1988 Worldwide Survey

of Substance Abuse and Health Behaviors Among Military Personnel

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ERRATA COMMENTS FOR 1988 WORLDWIDE SURVEY HIGHLIGHTS REPORT

Recent analyses of the Worldwide Survey data revealed a labeling error for heavy drinkers for the Worldwide Survey Reports. The estimates for heavy drinking in these reports were for consumption of five or more drinks per typical drinking occasion at least twice a week, although those results were erronesouly labeled five or more drinks at least once a week. The algorithm for computing the drinking levels measure was modified to correct the labeling error and new estimates of drinking levels were computed using the definition of five or more drinks per typical drinking occasion at least once a week. Estimates of the numbers of heavy drinkers using this definition are larger than the previous estimates.

Figures 1, 2, 6, 7, and 8 replace respective figures in the 1988 Worldwide Highlights report. Attached Table 3 replaces Table 3 in the body of the report. Tables A.1 and A.2 replace tables in the Appendix of the report.

Figure 1 presents the trends over the four Worldwide Surveys of the percentage of the total active military force who engaged in heavy alcohol use, any drug use, and any cigarette use during the past 30 days. Table 3 presents the observed rates of use of the three substances for the four survey years and information about the statistical signicance of changes in substance use between the survey years. As shown, use of all three substances declined significantly between 1980 and 1988, although the rate of decline varied for each of the substances and between the four surveys.

The prevalence of heavy alcohol use declined significantly from 20.8 percent of all military personnel in 1980 to 17.0 percent in 1988. Table 3 shows, however, that heavy alcohol use increased significantly from 1980 to 1982, remained relatively stable between 1982 and 1985 and then declined significantly between 1985 and 1988.

Table 3. Substance Use and Health Summary, 1980-88 - Total DoD

Measure	Year of Survey							
	1980		1982		1985		1988	
Alcohol Drinking Levels								
Abstainer	13.5	(0.5)[b,c]	11.8	(0.5)[d]	13.4	(0.6)[e]	17.2	(0.4)
Infrequent/Light	12.1	(0.4)[b,c]	17.8	(0.8)	16.8	(0.7)	17.5	(0.5)
Moderate	21.2	(0.7)[b]	17.0	(0.5)[d]	18.6	(0.6)	19.5	(0.5)
Moderate/Heavy	32.4	(0.6)[b,c]	29.6	(0.6)	28.5	(0.8)	28.8	(0.7)
Heavy	20.8	(1.1)[b,c]	24.1	(1.0)	22.9	(1.1)[e]	17.0	(0.9)
Any Drug Use[a]								
Past 30 Days	27.6	(1.5)[b,c]	19.0	(1.0)[d]	8.9	(0.8)[e]	4.8	(0.3)
Past 12 Months	36.7	(1.5)[b,c]	26.6	(1.0)[d]	13.4	(1.0)[e]	8.9	(0.8)
Cigarette Use, Past 30 Days	51.0	(0.8)[c]	51.4	(0.8)[d]	46.2	(1.0)[e]	40.9	(0.8)
Alcohol Use Negative Effects								
Serious Consequences	17.3	(1.1)[b,c]	14.6	(0.8)[d]	10.7	(0.9)	9.0	(0.6)
Productivity Loss	26.7	(1.2)[b,c]	34.4	(0.7)[d]	27.1	(1.1)[e]	22.1	(1.2)
Dependence	8.0	(0.6)[c]	9.0	(0.5)	7.7	(0.7)	6.4	(0.5)
Drug Use Negative Effects								
Serious Consequences	13.3	(1.0)[b,c]	6.2	(0.4)[d]	3.0	(0.4)[e]	1.8	(0.2)
Productivity Loss	14.4	(1.1)[b,c]	9.9	(0.5)[d]	3.4	(0.6)	2.1	(0.4)
Health Practices, Past 12 Months	-	-	-	-	3.79	(0.02)[e]	3.91	(0.04)

Note: Entries for health practices are mean values. Other entries are percentages with standard errors in parentheses. Serious consequences for alcohol and drugs are reported for the past 12 months.

[a]Any nonmedical use of marijuana, PCP, LSD/hallucinogens, cocaine, amphetamines/stimulants, tranquilizers, barbiturates/sedatives, heroin/other opiates, analgesics, inhalants, and "designer drugs."

[b]Comparisons between 1980 and 1982 are statistically significant at the 95 percent confidence level.

[c]Comparisons between 1980 and 1988 are statistically significant at the 95 percent confidence level.

[d]Comparisons between 1982 and 1985 are statistically significant at the 95 percent confidence level.

[e]Comparisons between 1985 and 1988 are statistically significant at the 95 percent confidence level.

-Data are not available before 1985.

Figure 1. Trends in Substance Use Past 30 Days
Total DoD, 1980-88

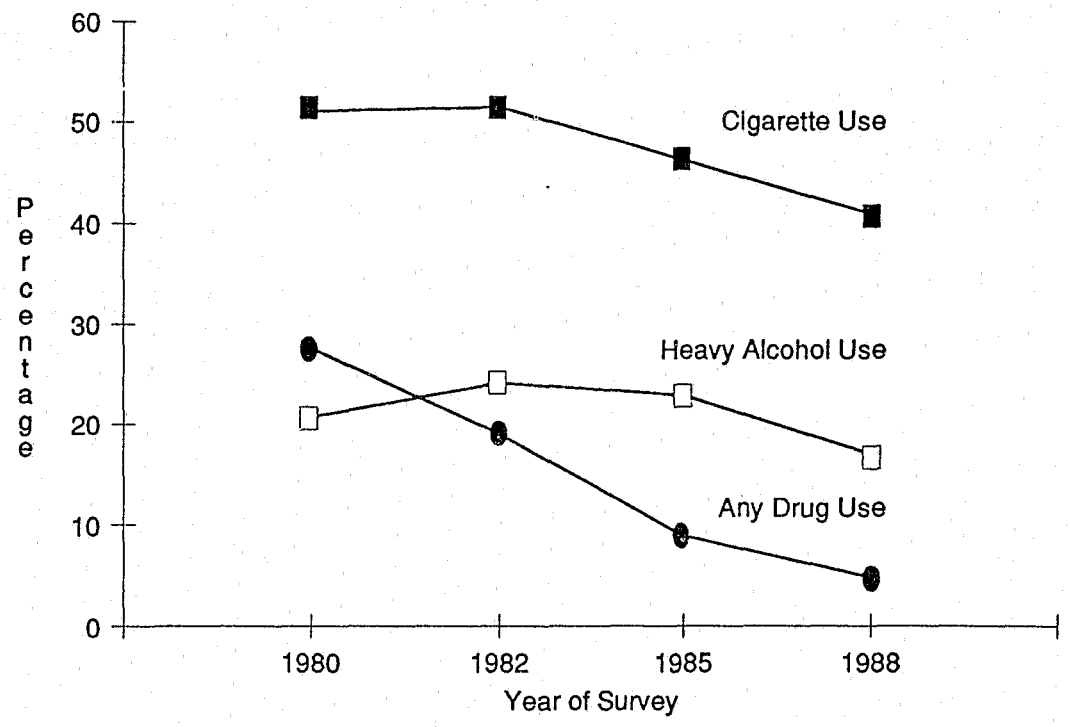


Figure 2. Trends in Substance Use Past 30 Days by Service, 1980-88

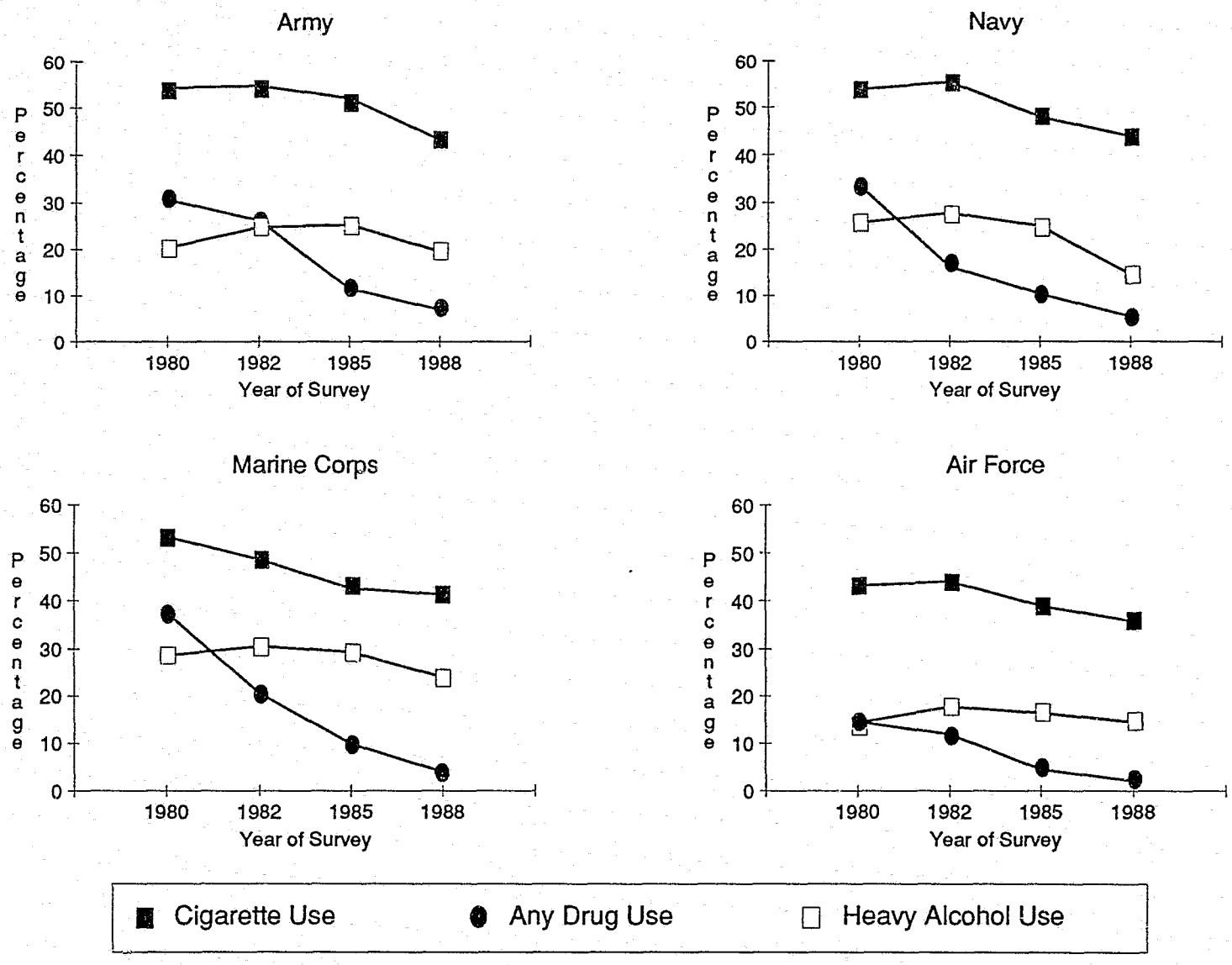


Figure 6. Trends in Heavy Alcohol Use Past 30 Days, 1980-88

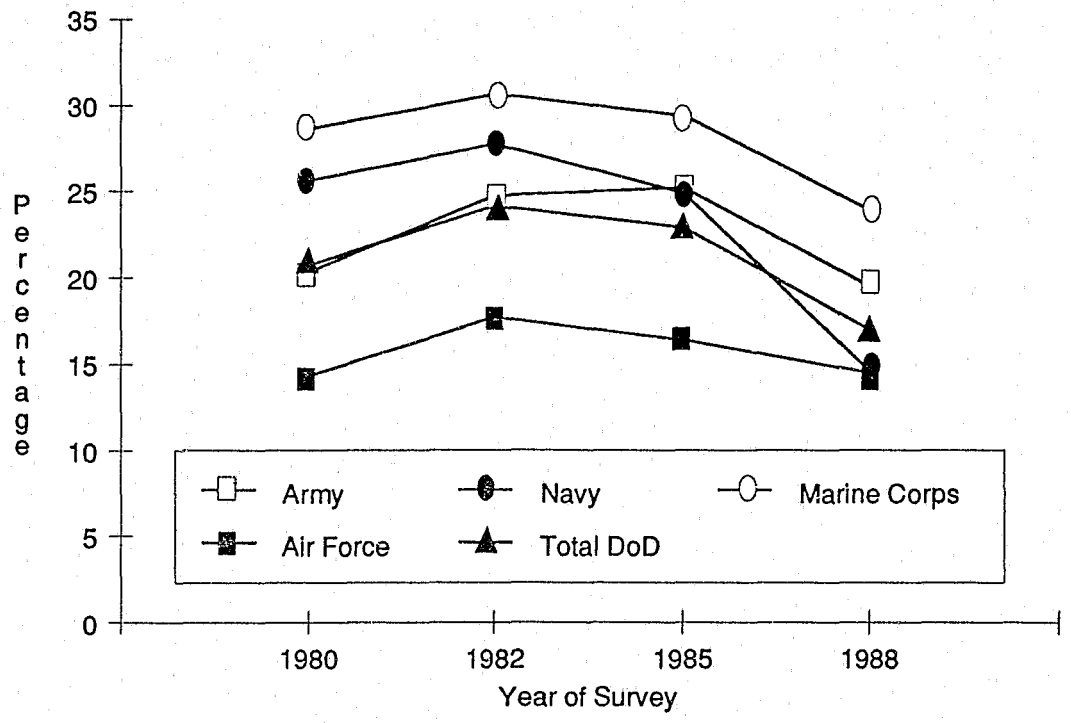


Figure 7. Heavy Alcohol Use by Paygrade, Total DoD

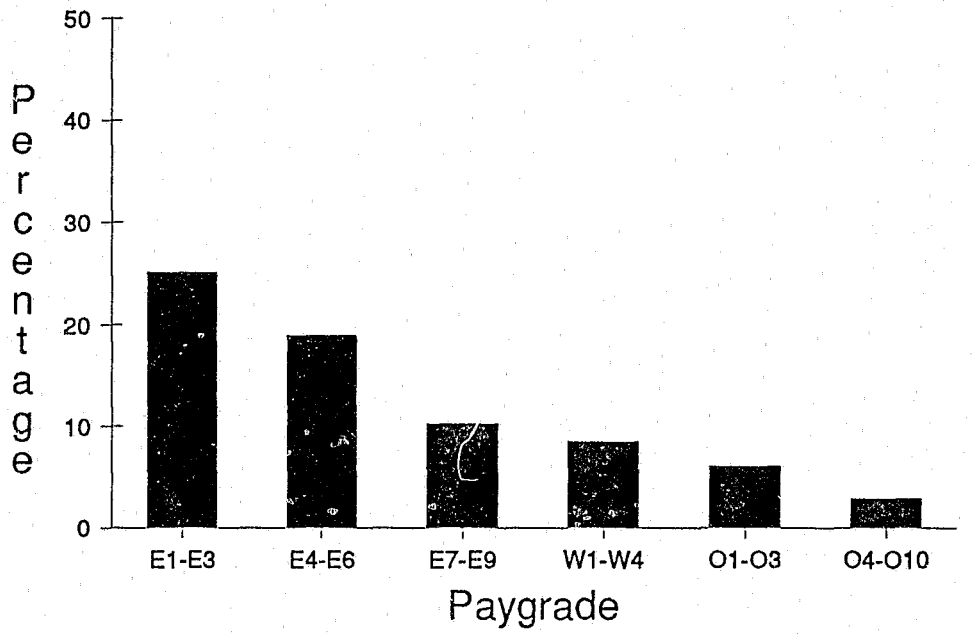


Figure 8. Heavy Alcohol Use for E1-E3s by Service

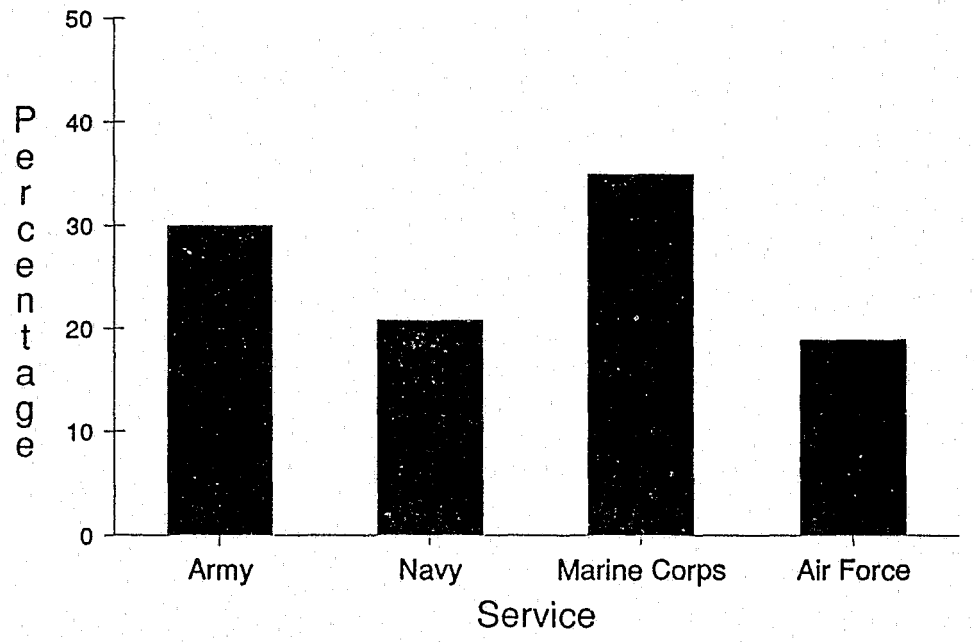


Table A.1. Trends in Alcohol Use, Past 30 Days, 1980-88

Service/Measure	Year of Survey							
	1980		1982		1985		1988	
Army								
Ethanol Ounces	1.61	(0.10)[b]	1.58	(0.08)	1.38	(0.12)	1.14	(0.06)
Drinking Level								
Abstainer	15.5	(0.7)[a]	11.7	(0.5)[c]	14.9	(0.7)[d]	17.1	(0.7)
Infrequent/light	12.2	(0.9)[a,b]	16.7	(1.0)	16.6	(1.1)	16.8	(0.9)
Moderate	19.9	(1.2)[a]	16.6	(0.8)	17.6	(0.7)	19.5	(0.8)
Moderate/Heavy	32.0	(0.7)[b]	30.3	(1.0)[c]	25.6	(1.8)	27.1	(0.8)
Heavy	20.3	(1.6)[a]	24.7	(1.4)	25.2	(2.2)[d]	19.5	(1.1)
Navy								
Ethanol Ounces	1.64	(0.12)[a]	1.64	(0.12)	1.33	(0.10)[d]	0.92	(0.06)
Drinking Level								
Abstainer	10.0	(0.5)[b]	10.5	(1.4)	9.6	(0.8)[d]	15.7	(0.6)
Infrequent/light	11.7	(0.6)[a,b]	20.7	(2.3)	18.8	(2.0)	18.3	(0.9)
Moderate	20.5	(1.3)[a]	15.1	(1.1)[c]	18.7	(1.1)	20.9	(1.2)
Moderate/Heavy	32.2	(1.6)[a]	26.1	(1.5)	27.9	(1.4)	30.5	(1.6)
Heavy	25.6	(2.3)[b]	27.7	(2.9)	24.9	(1.4)[d]	14.6	(2.1)
Marine Corps								
Ethanol Ounces	1.75	(0.09)[a,b]	1.45	(0.09)	1.47	(0.22)	1.25	(0.13)
Drinking Level								
Abstainer	10.4	(1.0)[b]	13.5	(2.0)	10.8	(2.5)[d]	18.0	(0.9)
Infrequent/light	11.0	(0.5)	13.2	(1.8)	13.6	(1.7)	15.9	(3.2)
Moderate	17.6	(1.2)[a,b]	14.9	(0.3)	15.1	(2.1)	14.0	(1.1)
Moderate/Heavy	32.3	(1.4)	27.8	(0.7)	31.1	(1.8)	28.2	(1.7)
Heavy	28.6	(2.5)[b]	30.6	(0.9)	29.4	(3.7)	23.9	(3.9)
Air Force								
Ethanol Ounces	1.08	(0.11)[b]	0.96	(0.05)	0.86	(0.07)	0.72	(0.03)
Drinking Level								
Abstainer	15.0	(1.0)[b]	12.6	(0.7)[c]	15.8	(1.0)[d]	18.5	(0.8)
Infrequent/light	12.6	(0.5)[a,b]	17.3	(0.8)	15.4	(0.8)[d]	18.2	(0.8)
Moderate	24.9	(1.2)[a,b]	19.8	(0.7)	20.8	(1.2)	19.7	(0.8)
Moderate/Heavy	33.2	(0.9)[b]	32.6	(0.8)	31.5	(1.1)	29.2	(1.1)
Heavy	14.3	(1.4)	17.7	(1.2)	16.4	(1.4)	14.5	(1.0)
Total DoD								
Ethanol Ounces	1.48	(0.07)[b]	1.41	(0.05)[c]	1.22	(0.06)[d]	0.98	(0.03)
Drinking Levels								
Abstainer	13.5	(0.5)[a,b]	11.8	(0.5)[c]	13.4	(0.8)[d]	17.2	(0.4)
Infrequent/Light	12.1	(0.4)[a,b]	17.6	(0.8)	16.8	(0.7)	17.5	(0.5)
Moderate	21.2	(0.7)[a]	17.0	(0.5)[c]	18.6	(0.6)	19.5	(0.5)
Moderate/Heavy	32.4	(0.6)[a,b]	29.6	(0.8)	28.5	(0.8)	28.8	(0.7)
Heavy	20.8	(1.1)[a,b]	24.1	(1.0)	22.9	(1.1)[d]	17.0	(0.9)

Note: Entries for Ethanol Ounces are the average (mean) number of ounces consumed daily. Entries for Drinking Levels are percentages. Standard errors in parentheses.

[a]Comparisons between 1980 and 1982 are statistically significant at the 95 percent confidence level.

[b]Comparisons between 1980 and 1988 are statistically significant at the 95 percent confidence level.

[c]Comparisons between 1982 and 1985 are statistically significant at the 95 percent confidence level.

[d]Comparisons between 1985 and 1988 are statistically significant at the 95 percent confidence level.

Table A.2. Alcohol Use by Pay Grade, Past 30 Days

Pay Grade/ Alcohol Measure	Service				Total DoD
	Army	Navy	Marine Corps	Air Force	
E1-E3					
Ethanol ounces	1.97 (0.20)	1.39 (0.15)	1.79 (0.18)	0.90 (0.08)	1.47 (0.08)
Heavy drinkers	30.0 (2.0)	20.8 (5.6)	35.0 (5.4)	18.9 (0.9)	25.1 (2.3)
E4-E6					
Ethanol ounces	1.21 (0.07)	0.90 (0.04)	1.02 (0.16)	0.74 (0.04)	0.97 (0.03)
Heavy drinkers	23.3 (1.2)	15.4 (2.2)	20.4 (2.1)	17.2 (1.4)	19.0 (1.0)
E7-E9					
Ethanol ounces	0.69 (0.05)	0.62 (0.05)	0.70 (0.08)	0.63 (0.03)	0.65 (0.03)
Heavy drinkers	9.3 (1.0)	11.2 (1.4)	12.8 (1.0)	10.0 (1.1)	10.3 (0.6)
W1-W4					
Ethanol ounces	0.52 (0.07)	0.58 (0.08)	0.45 (0.03)	* (*)	0.52 (0.05)
Heavy drinkers	7.8 (1.8)	9.6 (3.3)	12.6 (1.6)	* (*)	8.5 (1.5)
01-03					
Ethanol ounces	0.43 (0.05)	0.48 (0.05)	0.63 (0.11)	0.53 (0.05)	0.49 (0.03)
Heavy drinkers	5.4 (1.2)	5.2 (1.2)	9.4 (2.8)	6.6 (1.0)	6.1 (0.6)
04-010					
Ethanol ounces	0.52 (0.07)	0.52 (0.08)	0.65 (0.07)	0.52 (0.02)	0.52 (0.03)
Heavy drinkers	3.4 (1.1)	2.6 (1.1)	0.8 (0.6)	2.8 (0.8)	2.9 (0.6)
Total					
Ethanol ounces	1.14 (0.06)	0.92 (0.06)	1.25 (0.13)	0.72 (0.03)	0.96 (0.03)
Heavy drinkers	19.5 (1.1)	14.6 (2.1)	23.9 (3.9)	14.5 (1.0)	17.0 (0.9)

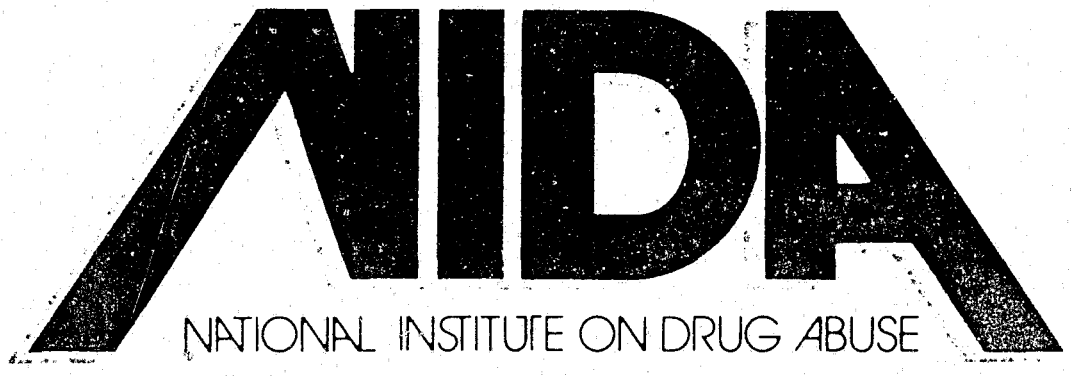
Note: Average daily ethanol ounces are mean scores and heavy drinkers are percentages with standard errors in parentheses.

*There are no warrant officers in the Air Force.

Presentation Abstracts

DRUGS IN THE WORKPLACE:

Research
&
Evaluation Data



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Drugs in the Military Workplace: Results of the 1988 Worldwide Survey

Robert M. Bray

Research Triangle Institute

The U.S. active duty military comprises a workforce of over two million personnel stationed worldwide with a mission to protect and defend the nation. In May 1981, national attention focused on drug use in the military workplace when a plane crashed on the flight deck of the aircraft carrier, Nimitz, and subsequent autopsies showed traces of marijuana in the blood of six sailors and Marines. The Department of Defense moved quickly to institute rigorous drug and alcohol abuse prevention programs including urinalyses to combat the problem. A series of Worldwide Surveys of substance use among military personnel has been used to monitor the prevalence of substance use and associated negative consequences.

This paper will describe results of the 1988 Worldwide Survey of Substance Abuse and Health Behaviors Among Military Personnel (Bray et al, 1988). The study sampled all active-duty military personnel except recruits, Service academy students, persons absent without leave and persons who had been transferred to another installation at the time of data collection. Two-person data collection teams traveled to 65 military installations located worldwide and administered self-report questionnaires in group settings. Data were obtained from 18,673 military personnel for an 81.4 percent response rate.

The presention will first provide an overview of prevalence of alcohol use, drug use, and cigarette use for the 1988 Survey. This will be followed by a discussion of trends across the series of Worldwide surveys for these substances. Prevalence and trend results will be complemented by a discussion of negative effects attributed to alcohol use and drug use. Data will focus on measures of serious consequences, productivity loss, and dependence.

The paper will then focus on the military job and substance use. Data will consider use of alcohol before or during work hours and examine the relationship of alcohol, drug, and cigarette use with self-reported stress at work. Findings will be discussed in terms of military substance abuse prevention programs and the military environment.

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PREFACE AND ACKNOWLEDGEMENTS

The 1988 Worldwide Survey of Substance Abuse and Health Behaviors Among Military Personnel was conducted by the Research Triangle Institute (RTI) under the sponsorship and guidance of the Assistant Secretary of Defense (Health Affairs). The survey is the fourth in a series of Worldwide Surveys conducted since 1980, and provides comprehensive and detailed estimates of the prevalence of use of alcohol, drugs, and tobacco and the negative consequences of alcohol and drug abuse among active-duty military personnel. The study also examines the prevalence of health behaviors and attitudes and knowledge about AIDS transmission and prevention.

Many individuals contributed to the success of this study. Among DoD and military Services personnel, special appreciation is due Air Force Lieutenant Colonel Michael R. Peterson, the Contracting Officer's Representative who provided valuable guidance throughout the study. Excellent liaison between DoD, RTI and the Services was provided by Lieutenant Colonel Samuel Holley for the Army, Commander Joseph Kavale for the Navy, Captain Kevin Sandri for the Marine Corps, and Major Mondo Dennett for the Air Force. The efforts of the four Service centers that provided programming and data processing support for personnel sample selection are gratefully acknowledged. The cooperation of installation commanders both for the pretest and the main survey, and the assistance and courtesies provided by the Military Liaison Officers who coordinated the activities of the data collection teams, were essential for the successful completion of this effort. Finally, appreciation is extended to the participating Service members whose responses made this study possible.

Under subcontract to RTI, James J. Tully and the staff of National Computer Systems assisted with the production and scoring of questionnaires. They printed, shipped, received, and optically scanned the survey questionnaires and constructed the raw data file for the analysis.

Many staff members of the Research Triangle Institute contributed significantly to the success of this project by composing the questionnaire, coordinating data collection activities, tabulating data, completing various data processing tasks, and typing of the manuscript. In particular,

D. Kirk Pate provided assistance in data collection activities, and Gayle S. Bieler, Anne Carroll Theisen, and Jill Anderson assisted with data analysis, table production, and report preparation. George H. Dunteman provided helpful advice on multivariate analyses. J. Valley Rachal, Director of the Center for Social Research and Policy Analysis, provided direction, support, and encouragement throughout the project. Members of the RTI field teams are commended for accomplishing their data collection tasks under rigorous travel and scheduling demands. Finally, thanks are due Elizabeth R. Cavanaugh who edited the report and to Lillian W. Clark, R. Teresa Ferguson, and Donna J. Albrecht, who completed the enormous typing and clerical requirements.

Robert M. Bray, Ph.D.
Project Director

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EXECUTIVE SUMMARY

This report presents the results of the 1988 Worldwide Survey of Substance Abuse and Health Behaviors Among Military Personnel. The survey is the fourth sponsored by the Office of the Assistant Secretary of Defense (Health Affairs) since 1980 to investigate the prevalence of use of alcohol, drugs, and tobacco and the consequences of alcohol and drug abuse on the work performance, social relationships and health of active-duty military personnel. The last two surveys also examine the prevalence of health behaviors other than substance use and the implications of health behaviors for military readiness and the overall well-being of military personnel. The 1988 survey also considers attitudes and knowledge about AIDS transmission and prevention. Findings from the current survey are examined in light of the military's health promotion policies and programs.

The eligible population of the 1988 survey consists of all active-duty military personnel except recruits, Service academy students, persons absent without leave (AWOL), and persons who had a permanent change of station (PCS) at the time of data collection. Usable questionnaires were obtained from 18,673 military personnel (6,470 Army; 5,436 Air Force; 4,797 Navy; and 1,970 Marine Corps) for an 81.4 percent response rate.

A. Overview of Trends in Substance Use, Negative Effects, and Health Behaviors

- Alcohol use, drug use, and cigarette use have declined significantly since 1980 and are now the lowest since the survey series began.

- The declines are largest for drug use. The percentage of military personnel who used any drug during the past 30 days declined from 27.6 percent in 1980 to 4.8 percent in 1988. The percentage who were heavy drinkers declined from 14.1 percent in 1980 to 8.2 percent in 1988. The percentage who were cigarette smokers declined from 51.0 percent in 1980 to 40.9 percent in 1988.

- As alcohol use and drug use declined, the percentage of military personnel reporting alcohol- and drug-related negative effects also declined. Alcohol-related serious consequences decreased from 17.0 percent in 1980 to 9.0 percent in 1988; drug-related serious consequences decreased from 13.3 percent in 1980 to 1.8 percent in 1988. Alcohol dependence and productivity loss associated with alcohol or drug use also declined.

- The involvement of military personnel in selected health practices showed a small but significant increase between 1985 and 1988.

In sum, substantial declines in alcohol use, drug use, and cigarette use and in the negative effects associated with alcohol and drug use were found among military personnel in the 1980s. Although these decreases may partially reflect related changes among civilians, they are likely also the result of intense military efforts to reduce substance abuse. The involvement of military personnel in other health behaviors increased between 1985 and 1988 (the period for which such data were available).

B. Alcohol Use

- In 1988, about 83 percent of military personnel were current drinkers, with about two-thirds being moderate to heavy drinkers and 8.2 percent being heavy drinkers. They consumed an average of 0.96 ounces of ethanol per day.

- The average daily volume of ethanol consumed has declined steadily since 1980; the decreases between the 1982 and later surveys were statistically significant.

- Alcohol consumption has been consistently lower among Air Force personnel than among personnel in the other Services. These between-Service differences are not accounted for by differences in the sociodemographic composition of the Services.

- Beer is the most commonly consumed beverage (consumed by 72 percent of military personnel in the past 30 days), followed by liquor (46 percent) and wine (32 percent).

- Most military personnel do not drink frequently or heavily.

- The alcohol-related beliefs and attitudes of heavy drinkers and light drinkers or abstainers differ.

- Controlling for the effects of other factors the average daily consumption of more ounces of ethanol is significantly more likely among personnel who are: single, in pay grades E1-E3, black, males and in the Army or the Marines; who did not continue their education beyond high school; who are highly motivated to drink; who engage in fewer health practices; who believe that the military will help those with alcohol problems; and who have favorable attitudes and beliefs toward drinking.

- In the past 30 days, about 10 percent of military personnel report drinking alcohol before or during work hours.

- Those reporting more stress at work report more alcohol consumption than those reporting little or no stress.

- Military personnel are more likely to report that they currently drink less than when they entered the military (40.2 percent) than to report that they drink more (26.5 percent) or about the same (21.1 percent).

In sum, the overall amount of drinking and heavy drinking have decreased substantially since 1980, particularly since 1985. These decreases are no doubt tied in part to similar decreases among civilians, but they also reflect the effectiveness of military efforts to decrease alcohol abuse.

C. Drug Use

- Use of any drugs decreased from 27.6 percent in the past 30 days in 1980 to 19.0 percent in 1982 to 8.9 percent in 1985 to 4.8 percent in 1985; the decreases between each of the surveys were statistically significant.

- Similar decreases were seen for use of marijuana and drugs other than marijuana.

- Similar decreases in drug use were seen for each of the Services between 1980 and 1988, but not all of the decreases were statistically significant between 1985 and 1988.

- Change in the sociodemographic composition of the military population between 1980 and 1988 was not an important reason for the observed decreases in drug use.

- Drug use has been consistently lower among Air Force personnel than personnel in the other Services. Differences in sociodemographic composition partially explain the observed Service differences in drug use.

- Marijuana is the most commonly used drug; in 1988, 2.7 percent of military personnel reported use of marijuana within the past 30 days; use of other drugs was 1 percent or less.

- The use of all specific drugs declined between 1985 and 1988.

- Most drug users use drugs infrequently, 1 to 3 times a month. Frequent use is more common among personnel in E1 to E3 pay grades.

- Controlling for effects of other factors, drug use is significantly more likely among enlisted personnel who do not believe drug use is harmful, who engage in poor health practices, who are in the Army or the Navy, who are white, and who are single or married but unaccompanied by their spouse.

- Drug use is not strongly related to reported stress at work.

In sum, drug use among military personnel declined dramatically between 1980 and 1988 and is now the lowest since the survey series began. The declines are probably partially related to similar declines among civilians, but they also demonstrate the continuing effectiveness of military efforts to eliminate drug use among military personnel.

D. Tobacco Use

- The prevalence of cigarette smoking declined from 51.0 percent in 1980 to 40.9 percent in 1988. Heavy cigarette smoking (1 or more packs per day) declined from 34.2 percent in 1980 to 22.7 percent in 1988. The decreases in smokers and heavy smokers between 1985 and 1988 were statistically significant. Similar trends were seen for each of the Services.

- The percentages of smokers and heavy smokers have been in general lower among Air Force personnel than the other Services. These observed differences are partially accounted for by differences in the sociodemographic composition of the Services.

- The percentage of heavy smokers is greater among higher pay grades within enlisted and officer ranks. Among enlisted personnel, 36.3 percent of E7-E9s are heavy smokers compared with 18.6 percent of E1-E3s. Among officers, 12.5 percent of 04-010s are heavy smokers compared with 7.8 percent of 01-03s.

- Almost one-fourth of military personnel smoke a cigar or pipe, unchanged since 1985; about one-sixth use smokeless tobacco, a slight decrease since 1985. More enlisted persons than officers smoke cigars or pipes or use smokeless tobacco.

- Controlling for the effects of other factors, any cigarette smoking and heavy smoking are significantly greater among military personnel who are in enlisted pay grades, who are white, who did not continue their educations beyond high school, who are in the Army rather than the Air Force, who follow poorer health practices, and who report higher levels of stress at work.

- Among those who have smoked within the past 2 years, 62 percent have tried to stop smoking and of those who tried to quit 21.1 percent were successful.

In sum, cigarette smoking has declined substantially among military personnel since 1980, particularly since 1985. These declines in part reflect similar declines among civilians but also reflect the emphasis of military smoking cessation and prevention programs.

E. Negative Effects of Alcohol and Drug Use

- Alcohol-related negative effects have declined significantly since 1980. In 1988, 9.0 percent of all military personnel reported any serious consequence, 22.1 percent any productivity loss, and 6.4 percent alcohol dependence. Between 1985 and 1988 each of these measures decreased, but only the decrease in productivity loss was statistically significant. Similar changes were found for personnel in the four active Services.

- Alcohol-related serious consequences, productivity loss, and alcohol dependence are substantially higher among E1 to E3 pay grades; for any negative effects and alcohol dependence, rates for E1s to E3s are almost twice as high as E4s to E6s and for productivity loss, about 10 percentage points higher.

- Drinking levels are positively related to serious consequences. Heavy drinkers experience the most consequences, and infrequent/light drinkers report the fewest.

- Drug-related negative effects have also decreased significantly since 1980. In 1988, 1.8 percent of military personnel reported a serious consequence associated with drug use and 2.1 percent an instance of productivity loss. The decreases in serious consequences between 1985 and 1988 were statistically significant.

- Drug-related serious consequences and productivity loss are several times higher among E1s to E3s than E4s to E6s and minimal among the other pay grades.

- Drug use patterns are positively related to serious consequences. Users of drugs other than marijuana report significantly more serious consequences than users of marijuana only.

- Increases in drinking and drug use are associated with increases in the occurrence of general negative behaviors. Heavy drinkers had an average of 6.71 negative behaviors, and abstainers had 4.43. Users of other drugs experienced 8.62 negative behaviors, and nonusers experienced 4.81 negative behaviors.

In sum, negative effects due to alcohol use and drug use have declined significantly among military personnel since 1980. These declines are consistent with declines in alcohol and drug use during this period. Heavy drinkers and users of drugs other than marijuana appear to be at high risk for experiencing negative effects.

F. Substance Use and Health

- Almost all military personnel (96.6 percent) describe their health as good or excellent, and most indicators of health status suggest that it is. For instance, almost all military personnel had a satisfactory performance rating on their last physical readiness test.

- Military personnel engaged in an average of 3.79 of six health practices in 1985 and 3.91 in 1988, a small, but significant increase.

- Almost 80 percent of military personnel took some action within the past year to improve their nutrition.

- A majority of military personnel engage in functional activities to relieve stress, while one-third engage in certain less functional ways to relieve stress.

- Over 90 percent of military personnel report having had their blood pressure checked during the past year, but only one-half are aware of their blood pressure readings. About 12 percent have been diagnosed as hypertensive.

- The use of alcohol, drugs, and tobacco is implicated in poorer health outcomes. Controlling for other variables, heavy drinkers reported significantly more illnesses in the past year than moderate drinkers but not more than abstainers; those who used drugs in addition to or other than marijuana had significantly more illnesses than those who had not used drugs; and those who smoked a pack or more of cigarettes a day had significantly more illnesses than nonsmokers.

- The use of alcohol, drugs, and tobacco are moderately interrelated.

In sum, these findings suggest that most military personnel enjoy good health, but there are some areas that need improvement. Greater attention should be directed toward education about hypertension prevention and effective, functional stress management techniques. Further, the relationship between substance use and illness should be emphasized. Despite these problem areas, military personnel engage in health practices that are productive of good health, and they have made a number of changes in their behavior to improve their health status.

G. Attitudes Toward AIDS

- Virtually all military personnel know that AIDS can be transmitted by needle-sharing and by having sex with someone who has AIDS, but

fewer know whether it can be transmitted by blood transfusions, donating blood, or nonpersonal contact.

- Most military personnel know how to prevent the sexual transmission of AIDS.

- Almost all military personnel have received information about AIDS from newspapers or magazines and commercial TV or radio, and a majority have received information pamphlets distributed by the Services, Command Information Program, and military medical personnel.

- Almost 40 percent of military personnel report having changed their sexual behavior because of concern about getting AIDS.

In sum, despite substantial knowledge about the means of transmission and prevention of aids, many military personnel are not well informed. These findings indicate the need to continue and to intensify military educational efforts about AIDS.

H. Alcohol and Drug Abuse Policies and Programs

- Personnel generally do not believe that drinking and drug use are broadly accepted norms in the military, indicating that the Services offer a climate supportive of reasoned use of alcohol and nonuse of drugs.

- Military personnel perceive regulatory policies to be effective in limiting accessibility and ease of use.

- About 9 percent report receiving counseling or treatment for an alcohol-related problem and 2 percent for a drug-related problem, primarily through military treatment programs rather than through civilian programs and facilities.

- Military personnel perceive a number of barriers to seeking help for an alcohol or drug abuse problem.

- Most personnel believe that urinalysis testing is an effective deterrent to drug use, but a majority also believe that the reliability of the test is questionable.

In sum, military policies and programs appear to be effective in creating an environment conducive to responsible alcohol use and nonuse of drugs. Personnel are generally aware of the health risks of alcohol and drug use and are moderately aware of the potential effects on job performance and combat readiness. The urinalysis program appears to be an espe-

cially effective component of the drug abuse prevention program, but educational programs regarding the risks of alcohol and drug use and effects on job performance need to be intensified. Further attention needs to be paid to any barriers to seeking help, either real or perceived.

1. BACKGROUND AND APPROACH

This report presents the findings from the 1988 Worldwide Survey of Substance Abuse and Health Behaviors Among Military Personnel conducted by the Research Triangle Institute of Research Triangle Park, North Carolina. This investigation is the fourth in a series of surveys of military personnel across the world conducted in 1980, 1982, 1985 and 1988 under the direction of the Office of Assistant Secretary of Defense (Health Affairs). All of the surveys investigate the prevalence of alcohol use, drug use, and tobacco use and the consequences of alcohol and drug use for military readiness, combat efficiency, and work performance. The 1985 and 1988 surveys also consider the role of health behaviors other than substance use on military readiness and the quality of life of military personnel. In addition, the 1988 survey examines attitudes and knowledge about AIDS transmission and prevention.

In this report we describe substance use, health behaviors, and attitudes of military personnel in 1988 and progress since 1980 toward achieving health-related goals set forth by the Department of Defense (DoD). This chapter introduces the DoD perspective on substance abuse and health behaviors, provides background on the Worldwide Survey series, describes objectives and conceptual issues for the 1988 survey, and outlines the organization of the report.

A. DoD Perspective on Substance Abuse and Health Behaviors

Substance abuse and poor health practices by military personnel deter the DoD mission of maintaining a high state of military readiness among the Armed Forces. Consequently, a central aim of DoD is the prevention and minimization of the effects of substance use on military performance and the promotion of health behaviors that contribute to good health.

The DoD policy emphasizes preventive drug and alcohol abuse education and law enforcement procedures focusing on early intervention (NIAAA, 1982).

Current policy on drug and alcohol abuse is guided by an August 1980 DoD Directive (No. 1010.4) which maintains that "alcohol and drug abuse is

incompatible with the maintenance of high standards of performance, military discipline, and readiness (p.2)." To free the military of alcohol and drug abuse, a comprehensive set of policies and programs is mandated to provide for:

- assessment of the nature, extent and consequences of substance use and abuse in the military;
- prevention programs designed to deter substance abuse;
- treatment and rehabilitation programs designed to return substance abusers to full performance capabilities; and
- evaluation of urinalysis and treatment and rehabilitation programs.

In addition to efforts to control substance abuse, the Department of Defense has long recognized the importance of healthy lifestyles for military performance and readiness. Military policy and practice have supported and encouraged the development of beliefs and behaviors that promote sound health through a comprehensive system of medical care. A concentrated health promotion program, however, has been a fairly recent phenomenon.

In 1986, the Department of Defense established a formal, coordinated and integrated health promotion policy (DoD Directive No. 1010.10). The policy was designed to improve and maintain military readiness and the quality of life of DoD personnel and other beneficiaries. Health promotion was defined as those activities designed to support and influence individuals in managing their own health through lifestyle decisions and self-care. The health promotion directive identified six broad program areas: smoking prevention and cessation, physical fitness, nutrition, stress management, alcohol and drug abuse prevention, and prevention of hypertension.

1. Smoking cessation and prevention programs aim to create a social environment that supports abstinence and discourages use of tobacco products, thereby creating a healthy working environment. The programs also seek to provide smokers with encouragement and professional assistance to stop smoking. A recent DoD policy prohibits smoking in work areas shared by smokers and nonsmokers, auditoriums, conference rooms, classrooms, and

certain other common spaces. Information on the health consequences of smoking is to be presented to military personnel when they enter the Service and at the time of a permanent change of station. At entry nonsmokers are encouraged not to smoke, and smokers are encouraged to quit.

2. Physical fitness programs aim to encourage and assist military personnel to establish and maintain the physical stamina and cardiorespiratory endurance necessary for good health and a productive lifestyle. Programs that integrate fitness activities into normal work routines as well as community activities are encouraged.

3. Nutrition programs aim to encourage and assist military personnel to establish and maintain dietary habits that contribute to good health, prevent disease, and control weight. The weight control aspect of health promotion overlaps with the goals of physical fitness programs discussed above, but nutrition programs also provide information about the nutritional value of foods and the relationship between diet and chronic disease.

4. Stress management programs aim to reduce environmental stressors and to help target populations cope with stress. Commanders are to develop leadership practices and work policies that promote productivity and health and to offer education to military personnel on stress management techniques.

5. Alcohol and drug abuse prevention programs aim to prevent the misuse of alcohol and other drugs, eliminate the illegal use of such substances, provide counseling or rehabilitation to abusers who desire assistance, and provide education to various target audiences about the risks associated with drinking. (This policy supplements earlier alcohol and drug abuse prevention policy).

6. Hypertension prevention programs aim to identify hypertension early, provide information about control and lifestyle factors, and provide treatment referral where indicated.

The individual Services have established their own programs consistent with DoD policy to meet the distinctive problems and needs of their members.

In a 1988 memorandum, the Department of Defense set forth military policy on the identification, surveillance, and administration of personnel

infected with the human immunodeficiency virus (HIV), the virus associated with the transmission of AIDS. The policy provides for testing military members and candidates for accession and establishes procedures for dealing with those who test positive for HIV. In addition, the military is providing extensive education on how AIDS is transmitted and how to prevent transmission.

DoD policy requires the systematic assessment of the (1) nature, extent and consequences of alcohol and drug abuse within the active force, (2) deterrence and detection efforts aimed at suppressing substance abuse, (3) education and training efforts for substance abuse prevention, (4) substance abuse treatment and rehabilitation programs, and (5) evaluation of the effectiveness of health promotion efforts. The Worldwide Survey series responds to these requirements.

B. The Worldwide Survey Series

A systematic effort to obtain data that can be used to guide and evaluate substance abuse and health programs and policies began in 1980 under the direction of the Assistant Secretary of Defense (Health Affairs). A series of recurrent surveys was begun in 1980 to improve understanding of the nature, causes, and consequences of substance use, and health in the military; determine the appropriateness of the emphasis placed on program elements, and examine the impact of current and future program policies. The 1980 survey was conducted by Burt Associates, Incorporated, of Bethesda, Maryland, and the 1982, 1985, and 1988 surveys by Research Triangle Institute of Research Triangle Park, North Carolina. All four surveys have assessed the extent and consequences of alcohol and drug abuse, while the last two surveys have broadened their focus to include an assessment of health promotion efforts. Selected findings from the first three surveys are presented throughout this report for comparison with findings from the 1988 survey. As discussed in more detail in Chapter 2, some of these findings are based on original analyses of the data from earlier Worldwide Surveys and have not appeared previously in the surveys' final reports.

In addition to the four Worldwide Surveys conducted by DoD, the individual Services have conducted several related surveys. These include a

1977 survey of alcohol problems among Air Force personnel (Polich and Orvis, 1979); the Sample Surveys of Military Personnel (SSMP), an ongoing series of semiannual surveys of Army personnel; a 1983 survey of alcohol and drug use among Marines (Stoloff and Barnow, 1984); and a 1975 survey of alcohol use and problem drinking among Navy personnel (Cahalan and Cisin, 1975). Here we briefly review the three previous DoD Worldwide Surveys.

1. The 1980 Worldwide Survey

The 1980 Worldwide Survey of Alcohol and Nonmedical Drug Use Among Military Personnel was designed to provide a "comprehensive, detailed and accurate estimate of the prevalence of nonmedical drug use and alcohol use among the active duty military population worldwide and to provide information on the physical, social, and work-related consequences of substance use in the population." The study thus concentrated on nonmedical drug use and alcohol use and associated consequences and provided the benchmark for the analysis of change in these measures over time.

The survey was conducted during February, March, and April, 1980. A total of 15,268 military personnel in pay grades E1 to O6 stationed at 81 installations completed self-administered questionnaires. The primarily descriptive analyses are reported in Burt et al. (1980). Analyses report the prevalence of nonmedical drug use, alcohol use, and associated negative consequences stemming from this use. Selected comparisons are also made between military and civilian populations. The data provided the first comprehensive assessment of substance use and abuse within the active duty military.

2. The 1982 Worldwide Survey

The 1982 Worldwide Survey of Alcohol and Nonmedical Drug Use Among Military Personnel was a followup study to the 1980 survey to track progress by the military in combatting substance abuse behaviors. It also examined alcohol and nonmedical drug use and associated physical, social, and work-related consequences. More specifically, the survey addressed seven objectives:

- determine the prevalence of alcohol and drug use within the military Services in terms of physical, social, and work consequences, and physical and psychological dependence;
- determine the demographic characteristics and behavioral factors associated with alcohol and drug abuse;
- assess the effects of alcohol and drug use on personal well-being and job performance through self-reported consequences;
- determine the social and family climate involved in the use of alcohol and drugs;
- assess the admitted reasons for using and not using alcohol and drugs;
- determine the history, availability, and success of treatment, the number who have sought treatment, and whether the treatment was in or outside the DoD; and
- compare alcohol and drug use of the military high risk subpopulation to similar subpopulations in civilian society.

Data were collected between September 1982 and January 1983, and analyses were based on completed questionnaires from 21,936 active duty military personnel in pay grades E1 to O6. Descriptive analyses of the prevalence of alcohol and drug use and associated consequences were supplemented with more explanatory approaches that examined the predictors of these behaviors. Selected comparisons of alcohol and drug use in military and civilian populations were conducted, and the contexts of alcohol and drug use in the military were investigated. Attitudes toward and involvement in military prevention and treatment programs were described. Analyses are reported in Bray, Guess, Mason, Hubbard, Smith, Marsden, and Rachal (1983; see also Allen and Mazzuchi, 1985).

3. The 1985 Worldwide Survey

The 1985 Worldwide Survey of Alcohol and Nonmedical Drug Use Among Military Personnel continued the investigation of nonmedical drug use, alcohol use, and associated consequences. Smoking behavior was assessed in more detail, and involvement in health behaviors other than alcohol and drug use was investigated for the first time. The relation of substance use and other health behaviors to health status was examined. Thus, the continuing concerns for the prevalence of alcohol use and nonmedical drug

use and associated consequences were placed within a broader health promotion framework. More specifically, the design and analysis of the 1985 Worldwide Survey were oriented toward achieving the following major objectives:

- assess the prevalence of alcohol use, nonmedical drug use, and tobacco use;
- identify the physical, social, and work consequences of use;
- identify the demographic and behavioral characteristics of users;
- determine trends in military drug and alcohol use over time;
- compare military drug use and alcohol use to civilian use, and assess health attitudes and behaviors of military personnel.

To meet these objectives, survey questionnaire data were obtained from a worldwide representative sample of personnel from the four active Services. Usable questionnaires were obtained from 17,328 military members. Research findings are described in Bray, Marsden, Guess, Wheeless, Pate, Dunteman, and Iannachione (1986). Specialized analyses are reported in Bray, Marsden, Guess, and Herbold (in press), Marsden, Bray, and Herbold (1988), and Ballweg and Bray (in press).

C. The 1988 Worldwide Survey

The 1988 Worldwide Survey is placed within a broad health promotion framework that continues prior emphases on nonmedical drug use and alcohol use and associated consequences and programmatic responses. The examination of health attitudes and behaviors has a more central role. Questions on health behaviors included in the 1985 survey were augmented, and additional questions on stress were included. Overall the questions permit the assessment of progress in the military in alcohol and drug abuse prevention, smoking prevention and cessation, physical fitness, nutrition, stress management, and hypertension prevention behaviors. These changes will provide a better knowledge base about ways to increase the combat readiness and well-being of military personnel.

1. Objectives

The 1988 Worldwide Survey provides comprehensive health promotion framework to examine the extent of involvement in alcohol, drugs, and tobacco; the association between substance use and negative consequences such as effects on work performance, health, and social behavior; and involvement in health behaviors other than alcohol, drug, and tobacco use. The major objectives of the 1988 Worldwide Survey illustrate how its approach is more holistic than prior Worldwide surveys.

- describe the prevalence of substance use (alcohol use, non-medical drug use, tobacco use) among military personnel,
- identify the physical, social and work consequences of this use,
- identify the demographic and behavioral characteristics of substance users to include age, rank, Service, social and family climate, reported reasons for using, not using or discontinuing use,
- compare reported drug and alcohol use and smoking habits to prior Worldwide Surveys and to appropriate comparable civilian populations, and
- assess health behaviors of Service members with regard to smoking, fitness and other health behaviors.

Prior Worldwide Surveys did not fully consider involvement in health behaviors; the relationship of substance use and health, smoking behavior, and the impact on health; and the role of stress in substance use. The 1988 Worldwide Survey provides an improved base of information from which to examine substance use and health behaviors among military personnel, the effectiveness of programmatic responses, and the need for additional programs. In addition to the above objectives, the study considers certain attitudes and knowledge about the transmission of AIDS, with a view of determining the need for additional educational efforts.

2. Conceptual Issues

The overall design, data analysis, and reporting for the 1988 Worldwide Survey are guided by a conceptual framework that links substance use and other health behaviors, their determinants, and consequences, and

the military readiness and well-being of military personnel. The major elements of the conceptual framework are presented in Figure 1.1.

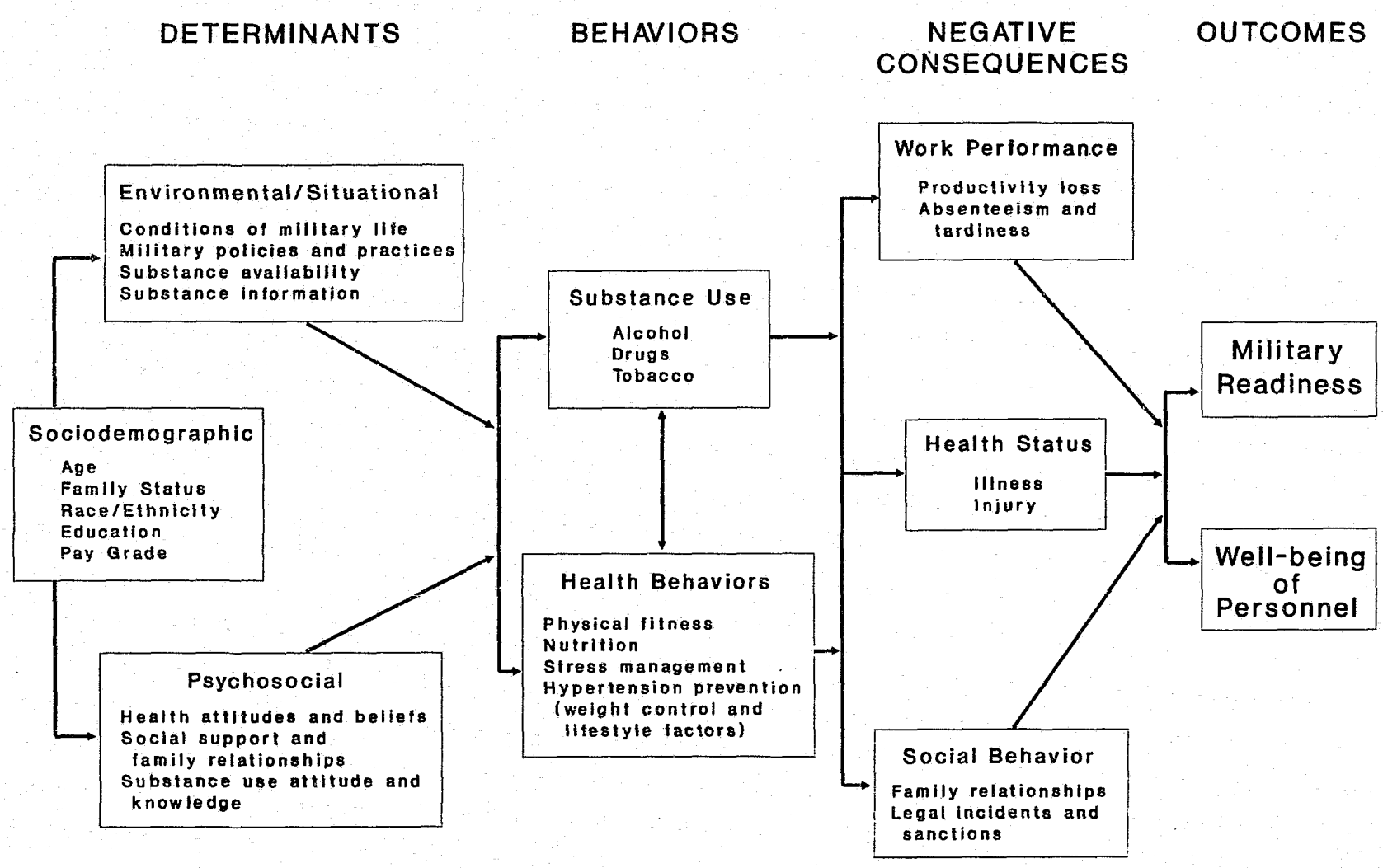
The framework recognizes the determinants and correlates of substance use and health, the interrelationship of substance use and health behavior, and the negative consequences of substance use and health practices for work performance, health status, and social behavior. The end products or outcomes of these elements are military readiness (both at the individual and unit levels) and the overall well-being of military personnel.

The framework implies that substance use and health behavior are the results of sociodemographic characteristics, environmental/situational factors, and psychosocial factors. Sociodemographic characteristics define certain regularities in the patterns of use of alcohol, drugs, and tobacco as well as involvement in health behaviors. Environmental/situational factors such as military conditions (including isolation from family) may encourage substance use, while military policies and practices may discourage use and encourage involvement in health behaviors. Substance use and health behaviors (including physical fitness, nutrition, stress management, and hypertension prevention practices) may, in turn, have certain immediate consequences for work performance, health status, and social behavior. Substance use and health behaviors may also have longer-term impacts on military readiness and the overall well-being of military personnel.

This conceptual framework is a general one, not arising from any one theoretical tradition but from current knowledge and research about substance use and its consequences and the relationship between substance use and health behaviors. The framework specifies relationships among variables and guides analyses described in this report. Note that the framework includes readiness and well-being as outcomes. These variables are not measured in the survey but are assumed to be compromised by substance use and poor health practices.

Those who study the use of alcohol, drugs and tobacco distinguish use from abuse. "Substance abuse" refers to any use of those three substances that results in negative consequences such as negative effects on work performance, health, or social behavior. For the military, this definition of abuse is expanded beyond negative effects to include <u>any</u> nonmedical use of drugs.

Figure 1.1. Conceptual Framework for Substance Use, Health Behaviors, and Related Consequences



The definition of substance abuse in terms of the consequences of use emerged from a World Health Organization (WHO) Committee that distinguished between alcohol dependence syndrome and alcohol-related disabilities. Since then, the traditional unitary disease concept of alcoholism has been elaborated to encompass the many different patterns of dysfunctional alcohol use and their associated disabilities (NIAAA, 1983, p. 100). These disabilities and consequences include various effects on health including mortality and morbidity; adverse social consequences such as intentional and unintentional injuries; and effects on work performance. The definition of alcohol abuse as negative consequences associated with alcohol use has been well accepted. This approach is being expanded to define substance use as use of alcohol, drugs, or tobacco that results in negative consequences. The present report also follows the military definition of drug abuse as any nonmedical use of drugs.

D. Organization of the Report

This report describes the context of substance use and health behaviors among active duty military personnel across the world in 1988, according to results from the 1988 Worldwide Survey. The general methodology for the study is described in Chapter 2, including sampling design, data collection, instrument development, measurement approaches, and analysis techniques. Chapter 3 provides an overview of trends in substance use, negative effects associated with alcohol and drug use, and involvement in health behaviors. Findings from the 1988 Worldwide Survey are compared with results from the 1980, 1982, and 1985 Worldwide Surveys.

The remaining chapters report survey findings in more detail. The next three chapters describe the prevalence, trends, correlates and relation to the military job of alcohol use (Chapter 4), drug use (Chapter 5), and tobacco use (Chapter 6). The consequences of alcohol and drug use for the health, social relationships, and work performance of military personnel are described in Chapter 7, while Chapter 8 presents analyses of the relationship of substance use to health. Attitudes and information about AIDS are examined in analyses reported in Chapter 9. Chapter 10 describes the context of military programs oriented toward alcohol and drug abuse prevention and treatment, including urinalysis.

The final chapter, Chapter 11, discusses findings from the 1988 Worldwide Survey in view of DoD health promotion policy that sets forth programs in the areas of alcohol and drug abuse prevention, smoking prevention and cessation, physical fitness, nutrition, stress management, hypertension prevention, and AIDS prevention.

2. METHODOLOGY OF THE 1988 WORLDWIDE SURVEY

This chapter describes the sampling design, data collection procedures, survey performance rates, organization and content of the survey questionnaire, and the 1988 survey respondents. In addition it provides an overview of measurement approaches and analysis techniques.

A. Sampling Design Overview

The sampling design for the 1988 Worldwide Survey was based on the design used in the 1982 and 1985 Worldwide Surveys (Bray et al., 1983, 1986) and can be summarized as a deeply stratified, two-stage, two-phase probability sample. Relevant statistical precepts have been rigorously applied to develop a demonstrably unbiased design. Linear statistics computed using the probability structure specified by the design can be shown to provide unbiased estimates of corresponding population parameters.

The eligible population of 1988 survey participants consists of all active-duty military personnel except recruits, Service academy students, persons absent without leave (AWOL), and persons who had a permanent change of station (PCS) at the time of data collection. Personnel who were recruits, academy students, or were AWOL are in special environments and were excluded because they have not been on active duty long enough to typify the Services or they were not accessible. Personnel with PCS status are typical of military personnel but were excluded due to the practical difficulties of obtaining data from them quickly enough to be of use to the study. The substance use and health behaviors for these individuals are assumed to be similar to those of other personnel represented in the survey. Further, the current survey includes information from an array of respondents broad enough (i.e., all pay grades, four Services, four regions) to address substance use policy and program issues.

The sample was selected in two phases: the first- and second-stage sampling units were selected in the first phase, and the nonresponse subsample was selected in the second phase.

1. Phase 1 Design

The Phase 1 sampling frame was constructed in two stages. The first-stage frame was comprised of geographically proximal organizational

units defined within each Service. The second-stage frame was comprised of eligible active-duty military personnel attached to selected first-stage units (FSUs).

FSUs were constructed by combining geographically proximal Service-level organizational units. These organizational units were:

- Army--Unit Identification Code (UIC),
- Navy--Unit Identification Code (UIC),
- Marine Corps--Monitor Command Code (MCC) and Reporting Unit Code (RUC), and
- Air Force--Consolidated Base Personnel Office (CBPO).

Units were combined into FSUs on the basis of five-digit Zipcodes in CONUS and Army Post Office (APO)/Fleet Post Office (FPO) numbers elsewhere. The use of Zipcodes and APO/FPO numbers was a refinement of the 1985 design that enabled FSUs to be constructed with a higher level of geographic compactness than was possible in 1985.

The first-stage sampling frame was stratified by Service within the following broadly defined geographic regions of the world:

- Americas--Alaska, Canada, Continental United States (CONUS), Greenland, Iceland, Antigua, Bermuda, Cuba, Diego Garcia, Panama, Puerto Rico;
- North Pacific--Republic of Korea, mainland Japan, Okinawa;
- Other Pacific--Australia, Canton Enderbury, Gilbert Ellice, Guam, Hawaii, Johnston Atoll, Midway, Pacific Trust, Philippines, Wake;
- Europe--Belgium, Egypt, Greece, Italy, Netherlands, North Africa, Portugal, Saudi Arabia, Spain, Sicily, Turkey, United Kingdom, West Germany.

Fifteen first-stage strata were defined (one for each Service in each region except for the Marine Corps in Europe which was sampled in conjunction with the Navy in Europe).

The first-stage sample was selected with probability proportional to size and with minimum replacement (Chromy, 1979). The first-stage sample was selected sequentially from an ordered frame listing which was also a

refinement of the 1985 design. In particular, the first-stage sampling frame was ordered by the Service-specific major commands in order to insure their proportional representation within each first-stage stratum. Composite size measures were constructed to ensure that personnel within each pay grade group in each first-stage strata were equally likely to be selected.

Second-stage sampling units were lines on the personnel rosters of the organizational units selected at the first stage of sampling. The second-stage frame was stratified into six pay grade groups:

- E1 - E4,
- E5 - E6,
- E7 - E9,
- W1 - W4,
- O1 - O3,
- O4 - O10.

The second-stage sample was selected with equal probability and without replacement from within second-stage strata.

In total, 605 first-stage sampling units were constructed, averaging 3,419 active duty personnel, and 63 first-stage units were selected in the sample. The second-stage sample consisted of 26,526 active duty personnel (9,375 Army, 7,106 Navy, 2,931 Marine Corps, 7,114 Air Force).

2. Phase 2 Design

A subsample of persons who were selected for, but did not participate in, Phase 1 was selected to take part in the Phase 2 data collection. The subsample was comprised of personnel who were on leave, in the hospital, on temporary duty assignments (TDY/TAD), at sea or deployed in the field, incarcerated, or available but absent during the Phase 1 survey sessions. The specifications for this subsample were based on the results of the 1985 Worldwide Survey. Phase 2 data were used to adjust the Phase 1 estimates to compensate for nonresponse bias.

Additional details of the sampling frame construction, sample allocation, and sample selection are given in Appendix A.

B. Data Collection Procedures

Phase 1 data collection of the 1988 Worldwide Survey consisted of field teams conducting group sessions at the installations with personnel selected for participation. Ninety percent of the 1988 questionnaires were completed in Phase 1. Phase 2 data collection consisted of mailing questionnaires to a subsample of selected personnel who did not attend any Phase 1 scheduled session.

1. Phase 1 Data Collection

Phase 1 questionnaire administrations were held from mid-March through April, 1988 at the selected installations located in the four world regions. A Headquarters Liaison Officer (HLO) in Washington was appointed for each Service and a Military Liaison Officer (MLO) was appointed at each participating installation to coordinate survey activities.

Each HLO performed a variety of tasks that were vital to a successful data collection effort. Specifically, HLO's:

- generated support for the survey by sending a series of notifications to appropriate command levels,
- obtained MLO names and addresses for RTI staff,
- monitored the production of computer-generated sample personnel lists,
- worked with RTI staff to coordinate survey scheduling and preparations at the installations.

Before the field team arrived, MLO's were responsible for:

- storing the survey instruments,
- receiving the sample personnel lists,
- notifying sample personnel of their selection for the survey,
- scheduling the survey sessions for the field team visit.

During the RTI field team visit, the MLO's were responsible for monitoring and ensuring attendance of selected personnel at the sessions and documenting the reasons for absence.

Phase 1 data were collected by 10 two-person RTI field teams in survey sessions at the installations selected for the study. The data collection

itinerary was generally arranged to permit personnel at a nucleus installation to be surveyed during a 2-day visit; additional time was allowed at locations that had personnel dispersed over large geographical areas. Five field teams were assigned to the Americas Region, one to the North Pacific Region, two to the Other Pacific Region, and two to the Europe Region. Before data collection, field team leaders were trained in two 1-day sessions, and each team leader subsequently trained his or her team assistant.

The field teams' major responsibilities were to:

- establish itineraries consistent with MLO recommendations,
- coordinate preparations with the MLO at the installation,
- conduct scheduled survey sessions,
- ship completed survey forms to National Computer Systems for scoring, and
- report to RTI central staff on the completion of the survey at each site.

At the Phase 1 sessions team members described the purpose of the study, assured the respondents of anonymity, and informed participants of the voluntary nature of participation and the correct procedures for marking the questionnaire. Optical-mark questionnaires were then distributed to participants who completed them and returned them to team members. On average, the questionnaire required 50 minutes to complete.

Naval personnel selected for the sample who were on ships that were inaccessible to field teams were surveyed by a military liaison officer. To ensure confidential treatment of questionnaires, a clerk from the ship's mail room collected the completed questionnaires in a mail bag after the group sessions and shipped them to the U.S. for processing.

During the visit to a first stage-unit (installation), team members attempted to survey all eligible individuals. At each FSU, rosters were prepared that documented whether each individual attended the session and, if not, why he or she was absent. At the completion of the site visit, field teams inventoried completed questionnaires, reconciled the inventory with documented counts from the lists of sample personnel completing the survey, and packaged the questionnaires for shipment. Questionnaires were shipped to National Computer Systems for optical scan processing.

2. Phase 2 Data Collection

At the conclusion of Phase 1 data collection for each first-stage unit, RTI field teams mailed questionnaires to a selected subsample of Phase 1 nonrespondents.

The procedure for conducting the Phase 2 data collection was:

- obtaining information from the MLO about the status of each individual on the selected personnel list (e.g., attended, TDY, leave),
- applying prespecified subsampling rates to select eligible individuals among those who did not attend Phase 1 sessions (see Appendix A for details of the subsampling rates),
- obtaining a correct mailing address from the MLO for the selected subsample, and
- preparing and mailing a survey packet to the subsample.

The Phase 2 packet included a cover letter from RTI that explained the purpose and importance of the study, a copy of a blank questionnaire precoded to identify the FSU and the study phase, and a business reply envelope for the respondent to use in mailing the completed questionnaire directly to National Computer Systems in Iowa City for scanning. As with Phase 1 data collection, the identity of the questionnaire respondents was anonymous.

C. Survey Performance Rates

Response rate information is useful for assessing the quality of survey field operations and for assessing nonresponse bias. The term, Response Rate, can be used for several different performance rates, each important from a survey operational perspective or from a statistical perspective. In the simplest of cases, the response rate is the ratio of

- the number of individuals in the population of inferential interest for whom the information was obtained
- divided by the total number of individuals in the population of inferential interest who were slated for the collection of information.

When the population surveyed and the population of inferential interest are not the same or when only partial information is obtained for the population units in the sample, however, the definition becomes more complicated.

Eligibility Rate, Availability Rate, Completion Rate, and Response Rate Among Eligibles are presented in Table 2.1 along with the corresponding response data used to compute them.

Table 2.1. Survey Response Data and Performance Rates

Item	Service				
	Army	Navy	Marine Corps	Air Force	Total DoD
Response Data					
1. Persons selected for survey (total sample)	9,375	7,106	2,931	7,114	26,526
2. Phase 1 eligible persons identified[a]	8,089	6,421	2,683	6,508	23,701
3. Eligibles available during Phase 1 data collection sessions	6,743	5,023	2,016	5,487	19,269
4. Questionnaires obtained from Phase 1	6,090	4,082	1,779	4,979	16,930
5. Questionnaires obtained from Phase 1 with usable information	6,057	4,047	1,770	4,955	16,829
6. Phase 2 sample size	2,133	2,736	781	1,596	7,246
7. Number of Phase 2 eligible persons identified	1,290	2,114	626	1,140	5,170
8. Questionnaires obtained from Phase 2 data collection	437	753	201	487	1,878
9. Questionnaires obtained from Phase 2 with usable information	413	750	200	481	1,844
10. Total questionnaires with usable information[b]	6,470	4,797	1,970	5,436	18,673
Performance Data					
11. Eligibility rate (%) = (Item 2/Item1)*100	86.3	90.4	91.5	91.5	89.4
12. Availability rate (%) = (Item 3/Item2)*100	83.4	78.2	75.1	84.3	81.3
13. Completion rate (%) = (Item 4/Item 3)*100	90.3	81.3	88.2	90.7	87.9
14. Phase 1 response rate among eligibles (%) (Item 5/Item 2)*100	74.9	63.0	66.0	76.1	71.0
15. Phase 2 response rate among eligibles (%) = (Item 9/Item 7)*100	32.0	35.5	31.9	42.2	35.7
16. Response rate among eligibles = (Item 14) + [1-(Item 14/100)*(Item 15/100)*100]	82.9	76.1	76.8	86.2	81.4

Note: Response data are frequencies; performance rates are percentages.

[a]Excludes 2,825 individuals from the sample who were separated (740), deceased (2), AWOL (6), unknown (124), PCS (1,847) or a Basic Trainee or Reservist (106).

[b]Overall 135 questionnaires were excluded.

Eligibility Rate is the percentage of individuals chosen for the sample who were still eligible several weeks later during data collection. Individuals selected might be ineligible because they left the military, were AWOL, were deceased, were PCS, or were unknown. The Eligibility Rate can be an important determinant of statistical efficiency because sampling variances are high when eligibility rates are low. If the eligibility status is not known for every case, some potential for missing data biases is introduced. As shown in Table 2.1, the overall Eligibility Rate was 89.4 percent.

Availability Rate is the percentage of identified eligible persons who were available to participate in Phase 1 group sessions. For various reasons, including temporary duty assignment, deployment and illness, some sample individuals were not available for Phase 1 questionnaire administrations. The Availability Rate is operationally important, largely determining the facilities needed for the group sessions, data collection schedules, and other factors. The nonresponse of available individuals adds another component to the total missing data or nonresponse bias potential. The overall Availability Rate during Phase 1 data collection was 81.3 percent. The availability rate suggests that the Phase 2 data were needed to compensate for the potential for nonresponse bias in Phase 1.

The Completion Rate is the percentage of identified eligible, available individuals who completed questionnaires. The completion rate affects data processing costs and schedules, and the missing data contribute to the potential for biases.

The 87.9 percent Completion Rate for Phase 1 data collection reflects the success of the field teams in obtaining questionnaires from eligible personnel who were available to be tested when the field teams were at the installations. Overall, the MLOs were highly successful in getting personnel to attend sessions. The Air Force (90.7 percent) and the Army (90.3 percent) had the highest rates, and the Navy had the lowest rate (81.3 percent).

Response Rate Among Eligibles is the rate at which usable questionnaires were obtained from eligible personnel for both phases of data collection. Ineligible individuals (i.e., those separated, deceased, AWOL,

PCS, or unknown) were excluded from the response rate calculation. Because subsampling was done at Phase 2, this rate was computed as the response rate at Phase 1 plus (1 minus the response rate at Phase 1 times the response rate at Phase 2). Overall, this rate was 81.4 percent.

D. Survey Questionnaire and Data Validity

The survey instrument was a self-administered questionnaire designed for optical mark reader scoring. The 1985 questionnaire was modified for 1988 to give greater emphasis to smoking behavior and new coverage to health attitudes and behaviors. Questionnaire items were developed to assess the areas specified in the 1988 Worldwide Survey objectives. These areas are:

- prevalence of alcohol use and drug use during the previous 30 days and 12 months;
- negative effects of alcohol and drug use;
- prevalence of tobacco use;
- health behaviors and attitudes;
- reasons for and the context of use and nonuse; and
- demographic characteristics of respondents.

The questionnaire appears in Appendix F.

During fall 1987, a pilot study was conducted at one military installation for each Service to examine the adequacy of questionnaire item wording, formatting, and response alternatives. Based on inspections of item distributions and informal debriefings of participants, item formatting/wording was changed to enhance clarity.

Many individuals question the validity of self-reported data on alcohol and drug use, claiming that survey respondents will give socially desirable rather than truthful answers. A series of studies has demonstrated, however, that although self-reports may sometimes underestimate the extent of substance use, the method generally provides useful and meaningful data. For example, Polich and Orvis (1979) examined the validity of alcohol-problem measures among Air Force personnel. They found little evidence of underreporting in comparisons of self-reported data on adverse effects with

police records and supervisor reports. Air Force beverage sales data, however, suggested that self-reports underestimate actual prevalence of alcohol use by as much as 20 percent.

The reliability and the validity of self-report data among U.S. civilian general population respondents have been explicitly tested in relation to alcohol use (Mayer and Filstead, 1979), drug use (Haberman et al., 1972; Kandel and Logan, 1984), and delinquent behavior among adolescents (Blackmore, 1974; Doleschal, 1970; Erickson and Empey, 1963; Gibson, Morrison, and West, 1970; Gold, 1966; Gould, 1969; Williams and Gold, 1972). Recent research on the validity of drug use self-reports was reviewed by Rouse, Kozel and Richards (1985). The various reviews of the literature concluded that self-reports of youth on alcohol use (Midanik, 1982), drug use (O'Malley, Bachman, and Johnston, 1983), and delinquent behavior (Elliott and Huizinga, 1984; Hindelang, Hirschi, and Weiss, 1981) are reliable and valid.

Support for the validity of data reported in the 1988 Worldwide Survey derives from this extensive body of research and corroborating urinalysis test data from military personnel. Urinalysis test results show a decline in opiate use from 41 per 10,000 urine tests in 1977 to 40 in 1978, 27 in 1979, 29 in 1980, and 14 in 1981 (Beary, Mazzuchi, and Richie, 1983). Survey data are consistent with these test results.

E. Sample Participants and Respondent Characteristics

Table 2.2 displays the distribution of survey respondents across Service, region, and pay grade. Overall, 18,673 usable questionnaires were obtained from sampled personnel. The Army had the largest number of respondents (6,470) followed by the Air Force (5,436), Navy (4,797) and Marines (1,970). The number of respondents is a function of the number of personnel sampled in each Service and the response rates.

The pay grade distribution for the total DoD shows the largest number of participants were E4-E6s, followed by E7-E9s, O4-O10s, E1-E3s, O1-O3s and W1-W4s. This pattern was generally consistent across regions. For the analyses, data are weighted to reflect the proportional representation of respondents in the population. That is, since E1-E3s comprise a larger proportion of the military than E4-E6s, their responses are weighted to reflect this greater representation.

Table 2.2. Distribution of 1988 Worldwide Survey Respondents

Region/Pay Grade	Service				
	Army	Navy	Marine Corps	Air Force	Total DoD
Americas					
E1-E3	224	244	126	329	923
E4-E6	1,210	1,129	283	1,369	3,991
E7-E9	995	1,004	229	1,070	3,298
W1-W4	249	174	49	*	472
O1-O3	241	196	72	281	790
O4-O10	413	321	70	478	1,282
Total	3,332	3,068	829	3,527	10,756
North Pacific					
E1-E3	24	26	74	58	182
E4-E6	206	191	141	268	806
E7-E9	173	155	135	182	645
W1-W4	47	37	45	*	129
O1-O3	53	45	38	61	197
O4-O10	74	53	69	58	254
Total	577	507	502	627	2,213
Other Pacific					
E1-E3	26	43	99	46	214
E4-E6	278	329	192	277	1,076
E7-E9	197	205	128	191	721
W1-W4	43	29	18	*	90
O1-O3	54	41	35	59	189
O4-O10	91	55	34	62	242
Total	689	702	506	635	2,532
Europe					
E1-E3	148	43	54	54	299
E4-E6	779	278	50	271	1,378
E7-E9	531	130	8	187	856
W1-W4	117	24	8	*	141
O1-O3	129	19	6	50	204
O4-O10	168	26	15	85	294
Total	1,872	520	133	647	3,172
Total Worldwide					
E1-E3	422	356	353	487	1,618
E4-E6	2,473	1,927	666	2,185	7,251
E7-E9	1,896	1,494	500	1,630	5,520
W1-W4	456	264	112	*	832
O1-O3	477	301	151	451	1,380
O4-O10	746	455	188	683	2,072
Total	6,470	4,797	1,970	5,436	18,673

Note: Table entries are numbers of respondents who completed a usable questionnaire.

*There are no warrant officers in the Air Force.

Many tables in subsequent chapters of the report present data in the form or some variation of the pattern shown in Table 2.2. Because of the large number of different cell sizes, it is not feasible to present sample sizes in the individual analytical tables. Thus, it is necessary to refer to this table for the approximate sample sizes used.

Table 2.3 presents the sociodemographic characteristics of the 1988 respondent population. This population includes all active duty personnel except recruits, Service academy students, those who were AWOL, and those

Table 2.3. Sociodemographic Characteristics of Eligible Respondent Population

Sociodemographic Characteristic	Service				
	Army	Navy	Marine Corps	Air Force	Total DoD
Sex					
Male	88.5 (1.1)	88.8 (3.2)	91.6 (1.0)	88.4 (0.7)	88.8 (1.0)
Female	11.5 (1.1)	11.2 (3.2)	8.4 (1.0)	11.6 (0.7)	11.2 (1.0)
Race/Ethnicity					
White	58.1 (1.7)	75.0 (1.8)	68.9 (1.0)	75.9 (1.3)	69.4 (0.9)
Black	27.8 (1.5)	12.3 (1.1)	18.3 (2.4)	14.3 (0.9)	18.5 (0.8)
Hispanic	9.0 (0.6)	7.7 (1.5)	11.1 (1.7)	6.4 (1.0)	8.0 (0.6)
Other	4.1 (0.3)	5.0 (1.0)	3.7 (0.6)	3.3 (0.4)	4.1 (0.3)
Education					
Less than high school	0.9 (0.2)	1.3 (0.2)	1.0 (0.3)	0.3 (0.2)	0.8 (0.1)
High school grad/GED	46.5 (2.3)	47.3 (2.9)	58.6 (6.2)	27.4 (1.8)	42.1 (1.5)
Some college	33.3 (1.0)	34.0 (1.2)	27.4 (4.9)	49.2 (2.0)	37.7 (0.9)
College degree or beyond	19.3 (2.3)	17.4 (2.5)	13.0 (2.6)	23.2 (2.9)	19.4 (1.4)
Age					
17-20	14.0 (1.5)	15.4 (2.8)	21.4 (4.0)	9.8 (1.4)	13.8 (1.1)
21-25	28.2 (1.8)	32.1 (2.5)	36.1 (3.2)	29.5 (2.2)	30.4 (1.2)
26-30	23.0 (0.7)	20.6 (2.0)	20.5 (2.7)	23.2 (0.8)	22.2 (0.7)
31-35	16.5 (1.1)	13.6 (1.1)	10.4 (0.9)	15.7 (0.8)	14.9 (0.6)
36 or older	18.3 (1.6)	18.3 (3.0)	11.6 (3.2)	21.8 (2.4)	18.8 (1.2)
Marital Status					
Not married	38.1 (1.5)	46.6 (5.2)	48.1 (2.5)	32.0 (2.0)	39.5 (1.9)
Married	61.9 (1.5)	53.4 (5.2)	51.9 (2.5)	68.0 (2.0)	60.5 (1.9)
Pay Grade					
E1-E3	16.7 (1.5)	20.4 (3.7)	40.4 (6.6)	20.6 (2.1)	21.0 (1.4)
E4-E6	53.7 (0.6)	55.9 (1.5)	37.9 (4.2)	50.2 (2.0)	51.9 (1.0)
E7-E9	11.6 (1.0)	9.8 (1.4)	9.1 (1.3)	10.0 (0.8)	10.4 (0.6)
W1-W4	2.4 (0.3)	0.6 (0.1)	1.0 (0.3)	* (*)	1.0 (0.1)
01-03	9.5 (0.9)	7.9 (1.3)	7.9 (1.3)	11.8 (1.7)	9.6 (0.7)
04-010	6.2 (1.3)	5.4 (1.0)	3.7 (1.9)	7.4 (1.6)	6.1 (0.7)
Total Personnel	33.4 (1.8)	27.8 (3.6)	8.8 (0.9)	30.0 (1.7)	- -

Note: Tabled values are column percentages with standard errors in parentheses.

*There are no warrant officers in the Air Force.

who were PCS at the time of data collection. Consequently, characteristics of the respondent population may differ somewhat from characteristics of the total Active Force. As shown in Table 2.3, the majority of personnel are males (88.8 percent), white (69.4 percent), age 30 or below (66.4 percent), married (60.5 percent), in pay grades E1-E6 (72.9 percent), and have a high school education or beyond (99.2 percent).

Table 2.3 and those in the following chapters often present two numbers in each cell. The first number is an estimate of the percentage of the population with the characteristics that define the cell. The second number, in parentheses, is the standard error of the estimate. Standard errors represent the degree of variation associated with observing a sample rather than every member of the population.

Confidence intervals, or ranges that are very likely to include the true population value, can be constructed using standard errors. The 95 percent confidence interval is computed by adding to and subtracting from the estimated proportion the result of multiplying 1.96 times the standard error for that cell. The confidence interval range is interpreted to mean that, if the study were repeated with 100 identically-drawn samples (which might include different individuals), the confidence interval will include the true parameter value 95 percent of the time. For a given confidence level (such as 95 percent), then, the precision with which the cell proportions estimate the true population value varies with the size of the standard error.

In tables where standard errors do not appear, the analyst/reader may estimate approximate standard errors by referring to an appropriate table that shows standard errors. The table chosen for reference should show standard errors for the same groups (e.g., Service by pay grade) for which an estimated standard error is needed and should show all percentages within subgroups that are equal to the percentages for which standard errors are desired. Given similarly defined groups, the error associated with any estimate in a cell (i.e., percentage or mean) is approximately equal to or larger than the error associated with an approximately equal-size point estimate in an equivalently defined cell.

F. Measurement Approaches

Measurement for the current study focuses on prevalence and correlates of substance use and abuse, adverse or negative effects, and health behaviors. This section provides a brief discussion of the key measures used in the analysis throughout the report. Additional details about construction of specific behavioral measures and attitudinal indexes appear in Appendix E.

1. Alcohol Use

Alcohol use is measured in this study in terms of both quantity consumed and frequency of drinking and is expressed in summary form as average number of ounces of absolute alcohol (ethanol) consumed per day and as drinking levels.

a. Average Daily Ethanol Consumption. An index constructed following the method used in the 1982 and 1985 Worldwide Surveys and the Rand Study (Polich and Orvis, 1979) combines the quantity and frequency of alcohol use to determine the average daily ounces of ethanol consumed. The ethanol index is computed as a function of the amount of ethanol contained in the ounces of beer, wine, and hard liquor consumed on a typical drinking day during the past 30 days, the frequency of use of each beverage, and the amount of ethanol consumed on atypical ("heavy") drinking days during the past 12 months. The index represents average daily ounces of ethanol consumed during a 12-month period. Although the index is expressed in terms of 12-month use, the data draw most heavily on reports of 30-day typical use. More detailed discussion of the method of construction is presented in Appendix E.

b. Drinking Level Classification. Another measure that combines information on quantity and frequency of alcohol use is the drinking level classification scheme adapted from Mulford and Miller (1960; see also Rachal et al. 1975, 1976, 1980) and that was used in the 1982 and 1985 Worldwide Surveys (Bray et al., 1983, 1986).

The classification scheme uses (a) the "quantity per typical drinking occasion" and (b) the "frequency of drinking" for the type of beverage (beer, wine, or hard liquor) with the largest absolute alcohol per day to

fit the individual into one of the ten categories resulting from all combinations of quantity and frequency of consumption. The resulting quantity/frequency categories are then collapsed into five drinking-level groups: abstainers, infrequent/light drinkers, moderate drinkers, moderate/heavy drinkers, and heavy drinkers as shown in Figure 2.1.

Figure 2.1. Drinking Level Classification Scheme

Drinking Level Groups	Definition
Abstainer	Drinks once a year or less.
Infrequent/Light Drinker	Drinks 1-4 drinks per typical drinking occasion 1-3 times per month.
Moderate Drinker	Drinks 1 drink per typical drinking occasion at least once a week, or 2-4 drinks per typical drinking occasion 2-3 times per month or 5 or more drinks per typical drinking occasion once a month or less.
Moderate/Heavy Drinker	Drinks 2-4 drinks per typical drinking occasion at least once a week or 5 or more drinks per typical drinking occasion 2-3 times per month.
Heavy Drinker	Drinks 5 or more drinks per typical drinking occasion at least once a week.

2. Drug Use

Drug use is measured in this study in terms of the frequency of nonmedical use of any of 10 categories of drugs. No attempt is made to measure quantity (e.g., number of pills) or the size of doses because most respondents cannot furnish adequate information and because of the considerable variation in "street" drug purity.

For estimating the prevalence of use, measures are available that indicate use of each drug type within the past 30 days and within the past 12 months. In addition, indices are created for estimating the prevalence of use of any drug (that was studied), and any drug besides marijuana. Definitions follow those used in the 1982 and 1985 Worldwide Surveys to facilitate comparisons. The indices of any drug use and any drug use except marijuana are constructed by creating use/no use dichotomies for each drug category and then setting an individual's score to the maximum score value

of the categories that are included (i.e., all, or all but the marijuana category).

Another index considers patterns of use: no use, marijuana-only use and any other drug use pattern (which could include marijuana use but requires use of one or more additional types of drugs). The other use pattern does not imply simultaneous use of the drugs but, rather, the use of several types of drugs during the past 30 days or 12 months.

3. Tobacco Use

In the current study, greater emphasis is placed on the analysis of tobacco use than in prior years. Most analyses focus on cigarette smoking, since this is the most common form of tobacco use. The primary measures of cigarette use assess prevalence of any current smoking and heavy smoking during the past 30 days. Current smokers are defined as those who smoked at least 100 cigarettes during their lifetime and smoked during the past 30 days. Heavy smokers are defined as current smokers who smoke one or more packs of cigarettes per day. Some analyses also classify personnel by categories of never smoked, former smokers (those who quit more than 30 days ago), and current smokers. The prevalence of use of other forms of tobacco use besides cigarettes are also presented.

4. Negative Effects

The negative effects of alcohol and drug use experienced by military personnel are examined using measures available in all of the Worldwide Surveys. Because of item changes across some of the Worldwide Surveys, some indexes used in the 1985 survey could not be computed. For this study three measures of negative effects are reported: serious consequences, productivity loss, and dependence. These measures are based on occurrences due to alcohol or drug use in the past 12 months of the items noted below:

- Serious Consequences--UCMJ punishment, loss of 3 or more work days, kept from duty 1 week or more by illness, hurt in accident (for drugs only), spouse left, DWI arrest, incarceration, fights, arrest for nondriving drinking or drug incident, not getting promoted, and being detoxified.

- Productivity Loss--being late for work or leaving early, not coming to work at all, being drunk or high at work, or performing below a normal level of productivity because of alcohol or drug use or the after effects or illness resulting from drinking or drug use.

- Dependence--unable to remember some things done while drinking the day before, had shakes because of drinking or hands shook at lot after drinking day before, could not stop drinking before becoming drunk, took drink first thing when got up.

The indexes of serious consequences for alcohol use and for drug use show the percentage of personnel who report any occurrence of the problems captured by the items. The productivity loss indexes assess days lost from work due to alcohol use and drug use. Data are shown for the percentage who report any productivity loss and the amount of time lost.

For the dependence measure, occurrences of each symptom during the past year are expressed as an estimated number of days. These frequencies are then summed over the four symptoms, and individuals with scores of 48 or more are classified as dependent. The dependence measure is computed only for alcohol use because of the small number of drug users.

5. Health Promotion

A major emphasis of the 1988 Worldwide Survey is the investigation of health behaviors of military personnel. The relationship between substance use and involvement in various health practices is examined, as well as health care utilization (number of illnesses, number of doctor visits, number of days hospitalized during the past 12 months), and awareness about AIDS. These analyses provide basic information about health practices in the military and the viability of health promotion approaches in decreasing substance abuse.

G. Analytical Approach

Analyses of the 1988 Worldwide Survey data are oriented toward providing knowledge about current levels of substance use and health behaviors, negative effects associated with alcohol and drug use, and trends in these behaviors throughout the Worldwide Survey series since 1980. These analyses will provide information to help assess and guide policy and program

directions, including the most effective targeting of resources to the problem areas.

To accomplish these aims, four basic types of analyses are conducted within this study:

- Descriptive univariate and bivariate analyses of the extent of substance use, negative consequences, and health behavior in 1988 and the relationship between substance use and a variety of negative effects, for the total DoD and the Services;
- Comparisons of the extent of substance use, health behaviors, and negative effects in 1980, 1982, 1985, and 1988 for the total DoD and the individual Services;
- Standardized comparisons of the extent of substance use among personnel in the four active Services; and
- Multivariate analyses of the contribution of certain causal factors to substance use and negative consequences.

These approaches, taken together, provide descriptive and interpretive information on the extent and nature of substance use and negative consequences among military personnel.

An important part of analyses conducted for this study is the comparison of trends across the series of Worldwide Surveys. Rather than relying on estimates in past published reports, the original data files were used for trend estimates. In some cases, data were edited to insure consistent treatment of data elements throughout the survey series. As a result, some of the data reported here may differ slightly from estimates in prior reports. Estimates for the 1980 survey are reported to tenths of a percent rather than whole percents. Some measures from past surveys are reported in this report for the first time (e.g., drinking levels for the 1980 Survey).

Comparing substance use over time is useful, but the limitations of such analyses should be recognized in drawing any policy conclusions. The data from the Worldwide Surveys are cross-sectional, not longitudinal, and come from different populations due to the high turnover in military personnel. Many individuals serving in the military in 1980, 1982, and 1985 were no longer in the military in 1988. Thus, caution must be used in

making inferences about reasons for the observed changes in rates of substance use, health behaviors, or problems. The changes may be due to effective substance use and health promotion programs and policies in the military, but they may also be due to differences in characteristics, attitudes, and values of the populations being surveyed. Where possible, we investigate the validity of some of these alternative explanations of observed changes.

H. Statistical Techniques

Analytical techniques for the report include univariate crosstabulations and multivariate regression analysis. Most of the analyses are descriptive crosstabulations of the responses from two or more variables. Significant differences for data in these tables are assessed using t tests.

In multiple regression analysis, independent variables are examined to determine how well they can account for or explain the variation that occurs in the criterion variable of interest. Generally, the size of the estimated regression parameters associated with each variable indicates the importance of the variable in predicting the criterion measure. The advantage of regression analysis over two-way descriptive tables is that it permits examination of the effects of variables of particular interest (e.g., drinking levels) on outcome measures (e.g., alcohol-related serious consequences) while controlling for the effects of the remaining variables in the analysis. Significant effects are assessed using F tests and t tests.

Some analyses use standardized comparisons to help control for differences among groups being compared. For example, one explanation for differences in substance use rates among the Services is the variation in sociodemographic composition of personnel in the Services. To assess the importance of this explanation, sociodemographic characteristics such as age and education that are associated with substance use must be standardized across the Services and comparisons made on the standardized estimates. Standardized comparisons use a regression-based standardization procedure developed by Williams and LaVange (1983).

3. OVERVIEW OF TRENDS IN SUBSTANCE USE, NEGATIVE EFFECTS AND HEALTH BEHAVIORS

The major objective of the Worldwide Survey series is to monitor the prevalence and trends in use of alcohol, drugs, and tobacco, associated negative effects, and involvement in health behaviors among military personnel. In this chapter we provide a brief overview of prevalence findings from the 1988 Worldwide Survey and examine the trends in substance use, negative effects associated with alcohol use and drug use, and health behaviors across the series of Worldwide Surveys. These findings are discussed in more detail in later chapters along with information about the correlates of substance use, relationship of substance use and health, programmatic issues, and other topics.

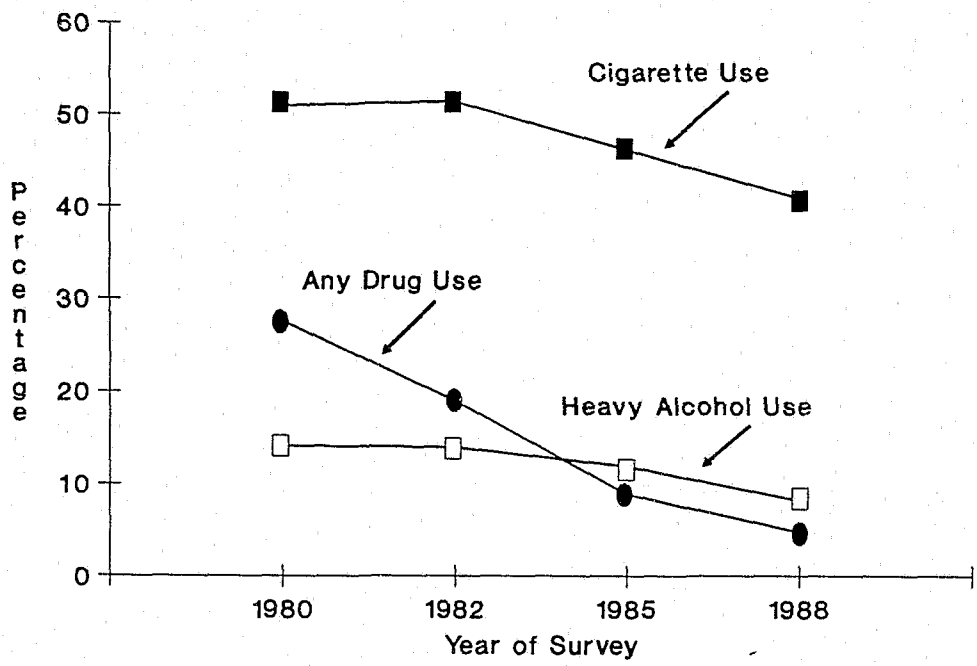
A. Trends in Substance Use

Prior surveys of military personnel and civilians have documented a decrease in the prevalence of use of alcohol, drugs, and tobacco during the 1980s. For cigarette smoking, this is a reflection of a longer term trend toward lower rates of use that began after the first report of the Surgeon General's Advisory Committee was released in 1964; for alcohol and drug use, the decrease is more recent. Data from the 1988 Worldwide Survey support the finding of a continuing downward trend in use of alcohol, drugs and tobacco among military personnel during the 1980s.

Figure 3.1 presents the trends over the four Worldwide Surveys of the percentage of the total active military force who engaged in heavy alcohol use, any drug use, and any cigarette use during the past 30 days. Table 3.1 presents the observed rates of use of the three substances for the four survey years and information about the statistical significance of changes in substance use between the survey years. As shown, use of all three substances declined significantly between 1980 and 1988, although the rate of decline varied for each of the substances and between the four surveys.

The prevalence of heavy alcohol use declined significantly from 14.1 percent of all military personnel in 1980 to 8.2 percent in 1988. Table 3.1 shows, however, that heavy alcohol use was relatively stable from

Figure 3.1. Trends in Substance Use Past 30 Days, Total DoD, 1980-88



1980 to 1985 and decreased significantly between 1985 and 1988. The prevalence of any drug use during the past 30 days declined sharply from 27.6 percent in 1980 to 4.8 percent in 1988. The rate of decrease was much greater than for heavy alcohol use, and the decreases were statistically significant between each of the four surveys. The percentage of military personnel who were cigarette smokers also decreased during the 8-year period, from 51.0 percent in 1980 to 40.9 percent in 1988. The decreases between 1982 and 1985 and between 1985 and 1988 were statistically significant. Similar trends were observed for each of the Services.

Considered together, the trend data on substance use are notable in two regards. First, despite an overall statistically significant downward trend in use of all three substances between 1980 and 1988, only drug use declined significantly between each of the surveys. Second, use of all three substances declined significantly between 1985 and 1988. These findings are consistent with the military's strong emphasis on the reduction of drug abuse that began in the early 1980s and the emphasis during the mid-1980s on the deglamorization of alcohol and cessation of smoking.

Although the downward trends shown in Figure 3.1 are impressive, the question arises about whether these changes reflect progress by the military in combating the problem of substance abuse or whether they are an artifact of demographic changes that may have occurred in the military during the 1980s. The 1980s, for example, have been boom years for recruiting and successful retention such that the military now boasts of a better educated, higher quality force than ever before. This success in the manpower arena has resulted in a force that is somewhat older, has more

Table 3.1. Substance Use and Health Summary, 1980-1988 - Total DoD

Measure	Year of Survey							
	1980		1982		1985		1988	
Alcohol Drinking Levels								
Abstainer	13.4	(Ø.5)[b,c]	11.8	(Ø.5)[d]	13.4	(Ø.6)[e]	17.2	(Ø.4)
Infrequent/Light	14.1	(Ø.5)[b,c]	18.9	(Ø.8)	17.9	(Ø.7)	19.Ø	(Ø.6)
Moderate	33.6	(Ø.8)[b,c]	29.8	(Ø.6)	31.1	(Ø.7)	32.1	(Ø.6)
Moderate/Heavy	24.6	(Ø.5)	25.5	(Ø.5)	25.6	(Ø.7)	23.5	(1.1)
Heavy	14.1	(Ø.9)[c]	14.Ø	(Ø.8)	11.9	(Ø.8)[e]	8.2	(Ø.6)
Any Drug Use[a]								
Past 30 Days	27.6	(1.5)[b,c]	19.Ø	(1.Ø)[d]	8.9	(Ø.8)[e]	4.8	(Ø.3)
Past 12 Months	36.7	(1.5)[b,c]	26.6	(1.Ø)[d]	13.4	(1.Ø)[e]	8.9	(Ø.8)
Cigarette Use, Past 30 Days	51.Ø	(Ø.8)[c]	51.4	(Ø.8)[d]	46.2	(1.Ø)[e]	40.9	(Ø.8)
Alcohol Use Negative Effects								
Serious Consequences	17.3	(1.1)[b,c]	14.6	(Ø.6)[d]	1Ø.7	(Ø.9)	9.Ø	(Ø.6)
Productivity Loss	26.7	(1.2)[b,c]	34.4	(Ø.7)[d]	27.1	(1.1)[e]	22.1	(1.2)
Dependence	8.Ø	(Ø.6)[c]	9.Ø	(Ø.5)	7.7	(Ø.7)	6.4	(Ø.5)
Drug Use Negative Effects								
Serious Consequences	13.3	(1.Ø)[b,c]	6.2	(Ø.4)[d]	3.Ø	(Ø.4)[e]	1.8	(Ø.2)
Productivity Loss	14.4	(1.1)[b,c]	9.9	(Ø.5)[d]	3.4	(Ø.6)	2.1	(Ø.4)
Health Practices, Past 12 Months	-	-	-	-	3.79	(Ø.Ø2)	3.91	(Ø.Ø4)

Note: Entries for health practices are mean values. Other entries are percentages with standard errors in parentheses. Serious consequences for alcohol and drugs are reported for the past 12 months.

