

1985 Worldwide Survey of Alcohol and Nonmedical Drug Use Among Military Personnel

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Robert M. Bray
Mary Ellen Marsden
L. Lynn Guess
Sarah C. Wheelless
D. Kirk Pate
George H. Duntzman
Vincent G. Iannacchione

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PREFACE AND ACKNOWLEDGEMENTS

The 1985 Worldwide Survey of Alcohol and Nonmedical Drug Use 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 provides comprehensive and detailed estimates, with known precision, of the prevalence of alcohol use, nonmedical drug use, and tobacco use for active duty military personnel. In addition, it provides information about some of the physical, legal, social, and work-related effects of psychoactive substance use. This is the third in a series of Worldwide surveys about the use of drugs and alcohol in the military.

Many individuals contributed to the success of this study. Special appreciation is due Air Force Lieutenant Colonel John R. Herbold, the Contracting Officer's Representative who provided valuable guidance throughout the study. Excellent liaison between DoD, RTI and the Services was provided by Ms. Susan Soucek and Lieutenant Colonel Larry Gilbertson for the Army, Lieutenant Cynthia Wilberg for the Navy, Captain Jane Truskey for the Marine Corps, and Major Frank T. Hartnett for the Air Force. Dr. Beatrice A. Rouse from National Institute on Drug Abuse provided useful comments and suggestions about questionnaire development and research analysis. The efforts of the four Service centers that provided programming and data processing support for personnel sample selection are 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, 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 coordinating data collection activities, typing and composing the questionnaire, tabulating data, and completing various data processing tasks. In particular, Dr. Robert E. Mason's direction was crucial to the sample design and implementation, and Michael A. Morgan assisted in the coordination of field team activities and Phase 2 data

collection. 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. Elizabeth R. Cavanaugh edited this final report and the Highlights report, and Lillian W. Clark completed the enormous typing and clerical requirements.

Robert M. Bray, Ph.D.
Project Director

EXECUTIVE SUMMARY

This report describes the results of the 1985 Worldwide Survey of Alcohol and Nonmedical Drug Use Among Military Personnel which was conducted by Research Triangle Institute. Data collection teams conducted survey sessions among a representative sample of active duty military personnel excluding recruits, Service academy students, persons absent without leave and persons who had a permanent change of station (PCS) at the time of data collection. Usable questionnaires were obtained from 17,328 respondents (5,879 Army, 4,335 Navy, 1,882 Marine Corps, 5,232 Air Force), for an 80 percent response rate.

The focus of the report is on understanding the nature and extent of substance use in the military and the resulting negative consequences from that use. Chapter 1 of the report provides a brief introduction and overview of the study and chapter 2 describes relevant past research on civilian and military substance use. Chapter 3 presents conceptual definitions of use, abuse and adverse effects and notes the analytic approach of the study. Chapter 4 discusses the methodology for the survey. Chapter 5 provides analyses that assess the prevalence and correlates of alcohol use, nonmedical drug use, and tobacco use. Chapter 6 describes negative effects attributed to alcohol use and drug use based on measures from prior Worldwide studies and develops new indicators of negative effects. Chapter 7 reports multivariate analyses of problem behaviors, drug and alcohol use, and negative effects of drug and alcohol use. Chapter 8 presents survey findings related to drug and alcohol policies and programs and Chapter 9 considers for the first time in the Worldwide studies the relationship between health practices, illness and substance abuse. The following pages of this Executive Summary provide an overview of the substantive findings described in Chapters 5 to 9 of the report.

A. Prevalence, Patterns and Correlates of Substance Use (Chapter 5)

1. Alcohol Use

- The large majority of military personnel (87 percent) drink at least on occasion, two-thirds drink at moderate to heavy levels, and 12 percent can be classified as heavy drinkers; on the average, military personnel consume 1.22 ounces of ethanol per day.

Between 1982 and 1985, the total volume of alcohol consumed declined significantly, but drinking patterns remained relatively stable.

- Drinking patterns are heavier among males, the less well educated, younger, unmarried and junior E1-E3 personnel.

2. Drug Use

- Overall in 1985, about 9 percent of military personnel report using any drug during the past 30 days and about 13 percent within the past 12 months.
- Marijuana is the most frequently used drug (about 7 percent, past 30 days); the use of other individual drugs is comparatively low (2.5 percent or less, past 30 days).
- Military personnel who used drugs are most likely to use them 1 to 3 days during the month rather than with greater frequency.
- Drug use is higher among personnel who are less well educated, younger, unmarried, of junior pay grade E1-E3 and who have fewer years of Service.
- Trend data show substantial declines in drug use between 1980-1985. Use of any drug during the past 30 days declined from 27 percent in 1980 to 19 percent in 1982 to about 9 percent in 1985. Declining patterns are consistent across all Services.

3. Tobacco Use

- About 46 percent of military personnel smoke cigarettes, almost one-fourth smoke cigars or a pipe and almost one in five use chewing tobacco, snuff, or other smokeless tobacco.
- Cigarette smoking indicated by the percentage of smokers declined significantly between 1982 (51 percent) and 1985 (46 percent).
- Cigarette smoking indicated by the number of pack years is higher among males, whites, those with less than a high school education or some college, and pay grades E4-E6, E7-E9 and W1-W4.

4. Summary

These findings reveal pervasive use of alcohol, substantial use of tobacco, and little nonmedical use of drugs among military personnel. Results suggest that alcohol use is by far the most serious substance use problem and that the military has made substantial progress in curbing nonmedical drug use. Despite decreases in drug use, the drug problem has not disappeared.

B. Negative Effects of Alcohol and Drug Use (Chapter 6)

1. Alcohol Use Negative Effects

- Overall, the majority of personnel do not experience negative effects from use of alcohol. Still, a significant percentage indicate problems resulting from use. About 27 percent report productivity loss due to alcohol use whereas less than 10 percent report work impairment, physical damage, social disruption, other consequences, or dependence.
- Overall, alcohol use negative effects experienced over a 12-month period declined significantly from 1982 to 1985 for measures of work impairment (8.9 percent to 6.3 percent), social disruption (10.6 percent to 7.5 percent), and productivity loss (34.4 percent to 27.1 percent). There were no significant changes in estimates of physical damage, other consequences, or dependence.
- The negative effects of alcohol use are concentrated among E1-E3 personnel and secondarily among E4-E6 personnel.
- Trends from 1980 to 1985 in productivity loss due to alcohol use show increases from 1980 to 1982 and decreases back to 1980 levels in 1985. Thus, progress has been made since 1982, but no overall gains since 1980.

2. Drug Use Negative Effects

- Most personnel do not use drugs and consequently only a few experience drug use negative effects.
- Overall, drug use negative effects declined significantly from 1982 to 1985 for work impairment (5.1 to 2.4 percent); physical damage (1.1 to 0.4 percent); social disruption (2.0 to 1.0 percent); and productivity loss (9.9 to 3.5 percent). There was no statistically significant change for other consequences.
- Most problems of drug use are concentrated in the lower pay grades.

3. Dimensions of Negative Effects

New measures of negative effects were developed using empirical data for alcohol use and for drug use. For alcohol use, four summary indexes were developed: work-related effects, legal effects, adverse physiological effects and general effects. For drug use, three summary indexes were developed: negative family or job effects, disruptive behaviors, and general negative effects.

- The new alcohol indexes, consistent with expectations, are related to alcohol problem categories and drinking levels. Personnel classified as dependent or heavy drinkers show scores on the new measures that are substantially higher than scores for other personnel.
- The new drug indexes are related to drug use patterns. Marijuana only users experience few negative effects of drug use; personnel with other drug use patterns consistently show more negative effects.

4. Summary

Overall, these findings show that the impact of alcohol and drug use on the productivity, health and social relationships of military personnel declined between 1982 and 1985. Nonetheless, substance use continues to have negative consequences for military personnel. The negative consequences are substantially more widespread for alcohol use than for drug use and are particularly prevalent for E1-E3 personnel, about half that level for E4-E6 personnel, and minimal for other pay grades. Alcohol-related consequences are particularly high among alcohol dependent persons and substantially higher among heavy drinkers than other drinkers. This suggests that primary attention should be placed on bringing about further reductions in alcohol abuse, particularly among E1-E6 pay grades.

C. Multivariate Analyses (Chapter 7)

Regression analyses examine and control for effects of several variables simultaneously. Three sets of regression analyses are conducted for behaviors that are not specific to drug or alcohol use (negative behaviors) or are attributed to alcohol use (negative effects due to drinking), or to drug use (negative effects due to drug use). In these analyses we focus on the effects of drinking levels and drug use patterns on the dependent measures, controlling for the effects of variables such as age, rank, educational level, and psychological/behavioral characteristics. Two other sets of regression analyses are concerned with predicting heavy drinking and predicting drug use patterns.

1. Effects of Drinking and Drug Use

- Alcohol use and drug use increase the likelihood that military personnel will experience general negative behaviors (e.g., arguments, trouble on job, neglected family responsibilities,

health problems) and legal incidents (e.g., UCMJ punishment, arrests, incarceration, trouble with police). Substance users at greatest risk are heavy drinkers or drug users who are not marijuana only users.

- Heavy drinkers experience significantly more negative work effects, legal effects, and physiological effects due to drinking than personnel in other drinking levels.
- Among enlisted drug users, the use of other drugs (besides marijuana) as compared to marijuana only, results in significantly more negative family/job consequences, disruptive consequences, and general negative consequences.
- Marijuana only users and other than marijuana only users may present distinct types of problems for the military. Marijuana only users primarily present a discipline problem. Users of drugs other than marijuana only, present both a problem of discipline and a problem of impaired performance.

2. Factors Affecting Heavy Drinking

- Both sociodemographic and psychological variables are important in explaining the probability of heavy drinking.
- Sociodemographic characteristics that distinguish heavy drinkers are being single, male, in pay grades E1-E9, and having lower educational levels.
- Psychological variables that distinguish heavy drinkers are high drinking motivation, beliefs about a favorable climate for using alcohol and receiving help for a problem (drinking climate), and beliefs that alcohol use does not affect work, health or fitness (drinking beliefs).
- Heavy drinkers experience significantly more negative work effects, legal effects, and physiological effects due to drinking than personnel in other drinking levels.

3. Factors Affecting Drug Use

- Age and beliefs about the harmful effects of drugs are important predictors of drug use. Drug use is inversely related to age and to beliefs about the harmful effects of drugs.

- The psychological belief variables (harmful effects of drugs, drug prevention efforts, prevalence of drugs) are more important in predicting other drug use than in predicting marijuana only use. Users of other drugs are more likely than nonusers to favor drug use and believe that drugs are not harmful, to indicate that drug deterrence is not effective, and to report that drugs are widely used and readily available.

4. Summary

Regression analyses confirmed that drug use and drinking levels are related to general negative behaviors and to negative effects of alcohol use and drug use. Any level of alcohol or drug use is associated with more general negative behaviors compared to nonuse, but heavy drinking and other drug use (besides marijuana) show exceptionally high levels of general negative behaviors. Similarly, heavy drinkers and users of drugs other than marijuana only are distinctive in experiencing significantly more negative effects than other users. Heavy drinkers are likely to be single enlisted males with lower educational levels who are highly motivated to drink and who believe that alcohol does not affect work, health and fitness. Drug users are likely to be younger, to be white, and to hold beliefs that drug use is not harmful. These findings suggest that primary attention should continue to be directed to reducing heavy drinking and drug use.

D. Alcohol and Drug Abuse Policies and Programs (Chapter 8)

The Department of Defense has adopted a comprehensive set of policies and programs to monitor, regulate and/or lessen the abuse of alcohol and drugs by military personnel.

1. The Context of Alcohol and Drug Abuse Prevention Programs

- Most military personnel feel that drinking and drug use are not generally accepted norms. They know the associated health risks and effects on work, but they do not perceive that drinking and drug use affect military readiness.
- Most military personnel feel that regulatory policies have a substantial effect on alcohol and drug availability and ease of use.

2. Orientations Toward Urinalysis Programs

- The majority of personnel believe that the urinalysis testing program has reduced drug use in the military (64 percent), but

they do not believe that the tests are reliable; nonusers are somewhat more likely than users to believe that urinalysis programs are effective.

3. Barriers to Seeking Help for Alcohol and Drug Abuse

- Some barriers exist to seeking help for alcohol and drug abuse, such as the perceived likelihood of disciplinary action, but many feel that personnel are helpful to those with alcohol or drug problems; the perceived barriers to seeking help from drug problems are greater than those for alcohol problems.

4. Summary

These findings suggest that military policies and programs directed toward substance abuse have been effective in creating a climate of reasoned use of alcohol and nonuse of drugs. Military personnel are aware of the substantial risks of substance use and are not supportive of substance abuse.

E. Health Practices and Substance Use (Chapter 9)

The Department of Defense is currently developing and implementing strategies to improve the health of military personnel.

1. Health Practices

- Most military personnel engage in positive health practices; they average 4.7 of 7 practices considered here: 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 a day at least 5 days a week; sleep more than 6 consecutive hours a day at least 5 days a week; meet the Services' weight standard. Officers engage in a greater number of positive health practices than do enlisted personnel.

2. Health Practices, Substance Use and Illness

- Substance users, particularly heavy users, engage in fewer positive health practices than nonusers.
- Heavy substance users and those who engage in fewer positive health practices report more illness, doctor visits and days hospitalized, within the past 12 months than nonusers or those who engage in more health practices.

3. Summary

These findings suggest that an emphasis on health promotion in the military can be effective in improving overall health status and may help decrease substance abuse.

1. INTRODUCTION

Alcohol misuse, nonmedical drug use and other substance use have negative effects on the health, productivity and social relationships of military personnel and on overall military readiness. Periodic data are needed by the Department of Defense (DoD) and the individual Services to monitor prevalence of substance use and resulting negative consequences.

A systematic effort to obtain data that can be used to guide and evaluate program policies was begun in 1980 under the direction of the Assistant Secretary of Defense (Health Affairs). A series of recurrent surveys was instituted to study drug and alcohol use in the military. The surveys provide a comprehensive worldwide assessment of the prevalence of alcohol use, nonmedical drug use, and tobacco use for the individual Services and for the total DoD. Results from these surveys are used to improve understanding of the nature, causes and consequences of substance use in the military, to determine the appropriateness of the emphasis placed on program elements, and to examine the impact of current and future program policies.

A. Objectives of the Study

This report describes the third study in the worldwide series, the 1985 Worldwide Survey of Alcohol and Nonmedical Drug Use Among Military Personnel. Research Triangle Institute (RTI) conducted the study which was guided by six major objectives:

- Assess the prevalence of alcohol use, nonmedical drug use, and tobacco use.
- Identify the physical, social, and work consequences of use.
- Identify demographic/behavioral characteristics of users.
- Determine trends in military drug and alcohol use over time.
- Compare military drug and alcohol use to civilian use.
- Assess health attitudes and behavior of military personnel.

To meet these objectives, RTI obtained survey questionnaire data from a worldwide representative sample of personnel from the four active Services. Usable questionnaires were obtained from 17,328 military members for a response rate of 80 percent.

B. Organization of the Report

This report describes the context of substance use in the military and the methodology and results of the data analyses for the 1985 Worldwide Survey. Prior studies of substance use including comparisons of trends in the civilian and military populations are presented in Chapter 2. Chapter 3 presents conceptual definitions of substance use, abuse, and adverse effects as well as the analytic approach of the research. The methodology of the study is discussed in Chapter 4. Chapter 5 provides an overview of the prevalence, patterns, and sociodemographic correlates of substance use. Chapter 6 draws on indicators from prior Worldwide studies and develops new measures to describe the dimensions of negative effects attributed to alcohol use and drug use. Results of multiple regression analyses of problem behaviors, substance use, and negative effects of substance use are described in Chapter 7. Chapter 8 presents survey findings about the effectiveness of the military's substance use policies and programs, including personnel's perceptions about substance use and their awareness of and participation in substance abuse programs. The final chapter, Chapter 9, considers, for the first time in the Worldwide studies, the relationship between health practices, illness, and substance use.

2. PRIOR EPIDEMIOLOGICAL STUDIES ON SUBSTANCE USE

Substance use refers to the use of alcohol, drugs, tobacco and other substances that can have negative effects on well-being. Substance abuse is generally defined in terms of use levels that produce negative consequences. For the military, however, any nonmedical use of drugs is termed abuse. The abuse of alcohol and drugs by military personnel is costly to the military and the nation because it affects the productivity, health, and social welfare of those personnel. Perhaps most important is that alcohol and drug abuse can substantially diminish military manpower availability and performance and the ability of the military to accomplish its mission in a timely manner. Alcohol and drug abuse also require large direct expenditures for prevention, intervention, and treatment programs, including drug surveillance programs such as urinalysis. Smoking can also substantially impair the health of military personnel.

This chapter examines those factors that provide a context within which to view observed levels of alcohol, drug, and tobacco use among military personnel currently and over time and to assess the effectiveness of the military's programmatic approaches. We first examine the costs associated with substance use and then review recent studies of alcohol, drug, and tobacco use in the U.S. civilian population and in the military.

A. Costs of Substance Use

The direct and indirect effects of substance use result in enormous social and economic costs to the nation. Harwood, Napolitano, Kristiansen, and Collins (1984) estimated that alcohol abuse cost \$116.7 billion and drug abuse cost \$59.7 billion in 1983, for a combined total of \$176.4 billion. The calculation of costs is based on the concepts and methodology formulated by a Public Health Service task force on cost-of-illness studies (Hodgson and Meiners, 1979). More specifically, costs were estimated by assigning economic values to decreased productivity of the workforce as a result of alcohol and/or drug abuse, provision of treatment services, premature mortality, vehicle crashes, and violent crime (including criminal justice system costs, incarceration costs, and victim losses).

Reduced productivity associated with alcohol and drug abuse accounts for \$98.9 billion or 56 percent of total costs and stems from unemployment, lost productivity, and impaired work performance. Alcohol and drug abusers have

lower incomes and are, in general, less successful in the workforce than are nonabusers. The estimates of the costs of reduced productivity were based on comparisons of the earnings potential of abusers and nonabusers, and losses of productive time due to accidents related to alcohol or drug abuse, illness, or treatment.

Smoking can also result in substantial social and economic costs. Luce and Schweitzer (1977), for example, estimated the cost of smoking in 1975 to be \$41.5 billion. Adjusted for inflation and population growth, this estimate is \$64.7 billion for 1980.

Alcohol abuse was found to be more costly to the nation (\$89.5 billion) than drug abuse, smoking, and seven other health problems in 1980, the most recent year for which comparable data were available. Smoking is the fourth most costly health problem (\$64.7 billion), after diseases of the circulatory system (\$79.4) and injury and poisoning (\$70.0 billion). Drug abuse is seventh (\$46.9 billion), after motor vehicle accidents (\$57.2 billion) and mental illness (\$54.2 billion) (Research Triangle Institute, 1985). Thus, substance use results in substantial social and economic costs to our nation each year, comparable to or greater than many major health problems.

The widespread use of alcohol, drugs, and tobacco in our society and their substantial consequences are reflected in the quantified economic costs. The costs of drug and alcohol abuse and smoking noted above, however, do not include the direct costs of alcohol and illicit drugs consumed or cigarettes smoked. The purchasing cost of illicit drugs, for instance, is estimated to be between \$56 and \$74 billion annually, almost equal to the societal costs of drug abuse (Harwood et al., 1984).

These societal costs, which include costs incurred by military personnel, underscore the magnitude of the substance abuse problem and the urgency of reducing the prevalence of substance abuse.

B. Trends in Substance Use in the Civilian Population

To help understand substance use patterns and trends in the military, it is useful to be aware of similar patterns and trends in the U.S. civilian population since the civilian sector is the source of military manpower. In this section we examine prevalence of use, characteristics of high risk groups, and consequences of use.

1. Prevalence of Substance Use

A series of studies conducted by the National Institute on Alcohol Abuse and Alcoholism (NIAAA), the National Institute on Drug Abuse (NIDA), and the U.S. Public Health Service document the prevalence of alcohol and drug abuse and smoking and their impact on society. The studies indicate relative stability in the levels of alcohol use, changing patterns of drug use, and declining cigarette use over the past decade.

Figures from NIAAA (1983, p.1) indicate that Americans in 1981 consumed an average of 2.77 gallons of beverage alcohol per year or about 1 ounce of absolute alcohol per day for persons aged 14 and over. These figures are calculated from official reports of alcoholic beverage sales, expressed in terms of the amount of consumption per drinking age population member. Of the total alcohol consumed, about 51 percent was beer, 36 percent distilled spirits, and 13 percent wine. Annual per capita consumption figures were relatively stable during the 1950s (about 2 gallons) and steadily increased to 1981. Per capita consumption of beer increased during the 1970s and 1980s, while consumption of spirits declined and consumption of wine slightly increased. By 1983, the most recent year for which data are available, average alcohol sales per capita had decreased slightly to 2.69 gallons per year (AEDS, 1985).

Levels of drinking remained relatively stable among adults over the 1970s. As shown in Table 2.1, the percentages of abstainers, lighter, moderate, and heavier drinkers were remarkably stable across a series of surveys conducted throughout the 1970s. Overall, about one-third of adults abstain, one third are light drinkers, and one third are moderate to heavy drinkers. About ten percent can be classified as heavy drinkers, that is, they tend to drink every day and consume five or more drinks at one sitting or several drinks during the day. Although heavy drinkers constitute only about 10 percent of the population, they drink about 50 percent of the alcohol consumed.

As also shown in Table 2.1, during the 1970s the percentage of abstainers decreased slightly, while the percentage of moderate drinkers increased slightly for all adults and for men and women separately. These figures suggest that more people drink now, and most of them drink at moderate rather than light or heavy levels. These data from the 1979 national alcohol survey are the most recent available on alcohol use patterns among adults. Complete data from a national survey conducted in 1985 were not available at the time of preparation of this report.

Table 2.1

Trends in Alcohol Consumption, 1971-1979, by Type of Drinker and Sex (in Percentages)

	Harris				Harris 1974	ORC 1975	RAC 1976	National 1979
	Harris 1971	Harris 1972	Spring 1973	Fall 1973				
Type of Drinker*								
Abstainer	36	36	34	37	36	36	33	33
Lighter	34	32	29	30	28	31	38	34
Moderate	20	23	23	21	28	21	19	24
Heavier	10	10	14	11	11	12	10	9
(N)**	(2,195)	(1,544)	(1,583)	(1,603)	(1,578)	(1,071)	(2,510)	(1,772)
Males								
Abstainer	30	28	25	26	24	27	26	25
Lighter	29	29	24	29	24	27	33	29
Moderate	26	28	29	26	34	26	24	31
Heavier	15	15	22	19	18	20	18***	14
Females								
Abstainer	42	44	42	47	42	45	39	40
Lighter	40	34	35	32	32	35	44	38
Moderate	13	18	17	17	21	15	15	18
Heavier	5	4	6	4	5	4	3	4

Note. Percentages are weighted figures and may not total to 100% due to rounding.

*Type of drinker is not directly comparable to the drinking level index reported elsewhere in this report. Abstainers are those who drink 0.0 ounces of ethanol/day; lighter drinkers, .01-.21 ounces; moderate drinkers, .22-.99 ounces; and heavier drinkers, 1.0 ounce or more a day.

**N's presented are the same as in the Third Special Report to the U.S. Congress on Alcohol and Health (NIAAA, 1978); however, actual N's used in this analysis varied slightly.

***Statistically significant linear trend ($p < .05$) from 1971 to 1976 indicating an increase (excluding 1979 survey).

Source: Clark and Midanik, 1982.

Data from national surveys on drug use presented in Table 2.2 (Miller et al., 1983) show that the use of a number of illicit drugs increased substantially during the 1970s but decreased from 1979 to 1982. Marijuana use in the past month among young adults increased from about 25 percent during the 1970s to 35 percent in 1979 but decreased to 27 percent by 1982. Similar trends were seen for hallucinogens, cocaine, and heroin, although use of each of those drugs was substantially lower (under 10 percent). The nonmedical use of prescription drugs (including sedatives, tranquilizers, and analgesics) was approximately the same in 1982 as in 1979. However, there appears to have been an increase in stimulant use. The 1982 data are the most recent national data on drug use patterns among adults. The 1985 national drug survey will provide more current information, but the data were not available at the time this report was prepared.

The prevalence of cigarette smoking among adults increased from 1925 to 1950, decreased about 1955, peaked in the early 1960s and has declined since the release of the Surgeon General's report in 1964. Available data from several survey series indicate that the percentage of regular cigarette smokers was approximately 38 percent in the 1950s, 42 percent just before the Surgeon General's report, 39 percent in the several years after the report, and about 35 percent in the 1970s (Harris, 1979). The most recent figures from the National Health Interview Survey for 1985 show that about 30 percent of adults aged 20 and over were current smokers. Of current smokers, 31 percent smoked less than 15 cigarettes a day, 41 percent smoked 15 to 24 cigarettes a day, and 27 percent smoked 25 or more cigarettes a day (NCHS, 1985).

2. Characteristics of High Risk Groups

Young adult males are at greatest risk for use of drugs and alcohol. Over 80 percent of males aged 18-34 drink beverage alcohol (NIAAA, 1983), and 68 percent of males aged 18-25 in 1982 had tried marijuana (Miller et al., 1983). Men drink significantly more than women, and the prevalence of alcohol use among adults aged 18-25 has been about 22 percent greater than among adults aged 26 and over. Young males report more drinking episodes, more daily use, and consumption of larger quantities on any single drinking occasion than do females (NIAAA, 1983).

Table 2.2

Use of Drugs in Past Month, 1972-1982, by Young Adults Aged 18-25

Young Adults: Age 18-25	1972 (772)	1974 (849)	1976 (882)	1977 (1500)	1979 (2400)	1982 (1284)	Change '79-'82**
Marijuana	27.8	25.2	25.0	27.4	35.4	27.4	.001
Hallucinogens	.	2.5	1.1	2.0	4.4	1.7	.001
Cocaine	.	3.1	2.0	3.7	9.3	6.8	.05
Heroin	.	*	*	*	*	*	--
Nonmedical Use of:							
Stimulants	x	3.7	4.7	2.5"	3.5	4.7	K
Sedatives	x	1.6	2.3	2.8"	2.8	2.6	K
Tranquilizers	x	1.2	2.6	2.4"	2.1	1.6	K
Analgesics	x	x	x	x	1.0	1.0	K
Any Nonmedical Use	xx	xx	xx	xx	6.2	7.0	K

* Less than .5%.

**Difference between 1979 and 1982 is significant at confidence level noted.

x Not asked.

xx Since questions on use of analgesics were not asked in surveys prior to 1979, the nonmedical use of any psychotherapeutic (including analgesics) could not be reported for these earlier years.

. Not tabulated.

"1977 estimates based on split sample: N=750.

K Significance test not performed (79-82 procedures not comparable).

Source: Miller et al., 1983.

Young adults (18-25) are much more likely than youth or older adults to use drugs currently. About 27 percent of those aged 18 to 25 reported they used marijuana in the past month compared to 12 percent of those aged 12 to 17 and 7 percent of those aged 26 and older. About 7 percent of young adults used prescription drugs for nonmedical purposes compared to 4 percent of youth and 1 percent of older adults. Males aged 18-25 (36 percent) were substantially more likely than females (19 percent) to report current use of marijuana or current use of psychotherapeutic drugs for nonmedical purposes (33 percent, 24 percent, respectively). Young adult blacks and other minorities were more likely than young adult whites to use marijuana currently (35 percent, 26 percent), while young adult whites were more likely to use psychotherapeutic drugs (31 percent), than young adult blacks and other minorities (14 percent) (Miller et al., 1983).

Males (33 percent) are also more likely than females (28 percent) to be current smokers and to smoke more than a pack of cigarettes a day (10 percent, 6 percent). Unlike alcohol and drug use, cigarette smoking is not concentrated among younger adults. Cigarette use is fairly constant and declines only after age 65. Over 30 percent of adults aged 64 and under smoke, compared with only 16 percent of adults aged 65 and over.

Military populations, which are predominantly young males, then, will be at high risk of alcohol and drug abuse because of the demographic regularities observed for the civilian population. Smoking is also expected to be common.

3. Consequences of Substance Use

Physiological dependence, addiction, and long-term organic deterioration are linked closely with heavy and frequent use of alcohol (Polich, Armor, and Braiker, 1981). Among the highest costs are those of fetal alcohol syndrome and deaths and illnesses related to alcoholism, alcoholic psychosis, and liver cirrhosis. Alcohol use also contributes to lowered work productivity, homicide, suicide, assaultive behaviors, and family problems. Alcohol has also been associated with nonfatal and fatal traffic accidents. Between 50 and 55 percent of all fatal accidents involve a drinking driver or pedestrian. Single-vehicle accidents in which young people are involved are disproportionately represented in fatal accident statistics (Podolsky, 1985).

