	2.0%	6.7%
1990	8.6%	11.5%	7.9%	4.7%	3.0%	2.0%	6.7%
1991	8.7%	11.7%	8.0%	4.8%	3.1%	2.0%	6.7%
1992	8.9%	11.9%	8.2%	4.9%	3.1%	2.1%	6.7%
1993	9.0%	12.1%	8.3%	5.0%	3.2%	2.1%	6.8%
1994	9.3%	12.4%	8.6%	5.1%	3.3%	2.2%	7.1%
1995	9.4%	12.7%	8.8%	5.3%	3.4%	2.2%	7.4%
1996	9.5%	12.7%	8.9%	5.3%	3.4%	2.3%	7.5%
1997	9.4%	12.6%	8.8%	5.3%	3.4%	2.3%	7.5%
1998	9.2%	12.3%	8.6%	5.2%	3.3%	2.2%	7.4%
1999	9.0%	12.0%	8.4%	5.1%	3.3%	2.2%	7.3%
2000	8.7%	11.7%	8.1%	4.9%	3.2%	2.1%	7.0%

1/ NPS Accession manpower requirements represent both active duty and estimated reserve requirements.

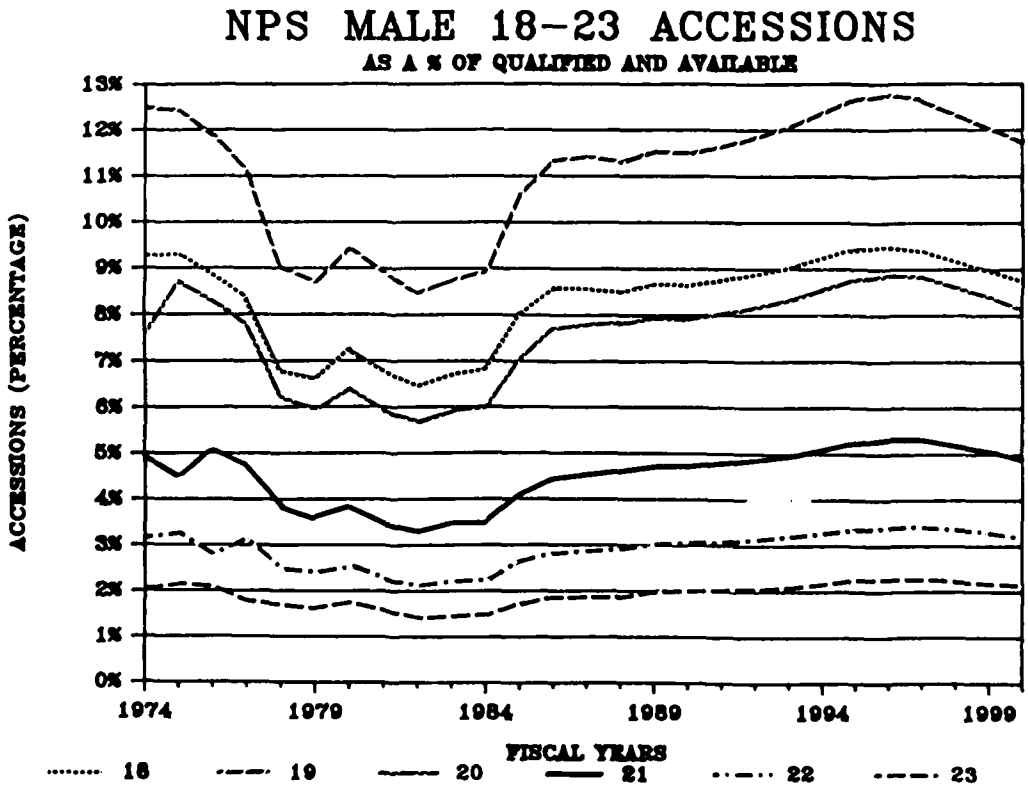


FIGURE 5-4

TABLE 5-3

TOTAL DOD ACTIVE DUTY AND RESERVE
NPS ACCESSIONS BY AGE AS A PERCENTAGE
OF TOTAL MALES
FISCAL YEARS 1974-2000

YEAR	18-23 ACCESSION TOTAL	TOTAL ACCESSION	18	19	20	21	22	23	18-23 AS PERCENT OF TOTAL
1974	406,703	446,000	24.4%	30.1%	18.2%	9.5%	5.6%	3.5%	91.2%
1975	419,027	460,000	24.7%	29.8%	18.1%	9.5%	5.6%	3.5%	91.1%
1976	410,712	451,000	24.2%	30.4%	17.9%	9.5%	5.6%	3.5%	91.1%
1977	393,420	434,000	23.7%	30.0%	18.3%	9.4%	5.6%	3.5%	90.6%
1978	321,410	357,000	23.4%	29.7%	18.1%	9.7%	5.6%	3.6%	90.0%
1979	320,216	357,000	23.5%	29.4%	17.9%	9.6%	5.8%	3.6%	89.7%
1980	351,802	395,000	23.0%	29.3%	17.7%	9.6%	5.8%	3.7%	89.1%
1981	326,230	370,000	22.9%	28.0%	17.9%	9.7%	5.8%	3.7%	88.2%
1982	309,137	353,000	22.7%	28.1%	17.2%	9.9%	6.0%	3.8%	87.6%
1983	306,132	352,000	22.0%	28.0%	17.4%	9.6%	6.1%	3.9%	87.0%
1984	311,727	362,000	21.2%	27.5%	17.6%	9.8%	6.0%	4.1%	86.1%
1985	354,779	415,000	21.2%	26.8%	17.4%	10.0%	6.2%	4.0%	85.5%
1986	366,455	431,000	21.4%	26.6%	16.8%	9.8%	6.3%	4.1%	85.0%
1987	360,732	421,000	22.5%	26.7%	16.7%	9.5%	6.1%	4.2%	85.7%
1988	359,298	411,000	23.6%	27.9%	16.6%	9.3%	5.9%	4.1%	87.4%
1989	370,154	416,000	23.9%	29.1%	17.2%	9.2%	5.8%	3.9%	89.0%
1990	361,813	408,000	22.0%	29.5%	18.0%	9.6%	5.7%	3.8%	88.7%
1991	354,748	408,000	21.6%	27.2%	18.3%	10.0%	6.0%	3.8%	86.9%
1992	348,375	408,000	21.2%	26.8%	16.9%	10.2%	6.2%	3.9%	85.4%
1993	347,329	408,000	22.1%	26.4%	16.7%	9.5%	6.4%	4.1%	85.1%
1994	351,633	408,000	22.3%	27.7%	16.5%	9.4%	5.9%	4.2%	86.2%
1995	358,477	408,000	23.6%	27.8%	17.3%	9.3%	5.9%	3.9%	87.9%
1996	362,322	408,000	23.7%	28.9%	17.1%	9.6%	5.7%	3.8%	88.8%
1997	364,937	408,000	24.4%	28.6%	17.6%	9.3%	5.8%	3.7%	89.4%
1998	367,963	408,000	25.3%	29.1%	17.1%	9.4%	5.6%	3.7%	90.2%
1999	371,446	408,000	25.0%	30.2%	17.4%	9.2%	5.7%	3.5%	91.0%
2000	370,832	408,000	24.7%	29.7%	18.0%	9.4%	5.5%	3.6%	90.9%