[a]Any nonmedical use of marijuana, PCP, LSD/hallucinogens, cocaine, amphetamines/stimulants, tranquilizers, barbiturates/sedatives, heroin/other opiates, analgesics, or inhalants.

[b]Comparisons between 1980 and 1982 are statistically significant at the 95 percent confidence level.

[c]Comparisons between 1980 and 1988 are statistically significant at the 95 percent confidence level.

[d]Comparisons between 1982 and 1985 are statistically significant at the 95 percent confidence level.

[e]Comparisons between 1985 and 1988 are statistically significant at the 95 percent confidence level.

-Data are not available before 1985.

officers, has more married personnel, and is better educated than in 1980--factors that are associated with less substance use. To examine whether changes in demographics explain the pattern of results, rates of use for the 1982, 1985 and 1988 surveys were standardized to the 1980 age/education/marital status distribution.

Table 3.2 presents the unstandardized and standardized trends in use of heavy alcohol use, drug use, and cigarette smoking for the total DoD during

Table 3.2. Trends in Substance Use Past 30 Days, Unstandardized and Standardized by Sociodemographic Characteristics-Total DoD

Substance/Type of Estimate	Year of Survey			
	1980	1982	1985	1988
Heavy Alcohol Use				
Unstandardized	14.1 (0.9)[c]	14.0 (0.8)	11.9 (0.8)[e]	8.2 (0.6)
Standardized[a]	14.1 (0.9)[c]	13.6 (0.7)	12.4 (0.8)[e]	9.7 (0.6)
Any Drug Use				
Unstandardized	27.6 (1.5)[b,c]	19.0 (1.0)[d]	8.9 (0.8)[e]	4.8 (0.3)
Standardized[a]	27.6 (1.5)[b,c]	18.2 (0.7)[d]	9.7 (0.6)[e]	5.6 (0.4)
Cigarette Use				
Unstandardized	51.0 (0.8)[c]	51.4 (0.8)[d]	46.2 (1.0)[e]	40.9 (0.8)
Standardized[a]	51.0 (0.8)[c]	52.0 (0.6)[d]	46.9 (0.8)[e]	42.9 (0.7)

Note: Estimates are percentages with standard errors in parentheses.

[a]Estimates have been standardized to the 1980 distribution by age, education, and marital status.

[b]Comparisons between 1980 and 1982 are statistically significant at the 95 percent confidence level.

[c]Comparisons between 1980 and 1988 are statistically significant at the 95 percent confidence level.

[d]Comparisons between 1982 and 1985 are statistically significant at the 95 percent confidence level.

[e]Comparisons between 1985 and 1988 are statistically significant at the 95 percent confidence level.

the four surveys. The pattern in the data is very clear. Standardization changed the estimates somewhat, but it did not alter the overall findings between 1980 and 1988. Thus, the observed changes in use are not accounted for by shifts in the sociodemographic composition of the military population between 1980 and 1988.

The trends in substance use shown in Figure 3.1 for all military personnel were also examined for each of the Services. Service trends in substance use during the past 30 days between 1980 and 1988 are presented in Figure 3.2, and corresponding prevalence data are presented in Appendix D, Tables D.1 to D.4. As shown in Figure 3.2, each of the Services follows the DoD pattern of a significant downward trend during the past 30 days in heavy alcohol use, any drug use, and any cigarette use between 1980 and 1988. As expected, despite a common downward pattern, trends in use for each of the Services differ slightly from the total DoD trend. Nonetheless, the same relative ranking of the levels of use for the substances clearly prevails.

B. Trends in Negative Effects

The substantial negative consequences of alcohol, drug, and tobacco use on the work performance, health, and social relationships of military personnel have been a continuing concern assessed in the Worldwide Surveys. The trends in negative effects are compared for the four Worldwide Surveys.

1. Alcohol-Related Negative Effects

The decline in heavy alcohol use observed in Figure 3.1 is expected to be accompanied by a decline in negative effects due to drinking. Changes in alcohol-related negative effects for the total DoD between 1980 and 1988 are presented in Figure 3.3. In 1980, 17.3 percent of military personnel reported having experienced one or more serious consequences associated with alcohol use during the year. By 1988, only 9.0 percent reported this. The 1980-88 decrease and the decreases between each of the surveys are also statistically significant.

Alcohol use productivity loss, also shown in Figure 3.3, decreased significantly between 1980 and 1988, from 26.7 percent to 22.1 percent. The pattern of change for this measure differs from the other measures in this figure in that it shows a significant increase from 1980 to 1982 and a

Figure 3.2. Trends in Substance Use Past 30 Days by Service, 1980-88

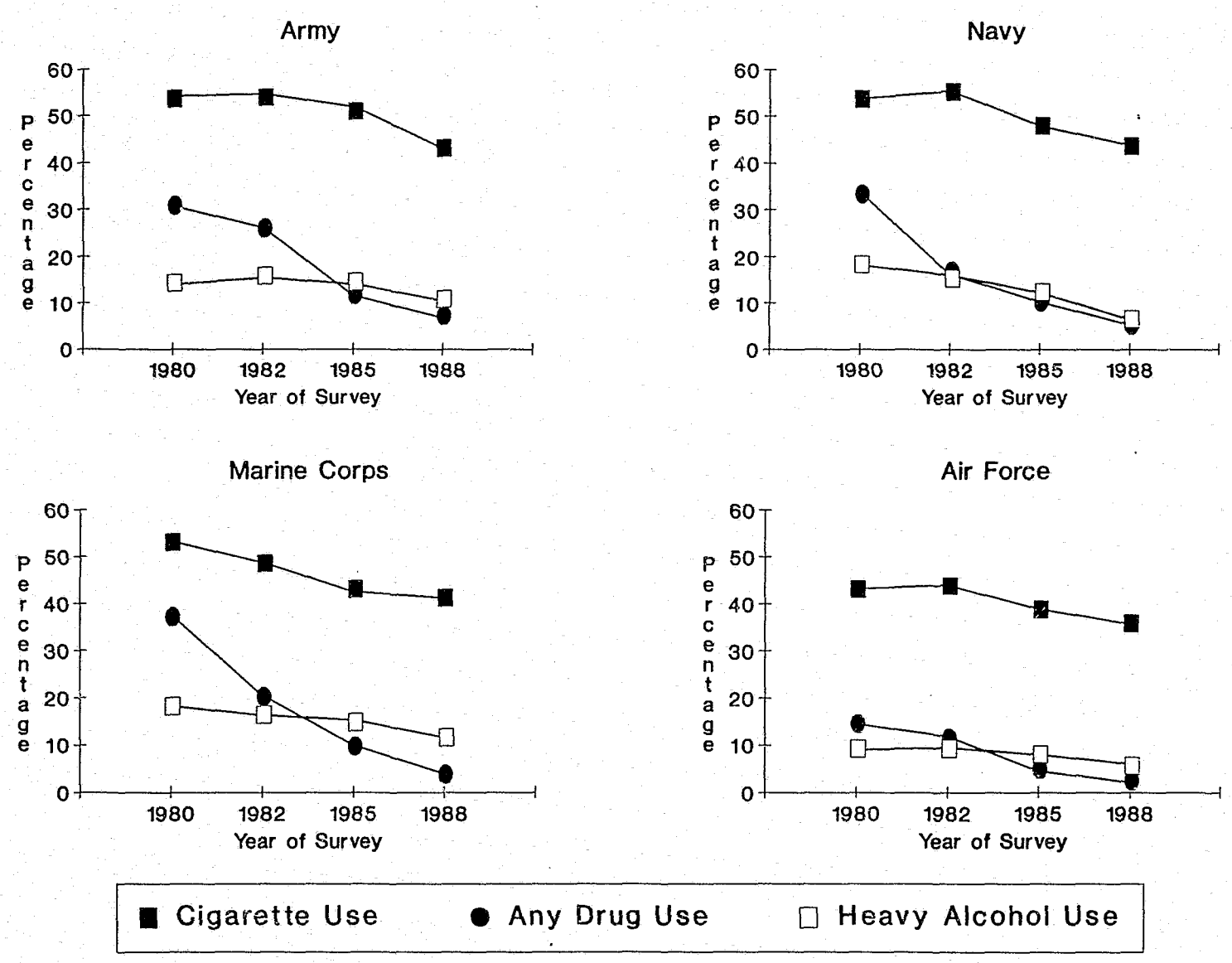
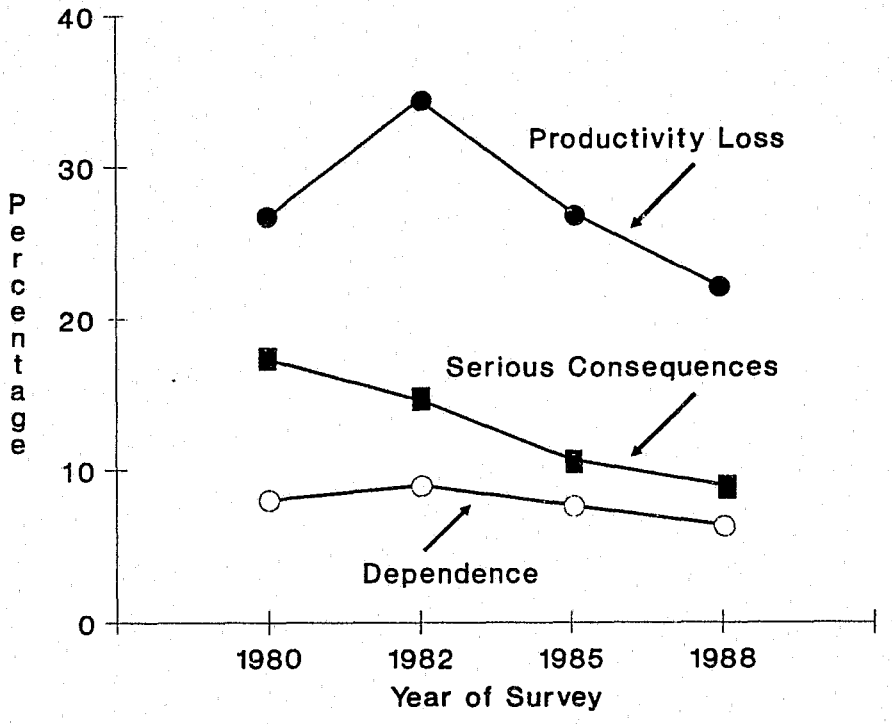


Figure 3.3. Alcohol Use Negative Effects, Total DoD, 1980-88



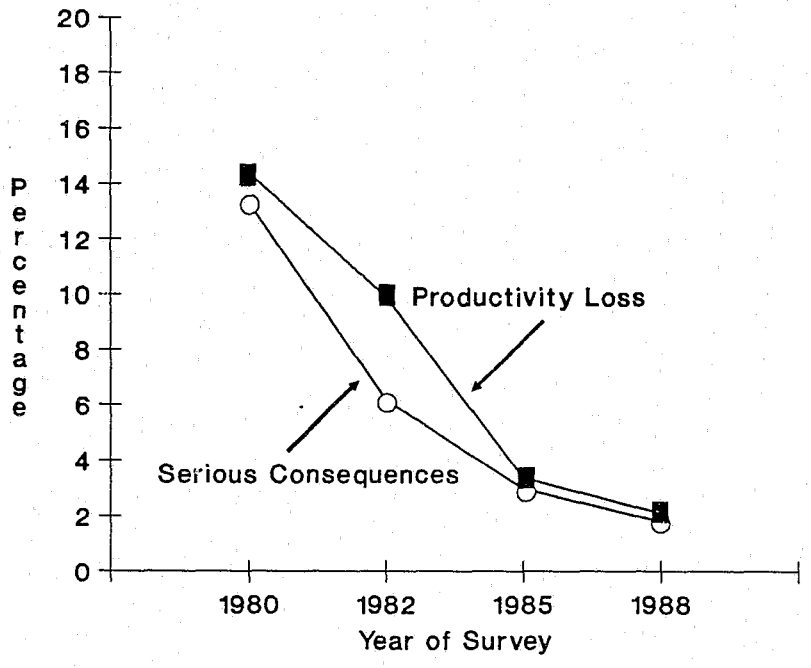
significant decrease thereafter. Even though alcohol productivity loss declined significantly from 1982 to 1985, the decline only reduced the problem to the level experienced in 1980. Thus, net progress since 1980 has only been achieved in the 1985-88 significant decrease.

Less substantial decreases were found in the percentage of military personnel reporting symptoms of alcohol dependence between 1980 and 1988, although there was a significant decline over the 8-year period. In 1980, as shown in Figure 3.3, 8.0 percent of total DoD personnel indicated that they had experienced symptoms of dependence during the year. This percentage did not change significantly in 1982 but declined thereafter, to 6.4 percent in 1988.

2. Drug-Related Negative Effects

Figure 3.4 shows that the prevalence of drug-related negative effects for all DoD personnel decreased substantially between 1980 and 1988. In 1980, 13.3 percent of military personnel reported experiencing a drug-related serious consequence during the year; by 1988, only 1.8 percent

Figure 3.4. Drug Use Negative Effects, Total DoD, 1980-88



reported this. The decreases between 1980 and 1982, 1982 and 1985, and 1985 and 1988 were all statistically significant.

The amount of productivity loss associated with drug use also decreased significantly between 1980 and 1988, from 14.4 percent of all military personnel to 2.1 percent, as shown in Figure 3.4. For the individual surveys, the declines between 1980 and 1982 and between 1982 and 1985 were statistically significant; the small decrease between 1985 and 1988 was not significant.

These declines in drug-related negative effects between 1980 and 1988 reflect the substantial declines in drug use during the same time period (Figure 3.1). By 1988, the percentage of military personnel reporting any serious consequences or productivity loss associated with drug use was minimal.

C. Trends in Health Practices

The 1985 Worldwide Survey first monitored the involvement of military personnel in health practices that encourage sound health and good work performance. In 1985, military personnel on average reported that they had

engaged in 3.79 of six health practices during the past year; in 1988 this figure was 3.91 health practices, a small but statistically significant difference. Findings for the Services showed a small but significant increase for the Army but no significant changes for the Navy, Marine Corps, or Air Force between 1985 and 1988. The six health practices reported here were: using alcohol moderately or less; not using drugs; never smoking cigarettes; exercising twice a week or more; eating two full meals a day at least 5 days per week; and sleeping 6 or more hours a day at least 5 days a week. Standardization of the 1988 results to the 1985 age/education/marital status distribution for the total DoD and each of the Services yielded similar results, suggesting that changes in the sociodemographic composition of the military were not important reasons for observed changes in health practices.

D. Summary

Comparisons of findings from four Worldwide Surveys of military personnel conducted in 1980, 1982, 1985, and 1988 show a downward trend in the use of alcohol, drugs, and cigarettes. The percentage of military personnel for total DoD who used any drug declined dramatically between 1980 and 1988, from 27.6 percent to 4.8 percent for the 30 days before the survey. The decrease in heavy alcohol users was also substantial, from 14.1 percent in 1980 to 8.2 percent in 1988. Significant decreases were also observed in the percentage of cigarette smokers, from 51.0 percent in 1980 to 40.9 percent in 1988. Similar trends were found for personnel in each of the four active Services.

Substantial declines were also found in the percentage of military personnel experiencing alcohol- and drug-related negative effects. In 1980, about 17 percent reported experiencing a serious consequence related to their use of alcohol during the year; by 1988, 9 percent reported this. The comparable percentages for serious consequences related to drug use were 13.3 percent in 1980 and 1.8 percent in 1988. The percentage of personnel reporting productivity loss associated with alcohol or drug use also decreased, but the decreases in the percentage reporting symptoms of alcohol dependence were less substantial.

At the same time that the use of alcohol, drugs, and tobacco and alcohol- and drug-related negative effects decreased, the involvement of military personnel in health practices related to good health increased between 1985 and 1988.

4. ALCOHOL USE

This chapter presents more detailed analyses of alcohol use among military personnel, including examination of the prevalence and trends in alcohol use, use patterns, beliefs about use, correlates of use, and aspects of the military job related to use. Alcohol use is defined both in terms of the number of absolute ounces of alcohol (i.e. ethanol) consumed and drinking levels, as described in chapter 2. Comparisons are made to prior Worldwide Surveys and to other related civilian and military surveys.

A. Prior Studies

A number of surveys of civilian and military populations conducted over the past decades, coupled with longer-term information about alcohol sales, indicate that most Americans drink alcoholic beverages, but they are now drinking less. The percentage who are abstainers has recently increased slightly, although drinking patterns on the whole have not changed significantly over the past several decades. These changes are often interpreted as evidence of increasing public awareness about the health risks of alcohol use (NIAAA, 1987, xiv). Because military personnel are drawn from the civilian population, they may be expected to demonstrate trends in alcohol use similar to those among civilians. Special military conditions, such as isolation from family, however, may exacerbate drinking. On the other hand, a newly intensified military effort to decrease alcohol abuse may counteract this tendency.

1. Overview of Consumption Patterns

Ppolitical and economic events have affected consumption of alcohol in the United States over time. The most recent is the apparent response to growing concerns with the effects of alcohol on health. Statistics on per capita consumption, estimated by dividing total annual alcohol sales in the United States by the total drinking age population (generally those age 14 and older), give an overview of changes in alcohol consumption.

Apparent U.S. per capita consumption of alcoholic beverages increased from about 1 gallon in 1935 to almost 2 and 3/4 gallons in 1984. Per capita consumption increased following the repeal of Prohibition in 1933

and continued rising during the years following World War II. It flattened out during the 1950s, but again increased during the 1960s, and 1970s, peaking in 1981. Total consumption has decreased since, and in 1984 it was estimated to be 2.65 gallons. Beer consumption has followed a pattern similar to total alcohol consumption, while liquor has decreased since 1970 and wine has slowly increased from the 1930s. Consumption of beer remains highest, closely followed by liquor and distantly by wine (NIAAA, 1987).

These findings of a recent decline in alcohol consumption are supported by the results of self-reported surveys of civilian and military populations. Data on civilian populations were collected beginning in the 1960s, while data on military populations were collected beginning in the 1970s. Note that the differences in the definitions of drinking patterns, heavy drinking, problem drinking, among others, vary widely across studies and make comparison of results across surveys difficult.

2. Patterns in Civilian Populations

Surveys of youth and adult populations conducted by the National Institute on Alcohol Abuse and Alcoholism (NIAAA), National Institute on Drug Abuse (NIDA), and other agencies have investigated the prevalence of alcohol use among civilians. Two national surveys were conducted during the 1960s by Cahalan and associates; nine were conducted during the 1970s--five by Louis Harris and associates, one by Response Analysis Corporation, two by Rappeport and associates, and one by Clark and associates; and one was conducted during the 1980s, a 1984 study by Clark and associates with the Alcohol Research Group in Berkeley, California (Clark and Midanik, 1982; Polich and Kaelber, 1985; Clark and Hilton, 1986). Two national surveys of drinking among adolescents were also conducted during the 1970s by the Research Triangle Institute (Rachal et al., 1975, 1980). All were funded by NIAAA. In addition, NIDA has supported a series of surveys of drug use (including alcohol use and cigarette use) among high school seniors (Johnston et al., 1987). Additional information about drinking patterns among those age 18 and older is available from the 1985 National Health Interview Survey.

Direct comparison of findings across the surveys is somewhat difficult because of differences in measurement of drinking behavior and associated problems. However, the studies concur that about two-thirds of Americans currently drink alcoholic beverages; about one-third are light drinkers and one-third are moderate to heavy drinkers. Perhaps 10 percent of the population are heavier drinkers (they drink on average 1.0 or more ounces of ethanol per day). Men are more likely than women to drink and to drink heavily. At least 10 percent of the population experiences problems because of their drinking. Young men, minorities, and those with unstable work or family environments (summarized in NIAAA, 1987) have higher rates of problem drinking. These regularities in drinking patterns suggest that drinking and drinking problems may be particularly widespread among military personnel, who are predominantly young males and many of whom are either unmarried or away from their spouses.

Results from the most recent national alcohol survey, conducted in 1984, indicate that 76 percent of adult men and 64 percent of adult women are current drinkers and that drinking is more common among younger than older persons. Twenty percent of current drinkers (26 percent for men and 14 percent for women) experienced problem drinking during the past year, and 21 percent experienced tangible consequences such as getting into a fight (26 percent for men and 16 percent for women) (Hilton, 1987).

Data from the 1985 National Health Interview Survey (the Health Promotion and Disease Prevention Questionnaire) show that 76 percent of men but only 56 percent of women were current drinkers. This survey's findings for men were similar to those in the 1984 national alcohol survey, but the findings for women were lower. However, differences in the definition of current drinker between the two surveys may have contributed to this disparity. Thirteen percent of men and 3 percent of women were classified as heavier drinkers (they consumed 1 or more ounces of ethanol a day). Drinkers were more common among younger adults, those with a high school education or more and those with higher incomes. The percentage of heavier drinkers differed little across these age groups (Williams, Dufour and Bertolucci, 1986). In 1987, 66 percent of high school seniors were current drinkers (NIDA, 1988).

Comparisons of these recent surveys with earlier national surveys indicate few significant differences in drinking patterns over the past decade or two. Comparing adult drinking patterns from the most recent national survey of the adult population conducted in 1984 with one conducted in 1967 showed little change in the overall volume of alcohol consumption, but a slight increase in the percentage of abstainers among men. Similarly, there was little difference in the proportion experiencing drinking problems but an increase in the proportion with dependence symptoms (Hilton and Clark, 1987). Comparisons of the percentage of drinkers among high school seniors indicates that the percentage of current drinkers in 1984 (66.4 percent) is similar to that in 1975 but lower than the peak reached during the late 1970s. There have been recent slight declines, however, in the percentage of seniors who drink daily or drinking heavily (Johnston et al., 1987).

Overall, drinking patterns among civilians have been relatively stable in recent years with the exception of an increase in abstainers. Indeed, there has been little change since 1979 in the percentages of the population who are moderate to heavier drinkers (NIAAA, 1987). There have, however, been substantial shifts in beverage preference, with significant increases in the consumption of wine and beer and decreases in the consumption of liquor (Hilton and Clark, 1987). These changes in beverage preference are consistent with data on sales of beer, wine and liquor.

3. Patterns in Military Populations

Information on alcohol use among military personnel in the four active Services is available from the Worldwide Surveys conducted in 1980, 1982 and 1985 (Burt et al., 1980; Bray et al., 1983; Bray et al., 1986) and several surveys conducted by the individual Services. The latter studies include research for the Air Force in 1977 (Polich and Orvis, 1979), the ongoing sample surveys of military personnel in the Army conducted under the direction of the office of the Deputy Chief of Staff for Personnel, a survey of Marines in 1983 (Stoloff and Barnow, 1984) and a survey of Naval personnel (Cahalan and Cisin, 1975).

Findings from the Worldwide Surveys show that the overall volume of daily alcohol consumption among DoD personnel declined from 1.48 ounces of

ethanol in 1980 to 1.41 ounces in 1982 and 1.22 ounces in 1985; the decline between 1982 and 1985 was statistically significant. The most notable declines between 1980 and 1985 were for Navy and Marine Corps personnel. In 1985, Army personnel reported consumption of 1.38 ounces; Navy personnel, 1.33 ounces; Marine Corps personnel, 1.47 ounces; and Air Force personnel, 0.86 ounces of ethanol. Ounces of ethanol among Army, Navy, and Marine Corps personnel were significantly different from Air Force rates. Part of this difference, however, was accounted for by differences in the sociodemographic composition of the Services. Air Force personnel are likely to be older, married, and better educated--characteristics associated with lower drinking levels. Standardization of daily ounces of ethanol across the Services narrows Service differences. Whereas unstandardized rates of the three Services are different from unstandardized Air Force rates, only the 1985 comparisons of standardized rates for Army/Air Force and Navy/Air Force comparisons remain statistically significant. Thus, part of the difference among the Services is accounted for by Service differences in sociodemographic composition (Bray et al., 1986).

Despite the recent declines in the overall volume of alcohol consumption among military personnel, drinking patterns remained relatively stable between 1982 and 1985 except for a slight but statistically significant increase in the percentage of abstainers. In 1985, over 80 percent of military personnel were drinkers, and almost 12 percent were heavy drinkers (they drank at least once a week and 5 or more drinks per typical drinking occasion).

Findings from the surveys of the individual Services may not be directly comparable to those from the Worldwide Surveys because of differences in survey methodologies and question wording. However, the 1977 Rand survey of Air Force personnel yielded an estimate of 1.0 ounces of ethanol, which was similar to the estimate of 1.1 ounces for Air Force personnel from the 1980 Worldwide Survey, the Worldwide Survey closest in time to the Air Force survey. The 1985 survey of Army personnel indicated that heavy drinking was declining (Department of the Army, 1986), as did the 1985 Worldwide Survey for Army personnel. The 1983 Marine Corps survey also indicated a decline in drinking (Stoloff and Barnow, 1984) which is

consistent with findings from the 1982 Worldwide Survey. Although tests of significance were not generally conducted, these Service surveys support findings from the Worldwide Surveys.

4. Military and Civilian Comparisons

The findings from military surveys are in general supportive of findings from civilian surveys. Both show a relative stability in drinking patterns, except for an increase in the percentage of abstainers and an overall decline in volume. However, the percentage of drinkers and heavy drinkers is generally higher among military personnel than among civilians. Differences in the sociodemographic composition of military and civilian populations and in the context of drinking in military and in civilian life may preclude direct comparisons from these studies. In contrast to the adult civilian population, military personnel are predominantly young and male, factors both associated with higher rates of alcohol use. Thus, valid comparison of alcohol use among military personnel and civilians requires analyses that control for sociodemographic differences. Because of sociodemographic differences, unstandardized military rates would be expected to be substantially higher than civilian rates. Further, certain military conditions such as separation from spouse or family or duty in isolated areas may foster higher rates of drinking.

The few studies that have made military and civilian comparisons have had too narrow a scope or methodological problems. The most useful comparisons come from the research on alcohol problems in the Air Force (Polich and Orvis, 1979) and the Worldwide Survey series (Burt et al., 1980; Bray et al., 1983; Bray et al., 1986).

Polich and Orvis (1979) showed that unstandardized rates of problem drinking were substantially higher among Navy and Army personnel than among civilians; Air Force rates were only slightly higher than among civilians. Standardization for education, age, marital status, and location of residence reduced the military/civilian differential by about 50 percent. The standardized Army and Navy rates, however, remained higher than civilian rates; Air Force rates and civilian rates were nearly equal. Polich and Orvis (1979) caution that these differences may be attributable to differences in survey methodologies, time periods when data were collected

(civilian comparison data were obtained 3 to 8 years before military data), and differences in response rates among studies.

Close comparison of patterns has been hampered by the lack of civilian data that are contemporaneous with the Worldwide Survey data. After standardizing the 1979 civilian population for sex, age, marital status, and education to approximate the demographic distribution of the 1980 Worldwide Survey population, Burt et al. (1980) found that slightly higher proportions of military personnel than civilians drank. Similarly, using a comparable standardization procedure with civilian data from the 1982 National Survey on Drug Abuse, Bray et al. (1983) found that alcohol use prevalence was higher for military personnel than for civilians among 18-25 year old males.

Although interesting, these comparisons of civilian data with the Worldwide studies were limited to information on the prevalence of alcohol use; no information was available on the quantity of use. In comparisons of the percentage of current drinkers and those who consumed 1 or more ounces of ethanol per day for males for selected age groups, Bray et al. (1986) observed age differences in drinking among military and civilian populations. Overall, military personnel in each age group were more likely than civilians to drink at least some alcoholic beverages. Military personnel under 35 were more likely than civilians to drink 1 or more ounces per day, however, whereas military personnel 35 or older were less likely to do so.

These analyses suggest in general that alcohol use among military personnel is more common and heavier than among civilians. This assertion must be considered tentative since there are no definitive analyses comparing military and civilian alcohol use rates. Research by Bray, Marsden, and Guess (in progress) is currently underway to address this issue more systematically and definitively.

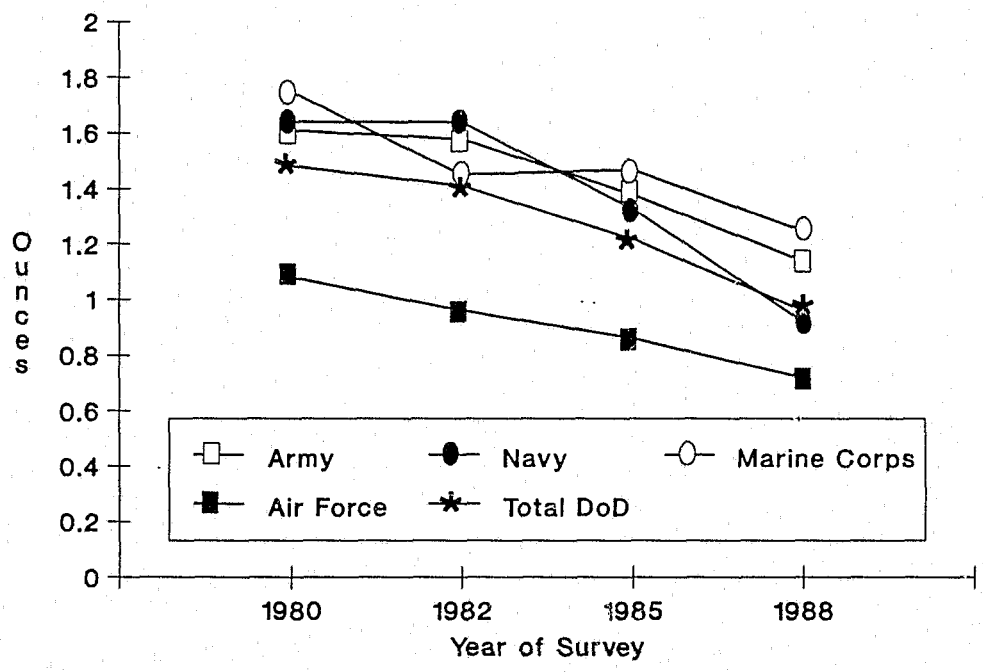
B. Trends in Alcohol Use

As noted in the literature review above, drinking patterns have remained relatively stable over the past two decades. Despite overall stability, however, the average amount of alcohol consumed per day has decreased and the proportion of individuals who are abstainers has

increased. These trends are also demonstrated in findings from the 1988 Worldwide Survey.

Figure 4.1 shows that the average amount of ethanol consumed by military personnel per day has steadily declined since 1980. For the total DoD, the amount decreased from 1.48 ounces per day in 1980 to 1.41 in 1982, 1.22 in 1985, and 0.96 in 1988; the declines from 1985 to 1988 and from 1982 to 1985 are statistically significant. The 35 percent decline in average consumption over the 8-year period is substantial, particularly in such a short period of time.

Figure 4.1. Average Daily Ounces of Alcohol (Ethanol), 1980-88



Over the 8-year period, the amount of alcohol consumed decreased significantly for each of the Services (see unstandardized portion of Table 4.1). Most notable was the 44 percent decline for Navy personnel, from 1.64 ounces per day in 1980 to 0.92 per day in 1988. Percentage decreases for the 8-year period were 33 percent for Air Force personnel and about 29 percent for Army and Marine Corps personnel. Marine Corps personnel consumed the highest amount of ethanol of all the Services in 1980,

when the Worldwide Survey series began, and they remain highest in 1988 despite substantial declines. Air Force personnel have had by far the lowest alcohol consumption of all the Services in each of the survey years. For most Services, the recent declines in the amount of consumption have

Table 4.1. Trends in Average Daily Ounces of Ethanol, Past 30 Days, Unstandardized and Standardized by Sociodemographic Characteristics

Service/Type of Estimate	Year of Survey			
	1980	1982	1985	1988
Army				
Unstandardized	1.61(0.10)[c]	1.58(0.08)	1.38(0.12)	1.14(0.06)
Standardized[a]	1.61(0.10)[c]	1.51(0.06)	1.50(0.11)[e]	1.21(0.04)
Navy				
Unstandardized	1.64(0.12)[c]	1.64(0.12)	1.33(0.10)[e]	0.92(0.06)
Standardized	1.64(0.12)[c]	1.58(0.09)	1.46(0.09)[e]	1.02(0.06)
Marine Corps				
Unstandardized	1.75(0.09)[b,c]	1.45(0.09)	1.47(0.22)	1.25(0.13)
Standardized	1.75(0.09)[b]	1.47(0.02)	1.52(0.16)	1.51(0.19)
Air Force				
Unstandardized	1.08(0.11)[c]	0.96(0.05)	0.86(0.07)	0.72(0.03)
Standardized	1.08(0.11)[c]	0.97(0.04)	0.84(0.06)	0.75(0.03)
Total DoD				
Unstandardized	1.48(0.07)[c]	1.41(0.05)[d]	1.22(0.06)[e]	0.96(0.03)
Standardized	1.48(0.07)[c]	1.38(0.03)	1.29(0.05)[e]	1.06(0.03)

Notes: Estimates are means with standard errors in parentheses.

[a]Estimates have been standardized to the 1980 distribution by age, education, and marital status.

[b]Comparisons between 1980 and 1982 are statistically significant at the 95 percent confidence level.

[c]Comparisons between 1980 and 1988 are statistically significant at the 95 percent confidence level.

[d]Comparisons between 1982 and 1985 are statistically significant at the 95 percent confidence level.

[e]Comparisons between 1985 and 1988 are statistically significant at the 95 percent confidence level.

been more dramatic than in the earlier part of the 8-year period. This is consistent with the military's recent emphasis on deglamorization of alcohol.

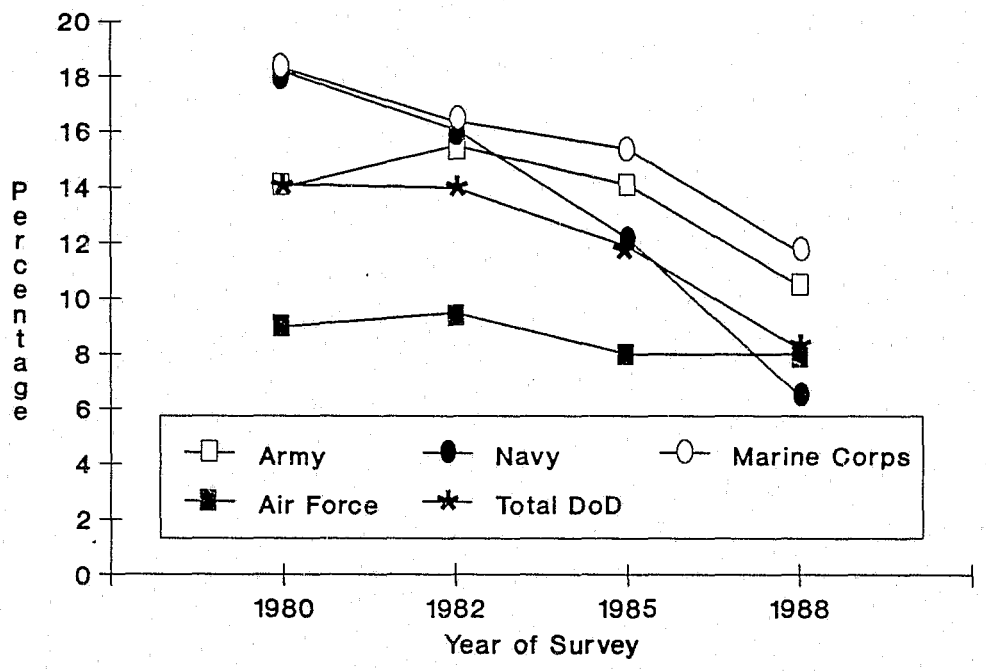
The observed decreases in alcohol use may partially reflect changes in the sociodemographic composition of the military population. During the 1980s comparisons of sociodemographic characteristics noted in the Worldwide Surveys indicate that the military population has become slightly older and more likely to be married, factors both related to lower alcohol use. To examine whether the observed decreases in alcohol use are partially associated with sociodemographic changes, data from the 1982, 1985 and 1988 surveys were standardized to the 1980 age/education/marital status distribution for each Service and the total DoD. These results are presented in Table 4.1. As shown, the results of the standardization are highly similar to the unstandardized findings between each of the Worldwide Surveys and between 1980 and 1988. The one notable difference concerns the Marine Corps. The significant decline in consumption in 1980 and 1988 for Marine Corps personnel seen using unstandardized data is not significant after standardization. Standardized rates for the Marines show a significant decline from 1980 to 1982 but little change thereafter. This suggests that a different sociodemographic composition of the Corps in more recent years is partly responsible for the decline in alcohol use for the Marines.

The decreases in amount of alcohol consumed shown in Figure 4.1 for the total DoD and each of the Services are consistent with changes in drinking levels. Figure 4.2 shows trends in heavy alcohol use from 1980 to 1988.

As previously noted from Figure 3.1, the percentages of all military personnel who were heavy drinkers decreased significantly between 1980 and 1988. However, the pattern of use was relatively flat for the first three surveys followed by a significant decrease between 1985 and 1988. Army and Air Force personnel showed this trend across the four surveys, although only the Army changes were significant.

As with the total DoD, heavy drinking for each of the Services declined significantly between 1980 and 1988. The decreases were particularly dramatic among Navy personnel. In 1980, the Marines matched the Navy in having the highest percentage of heavy drinkers, but by 1988, their use rate

Figure 4.2. Trends in Heavy Alcohol Use Past 30 Days, 1980-88



declined 11.7 percentage points to match the Air Force use rate, the lowest of all the Services. Aside from this notable change by the Navy, the relative ranking of the Services has remained constant, especially since 1982--Marines and Army at about the same levels and Air Force at the lowest level.

Data on changes in drinking levels between 1985 and 1988 are shown in the unstandardized portion of Table 4.2. The percentage of abstainers increased significantly for the total DoD from 13.4 percent in 1985 to 17.2 percent in 1988. Similar significant increases in abstainers were found for each of the Services.

Concurrent with the increase in abstainers is a significant decrease in the percentage of heavy drinkers from 11.9 percent in 1985 to 8.2 percent in 1988 for the total DoD. The Services show a similar pattern, but only the decreases for the total DoD and Navy personnel were statistically significant for 1985 and 1988. There were no significant decreases in the

Table 4.2. Trends in Drinking Levels, 1985 and 1988

Drinking Levels	Service											
	Army		Navy		Marine Corps		Air Force		Total DoD	
	1985	1988	1985	1988	1985	1988	1985	1988	1985	1988
UNSTANDARDIZED										
Abstainer	14.9 (0.7)	17.1 (0.7)*	9.6 (0.8)	15.7 (0.6)*	10.8 (2.5)	18.0 (0.9)*	15.8 (1.0)	18.5 (0.8)*	13.4 (0.6)	17.2 (0.4)*
Infrequent/Light	17.8 (1.1)	18.5 (1.1)	19.9 (1.9)	19.3 (1.1)	14.0 (1.7)	17.1 (3.2)	17.7 (1.0)	20.0 (0.8)	17.9 (0.7)	19.0 (0.6)
Moderate	29.3 (1.4)	31.7 (1.0)	29.8 (1.0)	32.4 (1.4)	28.9 (1.1)	27.1 (1.5)	35.1 (0.9)	33.7 (0.8)	31.1 (0.7)	32.1 (0.6)
Moderate/Heavy	23.9 (1.5)	22.2 (0.8)	28.5 (1.1)	26.1 (3.2)	31.0 (2.2)	26.1 (3.5)	23.4 (1.2)	21.7 (1.3)	25.6 (0.7)	23.5 (1.1)
Heavy	14.1 (1.6)	10.5 (0.9)	12.2 (1.0)	6.5 (1.4)*	15.4 (3.3)	11.7 (1.0)	8.0 (0.9)	6.1 (0.5)	11.9 (0.8)	8.2 (0.6)*
STANDARDIZED[a]										
Abstainer	14.9 (0.7)	16.9 (0.8)	9.6 (0.8)	15.3 (0.6)*	10.8 (2.5)	18.3 (2.0)*	15.8 (1.0)	17.8 (0.8)	13.4 (0.6)	17.2 (0.4)*
Infrequent/Light	17.8 (1.1)	17.9 (0.9)	19.9 (1.9)	18.7 (0.7)	14.0 (1.7)	16.1 (2.7)	17.7 (1.0)	19.7 (0.8)	17.9 (0.7)	18.5 (0.5)
Moderate	29.3 (1.4)	31.0 (1.1)	29.8 (1.0)	32.0 (1.3)	28.9 (1.1)	24.5 (1.2)*	35.1 (0.9)	33.8 (0.8)	31.1 (0.7)	31.5 (0.6)
Moderate/Heavy	23.9 (1.5)	22.8 (0.7)	28.5 (1.1)	27.1 (2.5)	31.0 (2.2)	27.0 (3.0)	23.4 (1.2)	22.1 (1.2)	25.6 (0.7)	24.0 (0.8)
Heavy	14.1 (1.6)	11.5 (0.6)	12.2 (1.0)	6.9 (1.7)*	15.4 (3.3)	14.1 (1.4)	8.0 (0.9)	6.6 (0.5)	11.9 (0.8)	9.1 (0.5)*

Note: See Appendix E for variable definition and source of variables. Observed differences among the Services are associated in part with differences in sociodemographic characteristics of Service members.

[a]Estimates are standardized on age, education, and marital status to the comparable 1985 distribution.
*Comparisons between 1985 and 1988 are statistically significant at the 95 percent confidence level.

percentages of infrequent/light, moderate, or moderate/heavy drinkers for the total DoD or any of the Services. In 1988, then, about 17 percent of total DoD personnel were abstainers, 19 percent were infrequent/light drinkers, almost one-third were moderate drinkers, and almost one-third were moderate/heavy to heavy drinkers.

As with standardization of the average daily ounces of ethanol for 1982, 1985, and 1988 to the 1980 sociodemographic distributions, standardization of drinking levels in 1988 to the 1985 sociodemographic distribution for the Services and the total DoD produced few changes in significance levels (standardized rates, Table 4.2). Thus, observed differences in drinking levels between 1985 and 1988 are not in large part associated with changes in the sociodemographic distribution of the Services or the total DoD.

To summarize, by 1988, the overall amount of alcohol consumption and the percentage of personnel who were heavy drinkers were the lowest since the Survey series began in 1980. Dramatic decreases in drinking are evident over only an 8-year period. These decreases may reflect a more general societal trend toward more abstainers and lower alcohol consumption among drinkers, but they also may reflect military efforts to reduce alcohol abuse. Decreases have been particularly dramatic since 1985, after the implementation of the military's new health promotion policy with its emphasis on preventing the misuse of alcohol.

C. Service Comparisons

Comparisons of average daily consumption for the Services (Figure 4.1, Table 4.1) show that alcohol consumption has been consistently lower among Air Force personnel for each of the Worldwide Survey years. The other Services are more similar to each other in the overall amount consumed, although there are small differences among them. Differences in drinking patterns (Table 4.2) among the Services are less extreme than for overall consumption, although the percentage of heavy drinkers is lower among Air Force and Navy personnel than among personnel from the Marines or Army (see Figure 4.2).

The difference in sociodemographic composition among the Services is a frequent explanation for these Service differences in alcohol use. Air Force personnel, for example, are more likely to be older, better educated

and married than personnel in the other Services (see Table 2.3), and these characteristics are generally related to lower levels of alcohol use. Thus, observed differences may be due in part to differences in the sociodemographic composition of the Services.

To examine the impact of sociodemographic differences on alcohol use rates for the Services, estimates of average daily ounces of ethanol consumed and the percentage of heavy drinkers for each of the Services were standardized to the DoD distribution for age, education, and marital status. Table 4.3 shows two clear and consistent findings for both indicators of alcohol use. First, the Army and Marine Corps show very similar use rates for 1988, as do the Navy and the Air Force. In prior surveys, Air Force alcohol use rates were distinctively lower than rates of other services (see Table 4.1). Thus, the lack of a significant difference

Table 4.3. Estimates of Alcohol Use, Unstandardized and Standardized by Sociodemographic Characteristics

	Service			
	Army	Navy	Marine Corps	Air Force
Average Daily Ounces of Ethanol				
Unstandardized	1.14 (Ø.Ø6)[b,c]	Ø.92 (Ø.Ø6)[d]	1.25 (Ø.13)[c]	Ø.72 (Ø.Ø3)
Standardized[a]	1.14 (Ø.Ø4)[b,c]	Ø.85 (Ø.Ø3)[d]	1.12 (Ø.11)[c]	Ø.84 (Ø.Ø3)
Heavy Drinkers				
Unstandardized	1Ø.5 (Ø.9)[b,c]	6.5 (1.4)[d]	11.7 (1.Ø)[c]	6.1 (Ø.5)
Standardized[a]	1Ø.4 (Ø.7)[b,c]	5.6 (1.8)[d]	1Ø.Ø (Ø.7)[c]	7.6 (Ø.6)

Note: Entries for average daily ounces of ethanol are mean values, and heavy drinkers are percentages. Standard errors are in parentheses.

[a]Estimates have been standardized by age, education, and marital status to the DoD distribution.

[b]Estimate is significantly different from the Navy at the 95 percent confidence level.

[c]Estimate is significantly different from the Air Force at the 95 percent confidence level.

[d]Estimate is significantly different from the Marine Corps at the 95 percent confidence level.

between Air Force and Navy personnel is accounted for by decreases among Navy personnel that are so substantial that their drinking patterns are now more similar to the low rates among Air Force personnel.

The second finding is that standardization does not alter the pattern of significance among the comparisons observed for unstandardized estimates. Sociodemographic differences among the Services, however, are not a likely explanation for observed Service differences. All significant differences between Services for unstandardized rates are also found for standardized rates. These results suggest that the observed Service differences in alcohol use are not attributable to Service differences in age, education, and marital status. The difference may be found in Service policy and practice regarding alcohol use or in other differences in personnel among the Services that have not been controlled for in these analyses.

D. Patterns of Alcohol Use

Overall, about 83 percent of military personnel are current drinkers who consume on average about 0.96 ounces of ethanol daily. Thus, military personnel have about 2 drinks per day. About one in five are infrequent/light drinkers, and almost one-third are either moderate or moderate/heavy to heavy drinkers. As shown in Table 4.4, beer is the most commonly consumed beverage (consumed by about 72 percent of military personnel in the past 30 days), followed by liquor (46 percent) and wine (32 percent). Compared with findings from the 1985 Worldwide Survey, these figures indicate that use of all beverages has declined.

Most military personnel do not drink heavily or frequently. Across all three beverages, as shown in Table 4.4, those who drink are most likely to drink less than weekly and to drink 1 to 3 drinks per occasion. For total DoD, 34.5 percent of military personnel drink beer less than once a week, 26.3 percent drink wine less than once a week, and 32.5 percent drink liquor less than once a week. Other frequencies are less common for each of the beverages; 41.1 percent of military personnel drink 1 to 3 beers per occasion, 26.4 percent consume 1 to 3 glasses of wine, and 30.5 percent 1 to 3 drinks of liquor. Relatively few military personnel drink every day or drink more than a few drinks per sitting.

Table 4.4. Quantity and Frequency of Alcohol Consumption, Total DoD Past 30 Days

Beverage/Quantity	Frequency of Consumption: None	Less Than Weekly	1-2 Days/Week	3-4 Days/Week	5-7 Days/Week	Total
Beer						
None	28.3	0.0	0.0	0.0	0.0	28.3
1-3	0.0	24.8	10.5	3.8	2.1	41.1
4-7	0.0	7.1	7.8	3.9	2.2	21.0
8-11	0.0	1.8	2.4	1.5	1.0	6.6
12 or more	0.0	0.8	1.0	0.5	0.7	2.9
Total	28.3	34.5	21.6	9.7	5.9	100.0
Wine						
None	67.8	0.0	0.0	0.0	0.0	67.8
1-3	0.0	22.0	3.3	0.8	0.3	26.4
4-7	0.0	3.2	0.8	0.2	0.1	4.3
8-11	0.0	0.4	0.1	0.0	0.0	0.5
12 or more	0.0	0.7	0.1	0.1	0.0	1.0
Total	67.8	26.3	4.4	1.0	0.5	100.0
Liquor						
None	54.4	0.0	0.0	0.0	0.0	54.4
1-3	0.0	24.5	4.6	1.0	0.4	30.5
4-7	0.0	6.3	3.3	1.1	0.3	11.0
8-11	0.0	1.4	1.0	0.4	0.2	2.9
12 or more	0.0	0.3	0.4	0.3	0.2	1.2
Total	54.4	32.5	9.3	2.8	1.1	100.0

Note: Data entries are cell percentages. Quantities are the number of beers, glasses of wine, or drinks of hard liquor usually consumed on a typical day they drink the beverage.

E. Beliefs and Alcohol Use

To change alcohol use patterns, the nature of antecedents that relate to alcohol use must be known and understood. Past theory and research suggest that attitudes and beliefs can be strong predictors of behavior (e.g., Ajzen and Fishbein, 1980; Fishbein and Ajzen, 1975), and more recent research points to the promise of this approach in understanding alcohol use (McCarty, Morrison and Mills, 1983).

Questions that were based on the work of McCarty et al. (1983) were included in the 1988 Worldwide Survey that examined the beliefs of respondents about the potential effects of having 6 or more drinks on a single

occasion and the respondents' evaluations of those beliefs. A set of nine items was asked using a 7-point scale ranging from very likely to very unlikely for the beliefs and from bad to good for the evaluations. Table 4.5 shows the mean scores from crosstabulating the item responses with drinking levels. Higher mean scores indicate greater concurrence with the item. As shown in the overall total column, military personnel on average tended to believe that after 6 drinks: it was slightly likely that they would be drunk, feel good, and have a good time; slightly unlikely that they would injure themselves or forget their worries; and neither likely nor unlikely that they would be asked to drink more, act foolishly, feel part of the group, or would remain in control. Evaluations of the acts indicated that being drunk, acting foolishly, injuring self, and being asked to drink more were considered bad; forgetting worries and feeling part of the group were considered neither bad nor good; and feeling good, having a good time, and remaining in control were considered good.

In addition to the overall beliefs and evaluations, Table 4.5 also shows that there are clear patterns in the association of beliefs and drinking levels. For each successful drinking level from abstainer to heavy, respondents' beliefs are systematically lower that after 6 drinks they will be drunk, act foolishly, or injure themselves. Heavy drinkers were significantly less likely to believe this than were abstainers. In contrast, heavy drinkers were more likely than abstainers to believe that they would feel good, have a good time, and remain in control. The other three items showed little variation across drinking levels. Evaluation of the belief items showed less variation than the belief ratings across drinking levels. The two items that showed the strongest association with drinking levels were being drunk, and being asked to drink more. Those in higher drinking levels rates these items as less objectionable. Thus, heavy drinkers rate these items as more favorable than do abstainers.

Taken together, the results show that beliefs and attitudes about drinking are clearly related to drinking levels. Heavy drinkers believe more strongly than abstainers or light drinkers that drinking relatively heavily (i.e. 6 or more drinks on a single occasion) results in positive or enjoyable outcomes (i.e., feeling good, having a good time, remaining in control) and does not result in negative or unenjoyable outcomes (being

Table 4.5. Beliefs About Effects of Drinking 6 or More Drinks and the Evaluation of Those Beliefs by Drinking Levels, Total DoD

Potential Effect	Drinking Levels: Abstainer	Infrequent/ Light	Moderate	Moderate/ Heavy	Heavy	Total
Beliefs[a]						
Be drunk	5.6 (Ø.Ø7)	5.6 (Ø.Ø8)	5.2 (Ø.Ø7)	4.7 (Ø.Ø3)	3.9 (Ø.Ø8)	5.1 (Ø.Ø5)
Act foolishly	5.1 (Ø.Ø7)	4.6 (Ø.Ø9)	4.3 (Ø.Ø8)	3.9 (Ø.Ø5)	3.2 (Ø.Ø8)	4.3 (Ø.Ø4)
Injure myself	4.3 (Ø.Ø6)	3.5 (Ø.Ø8)	2.9 (Ø.Ø5)	2.5 (Ø.Ø6)	2.2 (Ø.Ø8)	3.1 (Ø.Ø4)
Forget worries	3.8 (Ø.Ø5)	3.4 (Ø.Ø5)	3.4 (Ø.Ø4)	3.3 (Ø.Ø5)	3.4 (Ø.Ø7)	3.5 (Ø.Ø2)
Be asked to drink more	4.4 (Ø.Ø6)	4.Ø (Ø.Ø5)	3.9 (Ø.Ø4)	4.1 (Ø.Ø6)	4.4 (Ø.Ø8)	4.1 (Ø.Ø2)
Feel part of group	3.6 (Ø.Ø5)	3.6 (Ø.Ø5)	3.8 (Ø.Ø4)	3.8 (Ø.Ø5)	3.9 (Ø.Ø7)	3.7 (Ø.Ø2)
Feel good	3.5 (Ø.Ø4)	4.1 (Ø.Ø5)	4.6 (Ø.Ø6)	5.1 (Ø.Ø5)	5.2 (Ø.Ø7)	4.5 (Ø.Ø4)
Have a good time	3.5 (Ø.Ø5)	4.1 (Ø.Ø6)	4.7 (Ø.Ø5)	5.2 (Ø.Ø6)	5.3 (Ø.Ø5)	4.6 (Ø.Ø4)
Remain in control	2.9 (Ø.Ø6)	3.8 (Ø.Ø7)	4.6 (Ø.Ø7)	5.2 (Ø.Ø4)	5.4 (Ø.Ø7)	4.4 (Ø.Ø5)
Evaluation of Beliefs[b]						
Being drunk	1.6 (Ø.Ø4)	2.Ø (Ø.Ø4)	2.4 (Ø.Ø4)	2.9 (Ø.Ø7)	3.2 (Ø.Ø7)	2.4 (Ø.Ø4)
Acting foolishly	2.Ø (Ø.Ø4)	2.2 (Ø.Ø3)	2.5 (Ø.Ø2)	2.6 (Ø.Ø4)	2.5 (Ø.Ø6)	2.4 (Ø.Ø2)
Injuring myself	1.3 (Ø.Ø2)	1.2 (Ø.Ø2)	1.2 (Ø.Ø1)	1.2 (Ø.Ø1)	1.3 (Ø.Ø3)	1.2 (Ø.Ø1)
Forgetting worries	3.2 (Ø.Ø6)	3.3 (Ø.Ø4)	3.5 (Ø.Ø3)	3.6 (Ø.Ø3)	3.8 (Ø.Ø8)	3.5 (Ø.Ø2)
Being asked to drink more	1.7 (Ø.Ø3)	2.1 (Ø.Ø3)	2.5 (Ø.Ø3)	2.9 (Ø.Ø4)	3.2 (Ø.Ø5)	2.4 (Ø.Ø3)
Feeling part of group	4.1 (Ø.Ø6)	4.3 (Ø.Ø4)	4.4 (Ø.Ø4)	4.5 (Ø.Ø4)	4.6 (Ø.Ø7)	4.4 (Ø.Ø3)
Feeling good	5.2 (Ø.Ø5)	5.4 (Ø.Ø4)	5.6 (Ø.Ø4)	5.7 (Ø.Ø4)	5.7 (Ø.Ø7)	5.5 (Ø.Ø2)
Having a good time	5.5 (Ø.Ø4)	5.7 (Ø.Ø5)	5.8 (Ø.Ø4)	6.1 (Ø.Ø3)	6.Ø (Ø.Ø7)	5.8 (Ø.Ø2)
Remaining in control	6.2 (Ø.Ø4)	6.5 (Ø.Ø3)	6.6 (Ø.Ø2)	6.6 (Ø.Ø2)	6.5 (Ø.Ø7)	6.5 (Ø.Ø1)

Note: Data entries are mean scores with standard errors in parentheses.

[a]Belief strength was assessed on a 7-point "unlikely-likely" dimension with higher scores reflecting stronger likelihood that the effects will occur.

[b]Evaluations were assessed on a 7-point "bad-good" dimension with higher scores reflecting positive feelings.

drunk, acting foolishly, and injuring themselves). This suggests that one approach to changing drinking behavior is to target education and prevention efforts toward beliefs and attitudes that reinforce more moderate drinking patterns.

F. Correlates of Alcohol Use

Past research on both military and civilian populations has firmly established that alcohol use patterns have certain regularities. For instance, drinking tends to be more common and heavier among younger persons, males, and the less well educated. Knowledge about these regularities is important for effective targeting of educational and treatment efforts.

1. Descriptive Findings

The findings from the 1988 Worldwide Survey support previous research on patterns of drinking among sociodemographic groups (see Tables D.5 and D.6 in the Appendix). Table D.5 presents average daily ounces of ethanol by sociodemographic characteristics for the total DoD and each of the Services, while Table D.6 presents drinking levels by sociodemographic characteristics for the total DoD. Comparable tables with drinking levels for the individual Services are Tables D.7 to D.10.

Table D.5 shows that the overall amount of alcohol consumed among total DoD personnel and personnel in each of the Services is substantially higher among males than females, among blacks than among other race/ethnic groups, among the less well educated, among younger personnel, those not married, and those in the lower pay grades. Several of these differences are particularly strong. For instance, average daily consumption among males (1.03 ounces) is more than double that among females (0.44). The consumption of those with a high school education or less (1.31 to 1.42) is two to three times that of college graduates (0.52). Consumption among those who were not married (1.35) is almost double that among those married with spouse present (0.69). Consumption among those aged 25 or less (1.22 to 1.25) is about twice that of personnel over age 35 (0.61). Consumption among E1 to E3 pay grades (1.47) is three times that of O4s to O10s (0.52). Consumption among those with 1 to 3 years of active service (1.13 to 1.31) is almost double that of personnel with 10 or more years of service (0.69).

Findings are less consistent across the Services for time spent on active duty and for region, although for the total DoD, alcohol consumption was heavier among those with 1 to 3 years of service and among those stationed in Europe and the North Pacific.

These findings observed for average daily ounces of ethanol also held true for heavier drinking levels for the total DoD and the individual Services.

Figure 4.3 illustrates these findings for heavy alcohol use by pay grade. As shown in Figure 4.3, heavy alcohol use is highest among junior enlisted personnel and lowest among officers. Overall for DoD, 12.3 percent of E1-E3s report heavy use, followed by 9.1 percent of E4-E6s, 5.3 percent of E7-E9s, 4.6 percent of warrant officers, 1.9 percent of O1-O3s, and 1.4 percent of O4-O10s.

Figure 4.4 shows heavy alcohol use among the junior enlisted personnel (E1-E3s) for each Service. As shown, the percentages of heavy drinkers in the Army (18.0 percent) and Marine Corps (15.8 percent) are substantially higher than those in the Navy (7.7 percent) or the Air Force (8.6 percent).

Figure 4.3. Heavy Alcohol Use by Pay Grade, Total DoD

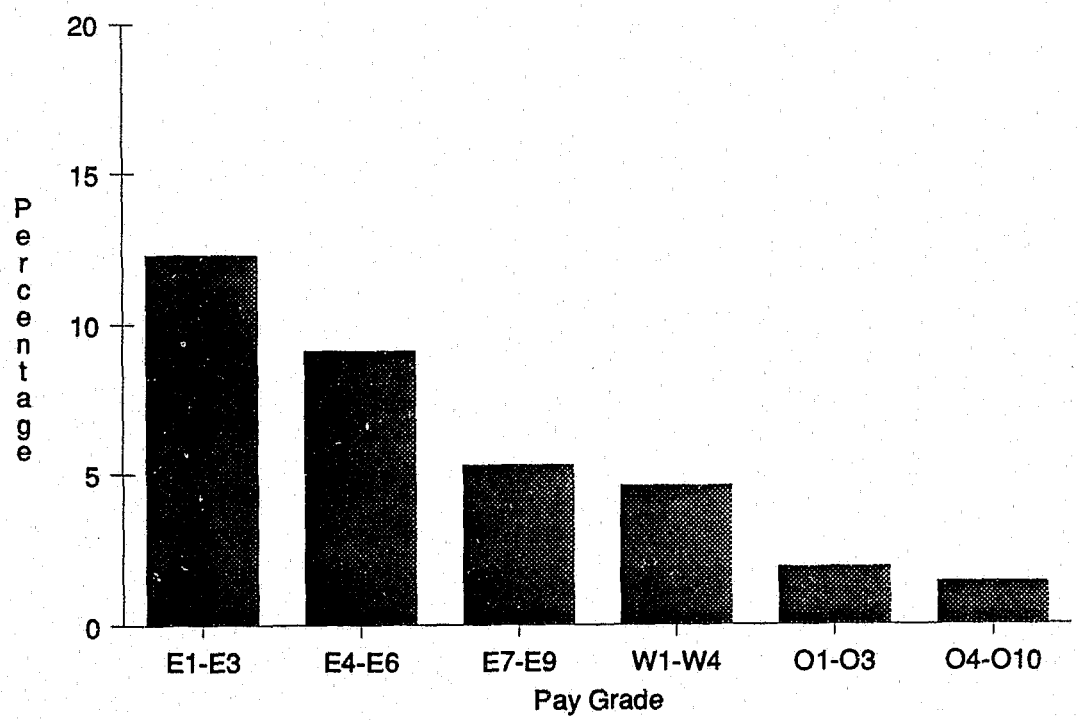
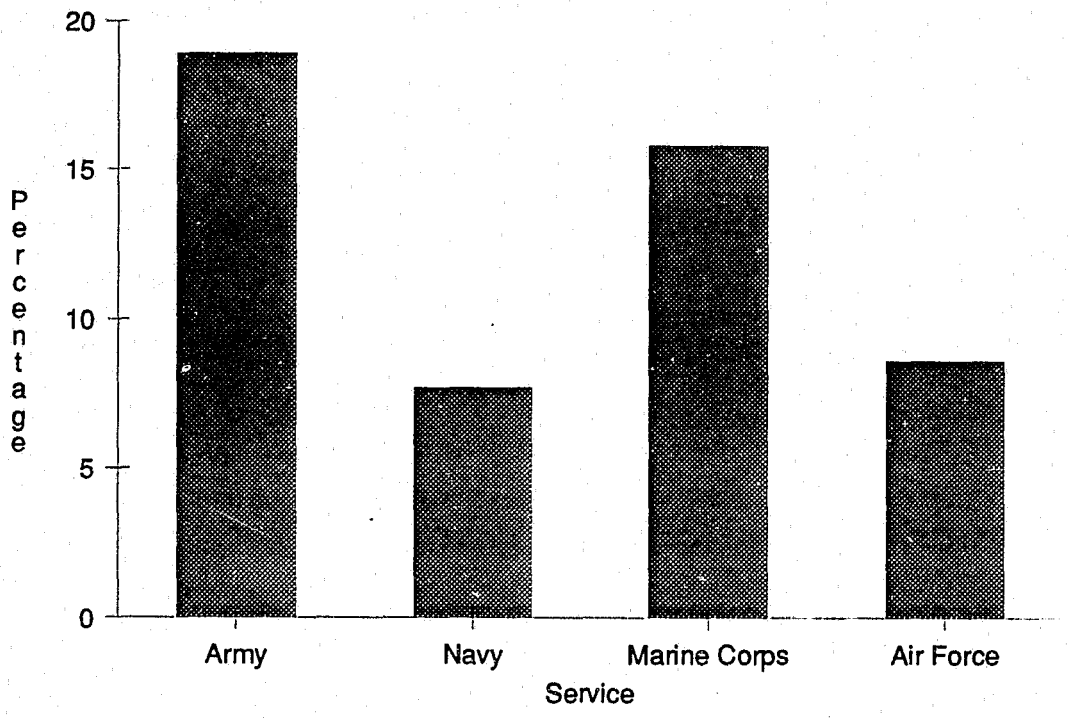


Figure 4.4. Heavy Alcohol Use for E1-E3s by Service



2. Multivariate Findings

The findings on the demographic regularities in alcohol use are informative as to high-risk groups that are likely to experience alcohol-related problems, but they neither describe the independent relationship of particular demographic characteristics of alcohol use nor do they consider the significance of the relationships. Findings for number of years in service, for instance, may reflect the effects of age. Some substantial differences may not be statistically significant when the effects of other factors are taken into account.

To examine the independent effects of a variety of factors on heavy drinking or on the amount of alcohol consumed, regression analyses were conducted. For heavy drinking, a dichotomous (0,1) criterion measure was created from the drinking level variable. Heavy drinkers were coded as 1, and all others were coded as 0. The regression analysis for this measure thus estimates the probability of being a heavy drinker. For ounces of ethanol, the criterion measure was a continuous variable in ounces. Abstainers were omitted from both analyses because interest focused on understanding levels of use among users.

a. Sociodemographic Variables. Ten sociodemographic variables were used in the regression analyses. They were Service, race/ethnicity, sex, education, family status, region, pay grade, years of service, age of respondent, and age at first regular use of alcohol. For the analyses, the coding of the independent variables determined the comparisons that were made. For Service, the coding provided comparisons of the Army, Navy, and Marine Corps to the Air Force. Race/ethnicity was coded to compare blacks, Hispanics, and "others" to whites. Educational level was divided to compare high school graduates or less to those beyond high school. Family status was dichotomized to contrast single personnel and married personnel whose spouse was not present to married personnel whose spouse was present. Region was contrasted as Americas, North Pacific, and Other Pacific versus Europe. Pay grades E1-E3s, E4-E6s, E7-E9s, W1-W4s, and O1-O3s were each compared to O4-O10s. Years of service contrasted those with 0-3 years, 4-9 years, and 10-19 years to those with 20 or more years. Current age and age at first regular use of alcohol retained their original coding of years.

b. Psychological/Behavioral Variables. Besides the sociodemographic variables, six psychological/behavioral indicators were also studied to help understand relationships surrounding alcohol use. Some of these indicators were based on items in the questionnaire that assessed attitudes, beliefs, norms, and behavior of participants, and some were created using the results of factor analyses. The six psychological/behavioral measures were: reported stress at work, health practices, the drinking attitudes index, the drinking climate index, the drinking motivation index, and beliefs about heavy drinking index. Briefly the measures were as follows:

- Stress at work is self-reported stress on the job and was coded high, low, and none;
- Health practices is a modified health practices index that includes the five health practices of no drug use, never smoked, regular exercise, proper eating and proper sleeping habits, and omits any measure of alcohol use.
- The drinking attitude index provides a measure of favorability/unfavorability toward drinking with high scores indicating unfavorable attitudes about use;

- The drinking climate index assesses perceived beliefs about the climate that exists in the military for obtaining help with alcohol problems, and high scores indicate a favorable climate for help;

- The drinking motivation index is based on items that assess importance of various reasons for drinking, with high scores indicating strong motivation to drink.

- Beliefs about heavy drinking index examines perceived consequences that will result from having 6 or more drinks on a single occasion, with high scores indicating beliefs that heavy drinking will have negative effects.

Additional details about construction of the drinking attitude measures appear in Appendix E.

c. Heavy Drinking Correlates. Results of the regression analyses are shown in Table 4.6. As shown, there is some (though not perfect) similarity in findings from the two analyses as might be expected because both criterion variables reflect different ways of measuring alcohol use. The R^2 for heavy drinking was .13 which is significant at the .001 level. This indicates that the variables included in the analyses explained 13 percent of the variation in the criterion measure.

The analysis for heavy drinking showed significant effects for Service, race/ethnicity, sex, education, family status, pay grade, age, age at first use, drinking motivation, drinking climate, and beliefs about heavy drinking. Results show that the probability of being a heavy drinker is significantly higher, after adjusting for all other variables in the analysis, for:

- Army personnel than for Air Force personnel,
- Whites than for Hispanics,
- males than for females,
- those with less education than those with more education,
- single personnel than for married personnel with spouse present,
- enlisted pay grades than for senior officers,

Table 4.6. Predicting Heavy Drinking and Ounces of Ethanol Consumed

Independent Variables	Heavy Drinking Regression Parameters	Ounces of Ethanol Regression Parameters
Service		
Army versus Air Force	.0257*	.2336***
Navy versus Air Force	-.0311	-.0778
Marine Corps versus Air Force	.0223	.3145*
Race/Ethnicity		
Black versus White	-.0011	.3477***
Hispanic versus White	-.0340*	-.0237
Other versus White	-.0290	-.0089
Sex		
Male versus Female	.0457***	.3664***
Education		
High School or Less versus Beyond School	.0515***	.2472***
Family Status		
Single versus Married, spouse present	.0513***	.4198***
Married, spouse not present versus Married, spouse present	.0120	.1135
Region		
Americas versus Europe	-.0141	-.2238***
North Pacific versus Europe	.0185	-.0167
Other Pacific versus Europe	.0436	-.0321
Pay Grade		
E1-E3 versus O4-O10	.0452	.3654**
E4-E6 versus O4-O10	.0491***	.1122
E7-E9 versus O4-O10	.0296**	-.0467
W1-W4 versus O4-O10	.0188	-.1810*
O1-O3 versus O4-O10	.0032	-.0705
Age	.0024*	.0279**
Years of Service		
0-3 vs 20+	-.0182	-.0289
4-9 vs 20+	-.0027	.0926
10-19 vs 20+	-.0124	.0168
Age of 1st Regular Use of Alcohol	-.0034*	-.0487***
Self-Reported Stress at Work	.0015	.0433
Drinking Motivation	.1320***	1.1048***
Health Practices Index	-.0030	-.1134***
Drinking Climate	.0020	.0224***
Drinking Attitudes	-.0026	-.0255**
Beliefs about Heavy Drinking	-.0051***	-.0418***

Note: Entries are regression parameters which indicate the effects of the tabled variables and the average daily ounces of ethanol consumed.

*p<.05. **p<.01. ***p<.001.

- those who are older,
- those who first used alcohol at early ages,
- those with high drinking motivation,
- those who do not perceive that negative consequences will result from heavy drinking.

One of the strongest predictors in the analysis is drinking motivation. The data indicate that an increase of one point on the drinking motivation scale is associated with an increase of .132 in the probability of heavy drinking. This is an extremely large effect and suggests that military personnel who rely on drinking to satisfy their social, recreational, and personal needs are much more likely to be heavy drinkers. The other variables showing particularly strong effects are beliefs about heavy drinking, family status, educational level, sex, and pay grade.

The one puzzling analytical finding is that the probability of heavy drinking is higher for older ages. Earlier analyses suggested the opposite pattern. This finding may be explained in that several variables are related to age (e.g., age at first alcohol use, pay grade, education, marital status) and that those other variables account for the expected pattern of younger personnel having a greater likelihood of being a heavy drinker. Once adjustments are made for the other age-related variables, it appears that the probability of being a heavy drinker increases as age increases. Although significant, the age parameter is small and relatively unimportant.

d. Ethanol Use Correlates. The R^2 for the regression analysis of average daily ounces of ethanol was .24, which was significant at the .001 level. The analysis showed significant effects for Service, race/ethnicity, sex, education, family status, region, pay grade, age, age at first use, drinking motivation, health practices, drinking climate, drinking attitudes, and beliefs about heavy drinking. Results show that after adjusting for all other variables in the analysis, significantly more average daily ounces of ethanol are consumed by:

- Army and Marine personnel than by Air Force personnel;
- blacks than by whites;
- males than by females;
- those with high school education or less than those with education beyond high school;
- single personnel than by married personnel with spouse present;
- personnel in Europe than by personnel in CONUS;
- junior enlisted pay grades than by senior officers;
- those who are older;
- those who first used alcohol at early ages;
- those with high drinking motivation;
- those with poor health practices;
- those who believe there is a positive climate in the military for getting help with alcohol problems,
- those with favorable attitudes toward alcohol use; and
- those who do not perceive that negative consequences will result from heavy drinking.

One of the strongest predictors in the analysis is drinking motivation. The data indicate that an increase of one point on the drinking motivation scale is associated with an increased consumption of 1.1048 average daily ounces of ethanol. As with the analysis of heavy drinking, this is an extremely large effect. The other variables showing particularly strong effects are service, race/ethnicity, sex, educational level, family status, region, age at first regular use, health practices, drinking climate, and beliefs about heavy drinking.

The analysis also shows the unexpected finding that daily ounces of ethanol increase as age increases whereas earlier descriptive analyses suggested the opposite pattern. This finding is likely explained in the same manner noted above for heavy drinking.

Findings that psychological/behavioral variables including health practices, motivation to drink, and attitudes and beliefs about drinking play

an important part in explaining drinking behavior suggest that education may be an effective approach to encouraging controlled alcohol use. More specifically, these findings suggest that education should focus on informing military personnel about drinking problems and alternative ways of meeting social, recreational, and personal needs besides drinking.

G. Alcohol Use and the Military Job

The negative effects of drinking on work performance--lowered productivity, missing work or coming to work late, an inability to concentrate on tasks--are among the major reasons the Department of Defense is concerned with drinking among military personnel. Drinking can impair combat readiness and overall productivity. These effects on work performance are discussed in more detail in Chapter 7. Here we examine the likelihood of experiencing alcohol-related problems on the job, drinking behavior since entering military Service, and the relation of perceived work-related stress to drinking.

Relatively low percentages of military personnel drink alcoholic beverages within 2 hours of going to work (4.8 percent of all military personnel), during lunch break (6.8 percent), or during work or a work break (2.0 percent). However, 10 percent of military personnel engage in one or more of these three behaviors. These findings are shown in Table 4.7 for the total DoD and for enlisted personnel and officers. Officers are somewhat less likely than enlisted personnel to drink before going to work or during work, but officers and enlisted personnel are equally likely to drink at lunch. Overall about 10 percent of enlisted personnel, and almost 8 percent of officers drink alcohol before or during work hours.

There are few Service differences in these drinking patterns, except for the substantially higher percentages of Navy officers who drink during lunch (11.7 percent) and the relatively low percentages of Army and Marine Corps officers who do so (2.2 and 2.8 percent, respectively). Almost 12 percent of Navy and Marine Corps personnel report one or more of these three behaviors, and about 9 percent of Army and Air Force personnel do so. Although relatively low percentages of military personnel engage in any one of these behaviors, about 10 percent drink before or during work hours. These behaviors indicate that many military personnel are at risk of expe-

Table 4.7. Alcohol Use on Work Days, Past 30 Days

Grade/Drinking Occasions	Service				Total DoD
	Army	Navy	Marine Corps	Air Force	
Enlisted					
Within 2 hours of going to work	6.5(0.7)	5.8(0.6)	6.5(1.2)	3.9(0.5)	5.5(0.3)
During lunch break	8.1(0.4)	7.7(1.3)	9.4(0.8)	5.9(0.7)	6.8(0.4)
During work or work break	3.4(0.5)	1.4(0.4)	3.7(1.0)	1.3(0.3)	2.3(0.3)
Total	10.2(0.9)	11.7(1.1)	12.6(0.8)	8.8(0.9)	10.4(0.5)
Officers					
Within 2 hours of going to work	1.1(0.3)	1.5(0.6)	0.7(0.4)	1.2(0.3)	1.2(0.2)
During lunch break	2.2(0.4)	11.7(3.2)	2.8(0.6)	8.4(2.4)	6.6(1.2)
During work or work break	0.4(0.1)	0.7(0.4)	0.7(0.4)	1.7(0.5)	0.9(0.2)
Total	3.0(0.5)	12.7(3.1)	4.1(1.3)	10.4(2.3)	7.9(1.2)
Total					
Within 2 hours of going to work	5.5(0.6)	5.2(0.6)	5.8(1.1)	3.4(0.4)	4.8(0.3)
During lunch break	5.4(0.3)	8.3(1.4)	8.5(0.7)	6.4(0.9)	6.8(0.5)
During work or work break	2.9(0.4)	1.3(0.3)	3.4(0.9)	1.4(0.3)	2.0(0.4)
Total	8.9(0.8)	11.9(1.2)	11.5(0.7)	9.1(1.0)	10.0(0.5)

Note: Entries are percentages with standard errors in parentheses.

riencing alcohol-related problems at work that may detract from work performance and military readiness.

Distinctive military conditions (such as being away from home and family) or a military climate supporting drinking may actually "create" drinkers. That is, military personnel may become drinkers or increase their drinking after they enter military service. Although information on actual drinking levels before entering military service is not available, respondents to the 1988 Worldwide Survey were asked to assess whether they drink more now, about the same, or less after entering military Service or whether they were abstainers before entering and at present.

These findings are presented for the total DoD and the individual Services by years of service in Table 4.8. Military personnel are most likely

Table 4.8. Drinking Behavior Since Entering Military by Time in Service

Service/Drinking Behavior	Years of Service 0-3	4-9	10-19	20 or More	Total
Army					
Drink more now	33.4 (1.4)	27.2 (1.6)	22.0 (0.8)	24.2 (2.4)	27.9 (0.8)
Drink about the same	19.9 (1.2)	20.4 (1.4)	20.4 (1.4)	21.6 (2.3)	20.3 (0.8)
Drink less	32.1 (1.9)	39.3 (2.1)	44.7 (1.8)	38.3 (2.0)	38.1 (0.9)
Nondrinker before and at present	14.5 (1.6)	13.0 (1.2)	12.8 (0.7)	15.9 (2.0)	13.7 (0.9)
Navy					
Drink more now	30.8 (2.7)	23.8 (3.0)	21.1 (1.3)	26.8 (2.7)	26.2 (2.3)
Drink about the same	21.8 (2.6)	19.6 (1.6)	20.2 (1.1)	16.8 (0.9)	20.5 (1.1)
Drink less	33.7 (1.8)	49.6 (3.8)	49.0 (1.8)	43.4 (2.2)	42.7 (2.5)
Nondrinker before and at present	13.8 (1.6)	6.9 (0.8)	9.6 (0.9)	13.0 (0.8)	10.7 (0.9)
Marine Corps					
Drink more now	28.1 (3.9)	31.2 (1.2)	20.6 (1.4)	32.2 (5.4)	27.5 (2.2)
Drink about the same	28.5 (1.5)	15.3 (2.1)	18.1 (2.0)	14.7 (3.6)	22.5 (0.9)
Drink less	30.7 (5.4)	40.7 (2.9)	48.4 (1.1)	41.8 (1.8)	37.3 (3.5)
Nondrinker before and at present	12.7 (2.7)	12.9 (3.5)	12.9 (1.3)	11.3 (4.7)	12.7 (1.1)
Air Force					
Drink more now	24.0 (2.0)	23.1 (1.0)	25.8 (1.1)	30.5 (1.4)	24.8 (0.9)
Drink about the same	25.6 (2.6)	21.9 (1.7)	20.8 (0.9)	15.1 (2.0)	22.2 (1.1)
Drink less	37.3 (2.0)	44.0 (1.3)	41.1 (1.2)	44.7 (2.8)	41.1 (1.1)
Nondrinker before and at present	13.1 (1.3)	11.0 (1.1)	12.3 (0.7)	9.7 (1.5)	11.9 (0.7)
Total DoD					
Drink more now	29.6 (1.2)	25.3 (1.0)	23.0 (0.6)	27.8 (1.2)	26.5 (0.8)
Drink about the same	22.9 (1.2)	20.3 (0.8)	20.4 (0.6)	17.4 (1.1)	21.1 (0.5)
Drink less	33.7 (1.2)	43.7 (1.3)	44.8 (0.9)	42.4 (1.4)	40.2 (0.8)
Nondrinker before and at present	13.7 (0.8)	10.7 (0.7)	11.8 (0.4)	12.5 (0.9)	12.2 (0.4)

Note: Entries are column percentages with standard errors in parentheses.

to state that they now drink less than when they entered the military (40.2 percent). About one in four state that they drink more now, about one in five state they drink about the same, and about one in eight were abstainers now and before entering the military. Drinking patterns did not differ substantially for the Services or by years in service. In contrast to popular belief, junior grade personnel with less than 4 years of service were no more likely than other personnel to drink more after entering the military.

Stress at work is a reason offered by some for drinking. Assuming that drinking helps many to relax, those reporting a great deal of stress at the workplace may be expected to be heavier drinkers than those reporting little stress. The percentage distribution for levels of stress reported at work, for officers and enlisted personnel, is shown in Table 4.9; the relationship between reports of stress at work and drinking level is presented in Table 4.10 for total DoD, enlisted personnel and officers. As shown in Table 4.9, almost 80 percent of military personnel report some stress at work, 22 percent report that they are under a great deal of stress, and another 26 percent report that they are under a large amount of stress. Officers report somewhat higher levels of stress than enlisted personnel.

The relationship between reported stress at work and drinking level is presented in Table 4.8 for total DoD, enlisted personnel and officers. Overall, the data show a positive relationship between reported stress at work and drinking levels. The percentage of moderate/heavy or heavy drinkers is substantially higher among those under a great deal of stress (35.1 percent) than those reporting no stress (26.1 percent). There are correspondingly fewer abstainers among those reporting a great deal of stress (15.4 percent) than among those reporting no stress (25.8 percent), but there is little variation in the percentage of infrequent/light and moderate drinkers. This pattern is much stronger for enlisted personnel than for officers. Thus, drinking levels show a significant association with reported work-related stress.

These findings suggest that although drinking can result in substantial negative effects on work performance, relatively few military personnel

Table 4.9. Reported Stress Experienced at Work, Past 30 Days

Stress Level	Grade Level		
	Enlisted	Officer	Total
Great deal	21.8 (0.8)	23.2 (1.1)	22.0 (0.7)
Fairly large amount	24.7 (0.7)	32.3 (0.9)	26.0 (0.6)
Some	30.0 (0.8)	31.6 (1.0)	30.2 (0.7)
A little	16.0 (0.4)	10.5 (0.7)	15.1 (0.4)
None	7.6 (0.3)	2.5 (0.4)	6.7 (0.2)

Note: Entries are column percentages with standard errors in parentheses.

Table 4.10. Reported Stress Experienced at Work Past 30 Days and Drinking Level

Grade/Stress Level	Drinking Level		
	Abstainer	Infrequent/Light and Moderate	Moderate/Heavy and Heavy
Enlisted			
Great deal	16.3 (1.0)	45.8 (1.5)	37.9 (1.5)
Fairly large amount	16.6 (1.2)	49.1 (1.3)	34.9 (1.7)
Some	18.1 (0.9)	49.2 (1.1)	32.7 (0.9)
A little	18.6 (1.4)	49.6 (2.3)	31.8 (1.9)
None	26.1 (2.3)	47.3 (2.3)	26.6 (2.5)
Officer			
Great deal	11.1 (1.5)	66.7 (2.6)	22.2 (2.4)
Fairly large amount	13.9 (1.4)	64.9 (1.9)	21.2 (1.8)
Some	13.7 (1.4)	63.3 (1.9)	23.0 (1.5)
A little	17.8 (2.9)	65.2 (3.2)	17.0 (2.8)
None	21.0 (5.2)	60.1 (7.2)	18.9 (5.5)
Total			
Great deal	15.4 (0.9)	49.5 (1.4)	35.1 (1.3)
Fairly large amount	15.5 (1.0)	52.4 (1.3)	32.0 (1.6)
Some	17.3 (0.8)	51.6 (1.1)	31.0 (0.8)
A little	18.5 (1.2)	51.5 (2.0)	30.0 (1.8)
None	25.8 (2.1)	48.1 (2.4)	26.1 (2.4)

Note: Entries are row percentages with standard errors in parentheses.

drink immediately before or during work hours and that the military itself does not appear to foster heavier drinking, although higher levels of reported stress on the job are associated with heavier drinking. Drinking patterns are most likely developed before entering the Service and continue until the same forces that affect civilians (including growing older) begin to decrease drinking.

H. Summary

Surveys of civilian and military populations conducted over the past several decades and information about alcohol sales indicate that most people drink but they now drink less. Recently, abstainers have increased slightly and heavy drinkers have decreased, although drinking patterns on the whole have not changed substantially over the past decades.

1. Trends in Alcohol Use

The findings from the 1988 Worldwide Survey support these findings on trends in drinking among military personnel and civilians. By 1988, the overall amount of alcohol consumed and the percentage of persons who were heavy drinkers were the lowest since the survey series began in 1980.

- The average daily amount of ethanol consumed by total DoD personnel has declined steadily since 1980, from 1.48 ounces per day in 1980 to 0.96 ounces in 1988, a decrease of 35 percent in 8 years.
- Alcohol consumption has been consistently lower among Air Force personnel, in part because of the distinctive sociodemographic composition of the Air Force, but substantial decreases in drinking have occurred for personnel in the other Services.
- In 1988, about 83 percent of total DoD personnel were current drinkers, with about two-thirds being moderate to heavy drinkers and 8.2 percent heavy drinkers.
- The percentage of abstainers among total DoD personnel increased significantly, and the percentage of heavy drinkers decreased significantly from 1985 to 1988 for the total DoD; some variation in this general pattern was evident for the four Services.

2. Service Comparisons

In the 1985 Worldwide Survey, some of the differences in heavy drinking and alcohol consumption between the Air Force and the other Services were attributable to sociodemographic differences among Service personnel. In 1988, the pattern of results was not attributable to sociodemographic differences.

- In 1988, Air Force and Navy personnel were similar and significantly lower than the Army and Marine Corps on unstandardized rates of the total amount of alcohol consumption and percentage of heavy drinkers. None of the significant Service differences changed after standardization for age, education, and marital status.

3. Patterns of Alcohol Use

Comparisons of the 1985 and 1988 Worldwide Survey findings indicate that use of all alcoholic beverages (beer, wine, and liquor) is declining and that drinking is not heavy or frequent for most military personnel.

- Overall, about 83 percent of military personnel are current drinkers who consume on average about 0.96 ounces of ethanol daily.

- Beer is the most frequently consumed beverage (consumed by 72 percent of total DoD personnel in the past 30 days), followed by liquor (46 percent) and wine (32 percent).

- Military personnel are most likely to drink less often than weekly and consume on average 1 to 3 drinks per occasion.

4. Beliefs and Alcohol Use

Theory and research suggest an association between beliefs and attitudes about alcohol use and actual alcohol consumption. Analyses examined the association of nine beliefs about effects of drinking 6 or more drinks at one time and actual drinking levels.

- Beliefs and attitudes are clearly related to drinking levels. Heavy drinkers believe more strongly than light drinkers or abstainers that drinking 6 or more drinks at one time results in positive outcomes such as feeling good, having a good time and remaining in control and does not result in negative or unenjoyable outcomes such as being drunk, acting foolishly, or injuring themselves.

- Results suggest that one approach to changing drinking behavior is to target education and prevention efforts toward beliefs and attitudes that support more moderate drinking.

5. Correlates of Alcohol Use

Surveys of military and civilian populations have established certain demographic regularities in the volume and patterns of drinking that are useful in targeting prevention, intervention, and treatment efforts.

- Heavy drinking is strongly predicted by family status, pay grade, sex, educational status, drinking motivation, and beliefs about heavy drinking. The probability of being a heavy drinker is significantly more likely among military personnel who are single, enlisted, and males; who did not continue their education beyond high school; who are more highly motivated to drink; and who believe that negative consequences will not result from heavy drinking than their counterparts.

- Average daily ounces of ethanol consumed is strongly predicted by family status, pay grade, race/ethnicity, sex, Service, education, region, age at first regular use, drinking motivation, health practices, drinking climate, drinking attitudes, and beliefs about heavy drinking. The average daily consumption of more ounces of ethanol is significantly more likely among personnel who are: single, in pay grades E1-E3, black, males and in the Army or the Marines; who did not continue their education beyond high school; who are highly motivated to drink; who engage in fewer health practices; who believe that the military will help those with alcohol problems; and who have favorable attitudes and beliefs toward drinking.

6. Alcohol Use and the Military Job

Drinking can impair combat readiness and overall productivity, and the workplace can itself generate alcohol abuse.

- Relatively few military personnel drink within 2 hours of going to work (4.8 percent), during lunch break (6.8 percent), or during work or a work break (2.0 percent). However, 10 percent of military personnel engage in one or more of these three behaviors.

- More military personnel report that they currently drink less compared to when they entered the military (40.2 percent) than report that they drink more (26.5 percent) or about the same (21.1 percent) than when they entered the military. There is little variation by Service or years in service.

- Reported stress at work is related to drinking patterns. The percentage of moderate/heavy or heavy drinkers was substantially higher among those reporting a great deal of stress (35.1 percent) than among those reporting no stress (26.1 percent).

These findings from the 1988 Worldwide Survey indicate that substantial decreases in the overall volume of drinking and heavy drinking have been made since 1980, particularly since 1985. These decreases are no doubt tied in part to similar decreases among civilians, as society becomes less tolerant of alcohol abuse, but they also reflect the effectiveness of military efforts to decrease alcohol abuse. These gains should continue as societal trends and military policy foster more moderate use of alcohol.

5. DRUG USE

In this chapter we examine drug use among military personnel including trends in use, Service comparisons of drug use, prevalence of specific drugs and classes of drugs, frequency of drug use, correlates of drug use, and the relationship between the military job and drug use. We compare these findings to prior surveys of military and civilian populations. Supplementary tables on drug use, including more detailed information about drug use among the pay grades and regions of the world, are included in Appendix D.

A. Prior Studies

A series of surveys has examined the prevalence and correlates of drug use among civilians and military personnel. The major source of information on drug use among civilians is a series of related national surveys that began in 1971, while information on drug use among military personnel is available from the Worldwide Survey series and several surveys of the individual Services.

Drug use has steadily declined during the 1980s for both civilians and military personnel. Civilian surveys document a decrease in the use of most drugs that began after 1979, while surveys of military personnel find a downward trend in drug use since at least 1980 when the first Worldwide Survey was conducted. Thus, drug use for both civilians and military personnel began to decrease during the late 1970s and early 1980s. Comparisons of drug use prevalence and trends across military and civilian surveys are problematic, however, because military and civilian populations vary substantially in sociodemographic characteristics that mark significant variation in drug use. This section examines data supporting these conclusions from civilian populations, military populations, and those making comparisons between the two.

1. Civilian Populations

The National Survey on Drug Abuse, conducted periodically since 1971, traces trends in the use of illicit drugs and nonmedical use of licit drugs for youth and adults. The 1971 and 1972 surveys were conducted for

the National Commission on Marijuana and Drug Abuse; the 1974 and later surveys have been sponsored by the National Institute on Drug Abuse (NIDA). The series shows that the use of most drugs began a downward trend after a peak in 1979 (Clayton, 1987).

The most recent national survey was conducted in 1985 by Temple University. The survey indicates that current and lifetime use of most drugs has decreased between 1982 and 1985. Although the use of cocaine increased in recent years, its use has now stabilized (Clayton 1987). In 1985, 12.0 percent of persons aged 12 and over reported any illicit use of drugs in the past month; comparable figures were 25.5 percent for those aged 18 to 25 (30.0 percent for males and 21.0 percent for females) and 20.7 percent for those aged 26 to 34 (26.2 percent for males and 15.4 percent for females). For marijuana, the most commonly used drug, 9.4 percent of the total population reported use during the past month; comparable figures for those aged 18 to 25 were 21.7 percent and for those aged 26 to 34, 16.8 percent. Comparable figures for cocaine were 2.9 percent for the total population, 7.6 percent for those aged 18 to 25, and 6.1 percent for those aged 26 to 34. During the year, about 36.8 million persons used any illicit drugs, about 29.4 million used marijuana and about 12.2 million used cocaine (NIDA, 1987).

Similar trends in drug use are observed among high school seniors, surveyed since 1975 in conjunction with the Monitoring the Future Surveys conducted by the University of Michigan (Johnston, O'Malley and Bachman, 1987; see also NIDA, 1988). Because many military recruits are drawn from the high school graduating class, prevalence figures for high school seniors may be predictive of drug use among entering personnel. Thirty-one percent of high school seniors surveyed in 1975 had used illicit drugs during the past month. This percentage peaked in 1979 at 38.9 percent and steadily declined to an apparent leveling off at 29.7 in 1985 but again declined in 1986, to 27.1 percent. The use of marijuana during the past month increased from 27.1 percent in 1975 to a high of 37.1 percent in 1978 and has declined steadily thereafter. In 1987, 21.0 percent of high school seniors reported using marijuana during the past month, 5.2 percent reported using stimulants, and 4.3 percent reported using cocaine. The

prevalence of use of other drugs was lower. Half of the high school seniors reported that they had ever used marijuana, about 19 percent had used inhalants, about 15 percent had used cocaine, and fewer had used other drugs. Thus, as with findings for adults and youth from the National Drug Abuse Survey, drug use among high school seniors declined after a peak in the late 1970s. Over one in four high school seniors, however, currently uses drugs at least once a month.

2. Military Populations

Data on drug use among military personnel are available from the Worldwide Surveys of Alcohol and Nonmedical Drug Use conducted in 1980, 1982, and 1985 as well as surveys of the individual Services. As noted in chapter 3 on substance use trends, drug use declined dramatically between 1980 and 1985. The prevalence of any drug use by DoD personnel during the past 30 days declined from 27.6 percent in 1980 to 19.0 percent in 1982 and to 8.9 percent in 1985; the decline between 1982 and 1985 was statistically significant. Marijuana use declined from 26.0 percent of all personnel in 1980 to 16.5 percent in 1982 and to 6.5 percent in 1985. These declines were statistically significant. In 1985, use of any drug during the past 30 days was highest among Army personnel (11.5 percent) and Navy personnel (10.3 percent), followed by Marine Corps personnel (9.9 percent) and Air Force personnel (4.5 percent). Part of this difference among the Services is accounted for by differences in the sociodemographic composition of the Services; Air Force personnel are more likely to be older, better educated, and married, characteristics associated with a lower likelihood of drug use. Standardization of Service prevalence rates by age, marital status, and education reduced the magnitude of Service differences, but Air Force rates remained significantly different from Army and Navy rates (Bray et al., 1986).

Comparable statistics from the Soldier Survey series of the Department of the Army (1986) indicate that marijuana use declined substantially among first-term and career soldiers between 1974 and 1985, except for a slight peak in 1981. The use of drugs other than marijuana has shown a long-term decrease since 1974 but a slight increase after 1983, perhaps associated with a shift from marijuana to other drugs. A rapid decrease in rates

after 1981 may be attributed to increased urinalysis testing and the initiation of mandated actions against drug abusers. Data from the Marine Corps survey in 1983 indicate a decline in marijuana use during the past 30 days from 36 percent in 1980 to 17 percent in 1982 and to 15 percent in 1983; any drug use declined from 37 percent to 21 percent and then to 17 percent (Stoloff and Barnow, 1984).

3. Military and Civilian Comparisons

To validly compare the military and civilian populations, the differences in their sociodemographic compositions must be controlled in the analyses. Because military personnel are predominantly young and male, factors associated with higher rates of drug use, unstandardized military rates would be expected to be substantially higher than civilian rates. Standardization for sociodemographic differences should reduce the disparity between military and civilian populations.

Burt et al. (1980) used data from the 1980 Worldwide Survey to conduct standardized comparisons of drug use among military personnel and civilians. They found that the prevalence of drug use among military personnel was higher for some drugs but lower for others. Bray et al. (1983) compared 1982 data on drug use among male civilians and military personnel aged 18 to 25. As with earlier analyses by Burt and associates, civilians had higher prevalence rates for marijuana and cocaine, but military personnel had higher rates for drugs such as hallucinogens and stimulants. Because comparable civilian data were not available in 1985, Bray et al. (1986) conducted no standardized comparisons of military and civilian drug use in analyses of the 1985 Worldwide Survey. Civilian data from the 1985 National Survey on Drug Abuse are now available, and analyses are currently in progress (Bray et al., in progress).

Considered together, data from both civilian and military studies show that drug use is primarily a younger age phenomenon and is more common among men than women. As findings from the 1985 National Survey on Drug Abuse demonstrate, the differences between age and sex groups are substantial. Across all age groups in 1985, 15.0 percent of males and 9.3 percent of females reported any illicit drug use within the past month. Prevalence of any drug use ranged from 15.1 percent among those aged 12 to 17 to 25.5

percent among those aged 18 to 25, to 20.7 percent among those aged 26 to 34, and to 3.9 percent among those aged 35 and older. Other differences, such as among race and ethnic groups or across regions of the country are less dramatic (NIDA, 1987).

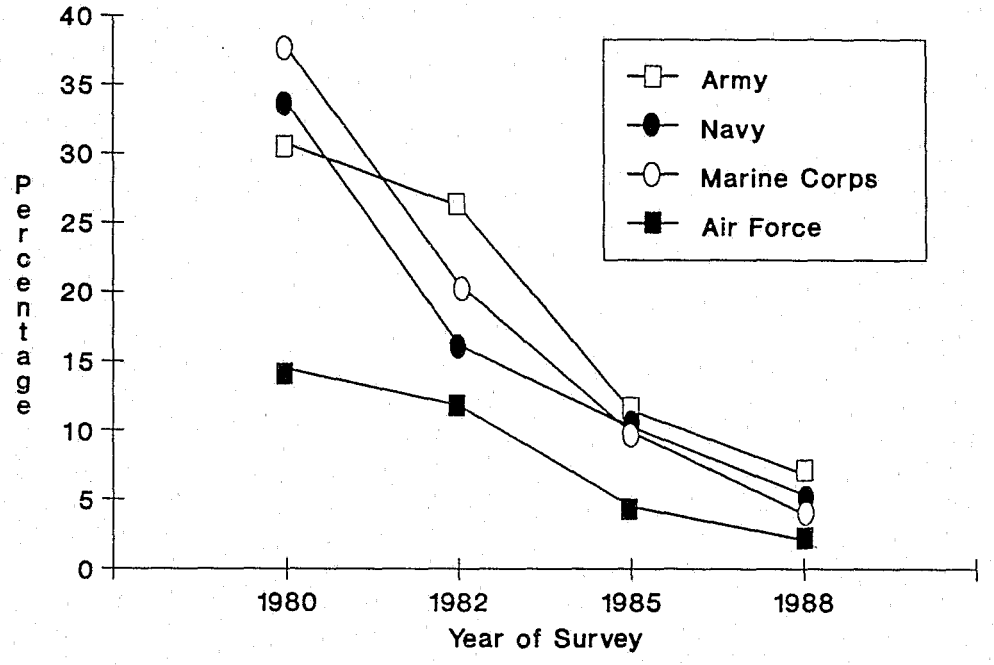
B. Trends in Drug Use

Drug use reported by military personnel has steadily declined since 1980 when the Worldwide Survey series began. From a high of 27.6 percent of all military personnel reporting drug use during the past 30 days in 1980, prevalence declined to 19.0 percent in 1982, 8.9 percent in 1985, and 4.8 percent in 1988. Figure 3.1 in Chapter 3 shows these percentages. Each of the decreases was statistically significant over the prior measurement. The rate of decline was greater during the latter part of the period. Use decreased almost 30 percent from 1980 to 1982, 53.2 percent from 1982 to 1985, and 46.1 percent from 1985 to 1988, for a total decrease of 82.2 percent between 1980 and 1988. This time period was also marked by substantial decreases in drug use among civilians. Part of the observed decline may thus reflect broader societal trends. The rapidity of the decreases, however, indicates the effectiveness of military efforts to reduce drug use among military personnel.

These decreases in any drug use for total DoD personnel are also apparent for personnel in each of the Services, as shown in Figure 5.1. All four Services showed a large and significant decline in drug use during the 8-year period. There were significant decreases in drug use between each of the surveys for Navy personnel but not for personnel in the other Services. Each of the other Services had at least one period during the 8-years in which the decrease was not significant, although the estimates were always in the downward direction.

Comparisons of drug use prevalence for the total DoD and the individual Services for 1985 and 1988 are shown in the top panel of Table 5.1 (unstandardized rates). Because marijuana is the most commonly used drug, figures are presented separately for any drug use, marijuana use, and any drug use except marijuana. The last category includes a broad range of drugs, ranging from hallucinogens to cocaine and prescription psychotherapeutic drugs. For total DoD personnel, the use of any drugs, marijuana,

Figure 5.1. Trends in Any Drug Use Past 30 Days, by Service, 1980-88



and any drugs except marijuana decreased significantly from 1985 to 1988, both for use within the past 30 days and within the past year. In 1988, 4.8 percent of total DoD personnel had used any drug within the past 30 days, 2.7 percent had used marijuana, and 3.1 percent had used drugs other than marijuana. Comparable figures for use within the year are 8.9 percent for use of any drug, 6.1 percent for marijuana, and 5.9 percent for any drug except marijuana. Thus, by 1988 drug use was the lowest since the survey series began.

Similar decreases in drug use are seen for each of the Services between 1985 and 1988, but not all of the decreases are statistically significant (top panel of Table 5.1, unstandardized rates). Declines in any drug use, marijuana use, and any drug use except marijuana are significant for Army and Navy personnel, and each of the declines is significant for Air Force personnel except for drugs other than marijuana. The declines in any drug use, marijuana use, and any drug use except marijuana are substantial for Marine Corps personnel, but the declines are only marginally significant ($p < .06$). For most comparisons, for the total DoD and the individual Ser-

Table 5.1. Trends in Drug Use, Unstandardized and Standardized 1985 and 1988

Substance/Time Period	Service									
	Army		Navy		Marine Corps		Air Force		Total DoD	
	1985	1988	1985	1988	1985	1988	1985	1988	1985	1988
UNSTANDARDIZED										
Marijuana										
Past 30 Days	9.2 (1.1)	4.4 (0.5)*	7.0 (1.0)	3.5 (0.5)*	7.7 (3.2)	1.4 (0.5)	2.5 (0.8)	0.5 (0.2)*	6.5 (0.6)	2.7 (0.3)
Past 12 months	14.8 (1.3)	9.0 (1.0)*	12.5 (1.8)	7.9 (1.6)	11.7 (3.4)	4.7 (0.9)	5.4 (0.8)	1.7 (0.5)*	11.1 (0.8)	6.1 (0.6)
Any Drug Except Marijuana[a]										
Past 30 Days	6.4 (0.8)	3.9 (0.4)*	8.0 (1.4)	3.4 (0.4)*	6.6 (2.3)	3.6 (0.3)	3.1 (0.6)	1.9 (0.3)	5.8 (0.6)	3.1 (0.2)
Past 12 months	9.2 (1.1)	6.9 (0.7)	11.9 (2.7)	8.1 (1.8)	10.6 (4.0)	5.9 (1.1)	4.2 (0.7)	2.9 (0.4)	8.5 (0.9)	5.9 (0.7)
Any Drug[b]										
Past 30 Days	11.5 (1.3)	6.9 (0.7)*	10.3 (1.7)	5.4 (0.7)*	9.9 (3.2)	4.0 (0.7)	4.4 (0.8)	2.1 (0.4)*	8.9 (0.8)	4.8 (0.3)
Past 12 Months	16.6 (1.3)	11.8 (1.1)*	15.9 (2.7)	11.3 (2.1)	14.7 (3.8)	7.8 (1.0)	7.2 (0.9)	3.8 (0.6)*	13.4 (1.0)	8.9 (0.8)
STANDARDIZED[c]										
Marijuana										
Past 30 Days	9.2 (1.1)	5.1 (0.5)*	7.0 (1.0)	3.9 (0.5)*	7.7 (3.2)	1.6 (0.4)	2.5 (0.8)	0.6 (0.2)*	6.5 (0.6)	3.1 (0.2)
Past 12 Months	14.8 (1.3)	10.3 (0.9)*	12.5 (1.8)	8.9 (1.2)	11.7 (3.4)	5.2 (0.8)	5.4 (0.8)	1.9 (0.5)*	11.1 (0.8)	7.0 (0.5)
Any Drug Except Marijuana[a]										
Past 30 Days	6.4 (0.8)	4.1 (0.5)*	8.0 (1.4)	3.7 (0.4)*	6.6 (2.3)	4.6 (1.0)	3.1 (0.6)	2.0 (0.3)	5.8 (0.6)	3.4 (0.2)
Past 12 Months	9.2 (1.1)	7.2 (0.7)	11.9 (2.7)	9.1 (1.5)	10.6 (4.0)	7.5 (1.2)	4.2 (0.7)	3.2 (0.5)	8.5 (0.9)	6.5 (0.5)
Any Drug[b]										
Past 30 Days	11.5 (1.3)	7.6 (0.7)*	10.3 (1.7)	6.0 (0.7)*	9.9 (3.2)	4.9 (1.1)	4.4 (0.8)	2.3 (0.4)*	8.9 (0.8)	5.4 (0.3)
Past 12 Months	16.6 (1.3)	13.2 (1.0)*	15.9 (2.7)	12.6 (1.7)	14.7 (3.8)	9.1 (1.4)	7.2 (0.9)	4.1 (0.7)*	13.4 (1.0)	10.0 (0.6)

Note: Entries are percentages with standard errors in parentheses.