Though problems appear to be most likely to occur among alcoholics or heavy drinkers, many problems may be exacerbated by moderate drinking. Because moderate drinkers are more prevalent than heavy drinkers, they may substantially

contribute to social problems. Clark and Midanik (1982) reviewed findings from 1967 and 1979 surveys regarding alcohol-related problems in the areas of health, friends, dependence, jobs, legal, and marital problems. The major alcohol-related problem reported in each year was psychological dependence, affecting 37 percent of respondents in 1967 and 21 percent in 1979. Other problems were under 10 percent except for "symptomatic drinking" or signs of physical dependence, which reached 14 percent in 1979.

Drug use is related to medical/physical, mental health/emotional, family/friends, legal, job/education, and financial problems as well as dependence, addiction, and physiological damage (Nurco, 1972; O'Donnell, 1969). As reported in Bray et al. (1982) and Hubbard et al. (1984), 80 percent or more of clients entering drug abuse treatment had drug-related problems. The few studies of the effects of drug use in general populations, unlike alcohol studies, have rarely distinguished heavy drug users and incidental users.

Smoking also has substantial effects on health. The Surgeon General's Report on Smoking and Health concluded in 1979 that "...smoking is the largest preventable cause of death in America." Each year cigarette smoking is implicated in 80,000 deaths from lung cancer, 22,000 deaths from other cancers, 225,000 deaths from cardiovascular disease, and 19,000 deaths from chronic pulmonary disease (Smoking and Health, 1979). Recent data indicate that cigarette smokers have a 70 percent higher overall annual death rate than nonsmokers. Further, the risk of death from lung cancer among smokers is 10 times greater than among nonsmokers, a fatal heart attack two times greater, and chronic obstructive lung disease six times greater (Health: United States and Prevention Profile, 1983; Luoto, 1983). Indeed, the 1984 Surgeon General's report maintains that 50,000 of the previous year's 62,000 chronic lung disease deaths could have been prevented if those individuals had not smoked (Smoking and Health, 1984).

In addition to evidence of its causative role in cancer, smoking has been implicated in unfavorable pregnancy outcome and infant health, peptic ulcer disease, and allergies. The effects of "passive smoking" are increasingly recognized. The 1984 Surgeon General's Report on Smoking and Health cites research findings on the effect of cigarette smoke on indoor air pollution, changes in pulmonary function, and greater respiratory illness among children.

In addition, it is apparent that cigarette smoking is one of the primary causes of drug interactions in humans. Cigarette smoking can alter the effects of prescription drugs and other clinical laboratory tests (Smoking and Health, 1979).

C. Trends in Substance Use in the Military

This section considers military trends in substance use. We begin by discussing some factors that are related to the nature of the problem, and then examine data briefly for the 1980 Worldwide Survey, the 1982 Worldwide Survey, and the 1983 Marine Corps survey.

1. Nature of the Problem

Given the readiness requirements of the military, reduction in manpower availability and performance because of substance use impairs combat effectiveness. At any time, the effects of drugs or alcohol impair the individual's performance of duty, even if only by slowing reaction time and motor control, and may jeopardize the safety of others. Immediate readiness of whole units can be reduced by the poor performance of only a few members. Over the long run, manpower levels, discipline, and morale are affected by the need to deal with individuals whose alcohol or drug use interferes with job performance or results in violations of the Uniform Code of Military Justice.

The military has a disproportionately large segment of young single males, among whom substance use and abuse are most prevalent. The worldwide dispersion of military personnel to areas where they feel isolated or unable to adjust may contribute to the seriousness of drug and alcohol problems. Additionally, control over availability of psychoactive substances is hampered by the need to locate some installations in areas where drugs may be easy to get. Studies of Vietnam veterans (Robins, 1974), for instance, indicated that accessibility to drugs and the nature of the Vietnam rotation contributed to nonmedical drug use in Southeast Asia.

Of course, overseas assignments do not necessarily mean that there will be more drug and alcohol use. Johnston, O'Malley, and Davis-Sacks (1983), for example, concluded that the worldwide dispersion of military forces does not necessarily raise use levels. They found that drug and alcohol use among students in DoD Dependent Schools was similar to, not higher than, drug and alcohol use among students stateside, despite some differences in availability and students' perceptions of risk associated with drug and alcohol use abroad and stateside.

Circumstances fairly unique to the military such as isolation or high stress may contribute to nonmedical drug use and alcohol use. They neither cause the problems associated with substance abuse nor do they make the effects more tolerable; rather, they argue for developing prevention and intervention strategies that take into account the military situation.

2. Recent Studies of Military Personnel

The influence of drug and alcohol use has been a topic of concern to the Department of Defense since the late 1960s (Cahalan, Cisin, Gardner, and Smith, 1972; Cahalan and Cisin, 1975; Cook, Hostetter and Ramsey, 1975; Black, Owens, and Wolff, 1970; Greden, Frenkel, and Morgan, 1975). Discharge policies and prevention and treatment programs have been established to deal with the problem. As part of this effort, the three Military Departments independently conducted surveys of substance use during the 1970s. For example, in 1977 the RAND Corporation studied alcohol problems for the U.S. Air Force (Polich and Orvis, 1979). The Army has been collecting data on drug use through the Office of the Deputy Chief of Staff for Personnel (ODCSPER) Annual Survey since 1974. Since 1981, the ODCSPER survey has included questions concerning alcohol use among Army personnel.

Three major studies of drug and alcohol use in the military have recently been conducted: the 1980 and 1982 Worldwide Surveys and the 1983 study of the Marine Corps.

a. The 1980 Worldwide Survey

The 1980 Worldwide Survey was conducted by Burt Associates, Incorporated, of Bethesda, Maryland (Burt and Biegel, 1980). This survey was intended 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" (p. iii). The study thus concentrated on nonmedical drug use and alcohol use and associated consequences and provided a benchmark for the analysis of change over time. The survey was conducted during February, March and April, 1980, and a total of 15,268 military personnel in pay grades E1-06 stationed at 81 installations completed self-administered questionnaires. Analyses were primarily descriptive.

Overall, 36 percent of military personnel reported use of one or more drugs in the past year and 27 percent in the past month. The figures for marijuana were very similar to those for any drug use. Across all pay grades, reports of drug use during the past month were highest in the Marine Corps (37 percent), followed by the Navy (33 percent), Army (29 percent), and Air Force (14 percent). Most nonmedical drug use occurred among E1-E5s.

Almost all personnel (83 percent) drank at least occasionally, and about 7 percent were alcohol dependent during the preceding 12 months. About one-fifth reported work impairment because of their alcohol use, and about one-tenth reported impairment because of drug use.

b. The 1982 Worldwide Survey

The 1982 Worldwide Survey was conducted by the Research Triangle Institute of Research Triangle Park, North Carolina (Bray, Guess, Mason, Hubbard, Smith, Marsden, and Rachal, 1983; see also Allen and Mazzuchi, 1985). The survey addressed seven specific 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.
- 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-O6. Descriptive analyses were supplemented with more explanatory approaches.

Results showed a statistically significant decline in nonmedical drug use from 1980 (27 percent) to 1982 (19 percent), primarily attributable to the decline in use among E1-E5 personnel (from 38 percent to 26 percent). As expected, declines in reported drug use were accompanied by declines in reports of productivity loss due to drugs (from 21 percent to 14 percent).

The percentage of personnel who were moderate drinkers increased significantly from 1980 to 1982, while the percentage drinking most heavily decreased significantly. More personnel experienced drunkenness, negative consequences, and productivity loss in 1982 than in 1980, but about the same percentage indicated alcohol dependence in both years. Overall, an estimated 9 percent of military personnel in 1982 were alcohol dependent, and 18 percent suffered negative consequences and were, therefore, classified as problem drinkers. Note that these overall comparisons used cross-sectional data; they do not represent changes in drinking behavior occurring over time for the same individuals.

Multivariate analyses examined the independent effects of demographic and psychological/behavioral variables. Psychological variables such as attitudinal and motivational measures were better predictors of both drug and alcohol use than were demographic variables. Alcohol use was more prevalent among Hispanics, males, single persons, those reporting various problem behaviors, drug users, and those for whom drinking served important functions. Drug use was more likely among those with less education, those who were single or younger, and those reporting problem behaviors or social support for drugs. For both sets of analyses, after adjusting for all factors in the model, there were few differences among Services and regions. This suggests that apparent Service and regional differences in drug and alcohol use are partly a function of the frequencies of demographic variables and psychological/behavioral variables related to drug and alcohol use among personnel in the different Services and regions. The importance of psychological/behavioral indicators in predicting drug and alcohol use suggests that programs directed toward attitudinal and behavioral change could result in reductions in drug and alcohol use.

c. The 1983 Marine Corps Survey. The 1983 Marine Corps survey of 18,000 enlisted personnel and officers conducted by the Center for Naval Analysis assessed the prevalence of alcohol and drug use and the effectiveness

of programs to combat it (Stoloff and Barnow, 1984). Survey results were compared with results for Marine Corps personnel from the 1980 and 1982 World-wide Surveys. Overall, both drinking and nonmedical drug use declined. In 1983, Marines drank the equivalent of 2.4 beers a day compared to 2.7 in 1982 and 3.3 in 1980. The proportion of heavy drinkers in 1983 was less than half what it was in 1980. In 1983, about 17 percent of Marines used drugs compared with 21 percent in 1982 and 36 percent in 1980. The perception of negative consequences of alcohol and drug use has risen, perhaps because of increased awareness or changes in policies for dealing with abusers. Most were aware of on-base programs for alcohol and drugs, and 43 percent had participated in a drug education program. Alcohol and drug rehabilitation efforts appear to have been highly successful.

These surveys indicate that patterns of alcohol and drug use in the civilian population and the military are changing, but there is a continuing need for programs directed toward decreasing abuse and negative consequences associated with abuse.

3. CONCEPTUAL DEFINITIONS AND ANALYTICAL APPROACH

There is considerable societal ambiguity about the definitions of substance use and abuse. Many of the ambiguities stem from differences in cultural, moral, and legal perspectives. For example, drinking on the job is generally unacceptable in the United States although drinking while entertaining clients is an accepted practice; some religious groups prohibit use of any psychoactive substances (even caffeine) while others incorporate alcohol into their rituals and disapprove only of excessive private use; and laws differ among the states regarding the minimum age for legal purchase of beverage alcohol. Even more ambiguous are the differences among inappropriate use, acceptable use, and abuse. Reliance on medical evidence or legal strictures only serves to illustrate, not solve, the dilemma. Medical experts, for example, disagree about the benefits of some alcohol use such as a daily glass of wine. The law forbids possession of the smallest amount of marijuana but there is no law against daily consumption of quarts or gallons of beverage alcohol. Few would disagree with the U.S. Surgeon General's conclusions about the harmful effects of cigarette smoking, but the term "tobacco abuse" has yet to gain a widespread acceptance. Thus, much of the ambiguity surrounding the "problems" of psychoactive substance use is a function of the meanings and definitions of the terms used. It is, therefore, appropriate to make explicit the meanings and definitions of the terms used in this report and to discuss in some detail the conceptual rationale that has guided the approach of the current study.

This chapter provides a discussion of the concepts of substance use, abuse, and adverse effects used in this study. Included are a presentation of the DoD perspective on substance use and abuse; development and definition of the concepts of use, abuse, and adverse effects; discussion of measurement issues, approaches, and definitions; and a description of the analytic approach taken throughout the study.

A. The DoD Perspective Regarding Substance Use and Abuse

The Department of Defense is charged with maintaining a high state of military readiness and proficiency. Thus, a central aim of the military perspective is the prevention and minimization of the effects of substance use on military performance. Policy 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.

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

The nature and extent of the substance abuse problem within DoD is a function of the definition of abuse. The DoD definition of drug abuse follows from the 1979 guidelines of the Office of Drug Abuse Policy, the Executive Office of the President, for the Federal effort on drug abuse. The Presidential guidelines focus not on any particular substance nor on misuse per se but on the consequences of use of any substance for the health and well-being of the individual and society. Drug abuse was defined in the presidential guidelines as

The nontherapeutic use of any psychoactive substance, to include alcohol and tobacco, in such manner as to adversely affect some aspect of the user's life, the lives of others, or the community at large. (DoD Office of Drug and Alcohol Prevention, 1979).

Drawing on the presidential guidelines, the DoD definition states that alcohol and drug abuse are

The use of alcohol and/or other drugs to an extent that it has an adverse effect on the user's health or behavior, family, community, or the Department of Defense and/or the illegal use of such substances. (DoD Directive 1010.4, 1980, p.1)

Like the Presidential guidelines' definition, the DoD definition focuses on the consequences of alcohol and drug use. Unlike the definition in the presidential guidelines, the DoD definition specifies the illegal use of both alcohol and drugs and omits specific mention of tobacco.

This concept implies that alcohol use, under certain circumstances, and any drug use, per se, are problems. The focus on consequences, however, suggests that abuse of substances that results in more negative consequences

is more serious and more likely to cause problems. A wide variety of consequences is possible, ranging from morning-after headaches to effects on job performance, health, the military organization, and society at large. Furthermore, even if the effects or consequences are trivial for the user of illicit drugs, the deleterious effect on military discipline that results from defiance of laws and regulations is sufficient to constitute abuse.

B. Conceptual Definitions and Distinctions

The military's perspective and most current public health thinking on alcohol and drug abuse are fairly consistent although the military gives greater emphasis to order and legality in defining drug abuse. Still, a number of questions are unsettled. What is "appropriate" substance use? Do the characteristics of the user, the kind of substance, or the manner of use distinguish use from misuse? What substances should be included in considerations of use and abuse? What constitutes "abuse" and what constitutes an "adverse effect"?

1. An Historical Perspective

Generally, the "problem" of psychoactive substance use is defined in terms of the consequences of nonmedical use for the performance, health, and well-being of the individual. This concept emerges from that of the World Health Organization (WHO) committee on alcohol-related disabilities (Edwards, Arif, and Hodgson 1981).

In the mid-1970s, a WHO steering group assessed the current state of knowledge regarding alcohol-related disabilities and developed a commonly accepted terminology. Previously it had been assumed that people who had alcohol-related problems were "alcoholics," variously defined. Yet it was apparent that many who did not satisfy any definition of "alcoholic" had alcohol-related problems. Thus, the WHO committee made a primary distinction between an "alcohol dependence syndrome" and alcohol-related disabilities. The alcohol dependence syndrome is manifested by alterations at the behavioral, affective, and psychobiological levels; impaired control over intake of alcohol is the leading symptom. An alcohol-related disability is a physical, mental or social impairment that is at least partially caused by alcohol use (Edwards et al., 1981).

Since the WHO committee made its initial distinctions, the diagnosis and classification of alcohol-related problems have been refined. 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 sickness and death; adverse social consequences, such as traffic accidents, industrial accidents, disruptions in family relationships, and suicide; and effects on job-related productivity.

Polich and Orvis (1979) adapted the perspective of the WHO committee for the Rand Corporation surveys of alcohol-related problems in the Air Force. According to Polich and Orvis, it is essential for adequate understanding and decision-making about alcohol-related problems that the three conceptually independent conditions of alcohol dependence, adverse effects, and alcohol consumption be kept distinct.

Classification of alcohol-related problems in these three categories is not simply a conceptual exercise. As discussed above, clinical and other empirical evidence supports the distinction; indeed, alcohol dependence and adverse effects may exist independently of one another and at different levels of consumption. Since not every problem that Air Force personnel had experienced as a result of alcohol use was severe enough to warrant official intervention, Polich and Orvis limited the scope of their inquiry to two basic types of alcohol problems:

- Alcohol Dependence. A chronic behavioral pattern indicating that the individual consumes high amounts of alcohol and relies on alcohol in everyday functioning.
- Adverse Effects of Alcohol. Any type of serious consequence of drinking not reflected under alcohol dependence if it results in concrete and serious damage or disruption to the individual's life or to the Air Force. (Polich and Orvis, 1979, p. 12)

The significance of the work by Polich and Orvis lies less in their findings about the Air Force than in the creativity and clarity of their adaptation of the alcohol disabilities perspective to satisfy two considerations:

- Suitability for use with a survey data collection methodology that relies on self-administered questionnaires, and
- Policy-relevance, in that the findings should discriminate between different kinds of problems, suggest intervention strategies, and identify target populations.

This view of alcohol-related disabilities defines the following elements as essential:

- differentiating between users and nonusers;
- ascertaining levels of use; and
- differentiating between types of problems associated with use.

The issue of levels of use arises from the evidence that, while some alcohol users may experience negative consequences at low levels of use, usually such problems are a function of episodic excessive consumption, and the alcohol dependence syndrome is invariably accompanied by heavy consumption.

The conceptualization of substance abuse in the current and previous Worldwide studies recognizes this work on alcohol-related disabilities over the past decade. This perspective on alcohol-related problems was adopted and extended to drugs other than alcohol in the 1980 and 1982 Worldwide Surveys.

Obviously, the definitional problem must be resolved before assessing the nature, extent, and consequences of substance use and abuse. In order to determine the size of the problem and to decide what to do about it, it must be clear what the problem is. Therefore, for this study, a distinction is made between the terms:

- Use,
- Dependence,
- Adverse effects, negative consequences, or problems, and
- Abuse.

2. Substance Use

We define substance use simply as taking the substance into the body, where substances include alcohol, drugs, and tobacco. Unfortunately, because various cultural, moral, legal, and medical meanings have become associated with different substances, use often implies excessiveness, irresponsibility, moral turpitude, illegality, or physical damage. For example, hearing that someone smokes cigarettes or enjoys an occasional drink evokes far less dismay than hearing that someone "uses drugs." Whether or not these extra connotations are valid, having a term that simply means "taking into the body" is conceptually useful. In this framework, it is possible to discuss the "use" of alcohol, tobacco, and other drugs without including the meanings associated with their immediate physiological effects, their different legal statuses, or the physical consequences of their chronic long-term use.

Other than alcohol and tobacco, there are two broad categories of drugs. The first category has no legitimate (except some experimental) medical value. Principal drugs in this category are heroin, PCP, hallucinogens, cocaine, and marijuana. The second category of drugs are those with legitimate medical purposes. Most are available only by prescription, but others, such as analgesics, some sleeping pills, and some antihistamines, are available over-the-counter. In addition, some other drugs (e.g., inhalants) have both non-medical and medical value (e.g., glue, ether). For this study, medical use of drugs other than alcohol or tobacco in the dosage prescribed or for purposes recommended by the manufacturer is not of interest. Rather, we are interested in the use of any of these drugs:

- Either without a doctor's prescription, or
- In greater amounts or more often than prescribed or recommended,
- Or for any nonmedical reason such as to get high, for thrills or kicks, to relax, to give insight, for pleasure, or curiosity about the substance's effects.

3. Dependence

For the purposes of this study, distinguishing dependence from other substance use problems is useful for policy and programmatic reasons. Conceptually, the dependent person is characterized by inability to control his substance use; even a tiny dose must be followed by consumption sufficient to satisfy the subjective (i.e., felt) need for the substance. Elaboration of the concept beyond its physiological elements to include subjective dependence owes much to the disease model of alcoholism, in which "loss of control" over drinking constitutes the essential characteristic. Experiencing withdrawal symptoms or acquiring physical tolerance (i.e., increasingly heavier dosages are required to feel the effects or to prevent withdrawal symptoms) also characterize this condition. Dependence is associated with high consumption, and high consumption has long-term, serious physical consequences. In the short-term, however, dependence is a serious disability only if the user is deprived of the substance.

A nondependent user, even a chronic habitual excessive user, on the other hand, can control his behavior (even if he does not) and can be helped by normal social mechanisms of control and change, such as education, law enforcement, peer pressure, and restrictions on availability. Since the dependent user has no control over his "craving" and is unable to control his

consumption once use begins, his "problem" is not amenable to traditional socialization/sanctioning methods. Based on the clinical validity of this distinctive characteristic of dependence, then, there obviously is considerable policy relevance in being able to identify dependence and to direct persons with this condition to special treatment.

4. Adverse Effects, Negative Consequences, or Problems

The perspective on alcohol disabilities developed above differentiates between the condition of dependence on alcohol and the harm that results from use of alcohol, either at levels sufficient to induce and sustain dependence or at lesser levels. The notion of problem drinking recognizes that many drinkers experience negative effects without being dependent on alcohol. Nondependent drinkers who suffer adverse effects, often resulting from irregularly-occurring episodes of extremely heavy consumption, require different treatment approaches than dependent persons.

It is important to point out that the notion of "problem" substance use, with its focus on negative consequences, does not lessen the seriousness of the condition of alcohol dependence. The harm resulting from dependence is itself included within the scope of adverse effects related to use of the substance, and it is axiomatic that persons dependent on psychoactive substance experience many of the other negative consequences at higher than normal rates.

Conceptually, then, any experiences which disrupt the health, social life, or work performance of military personnel are included within the meaning of the terms "adverse effects," "negative consequences," or "problems" due to substance use. This concept does not require that the disruption be cataclysmic, such as losing a job. Rather, the focus is on specific, concrete, behavioral (as opposed to subjective) incidents serious enough that associates become concerned about the individual. Some adverse effects are not immediate, but the risk of adverse effects rises as the substance is repeatedly used (e.g., lung cancer after long-term regular smoking, alcoholic psychosis after chronic habitual excessive drinking).

In general, then, the incidents that qualify as adverse effects from the perspective followed in this study are serious enough, either immediately on their own merit or as indicators that a critical problem may be developing, to justify official attention and action.

5. Substance Abuse

For purposes of this study (and consistent with the DoD definition), the term abuse applies to any or all of the following conditions:

- Dependence, physiological or psychological, as evidenced by withdrawal symptoms and uncontrolled use;
- Regular (almost daily) consumption at a level certain to result in physical damage or considered excessive when compared with community norms;
- Any experience of adverse effects related to use of a psychoactive substance, regardless of amount consumed on the occasion of the negative incident or "usual" quantity-frequency of consumption;
- Any unauthorized possession or use of any psychoactive substance other than alcohol for nonmedical purposes, as defined above.

Conceptually then, substance abuse is a generic term that applies to use of any one or more of the psychoactive substances of interest when that use results in any or all of the conditions or behaviors listed above. Operationally, it can be seen that for drugs other than alcohol and tobacco, "use" and "abuse" are equivalent because any nonmedical drug use by military personnel is illegal and against military regulations.

In summary, disabilities related to the use of alcohol or drugs include work impairment, physical damage, social disruption, and either physiological or psychological dependence. It is also recognized that alcohol, drugs, and tobacco can negatively affect the health of users. Furthermore, this study recognizes that particularly serious adverse effects can arise from the simultaneous use of several different substances. Thus, the 1985 Worldwide Survey characterizes the abuse of alcohol and other drugs as a matter of kind of dysfunction (i.e., excessive amounts, dependence, adverse effects, illegal use) and degree of dysfunction (i.e., serious enough to interfere with normal productive functioning, serious enough to warrant official intervention, catastrophic).

C. Measurement Approaches

Measurement in this study is guided by the conceptualizations of substance use, dependence, adverse effects, and abuse discussed above. A more prominent role is given to smoking behavior and its negative effects than in the 1980 and 1982 Worldwide Surveys.

1. Alcohol Use and Dependence

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 ethanol consumed per day and as drinking levels.

a. Average Daily Ethanol Consumption. An index constructed following the method used in the 1982 Worldwide Survey and the Rand Study (Polich and Orvis, 1979) combined 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 Worldwide Survey (Bray et al., 1983).

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 3.1.

c. Alcohol Dependence. The measure of alcohol dependence is based on the Rand Air Force study definition (Polich and Orvis, 1979). The items used represent the four symptoms of blackouts, tremors (shakes), impaired control, and morning drinking. 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

Figure 3.1. Drinking Level Classification Scheme

Drinking Level Groups	Definition
Abstainer	Doesn't drink or drinks less than once a year.
Infrequent/Light Drinker	Drinks once a month at most and drink less than 2 drinks per typical drinking occasion <u>or</u> drinks no more than once a month and 2-4 drinks per typical occasion <u>or</u> drinks 3-4 times a month and less than 2 drinks per typical drinking occasion.
Moderate Drinker	Drinks at least once a week and less than 2 drinks per typical drinking occasion <u>or</u> 3-4 times a month and 2-4 drinks per typical drinking occasion <u>or</u> no more than once a month and 5 or more drinks per typical drinking occasion.
Moderate/Heavy Drinker	Drinks at least once a week and 2-4 drinks per typical drinking occasion <u>or</u> 3-4 times a month and 5 or more drinks per typical drinking occasion.
Heavy Drinker	Drinks at least once a week and 5 or more drinks per typical drinking occasion.

classified as dependent. The conceptual basis for this measure is an "addiction" model, but the operational definition noted here is less restrictive, reflecting a frequent physiological or subjective need for alcohol.

2. Drug Use

Drug use is measured in this study in terms of the frequency of nonmedical use of any of ten 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. Thus, there are insufficient data to address issues such as the interaction of dosage with such factors as body weight and tolerance. No measures of drug dependence are developed analogous to those for alcohol because of the extremely small number of military personnel in the 1982 Worldwide Survey who exhibited symptoms of dependence.

a. Drug Types or Categories. The military is most concerned with use, without a prescription or authorization, of any of the psychoactive substances listed in regulations promulgated by the Attorney General of the United States under the authority of the Comprehensive Drug Abuse Prevention and Control Act of 1970 (PL 91-513). It was, therefore, required that this study measure use of five specific substances (marijuana, hashish, phenobarbital, cocaine, and heroin) and seven classes of drugs subject to PL 91-513 (hallucinogens, amphetamines, other stimulants, barbiturates, tranquilizers, other depressants, and narcotics). There was interest in a somewhat broader set of psychoactive substances and the desire to collect data comparable to that being gathered by the National Institute on Drug Abuse (NIDA) in its current survey of drug use among a large sample of persons in the national civilian household population. This resulted in measurement of use for the following ten categories of drugs:

- Marijuana or hashish,
- PCP (phencyclidine),
- LSD or other hallucinogens,
- Cocaine,
- Amphetamines or other stimulants,
- Tranquilizers or other depressants,
- Barbiturates or other sedatives,
- Heroin or other opiates,
- Analgesics, other narcotics, and
- Inhalants.

Within each category of drugs, a number of drugs of the type were identified by common trade or chemical name to facilitate identification by military personnel. For each type of drug, respondents were asked to indicate the recency of last use of any drug of the type and the number of days of use within the past 30 days.

b. Measures of Use. 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), any drug besides marijuana, and the number of different types of drugs used within a period. Definitions generally follow those used in the 1982 Worldwide Survey 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). The number of drugs index is created by summing similar use/no use dichotomies across the entire set of drugs.

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

In the current study, greater emphasis is placed on the analysis of smoking behavior than in prior years. Most analyses focus on current (past 30 days) levels of cigarette smoking. A measure of cigarette smoking equivalence, pack-years, is interpretable as the number of years cigarettes have been smoked at the constant level (dosage) of one pack a day.

4. Negative Effects

The negative effects of alcohol and drug use experienced by military personnel are examined using measures from the 1982 Worldwide Survey and using new measures developed in the current study. The 1982 measures include work impairment, physical damage, the disruption of social relationships, other consequences, and productivity loss. Specifically, these measures are based on any occurrence due to alcohol or drug use in the past 12 months of any of the items noted below:

- work impairment--UCMJ punishment, low performance rating, loss of three or more work days;
- physical damage--kept from duty one week or more by illness, hurt in accident, causing an accident with injury to others or property damage;
- social disruption--spouse left or threatened to leave, DWI arrest, incarceration, fights, arrest for nondriving drinking or drug incident;
- other consequences--not getting promoted, hitting spouse or children, 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.

In addition to these measures of negative effects used in the 1982 Worldwide Survey, new items were also included from the 1985 NIDA survey. New measures of negative effects were developed for the current study based on results of factor analyses of the total set of negative effects items. For alcohol-related problems, new measures were developed that address the following independent dimensions:

- work effects,
- legal effects,
- physiological effects, and
- general effects.

For drug-related problems, new measures were developed that address the dimensions of:

- family and job effects,
- disruptive effects, and
- general effects.

Detailed discussion about the construction of these measures appears in Chapter 6.