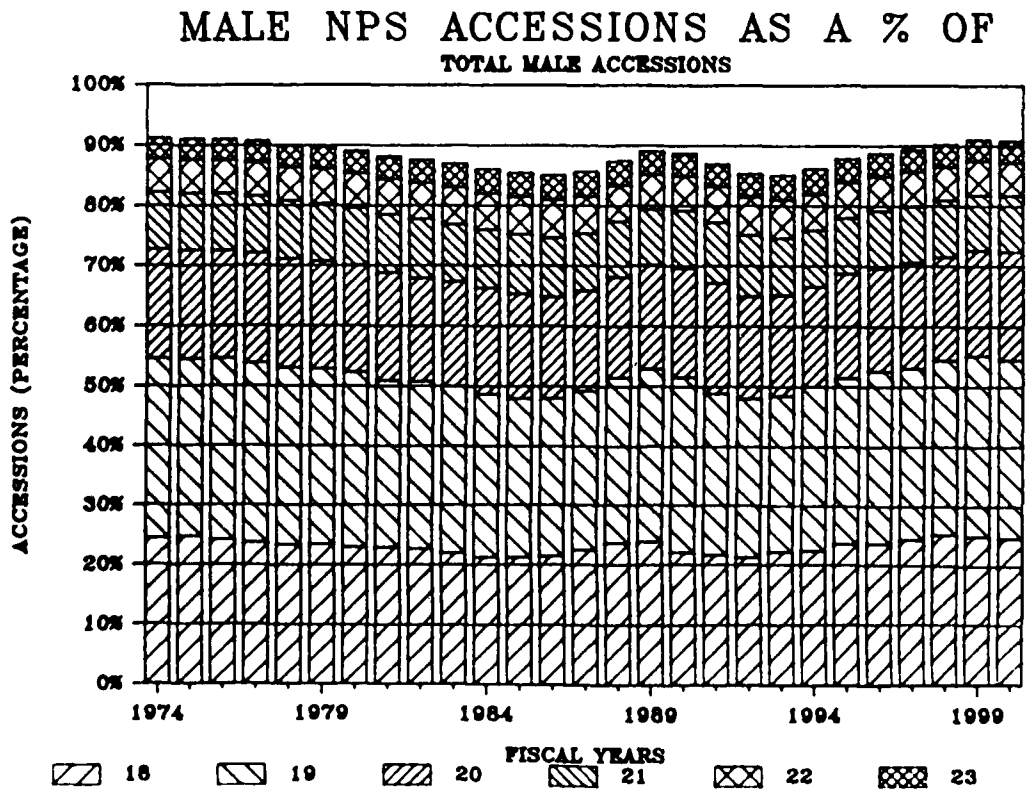


FIGURE 5-3

TABLE 5-2

QUALIFIED AND AVAILABLE MALE POPULATION
(EXCLUDING CURRENT YEAR FORECASTED ACCESSIONS)
FISCAL YEARS 1974-2000

YEAR	18	19	20	21	22	23	TOTAL
1974	1,066,514	939,356	991,972	807,423	755,585	724,133	5,284,983
1975	1,108,292	965,188	869,064	919,603	761,942	730,247	5,354,336
1976	1,125,617	1,012,317	892,595	796,379	874,513	737,989	5,439,409
1977	1,127,844	1,041,004	937,053	822,268	752,115	852,747	5,533,031
1978	1,148,229	1,073,499	977,582	873,167	784,064	740,504	5,597,044
1979	1,183,681	1,100,202	1,007,420	915,729	836,158	770,105	5,813,295
1980	1,160,245	1,111,220	1,023,862	949,102	884,678	826,178	5,955,285
1981	1,165,269	1,060,157	1,047,897	990,828	930,391	874,339	6,068,880
1982	1,161,758	1,069,138	1,001,938	1,015,965	972,701	919,904	6,141,403
1983	1,081,564	1,029,642	974,006	934,302	957,511	922,004	5,899,029
1984	1,048,891	1,017,789	1,002,438	974,386	947,831	980,938	5,972,273
1985	1,009,491	940,754	948,121	962,847	950,528	933,572	5,745,313
1986	983,758	897,592	870,051	907,610	937,601	935,149	5,531,761
1987	1,010,576	874,138	829,689	832,511	883,496	922,435	5,352,845
1988	1,043,473	898,761	808,131	793,083	810,035	869,186	5,222,669
1989	1,044,133	925,552	829,441	771,496	770,865	796,334	5,137,821
1990	950,953	926,606	854,391	791,996	750,458	758,325	5,032,730
1991	919,760	842,706	854,247	815,152	769,997	737,427	4,939,290
1992	888,456	813,318	775,952	814,256	791,417	756,302	4,839,701
1993	909,417	783,284	747,618	739,616	790,031	777,528	4,747,493
1994	893,325	799,298	718,728	711,558	717,100	775,678	4,615,687
1995	923,342	782,676	731,609	683,158	689,325	703,955	4,514,065
1996	921,376	808,190	715,242	694,352	661,610	676,620	4,477,389
1997	961,000	807,459	738,908	679,498	673,002	649,541	4,509,408
1998	1,020,350	844,556	739,999	702,750	659,061	660,916	4,627,631
1999	1,033,755	899,577	776,312	704,726	682,010	647,516	4,743,896
2000	1,051,883	915,347	829,075	739,908	684,042	670,338	4,890,593