[a]Any nonmedical use of PCP, LSD/hallucinogens, cocaine, amphetamines/stimulants, tranquilizers, barbiturates/sedatives, heroin/other opiates, analgesics, "designer" drugs or inhalants.

[b]Same definition as "a" except marijuana is included in the set of drugs.

[c]Estimates are standardized on age, education, and marital status to the 1985 distribution.

*Comparisons between 1985 and 1988 are statistically significant at the 95 percent confidence level.

vices, drug use rates declined by 40 percent or more over the 3-year period between 1985 and 1988.

One possible explanation for the observed decrease in drug use between 1985 and 1988 is changes in the sociodemographic composition of the military. For instance, if military personnel in 1988 were on average older or better educated than in 1985, drug use would be expected to be somewhat lower because these characteristics are associated with lower drug use. Thus, any observed decrease in the prevalence of drug use might be due, in part, to changes in the sociodemographic composition of the military population as well as changes in military policy or the behavior of military personnel. Data on estimates of the eligible population for the survey in 1988 (see Table 2.3) suggest that the military population is slightly older, more likely to be married, and better educated than in 1985 (see Table 4.4 in Bray et al., 1986).

To investigate the validity of changes in sociodemographic differences as an explanation for the observed decreases in drug use in 1988, standardized comparisons were conducted. Using a regression-based standardization procedure developed by Williams and LaVange (1983), 1988 prevalence rates for each Service and the total DoD were standardized to the appropriate 1985 age/education/marital status distribution. The results of these standardizations are presented in the bottom panel of Table 5.1, standardized rates. As shown, standardized rates in most cases are higher than unstandardized rates. However, standardization did not alter the significance of the observed differences between the 1985 and 1988 unstandardized rates.

Standardizations across the four Worldwide Surveys were also conducted to examine the validity of this explanation for changes in drug use since 1980. In these analyses, reported in Table 3.2, estimates of the prevalence of any drug use in 1982, 1985, and 1988 for the total DoD were standardized to the 1980 age/education/marital status distribution. Significant differences between each of the survey years observed for unstandardized rates remained for comparisons of the standardized rates. Thus, change in the sociodemographic composition of the military population is not a viable

reason for the observed decreases in drug use between 1985 and 1988 or, indeed, across the four Worldwide Surveys conducted between 1980 and 1988.

C. Service Comparisons

Drug use has steadily declined among personnel in all the Services, but use among Air Force personnel has been consistently the lowest of all the Services (see Figure 5.1). One reason for differences in drug use among the Services may be associated with the sociodemographic composition of Service personnel. Air Force personnel, for example, tend to be older, better educated, and more often married, characteristics associated with lower drug use. Several prior analyses of this issue, discussed above in section A of this chapter, have compared unstandardized and standardized rates of drug use and concluded that part of the difference among the Services is, indeed, related to differences in sociodemographic composition among the Services.

Standardized and unstandardized comparisons were conducted with data from the 1988 Worldwide Survey to determine the extent to which Service differences marked real differences in use and the extent to which they marked sociodemographic differences. The results of these analyses are presented in Table 5.2.

As shown in Table 5.2, unstandardized rates of use of marijuana, any drug except marijuana, and any drug during the past 12 months show that drug use among Air Force personnel is significantly lower than each of the other Services. Standardization increases the Air Force estimates and decreases the Marine Corps estimates so that they are very similar. In like manner, standardization made the Army and Navy estimates more similar. Overall, standardized rates show the Air Force to be significantly lower than the Army and the Navy but no longer lower than the Marine Corps. This finding suggests that a major part of the unstandardized Air Force-Marine Corps difference was associated with sociodemographic differences between the two Services. The differences between the Air Force and the Army and Navy, however, are not attributable to variations in the sociodemographic attributes of personnel. Comparisons of the significance of difference of unstandardized and standardized rates for the Marine Corps with the other Services suggests that little of the observed difference between the Marine

Table 5.2. Estimates of Drug Use Past 12 Months, Unstandardized and Standardized by Sociodemographic Characteristics

Drug Use, Past 12 Months	Service			
	Army	Navy	Marine Corps	Air Force
Marijuana				
Unstandardized	9.0 (1.0)[d,e]	7.9 (1.6)[e]	4.7 (0.9)[e]	1.7 (0.5)
Standardized[a]	8.9 (0.9)[d,e]	7.3 (1.0)[d,e]	2.9 (1.1)	2.8 (0.6)
Any Drug Except Marijuana[b]				
Unstandardized	6.9 (0.7)[e]	8.1 (1.8)[e]	5.9 (1.1)[e]	2.9 (0.4)
Standardized[a]	6.9 (0.6)[d,e]	7.6 (1.3)[e]	4.5 (0.9)	3.8 (0.5)
Any Drug[c]				
Unstandardized	11.8 (1.1)[d,e]	11.3 (2.1)[e]	7.8 (1.0)[e]	3.8 (0.6)
Standardized[a]	11.8 (0.9)[d,e]	10.5 (1.3)[d,e]	5.7 (0.9)[e]	5.1 (0.7)

Note: Entries are percentages with standard errors in parentheses.

[a]Estimates have been standardized by age, education, and marital status to the total DoD distribution.

[b]Any nonmedical use of PCP, LSD/hallucinogens, cocaine, amphetamines/stimulants, tranquilizers, barbiturates/sedatives, heroin/other opiates, analgesics, "designer" drugs or inhalants.

[c]Same definition as "b" except marijuana is included in the set of drugs.

[d]Estimate is significantly different from the Marine Corps at the 95 percent confidence level.

[e]Estimate is significantly different from the Air Force at the 95 percent confidence level.

Corps and the Army and Navy is associated with differences in sociodemographic composition.

Overall, these findings suggest that differences among the Services in sociodemographic composition remain viable as a partial explanation for some observed differences in drug use, particularly between the Marine Corps and the Air Force. Clearly, this explanation does not account for all observed differences in drug use among the Services. The standardizations conducted here controlled for Service differences in age, education,

and marital status, but they may not have controlled for all important differentiating factors. An alternative explanation accounting for observed differences is that the Services may differ in policies and practices associated with controlling drug use.

D. Prevalence of Specific Drugs

As overall drug use declined, use of each of the specific drugs or types of drugs considered in this survey also declined. Table 5.3 presents the percentage of users of 11 specific drugs or drug classes during the 30 days or 12 months before the survey. A similar table for pay grades E1 to E5 is presented in Table D.11 (Appendix D) to permit ease of comparison with the 1980 and 1982 surveys. As shown in Table 5.3, marijuana remains the most commonly used drug, used by 2.7 percent of military personnel during the past month and 6.1 percent within the past year. Thirty-day use of each of the other drugs is less than 1 percent, except for analgesics, which is 1.1 percent; 12-month use is generally less than 2 percent, except for cocaine which was used by 2.5 percent of military personnel during the past year. "Designer drugs" were added to the questionnaire in 1988. These drugs are chemical variations of psychoactive drugs. Very few military personnel used designer drugs, 0.2 percent during the past 30 days and 0.6 percent during the past 12 months.

Comparing these figures with those from 1985 shows substantial decreases for all drugs between 1985 and 1988. Even the use of cocaine declined, from 2.4 percent during the past 30 days in 1985 to 0.9 percent in 1988; comparable figures for 12-month use were 4.2 percent in 1985 and 2.5 percent in 1988.

Much of the drug use among military personnel is concentrated among the lower pay grades. The percentages of users of any drug during the past 30 days and past 12 months for pay grade groupings are presented in Table 5.4; comparable tables for marijuana use and for cocaine use are presented in Tables D.12 and D.13 (Appendix D). As shown in Table 5.4 and illustrated in Figure 5.2, the use of any drug during the past 30 days and 12 months occurs primarily among the lower enlisted pay grades. For the past 30 days, 8.9 percent of E1s to E3s and 5.1 percent of E4s to E6s report drug use compared to about 1 percent of personnel in other pay grades. The pattern of findings is similar for 12-month use.

Table 5.3. Nonmedical Drug Use During the Past 30 Days and the Past 12 Months

Drug/Period of Use	Service								Total DoD	
	Army		Navy		Marine Corps		Air Force			
Marijuana										
Past 30 Days	4.4	(0.5)	3.5	(0.5)	1.4	(0.5)	0.5	(0.2)	2.7	(0.3)
Past 12 Months	8.9	(1.0)	7.9	(1.6)	4.7	(0.9)	1.7	(0.5)	6.1	(0.6)
Cocaine										
Past 30 Days	1.5	(0.3)	0.9	(0.2)	1.1	(0.5)	0.2	(0.1)	0.9	(0.1)
Past 12 Months	3.0	(0.4)	4.2	(1.4)	2.0	(0.8)	0.5	(0.2)	2.5	(0.5)
PCP										
Past 30 Days	0.2	(0.1)	0.1	(**)	0.1	(0.1)	0.1	(0.1)	0.1	(**)
Past 12 Months	0.3	(0.1)	0.1	(0.1)	0.1	(0.1)	0.1	(0.1)	0.1	(**)
LSD/Hallucinogens										
Past 30 Days	0.6	(0.1)	0.5	(0.3)	0.3	(0.1)	**	(**)	0.4	(0.1)
Past 12 Months	1.7	(0.5)	2.3	(0.9)	0.7	(0.2)	0.1	(**)	1.3	(0.3)
Amphetamines/Stimulants										
Past 30 Days	1.0	(0.2)	1.0	(0.2)	1.3	(0.3)	0.2	(0.1)	0.8	(0.1)
Past 12 Months	1.6	(0.3)	2.5	(1.0)	2.2	(0.5)	0.6	(0.2)	1.6	(0.3)
Tranquilizers										
Past 30 Days	0.6	(0.1)	0.3	(0.2)	0.3	(0.2)	0.3	(0.1)	0.4	(0.1)
Past 12 Months	0.8	(0.1)	0.9	(0.2)	0.5	(0.2)	0.5	(0.1)	0.7	(0.1)
Barbiturates/Sedatives										
Past 30 Days	0.4	(0.1)	0.5	(0.2)	0.1	(0.1)	0.1	(0.1)	0.3	(0.1)
Past 12 Months	0.8	(0.3)	0.7	(0.3)	0.4	(0.2)	0.1	(0.1)	0.6	(0.1)
Heroin/Other Opiates										
Past 30 Days	0.3	(0.1)	0.1	(**)	0.1	(0.1)	**	(**)	0.1	(**)
Past 12 Months	0.3	(0.1)	0.4	(0.2)	0.1	(0.1)	**	(**)	0.2	(0.1)
Analgesics										
Past 30 Days	1.1	(0.2)	1.3	(0.4)	0.9	(0.3)	1.1	(0.2)	1.1	(0.1)
Past 12 Months	1.9	(0.3)	1.9	(0.4)	1.8	(0.2)	1.6	(0.2)	1.8	(0.2)
Inhalants										
Past 30 Days	0.8	(0.2)	0.9	(0.2)	0.6	(0.2)	0.3	(0.1)	0.7	(0.1)
Past 12 Months	1.3	(0.3)	1.2	(0.2)	0.7	(0.2)	0.5	(0.1)	1.0	(0.1)
"Designer" Drugs										
Past 30 Days	0.2	(0.1)	0.4	(0.2)	0.4	(0.3)	0.1	(**)	0.2	(0.1)
Past 12 Months	0.5	(0.1)	1.1	(0.8)	0.5	(0.4)	0.2	(0.1)	0.6	(0.3)
Any Drug[a]										
Past 30 Days	6.9	(0.7)	5.4	(0.7)	4.0	(0.7)	2.1	(0.4)	4.8	(0.3)
Past 12 Months	11.8	(1.1)	11.3	(2.1)	7.8	(1.0)	3.8	(0.6)	8.9	(0.8)
Any Drug Except Marijuana[b]										
Past 30 Days	3.9	(0.4)	3.4	(0.4)	3.6	(0.3)	1.9	(0.3)	3.1	(0.2)
Past 12 Months	6.9	(0.7)	8.1	(1.8)	5.9	(1.1)	2.9	(0.4)	5.9	(0.7)

Note: Tabled values are percentages and represent prevalence estimates with standard errors in parentheses.

[a]Nonmedical use one or more times of any drug or class of drugs listed in the table.

[b]Nonmedical use one or more times of any drug or class of drugs listed in the table excluding marijuana.

**Estimate rounds to zero.

Table 5.4 Any Drug Use by Pay Grade During Past 30 Days and Past 12 Months

Pay Grade/Period of Use	Service				
	Army	Navy	Marine Corps	Air Force	Total DoD
E1-E3					
Past 30 Days	16.0 (2.7)	9.7 (0.8)	6.5 (0.8)	3.2(0.9)	8.9 (0.9)
Past 12 Months	28.4 (2.9)	24.0 (3.6)	10.5 (1.4)	6.2(1.4)	17.6 (1.8)
E4-E6					
Past 30 Days	7.1 (0.7)	5.7 (1.0)	3.4 (1.1)	2.4(0.6)	5.1 (0.4)
Past 12 Months	11.8 (1.2)	10.9 (1.6)	8.9 (1.4)	4.2(1.0)	9.1 (0.7)
E7-E9					
Past 30 Days	1.3 (0.4)	1.2 (0.2)	0.6 (0.4)	0.8(0.2)	1.1 (0.2)
Past 12 Months	2.2 (0.5)	1.6 (0.3)	0.9 (0.6)	1.6(0.3)	1.8 (0.2)
W1-W4					
Past 30 Days	1.3 (0.6)	0.3 (0.2)	2.5 (2.3)	* (*)	1.2 (0.5)
Past 12 Months	1.5 (0.6)	0.8 (0.5)	2.5 (2.3)	* (*)	1.5 (0.5)
01-03					
Past 30 Days	2.4 (0.8)	0.8 (0.6)	** (**)	0.7(0.3)	1.2 (0.3)
Past 12 Months	4.2 (0.8)	1.6 (1.3)	0.4 (0.4)	0.7(0.3)	2.0 (0.4)
04-010					
Past 30 Days	0.9 (0.4)	1.3 (0.7)	0.7 (0.6)	1.2(0.5)	1.1 (0.3)
Past 12 Months	1.2 (0.4)	1.3 (0.7)	0.7 (0.6)	1.4(0.5)	1.2 (0.3)
Total					
Past 30 Days	6.9 (0.7)	5.4 (0.7)	4.0 (0.7)	2.1(0.4)	4.8 (0.3)
Past 12 Months	11.8 (1.1)	11.3 (2.1)	7.8 (1.0)	3.8(0.6)	8.9 (0.8)

Note: Tabled values are percentages and represent prevalence estimates with standard errors in parentheses. Any drug use refers to nonmedical use one or more times of marijuana, PCP, LSD/hallucinogens, cocaine, amphetamines/stimulants, tranquilizers, barbiturates/sedatives, heroin/other opiates, analgesics, "designer" drugs or inhalants.

*There are no warrant officers in the Air Force.

**Estimate rounds to zero.

For marijuana use (Table D.12), 30-day use levels were 2.7 for all personnel, 5.6 percent for E1s to E3s, and 2.8 percent for E4s to E6s; less than 1 percent of personnel in the higher pay grades used marijuana during the past 30 days. For cocaine use (Table D.13), 30-day use levels were 0.9 percent for all pay grades, 2.0 percent for E1s to E3s, 0.9 percent for E4s to E6s, and 0.1 percent or less for military personnel in the higher pay grades.

All Services show the same pattern of findings noted for total DoD, with E1s to E3s having the highest prevalence rates followed by E4s to E6s (Table 5.4). Service comparisons of drug use rates for E1s to E3s are shown in Figure 5.3. Results show that use is highest among Army personnel

Figure 5.2. Any Drug Use by Pay Grade, Total DoD

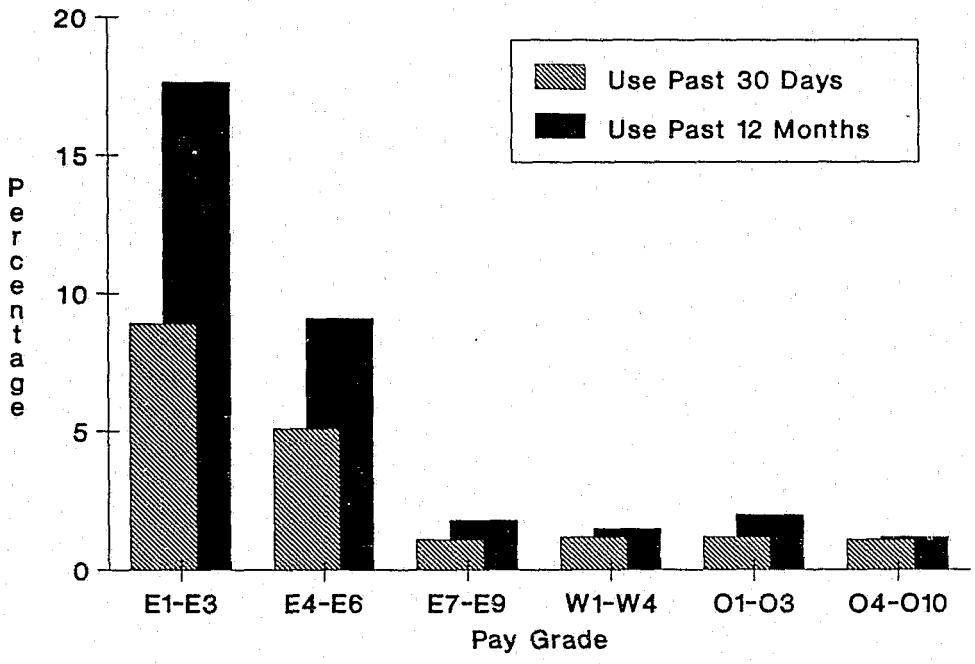
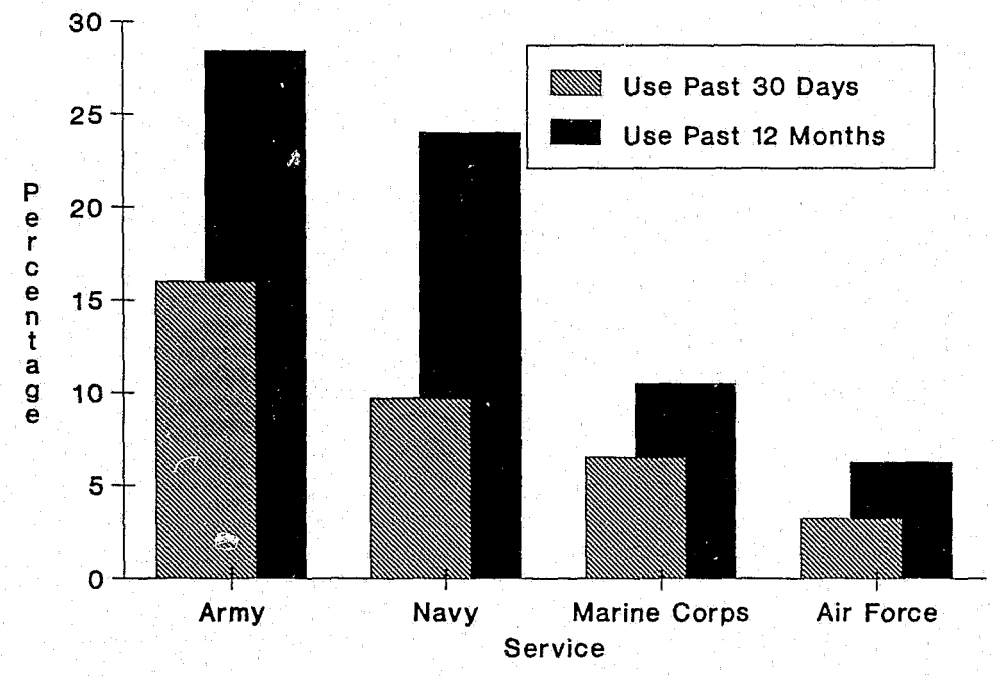


Figure 5.3. Any Drug Use for E1-E3s by Service



followed by Navy, Marine Corps, and Air Force. Sixteen percent of E1s to E3s in the Army reported using one or more drugs during the past 30 days, and 28.4 percent indicated use of drugs in the past year. Among E1s to E3s in the Navy, 9.7 percent reported 30-day use, and 24.0 percent indicated 12-month use. E1s to E3s in the Marines show 6.5 percent 30-day use and 10.5 percent 12-month use, and the comparable group in the Air Force shows 3.2 percent 30-day use and 6.2 percent 12-month use.

These results agree with findings of prior Worldwide Surveys that drug use prevalence is highest among junior enlisted personnel. The findings suggest that prevention, intervention, and treatment efforts should be closely targeted to personnel in the lower pay grades.

E. Frequency of Drug Use

Most drug use is infrequent. The frequency of any drug use among enlisted personnel during the past 30 days is presented in Table 5.5.

Table 5.5. Frequency of Any Drug Use for Enlisted Personnel During the Past 30 Days

	Service				
Pay Grade/Days Used	Army	Navy	Marine Corps	Air Force	Total DoD
E1-E3					
None	84.0 (2.7)	90.3 (0.8)	93.5 (0.8)	96.8 (0.9)	91.1 (0.9)
1-3	9.3 (1.5)	5.5 (0.9)	4.6 (0.4)	1.9 (0.7)	5.3 (0.6)
4-10	1.7 (0.8)	1.5 (0.5)	1.2 (0.6)	1.0 (0.5)	1.4 (0.3)
11-30	5.0 (1.8)	2.7 (1.0)	0.7 (0.5)	0.2 (0.2)	2.2 (0.6)
E4-E6					
None	92.9 (0.7)	94.3 (1:0)	98.6 (1.1)	97.6 (0.6)	94.9 (0.4)
1-3	5.0 (0.5)	4.1 (1.1)	2.3 (0.7)	1.8 (0.5)	3.6 (0.4)
4-10	1.2 (0.2)	0.9 (0.3)	0.3 (0.3)	0.5 (0.2)	0.8 (0.1)
11-30	0.9 (0.3)	0.8 (0.3)	0.7 (0.5)	0.2 (0.1)	0.7 (0.1)
E7-E9					
None	98.7 (0.4)	98.8 (0.2)	99.4 (0.4)	99.2 (0.2)	98.9 (0.2)
1-3	1.1 (0.3)	0.8 (0.3)	0.1 (0.1)	0.5 (0.1)	0.8 (0.1)
4-10	0.1 (0.1)	0.4 (0.1)	0.5 (0.4)	0.1 (0.1)	0.2 (0.1)
11-30	0.2 (0.1)	0.1 (0.1)	0.0 (**)	0.3 (0.1)	0.2 (**)
Total					
None	91.9 (0.7)	93.8 (0.8)	95.5 (0.8)	97.6 (0.5)	94.4 (0.4)
1-3	5.3 (0.5)	4.1 (0.8)	3.1 (0.4)	1.7 (0.4)	3.7 (0.3)
4-10	1.1 (0.2)	1.0 (0.3)	0.8 (0.2)	0.6 (0.2)	0.9 (0.1)
11-30	1.6 (0.4)	1.1 (0.4)	0.6 (0.4)	0.2 (0.1)	1.0 (0.2)

Note: Tables values are column percentages and represent prevalence estimates with standard errors in parentheses.

**Estimate rounds to zero.

Figures are presented only for enlisted personnel because drug use is minimal among officers. For all enlisted personnel, 94.4 percent used no within the past 30 days, about 3.7 percent used drugs 1 to 3 times during the month, 0.9 percent used drugs 4 to 10 times, and 1.0 percent used drugs over 10 times. Thus, use 1 to 3 times during the month, rather than more frequent use, is the most common pattern. This tendency is apparent across all Services and enlisted pay grades. E1s to E3s are more likely to be users and frequent users. In the Army 5.0 percent of E1s to E3s report having used drugs over 10 times during the past month, and in the Navy 2.7 percent report having done so.

Thus, not only has drug use declined dramatically, but drugs tend to be used only on occasion, not daily or even weekly by most users. Although frequent use of drugs among drug users is not the norm, frequent use is slightly more common among the lower pay grades and differs somewhat by Service.

F. Correlates of Drug Use

Drug use is most common among young persons and is more common among men than women, according to the results of a variety of epidemiological studies. Among military personnel, drug use is also more common among younger persons but is not substantially different among men and women. Use is high, however, among certain other groups.

1. Descriptive Findings. The percentages of military personnel in selected sociodemographic groups who report having used any drug during the past year are reported in Table D.14 (Appendix D). Detailed tables of any drug use by pay grade and region also appear in Appendix D, Tables D.15 to D.18. Age is perhaps the strongest correlate of drug use, but substantial differences are found among personnel who differ on educational status, family status, pay grade, and time on active duty. Differences among men and women, race and ethnic groups, and personnel stationed in different regions of the world are not large.

Drug use among some groups varies by a factor of two or three or more. About 13 percent of those with a high school education or less used drugs in the past year, compared with 7.5 percent of those with some college and

3.0 percent with a college degree. Use was substantially lower among older personnel than among younger personnel; 16 percent of those under age 21 had used drugs in the past year compared with less than 4 percent of those over age 30. Over 12 percent of unmarried personnel and married personnel with spouse not present used drugs in the past year compared with about 4 percent of married personnel with spouse present at the duty station. About 18 percent of personnel in pay grades E1 to E3 and 9 percent of personnel in pay grades E4 to E6 used drugs in the past year compared with 2 percent or fewer of other pay grade groupings. About 15 percent of those on active duty one year or less used drugs in the past year compared with almost 13 percent of those on duty 3 to 4 years and about 3 percent of those on duty 10 years or more. Findings for the individual services were similar to these for the total DoD. Note that several of these characteristics--time on active duty, pay grade and even marital status--are strongly related to age. Thus, drug use appears to be strongly related to youth and being unaccompanied.

2. Multivariate Findings. The comparisons of sociodemographic correlates of drug use are useful for understanding the overall effect of any particular variable but limited in that they do not permit an assessment of the independent effects of the complete set of variables. To consider the significant predictors of drug use, we estimated a model of any drug use during the past 12 months.

Independent variables in the model were Service, race/ethnicity, sex, education, family status, region, pay grade, age, stress at work, health practices, beliefs about the harmful effects of drugs, beliefs about drug testing effectiveness, drug treatment climate, and attitudes toward marijuana use. Definitions of the first nine variables are given in chapter 4 in connection with the multivariate analyses conducted for alcohol use.

Briefly the remaining measures were as follows:

- health practices was a modified health practices index that included five health practices of moderate alcohol use or less, never smoked, regular exercise, proper eating and proper sleeping habits (omits drug use item);
- beliefs about harmful effects of drugs index measures perceived effects of drugs on health, work, and attitudes and

norms about not using drugs with high scores indicating low tolerance for drug use;

- beliefs about drug testing effectiveness index assesses perceptions of effect of urinalysis testing program on deterring drug use with high scores reflecting beliefs that the testing program has a deterrent effect;
- drug treatment climate index assesses perceptions of barriers to seeking treatment for drug problems with high scores indicating the presence of barriers;
- attitudes toward marijuana use index examines feelings that marijuana use should be permitted in the military with high scores indicating negative attitudes.

The dependent variable for the analysis was coded 1 if the respondent was a user of any drugs during the past 12 months and a 0 otherwise. Thus, the estimated regression parameters reflect changes in the probability of drug use. The analysis was restricted to enlisted personnel because drug use was very low for officers (see Table 5.4).

Table 5.6 presents the parameter estimates of the regression model for predicting any drug use during the past 12 months. The R^2 for the model was .176, which was significant at the .001 level. This compares to an R^2 of .065 from an earlier exploratory regression that was based on sociodemographic variables only. The analysis showed significant effects for Service, race/ethnicity, family status, region, age, health practices, and beliefs about the harmful effects of drugs. Results show that the probability of using drugs during the past 12 months is significantly higher, after adjusting for all other variables in the analysis, for:

- Army and Navy personnel than for Air Force personnel;
- whites than for blacks;
- single personnel and married personel unaccompanied by their spouse than for married personnel who were accompanied by their spouse;
- those in the Americas than those in Europe;
- those who are younger;
- those who follow fewer health practices;
- those who do not believe that drug use is harmful.

Table 5.6. Predicting the Probability of Any Drug Use During the Past 12 Months for Enlisted Personnel

Independent Variables	Any Drug Use Regression Parameter
Service	
Army versus Air Force	.0675***
Navy versus Air Force	.0477***
Marines versus Air Force	.0080
Race	
Black versus White	-.0592***
Hispanic versus White	-.0287
Other versus White	-.0569
Sex	
Male versus Female	-.0019
Education	
High School or Less versus Beyond High School	-.0064
Family Status	
Single versus Married, spouse present	.0449***
Married, spouse not present versus married, spouse present	.0721***
Region	
Americas versus Europe	.0266*
North Pacific versus Europe	-.0228
Other Pacific versus Europe	.0078
Pay Grade	
E1-E3 versus E7-E9	.0324
E4-E6 versus E7-E9	.0006
Age	-.0029**
Stress at Work	-.0046
Health Practices	-.0142***
Beliefs About Harmful Effects of Drugs	-.0198***
Beliefs About Drug Testing Effectiveness	-.0011
Drug Treatment Climate	.0016
Attitudes Toward Marijuana Use	.0011

Note: Entries are regression parameters that indicate the effects of the tabled variables on the probability of any drug during the past year.

The strongest predictors in the analysis are beliefs about harmful effects of drugs, health practices, Service, race/ethnicity, and family status. The significant effect for beliefs about the harmful effects of drugs indicates that an increase of one point on the belief scale is associated with a .019 decrease in the probability of drug use. Although the unit change is relatively low, the effect is very strong for this variable because the 28-point scale is much larger than the scales of other variables in the analysis.

The effect for health practices shows that an increase of one point on the health practice index is associated with a .014 decrease in the probability of using drugs. Army personnel have a probability of being a drug user that is .067 points higher and Navy personnel have a probability .047 points higher than Air Force personnel. Blacks are .059 points less likely, and those of "other" race/ethnicity are .057 points less likely than whites to use drugs. Singles have a probability of drug use that is .043 points higher than married with spouse present, and marrieds whose spouse is not present have a probability .071 points higher of using drugs than married whose spouse is present.

Taken together the results show that both psychological and sociodemographic variables influence drug use behavior. Beliefs about the harmful effects of drugs, health practices, Service, race/ethnicity and family status all show strong effects on drug use. The strong influence of the belief variables suggests that continued emphasis should be placed on education efforts that inform military personnel about the harmful effects of nonmedical drug use and emphasize the importance of following good health practices.

G. Military Job and Drug Use

Pressures of the job is a reason that may be given for using drugs. The relationship between any drug use and reported stress at work is examined in Table 5.7 for enlisted personnel, officers, and total DoD personnel. Enlisted personnel who report being under stress at work are slightly more likely to also use drugs than those who do not report stress. Almost 12 percent of enlisted personnel who report a great deal of stress at work use drugs, compared to about 7 percent who report that they are under no

Table 5.7. Reported Stress Experienced at Work Past 30 Days and Drug Use

Position/Stress Level at Work	Drug Use Pattern Past 30 Days: Nonuser	Marijuana Only	Other Drug Use
Enlisted			
Great deal	88.3 (1.2)	3.3 (0.5)	8.4 (1.2)
Fairly large amount	89.0 (1.0)	2.8 (0.4)	8.2 (1.0)
Some	89.5 (1.2)	4.9 (0.6)	5.7 (0.9)
A little	91.2 (1.1)	3.4 (0.7)	5.4 (0.7)
None	92.8 (1.3)	2.4 (0.9)	4.8 (1.1)
Officer			
Great deal	98.3 (0.8)	** (**)	1.6 (0.8)
Fairly large amount	97.9 (0.5)	0.1 (0.1)	2.0 (0.6)
Some	98.5 (0.4)	0.1 (0.1)	1.4 (0.4)
A little	98.6 (0.7)	0.1 (0.1)	1.3 (0.7)
None	95.8 (2.8)	0.8 (0.8)	3.4 (2.7)
Total			
Great deal	90.1 (1.0)	2.7 (0.4)	7.2 (1.0)
Fairly large amount	90.9 (0.9)	2.2 (0.3)	6.9 (0.9)
Some	91.1 (1.1)	4.0 (0.5)	4.9 (0.7)
A little	92.1 (1.0)	3.0 (0.7)	4.9 (0.6)
None	93.0 (1.2)	2.3 (0.9)	4.7 (1.1)

Note: Entries are row percentages with standard errors in parentheses.

**Estimate rounds to zero.

stress; thus the relationship exists but is not strong. There is no such tendency for officers. Those reporting a great deal of stress were only slightly more likely than those reporting no stress to use marijuana. The level of association between reported stress and drug use is greater for the use of drugs other than marijuana. These drugs might include tranquilizers and sedatives used without prescription.

H. Summary

Drug use has declined steadily during the 1980s for both military personnel and civilians, according to the results of a series of surveys.

Among civilians, the use of most drugs began a downward trend after a peak in 1979. The Worldwide Survey series, which began in 1980, also finds a downward trend in drug use during the same time period. Drug use among military personnel in 1988 is the lowest since the survey series began. The decline in drug use among military personnel reflects a broader societal trend of reduction in drug use as well as the effectiveness of military policies and programs directed toward reducing or eliminating drug use.

1. Trends in Drug Use

Drug use among military personnel declined dramatically between 1980 and 1988, showing a significant decrease in the prevalence of drug use of over 80 percent in 8 years.

- Use of any drugs decreased from 27.6 percent in the past 30 days in 1980 to 19.0 percent in 1982 to 8.9 percent in 1985 to 4.8 percent in 1985; similar decreases were seen for use of marijuana and drugs other than marijuana.

- The Services showed the same pattern of decreases from 1980 to 1988 observed for total DoD. However, not all the decreases in any drug use, marijuana use, or drug use other than marijuana were statistically significant between 1985 and 1988. ..

- Change in the sociodemographic composition of the military population between 1980 and 1988 was not an important reason for the observed decreases in drug use over the time period.

2. Service Comparisons

Although drug use has declined steadily among personnel in all four Services between 1980 and 1988, use among Air Force personnel has consistently remained the lowest of all the Services. Prior analyses of Service differences in drug use have suggested that part of the observed differences are associated with differences in sociodemographic composition among the Services.

- Service differences in sociodemographic composition remain a partial explanation for differences in drug use, especially between the Marine Corps and Air Force.

3. Prevalence of Drug Use

Marijuana remains the drug used most commonly by military personnel, and use of other drugs is minimal.

- In 1988, 2.7 percent of military personnel reported use of marijuana within the past month and 30 day use of other drugs was about 1 percent or less.

- The use of all specific drugs declined between 1985 and 1988.

4. Frequency of Drug Use

Most drug use among enlisted personnel during the past 30 days is infrequent.

- Use of drugs 1 to 3 times during the past 30 days is the most common use pattern for enlisted personnel. Frequent use 11 or more times is more common among E1-E3s than the other pay grade groups.

5. Correlates of Drug Use

Drug use is most common among young persons and personnel in the lower enlisted pay grades, but the differences between men and women are small.

- Drug use for enlisted personnel is strongly predicted by beliefs about the harmful effects of drugs, health practices, Service, race/ethnicity and family status. The probability of being a drug user is significantly more likely among enlisted personnel who do not believe drug use is harmful, who engage in poor health practices, who are in the Army or the Navy, who are white, and who are single or married but unaccompanied by their spouse.

6. Military Job and Drug Use

For military personnel, drug use is only weakly related to reported stress at work during the past 30 days.

- There is a tendency for enlisted personnel to report using drugs when they feel they are stressed at work compared to when they are not, but there is no such tendency for officers.

Taken together, these findings demonstrate the continuing effectiveness of military efforts to eliminate drug use among military personnel. As in the earlier part of this decade, drug use decreased between 1985 and 1988, and the declines were statistically significant.

6. TOBACCO USE

Use of cigarettes among military personnel has shown a strong decline since 1980, when the first Worldwide Survey was conducted. Even so, tobacco use remains common among military personnel. A brief overview of the trend in cigarette use in the military was presented in Chapter 3. In this chapter, we provide a more extensive examination of tobacco use among military personnel, including use of cigarettes, cigars, pipes, and smokeless tobacco. Following a review of prior relevant studies, we look at information regarding prevalence and trends in tobacco use among the Services, correlates of smoking, the relationship of reported job stress and smoking, and attempts to stop smoking.

A. Prior Studies

The prevalence and correlates of tobacco use among civilians and military personnel have been examined in a series of surveys. These surveys document a decline in the prevalence of smoking since the release of the first report of the Surgeon General's Advisory Committee in 1964. However, the use of smokeless tobacco products has increased substantially in recent years.

1. Civilian Population

In 1964, when the Surgeon General's report was released, almost 45 percent of adults smoked cigarettes on a regular basis; in 1985, the figure was about 30 percent. Smoking rates for men decreased more rapidly than for women during this time period. A sex differential that was apparent in the 1960s decreased over the next two decades. In 1965, over 50 percent of men and about one-third of women smoked regularly; in 1985, these percentages had declined to 33 percent and 28 percent. In 1985, 45 percent of the adult population had never smoked, 25 percent were former smokers, and 32 percent were current smokers. Smoking rates were higher among those aged 18 to 34 than among younger or older persons. These figures were drawn from the Health Promotion and Disease Prevention Supplement to the National Health Interview Survey (Morbidity and Mortality Weekly Report, 1986; NCHS, 1985 1988) and were corroborated by findings from the 1985 National Household Survey on Drug Abuse (NIDA, 1987, 1988).

Cigarette smoking among high school seniors declined during the past decade. In 1975, 36.7 percent of high school seniors indicated that they had smoked during the past year, compared with 29.4 percent in 1987. Prevalence has been relatively stable during the 1980s at 29 to 30 percent (NIDA, 1988).

Civilian consumption of smokeless tobacco products (snuff and chewing tobacco) increased rapidly in the early 1970s (Connolly et al., 1986). By 1985, the National Household Survey on Drug Abuse indicated that 12.2 percent of men and less than 1 percent of women had used smokeless tobacco in the preceding year. The rate for those under age 26 was 11.1 (NIDA, 1988).

2. Military Population

Cigarette smoking declined among DoD personnel from 1980 to 1985, but no trend data are available for smokeless tobacco during this period. The percentages of military personnel reporting current cigarette smoking declined from 51.0 percent in 1980 and 51.4 percent in 1982 to 46.2 percent in 1985 (Bray et al., 1986; Herbold, 1987). Between 1982 and 1985, the percentage of nonsmokers increased significantly, and the percentage of light smokers (less than a pack a day) and the percentage of those smoking 2 or more packs a day decreased significantly.

Among the Services in 1985, the percentage of smokers was highest for Army personnel (52.0 percent), followed by Navy personnel (47.9 percent), Marine Corps personnel (42.6 percent), and Air Force personnel (39.0 percent). Unstandardized comparisons of the percentage of smokers between Army/Air Force and Navy/Air Force were statistically significant. These differences remained statistically significant after controlling for differences in the sociodemographic composition of the Services (Bray et al., 1986). In 1985, 25.7 percent of DoD personnel reported smoking a cigar or pipe during the past 12 months, and 20.9 percent reported using smokeless tobacco.

3. Military and Civilian Comparisons

Several comparisons of military and civilian rates of use of tobacco have been made. Because military and civilian populations differ

in sociodemographic composition, valid comparison requires controlling for sociodemographic differences. Because military personnel are predominantly young, unmarried, and male, unstandardized military rates would be expected to be substantially higher than civilian rates.

Analyses by the Department of Defense (1986) indicate that smoking rates are high among military personnel and higher than among civilians. Analyses of smoking behavior among Navy personnel by Cronan and Conway (1987) show that part of the military/civilian difference is associated with the military environment. Many individuals begin to smoke after entering the Service; the Services do not simply attract smokers. However, more definitive analyses of this issue need to be conducted.

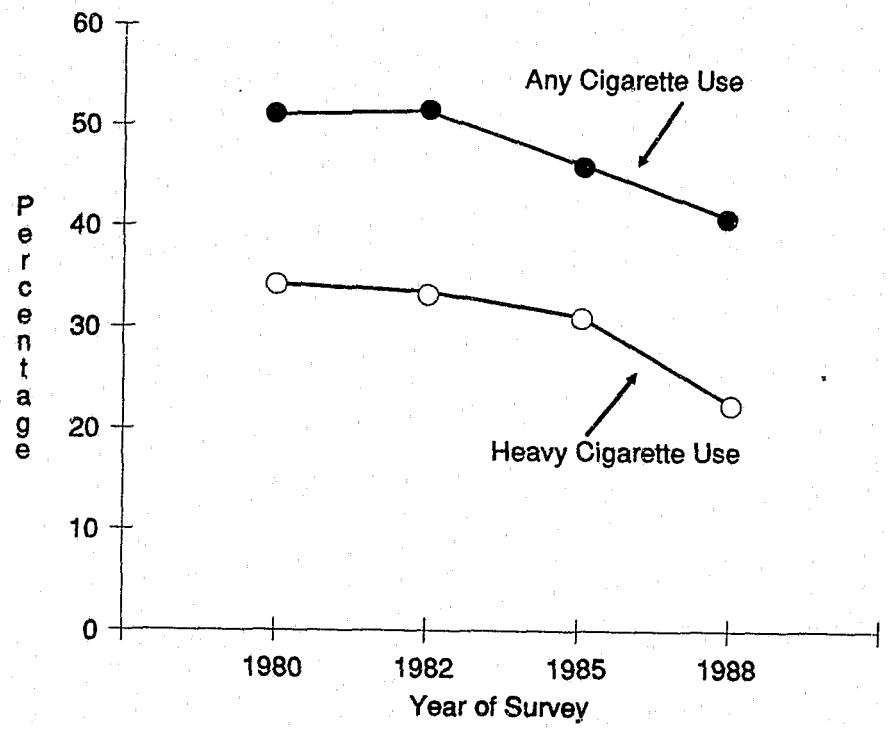
B. Trends in Cigarette Use

Chapter 3 provided an introductory overview of the trend in cigarette use in the military between 1980 and 1988. In this section we also consider the trend in heavy smoking for the DoD and for each Service. We then focus on the most recent changes in smoking levels by comparing 1985 and 1988 data.

Figure 6.1 (see also Table 6.1) shows trends for DoD in any cigarette use and in heavy cigarette use (1 or more packs of cigarettes per day) during the past 30 days across the four Worldwide Surveys. The trends for both indicators between 1980 and 1988 are similar. During the 8-year period, any cigarette use declined significantly from 51.0 percent to 40.9 percent. Any cigarette use remained relatively constant from 1980 to 1982 and then showed significant declines from 1982 to 1985 and from 1985 to 1988. Heavy smoking also declined significantly, from 34.2 percent in 1980 to 22.7 percent in 1988. Like any cigarette use, heavy smoking did not change significantly between 1980 and 1982 but declined significantly between 1982 and 1985 and again between 1985 and 1988. The latter decline was the sharpest, 8.5 percentage points. It is likely that these trends reflect, in part, societal trends in smoking described above as well as the increased emphasis on smoking cessation and prevention within the military.

Figure 6.2 presents Service level trends from 1980 to 1988 for the prevalence of cigarette smoking during the 30 days before the survey (see also Table 6.1). The most important finding is that the percentage of

Figure 6.1. Trends in Cigarette Use, Past 30 Days, Total DoD, 1980-88



smokers in each of the Services decreased significantly over the 8-year time period. Cigarette smoking decreased significantly among Marine Corps personnel between 1980 and 1982, among Navy personnel between 1982 and 1985, and among Army personnel between 1985 and 1988. Although no significant decreases were observed for Air Force personnel between any of the surveys, cigarette use decreased significantly over the 8-year period and was consistently the lowest among all the Services.

Figure 6.3 presents Service-specific comparisons of the trends in heavy smoking (see also Table 6.1). The DoD-wide pattern for heavy smoking decline shown in Figure 6.1 also occurs within each of the four Services. The Army and the Navy show very similar patterns across the four surveys with respective declines in heavy smokers between 1980 and 1988 of 12.4 and 12.7 percentage points. The Marine Corps shows the greatest change over the 8-year period with a 15.8 percentage point decline. In 1980, heavy smoking rates for Marines were approximately as high as those for the Army and Navy, but by 1988 they were the lowest of all Services. The Air Force

Table 6.1. Trends in Cigarette Smoking, Past 30 Days, 1980-88

Service/Level of Use	Year of Survey							
	1980		1982		1985		1988	
Army								
Any Smoking	54.3	(0.7)[b]	54.7	(1.8)	52.0	(1.8)[d]	43.1	(1.1)
Heavy Smoking	35.2	(0.7)[b]	34.6	(1.4)	33.6	(1.4)[d]	22.8	(0.7)
Navy								
Any Smoking	53.8	(1.2)[b]	55.4	(1.0)[c]	47.9	(1.2)	43.8	(1.8)
Heavy Smoking	37.3	(1.3)[b]	35.7	(1.4)	34.8	(1.6)[d]	24.6	(2.0)
Marine Corps								
Any Smoking	53.4	(0.6)[a,b]	48.7	(0.4)	42.6	(3.1)	41.3	(1.8)
Heavy Smoking	34.5	(0.9)[a,b]	31.6	(0.7)[c]	26.1	(0.8)[d]	18.7	(2.2)
Air Force								
Any Smoking	43.2	(1.8)[b]	44.1	(1.6)	39.0	(2.3)	35.8	(1.2)
Heavy Smoking	29.7	(1.3)[b]	30.6	(1.2)	26.8	(1.7)[d]	22.0	(0.8)
Total DoD								
Any Smoking	51.0	(0.8)[b]	51.4	(0.8)[c]	46.2	(1.0)[d]	40.9	(0.8)
Heavy Smoking	34.2	(0.6)[b]	33.5	(0.7)[c]	31.2	(0.8)[d]	22.7	(0.7)

Note: Entries are percentages with standard errors in parentheses. Heavy smoking is defined as smoking one or more packs of cigarettes per day.

[a]Estimates between 1980 and 1982 are statistically significant at the 95 percent confidence level.

[b]Estimates between 1980 and 1988 are statistically significant at the 95 percent confidence level.

[c]Estimates between 1982 and 1985 are statistically significant at the 95 percent confidence level.

[d]Estimates between 1985 and 1988 are statistically significant at the 95 percent confidence level.

had the lowest percentage of heavy smokers in 1980, but beginning in 1982 the Marines and Air Force had similar rates.

Table 6.2 compares 1985 and 1988 smoking levels for the total DoD and for each Service ranging from nonsmokers to those who smoke 2 or more packs per day. The data reveal two key patterns between 1985 and 1988: a significant increase in nonsmokers and light smokers (less than 1 pack per

Figure 6.2. Trends in Any Cigarette Use Past 30 Days by Service, 1980-88

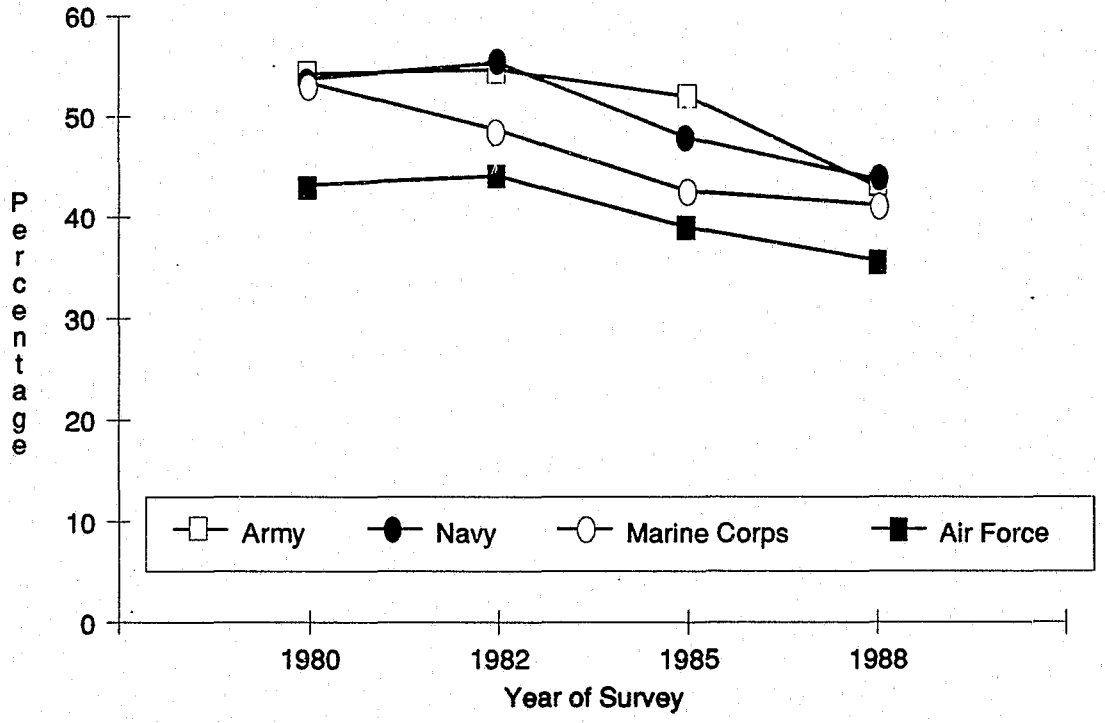


Figure 6.3. Trends in Heavy Cigarette Use Past 30 Days by Service, 1980-88

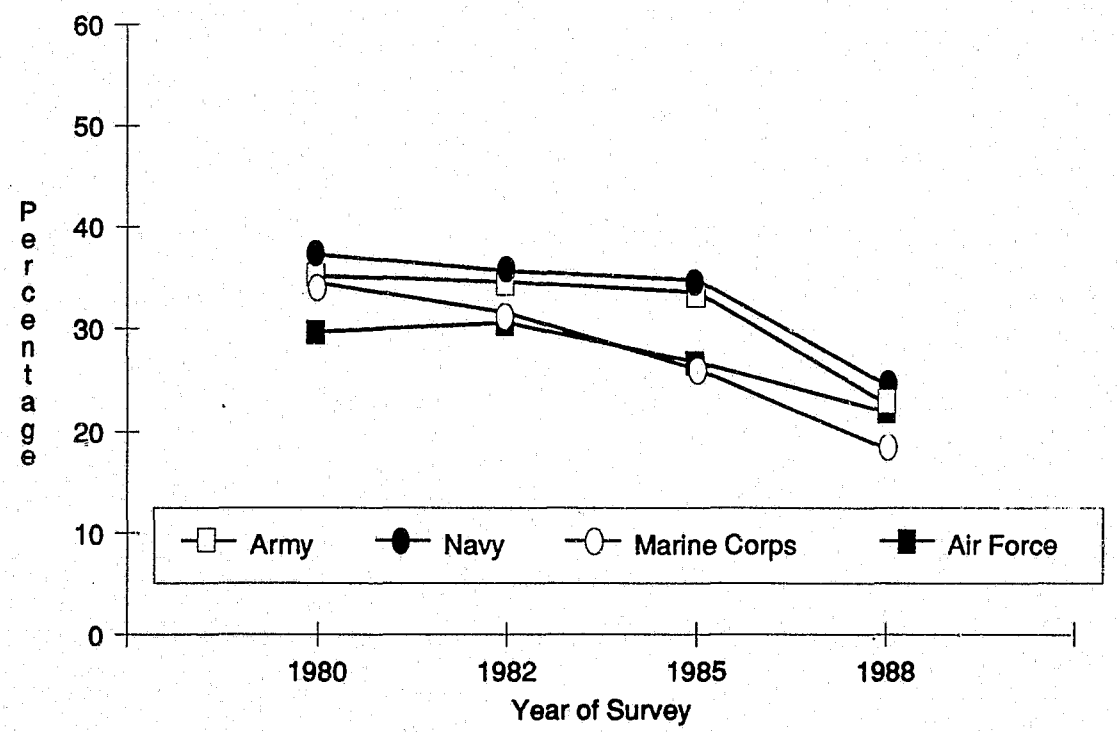


Table 6.2. Patterns of Cigarette Smoking, Past 30 Days 1985 and 1988

	Service									
	Army		Navy		Marine Corps		Air Force		Total DoD	
Smoking Levels	1985	1988	1985	1988	1985	1988	1985	1988	1985	1988
Didn't smoke	48.0(1.8)	56.9(1.1)*	52.1(1.2)	56.2(1.8)	57.4(3.1)	58.7(1.8)	61.0(2.3)	64.2(1.2)	53.8(1.0)	59.1(0.8)*
1/2 pack or less/day (1-15 cig.)	18.3(1.2)	20.2(1.1)	13.1(0.8)	19.3(2.3)*	16.5(3.0)	22.5(3.3)	12.1(1.0)	13.8(0.9)	15.0(0.6)	18.2(0.9)*
About 1 pack/day (16-25 cig.)	15.5(1.0)	12.8(0.6)*	14.6(1.3)	11.7(1.1)	10.8(0.6)	10.9(1.6)	14.0(0.9)	12.3(0.9)	14.4(0.5)	12.2(0.5)*
About 1 1/2 packs/day (26-35 cig.)	9.3(0.8)	6.0(0.4)*	10.6(0.7)	7.5(0.6)*	9.5(0.8)	3.8(0.9)*	7.2(0.7)	5.8(0.3)	9.0(0.4)	6.2(0.2)*
About 2 or more packs/day (≥ 36 cig.)	8.9(0.9)	4.1(0.3)*	9.5(0.7)	5.5(0.7)*	5.8(0.7)	4.0(1.1)	5.6(0.6)	3.9(0.5)*	7.8(0.4)	4.4(0.3)*

Note: Entries are percentages with standard errors in parentheses.

*Comparisons between 1985 and 1988 are statistically significant at the 95 percent confidence level.

Table 6.3. Estimates of Cigarette Use, Unstandardized and Standardized by Sociodemographic Characteristics

Smoking Measure	Service			
	Army	Navy	Marine Corps	Air Force
Any Smoking				
Unstandardized	43.1 (1.1)[b]	43.8 (1.8)[b]	41.3 (1.8)[b]	35.8 (1.2)
Standardized[a]	42.7 (0.8)[b]	42.8 (1.4)[b]	39.5 (1.6)	37.7 (1.1)
Heavy Smoking				
Unstandardized	22.8 (0.7)	24.6 (2.0)	18.7 (2.2)	22.0 (0.8)
Standardized[a]	22.5 (0.6)	24.2 (1.7)[c]	19.0 (1.8)	22.7 (0.8)

Note: Entries are percentages with standard errors in parentheses. Heavy smoking is defined as smoking one or more packs of cigarettes per day.

[a]Estimates have been standardized by age, education, and marital status to the total DoD.

[b]Estimate is significantly different from the Air Force at the 95 percent confidence level.

[c]Estimate is significantly different from the Marine Corps at the 95 percent confidence level.

day) and a significant decrease in heavy smokers (1 or more packs per day). For the entire DoD, the percentage of nonsmokers significantly increased by 5 percent from 53.8 percent in 1985 to 59.1 percent in 1988. Similarly, light smokers increased from 15.0 percent to 18.2 percent. The percentages dropped significantly for all three heavy smoker categories. Declines of 2 to 3 percentage points are seen in each of the three categories of heavy smokers.

These patterns of increased nonsmokers and light smokers and decreased heavy smokers are found in each of the Services, although not all changes are significant. The largest number of significant changes occurred in the Army, followed by the Navy. The Army also shows the largest and only significant increase (8.9 percentage points) in personnel who do not smoke, though the other Services also show a similar pattern.

C. Service Comparisons of Cigarette Use

Although cigarette use has been declining among military personnel, use of cigarettes remains widespread. In 1988, 40.9 percent of military personnel smoked cigarettes, and 22.7 percent were heavy smokers. In this section we compare cigarette use among the Services by examining Service-specific estimates of cigarette use, which are shown in Table 6.3.

The percentage of smokers is lower in the Air Force than in the other three Services, which are fairly similar to one another. As with alcohol and drug use, one possible explanation for this finding is differences in sociodemographic composition among the Services. That is, the divergence of the Air Force from the other Services may be due, at least in part, to the Air Force having personnel who are older, better educated, and married. To examine this possibility, estimates of percentages of personnel smoking any cigarettes and personnel smoking 1 or more packs per day in 1988 were standardized to the distributions of age, education, and marital status for the total DoD.

Standardized and unstandardized estimates are presented in Table 6.3. For any smoking, unstandardized estimates show the Army, Navy, and Marines to be similar to one another but significantly higher than the Air Force. Standardization modifies the estimates for Marine Corps and Air Force personnel so they no longer differ significantly from one another, but both are significantly lower than personnel in the Army and Navy. This indicates that the variation in cigarette use between the Air Force and the Marine Corps may be due in part to differences in sociodemographic composition of the two Services.

For heavy smoking, unstandardized rates show no significant differences among the Services. After standardization, the Navy and Marine Corps differ significantly because the variability of the estimates between these two Services is reduced. This indicates that the difference in heavy cigarette use between the Navy and Marine Corps is due in part to differences in sociodemographic composition.

D. Other Tobacco Use

Cigarette use is by far the most pervasive form of tobacco use, but military personnel also use other forms of tobacco. Knowing the extent to

which use of tobacco other than cigarettes is used and understanding the relationship between cigarette use and other tobacco use is necessary to develop comprehensive policies and programs for smoking prevention and cessation. In this section we examine data related to these aspects of tobacco use.

1. Prevalence of Cigar, Pipe and Smokeless Tobacco Use

Table 6.4 examines the prevalence of cigar, pipe, and smokeless tobacco use for the total DoD and for each of the Services. As shown, 24.0 percent or nearly one-fourth of military personnel smoke cigars or a pipe, indicating no change since 1985 (Bray et al., 1986). Smokeless tobacco is used by 17.3 percent of military personnel or approximately by one in six. This is a decrease from 1985, when the rate was almost one in five (Bray et al., 1986). Use of these products continues to be infrequent (less than once per week for most users).

Table 6.4 shows that cigars and pipes are used most frequently by Marines (32.9 percent) followed by the Navy (25.9 percent), Army (22.9 percent), and Air Force (20.7 percent). Use of smokeless tobacco is also highest in the Marines (32.7 percent) followed by the Army (18.7 percent), Navy (16.1 percent), and the Air Force (12.5 percent). In addition to

Table 6.4. Prevalence of Cigars, Pipe, and Smokeless Tobacco Use, Past 12 Months

	Service									
Tobacco/Frequency	Army		Navy		Marine Corps		Air Force		Total DoD	
Cigars/Pipe										
Didn't smoke	77.1	(1.0)	74.1	(2.0)	67.1	(3.1)	79.3	(0.8)	76.0	(0.8)
Less than once/week	13.1	(0.8)	15.9	(1.2)	23.4	(3.0)	13.4	(0.8)	14.9	(0.6)
1-4 days/week	1.7	(0.2)	3.1	(0.9)	2.1	(0.6)	1.6	(0.3)	2.1	(0.3)
5 or more days/week	8.0	(0.5)	7.0	(0.5)	7.5	(1.5)	5.7	(0.2)	7.0	(0.3)
Smokeless Tobacco										
Didn't use	81.3	(1.3)	83.9	(1.5)	67.3	(4.8)	87.5	(1.2)	82.7	(0.8)
Less than once/week	8.8	(0.9)	8.4	(0.8)	14.7	(1.8)	6.4	(0.7)	8.5	(0.5)
1-4 days/week	2.5	(0.4)	2.8	(0.6)	3.5	(0.5)	1.9	(0.5)	2.5	(0.3)
5 or more days/week	7.4	(0.8)	4.8	(0.3)	14.5	(2.9)	4.3	(0.5)	6.4	(0.4)

Note: Entries are percentages with standard errors in parentheses.

overall highest prevalence of smokeless tobacco use, Marines also show distinctively higher rates of smokeless tobacco use 5 or more days/ week (14.5 percent) than the other Services (4.3 to 7.4 percent).

2. Other Tobacco Use and Cigarette Smoking

Table 6.5 shows the relationship of other tobacco use to cigarette smoking. The marginals of this table provide information about the percentage of military personnel who have never smoked (37.6 percent), are former smokers (21.5 percent), or are currently light smokers (18.2 percent) or heavy smokers (22.7 percent). Larger percentages of officers than enlisted personnel are former smokers or have never smoked. In contrast, enlisted personnel show larger percentages in all three categories of current smokers.

Table 6.5 also shows significantly larger percentages of enlisted personnel than officers smoking cigars or pipes and using smokeless tobacco. The difference between these two groups is particularly sizeable for use of smokeless tobacco. Among enlisted personnel, 24.8 percent smoke cigars or a pipe compared to 20.0 percent of officers. Smokeless tobacco is used by 18.9 percent of enlisted personnel compared to 9.8 percent of officers.

Comparisons of enlisted personnel and officers reveal that the relationship of other tobacco use and cigarette smoking is similar within these two groups. For both groups, use of other tobacco is lowest among those who have never smoked, followed by former smokers. Current smokers show highest rates of other tobacco use. Among current smokers, highest use occurs among those who smoke less than a pack per day.

E. Correlates of Smoking

The development of sound policies and programs that meet the needs of the military organization and individual persons within the military requires knowledge of characteristics of tobacco users. In this section we examine the sociodemographic correlates of cigarette smoking. First, we examine the relationship of individual characteristics and smoking. Then, we present the results of multivariate regression analyses of any smoking and heavy smoking.

Table 6.5. Relationship of Other Tobacco Use to Cigarette Smoking

Grade/Cigarette Smoking Level	Other Tobacco Use: Smoke Cigars/Pipe	Other Tobacco Use: Use Smokeless Tobacco	Total
Enlisted			
Never smoked	5.4 (0.5)	9.6 (0.7)	35.2 (0.6)
Former smoker	21.1 (1.3)	19.7 (1.4)	19.4 (0.6)
Smoke <1 pack/day	44.1 (2.2)	28.4 (1.9)	20.2 (0.9)
Smoke 1 pack/day	38.3 (1.5)	25.9 (1.9)	13.5 (0.6)
Smoke >1 pack/day	39.8 (1.7)	20.8 (1.5)	11.7 (0.5)
Total	24.8 (0.9)	18.9 (0.8)	100.0 -
Officer			
Never smoked	10.8 (1.4)	6.1 (0.8)	49.3 (1.3)
Former smoker	19.6 (1.4)	11.1 (2.1)	31.8 (1.4)
Smoke <1 pack/day	46.8 (5.1)	26.7 (3.1)	8.4 (0.7)
Smoke 1 pack/day	45.2 (6.3)	10.9 (3.1)	5.4 (0.5)
Smoke >1 pack/day	41.5 (3.7)	9.0 (2.5)	5.1 (0.5)
Total	20.0 (1.1)	9.8 (1.2)	100.0 -
Total DoD			
Never smoked	6.6 (0.5)	8.8 (0.6)	37.6 (0.5)
Former smoker	20.8 (1.0)	17.5 (1.2)	21.5 (0.7)
Smoke <1 pack/day	44.3 (2.1)	28.3 (1.8)	18.2 (0.9)
Smoke 1 pack/day	38.9 (1.6)	24.8 (1.7)	12.1 (0.5)
Smoke >1 pack/day	39.9 (1.6)	19.9 (1.5)	10.6 (0.4)
Total	24.0 (0.8)	17.3 (0.8)	100.0 -

Note: Tabled values are percentages with standard errors in parenthesis. Entries show those at the cigarette smoking level who also smoke cigars/pipes or use smokeless tobacco.

1. Descriptive Findings. Previous chapters have indicated substantial variation among pay grades in alcohol and drug use, with those in the lower pay grades showing greater use. Table 6.6 presents information about cigarette smoking by pay grade. For the total DoD, the prevalence of any smoking is substantially higher among enlisted personnel (44.5 percent to 47.7 percent) than among officers (about 18 percent for commissioned officers and 32.1 percent for warrant officers).

There is also a larger percentage of heavy smokers among enlisted personnel than officers. For heavy smoking there is also a clear pattern for

Table 6.6. Cigarette Use by Pay Grade, Past 30 Days

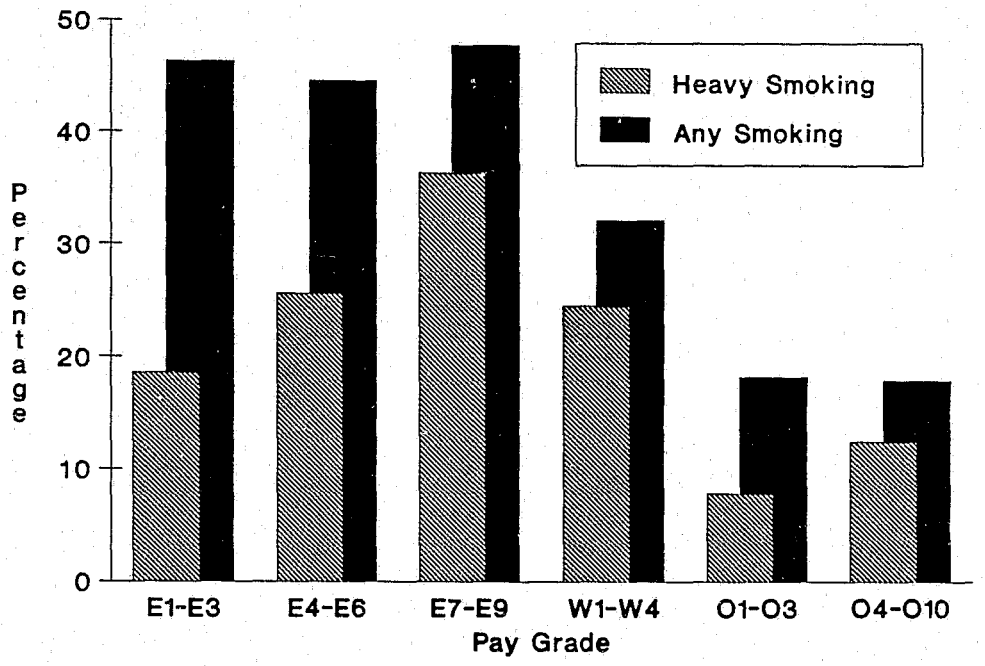
Pay Grade/ Smoking Measure	Service									
	Army		Navy		Marine Corps		Air Force		Total DoD	
E1-E3										
Any smoking	45.0	(3.1)	55.3	(3.8)	47.6	(2.8)	38.4	(3.2)	46.3	(2.0)
Heavy smoking	18.4	(1.8)	20.8	(2.3)	15.1	(4.1)	18.8	(2.2)	18.6	(1.2)
E4-E6										
Any smoking	48.4	(1.3)	44.5	(1.5)	42.9	(1.4)	40.4	(1.6)	44.5	(0.8)
Heavy smoking	24.5	(1.2)	26.6	(2.3)	23.5	(2.6)	26.3	(1.0)	25.6	(0.9)
E7-E9										
Any smoking	52.8	(1.5)	48.5	(2.1)	44.6	(1.6)	41.1	(1.2)	47.7	(0.9)
Heavy smoking	39.7	(2.0)	38.8	(1.8)	29.3	(2.8)	31.4	(1.1)	36.3	(1.0)
W1-W4										
Any smoking	31.4	(2.7)	38.5	(3.6)	26.9	(4.0)	*	(*)	32.1	(2.2)
Heavy smoking	23.5	(2.5)	32.8	(3.0)	18.5	(6.6)	*	(*)	24.5	(2.1)
01-03										
Any smoking	18.0	(2.6)	20.8	(2.0)	12.8	(1.4)	17.8	(2.3)	18.2	(1.3)
Heavy smoking	7.3	(1.4)	9.9	(2.8)	6.4	(2.9)	7.2	(2.0)	7.8	(1.1)
04-010										
Any smoking	16.3	(1.2)	18.6	(1.8)	13.6	(2.1)	19.5	(2.1)	17.9	(1.0)
Heavy smoking	12.2	(1.3)	13.2	(1.4)	8.8	(1.5)	12.8	(2.1)	12.5	(1.0)
Total DoD										
Any smoking	43.1	(1.1)	43.8	(1.8)	41.3	(1.8)	35.8	(1.2)	40.9	(0.8)
Heavy smoking	22.8	(0.7)	24.6	(2.0)	18.7	(2.2)	22.0	(0.8)	22.7	(0.7)

Note: Estimates are percentages with standard errors in parentheses.

*There are no warrant officers in the Air Force.

the percentage of heavy smokers to be greater in the higher pay grades both within the enlisted and officer ranks. Among enlisted personnel, E7-E9s have the most heavy smokers (36.3 percent) followed by E4-E6s (25.6 percent) and E1-E3s (18.6 percent). Similarly, officers in the 04-010 pay grades are more likely to smoke heavily (12.5 percent) than officers in the more junior 01-03 pay grades (7.8 percent). The percentages of warrant officers who smoke at all or smoke heavily fall between those of enlisted personnel and officers. This contrasting pattern of use for any smoking and heavy smoking is illustrated in Figure 6.4. This finding for heavy smokers may reflect societal trends toward reduced smoking, which could be expected to have a greater influence on younger personnel who have not experimented with or developed a habit of using cigarettes.

Figure 6.4. Cigarette Use by Pay Grade, Total DoD



Although there are a few exceptions, these DoD patterns for smoking for pay grades tend to hold true for each of the Services. Comparing the Services, Air Force enlisted personnel have lower percentages of smokers than the other Services, while Navy officers have fewer smokers than the other Services. Table D.19 (Appendix D) provides a more detailed presentation of frequency of cigarette use by pay grade.

Appendix D.20 presents cigarette use by selected sociodemographic characteristics. Although past research on civilians has shown that males are more likely to smoke than females, such differences do not appear in the military. There is little difference among the percentages of males (41.1 percent) and females (39.7 percent) who smoke. Cigarette smoking is negatively related to level of education and pay grade. The presence of a spouse also is related to a lower likelihood of smoking. All of these patterns of association between sociodemographic characteristics and smoking observed for the total DoD, with few exceptions, are seen for the four individual Services.

2. Multivariate Findings. The observed relationships between each of the individual characteristics and smoking may be misleading

because many of the characteristics are themselves related (e.g., age, pay grade, education, marital status). A multivariate framework is needed to assess the independent effects of these factors. Regression analyses were conducted to examine the independent contribution of each of the demographic characteristics when they are considered simultaneously.

Two regression analyses were conducted, one predicting any cigarette smoking and the other predicting heavy smoking. For both analyses a dichotomous (0,1) variable was created. For the analysis of any smoking, smokers were coded as 1 and nonsmokers were coded as 0; for the analysis of heavy smoking, those smoking 1 or more packs a day were coded as 1 and nonsmokers and those who smoked less than 1 pack a day were coded as 0. The regression analyses for these measures estimate the probability of being a smoker or a heavy smoker. Independent variables in each of the analyses were Service, race/ethnicity, sex, level of education, family status, region, pay grade, age, years of service, health practices, and reported stress at work.

Results of the regression analyses are shown in Table 6.7. The R^2 for predicting the probability of any smoking is .095, and the R^2 for predicting the probability of heavy smoking is .114, both of which are significant at the .001 level. Overall, both analyses show significant effects for Service, race/ethnicity, education, pay grade, age, health practices, and reported stress at work. In addition, heavy smoking shows a significant effect for years of service. Results show that the probability of being a smoker or a heavy smoker is significantly higher, after adjusting for all other variables in the analysis, for:

- Army personnel than for Air Force personnel,
- whites than for blacks or Hispanics,
- those with lower education than those with higher education,
- enlisted personnel than officers,
- those who are older,
- those who have poorer health practices, and
- those who report higher levels of stress at work.

The strongest predictors in the analysis are Service, race/ethnicity, education, pay grade, age, health practices, and reported stress at work for heavy smoking after controlling for all other variables in the models.

Table 6.7. Predicting Any Cigarette Smoking and Heavy Smoking, Past 30 Days

Independent Variables	Any Smoking Regression Parameter	Heavy Smoking[a] Regression Parameter
Service		
Army versus Air Force	.0739***	.0296*
Navy versus Air Force	.0460**	.0068
Marine Corps versus Air Force	.0313	-.0182
Race/Ethnicity		
Black versus White	-.0918***	-.1889***
Hispanic versus White	-.0695*	-.1625***
Other versus White	-.0032	-.0670**
Sex		
Male versus Female	-.0611	.0112
Education		
High School or Less versus Beyond High School	.0669***	.0538***
Family Status		
Single versus Married, spouse present	.0093	.0040
Married, spouse not present versus Married, spouse present	.0093	.0046
Region		
Americas versus Europe	-.0158	-.0220
North Pacific versus Europe	-.0243	-.0243
Other Pacific versus Europe	-.0313	-.0173
Pay Grade		
E1-E3 versus O4-O10	.3828***	.2538***
E4-E6 versus O4-O10	.3311***	.2560***
E7-E9 versus O4-O10	.2828***	.2532***
W1-W4 versus O4-O10	.1391***	.1404***
O1-O3 versus O4-O10	.0952***	.0769**
Age	.0069***	.0065***
Years of Service		
0-3 versus 20+	-.0264	-.0778*
4-9 versus 20+	-.0187	-.0392
10-19 versus 20+	-.0087	.0171
Health Practices	-.0753***	-.0613***
Reported Stress at Work	.0508***	.0330***

Note: Entries are regression parameters that indicate the effects of the tabled variables on the probability of any cigarette smoking and heavy smoking.

[a]Defined as smoking 1 or more packs of cigarettes/day.

*p<.05. **p<.01. ***p<.001.

Both Army and Navy personnel have a significantly higher adjusted probability of any smoking than Air Force personnel. Army personnel, for example, have a .0739 greater adjusted probability of smoking than Air Force personnel. In the model for heavy smoking, the proportion of Army personnel smoking heavily is significantly higher than that of Air Force personnel although the effect is small.

The effects of race/ethnicity show that the probability of being a current smoker is .092 higher for whites than for blacks and .0695 higher for whites than for Hispanics after adjusting for the remaining independent variables in the model. A similar pattern holds for heavy smoking, although there is also a significant negative effect for the "other" race/ethnicity group. Whites have a probability of being a heavy smoker that is .189 higher than blacks, .163 higher than Hispanics, and .067 higher than "others".

The effects for education show that the probability that personnel with high school or less education smoke is .0669 higher than for personnel with education beyond high school. For heavy smoking, the probability is .0538.

Each pay grade group from E1s to O3s has a significantly higher adjusted probability of any smoking and heavy smoking than senior officers O4-O10s. As an example, the adjusted probability for any smoking for E1-E3s is .38 higher than for senior officers (O4-O10s). Examination of Table 6.7 shows that the size of the pay grade effect is much larger for enlisted personnel than for warrant (W1-W4) or junior officers (O1-O3). For example, the adjusted probability for any smoking for O1-O3s is only .0952 higher than for senior officers.

The effect of age indicates a .0069 increase in the proportion of any smoking and a .0065 increase in heavy smoking for each year of increase in age. The years of service effect shows that the probability of heavy smoking is .078 greater for those with 20 or more years than for those with 0-3 years of service.

Finally, health practices and reported stress are related to cigarette smoking. The probability of any smoking decreases .075 points and heavy smoking decreases .061 points for each health practice that personnel follow. The probability of any smoking increases by .051 for each scale

point change in the reported stress variable, and the probability of heavy smoking increases by .033 for each scale point change on the reported stress variable.

Overall, results of these regression analyses indicate that Service race/ethnicity, education, pay grade, age, health practices, and reported stress have strong effects on both any smoking and heavy smoking after controlling for all variables in the model. Differences in family status and region shown in earlier crosstabulations (Table D.20) are not significant in these analyses after controlling for other variables.

F. Military Job and Smoking

A common reason given for smoking is to help individuals relax or reduce stress that they may be feeling. Analyses presented in Table 6.8 address this issue by investigating the relationship of reported job stress and cigarette smoking. Overall, results show that the percentage of personnel who are heavy smokers is higher for those who report more stress. Among those reporting no stress, 16.3 percent smoke 1 or more packs of cigarettes per day compared with those reporting a great deal of stress, of whom 28.2 percent smoke. This pattern for the total DoD holds both among officers and enlisted personnel but is more pronounced among enlisted personnel. For officers, heavy smokers range from 9.1 percent for no reported stress to 11.5 percent for those reporting a great deal of stress. For enlisted personnel, heavy smoking ranges from 16.8 percent for those reporting no stress to 31.8 percent for those reporting a great deal of stress. This relationship is illustrated in Figure 6.5.

G. Tobacco Use After the "No Smoking" Policy

Information regarding attempts to stop smoking provides valuable insight into the level of interest among smokers in policies and programs designed to reduce smoking. For this reason, these data are particularly relevant to development of military smoking policies and programs. Smokeless tobacco may be a substitute for cigarette smoking. We, therefore, also consider whether smokeless tobacco use may have increased after the "no smoking" policy began.

Table 6.8. Reported Stress Experienced at Work Past 30 Days and Cigarette Use

Grade/Stress Level at Work	Smoking Level		
	Nonsmoker	Less Than 1 Pack/Day	1 or More Packs/Day
Enlisted			
Great deal	46.3 (1.7)	21.9 (1.8)	31.8 (1.5)
Fairly large amount	53.4 (1.3)	19.3 (1.2)	27.3 (1.3)
Some	57.2 (1.3)	18.9 (0.9)	24.0 (1.3)
A little	59.0 (1.4)	22.2 (1.8)	18.8 (1.4)
None	64.0 (2.6)	19.2 (2.3)	16.8 (1.6)
Officer			
Great deal	77.0 (2.4)	11.5 (1.7)	11.5 (1.5)
Fairly large amount	80.0 (1.2)	8.8 (1.2)	11.1 (1.4)
Some	83.0 (1.1)	7.2 (1.0)	9.8 (0.9)
A little	87.3 (2.5)	4.2 (1.2)	8.5 (2.0)
None	84.9 (4.5)	6.0 (3.6)	9.1 (3.3)
Total DoD			
Great deal	51.7 (1.6)	20.0 (1.6)	28.2 (1.2)
Fairly large amount	59.0 (1.3)	17.1 (1.0)	23.9 (1.1)
Some	61.7 (1.3)	16.8 (0.8)	21.5 (1.1)
A little	62.3 (1.3)	20.1 (1.6)	17.6 (1.3)
None	65.3 (2.5)	18.4 (2.2)	16.3 (1.6)

Note: Entries are percentages with standard errors in parentheses.

Table 6.9 presents findings on attempts to stop smoking cigarettes during the past 2 years. As shown in the top panel, a large percentage (37.6 percent) of military personnel have never smoked. In the total DoD, a substantial number of personnel (21.4 percent) have successfully stopped smoking, 15.2 percent over 2 years ago, and 6.2 percent within the past two years. An additional 23.1 percent have made a serious but unsuccessful attempt to quit smoking within the past 2 years, whereas 17.9 percent did not try to quit within this period. This group of current smokers who have tried to quit may be some of the most promising personnel for efforts to further reduce smoking in the military.

The lower half of Table 6.9 shows attempts to stop smoking cigarettes among smokers during the past 2 years (i.e., the bottom three groups in the

Figure 6.5. Heavy Cigarette Smoking by Level of Stress, Past 30 days

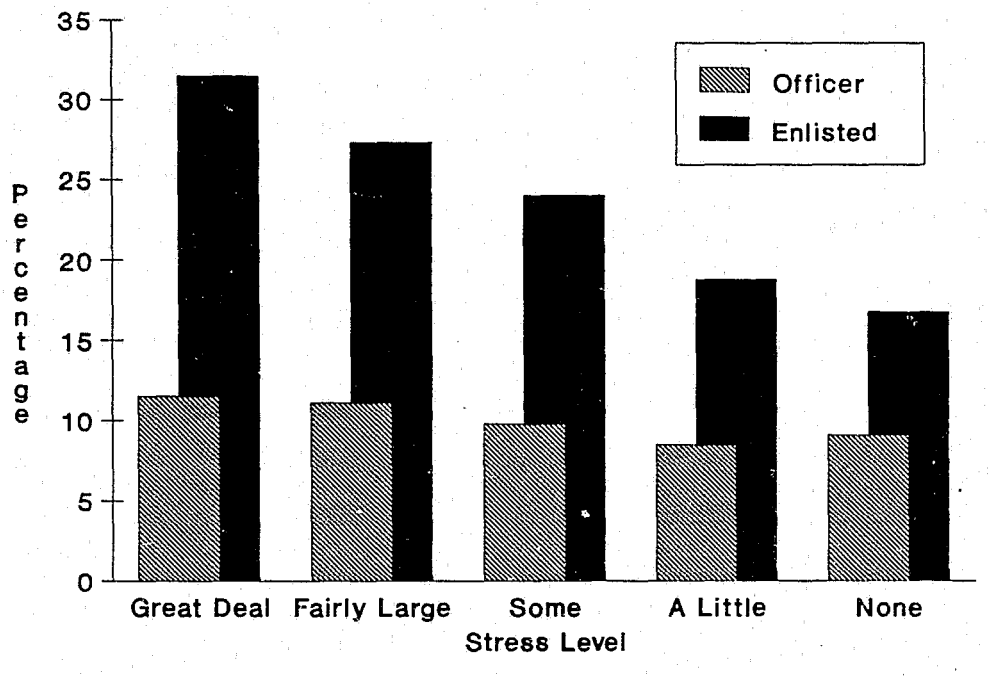


Table 6.9. Serious Attempt to Stop Smoking Cigarettes During the Past 2 Years

Group/Status	Service				
	Army	Navy	Marine Corps	Air Force	Total DoD
Among All Personnel					
Never smoked	37.4 (1.1)	35.3 (0.7)	37.8 (2.3)	39.9 (0.9)	37.6 (0.5)
Former smoker, quit over 2 years ago	14.2 (0.9)	14.4 (1.7)	13.3 (1.0)	17.8 (0.8)	15.2 (0.6)
Former smoker, quit within 2 years	5.3 (0.4)	6.5 (0.7)	7.6 (0.7)	6.4 (0.6)	6.2 (0.3)
Current smoker, tried to quit	23.7 (0.5)	24.8 (1.5)	25.1 (1.7)	20.1 (0.9)	23.1 (0.6)
Current smoker, didn't try to quit	19.3 (1.0)	19.0 (0.6)	16.2 (0.9)	15.7 (0.8)	17.9 (0.5)
Among Smokers, Past Two Years					
Former smoker, quit within 2 years	10.9 (0.7)	13.0 (1.4)	15.6 (1.0)	15.2 (1.3)	13.1 (0.6)
Current smoker, tried to quit	49.1 (1.2)	49.3 (1.7)	51.3 (2.2)	47.7 (1.9)	49.0 (0.8)
Current smoker didn't try to quit	40.0 (1.3)	37.7 (1.1)	33.1 (1.9)	37.1 (1.3)	37.9 (0.7)

Note: Entries are column percentages with standard errors in parentheses.

top panel of the table). For the total DoD, 13.1 percent of these smokers quit within the past 2 years, 49.0 percent tried to quit but continued smoking, and 37.9 percent did not try to quit. Overall, then, 62.1 percent of smokers made an attempt to quit during the past 2 years. Of those who tried to quit, only 21.1 percent were successful. These data suggest considerable interest in cessation of smoking and a relatively large potential audience for programs designed to help stop smoking. The 37.9 percent of smokers in the military who did not try to quit during the past 2 years may represent a more formidable target for policies and programs designed to reduce or eliminate smoking. The pattern of smokers in each Service is similar to that for the entire DoD.

After issuance of the 1986 smoking prevention and cessation guidelines, only 2.2 percent of military personnel started using smokeless tobacco. Although this is a relatively small percentage of military personnel, it represents a relatively large increase in the percentage of smokeless tobacco users. This initiation of the use of smokeless tobacco by 2.2 percent of military personnel diminishes, at least to some extent, the 5 percent gain in nonsmokers that occurred between 1985 and 1988.

H. Summary

This chapter describes tobacco use among military personnel. It focuses primarily on the most prevalent form of tobacco use--cigarette smoking and its correlates.

1. Trends in Cigarette Use

Prior studies among civilians and military personnel show a decline in the prevalence of cigarette smoking. This trend is supported by findings of the 1988 Worldwide Survey which show smoking levels at their lowest level since the Worldwide Survey series was begun in 1980.

- The prevalence of any cigarette smoking declined from 51.0 percent in 1980 to 40.9 percent in 1988.
- Heavy cigarette smoking (1 or more packs per day) also showed a significant decline from 34.2 percent in 1980 to 22.7 percent in 1985. The Services also all showed a declining pattern of use over the 8-year period.

- Between 1985 and 1988, there were significant increases in nonsmokers (from 53.8 percent to 59.1 percent) and in light smokers (from 15.0 percent to 18.2 percent) and significant decreases in heavy smokers (from 31.2 percent to 22.7 percent).

2. Service Comparisons of Cigarette Use

Standardized and unstandardized comparisons were made to test whether Service differences in any cigarette use and heavy cigarette use were attributable to variations in sociodemographic composition of the Services.

- Overall, the comparisons of standardized and unstandardized rates for any smoking and heavy smoking suggest that some, but not all, Service differences in smoking are due to variations in sociodemographic composition of the Services.

3. Cigarette Use and Other Tobacco Use

An understanding of the relationship between cigarette use and other tobacco use is necessary for the development of comprehensive policies and programs for smoking prevention and cessation.

- Nearly one-fourth of military personnel smoke cigars or a pipe, indicating no change since 1985. Approximately one in six uses smokeless tobacco, which is a decrease from 1985, when the rate was almost one in five. Use of these products continues to be infrequent (less than once per week for most users).

- There are significantly larger percentages of enlisted personnel than officers who smoke cigars or pipes and use smokeless tobacco.

4. Correlates of Smoking

Development of sound policies and programs regarding smoking requires knowledge of characteristics of tobacco users.

- For the total DoD and the Services, both any smoking and heavy smoking are substantially higher among enlisted personnel than officers.

- Heavy smoking is higher among personnel in higher pay grades both within enlisted and officer ranks. Among enlisted personnel, 36.3 percent of E7-E9s are heavy smokers compared

with 18.6 percent of E1-E3s. Among officers, 12.5 percent of 04-010s are heavy smokers compared with 7.8 percent of 01-03s.

- Any smoking and heavy smoking are predicted by pay grade, race/ethnicity, education, Service, age, poor health practices, and higher stress at work. The probability of being a smoker is significantly higher among military personnel who are in enlisted pay grades, who are white, who did not continue their education beyond high school, who are in the Army compared with the Air Force, who follow poorer health practices, and who report higher levels of stress at work.

5. Military Job and Smoking

A common reason given for smoking is to reduce stress.

- Cigarette smoking is more likely among those who report being under a great deal of stress at work than among those who report no stress.

6. Tobacco Use After the "No Smoking" Policy

- In the total DoD, 21.4 percent of all personnel have successfully stopped smoking, 6.2 percent in the past 2 years. Overall, 23.1 percent are current smokers who tried to quit within the past 2 years, and 17.9 percent made a serious, but unsuccessful, attempt to stop during that time. Overall, 37.6 percent of military personnel have never smoked.

- During the past 2 years among those who smoked, 62.1 percent made an attempt to quit smoking. Of those who tried to quit, only 21.1 percent succeeded.

- After issuance of the 1986 smoking prevention and cessation guidelines, 2.2 percent of military personnel started using smokeless tobacco.

7. NEGATIVE EFFECTS OF ALCOHOL AND DRUG USE

Alcohol and drug use can damage the health, social life, family relationships, and work performance of military personnel. Moreover, the negative effects of alcohol and drug use are of great practical importance because they can diminish military readiness and, in turn, compromise our nation's security. Alcohol and drug use may also require large expenditures of funds for substance abuse prevention, intervention, detoxification, rehabilitation, and treatment programs.

The analyses presented in this chapter describe the negative effects of alcohol and drug use on DoD personnel. The damage to health and well-being of tobacco use is not considered. The chapter first examines prior studies of negative effects of alcohol use and drug use. Data that assess negative effects that respondents attribute to alcohol use and to drug use are then presented. The chapter concludes by examining effects of alcohol and drug use on general negative behaviors.

A. Prior Studies

Many studies have investigated the negative consequences of alcohol use on work performance, health, and social relationships, but fewer studies have examined the negative effects associated with drug use. Available information about these effects rests on alcohol and drug users' attributions of negative consequences to their drinking or drug use.

1. Negative Effects of Alcohol Use

NIAAA's national surveys of alcohol use have documented the magnitude of the effects of alcohol use on work performance, health, and social behavior. Clark and Hilton (1986) examined adults' self-reports of nine problem consequences and four dependence symptoms in 1984 and 1967. In 1984, the most recent year for which survey data are available, 13.3 percent of men and 7.1 percent of women reported having experienced an alcohol-related problem over the past year; 18.8 percent of men and 8.2 percent of women reported a dependence symptom. The percentages of men and women reporting a dependence symptom had increased significantly since 1967, but the percentages reporting problems in 1967 and 1984 were not

significantly different. Rates of dependence and negative consequences were strongly related to the overall amount of drinking and the maximum consumed per occasion.

The Worldwide Surveys have also assessed the nature and extent of negative consequences associated with alcohol use. In the 1985 Worldwide Survey report, Bray et al. (1986) compared the extent of alcohol use negative effects with measures used in prior Worldwide Surveys as well as with new measures developed from factor analyses of negative effects items in the survey. Using previous measures, the 1985 Worldwide analyses estimated that less than 10 percent of military personnel experienced work impairment, physical damage, social disruption, dependence, or other consequences; 27 percent experienced some productivity loss. Most types of consequences had declined since 1982; the decreases in work impairment, social disruption, and productivity loss were statistically significant. Factor analysis identified four dimensions of alcohol-related negative effects in 1985--work-related, legal, physiological, and general negative effects. Mean scores for these measures were 4.8, 0.1, 72.0, and 0.3 occurrences during the past year, respectively. Negative effects among dependent persons were 3 to 5 times higher than among nondependent persons, and 4 or more times higher among heavier drinkers than among infrequent/light drinkers.

Polich (1979) is one of the few researchers to have compared the extent of negative consequences among civilians and military personnel. He compared results from Army, Navy, and Air Force surveys during the 1970s to results from the 1969 national alcohol survey on measures of "tangible" problems and serious adverse consequences. After standardizing for education, age, and marital status, military rates were only slightly higher than civilian rates. Polich argued that only a minor difference in rates remained after controlling for differences in the demographic composition of civilian and military populations. This difference could be accounted for by unique conditions of military life such as location, working conditions, or differences in customs and attitudes.

2. Negative Effects of Drug Use

The consequences of nonmedical use of drugs for work performance, health, and social behavior have been less well documented. The summary

report of the 1982 National Survey on Drug Abuse did not include the six survey items on the side effects of medical or nonmedical use of drugs (Miller et al., 1983). Similarly, a set of items in the 1979 national survey concerned the effects of marijuana on driving or level of effort, but the findings were not included in the final report (Fishburne et al., 1980). A set of items in the 1985 national survey concerns a variety of consequences of any substance use (respondent-specified type of substance responsible for consequence), ranging from work performance to health, economic problems, cognitive ability, and interpersonal problems.

The 1985 NIDA Household Survey on Drug Abuse (1988) found those who had used marijuana in the past year most often reported that they were unable to think clearly (10.6 percent), became depressed or lost interest in things (6.4 percent), felt very nervous and anxious (5.6 percent), or got less work done than usual at school or on the job (5.6 percent). Those who used cocaine during the past year indicated that they felt very nervous and anxious (9.8 percent), felt irritable and upset (5.3 percent), skipped four or more regular meals (5.1 percent), or become depressed or lost interest in things (5.0 percent). Other problems were mentioned less often. These data suggest that the types of negative effects may depend on the particular drug and may not occur uniformly across all drugs.

B. Negative Effects of Alcohol Use

This section examines negative effects of alcohol consumption on military personnel. It first examines trends in negative effects and contrasts findings from the 1980 to the 1988 Worldwide Surveys. It next examines negative effects as a function of pay grade and then examines the role of drinking levels on serious consequences.

1. Trends in Negative Effects

Alcohol-related negative effects have declined significantly since 1980. In 1988, 9.0 percent of military personnel reported having experienced a serious consequence associated with alcohol use during the past year, 22.1 percent reported some productivity loss, and 6.4 percent reported one or more symptoms of dependence. Between 1980 and 1988, the decreases in each of the indicators were statistically significant.

Reductions in negative effects observed for total DoD were seen for personnel in each of the Services. Figures 7.1, 7.2, and 7.3 (see also Tables D.1--D.4) show Service trends in negative effects due to alcohol use. As shown in Figure 7.1, serious consequences declined for each of the Services between 1980 and 1988. The Army declined from 17.9 percent to 10.3 percent, the Navy from 22.1 percent to 10.4 percent, the Marines from 26.2 percent to 17.0 percent, and the Air Force from 9.0 percent to 3.9 percent.

As shown in Figure 7.2. each of the Services show an increase in productivity loss between 1980 and 1982 followed by a return roughly to 1980 levels in 1985. The most recent data for 1988 show that declines in productivity loss since 1985 were statistically significant for three of the Services (the Marine Corps showed an increase that was not statistically significant).

As shown in Figure 7.3, symptoms of alcohol dependence show a somewhat different pattern than serious consequences or productivity loss. For the Army, alcohol dependence increased from 8.8 percent in 1980 to 12.1 percent in 1985 and then declined significantly to 7.2 percent in 1988. For the Navy, dependence increased from 9.7 percent in 1980 to 11.6 percent in 1982 and then declined to 6.8 percent in 1985 and shifted to 7.2 percent in 1988. For the Marines, dependence remained roughly stable from 1980 to 1982, then showed a decline in 1985 and a slight increase in 1988. The Air Force has shown the fewest dependence symptoms throughout the 1980s and has not changed significantly since 1980.

Table 7.1 presents the results of the analysis of the overall prevalence of the negative effects of alcohol use among military personnel in 1988 and provides a comparison with data from the 1985 survey. The top portion of the table shows responses for the individual indicators of serious consequences and a summary of the percentage experiencing one or more of these consequences. For both years the events with the highest prevalence, ranging from 2-4 percent, are: 3 or more work days lost, arrested for driving while intoxicated, and fights. Other events are reported by approximately 1.0 percent of personnel or less. For 1988, 9.0 percent of the respondents experienced any type of serious negative consequence. For

Figure 7.1. Alcohol-Related Serious Consequences by Service, 1980-88

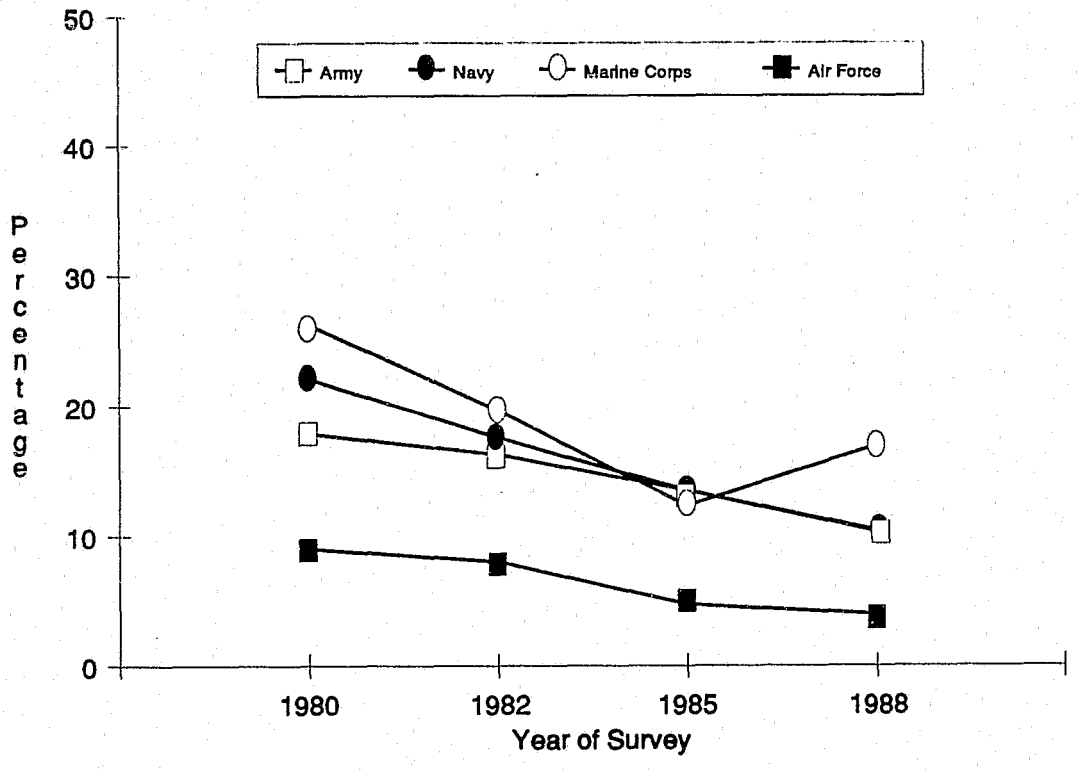


Figure 7.2. Alcohol-Related Productivity Loss by Service, 1980-88

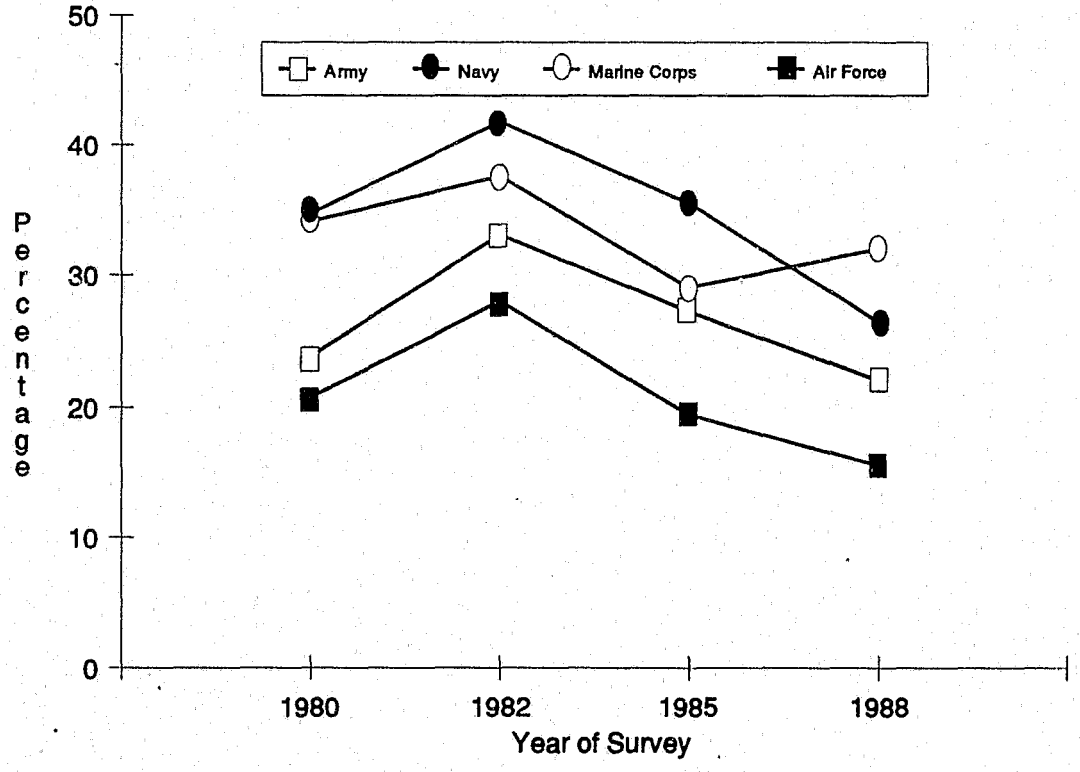
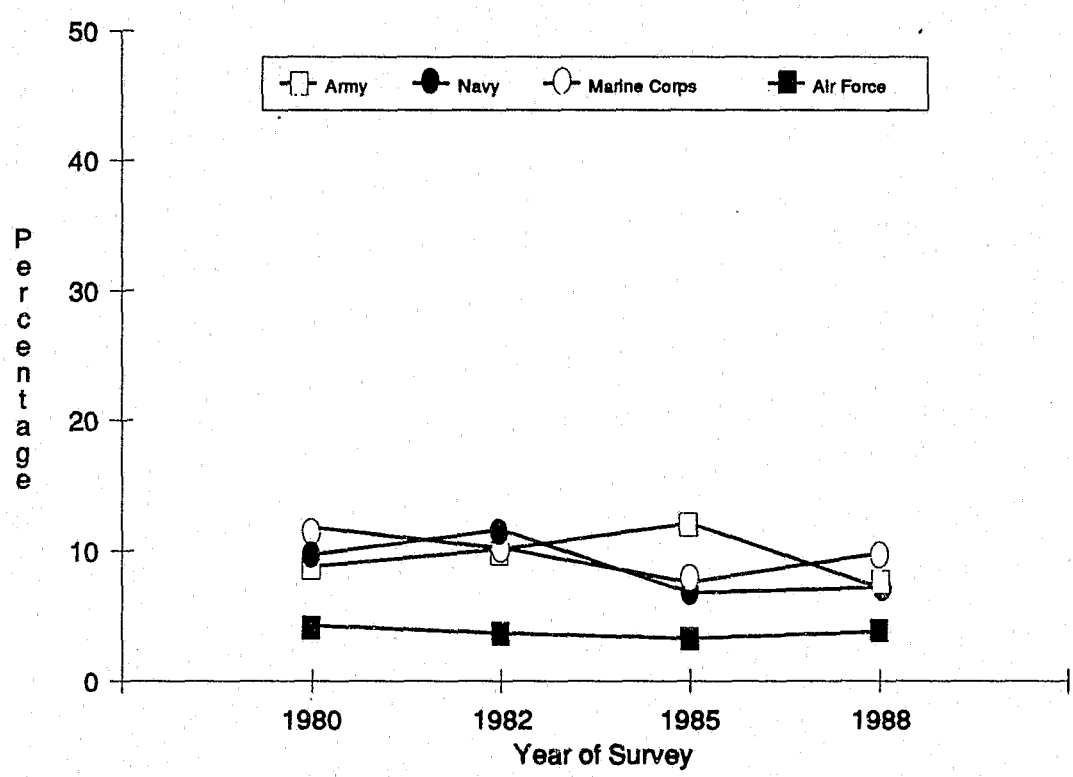


Figure 7.3. Alcohol-Related Dependence by Service, 1980-88



all respondents in 1988, the average number of serious consequences reported was .15. Thus in a 100-person unit in the year before the survey, nine persons would experience a total of 15 negative effects.