5. Health Promotion

These negative effects measures are supplemented with an examination of the relationship between substance use and involvement in various health practices as well as health care utilization (number of illnesses, number of doctor visits, and number of days hospitalized during the past 12 months). These analyses, conducted for the first time in the 1985 Worldwide Survey, provide basic information about health practices in the military and the viability of health promotion approaches in decreasing substance abuse. The construction of the health practices index is described in Chapter 9.

D. Analytical Approach

Analyses of the 1985 Worldwide Survey data are oriented toward providing knowledge about current levels of substance use and associated negative effects; trends in use and negative effects compared with surveys conducted in 1982 and 1980; and information about the distinctiveness of use patterns among military personnel relative to the civilian population. 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, five basic types of analyses are conducted within this study:

- Descriptive univariate and bivariate analyses of the extent of substance use and negative consequences in 1985 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 and negative effects in 1980, 1982 and 1985, for the total DoD and the individual Services;
- selected comparisons of the extent of substance use in military and civilian populations,
- 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.

Analyses that examine changes in substance use over time are useful in comparing current and prior problems, but such analyses have limitations that should be recognized in drawing any policy conclusions. The data from the 1980, 1982, and 1985 surveys are cross-sectional, not longitudinal, and come from different populations due to the larger turnover in military personnel. That is, many individuals serving in the military in 1980 or 1982 were no longer in the military in 1985. Thus, caution must be used in making inferences about reasons for changes in rates of substance use or problems that are observed. The changes may be due to effective substance use programs and policies in the military, but they may also be due to differences in characteristics, attitudes, and values of the populations being surveyed.

4. METHODOLOGY OF THE 1985 WORLDWIDE SURVEY

This chapter describes the sampling design, data collection procedures, survey performance rates, organization, and content of the survey questionnaire, and the 1985 survey respondents.

A. Sampling Design Overview

The 1985 Worldwide Survey used rigorous statistical techniques to create a demonstrably unbiased sample. The eligible population of participants for the survey was defined by the Department of Defense (DoD) to be 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 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. Excluding PCS individuals is not viewed as a serious problem. PCS orders are, for the most part, random, and the drug and alcohol use behavior for these individuals is assumed to be similar to that 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. Personnel in all other excluded groups are in special environments and, in general, do not typify the Services.

The sampling was patterned after the design used in the 1982 Worldwide Survey (Bray et al., 1983). A deeply stratified, two-stage, two-phase design, the first phase involved the selection of the first and second stage sampling units, and the second phase involved the selection of the nonresponse sub-sample.

1. Phase 1 Design

First stage sampling units were constructed by combining geographically proximal Service level organizational units. These organizational units for the Services were:

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

The first stage sampling frame was stratified by Service (Army, Navy, Marine Corps, Air Force) within four broadly stratified geographic regions of the world. The geographic regions and the areas they encompassed were:

- 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.

A total of 15 first stage strata were defined (one for each Service in each region except for Marines in Europe who were 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). Composite size measures were constructed to ensure that personnel within each pay grade group in each of the 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-E4s, E5-E6s, E7-E9s, W1-W4s, O1-O3s, and O4-O10s) within each first stage unit, except for the Air Force which does not have warrant officer grades. The second stage sample was selected with equal probability and without replacement from within second stage strata.

Table 4.1 shows the distribution of the first stage sampling units, and the first and second stage sample sizes. In total, 498 first stage sampling units were constructed, and 63 first stage units were selected in the sample. The second stage sample consisted of 25,547 active duty personnel (9,008 Army, 6,648 Navy, 2,949 Marine Corps, 6,942 Air Force) in the following countries for each region.

- Americas--Alaska, CONUS, Cuba, Panama, Puerto Rico,
- North Pacific--Republic of Korea, mainland Japan, Okinawa
- Other Pacific--Guam, Hawaii, Philippines,
- Europe--Belgium, Denmark, Egypt, Italy, Norway, Saudi Arabia, Sicily, Turkey, United Kingdom, West Germany.

Table 4.1. Allocation of the Sample

Region	Service	Total Number of First Stage Sampling Units	First Stage Sample Size (Installations)	Second Stage Sample Size (Individuals)
Americas	Army	75	13	5,011
	Navy	106	9	4,169
	Marine Corps	39	4	1,442
	Air Force	<u>93</u>	<u>11</u>	<u>4,406</u>
	Total	313	37	15,028
North Pacific	Army	18	2	883
	Navy	5	2	852
	Marine Corps	3	2	802
	Air Force	<u>5</u>	<u>2</u>	<u>828</u>
	Total	31	8	3,365
Other Pacific	Army	4	2	907
	Navy	9	2	867
	Marine Corps	3	2	651
	Air Force	<u>3</u>	<u>2</u>	<u>823</u>
	Total	19	8	3,248
Europe	Army	99	6	2,207
	Navy	9	2	760
	Marine Corps ^a	0	0	54
	Air Force	<u>27</u>	<u>2</u>	<u>885</u>
	Total	135	10	3,906
Total Worldwide	Army	196	23	9,008
	Navy	129	15	6,648
	Marine Corps	45	8	2,949
	Air Force	<u>128</u>	<u>17</u>	<u>6,942</u>
	Total	498	63	25,547

^aMarine Corps personnel in Europe were classified into Navy first stage units.

2. Phase 2 Design

Personnel who were on leave, in the hospital, on temporary duty assignments (TDY/TAD), on duty that was deemed mission essential, at sea or deployed in the field, incarcerated, or available but absent from the survey sessions may not have completed questionnaires in Phase 1. If nonrespondents differ from respondents, population estimates based on respondents alone will be biased. To determine and compensate for the bias in the data from the initial questionnaire administration, a subsample of nonrespondents to Phase 1 was allocated to take part in the Phase 2 data collection. The specifications for this subsample were based on the findings of the 1982 Worldwide Survey. Phase 2 data were used to adjust the Phase 1 estimates to compensate for nonresponse bias.

Additional details of the sampling design are given in Appendix A.

B. Data Collection Procedures

Phase 1 data collection of the 1985 Worldwide Survey consisted of in-person group sessions conducted by field teams at the installations. Eighty-five percent of the 1985 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 September to mid-October, 1985 at the selected installations located in the four geographical 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 to:

- store the survey instruments,
- receive the sample personnel lists,
- notify sample personnel of their selection for the survey,
- coordinate and schedule the survey sessions during 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 nine two-person RTI field teams in survey sessions at the installations selected for the study. The data collection itinerary was arranged to permit personnel at a nucleus installation to be surveyed during a 2-day visit although 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, one to the Other Pacific Region, and two to the Europe Region. Before data collection, field team leaders were trained in a 2-day conference by RTI staff in collaboration with the HLOs and the DoD project officer. Each team leader subsequently trained his or her other team member.

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 introduced the survey, assured the respondents of anonymity, and informed participants of the voluntary nature of participation and the correct procedures for marking the questionnaire. During the visit to a first stage unit (installation), team members attempted to survey all eligible individuals. Rosters that documented reasons why individuals were absent from any session were prepared for RTI central staff.

At the completion of the site visit, field teams inventoried completed instruments, reconciled the inventory with documented counts from the lists of

le personnel completing the survey, and packaged the instruments for ment. Questionnaires were shipped to National Computer Systems for cal scan processing.

2. Phase 2 Data Collection

As noted above, reasons for personnel not completing the survey stionnaire in Phase 1 included illness or hospitalization, temporary duty ignments (TDY, TAD), mission essential assignments, individual leave, loyment status, and unexplained failure to appear. At the conclusion of se 1 data collection for each first stage unit, RTI field teams mailed stionnaires 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 indivi- dual on the selected personnel list (e.g., attended, TDY, leave),
- applying prespecified subsampling rates to select eligible indivi- duals 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 rpose and importance of the study,* a copy of a blank questionnaire precoded identify the first stage sampling unit and the study phase, and an addressed, amped envelope for the respondent to use in mailing the completed question- aire directly to National Computer Systems in Iowa City for scoring. As with ase 1 data collection, the respondents were anonymous.

Survey Performance Rates

Response rate information is useful for assessing the quality of survey ield 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 information was obtained,

* The Air Force also provided an additional cover letter encouraging their personnel participate.

- 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 Coverage Rate or Response Rate Among Eligibles are presented in Table 4.2 along with the corresponding response data used to compute them. Each performance rate is briefly described.

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 4.2, the overall Eligibility Rate was approximately 89 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 only 74 percent. As might be expected, the Navy had the lowest availability rate (63 percent) due to personnel at sea. The availability rate suggests that the Phase 2 data were needed to compensate for considerable potential 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.

Table 4.2. Survey Response Data and Performance Rates

Item	Service				Total DoD
	Army	Navy	Marine Corps	Air Force	
Response Data					
1. Persons selected for survey (total sample)	9,008	6,648	2,949	6,942	25,547
2. Phase 1 eligible persons identified ^a	8,047	5,897	2,543	6,215	22,702
3. Eligibles available during Phase 1 data collection sessions	6,325	3,699	1,849	4,802	16,675
4. Questionnaires obtained from Phase 1	5,379	3,483	1,673	4,701	15,247
5. Questionnaires obtained from Phase 1 with usable information	5,300	3,435	1,671	4,607	15,013
6. Phase 2 sample size	1,845	2,916	848	1,424	7,033
7. Number of Phase 2 eligible persons identified	1,500	2,267	652	1,077	5,496
8. Questionnaire obtained from Phase 2 data collection	586	901	211	635	2,337
9. Questionnaires obtained from Phase 2 with usable information	579	900	211	625	2,315
10. Total Questionnaires with usable information ^b	5,879	4,335	1,882	5,232	17,328
Performance Rates					
11. Eligibility Rate (%) = (Item 2/Item 1)*100	89.3	88.7	86.2	89.5	88.9
12. Availability Rate (%) = (Item 3/Item 2)*100	78.6	62.7	72.7	77.3	73.5
13. Completion Rate (%) = (Item 4/Item 3)*100	85.0	94.2	90.5	97.9	91.4
14. Phase 1 response rate among eligibles (%) = (Item 5/Item 2)*100	65.9	58.3	65.7	74.1	66.1
15. Phase 2 response rate among eligibles (%) = (Item 9/Item 7)*100	38.6	39.7	32.4	58.0	42.1
16. Coverage rate, or response rate among eligibles = (Item 14/100) + [1-(Item 14/100)*(Item 15/100)]*100	79.0	74.8	76.8	89.1	80.4

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

^aExcludes 2,845 individuals from the sample who were separated (431), deceased (2), AWOL (10), unknown (186), or PCS (2,216).

^bOverall 256 questionnaires were excluded.

The 91 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 had the greatest success (98 percent), and the Army had the least success (85 percent).

Coverage Rate, or 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, the coverage 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 approximately 80 percent.

D. Survey Questionnaire and Data Validity

The survey instrument was a self-administered questionnaire designed for optical mark reader scoring. The 1982 questionnaire was modified for 1985 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 1985 Worldwide Survey objectives. These areas are:

- prevalence of alcohol use and drug use during periods of 30 days and 12 months,
- negative effects of substance use (e.g., work impairment, physical damage, social disruption, and dependence),
- prevalence of tobacco use (especially cigarettes),
- 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 Spring 1985, a pilot study was conducted at one military installation for each Service to examine the adequacy of item wording, formatting, and response alternatives. After inspecting item distributions and informally debriefing 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 underestimate the extent of substance use, the

data generally provide useful and meaningful patterns. 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. Beverage sales data, however, suggest 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 (Erickson and Empey, 1963; Blackmore, 1974; Gibson, Morrison, and West, 1970; Gold, 1966; Gould, 1969; Doleschal, 1970; 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 1985 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). Thus, even if self-reports underestimate actual use, they appear to represent overall trends.

E. Sample Participants and Respondent Characteristics

The section on response rates presents the total number of survey respondents for each Service and total DoD. Table 4.3 displays the distribution of survey respondents across Service, Region, and Pay Grade. Overall, the Army had the largest number of respondents (5,879) followed by the Air Force (5,232), Navy (4,335) and Marines (1,882). The Marines, as the smallest service, had the fewest numbers of participants across the regions. In the Americas, the Air Force (3,367) and the Army (3,240) were similar followed by the Navy (2,458), and Marines (886). In the North Pacific, the Navy (645) and Army (604) had the largest representation followed by the Air Force (577) and Marines (507). The Army (662), Navy (645) and Air Force (633) had roughly equal numbers of respondents in the Other Pacific region with the Marine Corps having the fewest (450). In Europe, the Army (1,373) dominated the sample respondents with the Air Force (655) and Navy being about the same (587).

Table 4.3 Distribution of 1985 Worldwide Survey Respondents

Region/Pay Grade	Army	Navy	Marine Corps	Air Force	Total DoD
Americas					
E1-E3	268	160	143	383	954
E4-E6	1,181	858	292	1,215	3,546
E7-E9	958	789	242	939	2,928
W1-W4	241	186	60	*	487
O1-O2	97	76	31	145	349
O3	153	96	37	157	443
O4-O10	342	293	81	528	1,244
Total	3,240	2,458	886	3,367	9,951
North Pacific					
E1-E3	45	63	92	43	243
E4-E6	245	263	176	267	951
E7-E9	183	183	137	157	660
W1-W4	37	39	33	*	109
O1-O2	22	13	14	20	69
O3	24	26	15	43	108
O4-O10	48	58	40	47	193
Total	604	645	507	577	2,333
Other Pacific					
E1-E3	27	52	93	79	251
E4-E6	271	279	164	278	992
E7-E9	190	173	113	171	647
W1-W4	48	41	24	*	113
O1-O2	19	10	15	11	55
O3	28	38	9	45	120
O4-O10	79	52	32	49	212
Total	662	645	450	633	2,390
Europe					
E1-E3	89	50	10	68	217
E4-E6	607	321	17	283	1,228
E7-E9	383	127	5	162	677
W1-W4	79	24	0	*	103
O1-O2	52	3	1	9	65
O3	55	23	2	43	123
O4-O10	108	39	4	90	241
Total	1,373	587	39	655	2,654
Total Worldwide					
E1-E3	429	325	338	573	1,665
E4-E6	2,304	1,721	649	2,043	6,717
E7-E9	1,714	1,272	497	1,429	4,912
W1-W4	405	290	117	*	812
O1-O2	190	102	61	185	538
O3	260	183	63	288	794
O4-O10	577	442	157	714	1,890
Total	5,879	4,335	1,882	5,232	17,328

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

*There are no warrant officers in the Air Force.

The paygrade distribution showed the largest number of participants being E4-E6s, followed by E7-E9s, O4-O10s, E1-E3s, W1-W4s, O3s and O1-O2s. This pattern was generally consistent across regions.

Many tables in subsequent chapters of the report present data in the form or some slight variation of the pattern shown in Table 4.3. Because of the large number of different cell sizes, it is not feasible to present sample sizes in the individual analytical tables. Thus, reference to this table for the approximate sample sizes used will be necessary.

Estimates of the sociodemographic characteristics of the 1985 respondent population based on the sample and actual population characteristics are presented in Table 4.4. This table 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. (Obviously, for very small or very large estimates, the respective smallest or largest value in the confidence interval range will be zero or 100 percent.) The interpretation of the confidence interval range is that, if the study were repeated with 100 identically-drawn samples, 95 of the sample estimates would fall within the confidence interval range; thus, we are 95 percent certain that the true population value also lies within that range. Clearly, for a given confidence level (e.g., 95 percent), 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

Table 4.4. Estimated Sociodemographic Characteristics of Eligible Respondent Population and Actual Characteristics of DoD Personnel

Sociodemographic Characteristic	Army		Navy		Marine Corps		Air Force		Total DoD	
	Sample	Population	Sample	Population	Sample	Population	Sample	Population	Sample	Population
<u>Sex</u>										
Male	91.7 (0.9)	89.9	90.8 (1.4)	90.9	95.2 (1.1)	95.1	89.1 (0.8)	88.4	91.0 (0.6)	90.2
Female	8.3 (0.9)	10.1	9.2 (1.4)	9.1	4.8 (1.1)	4.9	10.9 (0.8)	11.6	9.0 (0.6)	9.8
<u>Race/Ethnicity</u>										
White	62.6 (1.4)	65.8	77.6 (1.9)	78.8	71.5 (1.0)	74.3	79.4 (1.5)	78.4	72.3 (0.9)	73.5
Black	24.1 (1.3)	27.0	11.7 (1.0)	12.2	16.8 (2.1)	18.7	12.9 (1.4)	14.9	16.9 (0.7)	18.9
Hispanic	9.3 (0.9)	3.5	6.1 (0.6)	3.5	7.2 (1.6)	4.6	4.0 (0.6)	3.5	6.7 (0.4)	3.6
Other	4.0 (0.5)	3.7	4.7 (1.0)	5.6	4.4 (2.3)	2.5	3.7 (0.4)	3.3	4.1 (0.4)	4.0
<u>Education</u>										
Less than high school	2.3 (0.4)	3.5	1.3 (0.2)	5.6	2.4 (0.9)	2.2	0.3 (0.1)	0.1	1.5 (0.2)	3.0
High school grad/GED	51.9 (2.2)	69.7	54.1 (2.4)	72.6	64.5 (5.7)	86.6	30.9 (3.0)	57.3	47.3 (1.5)	68.6
Some college	29.6 (1.4)	12.3	31.0 (1.5)	10.0	23.5 (5.5)	1.6	47.5 (1.8)	22.3	34.7 (1.1)	13.5
College degree or beyond	16.2 (1.7)	14.4	13.5 (1.4)	11.7	9.6 (1.8)	9.6	21.3 (3.7)	20.4	16.4 (1.3)	14.9
<u>Age</u>										
17-20	21.1 (2.2)	20.6	15.3 (3.1)	17.8	29.7 (3.5)	28.9	10.4 (1.7)	11.8	17.3 (1.3)	18.2
21-25	31.3 (2.0)	33.3	40.6 (1.6)	36.3	39.9 (4.3)	38.9	34.4 (2.0)	34.2	35.3 (1.1)	34.9
26-30	19.2 (1.4)	20.1	17.4 (1.8)	19.9	14.6 (1.5)	16.6	23.1 (1.5)	21.2	19.5 (0.9)	20.0
31 or older	28.4 (2.1)	26.0	26.7 (1.4)	26.0	15.8 (3.6)	15.6	32.1 (2.6)	32.8	27.9 (1.2)	26.9
<u>Marital Status</u>										
Not married	42.8 (1.8)	45.6	49.8 (2.4)	48.3	54.6 (4.5)	55.3	37.4 (1.8)	36.7	44.0 (1.2)	45.6
Married	57.2 (1.8)	54.4	50.2 (2.4)	51.7	45.4 (4.5)	44.7	62.6 (1.8)	63.3	56.0 (1.2)	54.4
<u>Pay Grade</u>										
E1-E3	23.7 (2.2)	25.4	25.2 (2.8)	29.3	44.2 (4.5)	45.8	25.7 (2.8)	25.4	26.6 (1.4)	28.3
E4-E6	51.7 (1.9)	51.2	54.2 (1.4)	50.0	39.3 (3.3)	36.8	47.7 (1.9)	47.7	50.0 (1.0)	48.6
E7-E9	10.1 (0.9)	9.3	8.8 (0.5)	8.3	6.8 (1.2)	7.2	8.3 (0.6)	8.8	8.9 (0.4)	8.7
W1-W4	2.0 (0.4)	2.0	0.5 (0.1)	0.6	0.8 (0.3)	0.7	* (0.1)	*	0.9 (0.1)	0.9
O1-O2	3.4 (0.5)	3.3	2.8 (0.4)	3.6	2.9 (1.0)	3.6	5.7 (1.9)	4.9	3.9 (0.6)	3.8
O3	4.7 (0.5)	4.6	4.3 (0.7)	3.9	3.0 (0.9)	3.0	6.2 (1.3)	6.9	4.9 (0.5)	4.9
O4-O10	4.4 (1.0)	4.3	4.2 (0.6)	4.5	3.1 (1.2)	2.8	6.4 (2.0)	6.4	4.8 (0.7)	4.8
<u>Total Personnel</u>	35.6 (1.7)	36.3	25.4 (2.3)	26.5	9.2 (0.9)	9.3	29.8 (1.6)	27.9	-	-

Note: Tabled values are column percentages with standard errors in parentheses. Actual population data for DoD personnel (excluding Service Academy personnel) on September 30, 1985 were provided by the Defense Manpower Data Center.

* There are no warrant officers in the Air Force.

Source: Questions 2, 5-10.

(i.e., percentage or mean) is approximately equal to or larger than an equal-sized point estimate.

As shown in Table 4.4, the sample is generally representative of the military on displayed characteristics. Most estimates are within two standard errors and many within one standard error of the population values. Educational background of the sample deviated most from that of the DoD population with sample respondents reporting more formal education (particularly non-degreed postsecondary education) than is typical of military personnel according to DoD statistics. This difference is largely explained by the fact that the primary source of data for the DoD personnel files is educational level at entry into the military. Additional educational training has not been systematically updated on Service records. Further, DoD asked for highest year of school completed, whereas the survey asked respondents to indicate highest level of education now. Thus, survey respondents who attended college for one term but did not complete the year were counted in the survey as beyond high school but were considered to have only a high school education in the DoD data.

Estimates of the percentages in the various race/ethnicity groups also varied from the data on DoD personnel files with Hispanics showing the greatest discrepancy. Sample data estimate 6.7 percent of the force as Hispanic, whereas DoD personnel files show 3.6 percent. Reasons for the differences are not clear but may be related to the method used to classify race/ethnicity on the DoD files. Data from two other independent surveys (The 1982 Worldwide Survey and The 1985 DoD Survey of Officer and Enlisted Personnel*), however, agree with the estimates of the percentage of Hispanics observed in the present study.

* A manpower planning survey of active-duty military members sponsored by the Defense Manpower Data Center.

5. PREVALENCE, PATTERNS, AND CORRELATES OF SUBSTANCE USE

This chapter describes the prevalence, patterns, and correlates of substance use among military personnel for the entire Department of Defense (DoD) and for each of the Services.¹ Alcohol use and drug use are considered together throughout this report to emphasize that substance use, not simply alcohol or drug use, is the problem for the military. Singly, and in combination, these drugs can negatively affect the health and productivity of military personnel. Because smoking and drinking caffeinated beverages may also be deleterious, the use of these substances is examined.

We begin with an overview of current levels of alcohol, drug, and tobacco use and compare prevalence estimates for 1985 to those in 1982 and 1980. Later sections of the chapter examine the prevalence and correlates of alcohol use, drug use, and tobacco use in 1985 and compare these data to those for the civilian population. We conclude with a brief discussion of the prevalence of caffeine use.

A. Overview: Current Use and Trends

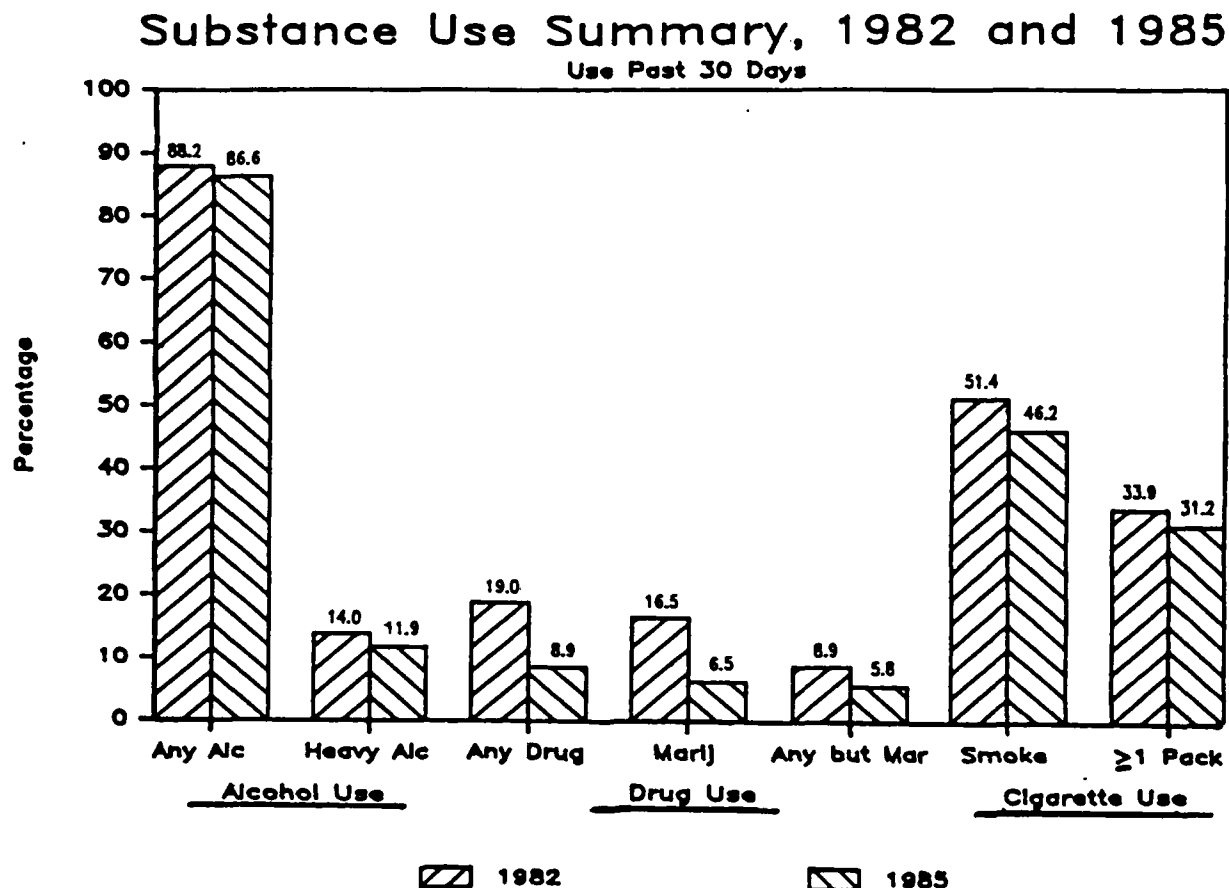
Data presented below indicate that nearly all military personnel drink beverage alcohol. Alcohol is by far the most widely used substance. Almost half smoke cigarettes. Relatively few use drugs, but drug use remains an important problem for the military because the possession of many drugs is illegal. Although the pattern of alcohol use remained relatively stable, the overall volume of alcohol consumed declined between 1982 and 1985, part of a longer-term decline in alcohol use since 1980. During the same period, drug use declined, as did cigarette use. These patterns of change are consistent for each of the Services and for total DoD.

1. Total DoD

Figure 5.1 compares the magnitude and overall use patterns of alcohol, drugs, and cigarettes in 1982 and 1985. More complete data are presented in Table 5.1. Alcohol use is indicated by two measures: average daily ounces of ethanol consumption and drinking levels (abstainer, infrequent/light drinker,

¹Throughout the report, numbers presented in the text are usually rounded to whole percents for the sake of brevity, whereas those in tables and figures are reported to the nearest tenth of a percent. The rounding convention used is to round up to the next higher percentage for decimals greater than .5 and to round down to the next lower percentage for decimals less than .5. For decimals that equal .5, even numbers are rounded down, and odd numbers are rounded up to the closest whole percent.

Figure 5.1



moderate, moderate/heavy, and heavy). The overall volume of alcohol used declined significantly between 1982 and 1985 from 1.41 ounces of ethanol per day to 1.22 ounces per day. The drinking level index, however, showed a relatively stable pattern. The 2 percentage point increase in abstainers between 1982 and 1985 is significant, but there are no significant changes in the other drinking levels. The 2 percentage point decline in heavy drinkers is not statistically significant. Most military personnel drink alcoholic beverages, averaging between two and three drinks a day of beer, wine, or liquor (assuming that about one-half ounce of ethanol is contained in the average drink). About two-thirds drink at moderate or heavy levels. The modal category is moderate drinking (31 percent) followed by moderate/heavy drinking (26 percent).