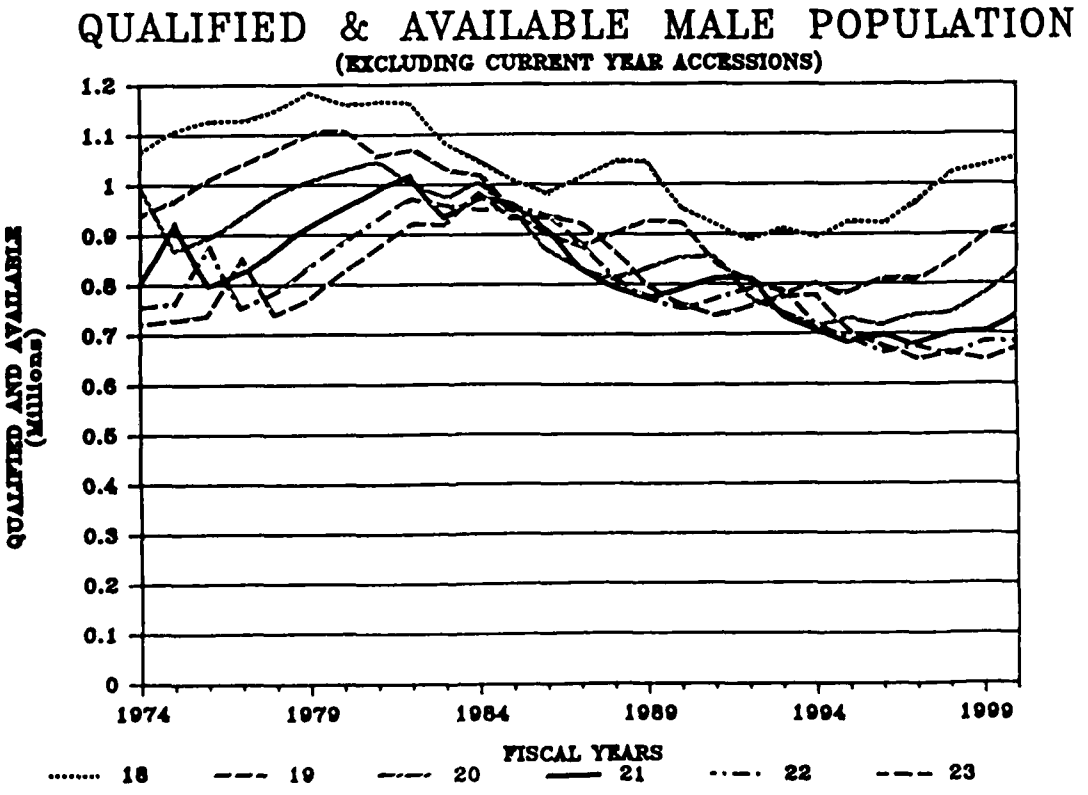


FIGURE 5-2

TABLE A-1

TOTAL UNITED STATES POPULATION, INCLUDING ARMED FORCES, FEMALES
AGES 18-23, FISCAL YEARS 1974 THROUGH 2000
(THOUSANDS)

	AGE							
YEAR	18	19	20	21	22	23	TOTAL	% CHANGE
1974	2,024	2,051	2,023	1,923	1,865	1,816	11,702	-
1975	2,097	2,084	2,062	1,978	1,919	1,867	12,007	2.61%
1976	2,101	2,164	2,090	2,018	1,975	1,923	12,271	2.20%
1977	2,099	2,175	2,164	2,047	2,015	1,979	12,479	1.70%
1978	2,090	2,183	2,174	2,126	2,047	2,025	12,645	1.33%
1979	2,121	2,181	2,177	2,138	2,127	2,060	12,804	1.26%
1980	2,091	2,210	2,187	2,161	2,142	2,142	12,933	1.01%
1981	2,071	2,097	2,216	2,194	2,168	2,150	12,896	-0.29%
1982	2,051	2,077	2,103	2,222	2,200	2,175	12,828	-0.53%
1983	1,972	2,056	2,082	2,108	2,228	2,206	12,652	-1.37%
1984	1,854	1,979	2,065	2,092	2,120	2,241	12,351	-2.38%
1985	1,803	1,862	1,988	2,075	2,103	2,132	11,963	-3.14%
1986	1,762	1,811	1,871	1,998	2,085	2,115	11,642	-2.68%
1987	1,810	1,770	1,820	1,881	2,009	2,097	11,387	-2.19%
1988	1,860	1,818	1,779	1,830	1,891	2,020	11,198	-1.66%
1989	1,865	1,868	1,826	1,789	1,841	1,903	11,092	-0.95%
1990	1,700	1,873	1,877	1,836	1,799	1,852	10,937	-1.40%
1991	1,647	1,707	1,882	1,887	1,847	1,811	10,781	-1.43%
1992	1,591	1,655	1,716	1,892	1,898	1,859	10,611	-1.58%
1993	1,630	1,599	1,664	1,726	1,903	1,909	10,431	-1.70%
1994	1,608	1,638	1,608	1,674	1,737	1,914	10,179	-2.42%
1995	1,664	1,616	1,647	1,618	1,685	1,749	9,979	-1.96%
1996	1,663	1,672	1,625	1,657	1,629	1,697	9,943	-0.36%
1997	1,731	1,671	1,681	1,635	1,668	1,641	10,027	0.84%
1998	1,837	1,739	1,680	1,691	1,646	1,680	10,273	2.45%
1999	1,854	1,845	1,748	1,690	1,702	1,658	10,497	2.18%
2000	1,883	1,862	1,854	1,758	1,701	1,714	10,772	2.62%

SOURCE: UNITED STATES BUREAU OF THE CENSUS, CURRENT POPULATION REPORTS (SERIES P-25, NUMBERS 917, 949 AND 952), JULY 1982 - MAY 1984.