The most striking result of the analysis is that over one-fifth of all service personnel experienced some productivity loss due to alcohol use during the 12 months before to the survey. The average number of days of work lost during the year due to alcohol use was .38 days per person. Thus, on average a 100-person unit lost 38 person days of work during the past year due to alcohol use. Roughly one in 20 military personnel (6.4 percent) exhibited the symptoms of alcohol dependence during the year before the survey.

Comparisons of the 1988 data, however, with 1985 data indicate that of the three summary measures, only productivity loss was significantly lower. The percentage losing productive work time due to drinking declined from 27.1 percent in 1985 to 22.1 percent in 1988. This change represents an 18 percent reduction in productivity loss during the 3 years between the sur-

veys. Though none of the other measures shows a statistically significant change, all of the 1988 estimates are lower than the 1985 estimates.

The overall findings noted for DoD in Table 7.1 are mirrored by the results for each Service (Table 7.2), with a few notable exceptions. The

Table 7.1. Alcohol Use Negative Effects, 1985 and 1988 - Total DoD

Indicator	Year of Survey 1985		1988		85-88 Change
Serious Consequences					
Received UCMJ punishment	2.3	(0.3)	1.8	(0.2)	-0.5
Loss of 3 or more work days	4.1	(0.6)	2.9	(0.3)	-1.2
Illness kept from duty 1 week or more	0.8	(0.2)	0.5	(0.1)	-0.3
Spouse left	0.8	(0.1)	0.3	(0.1)	-0.5*
Arrested for driving while intoxicated	2.2	(0.2)	2.1	(0.3)	-0.1
Arrested for nondriving incident	1.5	(0.2)	1.3	(0.2)	-0.2
Incarcerated	1.5	(0.2)	1.2	(0.2)	-0.3
Fights	3.2	(0.6)	3.1	(0.3)	-0.1
Did not get promoted	1.6	(0.4)	0.8	(0.1)	-0.8
Entered rehabilitation or treatment program	0.7	(0.1)	0.7	(0.1)	0.0
Any serious consequence[a]	10.7	(0.9)	9.0	(0.6)	-1.7
Average number of consequences	0.19	(0.2)	0.15	(0.01)	-0.04
Productivity Loss					
Any time lost	27.1	(1.1)	22.1	(1.2)	-5.0*
Average days lost	0.60	(0.1)	0.38	(**)	-0.22*
Dependence	7.7	(0.7)	6.4	(0.5)	-1.3

Note: Table values are percentages except for average number of consequences and average days lost which are mean values. Standard errors are in parentheses.

[a]One or more occurrences of any of the items in the set.

*Comparisons between 1985 and 1988 are statistically significant at the 95 percent confidence level.

Table 7.2 Alcohol Use Negative Effects by Service, 1985 and 1988

Indicator	Service							
	Army		Navy		Marine Corps		Air Force	
	1985	1988	1985	1988	1985	1988	1985	1988
Serious Consequences								
Received UCMJ Punishment	2.4 (0.4)	2.3 (0.4)	2.7 (0.7)	1.9 (0.6)	2.8 (0.6)	2.2 (0.5)	1.6 (0.3)	1.0 (0.2)
Loss of 3 or more work days	4.7 (1.3)	2.8 (0.3)	5.8 (1.3)	3.6 (0.8)	4.8 (1.9)	6.4 (2.3)	1.6 (0.3)	1.1 (0.2)
Illness kept from duty > 1 week	1.5 (0.5)	0.5 (0.2)	0.3 (0.1)	0.6 (0.2)	1.1 (0.6)	0.3 (0.1)	0.3 (0.1)	0.3 (0.2)
Spouse left	1.4 (0.3)	0.4 (0.1)*	0.2 (0.1)	0.4 (0.2)	1.3 (0.7)	0.2 (0.1)	0.2 (0.1)	0.1 (**)
Arrested for driving while intoxicated	2.3 (0.5)	2.5 (0.4)	2.4 (0.3)	2.9 (0.7)	3.4 (1.0)	2.0 (0.4)	1.4 (0.3)	1.1 (0.2)
Arrested, non-driving incident	1.9 (0.5)	1.8 (0.4)	1.3 (0.4)	1.5 (0.4)	3.0 (0.7)	2.0 (0.4)	0.8 (0.2)	0.5 (0.1)
Incarcerated	1.7 (0.3)	1.1 (0.3)	1.7 (0.4)	1.3 (0.2)	2.7 (0.6)	2.6 (1.0)	0.9 (0.2)	0.7 (0.2)
Fights	4.6 (1.5)	3.9 (0.6)	3.8 (0.9)	3.0 (0.7)	3.2 (1.2)	7.6 (2.1)	1.0 (0.2)	1.1 (0.3)
Did not get promoted	2.7 (1.0)	0.9 (0.2)	1.1 (0.5)	0.6 (0.1)	1.9 (0.7)	1.8 (0.4)	0.7 (0.2)	0.4 (0.2)
Entered rehabilitation or treatment program	1.1 (0.2)	0.7 (0.2)	0.5 (0.2)	0.8 (0.2)	1.1 (0.5)	1.2 (0.3)	0.4 (0.1)	0.4 (0.2)
Any serious consequences[a]	13.5 (2.0)	10.3 (0.8)	13.5 (2.0)	10.4 (1.5)	12.3 (1.7)	17.0 (3.4)	4.7 (0.5)	3.9 (0.5)
Productivity Loss	27.2 (1.3)	22.0 (1.0)*	35.5 (2.4)	26.4 (3.1)*	29.0 (5.0)	32.0 (3.8)	19.4 (1.1)	15.5 (0.8)*
Dependence	12.1 (1.5)	7.2 (0.6)*	6.8 (0.8)	7.2 (1.3)	7.6 (1.4)	9.8 (1.7)	3.3 (0.5)	3.8 (0.4)

Note: Tables values are percentages with standard errors in parentheses.

[a]One or more occurrences of the items noted above.

*Comparisons between 1985 and 1988 are statistically significant at the 95 percent confidence level.

**Estimate rounds to zero.

reduction in productivity loss noted for total DoD in Table 7.1 holds for Army, Navy, and Air Force but not for the Marines. Although there was no overall reduction in dependence for DoD, Army personnel show a substantial and significant reduction in alcohol dependence from 12.1 percent in 1985 to 7.2 percent in 1988.

Examination of Table 7.2 also shows that in 1988 the Marines were at the highest level on the three summary measures (17.0 percent serious consequences, 32.0 percent productivity loss, and 9.8 percent dependence), the Army and Navy were approximately the same at the next level (10.3 percent serious consequences, 22.0 to 26.4 percent productivity loss, and 7.2 percent dependence), and the Air Force was at the lowest level (3.9 percent serious consequence, 15.5 percent productivity loss, and 3.8 percent dependence). Thus, although there has been progress since 1985, substantial negative effects due to alcohol use still occur.

2. Pay Grade Differences

Because, as shown previously, those in the lower pay grades are more likely to drink heavily, a similar distribution might be expected for negative effects. As Table 7.3 and Figure 7.4 indicate, there is considerable variation in the problems reported by individuals in different pay grades. The highest levels of serious consequences, productivity loss, and dependence consistently occur in the lowest pay grades, E1 to E3. Generally, those in higher pay grades have fewer alcohol negative effects for serious consequences, productivity loss, and dependence, with those in the highest pay grades, 04 to 010, having the lowest prevalences. For DoD 17.5 percent of junior enlisted personnel but only 1 percent of senior officers report the occurrence of serious consequences. For productivity loss, 32.6 percent of E1-E3s report a problem compared with 10.5 percent of 04-010s. The level of dependence is 13.4 percent for E1-E3s, and 0.7 percent for 04-010s. The pattern observed for total DoD occurs for all of the Services.

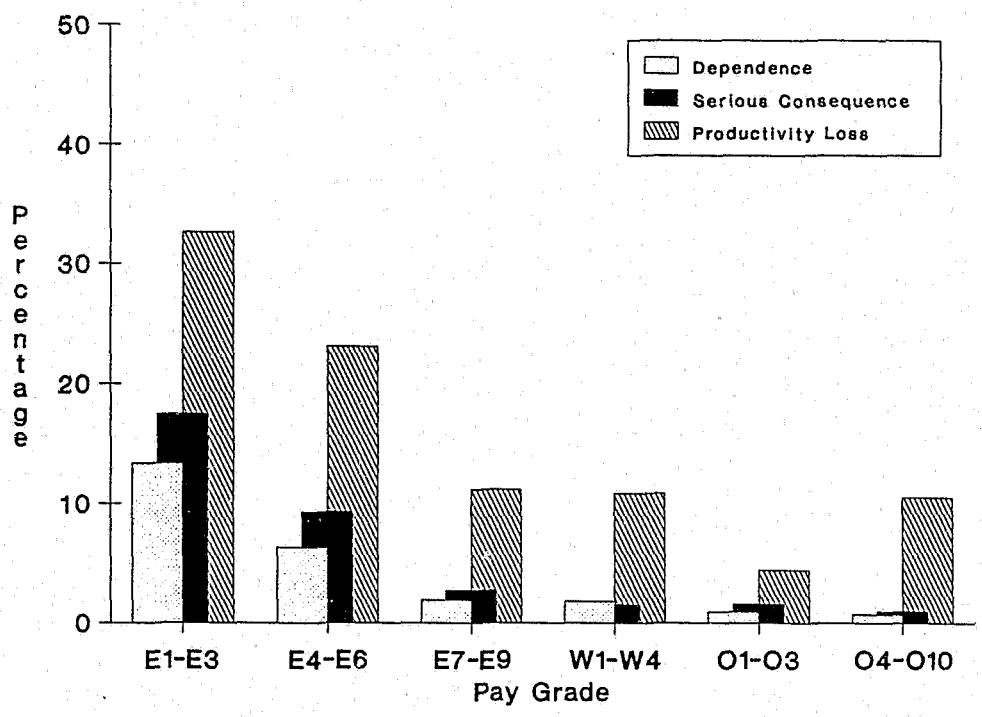
In view of the high rates of problems among E1-E3s, Service comparisons are shown in Figure 7.5. Over a third of E1-E3s in the Army, Navy, and Marines and about a fourth of those in the Air Force report productivity loss. About a fifth of E1-E3s in the Army and Navy, a fourth of those in

Table 7.3. Alcohol Use Negative Effects by Pay Grade

Measure/Pay Grade	Service				Total DoD
	Army	Navy	Marine Corps	Air Force	
Serious Consequences					
E1-E3	21.2 (2.7)	18.4 (2.8)	26.6 (6.6)	8.2 (1.8)	17.5 (1.8)
E4-E6	11.3 (0.8)	10.8 (1.6)	15.5 (1.8)	3.9 (0.5)	9.3 (0.7)
E7-E9	3.8 (0.6)	2.5 (0.6)	3.2 (1.0)	1.6 (0.3)	2.7 (0.3)
W1-W4	1.6 (0.6)	1.3 (0.8)	1.2 (1.2)	* (*)	1.5 (0.5)
O1-O3	2.1 (0.6)	3.3 (1.3)	1.6 (0.9)	0.3 (0.3)	1.6 (0.4)
O4-O10	0.3 (0.3)	2.0 (0.9)	0.5 (0.6)	0.9 (0.4)	1.0 (0.3)
Productivity Loss					
E1-E3	33.9 (2.2)	35.0 (4.2)	40.7 (5.3)	24.5 (1.5)	32.8 (1.7)
E4-E6	24.6 (1.4)	27.8 (3.7)	32.6 (2.6)	14.4 (1.3)	23.1 (1.5)
E7-E9	10.9 (1.0)	13.2 (0.9)	10.6 (1.1)	10.0 (0.9)	11.2 (0.6)
W1-W4	9.6 (2.2)	13.0 (2.3)	18.7 (2.7)	* (*)	10.9 (1.7)
O1-O3	11.7 (1.7)	19.2 (4.4)	20.6 (7.1)	12.7 (0.9)	14.4 (1.3)
O4-O10	8.3 (2.2)	13.7 (3.5)	11.2 (2.2)	10.3 (1.0)	10.5 (1.2)
Dependence					
E1-E3	19.7 (2.2)	12.2 (2.0)	15.8 (1.2)	7.4 (1.2)	13.4 (0.9)
E4-E6	6.7 (0.5)	7.7 (1.4)	7.7 (2.2)	3.9 (0.5)	6.3 (0.5)
E7-E9	2.0 (0.4)	2.1 (0.3)	2.8 (1.1)	1.4 (0.3)	1.9 (0.2)
W1-W4	1.7 (0.8)	2.3 (0.9)	1.2 (1.2)	* (*)	1.8 (0.7)
O1-O3	0.9 (0.3)	1.5 (1.1)	1.3 (0.9)	0.4 (0.2)	0.9 (0.3)
O4-O10	0.3 (0.2)	0.6 (0.3)	2.0 (1.0)	1.0 (0.7)	0.7 (0.3)

Note: Tabled values are percentages of all personnel with standard errors in parentheses.
*There are no warrant officers in the Air Force.

Figure 7.4. Alcohol Use Negative Effects by Pay Grade, Total DoD

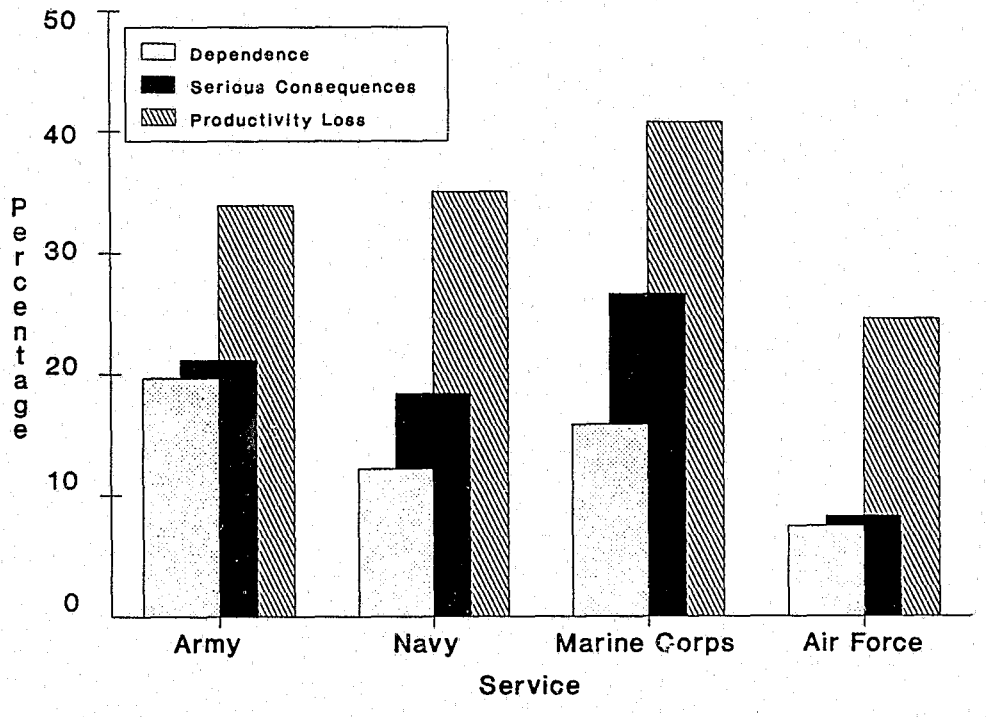


the Marines, and a tenth of those in the Air Force report serious consequences. Finally, from 12 to 20 percent of E1-E3s in the Army, Navy, and Marines experience dependence along with 7 percent for Air Force. Since junior enlisted personnel comprise a substantial segment of the military personnel, these large rates of negative effects show that there is still much work to be done to reduce alcohol problems.

3. Drinking Levels and Serious Consequences

It is clear from the preceding sections that negative effects of alcohol use remain a substantial problem for the military. To better understand the influence of drinking levels on service consequences, we conducted a regression analysis predicting the number of serious consequences of alcohol use after controlling for other sociodemographic and psychological/behavioral variables.

Figure 7.5. Alcohol Use Negative Effects for E1-E3s by Service



Independent variables in the regression model were Service, race/ethnicity, sex, education, family status, region, pay grade, age, age of first regular use of alcohol, reported stress at work, drinking motivation, drinking climate, drinking attitudes, beliefs about heavy drinking, and drinking levels. Definitions of these variables are given in chapters 2, 4, and Appendix E.

The dependent variable for the analysis was the number of reported serious consequences occurring during the past 12 months attributed to alcohol consumption. Thus this measure is a count of the number of occurrences of each of the 10 events noted in Table 7.1. Because negative effects apply only to those who drink, abstainers were excluded, and the analysis was based on 13,856 cases.

Table 7.4 presents the parameter estimates of the regression model for predicting the number of serious consequences. The R^2 for the model was .177, which was significant at the .001 level. The analysis showed significant effects for Service, sex, family status, region, pay grade, age at first regular use of alcohol, drinking motivation, drinking attitudes, beliefs about heavy drinking, and drinking levels.

Because the primary focus of the analysis is on the effects of drinking levels while controlling for effects of other variables, only the effects of drinking levels will be discussed. The regression analysis indicates that drinking levels is one of the most important predictors in the model, and heavy drinking shows significantly more serious consequences than infrequent/light drinking.

The relationship of drinking levels to serious consequences can be seen more clearly in Table 7.5 which shows the adjusted means of alcohol use serious consequences for drinking levels. As shown, there were 1.50 serious consequences during the past 12 months for heavy drinkers on average compared with .68 serious consequences for infrequent/light drinkers. This very strong effect shows the expected association of negative consequences to drinking levels.

The analysis also shows that moderate drinkers experience significantly fewer consequences (.40) than infrequent/light drinkers (.68). This somewhat surprising finding may result from the two groups' differing levels of

Table 7.4. Predicting Alcohol Use Serious Consequences

Independent Variables	Number of Serious Consequences Regression Parameters
Service	
Army versus Air Force	.1643**
Navy versus Air Force	.2111**
Marine Corps versus Air Force	.5713***
Race/Ethnicity	
Black versus White	-.0347
Hispanic versus White	-.0722
Other versus White	-.1662
Sex	
Male versus Female	.2549***
Education	
High School or Less versus Beyond High School	-.0143
Family Status	
Single versus Married, spouse present	.3401***
Married, spouse not present versus Married, spouse present	.3001*
Region	
Americas versus Europe	.0290
North Pacific versus Europe	-.2142**
Other Pacific versus Europe	-.0675
Pay Grade	
E1-E3 versus 04-010	.1863
E4-E6 versus 04-010	.0963
E7-E9 versus 04-010	-.0776
W1-W4 versus 04-010	-.1487*
01-03 versus 04-010	-.0990
Age	.0057
Age of 1st Regular Use of Alcohol	-.0295*
Drinking Motivation	.8531***
Drinking Climate	.0154
Drinking Attitudes	.0287***
Beliefs About Heavy Drinking	-.0144**
Reported Stress at Work	.0525
Drinking Level	
Heavy versus Infrequent/Light	.8201***
Moderate/Heavy versus Infrequent Light	-.1629
Moderate versus Infrequent/Light	-.2796***

Note: Entries are regression parameters that indicate effects of the tabled variables on the number of serious consequences experienced during the past 12 months.

*p<.05. **p<.01. ***p<.001.

alcohol tolerance and drinking experience. Moderate drinkers may be better able than infrequent/light drinkers to drink more than usual at social functions and to handle the effects.

These findings suggest that education and prevention programs should target all drinkers because most experience some negative effects. Education efforts for the smaller number of heavy drinkers, however, should also have a high impact because heavy drinkers experience many alcohol negative effects.

C. Negative Effects of Drug Use

This section examines negative effects due to drug use. It first examines trends in negative effects and contrasts findings from the 1980 survey to the 1988 survey. It next considers negative effects as a function of pay grade and then examines the relationship between negative effects and drug use patterns.

Table 7.5. Adjusted Means of Alcohol Use Serious Consequences for Different Drinking Levels

Drinking Level	Serious Consequences
Infrequent/Light	0.68 (.077)
Moderate	0.40[b] (.030)
Moderate/Heavy	0.52 (.038)
Heavy	1.50a (.140)

Note: Entries are mean scores of drinking levels for serious consequences that have been adjusted for effects of all other variables in the model. Standard errors are in parentheses.

[a]Significantly higher than infrequent/light drinkers.

[b]Significantly lower than infrequent/light drinkers.

1. Trends in Negative Effects

Drug-related negative effects decreased significantly since 1980. In 1980, 13.3 percent of military personnel reported a serious consequence associated with drug use, and this declined to 1.8 percent in 1988. In 1980 14.4 percent of personnel indicated some productivity loss due to drug use, and this declined to 2.1 percent in 1988. Figures 7.6 and 7.7 (see also Tables D.1--D.4) show the patterns of drug-related negative effects for the Services. As shown, the Services all show significant declining patterns from 1980 to 1988 for both indicators. For the serious consequences, the Army declined from 14.4 percent in 1980 to 1.0 percent in 1988, the Navy from 17.2 percent in 1980 to 2.4 percent in 1988, the Marines from 19.4 percent in 1980 to 1.9 percent in 1988, and the Air Force from 6.1 percent in 1980 to 0.3 percent in 1988. For productivity loss the Army declined from 15.7 percent in 1980 to 2.4 percent in 1988, the Navy from 18.8 percent in 1980 to 3.1 percent in 1988, the Marines from 20.8 percent in 1980 to 3.0 percent in 1988, and the Air Force from 6.4 percent in 1980 to 0.4 percent in 1988. These data indicate that all of the Services have made impressive progress in reducing the negative effects due to drug use among military personnel.

The prevalence of negative effects associated with drug use is much lower than the prevalence of negative effects from alcohol use, as shown in Table 7.6. The most common serious consequence is receiving UCMJ punishment, but only 1.1 percent reported this effect. As with the results for alcohol negative effects, the most frequently occurring negative effect of drug use is productivity loss. In 1988, over one-fifth of the respondents reported productivity loss due to alcohol use, but only 2.1 percent of respondents reported productivity loss due to drug use. The average reported productivity loss was less than one-tenth of a day. In a unit of 100 persons, 7 person days of effort would be lost in a year due to drug use.

The prevalence of any serious consequences is even lower than that for productivity loss. The average number of serious consequences reported was .04. This means that in a 100-person unit during a single year, two individuals are expected to experience four serious consequences due to drug use.

Figure 7.6. Drug-Related Serious Consequences by Service, 1980-88

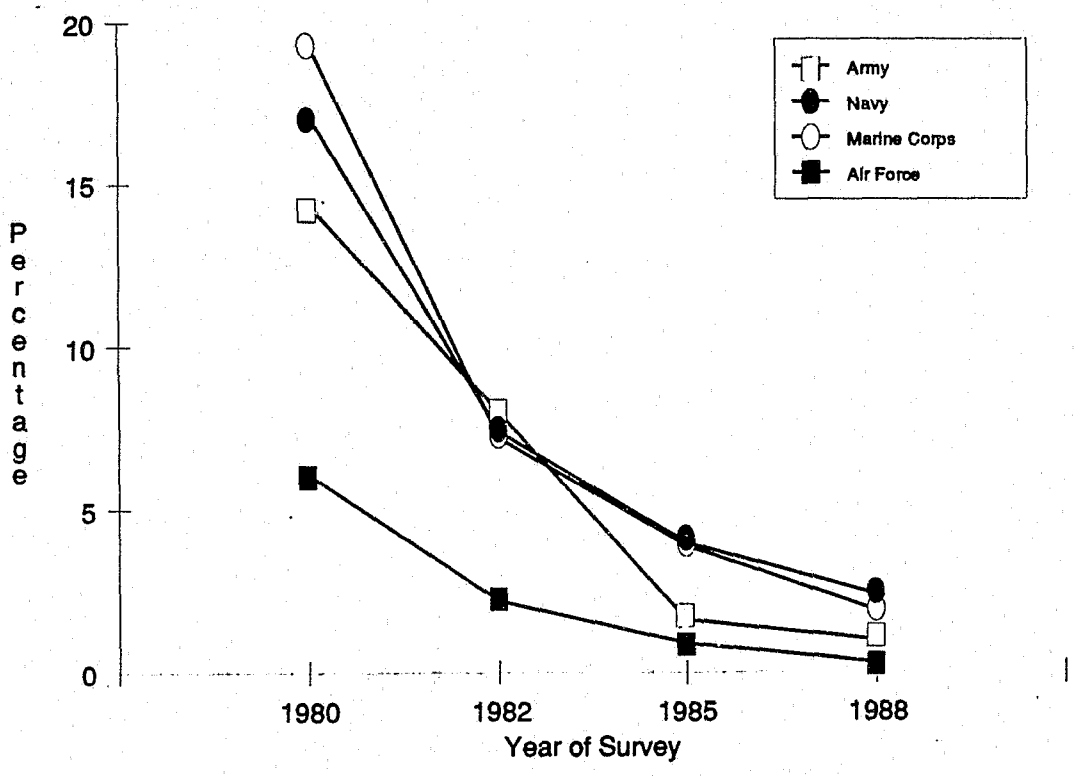
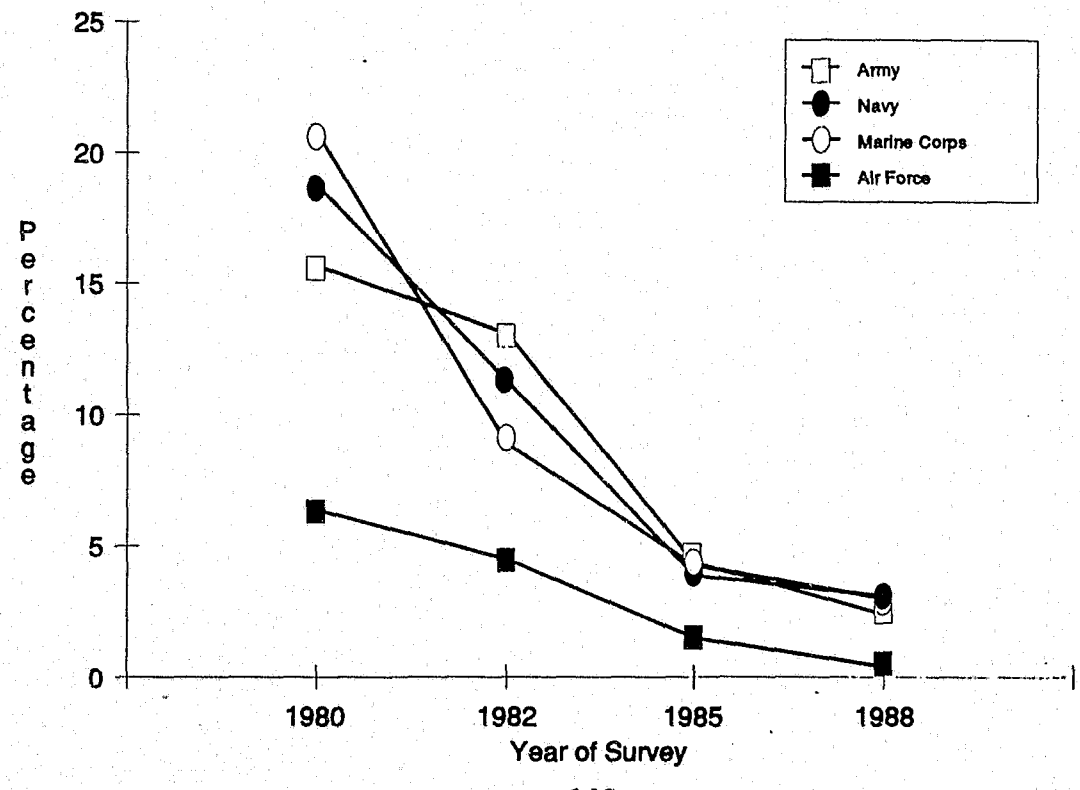


Figure 7.7. Drug-Related Productivity Loss by Service, 1980-88



Although all of our measures show a declining pattern from 1985 to 1988, only four of these changes are statistically significant: 3 or more lost work days, illness that kept from duty 1 week or more, hurt in an

Table 7.6. Drug Use Negative Effects, 1985 and 1988 - Total DoD

Indicator	Year of Survey 1985	1988	85-88 Change
Serious Consequences			
Received UCMJ punishment	1.4 (0.2)	1.1 (0.2)	-0.3
Loss of 3 or more work days	1.2 (0.2)	0.5 (0.1)	-0.7*
Illness kept from duty 1 week or more	0.3 (0.1)	0.1 (**)	-0.2*
Hurt in accident	0.3 (0.1)	0.1 (**)	-0.2*
Spouse left	0.3 (0.1)	0.1 (0.1)	-0.2
Arrested for driving while intoxicated	0.2 (0.1)	0.2 (0.1)	0.0
Arrested for nondriving incident	0.3 (0.1)	0.2 (**)	-0.1
Incarcerated	0.3 (0.1)	0.2 (0.1)	-0.1
Fights	0.4 (0.2)	0.2 (0.1)	-0.2
Did not get promoted	1.1 (0.3)	0.7 (0.2)	-0.4
Entered rehabilitation or treatment program	0.3 (0.2)	0.1 (0.1)	-0.2
Any serious consequences[a]	3.0 (0.4)	1.8 (0.2)	-1.2*
Average number of consequences	0.06 (**)	0.04(**)	-0.02
Productivity Loss			
Any time lost	3.4 (0.6)	2.1 (0.4)	-1.3
Average days lost	0.2 (**)	0.07(**)	-.13

Note: Tables values are percentages with standard errors in parentheses.

[a]One or more occurrences of the items listed above.

*Comparisons between 1985 and 1988 are statistically significant at the 95 percent confidence level.

**Estimate rounds to zero.

accident, and the total of any serious consequences. The last measure declined from 3.0 percent in 1985 to 1.8 percent in 1988.

Table 7.7 presents data parallel to Table 7.6 for the Services. As shown, estimates of problems are very low, and few significant reductions occurred among the Services between 1985 and 1988. The Army and the Air Force showed significant reductions in the percentage losing 3 or more work days due to drug use, and the Army showed a significant reduction in the percentage of arrests for nondriving incidents due to drugs. In addition, the Air Force showed a significant reduction between 1985 (0.9 percent) and 1988 (0.3 percent) for any serious consequences, and the Army showed a significant decrease in productivity loss from 4.4 percent to 2.4 percent in the same period.

2. Pay Grade Differences

Table 7.8 shows how negative effects of drug use are distributed across pay grade for total DoD and for the four Services. Figure 7.8 illustrates the pattern for total DoD. The results for total DoD show that drug use negative effects occur primarily among junior enlisted personnel in pay grades E1 to E3. For both measures of serious consequences and productivity loss, 5.0 percent of E1-E3s report negative effects, E4-E6s show the next highest level of effects, and the remaining pay grades show only traces of any effects. This pattern for DoD holds for the Services.

Drug use negative effects among E1-E3s are shown for the Services in Figure 7.9. Among E1-E3s the largest percentages of serious consequences and productivity loss, respectively, occur among E1-E3s in the Army (9.9 percent; 8.3 percent) and Navy (6.2 percent; 7.7 percent). Rates are lower in the Marines and Air Force. The concentration of negative consequences among the lower pay grades is consistent with earlier findings that the largest amount of drug use occurs among junior enlisted personnel.

3. Drug Use Patterns and Serious Consequences

To better understand the influence of drug use behavior on serious consequences, we conducted a regression analysis predicting the number of serious consequences of drug use after controlling for other sociodemographic and psychological/behavioral variables.

Table 7.7. Drug Use Negative Effects by Service, 1985 and 1988

Indicator	Service							
	Army		Navy		Marine Corps		Air Force	
	1985	1988	1985	1988	1985	1988	1985	1988
Serious Consequences								
Received UCMJ Punishment	1.9 (0.4)	1.6 (0.3)	1.9 (0.5)	1.6 (0.6)	1.4 (0.6)	1.1 (0.2)	0.4 (0.2)	0.1 (0.1)
Loss of 3 or more work days	2.0 (0.5)	0.6 (0.2)*	1.2 (0.3)	0.8 (0.2)	0.3 (0.2)	0.7 (0.4)	0.4 (0.1)	0.1 (0.1)*
Illness kept from duty 1 week or more	0.4 (0.2)	0.2 (0.1)	** (**)	** (**)	0.9 (0.6)	0.1 (0.1)	0.1 (**)	** (**)
Hurt in accident	0.5 (0.3)	0.3 (0.1)	0.3 (0.2)	** (**)	0.3 (0.2)	0.1 (0.1)	0.1 (**)	** (**)
Spouse left	0.4 (0.2)	0.2 (0.1)	0.1 (0.1)	0.2 (0.2)	0.8 (0.7)	0.1 (**)	0.1 (**)	** (**)
Arrested for driving while intoxicated	0.4 (0.1)	0.3 (0.1)	0.1 (0.1)	0.1 (**)	0.3 (0.2)	0.1 (0.1)	0.1 (**)	** (**)
Arrested for non-driving incident	0.6 (0.1)	0.3 (0.1)*	** (**)	0.3 (0.2)	0.5 (0.2)	0.2 (0.1)	0.1 (**)	0.2 (0.1)
Incarcerated	0.5 (0.2)	0.3 (0.2)	0.2 (0.1)	0.3 (0.2)	0.5 (0.2)	0.2 (**)	** (**)	0.1 (**)
Fights	0.6 (0.4)	0.3 (0.1)	0.7 (0.5)	0.3 (0.2)	0.5 (0.2)	0.1 (0.1)	0.1 (**)	** (**)
Did not get promoted	1.4 (0.3)	0.9 (0.4)	1.0 (0.4)	1.1 (0.4)	2.7 (2.3)	0.4 (0.2)	0.2 (0.1)	0.1 (0.1)
Entered rehabilitation or treatment program	0.4 (0.2)	0.2 (0.1)	0.7 (0.5)	0.2 (0.2)	0.3 (0.2)	0.1 (0.1)	** (**)	** (**)
Any serious consequences[a]	3.9 (0.7)	2.7 (0.4)	4.0 (1.0)	2.4 (0.5)	3.9 (2.2)	1.9 (0.5)	0.9 (0.2)	0.3 (0.1)*
Productivity loss	4.4 (0.8)	2.4 (0.4)*	3.9 (1.1)	3.1 (1.3)	4.3 (3.0)	3.0 (0.9)	1.5 (0.7)	0.4 (0.1)

Note: Tabled values are percentages with standard errors in parentheses.

[a]One or more occurrences of items listed above.

*Comparisons between 1985 and 1988 are statistically significant at the 95 percent confidence level.

**Estimate rounds to zero.

Figure 7.8. Drug Use Negative Effects by Pay Grade, Total DoD, 1980-88

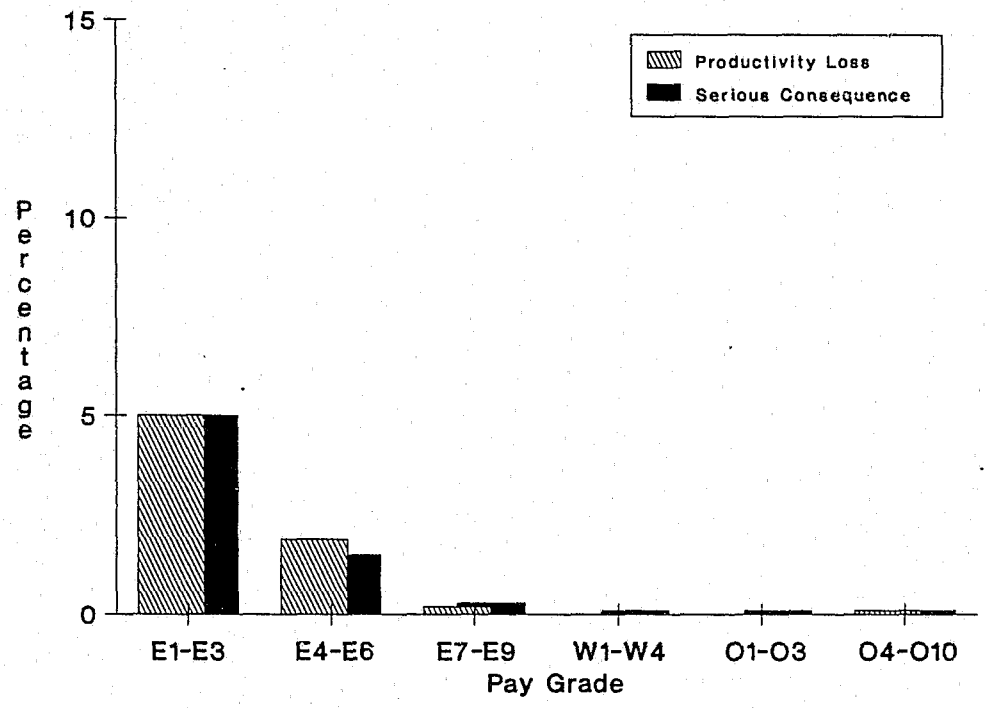


Table 7.8. Drug Use Negative Effects by Pay Grade

Negative Effect/ Pay Grade	Service								Total DoD	
	Army		Navy		Marine Corps		Air Force			
Serious Consequences										
E1-E3	9.9	(2.0)	6.2	(1.3)	3.4	(0.6)	0.3	(0.2)	5.0	(0.7)
E4-E6	1.9	(0.3)	1.9	(0.4)	1.4	(0.5)	0.5	(0.2)	1.5	(0.2)
E7-E9	0.4	(0.1)	0.3	(0.1)	0.3	(0.3)	**	(**)	0.3	(0.1)
W1-W4	0.1	(0.1)	**	(**)	**	(**)	*	(*)	0.1	(0.1)
O1-O3	0.2	(0.2)	**	(**)	**	(**)	**	(**)	0.1	(0.1)
O4-O10	0.1	(0.1)	0.3	(0.3)	**	(**)	**	(**)	0.1	(0.1)
Productivity Loss										
E1-E3	8.3	(2.4)	7.7	(3.2)	3.6	(0.6)	0.3	(0.2)	5.0	(1.3)
E4-E6	1.9	(0.4)	2.7	(0.8)	4.0	(2.0)	0.6	(0.2)	1.9	(0.3)
E7-E9	0.2	(0.1)	0.2	(0.1)	0.3	(0.3)	0.1	(0.1)	0.2	(0.1)
W1-W4	**	(**)	**	(**)	**	(**)	*	(*)	**	(**)
O1-O3	**	(**)	**	(**)	**	(**)	**	(**)	**	(**)
O4-O10	0.1	(0.2)	0.3	(0.3)	**	(**)	**	(**)	0.1	(0.1)

Note: Tabled values are percentages of all personnel with standard errors in parentheses.

*There are no warrant officers in the Air Force.

**Estimate rounds to zero.

Independent variables in the regression model were Service, race/ethnicity, sex, education, family status, region, pay grade, age, age of first regular use of marijuana, reported stress at work, beliefs about the harmful effects of drugs, drug treatment climate, attitudes toward marijuana use, and drug use pattern. Definitions of these variables are given in chapters 2, 5, and Appendix E.

The dependent variable for the analysis was the number of reported serious consequences occurring during the past 12 months due to drug use. Thus this measure is a count of the number of occurrences of each of the 11 events noted in Table 7.6. Because negative effects apply only to those who use drugs, nonusers were excluded and the analysis was based on a sample of 697 cases.

Table 7.9 presents the parameter estimates of the regression model for predicting number of serious consequences. The R^2 for the model was .115, which was significant at the .001 level. The analysis showed significant effects for age at first regular use of marijuana, beliefs about harmful effects of drugs, and drug use pattern.

Figure 7.9. Drug Use Negative Effects for E1-E3s by Service, 1980-88

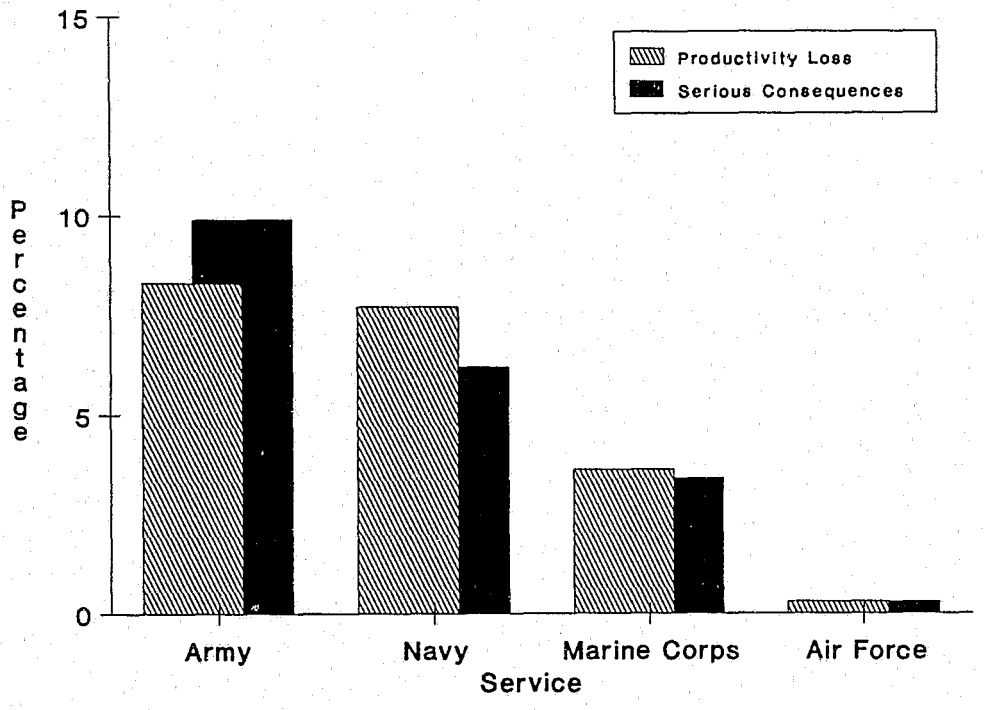


Table 7.9. Predicting Serious Consequences due to Drug Use

Independent Variables	Number of Serious Consequences Regression Parameters
Service	
Army versus Air Force	.0585
Navy versus Air Force	.1103
Marine Corps versus Air Force	.3352
Race/Ethnicity	
Black versus White	.1187
Hispanic versus White	.6985
Other versus White	1.1308
Sex	
Male versus Female	.2237
Education	
High School or Less versus Beyond High School	.0101
Family Status	
Single versus Married, spouse present	.2190
Married, spouse not present versus Married, spouse present	.1204
Region	
Americas versus Europe	-.0810
North Pacific versus Europe	.0866
Other Pacific versus Europe	-.1395
Pay Grade	
E1-E3 versus E7-E9	-.5634
E4-E6 versus E7-E9	-.7389
Age	-.0149
Age of 1st Regular Use of Marijuana	-.1516*
Reported Stress at Work	-.0294
Beliefs About Harmful Effects of Drugs	-.0886**
Drug Treatment Climate	.0156
Attitudes toward Marijuana Use	-.0073
Drug Use Pattern	
Marijuana Use versus Other Drug Use	-.7472***

Note: Entries are regression parameters that effects of the tabled variables on the number of serious conseqeunces experienced during the past 12 months.

*p<.05. **p<.01. ***p<.001.

Because the primary focus of the analysis is on the effects of drug use levels while controlling for effects of other variables, only the effects of drug use level will be discussed. The regression analysis indicates that drug use level is one of the most important predictors in the model, and drug use other than marijuana only shows significantly more serious consequences than marijuana only use.

The relationship of drug use category to serious consequences can be seen more clearly in Table 7.10 which shows the adjusted means of drug use serious consequences for use of marijuana only and any other use. As shown, those in the latter category experienced an average of 1.18 serious consequences during the past 12 months compared with .43 serious consequences for marijuana only users. This is a very strong effect and shows the expected association of an increased number of negative effects with heavier drug use.

Drug use in the military remains a problem due to its illegal status. Aside from illegality, these data show that serious negative consequences are strongly associated with drug use and, particularly, with heavier levels of use. This suggests that prevention efforts should continue to emphasize the undesirable negative consequences of drug use as well as its unacceptability and illegal status.

D. Substance Use and General Negative Behaviors

So far we have discussed whether respondents believed that they experienced negative effects as a result of their use of alcohol or drugs. Although this approach is useful, some individuals may look for reasons to explain away their negative behavior and attribute it to alcohol or drug use. An alternative approach to examining negative effects and alcohol and drug use is to ask respondents about negative events that happen to them without any attribution as to the reason and then to test for an association of these events and substance use.

In the current survey, there were items in the beginning of the questionnaire about the frequency with which a series of negative events may have happened to respondents (see questions 15 and 16 in Appendix F). These items appeared before any questions about substance use behavior or about negative events attributed to substance use. Their placement thus

Table 7.10. Adjusted Means of Drug Use Serious Consequences for Drug Use Categories

Drug Use Category	Serious Consequences
Marijuana only	.43 (.158)
Any other use	1.18[a] (.167)

Note: Entries are drug use mean scores for serious consequences that have been adjusted for effects of all other variables in the regression model. Higher scores indicate occurrence of more serious consequences.

[a]Significantly higher than marijuana only users.

minimized any association of the answers to substance use questions and reports of negative behaviors.

To test for the relationship of alcohol and drug use patterns on negative behaviors, a regression analysis was conducted predicting the number of general negative behaviors controlling for effects of other variables. The dependent variable for the analysis was an index of general negative behaviors constructed by summing the counts of unattributed negative occurrences during the past 12 months. The analysis was based on the total sample of 18,473 respondents who had complete data on the independent and dependent variables.

Independent variables in the regression model were Service, race/ethnicity, sex, education, family status, region, pay grade, age, reported stress at work, drinking levels, and drug use pattern.

Table 7.11 presents the parameter estimates of the regression model for predicting the number of general negative behaviors. The R^2 for the model was .188, which was significant at the .001 level. The analysis showed significant effects for Service, race/ethnicity, sex, pay grade, age, reported stress at work, drinking levels, and drug use pattern. Because the primary focus of the analysis is on the effects of drinking levels and drug use patterns while controlling for effects of other variables, only the effects of drinking level and drug use patterns will be discussed.

Table 7.11. Predicting General Negative Behaviors

Independent Variables	General Negative Behaviors Parameter Estimate
Service	
Army versus Air Force	.8527***
Navy versus Air Force	.8680***
Marine Corps versus Air Force	1.1742**
Race/Ethnicity	
Black versus White	.8191***
Hispanic versus White	.3655
Other versus White	.2869
Sex	
Male versus Female	-.4475*
Education	
High School or Less versus Beyond High School	-.0223
Family Status	
Single versus married, spouse present	.0978
Married, spouse not present versus married, spouse present	.1498
Region	
Americas versus Europe	-.1346
North Pacific versus Europe	-.4882
Other Pacific versus Europe	-.1132
Pay Grade	
E1-E3 versus Ø4-Ø1Ø	2.43Ø2***
E4-E6 versus Ø4-Ø1Ø	1.743Ø***
E7-E9 versus Ø4-Ø1Ø	.8599***
W1-W4 versus Ø4-Ø1Ø	.Ø5Ø2
Ø1-Ø3 versus Ø4-Ø1Ø	-.3Ø68
Age	-.Ø393***
Reported Stress at Work	2.Ø417***
Drinking Level	
Heavy versus Abstainer	2.2791***
Moderate/Heavy versus Abstainer	.8537**
Moderate versus Abstainer	.4384*
Infrequent/Light versus Abstainer	.5170*
Drug Use Pattern	
Marijuana Only versus Non-Use	.9752*
Other Use versus Non-Use	3.8Ø93***

Note: Entries are regression parameters that indicate effects of the tabled variables on the number of general negative behaviors during experienced during the past 12 months.

*p <.Ø5 **p <.Ø1 ***p <.ØØ1

The relationship of drinking levels and drug use pattern to general negative consequences can be seen more clearly in Table 7.12 which shows the adjusted means of general negative behaviors for different drinking levels and drug use patterns. As shown, higher levels of drinking and drug use are associated with significantly higher levels of general negative behaviors. Heavy drinkers experienced an average of 6.71 negative behaviors, and abstainers experienced only 4.43. Drug users also reported significantly more negative behaviors than nonusers. Marijuana only users experienced an average of 5.78 negative behaviors and users of other drugs experienced 8.62 negative behaviors compared with nonusers who experienced an average of 4.81 negative behaviors.

These observed effects are very strong and show that the higher the amount of substance use, the greater the number of negative behaviors. However, it is also clear that alcohol abstainers and nonusers of drugs also experience many negative behaviors. This analysis supports the earlier analyses that examined negative behaviors attributed to alcohol and drug use and suggests that prevention and education programs should be directed toward heavy drinkers and drug users.

E. Summary

This chapter has examined the negative effects associated with alcohol use and drug use. Trends in use since 1980 have been noted, and comparisons have been made between 1985 and 1988. Analyses examined negative behaviors attributed to alcohol and drug use, and general negative behaviors not attributed to alcohol and drug use.

1. Alcohol Use Negative Effects

Alcohol use negative effects were measured in terms of any serious consequences, productivity loss, and dependence.

- Alcohol-related negative effects have declined significantly since 1980. In 1988, 9.0 percent of all military personnel reported serious consequences, 22.1 percent productivity loss, and 6.4 percent alcohol dependence. Between 1985 and 1988 all three measures showed a declining pattern, but only the decrease in productivity loss was statistically significant. Similar changes appeared for the Services.

Table 7.12. Adjusted Means of General Negative Behaviors for Different Drinking Levels and Drug Use Categories

Substance	General Negative Behaviors
Drinking Level	
Abstainer	4.43 (.144)
Infrequent/Light	4.95 (.116)
Moderate	4.87[a] (.104)
Moderate/Heavy	5.29[a] (.165)
Heavy	6.71[a] (.335)
Drug Use Category	
No use	4.81 (.071)
Marijuana only	5.78[b] (.377)
Any other use	8.62[b] (.412)

Note: Entries are mean scores with standard errors in parentheses of the number of occurrences of general negative behaviors that have been adjusted for effects of all other variables in the regression model.

[a]Significantly greater than abstainers.

[b]Significantly greater than nonusers.

- Alcohol-related serious consequences, productivity loss, and dependence are substantially higher among E1-E3 pay grades; for any serious consequences and dependence, rates for E1-E3s are almost twice as high as E4-E6s and for productivity loss, about 10 percentage points higher.
- Drinking levels are positively related to serious consequences. Heavy drinkers report the most consequences, and infrequent light drinkers report the fewest.

2. Drug Use Negative Effects

Negative effects of drug use were measured by serious consequences and productivity loss.

- Drug-related negative effects have decreased significantly since 1980. In 1988, 1.8 percent of all military personnel reported a serious negative effect associated with drug use and 2.1 percent an instance of productivity loss. The decreases in any serious consequences between 1985 and 1988 were statistically significant.

- Drug-related negative effects are several times higher among E1s to E3s than E4s to E6s and minimal among the other pay grades.

- Drug use patterns are positively related to serious consequences. Users of drugs other than or in addition to marijuana report significantly more serious consequences than users of marijuana only.

3. Substance Use and General Negative Behaviors

An alternate approach to examining negative effects of alcohol and drug use was to ask respondents about negative events that happen to them without any attribution as to the reason and then to test for an association of these events and substance use.

- Increases in drinking and drug use are associated significantly with increases in the occurrence of general negative behaviors. Heavy drinkers experienced an average of 6.71 negative behaviors, and abstainers experienced 4.43 behaviors. Users of other drugs experienced 8.62 negative behaviors, and nonusers experienced 4.81 behaviors.

- The data suggest that heavy drinkers and drug users are important groups to target in education and prevention efforts.

8. SUBSTANCE USE AND HEALTH

The 1988 Worldwide Survey recognizes the importance of substance use and health behaviors for work performance, military readiness, and the overall well-being of military personnel. The use of alcohol, drugs, and tobacco can have substantial negative effects on work performance, health, and social relationships. Poor health practices can also have significant negative effects on productivity at work and health status. Alternatively, good health practices can foster work productivity and sound health. Chapter 7 reported the direct effects of substance use on work performance and social relationships. This chapter examines in more detail the impact of substance use on health and the involvement of military personnel in health practices associated with healthy lifestyles and overall well-being.

A. Prior Studies

Numerous studies have demonstrated the deleterious effects of alcohol, drugs, and tobacco on health. Alcohol, drugs, and tobacco have short- and long-term consequences for health and well-being, including increased risk of unintentional injuries, morbidity, and mortality. Some studies have found a relationship between substance use and involvement in health practices. Those who drink or use drugs or tobacco are more likely than non-users to compromise their health status by not being involved in practices that foster good health. Multifaceted health promotion programs can result in less alcohol, drug, and tobacco use and can foster better health. Prior studies of the relationship of substance use and health, involvement in health practices that support good health, and the effectiveness of health promotion programs are briefly reviewed here.

1. Substance Use and Health

The health risks of alcohol and tobacco have been well documented. Chronic heavy alcohol use, for instance, substantially increases the risk of mortality, morbidity, and unintentional injuries. Alcohol affects almost every organ system in the body, either directly or indirectly: digestive, nervous, endocrine, reproductive, musculo-skeletal, cardiovascular, immune and respiratory. NIAAA (1987) reviewed the current knowledge

about these effects. This knowledge base is still expanding. A multitude of studies have found significantly elevated death rates among alcoholics and heavy drinkers from tuberculosis, cancer, cardiovascular diseases, pneumonia, peptic ulcer, cirrhosis, suicide, and unintentional injuries (Popham, Schmidt and Israelstam, 1985).

Alcohol is estimated to be a factor in 50 percent of accidents involving motor vehicles, 25 percent of fire-related incidents, 40 percent of falls, and 10 to 20 percent of aviation/rail/marine accidents (Trumble and Walsh, 1985). Roizen (1979) reported similar estimates in a review of prior studies. She also estimated that between a third and a half of adult Americans involved in accidents, crimes, and suicides had been drinking alcohol before the event.

The incidence and severity of alcohol-related impairments are related to the amount of alcohol consumed. Research suggests that as little as one-third of an ounce of ethanol in the body can produce performance deficits through its effects on such brain functions as perception, information processing, cognition, and task performance (Moskowitz, 1985).

The health consequences of tobacco use, particularly cigarette smoking, are well known. There are now over 30,000 studies linking cigarette smoking to adverse health consequences. Smoking is strongly associated with increased morbidity and mortality from cardiovascular diseases, various types of cancer, and chronic obstructive lung disease. Smoking is also involved in chronic respiratory diseases, infant health problems, and "passive smoking" effects (U.S. Public Health Service, 1979). Smokeless tobacco is also a significant health risk implicated in oral cancer (Cullen et al., 1986).

Less is known about the effects of drug use on health. Clayton (1984; 1987) reviewed existing research on negative consequences associated with drug use. These include medical emergencies associated with drug overdoses (over 100,000 emergency room episodes per year), drug-related deaths from suicide or accidental overdose (over 7,000 per year), and vehicular accidents. Trumble and Walsh (1985) estimated that drugs were involved in as many as 20 percent of motor vehicle accidents each year. The cocaine epidemic, new knowledge about the effects of drugs on fetal development, and

the role of intravenous drug use in the transmission of AIDS have recently increased concern over the impact of drugs on society (Clayton, 1987).

2. Health Practices

Poor health practices shorten lives and adversely affect both physical and mental health. Belloc and Breslow (1972) and Breslow and Enstrom (1980) conducted a series of studies over a 10-year period that demonstrated that good health practices have an additive effect on health. Those who engaged in more of seven practices were healthier than those who engaged in fewer. These practices were: "having never smoked," "drinking less than 5 drinks at one sitting," "sleeping 7-8 hours per night," "exercising," "maintaining desirable weight for height," "avoiding snacks," and "eating breakfast regularly." Indeed, a number of studies have documented that these behaviors are not independent. Norton and Colliver (1988) find that 14 percent of the U.S. population used alcohol and drugs within the past month, and Istvan and Matarazzo (1984) find moderate to strong relationships between alcohol and tobacco use. The 1985 Worldwide Survey also documents a moderate correlation between use of alcohol, drugs, and cigarettes and the somewhat weaker relationship between substance use and other health practices. Because of the additive effect of substance use and other health practices on health status, and the performance and safety problems posed by joint use of alcohol and drugs, the interrelationship of these substances suggests that many military personnel are affected.

Since the 1979 Surgeon General's Report on Health Promotion and Disease Prevention, these and other health behaviors known to affect morbidity and mortality have been monitored in the U.S. population through two principal surveys--the National Health Interview Survey (National Centers for Health Statistics) and the Behavioral Risk Factors Surveillance Survey (National Centers for Disease Control). Concern about health practices among military personnel is more recent, and trends began to be monitored through the Worldwide Survey series in 1985 and through surveys conducted by the individual Services.

a. Civilian Population. In 1985, a subsample of households participating in the National Health Interview Survey completed a supplement

on Health Promotion and Disease Prevention. Questions were asked about involvement in five health behaviors in addition to smoking and drinking. Each of these behaviors (eating breakfast, snacking between meals, sedentary lifestyle or low physical activity, getting 7 or 8 hours of sleep a night, and obesity) has been linked to health status. Over one-half of U.S. adults eat breakfast, 29 percent do not snack between meals, 40 percent exercise regularly, about two-thirds have adequate sleep each night, and about 24 percent of the population were more than 20 percent over their desired weight. Sex differences on most of these behaviors were small, although women were somewhat less likely to exercise regularly (38 percent) and to be above their desired weight (22 percent). Older persons were more likely to eat breakfast and less likely to eat between meals, less likely to exercise regularly, and more likely to sleep less (NCHS, 1985, 1988).

Trends in health practices in 25 states and the District of Columbia have been monitored since 1981 through the Behavioral Risk Factors Surveillance Survey. Cardiovascular risk factors including obesity, smoking, sedentary lifestyle, alcohol use, and driving-related behavior were the primary foci of these surveys. Rates of involvement in each of these behaviors varied from state to state, but some trends were apparent. The results of the four surveys conducted during this time period showed little change in the rates of obesity for populations within the states. Rates of obesity across the states, however, varied from about 17 percent of the population to 29 percent (Morbidity and Mortality Weekly Report, 1987; Marks et al., 1985). There were also few changes in the percentages reporting sedentary lifestyles; in 1986, about half of the states surveyed had 60 percent or more of their populations reporting sedentary lifestyles. Rates of smoking in the states in 1986 varied from 18 percent to 35 percent, and about half of the states surveyed reported that 7.5 percent or more of their populations were heavy drinkers. Seatbelt laws contributed to a decline in seatbelt nonuse. In 1981 half of the states had nonuse rates greater than 58 percent, but in 1986 half had nonuse rates greater than 50 percent.

b. Military Population. Health practices of military personnel have been monitored through surveys conducted by the individual Services

and the 1985 Worldwide Survey. These surveys in general followed the procedures of Belloc and associates and focused on the seven health practices included in the civilian surveys. Questions on health practices were included in the Worldwide Surveys for the first time in 1985. Most military personnel engaged in positive health practices: 93 percent reported that they met proper weight standards; 67 percent exercised regularly; 70 percent ate properly; 54 percent had good sleeping habits; about 86 percent had used no drugs during the past year; 62 percent drank moderately or less; and about 41 percent had never smoked. Of these seven health practices, military personnel were, on average, involved in 4.7 practices, and about two-thirds reported being involved in at least five. Involvement in health practices was related to the number of illnesses, doctor visits, and hospitalizations (Bray et al., 1986).

Several studies of health practices have been conducted by the individual Services, and have even better results. As with alcohol and drug use, however, the prevalence of health behaviors among personnel within a Service is partially dependent on the sociodemographic composition of the Service; if a Service has older personnel on average, for instance, its health behaviors and health status may differ from Services with a younger population. In a 1986 study comparing health practices of Air Force personnel and civilians, Vogel found that rates of smoking were lower and overall involvement in health practices was higher than for all DoD personnel in the 1985 Worldwide Survey, but that rates of drinking were similar. A study of health practices among captains at Wright Patterson Air Force Base found reductions in smoking, reductions in alcohol consumption, increases in exercise, no change in the frequency of eating breakfast or snacks, increases in weight, and poorer sleeping habits since beginning active duty (Hyde, 1986). In one of several studies of health behaviors among Navy personnel, Cronan and Conway (1987) found that smoking levels among recruits were considerably lower than among shipboard personnel, and that smokers were more likely to be older, white, and better educated. Using data from the 1985 Worldwide Survey, Ballweg and Bray (in press) found that a significantly larger percentage of nonsmokers reported "excellent" health than did smokers.

3. Health Promotion

Health promotion programs represent an integrated, holistic approach to encouraging health by emphasizing optimal functioning in physical, social, and psychological areas of life. These programs are targeted at all people, with special emphasis on those engaging in behaviors such as smoking, alcohol and drug use, or poor nutrition and poor eating habits that threaten good health. Program activities generally focus on three goals: risk assessment, risk avoidance, and risk reduction. Individuals at risk for adverse health outcomes are identified and encouraged to engage in behaviors that improve current health status and enhance future status (Best et al., 1986; Goodstadt et al., 1987; Perry and Jessor, 1985).

Concern about the impact of unhealthy behaviors on health status, job performance, and readiness of military personnel was reflected in the report of the DoD Blue Ribbon Panel on Health Promotion (1985) and the 1986 Health Promotion Directive that followed (described in Chapter 1). As noted in Chapter 1, the directive pledged to implement health promotion programs in the military that emphasized the following areas known to be related to increased longevity and improved health:

- smoking prevention,
- physical fitness,
- nutrition,
- stress management,
- alcohol and drug abuse prevention, and
- hypertension prevention.

A full assessment of the impact of health promotion programs in the military is beyond the scope of this report, but the 1985 and 1988 Worldwide Surveys provide basic information for monitoring involvement in health practices. We assess in this chapter progress in the health areas other than substance use and, in the final chapter, provide an overview of the military's health promotion program areas and needs.

Health promotion programs have been shown to be cost-effective for businesses in terms of productivity gains. Similar to programs for military personnel, civilian health promotion efforts have focused on physical

fitness, smoking cessation, alcohol and drug abuse prevention, weight reduction, and screening for hypertension and risk factors for cardiovascular disease (Vogel, 1986). The workplace is the most common setting for these programs since, in the civilian sector, businesses have more resources to implement the programs and a financial incentive to do so.

Many companies have implemented health promotion programs or expanded employee assistance programs in the last 10 years to provide more health-related services and to encourage healthier employees. The benefits to companies (which have included the Xerox Corporation, Metropolitan Life Insurance, New York Telephone, Kimberly-Clark, and Rockwell International) have been substantial and well documented. The most widely obtained results of implementing health promotion programs in the workplace include significant decreases in absenteeism, sick leave, and turnover and increases in job satisfaction and perceived productivity (South Carolina Health Services, 1983; Vogel, 1986; Massachusetts Health Services, 1985; Castillo-Salgado, 1984). Programs that have concentrated on physical fitness and exercise have resulted in reduced weight, lower percentage of body fat, improved fitness, increased lung capacity, and lower cholesterol (South Carolina Health Services, 1983; Massachusetts Health Services, 1985; Hyde, 1986; Vogel, 1986).

These outcomes can be translated directly into financial gains. For example, a survey conducted by Health Research Institute of the 1500 largest companies found that average annual health care costs for workers in companies where health promotion programs were provided were $806 compared with $1,015 in companies overall. Kennicott Cooper reported savings of $5.78 for each $1.00 spent on health promotion activities (South Carolina Health Services, 1983). Kristein (1977) reported that medical costs saved each year were $200 for each employee who stopped smoking, $260 for each employee who gained control of blood pressure, and $60 for each employee who reduced his or her cholesterol level by 20 percent.

Thus, health promotion programs have been widely implemented in civilian settings with substantial tangible results. Productivity was increased through fewer worker absences, and employers saved the cost of employee benefits such as paid leave and medical care services. Only recently with

the introduction of the health promotion directive in 1986 has the military begun a highly focused effort on health promotion. The 1985 Worldwide Survey provided baseline data about health behaviors, and the 1988 Survey provides information with which to assess trends in health behaviors and health status.

B. Health Behaviors

Understanding health promotion programs first requires examining overall health status and involvement in those health behaviors that foster good health. Where possible, we compare the results from the 1988 survey with those from 1985. We examine not only those health practices considered in many studies of the civilian population but also those behaviors included in the DoD health promotion effort: nutrition behavior, stress management, and awareness of and efforts taken to diagnose hypertension. Alcohol use, drug use, and tobacco use are also health behaviors, and they have been considered in earlier chapters.

1. Health Status

Military personnel generally describe their health as good and as causing them little worry, and they tend to believe that they have a great deal of control over their health. The general perceptions of military personnel about their health are presented in Table 8.1 for the total DoD and the individual Services. For the total DoD (and similarly for the individual Services), about 97 percent describe their health as good to excellent, and 32.1 percent describe it as excellent. For 81.1 percent of the respondents, their health has caused them little or no worry during the past year, and 79.7 percent believe that they have a great deal of control over their own health. These findings are highly similar to those reported in 1985.

Another indicator of health status is the number of illnesses experienced within the year. Findings from the 1985 Worldwide Survey indicated that military personnel on average reported about 2.45 illnesses during the year. In 1988, military personnel on average reported having 3.40 illnesses during the year, a small but statistically significant increase. Similar findings were evident for each of the individual Services. The average

Table 8.1. General Perceptions of Health

Item/Response	Service				
	Army	Navy	Marine Corps	Air Force	Total DoD
How Describe Own Health					
Excellent	31.8 (1.2)	31.6 (Ø.9)	38.2 (4.1)	31.2 (1.2)	32.1 (Ø.7)
Very good	42.2 (Ø.9)	39.Ø (1.2)	42.4 (5.2)	42.6 (Ø.6)	41.5 (Ø.7)
Good	22.4 (1.2)	25.1 (Ø.9)	17.3 (1.4)	23.4 (1.Ø)	23.Ø (Ø.6)
Fair or poor	3.5 (Ø.3)	4.3 (Ø.7)	2.Ø (Ø.5)	2.8 (Ø.3)	3.4 (Ø.3)
Worry Caused by Health, Past Year					
Great deal	1.7 (Ø.2)	2.2 (Ø.3)	2.3 (Ø.3)	1.2 (Ø.2)	1.7 (Ø.1)
Some	18.1 (Ø.6)	18.2 (Ø.8)	13.9 (1.Ø)	16.1 (Ø.9)	17.2 (Ø.4)
Hardly any	3Ø.4 (Ø.7)	3Ø.2 (1.Ø)	27.6 (2.1)	31.2 (Ø.7)	3Ø.3 (Ø.4)
None	49.8 (Ø.9)	49.4 (1.3)	56.2 (2.7)	51.5 (Ø.9)	5Ø.8 (Ø.6)
Control Have Over Own Future Health					
Great deal	77.8 (1.Ø)	8Ø.2 (Ø.9)	8Ø.7 (2.7)	81.1 (Ø.6)	79.7 (Ø.5)
Some	19.4 (1.Ø)	17.8 (1.Ø)	16.5 (2.1)	17.8 (Ø.5)	18.2 (Ø.5)
Very little	1.8 (Ø.3)	1.2 (Ø.3)	2.3 (Ø.8)	1.Ø (Ø.2)	1.4 (Ø.2)
None	1.1 (Ø.1)	Ø.8 (Ø.3)	Ø.5 (Ø.2)	Ø.3 (Ø.1)	Ø.7 (Ø.1)

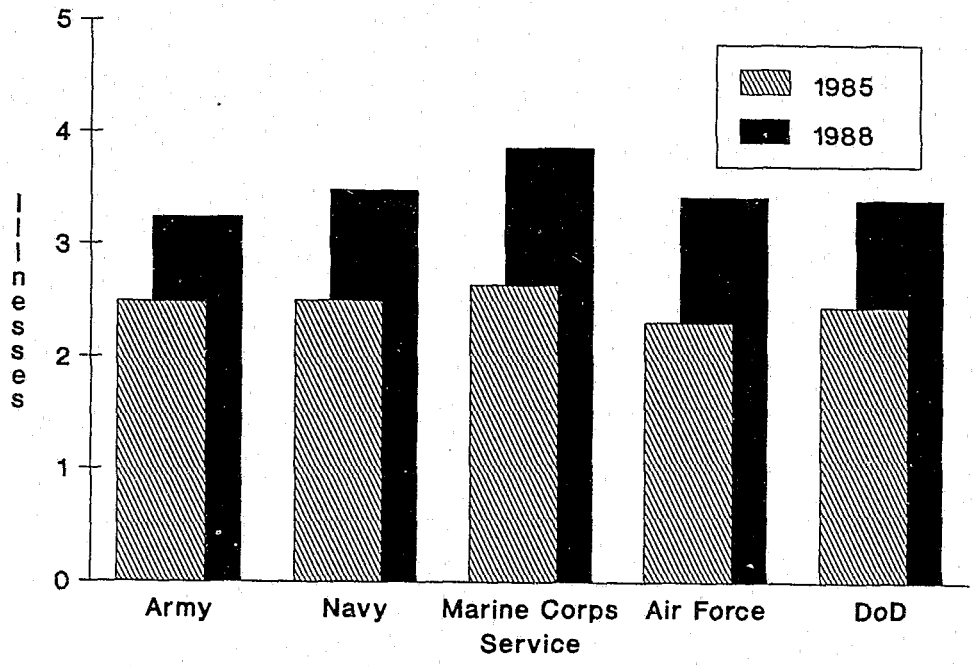
Note: Entries are percentages with standard errors in parentheses.

numbers of illnesses for the total DoD and each of the Services for 1985 and 1988 are shown in Figure 8.1. Standardization of the 1988 responses to the appropriate 1985 age/education/marital status distribution supported these findings and indicated that the observed differences were not related to differences in sociodemographic composition of the military population between 1985 and 1988 (table not presented).

Although the increase in the number of reported illnesses suggests a decrease in overall health status, this interpretation is not consistent with other findings regarding health status and health behaviors presented in this chapter. Other indicators suggest that there was little change in health status and a small but significant increase in health behaviors between 1985 and 1988. The increase in reported illnesses may, however, be an indication of a greater awareness of health.

Almost all military personnel had a satisfactory performance on their last physical readiness test, as shown in Table D.21 in the Appendix. For total DoD personnel, over 94 percent reported a satisfactory rating, almost 2 percent had an unsatisfactory rating, and almost 4 percent were exempt. This is another indication of the good health status of most military personnel.

Figure 8.1. Average Number of Illnesses, 1985 and 1988



2. Health Practices

Good health has been found to be associated with engaging in sound health practices, including moderate use of alcohol, nonuse of tobacco, regular exercise, eating breakfast, not eating between meals, getting a good night's sleep, and meeting weight standards (Belloc and Breslow, 1972; Breslow and Enstrom, 1980). The greater the number of these health practices engaged in, other things being equal, the lower the mortality rates.

The health practices examined in the 1988 Worldwide Survey were roughly comparable to those examined by Belloc and Breslow, but we did not include a question about eating between meals and included an item about drug use. Because of the near universality of military personnel in meeting weight standards, this item was omitted from the 1988 questionnaire. Thus, we consider six health practices. As in the 1985 survey, we dichotomized each of these health practices as healthy or unhealthy. Figure 3.5 presented average scores across the six health practices. There was a small but significant increase in the overall number of health practices from 3.79 in 1985 to 3.91 in 1988 (Figure 3.5). In 1985, total DoD personnel engaged in 3.79 of six health practices; in 1988, this figure was 3.91. The Army also showed a significant increase in health practices from 3.82 in 1985 to 3.99

in 1988, whereas the Navy, Marine Corps, and Air Force showed no significant change. Note in Figure 3.5 that we have recalculated the 1985 rates to have six items that are consistent between 1985 and 1988 (one of the items used in the 1985 index is not included in 1988).

The percentage of personnel in the total DoD and the individual Services who reported having engaged in each of the six specific health practices is presented in Table 8.2. Across the total DoD, 68.3 percent met the alcohol criterion of moderate alcohol use or less; 91.1 percent used no drugs within the past year; 37.5 percent never smoked; 69.2 percent exercised regularly; 66.3 ate meals regularly; and 58.2 percent had adequate sleep. This yielded an average of 3.91 across the six items or 1.94 across the three items excluding alcohol, drug, and tobacco use. These findings are similar for each of the individual Services.

More detailed information about exercise, eating, and sleeping patterns for the total DoD and the individual Services is included in Table D.22 in the Appendix. Table entries are percentages engaging in the behavior 3 to 4 days a week or more often and will thus vary slightly from similar ques-

Table 8.2 goes here

Table 8.2. Individual Health Practices and Scores on Health Practice Indexes

Individual Practice	Service								Total DoD	
	Army		Navy		Marine Corps		Air Force			
Moderate alcohol use or less	67.2	(1.3)	67.5	(2.1)	62.2	(4.1)	72.2	(1.3)	68.3	(0.9)
No drug use in the past 12 months	88.2	(1.1)	88.7	(2.1)	92.1	(0.9)	96.2	(0.6)	91.1	(0.8)
Never smoked	37.4	(1.0)	35.2	(0.7)	37.4	(2.4)	39.9	(0.9)	37.5	(0.5)
Exercise twice a week or more	85.7	(1.4)	60.6	(2.4)	79.0	(0.9)	56.0	(1.1)	69.2	(1.2)
Eat two full meals a day at least 5 days a week	66.8	(1.1)	67.1	(1.8)	64.4	(3.4)	65.6	(1.2)	66.3	(0.8)
Sleep more than 6 consecutive hours a day at least 5 days a week	53.9	(1.2)	56.6	(3.3)	57.0	(2.9)	64.7	(1.4)	58.2	(1.2)
Health Practice Index A (All Items above)	3.99	(0.02)	3.76	(0.10)	3.92	(0.06)	3.95	(0.03)	3.91	(0.04)
Health Practice Index B (Items 4-6 above)	2.06	(0.02)	1.84	(0.06)	2.00	(0.02)	1.86	(0.03)	1.94	(0.02)

Note: Entries for the first six items are percentages of individuals practicing the behavior with standard errors in parentheses. Entries for the Health Practice Indexes A and B are mean scores. For these indexes, each respondent was credited one point for each healthy behavior.

tions reported in Table 8.2. Also included in the Appendix is a report of the health practices ever recommended by a doctor or other health professionals (Table D.23). As noted, stopping smoking is the behavior most often recommended (reported by 27.3 percent of total DoD personnel), followed by exercise (21.8 percent). Other actions are less frequently recommended, including reducing use of alcohol or other dietary changes.

The average of six health practices varied little by most sociodemographic characteristics (see Table D.24, Appendix D) for total DoD or the Services. The number of health practices reported by men and women was similar, as were the numbers reported by groups defined by race/ethnicity, age, time on active duty, and region of the world. There was some variation by family status, with the average number of health practices slightly higher among those who were married with spouse present at the duty station than among those who were not married or among those who were married with spouse not present. Greater differences were apparent among education groups and pay grades. The average number of health practices was higher among those with a college degree than among those with less education, and higher among officers than among enlisted personnel. The lack of difference between the age groups suggests that there is a meaningful difference between officers and enlisted personnel that is not accounted for by differences in age.

In addition to these general health practices, military personnel engage in certain other health practices that are consistent with military health promotion policies regarding nutrition, stress management, and hypertension prevention. The involvement of military personnel in each of these types of behaviors that improve health and well-being is discussed below.

3. Nutrition

Many military personnel have improved their diets within the past year, as shown in Table 8.3 for the total DoD and the individual Services. Across all Services, 78.9 percent of military personnel have taken some action in the past year to improve their nutrition, ranging from eating fewer calories and less salt and fried foods to cutting down on the use of alcohol. About half of military personnel stated they were eating more high fiber foods, eating fewer calories to lose weight, eating fewer foods

Table 8.3. Nutrition Behavior Changes During Past Year

Item	Service				
	Army	Navy	Marine Corps	Air Force	Total DoD
Eat fewer calories to lose weight	45.5 (1.1)	52.4 (1.7)	38.3 (2.8)	52.4 (1.0)	49.4 (0.8)
Reduce amount of salt in diet	42.0 (0.8)	43.9 (1.4)	37.5 (1.9)	46.6 (1.0)	43.5 (0.6)
Cut down on use of alcohol	40.3 (0.7)	39.0 (2.4)	38.7 (2.7)	35.8 (1.2)	38.4 (0.8)
Eat more raw vegetables, whole wheat products and other high-fiber foods	57.2 (1.0)	60.6 (1.6)	49.4 (2.4)	61.0 (1.1)	58.6 (0.7)
Eat fewer foods with high fat content	47.9 (1.0)	51.9 (1.1)	41.4 (2.3)	53.0 (0.7)	50.0 (0.6)
Cut down on the amount of fried foods	46.9 (1.2)	49.8 (1.4)	39.3 (3.1)	50.0 (0.8)	48.0 (0.7)
Any changes	77.2 (0.7)	79.8 (1.2)	75.9 (1.2)	80.7 (0.7)	78.9 (0.5)

Note: Entries are percentage estimates with standard errors in parentheses for those who have made a change for health reasons.

with high fat content, and cutting down on the amount of fried foods. More than 40 percent had reduced the amount of salt in their diets, and slightly less than 40 percent had cut down on their use of alcohol. The variation across the Services on many of the behaviors was not large, but on several behaviors, such as eating fewer calories, reducing the amount of salt or fried foods, and eating more high fiber foods, Marine Corps personnel were substantially less likely than the other Services to have done so. Overall, however, these actions indicate an increasing awareness of the role of nutrition in health and a willingness to take actions to improve health.

Military personnel believe that reliable information about nutrition can be obtained from a variety of sources, as shown in Table D.25 (Appendix D). A little over half of military personnel state that newspapers and television are reliable sources of information, while three-fourths or more state that reliable information can be obtained from magazines, books, health food stores, nurses, doctors, or dietitians. Thus, most military personnel would probably seek information about nutrition from the medical profession or from books.

4. Stress and Coping

Many military personnel engage in functional behaviors to relieve reported stress at work, while others engage in less functional behaviors to do so. As shown in Table 8.4, functional ways to relieve stress and anxiety are more commonly used than less functional ways. A majority of persons state that they engage in thought or meditation, talk with others, or engage in leisure time activities to relieve stress. However, relatively few seek professional help or take prescribed medication to relieve stress, which may also be functional alternatives. Half or more get something to eat, sleep, or just think about the problem, while a third or more engage in such less functional alternatives as smoking, drinking, or buying something new. Those who report being under more stress are more likely than those under little or no stress at work to engage in each of these functional and less functional alternatives. The relationship between these coping behaviors and reported stress in family life is presented in Table D.26 (Appendix D).

Table 8.4. Levels of Reported Stress at Work and Coping Behaviors

Functionality/Coping/Behavior	Levels of Stress		
	Higher	Lower	None
More Functional			
Think of plan to solve problem	93.5 (0.4)	92.8 (0.4)	79.7 (2.8)
Meditate/sit quietly	65.5 (0.9)	62.7 (1.0)	46.2 (2.3)
Talk to friend/family member	79.9 (0.6)	82.6 (0.6)	71.1 (2.2)
Exercise or play sports	71.5 (0.8)	75.1 (1.0)	70.4 (2.5)
Read or work on hobby	61.9 (1.1)	63.9 (1.0)	58.0 (2.7)
Watch TV/listen to music	89.8 (0.5)	90.1 (0.6)	81.1 (2.2)
Seek professional help	5.8 (0.4)	4.3 (0.4)	5.8 (1.6)
Take prescribed medication	6.1 (0.4)	4.5 (0.3)	7.1 (1.3)
Less Functional			
Light up cigarette	35.5 (0.9)	28.7 (0.9)	24.0 (1.8)
Have a drink	31.3 (0.9)	23.6 (1.0)	16.0 (1.5)
Get something to eat	61.9 (0.7)	58.9 (0.7)	48.0 (2.3)
Smoke marijuana or use illegal drugs	3.1 (0.4)	2.4 (0.3)	2.8 (0.8)
Get headache or feel ill	33.4 (0.8)	15.9 (0.7)	12.0 (2.0)
Take a nap	50.7 (1.2)	48.7 (0.7)	44.6 (2.5)
Buy something new	31.8 (1.1)	27.0 (0.8)	24.0 (1.9)
Consider hurting or killing yourself	7.6 (0.5)	2.2 (0.2)	2.8 (0.7)
Just think about things a lot	90.3 (0.5)	85.2 (0.6)	66.0 (2.6)

Note: Entries are percentages with standard errors in parentheses. Data are percentages of respondents reporting that they frequently or sometimes engage in this behavior when they feel pressured, stressed, depressed, or anxious at work.

5. Hypertension

Hypertension prevention is a central component of the military's health promotion program. Awareness of and checking blood pressure are important in hypertension control. As noted in Table 8.5, over 91.4 percent of all military personnel report having had their blood pressure checked during the past year. Only 48.7 percent, however, know their diastolic and systolic readings. Fewer enlisted men than officers report awareness, and Marine Corps personnel appear to be less aware of their blood pressure than members of the other Services. As Table 8.5 indicates, 11.8 percent of personnel have been diagnosed as hypertensive and judging by the fact that 57.5 percent of military personnel have a close blood relative who has been diagnosed, more may become hypertensive. As noted in Table D.23 (Appendix D), 3.7 percent of military personnel are currently taking medication to control their blood pressure.

Table 8.5 goes here

Table 8.5. Hypertension Among Military Personnel

Position/Item Response	Service				
	Army	Navy	Marine Corps	Air Force	Total DoD
Enlisted					
Aware of blood pressure readings	45.1 (1.9)	51.2 (3.3)	40.8 (2.3)	52.9 (1.2)	48.7 (1.2)
Had blood pressure checked in past year	87.9 (1.2)	92.8 (0.5)	91.3 (1.3)	93.9 (0.6)	91.4 (0.5)
Have been diagnosed as hypertensive	13.0 (0.7)	10.9 (0.6)	12.7 (0.6)	11.0 (0.6)	11.8 (0.3)
Family member diagnosed as hypertensive	59.2 (0.9)	57.1 (2.1)	57.1 (5.5)	56.4 (1.0)	57.6 (0.9)
Officer					
Aware of blood pressure readings	72.7 (3.0)	76.3 (3.5)	67.4 (4.6)	76.4 (2.1)	74.5 (1.5)
Had blood pressure checked in past year	94.9 (0.7)	97.2 (0.9)	95.6 (1.6)	97.3 (0.7)	96.3 (0.4)
Have been diagnosed as hypertensive	11.2 (1.2)	16.6 (1.6)	14.2 (3.9)	11.7 (1.6)	12.8 (0.8)
Family member diagnosed as hypertensive	57.5 (1.2)	55.5 (2.3)	53.9 (7.9)	57.5 (2.0)	56.8 (1.1)
Total					
Aware of blood pressure readings	50.1 (2.1)	54.7 (3.5)	44.1 (2.4)	57.5 (1.1)	53.1 (1.2)
Had blood pressure checked in past year	89.2 (1.0)	93.4 (0.5)	91.8 (1.1)	94.6 (0.6)	92.2 (0.4)
Have been diagnosed as hypertensive	12.7 (0.6)	11.7 (0.5)	12.9 (0.8)	11.2 (0.6)	12.0 (0.3)
Family member diagnosed as hypertensive	58.9 (0.8)	56.9 (1.8)	56.7 (4.8)	56.6 (0.9)	57.5 (0.7)

Note: Entries are percentages with standard errors in parentheses.

These findings suggest that greater educational efforts should be directed toward increasing awareness of blood pressure and perhaps toward greater awareness of ways to reduce hypertension. The fact that only about one-half know what their blood pressure readings are, although almost all report having been checked during the year, suggests the need for education about hypertension and its prevention.

C. Use of Alcohol, Drugs, and Tobacco

Many people use more than one substance (alcohol, drugs, and tobacco), and the likelihood of using any particular substance is greater for those who use other substances. Previous studies have documented the combined (simultaneous) and concurrent (same time period, but not necessarily simultaneously) use of alcohol and drugs, and alcohol and cigarettes. Because health risks and performance deficits are greater for those who use more than one substance, this is an important consideration.

The use of alcohol, drugs, and tobacco by military personnel within the past 30 days is shown in Table 8.6. Smokers are more likely than nonsmokers to drink (90.9 percent of smokers drink compared to 77.2 percent of the nonsmokers) and to drink heavily (12.4 percent, 5.3 percent) and to use drugs (7.4 percent, 0.7 percent). Similarly, drug users are more likely than nonusers to drink (99.8 percent, 83.0 percent). Drug users, however, are less likely than nonusers to drink heavily (1.3 percent, 6.9 percent). About 7 percent of smokers use drugs and drink compared with less than 3 percent of nonsmokers. Thus, there is a moderately strong likelihood of using multiple substances, but drug users do not tend to be heavy alcohol users.

D. Relationship Between Substance Use and Health

The use of alcohol, drugs, and tobacco has been implicated in poorer health outcomes. As demonstrated by Marsden, Bray and Herbold (1988) in analyses of the 1985 Worldwide Survey data, heavy drinkers, users of drugs other than marijuana, and heavy smokers were substantially more likely than nonusers of each of these substances to report illness during the year. With data from the 1988 Worldwide Survey, we again considered in regression analyses the relationship between substance use and the number of illnesses.

Table 8.6. Relationship of Cigarette Use, Drug Use and Alcohol Use Past 30 Days

Cigarette Use/ Drug Use	Drinking Level					
	Abstainer	Infrequent/ Light	Moderate	Moderate/ Heavy	Heavy	Total
Smoker						
Use drugs	0.2 (0.1)	0.6 (0.2)	1.2 (0.2)	3.2 (0.4)	2.2 (0.3)	7.4 (0.6)
Don't use drugs	8.9 (0.5)	15.1 (0.7)	31.6 (0.9)	26.8 (1.1)	10.2 (0.8)	92.6 (0.6)
Total	9.1 (0.5)	15.8 (0.7)	32.8 (0.9)	30.0 (1.3)	12.4 (0.9)	100.0 -
Nonsmoker						
Use drugs	0.2 (0.1)	0.4 (0.1)	0.6 (0.1)	1.1 (0.2)	0.7 (0.1)	3.0 (0.3)
Don't use drugs	22.6 (0.6)	20.9 (0.7)	31.0 (0.8)	17.8 (1.1)	4.6 (0.4)	97.0 (0.3)
Total	22.8 (0.6)	21.3 (0.7)	31.6 (0.8)	19.0 (1.1)	5.3 (0.4)	100.0 -
Total						
Use drugs	0.2 (*.*)	0.5 (0.1)	0.8 (0.1)	2.0 (0.3)	1.3 (0.2)	4.8 (0.3)
Don't use drugs	17.0 (0.4)	18.5 (0.6)	31.3 (0.6)	21.5 (1.0)	6.9 (0.5)	95.2 (0.3)
Total	17.2 (0.4)	19.0 (0.6)	32.1 (0.6)	23.5 (1.1)	8.2 (0.6)	100.0 -

Note: Percentages are those in a cigarette use/drug use category who fall into each drinking level. Standard errors are in parentheses.

Independent variables in the regression model were Service, race/ethnicity, sex, education, family status, region, pay grade, age, years of service, reported stress at work, drinking levels, drug use patterns and smoking patterns. The first 10 variables were defined in chapter 4 in connection with the multivariate analyses conducted for alcohol use, and the substance use measures were defined in chapter 2.

The dependent variable for the analysis was the number of reported illnesses in the past 12 months. Specifically, survey respondents were asked to report the number of times they were sick with symptoms such as runny nose or eyes, feeling flushed or sweaty, chills, nausea or vomiting, stomach cramps, diarrhea, muscle pains or severe headaches. The estimated regression parameters reflect changes in the counts of reported illnesses.

Table 8.7 presents the parameter estimates of the regression model for predicting number of illnesses. The R^2 for the model was .04, which was significant at the .001 level. The analysis showed significant effects for race/ethnicity, sex, pay grade, age, reported stress at work, drinking levels, drug use pattern, and smoking pattern. Results show that the number of illnesses during the past 12 months is significantly higher, after adjusting for all other variables in the analysis, for:

- whites than for blacks;
- females than for males;
- mid-career pay grades than for senior officers;
- those who are younger;
- those who report higher levels of stress at work;
- moderate drinkers compared to abstainers;
- drug users who use more than marijuana only compared with nonusers; and
- heavy smokers compared with nonsmokers.

The issue of greatest interest in the analysis is how alcohol use, drug use and cigarette use affect reported illnesses. As noted above, all three substance-use variables are significantly related to illnesses. To see these effects more clearly, the adjusted means of the number of illnesses

Table 8.7. Predicting Number of Illnesses

Independent Variables	Number of Illnesses Regression Parameters
Service	
Army versus Air Force	-.3103
Navy versus Air Force	-.1164
Marine Corps versus Air Force	.0848
Race/Ethnicity	
Black versus White	-.5020**
Hispanic versus White	.1303
Other versus White	-.1991
Sex	
Male versus Female	-1.539***
Education	
High School or Less versus Beyond High School	-.1485
Family Status	
Single versus Married, spouse present	-.1964
Married, spouse not present versus Married, spouse present	.2109
Region	
Americas versus Europe	-.0904
North Pacific versus Europe	-.3291
Other Pacific versus Europe	-.1129
Pay Grade	
E1-E3 versus 04-010	.8827
E4-E6 versus 04-010	1.0542**
E7-E9 versus 04-010	.8026
W1-W4 versus 04-010	.1050
01-03 versus 04-010	.1288
Age	-.0661*
Duration	.0406
Reported Stress Level at Work	-1.5302***
Drinking Level	
Heavy versus Abstainer	.3136
Moderate/Heavy versus Abstainer	-.2541
Moderate versus Abstainer	-.7672**
Infrequent/Light versus Abstainer	-.4567
Drug Use Pattern	
Marijuana Only versus Nonuse	.1281
Other Use versus Nonuse	.8446*
Smoking	
Light smoker versus nonsmoker	.0298
Heavy smoker versus nonsmoker	.3918*

Note: Entries are regression parameters that indicate the effects of the tabled variables on the number of illnesses experienced.

for the substance use categories of drinking levels, drug use patterns, and smoking levels are presented in Table 8.8. The effects for drug use and smoking are clear: heavy users experience significantly more illnesses than nonusers. For drugs, other drug users report an average of 4.17 illnesses compared to 3.32 illnesses for nonusers. Similarly, heavy smokers report 3.67 illnesses compared to 3.28 for nonsmokers. Findings are less clear for alcohol use. The pattern is consistent for the heavy drinkers to experience the greatest number of illnesses, but the difference between heavy drinkers and abstainers is not statistically significant. However, heavy drinkers do report significantly more illnesses than moderate drinkers. These findings reinforce those observed in the 1985 survey and show a relationship between substance use and health that is worthy of increased attention in prevention and intervention efforts.

Table 8.8. Adjusted Means of Number of Illnesses for Substance Use Categories

Substance	Number of Illnesses
Drinking Level	
Abstainer	3.74
Infrequent/Light	3.29
Moderate	2.98
Moderate/Heavy	3.49
Heavy	4.06[a]
Drug Use Pattern	
No use	3.32
Marijuana only	3.45
Any other use	4.17[b]
Smoking Level	
Nonsmoker	3.28
Less than a pack a day	3.31
One or more packs a day	3.67[c]

Note: Entries are mean scores of the number of reported illnesses that have been adjusted for effects of all other variables in the regression model.

[a]Significantly greater than moderate drinkers at 95 percent confidence level.

[b]Significantly greater than nonusers at 95 percent confidence level.

[c]Significantly greater than nonsmokers at 95 percent confidence level.

E. Summary

The relationship between substance use and health is complex and multidirectional. Substance users have poorer health than nonusers and are less

likely to engage in those health practices that are associated with good health. DoD policy on health promotion is directed toward improving the health of military personnel by reducing substance use and increasing involvement in health practices directed toward better nutrition, stress management, and hypertension prevention.

1. Health Status

Military personnel believe that they are healthy, and most indicators of health status suggest they are.

- Almost all (96.6 percent) military personnel describe their health as good to excellent, and 32.1 percent describe it as excellent; 81.1 percent state that their health caused them little worry in the past year, and about 79.7 percent feel they have a great deal of control over their health.
- Self-perceptions of overall health status did not change between 1985 and 1988, although the number of reported illnesses increased significantly from 2.45 to 3.40.
- Almost all military personnel had a satisfactory performance on their last physical readiness test.

2. Health Practices

Good health is associated with engaging in sound health practices, including moderate use of alcohol, nonuse of tobacco, regular exercise, eating breakfast, not eating between meals, getting a good night's sleep, and meeting weight standards.

- DoD personnel engaged in an average of 3.79 of six health practices in 1985 and showed a small but significant increase to 3.91 in 1988; 91.1 percent met the criterion for nonuse of drugs, 68.3 percent met the criterion for moderate or less alcohol use, 69.2 percent exercised regularly, 66.3 percent ate meals regularly, 58.2 percent received adequate sleep, and 37.5 percent met the criterion for nonuse of tobacco.
- The average number of health practices was higher for those with a college education than for those with less education and higher for officers than enlisted personnel.

3. Nutrition

Many military personnel have within the past year taken actions to improve their nutrition, and they feel that they can get reliable information about nutrition from a variety of sources.

- Of all military personnel, four out of five (79.8 percent) took some action within the past year to improve their nutrition; about one-half stated they were eating more high fiber foods, eating fewer calories to lose weight, eating fewer foods with high fat content, and cutting down on the amount of fried foods. Fewer were reducing the amount of salt in their diet or cutting down on the use of alcohol.

4. Stress and Coping

Many military personnel engage in functional behaviors to relieve stress, while others engage in less functional behaviors to do so.

- A majority of military personnel engage in thought or meditation, talk with others, engage in leisure time activities or other functional ways to relieve stress at work, while one-third or more engage in certain less functional ways to relieve stress.

5. Hypertension

Awareness of and checking blood pressure are important factors in the military's policy on hypertension prevention.

- Most military personnel (91.4 percent) report having had their blood pressure checked during the past year, but only 48.7 percent know what their blood pressure readings were.

- While 11.8 percent have been diagnosed as hypertensive, 57.5 percent have close blood relatives who have been diagnosed as hypertensive, indicating that many more military personnel may be at risk of diagnosis.

6. Use of Alcohol, Drugs, and Tobacco

Health risks and performance deficits are greater for those who use more than one substance.

- Use of alcohol, drugs, and tobacco are moderately interrelated.

7. Relationship Between Substance Use and Health

The use of alcohol, drugs, and tobacco are implicated in poorer health outcomes.

- The number of illnesses is predicted by race/ethnicity, sex, pay grade, age, reported stress at work, drinking levels, drug use pattern, and smoking level. Those using drugs other

than or in addition to marijuana and heavy smokers had significantly more illnesses than nonusers. Heavy drinkers reported more illnesses than moderate drinkers, but not more than abstainers.

These findings regarding health practices and the relationship between substance use and health confirm the good health status of military personnel overall but suggest areas in which improvement can be made. For instance, greater attention should be directed toward education about hypertension prevention and effective, functional stress management techniques. However, many military personnel engage in good health practices and are making changes in their behavior to improve their health.

9. ATTITUDES TOWARD AIDS

In this chapter we examine attitudes and knowledge of military personnel about AIDS. We consider beliefs about how AIDS is transmitted and prevented, use of various military and nonmilitary information sources and perceptions of their usefulness, and behavioral changes motivated by concern about getting AIDS.

A. Importance of Attitudes toward AIDS

Prevention of AIDS requires avoiding exposure to the human immunodeficiency virus (HIV) in circumstances under which it can be transmitted. Knowing how the virus is transmitted is essential for effectively preventing exposure while still carrying on the normal activities of everyday life. The Services have implemented AIDS-information programs to provide military personnel with the facts about AIDS transmission and to dispel the rumors, half-truths, and falsehoods that inevitably accompany the spread of any dangerous disease. Official DoD policy on identification, surveillance, and administration of personnel infected with HIV is in an August 4, 1988 memorandum. All Services provide education for their personnel about the HIV, means of transmission of the virus, and prevention of spread of the virus.

Extensive and complete public knowledge about the agent-host-environment relationship is not critical for many infectious diseases because programs of sanitation/eradication, quarantine, or immunization can effectively protect public health. Sanitation and eradication programs disrupt the disease transmission process by directly attacking disease agents or by changing environmental conditions. Using pesticides and eliminating breeding pools of standing water, for example, reduce the number of mosquitoes that carry Yellow Fever, and purifying water supplies controls the amoebic-agent that causes dysentery. Thus, widespread public knowledge about such diseases generally is not required. Quarantine is especially effective for diseases such as measles or leprosy that cause immediate and publicly obvious symptoms; technically, the disease is not prevented, but its spread is controlled. Immunization is effective in preventing diseases where virtually complete coverage of the population-at-risk (i.e., basic train-

ees) can be assured; but such programs depend on the development of effective vaccines. None of these conditions holds for AIDS. There is no known HIV transmission agent separate from the host, nor is there a single environmental condition that can be altered to disrupt the transmission process. Even intimates, close friends, family, and lovers cannot necessarily tell that an individual has the HIV infection, and no effective vaccine has yet been developed. Thus, the major public health AIDS-prevention activity must be education aimed at informing and motivating the public so that high-risk situations and behaviors will be reduced or eliminated.

Knowing how infectious diseases are transmitted provides the context for knowledge about AIDS transmission. Generally, most people know that infectious agents can be transmitted from host to host through the air, by physical contact, or by contact with items handled by an infected host. Less commonly understood are the means of transmission of sexually-transmitted diseases or of those microorganisms that are always present in the environment but which only rarely result in the development of disease (e.g., meningitis). AIDS transmission approximates the latter situation in that it occurs under a fairly specific set of circumstances. Even so, the prognosis for AIDS is so dismal that there is a natural inclination to try to protect oneself by behaving as though the HIV could be as easily transmitted as are the viruses that cause the common cold. Thus, complete awareness about AIDS transmission must include information on how AIDS is not transmitted as well as information specifying means and mechanisms of transmission. Otherwise, and particularly under conditions such as those in the military where group living and communal dining are common and where blood transfusions among personnel are a real possibility, the potential for fear and interpersonal avoidance can interfere with accomplishing the military's mission.

Experience and epidemiological findings have established how AIDS can be transmitted. HIV spreads from infected persons either by anal or vaginal intercourse or by the introduction of infected blood (or blood products) through the skin and into the bloodstream (e.g. IV drug use). In addition, it can spread from an infected mother to her infant during preg-

nancy or at the time of birth. Apparently, the HIV agent requires a medium such as semen or blood products to remain viable during transmission. (The HIV has been isolated in other body fluids, such as tears, saliva, and urine, but apparently the concentration in these fluids is too low to result in infection.) Breathing air containing the HIV and physical contact without exchange of bodily fluids are, therefore, not effective means of transmission. Discounting these latter two transmission methods, specifying the variety of ways in which infectious bodily fluids may be exchanged, and motivating individuals to avoid high-risk situations and behaviors are the major aims of AIDS-information programs.

B. Prior Studies

A number of studies have examined knowledge and attitudes about AIDS. Perhaps the most complete information is provided by the set of supplemental questions in the 1988 National Health Interview Survey (NHIS). Dawson (1988) reported results of the first 3 months of data collection. The questionnaire includes items on sources of information about AIDS; knowledge about the virus and how it is transmitted; and perceptions of the risk of getting the virus.

In July 1988, 86 percent of adults reported having seen public service announcements about AIDS on television, about one-fourth read brochures about AIDS in the previous month, and 63 percent had received the brochure "understanding AIDS." Judging from responses to several questions measuring knowledge about AIDS, the level of knowledge is increasing. In 1988, 84 percent of adults thought it was definitely true that there was no cure for AIDS and 81 percent believed that AIDS could be transmitted by sexual intercourse.

Regarding preventive measures, 84 percent of adults felt that condoms are somewhat effective or very effective in preventing transmission of the AIDS virus, 83 percent felt that a monogamous relationship with someone without AIDS is effective, and over half realized that the diaphragm and spermicidal jellies and creams are not effective preventive measures.

Responses to these items are the basis for comparison of civilian knowledge and attitudes about AIDS with those of military personnel. Differ-

ences in the sociodemographic composition of military and civilian populations, however, may preclude direct comparison.

C. Beliefs about AIDS Transmission

The effectiveness with which the military population's public health has been protected from AIDS will ultimately be apparent from rates of incidence and prevalence of the disease among current personnel. A first indication of the extent and accuracy of knowledge among military personnel about AIDS can be determined by investigating awareness about AIDS transmission, in terms of beliefs about the likelihood of the HIV's being transmitted in different ways. Table 9.1 presents the proportions of military personnel who believe that a person "probably will" or "definitely will" get AIDS in each of seven ways.

For the Services overall (Total DoD), nearly all military personnel are aware that a person probably will get AIDS by sharing needles used by someone with AIDS to inject illegal drugs (96.6 percent) and by having sex with someone who has AIDS (96.0 percent). Leaving aside the problem of how an individual would know whether the other person using the needle or participating in sexual activity has AIDS, these results are both reassuring and alarming--reassuring in that awareness is so widespread and alarming in that 3 to 4 percent of the responding military personnel are not adequately informed, particularly with respect to the likelihood of infection as a result of having sex with a HIV-carrier. Although intravenous drug use is nearly nonexistent among military personnel (see Chapter 4), the same kind of natural self-limiting effect cannot be counted on to reduce the need for awareness about the danger of engaging in sexual activity with possible HIV-carriers.