Table 5.1. Substance Use Summary, 1982 and 1985 - Total DoD

Substance	Year of Survey				82-85 Change
	1982		1985		
<u>Alcohol Use</u>					
Average Daily Ounces of Ethanol	1.41	(0.05)	1.22	(0.06)	-0.19*
Drinking Levels					
Abstainer	11.8	(0.5)	13.4	(0.6)	+1.6*
Infrequent/Light	18.9	(0.8)	17.9	(0.7)	-1.0
Moderate	29.8	(0.6)	31.1	(0.7)	+1.3
Moderate/Heavy	25.5	(0.5)	25.6	(0.7)	+0.1
Heavy	14.0	(0.8)	11.9	(0.8)	-2.1
<u>Drug Use</u>					
Marijuana					
Past 30 days	16.5	(0.9)	6.5	(0.6)	-10.0*
Past 12 months	24.3	(0.9)	11.1	(0.8)	-13.2*
Any Drug Except Marijuana ^a					
Past 30 days	8.9	(0.6)	5.8	(0.6)	-3.1*
Past 12 months	13.8	(0.7)	8.5	(0.9)	-5.3*
Any Drug ^b					
Past 30 days	19.0	(1.0)	8.9	(0.8)	-10.1*
Past 12 months	26.6	(1.0)	13.4	(1.0)	-13.2*
<u>Cigarette Use, Past 30 Days</u>					
Didn't smoke	48.6	(0.8)	53.8	(1.0)	+5.2*
Less than a pack/day	17.9	(0.5)	15.0	(0.6)	-2.9*
1 to 1½ packs/day	24.5	(0.4)	23.4	(0.7)	-1.1
2 packs or more/day	9.0	(0.4)	7.8	(0.4)	-1.2*

Note: Entries for average daily ounces of ethanol are mean values. Other entries are percentages with standard errors in parentheses. The final column is a difference score.

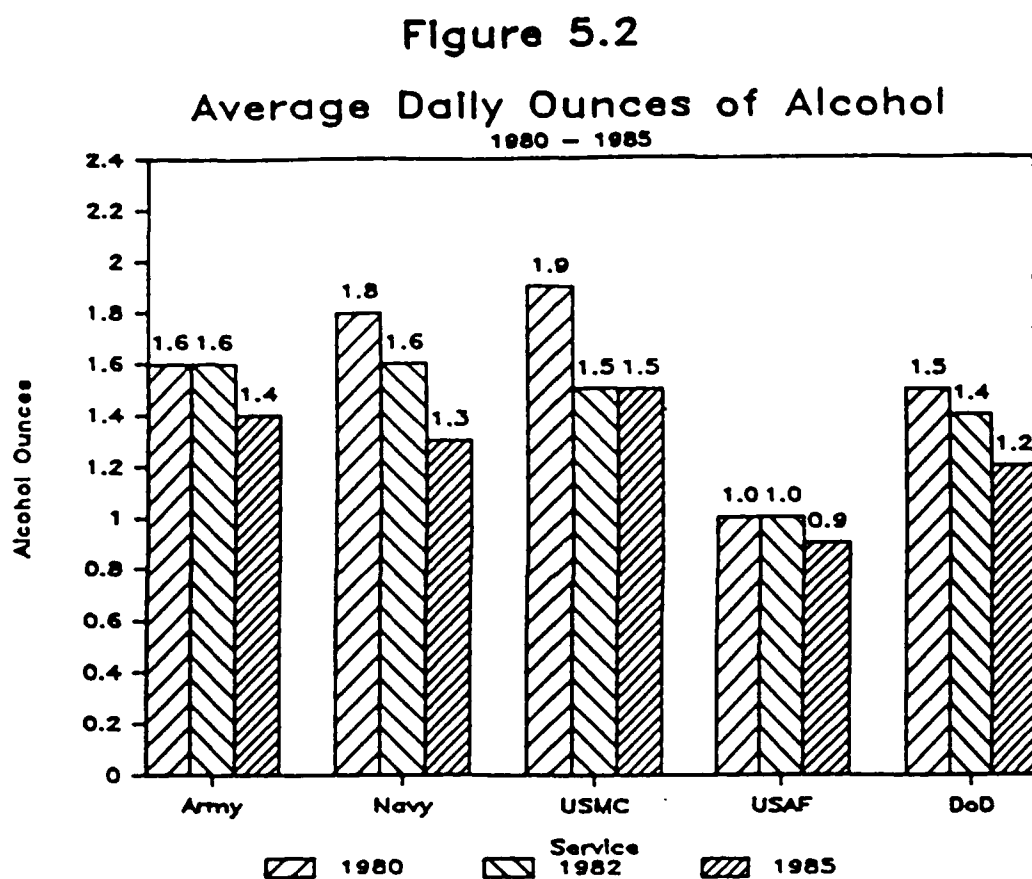
* Comparisons between 1982 and 1985 are statistically significant at the 95 percent confidence level.

^aAny nonmedical use of PCP, LSD/hallucinogens, cocaine, amphetamines/stimulants, tranquilizers, barbiturates/sedatives, heroin/other opiates, analgesics, or inhalants.

^bSame definition as "a" except marijuana is included in the set of drugs.

Source: Alcohol Use 1982: Questions 20-28.
 Alcohol Use 1985: Questions 23-31.
 Drug Use 1982: Questions 67, 96.
 Drug Use 1985: Questions 52, 77.
 Cigarette Use 1982: Question 103.
 Cigarette Use 1985: Question 14.

The declines in overall volume of alcohol consumption between 1982 and 1985 are part of a longer term decline beginning as early as 1980, the first year that the Worldwide Survey was conducted, as shown in Figure 5.2. Overall, average daily ethanol consumption declined from 1.5 ounces in 1980 (computed from data in Burt and Biegel, 1980, p. 241) to 1.4 ounces in 1982 and to 1.2 ounces in 1985. For the Services, the most notable declines since 1980 occurred for the Navy and for the Marine Corps.



In making cross-year comparisons, some caution is in order in making generalizations. There are some differences across the three studies in the sampling methodology, the field procedures, the survey questionnaires, and the sociodemographic composition of the Services.¹ Nonetheless, these differences are not so serious as to preclude making comparisons. The studies also have many similarities (e.g., key questionnaire items remained the same, two-person teams surveyed personnel, random procedures were used), and the large numbers of personnel surveyed make estimates robust.

¹See Bray et al., 1983, chapter 8, for a discussion of 1980-1982 survey differences.

Taken together, the similarities suggest that tentative conclusions about levels of use across studies can be drawn. However, much less can be stated about the reasons for observed changes. It is not possible in cross-sectional data such as these to determine and isolate the possible influence of such factors as effectiveness of education and prevention programs, shifts in drug enforcement policies, availability and access to substances, changes in the level of commitment to use, changes in the sociodemographic characteristics of personnel in the military, and trends of use in the U.S. civilian population.

For drugs, substantial and statistically significant decreases were observed between 1982 and 1985 in the percentages who had used marijuana, any drug except marijuana,¹ or any drug² for nonmedical purposes during the past 30 days and the past 12 months. The proportion of military personnel reporting any nonmedical drug use within the past 30 days declined from 19 percent in 1982 to 9 percent in 1985; for the past 12 months, reported use declined from 27 percent to 13 percent. There are also statistically significant declines in the percentages who used marijuana or any drug except marijuana between 1982 and 1985. The percentage who used marijuana in the past 30 days decreased from 16 percent in 1982 to 6 percent in 1985; comparable figures for the past 12 months are 24 percent and 11 percent. The percentage using any drug except marijuana during the past 30 days decreased from 9 percent in 1982 to 6 percent in 1985; comparable figures for the past 12 months are 14 percent and 8 percent.

The declines in drug use observed between 1982 and 1985 are part of a longer term decline beginning as early as 1980. Figure 5.3 illustrates the percentage of all military personnel using any drug, marijuana, cocaine or amphetamines in 1980, 1982 and 1985. Other drugs were either used less frequently or differences in questionnaire items precluded comparison over the three time points. For each of the types of drugs, use during the past 30 days declined significantly from 1980 to 1982 and to 1985. In 1980, 27 percent of military personnel had used drugs in the past 30 days, compared to 9 percent in 1985. Similar declines in any drug use during the past 30 days were observed for personnel in each of the Services, as shown in Figure 5.4.

¹Any nonmedical use of PCP, LSD/hallucinogens, cocaine, amphetamines/stimulants, tranquilizers, barbiturates/sedatives, heroin/other opiates, analgesics, or inhalants.

²Same definition as "any drug except marijuana" except marijuana is included in the set of drugs.

Figure 5.3

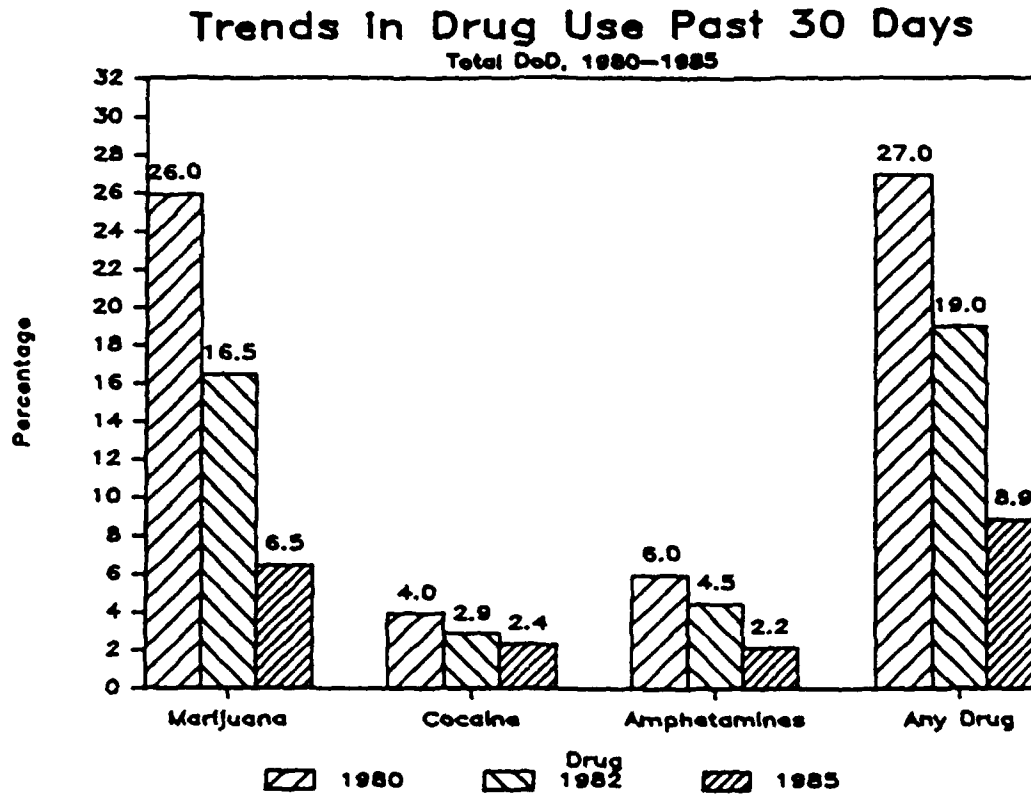
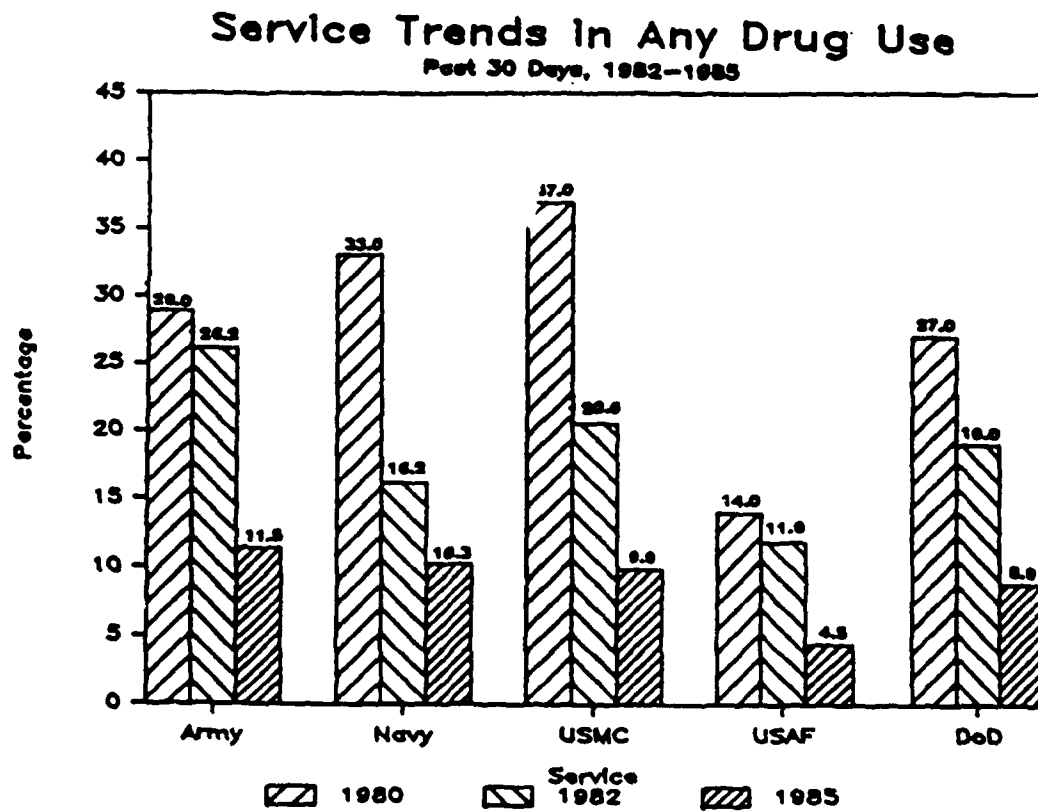


Figure 5.4



For cigarettes (Table 5.1), the percentage of nonsmokers increased significantly between 1982 and 1985 (49 percent to 54 percent). The percentages who smoked less than a pack, 1 to 1½ packs, or 2 packs or more a day all decreased, and only the decrease in the percentage smoking 1 to 1½ packs a day was not statistically significant. Data on cigarette smoking were not included in the 1980 report, so the long-term trend cannot readily be examined. However, Herbold's (in press) reanalysis of the 1980 and 1982 Worldwide Survey data finds the percentage who were smokers for the total DoD and four age groups was relatively stable between 1980 and 1982.

These trends reflect, in part, societal trends in substance use described in Chapter 2. Alcohol use in the U.S. civilian population remained fairly stable throughout the 1970s, but drug use declined after a peak in the 1970s. Cigarette use has continued to decline since the release of the Surgeon General's report in 1964. These trends also reflect the substantial investment of the military in prevention, intervention, and treatment programs designed to decrease drug and alcohol abuse and promote health in the military. An important component of this effort is the urinalysis program to which a large proportion of the decline in drug use has been attributed (Beary, Mazzuchi, and Richie, 1983).

2. Service-Specific Comparisons

The prevalence, patterns, and trends in alcohol, drug, and cigarette use observed for the total DoD, with a few exceptions, are seen for the four individual Services, as shown in Table 5.2.

For each of the Services, alcohol use remained relatively stable between 1982 and 1985. Only the Navy had a significant decrease in the average daily ounces of ethanol. There were also few significant changes in drinking levels across the Services. The percentage of abstainers among Army and Air Force personnel increased significantly, while the percentage of moderate drinkers increased significantly for Navy personnel. Overall, these trends in alcohol use were consistent with the trend observed for the total DoD toward more moderate drinking patterns or abstention. Note, however, that the percentage of abstainers decreased significantly among Marine Corps personnel.

Each of the Services also showed a significant decline between 1982 and 1985 in the percentages of personnel using marijuana, any drug except marijuana, and any drug for nonmedical purposes, with one exception. Use of any drug except marijuana was not significantly lower among Navy personnel.

Table 5.2. Substance Use Summary, 1982 and 1985 by Service

Substance	Service							
	Army		Navy		Marine Corps		Air Force	
	1982	1985	1982	1985	1982	1985	1982	1985
<u>Alcohol Use</u>								
Average Daily Ounces of Ethanol	1.58 (0.08)	1.38 (0.12)	1.64 (0.12)	1.33 (0.10)*	1.45 (0.09)	1.47 (0.22)	0.96 (0.05)	0.86 (0.07)
<u>Drinking Levels</u>								
Abstainer	11.7 (0.5)	14.9 (0.7)*	10.5 (1.4)	9.6 (0.8)	13.5 (2.0)	10.8 (2.5)*	12.6 (0.6)	15.8 (1.0)*
Infrequent/Light	18.0 (0.9)	17.8 (1.1)	21.6 (2.3)	19.9 (1.9)	13.4 (1.9)	14.0 (1.7)	19.1 (1.0)	17.7 (1.0)
Moderate	29.8 (1.1)	29.3 (1.4)	25.5 (1.3)	29.8 (1.0)*	27.3 (1.0)	28.9 (1.1)	34.8 (0.7)	35.1 (0.9)
Moderate/Heavy	25.1 (1.0)	23.9 (1.5)	26.4 (0.4)	28.5 (1.1)	29.4 (1.5)	31.0 (2.2)	23.9 (0.8)	23.4 (1.2)
Heavy	15.5 (1.0)	14.1 (1.6)	16.1 (2.6)	12.2 (1.0)	16.4 (0.8)	15.4 (3.3)	9.5 (0.7)	8.0 (0.9)
<u>Drug Use</u>								
<u>Marijuana</u>								
Past 30 days	23.9 (1.7)	9.2 (1.1)*	13.4 (2.0)	7.0 (1.0)*	17.1 (2.0)	7.7 (3.2)*	9.6 (1.1)	2.5 (0.8)*
Past 12 months	30.5 (1.7)	14.8 (1.3)*	25.6 (1.6)	12.5 (1.8)*	26.4 (2.4)	11.7 (3.4)*	14.3 (1.5)	5.4 (7.9)*
<u>Any Drug Except Marijuana</u>								
Past 30 days	10.6 (1.0)	6.4 (0.8)*	9.6 (1.6)	8.0 (1.4)	12.0 (1.3)	6.6 (2.3)*	5.1 (0.8)	3.1 (0.6)*
Past 12 months	15.5 (1.2)	9.2 (1.1)*	17.0 (1.7)	11.9 (2.7)	17.2 (2.0)	10.6 (4.0)	7.3 (1.0)	4.2 (0.7)*
<u>Any Drug</u>								
Past 30 days	26.2 (1.8)	11.5 (1.3)*	16.2 (2.2)	10.3 (1.7)*	20.6 (2.0)	9.9 (3.2)*	11.9 (1.5)	4.5 (0.8)*
Past 12 months	32.4 (1.8)	16.6 (1.3)*	28.1 (1.7)	15.9 (2.3)*	29.9 (3.2)	14.7 (3.8)*	16.4 (1.8)	7.2 (0.9)*
<u>Cigarette Use, Past 30 Days</u>								
Didn't smoke	45.3 (1.8)	48.0 (1.8)	44.6 (1.0)	52.1 (1.2)*	51.3 (0.4)	57.4 (3.1)*	55.9 (1.6)	61.0 (2.3)
Less than a pack	20.1 (0.8)	18.3 (1.2)	19.7 (1.0)	13.1 (0.8)*	17.1 (1.0)	16.5 (3.0)	13.5 (0.5)	12.1 (1.0)
1 to 1½ packs	24.6 (0.4)	24.8 (1.2)	26.0 (0.8)	25.2 (1.5)	24.7 (0.6)	20.3 (1.3)*	23.0 (0.9)	21.3 (1.4)
2 packs or more	10.1 (1.0)	8.9 (0.9)	9.7 (0.7)	9.5 (0.7)	6.8 (0.2)	5.8 (0.7)	7.7 (0.5)	5.6 (0.6)*

Note: See Table 5.1 note for variable definition and source of variables. Observed differences among the Services are associated with differences in sociodemographic characteristics of Service members (see Table 5.6).

*Comparisons between 1982 and 1985 are statistically significant at the 95 percent confidence level.

All of the Services also showed a higher percentage of nonsmokers, but only the comparisons between 1982 and 1985 for Navy and Marine Corps personnel were statistically significant.

The Services vary among themselves in the prevalence and patterns of substance use. For all substances, levels of use in the Air Force are substantially lower than in the other three Services. Levels of use among personnel in the Army, Navy, and Marine Corps are fairly similar. Marine Corps personnel, however, drink more alcohol (an average of 1.47 ounces of ethanol per day) and are more likely to be heavy drinkers (15 percent) compared to the other Services (0.86 to 1.38 ounces of ethanol a day and 8 to 14 percent heavy drinkers). The percentages of marijuana users (9 percent in the past 30 days) and smokers (52 percent) are highest in the Army, and the percentage who use any drug except marijuana is highest in the Navy (8 percent in the past 30 days).

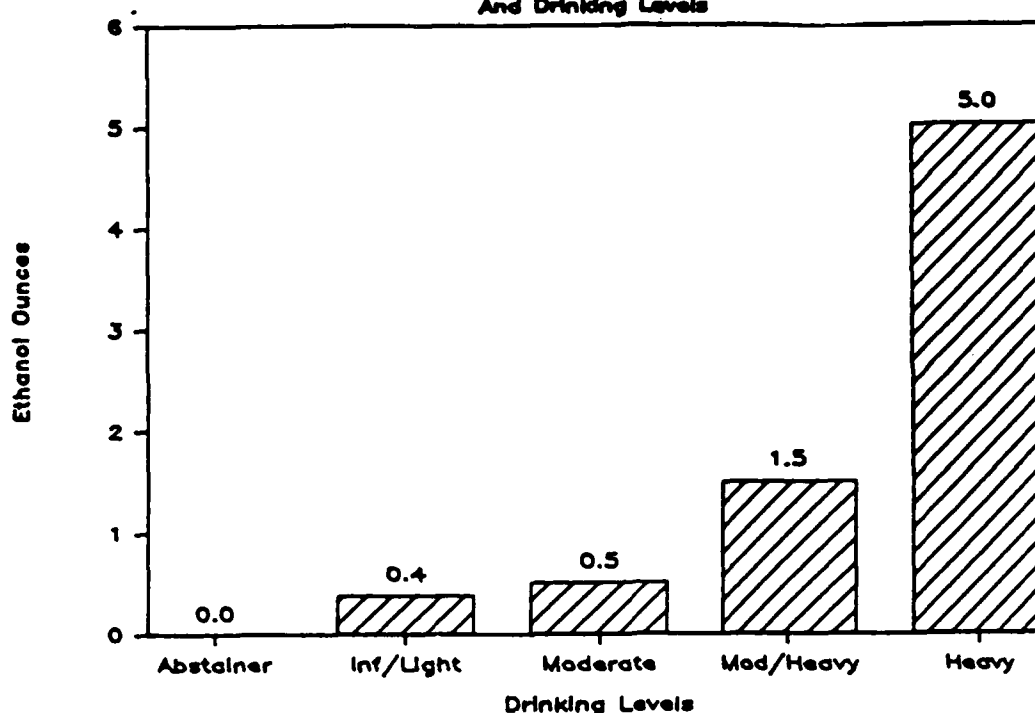
Despite these differences, the major distinction remains between the use levels among Air Force personnel and those in the other three active Services. Part of this difference is associated with differences in the sociodemographic composition of the Services. Air Force personnel on the whole are more likely than personnel in the other Services to be older, better educated, and married, characteristics associated with a lower likelihood of substance use. Analyses of the observed differences among the Services using standardized comparisons (see Section B.3 of this chapter) suggest that differences in sociodemographic composition of the Services account for some, but not all, of the variation in differences in substance use among the Services.

B. Prevalence, Patterns and Correlates of Alcohol Use

Alcohol use is generally described by two indexes of drinking behavior--the drinking level index and the average daily ounces of ethanol index. The derivation and construction of these indexes are described in Chapter 3 and Appendix E. Both measures summarize information about the average quantity, frequency, and volume of drinking over the past 30-day period. The ethanol index also includes information about the volume of drinking on atypical occasions. Within the ethanol index, there is a common indicator of the amount of ethanol contained in beer, wine, and liquor.

The drinking level index and ethanol index are expected to be inter-related since they both capture alcohol consumption. Figure 5.5 shows the mean ounces of ethanol for each of the five drinking levels. Abstainers (some of whom may drink on occasion), infrequent/light, and moderate drinkers all consume well under an ounce of ethanol a day; moderate/heavy drinkers consume 1.5 ounces a day on average; and heavy drinkers consume an average of 5.0 ounces a day. Clearly, heavy drinkers are distinct from those in other drinking levels.

Figure 5.5
Average Daily Ounces of Ethanol
And Drinking Levels



This section examines the patterns and correlates of alcohol use. Alcohol use is described by the drinking level index and the ethanol index. Standardized and unstandardized estimates are compared to ascertain the extent to which observed differences among the Services are associated with the Services' socio-demographic differences. In addition, estimates of the extent of alcohol use among military personnel are compared with use in the U.S. civilian population.

1. Prevalence and Patterns of Alcohol Use

The large majority of military personnel (87 percent) drink at least on occasion, two-thirds drink at moderate to heavy levels, and 12 percent are heavy drinkers, as shown earlier in Table 5.1. The modal drinking level (31 percent) is moderate drinkers who drink no more than 3 or 4 times a month and 2-4 drinks per typical drinking occasion or once a month and 5 or more drinks per occasion. Overall, military personnel drink on the average 1.22 ounces of ethanol per day.

Information about the average quantity and frequency of beer, wine, and liquor consumed over the past 30 days for the total DoD is presented in Table 5.3. Beer is the most frequently consumed beverage (76 percent of all military personnel drank beer within the past 30 days), followed by liquor (52 percent) and wine (38 percent). Nine percent of military personnel drink beer

Table 5.3. Quantity and Frequency of Alcohol Consumption, Past 30 Days

Beverage/Quantity	Frequency of Consumption					Total
	None	<Weekly	1-2 Days/Week	3-4 Days/Week	5-7 Days/Week	
Beer						
None	23.8	-	-	-	-	23.8
1-3	-	24.1	10.8	4.7	2.6	42.2
4-7	-	5.3	9.4	4.6	3.9	23.3
8-11	-	1.2	2.6	2.2	1.6	7.6
12 or more	-	0.5	0.7	0.7	1.2	3.2
Total	23.8	31.2	23.5	12.2	9.3	100.0
Wine						
None	62.3	-	-	-	-	62.3
1-3	-	26.3	3.3	0.8	0.3	30.8
4-7	-	4.1	1.0	0.2	0.2	5.5
8-11	-	0.2	0.2	-	0.1	0.6
12 or more	-	0.6	0.1	0.1	0.1	0.9
Total	62.3	31.2	4.6	1.1	0.7	100.0
Liquor						
None	47.8	-	-	-	-	47.8
1-3	-	25.5	4.6	1.1	0.7	31.9
4-7	-	8.1	4.3	1.5	0.6	14.5
8-11	-	1.3	1.8	0.6	0.3	4.0
12 or more	-	0.5	0.6	0.5	0.4	1.9
Total	47.8	35.4	11.2	3.6	1.9	100.0

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

Source: Questions 23, 25, 26, 28, 29, 31.

daily or almost daily. One percent drink wine, and 2 percent drink liquor daily or almost daily.

Across all three beverages, military personnel are most likely to drink less than once a week compared to other frequencies. Thirty-one percent of military personnel consume beer or wine less than once a week, and 35 percent consume liquor less than weekly. Other frequencies are less common. For beer, wine, and liquor, the most frequent consumption pattern is drinking less than once a week and 1-3 drinks per typical occasion. Relatively few drink 8 or more drinks per occasion. For those who do, eight or more beers is more common than eight or more glasses of wine or drinks of whiskey. Tables D.1-D.3 in Appendix D present additional data on frequency of consumption of eight or more drinks on a single occasion during the past year.

Drinking is not heavy or frequent for most military personnel. Drinking is heavy for a substantial minority, however, and more often involves beer than wine or liquor. More important than the overall quantity and frequency of alcohol consumption, however, is the extent to which drinking results in negative effects for military personnel, their families and associates, and the military. This issue is investigated in Chapters 6 and 7.

2. Correlates of Alcohol Use

Past research has firmly established that the levels and patterns of drinking differ by sociodemographic characteristics such as sex and age. The sociodemographic correlates of drinking are important to permit better targeting of prevention, intervention, and treatment efforts. Knowledge about which types of persons drink heavily is useful in directing policies and programs toward those most in need.

This section describes the drinking patterns among sociodemographic groups of military personnel. Note at the outset that observed relationships between sociodemographic characteristics and drinking, while informative about overall patterns, may be somewhat misleading. Differences observed on each of the individual characteristics may not be apparent when the characteristics are considered in a multivariate framework that considers the independent contribution of each characteristic. For example, those who have been on active duty for longer periods of time are, by and large, older than those on duty for shorter periods. Their lighter drinking patterns may reflect the drinking patterns characteristic of older people and not be directly associated with length of duty. Thus, caution should be used when interpreting these

results, and the findings from multivariate analyses should be considered in determining the relative contribution of each characteristic (see Chapter 7).