TABLE A-2

QUALIFIED AND AVAILABLE FEMALE POPULATION
(EXCLUDING CURRENT YEAR FORECASTED ACCESSIONS)
FISCAL YEARS 1974-2000

YEAR	18	19	20	21	22	23	TOTAL
1974	950,062	947,889	933,115	887,592	862,822	841,487	5,422,967
1975	983,409	963,338	943,923	906,900	882,858	862,001	5,542,428
1976	986,771	1,001,285	957,966	918,665	902,901	883,148	5,650,736
1977	986,255	1,008,437	993,095	933,288	914,713	903,208	5,738,996
1978	980,290	1,010,425	998,397	969,913	930,305	917,570	5,806,901
1979	994,291	1,007,116	997,579	975,915	967,156	934,471	5,876,528
1980	978,516	1,017,762	998,609	983,830	974,132	971,916	5,924,765
1981	970,930	965,690	1,010,512	996,460	983,885	975,848	5,903,324
1982	963,293	960,401	960,281	1,008,587	996,451	985,392	5,874,406
1983	925,579	951,681	954,141	957,871	1,008,378	997,355	5,795,005
1984	869,693	914,837	947,008	953,930	960,531	1,012,488	5,658,487
1985	845,583	859,292	909,869	946,478	955,919	964,124	5,481,267
1986	825,621	834,655	854,292	909,198	947,807	959,390	5,330,964
1987	848,066	814,972	829,873	853,919	911,115	951,288	5,209,233
1988	871,518	837,054	810,411	829,649	855,561	914,206	5,118,399
1989	873,741	859,953	831,698	810,252	831,819	859,232	5,066,694
1990	796,497	862,211	854,863	831,435	812,031	835,080	4,992,117
1991	771,399	785,516	856,871	854,337	833,537	768,347	4,870,006
1992	745,098	761,237	780,966	856,296	856,331	837,205	4,837,133
1993	763,167	735,176	756,808	780,775	858,227	859,433	4,753,585
1994	752,554	752,524	730,808	743,881	782,910	861,264	4,623,941
1995	778,553	741,859	747,793	730,716	758,889	786,577	4,544,386
1996	778,041	767,301	737,215	747,566	732,983	762,609	4,525,715
1997	809,963	766,923	762,428	737,096	749,787	736,784	4,562,981
1998	859,885	798,610	762,275	762,262	739,428	753,591	4,676,050
1999	868,126	847,951	793,798	762,217	764,559	743,296	4,779,947
2000	882,043	856,453	842,834	793,674	764,591	768,414	4,908,009

TABLE A-3

FORECASTED FEMALE ENLISTMENT BY AGES 18-23
FISCAL YEARS 1974-2000

YEAR	18	19	20	21	22	23	TOTAL
1974	11,276	13,881	8,347	4,343	2,548	1,595	41,990
1975	12,623	15,240	9,193	4,827	2,833	1,772	46,489
1976	11,162	13,966	8,224	4,347	2,574	1,611	41,883
1977	10,727	13,503	8,191	4,241	2,526	1,594	40,783
1978	12,415	15,753	9,565	5,120	2,982	1,896	47,731
1979	13,147	16,423	9,994	5,373	3,234	2,013	50,183
1980	14,664	18,829	11,360	6,145	3,685	2,368	57,051
1981	12,745	15,678	10,101	5,474	3,273	2,086	49,356
1982	10,876	13,380	8,260	4,777	2,862	1,818	41,974
1983	11,045	13,989	8,636	4,787	3,061	1,948	43,465
1984	10,849	14,069	8,950	4,963	3,043	2,068	43,943
1985	11,320	14,203	9,245	5,282	3,239	2,110	45,399
1986	11,797	14,730	9,278	5,424	3,424	2,232	46,885
1987	12,164	14,451	9,059	5,125	3,312	2,222	46,334
1988	12,476	14,814	8,838	4,977	3,111	2,136	46,352
1989	12,629	15,367	9,158	4,912	3,058	2,032	47,156
1990	11,455	15,332	9,367	5,016	2,973	1,967	46,110
1991	11,364	14,308	9,617	5,279	3,126	1,861	45,554
1992	11,050	13,964	8,827	5,327	3,233	2,035	44,436
1993	11,516	13,724	8,707	4,944	3,298	2,126	44,315
1994	11,673	14,445	8,645	4,847	3,093	2,190	44,893
1995	12,289	14,498	9,009	4,845	3,052	2,036	45,728
1996	12,326	15,055	8,920	4,979	2,961	1,983	46,224
1997	12,722	14,920	9,151	4,872	3,007	1,901	46,573
1998	13,178	15,155	8,926	4,918	2,896	1,900	46,973
1999	13,016	15,736	9,089	4,810	2,931	1,835	47,417
2000	12,882	15,475	9,394	4,876	2,854	1,849	47,331

1/ Accession can be into either active duty or reserves.