Large proportions of military personnel consider it unlikely that a person will get AIDS by receiving a blood transfusion (65.2 percent) or by donating blood (81.3 percent). However, the relatively high proportions of persons who responded that a person probably or definitely will get AIDS in each of these ways--34.8 percent and 18.7 percent, respectively--may reflect recognition of the possibility that AIDS can be acquired through exchange of blood rather than well-informed estimates of their own likeli

Table 9.1. Beliefs About How AIDS Is Transmitted

Grade/Item	Service				
	Army	Navy	Marine Corps	Air Force	Total DoD
Enlisted					
Receiving blood transfusion	44.7 (0.9)	34.6 (1.3)	38.2 (3.7)	33.8 (0.9)	38.0 (0.7)
Giving or selling blood	27.5 (0.9)	19.7 (1.3)	22.5 (3.2)	16.0 (1.2)	21.4 (0.7)
Working near someone with AIDS	12.0 (0.7)	8.8 (1.0)	13.6 (2.5)	7.7 (0.4)	10.0 (0.5)
Casual contact with someone with AIDS	15.6 (0.8)	10.8 (0.6)	14.3 (1.8)	9.2 (0.6)	12.2 (0.4)
Eating in dining facility where the cook has AIDS	31.2 (1.1)	26.1 (0.8)	34.1 (2.1)	21.9 (1.1)	27.3 (0.6)
Sharing needles with someone with AIDS	95.1 (0.4)	95.9 (0.4)	95.7 (1.0)	97.4 (0.5)	96.1 (0.3)
Having sex with someone with AIDS	94.9 (0.4)	95.5 (0.5)	95.3 (0.8)	96.7 (0.5)	95.7 (0.2)
Officers					
Receiving blood transfusion	20.1 (1.6)	16.7 (2.1)	20.3 (1.8)	18.1 (1.0)	18.6 (0.8)
Giving or selling blood	6.1 (1.1)	4.5 (1.0)	8.7 (1.0)	3.6 (0.7)	5.0 (0.5)
Working near someone with AIDS	3.5 (0.6)	3.7 (1.2)	4.0 (1.1)	2.3 (0.6)	3.2 (0.4)
Casual contact with someone with AIDS	3.3 (0.7)	3.3 (0.6)	4.6 (2.1)	3.0 (0.9)	3.3 (0.4)
Eating in dining facility where the cook has AIDS	11.3 (1.8)	8.7 (1.1)	19.0 (2.8)	12.8 (1.5)	11.7 (0.9)
Sharing needles with someone with AIDS	99.3 (0.3)	98.5 (0.5)	100.0 (**)	99.3 (0.2)	99.2 (0.2)
Having sex with someone with AIDS	97.3 (1.0)	97.1 (0.6)	97.2 (0.5)	98.0 (0.6)	97.5 (0.4)
Total					
Receiving blood transfusion	40.2 (1.1)	32.1 (1.4)	35.9 (3.3)	30.8 (0.8)	34.8 (0.7)
Giving or selling blood	23.6 (1.1)	17.6 (1.4)	20.8 (3.0)	13.6 (1.0)	18.7 (0.7)
Working near someone with AIDS	10.5 (0.7)	8.1 (1.0)	12.3 (2.3)	6.7 (0.4)	8.8 (0.4)
Casual contact with someone with AIDS	13.3 (0.7)	9.7 (0.6)	13.1 (1.6)	8.0 (0.6)	10.7 (0.4)
Eating in dining facility where the cook has AIDS	27.8 (1.1)	23.7 (0.9)	32.2 (2.2)	20.2 (1.0)	24.7 (0.6)
Sharing needles with someone with AIDS	95.8 (0.4)	96.3 (0.4)	96.2 (0.9)	97.8 (0.4)	96.8 (0.2)
Having sex with someone with AIDS	95.3 (0.4)	95.8 (0.4)	95.6 (0.7)	97.0 (0.4)	96.0 (0.2)

Note: Table entries are percentages with standard errors in parentheses. Data are estimates of individuals who believe that AIDS "definitely will" or "probably will" be transmitted in the ways mentioned.

**Estimate rounds to zero.

hood of infection in these ways. Confidence in the efficacy of the blood supply system to detect and avoid transmission of the HIV is apparently not shared among all military personnel.

Most researchers contend that AIDS cannot be transmitted in any of the remaining three ways--that is, by working near or through casual contact with someone with AIDS or by eating in a dining facility where the food is prepared by a cook with AIDS. Yet from nine to 11 percent of military personnel consider getting AIDS at least probable through physical proximity, and 24.7 percent believe that eating food prepared by a cook who has AIDS will probably result in one's being infected. These percentages represent levels of misinformation about AIDS transmission that should be addressed to avoid deflecting attention from transmission modes that are truly dangerous, alleviate undue alarm, and enhance the credibility of the prevention and education effort.

Among personnel in the four Services, patterns of awareness about AIDS transmission are similar to those for the total DoD. In general, Army personnel are the least well informed, and Air Force personnel are best informed, with the absolute differences between levels of awareness ranging from about 2 to 12 percent.

Comparing beliefs of enlisted personnel about how AIDS is transmitted with those beliefs among officers reveals that officers tend to be much better informed than enlisted personnel. Virtually all officers are aware of the dangers of needle-sharing and of having sex with someone with AIDS. Furthermore, the level of misinformation about the other methods is considerably lower for officers than for enlisted personnel. Some of these differences in awareness between officers and enlisted personnel and between the Services probably stem from a greater representation of medical personnel within the officer's group, from the fact that officers are responsible for public health education, and from differences in the two groups' overall educational levels.

D. Beliefs about Preventing Sexual Transmission of AIDS

It is clear that most, if not all, military personnel are aware that a person may get AIDS by having sex with someone who has the disease. Respondents were asked to indicate whether or not six different activities

Table 9.2. Beliefs About How AIDS Can Be Prevented Through Sexual Activity

Grade/Item	Service				
	Army	Navy	Marine Corps	Air Force	Total DoD
Enlisted					
Using a diaphragm	6.6 (0.6)	3.7 (0.3)	5.4 (0.6)	2.8 (0.4)	4.6 (0.3)
Using a condom	72.6 (0.9)	78.2 (1.2)	74.4 (0.8)	77.5 (1.6)	75.8 (0.7)
Using a jelly, foam, or cream to kill sperm	5.3 (0.5)	5.1 (1.0)	3.1 (0.4)	4.2 (0.5)	4.8 (0.4)
Not having sex at all	88.5 (0.6)	93.1 (0.7)	87.0 (1.5)	92.9 (0.6)	91.0 (0.4)
Two people having sex with only each other	86.2 (0.4)	86.6 (1.0)	87.7 (1.9)	88.2 (0.7)	87.0 (0.4)
Asking possible sex partners if they have the virus	33.9 (1.2)	28.0 (1.0)	32.5 (2.2)	29.0 (1.4)	30.6 (0.7)
Officers					
Using a diaphragm	2.5 (0.5)	1.7 (0.7)	2.4 (0.9)	0.7 (0.3)	1.7 (0.3)
Using a condom	85.7 (2.3)	87.3 (2.0)	91.8 (1.7)	85.2 (1.9)	86.3 (1.2)
Using a jelly, foam, or cream to kill sperm	5.1 (1.0)	6.0 (1.5)	4.3 (1.9)	2.9 (0.5)	4.5 (0.6)
Not having sex at all	97.8 (0.5)	98.3 (0.6)	97.5 (1.1)	98.6 (0.6)	98.1 (0.3)
Two people having sex with only each other	90.6 (0.8)	92.9 (1.1)	96.1 (1.2)	92.6 (1.0)	92.2 (0.5)
Asking possible sex partners if they have the virus	17.2 (1.0)	11.3 (1.5)	19.2 (1.1)	13.4 (2.4)	14.7 (1.0)
Total					
Using a diaphragm	5.9 (0.6)	3.5 (0.3)	5.0 (0.5)	2.4 (0.3)	4.1 (0.2)
Using a condom	75.0 (0.9)	79.5 (0.8)	76.6 (0.7)	78.9 (1.3)	77.6 (0.6)
Using a jelly, foam, or cream to kill sperm	5.3 (0.5)	5.3 (0.9)	3.2 (0.6)	4.0 (0.5)	4.7 (0.4)
Not having sex at all	90.2 (0.6)	93.9 (0.7)	88.4 (1.6)	94.0 (0.6)	92.2 (0.4)
Two people having sex with only each other	87.0 (0.4)	87.5 (1.0)	88.8 (1.7)	89.1 (0.6)	87.9 (0.4)
Asking possible sex partners if they have the virus	30.8 (1.1)	25.7 (1.0)	30.8 (1.8)	26.0 (1.6)	27.9 (0.7)

Note: Tabled values are percentages with standard errors in parentheses. Data are estimates of individuals who believe the method is effective in preventing an infection from the HIV virus.

associated with sexual activity were effective in preventing infection by the HIV. Table 9.2 provides evidence that most military personnel are fairly well informed about the relative effectiveness of different methods of limiting susceptibility to HIV infection through sexual activity. Most individuals (92.2 percent) recognize that abstention is effective, and almost as many (87.9 percent) think that monogamous sex is effective. That not everyone thinks these two restrictions are effective is not surprising, given the findings in Table 9.1 that so many believe that AIDS can be acquired through physical proximity. On the other hand, very few individuals believe that HIV infection can be prevented by using a diaphragm (4.1 percent) or by using a jelly, foam, or cream spermicide (4.7 percent). A majority (77.6 percent) of all military personnel assert that using a condom is an effective means of preventing HIV infection; the remainder may be aware that sex with a condom is safer but not a totally effective method of preventing infection. Asking one's sex partners if they have the virus is considered an effective means of preventing infection by a small percentage (27.9 percent). Even that large a group probably represents a need for more effective public health education because the question implies multiple sex partners and a sex partner may well be carrying the virus without being aware of it. That is, current tests are unable to detect the virus for 6 to 12 weeks after infection, and sex partners may not have been tested in the absence of any indications of infection.

Differences across Services in awareness of the effectiveness of the six methods for preventing HIV infection are not great. Officers, however, tend to be better informed than are enlisted personnel, although both groups agree on relative effectiveness of the measures.

E. AIDS Information Sources

While the Services have implemented AIDS-information programs to provide personnel with the facts about this disease and its precursor, infection with the HIV, the public concern and publicity about AIDS have been so widespread that these programs are probably only marginal additions to most Service members' knowledge. Indeed, as shown in Table 9.3, over 90 percent of all personnel report having gotten information about AIDS from sources such as newspapers or magazines and commercial TV or radio. The sources

Table 9.3. Use and Usefulness of Information Sources About AIDS

Item	Service				Total DoD
	Army	Navy	Marine Corps	Air Force	
Use of Source[a]					
Command Information Program	73.2 (1.3)	73.4 (1.8)	65.2 (2.3)	49.8 (2.7)	65.5 (1.2)
Armed Forces Radio and Television (AFRTS)	61.8 (1.4)	51.4 (7.9)	46.3 (3.3)	35.9 (3.9)	49.7 (2.6)
Military medical personnel	74.3 (1.0)	66.2 (4.0)	62.9 (4.6)	53.8 (2.9)	64.9 (1.5)
Newspapers or magazines	92.5 (0.5)	91.3 (0.8)	87.1 (2.8)	90.4 (0.7)	91.1 (0.4)
Military school or training program	64.6 (1.4)	54.4 (3.5)	51.6 (1.4)	45.6 (2.2)	54.9 (1.2)
Spouse or other family member	73.9 (1.2)	67.2 (1.8)	65.4 (1.4)	63.4 (1.3)	68.1 (0.8)
Friends	78.7 (1.2)	72.8 (2.2)	72.7 (1.7)	68.8 (1.3)	73.6 (0.8)
Commercial TV or radio	92.3 (0.6)	87.7 (1.2)	84.4 (3.0)	91.5 (0.7)	90.1 (0.6)
Chaplain	45.6 (1.3)	37.9 (3.6)	40.5 (3.9)	27.8 (1.4)	37.7 (1.2)
Pamphlets and brochures distributed by the Services	79.1 (1.2)	73.1 (1.2)	73.0 (4.0)	64.7 (2.1)	72.5 (0.9)
Usefulness of Source[b]					
Command Information Program	54.5 (1.5)	49.5 (2.8)	43.8 (2.4)	38.8 (3.2)	48.4 (1.2)
Armed Forces Radio and Television (AFRTS)	45.5 (1.4)	39.1 (3.4)	33.2 (2.8)	31.3 (1.6)	39.6 (1.2)
Military medical personnel	60.9 (1.4)	57.1 (2.6)	53.2 (2.2)	48.9 (1.9)	56.2 (1.0)
Newspapers or magazines	70.8 (0.9)	67.1 (1.3)	73.3 (1.2)	69.1 (1.0)	69.5 (0.5)
Military school or training program	49.6 (1.3)	42.4 (2.5)	38.4 (0.8)	38.9 (1.8)	44.0 (1.0)
Spouse or other family member	46.3 (1.2)	41.2 (3.5)	42.6 (2.1)	39.3 (1.0)	42.6 (1.1)
Friends	39.0 (1.0)	33.2 (2.9)	37.3 (1.9)	32.5 (1.1)	35.4 (0.9)
Commercial TV or radio	63.7 (1.1)	62.5 (2.2)	63.1 (2.7)	69.0 (0.8)	64.9 (0.8)
Chaplain	37.3 (1.2)	34.2 (2.2)	34.4 (2.0)	30.6 (1.2)	34.6 (0.9)
Pamphlets and brochures distributed by the Services	68.3 (0.9)	64.6 (2.2)	64.6 (2.7)	62.5 (1.5)	65.4 (0.9)

Note: Table entries are percentages with standard errors in parentheses.

[a]Estimates of individuals who used the information source.

[b]Estimates for users of the source who report that it is "very useful" or "fairly useful" in providing information about AIDS.

most members report having gotten information from are friends (73.6 percent) and pamphlets and brochures distributed by the Services (72.5 percent).

The differences between Services in the use of types of information sources, probably reflects differences in the Services' AIDS-information programs. In general, fewer Air Force personnel report having used any of the sources except commercial TV and radio, yet earlier findings indicate that this Service's personnel are better informed.

Newspapers and magazines, commercial TV and radio, and literature distributed by the Services have been found to be fairly or very useful by at least 65 percent of all users of these different information sources. Fewer users of the other sources report those sources to be as useful. Since the military can control both content and distribution of AIDS-related literature and since many users have found this source of information to be useful, these findings seem to indicate that distribution of pamphlets and brochures can be an effective tool for increasing overall knowledge and awareness about AIDS in the general military population. Other military-sponsored sources of information reach smaller audiences and are reported by fewer personnel to be useful; to the extent that these audiences are composed of persons at high risk or with needs for special information, such information activities are still necessary elements of effective AIDS-information programs. In the final analyses direct distribution of brochures to military personnel appears to be the most effective comprehensive education program.

F. Changes in Behavior with AIDS Awareness

The final outcome that determines the effectiveness of any current education-based effort to prevent AIDS is the extent to which high-risk behaviors are reduced. No direct measures of rates of engaging in high-risk behaviors are available from the 1988 Worldwide Survey, but a question was included that asked whether respondents had changed their sexual behavior as a result of concern about getting AIDS. Results are reported in Table 9.4. Overall, 39.1 percent of military personnel report that they have changed their sexual behavior because of concern about contracting AIDS. Among commissioned and warrant officers and senior enlisted person

Table 9.4. Changed Sexual Behavior Because of Concern About Getting AIDS

Pay Grade	Service								Total DoD	
	Army		Navy		Marine Corps		Air Force			
E1-E3	58.5	(2.4)	57.9	(1.7)	54.9	(2.8)	46.0	(3.2)	54.0	(1.4)
E4-E6	48.4	(1.4)	43.5	(4.5)	38.2	(2.1)	32.2	(1.9)	41.6	(1.6)
E7-E9	34.3	(1.7)	27.5	(2.2)	34.1	(2.1)	22.7	(1.3)	29.2	(1.0)
W1-W4	25.4	(2.4)	24.1	(3.3)	18.0	(5.6)	*	(*)	24.6	(2.0)
O1-O3	25.4	(2.3)	24.0	(3.3)	25.7	(4.6)	19.3	(2.2)	22.9	(1.4)
O4-O10	12.4	(2.1)	13.0	(2.7)	13.6	(2.8)	11.7	(1.5)	12.4	(1.1)
Total	43.5	(1.6)	41.6	(3.6)	42.5	(2.5)	31.1	(1.6)	39.1	(1.3)

Note: Entries are percentage estimates of individuals who changed their sexual behavior. Standard errors are in parentheses.

*There are no warrant officers in the Air Force.

nel, fewer than 30 percent reported having changed their sexual behavior, while 41.6 percent of middle-grade and 54.0 percent of junior enlisted personnel report changed sexual behavior. These differences are probably most strongly related to marital status and educational levels, particularly since fewer Air Force personnel at all grades report changes, and that Service's proportions of married and more highly educated personnel are also larger than those of other Services.

Unfortunately, it is difficult to interpret these findings in the absence of information about previous sexual behavior, number and sex of sex partners, and frequency of sexual activity. Presumably, the changes are in the direction of fewer partners, greater use of condoms, abstention, or all of these. The results in Table 9.4 indicate, however, that sizeable numbers of individuals (particularly among the youngest age group most at risk for engaging in frequent sex with multiple partners) are both aware of the connection between sexual activity and the risk of getting AIDS and have consciously applied that knowledge to their own behavior.

G. Summary

Most military personnel know how HIV infection spreads. There is a high degree of awareness that AIDS transmission is strongly associated with sexual behavior and that certain sexual practices can minimize the risk of infection. Indeed, many military personnel report having changed their sexual behavior as a result of concern about getting AIDS. Nonetheless, there is a fairly high level of misinformation about some means of HIV-transmission that might interfere with day-to-day activities of military life.

1. Beliefs about AIDS Transmission

An indication of the extent and accuracy of military personnel's knowledge about AIDS is reflected in their level of awareness about AIDS transmission and their beliefs about the likelihood of HIV transmission through various avenues.

- Virtually all military personnel know that AIDS can be transmitted by needle-sharing (96.6 percent) and by having sex with someone who has AIDS (96.0 percent).

- Nearly two-thirds (65.2 percent) of all military personnel believe that it is unlikely that a person will contract AIDS from receiving a blood transfusion, and even more (81.3 percent) do not believe that donating blood is a means by which AIDS is transmitted. Still, sizeable percentages believe that AIDS can be transmitted by nonpersonal contact.

- In general, Army personnel are least well informed about means of AIDS transmission, and Air Force personnel are best informed; officers are much better informed than enlisted personnel.

2. Beliefs about Preventing Sexual Transmission of AIDS

Most military personnel know that you can catch AIDS by having sex with someone who has AIDS. It is also important that personnel know strategies for lowering the likelihood of the disease's sexual transmission.

- Most military personnel know how to prevent sexual transmission of AIDS, with 92.2 percent recognizing that abstention is effective, 87.8 percent believing that monogamous sex is effective, and 77.6 percent that use of a condom is effective.

3. AIDS Information Sources

Military personnel receive information about AIDS from various civilian and military sources. Information dissemination strategies may be the first line of defense against the further spread of AIDS, assuming these strategies actually get information to the at-risk populations and that the target audiences use the information.

- Over 90 percent of military personnel have received information about AIDS from newspapers or magazines and commercial TV or radio.

- At least half or more have also received information from pamphlets distributed by the Services (72.5 percent), Command Information Program (65.5 percent), military medical personnel (64.5 percent), Armed Forces Radio and Television (49.7 percent), and military school or training programs (54.9 percent).

4. Changes in Behavior with AIDS Awareness

One measure of the effectiveness of an AIDS education campaign is the extent to which it reduces high-risk behaviors.

- Almost 40 percent of all military personnel report having changed their sexual behavior because of concern about getting AIDS.
- The largest percentages reporting behavior changes are personnel at the junior enlisted (54.0 percent) and middle-grade (41.6 percent) levels, likely reflecting an association of marital status and education level with sexual practices.

Despite substantial knowledge about the means of transmission and prevention of AIDS, many military personnel are not well informed. These findings indicate the need to continue and to intensify military educational efforts about AIDS.

10. ALCOHOL AND DRUG ABUSE POLICIES AND PROGRAMS

Over the past few years, the Department of Defense has mounted a series of policy directives and programs designed to detect, prevent, and reduce alcohol and drug abuse in the Services. While the DoD provides overall policy guidance, it is the responsibility of the individual Services to tailor specific programs to meet the needs of their personnel. This chapter traces the development of DoD policies and programs on alcohol and drug abuse and examines the current perceptions of military personnel about the nature and scope of the problem in the Services and the effectiveness of Service-specific programs and policies in coping with the problem.

A. The Evolution of DoD and Services Policies and Programs on Alcohol and Drug Abuse

A DoD task force was formed in 1967 in response to reports of widespread drug abuse among troops in Vietnam. Although the task force was especially concerned about ways to prevent and treat drug abuse in the military, Senator Harold Hughes led the Congress to specify that alcohol be accorded equal emphasis in the DoD's drug program development efforts. Recommendations from that 1967 task force led to a drug and alcohol abuse policy focusing on prevention, education, and law enforcement practices directed at detection and early intervention (NIAAA, 1982).

Title V of the 1971 P.L. 92-129 (the Military Selective Service Act) required that a program be developed to identify and treat alcohol and drug dependent military personnel. By mandate of the Secretary of Defense, each Service then developed its own prevention and treatment programs responsive to its personnel needs and circumstances yet in compliance with the Title V guidelines.

Emphasizing the significance of the alcohol abuse problem in the Services, the DoD issued a policy directive in 1972 (No. 1010.2) which set forth prevention and treatment policies for alcohol abuse and alcoholism among military personnel. Although the directive addressed prevention and education and treatment, it also emphasized detection and enforcement. In instances where individuals fail to respond to rehabilitative interventions, the directive specifies provisions for transitioning such personnel to civilian life (NIAAA, 1982).

The DoD policy directive of 1980 (No. 1010.4) superceded the 1972 directive and reflected a tougher, less tolerant, and more results-oriented stance toward alcohol and drug abuse than previous policy initiatives. This directive established becoming "free of the effects of alcohol and drug abuse" and of possession, trafficking, use, sale, or promotion of illicit drugs and drug abuse paraphernalia (p. 2) as DoD goals. Since the DoD views drug and alcohol abuse as a threat to high performance standards and combat readiness, it has established a multi-faceted policy which addresses the problem from a more comprehensive perspective than previous policy directives. Specifically, the 1980 drug and alcohol abuse policy directive states that the DoD will not only detect, treat and, to the extent possible, rehabilitate drug and alcohol abusers but will also work to prevent abuse. Preventive measures include prohibiting the possession, sale, or trafficking of drugs and drug abuse paraphernalia; detecting and refusing admission to drug- and alcohol-dependent inductees or DoD civilian job candidates; providing education and training to commanders, supervisors, program personnel, and other military members and civilian employees and their families concerning alcohol and drug abuse and measures to impact on the problem; and working with other national government and non-government alcohol and drug abuse prevention efforts (DoD Directive No. 1010.4, pp. 2-3).

Specific responsibility for the development, coordination, and supervision of the DoD alcohol and drug abuse prevention program rests with the Assistant Secretary of Defense for Health Affairs. Although the Office of the Secretary of Defense offers general policy guidance, policy implementation is the responsibility of the military departments. The major areas of policy focus are monitoring, deterrence and detection, treatment and rehabilitation, and education and training.

1. Monitoring

Policy requires DoD to systematically monitor the extent of alcohol and drug abuse in the military, assess the impact of abuse on the military, and identify the factors responsible for changes in abuse rates. In order to assess changes in the extent of abuse, the DoD must also monitor abuse rates in the general population as well as DoD program initiatives

and policy changes. The goal of these monitoring activities is to enable the DoD to rapidly modify and develop programs and policies to target the kinds of treatment and prevention efforts that will reduce the negative impacts of abuse on military outcomes.

Policy requires that the DoD formally report on findings from urinalysis testing, alcohol and drug education and treatment program activities, military law enforcement activities related to abuse, and legal or administrative disposition of drug abuse offenders. Additionally, DoD must implement a system for capturing information on the scope of the abuse problem. Such data must then be made available upon request by governmental, Congressional, or public agencies and in support of budget requests for alcohol and drug abuse treatment and prevention efforts (DoD Directive No. 1010.3).

2. Deterrence and Detection

DoD deterrence and detection efforts are designed to prevent and inhibit the abuse of alcohol and drugs among military personnel and to identify any target abusers or those at high risk of abuse for education and early intervention efforts. As described in DoD Directive No. 1010.1, "Drug Abuse Testing Program," the DoD drug testing program is designed to identify drug abusers not only for counseling, rehabilitation, or medical treatment purposes, but also to allow commanders to evaluate the fitness of their charges to assume their military responsibilities and to meet acceptable standards of performance.

Recruiters are encouraged to identify and reject potential enlistees who have current abuse problems or histories of serious alcohol and drug abuse. Background checks and urinalysis tests on enlistees are conducted to confirm recruiters' findings. After induction, deterrence measures include having recruits read and sign documents that indicate they understand the DoD policy on substance abuse and having commanders conduct periodic, random urinalysis tests.

Personnel may be deterred by detection practices. For example, law enforcement measures such as breathalyzers, blood tests, and drug detection dogs may not only detect abusers but may also prevent abuse if personnel believe that detection is likely. DoD Directive 1010.7, "Drunk and Drugged

Driving by DoD Personnel," is designed to prevent intoxicated driving and specifies that persons caught and convicted will have their driving privileges suspended. The directive specifies a coordinated program of education, detection, law enforcement, and treatment for the offender. Additionally, it specifies education and training for personnel who may encounter abusers, such as law enforcement, public information, and emergency room personnel; safety personnel; bartenders; waitresses; and sales personnel.

3. Treatment Interventions

The large DoD drug and alcohol treatment and rehabilitation program is tailored to individual needs and ranges from intensive education seminars to inpatient hospital care. In fiscal year 1987, the DoD treated approximately 51,000 active-duty personnel for drug and alcohol problems. Nearly 44,000 of these individuals were treated as outpatients in 400 nonresidential facilities, while approximately 7,000 were treated as inpatients in 52 residential facilities.

As described in DoD Instruction No. 1010.6, "Rehabilitation and Referral Services for Alcohol and Drug Abusers," DoD's treatment goals are two-pronged: (1) to identify those at risk of abuse, and (2) to provide counseling and rehabilitative services through residential, nonresidential, consultative, and educational interventions. The treatment-rehabilitation services continuum includes, where appropriate, detoxification, family counseling, and aftercare. Individuals who have had their installation driving privileges revoked as a result of an intoxicated driving conviction (or refusal to take a blood alcohol concentration test) are required to participate in alcohol and drug awareness programs.

4. Education and Training

A major component of the DoD alcohol and drug abuse prevention program is the provision of education and training both for abusers and for those responsible for the supervision of military personnel and treatment of abusers. As specified in DoD Instruction No. 1010.5, "Education and Training in Alcohol and Drug Abuse Prevention," military leadership and program supervisors are offered instruction regarding DoD alcohol and drug

abuse programs and other resources. One goal of such activities is to improve the competence of personnel such as health care professionals and paraprofessionals, military commanders, military and civilian supervisors, and program personnel regarding DoD alcohol and drug abuse prevention policy and effective strategies for impacting on alcohol and drug abuse and its associated problems. Other military and DoD civilians receive appropriately tailored alcohol and drug abuse education interventions.

For military personnel, education is offered at the time of enlistment, at permanent change of station (PCS) moves, during professional or military education, and after an alcohol- or drug-related incident. For enlisted personnel, such programs are designed to raise awareness about prevention and the legal consequences of abuse; for officers and commanders, the goal is to offer information regarding the responsibilities of the leadership for alcohol and drug abuse prevention.

B. Alcohol and Drug Abuse Programs Across the Services

While the DoD establishes general alcohol and substance abuse policy, it delegates to the individual Services the responsibility for developing and operating programs responsive to the needs of its personnel. Still, the individual Services reflect the overriding DoD philosophy of the basic incompatibility between alcohol and drug abuse and military service. This philosophy is evident in the Services' emphasis on detection and discipline as basic elements of programs they develop. Although the ultimate aim of the DoD is zero tolerance, the Services have made uneven progress toward this goal, even though programs contain certain common elements. Generally, across all the Services, the sanctions applied for officers' violation of alcohol and drug abuse policies are more severe than those for enlisted personnel. The types of prevention programs currently in place across all Services vary more than the detection and deterrence mechanisms such as the urinalysis test.

1. Army

Army policy states that alcohol and other drug abuse are incompatible with military service and have a negative impact on readiness, morale, and productivity. The Army Alcohol and Drug Abuse Prevention and

Control Program (ADAPCP) seeks to deter, identify, and rehabilitate drug and alcohol abusers through a centrally managed, locally implemented command program.

The ADAPCP consists of prevention, education, identification, and rehabilitation programs at 190 outpatient counseling centers and nine residential treatment centers worldwide. Prevention and education services are provided to Army personnel, civilian employees, and family members upon entry into the Service, at training schools, when changing assignments, and at other training events. Early identification of abusers is emphasized using biochemical testing, law enforcement initiatives, and commander involvement. For those soldiers who demonstrate potential for further service, rehabilitation services are provided through medically supervised programs.

Deterrence of alcohol and other drug abuse is a major Army initiative. The most effective deterrents to drug use are urinalysis testing and strong command policies. The Army tests approximately 1.2 million urine specimens annually and has successfully reduced the positive rate from 10 percent in 1983 to less than 2 percent in 1988. Officers and non-commissioned officers are processed for discharge upon identification for any drug offense. Lower enlisted personnel demonstrating potential are given one chance to change their drug use behavior and are processed for separation after a second offense.

The Army views alcohol as its primary abuse problem. Although, alcohol use is legally and socially accepted, on-duty impairment is not tolerated. A blood alcohol level of .05 percent or higher while on duty is a punishable offense for all Army personnel. The Army has initiated a broad spectrum program of deglamorization of alcohol which has resulted in a reduction of DWI offenses and per capita alcohol consumption.

The ADAPCP rehabilitation services are offered through a short-term education/awareness program, outpatient individual or group counseling, and hospital-based residential treatment (6-8 weeks) with one-year aftercare counseling. Approximately 68 percent successfully complete the rehabilitation program and are returned to full and effective duty status.

2. Navy

The Navy has adopted a zero-tolerance philosophy toward alcohol and drug abuse and is striving to establish an abuse-free environment. The Navy pursues its goals of prevention and control through programs emphasizing education, detection, deterrence, treatment, and rehabilitation. New officers and enlisted personnel receive drug and alcohol training, instruction which is extended to service schools and command training, and through the Navy Alcohol and Drug Safety Action Program (NADSAP) training program that is offered fleet-wide. Philosophically, these programs emphasize: (1) the importance of individual and peer efforts in preventing and controlling abuse, and (2) the harmful effects of alcohol and drug abuse on health, career, and quality of life.

The Navy depends heavily on urinalysis testing for drug abuse deterrence and detection. Its five Navy Drug Screening Laboratories conduct approximately 1.8 million tests per year for marijuana, cocaine, PCP, amphetamines, barbiturates, and opiates. A portion of the tests conducted under this program are for the Marine Corps. Personnel in the E1-E5 ranks who test positive for drug use may be allowed another opportunity to remain in the Navy upon the recommendation of the commanding officer. Abuse by first class petty officers and commissioned officers is not tolerated, and they will be processed for separation.

The Navy organizes its rehabilitation programs according to the intensity of intervention delivered. Level I intervention includes a local command education program and NADSAP attendance. Level II includes screening and outpatient counseling provided through approximately 75 counseling and assistance centers located worldwide. Level III provides rehabilitation interventions and presently serves approximately 6,000 patients at 26 inpatient facilities.

3. Marine Corps

The Marines have adopted a stance of nontolerance on alcohol and drug abuse while incorporating rehabilitation into their goal of identifying, treating, and returning abusers to active duty. The urinalysis test is the major tool for deterrence and detection and is used extensively.

The goal is to test each member three times per year. The use of a porta-kit test package makes urinalysis testing in the field possible and enables personnel to meet their quota of 468,000 urine screenings per year.

An education program offered to all Marines throughout their time in service stresses responsible use of alcohol. Classes are offered through recruit and officer training, formal unit level schools, and specialized leadership courses at Headquarters level.

If identified as a drug abuser, personnel at the E6 (staff sergeant) level and above are automatically discharged. Those at the E1-E5 levels are given a second chance but usually are discharged after a second violation. A waiver by the Commandant is necessary for a member to remain after a second offense. Like the Army and the Navy, the Marine Corps drug and alcohol abuse program is organized by level of intensity: education and identification, outpatient treatment and referral, and inpatient treatment at one of the rehabilitation facilities operated by the Navy.

4. Air Force

Air Force drug and alcohol programs emphasize education, drug testing, and drug and alcohol rehabilitation. Education and alcohol and drug abuse training are offered through recruit training, orientation, professional military education, and a senior officer's course.

Like the other Services, the Air Force relies on urinalysis testing as a major component of its deterrence and detection effort, but its testing quotas are less stringent than those of the Marines. Where the Marines aim for three urinalysis tests per member per year, the Air Force aims for an average of one test per member every 2 years.

The Air Force's treatment and rehabilitation program is organized into residential and nonresidential components. Individuals who test positive for drug or alcohol abuse are evaluated and treated for 6 weeks through the nonresidential program. If more extensive treatment is indicated, personnel transfer to one of the 11 Air Force residential treatment centers for a 28-day program. Participants in both the residential and nonresidential components receive a 1-year follow-on support program, during which time they may resume their regular duties. Personnel at the E-1 through E-4

levels identified for minor drug offenses may be retained upon the unit commander's recommendation. Sergeants and above are generally discharged for any drug abuse incident.

5. Summary of Alcohol and Drug Abuse Program Emphases

Alcohol and drug abuse programs offered by the individual Services are tailored to the specific needs of their personnel. While all the Services embrace the overall DoD substance abuse policy, program offerings and sanctions for detection vary across the Services and uneven progress has been made toward the DoD goal of zero tolerance. The Army and Air Force generally allow E1-E4 personnel to remain after a first drug violation, while the Marine Corps and Navy allow E1-E5s to remain. These differences may reflect factors unique to the individual Services, such as philosophy and beliefs about the causes of abuse, attitudes about the roles of technical and supervisory personnel, age of members, comparability of pay grades, and promotion rates.

C. Context of Alcohol and Drug Use Prevention Programs

Most current approaches to the prevention of substance abuse incorporate multiple strategies. In this section we first describe various perspectives on prevention. Following this discussion, we consider service members' beliefs about the effects of alcohol and drug use.

1. Perspectives on Prevention

The public health model of substance abuse specifies three avenues of access to prevention--the individual (host), substance (agent), and environment (Moore and Gerstein, 1981; West, 1984). Strategies targeting the host attempt to prevent abuse by changing the individual's knowledge, behavior, and attitudes about substance use (Durell and Bukoski, 1984). Examples include education programs that emphasize the negative effects of alcohol and drug use on health and the potential legal consequences. Such programs are available to military personnel at entry, at permanent change of station (PCS) moves, during military education and after an alcohol or drug-related incident. Both enlisted personnel and officers are educated

about the health and legal ramifications of substance use. In addition, officers and commanders receive training that includes leader responsibilities in abuse prevention.

Additional strategies targeting the host aim to prevent substance abuse by creating a climate supportive of nonuse or controlled use. Health promotion efforts strive to foster healthy lifestyles incompatible with substance abuse. The military's recent establishment of health promotion programs should encourage the kind of health practices that result in further declines in substance abuse.

Prevention strategies aimed toward the agent are designed to control use by regulating the availability and cost of use. Examples of agent-oriented practices include raising prices of alcohol, restricting the hours of sale, controlling the number and location of vendors, enforcing minimum age requirements for purchases, and restricting the areas where drinking is allowed. Agent-directed prevention strategies addressing illicit drugs enforce the ban on the sale of such substances.

Environmentally-directed prevention strategies attempt to minimize the risk and injury associated with substance abuse by modifying the environment in which the potential abuser exists. Examples include improving roads and road signs to minimize the risks of accidents by impaired drivers. These strategies are less the responsibility of the military than governmental, consumer, and citizen safety organizations.

2. Perceived Acceptability and Risks of Alcohol and Drug Use

Attitudes of military personnel towards alcohol and drug abuse and the perceived effects on health and well-being create an atmosphere of acceptance or nonacceptance of alcohol and drug use and abuse. The military can mount educational and informational campaigns to shape beliefs and perceptions about use, abuse, and its consequences. Alcohol and drug use and incidents of abuse should decrease once personnel are aware of the risks and consequences associated with use or if use is made less acceptable.

Table 10.1 presents information regarding the percentages of individuals who agree or disagree with several items tapping beliefs and perceptions. While 29.6 percent of military personnel believe that everyone is

Table 10.1 Perceptions Relevant to Education Programs for Alcohol and Drug Abuse

Perception/Items	Service				
	Army	Navy	Marine Corps	Air Force	Total DoD
Acceptability of Use					
Drinking is part of being in the military	25.9 (1.0)	26.2 (1.4)	26.3 (1.8)	26.7 (0.9)	26.2 (0.6)
Everyone is encouraged to drink at social functions at this installation	27.5 (1.3)	28.4 (1.7)	31.2 (1.6)	32.7 (1.3)	29.6 (0.7)
It's easy to use drugs at parties or social functions at this installation	13.0 (1.2)	11.5 (2.3)	12.7 (1.1)	4.6 (0.4)	10.0 (0.8)
Effects on Work and Readiness					
Drinking sometimes interferes with my work	6.0 (0.5)	6.6 (1.5)	9.4 (1.7)	2.9 (0.4)	5.5 (0.5)
Heavy drinking reduces the readiness of my unit	47.9 (1.5)	45.5 (1.8)	43.1 (1.9)	34.3 (0.9)	42.7 (0.8)
Using drugs would interfere with my work	75.1 (1.1)	79.5 (1.3)	79.0 (2.0)	83.0 (0.7)	79.0 (0.6)
Drug use reduces the readiness of units at this installation	38.4 (1.1)	33.4 (0.9)	40.4 (2.3)	23.8 (0.7)	32.8 (0.6)
Effects on Health					
Drinking will interfere with my health or physical fitness	79.2 (0.8)	80.2 (0.8)	78.9 (2.6)	77.8 (0.8)	79.0 (0.5)
Using drugs would interfere with my health or physical fitness	81.9 (0.7)	85.0 (1.3)	86.3 (1.0)	85.1 (0.9)	84.1 (0.5)
Using drugs would mess up my mind	72.5 (1.2)	75.9 (2.4)	79.4 (1.9)	78.8 (0.8)	76.0 (0.8)

Note: Data are percentages of respondents who "agreed" or "strongly agreed" with the item. Standard errors are in parentheses.

encouraged to drink at social functions at their installation, 26.2 percent believe that drinking is just a part of being in the military. Interestingly, only 10.0 percent believe that it is easy to use drugs at their installation's social functions. Thus, considerably less than half of all military personnel appear to believe that alcohol and drug use are part of the accepted norms in the military.

From 79.0 to 84.1 percent of military personnel believe that alcohol or drug use can pose health risks. While only 6 percent report that alcohol use sometimes interferes with their work, 79 percent believe that using drugs would interfere with work. Less than half of all personnel are likely to believe that alcohol and drug use reduces unit readiness (42.7 percent and 32.8 percent, respectively). These perceptions may be tied to the knowledge of relative alcohol and drug use levels in the military.

While there are few large Service differences in beliefs about the acceptability, effects, and risks of alcohol and drug use, the Air Force appears to be slightly more accepting of social alcohol use than the other Services and less accepting of drug use at social functions than the other Services. Air Force personnel are also less likely than personnel in other Services to believe that alcohol and drug use affects the readiness of their units. These perceptions may be due to the lower levels of alcohol and drug abuse among Air Force personnel.

The perceptions of military personnel about alcohol and drug abuse acceptability and risk indicate that a general climate of controlled alcohol use and nonuse of drugs exists in the military. These perceptions suggest that current prevention programs operated by the military are effective. The fact that such a small percentage of personnel view alcohol and drug use as potentially interfering with unit readiness is of concern. Education efforts by the military could address these perceptions and strive to raise awareness about the effects and risks of alcohol and drug use and abuse on readiness and on individual health and functioning. Education may be effective in countering the misperception that level of substance use has little effect on performance or affects an inconsequential number of individuals.

3. Perceptions of Regulatory Policies

Military policy regulates the availability of alcohol and drugs on installation premises by establishing hours and prices for alcohol sales, controlling the availability of drugs, enforcing DWI laws, and establishing the circumstances for discharge for drug- and alcohol-related incidents. Table 10.2 presents members' beliefs about these policies and about their effects on alcohol and drug use.

As shown in Table 10.2, 22.9 percent of all personnel believe that happy hours make drinking easy at their installations, while 46.7 percent believe that alcoholic beverages are too expensive. These perceptions indicate that installation policies regulating alcohol accessibility are having a positive impact, at least to some degree. The military may benefit from continued monitoring of these policies, considering particularly the potential impacts of further restricting happy hour periods and increasing the price of alcoholic beverages.

Nine out of 10 believe that driving while intoxicated on the military installation would lead to arrest. The DWI (driving while intoxicated) regulation, then, is an effective deterrent. Only 45.5 percent believe that marijuana users should be discharged, however, indicating that there is less consensus about sanctions against marijuana users.

The only apparent marked Service differences concern the beliefs about whether marijuana users should be discharged. Air Force personnel were most likely and Army personnel were least likely to believe that discharge sanctions against marijuana users are warranted.

These findings support the conclusion that military regulatory policies generally are effective and that most military personnel believe these policies have a large impact on accessibility to alcohol and drugs and ease of use.

D. Context of Alcohol and Drug Use Treatment Programs

For alcohol and drug problems to be effective, the personnel whom they were designed to reach must not only be aware of their existence, but they must also be willing to use the programs. Factors that inhibit program participation ultimately impede the Services' rehabilitation efforts.

Table 10.2 Beliefs About Regulatory Policies

Beliefs/Items	Service				
	Army	Navy	Marine Corps	Air Force	Total DoD
Availability					
Happy hours at this installation make drinking easy	20.9 (1.0)	22.5 (1.7)	23.3 (1.4)	25.3 (0.9)	22.9 (0.6)
Alcoholic beverages cost too much	48.2 (1.3)	47.7 (1.6)	48.0 (2.2)	43.8 (1.2)	46.7 (0.7)
Arrest/Discharge					
Driving on base while intoxicated is a sure way to get arrested	91.5 (0.7)	88.3 (0.9)	92.2 (2.2)	92.6 (0.7)	91.0 (0.5)
Anyone detected using marijuana should be discharged	38.4 (1.1)	44.2 (2.0)	46.8 (2.8)	54.2 (1.3)	45.5 (0.9)

Note: Data are percentages of respondents who "agreed" or "strongly agreed" with the item. Standard errors are in parentheses.

1. Barriers to Seeking Help

There are many reasons that individuals may not actively seek help for drug or alcohol problems. Examples include a belief that getting help is difficult, could have a detrimental effect on military careers, or could result in disciplinary action. Although having a drug or alcohol abuse problem could result in discharge, the Services have established policies which encourage efforts to obtain assistance. Discharge is the consequence for untreated problems or failed rehabilitative efforts.

As Tables 10.3 and 10.4 indicate, a major barrier to seeking treatment for an alcohol or drug problem is the belief that disciplinary action will be taken against the person seeking treatment (58.0 percent for an alcohol problem, 60.9 percent for a drug problem). Ranking second in importance is the belief that the commander would find out (42.7 percent for an alcohol problem, 48.7 percent for a drug problem) and, third, that seeking help would damage one's career (30.4 percent for an alcohol problem, 43.5 percent for a drug problem). Less important reasons were fear of surprise searches (14.7 percent for an alcohol problem, 28.2 percent for a drug problem) and difficulty in getting off duty to attend sessions (13.1 percent for an alcohol problem, 10.6 percent for a drug problem).

Overall, military personnel were more likely to perceive the factors noted in the tables as barriers to seeking drug treatment than for alcohol treatment. Based on these data, it appears that drug abusers may be less likely to seek treatment than alcohol abusers.

Some differences in these perceptions are evident across Services. Air Force personnel were more likely than other Service personnel to disciplinary action and believe that seeking help for alcohol and drug problems might damage their careers. They were considerably less likely than other Service personnel to believe that they would have difficulty getting off duty to attend counseling. Overall, it appears that Air Force personnel may be less likely than personnel from other Services to seek help for an alcohol or drug problem.

The propensity of military personnel to seek treatment for an abuse problem must be examined in view of the disciplinary actions and other

Table 10.3 Barriers to Seeking Help for Alcohol Abuse

Alcohol Items	Service				Total DoD
	Army	Navy	Marine Corps	Air Force	
If seek treatment, will later experience surprise searches	15.8 (1.0)	14.1 (2.0)	18.0 (1.7)	13.0 (0.9)	14.7 (0.7)
Can't get help for drinking problem without commander finding out	46.1 (1.3)	40.0 (1.5)	47.3 (3.1)	40.2 (1.1)	42.7 (0.8)
Have trouble getting off duty to attend counseling sessions	15.2 (1.0)	15.8 (2.9)	15.6 (2.5)	7.6 (0.5)	13.1 (1.0)
Disciplinary action will be taken against a person (with a drinking problem)	58.0 (1.2)	56.2 (1.5)	58.4 (1.9)	62.5 (1.2)	58.0 (0.7)
Seeking help for a drinking problem will damage military career	27.6 (0.9)	27.0 (1.0)	31.9 (2.3)	36.3 (1.0)	30.4 (0.6)

Note: Data are percentages of those who "agreed" or "strongly agreed" with the item. Standard errors are in parentheses.

Table 10.4 Barriers to Seeking Help for Drug Abuse

Drug Items	Service				
	Army	Navy	Marine Corps	Air Force	Total DoD
If seek treatment, will later experience surprise searches	28.5 (0.9)	27.7 (2.2)	27.4 (1.9)	28.5 (1.2)	28.2 (0.8)
Personnel at installation try to help people who have drug problems	41.8 (1.1)	39.8 (2.3)	45.2 (1.8)	31.6 (1.5)	38.5 (0.9)
Can't get help for drug problem without commander finding out	49.0 (1.1)	47.4 (2.5)	53.3 (2.2)	48.2 (1.3)	48.7 (0.9)
Have trouble getting off duty to attend counseling sessions	11.8 (0.7)	12.8 (2.8)	13.2 (2.3)	6.4 (0.5)	10.6 (0.9)
Disciplinary action will be taken against a person (with a drug problem)	56.7 (1.0)	62.4 (0.8)	62.3 (1.7)	63.9 (1.3)	60.9 (0.6)
Seeking help for a drug problem will damage military career	34.8 (0.9)	42.7 (1.0)	43.7 (2.0)	53.7 (1.1)	43.5 (0.6)

Note: Data are percentages of those who "agreed" or "strongly agreed" with the item. Standard errors are in parentheses.

policies regulating alcohol and drug abuse treatment. While policies encourage rehabilitation, especially for junior enlisted first offenders, personnel may feat that seeking help will result in negative consequences, especially in view of discharge practices for drug offenders. For this reason, some personnel may not feel free to seek help, regardless of stated policies.

2. Participation in Counseling and Treatment Programs

As Table 10.5 indicates, few military personnel reported actually receiving treatment for an alcohol or drug problem. Only 8.6 percent of all active-duty personnel reported having received treatment for an alcohol problem, and 1.9 percent reported receiving treatment for a drug problem. Both drug and alcohol treatment were more likely to be provided through a military treatment program than through military medical facilities or through civilian medical facilities or treatment programs. Although fewer Air Force personnel reported having treatment for an abuse problem, their lower treatment rates are likely closely tied to lower use levels.

E. Beliefs About Urinalysis Programs

The urinalysis program begun in 1981 has been credited with the decline in drug use in the military. Table 10.6 presents the perceptions of military personnel regarding the effects of the urinalysis program. As the table indicates, 75.9 percent of military personnel believe that urinalysis testing has reduced drug use in the military, and 85.1 percent believe that the testing program has not hurt morale. On the other hand, only 41.2 percent believe that the tests are reliable. This may be due to publicity surrounding the alleged mishandling of specimens and the discharges resulting from "false positives." The military may benefit from exploring ways to build confidence in the tests and the procedures and equipment used to monitor use levels.

While nearly 22.7 percent of military personnel report that urinalysis testing has kept them from trying drugs, 76.4 percent maintain that they would not use drugs even if there were no urinalysis testing. A sizeable percentage (41.2 percent) believe that some people get away with using drugs that will not be detected by the test, and 33.2 percent believe that

Table 10.5 Participation in Alcohol and Drug Counseling and Treatment Programs

Counseling and Treatment Programs	Service				
	Army	Navy	Marine Corps	Air Force	Total DoD
Alcohol Programs					
Through military medical facility	3.4 (0.3)	3.2 (0.4)	5.0 (1.2)	3.1 (0.3)	3.4 (0.2)
Through military treatment program	8.0 (0.7)	8.3 (0.4)	8.0 (1.2)	5.3 (0.5)	7.3 (0.3)
Through civilian medical facility	0.6 (0.1)	0.4 (0.1)	0.4 (0.2)	0.1 (**)	0.4 (0.1)
Through civilian treatment program	1.8 (0.3)	1.3 (0.2)	1.2 (0.3)	1.1 (0.2)	1.4 (0.1)
Any counseling or treatment	9.6 (0.8)	9.3 (0.5)	9.5 (1.2)	6.6 (0.6)	8.6 (0.4)
Drug Programs					
Through military medical facility	0.4 (0.1)	0.5 (0.2)	0.9 (0.6)	0.4 (0.1)	0.5 (0.1)
Through military treatment program	2.6 (0.5)	1.6 (0.2)	1.9 (0.5)	0.9 (0.2)	1.8 (0.2)
Through civilian medical facility	** (**)	0.1 (0.1)	0.1 (0.1)	** (**)	0.1 (**)
Through civilian treatment program	0.1 (0.1)	0.4 (0.2)	0.2 (0.1)	** (**)	0.2 (0.1)
Any counseling or treatment	2.8 (0.5)	1.9 (0.3)	1.9 (0.5)	1.0 (0.2)	1.9 (0.2)

Note: Entries are percentages with standard errors in parentheses.

**Estimate rounds to zero.

Table 10.6. Beliefs About Urinalysis Program

Effects/Items	Service					Total DoD	
	Army	Navy	Marine Corps	Air Force	Total DoD	User	Nonuser
Deterrent Effects							
Reduces drug use in the military	74.9 (1.1)	80.7 (1.9)	80.0 (2.7)	71.4 (0.9)	75.9 (0.7)	76.8 (2.0)	75.8 (0.7)
Has prevented drug use in my unit	52.2 (1.2)	58.0 (2.0)	54.9 (4.5)	47.4 (1.6)	52.6 (0.9)	46.2 (3.2)	53.2 (0.8)
Has kept me from trying some drugs	24.2 (0.9)	26.4 (2.5)	27.0 (2.0)	16.2 (1.3)	22.7 (1.0)	45.6 (2.7)	20.4 (0.8)
I wouldn't use drugs even if there were no urinalysis testing	72.6 (1.3)	74.0 (3.0)	77.2 (2.6)	82.4 (1.0)	76.4 (1.1)	28.7 (2.6)	81.0 (0.7)
Some drug users curtail use when they think they will be selected for urinalysis	44.7 (1.8)	37.2 (3.4)	37.6 (3.6)	15.3 (0.9)	33.2 (1.4)	69.2 (2.3)	29.6 (1.1)
Reliability							
Tests are reliable	43.6 (0.9)	44.1 (1.3)	43.2 (3.0)	35.1 (0.9)	41.2 (0.6)	32.0 (2.5)	42.1 (0.7)
People get away with using certain drugs that can't be detected	47.4 (1.6)	47.8 (2.7)	45.4 (1.8)	27.0 (1.0)	41.2 (1.2)	60.4 (3.3)	39.3 (1.0)
Effects on Morale							
Emphasis on detection and discipline in my Service's drug program hurts morale	17.0 (0.8)	17.2 (3.5)	15.5 (1.5)	10.2 (0.7)	14.9 (1.1)	35.3 (3.1)	12.9 (0.8)

Note: Entries are percentages who "agreed " or "strongly agreed" with the item. Standard errors appear in parentheses. "User" refers to reports of any drug use during the past 12 months.

drug users avoid detection by curtailing their drug use when they think they will be tested.

Both Navy and Marine Corps personnel are more likely than those of the other Services to believe that the urinalysis tests are deterrents. They are also somewhat more likely to believe the tests are reliable. Air Force personnel are less likely than other personnel to believe that there are ways to circumvent detection by the tests or that an emphasis on detection and discipline hurts morale. Air Force personnel are also more likely to report that they would not use drugs even if there were no urinalysis program and less likely to report that the program deterred them from using drugs. Such differences may simply reflect varying rates of drug use across the Services. For example, Air Force personnel are less likely to use drugs, even when controlling for sociodemographic differences in the composition of the Services.

Drug users and nonusers tended to have different perceptions in several areas. Users were more likely than nonusers to state that urinalysis testing deterred them from using drugs and that it curtailed their drug use when they thought they would be detected. Users also are more likely than nonusers to believe that the urinalysis program hurts morale. These findings indicate that the tests are deterring drug use, even though some drug users have learned to periodically suppress their drug use in order to avoid detection. Nonusers appear to have more confidence in the tests than users and believe more strongly that the tests have reduced drug use in the military overall and in their own unit.

In general, military personnel across the Services believe that urinalysis testing has significant deterrent effects. Self-reported drug users tend to be more skeptical, however, and are more inclined than nonusers to see the limitations of urinalysis testing. These findings underscore the need for continued drug education, awareness, and abuse prevention programs. Both overall and in the individual Services, drug use has declined dramatically over the 5 years since the survey began. The decline is likely due to a combination of factors, including societal declines in drug use as well as the increased effectiveness of military policies and programs addressing drug abuse.

F. Summary

This chapter has examined the perceptions of military personnel about the nature and scope of the alcohol and drug abuse problem in the Services, and the likely impact of DoD policies and programs designed to regulate and reduce alcohol and drug abuse among military personnel. Findings from the survey administration were presented and discussed and implications for policy and program development and targeting were explored.

1. Perceived Acceptability and Risks of Alcohol and Drug Use

The attitudes that military personnel hold toward alcohol and drug use and the perceived effects on health and well-being help shape a social climate which may either reinforce or discourage alcohol and drug use and abuse.

- A majority or military personnel--79.0 to 84.1 percent--believe that alcohol or drug use is a threat to health and fitness.
- Although only 5.5 percent report that drinking sometimes interferes with their work, 79.0 percent believe that using drugs would interfere with their ability to do their job.
- Personnel generally do not believe that drinking and drug use are broadly accepted social norms in the military, indicating that the Services offer a climate supportive of reasoned use of alcohol and nonuse of drugs. The need for further educational efforts is suggested by the finding that many personnel do not view alcohol and drug use (57.3 percent and 67.2 percent, respectively) as a threat to unit readiness.

2. Perceptions of Regulatory Policies

The military controls access to alcohol and drugs on its installations by setting the hours and prices for alcohol sales and by enforcing the sanctions for illegal alcohol and drug use and possession. The extent to which military personnel view these control policies and practices as effective indicates the degree to which they are having a positive impact on alcohol and drug abuse.

- Only 22.9 percent of all personnel believe that happy hours make drinking easy at their installation, while less than half, 46.7 percent, believe that alcoholic beverages are too

expensive. Thus, happy hours generally are not seen as promoting drinking, but the fact that less than half view alcoholic beverages as too expensive indicates that continued monitoring of the impacts of restricted happy hour periods and the prices of alcoholic beverages is warranted.

- Although 91.0 percent of all personnel believe that driving while intoxicated on the military installation would lead to arrest, only 45.5 percent believe that marijuana users should be discharged. These findings offer strong support for the effectiveness of DWI sanctions, and weaker support for sanctions against marijuana use.

3. Content of Alcohol and Drug Use Treatment Programs

Precursors to the effectiveness of alcohol and drug treatment programs are awareness of the programs and the perceived absence of barriers to participation.

- most military personnel have not received alcohol or drug abuse treatment---8.6 percent for an alcohol problem and 1.9 percent for a drug problem.

Most of these individuals receive counseling and treatment through a military treatment program rather than through a medical facility or through civilian programs and facilities. The major barriers to seeking help for an alcohol or drug abuse problem are perceptions that: (1) disciplinary action would result (58.0 percent for an alcohol problem, 60.9 percent for a drug problem), (2) commanders will find out (42.7 percent for an alcohol problem, 48.7 percent for a drug problem, and (3) the military career will be damaged (30.4 percent for an alcohol problem, 43.5 percent for a drug problem). Perceived barriers to seeking assistance for drug abuse are greater than for alcohol abuse.

4. Beliefs About Urinalysis Programs

The urinalysis program has been associated with a decline in drug use in the military.

- While 75.9 percent of military personnel believe that urinalysis testing is effective in reducing and preventing drug use, a majority (58.8 percent) also feel that the test's reliability is questionable. Users more than nonusers are skeptical of the test's accuracy and believe that the emphasis on detection and discipline hurts morale.

- Although 22.7 percent of military personnel report that urinalysis testing has kept them from trying drugs, 76.4 percent maintain that they would not use drugs even if there were no urinalysis testing.

Military policies and programs appear to be effective in creating an environment conducive to responsible alcohol use and nonuse of drugs. Personnel are generally aware of the health risks of alcohol and drug use and abuse and are moderately aware of the potential effects on job performance and combat readiness. The substantial declines in drug use since the urinalysis testing program began in 1981 and beliefs of military personnel in its deterrent properties lend support to the conclusion that the program is an effective strategy for preventing and reducing drug use.

Survey findings suggest two areas where the military may profit from targeted strategies. First, the fact that personnel seem to be only moderately aware of the effects of alcohol and drug abuse on military outcomes and job performance standards suggests the need for an educational awareness campaign. Second, the fact that a sizable number of personnel perceive barriers to seeking help for alcohol and drug abuse, especially drug abuse, suggests the need for a closer examination of existing policies governing the sanctions for voluntary help-seeking. Reducing these sanctions would likely strengthen the military's rehabilitative efforts.

11. HEALTH PROMOTION IN THE MILITARY: A SUMMARY

Substance use and poor health behaviors of military personnel can detract from military readiness, combat efficiency, work performance, and overall well-being. Department of Defense policy on health promotion aims to improve and maintain military readiness and the quality of life of DoD personnel and other beneficiaries. Health promotion is defined as those activities designed to support and influence individuals in managing their own health through lifestyle decisions and self-care. Six broad program areas are included in the health promotion policy: alcohol and drug abuse prevention, smoking prevention and cessation, physical fitness, nutrition, stress management, and hypertension prevention. An earlier emphasis on alcohol and drug abuse prevention is thus now placed within a broader framework that recognizes the importance of all health behaviors for military readiness and the overall well-being of military personnel. In addition to these program areas, the military has initiated efforts to inform military personnel about the means of transmission and prevention of AIDS.

The series of Worldwide Surveys, conducted in 1980, 1982, 1985 and 1988, has investigated the extent of involvement in substance use and other health behaviors and the consequences for work performance, social relationships, and health. In this chapter we summarize and interpret study findings from the 1988 survey in terms of the military's six-point health promotion policy and AIDS-related educational efforts. For each of these seven areas, we discuss findings from the 1988 Worldwide Survey regarding the attitudes and behaviors of military personnel, changes during the 1980s, and specific problem areas.

A. Alcohol and Drug Abuse Prevention

The military aims to prevent the misuse of alcohol and other drugs, eliminate the illegal use of such substances, provide counseling or rehabilitation to abusers who desire assistance, and provide education to various target audiences about the risks associated with drinking and drug use. Misuse refers to using any illicit drug, using any prescribed medication for nonmedical purposes, or drinking so much that it adversely effects the user's health or behavior, family, community, or the Department of Defense.

Military policy also provides for urinalysis testing to detect drug use among military personnel. Alcohol and drug abusers are given appropriate counseling, rehabilitation, medical treatment, or disciplinary action, or are separated from the Service.

The 1988 Worldwide Survey documents a decline in alcohol and drug use and associated negative consequences between 1985 and 1988 and since 1980, when the survey series began. In 1988 any alcohol use, heavy alcohol use, total amount of alcohol consumed, all measures of drug use, and alcohol- and drug-related negative effects and productivity loss were all at their lowest levels since the survey series began, and all decreased significantly between 1985 and 1988.

These decreases in alcohol use, drug use, and associated negative effects no doubt in part reflect similar declines among civilians. However, the fact that the decreases in alcohol use tend to be greater during the latter part of the 8-year period than during the earlier part suggests that an intensified military effort to reduce alcohol misuse has been effective. The impact of a sustained military effort to decrease drug use is indicated in the significant decline in drug use between each of the surveys.

In addition to monitoring these changes in alcohol and drug use and associated negative effects, the military sponsors programs in deterrence and detection, treatment and rehabilitation, and education and training. Military educational policies and programs appear to be creating an environment conducive to responsible alcohol use and nonuse of drugs. Personnel are generally aware of the health risks of alcohol and drug use and are moderately aware of the potential effects on job performance and combat readiness. Substantial percentages still believe, however, that alcohol and drug use are part of the accepted norms of being in the military. Greater emphasis should be placed, therefore, on making military personnel aware of the problems of alcohol and drug misuse for military readiness and individual health and well-being. While most military personnel believe that military regulatory policies such as happy hours or arrest for driving while intoxicated are limiting substance use, only about one-half report that the price of alcohol on base is an effective deterrent to alcohol use.

The military's urinalysis testing program appears to be an especially effective component of the strategy for preventing and reducing drug use. Drug use has declined substantially since urinalysis testing was instituted in 1981, and a majority of military personnel feel that it is an effective deterrent. Urinalysis also appears to curtail use among users, perhaps preventing more intense levels of use among those who have begun to use drugs. Despite the perception of the overall deterrent effect, however, many military personnel distrust the reliability of the tests. Early problems with "false positives" may have contributed to this perception.

Relatively high percentages of military personnel perceive that there are barriers to seeking help for alcohol or drug problems in the military, particularly drug problems. Many believe that disciplinary action will be taken against the person seeking treatment either for alcohol or drug abuse or that seeking help will damage a person's military career. Although military policies emphasize rehabilitation, punitive action is often taken for drug abuse and in some instances for alcohol abuse. Thus, the perceptions among military personnel of possible repercussions may lead them away from a solution.

Military policies and programs directed toward alcohol and drug abuse prevention are clearly resulting in decreased alcohol and drug misuse among military personnel. Not only are alcohol and drug use and associated negative effects the lowest since the survey series began, but a majority of military personnel indicate that they believe the policies and programs are effective. Drug use is now at minimal levels, and alcohol use has declined substantially, particularly in the past several years as military efforts to deglamorize alcohol use have been intensified. In fact, more military personnel state that they drink less now than they did before entering military service than state that they drink more. Despite these effects, greater emphasis could be placed on informing military personnel about the risks of alcohol and drug use, and the impacts on military readiness and job performance, and on decreasing the perceived barriers to seeking help for alcohol and drug related problems. For many, alcohol use remains at abusive levels. This, argues for increased emphasis on preventing alcohol misuse.

B. Smoking Prevention and Cessation

Smoking prevention and cessation programs aim to create a social environment that supports abstinence and discourages use of tobacco products, create a healthy working environment, and provide smokers with encouragement and professional assistance in quitting. To these ends, the military prohibits smoking in public places and common work areas and permits smoking only in those places where it will not endanger others. Information about smoking is incorporated with information about alcohol and drug abuse at entry and permanent change of station; at entry, nonsmokers are encouraged to refrain from smoking, and smokers are encouraged to quit and are offered assistance in quitting. Information about smoking is also given during routine physical examinations, and public education programs are directed toward various target audiences. These policies and programs are expected to result in substantial declines in smoking among military personnel.

The percentage of military personnel who smoke cigarettes and who are heavy smokers (smoke a pack or more of cigarettes a day) declined between 1980 and 1988. These declines were statistically significant, however, only after military efforts to decrease smoking were intensified during the latter part of the period. The percentages who were smokers or heavy smokers were stable between 1980 and 1982, but declined significantly between 1982 and 1985 and between 1985 and 1988. These trends were also observed for each of the Services, and decreases were particularly large for Marine Corps personnel over the 8-year period. Use of tobacco besides cigarettes was substantially lower than cigarette use. The percentage smoking cigars or a pipe was stable between 1985 and 1988, while the percentage using smokeless tobacco products declined slightly. Enlisted personnel are much more likely than officers to smoke cigarettes or use smokeless tobacco, but only slightly more likely to smoke cigars or a pipe.

Two years ago, military efforts to reduce the percentage of smokers were intensified. Comparison of current smokers and former smokers reveals that of those who smoked within the past 2 years, 62.1 percent tried to quit, and about 21 percent of these have been successful. At the same time, only about 2 percent of military personnel state that they began to

use smokeless tobacco as a substitute for smoking cigarettes after the enforcement of the "no smoking" policy began.

These findings suggest that military smoking cessation programs are having positive effects on reducing cigarette smoking behavior. Although the observed decreases in smoking, no doubt, partially reflect the long-term decline in smoking among the civilian population, recent decreases concurrent with the enforcement of the "no smoking" policy are also apparent. Despite these gains, 40.9 percent of military personnel remain smokers, and 22.9 percent smoke heavily. Thus, there is room for considerable improvement and military educational efforts and enforcement of smoking policies may need to be intensified or modified.

C. Physical Fitness

Physical fitness programs aim to encourage and assist all target populations to establish and maintain the physical stamina and cardiorespiratory endurance necessary for better health and a more productive lifestyle. Health care professionals, commanders, and managers are to encourage participation in exercise programs.

Most military personnel feel that they have good to excellent health, that their health causes them little worry, and that they have a great deal of control over their health. The number of reported illnesses increased by 1 between 1985 and 1988. Other health indicators suggest that military personnel are in good health. Virtually all military personnel reported a satisfactory performance rating on their last physical readiness test, and a majority report engaging in good health practices. Almost 70 percent report that they exercise twice a week or more, but only about one-half report that they engage in 20 minutes of strenuous physical activity three or four times a week. Further, only about one in five reports having been advised by a physician or other health care professional to get more exercise. Overall these findings indicate relatively good health status and good health practices among military personnel. Nonetheless, the findings that many do not exercise regularly suggests that greater emphasis should be placed on regular cardiovascular exercise.

D. Nutrition

Nutrition programs aim to encourage or assist target populations to establish and maintain dietary habits contributing to good health, disease prevention, and weight control. Nutrition programs include efforts to help individuals develop appropriate dietary habits as well as to modify the environment so that it encourages and supports appropriate habits. Health care professionals are to provide nutritional advice and assistance, and nutritional information is to be made readily available in dining facilities. Public information campaigns are to alert target populations about the relationship of diet and chronic disease.

Almost 80 percent of military personnel have tried to improve their nutrition within the past year. One-third to one-half report have taken any of six specific actions. These include eating fewer calories, less salt, and fried foods and eating more high fiber foods. Although these responses do not indicate how many military personnel had already undertaken these actions, they do suggest a concern over nutritional issues and a willingness to take action to change nutritional habits. Relatively few military personnel have been advised by a physician or other health professional to diet to lose weight or to reduce salt in the diet.

E. Stress Management

Stress management programs aim to reduce environmental stressors and help target populations cope with stress. A major emphasis is reduction of stress in the work setting. Commanders are to develop leadership practices, work policies and procedures, and physical settings that promote productivity and health for military personnel and civilian employees. Health and physical fitness professionals are encouraged to advise target groups on scientifically supported stress management techniques.

Many military personnel report that they are under stress at work. Almost 80 percent report some stress at work, and 22 percent report that they are under a great deal of stress. Many engage in functional behaviors to relieve stress at work. These activities range from thinking and meditation to exercise to seeking professional help. Fewer report that they engage in less functional activities to relieve stress, including smoking

or drinking, drug use, eating, or sleeping. Still, use of alcohol, drugs, and cigarettes are associated with perceived stress levels. Those reporting greater levels of stress are more likely to be substance users than those with no stress. In general, substance use is higher for those under more stress. Those who report being under more stress are more likely than those who report less stress to engage in each of these more functional and less functional behaviors to relieve stress.

F. Hypertension Prevention

Hypertension prevention programs aim to identify hypertension early, provide information regarding control and lifestyle factors, and provide treatment referral where indicated. Early identification programs include hypertension screening as part of all medical examinations and annual dental examinations for active duty members, periodic mass screenings, and public information programs emphasizing the dangers of hypertension and the importance of periodic hypertension screening and dietary regulation.

Almost all military personnel report having their blood pressure checked during the past year, but only about one-half are aware of their blood pressure reading. Fewer enlisted personnel than officers report awareness, and Marine Corps personnel appear to be less knowledgeable than personnel in the other Services. About 12 percent have been diagnosed as hypertensive and about 4 percent are taking medication.

Although almost all military personnel have their blood pressure checked each year, the relative lack of awareness about blood pressure numbers suggests the need for further education about hypertension and its prevention.

G. AIDS Awareness

Although it is not formally part of the military's health promotion programs, the means of transmission and prevention of AIDS are included in the military education programs. Military personnel receive AIDS information from a variety of military and civilian sources and are quite knowledgeable about these issues. Most military personnel are knowledgeable about the means of transmission and prevention of AIDS. Virtually all are aware that AIDS can be transmitted through needle-sharing and by having sex

with someone who has AIDS, but fewer know about the relationship of AIDS transmission to blood transfusion, blood donations, and nonpersonal contact. Almost 40 percent of military personnel report that they have changed their sexual behavior because of concern about getting AIDS. In general, Army personnel are least well informed, and Air Force personnel best informed about AIDS issues; officers, in general, are better informed than enlisted personnel.

These findings suggest that although most military personnel know the major risk factors for AIDS transmission, there are some misperceptions about the role of other behaviors in the transmission and presention of AIDS. This suggests that continuing educational efforts are needed about how AIDS in transmitted and how to prevent AIDS.

H. Summary

Findings from the 1988 Worldwide Survey of Substance Abuse and Health Behaviors Among Military Personnel indicate substantial progress in the reduction of substance use and the promotion of health during the 1980s. Although these changes partially reflect similar changes in the civilian sector, specific changes appeared to be related to intensified military program efforts. Despite the clear progress in alcohol and drug abuse prevention, smoking cessation and prevention, and promotion of other health behaviors, work remains to be done.

Drug use is now at minimal levels, but it has not been eliminated. Many military personnel, however, continue to abuse alcohol and to smoke cigarettes. Alcohol and drug abuse, particularly alcohol abuse, are still associated with certain detriments to work performance. Use of alcohol, drugs, and tobacco are associated with illness and higher levels of health care utilization. Involvement in other health practices that encourage good health could be increased.

These findings suggest the need to continue the military's effective approach to drug abuse prevention, to intensify efforts to prevent alcohol abuse and smoking, and to promote health practices productive of good health. Findings regarding the correlates of substance use and health behaviors suggest that alcohol and drug abuse programs should focus on enlisted personnel, particularly E1s and E3s and to a lesser extent, E4s to

E6s. Smoking cessation and prevention programs and health promotion programs should be broader-based, concentrating on enlisted personnel but also reaching officers.

Appendix A

Sampling Design

Appendix A

Sampling Design

A. Design Parameters

The sampling design for the 1988 Worldwide Survey is a refinement of the design used in the 1985 survey (Bray et al., 1986). The primary objective of the 1985 design was the estimation of the population parameters listed in Table A.1. DoD originally required each estimate of these parameters to have a coefficient of variation (c.v.) of 0.05 or less. Subsequent design optimizations revealed, however, that the attainment of this level of precision for estimates of the proportion of senior NCOs, warrant officers, and senior officers with problem drinking caused the minimum precision requirements for the other reporting groups to be substantially exceeded. Therefore, the precision requirements for these reporting domains were relaxed.

To satisfy the precision requirements specified for the 1985 survey, equations were developed to describe the variable survey costs and sampling variances assuming various features about the design. These features, collectively termed design effects, included estimates of the intracluster correlation among individuals in the same first-stage unit, the first- and second-stage stratum sizes, and the nonresponse subsampling fraction. Estimates of the data collection costs and the sampling variances were obtained from the 1982 survey. The minimum cost allocations were obtained by solving the equations simultaneously subject to the precision constraints.

The evaluation of the efficiency of the 1985 sampling design included the constraints under which it was developed. Thus, the evaluation focused on determining the c.v. of the parameter estimates obtained from the 1985 survey, assuming the design effects that were used to develop the 1985 design. Notice in the presentation of the results of this evaluation in Table A.1 that, while the precision requirements were met for each of the parameter estimates, the c.v.s based on the actual estimates are, in general, higher than were expected. This can be explained by the fact that drug and alcohol use among military personnel was generally lower than anticipated.

Table A.1 Efficiency of the 1985 Sampling Design

Response	Reporting Domain	Estimated Proportion[1]		Coefficient of Variation[2]	
		Expected	Actual	Expected	Actual
Marijuana use during preceding 30 days	Army	0.21	0.09	0.004	0.006
	Navy	0.11	0.07	0.007	0.009
	Marine Corps	0.15	0.08	0.009	0.013
	Air Force	0.09	0.03	0.007	0.014
	E1 - E4	0.22	0.11	0.004	0.010
	O1 - O3	0.02	0.07	0.010	0.046
Illicit drug use other than marijuana during preceding 30 days	Army	0.09	0.06	0.006	0.007
	Navy	0.08	0.08	0.008	0.008
	Marine Corps	0.11	0.07	0.001	0.014
	Air Force	0.05	0.03	0.001	0.013
	E1 - E4	0.12	0.10	0.006	0.007
Problem drinking	Army	0.22	0.22	0.004	0.004
	Navy	0.24	0.19	0.004	0.005
	Marine Corps	0.21	0.25	0.007	0.007
	Air Force	0.14	0.10	0.006	0.007
	E1 - E4	0.27	0.29	0.004	0.004
	E5 - E6	0.16	0.19	0.010	0.009
	E7 - E9[3]	0.13	0.07	0.062	0.051
	W1 - W4[3]	0.02	0.05	0.747	0.470
	O1 - O3	0.06	0.06	0.051	0.051
	O4 - O6[3]	0.09	0.03	0.076	0.149

[1]Expected estimates computed using the 1982 survey data applied to the 1984 personnel distribution by pay grade.

[2]Proportion of the parameter estimate assuming design effects used in the 1985 design optimization.

[3]The attainment of required precision levels for these reporting domains caused the precision of the other reporting domains to substantially exceed the minimum level. Therefore, the precision requirements for these pay grade groups were relaxed.

B. First-Stage Sampling Frame

The sampling frame was constructed in two stages. The first-stage frame was comprised of geographically proximal organizational units defined within each Service. The second-stage frame was comprised of eligible active duty military personnel attached to selected FSUs.

FSUs were constructed to have a minimum size that ensured a cost-effective size for group administration of the questionnaire. In particular, each FSU was required to contain at least one organizational unit (called a nucleus unit) with 300 available persons. The number of available persons was determined by the Service-specific rates at which 1985 sample persons were available for group-session questionnaire administrations.

Optionally, FSUs contained one or more operational units that were too small to be nucleus units and that were geographically proximal to the nucleus unit. These units (called satellite units) were associated with nucleus units on the basis of their Zip codes in CONUS or APO/FPO overseas. The geographic specificity and hierarchical labeling of Zip codes was amenable to mechanical collapsing algorithms, while APO/FPO numbers were specific enough to identify cities and towns overseas. As a result, FSUs were constructed in a geographically concise fashion within states in CONUS and within countries overseas.

Each FSU was assigned to one of sixteen first-stage strata defined by the intersection of the four Services with each of the four regions of the world. These regions, defined on the basis of data collection costs, consisted of 1) the Americas (including Greenland and Iceland), 2) Europe (including Africa and the Middle East), 3) North Pacific (i.e. Japan, China, and Korea), and 4) Other Pacific (including the Indian Ocean)

For the 1988 survey, a data file created from the September 30, 1987 version of the Active Duty Military Personnel File maintained by the Defense Manpower Data Center (DMDC) was the sole data source for the construction of the first-stage sampling frame. This file contained all of the data needed for the construction of the first-stage sampling frame, including the unit Zipcode/APO/FPO numbers described in Chapter 2.

1. Construction of Army FSUs

The organizational unit used to construct Army FSUs was the Unit Identification Code (UIC). The geographic location of UICs was determined by Zipcode if the unit was in the U.S. and by APO number otherwise. Because the Army experienced an availability rate of 0.702 in the 1985 survey, each FSU was required to have exactly one Zip/APO number where at least 427 persons were stationed. Of the 1,333 distinct Zip/APO numbers on the Army portion of the data file provided by the DMDC, 188 satisfied this requirement. UICs located in these Zip/APOs were deemed nucleus units. UICs located in the remaining 1,145 Zip/APOs were considered satellite units. FSUs were constructed by associating satellite units with nucleus units on the basis of geographic proximity.

The Army first-stage frame consisted of 188 FSUs. It accounted for 739,530 (99.6%) of the 742,588 eligible Army personnel on the 30 September, 1987 version of the Active-Duty Master Personnel File provided by the DMDC. Army personnel not accounted for on the sampling frame had missing or unusable Zip/APO numbers.

2. Construction of Navy FSUs

The organizational unit used to construct Navy FSUs was the Unit Identification Code (UIC). The geographic location of ashore units was determined by Zipcode if the unit was in the U.S. and by FPO number otherwise. Afloat units were identified by FPO numbers assigned to ships. The geographic location used for afloat units was the state/country of the unit's home port.

Each FSU was required to have exactly one Zip/FPO number where 63% of the personnel ashore and 25% of the personnel afloat accounted for at least 300 of the persons stationed there. Of the 1,253 distinct Zip/FPO numbers on the Navy portion of the data file provided by the DMDC, 178 satisfied this requirement. UICs located in these Zip/FPOs were deemed nucleus units. UICs located in the remaining 1,075 Zip/FPOs were considered satellite units. FSUs were constructed by associating satellite units with nucleus units on the basis of geographic proximity.

The Navy first-stage frame consisted of 178 FSUs, of which 72 contained afloat nucleus units. It accounted for 554,884 (98.6%) of the 577,628 eligible Navy personnel on the 30 September, 1987 version of the Active-Duty Master Personnel File provided by the DMDC. Navy personnel not accounted for on the sampling frame had missing or unusable Zip/FPO numbers.

3. Construction of Marine Corps FSUs

The organizational units used to construct Marine Corps FSUs were the Monitored Command Code (MCC) and the Reporting Unit Code (RUC). Like the Navy, the geographic location of ashore units was determined by Zipcode if the unit was in the U.S. and by FPO number otherwise. Afloat units were identified by FPO numbers assigned to ships. The geographic location used for afloat units was the state/country of the unit's homeport.

Each FSU was required to have exactly one MCC-RUC combination at a specific Zip/FPO where 63% of the personnel ashore and 25% of the personnel afloat accounted for at least 300 of the persons assigned to it. Of the 2,333 distinct MCC-RUC, Zip/FPO combinations on the Marine Corps portion of the data file provided by the DMDC, 96 satisfied this requirement and were deemed nucleus units. The remaining 2,237 combinations were considered satellite units. FSUs were constructed by associating satellite units with nucleus units on the basis of geographic proximity.

The Marine Corps first-stage frame consisted of 96 FSUs, of which 3 contained afloat nucleus units. In addition, Marine Corps personnel in Europe, Africa, and the Near East were associated with the eight Navy FSUs in the same cost region. The frame accounted for 190,665 (97.7%) of the 195,070 eligible Marine Corps personnel on the 30 September, 1987 version of the Active-Duty Master Personnel File provided by the DMDC. Marine Corps personnel not accounted for on the sampling frame had missing or unusable Zip/FPO numbers.

4. Construction of Air Force FSUs

The organizational unit used to construct Air Force FSUs was the Consolidated Base Personnel Office (CBPO). The geographic location of

personnel assigned to CBPOs was determined by Zipcode if their unit was in the U.S. and by APO number otherwise. Because the Air Force experienced an availability rate of 0.692 in the 1985 survey, each FSU was required to have exactly one CBPO-Zip/APO combination with at least 434 persons. Of the 16,350 CBPO-Zip/APO combinations on the Air Force portion of the data file provided by the DMDC, 143 satisfied this requirement. Units associated with these CBPO-Zip/APOs were deemed nucleus units. All other units were considered satellite units. FSUs were constructed by associating satellite units with nucleus units on the basis of geographic proximity.

The Air Force first-stage frame consisted of 143 FSUs. It accounted for 583,643 (98.0%) of the 595,582 eligible Air Force personnel on the 30 September, 1987 version of the Active-Duty Master Personnel File provided by the DMDC. Air Force personnel not accounted for on the sampling frame had missing or unusable Zip/APO numbers.

5. Total DOD FSU Summary

The entire first-stage frame consisted of 605 FSUs averaging 3,419 active-duty personnel. Overall, there were 3,582 unique Zipcode/APO/FPO numbers on the data file provided by the DMDC. Of these, all but 45 corresponded to valid codes. As a result, the frame accounted for 2,068,650 (98.72%) of the 2,095,933 eligible personnel on the 30 September, 1987 version of the Active-Duty Master Personnel File provided by the DMDC. Persons not accounted for had missing or unusable Zip/APO/FPO numbers. In the 1985 survey, the first-stage frame accounted for 99.00% of the eligible personnel.

The frame was stratified by broadly defined geographic regions and by Service within region. The sample allocation was determined jointly by the precision requirements documented in the 1985 final report (Bray et al., 1986) and the costs of data collection and processing in the different cost regions. Because the number and distribution of military personnel have changed little since 1985, the sample allocation for the 1988 survey, presented in Table A.2, is the same as 1985.

Table A.2. Allocation of the 1988 Sample

First-Stage Stratum		First-Stage Units		Personnel[1]	
Cost Region	Service	Frame	Sample	Frame	Sample[2]
Americas	Army	74	13	462,223	5,193
	Navy	152	9	485,583	4,010
	Marine Corps	85	4	151,206	1,437
	Air Force	99	11	442,799	4,461
	Total	410	37	1,541,811	15,101
North Pacific	Army	13	2	35,440	960
	Navy	7	2	16,626	868
	Marine Corps	4	2	24,064	923
	Air Force	8	2	29,827	804
	Total	32	8	105,957	3,555
Other Pacific	Army	4	2	19,607	942
	Navy	8	2	37,576	868
	Marine Corps	7	2	11,748	856
	Air Force	4	2	20,746	812
	Total	23	8	89,677	3,478
Europe	Army	97	6	222,188	2,406
	Navy	8	2	15,099	797
	Marine Corps[3]	0	0	3,647	194
	Air Force	32	2	90,271	807
	Total	137	10	331,205	4,204
Total	Army	188	23	739,458	9,501
	Navy	178	15	554,884	6,543
	Marine Corps	96	8	190,665	3,410
	Air Force	143	17	583,643	6,884
	Total	605	63	2,068,650	26,338

[1] Based on the 30 September, 1987 distribution of military personnel.

[2] Targeted second-stage sample size.

[3] Marine Corps personnel in Europe, Africa, and the Near East were attached to the eight Navy FSUs in the same cost region.

C. Second-Stage Sampling Frame

Second-stage sampling units were individual active duty personnel within each FSU. However, the fact that the frame information supplied by DMDC was approximately 4 months old by the time the second-stage sample was selected introduced an additional step in identifying sample individuals.

To account for personnel changes that took place during this time, second-stage sampling units were considered to be lines on a roster rather than specific individuals. Specifically, after the first-stage sample was selected, positions on a conceptual roster were serially numbered and a random sample of line numbers selected. To accommodate potential increases in the personnel complement, the length of the roster was assumed to be 125% of what was expected. Then, personnel were associated with the line numbers using the most current personnel files available. If the personnel complement had not increased during the 4 months, some of the line numbers were not used. Conversely, if the personnel complement had increased, more than the expected number were used.

The second-stage frame was stratified (and rostered) by pay grade group to control the distribution of the sample by pay grades and, thus, meet the precision requirements that were specified for the 1985 survey. The second-stage sample was allocated to these strata within each FSU to provide a self-weighting sample at the level of pay grade groups within first-stage strata. Table A.3 shows the distributions of personnel across second-stage strata for both the population and sample.

D. Nonresponse Subsample

Missing data biases can compromise the validity of inferences drawn from sample data. Nonresponse is registered whenever the information needed to compute an estimate is not obtained for a unit of observation that has been selected into the sample. Conversely, the response rate is defined as the proportion of sample individuals supplying the information needed to compute the parameter estimate. Note that, by definition, all individuals for whom eligibility status is not determined are nonrespondents.

Table A.3. Distribution of Personnel Across Second-Stage Strata

Second-Stage Stratum					
Service	Pay Grade Group	Number of Personnel[1] Population		Sample	
			%		%
Army	E1-E4	351,287	47.5	1,772	18.7
	E5-E6	206,826	27.9	2,765	29.1
	E7-E9	71,704	9.8	2,728	28.7
	W1-W4	15,155	2.0	624	6.6
	01-03	60,522	8.2	668	7.0
	04-010	33,964	4.6	944	9.9
		739,458	100.0	9,501	100.0
Navy	E1-E4	251,545	45.3	1,329	20.3
	E5-E6	183,509	33.1	2,092	32.0
	E7-E9	47,101	8.5	1,864	28.5
	W1-W4	2,923	0.5	301	4.6
	01-03	44,130	8.0	417	6.4
	04-010	25,676	4.6	540	8.2
		554,884	100.0	6,543	100.0
Marine Corps	E1-E4	115,752	60.7	979	28.7
	E5-E6	39,939	21.0	1,003	29.5
	E7-E9	14,817	7.8	786	23.0
	W1-W4	1,420	0.7	148	4.3
	01-03	13,157	6.9	240	7.0
	04-010	5,580	2.9	254	7.5
		190,665	100.0	3,410	100.0
Air Force	E1-E4	254,180	43.5	1,354	19.7
	E5-E6	168,065	28.8	2,088	30.3
	E7-E9	52,998	9.1	1,970	28.6
	W1-W4	0	0.0	0	0.0
	01-03	69,472	11.9	602	8.8
	04-010	38,928	6.7	870	12.6
		583,643	100.0	6,884	100.0

[1] Based on the 30 September, 1987 distribution of military personnel.

Using the above definition of the response rate, the nonresponse bias associated with an estimate of the d-th population proportion, $\hat{P}(d)$, is the quantity,

$$B(d) = [1 - N_R/N][P(d)_R - P(d)_N],$$

where,

N_R/N = the response rate,

$P(d)_R$ = the value of the proportion in the population of respondents,

$P(d)_N$ = the value of the proportion in the nonresponding population.

As can be seen, this equation demonstrates that the magnitude of the bias depends on both the response rate and the differences between the responding and nonresponding populations.

The objective of the nonresponse (or Phase 2) subsample is to provide estimates of the parameter, $P(d)_N$, such that the biases can be removed from the estimates, $\hat{P}(d)$. In determining subsample allocations, this bias was estimated given an expected response rate to the initial (Phase 1) sample. The resulting subsampling fractions for enlisted pay grades (E1-E9) are shown in Table A.4. All warrant and and commissioned officers who did not respond during Phase 1 data collection were included in the nonresponse subsample. Double or two-phase sampling designs for nonresponse were first suggested by M. H. Hansen and W. N. Hurwitz (1946).

E. Sample Allocation and Selection

1. Allocation of the Sample

Sixty-three first-stage sample FSUs were selected, proportionally allocated to the Services within the four geographic cost strata. Because variances are not estimable if fewer than two FSUs are selected in any first-stage stratum, a minimum allocation of two FSUs per stratum was imposed. Allocating two FSUs to the Marine Corps in Europe introduced a problem because very few Marines are stationed there (Table A.2). As was done in the 1985 survey, Marine Corps units in Europe were associated with Navy FSUs, preventing the oversampling of Marines from this stratum (which would have increased the variances of the Marine Corps Service-level estimates).

Table A.4. Nonresponse Subsampling Fractions for Enlisted Personnel[1]

Service	Region	Subsampling Fraction
Army	Americas	0.33
	North Pacific	0.33
	Other Pacific	0.33
	Europe	0.40
Navy	Americas	0.90
	North Pacific	0.75
	Other Pacific	0.80
	Europe	0.85
Marine Corps	Americas	0.50
	North Pacific	0.50
	Other Pacific	0.55
	Europe	1.00
Air Force	Americas	0.50
	North Pacific	0.50
	Other Pacific	0.60
	Europe	0.80

[1]All warrant and commissioned officers who were selected into but did not respond to the Phase 1 sample were included in the nonresponse sample.

Pay grade groups were sampled disproportionally with senior officers and senior NCOs oversampled relative to the junior grades (Table A.3). This was necessary because the generally lower drug and alcohol use levels in the senior grades require a larger sample size to attain levels of precision that are comparable to the junior grades.

2. Composite Size Measures

Composite size measures for selecting the first-stage sample were constructed using the number of persons in each pay grade group in each FSU. Notationally, first-stage strata are denoted by,

$$a = 1, 2, \ldots, 15.$$

FSUs listed in the frame are identified by the subscript,

$$i = 1, 2, \ldots, N_1(a),$$

and in the sample by,

$$i = 1, 2, \ldots, n_1(a).$$

The range of the subscript differentiates between units in the frame and units in the sample. The total number of FSUs in the frame classified into the a-th stratum, $N(a)$, and the total first-stage sample size selected from the a-th stratum, $n(a)$, are shown in Table A.2. Second-stage strata are identified by the subscript,

$$b = 1, 2, \ldots, 6.$$

SSUs in each of the pay grade strata are identified by the subscript,

$$j = 1, 2, \ldots, N_2(a, i, b),$$

denoting units in the second-stage frame, or by,

$$j = 1, 2, \ldots, n_2(a, i, b)$$

denoting units in the second-stage sample. The values $N_2(a,i,b)$ are computed using the personnel counts in each of the organizational units.

In calculating the composition size measures, the objective is to make equal, for specified values of the a-subscript and the b-subscript, the expected frequencies with which SSUs are selected into the sample, given the sample size requirements derived from the cost and variance equations. Let,

$\pi(a,i)$ = the expected frequency of selecting the i-th FSU from the a-th stratum in samples of size, $n_1(a)$, and,

$\pi(j \mid a,i,b)$ = the expected frequency of selecting the k-th SSU from the b-th pay grade stratum conditionally on the selection of the i-th FSU given the second-stage sample sizes.

The value,

$$\pi(a,i) = n_1(a) \cdot \frac{S(a,i)}{S(a)} ,$$

where,

$$S(a) = \sum_{i \epsilon a} S(a,i)$$

and the value,

$$\pi(j \mid a,i,b) = \frac{n_2(a,i,b)}{N_2(a,i,b)} , \; j = 1, 2, \ldots, N_2(a,i,b) \; .$$

Computing the composite size measures is equivalent to finding values, $S(a,i)$ and $n_2(a,i,b)$, such that,

$$\pi(a,i,b,j) = \pi(a,i) \cdot \pi(j \mid a,i,b)$$
$$= K(a,b),$$

a constant within values of the a-subscript and the b-subscript. The solutions are given by,

$$S(a,i) = \sum_{b=1}^{6} f(a,b) \cdot N_2(a,i,b),$$

and

$$n_2(a,i,b) = \frac{n_2(a) f(a,i) N_2(a,i,b)}{S(a,i)} ,$$

where,

$f(a,b)$ = the sampling frequency used in the b-th pay grade group relative to the other pay grade groups in the a-th first-stage stratum, and,

$n_2(a)$ = the targeted second-stage sample size in the a-th first-stage stratum.

With reference to the values, f(a,b), SSUs were allocated via the cost and variance equations to the pay grade group strata.

3. Selection Procedures

The sample of FSUs were selected with probability proportional to size (PPS) using the composite size measures described above. As a result, equal sized second-stage samples were drawn from each FSU, and an equal-probability sample of individuals within pay grade groups was achieved whenever the actual numbers involved would permit.

Because FSUs varied considerably with respect to numbers of personnel, the first-stage sample was chosen with minimum replacement (Chromy, 1979). The minimum replacement procedure is equivalent to PPS without replacement selection if none of the $\pi(a,i)$ values exceeds unity, i.e. no self-representing FSUs. Otherwise the procedure achieves the required frequencies over repeated samples and, at any specific drawing of the sample, comes within one unit of the expected allocation. This minimum replacement method is superior to either with or without replacement schemes in that it controls the number of selections assigned to a sampling unit so that the actual allocation and the proportional-to-size allocation differ by less than one and, at the same time, include self-representing FSUs with their required frequencies.

In order to control the distribution of sample FSUs across major commands, the first-stage frame was ordered by major command within each stratum. Then, the selection procedure was applied within each stratum by selecting the first FSU at random with probability $\pi(a,i)$. Given this random starting point, selections proceeded sequentially in a circular fashion through the frame until the starting point was again reached. This sequential selection from a controlled circular ordering has the effect of implicit stratification in a similar way that a systematic selection also imposes stratification on an ordered list (Cochran, 1977) except that the conditional selection within each zone is not determined by the random starting point. The random starting point for the sequential selection

also means that every pair of FSUs on the frame has a chance of appearing in the sample. This is a necessary condition for strictly unbiased estimation of sampling variances. Table A. shows the distributions of personnel by major command for the population and the sample.

At the second-stage, sample individuals were selected with conditionally equal probability (given the FSU and the specified pay groups) and without replacement from personnel belonging to the 63 selected FSUs. Computer software developed jointly by RTI and the Services for the 1982 and 1985 surveys was used for this purpose. The software partitioned all personnel in a selected FSU into the specified pay grade groupings. Then, personnel within each grouping were matched to the random sample of line numbers described in Section C. Finally, a printout of selected personnel was produced. The Service units that implemented the software are:

- Army: Military Personnel Center (MILPERCEN), Alexandria, VA.
- Navy: Enlisted Personnel Management Center (EPMAC), New Orleans, LA.
- Marines: Information Retrieval Section of the Manpower Management Information Systems Branch (HQMC), Washington, DC.
- Air Force: Air Force Manpower and Personnel Center (AFMPC), Randolph Air Force Base, TX.

Sample persons not attending the group administrations were eligible for selection into the nonresponse subsample. The subsample was selected with equal probability and without replacement from within pay grade groups. Names of all ineligible (PCS, separated, deceased, AWOL) individuals were crossed off the list of sample persons, and the remaining names comprised the nonresponse sample.

Except for the nonresponse subsample, the selection procedures produced a self-weighting sample of individuals within pay grade groups and first-stage strata. Individuals in the nonresponse subsample will be weighted differently to provide unbiased estimates of parameters describing the population of nonrespondents. Overall population estimates will be computed as the sum of the estimates for the responding and nonresponding populations. Details of the weighting and estimation procedures are discussed in Appendix B.

Table A.5 Distribution of Personnel by Major Command

Service	Major Command	Number of Personnel[1] Population n	%	Sample n	%
Army	Forces Command	276,314	37.4	2,320	24.4
	Training & Doctrine Command	91,664	12.4	1,425	14.0
	VII Corps, Europe	73,580	10.0	890	9.4
	V Corps, Europe	63,782	8.6	865	9.1
	Health Services Command	35,002	4.7	574	6.0
	Others	199,112	26.9	3,427	36.1
		739,458	100.0	9,501	100.0
Navy	CinC, Atlantic Fleet	188,788	34.0	1,305	19.9
	CinC, Pacific Fleet	171,182	30.9	2,142	32.7
	Chief of Naval Ed. & Training	83,601	15.1	955	14.6
	Bureau of Medicine & Surgery	33,591	6.0	413	6.3
	Office of the Chief of Naval Ops	10,952	2.0	195	3.0
	Others	66,770	12.0	1,533	23.4
		554,884	100.0	6,543	100.0
Air Force	Strategic Air Command	116,173	19.9	1,500	21.8
	Tactical Air Command	105,747	18.1	1,178	17.1
	Military Airlift Command	73,303	12.6	773	11.2
	U.S. Air Force, Europe	68,132	11.7	441	6.4
	Air Training Command	62,443	10.7	880	12.8
	Others	157,845	27.0	2,112	30.7
		583,643	100.0	6,884	100.0
Marine Corps	2nd Force Service Support Group	9,284	4.8	0	0.0
	1st Force Service Support Group	7,384	3.9	301	8.8
	3rd Force Service Support Group	7,220	3.8	513	15.0
	2nd Marine Division	6,790	3.6	306	9.0
	1st Marine Division	5,457	2.9	74	2.2
	Others	154,530	81.0	2,216	65.0
		190,665	100.0	3,410	100.0

[1]Based on the 30 September, 1987 distribution of military personnel.

Appendix B

Sample Weighting and Estimation Procedures

Appendix B

Sample Weighting and Estimation Procedures

A. Initial Sample Weights

Initial sample weights were calculated as the inverse of the probabilities of selection at each phase/stage of the design. At the first stage of Phase 1, the expected frequency of selecting the i-th FSU from the a-th first-stage stratum is

$$\pi(a,i) = n_1(a) \cdot S(a,i) \,/\, S(a),$$

where $S(a,i)$ = the composite size measure assigned to the i-th FSU,
$S(a)$ = the sum of the composite size measures in the a-th stratum, and,
$n_1(a)$ = the number of FSUs selected from the a-th stratum.

Thus, the sample weight assigned to the i-th FSU is

$$FSUWGT(a,i) = 1 \,/\, \pi(a,i).$$

At the second stage, simple random samples of persons were selected from each pay grade group with sampling rates that would attain the desired stratum sizes and make the overall selection probabilities assigned to persons in the same first- and second-stage strata equal whenever possible. The expected frequency of selecting the j-th person from the b-th pay grade stratum conditional on the selection of the i-th FSU is

$$\pi(j \mid a,i,b) = f(a,b) \cdot n_2(a) \,/\, S(a,i),$$

where $f(a,b)$ = the relative sampling frequency used in the b-th pay grade stratum in the a-th first-stage stratum, and
$n_2(a)$ = the targeted second-stage sample size for the a-th first-stage stratum.

Thus, the Phase 1 sample weight assigned to the j-th person of the b-th pay grade stratum of the i-th FSU is

$$SSUWGT_1(a,i,b,j) = FSUWGT(a,i) \;/\; \pi(j \mid a,i,b).$$

This sample weight was assigned to each of the 26,275 persons selected for the Phase 1 data collection.

B. Final Analysis Weights

A person was considered a respondent to the Phase 1 if he/she returned a usable questionnaire. Accordingly, the following Phase 1 response indicator was assigned to the j-th person of the b-th pay grade stratum in the i-th FSU of the a-th first-stage stratum:

$$RESP_1(a,i,b,j) = \begin{cases} 1 & \text{if he/she was a Phase 1 respondent, and} \\ 0 & \text{otherwise.} \end{cases}$$

This response indicator was used to assign the following Phase 1 adjusted weight:

$$ADJWGT_1(a,i,b,j) = SSUWGT_1(a,i,b,j) \cdot RESP_1(a,i,b,j).$$

Nonzero values of this weight were assigned to the 16,829 Phase 1 respondents.

To compensate for the potentially biasing effects of survey nonresponse, a subsample of persons who were selected for but did not participate in Phase 1 was selected to take part in the Phase 2 data collection. The Phase 2 sample weight assigned to the j-th person of the b-th pay grade stratum of the i-th FSU in the a-th first-stage stratum is

$$SSUWGT_2(a,i,b,j) = SSUWGT_1(a,i,b,j) / \pi_2(a,b),$$

where $\pi_2(a,b)$ = the subsampling fraction assigned to the b-th pay grade stratum of the a-th first-stage stratum.

This sample weight was assigned to each of 7,151 persons who were selected for the Phase 2 data collection effort.

A weighting class adjustment was used to adjust the Phase 2 sample weights for nonresponse to the Phase 2 data collection effort. A total of 92 weighting classes were defined by intersecting first-stage strata with pay grade strata. Within each weighting class, the following Phase 2 response indicator was assigned to the j-th person selected for the Phase 2 subsample in the b-th pay grade stratum of the i-th FSU in the a-th first-stage stratum:

$$RESP_2(a,i,b,j) = \begin{cases} 1 & \text{if he/she was a Phase 2 respondent, and} \\ 0 & \text{otherwise.} \end{cases}$$

A person was considered a Phase 2 respondent if he/she returned a usable questionnaire or was found to be ineligible for the survey.

The response indicator then was used to calculate the weighted number of respondents in each weighting class:

$$WTRESP_2(a,b) = \sum_{i \epsilon a} \sum_{j \epsilon b} \left\{ SSUWGT_2(a,i,b,j) \cdot RESP_2(a,i,b,j) \right\}.$$

To adjust for nonresponse within a weighting class, the sum of the sample weights of persons selected for Phase 2 was divided by the sum of the sample weights of the Phase 2 respondents to yield the following weighting class adjustment:

$$WCADJ_2(a,b) = \sum_{i \epsilon a} \sum_{j \epsilon b} SSUWGT_2(a,i,b,j) \; / \; WTRESP_2(a,b) \; .$$

The nonresponse adjusted Phase 2 weight for the j-th person of the b-th pay grade stratum in the i-th FSU of the a-th first-stage stratum was calculated as:

$$ADJWGT_2(a,i,b,j) = SSUWGT_2(a,i,b,j) \cdot WCADJ_2(a,b) \cdot RESP_2(a,i,b,j).$$

Nonzero values of this weight were assigned to the 1,844 persons who were classified as respondents to the Phase 2.

The sum of the adjusted Phase 1 and Phase 2 weights in the a-th first-stage stratum and b-th pay grade stratum provides an estimate of the total number of military personnel on active duty at the time of data collection

in that service, region, and pay grade group. Notationally, this estimate can be written as:

$$\hat{N}(a,b) = \sum_{i \epsilon a} \sum_{j \epsilon b} \left\{ ADJWGT_1(a,i,b,j) + ADJWGT_2(a,i,b,j) \right\}.$$

Post-stratification ratio adjustments were made to the adjusted weights to force these estimates to agree with Department of Defense Military Manpower Statistics for the quarter ending December 31, 1987. The final ratio-adjusted weight assigned to the j-th person of the b-th pay grade stratum in the i-th FSU of the a-th first-stage stratum is:

$$FADJWGT(a,i,b,j) = \frac{N(a,b)}{\hat{N}(a,b)} \cdot \left\{ ADJWGT_1(a,i,b,j) + ADJWGT_2(a,i,b,j) \right\},$$

where N(a,b) = DoD personnel counts for the a-th first-stage stratum and the b-th pay grade stratum.

Questionnaire data were collected from Phase 1 and Phase 2 respondents who were eligible for the survey. An estimate of the total number of eligible persons can be obtained by summing the adjusted weights over all persons who completed a questionnaire. Table B.1 presents a comparison by Service and pay grade group of all active-duty military personnel and the estimated number of active-duty military personnel who were eligible for the survey. Estimates in the report are based on counts of the estimated eligible personnel.