The relationship between the ethanol index and selected sociodemographic characteristics is presented in Table 5.4 for DoD and the Services. Average daily consumption by pay grade is presented in Figure 5.6. Several categories of sociodemographic characteristics in the index of average daily ounces of ethanol vary by factors of 2 or 3. For the total DoD, average ethanol intake among males (1.28 ounces) is about double that among females (0.63 ounces). Personnel with less than a high school education (2.99 ounces) consume about twice as much as high school graduates (1.56 ounces), three times as much as those with some college (1.00 ounces), and about six times as much as those with a college degree (.55 ounces). Consumption is about three times higher among those aged 17-20 (1.96 ounces) than among those aged 31 and older (.73 ounces). Unmarried personnel (1.73 ounces) and married personnel with spouse not present (1.31 ounces) consume roughly twice as much alcohol as those married with spouse present (.75 ounces). Personnel in pay grades E1-E3 (1.79 ounces) consume three times more than officers (about .50 ounces). Alcohol consumption is substantially higher among E1-E3s and secondarily among E4-E6s.

Figure 5.6
Average Daily Ounces of Ethanol
by Pay Grade, 1985

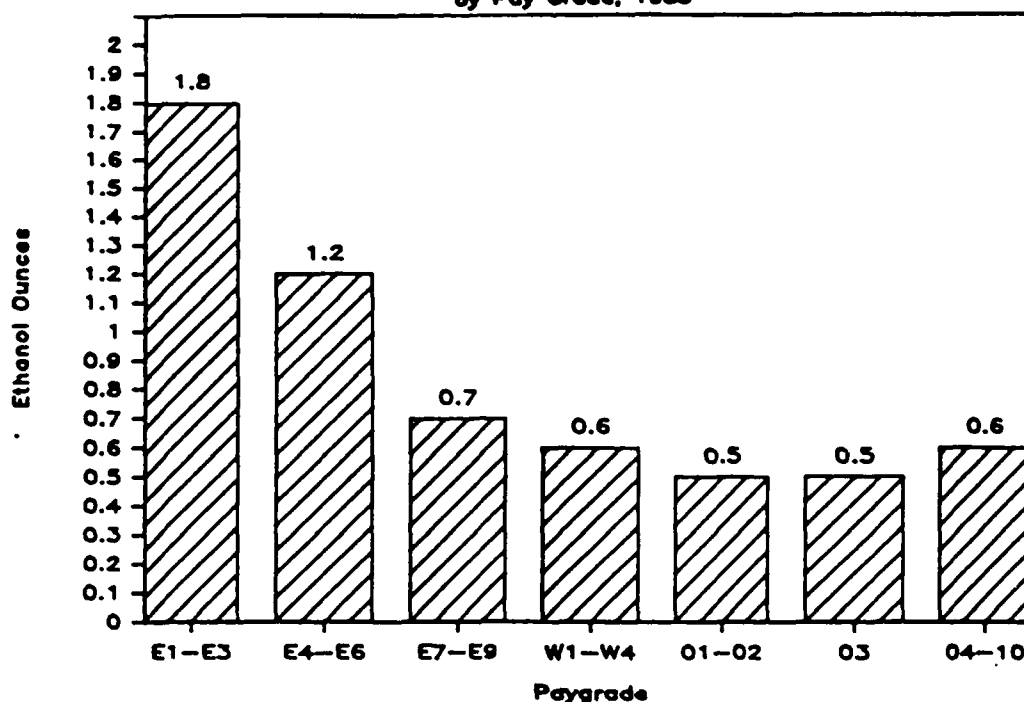


Table 5.4. Average Daily Ethanol Ounces by Sociodemographic Characteristics

Sociodemographic Characteristics	Service				Total DoD
	Army	Navy	Marine Corps	Air Force	
Sex					
Male	1.44 (0.13)	1.41 (0.10)	1.52 (0.22)	0.89 (0.08)	1.28 (0.06)
Female	0.68 (0.16)	0.62 (0.06)	0.61 (0.14)	0.60 (0.08)	0.63 (0.06)
Race/Ethnicity					
White	1.43 (0.16)	1.30 (0.09)	1.49 (0.22)	0.84 (0.08)	1.21 (0.07)
Black	1.23 (0.10)	1.75 (0.42)	1.04 (0.16)	0.91 (0.10)	1.23 (0.10)
Hispanic	1.24 (0.21)	0.96 (0.15)	1.31 (0.36)	1.00 (0.24)	1.14 (0.12)
Other	1.72 (0.82)	1.35 (0.83)	3.00 (0.55)	0.81 (0.24)	1.49 (0.40)
Education					
Less than high school graduate	3.72 (0.85)	1.76 (0.64)	2.32 (0.42)	3.07 (2.07)	2.99 (0.51)
High school graduate or GED	1.71 (0.17)	1.62 (0.12)	1.63 (0.26)	1.11 (0.15)	1.56 (0.09)
Some college	1.04 (0.10)	1.13 (0.06)	1.31 (0.23)	0.85 (0.05)	1.00 (0.04)
College graduate or higher	0.58 (0.06)	0.62 (0.07)	0.58 (0.04)	0.47 (0.04)	0.55 (0.03)
Age					
17-20	2.11 (0.41)	2.25 (0.36)	1.99 (0.38)	1.18 (0.20)	1.96 (0.21)
21-25	1.55 (0.11)	1.57 (0.09)	1.64 (0.17)	1.10 (0.12)	1.44 (0.06)
26-30	1.08 (0.10)	0.94 (0.11)	0.79 (0.09)	0.66 (0.06)	0.88 (0.05)
31 or older	0.85 (0.05)	0.70 (0.04)	0.69 (0.04)	0.63 (0.05)	0.73 (0.03)
Family Status					
Not married	1.93 (0.24)	1.82 (0.12)	1.87 (0.32)	1.27 (0.13)	1.73 (0.11)
Married, spouse not present at duty station	1.62 (0.23)	1.20 (0.23)	1.02 (0.16)	0.96 (0.15)	1.31 (0.12)
Married, spouse present at duty station	0.85 (0.05)	0.80 (0.05)	0.99 (0.11)	0.58 (0.04)	0.75 (0.03)
Pay Grade					
E1-E3	2.09 (0.37)	1.91 (0.24)	2.04 (0.34)	1.21 (0.17)	1.79 (0.16)
E4-E6	1.38 (0.08)	1.33 (0.08)	1.19 (0.05)	0.87 (0.06)	1.21 (0.04)
E7-E9	0.82 (0.05)	0.75 (0.06)	0.70 (0.11)	0.60 (0.05)	0.73 (0.03)
W1-W4	0.58 (0.05)	0.70 (0.07)	0.69 (0.05)	* (*)	0.61 (0.04)
O1-O2	0.69 (0.06)	0.49 (0.08)	0.59 (0.05)	0.36 (0.08)	0.50 (0.05)
O3	0.47 (0.05)	0.62 (0.06)	0.42 (0.06)	0.40 (0.06)	0.47 (0.04)
O4-O10	0.61 (0.07)	0.54 (0.04)	0.62 (0.07)	0.52 (0.05)	0.56 (0.04)
Time on Active Duty					
1 year or less	1.47 (0.21)	1.86 (0.33)	2.34 (0.20)	0.84 (0.08)	1.42 (0.13)
>1-2 years	2.18 (0.46)	1.42 (0.19)	1.92 (0.42)	1.14 (0.19)	1.72 (0.21)
>2-3 years	1.41 (0.13)	1.95 (0.30)	1.17 (0.41)	1.18 (0.26)	1.46 (0.13)
>3-4 years	2.00 (0.46)	2.07 (0.59)	2.27 (0.46)	1.07 (0.16)	1.84 (0.27)
>4-9 years	1.14 (0.06)	1.10 (0.07)	1.03 (0.15)	0.82 (0.09)	1.02 (0.04)
10 years or more	0.91 (0.06)	0.72 (0.05)	0.75 (0.07)	0.63 (0.03)	0.76 (0.03)
Region					
Americas	1.19 (0.11)	1.37 (0.12)	1.45 (0.27)	0.81 (0.09)	1.15 (0.07)
North Pacific	1.90 (0.06)	1.30 (0.06)	1.55 (0.13)	0.96 (0.31)	1.45 (0.11)
Other Pacific	1.33 (0.11)	1.11 (0.20)	1.62 (0.01)	0.94 (0.06)	1.17 (0.09)
Europe	1.76 (0.36)	1.25 (0.09)	1.62 (0.43)	1.02 (0.04)	1.49 (0.21)
Total DoD	1.38 (0.12)	1.33 (0.10)	1.47 (0.22)	0.86 (0.07)	1.22 (0.06)

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 30 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 0 to 30 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.

Source: Questions 2-3, 5-10.

Consumption is lower among E7-E9 personnel and officers (Figure 5.6). Similarly, individuals with four or fewer years of active duty consume about twice as much as those with 10 or more years. Smaller differences in drinking behavior among military personnel were defined by race/ethnicity and region of the world. Similar patterns are observed for the relationship between volume of drinking and sociodemographic characteristics for each of the Services.

The relationship between the drinking level index and selected sociodemographic characteristics is shown in Table 5.5; similar tables for each of the Services are presented in Appendix D, Tables D.4 to D.7. More detailed tables for drinking levels among individual pay grades E1-E9 for each of the Services are presented in Appendix D, Tables D.8 to D.12. In examining the relationship between drinking level and sociodemographic characteristics, it is particularly instructive to examine subgroup differences at the extreme ends of the distribution of drinking types--abstainers and heavy drinkers. The distributions of abstainers are generally similar across the sociodemographic groups. However, within these groups abstainers are more likely to be:

- females than males
- blacks or "other" race/ethnicity than whites or Hispanics,
- personnel with some college,
- personnel aged 31 or older,
- married with spouse present,
- pay grades other than E1-E3s and O4-O10s, and
- personnel with 10 or more years of active duty.

Among the Services, Army (15 percent) and Air Force personnel (16 percent) have the largest percentages of abstainers followed by Marines (11 percent) and Navy (10 percent). These figures compare with a DoD total percent of 13 percent abstainers.

Examination of Table 5.5 shows that about 12 percent of military personnel are heavy drinkers. Heavy drinkers are particularly evident among those with less than a high school education (24 percent), those aged 17-20 (19 percent), unmarried personnel (18 percent), E1-E3s (17 percent), and those with 1-4 years of active duty (15 to 19 percent).

The relationships of the drinking index to sociodemographic characteristics for the specific Services are similar to those for the total DoD. However, drinking levels among sociodemographic groups in the Air Force diverge less than in the other Services, and use levels are notably lower on average.

Table 5.5 Drinking Levels by Sociodemographic Characteristics - Total DoD

Sociodemographic Characteristic	Drinking Level				
	Abstainer	Infrequent/ Light	Moderate	Moderate/ Heavy	Heavy
Sex					
Male	13.0 (0.6)	17.0 (0.8)	30.7 (0.7)	26.6 (0.8)	12.7 (0.8)
Female	18.2 (1.9)	27.5 (1.7)	35.1 (2.5)	14.8 (1.8)	4.4 (0.9)
Race/Ethnicity					
White	12.0 (0.5)	17.5 (1.0)	30.6 (0.8)	27.2 (0.9)	12.7 (0.9)
Black	18.8 (1.7)	17.3 (1.1)	35.2 (1.9)	19.6 (1.2)	9.1 (0.8)
Hispanic	12.9 (1.8)	21.4 (2.4)	26.1 (1.9)	29.6 (2.7)	9.9 (1.5)
Other	18.1 (2.2)	22.3 (2.6)	30.8 (3.8)	14.9 (2.7)	13.9 (3.9)
Education					
Less than high school graduate	11.1 (5.5)	21.1 (5.5)	20.9 (4.4)	23.2 (4.1)	23.7 (4.6)
High school graduate or GED	12.0 (0.8)	16.8 (1.3)	26.9 (1.0)	28.2 (1.3)	16.1 (1.2)
Some college	15.4 (0.8)	17.7 (0.7)	32.3 (1.2)	24.5 (0.9)	10.1 (0.8)
College graduate or higher	13.7 (0.9)	21.3 (1.1)	41.5 (1.1)	20.6 (1.1)	2.9 (0.5)
Age					
17-20	10.5 (1.3)	16.9 (2.1)	22.6 (2.0)	30.8 (2.8)	19.2 (2.7)
21-25	10.2 (1.0)	16.6 (1.4)	30.4 (1.1)	28.0 (1.2)	14.8 (0.9)
26-30	15.3 (1.0)	18.0 (1.0)	35.1 (1.1)	23.0 (1.0)	8.7 (0.8)
31 or older	18.2 (0.9)	20.3 (0.7)	34.4 (0.8)	21.0 (0.7)	6.1 (0.5)
Family Status					
Not married	9.7 (0.8)	15.3 (1.4)	27.7 (1.1)	29.8 (1.4)	17.6 (1.3)
Married, spouse not present at duty station	12.1 (1.4)	19.5 (2.8)	28.1 (1.7)	26.1 (2.3)	14.2 (2.5)
Married, spouse present at duty station	17.0 (0.8)	20.1 (0.6)	34.6 (0.8)	21.7 (0.7)	6.6 (0.4)
Pay Grade					
E1-E3	9.6 (1.1)	16.5 (1.3)	26.5 (1.6)	30.3 (2.1)	17.0 (2.0)
E4-E6	14.7 (0.7)	17.6 (1.1)	29.9 (0.9)	24.9 (0.8)	12.9 (0.7)
E7-E9	19.3 (1.0)	18.7 (0.7)	33.1 (1.3)	21.8 (0.9)	7.1 (0.5)
W1-W4	16.1 (1.6)	19.9 (2.3)	33.9 (2.9)	25.0 (1.9)	5.1 (0.6)
O1-O2	12.9 (1.7)	21.2 (2.5)	42.6 (1.8)	20.2 (2.7)	3.1 (0.8)
O3	14.2 (2.1)	21.0 (1.9)	43.2 (2.2)	20.0 (1.8)	1.7 (0.5)
O4-O10	9.5 (1.0)	21.8 (1.1)	43.2 (1.4)	23.8 (1.3)	1.7 (0.5)
Time on Active Duty					
1 year or less	9.3 (1.5)	19.8 (3.1)	28.2 (3.3)	31.8 (4.2)	10.9 (1.5)
>1-2 years	10.7 (1.3)	15.2 (1.1)	27.2 (2.2)	28.4 (2.2)	18.5 (2.6)
>2-3 years	13.0 (2.1)	17.5 (2.6)	24.3 (2.0)	29.9 (2.1)	15.3 (1.5)
>3-4 years	9.6 (2.1)	14.4 (2.8)	31.8 (2.4)	25.7 (2.5)	18.6 (2.5)
>4-9 years	14.5 (0.9)	18.3 (0.9)	33.6 (1.0)	23.6 (1.1)	10.2 (0.6)
10 years or more	17.1 (0.7)	19.6 (0.7)	34.9 (1.0)	21.5 (0.7)	6.9 (0.5)
Region					
Americas	14.1 (0.7)	18.3 (0.9)	31.0 (0.7)	25.5 (0.9)	11.0 (0.8)
North Pacific	12.3 (0.8)	16.2 (1.6)	28.4 (1.9)	28.3 (2.7)	14.7 (1.6)
Other Pacific	11.6 (1.9)	16.2 (0.7)	32.2 (0.4)	26.8 (2.5)	13.3 (2.2)
Europe	11.3 (0.8)	17.4 (1.2)	31.9 (2.2)	24.6 (1.6)	14.8 (2.8)
Service					
Army	14.9 (0.7)	17.8 (1.1)	29.3 (1.4)	23.9 (1.5)	14.1 (1.6)
Navy	9.6 (0.8)	19.9 (1.9)	29.8 (1.0)	28.5 (1.1)	12.2 (1.0)
Marine Corps	10.8 (2.5)	14.0 (1.7)	28.9 (1.1)	31.0 (2.2)	15.4 (3.3)
Air Force	15.8 (1.0)	17.7 (1.0)	35.1 (0.9)	23.4 (1.2)	8.0 (0.9)
Total DoD	13.4 (0.6)	17.9 (0.7)	31.1 (0.7)	25.6 (0.7)	11.9 (0.8)

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 once/month at most and 1-4 drinks/occasion. Those in the Moderate category drink (a) at least once/week and 1 drink/occasion, (b) 3-4 times/month and 2-4 drinks/occasion, or (c) once/month or less and ≥ 5 drinks/occasion. Those in the Moderate/Heavy category drink at least once/week and 2-4 drinks/occasion or 3-4 times/month and ≥ 5 drinks/occasion. Those in the Heavy category drink at least once/week and ≥ 5 drinks/occasion.

Source: Questions 2-3, 5-10.

Comparing these results for drinking levels (Table 5.5) and those for the ethanol index (Table 5.4) reveals that drinking patterns are heavier among personnel who are males, less well educated, younger, unmarried or married with spouse not present, and junior pay grades E1-E3. Race/ethnicity, time on active duty, region, and Service (except for the Air Force) differentiate the drinking patterns of military personnel less well.

3. Standardized Comparisons

Service-specific comparisons of the prevalence and extent of alcohol use suggest important differences among the Services. Alcohol use is clearly lower among Air Force personnel than among those in the other three Services, who are fairly similar to each other. An explanation frequently given for this divergence between the Air Force and the other Services is the difference in the Services' sociodemographic composition. Air Force personnel are more likely to be older, better educated, and married than personnel in the other Services (see Table 4.4 that allows comparison of the sociodemographic characteristics of personnel of the four active Services). These characteristics are associated with a lower likelihood of alcohol use. Thus, observed differences among the Services may be due, in part, to differences in the sociodemographic composition of the Services.

To examine the contribution of variation in sociodemographic characteristics to observed Service differences, standardized comparisons were conducted. These comparisons utilize a regression-based standardization procedure (Williams and LaVange, 1983) that has the effect of controlling for variation in sociodemographic characteristics. In this case, estimates of the average daily ounces of ethanol and the percentage of heavy drinkers in each of the Services were standardized to the distributions of age, education, and marital status for total DoD. Unstandardized and standardized estimates are presented in Table 5.6.

Comparison of unstandardized estimates of the average daily ounces of ethanol shows that alcohol use among Air Force personnel is significantly lower than in the other three Services. After standardization, comparisons of the average daily ounces of ethanol between the Air Force and other Services remained significant for the Army and the Navy. Unstandardized differences between the Air Force and the Marine Corps were removed with standardization. Thus, part of the reason for the observed difference in alcohol use between Air Force and Marine Corps personnel appears to be differences in the sociodemographic composition of the two Services.

Table 5.6. Estimates of Alcohol Use Standardized by Sociodemographic Characteristics

Alcohol Measure	Service		
	Army	Navy	Air Force
<u>Average Daily Ounces Ethanol</u>			
Unstandardized	1.38 (0.12)*	1.33 (0.10)*	1.47 (0.22)*
Standardized ^a	1.35 (0.11)*	1.26 (0.07)*	1.25 (0.16)
<u>Heavy Drinkers</u>			
Unstandardized	14.1 (1.6)*	12.2 (1.0)*	15.4 (3.3)*
Standardized ^a	13.9 (1.4)*	11.4 (1.1)	12.9 (2.7)
			8.0 (0.9)
			9.8 (0.8)

^aEstimates have been standardized by age, education, and marital status.

*Comparisons between the Air Force and Other Services are statistically significant at the 95 percent confidence level.

Somewhat similar findings occurred for unstandardized and standardized Service-specific comparisons of the percentage of heavy drinkers. For unstandardized comparisons, the percentage of heavy drinkers in the Air Force is significantly lower than in any of the other Services. For standardized comparisons, only the difference between the percentage of heavy drinkers in the Air Force and the Army remains statistically significant.

The fact that standardization for age, education, and marital status removes some differences in alcohol use patterns among the Services suggests caution in interpreting simple unstandardized estimates and bivariate relationships that do not control for variation in sociodemographic composition among the Services. Other analyses that control for sociodemographic characteristics are presented in Chapter 7.

4. Military-Civilian Comparisons

Several studies of problem drinking among military personnel conducted during the 1970s (see Cahalan and Cisin, 1975) suggest that problem drinking among military personnel is considerably higher than in the U.S. civilian population. As a group, military personnel have been found to be substantially more likely than civilians to experience negative effects from alcohol use. It is generally recognized that the military-civilian difference is due in part to differences between military and civilian populations in risk factors associated with problem drinking. Military populations tend to be younger, unmarried, and stationed in remote locations, factors all related to higher rates of problem drinking. Polich and Orvis (1979) examined the extent to which military-civilian differences in problem drinking were the result of differences in risk factors by standardizing military and civilian problem drinking rates for education, age, marital status, and location. After standardization, the Air Force-civilian differences were minimal. Thus, the difference in risk factors is the principal reason for observed differences in problem drinking among Air Force personnel and civilians.

The issue of military-civilian comparisons of alcohol use is investigated for the 1985 Worldwide Survey. Table 5.7 presents the percentages of military personnel and civilians in four age groups who consumed any alcohol or an average of one or more ounces per day. The alcohol consumption measure is consistent with those reported for civilian populations in Clark and Midanik (1982) and is based on ounces of ethanol per day. The measure is slightly different than the ethanol index computed for this study. It is based on

typical drinking during the past 30 days and does not include atypical heavy drinking days and, thus, provides lower estimates than the ethanol index reported elsewhere in this chapter. The civilian rates presented in the table are averages from national surveys conducted in 1971 to 1976. The 1979 National Survey on Drug Abuse (Miller et al., 1983) alone, the most recent national data, shows substantially lower rates of heavier drinking than the 6-year average. It is believed that the 6-year average is a more reliable comparison for the analyses presented here than the single year 1979 survey because the character of alcohol use patterns has varied little over the past decade. Data will soon be available from the 1985 national alcohol survey to further investigate this issue. Even though the 1985 data are not available, the stable patterns of alcohol use during the past decade suggest that the national surveys of the 70's are still indicative of civilian alcohol use patterns.

Table 5.7. Comparison of Alcohol Consumption Among Males in Military and Civilian Populations

Age Group	Any Alcohol		1 or More Ounces Per Day	
	Total DoD	Civilian ^a	Total DoD	Civilian ^a
18-20	84	80	36	23
21-34	86	86	26	22
35-49	80	77	16	21
50-64	85	67	16	17

Note: Entries are percentages.

^aSource for civilian data: Clark and Midanik (1982); data are based on a 6-year average of surveys conducted 1971-1976.

As shown in Table 5.7, military personnel in each age group are somewhat more likely to drink than civilians. Younger military personnel (18-20 and 21-34) are more likely to consume one or more ounces per day than are civilians, while older military personnel (35 and over) are less likely than civilians to do so.

Although these analyses suggest some differences in the overall volume of drinking of military and civilian populations, they must be interpreted cautiously. There are differences between the studies in the context, wording, and ordering of the questions, and the method of data collection (personal interview for civilians, self-administered questionnaire for Worldwide). Additionally, the comparisons do not control for other risk factors such as educational level or marital status. These findings for the total DoD may also differ for individual Services.

C. Prevalence and Correlates of Drug Use

Drug use in the military, as in the civilian sector, is the use of both licit and illicit substances for nonmedical purposes. Illicit drugs include marijuana, PCP, LSD/hallucinogens, cocaine, and heroin/other opiates. Licit drugs are those primarily prescribed for medical purposes or available over-the-counter that are used for nonmedical purposes such as recreation or pleasure. Such drugs include amphetamines/stimulants, tranquilizers, barbiturates/sedatives, and analgesics. Available in aerosol sprays or various cleaning fluids, inhalants are also in this class.

This section examines the prevalence and correlates of nonmedical drug use in the military and the frequency of use of selected drugs. An overview of use of specific drugs is provided, but most of the presentation describes drug use in terms of "any drug use" (use of any licit or illicit substance for nonmedical purposes), marijuana use, and any drug except marijuana. Because of the considerable variation in drug purity and strength, and individual variation in effect, no attempt is made to describe dosage patterns. However, patterns of frequency of use are briefly described for marijuana and any drug except marijuana. As with alcohol use, standardized and unstandardized estimates are compared to ascertain the extent to which observed differences among the Services are associated with the sociodemographic differences of their personnel.

1. Prevalence of Drug Use

Table 5.8 presents the prevalence of nonmedical drug use during the past 30 days and past 12 months for each of the Services and total DoD. Overall, about 9 percent of military personnel reported using any drugs within the past 30 days, and about 13 percent reported using within the past 12 months. Marijuana use accounted for the major proportion of this use--6 percent in the past 30 days and 11 percent during the past year. These figures compare

Table 5.8. 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	9.2 (1.1)	7.0 (1.0)	7.7 (3.2)	2.5 (0.8)	6.5 (0.6)
Past 12 Months	14.8 (1.3)	12.5 (1.8)	11.7 (3.4)	5.4 (0.8)	11.1 (0.8)
PCP					
Past 30 Days	0.4 (0.2)	0.9 (0.5)	2.2 (1.3)	0.2 (0.1)	0.6 (0.2)
Past 12 Months	1.0 (0.4)	1.1 (0.5)	2.4 (1.5)	0.2 (0.1)	0.9 (0.2)
LSD/Hallucinogens					
Past 30 Days	2.7 (0.7)	2.3 (0.5)	1.5 (0.5)	0.1 (**)	1.7 (0.3)
Past 12 Months	3.6 (0.7)	4.6 (1.4)	4.6 (2.4)	0.2 (0.1)	2.9 (0.5)
Cocaine					
Past 30 Days	2.4 (0.4)	3.3 (0.9)	4.1 (2.7)	1.2 (0.6)	2.4 (0.4)
Past 12 Months	4.5 (0.6)	6.0 (1.2)	5.5 (3.0)	2.1 (0.7)	4.2 (0.5)
Amphetamines/Stimulants					
Past 30 Days	3.0 (0.7)	3.2 (0.6)	1.6 (0.5)	0.6 (0.2)	2.2 (0.3)
Past 12 Months	4.1 (0.8)	5.0 (0.7)	2.8 (1.1)	1.1 (0.2)	3.3 (0.4)
Tranquilizers					
Past 30 Days	1.4 (0.4)	1.0 (0.3)	2.1 (1.5)	0.6 (0.1)	1.1 (0.2)
Past 12 Months	2.1 (0.5)	1.7 (0.5)	2.7 (1.7)	0.9 (0.2)	1.7 (0.3)
Barbiturates/Sedatives					
Past 30 Days	1.0 (0.3)	0.3 (0.2)	0.5 (0.2)	0.3 (0.1)	0.6 (0.1)
Past 12 Months	1.4 (0.3)	0.9 (0.4)	1.1 (0.3)	0.4 (0.1)	0.9 (0.2)
Heroin/Other Opiates					
Past 30 Days	0.6 (0.1)	0.3 (0.2)	0.3 (0.2)	0.2 (0.1)	0.4 (0.1)
Past 12 Months	0.7 (0.2)	0.3 (0.2)	0.7 (0.4)	0.2 (0.1)	0.4 (0.1)
Analgesics					
Past 30 Days	1.5 (0.3)	1.8 (0.6)	3.2 (1.6)	1.1 (0.1)	1.6 (0.2)
Past 12 Months	1.9 (0.3)	1.9 (0.6)	3.5 (1.8)	1.1 (0.1)	1.8 (0.3)
Inhalants					
Past 30 Days	1.1 (0.3)	1.9 (0.4)	1.2 (0.5)	0.2 (0.1)	1.1 (0.2)
Past 12 Months	1.4 (0.3)	2.4 (0.4)	1.7 (0.7)	0.3 (0.1)	1.4 (0.2)
Any Drug ^a					
Past 30 Days	11.5 (1.3)	10.3 (1.7)	9.9 (3.2)	4.5 (0.8)	8.9 (0.8)
Past 12 Months	16.6 (1.3)	15.9 (2.7)	14.7 (3.8)	7.2 (0.9)	13.4 (1.0)
Any Drug Except Marijuana ^b					
Past 30 Days	6.4 (0.8)	8.0 (1.4)	6.6 (2.3)	3.1 (0.6)	5.8 (0.6)
Past 12 Months	9.2 (1.1)	11.9 (2.7)	10.6 (4.0)	4.2 (0.7)	8.5 (0.9)

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

**Informative standard error not available but is expected to be very close to zero.

^aNonmedical use one or more times of any drug or class of drugs listed above in the table.

^bNonmedical use one or more times of any drug or class of drugs listed above in the table excluding marijuana.

Source: Questions 52, 77.

with about 6 percent who used any drug except marijuana during the past 30 days and 8 percent during the past 12 months.

The use of other individual drugs is 2 percent or less during the past 30 days. Slightly more than 2 percent of total DoD personnel used cocaine and amphetamines in the past 30 days, and even fewer personnel used each of the other drugs.