TABLE A-4

TOTAL DOD ACTIVE DUTY AND RESERVE
NPS ACCESSIONS BY AGE AS A PERCENTAGE
OF TOTAL, FEMALES

YEAR	18-23 ACCESSION TOTAL	TOTAL ACCESSION	18	19	20	21	22	23	18-23 AS PERCENT OF TOTAL
1974	41,990	46,000	24.5%	30.2%	18.1%	9.4%	5.5%	3.5%	91.3%
1975	46,489	51,000	24.8%	29.9%	18.0%	9.5%	5.6%	3.5%	91.2%
1976	41,883	46,000	24.3%	30.4%	17.9%	9.4%	5.6%	3.5%	91.0%
1977	40,783	45,000	23.8%	30.0%	18.2%	9.4%	5.6%	3.5%	90.6%
1978	47,731	53,000	23.4%	29.7%	18.0%	9.7%	5.6%	3.6%	90.1%
1979	50,183	56,000	23.5%	29.3%	17.8%	9.6%	5.8%	3.6%	89.6%
1980	57,051	64,000	22.9%	29.4%	17.7%	9.6%	5.8%	3.7%	89.1%
1981	49,356	56,000	22.8%	28.0%	18.0%	9.8%	5.8%	3.7%	88.1%
1982	41,974	48,000	22.7%	27.9%	17.2%	10.0%	6.0%	3.8%	87.4%
1983	43,465	50,000	22.1%	28.0%	17.3%	9.6%	6.1%	3.9%	86.9%
1984	43,943	51,000	21.3%	27.6%	17.5%	9.7%	6.0%	4.1%	86.2%
1985	45,399	53,000	21.4%	26.8%	17.4%	10.0%	6.1%	4.0%	85.7%
1986	46,885	55,000	21.4%	26.8%	16.9%	9.9%	6.2%	4.1%	85.2%
1987	46,334	54,000	22.5%	26.8%	16.8%	9.5%	6.1%	4.1%	85.8%
1988	46,352	53,000	23.5%	28.0%	16.7%	9.4%	5.9%	4.0%	87.5%
1989	47,156	53,000	23.8%	29.0%	17.3%	9.3%	5.8%	3.8%	89.0%
1990	46,110	52,000	22.0%	29.5%	18.0%	9.6%	5.7%	3.8%	88.7%
1991	45,554	52,000	21.9%	27.5%	18.5%	10.2%	6.0%	3.6%	87.6%
1992	44,436	52,000	21.2%	26.9%	17.0%	10.2%	6.2%	3.9%	85.5%
1993	44,315	52,000	22.1%	26.4%	16.7%	9.5%	6.3%	4.1%	85.2%
1994	44,893	52,000	22.4%	27.8%	16.6%	9.3%	5.9%	4.2%	86.3%
1995	45,728	52,000	23.6%	27.9%	17.3%	9.3%	5.9%	3.9%	87.9%
1996	46,224	52,000	23.7%	29.0%	17.2%	9.6%	5.7%	3.8%	88.9%
1997	46,573	52,000	24.5%	28.7%	17.6%	9.4%	5.8%	3.7%	89.6%
1998	46,973	52,000	25.3%	29.1%	17.2%	9.5%	5.6%	3.7%	90.3%
1999	47,417	52,000	25.0%	30.3%	17.5%	9.3%	5.6%	3.5%	91.2%
2000	47,331	52,000	24.8%	29.8%	18.1%	9.4%	5.5%	3.6%	91.0%

TABLE A-5

18-23 FEMALE ACCESSION MANPOWER REQUIREMENT AS A PERCENTAGE OF QUALIFIED AND AVAILABLE FEMALES, BY AGES 18-23, FISCAL YEARS 1974-2000 1/

YEAR	18	19	20	21	22	23	18-23
1974	1.2%	1.4%	0.9%	0.5%	0.3%	0.2%	0.8%
1975	1.3%	1.6%	1.0%	0.5%	0.3%	0.2%	0.8%
1976	1.1%	1.4%	0.9%	0.5%	0.3%	0.2%	0.7%
1977	1.1%	1.3%	0.8%	0.5%	0.3%	0.2%	0.7%
1978	1.3%	1.5%	0.9%	0.5%	0.3%	0.2%	0.8%
1979	1.3%	1.6%	1.0%	0.5%	0.3%	0.2%	0.8%
1980	1.5%	1.8%	1.1%	0.6%	0.4%	0.2%	1.0%
1981	1.3%	1.6%	1.0%	0.5%	0.3%	0.2%	0.8%
1982	1.1%	1.4%	0.9%	0.5%	0.3%	0.2%	0.7%
1983	1.2%	1.4%	0.9%	0.5%	0.3%	0.2%	0.7%
1984	1.2%	1.5%	0.9%	0.5%	0.3%	0.2%	0.8%
1985	1.3%	1.6%	1.0%	0.6%	0.3%	0.2%	0.8%
1986	1.4%	1.7%	1.1%	0.6%	0.4%	0.2%	0.9%
1987	1.4%	1.7%	1.1%	0.6%	0.4%	0.2%	0.9%
1988	1.4%	1.7%	1.1%	0.6%	0.4%	0.2%	0.9%
1989	1.4%	1.8%	1.1%	0.6%	0.4%	0.2%	0.9%
1990	1.4%	1.7%	1.1%	0.6%	0.4%	0.2%	0.9%
1991	1.5%	1.8%	1.1%	0.6%	0.4%	0.2%	0.9%
1992	1.5%	1.8%	1.1%	0.6%	0.4%	0.2%	0.9%
1993	1.5%	1.8%	1.1%	0.6%	0.4%	0.2%	0.9%
1994	1.5%	1.9%	1.2%	0.6%	0.4%	0.3%	1.0%
1995	1.6%	1.9%	1.2%	0.7%	0.4%	0.3%	1.0%
1996	1.6%	1.9%	1.2%	0.7%	0.4%	0.3%	1.0%
1997	1.5%	1.9%	1.2%	0.7%	0.4%	0.3%	1.0%
1998	1.5%	1.9%	1.2%	0.6%	0.4%	0.3%	1.0%
1999	1.5%	1.8%	1.1%	0.6%	0.4%	0.2%	1.0%
2000	1.4%	1.8%	1.1%	0.6%	0.4%	0.2%	1.0%

1/ NPS Accession manpower requirements represent both active duty and estimated reserve requirements.

TABLE A-6

PERCENTAGE OF NPS FEMALES REQUIRED TO ACCESS
IN ORDER TO MEET ACCESSION NEEDS, BY YEAR OF BIRTH

YEAR OF BIRTH	YEAR TURNING 18	TOTAL ACCESSIONS FOR YEAR OF BIRTH 1/	QUALIFIED 18 YEAR OLDS FOR YEAR OF BIRTH	% OF AGE GROUP WHO MUST ACCESS
1956	1974	43,976	961,337	4.6%
1957	1975	45,503	996,032	4.6%
1958	1976	45,373	997,933	4.5%
1959	1977	47,710	996,982	4.8%
1960	1978	50,481	992,705	5.1%
1961	1979	51,982	1,007,438	5.2%
1962	1980	48,542	993,180	4.9%
1963	1981	45,197	983,675	4.6%
1964	1982	44,743	974,170	4.6%
1965	1983	45,230	936,624	4.8%
1966	1984	44,598	880,542	5.1%
1967	1985	45,112	856,904	5.3%
1968	1986	44,833	837,418	5.4%
1969	1987	46,314	860,231	5.4%
1970	1988	47,849	883,994	5.4%
1971	1989	48,394	886,370	5.5%
1972	1990	44,663	807,952	5.5%
1973	1991	43,917	782,762	5.6%
1974	1992	43,126	756,147	5.7%
1975	1993	44,856	774,683	5.8%
1976	1994	44,694	764,227	5.8%
1977	1995	46,192	790,842	5.8%
1978	1996	45,643	790,367	5.8%*
1979	1997	46,580	822,685	5.7%*
1980	1998	48,274	873,063	5.5%*
1981	1999	47,615	881,142	5.4%*
1982	2000	47,288	894,925	5.3%*

* Demand for these birth years is calculated by extending the model to the year 2005.