B. Estimation

Estimates of population totals are linear statistics, and their variances can be expressed in closed form. Proportions and ratios comprise much of the tabular results presented in this report. The estimators in

Table B.1. Comparison of Total Personnel and Eligible Personnel

Pay Grade	Service: Army Total Personnel	Army Estimated Eligible Personnel	Navy Total Personnel	Navy Estimated Eligible Personnel	Marine Corps Total Personnel	Marine Corps Estimated Eligible Personnel	Air Force Total Personnel	Air Force Estimated Eligible Personnel	Total DoD Total Personnel	Total DoD Estimated Eligible Personnel
E1-E4	383,540	217,902 (19,643)	258,989	189,744 (51,462)	119,027	84,430 (13,129)	259,394	195,642 (17,600)	1,000,928	687,718 (56,975)
E5-E8	214,527	163,530 (8,044)	192,606	155,451 (22,500)	40,970	27,275 (5,150)	171,539	149,243 (8,380)	619,642	495,499 (25,173)
E7-E9	74,949	62,775 (4,730)	49,114	44,123 (5,781)	15,202	13,043 (2,170)	54,131	48,483 (2,958)	193,396	168,425 (8,284)
W1-W4	15,747	12,884 (1,806)	3,077	2,664 (478)	1,454	1,416 (539)	*	* (*)	20,279	16,964 (1,944)
01-03	63,497	51,379 (4,683)	45,287	35,830 (6,076)	13,519	11,312 (1,312)	71,195	57,493 (8,205)	193,499	156,014 (11,289)
04-010	35,809	33,557 (7,156)	27,243	24,190 (3,311)	5,754	5,213 (2,352)	39,861	36,259 (6,820)	108,667	99,219 (10,731)
Total	768,069	542,027 (16,689)	576,297	452,002 (80,231)	195,926	142,689 (13,997)	596,119	487,120 (16,214)	2,136,411	1,623,838 (84,040)

Note: Total personnel is the number of persons, excluding cadets, midshipmen, and recruits who were on active duty as of December 31, 1987. Eligible personnel is the total number of these persons who were also not PCS, separated, deceased, or AWOL. The standard errors for the estimated number of eligible persons are given in parentheses beneath the estimates.

*There are no warrant officers in the Air Force.

this case are nonlinear statistics. The sampling variances for the nonlinear statistics are estimated using first order Taylor series linearizations. Many of the tables contain estimates of parameters describing subpopulations or domains defined within the total population of inferential interest. The estimation of regression coefficients is a multivariate extension of the Taylor series linearizations for ratios.

1. Estimate of Population Totals

Let w(a,i,b,j) = FADJWGT(a,i,b,j) be the final analysis weight described above.

Response variables, or observation variables, which are questionnaire items or quantities recoded from questionnaire items, are denoted by Y. The values obtained for the response variables are denoted by y.

A population total is estimated by the quantity,

$$\hat{Y} = \sum_{a=1}^{15} \sum_{i=1}^{n_1(a)} \sum_{b=1}^{6} \sum_{j=1}^{n_2(a,i,b)} w(a,i,b,j)\, y(a,i,b,j). \qquad (1)$$

For purposes of estimating the sampling variances, equation (1) can be conveniently rewritten as a sum of the separate estimates for each of the sampled first stage units. To this end, define,

$$\hat{Y}(a,i) = \sum_{b=1}^{6} \sum_{j=1}^{n_2(a,i,b)} w(a,i,b,j)\, y(a,i,b,j). \qquad (2)$$

Then equation (1) can be rewritten as,

$$\hat{Y} = \sum_{a=1}^{15} \sum_{i=1}^{n_1(a)} \hat{Y}(a,i) \quad ,$$

and the sampling variance, assuming sampling with replacement at the first

stage of the design, is estimated by,

$$\hat{\text{Var}}\{\hat{Y}\} = \sum_{a=1}^{15} \frac{n_1(a)}{n_1(a)-1} \sum_{i=1}^{n_1(a)} \left[\hat{Y}(a,i) - \hat{\bar{Y}}(a)\right]^2 \qquad (3)$$

where

$$\hat{\bar{Y}}(a) = \frac{1}{n_1(a)} \sum_{i=1}^{n_1(a)} \hat{Y}(a,i) \quad .$$

2. Estimates of Population Proportions

Estimates of population proportions take the form of (combined) ratio estimates, denoted in general by,

$$\hat{R} = \frac{\hat{Y}}{\hat{X}}$$

The numerator and denominator totals are individually estimated as described above. For example, $\hat{R}$ could be the mean ounces of ethanol consumed per person. Since the numerator and denominator quantities are random variables, the estimator is a nonlinear statistic. Ratio estimates are usually biased, but the bias becomes negligible in large sample (see, for example, Cochran, 1977).

The variance of the estimator can be approximated using a Taylor series linearization. The linearized response variable value,

$$z(a,i,b,j) = y(a,i,b,j) - \hat{R}\, x\, (a,i,b,j) \qquad (4)$$

is computed and used in place of the y-values in equation (2). The variance estimate is then computed as given in equation (3).

3. Domain Estimates

Membership of a sample person in some specified subpopulation or domain or interest can be denoted by the indicator variable,

$\delta(a,i,b,j)$ = 1, if the j-th sample individual (in the b-th pay grade group, i-th first stage unit and a-th first stage stratum) is a member of the domain,

= 0, otherwise.

Obviously, the products, $\delta(a,i,b,j)\ y(a,i,b,j)$, when substituted for the y-values alone in the previous formulas, restrict the calculations to the specified domain. Note that the ranges of summation in the formulas remain the same, namely over all of the individuals in the sample. This convention ensures that sampling variances are computed using the correct sample sizes.

Domain comparisons, taking the form of the difference or other linear combinations of domain estimates, have, in general, a covariance arising from the two-stage selection of the sample. This is, using a difference between two domains by way of example,

$$\mathrm{Var}\left\{\hat{\theta}_1-\hat{\theta}_2\right\} = \mathrm{Var}\left\{\hat{\theta}_1\right\} + \mathrm{Var}\left\{\hat{\theta}_2\right\} - 2\ \mathrm{Cov}\left\{\theta_1,\theta_2\right\} ,$$

where, $\hat{\theta}_1$ and $\hat{\theta}_2$ denote the two domain estimates. In terms of the previous formulas, the first stage level differences,

$$\hat{D}(a,i) = \hat{Y}_1(a,i) - \hat{Y}_2(a,i) \quad , \qquad i = 1,2,\ldots, n_1(a),$$

$$a = 1,2,\ldots, 15,$$

can be computed and used in equation (3), noting that,

$$\hat{\bar{D}}(a) = \frac{1}{n_1(a)} \sum_{i=1}^{n_1(a)} \hat{D}(a,i).$$

to estimate the variance of the difference. Except as the necessary distributional assumptions may not apply, the quasi Student's t statistic,

$$t^* = \frac{\hat{\theta}_1 - \hat{\theta}_2}{\left[\text{Var}\left\{\hat{\theta}_1 - \hat{\theta}_2\right\}\right]^{1/2}}$$

could be used with 48 degrees of freedom as an indicator of the statistical significance of the difference. The total degrees of freedom suggested is the number of first-stage units minus the number of first-stage strata.

C. Software

The computer software used for this report was developed by Research Triangle Institute (RTI) for the specific purpose of analyzing data from complex surveys. RTI developed this software because the analytical procedures in most of the popular statistical software packages (e.g., SAS, SPSS, BMD) assume that the data come from simple random samples and cannot properly estimate the variance of survey statistics (e.g., means, ratios, totals, proportions, regression coefficients) obtained from a complex sample survey such as this. Many software packages have no mechanism for dealing with sample design factors and either do not allow the use of sampling weights or use them in an unreliable or inconsistent fashion.

SESUDAAN (Shah, 1981), which RTI has implemented as part of SAS (SAS Institute, 1985), calculates weighted estimates of proportions, means, and totals along with estimates of their standard errors. Estimates are calculated separately for specified population domains. SESUDAAN also has the capability of producing standardized estimates for comparing the characteristics of two populations with differing distributions of confounding attributes. The approach used for the calculation of the standard errors

is a first order Taylor series approximation of the deviation of the estimates from their expected values (Woodruff, 1971).

The procedures RATIOEST and RATIO2 (Shah, 1981), which are also implemented as SAS procedures, generalize the capacities of SESUDAAN to general ratio-estimates and their standard errors. The procedure RTIFREQS (Shah, 1982) produces weighted frequencies, percentages, and estimates of their standard errors for specified domains.

All of the linear regression models were estimated using SURREGR, a linear regression package designed to appropriately estimate coefficients and their standard errors using data from a complex sample design (Holt, 1982). SURREGER produces linear model parameter estimates for survey data obtained from a stratified, multistage sample design. The Horvitz-Thompson estimators (Cochran, 1977) of the regression coefficients are produced, as well as a Taylor series approximation of the variance-covariance matrix of the regression coefficients in which the mean square error between primary sampling units within stratum is used to estimate the variance and covariance parameters.

Identical estimates of the regression coefficients can be produced via the SAS procedures GLM or REG using a WEIGHT statement with the sampling weight variable. However, the estimate of the variance and all tests statistics produced by GLM or REG are not appropriate for sample survey data. These statistics are applicable only for a sample of independent, normally distributed responses. Tests of hypotheses about regression coefficients estimated using SURREGR were based on a Hotelling's T^2-type statistic, which was assumed to have a transformed F-distribution in repeated samples (Shah, Holt, and Folsom, 1977). SURREGR uses a Taylor linearization method

that also does not depend on homoscedasticity, a property violated by linear probability models.

Appendix C
Estimated Sampling Errors

Appendix C
Estimated Sampling Errors

The procedures and methodology described here are presented to help the reader use the estimates of sampling errors that have been calculated and printed for various proportions and means in this report and to enable the reader to estimate sampling errors for those proportions and means for which standard errors do not appear in parentheses in the tables. "Sampling errors" is the general term used to describe all the sources of difference between an estimate based on a sample and the true value for the population. The difference arises because observations are made only on a sample rather than on every member of the population, as in a census. There are over two million officers and enlisted personnel in the four military services on active duty worldwide. Samples of 18,800 such military personnel clustered in 63 central installations can provide close, but less than perfect, estimates of the responses that would have been obtained had all officers and enlisted personnel been asked to complete the survey of substance abuse and health behaviors.

A. Confidence Intervals and Significant Differences

For any particular percentage resulting from a sampling survey, it is not possible to know the exact amount of error that has resulted from sampling. It is possible, however, to establish estimated "confidence intervals"--ranges which are very likely to include the true population value. For example, Table 4.1 shows that 17.2 percent of the military personnel in the 1988 sample reported having consumed no beverage alcohol in the past 30 days with a standard error of 0.4 percent. It is possible to set up a 95 percent confidence interval, which means that 95 percent of the time a computed interval can be expected to include the true (population) percentage. As a general rule the 95 percent confidence interval is formed by doubling the standard error (multiplying by 1.96 is the precise value to use) and then adding this result to the estimate to form the upper bound and subtracting this result from the estimate to form the lower bound. In this case the lower and upper limits of the 95 percent interval are 16.4 percent and 18.0 percent. A somewhat wider set of limits can be set up to indicate the 99 percent confidence interval.

It is also possible to construct a confidence interval for a difference between two estimated percentages. For example, the difference between 1985 and 1988 in the percentages of all military personnel who are classified as heavy drinkers is estimated to be 3.7 percent (Table 4.1), and the 95 percent confidence limits for that difference have been computed to be $\pm$ 2.0 percent of that estimate. In other words, we can be 95 percent certain that the true difference between the two years' populations is somewhere between 2.0 percent below the estimated difference and 2.0 percent above it. Since that range does not include zero difference between the two years, it can be seen that at the 95 percent level the estimated difference is significantly different from zero, or just "significant." If the interval had been larger, say 4.0 percent, the difference would have been "not significant" at the 95 percent level.

B. Factors Influencing the Size of Confidence Intervals in this Report

From a statistical standpoint, the most straightforward types of samples are simple random samples. In such samples the confidence limits for a percentage are simple functions of the percentage value and the size of the sample or subgroup on which it is based. For example, the 95 percent confidence interval for a proportion (p) can be approximated by $p \pm 1.96 \sqrt{p(1-p)/N}$. In a more complicated sample, such as the one used in this survey, other factors are also involved in the determination of confidence limits. In this section all of the factors will be discussed, beginning with the basic ones and proceeding to those that are more complex.

1. Number of Cases (N)

When other things are equal, the larger a sample or subgroup the more precise will be an estimate based thereon and, therefore, the narrower the confidence levels. One of the factors is $1/\sqrt{N}$, the reciprocal of the square root of the size of the sample or the subgroup. Thus, a sample of 400 will, ceteris paribus, have a confidence interval just half as wide as that for a sample of 100, since $1/\sqrt{400}$ is just about half of $1/\sqrt{100}$.

2. Percentage Size

Other things again being equal, percentage values around 50 percent have the largest confidence intervals because $\sqrt{p(1-p)}$ (where p is a

proportion between 0.0 and 100.0) is also a factor affecting the size of the confidence interval. This factor will be only three-fifths as large for 10 percent or 90 percent as large for 50 percent since $\sqrt{.1 \times .9}$ is $3/5 \times \sqrt{.5 \times .5}$.

C. Design Effects in Complex Samples

Under simple random sampling, a confidence interval can be determined from the two factors just described plus the appropriate constant for the confidence level desired; e.g., 1.96 for 95 percent. Where stratification, clustering and differential weighting of responses are involved, as in this survey, all of these also influence sampling error. Stratification tends to increase precision, but effects of clustering and weighting reduce it, and the result is usually lower precision than would be obtained by the use of a simple random sample of the same size. Accordingly, use of the simple formula would generally underestimate the sampling error involved.

There are methods for correcting for this underestimation, however. Kish (1965, p. 258) has defined a correction term known as the design effect (DEFF) where

$$\text{DEFF} = \frac{\text{actual sampling variance}}{p(1-p)/N}$$

If, therefore, the actual sampling variance for a proportion p is four times the value computed for a simple random sample of the same size N, the DEFF is 4.0. Because a confidence interval is based on the square root of the variance, any confidence interval set up would have to be twice as wide as the corresponding interval, and it would be necessary to have a sample four times as large.

A simple way of using a DEFF value is to divide the actual sample or domain size by it and obtain the "effective N," the size of a simple random sample that would have resulted in the same degree of precision. For example, with a DEFF of 4.0 and an actual sample size of 4,000, the "effective N" is 1,000. The value of the "effective N" can be used in the simple formula $\sqrt{p(1-p)/N}$ to compute standard errors of estimates and confidence interval limits. It is therefore possible to use formulas and tables appropriate for simple random samples, regardless of the actual type

of sample, by converting the sample size to the "effective N."

Actually, every statistic derived from a complex sample has its own design effect, different from all of the others. In practice, however, DEFF values are generally computed only for a cross-section of the statistics, and averages are computed and applied to those of the same types. Often a single average DEFF is used for all percentages.

In this study, standard errors have been computed for most estimated proportions. These calculations incorporated the appropriate (sub)sample sizes, proportions, and correction for design effects. In tables where standard errors do not appear, a reasonable rule-of-thumb is that the sampling error associated with any point estimate is equal to or slightly larger than the standard error presented with an equal-sized estimated proportion in table cells defined by similar characteristics (e.g., Service, pay grade).

Appendix D

Supplementary Tables

Table D.1. Substance Use and Health Summary, 1980-1988 - Army

Measure	Year of Survey							
	1980		1982		1985		1988	
Drinking Levels								
Abstainer	15.6	(0.7)[b]	11.7	(0.5)[d]	14.9	(0.7)[e]	17.1	(0.7)
Infrequent/light	14.5	(1.0)[b,c]	18.0	(0.9)	17.8	(1.1)	18.5	(1.1)
Moderate	32.1	(1.2)	29.8	(1.1)	29.3	(1.4)	31.7	(1.0)
Moderate/Heavy	23.9	(0.7)	25.1	(1.0)	23.9	(1.5)	22.2	(0.8)
Heavy	14.0	(1.1)[c]	15.5	(1.0)	14.1	(1.6)	10.5	(0.9)
Any Drug Use[a]								
Past 30 Days	30.7	(2.8)[c,]	26.2	(1.8)[d]	11.5	(1.3)[e]	6.9	(0.7)
Past 12 Months	39.4	(2.9)[b,c]	32.4	(1.8)[d]	16.6	(1.3)[e]	11.8	(1.1)
Cigarettes Past 30 Days	54.3	(0.7)[c]	54.7	(1.8)	52.0	(1.8)	43.1	(1.1)
Alcohol Negative Effects								
Serious Consequences	17.9	(1.6)[c]	16.3	(1.2)	13.5	(2.0)	10.3	(0.8)
Productivity Loss	23.8	(1.3)[b]	33.1	(0.8)[d]	27.2	(1.3)[e]	22.0	(1.0)
Dependence	8.8	(1.0)	10.1	(0.8)	12.1	(1.5)[e]	7.2	(0.6)
Drug Use Negative Effects								
Serious Consequences	14.4	(1.4)[b,c]	8.0	(0.7)	1.6	(0.4)	1.0	(0.4)
Productivity Loss	15.7	(1.7)[c]	13.1	(1.2)[d]	4.4	(0.8)[e]	2.4	(0.4)
Health Practices	-	-	-	-	3.82	(0.04)[e]	3.99	(0.02)

Note: Entries for health practices are mean values. Other entries are percentages with standard errors in parentheses. Serious consequences for alcohol and drugs are reported for the past 12 months.

[a]Any nonmedical use of marijuana, PCP, LSD/hallucinogens, cocaine, amphetamines/stimulants , tranquilizers, barbiturates/sedatives, heroin/other opiates, analgesics, or inhalants.

[b]Comparisons between 1980 and 1982 are statistically significant at the 95 percent confidence level.

[c]Comparisons between 1980 and 1988 are statistically significant at the 95 percent confidence level.

[d]Comparisons between 1982 and 1985 are statistically significant at the 95 percent confidence level.

[e]Comparisons between 1985 and 1988 are statistically significant at the 95 percent confidence level.

-Data for Health Practices and Number of Illnesses are not available before 1985.

Table D.2. Substance Use and Health Summary, 1980-1988 - Navy

Measure	Year of Survey 1980	1982	1985	1988
Drinking Levels				
Abstainer	10.0 (0.5)[c]	10.5 (1.4)	9.6 (0.8)[e]	15.7 (0.6)
Infrequent/light	13.0 (0.7)[b,c]	21.6 (2.3)	19.9 (1.9)	19.3 (1.1)
Moderate	32.8 (1.9)[b]	25.5 (1.3)[d]	29.8 (1.0)	32.4 (1.4)
Moderate/Heavy	26.0 (1.0)	26.4 (0.4)	28.5 (1.1)	26.1 (3.2)
Heavy	18.2 (2.0)[c]	16.1 (2.6)	12.2 (1.0)[e]	8.5 (1.4)
Any Drug Use[a]				
Past 30 Days	33.7 (2.1)[b,c]	16.2 (2.2)[d]	10.3 (1.7)[e]	5.4 (0.7)
Past 12 Months	43.2 (2.1)[b,c]	28.1 (1.7)[d]	15.9 (2.3)	11.3 (2.1)
Cigarettes Past 30 Days	53.8 (1.2)[c]	55.4 (1.0)[d]	47.9 (1.2)	43.8 (1.8)
Alcohol Negative Effects				
Serious Consequences	22.1 (2.1)[c]	17.6 (1.4)	13.5 (2.0)	10.4 (1.5)
Productivity Loss	34.7 (2.1)[b,c]	41.8 (1.8)[d]	35.5 (2.4)[e]	26.4 (3.1)
Dependence	9.7 (1.0)	11.6 (1.0)[d]	6.8 (0.8)	7.2 (1.3)
Drug Use Negative Effects				
Serious Consequences	17.2 (2.1)[b,c]	7.4 (0.9)[d]	4.0 (1.0)	2.4 (0.5)
Productivity Loss	18.8 (2.0)[b,c]	11.3 (0.9)[d]	3.9 (1.1)	3.1 (1.3)
Health Practices	- -	- -	3.57 (0.03)	3.76 (0.10)

Note: Entries for health practices are mean values. Other entries are percentages with standard errors in parentheses. Serious consequences for alcohol and drugs are reported for the past 12 months.

[a]Any nonmedical use of marijuana, PCP, LSD/hallucinogens, cocaine, amphetamines/stimulants, tranquilizers, barbiturates/sedatives, heroin/other opiates, analgesics, or inhalants.

[b]Comparisons between 1980 and 1982 are statistically significant at the 95 percent confidence level.

[c]Comparisons between 1980 and 1988 are statistically significant at the 95 percent confidence level.

[d]Comparisons between 1982 and 1985 are statistically significant at the 95 percent confidence level.

[e]Comparisons between 1985 and 1988 are statistically significant at the 95 percent confidence level.

-Data for Health Practices and Number of Illnesses are not available before 1985.

Table D.3. Substance Use and Health Summary, 1980-1988 - Marine Corps

Measure	Year of Survey							
	1980		1982		1985		1988	
Drinking Levels								
Abstainer	10.5	(1.0)[c]	13.5	(2.0)	10.8	(2.5)[e]	18.0	(0.9)
Infrequent/light	12.1	(0.8)	13.4	(1.9)	14.0	(1.7)	17.1	(3.2)
Moderate	30.7	(1.4)	27.3	(1.0)	28.9	(1.1)	27.1	(1.5)
Moderate/Heavy	28.3	(1.7)	29.4	(1.5)	31.0	(2.2)	26.1	(3.5)
Heavy	18.3	(1.3)[c]	16.4	(0.8)	15.4	(3.3)	11.7	(1.0)
Any Drug Use[a]								
Past 30 Days	37.7	(3.0)[b,c]	20.6	(2.0)[d]	9.9	(3.2)	4.0	(0.7)
Past 12 Months	48.0	(3.1)[b,c]	(29.9	(3.2)[d]	14.7	(3.8)	7.8	(1.0)
Cigarettes Past 30 Days	53.4	(0.6)[b,c]	48.7	(0.4)[d]	42.8	(3.1)	41.3	(1.8)
Alcohol Negative Effects								
Serious Consequences	26.2	(2.2)[b,c]	19.7	(1.0)[d]	12.3	(1.7)	17.0	(3.4)
Productivity Loss	34.1	(1.8)	37.6	(1.2)	29.0	(5.0)	32.0	(3.8)
Dependence	11.8	(1.2)	10.2	(1.8)	7.6	(1.4)	9.8	(1.7)
Drug Use Negative Effects								
Serious Consequences	19.4	(2.1)[b,c]	7.2	(1.1)	3.9	(2.2)	1.9	(0.5)
Productivity Loss	20.8	(2.1)[b,c]	8.9	(0.8)	4.3	(3.0)	3.0	(0.9)
Health Practices	-	-	-	-	3.83	(0.09)	3.92	(0.06)

Note: Entries for health practices are mean values. Other entries are percentages with standard errors in parentheses. Serious consequences for alcohol and drugs are reported for the past 12 months.

[a]Any nonmedical use of marijuana, PCP, LSD/hallucinogens, cocaine, amphetamines/stimulants, tranquilizers, barbiturates/sedatives, heroin/other opiates, analgesics, or inhalants.

[b]Comparisons between 1980 and 1982 are statistically significant at the 95 percent confidence level.

[c]Comparisons between 1980 and 1988 are statistically significant at the 95 percent confidence level.

[d]Comparisons between 1982 and 1985 are statistically significant at the 95 percent confidence level.

[e]Comparisons between 1985 and 1988 are statistically significant at the 95 percent confidence level.

-Data for Health Practices and Number of Illnesses are not available before 1985.

Table D.4. Substance Use and Health Summary, 1980-1988 - Air Force

Measure	Year of Survey							
	1980		1982		1985		1988	
Drinking Levels								
Abstainer	15.0	(1.0)[b,c]	12.6	(0.6)[d]	15.8	(1.0)[e]	18.5	(0.8)
Infrequent/light	15.6	(0.6)[b,c]	19.1	(1.0)	17.7	(1.0)	20.0	(0.8)
Moderate	37.3	(0.9)[b,c]	34.8	(0.7)	35.1	(0.9)	33.7	(0.8)
Moderate/Heavy	23.1	(0.8)	23.9	(0.8)	23.4	(1.2)	21.7	(1.3)
Heavy	9.0	(0.9)[c]	9.5	(0.7)	8.0	(0.9)	6.1	(0.5)
Any Drug Use[a]								
Past 30 Days	14.5	(1.1)[c]	11.9	(1.5)[d]	4.5	(0.8)[e]	2.1	(0.4)
Past 12 Months	23.4	(1.7)[b,c]	16.4	(1.8)[d]	7.2	(0.9)[e]	3.8	(0.6)
Cigarettes Past 30 Days	43.2	(1.8)	44.1	(1.6)	39.0	(2.3)	35.8	(1.2)
Alcohol Negative Effects								
Serious Consequences	9.0	(0.8)[c]	8.0	(0.8)	4.7	(0.5)	3.9	(0.5)
Productivity Loss	20.7	(1.2)[b,c]	28.0	(2.7)	19.4	(1.1)[e]	15.5	(0.8)
Dependence	4.3	(0.6)	3.7	(0.7)	3.3	(0.5)	3.8	(0.4)
Drug Use Negative Effects								
Serious Consequences	6.1	(0.6)[b,c]	2.2	(0.3)	0.9	(0.2)[e]	0.3	(0.1)
Productivity Loss	6.4	(0.7)[b,c]	4.5	(0.5)	1.5	(0.7)	0.4	(0.1)
Health Practices	-	-	-	-	3.95	(0.06)	3.95	(0.03)

Note: Entries for health practices are mean values. Other entries are percentages with standard errors in parentheses. Serious consequences for alcohol and drugs are reported for the past 12 months.

[a]Any nonmedical use of marijuana, PCP, LSD/hallucinogens, cocaine, amphetamines/stimulants, tranquilizers, barbiturates/sedatives, heroin/other opiates, analgesics, or inhalants.

[b]Comparisons between 1980 and 1982 are statistically significant at the 95 percent confidence level.

[c]Comparisons between 1980 and 1988 are statistically significant at the 95 percent confidence level.

[d]Comparisons between 1982 and 1985 are statistically significant at the 95 percent confidence level.

[e]Comparisons between 1985 and 1988 are statistically significant at the 95 percent confidence level.

-Data for Health Practices and Number of Illnesses are not available before 1985.

Table D.5. Average Daily Ethanol Ounces by Sociodemographic Characteristics

Sociodemographic Characteristic	Service				
	Army	Navy	Marine Corps	Air Force	Total DoD
Sex					
Male	1.24(Ø.Ø6)	Ø.98(Ø.Ø6)	1.32 (Ø.13)	Ø.75 (Ø.Ø3)	1.Ø3 (Ø.Ø3)
Female	Ø.38(Ø.Ø7)	Ø.46(Ø.Ø7)	Ø.53 (Ø.1Ø)	Ø.46 (Ø.Ø4)	Ø.44 (Ø.Ø3)
Race/Ethnicity					
White	1.Ø6(Ø.Ø8)	Ø.93(Ø.Ø8)	1.31 (Ø.15)	Ø.74 (Ø.Ø3)	Ø.94 (Ø.Ø4)
Black	1.39(Ø.12)	1.Ø3(Ø.Ø7)	1.14 (Ø.18)	Ø.89 (Ø.Ø6)	1.14 (Ø.Ø7)
Hispanic	Ø.93(Ø.11)	Ø.82(Ø.12)	1.15 (Ø.27)	Ø.83 (Ø.Ø6)	Ø.86 (Ø.Ø6)
Other	1.18(Ø.17)	Ø.65(Ø.2Ø)	1.Ø2 (Ø.23)	Ø.66 (Ø.15)	Ø.86 (Ø.11)
Education					
Less than high school graduate	1.14(Ø.46)	1.58(Ø.37)	2.Ø1 (Ø.96)	1.18 (Ø.24)	1.42 (Ø.25)
High school graduate or GED	1.58(Ø.Ø8)	1.2Ø(Ø.Ø8)	1.53 (Ø.11)	Ø.87 (Ø.Ø5)	1.31 (Ø.Ø4)
Some college	Ø.95(Ø.1Ø)	Ø.73(Ø.Ø4)	Ø.91 (Ø.17)	Ø.71 (Ø.Ø3)	Ø.8Ø (Ø.Ø3)
College graduate or higher	Ø.49(Ø.Ø4)	Ø.49(Ø.Ø5)	Ø.64 (Ø.1Ø)	Ø.57 (Ø.Ø3)	Ø.52 (Ø.Ø2)
Age					
17-2Ø	1.55(Ø.15)	1.Ø4(Ø.14)	1.56 (Ø.27)	Ø.87 (Ø.1Ø)	1.25 (Ø.Ø9)
21-25	1.48(Ø.11)	1.13(Ø.Ø9)	1.75 (Ø.38)	Ø.86 (Ø.Ø6)	1.22 (Ø.Ø6)
26-3Ø	1.16(1.1Ø)	Ø.99(Ø.12)	Ø.81 (Ø.Ø4)	Ø.64 (Ø.Ø3)	Ø.91 (Ø.Ø5)
31-35	Ø.76(Ø.Ø7)	Ø.72(Ø.14)	Ø.82 (Ø.Ø9)	Ø.56 (Ø.Ø3)	Ø.69 (Ø.Ø5)
36 & older	Ø.64(Ø.Ø3)	Ø.52(Ø.Ø5)	Ø.66 (Ø.Ø5)	Ø.66 (Ø.Ø4)	Ø.61 (Ø.Ø2)
Family Status					
Not married	1.67(Ø.1Ø)	1.17(Ø.Ø8)	1.76 (Ø.25)	Ø.98 (Ø.Ø9)	1.35 (Ø.Ø6)
Married, spouse not present	1.32(Ø.18)	Ø.71(Ø.11)	1.17 (Ø.26)	Ø.66 (Ø.16)	1.Ø0 (Ø.1Ø)
Married, spouse present	Ø.76(Ø.Ø4)	Ø.7Ø(Ø.14)	Ø.72 (Ø.11)	Ø.59 (Ø.Ø3)	Ø.69 (Ø.Ø4)
Pay Grade					
E1-E3	1.97(Ø.2Ø)	1.39(Ø.15)	1.79 (Ø.18)	Ø.9Ø (Ø.Ø8)	1.47 (Ø.Ø8)
E4-E6	1.21(Ø.Ø7)	Ø.9Ø(Ø.Ø4)	1.Ø2 (Ø.16)	Ø.74 (Ø.Ø4)	Ø.97 (Ø.Ø3)
E7-E9	Ø.69(Ø.Ø5)	Ø.62(Ø.Ø5)	Ø.7Ø (Ø.Ø8)	Ø.63 (Ø.Ø3)	Ø.65 (Ø.Ø3)
W1-W4	Ø.52(Ø.Ø7)	Ø.58(Ø.Ø8)	Ø.45 (Ø.Ø3)	* (*)	Ø.52 (Ø.Ø5)
Ø1-Ø3	Ø.43(Ø.Ø5)	Ø.48(Ø.Ø5)	Ø.63 (Ø.11)	Ø.53 (Ø.Ø5)	Ø.49 (Ø.Ø3)
Ø4-Ø1Ø	Ø.52(Ø.Ø7)	Ø.52(Ø.Ø8)	Ø.65 (Ø.Ø7)	Ø.52 (Ø.Ø2)	Ø.52 (Ø.Ø3)
Time on Active Duty					
1 year or less	1.4Ø(Ø.21)	Ø.98(Ø.15)	1.14 (Ø.35)	Ø.87 (Ø.13)	1.13 (Ø.1Ø)
>1 to 2 years	1.49(Ø.14)	1.51(Ø.22)	1.1Ø (Ø.13)	Ø.87 (Ø.Ø8)	1.28 (Ø.1Ø)
>2 to 3 years	1.66(Ø.15)	1.Ø3(Ø.Ø6)	2.45 (Ø.67)	Ø.77 (Ø.Ø9)	1.31 (Ø.1Ø)
>3 to 4 years	1.25(Ø.2Ø)	Ø.87(Ø.1Ø)	1.89 (Ø.35)	Ø.9Ø (Ø.Ø8)	1.11 (Ø.Ø8)
>4 to 9 years	1.12(Ø.1Ø)	Ø.91(Ø.Ø7)	1.Ø5 (Ø.17)	Ø.69 (Ø.Ø5)	Ø.93 (Ø.Ø5)
1Ø years or more	Ø.79(Ø.Ø8)	Ø.65(Ø.Ø6)	Ø.65 (Ø.Ø4)	Ø.64 (Ø.Ø3)	Ø.69 (Ø.Ø3)
Region					
Americas	Ø.92(Ø.Ø8)	Ø.89(Ø.Ø8)	1.23 (Ø.16)	Ø.68 (Ø.Ø3)	Ø.87 (Ø.Ø4)
North Pacific	1.42(Ø.49)	1.17(Ø.34)	1.32 (Ø.2Ø)	Ø.88 (Ø.Ø4)	1.18 (Ø.17)
Other Pacific	Ø.89(Ø.19)	1.2Ø(Ø.29)	1.25 (Ø.26)	Ø.94 (Ø.15)	1.Ø8 (Ø.14)
Europe	1.52(Ø.Ø8)	Ø.85(Ø.Ø7)	1.56 (Ø.29)	Ø.81 (Ø.Ø9)	1.26 (Ø.Ø6)
Total DoD	1.14(Ø.Ø6)	Ø.92(Ø.Ø6)	1.25 (Ø.13)	Ø.72 (Ø.Ø3)	Ø.96 (Ø.Ø3)

Note: Tabled values are mean scores with standard errors in parentheses. Construction of the ethanol index is based on estimates of typical drinking (quantity, frequency, and volume of alcohol) during the past 3Ø days and atypical drinking (frequency of 8 or more drinks) during the past 12 months for beer, wine and hard liquor. The index ranges from Ø to 3Ø and represents the mean number of ounces of ethanol consumed per day from all alcoholic beverages.

*There are no warrant officers in the Air Force.

Table D.6. Drinking Levels by Sociodemographic Characteristics - Total DoD

Sociodemographic Characteristic	Drinking Level									
	Abstainer		Infrequent/ Light		Moderate		Moderate/ Heavy		Heavy	
Sex										
Male	16.3	(Ø.4)	17.9	(Ø.5)	32.1	(Ø.6)	24.7	(1.2)	8.9	(Ø.7)
Female	24.7	(1.9)	27.9	(1.9)	31.7	(1.6)	13.5	(1.2)	2.2	(Ø.4)
Race/Ethnicity										
White	15.5	(Ø.6)	19.2	(Ø.6)	32.3	(Ø.7)	24.6	(1.4)	8.4	(Ø.6)
Black	22.4	(1.3)	16.9	(1.Ø)	32.6	(1.4)	19.3	(Ø.9)	8.8	(Ø.9)
Hispanic	18.Ø	(1.5)	21.8	(2.3)	28.9	(1.6)	25.5	(2.2)	5.8	(Ø.8)
Other	21.7	(1.9)	2Ø.5	(2.Ø)	32.2	(2.3)	19.6	(2.5)	6.1	(1.3)
Education										
< High school	13.6	(4.1)	15.4	(4.Ø)	2Ø.Ø	(5.1)	34.Ø	(7.8)	17.1	(5.Ø)
High school grad	16.8	(Ø.7)	16.2	(Ø.7)	28.Ø	(1.1)	26.5	(1.6)	12.5	(1.1)
Some college	18.8	(1.Ø)	19.5	(Ø.6)	33.6	(Ø.7)	22.Ø	(1.2)	6.1	(Ø.5)
College grad	15.3	(Ø.7)	24.4	(1.3)	38.5	(1.Ø)	19.4	(1.1)	2.3	(Ø.3)
Age										
17-2Ø	17.8	(1.7)	15.4	(1.4)	26.9	(1.9)	28.8	(2.4)	11.1	(1.8)
21-25	12.9	(Ø.6)	15.8	(1.1)	32.2	(1.6)	27.4	(2.Ø)	11.6	(1.1)
26-3Ø	17.8	(Ø.8)	2Ø.5	(1.Ø)	32.5	(1.1)	22.1	(Ø.8)	7.1	(Ø.6)
31-35	2Ø.Ø	(1.Ø)	21.8	(1.Ø)	34.Ø	(1.2)	19.Ø	(1.5)	5.1	(Ø.6)
36 or older	2Ø.8	(Ø.8)	23.1	(Ø.8)	33.5	(Ø.8)	18.4	(Ø.6)	4.2	(Ø.5)
Family Status										
Not married	14.7	(Ø.7)	14.6	(Ø.7)	29.8	(Ø.9)	28.5	(1.9)	12.4	(1.5)
Married, spouse not present	16.3	(1.6)	17.9	(1.8)	35.6	(1.9)	22.1	(2.1)	8.1	(1.9)
Married, spouse present	19.1	(Ø.5)	22.4	(Ø.8)	33.4	(Ø.7)	2Ø.Ø	(Ø.5)	5.1	(Ø.4)
Pay Grade										
E1-E3	16.4	(1.1)	15.1	(1.2)	26.9	(1.4)	29.3	(2.3)	12.3	(1.3)
E4-E6	17.7	(Ø.7)	18.4	(Ø.7)	31.4	(Ø.7)	23.4	(1.3)	9.1	(Ø.8)
E7-E9	22.2	(Ø.7)	21.4	(Ø.8)	32.7	(1.Ø)	18.4	(Ø.7)	5.3	(Ø.5)
W1-W4	21.2	(2.6)	23.8	(2.Ø)	3Ø.6	(2.1)	19.9	(1.2)	4.6	(1.1)
Ø1-Ø3	13.Ø	(1.1)	22.7	(1.9)	42.6	(1.4)	19.8	(1.5)	1.9	(Ø.4)
Ø4-Ø1Ø	13.7	(1.Ø)	27.4	(1.3)	38.2	(1.2)	19.2	(1.4)	1.4	(Ø.4)
Time on Active Duty										
1 year or less	18.6	(2.8)	13.4	(1.7)	33.1	(2.4)	23.7	(2.4)	11.2	(1.8)
>1-2 years	18.2	(1.4)	15.8	(1.3)	26.5	(1.8)	28.8	(1.7)	1Ø.8	(1.4)
>2-3 years	12.8	(1.2)	16.7	(2.2)	29.2	(1.5)	29.6	(3.5)	11.8	(1.8)
>3-4 years	14.4	(1.7)	13.8	(1.9)	33.2	(2.7)	29.5	(2.8)	9.1	(1.4)
>4-9 years	15.3	(Ø.6)	2Ø.6	(Ø.8)	33.4	(Ø.8)	22.3	(Ø.9)	8.4	(Ø.8)
>9 years	2Ø.4	(Ø.6)	22.Ø	(Ø.5)	33.4	(Ø.6)	19.1	(Ø.6)	5.Ø	(Ø.4)
Region										
Americas	18.4	(Ø.5)	2Ø.2	(Ø.8)	31.7	(Ø.7)	22.7	(1.6)	7.Ø	(Ø.6)
North Pacific	15.Ø	(1.1)	17.5	(1.8)	31.3	(1.2)	24.7	(2.1)	11.5	(2.2)
Other Pacific	16.3	(1.6)	16.5	(1.4)	31.7	(1.8)	23.2	(2.4)	12.3	(1.9)
Europe	13.6	(1.2)	15.7	(1.2)	33.7	(1.2)	26.1	(1.3)	1Ø.8	(1.2)
Total DoD	17.2	(Ø.4)	19.Ø	(Ø.6)	32.1	(Ø.6)	23.5	(1.1)	8.2	(Ø.6)

Note: Drinking Level values are row percentages. Drinking levels are based on quantity and frequency data during the past 3Ø days for the respondents' primary beverage. Abstainers drink once a year or less. Those in the Infrequent-Light category drink 1-4 drinks 1-3 times/month. Those in the Moderate category drink (a) 1 drink at least once/week, (b) 2-4 drinks 2-3 times/month, or (c) ≥5 drinks once/month or less. Those in the Moderate-Heavy category drink 2-4 drinks at least once/week, or ≥5 drinks 2-3 times/month. Those in the Heavy category drink ≥5 drinks at least once/week.

Table D.7. Drinking Levels by Sociodemographic Characteristics - Army

Sociodemographic Characteristic	Drinking Level: Abstainer		Infrequent/ Light		Moderate		Moderate/ Heavy		Heavy	
Sex										
Male	15.1	(Ø.7)	17.4	(Ø.9)	31.9	(1.Ø)	23.9	(Ø.8)	11.7	(Ø.9)
Female	32.6	(3.8)	26.6	(3.4)	29.7	(2.9)	9.5	(1.7)	1.6	(Ø.8)
Race/Ethnicity										
White	14.4	(Ø.9)	19.Ø	(1.4)	32.4	(1.2)	23.5	(1.2)	1Ø.6	(1.3)
Black	21.4	(1.9)	16.6	(1.2)	3Ø.9	(1.8)	19.4	(1.4)	11.7	(1.4)
Hispanic	2Ø.8	(2.3)	19.8	(1.9)	3Ø.7	(2.Ø)	21.1	(2.3)	7.6	(Ø.8)
Other	18.8	(3.4)	19.9	(2.6)	28.8	(3.6)	24.9	(3.2)	7.7	(2.5)
Education										
< High school	18.8	(8.7)	22.2	(9.1)	24.5	(9.9)	16.7	(6.6)	17.7	(9.Ø)
High school grad	16.7	(1.2)	14.Ø	(Ø.9)	27.9	(1.4)	25.3	(1.6)	16.1	(1.Ø)
Some college	18.6	(1.Ø)	2Ø.Ø	(Ø.9)	33.5	(1.6)	2Ø.1	(Ø.9)	7.8	(1.2)
College grad	15.5	(1.1)	26.3	(1.9)	37.9	(1.7)	18.7	(1.1)	1.6	(Ø.4)
Age										
17-2Ø	17.2	(2.3)	16.5	(2.5)	28.5	(2.6)	23.Ø	(2.4)	14.7	(1.6)
21-25	13.5	(1.3)	14.6	(1.6)	28.4	(1.7)	26.4	(1.5)	17.Ø	(1.4)
26-3Ø	16.4	(1.2)	18.6	(1.4)	34.Ø	(1.9)	22.5	(1.4)	8.5	(1.2)
31-35	2Ø.Ø	(1.4)	2Ø.5	(1.7)	35.1	(1.6)	18.6	(1.6)	5.7	(1.Ø)
36 or older	2Ø.8	(1.5)	23.8	(1.3)	33.1	(1.4)	18.1	(Ø.8)	4.3	(Ø.6)
Family Status										
Not married	14.6	(1.3)	14.1	(1.2)	29.5	(1.6)	25.2	(1.6)	16.6	(1.8)
Married, spouse not present	2Ø.1	(2.6)	14.1	(2.4)	33.Ø	(2.3)	18.7	(2.1)	14.2	(2.8)
Married, spouse present	18.5	(Ø.7)	22.Ø	(1.4)	33.Ø	(1.1)	2Ø.6	(Ø.9)	5.9	(Ø.8)
Pay Grade										
E1-E3	16.4	(3.1)	14.3	(2.8)	26.6	(2.8)	23.8	(2.6)	18.9	(2.1)
E4-E6	16.8	(Ø.6)	16.3	(1.1)	31.Ø	(1.3)	23.8	(1.2)	12.2	(1.1)
E7-E9	23.8	(1.2)	21.5	(1.1)	33.1	(1.8)	16.7	(1.4)	4.9	(Ø.7)
W1-W4	19.7	(3.1)	23.2	(2.5)	33.1	(2.2)	19.4	(1.4)	4.6	(1.4)
O1-O3	13.9	(1.7)	25.1	(2.8)	4Ø.Ø	(2.6)	19.8	(2.Ø)	1.3	(Ø.5)
O4-O1Ø	12.9	(1.6)	31.Ø	(2.2)	35.5	(1.2)	19.7	(2.3)	1.Ø	(Ø.5)
Time on Active Duty										
1 year or less	24.6	(3.5)	12.7	(2.6)	28.Ø	(3.5)	21.Ø	(2.4)	13.7	(3.1)
>1-2 years	14.1	(2.3)	17.1	(2.7)	3Ø.3	(3.4)	22.3	(2.1)	16.2	(2.4)
>2-3 years	11.Ø	(1.8)	13.2	(2.1)	28.Ø	(2.9)	3Ø.6	(3.8)	17.2	(2.5)
>3-4 years	17.2	(3.6)	18.8	(3.8)	29.2	(4.5)	23.5	(3.2)	11.4	(2.1)
>4-9 years	15.8	(Ø.8)	18.6	(1.2)	32.1	(1.7)	23.1	(1.5)	1Ø.4	(1.1)
>9 years	19.5	(1.1)	21.9	(1.Ø)	34.3	(1.3)	19.Ø	(1.1)	5.4	(Ø.6)
Region										
Americas	19.2	(Ø.7)	21.2	(1.4)	32.3	(1.4)	19.3	(1.2)	8.Ø	(1.Ø)
North Pacific	12.2	(3.1)	14.1	(1.Ø)	32.4	(3.8)	26.8	(1.7)	14.6	(8.2)
Other Pacific	19.2	(1.8)	18.5	(5.6)	31.1	(2.4)	21.Ø	(1.1)	1Ø.3	(5.1)
Europe	13.9	(1.8)	14.1	(1.5)	3Ø.5	(1.8)	26.9	(1.2)	14.5	(1.6)
Total Army	17.1	(Ø.7)	18.5	(1.Ø)	31.7	(1.Ø)	22.2	(Ø.8)	1Ø.5	(Ø.9)

Note: Drinking Level values are row percentages. Drinking levels are based on quantity and frequency data during the past 3Ø days for the respondents' primary beverage. Abstainers drink once a year or less. Those in the Infrequent-Light category drink 1-4 drinks 1-3 times/month. Those in the Moderate category drink (a) 1 drink at least once/week, (b) 2-4 drinks 2-3 times/month, or (c) ≥5 drinks once/month or less. Those in the Moderate-Heavy category drink 2-4 drinks at least once/week, or ≥5 drinks 2-3 times/month. Those in the Heavy category drink ≥5 drinks at least once/week.

Table D.8. Drinking Levels by Sociodemographic Characteristics - Navy

Sociodemographic Characteristic	Drinking Level									
	Abstainer		Infrequent/ Light		Moderate		Moderate/ Heavy		Heavy	
Sex										
Male	15.4	(Ø.7)	17.7	(Ø.7)	32.7	(1.4)	27.3	(3.3)	7.Ø	(1.6)
Female	18.7	(2.8)	32.5	(4.Ø)	3Ø.1	(2.8)	18.1	(2.6)	2.5	(Ø.7)
Race/Ethnicity										
White	14.6	(1.2)	19.5	(Ø.9)	32.2	(1.6)	26.8	(3.9)	6.9	(1.4)
Black	2Ø.9	(4.1)	16.6	(3.1)	35.5	(4.3)	19.9	(2.Ø)	7.1	(1.9)
Hispanic	16.3	(3.1)	19.7	(3.5)	27.1	(3.1)	34.2	(4.Ø)	2.7	(Ø.8)
Other	19.3	(2.7)	23.4	(4.Ø)	35.6	(4.2)	17.5	(5.1)	4.2	(2.2)
Education										
< High school	1Ø.5	(4.5)	15.3	(5.2)	2Ø.3	(6.7)	36.2	(12.7)	17.7	(6.9)
High school grad	15.Ø	(1.5)	17.7	(Ø.9)	28.5	(2.7)	29.5	(3.8)	9.2	(2.4)
Some college	17.4	(3.1)	17.8	(1.5)	34.7	(1.6)	25.9	(3.Ø)	4.2	(1.Ø)
College grad	14.9	(1.3)	27.Ø	(2.4)	39.3	(1.2)	16.3	(2.3)	2.6	(Ø.7)
Age										
17-2Ø	12.Ø	(1.7)	13.7	(2.4)	29.3	(3.6)	37.7	(3.5)	7.3	(3.5)
21-25	11.7	(1.2)	16.7	(1.8)	33.4	(4.3)	3Ø.8	(5.Ø)	7.4	(2.1)
26-3Ø	17.3	(2.Ø)	21.7	(2.1)	31.8	(2.3)	21.2	(1.7)	8.Ø	(1.2)
31-35	19.2	(2.7)	2Ø.9	(1.5)	35.3	(2.6)	19.7	(4.9)	5.Ø	(1.4)
36 or older	21.7	(1.7)	24.9	(1.5)	31.7	(1.3)	18.1	(1.6)	3.6	(Ø.9)
Family Status										
Not Married	14.2	(1.2)	14.7	(Ø.9)	29.5	(1.7)	32.5	(3.9)	9.1	(3.2)
Married, spouse not present	13.8	(1.9)	21.7	(2.7)	37.4	(3.6)	23.7	(4.Ø)	3.4	(2.Ø)
Married, spouse present	17.6	(1.1)	23.6	(2.2)	34.5	(1.3)	19.9	(1.1)	4.3	(Ø.5)
Pay Grade										
E1-E3	12.4	(2.9)	14.2	(1.4)	28.Ø	(3.1)	37.6	(3.9)	7.7	(2.9)
E4-E6	17.1	(1.7)	18.9	(1.7)	31.3	(1.3)	25.5	(3.5)	7.2	(1.7)
E7-E9	21.7	(1.4)	21.7	(2.2)	3Ø.7	(1.6)	2Ø.1	(1.1)	5.8	(1.1)
W1-W4	23.3	(2.8)	23.3	(3.2)	26.9	(3.2)	23.Ø	(3.8)	3.5	(1.5)
Ø1-Ø3	8.9	(1.3)	26.7	(2.7)	48.5	(2.4)	13.7	(2.1)	2.2	(Ø.9)
Ø4-Ø1Ø	13.Ø	(2.2)	27.8	(1.6)	4Ø.Ø	(2.3)	17.9	(3.5)	1.3	(Ø.5)
Time on Active Duty										
1 year or less	11.7	(4.9)	15.6	(2.8)	33.9	(3.4)	28.7	(5.6)	1Ø.1	(3.9)
>1-2 years	17.7	(1.9)	13.1	(2.7)	27.2	(3.7)	34.6	(2.4)	7.4	(2.3)
2-3 years	12.Ø	(2.3)	14.5	(4.8)	3Ø.Ø	(2.6)	37.6	(7.6)	5.9	(3.Ø)
3-4 years	15.1	(2.9)	13.9	(3.Ø)	36.Ø	(5.4)	3Ø.5	(4.2)	4.5	(2.1)
>4-9 years	12.2	(1.1)	23.2	(1.2)	34.4	(1.5)	22.3	(2.4)	7.9	(1.9)
>9 years	21.2	(1.2)	22.6	(1.Ø)	31.9	(1.1)	19.7	(1.6)	4.7	(1.1)
Region										
Americas	16.6	(Ø.7)	19.5	(1.3)	31.6	(1.5)	26.3	(3.8)	6.Ø	(1.6)
North Pacific	12.3	(Ø.6)	14.6	(7.2)	3Ø.1	(3.2)	33.6	1Ø.Ø)	9.3	(1.1)
Other Pacific	15.3	(2.4)	16.6	(1.7)	31.6	(3.7)	23.Ø	(4.7)	13.5	(3.1)
Europe	9.3	(Ø.1)	2Ø.8	(2.7)	4Ø.9	(Ø.5)	24.5	(3.4)	4.5	(Ø.2)
Total Navy	15.7	(Ø.6)	19.3	(1.1)	32.4	(1.4)	26.1	(3.2)	6.5	(1.4)

Note: Drinking Level values are row percentages. Drinking levels are based on quantity and frequency data during the past 3Ø days for the respondents' primary beverage. Abstainers drink once a year or less. Those in the Infrequent-Light category drink 1-4 drinks 1-3 times/month. Those in the Moderate category drink (a) 1 drink at least once/week, (b) 2-4 drinks 2-3 times/month, or (c) ≥5 drinks once/month or less. Those in the Moderate-Heavy category drink 2-4 drinks at least once/week, or ≥5 drinks 2-3 times/month. Those in the Heavy category drink ≥5 drinks at least once/week.

Table D.9. Drinking Levels by Sociodemographic Characteristics - Marine Corps

Sociodemographic Characteristic	Drinking Level									
	Abstainer		Infrequent/ Light		Moderate		Moderate/ Heavy		Heavy	
Sex										
Male	16.1	(0.9)	16.5	(3.0)	27.8	(1.3)	27.6	(4.1)	12.1	(0.9)
Female	38.6	(13.9)	24.2	(8.5)	20.1	(6.8)	9.6	(4.3)	7.5	(3.3)
Race/Ethnicity										
White	16.4	(2.2)	15.3	(2.2)	27.4	(2.6)	28.6	(5.2)	12.2	(1.5)
Black	25.5	(4.2)	17.6	(4.4)	29.7	(3.4)	17.7	(1.3)	9.5	(2.9)
Hispanic	17.7	(4.7)	28.8	(12.6)	17.3	(4.7)	24.1	(4.3)	12.2	(4.2)
Other	16.7	(4.5)	12.6	(4.0)	39.7	(8.7)	21.2	(10.7)	9.8	(6.2)
Education										
< High school	2.2	(2.5)	7.3	(6.1)	19.8	(17.0)	46.2	(24.9)	24.5	(18.9)
High school grad	18.4	(1.9)	15.4	(3.6)	22.1	(1.8)	28.3	(3.3)	15.7	(1.1)
Some college	20.8	(2.6)	18.7	(2.1)	33.1	(2.8)	20.3	(6.8)	7.0	(1.6)
College grad	11.5	(3.7)	22.0	(3.7)	37.7	(2.8)	26.5	(5.1)	2.4	(1.8)
Age										
17-20	25.7	(5.8)	12.0	(2.8)	15.4	(4.4)	33.9	(6.7)	12.9	(4.1)
21-25	11.0	(1.9)	12.2	(3.7)	30.1	(5.6)	28.2	(5.5)	18.5	(2.9)
26-30	21.1	(3.9)	25.3	(7.9)	27.8	(4.8)	21.7	(1.6)	4.1	(0.6)
31-35	17.5	(2.3)	25.5	(4.0)	31.4	(4.6)	16.7	(1.8)	9.0	(1.5)
36 or older	20.9	(4.2)	19.8	(2.5)	34.4	(4.8)	21.0	(3.7)	4.0	(0.3)
Family Status										
Not Married	19.5	(1.7)	10.1	(2.5)	21.8	(2.9)	31.7	(5.5)	16.9	(1.7)
Married, spouse not present	14.1	(6.8)	12.5	(1.8)	35.7	(8.7)	31.6	(9.1)	6.1	(2.3)
Married, spouse present	17.1	(1.3)	25.4	(4.8)	31.5	(2.5)	19.1	(1.3)	6.9	(1.8)
Pay Grade										
E1-E3	19.7	(1.1)	9.4	(2.6)	20.9	(3.8)	34.2	(5.2)	15.8	(1.2)
E4-E6	16.4	(1.4)	22.3	(3.6)	29.4	(2.0)	20.6	(1.8)	11.3	(2.1)
E7-E9	22.2	(3.2)	22.1	(1.6)	31.6	(5.1)	18.0	(1.6)	6.1	(1.5)
W1-W4	30.2	(6.3)	29.9	(3.7)	14.6	(8.3)	18.5	(2.6)	6.6	(1.3)
O1-O3	15.2	(6.5)	22.6	(6.2)	38.5	(2.8)	19.2	(4.1)	4.4	(2.4)
O4-O10	9.1	(2.3)	20.4	(1.7)	40.4	(6.3)	29.5	(6.3)	0.6	(0.6)
Time on Active Duty										
1 year or less	23.1	(12.7)	11.4	(5.1)	17.2	(1.9)	30.3	(8.8)	17.9	(6.0)
>1-2 years	23.5	(5.3)	13.1	(3.7)	18.2	(3.4)	36.9	(4.5)	8.2	(1.6)
2-3 years	16.4	(4.6)	13.0	(5.0)	23.4	(1.8)	22.6	(4.8)	24.7	(6.7)
3-4 years	8.7	(3.3)	5.4	(2.2)	26.4	(6.4)	44.3	(8.4)	15.2	(2.7)
>4-9 years	15.0	(4.2)	23.0	(5.2)	33.7	(0.8)	18.4	(1.9)	9.9	(2.9)
>9 years	20.7	(2.2)	23.4	(2.5)	32.3	(2.3)	17.7	(3.0)	5.9	(0.6)
Region										
Americas	19.1	(1.1)	17.8	(4.0)	26.6	(1.8)	25.7	(4.4)	10.8	(1.2)
North Pacific	16.5	(0.6)	14.2	(1.7)	29.5	(0.6)	25.7	(0.3)	14.1	(2.6)
Other Pacific	12.9	(3.5)	14.0	(3.3)	28.1	(4.8)	29.4	(2.5)	15.5	(4.4)
Europe	7.3	(2.1)	18.1	(3.7)	29.6	(1.2)	28.8	(3.1)	16.2	(3.9)
Total Marine Corps	18.0	(0.9)	17.1	(3.2)	27.1	(1.5)	26.1	(3.5)	11.7	(1.0)

Note: Drinking Level values are row percentages. Drinking levels are based on quantity and frequency data during the past 30 days for the respondents' primary beverage. Abstainers drink once a year or less. Those in the Infrequent-Light category drink 1-4 drinks 1-3 times/month. Those in the Moderate category drink (a) 1 drink at least once/week, (b) 2-4 drinks 2-3 times/month, or (c) ≥5 drinks once/month or less. Those in the Moderate-Heavy category drink 2-4 drinks at least once/week, or ≥5 drinks 2-3 times/month. Those in the Heavy category drink ≥5 drinks at least once/week.

Table D.10. Drinking Levels by Sociodemographic Characteristics - Air Force

Sociodemographic Characteristic	Drinking Level									
	Abstainer		Infrequent/ Light		Moderate		Moderate/ Heavy		Heavy	
Sex										
Male	18.5	(1.0)	19.2	(0.8)	33.1	(1.1)	22.4	(1.4)	6.7	(0.5)
Female	18.4	(1.7)	26.0	(2.3)	37.8	(2.3)	16.2	(2.4)	1.5	(0.5)
Race/Ethnicity										
White	17.0	(0.8)	20.2	(1.0)	33.6	(0.8)	22.4	(1.4)	6.9	(0.6)
Black	24.7	(1.5)	17.5	(1.6)	35.2	(2.7)	19.1	(1.8)	3.6	(0.8)
Hispanic	15.9	(3.1)	23.7	(3.7)	34.0	(3.5)	23.4	(4.0)	3.1	(1.3)
Other	30.6	(4.2)	20.0	(4.7)	29.5	(3.1)	14.6	(4.0)	5.3	(1.9)
Education										
< High school	20.3	(18.0)	**	(**)	2.5	(2.8)	73.3	(20.6)	3.8	(4.3)
High school grad	18.7	(1.6)	18.4	(1.2)	31.0	(1.4)	22.6	(1.8)	9.2	(1.0)
Some college	19.4	(1.2)	20.4	(0.8)	33.0	(0.6)	21.3	(1.6)	6.0	(0.4)
College grad	16.2	(1.2)	21.4	(2.1)	38.7	(2.0)	20.9	(2.1)	2.8	(0.7)
Age										
17-20	22.4	(2.7)	18.0	(3.3)	28.3	(3.1)	21.5	(3.7)	9.7	(3.4)
21-25	14.1	(1.4)	17.6	(2.5)	35.9	(2.0)	24.8	(3.2)	7.6	(1.0)
26-30	18.9	(1.2)	20.4	(1.2)	32.6	(1.8)	22.4	(1.4)	5.7	(1.0)
31-35	21.2	(1.5)	23.2	(2.1)	32.3	(2.3)	19.4	(1.4)	3.8	(0.7)
36 or older	20.2	(0.9)	21.5	(1.3)	35.2	(1.5)	18.4	(0.8)	4.6	(1.0)
Family Status										
Not Married	13.5	(1.7)	16.9	(1.6)	34.1	(1.3)	26.1	(3.2)	9.4	(1.2)
Married, spouse not present	13.4	(3.0)	23.4	(5.4)	38.6	(4.3)	20.0	(4.2)	4.6	(2.3)
Married, spouse present	21.1	(1.1)	21.4	(0.6)	33.3	(1.1)	19.6	(1.0)	4.6	(0.7)
Pay Grade										
E1-E3	18.0	(1.5)	20.1	(2.3)	29.7	(1.7)	23.7	(3.6)	8.6	(1.9)
E4-E6	19.7	(1.0)	19.6	(0.9)	32.4	(0.9)	21.5	(1.4)	6.9	(0.8)
E7-E9	20.6	(1.3)	20.9	(1.1)	34.3	(1.6)	19.1	(0.5)	5.1	(0.7)
O1-O3	14.2	(1.8)	18.1	(3.3)	42.1	(2.6)	23.7	(2.9)	1.8	(0.7)
O4-O10	15.6	(1.6)	24.8	(2.3)	39.3	(2.4)	18.3	(1.4)	2.1	(0.8)
Time on Active Duty										
1 year or less	15.3	(4.6)	12.5	(4.3)	46.3	(5.3)	20.1	(5.3)	5.8	(2.0)
>1-2 years	21.6	(2.3)	18.0	(2.0)	24.8	(2.7)	27.8	(4.0)	7.8	(2.6)
2-3 years	14.2	(1.8)	25.2	(3.7)	31.8	(3.2)	21.3	(3.6)	7.5	(1.6)
3-4 years	13.8	(3.1)	13.2	(4.3)	36.9	(6.2)	26.2	(5.5)	9.9	(1.8)
>4-9 years	17.5	(0.9)	20.1	(1.0)	33.9	(1.1)	22.4	(1.3)	6.2	(1.4)
>9 years	20.7	(0.8)	21.4	(0.8)	34.1	(0.9)	19.1	(0.6)	4.7	(0.8)
Region										
Americas	19.2	(1.0)	20.6	(0.9)	32.9	(1.1)	21.2	(1.5)	6.0	(0.6)
North Pacific	17.4	(0.5)	23.4	(3.0)	32.0	(0.5)	19.2	(2.7)	8.0	(0.2)
Other Pacific	17.5	(4.6)	15.9	(1.6)	34.8	(1.3)	21.9	(5.0)	9.9	(2.5)
Europe	15.5	(1.6)	16.9	(1.9)	37.7	(0.6)	24.9	(4.1)	5.0	(1.2)
Total Air Force	18.5	(0.8)	20.0	(0.8)	33.7	(0.8)	21.7	(1.3)	6.1	(0.5)

Note: Drinking Level values are row percentages. Drinking levels are based on quantity and frequency data during the past 30 days for the respondents' primary beverage. Abstainers drink once a year or less. Those in the Infrequent-Light category drink 1-4 drinks 1-3 times/month. Those in the Moderate category drink (a) 1 drink at least once/week, (b) 2-4 drinks 2-3 times/month, or (c) ≥5 drinks once/month or less. Those in the Moderate-Heavy category drink 2-4 drinks at least once/week, or ≥5 drinks 2-3 times/month. Those in the Heavy category drink ≥5 drinks at least once/week.

**Estimate rounds to zero.

Table D.11. Nonmedical Drug Use During the Past 30 Days and the Past 12 Months - E1-E5s

Drug/Period of Use	Service									
	Army		Navy		Marine Corps		Air Force		Total DoD	
Marijuana										
Past 30 Days	7.1	(0.8)	5.4	(0.7)	2.0	(0.7)	0.7	(0.3)	4.2	(0.4)
Past 12 Months	14.6	(1.4)	12.3	(2.0)	6.5	(1.3)	2.6	(0.7)	9.5	(0.9)
Cocaine										
Past 30 Days	2.4	(0.5)	1.3	(0.4)	1.5	(0.7)	0.3	(0.2)	1.3	(0.2)
Past 12 Months	4.8	(0.7)	6.5	(1.8)	2.8	(1.3)	0.7	(0.3)	3.8	(0.7)
PCP										
Past 30 Days	0.3	(0.1)	0.1	(0.1)	0.2	(0.1)	**	(**)	0.1	(**)
Past 12 Months	0.4	(0.1)	0.2	(0.1)	0.2	(0.1)	**	(**)	0.2	(0.1)
LSD/Hallucinogens										
Past 30 Days	1.0	(0.2)	0.9	(0.4)	0.4	(0.2)	**	(**)	0.6	(0.1)
Past 12 Months	2.9	(0.8)	3.8	(1.3)	0.9	(0.3)	0.1	(**)	2.1	(0.5)
Amphetamines/Stimulants										
Past 30 Days	1.8	(0.3)	1.5	(0.3)	1.7	(0.4)	0.2	(0.1)	1.2	(0.2)
Past 12 Months	2.8	(0.5)	3.9	(1.4)	3.1	(0.5)	0.8	(0.3)	2.5	(0.5)
Tranquilizers										
Past 30 Days	0.7	(0.2)	0.5	(0.3)	0.4	(0.3)	0.5	(0.2)	0.6	(0.1)
Past 12 Months	1.1	(0.2)	1.2	(0.4)	0.7	(0.3)	0.7	(0.3)	0.9	(0.2)
Barbiturates/Sedatives										
Past 30 Days	0.7	(0.2)	0.7	(0.3)	0.1	(0.1)	0.1	(0.1)	0.5	(0.1)
Past 12 Months	1.4	(0.5)	1.0	(0.4)	0.5	(0.3)	0.2	(0.1)	0.8	(0.2)
Heroin/Other Opiates										
Past 30 Days	0.4	(0.2)	0.1	(0.1)	0.1	(0.1)	0.2	(**)	0.2	(0.1)
Past 12 Months	0.5	(0.2)	0.6	(0.4)	0.1	(0.1)	**	(**)	0.4	(0.1)
Analgesics										
Past 30 Days	1.1	(0.3)	1.6	(0.6)	1.1	(0.5)	1.5	(0.3)	1.4	(0.2)
Past 12 Months	2.3	(0.5)	2.5	(0.7)	2.2	(0.2)	2.2	(0.4)	2.3	(0.3)
Inhalants										
Past 30 Days	1.1	(0.3)	1.3	(0.4)	0.8	(0.3)	0.5	(0.1)	0.9	(0.1)
Past 12 Months	1.9	(0.5)	1.9	(0.3)	1.0	(0.3)	0.6	(0.2)	1.4	(0.2)
"Designer" Drugs										
Past 30 Days	1.1	(0.3)	1.3	(0.4)	0.8	(0.3)	0.5	(0.1)	0.9	(0.1)
Past 12 Months	1.9	(0.5)	1.9	(0.3)	1.0	(0.3)	0.6	(0.2)	1.4	(0.2)
Any Drug[a]										
Past 30 Days	10.5	(0.9)	8.0	(1.1)	5.4	(1.0)	2.8	(0.6)	7.0	(0.5)
Past 12 Months	18.1	(1.4)	17.0	(2.6)	10.7	(1.3)	5.1	(1.0)	13.1	(1.2)
Any Drug Except Marijuana[b]										
Past 30 Days	5.6	(0.6)	4.8	(0.7)	4.7	(0.5)	2.4	(0.4)	4.3	(0.3)
Past 12 Months	10.2	(1.1)	12.1	(2.3)	7.8	(1.4)	3.9	(0.7)	8.6	(1.0)

Note: Tables values are percentages and represent prevalence estimates with standard errors in parentheses.

**Estimate rounds to zero.

[a]Nonmedical use one or more times of any drug or class of drugs listed above in the table.

[b]Nonmedical use one or more times of any drug or class of drugs listed above in the table excluding marijuana.

Table D.12. Marijuana Use During Past 30 Days and Past 12 Months

Pay Grade/Period of Use	Service				
	Army	Navy	Marine Corps	Air Force	Total DoD
E1-E3					
Past 30 Days	11.9 (2.3)	7.8 (0.7)	1.4 (0.7)	0.5 (0.3)	5.6 (0.8)
Past 12 Months	24.9 (3.1)	18.1 (3.1)	5.3 (0.9)	2.8 (0.8)	13.2 (1.5)
E4-E6					
Past 30 Days	4.3 (0.6)	3.3 (0.7)	2.2 (1.5)	0.8 (0.3)	2.8 (0.3)
Past 12 Months	8.5 (1.0)	7.4 (1.3)	6.5 (2.1)	2.1 (0.8)	6.2 (0.6)
E7-E9					
Past 30 Days	0.2 (0.1)	0.3 (0.2)	0.3 (0.3)	0.1 (0.1)	0.2 (0.1)
Past 12 Months	0.6 (0.1)	0.5 (0.2)	0.5 (0.4)	0.4 (0.2)	0.5 (0.1)
W1-W4					
Past 30 Days	0.4 (0.4)	** (**)	** (**)	* (*)	0.3 (0.3)
Past 12 Months	0.5 (0.4)	** (**)	** (**)	* (*)	0.4 (0.3)
01-03					
Past 30 Days	0.3 (0.2)	** (**)	** (**)	** (**)	0.1 (0.1)
Past 12 Months	0.0 (0.4)	0.0 (0.0)	** (**)	** (**)	0.4 (0.2)
04-010					
Past 30 Days	** (**)	0.3 (0.3)	** (**)	** (**)	0.1 (0.1)
Past 12 Months	** (**)	0.3 (0.3)	** (**)	** (**)	0.1 (0.1)
Total					
Past 30 Days	4.4 (0.5)	3.5 (0.5)	1.4 (0.5)	0.5 (0.2)	2.7 (0.3)
Past 12 Months	8.9 (1.0)	7.9 (1.0)	4.7 (0.9)	1.7 (0.5)	6.1 (0.6)

Note: Tabled values are percentages and represent prevalence estimates with standard errors in parentheses.

*There are no warrant officers in the Air Force.

**Estimates round to zero.

Table D.13. Cocaine Use During Past 30 Days and Past 12 Months

Pay Grade/Period of Use	Service				
	Army	Navy	Marine Corps	Air Force	Total DoD
E1-E3					
Past 30 Days	4.5 (1.3)	1.8 (0.9)	1.4(1.0)	0.3 (0.3)	2.0 (0.5)
Past 12 Months	7.9 (1.6)	10.2 (2.4)	2.9(1.6)	0.6 (0.3)	5.5 (1.2)
E4-E6					
Past 30 Days	1.3 (0.2)	0.8 (0.3)	1.4(0.5)	0.2 (0.1)	0.9 (0.1)
Past 12 Months	2.9 (0.5)	3.6 (1.1)	2.1(0.8)	0.7 (0.3)	2.5 (0.4)
E7-E9					
Past 30 Days	0.1 (0.1)	0.1 (0.1)	** (**)	** (**)	0.1 (**)
Past 12 Months	0.3 (0.1)	0.2 (0.1)	0.5(0.4)	0.1 (0.1)	0.2 (0.1)
W1-W4					
Past 30 Days	** (**)	** (**)	** (**)	* (*)	** (**)
Past 12 Months	0.1 (0.1)	0.3 (0.3)	** (**)	* (*)	0.1 (0.1)
01-03					
Past 30 Days	** (**)	** (**)	** (**)	** (**)	** (**)
Past 12 Months	0.1 (0.2)	0.6 (0.6)	** (**)	** (**)	0.2 (0.1)
04-010					
Past 30 Days	** (**)	0.3 (0.3)	** (**)	** (**)	0.1 (0.1)
Past 12 Months	** (**)	0.3 (0.3)	** (**)	** (**)	0.1 (0.1)
Total					
Past 30 Days	1.5 (0.3)	0.9 (0.2)	1.1(0.5)	0.2 (0.1)	0.9 (0.1)
Past 12 Months	3.0 (0.4)	4.2 (1.4)	2.0(0.8)	0.5 (0.2)	2.5 (0.5)

Note: Tabled values are percentages and represent prevalence estimates with standard errors in parentheses.

*There are no warrant officers in the Air Force.

**Estimate rounds to zero.

Table D.14. Any Drug Use During Past 12 Months by Sociodemographic Characteristics

Sociodemographic Characteristic	Service								Total DoD	
	Army		Navy		Marine Corps		Air Force			
Sex										
Male	12.1	(1.1)	11.5	(2.4)	8.0	(1.0)	3.4	(0.8)	9.0	(0.9)
Female	9.5	(1.8)	10.3	(1.7)	5.4	(2.4)	6.2	(1.8)	8.4	(1.0)
Race/Ethnicity										
White	12.3	(1.4)	12.1	(2.7)	8.5	(1.5)	4.0	(0.7)	9.2	(1.1)
Black	10.4	(1.4)	7.7	(1.1)	6.0	(1.6)	2.8	(0.9)	7.8	(0.8)
Hispanic	11.1	(2.2)	14.4	(2.2)	6.6	(2.3)	3.1	(0.9)	9.5	(1.2)
Other	16.2	(2.4)	4.4	(2.6)	5.5	(4.9)	3.1	(2.2)	8.1	(1.6)
Education										
Less than high school graduate	12.8	(6.9)	17.9	(8.9)	9.2	(6.2)	**	(**)	13.3	(4.1)
High school graduate or GED	15.6	(1.4)	15.9	(3.1)	9.2	(1.1)	5.1	(1.1)	12.9	(1.3)
Some college	10.7	(1.4)	8.9	(1.6)	8.0	(1.6)	4.0	(0.7)	7.5	(0.7)
College graduate or higher	4.6	(0.8)	3.3	(1.4)	1.0	(0.7)	1.6	(0.4)	3.0	(0.5)
Age										
17-20	21.3	(2.2)	21.5	(3.3)	9.5	(2.4)	3.2	(1.5)	15.8	(1.9)
21-25	18.4	(1.9)	16.1	(2.9)	13.7	(1.9)	6.3	(1.5)	13.7	(1.3)
26-30	10.1	(1.2)	10.3	(2.2)	3.9	(1.3)	3.8	(0.8)	7.7	(0.8)
31-35	4.9	(1.1)	3.4	(0.8)	1.5	(0.7)	2.4	(0.5)	3.5	(0.5)
36 & older	2.9	(0.4)	1.4	(0.5)	0.5	(0.2)	1.5	(0.3)	1.9	(0.2)
Family Status										
Not married	19.8	(2.0)	17.4	(2.6)	9.6	(1.3)	6.6	(1.2)	14.7	(1.3)
Married, spouse not present at duty station	10.9	(1.6)	15.1	(3.7)	22.1	(9.4)	1.6	(0.8)	12.4	(2.2)
Married, spouse present at duty station	6.5	(0.9)	4.7	(1.1)	3.6	(1.0)	2.5	(0.5)	4.4	(0.4)
Pay Grade										
E1-E3	28.4	(2.9)	24.0	(3.6)	10.5	(1.4)	6.2	(1.4)	17.7	(1.8)
E4-E6	11.8	(1.2)	10.9	(1.6)	8.9	(1.4)	4.2	(1.0)	9.1	(0.7)
E7-E9	2.2	(0.5)	1.6	(0.3)	0.9	(0.6)	1.6	(0.3)	1.8	(0.2)
W1-W4	1.5	(0.6)	0.8	(0.5)	2.5	(2.3)	*	(*)	1.5	(0.5)
01-03	4.2	(0.8)	1.6	(1.3)	0.4	(0.4)	0.7	(0.3)	2.0	(0.4)
04-010	1.2	(0.4)	1.3	(0.7)	0.7	(0.6)	1.4	(0.5)	1.2	(0.3)
Time on Active Duty										
1 year or less	20.8	(2.7)	17.4	(3.1)	11.5	(2.6)	3.7	(2.3)	15.0	(1.7)
>1 to 2 years	16.5	(2.1)	21.9	(5.5)	8.8	(1.8)	6.1	(1.7)	14.2	(2.3)
>2 to 3 years	26.6	(4.0)	17.5	(4.3)	10.3	(5.2)	7.2	(2.4)	16.7	(2.1)
>3 to 4 years	13.8	(3.1)	18.1	(4.7)	8.7	(1.4)	6.2	(3.7)	12.7	(2.5)
>4 to 9 years	10.7	(1.4)	9.7	(1.9)	11.3	(1.8)	3.2	(0.8)	8.2	(0.8)
10 years or more	3.9	(0.5)	2.9	(0.6)	0.6	(0.2)	2.3	(0.3)	2.9	(0.3)
Region										
Americas	11.2	(1.5)	12.5	(2.3)	7.7	(1.3)	3.7	(0.8)	9.0	(1.1)
North Pacific	6.7	(0.3)	2.9	(0.7)	7.9	(0.7)	4.2	(0.4)	5.6	(0.3)
Other Pacific	13.9	(2.5)	7.5	(1.1)	8.7	(3.9)	2.5	(0.3)	7.9	(1.1)
Europe	13.3	(1.7)	6.0	(1.1)	6.7	(1.6)	3.9	(0.1)	9.9	(1.1)
Total	11.8	(1.1)	11.3	(2.1)	7.8	(1.0)	3.8	(0.6)	8.9	(0.8)

Note: Entries are percentages with standard errors in parentheses.

*There are no warrant officers in the Air Force.

**Estimate rounds to zero.

Table D.15. Any Drug Use During the Past 30 Days and Past 12 Months by Enlisted Pay Grade

Pay Grade/ Time Period	Service								Total DoD	
	Army		Navy		Marine Corps		Air Force			
E1										
Past 30 days	17.0	(8.4)	17.0	(7.2)	**	(**)	**	(**)	15.4	(5.3)
Past 12 months	35.6	(6.5)	36.0	(12.4)	--	(--)	4.3	(4.4)	34.6	(5.7)
E2										
Past 30 days	10.7	(2.8)	10.0	(1.4)	8.3	(2.6)	**	(**)	7.1	(1.0)
Past 12 months	28.6	(3.4)	23.3	(5.1)	14.2	(2.1)	3.3	(2.1)	17.9	(2.5)
E3										
Past 30 days	17.6	(3.0)	9.0	(1.0)	6.3	(1.0)	4.2	(1.3)	9.1	(1.0)
Past 12 months	27.3	(3.6)	23.4	(3.8)	9.6	(1.3)	7.2	(1.6)	16.6	(2.0)
E4										
Past 30 days	10.5	(1.2)	8.9	(2.7)	5.4	(3.0)	3.8	(1.5)	7.8	(1.0)
Past 12 months	17.9	(2.1)	14.8	(1.8)	15.4	(3.3)	5.9	(2.0)	13.5	(1.2)
E5										
Past 30 days	4.9	(0.8)	4.9	(0.8)	1.7	(1.0)	1.4	(0.5)	3.5	(0.4)
Past 12 months	7.9	(1.1)	11.9	(2.7)	3.5	(1.2)	3.3	(0.7)	7.3	(1.1)
E6										
Past 30 days	3.8	(0.8)	2.3	(0.7)	0.9	(1.0)	1.9	(0.5)	2.7	(0.4)
Past 12 months	6.2	(1.1)	4.4	(0.9)	1.0	(1.0)	3.0	(0.7)	4.5	(0.5)
E7										
Past 30 days	1.3	(0.4)	1.5	(0.5)	0.5	(0.6)	1.1	(0.2)	1.2	(0.2)
Past 12 months	2.3	(0.5)	2.0	(0.5)	0.9	(0.6)	1.9	(0.4)	2.0	(0.3)
E8										
Past 30 days	1.7	(0.7)	1.2	(0.6)	1.0	(0.9)	0.5	(0.4)	1.2	(0.3)
Past 12 months	1.8	(0.7)	1.2	(0.6)	1.2	(0.8)	0.9	(0.7)	1.4	(0.4)
E9										
Past 30 days	0.9	(0.9)	**	(**)	**	(**)	**	(**)	0.2	(0.2)
Past 12 months	2.0	(1.3)	**	(**)	**	(**)	1.3	(0.8)	0.9	(0.4)
Total										
Past 30 days	8.1	(0.7)	8.2	(0.8)	4.5	(0.8)	2.4	(0.5)	5.6	(0.4)
Past 12 months	13.8	(1.2)	12.9	(2.3)	8.8	(1.0)	4.4	(0.7)	10.4	(0.9)

Note: Entries are percentages with standard errors in parentheses.

**Estimate rounds to zero.

--Unreliable estimate due to small sample size.

Table D.16. Any Drug Use During the Past 30 Days by Region and Pay Grade

Region/Pay Grade	Service				
	Army	Navy	Marine Corps	Air Force	Total DoD
Americas					
E1-E3	12.0 (3.0)	10.5 (0.8)	7.0 (1.0)	2.9 (1.2)	7.8 (0.8)
E4-E6	8.5 (1.0)	6.3 (1.3)	3.9 (1.3)	2.7 (0.8)	5.6 (0.6)
E7-E9	1.2 (0.4)	1.4 (0.3)	0.6 (0.5)	0.8 (0.2)	1.1 (0.2)
W1-W4	1.1 (0.8)	0.2 (0.3)	3.1 (3.0)	* (*)	1.2 (0.6)
01-03	2.8 (1.1)	0.2 (0.2)	** (**)	0.3 (0.3)	1.0 (0.4)
04-010	1.1 (0.5)	1.5 (0.8)	0.6 (0.7)	1.0 (0.6)	1.4 (0.4)
Total	6.5 (0.8)	5.9 (0.8)	4.3 (0.9)	2.1 (0.5)	4.8 (0.4)
North Pacific					
E1-E3	3.2 (3.3)	** (**)	5.2 (1.7)	1.5 (1.8)	3.1 (1.2)
E4-E6	4.2 (2.9)	0.8 (0.1)	1.5 (1.7)	2.2 (0.3)	2.7 (1.2)
E7-E9	0.9 (1.0)	** (**)	0.6 (0.5)	0.5 (0.5)	0.6 (0.4)
W1-W4	4.5 (5.5)	3.4 (2.3)	** (**)	* (*)	3.5 (3.9)
01-03	1.5 (1.8)	** (**)	** (**)	1.5 (1.6)	0.9 (0.7)
04-010	0.7 (1.0)	3.9 (0.8)	2.8 (0.6)	** (**)	1.4 (0.4)
Total	3.4 (1.5)	0.7 (**)	3.0 (0.3)	1.8 (0.4)	2.4 (0.6)
Other Pacific					
E1-E3	5.1 (2.1)	11.9 (3.9)	3.2 (0.2)	** (**)	5.3 (1.7)
E4-E6	10.5 (2.8)	5.0 (0.4)	1.2 (0.3)	1.8 (0.6)	5.2 (1.0)
E7-E9	1.2 (0.4)	0.9 (0.1)	0.7 (0.4)	2.1 (1.1)	1.2 (0.3)
W1-W4	** (**)	** (**)	** (**)	* (*)	** (**)
01-03	4.8 (2.7)	** (**)	** (**)	1.3 (1.6)	1.5 (1.1)
04-010	0.2 (0.4)	** (**)	** (**)	3.0 (0.3)	1.0 (0.2)
Total	7.5 (1.6)	4.8 (0.4)	2.0 (0.1)	1.5 (0.1)	4.3 (0.5)
Europe					
E1-E3	21.8 (4.7)	1.5 (1.0)	8.9 (**)	5.7 (1.0)	15.6 (3.3)
E4-E6	5.1 (1.0)	2.6 (0.2)	** (**)	1.6 (1.0)	3.8 (0.6)
E7-E9	1.8 (0.9)	** (**)	** (**)	1.0 (**)	1.3 (0.5)
W1-W4	1.0 (0.7)	** (**)	** (**)	* (*)	0.9 (0.7)
01-03	0.7 (0.7)	7.8 (7.2)	** (**)	4.5 (0.9)	2.7 (1.2)
04-010	** (**)	** (**)	** (**)	2.3 (0.3)	0.7 (0.2)
Total	8.0 (1.3)	2.4 (0.4)	4.2 (1.0)	2.6 (0.2)	5.8 (0.9)
Total DoD					
E1-E3	16.0 (2.7)	9.7 (0.8)	6.5 (0.8)	3.2 (0.9)	8.9 (0.9)
E4-E6	7.1 (0.7)	5.7 (1.0)	3.4 (1.1)	2.4 (0.6)	5.1 (0.4)
E7-E9	1.3 (0.4)	1.2 (0.2)	0.6 (0.4)	0.8 (0.2)	1.1 (0.2)
W1-W4	1.3 (0.6)	0.3 (0.2)	2.5 (2.3)	* (*)	1.2 (0.5)
01-03	2.4 (0.8)	0.8 (0.6)	** (**)	0.7 (0.3)	1.2 (0.3)
04-010	0.9 (0.4)	1.3 (0.7)	0.7 (0.6)	1.2 (0.5)	1.3 (0.3)
Total	6.9 (0.7)	5.4 (0.7)	4.0 (0.7)	2.1 (0.4)	4.8 (0.3)

Note: Entries are percentages with standard errors in parentheses.

*There are no warrant officers in the Air Force.

**Estimate rounds to zero.

Table D.17. Any Drug Use During the Past 12 Months by Region and Pay Grade

Region/Pay Grade	Service									
	Army		Navy		Marine Corps		Air Force		Total DoD	
Americas										
E1-E3	26.4	(2.7)	26.0	(3.5)	9.6	(1.8)	6.1	(1.7)	17.0	(2.4)
E4-E6	13.1	(1.5)	12.0	(1.8)	10.0	(1.5)	4.6	(1.3)	9.9	(1.0)
E7-E9	2.2	(0.6)	1.8	(0.3)	0.9	(0.7)	1.8	(0.4)	1.8	(0.3)
W1-W4	1.3	(0.8)	0.6	(0.5)	3.1	(3.0)	*	(*)	1.4	(0.6)
O1-O3	4.8	(1.0)	0.4	(0.3)	**	(**)	0.3	(0.3)	1.6	(0.4)
O4-O10	1.4	(0.5)	1.5	(0.8)	0.6	(0.7)	1.0	(0.6)	1.5	(0.4)
Total	11.2	(1.5)	12.5	(2.3)	7.8	(1.3)	3.7	(0.8)	9.0	(1.1)
North Pacific										
E1-E3	9.5	(10.0)	5.5	(3.6)	14.0	(1.0)	6.2	(3.9)	9.8	(2.2)
E4-E6	7.8	(2.1)	2.3	(0.7)	3.1	(0.8)	4.6	(1.1)	5.2	(1.1)
E7-E9	2.1	(0.9)	**	(**)	1.2	(0.1)	1.0	(1.1)	1.3	(0.5)
W1-W4	6.6	(3.9)	3.4	(2.3)	**	(**)	*	(*)	5.1	(2.6)
O1-O3	3.1	(3.6)	**	(**)	3.6	(3.4)	1.5	(1.6)	2.2	(1.4)
O4-O10	0.7	(1.0)	5.9	(3.2)	2.6	(0.6)	**	(**)	1.7	(0.6)
Total	6.7	(0.3)	2.9	(0.7)	7.9	(0.7)	4.2	(0.4)	5.6	(0.3)
Other Pacific										
E1-E3	17.4	(3.2)	21.3	(6.1)	11.9	(2.2)	2.1	(2.0)	13.5	(2.5)
E4-E6	17.0	(3.8)	7.1	(0.1)	8.1	(5.6)	2.7	(0.6)	8.4	(1.4)
E7-E9	2.4	(0.8)	1.8	(0.2)	0.7	(0.4)	2.6	(1.5)	2.0	(0.4)
W1-W4	**	(**)	3.6	(2.5)	**	(**)	*	(*)	1.0	(0.9)
O1-O3	12.1	(6.7)	**	(**)	**	(**)	1.3	(1.6)	3.2	(2.6)
O4-O10	0.2	(0.4)	**	(**)	**	(**)	3.0	(0.3)	1.0	(0.2)
Total	13.9	(2.5)	7.5	(1.1)	8.7	(3.9)	2.5	(0.3)	7.9	(1.1)
Europe										
E1-E3	32.4	(5.7)	4.6	(3.1)	14.2	(**)	7.8	(2.4)	23.2	(4.0)
E4-E6	10.0	(2.2)	6.9	(1.0)	**	(**)	2.9	(1.2)	7.8	(1.3)
E7-E9	2.2	(0.9)	**	(**)	**	(**)	1.0	(**)	1.5	(0.5)
W1-W4	1.0	(0.7)	**	(**)	**	(**)	*	(*)	0.9	(0.7)
O1-O3	1.4	(0.9)	15.6	(14.5)	**	(**)	4.5	(0.9)	4.3	(2.3)
O4-O10	0.3	(0.3)	**	(**)	**	(**)	4.0	(1.7)	1.4	(0.5)
Total	13.3	(1.7)	6.0	(1.1)	6.7	(1.6)	3.9	(0.1)	9.9	(1.1)
Total DoD										
E1-E3	28.4	(2.9)	24.0	(3.6)	10.5	(1.4)	6.2	(1.4)	17.7	(1.8)
E4-E6	11.8	(1.2)	10.9	(1.6)	8.9	(1.4)	4.2	(1.0)	9.1	(0.7)
E7-E9	2.2	(0.5)	1.6	(0.3)	0.9	(0.6)	1.6	(0.3)	1.8	(0.2)
W1-W4	1.5	(0.6)	0.8	(0.5)	2.5	(2.3)	*	(*)	1.5	(0.5)
O1-O3	4.2	(0.8)	1.6	(1.3)	0.4	(0.4)	0.7	(0.3)	2.0	(0.4)
O4-O10	1.2	(0.4)	1.3	(0.7)	0.7	(0.6)	1.4	(0.5)	1.4	(0.3)
Total	11.8	(1.1)	11.3	(2.1)	7.8	(1.0)	3.8	(0.6)	8.9	(0.8)

Note: Entries are percentages with standard errors in parentheses.
*There are no warrant officers in the Air Force.
**Estimate rounds to zero.

Table D.18. Drug Use During the Past 12 Months for Males

Drug	Age 18 - 25		Age 26 - 34		Age 35 or Older		Total DoD	
Marijuana	11.2	(1.1)	3.8	(Ø.5)	Ø.5	(Ø.1)	6.3	(Ø.7)
Cocaine	4.6	(1.1)	1.6	(Ø.3)	Ø.2	(Ø.1)	2.6	(Ø.5)
Amphetamines	2.7	(Ø.7)	1.5	(Ø.3)	Ø.3	(Ø.1)	1.7	(Ø.4)
LSD/Hallucinogens	2.8	(Ø.7)	Ø.6	(Ø.2)	Ø.1	(**)	1.4	(Ø.4)
Tranquilizers	Ø.9	(Ø.2)	Ø.8	(Ø.2)	Ø.2	(Ø.1)	Ø.7	(Ø.1)
Heroin/Other Opiates	Ø.4	(Ø.2)	Ø.1	(Ø.1)	Ø.1	(**)	Ø.2	(Ø.1)
Any Drug Use	15.Ø	(1.4)	5.9	(Ø.6)	1.8	(Ø.2)	9.Ø	(Ø.9)

Note: Entries are percentages with standard errors in parentheses.
**Estimate rounds to zero.

Table D.19. Prevalence of Cigarette Use, Past 30 Days

Pay Grade/Frequency of Use	Service									
	Army		Navy		Marine Corps		Air Force		Total DoD	
E1-E3										
Didn't smoke	55.0	(3.1)	44.7	(3.8)	52.6	(2.8)	61.6	(3.2)	53.7	(2.0)
1/2 pack or less/day	26.6	(3.0)	34.5	(3.9)	32.3	(4.8)	19.6	(2.5)	27.6	(2.0)
About 1 pack/day	12.6	(1.8)	10.7	(2.5)	11.3	(3.6)	14.3	(1.8)	12.4	(1.3)
About 1-1/2 packs/day	3.4	(0.9)	6.3	(1.3)	1.7	(0.8)	3.0	(0.7)	3.8	(0.6)
About 2 packs/day or more	2.4	(0.6)	3.7	(1.0)	2.1	(0.5)	1.5	(0.7)	2.4	(0.5)
E4-E6										
Didn't smoke	51.6	(1.3)	55.4	(1.4)	57.1	(1.4)	59.6	(1.6)	55.4	(0.8)
1/2 pack or less/day	23.9	(0.9)	18.0	(1.5)	19.4	(3.4)	14.0	(1.6)	19.0	(0.8)
About 1 pack/day	14.4	(1.1)	13.1	(1.0)	13.3	(2.4)	14.5	(1.0)	14.0	(0.6)
About 1-1/2 packs/day	6.7	(0.7)	8.1	(1.0)	5.0	(1.0)	7.1	(0.7)	7.1	(0.4)
About 2 packs/day or more	3.4	(0.3)	5.4	(0.9)	5.2	(2.2)	4.7	(0.7)	4.5	(0.4)
E7-E9										
Didn't smoke	47.2	(1.5)	51.5	(2.1)	55.5	(1.6)	58.9	(1.2)	52.3	(0.9)
1/2 pack or less/day	13.1	(0.9)	9.7	(1.2)	15.2	(2.5)	9.7	(0.8)	11.4	(0.6)
About 1 pack/day	16.0	(2.3)	12.2	(1.0)	11.7	(2.4)	12.0	(0.8)	13.5	(1.0)
About 1-1/2 packs/day	11.7	(1.2)	13.2	(0.8)	6.9	(2.3)	10.7	(0.6)	11.4	(0.6)
About 2 packs/day or more	12.0	(1.2)	13.4	(1.0)	10.6	(2.7)	8.7	(0.8)	11.3	(0.6)
W1-W4										
Didn't smoke	68.6	(2.7)	61.5	(3.6)	73.1	(4.0)	*	*	67.9	(2.2)
1/2 pack or less/day	7.9	(1.1)	5.7	(1.3)	8.3	(3.8)	*	*	7.6	(0.9)
About 1 pack/day	7.3	(2.4)	12.8	(1.9)	5.4	(2.8)	*	*	8.0	(2.0)
About 1-1/2 packs/day	6.7	(1.4)	7.3	(2.5)	5.2	(3.0)	*	*	6.7	(1.2)
About 2 packs/day or more	9.4	(1.8)	12.8	(3.0)	7.9	(1.7)	*	*	9.8	(1.4)
01-03										
Didn't smoke	82.0	(2.6)	79.2	(2.0)	87.2	(1.4)	82.3	(2.3)	81.8	(1.3)
1/2 pack or less/day	10.8	(2.4)	11.0	(1.6)	6.4	(2.6)	10.5	(1.1)	10.4	(1.0)
About 1 pack/day	5.6	(1.2)	7.2	(2.8)	0.4	(0.4)	4.2	(1.1)	5.1	(0.9)
About 1-1/2 packs/day	0.9	(0.5)	0.7	(0.5)	5.6	(2.7)	2.0	(1.0)	1.6	(0.5)
About 2 packs/day or more	0.7	(0.5)	2.0	(1.1)	0.4	(0.4)	1.0	(0.5)	1.1	(0.3)
04-010										
Didn't smoke	83.7	(1.2)	81.4	(1.8)	86.4	(2.1)	80.5	(2.1)	82.1	(1.0)
1/2 pack or less/day	4.1	(0.4)	5.4	(1.2)	4.8	(0.8)	6.7	(1.2)	5.4	(0.6)
About 1 pack/day	5.8	(1.3)	5.9	(0.9)	4.2	(1.3)	5.2	(1.4)	5.5	(0.7)
About 1-1/2 packs/day	4.1	(0.7)	4.2	(1.0)	1.7	(1.5)	4.7	(1.0)	4.2	(0.5)
About 2 packs/day or more	2.3	(0.6)	3.2	(0.9)	2.9	(0.7)	2.8	(0.9)	2.7	(0.4)
Total DoD										
Didn't smoke	56.9	(1.1)	56.2	(1.8)	58.7	(1.8)	64.2	(1.2)	59.1	(0.8)
1/2 pack or less/day	20.2	(1.1)	19.3	(2.3)	22.5	(3.3)	13.8	(0.9)	18.2	(0.9)
About 1 pack/day	12.8	(0.8)	11.7	(1.1)	10.9	(1.6)	12.3	(0.9)	12.2	(0.5)
About 1-1/2 packs/day	6.0	(0.4)	7.5	(0.8)	3.8	(0.9)	5.8	(0.3)	6.2	(0.2)
About 2 packs/day or more	4.1	(0.3)	5.5	(0.7)	4.0	(1.1)	3.9	(0.5)	4.4	(0.3)

Note: Estimates are percentages with standard errors in parentheses. Data for tobacco use other than cigarette smoking are not included.

*There are no warrant officers in the Air Force.

Table D.20. Cigarette Use, Past 30 Days by Sociodemographic Characteristics

Sociodemographic Characteristic	Service									
	Army		Navy		Marine Corps		Air Force		Total DoD	
Sex										
Male	43.6	(1.1)	43.8	(2.0)	41.6	(2.0)	35.6	(1.2)	41.1	(0.9)
Female	39.1	(3.5)	43.5	(3.0)	38.6	(7.5)	37.3	(2.3)	39.7	(1.7)
Race/Ethnicity										
White	43.9	(1.6)	45.1	(2.1)	42.8	(2.7)	38.8	(1.3)	41.8	(1.0)
Black	42.3	(1.9)	35.5	(2.1)	32.5	(2.8)	30.8	(2.3)	37.6	(1.2)
Hispanic	38.3	(2.7)	46.8	(6.9)	42.4	(6.1)	29.7	(3.5)	39.0	(2.2)
Other	46.5	(3.2)	39.6	(5.5)	49.4	(10.8)	45.9	(4.6)	44.2	(2.7)
Education										
Less than high school graduate	53.4	(8.0)	58.5	(8.0)	32.2	(19.1)	77.9	(18.9)	55.8	(5.8)
High school graduate or GED	49.8	(1.5)	51.1	(1.8)	46.8	(2.0)	43.3	(2.3)	48.6	(1.0)
Some college	46.8	(1.3)	44.8	(1.8)	40.5	(1.9)	38.7	(1.5)	42.7	(0.9)
College graduate or higher	19.9	(1.7)	20.9	(1.5)	19.0	(5.6)	20.4	(1.0)	20.3	(0.8)
Age										
17-20	37.3	(3.0)	51.8	(3.2)	49.7	(5.0)	38.0	(3.8)	43.3	(2.1)
21-25	46.9	(2.0)	43.5	(1.6)	41.2	(2.9)	37.4	(3.3)	42.5	(1.3)
26-30	44.2	(2.6)	40.1	(3.0)	37.8	(8.3)	35.4	(1.3)	39.8	(1.4)
31-35	43.7	(2.1)	42.9	(3.8)	36.6	(4.2)	36.2	(2.0)	40.7	(1.4)
36 or older	39.7	(2.4)	42.2	(2.2)	36.8	(5.7)	33.8	(1.3)	38.2	(1.2)
Family Status										
Not married	44.6	(1.5)	46.5	(2.8)	41.8	(1.8)	38.1	(2.1)	43.3	(1.2)
Married, spouse not present	44.9	(2.8)	49.1	(4.8)	46.1	(7.7)	36.7	(2.3)	45.3	(2.4)
Married, spouse present	41.8	(1.5)	40.2	(2.1)	40.0	(5.6)	34.7	(1.3)	38.8	(0.9)
Pay Grade										
E1-E3	45.0	(3.1)	55.3	(3.8)	47.6	(2.8)	38.4	(3.2)	46.3	(2.0)
E4-E6	48.4	(1.3)	44.5	(1.5)	42.9	(1.4)	40.4	(1.6)	44.5	(0.8)
E7-E9	52.8	(1.5)	48.5	(2.1)	44.6	(1.6)	41.1	(1.2)	47.7	(0.9)
W1-W4	31.4	(2.7)	38.5	(3.6)	26.9	(4.0)	*	(*)	32.1	(2.2)
01-03	18.0	(2.6)	20.8	(2.0)	12.8	(1.4)	17.7	(2.3)	18.2	(1.3)
04-010	16.3	(1.2)	18.6	(1.8)	13.6	(2.1)	19.5	(2.1)	17.9	(1.0)
Time on Active Duty										
1 year or less	35.0	(4.0)	49.0	(4.9)	39.8	(9.7)	33.7	(6.6)	39.1	(3.0)
>1 to 2 years	39.7	(2.7)	49.5	(7.3)	52.0	(6.4)	33.6	(2.1)	42.3	(2.4)
>2 to 3 years	49.1	(2.8)	44.7	(3.8)	40.4	(9.1)	40.2	(4.8)	44.4	(2.2)
>3 to 4 years	43.2	(4.2)	40.4	(3.9)	41.5	(3.0)	35.3	(4.4)	40.0	(2.1)
>4 to 9 years	43.9	(2.4)	40.9	(1.2)	35.4	(5.5)	34.0	(1.4)	39.4	(1.1)
10 years or more	43.9	(1.8)	43.8	(2.5)	39.8	(3.0)	37.2	(1.4)	41.3	(1.0)
Region										
Americas	40.4	(1.4)	44.0	(2.1)	41.8	(2.2)	35.7	(1.4)	40.2	(1.1)
North Pacific	42.7	(0.5)	40.4	(0.7)	41.7	(1.9)	35.6	(1.5)	39.7	(0.9)
Other Pacific	35.8	(4.3)	42.8	(3.4)	37.7	(1.0)	38.3	(2.1)	39.7	(1.8)
Europe	48.3	(1.9)	43.3	(3.6)	36.1	(0.5)	35.9	(3.9)	44.4	(1.6)
Total DoD	43.1	(1.1)	43.8	(1.8)	41.3	(1.8)	35.8	(1.2)	40.9	(0.8)

Note: Estimates are percentages with standard errors in parentheses.

*There are no warrant officers in the Air Force.

Table D.21. Performance on Last Physical Readiness Test

Test Performance	Service				
	Army	Navy	Marine Corps	Air Force	Total DoD
Satisfactory	95.0 (0.6)	92.3 (0.9)	98.4 (0.4)	94.1 (0.5)	94.3 (0.4)
Unsatisfactory	2.6 (0.4)	3.0 (0.3)	0.3 (0.2)	0.4 (0.1)	1.8 (0.2)
Exempt	2.4 (0.4)	4.7 (0.9)	1.3 (0.4)	5.4 (0.5)	3.8 (0.3)

Note: Entries are column percentages with standard errors in parentheses.

Table D.22. Exercise, Eating, and Sleeping Practices

Behavior	Service				
	Army	Navy	Marine Corps	Air Force	Total DoD
Exercise					
Run, cycle, walk 20 minutes or more	77.2 (2.0)	43.0 (2.4)	62.3 (3.4)	37.1 (1.1)	54.3 (1.4)
Do strenuous physical activity 20 minutes or more	49.7 (1.5)	33.2 (1.6)	43.5 (1.7)	31.6 (1.5)	39.2 (1.0)
Do mild physical activity (baseball, bowling)	36.5 (1.4)	23.7 (2.2)	33.0 (3.2)	26.7 (1.5)	29.7 (1.1)
Exercise to improve muscle strength (pushups, etc.)	72.3 (1.6)	45.8 (1.7)	57.1 (1.5)	35.5 (1.3)	52.5 (0.8)
Eating					
Eat at least two full meals/day	83.4 (0.8)	83.5 (1.5)	78.3 (2.5)	81.9 (0.8)	82.6 (0.6)
Eat breakfast	57.9 (1.3)	51.1 (1.6)	52.8 (4.1)	45.6 (0.8)	51.8 (0.8)
Eat between meals	64.1 (1.1)	58.8 (4.1)	65.5 (1.4)	68.6 (1.0)	63.5 (1.4)
Sleeping					
Get more than 6 consecutive hours of sleep/day	78.7 (0.9)	78.9 (1.9)	79.7 (3.0)	84.5 (1.0)	80.6 (0.8)

Note: Entries are percentages engaging in behavior 3-4 days/week or more often. Standard errors are in parentheses.