The percentages using each drug sum to a number greater than the total observed for "any drug." Thus, many personnel use several drugs, either simultaneously or within the same time period.

The drug use percentages in Table 5.8 indicate statistically significant declines in the use of marijuana, any drug except marijuana, and any drug since 1982 (see Table 5.1). The percentages using cocaine, tranquilizers, and PCP are similar in 1982 and 1985, while the percentages using other specific drugs have declined (LSD from 3.0 to 1.7 percent, amphetamines from 6.2 to 2.2 percent, and barbiturates from 1.6 to 0.6 percent). Because inhalants and analgesics were considered together in 1982 and heroin and other opiates (considered separately in 1982) were considered together in 1985, 1982 and 1985, figures for these drugs are not readily comparable.

Drug use tends to be lower in the Air Force than in the other Services. Use of any drug in the past 30 days, for instance, was 4 percent for Air Force personnel compared with 10 to 12 percent for the other Services. Similarly, marijuana use was 2 percent in the Air Force in the past 30 days and 7 to 9 percent in the other Services (Table 5.8). Part of this difference may be explained by the sociodemographic composition of the Services, a possibility investigated in Section C.4 below. As noted earlier, Air Force personnel are more likely to be older, better educated, and married than other military personnel, factors often associated with lower levels of drug use.

More detailed tables concerning the prevalence of use of marijuana, any drug except marijuana, and any drug during the past 30 days or 12 months are presented in Appendix D, Tables D.13 to D.18. Each of the tables presents information about the prevalence of use among personnel of the four Services, four regions of the world (Americas, North Pacific, Other Pacific, Europe), and pay grade. Inspection of these tables shows that drug use is concentrated primarily among E1-E3s and secondarily among E4-E6 personnel. Closer examination of data for individual enlisted pay grades presented in Appendix D, Tables D.19 to D.21 reveals that drug use is almost exclusively concentrated

among E1s to E4s. Use is generally 1 percent or lower among personnel in the higher pay grades. Marijuana use is lowest among those in the North Pacific. Prevalences in the other regions are similar to each other. Use of drugs other than marijuana is highest in the Americas, followed by the Other Pacific, the North Pacific, and Europe.

These region and pay grade patterns of use, coupled with differences among the Services, reveal several notable findings. Marijuana use during the past 30 days is highest among E1-E3 Army personnel stationed in Europe (21 percent) (Table D.13). Marijuana use during the past 12 months (Table D.14) was particularly high among E1-E3 Navy personnel in the Other Pacific (29 percent); Europe (24 percent) and the Americas (22 percent); E1-E3 Army personnel in Europe (26 percent), the North Pacific (25 percent), and the Americas (25 percent); and E4-E6 Army personnel in the Other Pacific (24 percent). Thirty-day use of any drug except marijuana (Table D.15) was highest among E1-E3s in the Army in Europe (19 percent) and the North Pacific (17 percent). Twelve-month use of any drug except marijuana (Table D.16) was also high among E1-E3 Army personnel in Europe (22 percent) and the North Pacific (20 percent) as well as among E1-E3 Navy (20 percent) and Marine Corps (20 percent) personnel in the Americas, E1-E3 Navy personnel in Europe (20 percent), and E1-E3 Navy personnel in the Other Pacific (19 percent).

These figures reveal elevated drug use in particular areas. Greater prevention and intervention efforts, perhaps, should be directed toward those groups and regions. Clearly the high risk group is the junior enlisted pay grades, primarily E1-E4 personnel (Tables D.19-D.21).

2. Frequency of Drug Use

Tables 5.9 and 5.10 present data on the frequency of marijuana use and any drug except marijuana during the past 30 days. As shown, most military personnel who used drugs within the past 30 days used them infrequently. Across the total DoD, military personnel who used drugs were most likely to use them no more than 1 to 3 days per month. Overall, 3.4 percent to 3.5 percent of military personnel used marijuana or other drugs 1-3 days a month, and 2.4 percent to 3.1 percent used more frequently.

This pattern of low frequency use is apparent for all pay grades (Tables 5.9 and 5.10). Use among grades E7 and higher was extremely low (1 percent or less). For E1-E3s and E4-E6s, infrequent use (1-3 days) was the most common pattern. About one-third of the E1-E3s who were users, however, used on 11 to

Table 5.9. Frequency of Marijuana/Hashish Use During the Past 30 Days

Pay Grade/Days of Use	Service				Total DoD
	Army	Navy	Marine Corps	Air Force	
E1-E3					
None	84.7 (2.3)	87.0 (2.3)	86.2 (4.6)	97.2 (0.7)	89.1 (1.3)
1-3	7.4 (1.1)	8.9 (2.4)	7.3 (2.1)	1.8 (0.4)	6.1 (0.8)
4-10	2.0 (0.6)	2.0 (0.6)	1.4 (0.4)	0.4 (0.2)	1.4 (0.3)
11-30	5.8 (1.5)	2.1 (1.0)	5.2 (3.6)	0.7 (0.3)	3.3 (0.8)
E4-E6					
None	89.5 (1.2)	93.1 (0.9)	96.1 (2.6)	96.5 (1.3)	93.0 (0.7)
1-3	5.7 (0.9)	2.9 (0.8)	2.1 (1.5)	1.6 (0.3)	3.5 (0.5)
4-10	1.7 (0.3)	1.9 (1.0)	0.8 (0.6)	1.5 (1.2)	1.6 (0.5)
11-30	3.2 (0.7)	2.1 (0.8)	1.0 (0.6)	0.4 (0.2)	1.9 (0.4)
E7-E9					
None	98.9 (0.4)	99.7 (0.2)	100.0 (**)	99.6 (0.2)	99.3 (0.2)
1-3	0.6 (0.3)	0.1 (0.1)	0.0 (**)	0.2 (0.1)	0.3 (0.1)
4-10	0.5 (0.3)	0.0 (**)	0.0 (**)	0.0 (**)	0.2 (0.1)
11-30	0.1 (0.1)	0.3 (0.2)	0.0 (**)	0.1 (0.1)	0.1 (0.1)
W1-W4					
None	100.0 (**)	100.0 (**)	100.0 (**)	* (*)	100.0 (**)
1-3	0.0 (**)	0.0 (**)	0.0 (**)	* (*)	0.0 (**)
4-10	0.0 (**)	0.0 (**)	0.0 (**)	* (*)	0.0 (**)
11-30	0.0 (**)	0.0 (**)	0.0 (**)	* (*)	0.0 (**)
O1-O2					
None	100.0 (**)	100.0 (**)	100.0 (**)	98.4 (1.1)	99.3 (0.5)
1-3	0.0 (**)	0.0 (**)	0.0 (**)	0.2 (0.3)	0.1 (0.1)
4-10	0.0 (**)	0.0 (**)	0.0 (**)	1.4 (1.1)	0.6 (0.5)
11-30	0.0 (**)	0.0 (**)	0.0 (**)	0.0 (**)	0.0 (**)
O3					
None	99.0 (0.5)	100.0 (**)	100.0 (**)	99.8 (0.2)	99.6 (0.2)
1-3	0.3 (0.3)	0.0 (**)	0.0 (**)	0.2 (0.2)	0.2 (0.1)
4-10	0.6 (0.4)	0.0 (**)	0.0 (**)	0.0 (**)	0.2 (0.2)
11-30	0.0 (**)	0.0 (**)	0.0 (**)	0.0 (**)	0.0 (**)
O4-O10					
None	100.0 (**)	99.9 (0.2)	100.0 (**)	99.9 (0.1)	99.9 (0.1)
1-3	0.0 (**)	0.1 (0.2)	0.0 (**)	0.0 (**)	0.0 (**)
4-10	0.0 (**)	0.0 (**)	0.0 (**)	0.0 (**)	0.0 (**)
11-30	0.0 (**)	0.0 (**)	0.0 (**)	0.1 (0.1)	0.0 (**)
Total DoD					
None	90.8 (1.1)	93.0 (1.0)	92.3 (3.2)	97.5 (0.8)	93.5 (0.6)
1-3	4.8 (0.7)	3.8 (0.9)	4.0 (1.2)	1.3 (0.2)	3.4 (0.4)
4-10	1.4 (0.2)	1.5 (0.6)	0.9 (0.4)	0.9 (0.6)	1.2 (0.2)
11-30	3.0 (0.5)	1.7 (0.6)	2.7 (2.0)	0.4 (0.1)	1.9 (0.3)

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

* There are no warrant officers in the Air Force.

** Informative standard error not available but is expected to be very close to zero.

Source: Question 52A.

Table 5.10. Frequency of Any Drug Use Except Marijuana/Hashish During the Past 30 Days

Pay Grade/Days of Use	Service				Total DoD
	Army	Navy	Marine Corps	Air Force	
E1-E3					
None	87.8 (2.4)	86.3 (3.5)	89.4 (3.0)	95.3 (1.3)	89.9 (1.4)
1-3	7.0 (1.4)	8.6 (2.0)	2.4 (1.0)	3.2 (0.9)	5.5 (0.8)
4-10	1.0 (0.5)	1.5 (0.8)	3.3 (2.4)	0.6 (0.4)	1.4 (0.5)
11-30	4.1 (1.6)	3.7 (1.9)	5.0 (1.6)	0.9 (0.4)	3.2 (0.8)
E4-E6					
None	93.9 (0.7)	91.8 (1.1)	95.6 (1.9)	96.7 (1.1)	94.2 (0.6)
1-3	4.1 (0.7)	5.9 (1.1)	1.9 (1.1)	1.5 (0.3)	3.7 (0.4)
4-10	0.7 (0.2)	1.1 (0.4)	1.5 (0.8)	1.6 (1.1)	1.1 (0.3)
11-30	1.2 (0.3)	1.3 (0.5)	0.9 (0.5)	0.2 (1.1)	0.9 (0.2)
E7-E9					
None	98.2 (0.6)	99.3 (0.2)	97.4 (1.4)	99.3 (0.2)	98.7 (0.3)
1-3	1.3 (0.4)	0.6 (0.2)	2.4 (1.4)	0.5 (0.2)	1.0 (0.2)
4-10	0.1 (0.1)	0.0 (**)	0.0 (**)	0.1 (0.1)	0.1 (**)
11-30	0.4 (0.3)	0.2 (0.1)	0.1 (0.1)	0.2 (0.1)	0.3 (0.1)
W1-W4					
None	99.8 (0.2)	100.0 (**)	98.7 (1.2)	* (*)	99.7 (0.2)
1-3	0.2 (0.2)	0.0 (**)	1.3 (1.2)	* (*)	0.3 (0.2)
4-10	0.0 (**)	0.0 (**)	0.0 (**)	* (*)	0.0 (**)
11-30	0.0 (**)	0.0 (**)	0.0 (**)	* (*)	0.0 (**)
01-02					
None	100.0 (**)	100.0 (**)	100.0 (**)	98.6 (1.1)	99.4 (0.5)
1-3	0.0 (**)	0.0 (**)	0.0 (**)	1.4 (1.1)	0.6 (0.5)
4-10	0.0 (**)	0.0 (**)	0.0 (**)	0.0 (**)	0.0 (**)
11-30	0.0 (**)	0.0 (**)	0.0 (**)	0.0 (**)	0.0 (**)
03					
None	97.8 (0.8)	100.0 (**)	99.6 (0.4)	98.9 (0.8)	98.8 (0.4)
1-3	1.8 (0.8)	0.0 (**)	0.4 (0.4)	1.1 (0.8)	1.1 (0.4)
4-10	0.0 (**)	0.0 (**)	0.0 (**)	0.0 (**)	0.0 (**)
11-30	0.4 (0.4)	0.0 (**)	0.0 (**)	0.0 (**)	0.1 (0.1)
04-010					
None	98.6 (0.6)	99.9 (0.1)	100.0 (**)	98.8 (0.4)	99.1 (0.2)
1-3	0.8 (0.4)	0.0 (**)	0.0 (**)	0.8 (0.4)	0.6 (0.2)
4-10	0.6 (0.4)	0.1 (0.1)	0.0 (**)	0.2 (0.2)	0.3 (0.2)
11-30	0.0 (**)	0.0 (**)	0.0 (**)	0.2 (0.1)	0.1 (0.1)
Total DoD					
None	93.6 (0.8)	92.0 (1.4)	93.4 (2.3)	96.9 (0.6)	94.2 (0.6)
1-3	4.1 (0.5)	5.4 (1.1)	2.0 (0.2)	1.8 (0.2)	3.5 (0.4)
4-10	0.7 (0.2)	1.0 (0.3)	2.1 (1.3)	1.0 (0.5)	1.0 (0.2)
11-30	1.7 (0.5)	1.6 (0.5)	2.6 (1.0)	0.3 (0.1)	1.4 (0.2)

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

* There are no warrant officers in the Air Force.

**Informative standard error not available but is expected to be very close to zero.

Source: Questions 52B-J.

30 days a month. About half of the 6.5 percent of military personnel who used marijuana during the past month or the 5.8 percent who used drugs other than marijuana during the past month may have used them only on 1 to 3 days.

3. Correlates of Drug Use

The relationship between any drug use and selected sociodemographic characteristics is presented in Table 5.11. The relationship between drug use and pay grade for enlisted personnel is illustrated in Figure 5.7. Overall, 13 percent of DoD personnel used drugs during the past 12 months, but use was substantially higher among certain sociodemographic groups. Across the total DoD, use was particularly high among those with less than a high school education (34 percent), those aged 17 to 20 (26 percent), unmarried personnel (20 percent), pay grades E1-E3 (22 percent), and those with less than 4 years of time on active duty (20-22 percent). Figure 5.7 shows that drug use for enlisted personnel is highest among E1-E3s and secondarily among E4-E6s. Drug use is minimal among E7-E9s. Few differences (Table 5.11) were observed in the prevalence of use among race/ethnic groups, among regions of the world, or between males and females for the total DoD. With a few exceptions, these same patterns were observed for each of the individual Services. The observed sociodemographic group differences in use seem to be particularly evident among Marine Corps personnel and somewhat less pronounced among Air Force personnel.

The relationship between prevalence and individual sociodemographic characteristics may disappear when other factors are controlled. Many of the observed differences in the prevalence of use among sociodemographic groups, for instance, appear to be related to age. The findings for marital status, pay grade, and years of service may be more a function of younger age status than those characteristics. The independent contribution of each of the sociodemographic characteristics to variations in use is examined in more detail in multivariate analyses discussed in Chapter 7.

4. Standardized Comparisons

Service-specific comparisons of the prevalence of use of marijuana and other drugs suggest important differences. As shown in Table 5.8, marijuana use during the past 12 months was clearly lower among Air Force personnel (5 percent) than personnel in the other three Services (12 to 15 percent). Use of any drug except marijuana was 4 percent among Air Force personnel compared to 9 to 12 percent among personnel in the other three Services. Part of this

Table 5.11. Any Drug Use During Past 12 Months by Sociodemographic Characteristics

Sociodemographic Characteristics	Service				Total DoD
	Army	Navy	Marine Corps	Air Force	
Sex					
Male	16.7 (1.3)	16.2 (2.8)	15.3 (4.0)	6.9 (0.9)	13.5 (1.0)
Female	15.4 (2.8)	12.8 (2.8)	2.6 (1.7)	9.5 (1.8)	12.0 (1.4)
Race/Ethnicity					
White	19.0 (1.8)	17.1 (2.9)	17.7 (4.6)	7.5 (1.0)	14.6 (1.2)
Black	9.8 (1.3)	13.8 (4.0)	9.9 (4.6)	7.5 (1.7)	10.0 (1.2)
Hispanic	17.5 (4.1)	9.6 (3.1)	4.6 (2.7)	3.3 (1.5)	11.9 (2.2)
Other	16.7 (6.6)	9.1 (3.8)	0.6 (0.7)	2.2 (1.5)	9.0 (2.7)
Education					
Less than high school graduate	45.0 (6.5)	7.7 (4.4)	41.7 (11.1)	15.3 (9.1)	33.5 (4.7)
High school graduate or GED	22.1 (1.4)	18.9 (3.6)	16.7 (5.6)	8.9 (1.0)	17.9 (1.4)
Some college	12.3 (1.6)	16.2 (2.2)	11.8 (1.8)	8.3 (1.5)	11.5 (1.0)
College graduate or higher	2.9 (0.4)	4.0 (1.4)	1.3 (0.9)	2.0 (0.5)	2.7 (0.4)
Age					
17-20	30.8 (2.9)	36.1 (3.6)	16.5 (2.9)	11.5 (1.9)	26.1 (1.9)
21-25	22.3 (1.8)	20.2 (3.5)	22.0 (6.6)	11.5 (2.0)	18.5 (1.6)
26-30	11.4 (1.6)	8.2 (1.1)	5.3 (2.9)	6.1 (1.1)	8.4 (0.8)
31 or older	3.3 (0.5)	3.2 (1.1)	1.5 (0.6)	1.8 (0.4)	2.7 (0.4)
Family Status					
Not married	24.4 (2.1)	21.5 (3.4)	23.1 (5.4)	11.5 (1.6)	20.1 (1.5)
Married, spouse not present at duty station	17.4 (3.8)	16.9 (7.3)	6.6 (3.5)	6.4 (2.0)	13.8 (2.7)
Married, spouse present at duty station	9.6 (1.1)	9.1 (1.7)	4.1 (1.7)	4.4 (0.6)	7.3 (0.6)
Pay Grade					
E1-E3	28.0 (2.9)	27.7 (4.1)	23.7 (5.2)	10.8 (1.7)	22.2 (1.9)
E4-E6	18.0 (1.3)	16.1 (2.6)	10.0 (2.8)	8.3 (1.3)	14.1 (1.0)
E7-E9	3.0 (0.6)	1.2 (0.4)	3.1 (1.2)	1.1 (0.2)	2.1 (0.3)
W1-W4	1.2 (0.5)	0.0 (**)	1.3 (1.2)	* (*)	1.0 (0.4)
O1-O2	2.7 (1.2)	3.1 (2.6)	0.0 (**)	2.4 (1.0)	2.5 (0.8)
O3	3.6 (0.9)	1.5 (1.1)	0.4 (0.4)	1.5 (0.9)	2.2 (0.5)
O4-O10	1.6 (0.6)	0.3 (0.2)	0.0 (**)	1.5 (0.3)	1.2 (0.2)
Time on Active Duty					
1 year or less	24.4 (3.6)	26.6 (5.4)	20.7 (3.1)	8.3 (1.4)	19.7 (2.1)
>1-2 years	26.4 (3.2)	26.7 (4.6)	14.1 (3.5)	10.4 (2.4)	21.5 (2.0)
>2-3 years	26.0 (3.0)	20.1 (3.1)	28.6 (9.0)	10.5 (2.8)	20.5 (2.0)
>3-4 years	27.2 (7.0)	24.9 (7.0)	27.5 (9.0)	8.9 (2.7)	21.9 (3.6)
>4-9 years	11.7 (1.6)	13.8 (2.9)	6.8 (1.6)	9.3 (1.9)	11.1 (1.1)
10 years or more	4.1 (0.6)	1.7 (0.3)	2.5 (1.3)	2.1 (0.4)	2.8 (0.3)
Region					
Americas	16.9 (1.6)	16.7 (3.3)	15.0 (4.6)	7.1 (1.1)	13.6 (1.3)
North Pacific	18.8 (6.1)	7.8 (1.0)	11.9 (0.2)	5.5 (1.7)	11.6 (2.0)
Other Pacific	19.0 (6.8)	13.1 (2.6)	14.2 (4.1)	7.5 (0.4)	13.1 (2.0)
Europe	15.2 (2.4)	14.4 (4.1)	18.1 (10.3)	7.8 (0.1)	13.2 (1.6)
Total	16.6 (12.8)	15.9 (2.7)	14.7 (3.8)	7.2 (0.9)	13.4 (1.0)

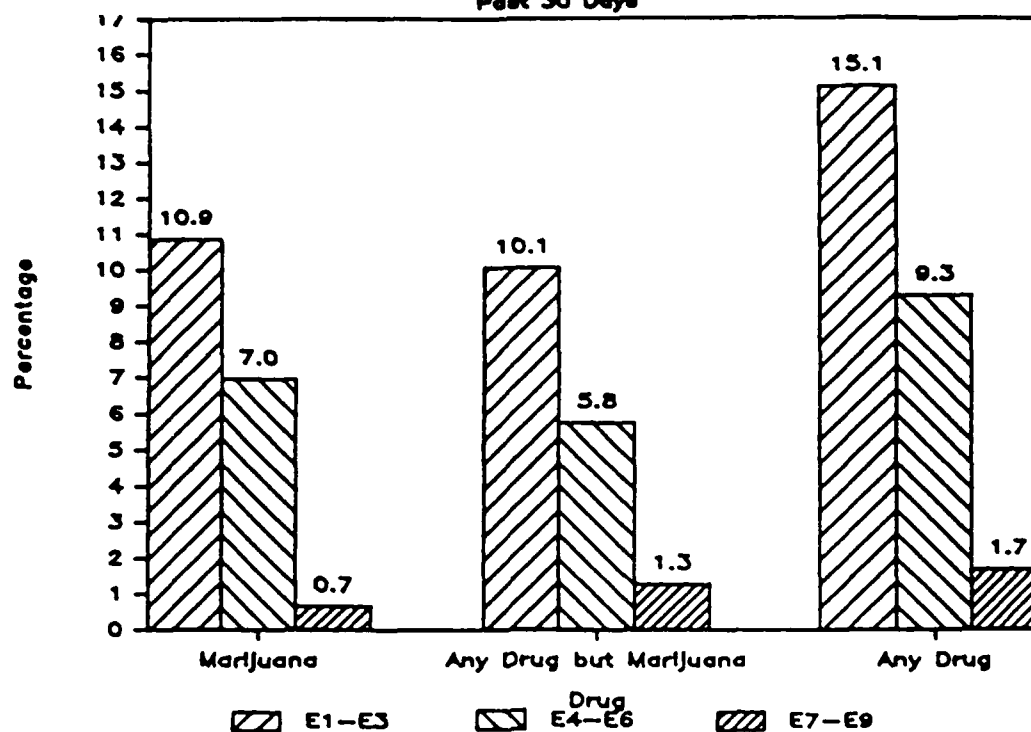
Note: Entries are percentages with standard errors in parentheses.

*There are no warrant officers in the Air Force.

** Informative standard error not available but is expected to be very close to zero.

Source: Questions 2-3, 5-10, 77.

Figure 5.7
Drug Use for Enlisted Personnel
Past 30 Days



observed difference may be associated with variation among the Services in sociodemographic characteristics associated with drug use. That is, the lower level of use among Air Force personnel may reflect the fact that they are, on the whole, more likely to be older, better educated, and married than other military personnel.

To examine this possibility, unstandardized and standardized prevalence estimates for marijuana use and other drug use during the past 12 months were compared (Table 5.12). These comparisons use a regression-based standardization procedure (Williams and LaVange, 1983) that controls for variation in age, marital status, and education. Comparison of the unstandardized estimates for the Air Force and the other Services showed statistically significant differences between the Air Force and the Army and between the Air Force and the Navy, and a statistically nonsignificant trend of lower use between the Air Force and the Marine Corps. The same pattern is observed for comparison

of standardized and unstandardized estimates for use of any drug except marijuana within the past 12 months. Although the statistically significant differences between the Air Force and the Army and Navy did not disappear when variation in selected sociodemographic characteristics was controlled in standardized estimates, the Service differences were smaller.

Table 5.12. Estimates of Drug Use Standardized by Sociodemographic Characteristics

Drug Use Past 12 Months	Service			
	Army	Navy	Marine Corps	Air Force
<u>Marijuana</u>				
Unstandardized	14.8 (1.3)*	12.5 (1.8)*	11.7 (3.4)	5.4 (0.8)
Standardized ^a	14.5 (1.0)*	11.9 (1.4)*	8.5 (3.1)	7.2 (0.9)
<u>Any Drug Except Marijuana</u>				
Unstandardized	9.2 (1.1)*	11.9 (2.7)*	10.6 (4.0)	4.2 (0.7)
Standardized ^a	9.0 (0.9)*	11.4 (2.3)*	8.2 (3.6)	5.5 (0.7)

^aEstimates standardized by age, marital status and education.

*Comparisons with the Air Force are statistically significant at the 95 percent confidence level.

Source: Question 77.

These analyses suggest that observed Service differences in the prevalence of drug use are partially a function of differences in the sociodemographic characteristics of age, education, and marital status, but they do not explain all of the variation among the Services.

5. Military-Civilian Comparisons

Several studies have noted that drug use is higher overall in the military than in civilian populations. Part of the reason for the difference could be the sociodemographic composition of the military. Those who are young, single, and male are more likely to use drugs, and young single males are overrepresented in the military population relative to the U.S. civilian population. Military-civilian differences in drug use disappear, however, when sociodemographic differences are controlled. Bray et al. (1983) compared

1982 military and civilian data on drug use for males 18-25. The results showed significantly lower levels of use of marijuana and cocaine among military personnel and no difference in use of hallucinogens, stimulants, tranquilizers.

At the time of preparation of this report, civilian data from the 1985 National Survey on Drug Abuse were not yet available. Accordingly, to enable later 1985 military-civilian comparisons, Appendix D, Table D.22 presents data that are consistent with those to be published from the national survey on drug use.

D. Multiple Drug and Alcohol Use

Some military personnel use both alcohol and drugs at some point within the same month or year although not necessarily simultaneously. Multiple drug and alcohol use increases the risk of certain negative effects associated with the use of either substance. The interaction of the two substances may cause greater health and productivity losses than a single substance. The extent of multiple use of alcohol and drugs is investigated in Tables 5.13 and 5.14.

Table 5.13. Use of Drugs by Alcohol Users, Past 30 Days

30-Day Drug Use	Drinking Level				
	Abstainer	Infrequent/ Light	Moderate	Moderate/ Heavy	Heavy
Marijuana	0.6 (0.3)	1.6 (0.4)	3.7 (0.6)	8.7 (1.2)	23.4 (2.7)
Any Drug Except Marijuana ^a	1.4 (0.4)	1.6 (0.4)	3.7 (0.7)	7.7 (1.0)	18.6 (2.1)
Any Drug ^b	1.5 (0.4)	2.8 (0.5)	5.6 (0.7)	12.1 (1.3)	28.7 (3.1)

Note: Entries are percentages with standard error in parentheses. Data indicate drug use and alcohol use during the past 30 days. Drugs and alcohol were not necessarily used at the same time.

^aAny nonmedical use of PCP, LSD/hallucinogens, cocaine, amphetamines/stimulants, tranquilizers, barbiturates/sedatives, heroin/other opiates, analgesics, or inhalants.

^bSame definition as "a" except marijuana is included in the set of drugs.

Source: Questions 52A-J, Questions 23-31.

The percentages of personnel classified in the various drinking levels that also used marijuana, any drug except marijuana, or any drug within the past 30 days are reported in Table 5.13. Clearly, the likelihood of drug use increases as the level of drinking increases. Drug use is substantially more likely among heavy drinkers (19 to 29 percent also use drugs) than among abstainers (2 percent or fewer use drugs). This finding suggests a high likelihood of combined drug and alcohol use but, as noted earlier, most drug users use drugs relatively infrequently. Therefore, the likelihood of concurrent use is lower than Table 5.13 indicates.

Table 5.14 presents the combinations of drinking levels and drug use. Of all personnel, the most common category (30 percent) is moderate drinkers who do not use drugs. The second most frequent pattern is moderate/heavy drinking/nondrug use (22 percent), followed by infrequent/light drinking/nondrug use (18 percent). These figures indicate, once again, that most military personnel drink but do not use drugs and that heavier alcohol users are more likely to use drugs than lighter users or abstainers.

Table 5.14. Patterns of Drug and Alcohol Use During the Past 30 Days

Any Drug Use	Drinking Level				
	Abstainer	Infrequent/ Light	Moderate	Moderate/ Heavy	Heavy
User	0.2 (0.1)	0.5 (0.1)	1.7 (0.2)	3.1 (0.3)	3.4 (0.5)
Nonuser	13.2 (0.5)	17.5 (0.8)	29.5 (0.7)	22.4 (0.8)	8.5 (0.5)

Note: Data entries are cell percentages with standard errors in parentheses. The table entries sum to 100 percent.

Source: Questions 52A-J, Questions 23-31.

E. Prevalence of Tobacco Use

Tobacco use is common among military personnel. About 46 percent smoke cigarettes, almost one-fourth smoke cigars or a pipe, and almost one in five use chewing tobacco, snuff, or other smokeless tobacco. The prevalence of cigarette use appears in Table 5.15, and the prevalence of other tobacco products appears in Appendix D, Table D.23.