1/ Accession can be into either active duty or reserves.

FIGURE A-1

TOTAL 18-23 QUALIFIED AND AVAILABLE

POPULATION, MALE AND FEMALE

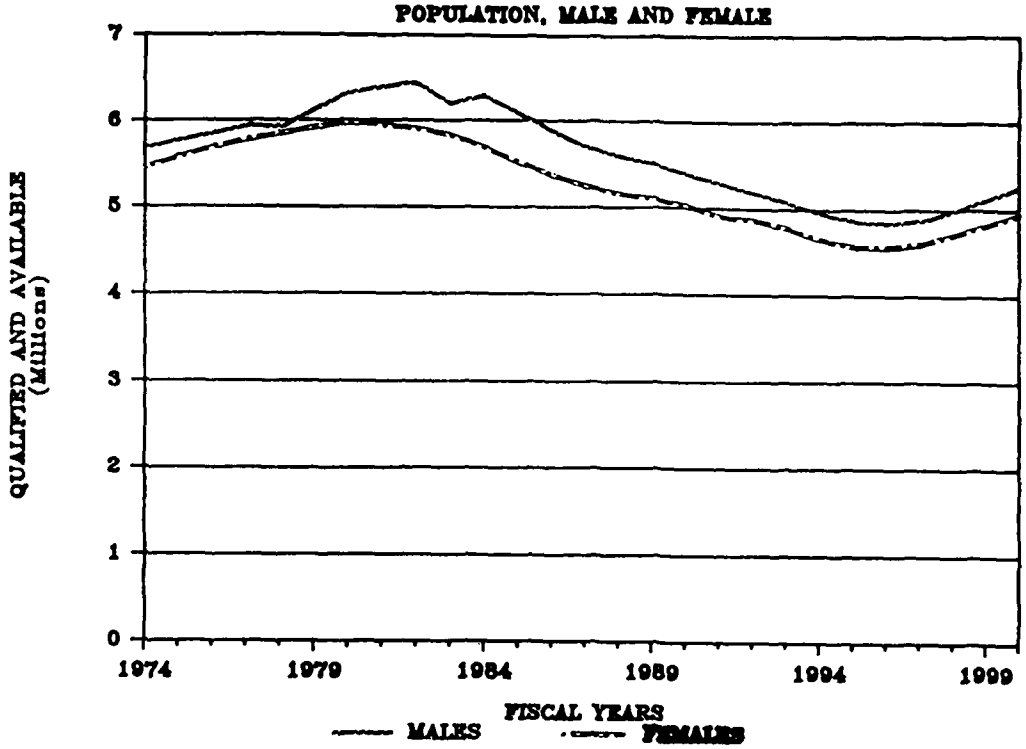


FIGURE A-2

TOTAL ACCESSIONS, 18-23

MALE AND FEMALE

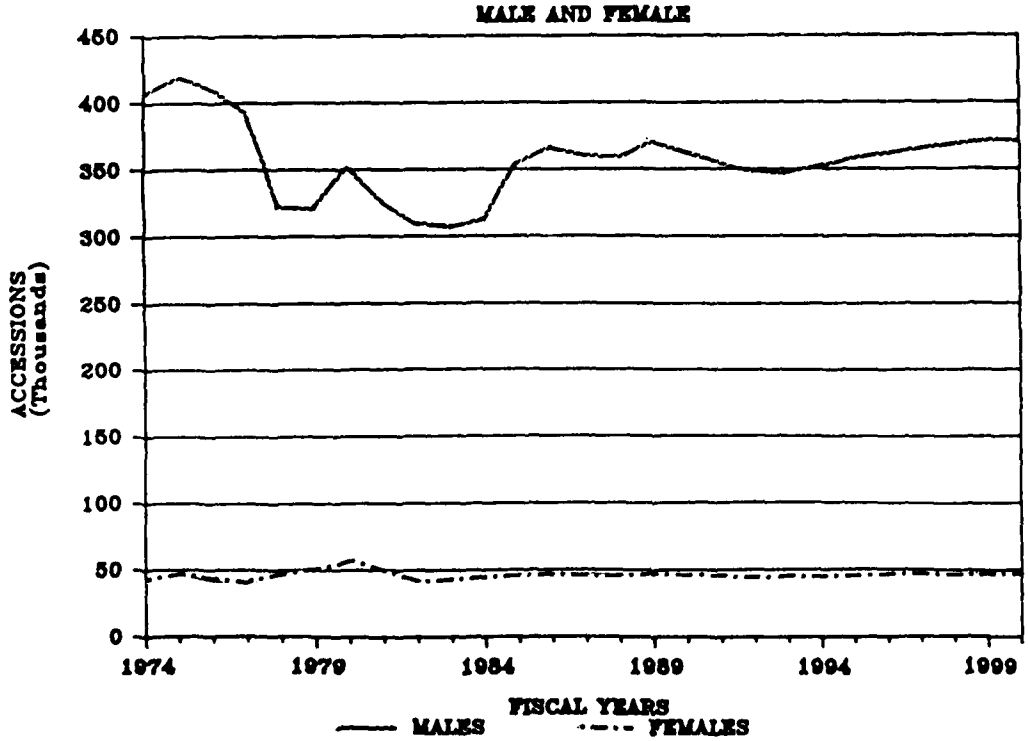