Table D.23. Actions Recommended by Doctor or Other Health Professionals

Action	Service				
	Army	Navy	Marine Corps	Air Force	Total DoD
Diet to lose weight	11.1 (Ø.6)	14.2 (Ø.9)	7.8 (1.7)	14.Ø (Ø.6)	12.6 (Ø.4)
Reduce salt or sodium in diet	16.2 (Ø.9)	14.1 (Ø.9)	1Ø.7 (2.5)	16.9 (Ø.7)	15.3 (Ø.5)
Exercise	18.6 (Ø.8)	24.2 (1.Ø)	13.4 (1.6)	25.5 (Ø.8)	21.8 (Ø.5)
Stop smoking	26.6 (Ø.9)	28.3 (1.2)	19.5 (2.9)	29.4 (Ø.7)	27.3 (Ø.6)
Take medication to control blood pressure	4.4 (Ø.5)	2.9 (Ø.4)	2.3 (Ø.6)	4.Ø (Ø.3)	3.7 (Ø.2)
Reduce use of alcohol	8.1 (Ø.5)	7.4 (Ø.4)	6.6 (1.7)	4.6 (Ø.4)	6.7 (Ø.3)

Note: Estimates are percentages of respondents advised to take action. Standard errors are in parentheses.

Table D.24. Average Number of Health Practices by Sociodemographic Characteristics

Sociodemographic Characteristic	Service				
	Army	Navy	Marine Corps	Air Force	Total DoD
Sex					
Male	4.00 (0.02)	3.76 (0.11)	3.90(0.08)	3.97 (0.03)	3.91 (0.04)
Female	3.92 (0.08)	3.74 (0.08)	4.17(0.22)	3.80 (0.07)	3.85 (0.04)
Race/Ethnicity					
White	3.98 (0.03)	3.74 (0.12)	3.89(0.09)	3.93 (0.03)	3.88 (0.05)
Black	3.94 (0.05)	3.93 (0.10)	4.11(0.09)	3.94 (0.08)	3.95 (0.03)
Hispanic	4.16 (0.09)	3.38 (0.17)	3.87(0.23)	4.18 (0.08)	3.92 (0.10)
Other	4.10 (0.07)	4.13 (0.19)	3.88(0.11)	4.00 (0.12)	4.07 (0.08)
Education					
Less than high school graduate	3.76 (0.36)	3.55 (0.25)	2.29(0.45)	2.99 (0.24)	3.43 (0.19)
High school graduate or GED	3.81 (0.03)	3.53 (0.08)	3.75(0.05)	3.76 (0.05)	3.71 (0.04)
Some college	4.01 (0.03)	3.76 (0.11)	4.01(0.11)	3.90 (0.04)	3.91 (0.04)
College graduate or higher	4.39 (0.03)	4.38 (0.10)	4.67(0.08)	4.28 (0.04)	4.36 (0.03)
Age					
17-20	3.95 (0.07)	3.64 (0.07)	3.84(0.13)	3.94 (0.11)	3.84 (0.05)
21-25	3.82 (0.06)	3.67 (0.13)	3.67(0.14)	3.97 (0.05)	3.80 (0.05)
26-30	4.07 (0.03)	3.81 (0.14)	4.15(0.11)	3.99 (0.04)	3.98 (0.04)
31-35	4.10 (0.03)	3.88 (0.14)	4.30(0.09)	3.89 (0.05)	3.99 (0.04)
36 & older	4.09 (0.03)	3.85 (0.06)	4.13(0.04)	3.92 (0.03)	3.97 (0.02)
Family Status					
Not married	3.82 (0.04)	3.58 (0.09)	3.81(0.09)	3.83 (0.06)	3.74 (0.05)
Married, spouse not present	3.99 (0.07)	3.80 (0.18)	3.36(0.12)	3.97 (0.15)	3.78 (0.09)
Married, spouse present at duty station	4.11 (0.03)	3.95 (0.06)	4.13(0.12)	4.00 (0.03)	4.04 (0.02)
Pay Grade					
E1-E3	3.79 (0.06)	3.44 (0.11)	3.75(0.05)	4.00 (0.08)	3.75 (0.06)
E4-E6	3.92 (0.04)	3.71 (0.09)	3.87(0.09)	3.83 (0.03)	3.83 (0.04)
E7-E9	3.94 (0.03)	3.70 (0.05)	3.91(0.09)	3.66 (0.04)	3.79 (0.02)
W1-W4	4.34 (0.08)	3.79 (0.11)	4.20(0.06)	* (*)	4.24 (0.07)
01-03	4.37 (0.07)	4.51 (0.11)	4.81(0.08)	4.33 (0.07)	4.42 (0.05)
04-010	4.50 (0.05)	4.44 (0.06)	4.48(0.04)	4.33 (0.06)	4.42 (0.03)
Time on Active Duty					
1 year or less	4.08 (0.12)	3.68 (0.11)	3.56(0.07)	4.14 (0.18)	3.94 (0.08)
>1 to 2 years	3.93 (0.05)	3.62 (0.15)	3.93(0.14)	4.10 (0.11)	3.89 (0.07)
>2 to 3 years	3.68 (0.08)	3.66 (0.12)	3.72(0.04)	3.96 (0.09)	3.75 (0.06)
>3 to 4 years	3.98 (0.10)	3.71 (0.28)	3.76(0.19)	3.86 (0.12)	3.83 (0.12)
>4 to 9 years	4.02 (0.05)	3.87 (0.09)	3.96(0.11)	3.99 (0.03)	3.96 (0.03)
10 years or more	4.06 (0.03)	3.76 (0.07)	4.16(0.03)	3.85 (0.04)	3.92 (0.03)
Region					
Americas	4.06 (0.03)	3.74 (0.12)	3.92(0.08)	3.96 (0.02)	3.92 (0.05)
North Pacific	4.18 (0.04)	3.75 (0.19)	3.97(0.08)	3.94 (0.09)	4.00 (0.05)
Other Pacific	3.96 (0.04)	3.87 (0.09)	4.01(0.07)	3.97 (0.01)	3.93 (0.04)
Europe	3.85 (0.04)	3.81 (0.14)	3.69(0.08)	3.86 (0.16)	3.84 (0.05)
Total DoD	3.99 (0.02)	3.76 (0.10)	3.92(0.06)	3.95 (0.03)	3.91 (0.04)

Note: Tabled values are mean scores with standard errors in parentheses. The Health Practices Index is calculated as a sum score of responses to six "healthy behaviors": moderate alcohol use or less, no drug use in the past 12 months, never smoked, exercise twice a week or more, eat two full meals at least 7 days a week, and sleep more than 6 consecutive hours a day at least 5 days a week. Scores can range from 0 to 6 with higher scores indicating that more health practices are being followed.

*There are no warrant officers in the Air Force.

Table D.25. Beliefs About Reliable Sources of Nutrition Information

Information Source	Service								Total DoD	
	Army		Navy		Marine Corps		Air Force			
Magazines	75.6	(Ø.7)	73.5	(1.5)	73.5	(2.3)	74.9	(1.2)	74.6	(Ø.6)
Newspapers	56.3	(1.Ø)	55.4	(Ø.6)	53.6	(2.Ø)	57.9	(1.3)	56.3	(Ø.6)
Books	87.3	(Ø.5)	87.9	(1.3)	88.1	(1.5)	89.1	(Ø.7)	88.1	(Ø.5)
Health Food Stores	75.9	(1.2)	72.4	(2.1)	81.1	(Ø.9)	71.8	(1.5)	74.1	(Ø.8)
Nurses	82.6	(Ø.8)	83.5	(Ø.6)	78.6	(2.Ø)	81.6	(Ø.7)	82.2	(Ø.4)
Doctors	89.3	(Ø.6)	9Ø.5	(Ø.6)	86.7	(2.4)	89.1	(Ø.5)	89.4	(Ø.4)
Dieticians	92.8	(Ø.4)	91.4	(Ø.7)	91.2	(1.3)	92.4	(Ø.5)	92.1	(Ø.3)
Library	82.2	(Ø.5)	83.7	(1.Ø)	84.Ø	(1.3)	85.6	(Ø.8)	83.8	(Ø.4)
Television	58.3	(1.2)	5Ø.8	(1.2)	52.Ø	(2.6)	56.4	(1.1)	55.1	(Ø.6)

Note: Entries are percentages indicating that source is reliable. Standard errors are in parentheses.

Table D.26. Levels of Stress and Coping Behaviors in Family Life

Functionality/Coping/Behavior	Levels of Stress		
	Higher	Lower	None
More Functional			
Think of plan to solve problem	93.1 (Ø.5)	93.6 (Ø.5)	87.5 (Ø.9)
Meditate/sit quietly	65.7 (1.2)	63.6 (1.Ø)	58.2 (2.1)
Talk to friend/family member	78.7 (Ø.8)	83.Ø (Ø.6)	76.3 (1.6)
Exercise or play sports	69.5 (1.Ø)	74.9 (Ø.9)	72.4 (1.2)
Read or work on hobby	58.9 (1.2)	64.9 (Ø.9)	6Ø.6 (1.4)
Watch TV/listen to music	89.8 (Ø.5)	9Ø.2 (Ø.6)	86.4 (1.Ø)
Seek professional help	7.7 (Ø.7)	4.3 (Ø.3)	4.4 (1.1)
Take prescribed medication	6.9 (Ø.7)	4.8 (Ø.3)	5.5 (Ø.6)
Less Functional			
Light up cigarette	37.4 (Ø.9)	3Ø.8 (Ø.8)	27.5 (1.4)
Have a drink	35.4 (1.4)	24.6 (Ø.8)	22.8 (1.6)
Get something to eat	63.6 (Ø.9)	6Ø.1 (Ø.8)	54.Ø (1.9)
Smoke marijuana or use illegal drugs	3.Ø (Ø.5)	2.5 (Ø.3)	3.1 (Ø.7)
Get headache or feel ill	35.1 (1.2)	22.Ø (Ø.6)	16.6 (1.1)
Take a nap	52.5 (1.3)	48.8 (1.1)	47.Ø (1.3)
Buy something new	33.4 (Ø.9)	27.4 (Ø.9)	28.8 (1.2)
Consider hurting or killing yourself	1Ø.2 (Ø.6)	2.8 (Ø.3)	3.8 (Ø.7)
Just think about things a lot	92.2 (Ø.7)	86.3 (Ø.6)	8Ø.Ø (1.7)

Note: Entries are percentages with standard errors in parentheses. Data are percentages of respondents reporting that they frequently or sometimes engage in this behavior when they feel pressured, stressed, depressed or anxious with their family life.

Appendix E

Calculation of Selected Measurement Indexes

Appendix E

Calculation of Selected Measurement Indexes

This appendix provides details about the construction of a variety of indexes that are used throughout this report. We first describe alcohol indexes and then drug indexes.

A. Alcohol Use Indexes

This section describes the construction of five alcohol indexes: drinking attitudes index, drinking climate index, drinking motivation index, beliefs about heavy drinking index, and the average daily ounces of ethanol index. The items comprising the first four indexes are presented in Table E.1.

1. Drinking Attitudes Index

The drinking attitudes index was constructed from the five attitude items noted in Table E.1 that described a unique dimension from a factor analysis of items listed in Q34 and Q44 in the questionnaire. Respondents answered these items along a 5-point scale anchored with strongly agree (scored 5) and strongly disagree (scored 1). Index scores were computed by summing item scores, after appropriate reverse scoring for items with phrasing opposite that of the index. Scores on the index can range from 5-25, and high scores indicate that the respondent's attitude is negative toward alcohol use.

2. Drinking Climate Index

The drinking climate index was constructed from the six items listed in Table E.1 and was also based on results of a factor analysis of items listed in Q34 and Q44 in the questionnaire. As with the items for the drinking attitudes index, items for the drinking climate index were also answered on a 5-point Likert-type scale anchored with strongly agree (5) and strongly disagree (1). The index score was computed by summing item responses for the six items after appropriate reverse scoring of negatively phrased items and can range from 6-30.

The index indicates beliefs about the climate that exists in the military toward alcohol use and toward getting help with an alcohol problem. High scores on the index indicate a favorable climate for using alcohol and for receiving help with an alcohol problem.

Table E.1. Drinking-Related Attitudinal Indexes

Index	Items Comprising Index
Drinking Attitudes Index (Range = 5-25)	
	• Drinking will interfere with my health or physical fitness. • Use of alcohol is against my religious beliefs. • The heavy drinking I see reduces the military readiness of my unit. • The number of happy hours at this installation makes drinking easy. • My spouse or person I date disapproves of my drinking (or would disapprove if I did drink)
Drinking Climate Index (Range = 6-30)	
	• Drinking is part of being in the military. • Persons who try to get treatment for alcohol problems will later experience surprise searches of themselves, their auto, or their quarters. • Persons who want treatment for alcohol problems have difficulty getting off duty to attend counseling sessions. • Drinking is just about the only recreation available at this installation. • There is no way to get help for a drinking problem without one's commander finding out. • At parties or social functions at this installation, everyone is encouraged to drink.
Drinking Motivation Index (Range = 1-4)	
	• To be friendly or social. • To forget my worries. • To relax. • To help cheer me up when I am in a bad mood. • To help me when I am depressed or nervous. • To help me when I am bored and have nothing to do. • To increase my self-confidence.
Beliefs about Heavy Drinking Index (Range = 6-42)	
	• After six or more drinks on a single occasion, I will be drunk. • After six or more drinks on a single occasion, I will act foolishly. • After six or more drinks on a single occasion, I will injure myself. • After six or more drinks on a single occasion, I will feel good. • After six or more drinks on a single occasion, I will have a good time. • After six or more drinks on a single occasion, I will remain in control.

3. Drinking Motivation Index

The Drinking Motivation Index was patterned after a similar index used by Polich and Orvis (1979) and was comprised of seven items shown in Table E.1 that assessed reasons for drinking. Respondents indicated how important these reasons were to their drinking along a four-point scale that ranged from not at all important (1) to very important (4). Item scores were averaged to yield the index score that retained the item range from 1 to 4. A high score on the index indicates that respondents thought these were important reasons to drink and were, thus, highly motivated to drink. The index was not completed for abstainers (persons who reported no alcohol use).

4. Beliefs about Heavy Drinking Index

The beliefs about heavy drinking index is comprised from six items shown in Table E.1. These items are based around beliefs respondents report about their expected behavior after drinking six or more drinks on a single occasion. Items were scored along a 7-point scale ranging from extremely unlikely that the behavior would occur to extremely likely that it would occur. The index ranged from 6 to 42 with high scores indicating beliefs that negative consequences would occur from heavy drinking.

5. Average Daily Ounces of Ethanol Index

The average daily ethanol consumption index used in this study combines measures of both the typical drinking pattern of an individual over the past 30 days and any episodes of heavier consumption during the past year. For all respondents, daily volume is computed separately for beer, wine, and hard liquor, using parallel procedures. The first step in these calculations is to determine the frequency of consuming each beverage during the past 30 days (Q.17, 20, and 23). Each frequency is computed in terms of the daily probability of consuming the given beverage. The response alternatives and corresponding frequency codes are listed in Table E.2.

The second step in computing daily volume resulting from typical drinking days is to determine the typical quantity (Qn) of each beverage drunk during the past 30 days on days when the given beverage was consumed (Q.19, 22, and 25). The codes used for the number of cans of beer, glasses of wine, and drinks of hard liquor are apparent for the smaller quantities.

Table E.2. Frequency Codes for Typical Drinking Days

Response Alternative[a]	Frequency Code (F)	Method of Calculation
28-30 days (about every day)	0.967	29/30
20-27 days (5-6 days a week, average)	0.786	5.5/7
11-19 days (3-4 days a week, average)	0.500	3.5/7
4-10 days (1-2 days a week, average)	0.214	1.5/7
2-3 days in the past 30 days	0.083	2.5/30
Once in the past 30 days	0.033	1/30
Didn't drink any wine in the past 30 days	0.000	0/30

[a]Frequency of consumption of given beverage during past 30 days.

For larger quantities, the value used is the mid-point of the indicated range; for example, 9-11 beers was coded as 10 cans. The codes used for the highest quantity are 22 beers, 15 glasses, and 22 drinks, for beer, wine, and hard liquor, respectively. The size of a glass of wine is specified as 4 ounces (standard wine glass). Two additional questionnaire items are employed to account for variations in the size of beer containers and strength of drinks containing hard liquor (Q.18, 24). The respondent indicated the size can or bottle of beer he/she usually drinks (Q.18), with alternatives of 8, 12, or 16 ounce containers, and the number of ounces of hard liquor in his average drink (Q.24), with alternatives of 1, 1.5, 2, 3, 4, and 5 or more (coded as 5) ounces.

Using the measures described in the preceding paragraph, typical quantity for beer and hard liquor was determined by multiplying (1) the number of cans or drinks typically consumed by (2) the number of ounces of the given beverage they contained. Since the standard 4-ounce size was used for wine glasses, the typical quantity for wine is simply 4 times the number of glasses consumed on a typical day when the respondent drank wine. Once typical quantity has been determined for each beverage, it is multiplied by the frequency code of drinking that beverage. The resulting product constitutes a measure of the average number of ounces of the given beverage consumed daily as a result of the individual's typical drinking behavior.

The final step in measuring typical volume was to transform the number of ounces of beer, wine, and liquor consumed daily to ounces of ethanol for each beverage. The transformations were made by weighting ounces of beer

by .04, wine by .12, and hard liquor by .43. These weights are determined by the standard alcohol content (by volume) of the three beverages. There was one exception to this weighting procedure. Since individuals consuming large quantities of wine on a regular basis often drink fortified wine, a question was included to measure the type of wine usually consumed by the respondent during the past 30 days (i.e., regular or fortified; see Q.21). If the respondent indicated fortified wine, the weight used for ethanol content was .18 (rather than .12); if wine coolers were usually consumed, ethanol content was set at .04.

The procedures described above measure daily ethanol volume resulting from the individual's typical drinking days. Most persons also experience atypical days on which larger quantities of alcohol are consumed. To the extent that the amounts consumed on those days are close to the individual's typical volume or that the number of atypical days is very small, the impact of such days on daily volume indices is minimal. However, as the quantity of alcohol consumed or the number of atypical days becomes large, these episodes of heavier drinking have a considerable impact on the individual's mean daily volume. Moreover, estimates of mean daily volume in the total population will be incomplete if they ignore the episodic consumption of such individuals. In light of the importance of accounting for the volume of alcohol consumed on atypical days, the frequency of consuming 8 or more cans, glasses, or drinks of beer, wine, or hard liquor in the last year (Q.31, 32, and 33) was measured. Because the intention was to measure episodic behavior, the frequency questions pertain to the past year (rather than the past 30 days, used to measure typical consumption). The quantity of ethanol consumed on such days was coded as 5 ounces (i.e., 10 cans, glasses, or drinks, each containing .5 ounces of ethanol). The response alternatives and corresponding frequency codes for these questions are listed in Table E.3. The sum of these three frequency codes (beer, wine, and hard liquor) constitute the measure of the "frequency of heavy drinking" (i.e., days of atypical high consumption).

The volumes resulting from typical and atypical consumption days were combined in a straightforward manner. For each beverage, the number of days during the past year on which the beverage was consumed was estimated by multiplying the likelihood of consuming it on a given day (F) by 365. This number was then partitioned into the number of days on which atypical high consumption occurred, D, according to the frequency codes in

Table E.3. Frequency Codes for Atypical High Consumption Days

Response Alternative[a]	Frequency Code (D)	Method of Calculation
About every day	338	6.5 x 52
5-6 days a week	286	5.5 x 52
3-4 days a week	182	3.5 x 52
1-2 days a week	78	1.5 x 52
2-3 days a month	30	2.5 x 12
About once a month	12	12
7-11 days in the past 12 months	9	9
3-6 days in the past 12 months	4.5	4.5
Once or twice in the past 12 months	1.5	1.5
Never in the past 12 months	0	0

[a]Frequency of atypical high consumption for given beverage during past year.

Table E.3, and the number of typical days, 365F minus the number of atypical days. If the respondent typically consumed 8 or more drinks of the given beverage--i.e., had a Qn greater than or equal to 5--the number of atypical days for that beverage was 0. If the number of atypical days was greater than or equal to the number of typical days, the term 365F - D was set to 0. Each number of days was then multiplied by the ounces of ethanol consumed on such days; i.e., 5 for atypical days and the typical quantity Qn for typical days. These products were then summed and divided by 365. The resulting composite estimates mean daily volume for the given beverage. The formula may be written as:

$$AQnF = \frac{5D + Qn(365F-D)}{365}$$

where

AQnF is the average daily volume of ethanol consumed in the form of the given beverage.

D is the number of atypical high consumption days for the given beverage (0 if Qn is greater than or equal to 5 for the given beverage).

Qn is the volume of ethanol consumed on typical drinking days for the given beverage.

F is the probability of consuming the given beverage on a given day.

The composite volume measures for the three beverages were then summed to equal the total average daily volume measure. In so doing, the following constraints were applied: (1) the composite and total volume measures were not computed for individuals for whom any typical beverage-specific volume could not be computed, and (2) the maximum value permitted for the composite and total volume measures was 30 ounces of ethanol per day.

B. Drug Use Indexes

This section describes the construction of four drug use attitudinal indexes: beliefs about drug testing effectiveness, drug treatment climate index, beliefs about marijuana use index, and beliefs about harmful effects of drugs. The indexes were based on results of a factor analysis of items in Q63 and Q72 in the questionnaire (Appendix F). Individual items used for these indexes are shown in Table E.4 and were answered using a 5-point scale ranging from strongly agree (5) to strongly disagree (1). Item scores were then summed after appropriate reversal for item phrasing to yield the index score.

1. Beliefs About Drug Testing Effectiveness

The index of beliefs about drug testing effectiveness consists of five items (Table E.4) concerning attitudes about the deterrent effects of the military urinalysis testing program. Scores can range from 5-25, and high scores indicate that urinalysis testing is perceived to be an effective deterrent to nonmedical drug use in the military.

2. Drug Treatment Climate Index

The drug treatment climate index consists of responses to four items noted in Table E.4 concerning respondents' perceptions of barriers to seeking treatment for drug problems. High scores indicate beliefs that there are barriers to seeking treatment for drug problems.

3. Attitudes Toward Marijuana Use

The third drug index concerns attitudes about use of marijuana and is assessed by three items noted in Table E.4. The index ranges from 3-15, and high scores indicate negative attitudes about military personnel using marijuana.

Table E.4. Drug-Related Belief and Attitudinal Indexes

Index	Items Comprising Index
Beliefs About Drug Testing Effectiveness (Range = 5-25)	• Urinalysis testing reduces drug use in the military. • Urinalysis testing has prevented drug use in my unit. • The military's urinalysis tests for drugs are reliable. • Urinalysis testing for drugs has kept me from trying some drugs when I had the chance. • Some drug users I know stop or cut down their use when they think they may be selected for urinalysis.
Drug Treatment Climate (Range = 4-20)	• The personnel at this installation sincerely try to help people who have a drug problem. • Persons who try to get treatment for drug problems will later experience surprise searches of themselves, their auto, or their quarters. • Persons who want treatment for their drug problems will have difficulty getting off duty to attend counseling sessions. • There is no way to get help for a drug problem without one's commander finding out.
Attitudes Toward Marijuana Use (Range = 3-15)	• Anyone detected using marijuana should be discharged. • I am opposed to personnel in my Service using marijuana at any time anywhere. • I am opposed to personnel in my Service using marijuana only if it hurts their performance.
Beliefs About Harmful Effects of Drugs (Range = 7-35)	• I would not use drugs even if there were no urinalysis testing. • Using drugs would mess up my mind. • Using drugs is about the only recreation available in this installation. • Using drugs would interfere with my work. • There are some times at work when I could use an "upper". • Most of my friends use drugs, at least marijuana. • My spouse or the person I date disapproves of my using drugs (or would disapprove if I did use drugs).

4. Beliefs About Harmful Effects of Drugs

The final drug index consists of seven items shown in Table E.4 which assess beliefs about the harmful effects of drug use on health, work, and associated attitudes and norms about not using drugs. A high score indicates low tolerance for drug use.

Appendix F

1988 Worldwide Survey Questionnaire

RCS # DD-HA (OT) 1785

HEALTH AFFAIRS

1988 DEPARTMENT OF DEFENSE SURVEY OF SUBSTANCE ABUSE AND HEALTH BEHAVIORS AMONG MILITARY PERSONNEL

INTRODUCTION

Who are we? We are from Research Triangle Institute, a not-for-profit research company under contract to the Assistant Secretary of Defense—Health Affairs.

How were you selected? You were randomly selected to participate in this important survey.

Must you participate? Your participation in this survey is voluntary. We encourage you to answer all of the questions honestly, but you are not required to answer any question to which you object.

What are the questions about? Mainly about use of alcohol and tobacco and other drugs. There is also a set of questions about health attitudes, knowledge, and behavior.

Who will see your answers? Only civilian researchers. No military personnel will see your answers. Your answers will be combined with those from other military personnel to prepare a statistical report. This questionnaire will be anonymous if you DO NOT WRITE YOUR NAME OR SOCIAL SECURITY NUMBER ANYWHERE ON THIS BOOKLET.

INSTRUCTIONS FOR COMPLETING THE SURVEY

- Most questions provide a set of answers. Read **all** the printed answers before marking your choice. If **none** of the printed answers exactly applies to you, mark the circle for the one answer that **best** fits your situation.

- Use only the pencil you were given.
- Make heavy black marks that **fill** the circle for your answer.

CORRECT MARK ○ ○ ● ○

INCORRECT MARKS ✓ ⊗ ⊙ ◒

- Erase **cleanly** any answer you wish to change.
- Do not make stray marks of any kind anywhere in this booklet.

- For many questions, you should mark only **one** circle for your answer in the column below the question, as shown here:

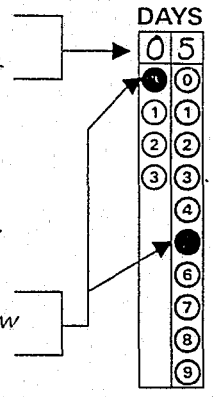
EXAMPLE: How would you describe your health?
- ○ Excellent
- ● Good
- ○ Fair
- ○ Poor

- If you are asked to give numbers for your answer, please complete the grid as shown below.

EXAMPLE: During the past 30 days, how many full 24-hour days were you deployed at sea or in the field?

- *First, write your answer in the boxes. Use both boxes. Write ONE number in each box.*
- *Always write the last number in the right-hand box. Fill in any unused boxes with zeros.*

  For example, an answer of "5 days" would be written as "05."
- *Then, darken the matching circle below each box.*



- Sometimes you will be asked to "Darken one circle on each line." For these questions, record an answer for each part of the question, as shown here:

EXAMPLE: How often do you do each of the following? (Darken one circle on each line)

	Often	Sometimes	Never
Swim	●	○	○
Bowl	○	○	●
Play tennis	○	●	○

NOW PLEASE TURN THE PAGE AND BEGIN WITH QUESTION 1.

1. **What Service are you in?**
   - ○ Army
   - ○ Navy
   - ○ Marine Corps
   - ○ Air Force

2. **What is your pay grade?**

ENLISTED		OFFICER	
○ E-1	○ E-6	○ Trainee	○ 0-4
○ E-2	○ E-7	○ W1-W4	○ 0-5
○ E-3	○ E-8	○ 0-1	○ 0-6
○ E-4	○ E-9	○ 0-2	○ 07-010
○ E-5		○ 0-3	

3. **What is your *highest* level of education now?**
   - ○ Did not graduate from high school
   - ○ GED or ABE certificate
   - ○ High school graduate
   - ○ Trade or technical school graduate
   - ○ Some college but not a 4-year degree
   - ○ 4-year college degree (BA, BS, or equivalent)
   - ○ Graduate or professional study but no graduate degree
   - ○ Graduate or professional degree

4. **How old were you on your last birthday?**

- *First, enter your age in the boxes. Use both boxes. Write ONE number in each box.*
- *Then, darken the matching circle below each box.*

AGE

	0
1	1
2	2
3	3
4	4
5	5
6	6
	7
	8
	9

5. **Are you male or female?**
   - ○ Male
   - ○ Female

6. **What is your marital status?**
   - ○ Married or living as married
   - ○ Separated and not living as married
   - ○ Divorced and not living as married
   - ○ Widowed and not living as married
   - ○ Single, never married and not living as married

If you are married or living as married, the term "spouse," as used in this questionnaire, refers to your wife or husband or to the person with whom you live as married.

7. **Is your spouse now living with you at your present duty location?**
   - ○ Yes
   - ○ No
   - ○ I have no spouse

8. **How many children do you have?**
   - ○ None
   - ○ One
   - ○ Two
   - ○ Three
   - ○ Four
   - ○ Five or more

9. **How old was your youngest child on his/her last birthday?**
   - ○ Less than 1 year old
   - ○ 1-3 years old
   - ○ 4-6 years old
   - ○ 7-9 years old
   - ○ 10-12 years old
   - ○ 13-15 years old
   - ○ 16-18 years old
   - ○ 19 years of age or older
   - ○ I have no children

10. **Is your youngest child now living with you at your present duty location?**
    - ○ Yes
    - ○ No
    - ○ I have no children

11. **Are you of Spanish/Hispanic origin or descent?**
    - ○ No (not Spanish/Hispanic)
    - ○ Yes, Mexican/Mexican-American/Chicano
    - ○ Yes, Cuban
    - ○ Yes, Central or South American
    - ○ Yes, other Spanish/Hispanic

12. **Are you:**
    - ○ American Indian/Alaskan Native
    - ○ Black/Negro/Afro-American
    - ○ Oriental/Asian/Chinese/Japanese/Korean/Filipino/Pacific Islander
    - ○ White/Caucasian
    - ○ Other

13. **In what type of housing do you currently live?**
    If your dependents are with you, mark type of family housing.
    - ○ Housing that you rent or lease from a civilian or that you personally own
    - ○ On board ship
    - ○ Military barracks/dormitory or bachelor quarters
    - ○ On-base military family housing
    - ○ Off-base military family housing

14. Find your Service and Rank below. Follow the instructions for your Service and Rank to complete one grid. After you have completed the appropriate grid, please turn the page and continue with Question 15.

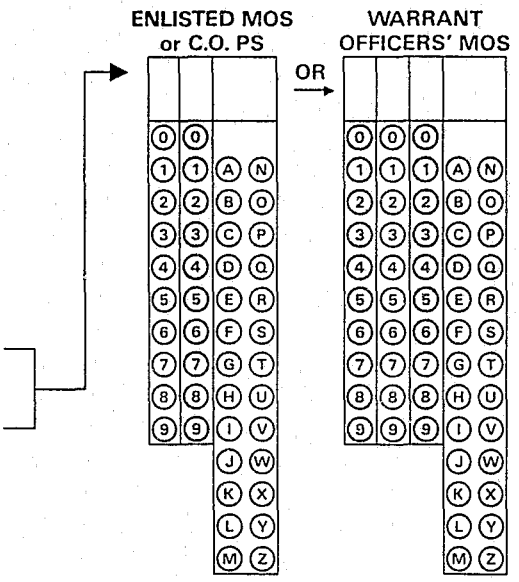
ARMY:

ENLISTED: Please record the FIRST TWO numbers and the ONE letter of your current PRIMARY Military Occupational Specialty (MOS).

COMMISSIONED OFFICERS: Please record the FIRST TWO numbers and the ONE letter of your current PRIMARY Specialty (PS).

WARRANT OFFICERS: Please record the FIRST THREE numbers and the ONE letter of your current PRIMARY Military Occupational Specialty (MOS).

- *First, write the numbers and letter in the boxes of your grid. Use all boxes above the grid, ONE character to a box.*
- *Then, darken the matching circle below each box.*
- *If you do not know your MOS or PS, record "00X" or "000X" in your grid.*



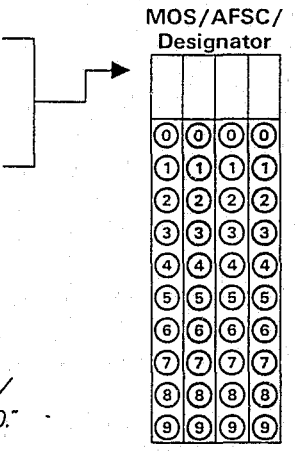
MARINE CORPS: Please record all FOUR numbers of your current PRIMARY Military Occupational Specialty (MOS).

AIR FORCE: Please record the FIRST FOUR numbers of your current PRIMARY Air Force Specialty Code (AFSC). DO NOT RECORD LETTERS - for example, AFSC P29323C should be recorded as "2932."

NAVY:

OFFICERS ONLY: Please record all FOUR numbers of your current PRIMARY Designator.

- *First, write the four numbers in the boxes. Use all four boxes. ONE number to a box.*
- *Then, darken the matching circle below each box.*
- *If you do not know your current MOS/AFSC/ Designator, record "0000."*

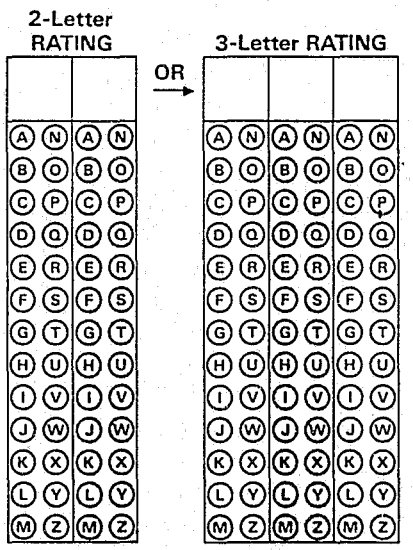


NAVY:

ENLISTED WITH RATING: Please record the TWO or THREE letters of your current PRIMARY Rating in the grid that matches the number of letters in your Rating. DO NOT RECORD NUMBERS - for example, Rating AK2 should be recorded as "AK" only.

UNDESIGNATED STRIKERS: Please record the TWO letters of your Apprenticeship Group in the 2-Letter Rating grid.

- *First, write the 2 or 3 letters in the boxes. Use all boxes above the grid. ONE letter to a box.*
- *Then, darken the matching circle below each box.*
- *If you do not know your current PRIMARY Rating, record "XX" in the 2-Letter grid.*



15. Here are some statements about things that happen to people. How many times in the past 12 months did each of the following happen to you?

(Darken one circle on each line.)

	NUMBER OF TIMES IN PAST 12 MONTHS				
	3 or More	2	1	Never	Doesn't Apply
I had an illness that kept me from duty for a week or longer	○	○	○	○	○
I didn't get promoted when I thought I should have been	○	○	○	○	○
I got a lower score than I expected on my efficiency report or performance rating	○	○	○	○	○
I received UCMJ punishment (Court Martial, Article 15, Captain's Mast, Office Hours)	○	○	○	○	○
I was arrested for a driving violation	○	○	○	○	○
I was arrested for an incident not related to driving	○	○	○	○	○
I spent time in jail, stockade, or brig	○	○	○	○	○
I was hurt in an accident (any kind)	○	○	○	○	○
I caused an accident where someone else was hurt or property was damaged	○	○	○	○	○
I hit my spouse or the person I date	○	○	○	○	○
I hit my child(ren) for a reason other than discipline (spanking)	○	○	○	○	○
I got into a fight where I hit someone other than a member of my family	○	○	○	○	○
My wife or husband threatened to leave me	○	○	○	○	○
My wife or husband left me	○	○	○	○	○

16. The statements below are about some other things that happen to people. How many times in the past 12 months did each of the following happen to you?

(Darken one circle on each line.)

	NUMBER OF TIMES IN PAST 12 MONTHS				
	3 or More	2	1	Never	Doesn't Apply
I had heated arguments with family or friends	○	○	○	○	○
I had trouble on the job	○	○	○	○	○
I was involved in a motor vehicle accident while I was driving (regardless of who was responsible)	○	○	○	○	○
I had health problems	○	○	○	○	○
I drove unsafely	○	○	○	○	○
I neglected my family responsibilities	○	○	○	○	○
I had serious money problems	○	○	○	○	○
I had trouble with the police (civilian or military)	○	○	○	○	○
I found it harder to handle my problems	○	○	○	○	○
I had to have emergency medical help (for any reason)	○	○	○	○	○
I got into a loud argument in public	○	○	○	○	○

The next group of questions is about past and current use of alcoholic beverages—that is, beer, wine, and hard liquor. Please take your time on these questions and answer each one as accurately as possible. If the answers provided are more exact than you can remember, mark your best estimate. If you can't decide between two answer choices because you drink different amounts at different times, answer for the time you drank the most.

17. During the past 30 days, on how many days did you drink beer?
- ○ 28-30 days (about every day)
- ○ 20-27 days (5-6 days a week, average)
- ○ 11-19 days (3-4 days a week, average)
- ○ 4-10 days (1-2 days a week, average)
- ○ 2-3 days in the past 30 days
- ○ Once in the past 30 days
- ○ Didn't drink any beer in the past 30 days

18. During the past 30 days, what size cans or bottles of beer did you usually drink? (Beer is most commonly sold and served in 12-ounce cans, mugs, bottles, or glasses in the U.S.)
- ○ 8-ounce can, bottle or glass
- ○ Standard 12-ounce can, bottle, or mug
- ○ 16-ounce ("tall boy") can, bottle, or mug (½ liter)
- ○ Liter or quart (32-oz.) bottle or mug
- ○ Some other size
- ○ Didn't drink any beer in the past 30 days

19. Think about the days when you drank beer in the past 30 days. How much beer did you usually drink on a typical day when you drank beer?
- ○ 18 or more beers
- ○ 15-17 beers
- ○ 12-14 beers
- ○ 9-11 beers
- ○ 8 beers
- ○ 7 beers
- ○ 6 beers
- ○ 5 beers
- ○ 4 beers
- ○ 3 beers
- ○ 2 beers
- ○ 1 beer
- ○ Didn't drink any beer in the past 30 days

20. During the past 30 days, on how many days did you drink wine?
- ○ 28-30 days (about every day)
- ○ 20-27 days (5-6 days a week, average)
- ○ 11-19 days (3-4 days a week, average)
- ○ 4-10 days (1-2 days a week, average)
- ○ 2-3 days in the past 30 days
- ○ Once in the past 30 days
- ○ Didn't drink any wine in the past 30 days

21. During the past 30 days, did you usually drink a regular wine or a fortified wine?
- ○ Regular wine (also called "table" or "dinner" wine)
- ○ Fortified wine (like sherry, port, vermouth, brandy, Dubonnet, champagne, etc.)
- ○ Wine cooler (such as California Cooler, Bartles & Jaymes, etc.)
- ○ Didn't drink any wine in the past 30 days

22. Think about the days when you drank wine in the past 30 days. How much wine did you usually drink on a typical day when you drank wine? (The standard wineglass holds about 4 ounces of wine. The standard wine bottle holds 750 ml.)
- ○ 12 or more wineglasses (2 bottles or more)
- ○ 9-11 wineglasses
- ○ 8 wineglasses
- ○ 7 wineglasses
- ○ 6 wineglasses (about 1 bottle)
- ○ 5 wineglasses
- ○ 4 wineglasses
- ○ 3 wineglasses (about ½ bottle)
- ○ 2 wineglasses
- ○ 1 wineglass
- ○ Didn't drink any wine in the past 30 days

23. During the past 30 days, on how many days did you drink hard liquor?
- ○ 28-30 days (about every day)
- ○ 20-27 days (5-6 days a week, average)
- ○ 11-19 days (3-4 days a week, average)
- ○ 4-10 days (1-2 days a week, average)
- ○ 2-3 days in the past 30 days
- ○ Once in the past 30 days
- ○ Didn't drink any hard liquor in the past 30 days

24. During the past 30 days, about how many ounces of hard liquor did you usually have in your average drink? (The average bar drink, mixed or straight, contains a "jigger" or 1½ ounces of hard liquor.)
- ○ 5 or more ounces
- ○ 4 ounces
- ○ 3 ounces (a "double")
- ○ 2 ounces
- ○ 1½ ounces (a "jigger")
- ○ 1 ounce (a "shot")
- ○ Didn't drink any hard liquor in the past 30 days

25. Think about the days when you drank hard liquor in the past 30 days. How much hard liquor did you usually drink on a typical day when you drank hard liquor?
- ○ 18 or more drinks
- ○ 15-17 drinks
- ○ 12-14 drinks
- ○ 9-11 drinks
- ○ 8 drinks
- ○ 7 drinks
- ○ 6 drinks
- ○ 5 drinks
- ○ 4 drinks
- ○ 3 drinks
- ○ 2 drinks
- ○ 1 drink
- ○ Didn't drink any hard liquor in the past 30 days

26. **The following list includes some of the reasons people give for drinking beer, wine, or hard liquor. Please tell us how important each reason is to you, for your drinking.**

(Darken one circle on each line.)

	Very Important	Fairly Important	Slightly Important	Not at all Important	Don't Drink
To be friendly or social	○	○	○	○	○
To forget my worries	○	○	○	○	○
To relax	○	○	○	○	○
To help cheer me up when I am in a bad mood	○	○	○	○	○
To help me when I am depressed or nervous	○	○	○	○	○
To help me when I am bored and have nothing to do	○	○	○	○	○
To increase my self-confidence	○	○	○	○	○

NOW THINK ABOUT YOUR USE OF BEER, WINE, OR HARD LIQUOR OVER THE PAST 12 MONTHS—THAT IS, SINCE THIS TIME LAST YEAR.

27. **The following statements describe some things connected with drinking that affect people on their *work days*. Please indicate on how many *work days* in the *past 12 months* these things ever happened to you.**

(Darken one circle on each line.)

	NUMBER OF WORK DAYS IN PAST 12 MONTHS									
	40 or More	21-39	12-20	7-11	4-6	3	2	1	None	Don't Drink
I was hurt in an on-the-job accident because of my drinking	○	○	○	○	○	○	○	○	○	○
I was late for work or left work early because of drinking, a hangover, or an illness caused by drinking	○	○	○	○	○	○	○	○	○	○
I did not come to work at all because of a hangover, an illness or a personal accident caused by drinking	○	○	○	○	○	○	○	○	○	○
I worked below my normal level of performance because of drinking, a hangover, or an illness caused by drinking	○	○	○	○	○	○	○	○	○	○
I was drunk or "high" while working because of drinking	○	○	○	○	○	○	○	○	○	○
I was called in during off-duty hours and reported to work feeling drunk or "high" from alcohol	○	○	○	○	○	○	○	○	○	○
I was less able to concentrate on my work because of my drinking	○	○	○	○	○	○	○	○	○	○
I paid less attention to my supervisor because of my drinking	○	○	○	○	○	○	○	○	○	○

28. **Here are some statements about things that happen to people while or after drinking or because of using alcohol. How many times in the past 12 months did each of the following happen to you?**

(Darken one circle on each line.)

	NUMBER OF TIMES IN PAST 12 MONTHS				
	3 or More	2	1	Never	Don't Drink
I didn't get promoted because of my drinking	○	○	○	○	○
I had an illness connected with my drinking that kept me from duty for a week or longer	○	○	○	○	○
I received UCMJ punishment (Court Martial, Article 15, Captain's Mast, Office Hours) because of my drinking	○	○	○	○	○
I was arrested for driving under the influence of alcohol	○	○	○	○	○
I was arrested for a drinking incident not related to driving	○	○	○	○	○
I spent time in jail, stockade, or brig because of my drinking	○	○	○	○	○
I got into a fight where I hit someone other than a member of my family when I was drinking	○	○	○	○	○
My wife or husband left me because of my drinking	○	○	○	○	○
I had to be detoxified because of my drinking	○	○	○	○	○

29. For each statement below, please indicate how often you have had this experience during the *past 12 months*.

(Darken one circle on each line.)

	About Every Day	5-6 Days a Week	3-4 Days a Week	1-2 Days a Week	1-3 Days a Month	Less Often Than Monthly	Never	Don't Drink
My hands shook a lot after drinking the day before	○	○	○	○	○	○	○	○
I awakened unable to remember some of the things I had done while drinking the day before	○	○	○	○	○	○	○	○
I could not stop drinking before becoming drunk	○	○	○	○	○	○	○	○
I was sick because of drinking (nausea, vomiting, severe headaches, etc.)	○	○	○	○	○	○	○	○
I took a drink the first thing when I got up for the day	○	○	○	○	○	○	○	○
I had the "shakes" because of drinking	○	○	○	○	○	○	○	○
I got into a fight where I hit someone when I was drinking	○	○	○	○	○	○	○	○
I got drunk or very high from drinking	○	○	○	○	○	○	○	○

30. The statements below are about some other things that happen to people because of drinking alcohol. How many times in the past 12 months did each of the following happen to you?

(Darken one circle on each line.)

	NUMBER OF TIMES IN PAST 12 MONTHS				
	3 or More	2	1	Never	Don't Drink
I had trouble on the job because of my drinking	○	○	○	○	○
I had trouble with the police (civilian or military) because of my drinking	○	○	○	○	○
I found it harder to handle my problems because of my drinking	○	○	○	○	○
I had to have emergency medical help because of my drinking	○	○	○	○	○

The next three questions ask about beer, wine, and hard liquor separately. Select the one answer that best describes your drinking during the past 12 months—that is, since this time last year.

31. During the past 12 months, how often did you drink 8 or more cans, bottles, or glasses of beer (3 quarts or more) in a single day?
- ○ About every day
- ○ 5-6 days a week
- ○ 3-4 days a week
- ○ 1-2 days a week
- ○ 2-3 days a month
- ○ About once a month
- ○ 7-11 days in the past 12 months
- ○ 3-6 days in the past 12 months
- ○ Once or twice in the past 12 months
- ○ Never in the past 12 months
- ○ Don't drink beer

32. During the past 12 months, how often did you drink 8 or more glasses of wine (more than a 750 ml bottle) in a single day?
- ○ About every day
- ○ 5-6 days a week
- ○ 3-4 days a week
- ○ 1-2 days a week
- ○ 2-3 days a month
- ○ About once a month
- ○ 7-11 days in the past 12 months
- ○ 3-6 days in the past 12 months
- ○ Once or twice in the past 12 months
- ○ Never in the past 12 months
- ○ Don't drink wine

33. During the past 12 months, how often did you drink 8 or more drinks of hard liquor (a half-pint or more) in a single day?
- ○ About every day
- ○ 5-6 days a week
- ○ 3-4 days a week
- ○ 1-2 days a week
- ○ 2-3 days a month
- ○ About once a month
- ○ 7-11 days in the past 12 months
- ○ 3-6 days in the past 12 months
- ○ Once or twice in the past 12 months
- ○ Never in the past 12 months
- ○ Don't drink hard liquor

The word "*installation*," as used in this questionnaire, refers to your post, camp, base, station, or other geographic duty location. Navy and Marines assigned to ships: The word "*installation*" refers to your ship's home port.

34. Please indicate how much you agree or disagree with each of the following statements.

(Darken one circle on each line.)

	Strongly Agree	Agree	Disagree	Strongly Disagree	Don't Know/No Opinion
Drinking will interfere with my health or physical fitness	O	O	O	O	O
The number of "happy hours" at this installation makes drinking easy	O	O	O	O	O
Disciplinary action will be taken against any person identified as having a drinking problem	O	O	O	O	O
Driving while intoxicated on-base at this installation is a sure way to get arrested	O	O	O	O	O
The military's alcohol education program has helped me make better decisions about drinking	O	O	O	O	O
Use of alcohol is against my religious beliefs	O	O	O	O	O
Seeking help for a drinking problem will damage one's military career	O	O	O	O	O
There are some times at work when I could use a drink	O	O	O	O	O
The heavy drinking I see reduces the military readiness of my unit	O	O	O	O	O

The next few questions concern alcoholic beverages of all kinds, without regard to whether they are beer, wine or hard liquor. In these questions, a "drink" includes beer, wine, or hard liquor, or any combination of the three.

35. Please indicate how likely it is that each of the following conditions will happen to you if you have 6 or more drinks of alcohol on a single occasion.

AFTER 6 OR MORE DRINKS ON A SINGLE OCCASION

(Darken one circle on each line.)

	Extremely Unlikely	Moderately Unlikely	Slightly Unlikely	Neither Likely nor Unlikely	Slightly Likely	Moderately Likely	Extremely Likely
I will be drunk	O	O	O	O	O	O	O
I will act foolishly	O	O	O	O	O	O	O
I will injure myself	O	O	O	O	O	O	O
I will forget my worries	O	O	O	O	O	O	O
I will be asked to drink more	O	O	O	O	O	O	O
I will feel like part of the group	O	O	O	O	O	O	O
I will feel good	O	O	O	O	O	O	O
I will have a good time	O	O	O	O	O	O	O
I will remain in control	O	O	O	O	O	O	O

36. Since you joined the Service, have you received professional counseling or treatment for a drinking-related problem from any of the following sources?

(Darken one circle on each line.)

	Yes	No	Have Had No Problem	Don't Drink
Through a military clinic, hospital, or other military medical facility	O	O	O	O
Through a military counseling center or other military alcohol treatment or rehabilitation program	O	O	O	O
Through a civilian doctor, clinic, hospital, or other civilian medical facility	O	O	O	O
Through a civilian alcohol counselor, mental health center, or other civilian alcohol treatment or rehabilitation program	O	O	O	O

37. Please indicate how bad or good you think each of the following conditions is.

(Darken one circle on each line.)

	Extremely Bad	Moderately Bad	Slightly Bad	Neither Bad nor Good	Slightly Good	Moderately Good	Extremely Good
Being drunk is	○	○	○	○	○	○	○
Acting foolishly is	○	○	○	○	○	○	○
Injuring myself is	○	○	○	○	○	○	○
Forgetting worries is	○	○	○	○	○	○	○
Being asked to drink more is	○	○	○	○	○	○	○
Feeling like part of the group is	○	○	○	○	○	○	○
Feeling good is	○	○	○	○	○	○	○
Having a good time is	○	○	○	○	○	○	○
Remaining in control is	○	○	○	○	○	○	○

The term "workday," as used in this questionnaire, refers to days when you worked at your duty station or were on quick-response (30 minutes or less) call.

38. Think about the days you worked during the past 30 days. How often did you have a drink two hours or less before going to work?
- ○ Every work day
- ○ Most work days
- ○ About half of my work days
- ○ Several work days
- ○ One or two work days
- ○ Never in the past 30 days
- ○ Don't drink

39. On work days during the past 30 days, how often did you have a drink during your lunch break? Answer for the main meal that occurred during your usual duty hours.
- ○ Every work day
- ○ Most work days
- ○ About half of my work days
- ○ Several work days
- ○ One or two work days
- ○ Never in the past 30 days
- ○ Don't drink

40. During the past 30 days, how often did you have a drink while you were working (on-the-job) or during a work break?
- ○ Every work day
- ○ Most work days
- ○ About half of my work days
- ○ Several work days
- ○ One or two work days
- ○ Never in the past 30 days
- ○ Don't drink

41. How often do you drive a motor vehicle within 2 hours after drinking any amount of any alcoholic beverage (beer, wine, or hard liquor), regardless of whether you feel any effects from the alcohol?
- ○ All of the time
- ○ Most of the time
- ○ About half of the time
- ○ Some of the time
- ○ Hardly any of the time
- ○ Never
- ○ Don't drink
- ○ Don't drive

42. Think about the days when you drank beer, wine, or hard liquor in the past 30 days. Which one of the following types of companions were you usually with during most of the occasions when you drank alcohol?
- ○ With my spouse or the person I date
- ○ Alone when no one else was around
- ○ With close friends, military only
- ○ With close friends, including civilians
- ○ With co-workers
- ○ With only acquaintances or strangers
- ○ None of the above
- ○ Didn't drink alcohol in the past 30 days

43. During the past 30 days, in what one kind of place did you drink most often?
- ○ My quarters or place of residence (including ships)
- ○ Enlisted, NCO, or officers' club
- ○ On-base quarters of friends
- ○ Off-base homes or residences of friends
- ○ Civilian bar, tavern, nightclub, or lounge
- ○ Driving around or sitting in a car
- ○ Out in the open, such as a sports event or picnic
- ○ None of the above
- ○ Didn't drink alcohol in the past 30 days

44. Please indicate how much you agree or disagree with each of the following statements.

(Darken one circle on each line.)

	Strongly Agree	Agree	Disagree	Strongly Disagree	Don't Know/No Opinion
Most of my friends drink	○	○	○	○	○
Drinking is part of being in the military	○	○	○	○	○
Persons who try to get treatment for alcohol problems will later experience surprise searches of themselves, their auto, or their quarters	○	○	○	○	○
My spouse or the person I date disapproves of my drinking (or would disapprove if I did drink)	○	○	○	○	○
Persons who want treatment for alcohol problems have difficulty getting off duty to attend counseling sessions	○	○	○	○	○
Drinking is just about the only recreation available at this installation	○	○	○	○	○
My drinking sometimes interferes with my work	○	○	○	○	○
There is no way to get help for a drinking problem without one's commander finding out	○	○	○	○	○
At parties or social functions at this installation, everyone is encouraged to drink	○	○	○	○	○
Alcoholic beverages cost too much	○	○	○	○	○

45. About how old were you when you first began to use alcohol once a month or more often?

- *First, enter the age in the boxes. Use both boxes. Write ONE number in each box.*
- *If you have never used alcohol at least once a month, enter "00."*
- *Then, darken the matching circle below each box.*

AGE

⓪	⓪
①	①
②	②
③	③
④	④
⑤	⑤
⑥	⑥
	⑦
	⑧
	⑨

46. Are you now drinking more, about the same, or less than you did before you entered the Service?

- ○ Drink more now
- ○ Drink about the same
- ○ Drink less now
- ○ Did not drink before entering the Service and do not drink now

47. Are you now drinking more, about the same, or less than you did before you came to this installation?

- ○ Drink more at this installation
- ○ Drink about the same
- ○ Drink less at this installation
- ○ Did not drink before coming to this installation and do not drink now

NOW WE WOULD LIKE TO ASK SOME QUESTIONS ABOUT CIGARETTES AND OTHER TOBACCO PRODUCTS.

48. During the past 12 months, how often on the average have you smoked cigars or a pipe?

- ○ About every day
- ○ 5-6 days a week
- ○ 3-4 days a week
- ○ 1-2 days a week
- ○ 2-3 days a month
- ○ About once a month
- ○ 7-11 days in the past 12 months
- ○ 3-6 days in the past 12 months
- ○ Once or twice in the past 12 months
- ○ Never in the past 12 months
- ○ Don't smoke cigars or pipe

49. During the past 12 months, how often on the average have you used chewing tobacco or snuff or other smokeless tobacco?

- ○ About every day
- ○ 5-6 days a week
- ○ 3-4 days a week
- ○ 1-2 days a week
- ○ 2-3 days a month
- ○ About once a month
- ○ 7-11 days in the past 12 months
- ○ 3-6 days in the past 12 months
- ○ Once or twice in the past 12 months
- ○ Never in the past 12 months
- ○ Don't use smokeless tobacco

50. **After your Service began to enforce the "No Smoking" policy, did you start using chewing tobacco or snuff or other smokeless tobacco?**

- ○ Yes
- ○ Used smokeless tobacco before the "No Smoking" policy took effect
- ○ Don't use smokeless tobacco

51. **How old were you when you first started smoking cigarettes fairly regularly?**

- *First, enter the age in the boxes. Use both boxes. Write ONE number in each box.*
- *If you have never smoked at least one cigarette a day for a week or longer, enter "00."*
- *Then, darken the matching circle below each box.*

AGE

○ 0	○ 0
○ 1	○ 1
○ 2	○ 2
○ 3	○ 3
○ 4	○ 4
○ 5	○ 5
○ 6	○ 6
	○ 7
	○ 8
	○ 9

52. **When was the most recent time you smoked a cigarette?**

- ○ Today
- ○ During the past 30 days
- ○ 5-8 weeks ago
- ○ 2-3 months ago
- ○ 4-6 months ago
- ○ 7-12 months ago
- ○ 1-3 years ago
- ○ More than 3 years ago
- ○ Never smoked cigarettes

53. **Think about the past 30 days. How many cigarettes did you usually smoke on a typical day when you smoked cigarettes?**

- ○ About 3 or more packs a day (more than 55 cigarettes)
- ○ About 2½ packs a day (46-55 cigarettes)
- ○ About 2 packs a day (36-45 cigarettes)
- ○ About 1½ packs a day (26-35 cigarettes)
- ○ About 1 pack a day (16-25 cigarettes)
- ○ About ½ pack a day (6-15 cigarettes)
- ○ 1-5 cigarettes a day
- ○ Fewer than 1 cigarette a day, on the average
- ○ Did not smoke any cigarettes in the past 30 days

54. **For about how many years have you smoked this many cigarettes per day (the number of cigarettes in question 53)?**

- *First, enter the number of years in the boxes. Use both boxes. Write ONE number in each box.*
- *If you did not smoke in the past 30 days, or if you have never smoked cigarettes, record "00."*
- *If you have smoked this much for less than 1 year, record "01."*
- *Then, darken the matching circle below each box.*

YEARS

○ 0	○ 0
○ 1	○ 1
○ 2	○ 2
○ 3	○ 3
○ 4	○ 4
○ 5	○ 5
	○ 6
	○ 7
	○ 8
	○ 9

55. **During the past 2 years, have you made a serious attempt to stop smoking cigarettes; that is, did you go for at least a week without smoking?**

- ○ Yes
- ○ No
- ○ Didn't smoke cigarettes in the past 2 years
- ○ Never smoked cigarettes

56. **For how many years altogether have you smoked or did you smoke at least one cigarette a day?** (Do not count any time when you quit smoking.)

- *First, enter the number of years in the boxes. Use both boxes, ONE number to a box.*
- *If you have never smoked at least one cigarette a day for a week or longer, record "00."*
- *If you have smoked regularly for less than 1 year, record "01."*
- *Then, darken the matching circle below each box.*

YEARS

○ 0	○ 0
○ 1	○ 1
○ 2	○ 2
○ 3	○ 3
○ 4	○ 4
○ 5	○ 5
	○ 6
	○ 7
	○ 8
	○ 9

57. **Have you ever smoked as many as five packs of cigarettes, that is, at least 100 cigarettes, during your life?**

- ○ Yes
- ○ No

The next set of questions is about use of other drugs, besides alcohol or tobacco, for non-medical purposes. First, we list the types of drugs we are interested in, along with some of their most common trade and clinical names.

DRUG TYPES	COMMON TRADE/CLINICAL NAMES
Marijuana or Hashish	Cannabis, THC
PCP (alone or combined with other drugs)	Phencyclidine (PCP)
LSD, Other Hallucinogens	LSD, Mescaline, Peyote, DMT, Psilocybin
Cocaine	Cocaine (including "crack" and Health Inca Tea)
Amphetamines and Other Stimulants	Preludin, Benzedrine, Biphetamine, Cylert, Desoxyn, Dextroamphetamine, Dexamyl, Dexedrine, Didrex, Eskatrol, Ionamin, Methedrine, Obedrin-LA, Plegine, Pondimin, Pre-Sate, Ritalin, Sanorex, Tenuate, Tepanil, Voranil
Tranquilizers and Other Depressants	Ativan, Meprobamate, Librium, Valium, Atarax, Benadryl, Equanil, Libritabs, Meprospan, Miltown, Serax, SK-Lygen, Thorazine, Tranxene, Verstran, Vistaril, Xanax
Barbiturates and Other Sedatives	Seconal, Alurate, Amobarbital, Amytal, Buticap, Butisol, Carbrital, Dalmane, Doriden, Eskabarb, Luminal, Mebaral, Methaqualone, Nembutal, Noctec, Noludar, Optimil, Parest, Pentobarbital, Phenobarbital, Placidyl, Quaalude, Secobarbital, Sopor, Tuinal
Heroin, Other Opiates	Heroin, Morphine, Opium
Analgesics, Other Narcotics	Darvon, Demerol, Percodan, Tylenol with Codeine, Codeine, Cough syrups with Codeine, Dilaudid, Dolene, Dolophine, Leritine, Levo-Dromoran, Methadone, Propoxyphene, SK-65, Talwin.
Inhalants	Lighter fluids, aerosol sprays like Pam, glue, toluene, amyl nitrite, gasoline, poppers, locker room odorizers, spray paints, paint thinner, halothane, ether or other anesthetics, nitrous oxide ("laughing gas"), correction fluids, cleaning fluids, degreasers
"Designer" drugs	These drugs, with names like "Ecstasy," "Adam," "Eve," are made by combining two or more, often legal, drugs or chemicals to produce drugs specifically for their mood-altering or psychoactive effects.

Although some of the drugs listed above may be prescribed for medical reasons, the questions that follow refer to use of these drugs *for non-medical purposes*. By *non-medical purposes*, we mean *any use of these drugs on your own*—that is, either without a doctor's prescription,
or in greater amounts or more often than prescribed,
or for any other reasons besides the reason a doctor said you should take them. (These "other reasons" might be to get high, for thrills or kicks, to relax, to give insight, for pleasure, or curiosity about the drug's effect.)
Please take your time and answer the questions as accurately as possible. Remember, *NO ONE will ever link your answers with your identity.*

58. During the *past 30 days*, on about how many days did you use each of the following drugs for non-medical purposes?

(Darken one circle on each line.)	28-30 Days	20-27 Days	11-19 Days	4-10 Days	1-3 Days	Never In Past 30 Days
Marijuana or hashish	○	○	○	○	○	○
PCP	○	○	○	○	○	○
LSD or other hallucinogens	○	○	○	○	○	○
Cocaine	○	○	○	○	○	○
Amphetamines or other stimulants	○	○	○	○	○	○
Tranquilizers or other depressants	○	○	○	○	○	○
Barbiturates or other sedatives	○	○	○	○	○	○
Heroin or other opiates	○	○	○	○	○	○
Analgesics, other narcotics	○	○	○	○	○	○
Inhalants	○	○	○	○	○	○
"Designer" drugs ("Ecstasy," etc.)	○	○	○	○	○	○

59. **The following statements describe some things connected with using drugs that affect people *on their work days*. Please indicate on how many *work days* in the *past 12 months* these things ever happened to you.**

NUMBER OF WORK DAYS IN PAST 12 MONTHS

(Darken one circle on each line.)

	40 or More	21-39	12-20	7-11	4-6	3	2	1	None	Don't Use Drugs
I was late for work or left work early because of my use of drugs	○	○	○	○	○	○	○	○	○	○
I was hurt in an on-the-job accident because of my use of drugs	○	○	○	○	○	○	○	○	○	○
I worked below my normal level of performance because of my use of drugs	○	○	○	○	○	○	○	○	○	○
I did not come to work at all because of the after effects, an illness, or a personal accident caused by my use of drugs	○	○	○	○	○	○	○	○	○	○
I was "high" or "strung out" while working because of my use of drugs	○	○	○	○	○	○	○	○	○	○
I was called in during off-duty hours and reported to work feeling "high" or "strung out" from my use of drugs	○	○	○	○	○	○	○	○	○	○

60. **Please indicate how much you agree or disagree with each of the following statements.**

(Darken one circle on each line.)

	Strongly Agree	Agree	Disagree	Strongly Disagree	Don't Know/No Opinion
At parties or social functions at this installation, it's easy to get away with using drugs	○	○	○	○	○
There's always a party somewhere at or near this installation where drugs are being used	○	○	○	○	○
Using drugs would interfere with my health or physical fitness	○	○	○	○	○
Disciplinary action will be taken against any person identified as having a drug problem, even if no drugs are found	○	○	○	○	○
The military's drug education program has helped me make better decisions about using drugs for non-medical purposes	○	○	○	○	○
Seeking help for a drug problem will damage one's military career	○	○	○	○	○
I might use (more) marijuana if it were easier to get	○	○	○	○	○
Education about drugs at this installation helps keep people from using drugs	○	○	○	○	○
I favor being able to use marijuana when I'm off-duty	○	○	○	○	○

61. **When did you *last* use each type of drug listed below for non-medical purposes?**

LAST USED THIS TYPE OF DRUG

(Darken one circle on each line.)

	Today	1-30 Days Ago	5-8 Weeks Ago	2-3 Months Ago	4-6 Months Ago	7-12 Months Ago	More Than One Year Ago	Never Used
Marijuana or hashish	○	○	○	○	○	○	○	○
PCP	○	○	○	○	○	○	○	○
LSD or other hallucinogens	○	○	○	○	○	○	○	○
Cocaine	○	○	○	○	○	○	○	○
Amphetamines or other stimulants	○	○	○	○	○	○	○	○
Tranquilizers or other depressants	○	○	○	○	○	○	○	○
Barbiturates or other sedatives	○	○	○	○	○	○	○	○
Heroin or other opiates	○	○	○	○	○	○	○	○
Analgesics, other narcotics	○	○	○	○	○	○	○	○
Inhalants	○	○	○	○	○	○	○	○
"Designer" drugs ("Ecstasy," etc.)	○	○	○	○	○	○	○	○

62. **Here are some statements about things that happen to people while or after using drugs or because of using drugs. How many times in the *past 12 months* did each of the following happen to you?**

(Darken one circle on each line.)	NUMBER OF TIMES IN PAST 12 MONTHS				
	3 or More	2	1	Never	Don't Use Drugs
I was arrested for driving under the influence of drugs	○	○	○	○	○
I didn't get promoted because of my use of drugs	○	○	○	○	○
I received UCMJ punishment (Court Martial, Article 15, Captain's Mast, Office Hours) because of my use of drugs	○	○	○	○	○
I had an illness connected with my use of drugs that kept me from duty for a week or longer	○	○	○	○	○
I was arrested for a drug incident not related to driving	○	○	○	○	○
I spent time in jail, stockade, or brig because of my use of drugs	○	○	○	○	○
I was hurt in any kind of accident caused by my use of drugs	○	○	○	○	○
I got into a fight where I hit someone other than a member of my family when I was using drugs	○	○	○	○	○
My wife or husband left me because of my use of drugs	○	○	○	○	○
I had to be detoxified because of my use of drugs	○	○	○	○	○
I came up positive on a drug urinalysis test	○	○	○	○	○

63. **Please indicate how much you agree or disagree with each of the following statements.**

(Darken one circle on each line.)	Strongly Agree	Agree	Disagree	Strongly Disagree	Don't Know/No Opinion
Urinalysis testing has prevented drug use in my unit	○	○	○	○	○
Urinalysis testing reduces drug use in the military	○	○	○	○	○
The emphasis on detection and discipline in my Service's drug program hurts morale	○	○	○	○	○
Anyone detected using marijuana should be discharged	○	○	○	○	○
I am opposed to personnel in my Service using marijuana:					
At any time anywhere	○	○	○	○	○
Only if it affects their performance	○	○	○	○	○
Some people get away with using certain drugs because the urinalysis tests won't detect those drugs	○	○	○	○	○
The people I associate with off-duty think that I should not use marijuana (or would disapprove if I did use marijuana)	○	○	○	○	○
Urinalysis testing for drugs has kept me from trying some drugs when I had the chance	○	○	○	○	○
Some drug users I know stop or cut down their use when they think they may be selected for urinalysis	○	○	○	○	○
I would not use drugs even if there were no urinalysis testing	○	○	○	○	○
The drug use I know about reduces the military readiness of the units at this installation	○	○	○	○	○
The military's urinalysis tests for drugs are reliable	○	○	○	○	○

64. **Which term best describes your use of marijuana or hashish during the *last six months*?**
- ○ Never
- ○ Rarely
- ○ Sometimes
- ○ Frequently

65. **Which term best describes your use of "hard drugs" such as heroin, cocaine, LSD, etc., during the *last six months*?**
- ○ Never
- ○ Rarely
- ○ Sometimes
- ○ Frequently

66. The statements below are about some other things that happen to people because of using drugs for non-medical purposes. How many times in the *past 12 months* did each of the following happen to you?

NUMBER OF TIMES IN PAST 12 MONTHS

(Darken one circle on each line.)

	3 or More	2	1	Never	Don't Use Drugs
I had trouble on the job because of my use of drugs	○	○	○	○	○
I had heated arguments with family or friends because of my use of drugs	○	○	○	○	○
I was involved in a motor vehicle accident while I was driving after using drugs (whether or not you were responsible)	○	○	○	○	○
I had health problems because of my use of drugs	○	○	○	○	○
I drove unsafely because of my use of drugs	○	○	○	○	○
My using drugs interfered with my family responsibilities	○	○	○	○	○
I had serious money problems because of my use of drugs	○	○	○	○	○
I had trouble with the police (civilian or military) because of my use of drugs	○	○	○	○	○
I found it harder to handle my problems because of my use of drugs	○	○	○	○	○
I got into a loud argument in public because of my use of drugs	○	○	○	○	○
A relative or friend told me that I should cut down on my use of drugs	○	○	○	○	○

67. About how old were you when you used marijuana or hashish for the first time?

- *First, enter the age in the boxes. Use both boxes. Write ONE number in each box.*
- *If you have never used marijuana or hashish, record "00".*
- *Then darken the matching circle below each box.*

AGE

0	0
1	1
2	2
3	3
4	4
5	5
6	6
	7
	8
	9

68. About how old were you the first time you used cocaine?

- *First, enter the age in the boxes. Use both boxes. Write ONE number in each box.*
- *If you have never used cocaine, record "00".*
- *Then darken the matching circle below each box.*

AGE

0	0
1	1
2	2
3	3
4	4
5	5
6	6
	7
	8
	9

69. About how old were you the first time you took amphetamines or other stimulants for any non-medical reason?

- *First, enter the age in the boxes. Use both boxes. Write ONE number in each box.*
- *If you have never used amphetamines or stimulants for non-medical purposes, record "00".*
- *Then darken the matching circle below each box.*

AGE

0	0
1	1
2	2
3	3
4	4
5	5
6	6
	7
	8
	9

70. About how old were you the first time you took a tranquilizer or barbiturate or depressant or sedative for any non-medical reason?

- *First, enter the age in the boxes. Use both boxes. Write ONE number in each box.*
- *If you have never used any of the drugs in this category for non-medical purposes, record "00".*
- *Then darken the matching circle below each box.*

AGE

0	0
1	1
2	2
3	3
4	4
5	5
6	6
	7
	8
	9

71. **Since you joined the Service, have you received professional counseling or treatment for a drug-related problem from any of the following sources?**

(Darken one circle on each line.)

	Yes	No	Have Had No Problem	Don't Use Drugs
Through a military clinic, hospital, or other military medical facility	○	○	○	○
Through a military drug counseling center or other military drug treatment or rehabilitation program	○	○	○	○
Through a civilian doctor, clinic, hospital, or other civilian medical facility	○	○	○	○
Through a civilian drug counselor, mental health center, or other civilian drug treatment or rehabilitation program	○	○	○	○

72. **Please indicate how much you agree or disagree with each of the following statements.**

(Darken one circle on each line.)

	Strongly Agree	Agree	Disagree	Strongly Disagree	Don't Know/No Opinion
Most of my friends use drugs, at least marijuana	○	○	○	○	○
There are some times at work when I could use an "upper"	○	○	○	○	○
The personnel at this installation sincerely try to help people who have a drug problem	○	○	○	○	○
Using drugs would mess up my mind	○	○	○	○	○
Persons who try to get treatment for drug problems will later experience surprise searches of themselves, their auto, or their quarters	○	○	○	○	○
My spouse or the person I date disapproves of my using drugs (or would disapprove if I did use drugs)	○	○	○	○	○
Persons who want treatment for their drug problems have difficulty getting off duty to attend counseling sessions	○	○	○	○	○
Using drugs is just about the only recreation available at this installation	○	○	○	○	○
Using drugs would interfere with my work	○	○	○	○	○
There is no way to get help for a drug problem without one's commander finding out	○	○	○	○	○

THE NEXT SET OF QUESTIONS DEALS MAINLY WITH HEALTH ATTITUDES, KNOWLEDGE, AND BEHAVIOR.

73. **In general, how would you describe your own health?**
- ○ Excellent
- ○ Very good
- ○ Good
- ○ Fair
- ○ Poor

74. **Over the past year, has your health caused you:**
- ○ A great deal of worry
- ○ Some worry
- ○ Hardly any worry
- ○ No worry at all

75. **How much control do you think you have over your future health?**
- ○ A great deal
- ○ Some
- ○ Very little
- ○ None at all

76. **During the past 30 days, how much stress did you experience at work or while carrying out your military duties?**
- ○ A great deal
- ○ A fairly large amount
- ○ Some
- ○ A little
- ○ None at all

77. **During the past 30 days, how much stress did you experience in your family life or in a relationship with a person you live with or date seriously?**
- ○ A great deal
- ○ A fairly large amount
- ○ Some
- ○ A little
- ○ None at all

78. **In the past 12 months,...**

(Darken one circle on each line.)

	NUMBER OF TIMES IN PAST 12 MONTHS								
	40 or More	21-39	12-20	7-11	4-6	3	2	1	None
How many days were you a bed patient in a hospital?	○	○	○	○	○	○	○	○	○
How many times did you visit a doctor's office, clinic, hospital or other medical facility as an outpatient?	○	○	○	○	○	○	○	○	○
How many times were you sick with symptoms such as runny nose or eyes, feeling flushed or sweaty, chills, nausea or vomiting, stomach cramps, diarrhea, muscle pains, or severe headaches?	○	○	○	○	○	○	○	○	○

79. **When you feel pressured, stressed, depressed, or anxious, how often do you engage in each of the following activities?**

(Darken one circle on each line.)

	Frequently	Sometimes	Rarely	Never
Meditate or just sit quietly	○	○	○	○
Talk to a friend or family member	○	○	○	○
Take prescribed medication	○	○	○	○
Just think about things a lot	○	○	○	○
Seek professional help	○	○	○	○
Light up a cigarette	○	○	○	○
Have a drink	○	○	○	○
Exercise or play sports	○	○	○	○
Get something to eat	○	○	○	○
Smoke marijuana or use other illegal drugs	○	○	○	○
Think of a plan to solve the problem	○	○	○	○
Take a nap	○	○	○	○
Buy something new	○	○	○	○
Think about hurting yourself or killing yourself	○	○	○	○
Get a headache or otherwise feel ill	○	○	○	○
Read or work on a hobby	○	○	○	○
Watch TV or listen to music	○	○	○	○

80. **Have you ever been told by a doctor or other health professional that you have hypertension, sometimes called high blood pressure?**
- ○ Yes
- ○ No
- ○ Don't remember

81. **Have you had your blood pressure checked in the last year?**
- ○ Yes
- ○ No
- ○ Don't remember

82. **Blood pressure is usually given as one number over another. Do you know the numbers of your blood pressure?**
- ○ Yes
- ○ No

83. **Think about your close blood relatives; that is, your grandparents, your parents, your aunts and uncles, and your brothers and sisters. Have any of these persons had high blood pressure or hypertension?**
- ○ Yes
- ○ No
- ○ Don't know

84. **Compared to most people, how much would you say you know about AIDS? Would you say you know...**
- ○ A lot
- ○ Some
- ○ A little
- ○ Nothing

85. **Have you changed your sexual behavior because of concern about getting AIDS?**
- ○ Yes
- ○ No

86. Please indicate how much you agree or disagree with each of the following statements.

(Darken one circle on each line.)

	Strongly Agree	Agree	Disagree	Strongly Disagree	Don't Know
ANY person with HIV (the virus that causes AIDS) can pass it on to someone else through sexual intercourse	○	○	○	○	○
Having sex with multiple sex partners increases the risk of passing the virus that causes AIDS	○	○	○	○	○
The use of a condom during sexual intercourse may lower the risk of getting AIDS	○	○	○	○	○

87. How likely do you think it is that a person will get AIDS in each of the following ways?

(Darken one circle on each line.)

	Definitely Will	Probably Will	Probably Won't	Definitely Won't	Don't Know
Receiving a blood transfusion	○	○	○	○	○
Giving or selling blood	○	○	○	○	○
Working near someone with AIDS	○	○	○	○	○
Casual contact with someone in the unit who has a positive blood test for the HIV antibody	○	○	○	○	○
Eating in a dining facility where the cook is infected with HIV	○	○	○	○	○
Sharing needles for illegal drug use with someone who has AIDS	○	○	○	○	○
Having sex with a person who has AIDS	○	○	○	○	○

88. Listed below are methods people use to prevent getting HIV (the virus that causes AIDS) through sexual activity. Please indicate whether you think each method is effective or not in preventing an infection from the virus through sexual activity.

(Darken one circle on each line.)

	Effective	Not Effective	Don't Know If Effective	Don't Know Method
Using a diaphragm	○	○	○	○
Using a condom	○	○	○	○
Using a jelly, foam, or cream to kill sperm	○	○	○	○
Not having sex at all	○	○	○	○
Two people having sex with **only** each other	○	○	○	○
Asking possible sex partners if they have the virus	○	○	○	○

89. In the past year, did you make any of the following changes for health reasons?

(Darken one circle on each line.)

	Yes	No
Eat fewer calories to lose weight	○	○
Reduce the amount of salt in your diet	○	○
Cut down on your use of alcohol	○	○
Eat more raw vegetables, whole wheat products, and other high-fiber foods	○	○
Eat fewer foods with high fat content (such as bacon, sausage, cheese, etc.)	○	○
Cut down on the amount of fried foods, beef, or pork that you eat	○	○

90. Do you think that each of the following resources provides you with reliable nutrition information?

(Darken one circle on each line.)

	Yes	No
Magazines	○	○
Newspapers	○	○
Books	○	○
Health food stores	○	○
Nurses	○	○
Doctors	○	○
Dieticians	○	○
Library	○	○
Television	○	○

91. **How useful has each of the following sources been to you for information about AIDS?**

(Darken one circle on each line.)

	Very Useful	Fairly Useful	Slightly Useful	Not at All Useful	Have Not Used
Command Information Program	○	○	○	○	○
Armed Forces Radio and Television (AFRTS)	○	○	○	○	○
Military medical personnel (doctors, nurses, etc.)	○	○	○	○	○
Newspapers or magazines	○	○	○	○	○
Military school or training program	○	○	○	○	○
Spouse or other family member	○	○	○	○	○
Friends	○	○	○	○	○
Commercial TV or radio	○	○	○	○	○
Chaplain	○	○	○	○	○
Pamphlets and brochures distributed by the Services	○	○	○	○	○

92. **During the past 30 days, how often did you do each of the following?**

(Darken one circle on each line.)

	About Every Day	5-6 Days a Week	3-4 Days a Week	1-2 Days a Week	1-3 Days a Month	Less Often Than Monthly	Never
Run, jog, bicycle, or briskly walk or hike for 20 minutes or more	○	○	○	○	○	○	○
Eat at least two full meals in one day (count breakfast, if eaten)	○	○	○	○	○	○	○
Engage for 20 minutes or more in other strenuous physical activity (e.g., handball, soccer, racquet sports, swimming laps, etc.)	○	○	○	○	○	○	○
Eat breakfast	○	○	○	○	○	○	○
Engage in mild physical activity (e.g., baseball, bowling, volleyball, other sports) more for the recreation than for the exercise	○	○	○	○	○	○	○
Get more than six consecutive hours of sleep in one day	○	○	○	○	○	○	○
Do exercises that improve muscle strength (e.g., pushups, situps, weight lifting, a Nautilus/ Universal workout, resistance training, etc.)	○	○	○	○	○	○	○
Eat between meals (including evening snacks)	○	○	○	○	○	○	○

93. **What was the result of your performance on your last official physical readiness test?**

- ○ Unsatisfactory (failed)
- ○ Satisfactory (passed)
  - → **MARINES ONLY:**
    - ○ First Class Pass
    - ○ Second Class Pass
    - ○ Third Class Pass
- ○ Exempt

94. **Has a doctor or other health professional ever advised you to do any of the following activities?**

(Darken one circle on each line.)

	Yes	No
Diet to lose weight	○	○
Cut down on salt or sodium in your diet	○	○
Exercise	○	○
Stop smoking	○	○
Take medication to control your blood pressure	○	○
Cut down on your use of alcohol	○	○

95. **How many people do you supervise most of the time?**

- ○ None
- ○ 1-5
- ○ 6-10
- ○ 11-15
- ○ 16-20
- ○ More than 20

96. **All in all, how satisfied or dissatisfied are you with your work assignment?**

- ○ Very satisfied
- ○ Satisfied
- ○ Dissatisfied
- ○ Very dissatisfied

PLEASE TURN THE PAGE AND ANSWER THE LAST FEW QUESTIONS.

97. **How long have you been on active duty?** If you had a break in Service, count current time and time in previous tours, but not time during the break in Service.

- ○ 6 months or less
- ○ 7-12 months
- ○ 13-18 months
- ○ 19-24 months
- ○ 25-36 months
- ○ 37-47 months
- ○ 4 to 9 years
- ○ 10 to 19 years
- ○ 20 or more years

98. **As of today, how many months have you been assigned to your present permanent post, base, ship, or duty station?** (Include any extension of your present tour. Do not count previous tours at this duty station.)

- ○ 1 month or less
- ○ 2-3 months
- ○ 4-6 months
- ○ 7-12 months
- ○ 13-18 months
- ○ 19-24 months
- ○ 25-36 months
- ○ More than 3 years

99. **During the past 30 days, how many days were you on official leave?** (Do not include overnight pass, 3-day pass, shore leave, or liberty.)

- *Use both boxes. Write ONE number in each box.*
- *If none, record "00."*
- *Then, darken the matching circle below each box.*

DAYS

0	0
1	1
2	2
3	3
	4
	5
	6
	7
	8
	9

100. **During the past 30 days, how many full 24-hour days were you deployed at sea or in the field?**

- *Use both boxes. Write ONE number in each box.*
- *If none, record "00."*
- *Then, darken the matching circle below each box.*

DAYS

0	0
1	1
2	2
3	3
	4
	5
	6
	7
	8
	9

101. **Are you currently serving on a ship that is deployed?**

- ○ Yes
- ○ No

102. **During the past 30 days, how much of the time did you work in jobs outside your current primary MOS/PS/Rating/Designator/AFSC?**

- ○ All of the time
- ○ Most of the time
- ○ About half of the time
- ○ Some, but less than half of the time
- ○ None of the time

103. **What is the ZIP code or APO or FPO number for the post, base, ship, or other duty station where you spent most of your duty time during the past 12 months?**

- *First, enter the ZIP code or APO/FPO numbers in the boxes. Use all five boxes. Write ONE number in each box.*
- *Then, darken the matching circle below each box.*

ZIP/APO/FPO

0	0	0	0	0
1	1	1	1	1
2	2	2	2	2
3	3	3	3	3
4	4	4	4	4
5	5	5	5	5
6	6	6	6	6
7	7	7	7	7
8	8	8	8	8
9	9	9	9	9

104. **When was the last time you were deployed at sea or in the field for 24 hours or more?**

- ○ Never deployed at sea or in the field
- ○ 1-7 days ago
- ○ 8-14 days ago
- ○ 2-4 weeks ago
- ○ 5-8 weeks ago
- ○ 2-3 months ago
- ○ 4-6 months ago
- ○ 7-12 months ago
- ○ More than one year ago

THANK YOU VERY MUCH FOR YOUR TIME, EFFORT, AND COOPERATION IN COMPLETING THIS QUESTIONNAIRE.

PLEASE CHECK OUT AND PLACE THE QUESTIONNAIRE IN THE BOX AS YOU LEAVE THE ROOM.

THIS BLOCK FOR OFFICE USE ONLY

FSU

0	0	0	0
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	6
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9

Nucleus Installation: _____

Survey Phase ○ I ○ II

Ⓛ Ⓞ

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REFERENCES

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1988 Worldwide Survey of Substance Abuse and Health Behaviors Among Military Personnel. NCJ-0121630

Post Office Box 12194 Research Triangle Park, North Carolina 27709-2194 Telephone: 919-541-6000

ERRATA COMMENTS FOR 1988 WORLDWIDE SURVEY FINAL REPORT

Recent analyses of the Worldwide Survey data revealed a labeling error for heavy drinkers for the Worldwide Survey Reports. The estimates for heavy drinking in these reports were for consumption of five or more drinks per typical drinking occasion at least twice a week, although those results were erronesouly labeled five or more drinks at least once a week. The algorithm for computing the drinking levels measure was modified to correct the labeling error and new estimates of drinking levels were computed using the definition of five or more drinks per typical drinking occasion at least once a week. Estimates of the numbers of heavy drinkers using this definition are larger than the previous estimates.

Figures 3.1, 3.2, and 4.2 replace the figures in the 1988 Worldwide final report. Figures 4.3 and 4.4 provide replacement data for the 1988 report and in addition contain comparable data for the 1985, 1982, and 1980 Worldwide Surveys. Tables 3.1, 3.2, and 4.3 replace tables in the body of the 1988 report. Tables D.1--D.4 replace tables in Appendix D of the 1988 report. Tables D.6--D.10 provide estimates of drinking levels by sociodemographic characteristics for DoD and each of the Services for the 1988, 1985, and 1982 surveys. Tables D.6a--D.10a replace Tables D.6--D.10 in the 1988 report; Tables D.6b--D.10b provide similar data for the 1985 Worldwide Survey and Tables D.6c--D.10c provide data for the 1982 Worldwide Survey.

Figure 3.1 presents the trends over the four Worldwide Surveys of the percentage of the total active military force who engaged in heavy alcohol use, any drug use, and any cigarette use during the past 30 days. Table 3.1 presents the observed rates of use of the three substances for the four survey years and information about the statistical signicance of changes in substance use between the survey years. As shown, use of all three substances declined significantly between 1980 and 1988, although the rate of decline varied for each of the substances and between the four surveys.

The prevalence of heavy alcohol use declined significantly from 20.8 percent of all military personnel in 1980 to 17.0 percent in 1988. Table

3.1 shows, however, that heavy alcohol use increased significantly from 1980 to 1982, remained relatively stable between 1982 and 1985 and then declined significantly between 1985 and 1988.

Table 3.2 presents the unstandardized and standardized trends in use for the total DoD during the four surveys. Data for the 1982, 1985, and 1988 surveys were standardized to the 1980 distribution by age, education, and marital status. Standardized rates show a significant increase in heavy alcohol use from 1980 to 1982 and then significant decreases between 1982 and 1985 and again between 1985 and 1988. In contrast to the unstandardized results, standardized rates of heavy drinking are not significantly lower in 1988 than in 1980 (although 1988 standardized rates are significantly lower than rates in 1982 and 1985). This suggests that part of the significant decline in unstandardized rates observed between 1980 and 1988 is attributable to changes in the sociodemographic composition of the military.

The most important finding from both the unstandardized and standardized rates is the clear decline in heavy alcohol use from 1982 to 1988. During this period rates of heavy alcohol use have decreased by 7 percentage points. Nonetheless, despite this improvement, nearly a fifth of the active military in 1988 are classified as heavy drinkers and are at relatively high risk for serious negative consequences.

Figure 3.1. Trends in Substance Use Past 30 Days
Total DoD, 1980-88

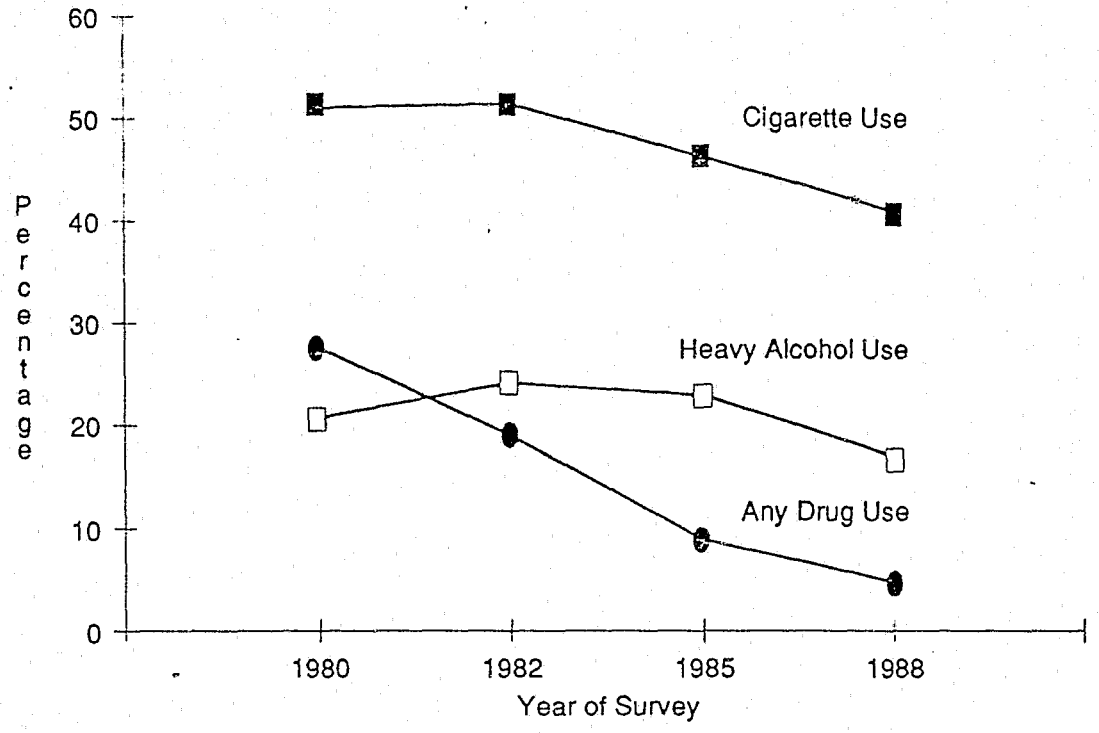


Figure 3.2. Trends in Substance Use Past 30 Days by Service, 1980-88

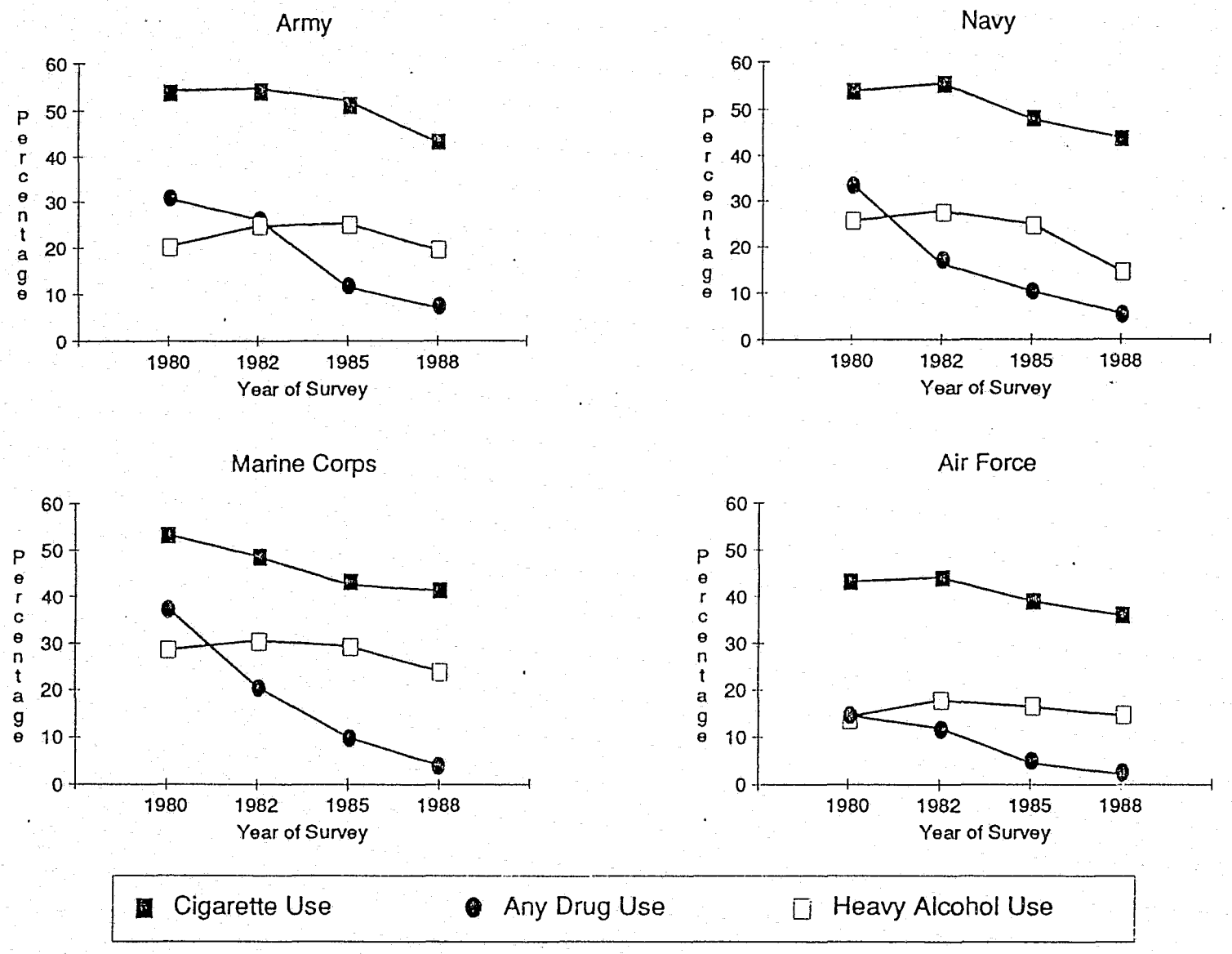


Figure 4.2. Trends in Heavy Alcohol Use Past 30 Days, 1980-88

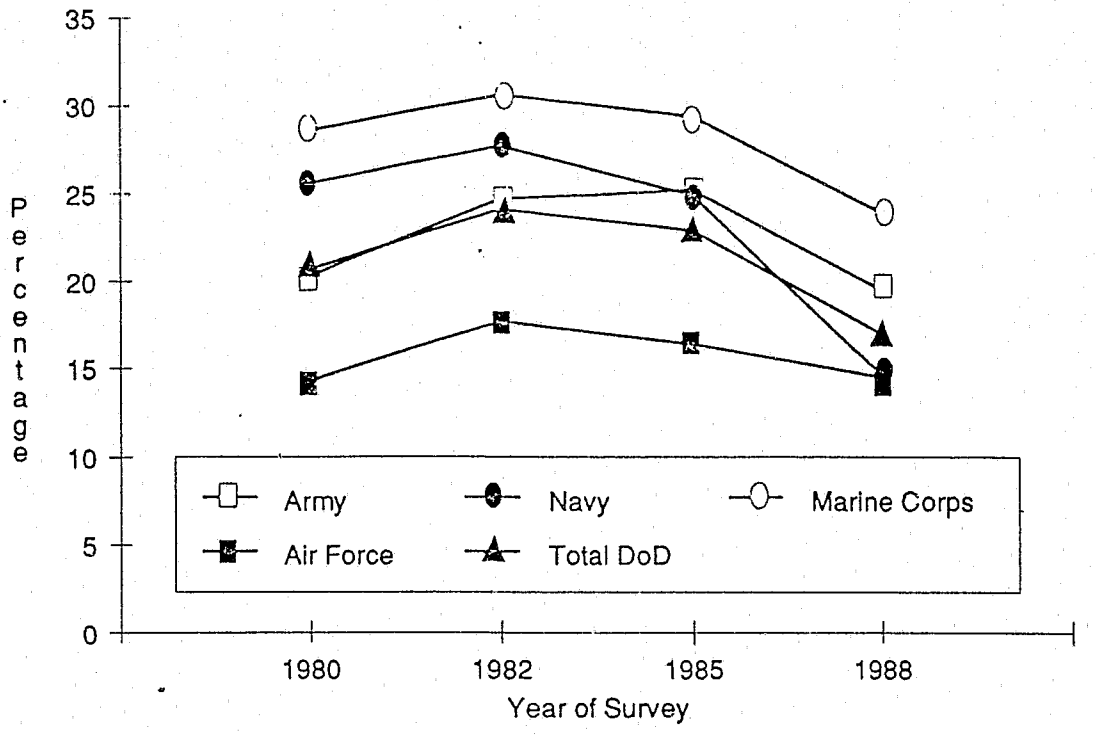


Figure 4.3 Heavy Alcohol Use by Paygrade, Total DoD, 1980-88

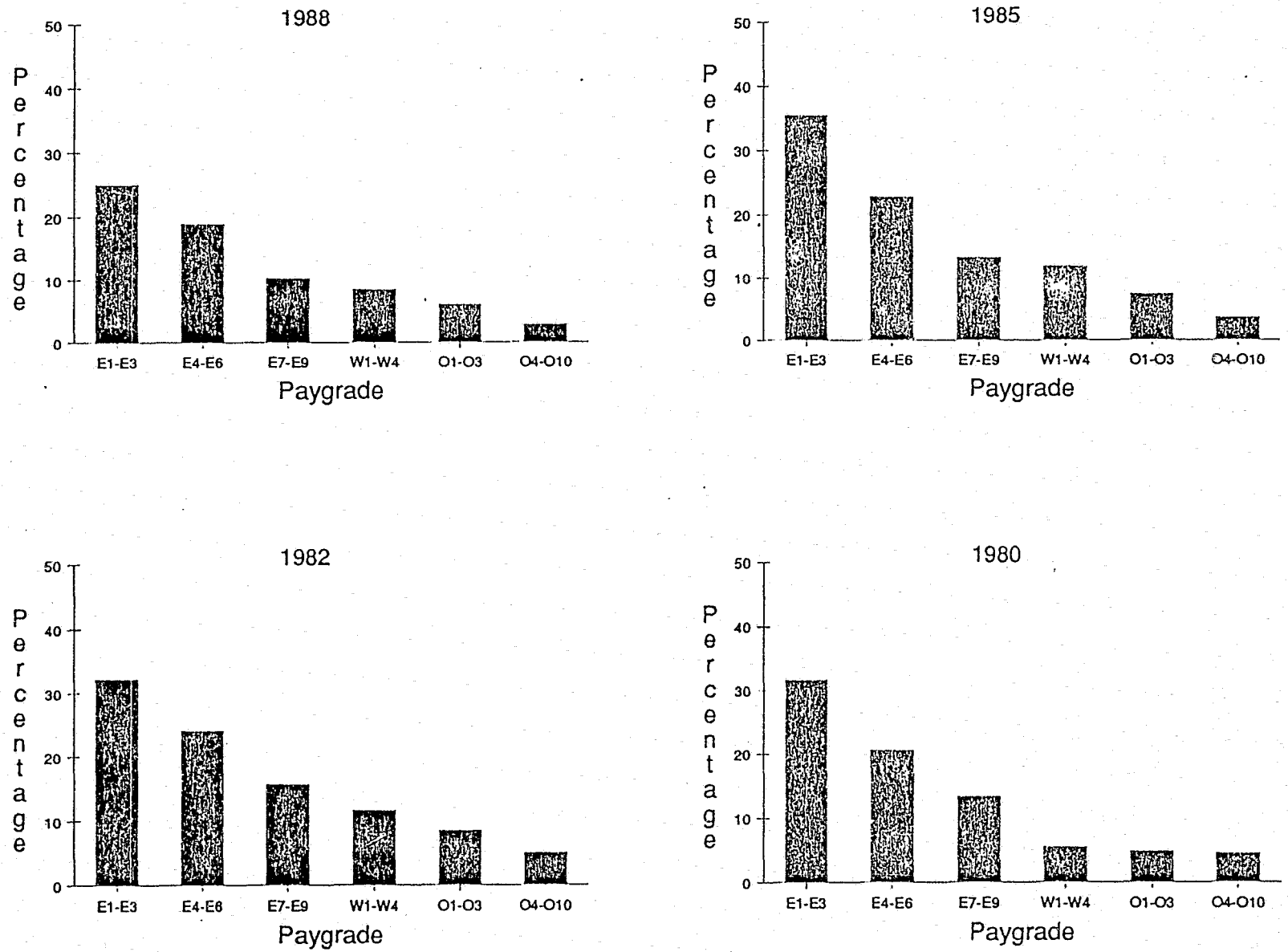
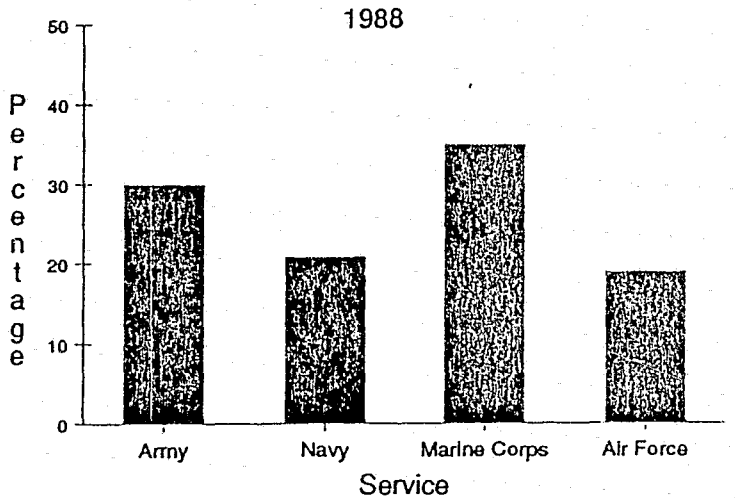
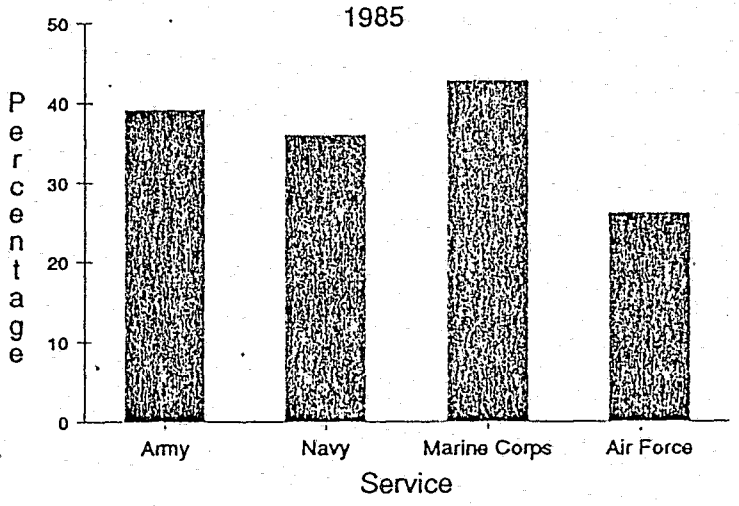
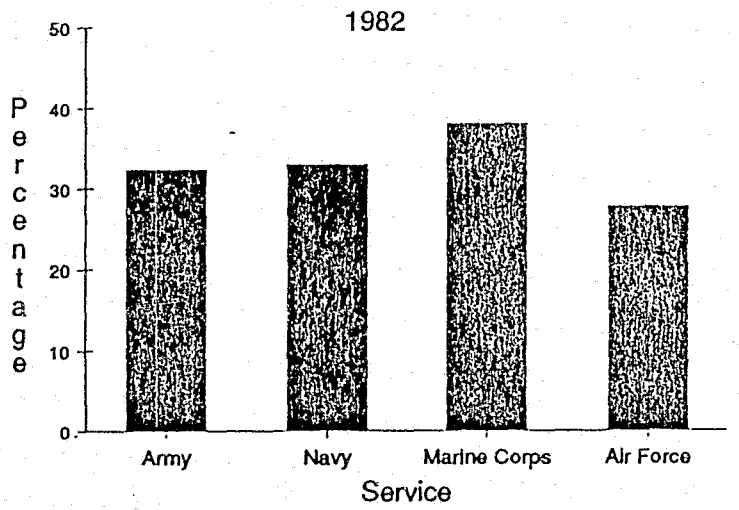


Figure 4.4 Heavy Alcohol Use for E1-E3s by Service, 1980-88







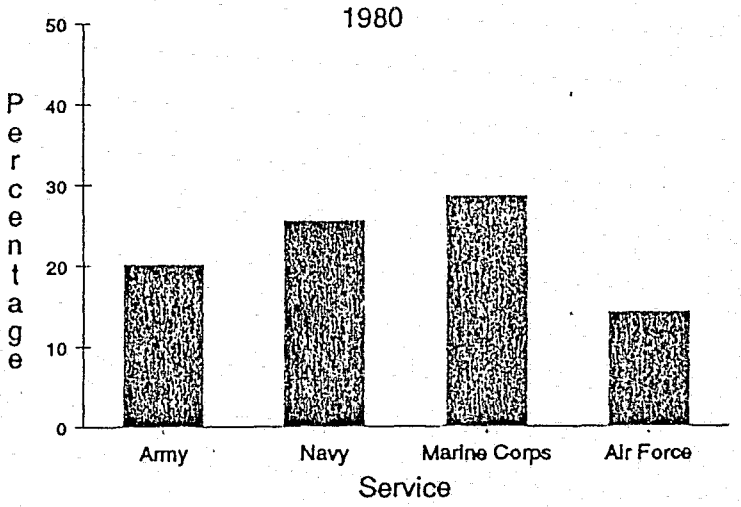


Table 3.1. Substance Use and Health Summary, 1980-1988 - Total DoD

Measure	Year of Survey			
	1980	1982	1985	1988
Alcohol Drinking Levels				
Abstainer	13.5 (0.5)[b,c]	11.8 (0.5)[d]	13.4 (0.6)[•]	17.2 (0.4)
Infrequent/Light	12.1 (0.4)[b,c]	17.6 (0.8)	16.6 (0.7)	17.5 (0.5)
Moderate	21.2 (0.7)[b]	17.0 (0.5)[d]	18.6 (0.6)	19.5 (0.5)
Moderate/Heavy	32.4 (0.6)[b,c]	29.6 (0.6)	28.5 (0.8)	28.8 (0.7)
Heavy	20.8 (1.1)[b,c]	24.1 (1.0)	22.9 (1.1)[•]	17.0 (0.9)
Any Drug Use[a]				
Past 30 Days	27.6 (1.5)[b,c]	19.0 (1.0)[d]	8.9 (0.8)[•]	4.8 (0.3)
Past 12 Months	38.7 (1.5)[b,c]	26.6 (1.0)[d]	13.4 (1.0)[•]	8.9 (0.8)
Cigarette Use, Past 30 Days	51.0 (0.8)[c]	51.4 (0.8)[d]	46.2 (1.0)[•]	40.9 (0.8)
Alcohol Use Negative Effects				
Serious Consequences	17.3 (1.1)[b,c]	14.6 (0.6)[d]	10.7 (0.9)	9.0 (0.6)
Productivity Loss	26.7 (1.2)[b,c]	34.4 (0.7)[d]	27.1 (1.1)[•]	22.1 (1.2)
Dependence	8.0 (0.6)[c]	9.0 (0.5)	7.7 (0.7)	6.4 (0.5)
Drug Use Negative Effects				
Serious Consequences	13.3 (1.0)[b,c]	6.2 (0.4)[d]	3.0 (0.4)[•]	1.8 (0.2)
Productivity Loss	14.4 (1.1)[b,c]	9.9 (0.5)[d]	3.4 (0.6)	2.1 (0.4)
Health Practices, Past 12 Months	- -	- -	3.79 (0.02)[•]	3.91 (0.04)

Note: Entries for health practices are mean values. Other entries are percentages with standard errors in parentheses. Serious consequences for alcohol and drugs are reported for the past 12 months.