Table 5.15. Prevalence of Cigarette Use, Past 30 Days

Paygrade/Frequency of Use	Service				Total DoD
	Army	Navy	Marine Corps	Air Force	
E1-E3					
Didn't smoke	45.7 (4.0)	53.9 (8.0)	56.3 (5.5)	59.9 (2.9)	53.4 (2.6)
½ pack or less/day	24.3 (2.9)	18.4 (1.9)	24.3 (3.0)	18.3 (1.6)	21.2 (1.3)
About 1 pack/day	14.2 (2.2)	17.9 (4.7)	8.1 (0.9)	14.3 (1.2)	14.2 (1.3)
About 1½ packs/day	8.1 (1.9)	6.6 (2.5)	8.3 (2.5)	6.1 (1.7)	7.2 (1.1)
About 2 or more packs/day	7.8 (2.2)	3.1 (1.1)	3.0 (0.6)	1.4 (0.7)	4.1 (0.8)
E4-E6					
Didn't smoke	43.6 (2.1)	46.3 (2.9)	54.3 (2.6)	54.1 (2.8)	48.1 (1.4)
½ pack or less/day	19.2 (1.4)	13.1 (1.8)	10.7 (2.7)	12.1 (1.8)	14.9 (0.9)
About 1 pack/day	18.6 (1.4)	15.3 (1.1)	15.7 (1.6)	17.5 (1.1)	17.2 (0.7)
About 1½ packs/day	10.7 (1.0)	13.1 (1.2)	12.0 (2.5)	9.3 (1.0)	11.0 (0.6)
About 2 or more packs/day	7.9 (1.0)	12.1 (1.4)	7.2 (1.9)	7.1 (0.8)	8.8 (0.6)
E7-E9					
Didn't smoke	37.6 (1.7)	46.4 (1.9)	50.8 (4.0)	50.3 (1.3)	44.2 (1.0)
½ pack or less/day	13.0 (1.1)	7.0 (0.8)	9.4 (2.6)	6.9 (1.0)	9.6 (0.6)
About 1 pack/day	14.5 (1.2)	14.2 (1.1)	12.6 (0.7)	14.4 (0.5)	14.3 (0.6)
About 1½ packs/day	13.6 (1.0)	14.7 (1.0)	10.1 (1.7)	11.1 (0.9)	12.9 (0.5)
About 2 or more packs/day	21.2 (1.3)	17.8 (1.2)	17.1 (2.0)	17.3 (0.9)	19.0 (0.7)
W1-W4					
Didn't smoke	60.4 (2.8)	50.7 (3.9)	68.7 (7.2)	* (*)	59.6 (2.4)
½ pack or less/day	9.0 (2.9)	5.6 (1.5)	8.1 (1.3)	* (*)	8.4 (2.3)
About 1 pack/day	10.9 (1.8)	13.1 (2.9)	10.1 (6.8)	* (*)	11.1 (1.6)
About 1½ packs/day	10.4 (1.6)	10.8 (2.3)	5.0 (2.0)	* (*)	10.0 (1.3)
About 2 or more packs/day	9.3 (2.5)	19.9 (4.9)	8.1 (1.9)	* (*)	10.7 (2.2)
01-02					
Didn't smoke	74.9 (3.4)	83.0 (3.0)	83.9 (8.6)	88.1 (2.1)	82.8 (2.1)
½ pack or less/day	16.0 (2.6)	7.6 (2.8)	12.6 (6.9)	6.1 (1.2)	9.9 (1.4)
About 1 pack/day	6.4 (2.0)	2.1 (1.5)	1.4 (1.7)	4.3 (1.3)	4.3 (0.9)
About 1½ packs/day	1.3 (0.7)	3.4 (1.1)	0.0 (**)	0.3 (0.2)	1.1 (0.4)
About 2 or more packs/day	1.4 (0.8)	3.8 (1.1)	2.1 (2.7)	1.2 (1.2)	1.8 (0.7)
03					
Didn't smoke	79.4 (2.3)	80.6 (2.9)	85.2 (5.8)	85.4 (3.2)	82.2 (1.5)
½ pack or less/day	8.5 (1.6)	7.6 (1.4)	6.1 (2.6)	6.8 (1.8)	7.5 (0.9)
About 1 pack/day	4.6 (1.3)	4.1 (1.6)	0.8 (0.8)	4.2 (1.8)	4.1 (0.9)
About 1½ packs/day	2.9 (0.9)	3.2 (1.7)	3.4 (1.5)	2.8 (0.9)	3.0 (0.6)
About 2 or more packs/day	4.6 (1.6)	4.4 (2.8)	4.5 (3.2)	0.8 (0.5)	3.1 (0.9)
04-010					
Didn't smoke	76.2 (1.5)	78.1 (3.6)	73.4 (6.9)	83.6 (1.5)	79.4 (1.4)
½ pack or less/day	4.9 (1.2)	4.0 (0.7)	7.9 (1.5)	5.0 (0.5)	4.9 (0.5)
About 1 pack/day	9.0 (1.8)	5.9 (1.7)	2.7 (1.0)	4.9 (0.9)	6.3 (0.9)
About 1½ packs/day	2.6 (0.8)	6.2 (1.9)	8.1 (2.5)	2.4 (0.5)	3.7 (0.6)
About 2 or more packs/day	7.3 (1.8)	5.8 (1.6)	7.8 (2.8)	4.1 (0.9)	5.7 (0.8)
Total					
Didn't smoke	48.0 (1.8)	52.1 (1.2)	57.4 (3.1)	61.0 (2.3)	53.8 (1.0)
½ pack or less/day	18.3 (1.2)	13.1 (0.8)	16.5 (3.0)	12.1 (1.0)	15.0 (0.6)
About 1 pack/day	15.5 (1.0)	14.6 (1.3)	10.8 (0.6)	14.0 (0.9)	14.4 (0.5)
About 1½ packs/day	9.3 (0.8)	10.6 (0.7)	9.5 (0.8)	7.2 (0.7)	9.0 (0.4)
About 2 or more packs/day	8.9 (0.9)	9.5 (0.7)	5.8 (0.7)	5.6 (0.6)	7.8 (0.4)

Note: Estimates are percentages with standard errors in parentheses.

* There are no warrant officers in the Air Force.

**Informative standard error not available but is expected to be very close to zero.

Source: Question 14.

This discussion focuses on cigarette use largely because it is the most widespread form of tobacco use. Cigarette use varies more substantially among the pay grades than across the Services. Overall prevalence is highest among Army personnel, followed by Navy personnel. Use among Marine Corps and Air Force personnel is somewhat lower. A similar pattern among the Services is observed for variation in smoking a pack a day or more. More significant is differences in the prevalence and level of smoking among the pay grades. Smoking is substantially more widespread among E1-E3s, E4-E6s, and E7-E9s (47 to 56 percent) than among warrant officers (40 percent) or commissioned officers (17 to 21 percent). Heavy smoking (a pack or more a day) is evident among all enlisted groups, but particularly among E7-E9s. Overall, 31 percent of military personnel smoke a pack or more of cigarettes a day, 15 percent smoke less than a pack, and 54 percent are nonsmokers.

Almost one-fourth of military personnel smoke cigars or a pipe, and almost one in five uses smokeless tobacco. Use of these products is generally infrequent (Appendix D, Table D.23). Most who use other tobacco products other than cigarettes use them less than once a week. Use is lower among Air Force personnel than among personnel of the other Services.

1. Correlates of Cigarette Smoking

An indication of the likelihood of negative effects of cigarette smoking on health is given by a measure of cigarette pack years. This measure represents the number of packs of cigarettes smoked per day times the number of years that individuals smoked at that level.

The distribution of average cigarette pack years by selected sociodemographic characteristics is presented in Table 5.16. It is assumed that a greater number of cigarette pack years will result in greater negative effects on health. The higher number of pack years observed for some groups such as older military personnel or those with a greater number of years of active Service is clearly a result of the method of calculating the pack years measure. Those groups would be expected to have a higher number of pack years than other groups partially because they have had a greater number of years of "exposure to risk" of smoking. However, this greater number of years is indicative of a greater likelihood of health problems.

Table 5.16. Average Cigarette Pack Years by Sociodemographic Characteristics

Sociodemographic Characteristics	Service				Total DoD
	Army	Navy	Marine Corps	Air Force	
Sex					
Male	4.42 (0.29)	4.10 (0.24)	2.75 (0.29)	3.44 (0.24)	3.88 (0.14)
Female	3.66 (0.87)	3.17 (0.43)	1.40 (0.70)	2.59 (0.27)	3.02 (0.32)
Race/Ethnicity					
White	5.00 (0.31)	4.44 (0.23)	3.12 (0.41)	3.55 (0.26)	4.19 (0.15)
Black	3.11 (0.34)	1.88 (0.43)	1.22 (0.21)	2.10 (0.22)	2.48 (0.21)
Hispanic	3.54 (0.64)	2.94 (0.58)	2.39 (0.32)	2.70 (0.50)	3.13 (0.35)
Other	3.62 (0.75)	3.44 (0.46)	1.74 (0.83)	3.99 (0.50)	3.48 (0.35)
Education					
Less than high school graduate	4.58 (1.15)	9.01 (0.84)	4.03 (0.81)	8.52 (1.79)	5.92 (0.74)
High school graduate or GED	4.01 (0.25)	4.05 (0.31)	2.47 (0.22)	3.36 (0.39)	3.70 (0.15)
Some college	5.62 (0.46)	4.59 (0.37)	3.28 (0.29)	3.93 (0.27)	4.54 (0.20)
College graduate or higher	3.09 (0.42)	2.08 (0.24)	2.43 (1.41)	2.00 (0.18)	2.41 (0.19)
Age					
17-20	1.17 (0.18)	1.28 (0.24)	0.93 (0.22)	0.80 (0.15)	1.09 (0.10)
21-25	2.12 (0.15)	2.37 (0.20)	1.60 (0.21)	1.60 (0.19)	1.99 (0.10)
26-30	4.21 (0.26)	3.86 (0.41)	4.04 (0.33)	2.86 (0.38)	3.63 (0.19)
31 or older	8.97 (0.59)	8.17 (0.38)	7.36 (0.64)	6.36 (0.57)	7.79 (0.31)
Family Status					
Not married	2.74 (0.33)	2.70 (0.16)	1.66 (0.24)	2.32 (0.27)	2.49 (0.14)
Married, spouse not present at duty station	5.66 (0.62)	4.82 (0.62)	3.99 (0.98)	4.55 (0.64)	5.01 (0.35)
Married, spouse present at duty station	5.52 (0.31)	5.37 (0.30)	3.88 (0.47)	3.91 (0.27)	4.80 (0.17)
Pay Grade					
E1-E3	1.89 (0.32)	1.92 (0.59)	1.33 (0.22)	1.23 (0.23)	1.61 (0.18)
E4-E6	4.46 (0.27)	4.22 (0.25)	3.09 (0.14)	4.06 (0.35)	4.18 (0.16)
E7-E9	11.30 (0.41)	10.51 (0.55)	9.35 (1.11)	9.64 (0.33)	10.50 (0.25)
W1-W4	5.86 (0.76)	10.92 (1.28)	4.12 (1.20)	* (*)	6.46 (0.70)
O1-O2	0.69 (0.29)	1.00 (0.22)	1.04 (1.05)	0.98 (0.32)	0.90 (0.18)
O3	1.80 (0.41)	1.81 (0.48)	1.01 (0.42)	1.23 (0.49)	1.54 (0.24)
O4-O10	4.57 (0.55)	3.52 (0.71)	4.98 (1.67)	2.62 (0.44)	3.58 (0.37)
Time on Active Duty					
1 year or less	1.58 (0.41)	1.76 (0.71)	1.66 (0.30)	0.79 (0.15)	1.38 (0.22)
>1-2 years	2.21 (0.31)	1.47 (0.30)	0.94 (0.31)	1.28 (0.22)	1.63 (0.15)
>2-3 years	2.35 (0.48)	2.61 (0.73)	1.46 (0.50)	1.71 (0.40)	2.14 (0.29)
>3-4 years	2.63 (0.53)	2.79 (0.70)	1.93 (0.25)	1.68 (0.37)	2.35 (0.33)
>4-9 years	3.31 (0.16)	3.07 (0.26)	2.22 (0.15)	2.70 (0.25)	2.95 (0.12)
10 years or more	9.28 (0.57)	8.77 (0.45)	7.43 (0.83)	6.41 (0.55)	8.02 (0.31)
Region					
Americas	4.47 (0.34)	4.06 (0.28)	2.77 (0.33)	3.36 (0.24)	3.83 (0.16)
North Pacific	3.82 (0.17)	4.32 (0.84)	2.44 (0.43)	4.16 (0.01)	3.68 (0.18)
Other Pacific	3.25 (0.28)	3.56 (0.37)	2.15 (0.82)	3.06 (0.25)	3.22 (0.17)
Europe	4.28 (0.45)	3.88 (0.22)	2.17 (0.53)	3.14 (0.76)	3.89 (0.35)
Total DoD	4.36 (0.26)	4.01 (0.23)	2.69 (0.27)	3.35 (0.22)	3.81 (0.13)

Note: Tabled values are mean scores with standard errors in parentheses. Construction of the pack years index is based on estimates of number of packs smoked per month x 12 x the number of years the respondent smoked at that level.

* There are no warrant officers in the Air Force.

Source: Questions 2-3, 5-10, 14.

As shown in Table 5.16, military personnel overall have an average of 3.81 cigarette pack years. Pack years for total DoD are highest among E7-E9 personnel (10.50), those with 10 years or more of active duty (8.02), military personnel aged 31 years and over (7.79), those with less than a high school education (5.92), and married personnel with spouse not present (5.01). Higher numbers of pack years are apparent among males than females, whites compared to other race/ethnic groups, those with less than a high school education or some college, older personnel, married personnel, E4-E9s and W1-W4s, and those with a greater number of years of active duty. Few differences are seen by region. Similar patterns are seen for each of the Services. Average pack years are substantially higher among Army personnel (4.36) and Navy personnel (4.01) than among Air Force personnel (3.35) or Marine Corps personnel (2.69).

These findings suggest that the groups noted above are more likely to have smoked for a longer period of time and, thus, are more likely to experience negative effects from smoking. Whether the observed patterns are associated with cohort differences in smoking or changes in smoking behavior cannot be ascertained with these data, but this important issue is worthy of further consideration. Regardless, many military personnel have smoked long enough to begin to experience effects on stamina, fitness, and performance.

2. Standardized Comparisons

Initial observation of the prevalence of cigarette smoking and amount of smoking per day suggests different use patterns among the Services. Unstandardized estimates in Table 5.17 show a pattern of significantly heavier smoking (1½ packs or 2 packs/day) among the Army and Navy than among the Air Force. Smoking patterns for the Marines are more similar to those for the Air Force, though they have significantly fewer 1 pack/day smokers and more 1½ pack/day smokers.

Two of the significant differences for the unstandardized estimates disappear when standardized estimates are compared (see Army and Marines who smoke about 1½ packs/day, Table 5.17), indicating that some of the observed Service-specific differences are due to variation among the Services in socio-demographic characteristics. The estimates were standardized using a regression-based procedure that controls for variation in age, education, and marital status across the Services (Williams and LaVange, 1983).

Table 5.17. Estimates of Cigarette Use Standardized by Sociodemographic Characteristics

Cigarette Use	Service			
	Army	Navy	Marine Corps	Air Force
Didn't Smoke				
Unstandardized	48.0* (1.8)	52.1* (1.2)	57.4 (3.1)	61.0 (2.3)
Standardized	48.6* (1.7)	53.4* (1.3)	59.1 (2.8)	58.8 (1.8)
½ Pack or less/day				
Unstandardized	18.3* (1.2)	13.1 (0.8)	16.5 (3.0)	12.1 (1.0)
Standardized	18.3* (1.2)	12.6 (0.7)	14.6 (2.6)	13.2 (0.9)
About 1 Pack/Day				
Unstandardized	15.5 (1.0)	14.6 (1.3)	10.8* (0.6)	14.0 (0.9)
Standardized	15.3 (0.9)	14.3 (1.3)	10.2* (0.7)	14.6 (0.8)
About 1½ Packs/Day				
Unstandardized	9.3* (0.8)	10.6* (0.7)	9.5* (0.8)	7.2 (0.7)
Standardized	9.1 (0.7)	10.4* (0.7)	9.4 (0.8)	7.7 (0.6)
About 2 or More Packs/Day				
Unstandardized	8.9* (0.9)	9.5* (0.7)	5.8 (0.7)	5.6 (0.6)
Standardized	8.8* (0.9)	9.3* (0.7)	6.6 (0.7)	5.7 (0.5)

Note: Table entries are percentages with standard errors in parentheses. Estimates were standardized by age, marital status and education.

*Comparisons with the Air Force are statistically significant at the 95 percent level of confidence.

Source: Question 14.

F. Prevalence of Caffeine Use

Most military personnel drink some form of caffeinated beverage (see Appendix D, Table D.24). Overall, 51 percent drink coffee, 36 percent drink tea, and 86 percent drink caffeinated soft drinks on an average day; 12 percent drink five or more cups of caffeinated coffee, 2 percent drink five or more cups or glasses of tea, and 4 percent drink five or more caffeinated soft drinks on an average day. Although the use of caffeinated beverages is not as deleterious to performance as alcohol or drug use, heavy use can have important negative effects for the health of military personnel.

G. Summary and Conclusions

This chapter has examined substance use prevalence and correlates. Emphasis has been on alcohol use, nonmedical drug use, and cigarette use. The substance use problem in the military is alcohol use as well as drug use. Several specific points illustrate current findings regarding substance use among military personnel.

1. Overview of Current Use and Trends

- Overall, about 87 percent of personnel consume some alcohol, about 46 percent smoke cigarettes, and about 9 percent engage in the nonmedical use of drugs. About 12 percent are classified as heavy drinkers, and about 31 percent smoke a pack or more a day.
- Between 1982 and 1985, the total volume of alcohol consumed declined significantly, but drinking patterns remained relatively stable. Nonmedical drug use and cigarette use declined significantly.
- Overall the average daily volume of ethanol consumption has declined since 1980.
- The same trends in alcohol, drug, and cigarette use observed for the total DoD in 1982 and 1985, with a few exceptions, are seen for the four individual Services.
- Levels of alcohol, drug, and cigarette use are lower among Air Force personnel than among personnel in the other active Services.

2. Prevalence, Patterns and Correlates of Alcohol Use

- Eighty-seven percent of military personnel drink at least on occasion; two-thirds drink at moderate to heavy levels and 12 percent are heavy drinkers; on the average, military personnel consume 1.22 ounces of ethanol per day.
- Beer is the most frequently consumed beverage (76 percent of military personnel drank beer within the past 30 days), followed by liquor (51 percent), and wine (38 percent).
- For beer, wine, and liquor, the most frequent consumption pattern is drinking less than once a week and 1-3 drinks per typical occasion; relatively few individuals drink eight or more drinks per occasion.

- Drinking patterns are heavier among males, the less well educated, younger, unmarried, and E1-E3 and E4-E6 personnel; fewer differences are observed for race/ethnicity, time on active duty, region and Service.
- Standardization of estimates for the average daily ounces of ethanol and the percentage of heavy drinkers in each of the Services removed some of the differences in alcohol use patterns among the Services. Before standardization, the Air Force was significantly lower than the other three Services on both measures. After standardization, the Air Force was no longer significantly different from the Marine Corps on average ethanol and was no longer significantly different from the Marine Corps or the Navy on heavy drinking. Caution should be used when interpreting Service differences in alcohol use because they partially reflect differences in sociodemographic characteristics of personnel.
- Comparisons of military (85 Worldwide Survey) and civilian (average from surveys conducted 1971-1976) alcohol use show that military personnel are more likely, overall, than civilians to drink beverage alcohol. Younger (18-20 year olds) military personnel are more likely than younger civilians to drink one or more ounces per day (36 percent military, 23 percent civilian), and older military personnel (aged 35 or above) are less likely than older civilians to drink one or more ounces per day (16 percent military, 17-21 percent civilian). The most current data on civilian alcohol use come from surveys conducted during the 1970s.

3. Prevalence and Correlates of Drug Use

- Overall in 1985, about 9 percent of military personnel report using any drug during the past 30 days and about 13 percent within the past 12 months.
- Drug use tends to be lower among Air Force personnel than among personnel in the other Services.
- Drug use is highest among E1-E3s followed by E4-E6s.

- Marijuana is the most frequently used drug (about 6 percent, past 30 days); the use of other individual drugs is comparatively low.
- Trend data show substantial declines in drug use from 1980 to 1982 and to 1985. Declining patterns are consistent across all Services.
- Military personnel who used drugs were most likely to use them 1 to 3 days per month rather than more often.
- Drug use is higher among personnel who are less well educated, younger, unmarried, and of junior pay grade E1-E3 and who have fewer years of Service; fewer differences occur due to race/ethnicity, sex of personnel, or region of the world where stationed.
- Differences in the prevalence of drug use are partially a function of the sociodemographic composition of the Services. Before standardization, estimates of use of marijuana and use of any drug except marijuana showed that the Air Force was significantly lower than the Army and the Navy (but not the Marines). After standardization, the same pattern of significance remained, but the Service differences were smaller.

4. Multiple Drug and Alcohol Use

- Drug use is more common among heavier than lighter drinkers.
- More military personnel are moderate drinkers/nondrug users (30 percent), moderate to heavy drinkers/nondrug users (22 percent) than other combinations of types of alcohol and drug use.

5. Prevalence of Tobacco Use

- About 46 percent of military personnel smoke cigarettes, almost one-fourth smoke cigars or a pipe, and almost one in five uses chewing tobacco, snuff, or other smokeless tobacco.
- Overall, 31 percent of military personnel smoke a pack or more of cigarettes a day, 15 percent smoke less than a pack, and 54 percent are nonsmokers.
- Cigarette smoking indicated by the number of pack years is higher among males, whites, those with less than a high school education or with some college, E4-E6s, E7-E9s and W1-W4s.

Other factors associated with greater risk of exposure (e.g., being older, having more years of service) also showed more pack years as expected. Pack years are highest in the Army followed by the Navy, Air Force, and Marine Corps.

- Observed Service-specific differences in the amount of smoking per day are due in part to variation among the Services in sociodemographic characteristics. Before standardization, estimates of personnel smoking about $1\frac{1}{2}$ packs per day were significantly higher in the Army, Navy, and Marine Corps than in the Air Force. After standardization, significant differences remained only between the Navy and the Air Force.

6. Prevalence of Caffeine Use

- Overall, 54 percent of military personnel drink coffee, 36 percent drink tea, and 86 percent drink caffeinated soft drinks on an average day; 12 percent drink five or more cups of caffeinated coffee, 2 percent drink five or more cups or glasses of tea, and 4 percent drink five or more caffeinated soft drinks on an average day.

These findings reveal the pervasive use of alcohol, substantial use of tobacco and little nonmedical use of drugs among military personnel. Results suggest that alcohol use is by far the most serious substance use problem, although the use of drugs presents important discipline problems for the military. The levels of use suggest that substance use will result in substantial effects on the productivity, health, and social relationships of military personnel.

Alcohol and drug use is concentrated among younger, unmarried, and junior enlisted personnel. Having a spouse present appears to deter substance use. Use tends to be lower among Air Force personnel than personnel of the other active Services, although part of this difference is accounted for by the sociodemographic composition of the Services. These findings suggest that programs and policies designed to prevent or treat substance abuse should be directed toward high risk groups.

Military-civilian differences are difficult to determine because there are no recent civilian data. Available evidence for alcohol from civilian surveys during the 70's suggests, however, that younger (18-20 year olds) military personnel are more likely than comparable aged civilians to drink one

or more ounces of ethanol per day, but older military personnel (aged 35 or above) are less likely than older civilians to drink one or more ounces per day.

The findings suggest that the military has made substantial progress in curbing nonmedical drug use. Part of the decline in drug use between 1980 and 1985 is no doubt associated with similar declines in the U.S. civilian population. Nevertheless, the substantial investments the military has made in programs designed to deter drug use, such as urinalysis, appear to have had positive results. Despite decreases in drug use, however, the drug problem has not disappeared. Efforts should continue to be directed toward preventing drug use and toward treating those with problems.

6. NEGATIVE EFFECTS OF ALCOHOL AND DRUG USE

Negative effects associated with alcohol and drug use disrupt the health, social life, family relationships, or work performance of military personnel. These negative effects diminish military readiness and require expenditures for alcohol and drug abuse prevention, intervention, detoxification, rehabilitation, and treatment.

Analyses presented in this chapter describe some negative effects attributed to the alcohol and drug use of military personnel. Special attention is given to productivity loss and the relative contributions of alcohol and drug use to the overall level of negative consequences. The analyses compare 1982 and 1985 results with the negative effect measures used in prior studies, assess 1980-1985 trends for productivity loss, and introduce new measures that consider somewhat different dimensions of consequences.

A. Prior Measures of Negative Effects

The basic measures of negative effects used for this study were developed for a study of alcohol problems in the Air Force conducted by Polich and Orvis (1979). The items comprising the measures were also used in the 1980 Worldwide Survey (Burt and Biegel, 1980) and the 1982 Worldwide Survey (Bray et al., 1983).

Following work on alcohol-related disabilities by the World Health Organization (see Edwards et al., 1981 for a recent discussion), Polich and Orvis distinguished two broad classes of alcohol problems--adverse effects and dependence. Adverse effects of alcohol use include health problems, poor social relationships, and diminished work performance. The dependence syndrome includes withdrawal symptoms in the absence of alcohol, and subjective need for alcohol. Adverse effects and dependence may occur together or separately. Adverse effects more often occur without dependence.

The alcohol-related negative effects items developed by Polich and Orvis were adapted by Burt and Biegel (1980) and by Bray et al. (1983) to describe drug-related negative effects. For the present study, six negative effects measures patterned after measures used in the 1982 Worldwide Survey were developed. Specifically, these measures report the occurrence of the following incidents due to either alcohol or drugs during the 12 months before the survey:

Work impairment: received UCMJ punishment, received a lower-than-expected performance rating, or lost three or more working days.

Physical damage: experienced an illness that kept the individual from duty 1 week or longer, was hurt in an accident, or had an accident that caused injury to others or property damage.

Social disruption: spouse left, spouse threatened to leave, arrested for driving under the influence, arrested for nondriving drinking or drug incident, incarcerated, or fighting.

Other consequences: not promoted, hit spouse or children, detoxified.

Productivity loss: lowered performance at work, late for work or left early, did not come to work, or drunk or high while working.

Dependence: experienced blackouts, tremors or "shakes," impaired control, or morning drinking an average of once a week.

Because of the low prevalence of drug dependence in the 1982 Worldwide Survey, questions concerning drug dependence were omitted in 1985. Summary measures that indicated the occurrence of one or more incidents in each class of negative effects were developed separately for alcohol use and for drug use.

B. Overview and Trends

The percentages of military personnel in the total DoD and in each of the Services who experienced work impairment, physical damage, social disruption, other consequences, productivity loss, and alcohol dependence in 1982 and 1985 are presented below. Results for adverse effects due to alcohol are presented first, followed by discussion of results about adverse effects due to drugs.

1. Alcohol Use Negative Effects

No more than 10 percent of military personnel in 1985 experienced negative effects attributed to alcohol use in any of the categories of work impairment, physical damage, social disruption, other consequences, or dependence. Only productivity loss shows higher levels (Figure 6.1). Slightly more than one-fourth report some productivity loss due to alcohol use. Significantly fewer military personnel experienced work impairment, social disruption, and productivity loss in 1985 than in 1982 (Table 6.1). There were no significant changes in estimates of physical damage, other consequences, or dependence.