FIGURE A-3

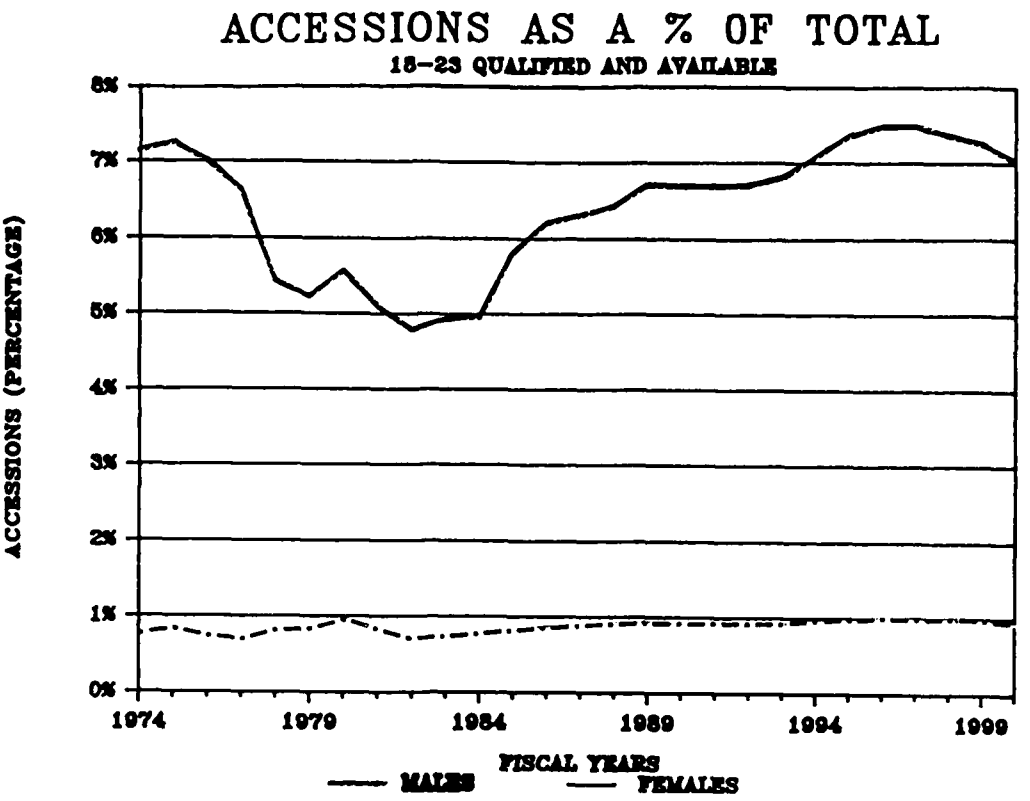


FIGURE A-4

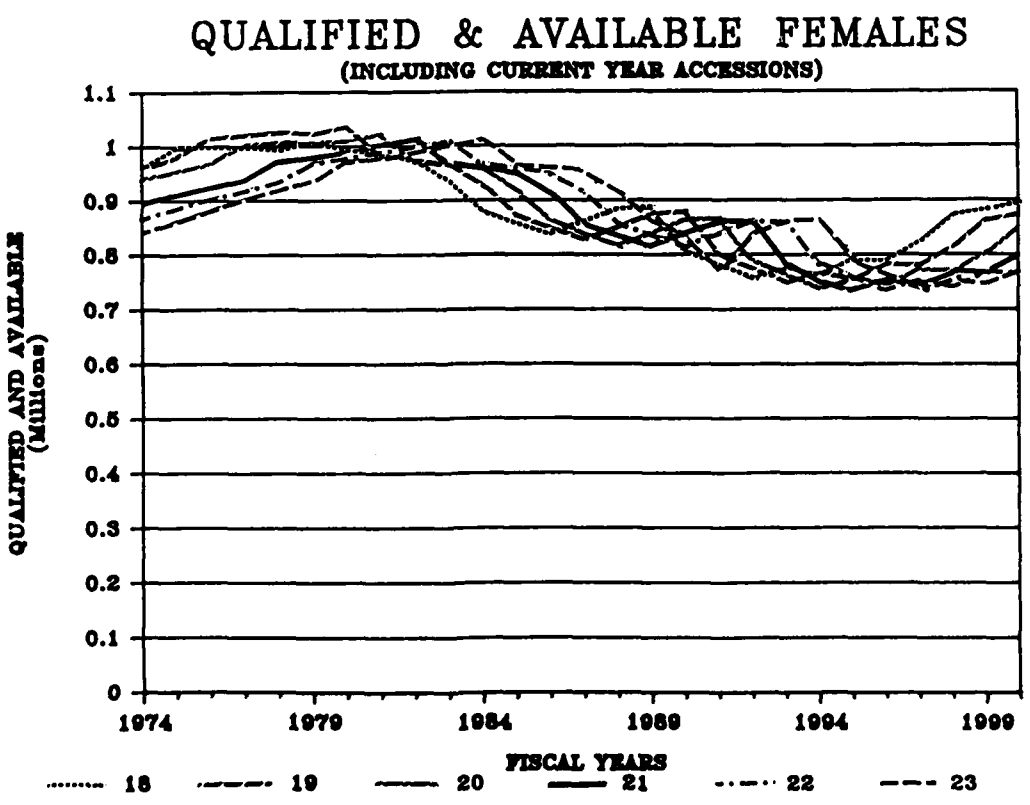


FIGURE A-5

NPS FEMALE 18-23 ACCESSIONS

AS A % OF ACCESSIONS

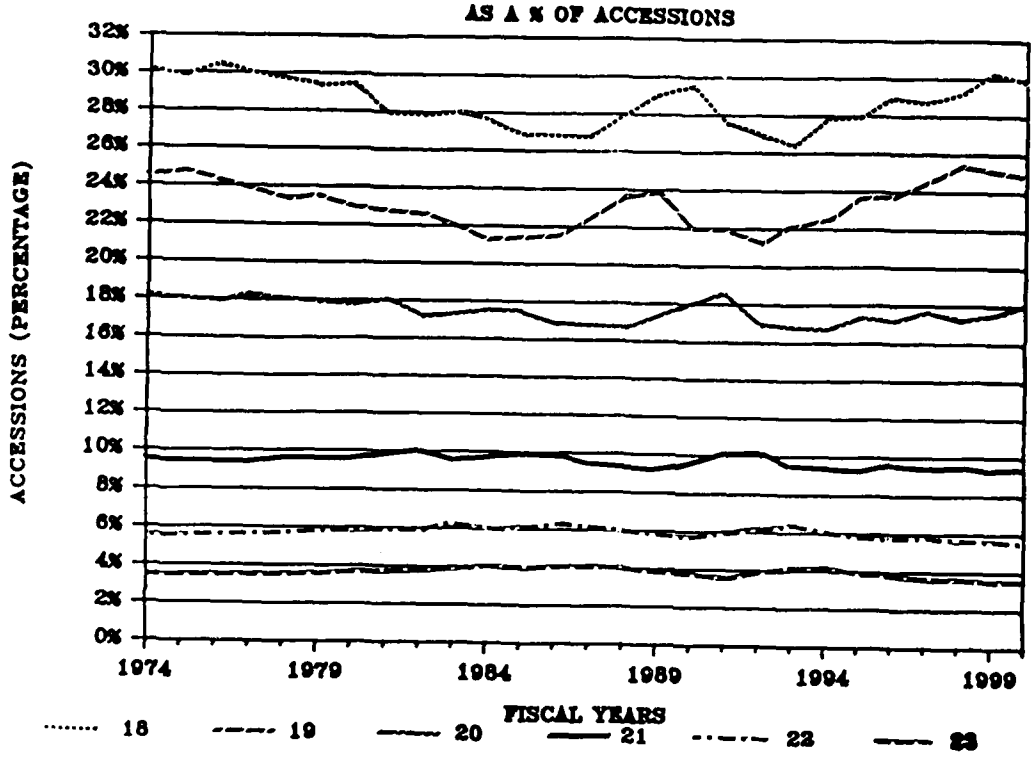


FIGURE A-6

NPS FEMALE 18-23 ACCESSIONS