[a]Any nonmedical use of marijuana, PCP, LSD/hallucinogens, cocaine, amphetamines/stimulants, tranquilizers, barbiturates/sedatives, heroin/other opiates, analgesics, or inhalants.

[b]Comparisons between 1980 and 1982 are statistically significant at the 95 percent confidence level.

[c]Comparisons between 1980 and 1988 are statistically significant at the 95 percent confidence level.

[d]Comparisons between 1982 and 1985 are statistically significant at the 95 percent confidence level.

[•]Comparisons between 1985 and 1988 are statistically significant at the 95 percent confidence level.

-Data are not available before 1985.

Table 3.2. Trends in Substance Use Past 30 Days, Unstandardized and Standardized by Sociodemographic Characteristics-Total DoD

Substance/Type of Estimate	Year of Survey			
	1980	1982	1985	1988
Heavy Alcohol Use				
Unstandardized	20.8 (1.1)[b,c]	24.1 (1.0)	22.9 (1.1)[e]	17.0 (0.9)
Standardized[a]	20.8 (1.1)[b]	26.4 (0.8)[d]	23.9 (0.8)[e]	19.3 (0.9)
Any Drug Use				
Unstandardized	27.6 (1.5)[b,c]	19.0 (1.0)[d]	8.9 (0.8)[e]	4.8 (0.3)
Standardized[a]	27.6 (1.5)[b,c]	18.2 (0.7)[d]	9.7 (0.6)[e]	5.6 (0.4)
Cigarette Use				
Unstandardized	51.0 (0.8)[c]	51.4 (0.8)[d]	46.2 (1.0)[e]	40.9 (0.8)
Standardized[a]	51.0 (0.8)[c]	52.0 (0.6)[d]	46.9 (0.8)[e]	42.9 (0.7)

Note: Estimates are percentages with standard errors in parentheses.

[a]Estimates have been standardized to the 1980 distribution by age, education, and marital status.

[b]Comparisons between 1980 and 1982 are statistically significant at the 95 percent confidence level.

[c]Comparisons between 1980 and 1988 are statistically significant at the 95 percent confidence level.

[d]Comparisons between 1982 and 1985 are statistically significant at the 95 percent confidence level.

[e]Comparisons between 1985 and 1988 are statistically significant at the 95 percent confidence level.

Table 4.3. Estimates of Alcohol Use, Unstandardized and Standardized by Sociodemographic Characteristics - 1988

	Service			
	Army	Navy	Marine Corps	Air Force
Average Daily Ounces of Ethanol				
Unstandardized	1.14 (Ø.Ø6)[b,c,d]	Ø.92 (Ø.Ø6)[c,d]	1.25 (Ø.13)[d]	Ø.72 (Ø.Ø3)
Standardized[a]	1.14 (Ø.Ø4)[b,c,d]	Ø.85 (Ø.Ø3)[c]	1.12 (Ø.11)[d]	Ø.84 (Ø.Ø3)
Heavy Drinkers				
Unstandardized	19.5 (1.1)[b,c,d]	14.6 (2.1)[c]	23.9 (3.9)[d]	14.5 (1.Ø)
Standardized[a]	19.4 (Ø.7)[b,c,d]	13.3 (Ø.3)[c,d]	2Ø.9 (Ø.3)[d]	16.8 (Ø.8)

Note: Entries for average daily ounces of ethanol are mean values, and heavy drinkers are percentages. Standard errors are in parentheses.

[a]Estimates have been standardized by age, education, and marital status to the DoD distribution.

[b]Estimate is significantly different from the Navy at the 95 percent confidence level.

[c]Estimate is significantly different from the Marine Corps at the 95 percent confidence level.

[d]Estimate is significantly different from the Air Force at the 95 percent confidence level.

Table D.1. Substance Use and Health Summary, 1980-1988 - Army

Measure	Year of Survey							
	1980		1982		1985		1988	
Drinking Levels								
Abstainer	15.5	(0.7)[b]	11.7	(0.5)[d]	14.9	(0.7)[e]	17.1	(0.7)
Infrequent/light	12.2	(0.9)[b,c]	16.7	(1.0)	16.6	(1.1)	16.8	(0.9)
Moderate	19.9	(1.2)[b]	16.6	(0.8)	17.6	(0.7)	19.5	(0.8)
Moderate/Heavy	32.0	(0.7)[c]	30.3	(1.0)[d]	25.6	(1.8)	27.1	(0.8)
Heavy	20.3	(1.6)[b]	24.7	(1.4)	25.2	(2.2)[e]	19.5	(1.1)
Any Drug Use[a]								
Past 30 Days	30.7	(2.8)[c,]	26.2	(1.8)[d]	11.5	(1.3)[e]	6.9	(0.7)
Past 12 Months	39.4	(2.9)[b,c]	32.4	(1.8)[d]	16.6	(1.3)[e]	11.8	(1.1)
Cigarettes Past 30 Days	54.8	(0.7)[c]	54.7	(1.8)	52.0	(1.8)	43.1	(1.1)
Alcohol Negative Effects								
Serious Consequences	17.9	(1.6)[c]	16.3	(1.2)	13.5	(2.0)	10.3	(0.8)
Productivity Loss	23.8	(1.3)[b]	33.1	(0.8)[d]	27.2	(1.3)[e]	22.0	(1.0)
Dependence	8.8	(1.0)	10.1	(0.8)	12.1	(1.5)[e]	7.2	(0.6)
Drug Use Negative Effects								
Serious Consequences	14.4	(1.4)[b,c]	8.3	(0.7)[d]	3.9	(0.7)	2.7	(0.4)
Productivity Loss	15.7	(1.7)[c]	13.1	(1.2)[d]	4.4	(0.8)[e]	2.4	(0.4)
Health Practices	-	-	-	-	3.82	(0.04)[e]	3.99	(0.02)

Note: Entries for health practices are mean values. Other entries are percentages with standard errors in parentheses. Serious consequences for alcohol and drugs are reported for the past 12 months.

[a]Any nonmedical use of marijuana, PCP, LSD/hallucinogens, cocaine, amphetamines/stimulants, tranquilizers, barbiturates/sedatives, heroin/other opiates, analgesics, or inhalants.

[b]Comparisons between 1980 and 1982 are statistically significant at the 95 percent confidence level.

[c]Comparisons between 1980 and 1988 are statistically significant at the 95 percent confidence level.

[d]Comparisons between 1982 and 1985 are statistically significant at the 95 percent confidence level.

[e]Comparisons between 1985 and 1988 are statistically significant at the 95 percent confidence level.

-Data for Health Practices and Number of Illnesses are not available before 1985.

Table D.2. Substance Use and Health Summary, 1980-1988 - Navy

Measure	Year of Survey			
	1980	1982	1985	1988
Drinking Levels				
Abstainer	10.0 (0.5)[c]	10.5 (1.4)	9.6 (0.8)[e]	15.7 (0.6)
Infrequent/light	11.7 (0.6)[b,c]	20.7 (2.3)	18.8 (2.0)	18.3 (0.9)
Moderate	20.5 (1.3)[b]	15.1 (1.1)[d]	18.7 (1.1)	20.9 (1.2)
Moderate/Heavy	32.2 (1.6)[b]	26.1 (1.5)	27.9 (1.4)	30.5 (1.6)
Heavy	25.6 (2.3)[c]	27.7 (2.9)	24.9 (1.4)[e]	14.6 (2.1)
Any Drug Use[a]				
Past 30 Days	33.7 (2.1)[b,c]	16.2 (2.2)[d]	10.3 (1.7)[e]	5.4 (0.7)
Past 12 Months	43.2 (2.1)[b,c]	28.1 (1.7)[d]	15.9 (2.3)	11.3 (2.1)
Cigarettes Past 30 Days	53.8 (1.2)[c]	55.4 (1.0)[d]	47.9 (1.2)	43.8 (1.8)
Alcohol Negative Effects				
Serious Consequences	22.1 (2.1)[c]	17.6 (1.4)	13.5 (2.0)	10.4 (1.5)
Productivity Loss	34.7 (2.1)[b,c]	41.8 (1.8)[d]	35.5 (2.4)[e]	26.4 (3.1)
Dependence	9.7 (1.0)	11.6 (1.0)[d]	8.8 (0.8)	7.2 (1.3)
Drug Use Negative Effects				
Serious Consequences	17.2 (2.1)[b,c]	7.4 (0.9)[d]	4.0 (1.0)	2.4 (0.5)
Productivity Loss	18.8 (2.0)[b,c]	11.3 (0.9)[d]	8.9 (1.1)	8.1 (1.3)
Health Practices	- -	- -	3.57 (0.03)	3.76 (0.10)

Note: Entries for health practices are mean values. Other entries are percentages with standard errors in parentheses. Serious consequences for alcohol and drugs are reported for the past 12 months.

[a]Any nonmedical use of marijuana, PCP, LSD/hallucinogens, cocaine, amphetamines/stimulants, tranquilizers, barbiturates/sedatives, heroin/other opiates, analgesics, or inhalants.

[b]Comparisons between 1980 and 1982 are statistically significant at the 95 percent confidence level.

[c]Comparisons between 1980 and 1988 are statistically significant at the 95 percent confidence level.

[d]Comparisons between 1982 and 1985 are statistically significant at the 95 percent confidence level.

[e]Comparisons between 1985 and 1988 are statistically significant at the 95 percent confidence level.

-Data for Health Practices and Number of Illnesses are not available before 1985.

Table D.3. Substance Use and Health Summary, 1980-1988 - Marine Corps

Measure	Year of Survey							
	1980		1982		1985		1988	
Drinking Levels								
Abstainer	10.4	(1.0)[c]	13.5	(2.0)	10.8	(2.5)[e]	18.0	(0.9)
Infrequent/light	11.0	(0.5)	13.2	(1.8)	13.6	(1.7)	15.9	(3.2)
Moderate	17.6	(1.2)[b,c]	14.9	(0.3)	15.1	(2.1)	14.0	(1.1)
Moderate/Heavy	32.3	(1.4)	27.8	(0.7)	31.1	(1.8)	28.2	(1.7)
Heavy	28.6	(2.5)[c]	30.6	(0.9)	29.4	(3.7)	23.9	(3.9)
Any Drug Use[a]								
Past 30 Days	37.7	(3.0)[b,c]	20.6	(2.0)[d]	9.9	(3.2)	4.0	(0.7)
Past 12 Months	48.0	(3.1)[b,c]	29.9	(3.2)[d]	14.7	(3.8)	7.8	(1.0)
Cigarettes Past 30 Days	53.4	(0.6)[b,c]	48.7	(0.4)[d]	42.6	(3.1)	41.3	(1.8)
Alcohol Negative Effects								
Serious Consequences	26.2	(2.2)[b,c]	19.7	(1.0)[d]	12.3	(1.7)	17.0	(3.4)
Productivity Loss	34.1	(1.6)	37.6	(1.2)	29.0	(5.0)	32.0	(3.8)
Dependence	11.8	(1.2)	10.2	(1.8)	7.6	(1.4)	9.8	(1.7)
Drug Use Negative Effects								
Serious Consequences	19.4	(2.1)[b,c]	7.2	(1.1)	3.9	(2.2)	1.9	(0.5)
Productivity Loss	20.8	(2.1)[b,c]	8.9	(0.8)	4.3	(3.0)	3.0	(0.9)
Health Practices	-	-	-	-	3.83	(0.09)	3.92	(0.06)

Note: Entries for health practices are mean values. Other entries are percentages with standard errors in parentheses. Serious consequences for alcohol and drugs are reported for the past 12 months.

[a]Any nonmedical use of marijuana, PCP, LSD/hallucinogens, cocaine, amphetamines/stimulants, tranquilizers, barbiturates/sedatives, heroin/other opiates, analgesics, or inhalants.

[b]Comparisons between 1980 and 1982 are statistically significant at the 95 percent confidence level.

[c]Comparisons between 1980 and 1988 are statistically significant at the 95 percent confidence level.

[d]Comparisons between 1982 and 1985 are statistically significant at the 95 percent confidence level.

[e]Comparisons between 1985 and 1988 are statistically significant at the 95 percent confidence level.

-Data for Health Practices and Number of Illnesses are not available before 1985.

Table D.4. Substance Use and Health Summary, 1980-1988 - Air Force

Measure	Year of Survey			
	1980	1982	1985	1988
Drinking Levels				
Abstainer	15.0 (1.0)[c]	12.6 (0.7)[d]	15.8 (1.0)[e]	18.5 (0.8)
Infrequent/light	12.6 (0.5)[b,c]	17.3 (0.8)	15.4 (0.8)[e]	18.2 (0.8)
Moderate	24.9 (1.2)[b,c]	19.8 (0.7)	20.8 (1.2)	19.7 (0.8)
Moderate/Heavy	33.2 (0.9)[c]	32.6 (0.8)	31.5 (1.1)	29.2 (1.1)
Heavy	14.3 (1.4)	17.7 (1.2)	16.4 (1.4)	14.5 (1.0)
Any Drug Use[a]				
Past 30 Days	14.5 (1.1)[c]	11.9 (1.5)[d]	4.5 (0.8)[e]	2.1 (0.4)
Past 12 Months	23.4 (1.7)[b,c]	16.4 (1.8)[d]	7.2 (0.9)[e]	3.8 (0.6)
Cigarettes Past 30 Days	43.2 (1.8)	44.1 (1.6)	39.0 (2.3)	35.8 (1.2)
Alcohol Negative Effects				
Serious Consequences	9.0 (0.8)[c]	8.0 (0.8)	4.7 (0.5)	3.9 (0.5)
Productivity Loss	20.7 (1.2)[b,c]	28.0 (2.7)	19.4 (1.1)[e]	15.5 (0.8)
Dependence	4.3 (0.6)	3.7 (0.7)	3.3 (0.5)	3.8 (0.4)
Drug Use Negative Effects				
Serious Consequences	6.1 (0.6)[b,c]	2.2 (0.3)	0.9 (0.2)[e]	0.3 (0.1)
Productivity Loss	6.4 (0.7)[b,c]	4.5 (0.5)[d]	1.5 (0.7)	0.4 (0.1)
Health Practices	- -	- -	3.95 (0.06)	3.95 (0.03)

Note: Entries for health practices are mean values. Other entries are percentages with standard errors in parentheses. Serious consequences for alcohol and drugs are reported for the past 12 months.

[a]Any nonmedical use of marijuana, PCP, LSD/hallucinogens, cocaine, amphetamines/stimulants, tranquilizers, barbiturates/sedatives, heroin/other opiates, analgesics, or inhalants.

[b]Comparisons between 1980 and 1982 are statistically significant at the 95 percent confidence level.

[c]Comparisons between 1980 and 1988 are statistically significant at the 95 percent confidence level.

[d]Comparisons between 1982 and 1985 are statistically significant at the 95 percent confidence level.

[e]Comparisons between 1985 and 1988 are statistically significant at the 95 percent confidence level.

-Data for Health Practices and Number of Illnesses are not available before 1985.

Table D.6a. 1988 (New) Drinking Levels by Sociodemographic Characteristics--Total DoD

	Drinking Levels									
	Abstainer		Infrequent/ Light		Moderate		Moderate/ Heavy		Heavy	
Sex										
Male	16.3	(0.4)	16.3	(0.5)	19.5	(0.6)	29.6	(0.7)	18.3	(1.0)
Female	24.7	(1.9)	26.9	(1.9)	19.0	(1.4)	22.4	(1.7)	7.1	(1.1)
Race/Ethnicity										
White	15.5	(0.6)	17.5	(0.5)	19.8	(0.6)	29.4	(0.9)	17.7	(1.0)
Black	22.4	(1.3)	15.7	(0.9)	17.7	(1.1)	29.5	(1.3)	14.7	(1.0)
Hispanic	18.0	(1.5)	21.1	(2.2)	19.7	(1.1)	24.5	(2.3)	16.7	(2.0)
Other	21.7	(1.9)	18.9	(1.8)	21.0	(2.1)	22.4	(1.9)	16.0	(2.5)
Education										
< High school	13.6	(4.1)	15.4	(4.0)	13.6	(5.1)	29.3	(6.7)	28.1	(6.3)
High school grad	16.8	(0.7)	15.6	(0.7)	17.3	(0.6)	26.5	(1.3)	23.9	(1.8)
Some college	18.8	(1.0)	18.6	(0.5)	19.3	(1.0)	28.8	(0.7)	14.6	(0.8)
College grad	15.3	(0.7)	19.8	(1.2)	24.7	(1.1)	33.8	(1.6)	6.4	(0.5)
Age										
17-20	17.8	(1.7)	14.9	(1.4)	18.4	(2.4)	25.3	(1.9)	23.6	(2.4)
21-25	12.9	(0.6)	15.1	(1.1)	18.0	(0.8)	30.2	(1.6)	23.9	(1.6)
26-30	17.8	(0.8)	19.3	(1.1)	19.4	(1.0)	27.8	(1.1)	15.7	(1.0)
31-35	20.0	(1.0)	19.7	(0.9)	20.3	(0.8)	29.6	(1.2)	10.3	(0.8)
36 or older	20.8	(0.8)	19.5	(0.7)	22.1	(0.9)	29.6	(0.8)	8.0	(0.5)
Family Status										
Not married	14.7	(0.7)	13.9	(0.7)	16.5	(0.8)	30.0	(1.4)	24.8	(2.2)
Married, spouse not present	16.3	(1.6)	17.3	(1.8)	20.3	(1.9)	30.3	(2.4)	15.9	(2.2)
Married, spouse present	19.1	(0.5)	20.1	(0.7)	21.5	(0.6)	27.7	(0.5)	11.6	(0.6)
Pay Grade										
E1-E3	16.4	(1.1)	14.6	(1.1)	16.3	(1.1)	27.7	(1.7)	25.1	(2.3)
E4-E6	17.7	(0.7)	17.6	(0.7)	18.7	(0.7)	27.0	(0.9)	19.0	(1.0)
E7-E9	22.2	(0.7)	19.9	(0.8)	19.1	(0.7)	28.6	(0.8)	10.3	(0.6)
W1-W4	21.2	(2.6)	22.2	(2.2)	20.2	(1.6)	28.0	(1.8)	8.5	(1.5)
O1-O3	13.0	(1.1)	18.7	(1.7)	28.0	(1.8)	36.2	(2.7)	6.1	(0.6)
O4-O10	13.7	(1.0)	20.0	(1.2)	27.4	(1.2)	36.1	(1.5)	2.9	(0.6)
Time on Active Duty										
1 Year or less	18.6	(2.8)	13.1	(1.7)	17.7	(1.7)	29.1	(2.4)	21.4	(2.4)
>1-2 Years	18.2	(1.4)	15.1	(1.3)	16.8	(1.3)	25.2	(1.6)	24.7	(1.8)
>2-3 Years	12.8	(1.2)	15.9	(2.1)	17.4	(2.0)	29.8	(2.9)	24.1	(2.4)
>3-4 Years	14.4	(1.7)	13.0	(1.8)	19.7	(2.0)	32.2	(2.2)	20.6	(2.5)
>4-9 Years	15.3	(0.6)	19.2	(0.8)	19.9	(0.8)	28.6	(1.0)	17.0	(1.1)
>9 Years	20.4	(0.6)	19.3	(0.5)	21.1	(0.6)	29.1	(0.6)	10.1	(0.6)
Region										
Americas	18.4	(0.5)	18.6	(0.7)	19.7	(0.6)	28.1	(0.9)	15.2	(1.1)
North Pacific	15.0	(1.1)	15.7	(1.6)	17.7	(0.9)	30.0	(1.1)	21.6	(2.5)
Other Pacific	16.3	(1.6)	15.2	(1.4)	18.3	(1.7)	28.3	(0.8)	22.0	(3.6)
Europe	13.6	(1.2)	14.4	(1.2)	19.2	(1.1)	31.3	(0.7)	21.6	(0.9)
Total	17.2	(0.4)	17.5	(0.5)	19.5	(0.5)	28.8	(0.7)	17.0	(0.9)

Note: Drinking Level values are row percentages. Drinking levels are based on quantity and frequency data during the past 30 days for the respondents' primary beverage. Abstainers drink once a year or less. Those in the Infrequent/Light category drink 1-4 drinks 1-3 times/month. Those in the Moderate category drink (a) 1 drink at least once/week, (b) 2-4 drinks 2-3 times/month, or (c) ≥5 drinks once/month or less. Those in the Moderate/Heavy category drink 2-4 drinks at least once/week, or ≥5 drinks 2-3 times/month. Those in the Heavy category drink ≥5 drinks at least once/week.

Table D.6b. 1985 (New) Drinking Levels by Sociodemographic Characteristics--Total DoD

	Drinking Levels									
	Abstainer		Infrequent/ Light		Moderate		Moderate/ Heavy		Heavy	
Sex										
Male	13.0	(0.6)	15.7	(0.8)	18.0	(0.6)	28.9	(0.9)	24.4	(1.1)
Female	18.2	(1.9)	24.9	(1.8)	24.7	(1.8)	23.9	(2.1)	8.3	(1.4)
Race/Ethnicity										
White	12.0	(0.5)	15.9	(1.1)	18.6	(0.8)	29.0	(0.8)	24.5	(1.3)
Black	18.8	(1.7)	16.5	(1.1)	19.1	(1.7)	30.2	(1.7)	15.5	(1.2)
Hispanic	12.9	(1.8)	20.8	(2.4)	16.4	(1.6)	23.4	(2.1)	26.6	(2.9)
Other	18.1	(2.2)	21.3	(2.5)	21.1	(4.2)	20.4	(2.6)	19.1	(3.7)
Education										
< High school	11.1	(5.5)	20.8	(5.5)	14.6	(3.9)	15.5	(4.1)	38.0	(4.5)
High school grad	12.0	(0.9)	16.3	(1.3)	15.6	(0.9)	25.8	(1.1)	30.2	(1.5)
Some college	15.4	(0.8)	18.5	(0.8)	19.2	(0.9)	29.1	(1.3)	19.8	(1.0)
College grad	13.7	(0.9)	17.0	(0.9)	26.3	(1.0)	36.0	(1.6)	7.0	(0.6)
Age										
17-20	10.5	(1.3)	16.5	(2.1)	14.5	(1.6)	19.9	(2.0)	38.6	(3.1)
21-25	10.2	(1.0)	15.9	(1.4)	17.1	(1.0)	28.9	(1.4)	28.0	(1.3)
26-30	15.3	(1.0)	16.0	(1.0)	20.5	(1.2)	31.8	(1.3)	16.4	(1.0)
31-35	17.9	(1.6)	18.9	(1.2)	20.4	(0.9)	29.5	(1.2)	13.4	(1.3)
36 or older	18.4	(1.0)	16.8	(0.7)	23.0	(0.8)	32.2	(1.2)	9.6	(0.6)
Family Status										
Not married	9.7	(0.8)	14.3	(1.4)	15.6	(1.0)	27.1	(1.3)	33.3	(1.9)
Married, spouse not present	12.1	(1.4)	18.4	(2.8)	15.7	(1.5)	28.4	(2.0)	25.5	(3.1)
Married, spouse present	17.0	(0.8)	18.3	(0.6)	21.7	(0.7)	29.7	(1.0)	13.3	(0.6)
Pay Grade										
E1-E3	9.6	(1.1)	16.2	(1.3)	16.0	(1.6)	23.0	(1.5)	35.3	(2.6)
E4-E6	14.7	(0.7)	16.6	(1.2)	17.7	(0.7)	28.1	(1.0)	22.8	(0.9)
E7-E9	19.3	(1.0)	17.4	(0.7)	19.4	(0.8)	30.7	(1.0)	13.3	(0.7)
W1-W4	16.1	(1.6)	16.2	(2.1)	21.4	(1.8)	34.4	(1.9)	11.9	(2.0)
O1-O3	13.6	(1.6)	17.3	(1.5)	24.9	(1.2)	36.8	(2.6)	7.4	(0.7)
O4-O10	9.5	(1.0)	15.6	(1.0)	29.6	(1.5)	41.7	(1.9)	3.6	(0.5)
Time on Active Duty										
1 Year or less	9.3	(1.5)	19.3	(3.1)	16.2	(2.4)	24.1	(2.3)	31.1	(4.3)
>1-2 Years	10.7	(1.3)	14.4	(1.1)	17.7	(1.8)	22.6	(2.4)	34.7	(2.6)
>2-3 Years	13.0	(2.1)	16.5	(2.6)	14.4	(1.5)	25.0	(2.0)	31.2	(2.5)
>3-4 Years	9.6	(2.1)	13.3	(2.8)	18.8	(2.4)	26.7	(2.7)	31.6	(3.0)
>4-9 Years	14.5	(0.9)	16.7	(0.8)	19.3	(1.0)	32.2	(1.3)	17.4	(0.9)
>9 Years	17.1	(0.7)	17.6	(0.7)	21.4	(0.6)	31.8	(1.1)	12.1	(0.6)
Region										
Americas	14.1	(0.7)	17.0	(1.0)	19.0	(0.7)	27.3	(0.9)	22.6	(1.3)
North Pacific	12.3	(0.8)	15.2	(1.6)	16.1	(1.3)	28.1	(1.2)	28.2	(2.4)
Other Pacific	11.6	(1.9)	15.3	(0.6)	17.5	(1.3)	32.2	(2.0)	23.4	(3.0)
Europe	11.3	(0.8)	15.3	(1.0)	17.8	(0.8)	32.9	(2.8)	22.7	(2.9)
Total	13.4	(0.6)	16.6	(0.7)	18.6	(0.6)	28.5	(0.8)	22.9	(1.1)

Note: Drinking Level values are row percentages. Drinking levels are based on quantity and frequency data during the past 30 days for the respondents' primary beverage. Abstainers drink once a year or less. Those in the Infrequent/Light category drink 1-4 drinks 1-3 times/month. Those in the Moderate category drink (a) 1 drink at least once/week, (b) 2-4 drinks 2-3 times/month, or (c) ≥5 drinks once/month or less. Those in the Moderate/Heavy category drink 2-4 drinks at least once/week, or ≥5 drinks 2-3 times/month. Those in the Heavy category drink ≥5 drinks at least once/week.

Table D.8c. 1982 (New) Drinking Levels by Sociodemographic Characteristics--Total DoD

	Drinking Levels									
	Abstainer		Infrequent/ Light		Moderate		Moderate/ Heavy		Heavy	
Sex										
Male	11.4	(Ø.5)	16.8	(Ø.7)	16.5	(Ø.4)	29.9	(Ø.6)	25.4	(1.Ø)
Female	15.4	(1.2)	26.1	(2.4)	21.6	(1.8)	25.9	(1.5)	11.Ø	(Ø.7)
Race/Ethnicity										
White	11.Ø	(Ø.6)	16.9	(Ø.8)	17.Ø	(Ø.5)	29.6	(Ø.8)	25.5	(1.1)
Black	13.9	(1.1)	19.1	(1.3)	17.4	(1.Ø)	31.6	(1.4)	18.Ø	(1.3)
Hispanic	11.9	(1.Ø)	19.Ø	(2.Ø)	14.3	(1.2)	27.4	(2.Ø)	27.5	(1.7)
Other	14.7	(1.2)	20.8	(1.9)	18.5	(1.9)	26.1	(1.7)	19.9	(1.6)
Education										
< High school	7.2	(1.3)	14.8	(1.4)	1Ø.3	(1.4)	25.Ø	(2.4)	42.7	(2.Ø)
High school grad	11.1	(Ø.8)	17.9	(1.2)	14.8	(Ø.6)	27.Ø	(Ø.7)	29.2	(1.5)
Some college	13.3	(Ø.5)	18.1	(Ø.6)	17.7	(Ø.6)	29.6	(Ø.8)	21.3	(Ø.8)
College grad	11.1	(Ø.5)	16.9	(1.Ø)	24.Ø	(1.Ø)	38.9	(1.4)	9.2	(Ø.7)
Age										
17-2Ø	1Ø.2	(Ø.9)	18.4	(1.9)	13.5	(Ø.7)	24.9	(1.Ø)	33.Ø	(2.4)
21-25	1Ø.2	(Ø.5)	16.8	(Ø.7)	15.8	(Ø.7)	29.2	(Ø.8)	27.9	(1.2)
26-3Ø	13.1	(Ø.8)	18.Ø	(1.1)	19.4	(Ø.7)	3Ø.4	(1.Ø)	19.Ø	(Ø.7)
31-35	14.2	(1.1)	18.6	(1.Ø)	19.9	(1.2)	33.1	(1.1)	14.2	(Ø.9)
36 or older	15.1	(1.1)	17.1	(1.2)	2Ø.3	(1.1)	35.1	(1.7)	12.4	(1.1)
Family Status										
Not married	9.Ø	(Ø.6)	16.Ø	(1.2)	14.2	(Ø.5)	28.2	(Ø.8)	32.6	(1.6)
Married, spouse not present	15.1	(Ø.7)	19.3	(Ø.8)	2Ø.3	(Ø.7)	31.Ø	(Ø.7)	14.2	(Ø.6)
Married, spouse present	9.2	(1.Ø)	18.2	(1.7)	15.1	(1.6)	3Ø.4	(1.8)	27.Ø	(1.8)
Pay Grade										
E1-E3	9.7	(Ø.8)	18.5	(1.7)	14.2	(Ø.7)	25.4	(1.Ø)	32.3	(2.1)
E4-E6	13.Ø	(Ø.7)	17.4	(Ø.8)	16.2	(Ø.5)	29.2	(Ø.6)	24.2	(Ø.8)
E7-E9	16.6	(1.1)	17.6	(1.1)	19.6	(1.5)	3Ø.4	(1.5)	15.8	(Ø.9)
W1-W4	17.1	(4.7)	12.2	(2.4)	28.3	(5.6)	3Ø.7	(3.4)	11.7	(3.6)
O1-O3	9.8	(1.Ø)	17.9	(1.5)	25.7	(1.7)	38.1	(2.4)	8.5	(Ø.9)
O4-O1Ø	8.3	(1.1)	13.4	(2.2)	23.5	(1.4)	49.8	(2.9)	5.Ø	(1.1)
Time on Active Duty										
1 Year or less	11.Ø	(1.1)	22.2	(2.3)	15.8	(1.3)	25.1	(1.6)	25.9	(2.7)
>1-2 Years	9.Ø	(Ø.8)	15.6	(Ø.8)	14.6	(1.Ø)	28.9	(1.2)	33.9	(1.6)
>2-3 Years	1Ø.1	(Ø.9)	15.Ø	(Ø.9)	15.4	(Ø.9)	26.8	(1.3)	32.7	(1.5)
>3-4 Years	11.8	(Ø.7)	16.9	(1.5)	15.2	(1.Ø)	29.3	(1.Ø)	26.8	(1.2)
>4-9 Years	11.5	(Ø.7)	17.3	(Ø.9)	18.4	(Ø.8)	32.Ø	(Ø.9)	2Ø.8	(1.1)
>9 Years	14.8	(1.Ø)	17.9	(Ø.6)	19.3	(Ø.9)	33.7	(1.3)	14.3	(Ø.9)
Region										
Americas	12.3	(Ø.6)	18.7	(1.Ø)	17.1	(Ø.6)	28.8	(Ø.7)	22.9	(1.2)
North Pacific	1Ø.5	(Ø.5)	14.5	(Ø.9)	15.1	(Ø.9)	29.7	(1.2)	3Ø.2	(2.1)
Other Pacific	9.3	(Ø.6)	13.6	(Ø.7)	16.9	(Ø.6)	32.6	(1.2)	27.5	(2.3)
Europe	9.9	(Ø.6)	14.2	(Ø.6)	16.6	(Ø.6)	32.3	(Ø.9)	27.Ø	(1.4)
Total	11.8	(Ø.5)	17.6	(Ø.8)	17.Ø	(Ø.5)	29.6	(Ø.6)	24.1	(1.Ø)

Note: Drinking Level values are row percentages. Drinking levels are based on quantity and frequency data during the past 3Ø days for the respondents' primary beverage. Abstainers drink once a year or less. Those in the Infrequent/Light category drink 1-4 drinks 1-3 times/month. Those in the Moderate category drink (a) 1 drink at least once/week, (b) 2-4 drinks 2-3 times/month, or (c) ≥5 drinks once/month or less. Those in the Moderate/Heavy category drink 2-4 drinks at least once/week, or ≥5 drinks 2-3 times/month. Those in the Heavy category drink ≥5 drinks at least once/week.

Table D.7a. 1988 (New) Drinking Levels by Sociodemographic Characteristics--Army

	Drinking Levels									
	Abstainer		Infrequent/ Light		Moderate		Moderate/ Heavy		Heavy	
Sex										
Male	15.1	(0.7)	15.6	(0.8)	19.7	(0.8)	28.2	(0.7)	21.4	(1.2)
Female	32.6	(3.8)	25.9	(3.3)	18.0	(1.6)	18.5	(3.3)	5.0	(1.2)
Race/Ethnicity										
White	14.4	(0.9)	16.9	(1.2)	21.0	(0.9)	27.3	(0.8)	20.3	(1.8)
Black	21.4	(1.9)	15.3	(1.2)	16.3	(1.2)	28.8	(2.0)	18.1	(1.4)
Hispanic	20.8	(2.3)	19.3	(2.0)	20.2	(1.7)	22.0	(2.7)	17.7	(1.6)
Other	16.8	(3.4)	19.1	(2.6)	18.4	(3.0)	22.4	(2.7)	21.4	(3.0)
Education										
< High school	18.8	(8.7)	22.2	(9.1)	16.6	(10.0)	17.1	(7.0)	25.3	(9.4)
High school grad	16.7	(1.2)	13.3	(0.9)	16.6	(1.0)	25.5	(1.0)	27.9	(1.1)
Some college	18.6	(1.0)	19.1	(0.9)	19.0	(1.0)	27.7	(1.3)	15.7	(1.6)
College grad	15.5	(1.1)	20.9	(1.8)	27.7	(1.8)	30.3	(1.8)	5.7	(0.8)
Age										
17-20	17.2	(2.3)	15.8	(2.4)	18.4	(1.7)	21.6	(2.6)	27.0	(2.4)
21-25	13.5	(1.3)	14.0	(1.5)	15.5	(1.5)	27.0	(1.5)	30.0	(1.4)
26-30	16.4	(1.2)	16.8	(1.4)	21.0	(1.2)	28.6	(1.3)	17.2	(1.6)
31-35	20.0	(1.4)	18.8	(1.7)	21.5	(1.7)	28.6	(2.1)	11.0	(1.4)
36 or older	20.8	(1.5)	19.9	(1.0)	23.0	(1.3)	28.1	(1.3)	8.2	(0.8)
Family Status										
Not married	14.6	(1.3)	13.4	(1.1)	15.6	(0.8)	28.1	(1.7)	28.4	(1.5)
Married, spouse not present	20.1	(2.6)	13.4	(2.3)	19.0	(2.1)	24.9	(1.8)	22.6	(3.2)
Married, spouse present	18.5	(0.7)	19.5	(1.3)	22.3	(1.0)	26.6	(1.0)	13.1	(1.2)
Pay Grade										
E1-E3	16.4	(3.1)	14.0	(2.7)	15.1	(1.5)	24.5	(3.1)	30.0	(2.0)
E4-E6	16.8	(0.6)	15.5	(1.1)	18.1	(1.2)	28.4	(0.8)	23.3	(1.2)
E7-E9	23.8	(1.2)	19.9	(1.2)	19.0	(0.9)	28.0	(1.4)	9.3	(1.0)
W1-W4	19.7	(3.1)	21.8	(2.8)	21.5	(1.8)	29.2	(2.0)	7.8	(1.8)
O1-O3	13.9	(1.7)	19.6	(2.5)	30.7	(3.3)	30.3	(3.1)	5.4	(1.2)
O4-O10	12.9	(1.6)	23.5	(2.1)	27.3	(1.8)	32.9	(1.8)	3.4	(1.1)
Time on Active Duty										
1 Year or less	24.6	(3.5)	12.7	(2.6)	16.8	(2.2)	24.4	(2.6)	21.5	(3.6)
>1-2 Years	14.1	(2.3)	16.2	(2.4)	17.7	(2.5)	23.2	(3.0)	28.8	(2.8)
>2-3 Years	11.0	(1.8)	12.1	(2.2)	14.5	(3.0)	29.0	(2.9)	33.4	(2.1)
>3-4 Years	17.2	(3.6)	17.3	(3.9)	19.8	(4.2)	24.7	(2.8)	21.1	(3.2)
>4-9 Years	15.8	(0.8)	16.9	(1.3)	19.6	(1.7)	28.0	(1.4)	19.7	(1.5)
>9 Years	19.5	(1.1)	19.2	(0.7)	22.4	(1.2)	28.4	(1.2)	10.6	(0.9)
Region										
Americas	19.2	(0.7)	19.2	(1.2)	20.2	(1.0)	26.0	(1.1)	15.4	(1.7)
North Pacific	12.2	(3.1)	13.0	(1.1)	20.4	(2.4)	29.1	(0.3)	25.4	(6.8)
Other Pacific	19.2	(1.8)	17.4	(4.6)	19.2	(4.1)	23.6	(1.4)	20.6	(8.4)
Europe	13.9	(1.8)	12.9	(1.4)	18.3	(1.5)	29.0	(1.0)	26.0	(1.1)
Total	17.1	(0.7)	16.8	(0.9)	19.5	(0.8)	27.1	(0.8)	19.5	(1.1)

Note: Drinking Level values are row percentages. Drinking levels are based on quantity and frequency data during the past 30 days for the respondents' primary beverage. Abstainers drink once a year or less. Those in the Infrequent/Light category drink 1-4 drinks 1-3 times/month. Those in the Moderate category drink (a) 1 drink at least once/week, (b) 2-4 drinks 2-3 times/month, or (c) ≥5 drinks once/month or less. Those in the Moderate/Heavy category drink 2-4 drinks at least once/week, or ≥5 drinks 2-3 times/month. Those in the Heavy category drink ≥5 drinks at least once/week.

Table D.7b. 1985 (New) Drinking Levels by Sociodemographic Characteristics--Army

	Drinking Levels									
	Abstainer		Infrequent/ Light		Moderate		Moderate/ Heavy		Heavy	
Sex										
Male	14.0	(0.7)	16.0	(1.2)	17.0	(0.7)	26.3	(2.0)	26.7	(2.3)
Female	23.9	(4.7)	23.8	(3.7)	25.0	(3.9)	18.5	(3.3)	8.9	(2.7)
Race/Ethnicity										
White	13.2	(0.7)	15.3	(1.4)	18.2	(0.9)	24.2	(1.8)	29.2	(2.9)
Black	20.7	(2.6)	17.3	(1.4)	16.4	(1.3)	30.5	(3.0)	15.2	(1.5)
Hispanic	12.9	(1.9)	22.4	(4.1)	14.0	(1.9)	23.8	(2.8)	26.9	(3.2)
Other	10.5	(2.8)	19.5	(5.0)	25.7	(10.3)	24.2	(5.0)	20.1	(6.7)
Education										
< High school	14.2	(9.3)	17.2	(8.7)	14.0	(5.5)	12.9	(5.4)	41.7	(5.4)
High school grad	12.7	(0.9)	17.1	(2.0)	14.1	(1.1)	23.3	(2.0)	32.8	(2.8)
Some college	17.9	(1.4)	15.8	(1.1)	18.6	(1.5)	27.6	(2.7)	20.1	(2.3)
College grad	16.3	(2.1)	16.4	(1.7)	27.8	(2.4)	31.5	(2.2)	8.0	(0.8)
Age										
17-20	12.3	(1.7)	19.4	(4.2)	10.5	(1.3)	17.4	(3.7)	40.5	(6.1)
21-25	12.2	(2.0)	16.1	(1.8)	17.0	(1.3)	26.2	(2.6)	28.5	(2.0)
26-30	13.7	(1.1)	15.3	(1.7)	20.2	(2.0)	29.6	(2.2)	21.1	(2.0)
31-35	21.9	(3.4)	16.5	(1.7)	19.8	(2.0)	26.9	(2.3)	14.9	(2.0)
36 or older	19.1	(1.6)	15.8	(1.1)	23.9	(1.7)	29.8	(2.2)	11.4	(1.0)
Family Status										
Not married	11.1	(1.2)	14.7	(2.2)	14.8	(1.3)	24.8	(2.8)	34.8	(3.7)
Married, spouse not present	10.4	(2.1)	15.7	(2.3)	16.8	(2.0)	25.4	(3.0)	32.0	(5.5)
Married, spouse present	18.9	(1.3)	18.5	(1.0)	20.5	(1.2)	26.5	(1.7)	15.7	(0.9)
Pay Grade										
E1-E3	10.0	(1.5)	18.0	(3.3)	15.8	(2.5)	17.0	(3.0)	39.2	(5.9)
E4-E6	16.3	(1.0)	16.3	(1.2)	16.0	(1.3)	25.8	(1.8)	25.7	(1.6)
E7-E9	21.4	(2.0)	16.2	(0.8)	17.3	(1.1)	30.3	(2.0)	14.8	(1.6)
W1-W4	15.6	(1.9)	16.4	(2.7)	22.5	(2.2)	34.0	(2.3)	11.5	(2.5)
O1-O3	13.9	(2.4)	16.1	(2.6)	24.9	(2.6)	36.2	(2.5)	8.8	(1.1)
O4-O10	10.7	(1.9)	14.9	(1.4)	32.4	(3.1)	37.2	(3.4)	4.8	(0.8)
Time on Active Duty										
1 Year or less	10.9	(2.6)	23.8	(6.0)	13.8	(2.9)	18.9	(3.9)	32.6	(8.4)
>1-2 Years	12.0	(2.4)	13.3	(1.8)	18.2	(3.5)	19.0	(3.6)	37.4	(4.7)
>2-3 Years	17.0	(4.1)	13.6	(3.0)	13.7	(2.2)	23.3	(2.4)	32.3	(3.8)
>3-4 Years	12.3	(3.5)	14.4	(2.9)	12.2	(3.7)	26.8	(3.9)	34.3	(6.8)
>4-9 Years	14.6	(1.3)	17.3	(1.6)	17.8	(1.4)	31.5	(1.7)	18.9	(1.5)
>9 Years	18.5	(1.3)	16.1	(1.0)	22.3	(1.5)	28.6	(2.1)	14.5	(1.2)
Region										
Americas	16.2	(0.9)	17.6	(1.6)	18.4	(0.8)	22.7	(1.8)	25.1	(2.8)
North Pacific	11.2	(1.7)	11.0	(0.8)	12.7	(3.8)	29.2	(2.8)	35.9	(0.1)
Other Pacific	11.9	(2.5)	14.2	(0.1)	15.4	(5.3)	35.1	(4.9)	23.4	(2.8)
Europe	12.4	(1.3)	15.5	(1.3)	16.8	(1.3)	31.3	(4.6)	24.0	(4.4)
Total	14.9	(0.7)	16.6	(1.1)	17.6	(0.7)	25.6	(1.8)	25.2	(2.2)

Note: Drinking Level values are row percentages. Drinking levels are based on quantity and frequency data during the past 30 days for the respondents' primary beverage. Abstainers drink once a year or less. Those in the Infrequent/Light category drink 1-4 drinks 1-3 times/month. Those in the Moderate category drink (a) 1 drink at least once/week, (b) 2-4 drinks 2-3 times/month, or (c) ≥5 drinks once/month or less. Those in the Moderate/Heavy category drink 2-4 drinks at least once/week, or ≥5 drinks 2-3 times/month. Those in the Heavy category drink ≥5 drinks at least once/week.

Table D.7c. 1982 (New) Drinking Levels by Sociodemographic Characteristics--Army

	Drinking Levels									
	Abstainer		Infrequent/ Light		Moderate		Moderate/ Heavy		Heavy	
Sex										
Male	11.0	(0.5)	15.2	(0.8)	16.5	(0.6)	30.8	(1.0)	26.5	(1.3)
Female	16.1	(1.7)	28.0	(4.7)	17.4	(3.6)	26.5	(2.2)	11.9	(1.2)
Race/Ethnicity										
White	10.5	(0.7)	15.9	(1.1)	16.8	(0.7)	30.4	(1.8)	26.4	(1.9)
Black	14.4	(1.7)	18.5	(1.7)	16.9	(1.7)	32.2	(1.4)	18.1	(1.6)
Hispanic	10.6	(1.0)	17.7	(2.8)	15.0	(1.9)	25.0	(2.1)	31.7	(2.4)
Other	14.0	(2.8)	17.0	(3.0)	15.9	(2.5)	29.0	(2.8)	24.1	(2.5)
Education										
< High school	6.2	(1.5)	11.4	(1.7)	12.0	(2.4)	27.6	(3.3)	42.7	(2.3)
High school grad	10.1	(0.5)	16.6	(1.0)	14.8	(1.0)	29.0	(1.2)	29.5	(2.1)
Some college	14.4	(0.9)	18.4	(1.6)	16.9	(0.9)	30.2	(1.3)	20.2	(1.3)
College grad	12.6	(1.0)	16.3	(1.4)	24.6	(1.4)	36.2	(1.8)	10.3	(1.4)
Age										
17-20	9.0	(0.9)	15.8	(1.6)	15.5	(1.1)	25.9	(1.7)	33.9	(3.9)
21-25	11.3	(0.7)	15.5	(1.3)	14.8	(1.1)	31.2	(1.4)	27.2	(1.7)
26-30	12.2	(1.6)	18.1	(1.7)	18.5	(1.1)	30.7	(1.1)	20.5	(0.8)
31-35	15.6	(1.7)	17.7	(1.2)	20.1	(1.9)	32.8	(1.6)	13.9	(1.3)
36 or older	13.6	(1.9)	20.3	(1.6)	19.0	(2.0)	33.8	(3.5)	13.4	(1.7)
Family Status										
Not married	8.7	(0.4)	14.6	(1.4)	14.7	(1.0)	29.7	(1.5)	32.2	(2.8)
Married, spouse not present	15.3	(1.0)	19.7	(0.9)	19.4	(0.9)	31.2	(0.7)	14.4	(0.7)
Married, spouse present	10.0	(1.5)	15.2	(2.2)	14.7	(2.1)	29.4	(2.4)	30.7	(2.6)
Pay Grade										
E1-E3	8.8	(1.0)	16.0	(1.5)	14.9	(1.5)	27.9	(1.4)	32.4	(4.2)
E4-E6	12.9	(0.9)	17.2	(1.2)	15.3	(1.0)	29.4	(1.2)	25.1	(0.9)
E7-E9	15.7	(2.0)	18.5	(1.5)	19.6	(1.4)	31.1	(3.0)	15.1	(1.8)
W1-W4	17.9	(5.3)	13.8	(2.9)	27.8	(6.1)	29.2	(2.9)	11.3	(3.9)
01-03	10.0	(1.2)	16.4	(1.9)	25.7	(2.6)	38.4	(3.1)	9.4	(1.7)
04-010	8.1	(2.9)	15.8	(3.9)	20.3	(2.4)	48.7	(6.8)	7.1	(2.8)
Time on Active Duty										
1 Year or less	10.1	(1.8)	16.9	(2.4)	19.2	(1.5)	30.1	(2.1)	23.8	(5.3)
>1-2 Years	10.3	(1.0)	15.5	(1.2)	14.5	(2.1)	26.2	(1.8)	33.4	(2.8)
>2-3 Years	10.6	(1.1)	15.9	(1.5)	13.0	(1.3)	27.3	(2.4)	33.3	(2.5)
>3-4 Years	10.4	(1.7)	16.7	(2.4)	15.9	(2.5)	30.9	(1.8)	26.1	(1.6)
>4-9 Years	12.5	(1.4)	16.6	(1.5)	16.6	(1.5)	32.4	(1.3)	21.9	(1.6)
>9 Years	14.1	(1.7)	18.7	(0.8)	19.4	(1.4)	32.8	(1.8)	15.0	(1.7)
Region										
Americas	12.6	(0.7)	18.6	(1.5)	17.5	(1.2)	29.8	(1.5)	21.5	(2.0)
North Pacific	10.9	(0.8)	11.6	(1.7)	14.7	(2.0)	30.0	(2.1)	32.9	(5.0)
Other Pacific	9.2	(0.7)	15.7	(2.4)	15.8	(0.3)	33.4	(4.5)	25.9	(7.2)
Europe	9.9	(0.7)	13.6	(0.8)	15.1	(0.5)	31.0	(1.0)	30.4	(1.2)
Total	11.7	(0.5)	16.7	(1.0)	16.6	(0.8)	30.3	(1.0)	24.7	(1.4)

Note: Drinking Level values are row percentages. Drinking levels are based on quantity and frequency data during the past 30 days for the respondents' primary beverage. Abstainers drink once a year or less. Those in the Infrequent/Light category drink 1-4 drinks 1-3 times/month. Those in the Moderate category drink (a) 1 drink at least once/week, (b) 2-4 drinks 2-3 times/month, or (c) ≥5 drinks once/month or less. Those in the Moderate/Heavy category drink 2-4 drinks at least once/week, or ≥5 drinks 2-3 times/month. Those in the Heavy category drink ≥5 drinks at least once/week.

Table D.8a. 1988 (New) Drinking Levels by Sociodemographic Characteristics--Navy

	Drinking Levels									
	Abstainer		Infrequent/ Light		Moderate		Moderate/ Heavy		Heavy	
Sex										
Male	15.4	(0.7)	18.6	(0.5)	21.3	(1.2)	31.6	(1.6)	15.1	(2.3)
Female	18.7	(2.8)	31.9	(3.9)	17.1	(3.1)	22.1	(3.0)	10.3	(2.9)
Race/Ethnicity										
White	14.6	(1.2)	18.3	(0.7)	21.0	(1.2)	31.0	(1.9)	15.1	(1.6)
Black	20.9	(4.1)	16.2	(3.0)	19.8	(4.1)	29.9	(2.1)	13.2	(3.0)
Hispanic	16.3	(3.1)	19.4	(3.3)	19.6	(1.6)	32.8	(4.3)	12.0	(4.9)
Other	19.3	(2.7)	21.6	(3.3)	23.4	(4.3)	22.2	(2.7)	13.6	(5.6)
Education										
< High school	10.5	(4.5)	15.3	(5.2)	15.3	(7.4)	37.9	(12.6)	21.0	(5.9)
High school grad	15.0	(1.5)	17.3	(0.8)	18.6	(1.2)	30.6	(3.0)	18.6	(4.2)
Some college	17.4	(3.1)	17.4	(1.5)	22.6	(3.0)	29.4	(1.3)	13.2	(1.6)
College grad	14.9	(1.3)	23.0	(1.9)	24.2	(1.5)	32.1	(2.7)	5.9	(0.9)
Age										
17-20	12.0	(1.7)	13.5	(2.4)	23.8	(5.5)	32.9	(2.8)	17.8	(5.3)
21-25	11.7	(1.2)	16.4	(1.8)	20.2	(2.1)	33.1	(3.7)	18.7	(3.5)
26-30	17.3	(2.0)	21.3	(2.1)	19.1	(2.7)	26.3	(2.6)	16.0	(2.3)
31-35	19.2	(2.7)	18.6	(1.1)	22.3	(1.1)	30.8	(2.7)	9.2	(1.8)
36 or older	21.7	(1.7)	21.9	(1.5)	20.5	(1.4)	28.7	(1.9)	7.2	(1.0)
Family Status										
Not married	14.2	(1.2)	14.5	(0.8)	18.7	(1.5)	31.9	(3.3)	20.8	(5.1)
Married, spouse not present	13.8	(1.9)	21.1	(2.7)	26.0	(3.3)	29.8	(5.3)	9.3	(1.9)
Married, spouse present	17.6	(1.1)	21.6	(1.8)	22.3	(1.4)	29.3	(0.7)	9.2	(0.8)
Pay Grade										
E1-E3	12.4	(2.9)	13.7	(1.3)	20.6	(1.9)	32.4	(3.1)	20.8	(5.6)
E4-E6	17.1	(1.7)	18.6	(1.6)	19.9	(1.5)	29.0	(2.2)	15.4	(2.2)
E7-E9	21.7	(1.4)	20.3	(2.2)	18.3	(1.3)	28.5	(1.8)	11.2	(1.4)
W1-W4	23.3	(2.8)	20.9	(2.7)	18.6	(2.2)	27.5	(3.9)	9.6	(3.3)
O1-O3	8.9	(1.3)	23.7	(2.0)	26.1	(3.3)	36.1	(3.4)	5.2	(1.2)
O4-O10	13.0	(2.2)	20.0	(2.0)	28.6	(2.3)	35.7	(3.0)	2.6	(1.1)
Time on Active Duty										
1 Year or less	11.7	(4.9)	15.0	(2.9)	19.9	(3.7)	28.2	(4.7)	25.1	(5.6)
>1-2 Years	17.7	(1.9)	13.0	(2.7)	22.0	(2.2)	27.4	(2.4)	19.9	(2.8)
>2-3 Years	12.0	(2.3)	14.3	(4.7)	20.2	(4.2)	37.1	(6.0)	16.4	(4.5)
>3-4 Years	15.1	(2.9)	13.0	(2.8)	21.7	(3.5)	36.3	(3.2)	13.9	(2.6)
>4-9 Years	12.2	(1.1)	22.6	(1.1)	21.3	(1.6)	29.2	(2.6)	14.8	(2.9)
>9 Years	21.2	(1.2)	20.1	(1.0)	20.3	(1.0)	29.0	(1.1)	9.4	(1.5)
Region										
Americas	16.6	(0.7)	18.5	(1.0)	21.1	(1.4)	30.1	(2.0)	13.7	(2.3)
North Pacific	12.3	(0.6)	12.0	(5.8)	18.3	(5.2)	35.2	(5.4)	22.1	(6.1)
Other Pacific	15.3	(2.4)	15.6	(2.2)	17.9	(3.4)	28.6	(1.1)	22.6	(6.8)
Europe	9.3	(0.1)	19.3	(3.1)	22.0	(0.6)	34.7	(0.9)	14.7	(1.5)
Total	15.7	(0.6)	18.3	(0.9)	20.9	(1.2)	30.5	(1.6)	14.6	(2.1)

Note: Drinking Level values are row percentages. Drinking levels are based on quantity and frequency data during the past 30 days for the respondents' primary beverage. Abstainers drink once a year or less. Those in the Infrequent/Light category drink 1-4 drinks 1-3 times/month. Those in the Moderate category drink (a) 1 drink at least once/week, (b) 2-4 drinks 2-3 times/month, or (c) ≥5 drinks once/month or less. Those in the Moderate/Heavy category drink 2-4 drinks at least once/week, or ≥5 drinks 2-3 times/month. Those in the Heavy category drink ≥5 drinks at least once/week.

Table D.8b. 1985 (New) Drinking Levels by Sociodemographic Characteristics--Navy

	Drinking Levels									
	Abstainer		Infrequent/ Light		Moderate		Moderate/ Heavy		Heavy	
Sex										
Male	9.4	(0.8)	17.8	(2.2)	18.1	(1.2)	28.4	(1.6)	26.3	(1.4)
Female	12.2	(2.6)	29.3	(3.3)	24.6	(2.8)	22.8	(2.6)	11.1	(2.8)
Race/Ethnicity										
White	8.0	(0.6)	18.9	(3.1)	17.9	(1.9)	29.6	(1.6)	25.6	(1.6)
Black	13.7	(3.0)	14.3	(3.6)	25.5	(7.4)	28.4	(2.0)	18.2	(4.8)
Hispanic	16.9	(8.3)	20.5	(3.5)	11.9	(3.0)	15.9	(4.8)	34.7	(7.8)
Other	17.8	(4.4)	26.6	(3.8)	24.5	(3.2)	13.6	(5.0)	17.6	(7.8)
Education										
< High school	3.2	(2.5)	27.1	(13.4)	20.5	(8.7)	18.8	(8.0)	30.4	(8.4)
High school grad	9.2	(1.3)	19.2	(3.0)	17.3	(1.5)	24.7	(1.9)	29.6	(1.7)
Some college	10.3	(1.0)	18.9	(1.9)	18.7	(2.5)	28.3	(2.6)	23.8	(1.7)
College grad	10.8	(1.3)	16.1	(1.7)	24.1	(1.6)	40.7	(3.9)	8.2	(1.7)
Age										
17-20	3.4	(1.9)	18.0	(3.1)	17.1	(3.2)	19.9	(3.3)	41.6	(4.5)
21-25	7.1	(1.5)	19.9	(3.9)	16.5	(2.6)	26.4	(2.5)	30.1	(1.9)
26-30	12.5	(1.5)	15.4	(1.9)	21.1	(1.5)	34.9	(2.3)	16.1	(1.6)
31-35	13.4	(2.9)	21.9	(3.1)	22.0	(1.8)	27.8	(1.6)	14.9	(3.8)
36 or older	16.8	(2.1)	18.2	(1.8)	20.9	(1.3)	32.3	(2.1)	11.8	(1.4)
Family Status										
Not married	7.3	(1.6)	17.8	(3.6)	15.0	(1.7)	24.9	(2.0)	34.9	(2.5)
Married, spouse not present	9.2	(2.9)	22.4	(8.5)	19.1	(4.2)	29.5	(4.6)	19.7	(4.9)
Married, spouse present	12.4	(0.9)	19.4	(1.2)	23.0	(1.3)	31.0	(1.1)	14.3	(1.3)
Pay Grade										
E1-E3	5.2	(1.8)	20.2	(1.8)	16.5	(3.4)	22.0	(3.3)	36.1	(3.3)
E4-E6	10.8	(1.0)	18.9	(3.6)	18.4	(1.6)	26.5	(1.8)	25.4	(1.7)
E7-E9	15.1	(1.0)	19.5	(1.7)	19.8	(1.2)	30.9	(1.4)	14.8	(0.9)
W1-W4	18.1	(3.1)	14.9	(2.3)	16.7	(1.3)	35.5	(4.9)	14.8	(3.0)
O1-O3	10.3	(1.6)	15.7	(3.9)	21.9	(1.5)	43.6	(3.7)	8.5	(1.3)
O4-O10	7.9	(1.0)	14.4	(1.6)	28.6	(2.7)	46.5	(3.8)	2.5	(0.8)
Time on Active Duty										
1 Year or less	0.8	(0.7)	20.7	(5.5)	14.9	(5.9)	25.6	(3.8)	38.0	(3.8)
>1-2 Years	8.6	(1.6)	20.4	(2.2)	16.4	(3.3)	19.7	(5.4)	34.9	(5.2)
>2-3 Years	5.1	(2.3)	20.2	(7.8)	15.1	(3.4)	22.8	(3.6)	36.7	(5.2)
>3-4 Years	8.7	(4.9)	15.1	(8.7)	21.8	(5.2)	25.3	(5.4)	29.2	(3.4)
>4-9 Years	10.1	(1.1)	18.9	(1.3)	19.5	(1.6)	32.3	(2.3)	19.2	(1.2)
>9 Years	15.1	(1.3)	18.5	(1.3)	20.7	(1.0)	32.6	(1.8)	13.2	(1.5)
Region										
Americas	9.9	(1.0)	19.2	(2.5)	18.6	(1.3)	26.7	(1.6)	25.6	(1.5)
North Pacific	13.1	(0.7)	16.7	(0.6)	18.5	(0.9)	26.2	(1.2)	25.5	(3.4)
Other Pacific	11.4	(3.8)	17.0	(0.1)	18.5	(1.2)	30.8	(2.3)	22.3	(7.3)
Europe	5.1	(0.7)	18.0	(0.9)	20.1	(0.7)	35.1	(4.9)	21.8	(5.8)
Total	9.6	(0.8)	18.8	(2.0)	18.7	(1.1)	27.9	(1.4)	24.9	(1.4)

Note: Drinking Level values are row percentages. Drinking levels are based on quantity and frequency data during the past 30 days for the respondents' primary beverage. Abstainers drink once a year or less. Those in the Infrequent/Light category drink 1-4 drinks 1-3 times/month. Those in the Moderate category drink (a) 1 drink at least once/week, (b) 2-4 drinks 2-3 times/month, or (c) ≥5 drinks once/month or less. Those in the Moderate/Heavy category drink 2-4 drinks at least once/week, or ≥5 drinks 2-3 times/month. Those in the Heavy category drink ≥5 drinks at least once/week.

Table D.8c. 1982 (New) Drinking Levels by Sociodemographic Characteristics--Navy

	Drinking Levels									
	Abstainer		Infrequent/ Light		Moderate		Moderate/ Heavy		Heavy	
Sex										
Male	10.5	(1.4)	20.5	(2.2)	14.6	(1.0)	26.1	(1.6)	28.3	(3.1)
Female	10.8	(1.9)	23.0	(4.8)	22.1	(3.5)	26.6	(5.2)	17.5	(1.5)
Race/Ethnicity										
White	10.3	(1.8)	19.4	(2.3)	14.3	(1.3)	26.6	(1.7)	29.4	(3.1)
Black	11.6	(2.1)	23.9	(4.6)	16.9	(1.8)	24.8	(3.7)	22.8	(3.3)
Hispanic	10.7	(3.2)	26.1	(3.4)	12.6	(2.0)	25.2	(3.6)	25.4	(4.7)
Other	10.7	(1.4)	26.3	(3.8)	23.6	(4.8)	22.9	(3.7)	16.6	(2.9)
Education										
< High school	7.2	(1.8)	23.2	(3.0)	6.4	(1.7)	22.6	(4.2)	40.6	(4.8)
High school grad	11.1	(2.0)	22.3	(3.3)	13.8	(1.2)	22.8	(1.3)	30.0	(4.0)
Some college	9.8	(1.1)	19.4	(1.0)	16.7	(1.6)	27.6	(2.0)	26.5	(1.9)
College grad	9.6	(1.6)	14.6	(2.2)	21.8	(2.5)	41.5	(4.3)	12.6	(1.9)
Age										
17-20	11.3	(1.9)	24.6	(4.5)	11.0	(1.4)	21.3	(1.5)	31.9	(4.9)
21-25	5.9	(0.8)	20.3	(1.1)	14.4	(1.7)	27.3	(1.5)	32.2	(3.4)
26-30	11.0	(1.2)	18.9	(1.9)	17.7	(1.5)	27.6	(1.7)	24.8	(2.1)
31-35	14.3	(2.8)	17.0	(3.4)	20.2	(3.1)	30.8	(2.6)	17.6	(2.9)
36 or older	18.7	(2.6)	16.3	(1.9)	20.6	(3.4)	30.2	(3.0)	14.2	(2.2)
Family Status										
Not married	8.9	(1.4)	20.9	(2.9)	12.3	(0.9)	23.2	(1.2)	34.7	(3.6)
Married, spouse not present	13.9	(1.7)	18.7	(1.7)	19.1	(1.9)	31.5	(2.6)	16.9	(2.2)
Married, spouse present	8.2	(2.2)	27.3	(3.6)	17.7	(3.5)	24.1	(4.1)	22.6	(4.0)
Pay Grade										
E1-E3	10.0	(1.8)	25.5	(3.9)	11.3	(1.2)	20.3	(1.7)	33.0	(4.3)
E4-E6	9.9	(1.4)	18.4	(2.3)	16.2	(0.5)	28.1	(0.8)	27.4	(3.0)
E7-E9	18.4	(2.0)	16.5	(2.0)	19.4	(5.1)	27.8	(3.5)	17.9	(1.0)
W1-W4	20.1	(17.4)	4.7	(2.5)	21.7	(10.9)	34.1	(9.9)	19.3	(12.4)
01-03	10.1	(2.3)	13.4	(5.0)	27.0	(2.5)	37.3	(7.9)	12.2	(1.4)
04-010	4.5	(2.4)	11.5	(3.1)	19.7	(2.7)	56.7	(3.3)	7.7	(3.2)
Time on Active Duty										
1 Year or less	12.8	(1.8)	29.0	(4.1)	12.2	(1.8)	18.7	(1.0)	27.3	(3.8)
>1-2 Years	4.9	(1.7)	16.2	(2.3)	12.4	(1.5)	26.0	(2.0)	40.6	(3.5)
>2-3 Years	5.4	(1.2)	15.9	(1.8)	15.7	(1.3)	25.4	(1.2)	37.6	(3.7)
>3-4 Years	6.7	(1.8)	20.2	(4.1)	11.9	(1.0)	34.0	(3.1)	27.2	(4.0)
>4-9 Years	8.0	(1.0)	18.3	(1.5)	17.8	(1.5)	29.4	(1.9)	26.5	(3.7)
>9 Years	17.1	(2.2)	17.5	(1.7)	19.1	(2.9)	30.6	(2.6)	15.7	(1.4)
Region										
Americas	10.6	(1.5)	21.2	(2.5)	14.7	(1.2)	25.5	(1.7)	28.0	(3.3)
North Pacific	10.4	(0.5)	23.8	(0.0)	15.6	(0.0)	24.2	(0.9)	25.9	(0.3)
Other Pacific	8.6	(1.0)	14.8	(1.0)	18.7	(1.3)	31.3	(1.3)	26.7	(3.4)
Europe	12.2	(4.3)	12.2	(0.7)	18.0	(1.8)	36.9	(7.1)	20.6	(5.4)
Total	10.5	(1.4)	20.7	(2.3)	15.1	(1.1)	26.1	(1.5)	27.7	(2.9)

Note: Drinking Level values are row percentages. Drinking levels are based on quantity and frequency data during the past 30 days for the respondents' primary beverage. Abstainers drink once a year or less. Those in the Infrequent/Light category drink 1-4 drinks 1-3 times/month. Those in the Moderate category drink (a) 1 drink at least once/week, (b) 2-4 drinks 2-3 times/month, or (c) ≥5 drinks once/month or less. Those in the Moderate/Heavy category drink 2-4 drinks at least once/week, or ≥5 drinks 2-3 times/month. Those in the Heavy category drink ≥5 drinks at least once/week.

Table D.9a. 1988 (New) Drinking Levels by Sociodemographic Characteristics--Marine Corps

	Drinking Levels									
	Abstainer		Infrequent/ Light		Moderate		Moderate/ Heavy		Heavy	
Sex										
Male	16.1	(0.9)	15.3	(3.0)	14.7	(1.1)	28.5	(1.5)	25.4	(4.0)
Female	38.6	(13.9)	22.0	(8.0)	6.3	(3.3)	25.4	(9.4)	7.7	(3.1)
Race/Ethnicity										
White	16.4	(2.2)	14.0	(2.1)	13.1	(1.2)	31.0	(2.3)	25.5	(5.4)
Black	25.5	(4.2)	15.8	(4.1)	18.2	(1.2)	23.2	(2.6)	17.3	(2.5)
Hispanic	17.7	(4.7)	28.6	(12.6)	10.4	(2.6)	18.2	(4.4)	25.1	(2.5)
Other	16.7	(4.5)	12.1	(4.0)	23.3	(5.0)	28.3	(5.5)	19.5	(10.5)
Education										
< High school	2.2	(2.5)	7.3	(6.1)	9.1	(9.4)	45.2	(21.6)	36.3	(21.8)
High school grad	18.4	(1.9)	14.7	(3.6)	12.4	(0.7)	24.9	(2.4)	29.5	(4.2)
Some college	20.8	(2.6)	18.2	(2.0)	14.6	(2.0)	28.8	(2.0)	17.6	(3.9)
College grad	11.5	(3.7)	16.7	(3.8)	20.2	(4.2)	40.4	(2.6)	11.2	(3.7)
Age										
17-20	25.7	(5.8)	11.9	(2.7)	5.9	(1.9)	20.2	(4.6)	36.2	(4.3)
21-25	11.0	(1.9)	11.6	(3.6)	14.2	(1.5)	32.0	(3.6)	31.3	(6.2)
26-30	21.1	(3.9)	23.9	(7.9)	19.2	(4.2)	24.9	(1.6)	10.9	(2.2)
31-35	17.5	(2.3)	21.9	(3.2)	14.2	(2.2)	29.1	(5.7)	17.3	(2.7)
36 or older	20.9	(4.2)	16.8	(3.5)	18.7	(1.3)	38.3	(7.4)	7.3	(1.0)
Family Status										
Not married	19.5	(1.7)	9.7	(2.4)	11.9	(1.5)	24.4	(2.5)	34.4	(5.6)
Married, spouse not present	14.1	(6.8)	11.8	(2.0)	8.9	(3.9)	48.5	(7.4)	16.7	(5.6)
Married, spouse present	17.1	(1.3)	23.1	(4.8)	17.0	(2.3)	29.0	(2.1)	13.8	(2.7)
Pay Grade										
E1-E3	19.7	(1.1)	9.2	(2.6)	8.8	(1.1)	27.3	(4.4)	35.0	(5.4)
E4-E6	16.4	(1.4)	21.3	(3.4)	16.2	(1.9)	25.9	(1.7)	20.4	(2.1)
E7-E9	22.2	(3.2)	20.9	(2.2)	18.8	(3.5)	25.4	(2.3)	12.8	(1.6)
W1-W4	30.2	(6.3)	28.0	(4.1)	11.3	(6.0)	17.8	(5.4)	12.6	(1.6)
O1-O3	15.2	(6.5)	19.1	(5.0)	19.0	(6.1)	37.3	(3.9)	9.4	(2.8)
O4-O10	9.1	(2.3)	10.7	(2.8)	26.4	(4.3)	52.9	(8.9)	0.8	(0.6)
Time on Active Duty										
1 Year or less	23.1	(12.7)	11.4	(5.1)	8.1	(4.3)	25.6	(4.1)	31.8	(10.8)
>1-2 Years	23.5	(5.3)	13.1	(3.7)	5.8	(1.2)	23.4	(5.1)	34.2	(6.8)
>2-3 Years	16.4	(4.6)	12.4	(5.0)	15.3	(2.3)	24.3	(4.1)	31.7	(5.3)
>3-4 Years	8.7	(3.3)	4.8	(2.0)	14.9	(1.8)	37.9	(6.8)	33.8	(8.2)
>4-9 Years	15.0	(4.2)	21.0	(5.3)	18.5	(2.8)	27.8	(3.4)	17.7	(2.6)
>9 Years	20.7	(2.2)	20.9	(3.6)	16.2	(1.6)	30.8	(3.5)	11.3	(1.4)
Region										
Americas	19.1	(1.1)	16.5	(4.0)	13.7	(1.3)	27.4	(2.1)	23.2	(4.9)
North Pacific	16.5	(0.6)	13.0	(1.0)	12.5	(1.0)	32.0	(0.2)	26.0	(2.5)
Other Pacific	12.9	(3.5)	13.0	(2.8)	17.5	(3.0)	29.4	(0.7)	27.2	(2.6)
Europe	7.3	(2.1)	14.9	(2.7)	19.1	(0.1)	32.4	(1.4)	26.3	(6.3)
Total	18.0	(0.9)	15.9	(3.2)	14.0	(1.1)	28.2	(1.7)	23.9	(3.9)

Note: Drinking Level values are row percentages. Drinking levels are based on quantity and frequency data during the past 30 days for the respondents' primary beverage. Abstainers drink once a year or less. Those in the Infrequent/Light category drink 1-4 drinks 1-3 times/month. Those in the Moderate category drink (a) 1 drink at least once/week, (b) 2-4 drinks 2-3 times/month, or (c) ≥5 drinks once/month or less. Those in the Moderate/Heavy category drink 2-4 drinks at least once/week, or ≥5 drinks 2-3 times/month. Those in the Heavy category drink ≥5 drinks at least once/week.

Table D.9b. 1985 (New) Drinking Levels by Sociodemographic Characteristics--Marine Corps

	Drinking Levels									
	Abstainer		Infrequent/ Light		Moderate		Moderate/ Heavy		Heavy	
Sex										
Male	11.0	(2.5)	13.0	(1.9)	15.0	(2.1)	30.8	(1.9)	30.2	(4.2)
Female	6.8	(2.8)	25.5	(9.4)	17.1	(12.4)	37.5	(21.7)	13.2	(12.7)
Race/Ethnicity										
White	9.0	(2.2)	12.2	(2.4)	14.1	(2.9)	33.5	(1.7)	31.2	(4.9)
Black	16.9	(8.2)	19.6	(2.5)	17.0	(2.6)	26.8	(3.2)	19.7	(2.2)
Hispanic	10.7	(3.9)	11.8	(4.8)	24.8	(5.7)	24.7	(6.7)	28.0	(10.6)
Other	15.9	(4.3)	17.3	(2.7)	9.0	(7.0)	19.8	(7.1)	38.2	(6.2)
Education										
< High school	11.2	(11.1)	26.3	(11.4)	5.8	(3.9)	18.0	(13.6)	38.8	(15.7)
High school grad	11.3	(3.8)	13.2	(2.4)	12.7	(2.7)	28.8	(2.1)	34.0	(4.5)
Some college	9.5	(2.9)	14.4	(2.3)	18.4	(2.4)	32.7	(4.1)	25.0	(2.2)
College grad	10.2	(1.7)	11.2	(2.1)	25.7	(4.9)	46.1	(5.2)	6.9	(2.3)
Age										
17-20	10.6	(3.2)	10.5	(1.5)	11.4	(3.2)	23.5	(2.4)	44.1	(4.4)
21-25	6.9	(2.8)	13.3	(1.5)	14.5	(3.6)	33.7	(2.3)	31.7	(5.5)
26-30	14.3	(3.3)	20.4	(4.4)	17.3	(3.1)	32.7	(3.5)	15.2	(2.8)
31-35	15.7	(3.4)	12.5	(1.8)	21.9	(2.7)	37.6	(4.6)	12.3	(1.9)
36 or older	19.9	(1.3)	15.7	(5.4)	21.4	(2.4)	37.4	(6.0)	5.5	(1.0)
Family Status										
Not married	6.1	(2.1)	10.8	(1.9)	12.8	(2.7)	26.5	(3.7)	43.8	(6.3)
Married, spouse not present	17.7	(2.0)	28.6	(9.3)	10.6	(3.6)	21.3	(6.3)	22.0	(10.4)
Married, spouse present	16.1	(3.3)	14.3	(2.7)	19.7	(3.4)	40.2	(5.0)	9.7	(1.4)
Pay Grade										
E1-E3	8.5	(2.6)	13.1	(1.3)	11.4	(3.2)	24.1	(2.4)	42.8	(5.8)
E4-E6	11.2	(2.6)	13.8	(2.5)	16.2	(0.9)	35.8	(4.3)	23.0	(1.8)
E7-E9	23.5	(1.9)	16.5	(3.0)	20.3	(3.3)	27.4	(4.4)	12.2	(2.5)
W1-W4	17.3	(2.3)	16.2	(4.8)	18.8	(6.0)	37.3	(3.5)	10.3	(0.9)
O1-O3	9.7	(1.5)	12.8	(2.8)	21.9	(5.6)	48.7	(6.7)	6.9	(1.7)
O4-O10	9.9	(2.8)	13.2	(5.5)	29.7	(3.1)	43.7	(3.6)	3.6	(3.1)
Time on Active Duty										
1 Year or less	3.7	(2.4)	7.7	(2.9)	6.1	(2.7)	30.1	(7.0)	52.3	(8.9)
>1-2 Years	6.9	(2.2)	10.2	(1.8)	15.6	(5.0)	25.5	(2.8)	41.7	(7.5)
>2-3 Years	14.8	(7.1)	23.5	(7.1)	12.4	(4.2)	19.5	(5.9)	29.9	(7.2)
>3-4 Years	4.0	(0.7)	6.8	(3.4)	15.8	(5.6)	29.7	(3.8)	43.7	(8.2)
>4-9 Years	13.9	(3.5)	16.3	(3.6)	13.9	(2.2)	39.7	(5.0)	16.2	(2.8)
>9 Years	16.6	(2.2)	14.2	(2.2)	22.6	(1.9)	36.4	(4.1)	10.1	(1.6)
Region										
Americas	10.5	(3.0)	13.1	(2.0)	15.3	(2.7)	32.5	(2.2)	28.5	(4.6)
North Pacific	13.3	(2.5)	18.0	(3.8)	14.3	(0.9)	24.4	(3.2)	30.0	(2.3)
Other Pacific	9.1	(3.0)	10.5	(0.4)	19.1	(0.4)	25.0	(0.5)	36.3	(2.7)
Europe	10.7	(6.2)	14.2	(2.6)	4.9	(4.5)	27.9	(3.9)	42.3	(11.9)
Total	10.8	(2.5)	13.6	(1.7)	15.1	(2.1)	31.1	(1.8)	29.4	(3.7)

Note: Drinking Level values are row percentages. Drinking levels are based on quantity and frequency data during the past 30 days for the respondents' primary beverage. Abstainers drink once a year or less. Those in the Infrequent/Light category drink 1-4 drinks 1-3 times/month. Those in the Moderate category drink (a) 1 drink at least once/week, (b) 2-4 drinks 2-3 times/month, or (c) ≥5 drinks once/month or less. Those in the Moderate/Heavy category drink 2-4 drinks at least once/week, or ≥5 drinks 2-3 times/month. Those in the Heavy category drink ≥5 drinks at least once/week.

Table D.9c. 1982 (New) Drinking Levels by Sociodemographic Characteristics--Marine Corps

	Drinking Levels									
	Abstainer		Infrequent/ Light		Moderate		Moderate/ Heavy		Heavy	
Sex										
Male	13.5	(2.7)	13.0	(1.6)	14.4	(1.1)	27.7	(0.5)	31.4	(0.7)
Female	13.7	(14.7)	18.0	(8.9)	28.0	(17.8)	29.8	(7.1)	10.5	(1.8)
Race/Ethnicity										
White	12.0	(2.0)	12.3	(1.0)	13.8	(0.3)	27.0	(0.9)	34.9	(1.7)
Black	20.3	(2.7)	14.3	(4.8)	21.3	(2.3)	25.8	(6.5)	18.4	(6.4)
Hispanic	12.5	(2.3)	13.5	(8.3)	16.7	(2.7)	36.8	(8.3)	20.5	(1.1)
Other	17.5	(1.3)	25.1	(8.4)	7.5	(3.6)	29.2	(1.2)	20.6	(6.3)
Education										
< High school	10.5	(6.0)	11.3	(0.8)	11.7	(0.8)	14.6	(6.3)	51.9	(0.8)
High school grad	12.4	(2.2)	13.8	(2.3)	13.0	(0.5)	27.2	(0.6)	33.6	(0.7)
Some college	16.4	(2.7)	12.3	(0.3)	17.6	(1.8)	27.0	(3.6)	26.7	(4.5)
College grad	13.2	(2.3)	13.3	(4.9)	19.6	(5.5)	42.4	(3.6)	11.5	(1.8)
Age										
17-20	13.2	(2.2)	11.6	(0.9)	11.8	(0.8)	24.7	(0.9)	38.6	(3.3)
21-25	13.0	(1.0)	14.8	(3.8)	14.8	(1.3)	25.2	(3.8)	32.2	(0.6)
26-30	14.2	(5.4)	11.9	(2.2)	17.0	(2.4)	34.0	(6.4)	23.0	(3.5)
31-35	21.7	(7.1)	13.4	(2.4)	22.8	(3.1)	31.9	(3.1)	10.2	(1.6)
36 or older	5.3	(3.5)	11.1	(1.7)	20.4	(6.9)	51.0	(2.2)	12.1	(4.4)
Family Status										
Not married	11.7	(2.6)	10.5	(1.2)	13.6	(0.5)	25.0	(1.9)	39.2	(3.9)
Married, spouse not present	16.8	(2.6)	17.2	(2.1)	17.9	(1.7)	30.1	(0.8)	18.1	(1.9)
Married, spouse present	9.2	(1.4)	10.7	(1.6)	10.5	(5.1)	41.5	(1.8)	28.1	(4.1)
Pay Grade										
E1-E3	12.2	(2.3)	10.8	(1.5)	13.6	(0.7)	25.4	(2.3)	38.1	(3.9)
E4-E6	15.3	(3.4)	14.9	(1.8)	14.1	(2.0)	25.4	(0.4)	30.3	(0.5)
E7-E9	16.0	(3.0)	12.1	(0.8)	21.8	(3.6)	37.6	(5.0)	12.6	(4.9)
W1-W4	0.0	(0.0)	0.0	(0.0)	48.4	(42.0)	48.0	(42.1)	3.6	(2.6)
O1-O3	13.1	(6.2)	16.3	(2.0)	21.9	(12.4)	39.9	(0.8)	8.9	(4.0)
O4-O10	0.5	(0.5)	8.1	(4.3)	18.9	(7.8)	71.8	(11.6)	0.6	(0.6)
Time on Active Duty										
1 Year or less	5.3	(0.5)	13.5	(1.0)	15.1	(0.4)	34.2	(3.2)	32.0	(2.7)
>1-2 Years	13.7	(3.8)	10.2	(0.8)	14.0	(0.4)	25.6	(2.4)	36.5	(1.8)
>2-3 Years	16.3	(4.8)	12.8	(2.3)	13.4	(0.8)	18.7	(1.8)	38.8	(3.6)
>3-4 Years	17.3	(2.7)	12.9	(2.4)	9.4	(2.6)	21.9	(1.2)	38.4	(3.5)
>4-9 Years	10.7	(0.8)	16.2	(2.9)	17.1	(0.5)	31.6	(3.4)	24.3	(0.4)
>9 Years	17.7	(7.6)	12.4	(0.8)	19.5	(0.4)	36.4	(3.2)	14.0	(4.1)
Region										
Americas	14.7	(2.5)	13.4	(2.2)	14.8	(0.3)	27.7	(0.8)	29.4	(0.8)
North Pacific	9.1	(1.0)	13.9	(2.5)	16.5	(0.6)	27.3	(1.9)	33.2	(4.4)
Other Pacific	8.1	(0.3)	10.1	(0.7)	13.6	(2.1)	26.9	(0.4)	41.2	(0.6)
Europe	11.8	(3.4)	7.3	(3.4)	13.2	(1.5)	40.9	(0.2)	26.8	(1.3)
Total	13.5	(2.0)	13.2	(1.8)	14.9	(0.3)	27.8	(0.7)	30.6	(0.9)

Note: Drinking Level values are row percentages. Drinking levels are based on quantity and frequency data during the past 30 days for the respondents' primary beverage. Abstainers drink once a year or less. Those in the Infrequent/Light category drink 1-4 drinks 1-3 times/month. Those in the Moderate category drink (a) 1 drink at least once/week, (b) 2-4 drinks 2-3 times/month, or (c) ≥5 drinks once/month or less. Those in the Moderate/Heavy category drink 2-4 drinks at least once/week, or ≥5 drinks 2-3 times/month. Those in the Heavy category drink ≥5 drinks at least once/week.

Table D.10a. 1988 (New) Drinking Levels by Sociodemographic Characteristics--Air Force

	Drinking Levels									
	Abstainer		Infrequent/ Light		Moderate		Moderate/ Heavy		Heavy	
Sex										
Male	18.5	(1.0)	17.3	(0.8)	19.1	(0.8)	29.5	(1.2)	15.6	(1.1)
Female	18.4	(1.7)	24.4	(2.4)	24.4	(2.8)	26.3	(2.5)	6.5	(1.7)
Race/Ethnicity										
White	17.0	(0.8)	18.2	(1.0)	19.5	(0.7)	29.5	(1.6)	15.8	(1.0)
Black	24.7	(1.5)	16.3	(1.4)	18.9	(2.2)	32.5	(2.5)	7.6	(1.3)
Hispanic	15.9	(3.1)	21.8	(3.0)	23.6	(2.4)	22.5	(2.2)	16.2	(3.6)
Other	30.6	(4.2)	17.0	(3.8)	20.6	(4.2)	20.8	(5.5)	11.1	(2.4)
Education										
< High school	20.3	(18.0)	0.0	(0.0)	0.0	(0.0)	19.2	(15.0)	60.5	(27.0)
High school grad	18.7	(1.6)	17.7	(1.2)	19.6	(1.5)	22.7	(1.2)	21.3	(1.7)
Some college	19.4	(1.2)	19.0	(0.7)	18.3	(0.8)	29.1	(1.3)	14.2	(0.9)
College grad	16.2	(1.2)	17.1	(2.2)	23.0	(2.2)	37.0	(3.4)	6.7	(0.9)
Age										
17-20	22.4	(2.7)	17.5	(3.2)	18.3	(2.6)	23.2	(2.3)	18.7	(1.8)
21-25	14.1	(1.4)	16.3	(2.4)	19.7	(1.3)	29.9	(2.4)	20.0	(1.9)
26-30	18.9	(1.2)	19.1	(1.4)	18.0	(1.5)	28.9	(2.1)	15.1	(1.9)
31-35	21.2	(1.5)	21.4	(1.7)	18.4	(1.3)	29.9	(1.8)	9.1	(1.1)
36 or older	20.2	(0.9)	17.7	(1.2)	23.1	(1.8)	30.5	(0.9)	8.5	(1.1)
Family Status										
Not married	13.5	(1.7)	15.7	(1.7)	17.0	(1.2)	32.6	(1.7)	21.2	(1.9)
Married, spouse not present	13.4	(3.0)	23.1	(5.4)	19.3	(4.6)	31.4	(7.0)	12.8	(3.5)
Married, spouse present	21.1	(1.1)	19.1	(0.7)	21.0	(0.8)	27.4	(1.0)	11.3	(1.1)
Pay Grade										
E1-E3	18.0	(1.5)	19.0	(1.9)	17.6	(1.8)	26.5	(2.3)	18.9	(0.9)
E4-E6	19.7	(1.0)	18.4	(0.9)	18.6	(1.0)	26.1	(1.1)	17.2	(1.4)
E7-E9	20.6	(1.3)	19.2	(1.1)	20.1	(1.4)	30.1	(0.9)	10.0	(1.1)
W1-W4	*	(*)	*	(*)	*	(*)	*	(*)	*	(*)
O1-O3	14.2	(1.8)	14.8	(3.2)	23.1	(2.8)	41.2	(5.7)	6.6	(1.0)
O4-O10	15.6	(1.6)	18.0	(1.7)	26.7	(2.2)	36.9	(2.0)	2.8	(0.8)
Time on Active Duty										
1 Year or less	15.3	(4.6)	12.2	(4.3)	19.9	(3.4)	39.5	(5.1)	13.0	(2.5)
>1-2 Years	21.6	(2.3)	16.8	(1.8)	16.3	(2.1)	26.6	(3.1)	18.6	(2.1)
>2-3 Years	14.2	(1.8)	23.8	(3.3)	18.1	(2.8)	23.9	(3.8)	20.0	(3.4)
>3-4 Years	13.8	(3.1)	13.2	(4.3)	19.3	(4.4)	31.2	(4.0)	22.6	(4.8)
>4-9 Years	17.5	(0.9)	18.4	(1.0)	19.4	(1.1)	29.0	(1.4)	15.7	(1.7)
>9 Years	20.7	(0.8)	18.5	(1.0)	21.3	(1.2)	29.5	(0.9)	9.9	(1.1)
Region										
Americas	19.2	(1.0)	18.7	(0.9)	19.8	(0.9)	28.0	(1.4)	14.3	(1.3)
North Pacific	17.4	(0.5)	21.0	(2.7)	18.6	(0.6)	27.6	(1.1)	15.5	(0.5)
Other Pacific	17.5	(4.6)	13.7	(1.1)	18.5	(0.2)	31.6	(1.1)	18.7	(4.8)
Europe	15.5	(1.6)	15.5	(2.3)	19.8	(2.3)	34.8	(1.3)	14.4	(0.3)
Total	18.5	(0.8)	18.2	(0.8)	19.7	(0.8)	29.2	(1.1)	14.5	(1.0)

Note: Drinking Level values are row percentages. Drinking levels are based on quantity and frequency data during the past 30 days for the respondents' primary beverage. Abstainers drink once a year or less. Those in the Infrequent/Light category drink 1-4 drinks 1-3 times/month. Those in the Moderate category drink (a) 1 drink at least once/week, (b) 2-4 drinks 2-3 times/month, or (c) ≥5 drinks once/month or less. Those in the Moderate/Heavy category drink 2-4 drinks at least once/week, or ≥5 drinks 2-3 times/month. Those in the Heavy category drink ≥5 drinks at least once/week.

*There are no warrant officers in the Air Force.

Table D.10b. 1985 (New) Drinking Levels by Sociodemographic Characteristics--Air Force

	Drinking Levels									
	Abstainer		Infrequent/ Light		Moderate		Moderate/ Heavy		Heavy	
Sex										
Male	15.5	(1.0)	14.6	(1.0)	20.2	(1.3)	32.0	(1.3)	17.8	(1.5)
Female	18.9	(2.5)	22.7	(2.4)	25.5	(2.0)	27.9	(3.3)	5.0	(1.2)
Race/Ethnicity										
White	15.0	(1.0)	15.0	(0.9)	20.8	(1.2)	31.8	(1.2)	17.4	(1.5)
Black	19.3	(2.4)	15.1	(1.3)	20.9	(2.5)	32.3	(2.4)	12.3	(2.1)
Hispanic	9.0	(2.8)	21.5	(4.2)	23.8	(4.2)	31.3	(4.8)	14.4	(4.8)
Other	28.9	(4.6)	19.4	(5.7)	15.9	(4.7)	23.3	(3.7)	12.5	(3.3)
Education										
< High school	15.2	(10.3)	15.0	(9.9)	17.6	(16.4)	18.8	(8.2)	33.5	(16.0)
High school grad	15.5	(1.7)	12.1	(1.1)	18.2	(2.5)	30.7	(1.6)	23.4	(2.6)
Some college	17.2	(1.5)	16.1	(1.2)	20.0	(1.3)	30.1	(2.0)	16.7	(1.3)
College grad	13.2	(1.3)	18.9	(1.2)	26.3	(0.8)	36.1	(2.7)	5.5	(0.8)
Age										
17-20	14.9	(3.0)	12.9	(3.8)	23.8	(4.9)	22.8	(3.6)	25.5	(3.1)
21-25	12.2	(1.8)	12.7	(1.3)	18.7	(1.3)	32.5	(2.5)	23.9	(2.8)
26-30	18.8	(2.1)	16.3	(1.5)	21.1	(2.3)	31.8	(2.3)	12.0	(1.5)
31-35	17.3	(1.7)	20.3	(2.0)	19.5	(1.1)	32.1	(2.1)	10.8	(1.5)
36 or older	18.4	(1.9)	17.1	(1.1)	23.7	(0.9)	34.0	(2.1)	6.8	(0.9)
Family Status										
Not married	12.0	(1.0)	11.5	(0.9)	18.9	(2.4)	33.2	(1.6)	24.5	(2.6)
Married, spouse not present	16.2	(2.8)	13.0	(2.8)	12.3	(2.8)	37.4	(3.8)	21.2	(5.1)
Married, spouse present	18.3	(1.5)	18.2	(1.0)	22.7	(1.2)	30.0	(1.7)	10.9	(0.9)
Pay Grade										
E1-E3	13.5	(2.4)	12.3	(1.7)	18.1	(3.3)	29.9	(2.4)	26.2	(3.6)
E4-E6	17.5	(1.1)	15.5	(0.9)	19.5	(1.0)	30.8	(1.6)	16.7	(1.6)
E7-E9	19.0	(1.9)	17.3	(1.0)	21.8	(1.7)	31.9	(1.7)	10.0	(0.6)
W1-W4	*	(*)	*	(*)	*	(*)	*	(*)	*	(*)
01-03	15.7	(3.1)	19.6	(1.9)	26.8	(1.4)	31.9	(4.8)	5.8	(1.3)
04-010	9.4	(2.0)	17.2	(1.7)	27.9	(2.2)	42.4	(3.4)	3.2	(0.7)
Time on Active Duty										
1 Year or less	12.8	(2.3)	14.4	(1.9)	23.5	(4.6)	30.3	(2.8)	19.0	(3.1)
>1-2 Years	13.3	(2.9)	10.9	(2.6)	19.6	(3.0)	31.3	(4.2)	24.9	(2.7)
>2-3 Years	14.2	(2.9)	14.1	(2.6)	15.3	(2.8)	31.2	(4.6)	25.2	(5.0)
>3-4 Years	11.6	(2.5)	13.3	(2.8)	22.5	(2.7)	27.2	(5.7)	25.3	(4.7)
>4-9 Years	18.1	(2.0)	14.3	(1.3)	22.0	(2.1)	30.9	(2.8)	14.8	(2.0)
>9 Years	17.1	(1.3)	19.2	(1.3)	20.7	(0.7)	33.6	(1.8)	9.4	(0.7)
Region										
Americas	16.8	(1.2)	15.8	(0.8)	21.3	(1.5)	30.7	(1.4)	15.5	(1.8)
North Pacific	12.4	(1.2)	16.8	(4.6)	20.0	(1.9)	31.4	(0.6)	19.4	(7.1)
Other Pacific	12.5	(3.0)	15.5	(2.4)	17.1	(0.3)	35.1	(4.2)	19.9	(1.5)
Europe	12.7	(0.2)	13.3	(3.1)	19.3	(0.7)	35.2	(1.8)	19.4	(2.2)
Total	15.8	(1.0)	15.4	(0.8)	20.8	(1.2)	31.5	(1.1)	16.4	(1.4)

Note: Drinking Level values are row percentages. Drinking levels are based on quantity and frequency data during the past 30 days for the respondents' primary beverage. Abstainers drink once a year or less. Those in the Infrequent/Light category drink 1-4 drinks 1-3 times/month. Those in the Moderate category drink (a) 1 drink at least once/week, (b) 2-4 drinks 2-3 times/month, or (c) ≥5 drinks once/month or less. Those in the Moderate/Heavy category drink 2-4 drinks at least once/week, or ≥5 drinks 2-3 times/month. Those in the Heavy category drink ≥5 drinks at least once/week.

*There are no warrant officers in the Air Force.

Table D.10c. 1982 (New) Drinking Levels by Sociodemographic Characteristics--Air Force

	Drinking Levels									
	Abstainer		Infrequent/ Light		Moderate		Moderate/ Heavy		Heavy	
Sex										
Male	12.1	(0.8)	16.2	(0.8)	19.0	(0.8)	33.6	(0.9)	19.1	(1.3)
Female	16.8	(1.7)	25.8	(2.8)	26.6	(1.6)	24.3	(1.5)	6.4	(0.9)
Race/Ethnicity										
White	12.0	(0.5)	17.0	(0.9)	20.7	(0.9)	32.3	(0.7)	18.0	(1.3)
Black	12.3	(1.9)	18.6	(1.6)	17.6	(0.8)	37.5	(3.3)	13.9	(2.2)
Hispanic	15.8	(2.6)	17.6	(2.8)	13.3	(3.5)	29.9	(3.8)	23.3	(2.7)
Other	20.8	(1.6)	18.1	(2.3)	18.6	(1.8)	25.2	(2.7)	17.4	(2.7)
Education										
< High school	9.9	(6.5)	5.2	(3.1)	12.8	(6.0)	37.0	(6.6)	35.1	(5.7)
High school grad	12.3	(1.9)	15.8	(1.3)	17.1	(1.3)	30.1	(0.8)	24.6	(1.8)
Some college	13.9	(0.8)	18.1	(0.7)	19.1	(0.6)	31.0	(1.4)	17.9	(1.2)
College grad	10.3	(0.6)	18.9	(1.5)	25.0	(1.6)	39.3	(2.4)	6.6	(0.9)
Age										
17-20	8.3	(1.3)	15.1	(1.5)	16.3	(1.4)	31.4	(1.8)	28.9	(2.7)
21-25	11.5	(1.1)	16.2	(1.0)	19.3	(0.8)	30.0	(1.2)	23.0	(2.0)
26-30	15.5	(0.6)	18.5	(2.1)	22.2	(0.9)	31.5	(1.9)	12.3	(1.3)
31-35	11.8	(1.8)	21.0	(1.7)	19.2	(1.9)	34.7	(2.1)	13.3	(1.4)
36 or older	14.8	(1.5)	16.0	(2.3)	20.9	(0.9)	37.3	(2.4)	10.9	(1.6)
Family Status										
Not married	8.3	(0.6)	13.7	(0.9)	16.4	(1.1)	34.9	(1.6)	26.6	(1.4)
Married, spouse not present	15.4	(1.2)	19.7	(1.0)	22.3	(1.1)	30.7	(0.8)	11.9	(1.0)
Married, spouse present	8.8	(1.1)	14.5	(3.8)	14.2	(3.2)	39.9	(4.3)	22.6	(3.0)
Pay Grade										
E1-E3	9.3	(1.0)	15.3	(0.6)	18.1	(0.8)	29.6	(1.8)	27.7	(1.9)
E4-E6	14.9	(1.1)	17.7	(0.8)	18.2	(0.7)	30.8	(1.3)	18.4	(0.9)
E7-E9	16.0	(2.0)	18.6	(2.2)	19.3	(1.2)	30.8	(1.2)	15.3	(1.7)
W1-W4	*	(*)	*	(*)	*	(*)	*	(*)	*	(*)
O1-O3	8.9	(1.4)	21.2	(2.0)	25.7	(2.3)	38.0	(4.0)	6.2	(1.4)
O4-O10	10.4	(1.8)	13.4	(3.5)	26.5	(1.6)	46.1	(3.9)	3.6	(1.1)
Time on Active Duty										
1 Year or less	10.2	(2.0)	17.7	(2.8)	20.0	(2.2)	28.7	(2.5)	23.4	(1.2)
>1-2 Years	8.0	(1.0)	17.7	(1.8)	17.1	(1.4)	29.4	(2.9)	27.8	(3.2)
>2-3 Years	11.1	(1.6)	13.7	(1.2)	20.0	(2.3)	31.7	(3.2)	23.5	(2.1)
>3-4 Years	15.0	(1.1)	16.3	(1.9)	19.9	(1.5)	27.1	(1.5)	21.7	(1.4)
>4-9 Years	13.2	(0.7)	17.8	(1.7)	21.7	(1.5)	33.7	(1.9)	13.7	(1.2)
>9 Years	13.8	(1.2)	18.2	(1.0)	19.3	(0.9)	35.6	(2.2)	13.2	(1.5)
Region										
Americas	13.3	(0.8)	17.9	(1.0)	20.1	(0.9)	31.8	(0.9)	16.9	(1.5)
North Pacific	11.3	(1.3)	13.1	(1.8)	14.2	(2.3)	34.7	(3.0)	26.7	(2.4)
Other Pacific	11.2	(1.8)	12.1	(0.7)	17.0	(0.4)	37.5	(2.5)	22.1	(4.7)
Europe	9.6	(0.5)	16.3	(0.9)	20.8	(0.2)	35.0	(1.5)	18.3	(3.0)
Total	12.6	(0.7)	17.3	(0.8)	19.8	(0.7)	32.6	(0.8)	17.7	(1.2)

Note: Drinking Level values are row percentages. Drinking levels are based on quantity and frequency data during the past 30 days for the respondents' primary beverage. Abstainers drink once a year or less. Those in the Infrequent/Light category drink 1-4 drinks 1-3 times/month. Those in the Moderate category drink (a) 1 drink at least once/week, (b) 2-4 drinks 2-3 times/month, or (c) ≥5 drinks once/month or less. Those in the Moderate/Heavy category drink 2-4 drinks at least once/week, or ≥5 drinks 2-3 times/month. Those in the Heavy category drink ≥5 drinks at least once/week.

*There are no warrant officers in the Air Force.