AS A % OF QUALIFIED AND AVAILABLE

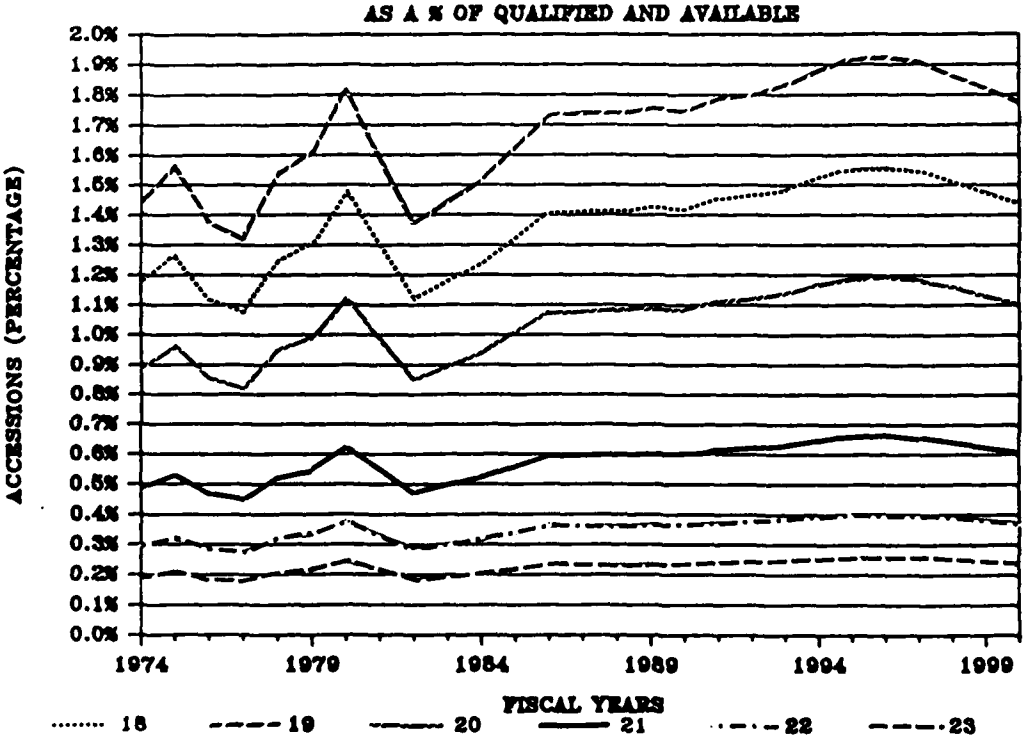
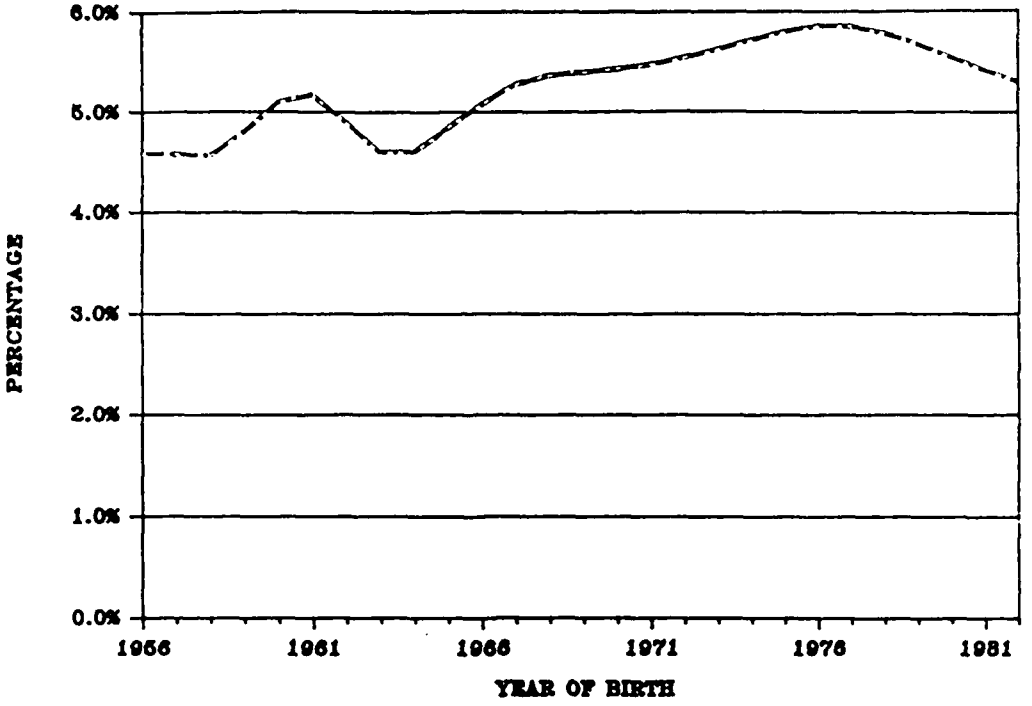


FIGURE A-7

PERCENTAGE OF NPS FEMALES REQUIRED

TO MEET ACCESSION NEEDS



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