Figure 6.1
Alcohol Use Negative Effects
Total DoD 1982 and 1985

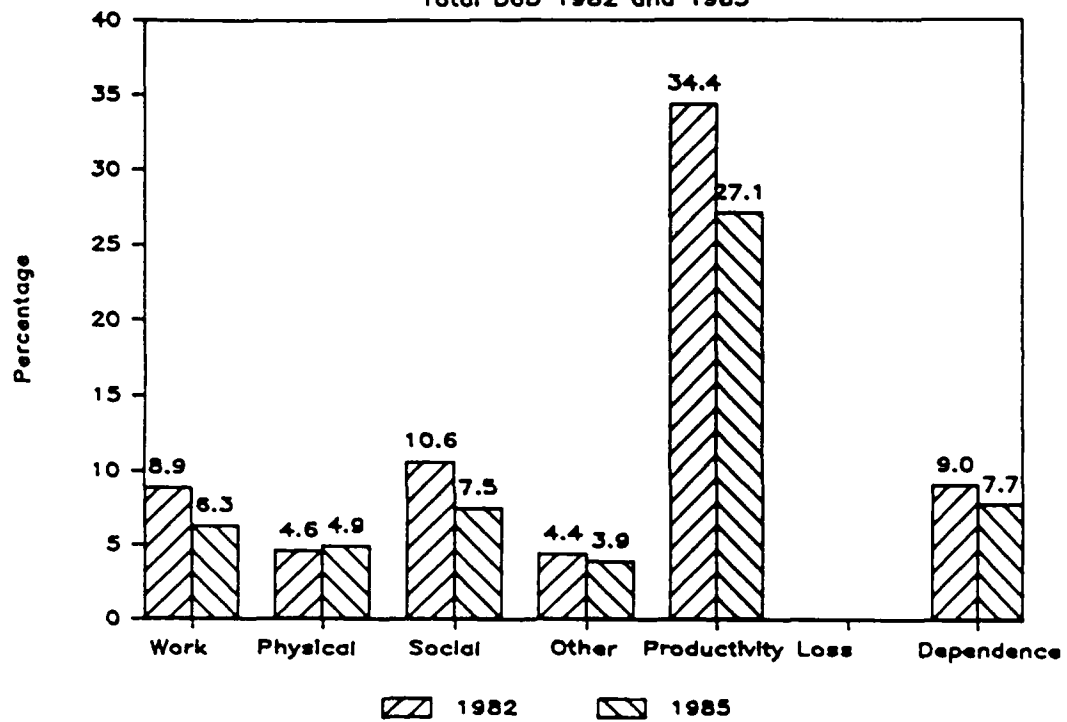


Table 6.1. Alcohol Use Negative Effects, 1982 and 1985 - Total DoD

Indicator	1982	1985	82-85 Change
<u>Negative Effects</u>			
Work impairment ^a	8.9 (0.4)	6.3 (0.7)	-2.6*
Physical damage ^b	4.6 (0.3)	4.9 (0.6)	+0.3
Social disruption ^c	10.6 (0.5)	7.5 (0.7)	-3.1*
Other consequences ^d	4.4 (0.3)	3.9 (0.4)	-0.5
Productivity loss ^e	34.4 (0.7)	27.1 (1.1)	-7.3*
<u>Dependence</u> ^f	9.0 (0.5)	7.7 (0.7)	-1.3

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

*Comparisons between 1982 and 1985 are statistically significant at the 95 percent confidence level.

^aFor 1982, questions 49c, 49d, 47a-f. For 1985, questions 44e, 44f, 37c-h.

^bFor 1982, questions 49a, h, i. For 1985, questions 44a-c.

^cFor 1982, questions 49e-g, m, n, 181, 491. For 1985, questions 44g-i, m, n, questions 211, 411.

^dFor 1982, questions 49B, j, k, o. For 1985, questions 44d, j, k, o.

^eFor 1982, questions 47a-c, e. For 1985, questions 37c-e, g.

^fFor 1982, questions 48a, c, d, g, h. For 1985, questions 41c, e, f, i, j.

More detailed information about the frequency of experiencing 12 physiological symptoms including those that comprise the alcohol dependence measure is presented in Appendix D, Table D.25. The symptoms most likely to have been experienced within the past year are: got drunk or very high from drinking (57 percent), was sick because of drinking (32 percent), awakened unable to remember some things from the day before while drinking (blackouts) (27 percent), tossed down several drinks to get a quicker effect (27 percent), and kept on drinking after promising self not to (22 percent). Symptoms such as the shakes, skipping meals, or staying drunk for more than a day at a time are less common. All symptoms except drunkenness are relatively infrequent, occurring only about 1 to 11 times per year. Twelve percent of military personnel report having gotten drunk one or more times a week; 27 percent got drunk once a month or more often.

Changes from 1982-1985 reported above for total DoD generally are apparent for the Services. As shown in Table 6.2, for at least three of the four Services (which three varies across the indicators), the percentages of personnel experiencing alcohol-related work impairment, social disruption, and productivity loss are significantly lower in 1985 than they were in 1982. None of the Services shows significant differences in the percentages reporting physical damage resulting from alcohol use. For the measure of dependence, Navy personnel showed a significant decline from 1982 to 1985, and the other Services showed no statistically significant changes.

The declines in alcohol-related negative effects are consistent with the decline in the quantity of alcohol consumed and the increase in the percentage of abstainers between 1982 and 1985. Rates of alcohol use and all measures of negative consequences are substantially lower in the Air Force than in the other Services.

Trends in negative effects from 1980 to 1985 are examined for productivity loss due to alcohol use.* Figure 6.2, which presents these data for each Service and total DoD, shows a clear pattern of results. Productivity loss increased significantly from 1980 to 1982 and then decreased significantly from 1985 back to 1980 levels. Thus, there has been progress since 1982, but there have been no overall gains since 1980.

* The negative effects indexes of work impairment, physical damage, social disruption, and other consequences were not computed in 1980 and so were not available for trend comparisons.

Table 6.2. Alcohol Use Negative Effects for Services, 1982 and 1985

Indicator	Service							
	Army		Navy		Marine Corps		Air Force	
	1982	1985	1982	1985	1982	1985	1982	1985
<u>Negative Effects</u>								
Work impairment	10.1 (0.8)	6.9 (1.3)*	10.6 (0.9)	8.2 (1.7)	11.3 (2.0)	8.6 (1.6)*	5.0 (0.6)	3.3 (0.5)*
Physical damage	5.3 (0.4)	6.1 (1.3)	5.8 (0.7)	4.9 (0.8)	5.0 (0.2)	7.6 (1.7)	2.6 (0.5)	2.8 (0.5)
Social disruption	11.5 (1.1)	10.0 (1.6)	12.6 (1.1)	7.9 (0.9)*	14.3 (1.1)	9.4 (0.9)*	6.3 (0.6)	3.8 (0.4)*
Other consequences	5.7 (0.6)	5.6 (0.9)	4.5 (0.5)	3.9 (0.7)	5.1 (0.4)	4.3 (0.8)	2.5 (0.3)	1.8 (0.3)
Productivity loss	33.1 (0.9)	27.2 (1.3)*	41.8 (1.8)	35.5 (2.4)*	37.6 (1.2)	29.0 (5.0)	28.0 (1.7)	19.4 (1.1)*
<u>Dependence</u>								
	10.5 (0.8)	12.1 (1.5)	11.6 (1.0)	6.8 (0.8)*	10.2 (1.8)	7.6 (1.4)	4.0 (0.7)	3.3 (0.5)

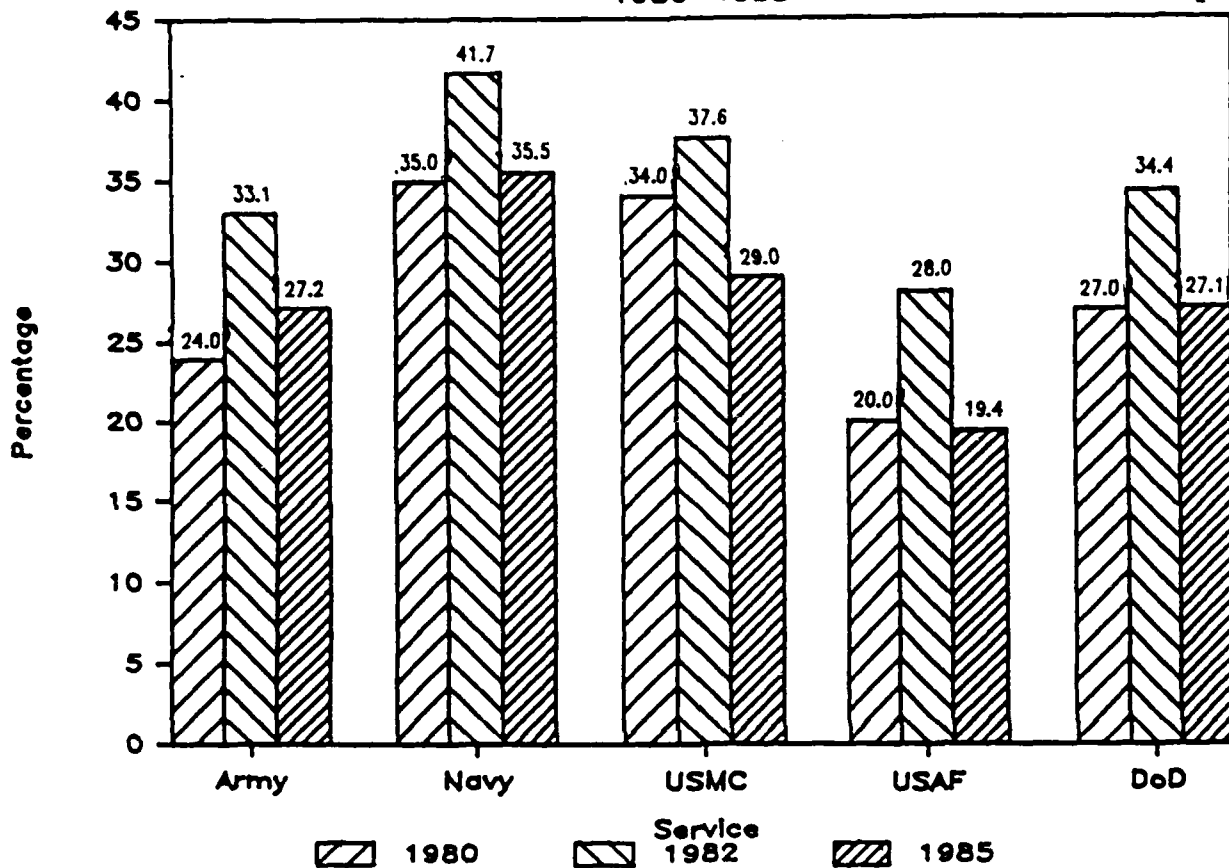
Note: Tabled values are percentages with standard errors in parentheses. See notes on Table 6.1 for definitions of variables.

*Comparisons between 1982 and 1985 are statistically significant at the 95 percent confidence level.

Figure 6.2

Alcohol Use Productivity Loss

1980-1985



2. Drug Use Negative Effects

Few personnel use drugs and, consequently, only a few experience drug use negative effects. Among all personnel (i.e., drug users and non-users) drug use negative effects declined between 1982 and 1985 (Figure 6.3). Except for "other consequences," the reductions in negative effects are statistically significant (Table 6.3). In 1985, fewer than 4 percent of military personnel experienced drug use negative effects within the past 12 months. These rates are substantially lower than those for alcohol use, particularly productivity loss. Twenty-seven percent of military personnel experienced productivity loss because of alcohol use, compared with only 3 percent because of drug use.

Figure 6.3
Drug Use Negative Effects
Total DoD, 1982 and 1985

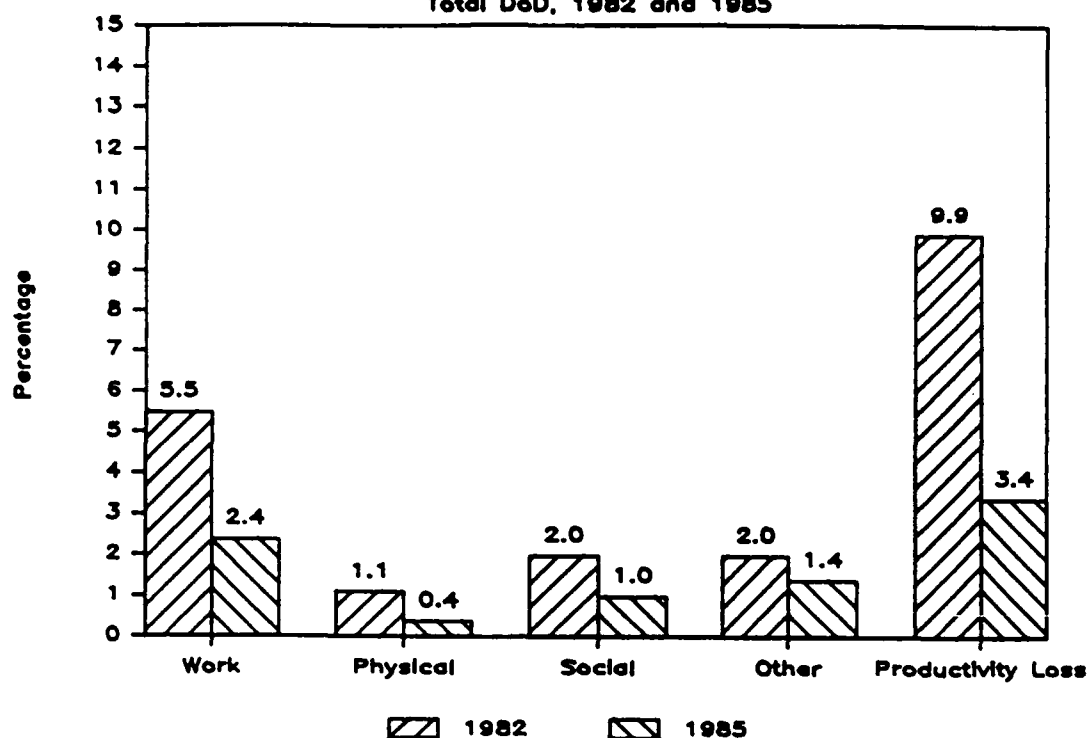


Table 6.3. Drug Use Negative Effects, 1982 and 1985 - Total DoD

Negative Effects Indicator	Year of Survey		82-85 Change
	1982	1985	
Work impairment ^a	5.5 (0.4)	2.4 (0.3)	-3.1*
Physical damage ^b	1.1 (0.1)	0.4 (0.1)	-0.7*
Social disruption ^c	2.0 (0.1)	1.0 (0.2)	-1.0*
Other consequences ^d	2.0 (0.2)	1.4 (0.3)	-0.6
Productivity loss ^e	9.9 (0.5)	3.4 (0.6)	-6.5*

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

*Comparisons between 1982 and 1985 are statistically significant at the 95 percent confidence level.

^aFor 1982, questions 76c-d, questions 75a-f. For 1985, questions 63d-e, 59a-f.

^bFor 1982, questions 76a, h, i. For 1985, questions 63b, i, j.

^cFor 1982, questions 76e-g, m, n, 181, 761. For 1985, questions 63f, h, n, o, 211, 63m.

^dFor 1982, questions 76b, j, k, o. For 1985, questions 63c, l, p.

^eFor 1982, questions 75a-c, e. For 1985, questions 59b-e.

Drug-related negative effects for all four active Services are significantly lower in 1985 than in 1982 (Table 6.4). Drug-related work impairment declined significantly for all four Services. Other significant decreases are productivity loss (Army, Navy, and Air Force), physical damage (Army and Navy), social disruption (Army and Air Force), and other consequences (Army). The declines in drug-related negative consequences are consistent with the significant declines in drug use observed for each of the active Services between 1982 and 1985. The percentages reporting drug-related negative effects are substantially lower among Air Force personnel than among personnel of the other Services. The lower prevalence of drug use negative effects among Air Force personnel reflects the lower Air Force use rates.

Trends in negative effects from 1980 to 1985 were examined for productivity loss due to drug use. Figure 6.4, which presents these data for E1-E5s* for each Service and total DoD, shows a clear pattern: productivity loss decreased significantly and consistently across all Services from 1980 to 1985. These data are consistent with the sharp decline in drug use during the same period (See Figure 5.4).

C. Pay Grade and Negative Effects

This section examines the rates of negative effects associated with alcohol use and drug use for seven pay grade groups. Table 6.5 presents the percentages by pay grade and Service of all military personnel experiencing one or more negative effects of alcohol use or drug use due to work impairment, physical damage, social disruption, or other consequences as defined earlier in this chapter. Across the total DoD, 14 percent of military personnel had an alcohol-related negative effect and 3 percent a drug-related negative effect in the past 12 months. Rates of negative effects are highest among E1-E3 personnel (23 percent alcohol, 7 percent drugs). Corresponding rates among E4-E6 personnel are about half the E1-E3 rates (14 percent alcohol and 3 percent drugs). Substantially lower percentages of other pay grades experienced alcohol-related negative effects (2 to 6 percent) or drug-related negative effects (.1 to .6 percent).

* Comparisons were restricted to E1-E5 pay grades because Burt and Biegel (1980) reported only these data.

Table 6.4. Drug Use Negative Effects for Services 1982 and 1985

Indicator	Service							
	Army		Navy		Marine Corps		Air Force	
	1982	1985	1982	1985	1982	1985	1982	1985
Work impairment	7.1 (0.8)	3.3 (0.6)*	6.7 (0.9)	3.1 (0.6)*	6.3 (1.3)	1.7 (0.8)*	2.1 (0.3)	0.8 (0.2)*
Physical damage	1.6 (0.3)	0.6 (0.3)*	1.2 (0.2)	0.3 (0.2)*	1.0 (0.5)	0.9 (0.6)	0.3 (0.1)	0.1 (**)
Social disruption	2.9 (0.3)	1.7 (0.5)*	1.9 (0.3)	1.0 (0.5)	2.5 (0.3)	1.2 (0.6)	0.7 (0.1)	0.2 (0.1)*
Other consequences	2.8 (0.3)	1.7 (0.4)*	2.3 (0.6)	1.7 (0.5)	2.7 (0.4)	2.9 (2.5)	0.6 (0.2)	0.2 (0.1)
Productivity loss	13.1 (1.2)	4.4 (0.8)*	11.4 (0.9)	3.9 (1.1)*	8.9 (0.8)	4.3 (3.0)	4.5 (0.5)	1.5 (0.7)*

Note: Tabled values are percentages with standard errors in parentheses. See notes on Table 6.3 for definitions of variables.

*Comparisons between 1982 and 1985 are statistically significant at the 95 percent confidence level.

**Informative standard error not available but is expected to be very close to zero.

Figure 6.4

E1-E5's Drug Use Productivity Loss
1980-1985

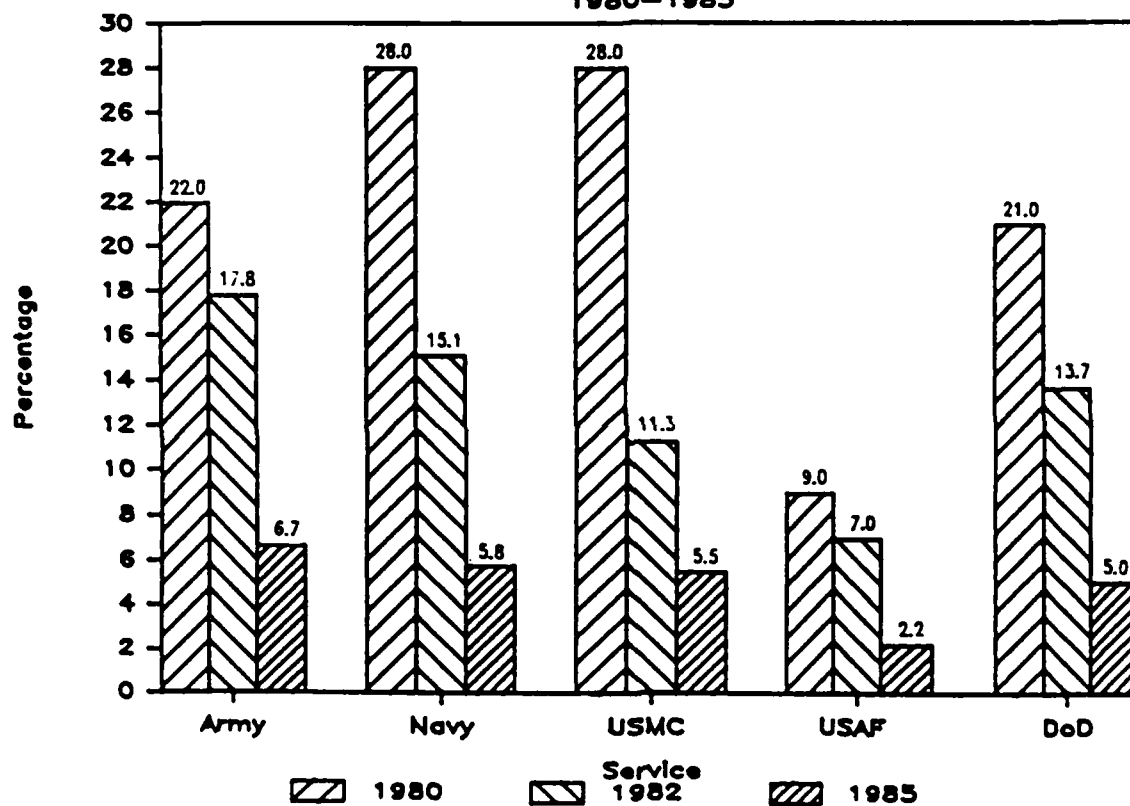


Table 6.5. Negative Effects from Alcohol and Drug Use by Pay Grade

Substance/ Pay Grade	Service				Total DoD
	Army	Navy	Marine Corps	Air Force	
<u>Alcohol Use Effects</u>					
E1-E3	28.0 (5.6)	25.2 (3.3)	26.4 (3.2)	12.9 (1.2)	22.7 (2.1)
E4-E6	17.5 (1.3)	17.4 (2.1)	16.9 (3.7)	7.3 (0.8)	14.5 (0.9)
E7-E9	6.9 (0.7)	4.4 (0.6)	6.4 (1.9)	3.2 (0.4)	5.2 (0.4)
W1-W4	3.3 (0.8)	4.3 (1.6)	4.4 (0.4)	0.0 (**)	3.6 (0.7)
O1-O2	9.7 (1.4)	1.8 (1.5)	9.6 (2.7)	3.7 (1.0)	5.6 (0.8)
O3	2.3 (1.2)	4.9 (2.3)	4.3 (2.9)	2.3 (1.3)	3.0 (0.8)
O4-O10	2.2 (0.8)	2.4 (0.7)	1.4 (1.0)	1.7 (0.5)	2.0 (0.4)
Total	16.9 (2.1)	16.5 (1.9)	19.2 (2.2)	7.5 (0.7)	14.2 (1.0)
<u>Drug Use Effects</u>					
E1-E3	8.5 (2.2)	9.9 (2.2)	7.9 (4.1)	1.3 (0.5)	6.6 (1.2)
E4-E6	4.2 (0.7)	3.0 (0.9)	1.1 (0.7)	1.0 (0.3)	2.7 (0.4)
E7-E9	0.2 (0.1)	0.2 (0.1)	0.0 (**)	0.0 (**)	0.1 (0.1)
W1-W4	0.0 (**)	0.0 (**)	0.0 (**)	* (*)	0.0 (**)
O1-O2	0.0 (**)	0.0 (**)	0.0 (**)	1.4 (1.1)	0.6 (0.6)
O3	0.3 (0.4)	0.0 (**)	0.0 (**)	0.0 (**)	0.1 (0.1)
O4-O10	0.0 (**)	0.0 (**)	0.0 (**)	0.1 (0.1)	0.1 (0.1)
Total	4.2 (0.7)	4.0 (1.0)	3.9 (2.2)	0.9 (0.2)	3.1 (0.4)

Note: Data entries are percentages of individuals reporting one or more occurrences of work impairment, physical damage, social disruption, or other consequences as defined in Tables 6.1 (alcohol) and 6.3 (drugs).

*There are no warrant officers in the Air Force.

**Informative standard error not available but is expected to be very close to zero.

Table 6.6 presents estimates of productivity loss by pay grade and shows that alcohol-related productivity loss is much more common than drug-related productivity loss both overall and within each pay grade group. Overall, 27 percent of military personnel experienced some productivity loss because of alcohol use and 3 percent because of drug use within the past 12 months. Over one-third of E1-E3 personnel experienced productivity loss because of alcohol use, as did 28 percent of E4-E6 personnel, and 13 to 19 percent of other pay grades. Rates of productivity loss because of drug use are highest among E1-E3 personnel (6 percent), followed by E4-E6 personnel (4 percent). They are minimal among personnel in other pay grades. These patterns are similar to those observed for other negative effects in Table 6.5.

Table 6.6. Loss of Productivity Because of Alcohol or Drug Use During the Past 12 Months by Pay Grade

Substance/ Pay Grade	Service				Total DoD
	Army	Navy	Marine Corps	Air Force	
<u>Loss Because of Alcohol Use</u>					
E1-E3	41.7 (4.1)	45.2 (2.7)	36.0 (7.5)	24.2 (3.1)	36.6 (2.3)
E4-E6	27.2 (0.9)	37.0 (2.2)	25.9 (4.5)	20.9 (1.3)	28.0 (1.0)
E7-E9	13.5 (1.0)	16.5 (1.2)	12.1 (2.2)	12.9 (0.9)	14.0 (0.6)
W1-W4	10.1 (2.3)	19.3 (2.3)	25.4 (2.4)	* (*)	12.6 (2.2)
O1-O2	17.7 (2.7)	27.1 (6.9)	30.0 (3.8)	14.0 (1.4)	18.7 (2.1)
O3	12.6 (2.1)	23.4 (5.9)	8.4 (1.6)	9.8 (3.0)	13.7 (2.0)
O4-O10	11.1 (1.3)	18.2 (2.4)	22.3 (1.9)	10.6 (1.4)	13.1 (1.0)
Total	27.2 (1.3)	35.5 (2.4)	29.0 (5.0)	19.4(11.1)	27.1 (1.1)
3 or more lost work days	4.7 (1.3)	5.8 (1.3)	4.8 (1.9)	1.6 (0.3)	4.1 (0.6)
Mean days lost per person	0.8 (0.2)	0.8 (0.1)	0.7 (0.2)	0.3 (**)	0.6 (0.1)
<u>Loss Because of Drug Use</u>					
E1-E3	7.1 (1.7)	7.7 (2.1)	7.8 (5.6)	1.1 (0.5)	5.6 (1.2)
E4-E6	5.1 (1.2)	3.7 (1.3)	1.9 (1.2)	2.4 (1.2)	3.7 (0.7)
E7-E9	0.2 (0.1)	0.2 (0.1)	0.3 (0.3)	0.0 (**)	0.1 (0.1)
W1-W4	0.0 (**)	0.0 (**)	0.0 (**)	* (*)	0.0 (**)
O1-O2	0.0 (**)	0.0 (**)	0.0 (**)	1.4 (1.1)	0.6 (0.5)
O3	0.3 (0.3)	0.0 (**)	0.0 (**)	0.0 (**)	0.1 (0.1)
O4-O10	0.0 (**)	0.0 (**)	0.0 (**)	0.1 (0.1)	- (-)
Total	4.3 (0.8)	3.9 (1.1)	4.3 (3.0)	1.5 (0.7)	3.4 (0.5)
3 or more lost work days	2.0 (0.5)	1.2 (0.3)	0.3 (0.2)	0.4 (0.1)	1.2 (0.2)
Mean days lost per person	0.3 (0.1)	0.1 (**)	0.1 (**)	0.1 (**)	0.2 (**)

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

*There are no warrant officers in the Air Force.

**Informative standard error not available but is expected to be very close to zero.

-Estimate rounds to zero.

Source: Questions 37c, d, e, g; 59b-e.

The percentages of military personnel who reported experiencing at least one symptom of alcohol dependence at least once a week are presented in Table 6.7. As with alcohol-related negative effects, alcohol dependence is concentrated among E1-E3 personnel (15 percent) and E4-E6 personnel (7 percent). Overall, almost 8 percent of military personnel report experiencing enough symptoms often enough to be classified as alcohol dependent. Army rates substantially exceed those for the other three active Services. Fully one-fourth of Army E1-E3 personnel meets the definition for alcohol dependency.*

Table 6.7. Alcohol Dependence During the Past 12 Months

Pay Grade	Service				Total DoD
	Army	Navy	Marine Corps	Air Force	
E1-E3	25.0 (4.6)	13.3 (4.3)	12.2 (1.4)	7.0 (0.8)	15.0 (2.0)
E4-E6	11.1 (1.2)	6.0 (0.8)	5.1 (1.5)	2.7 (0.7)	6.9 (0.6)
E7-E9	2.0 (0.4)	1.5 (0.4)	1.9 (0.4)	1.7 (0.4)	1.8 (0.2)
W1-W4	0.7 (0.4)	2.1 (1.5)	3.3 (1.2)	* (*)	1.1 (0.4)
O1-O2	1.9 (1.0)	0.6 (0.6)	0.0 (**)	0.3 (0.3)	0.8 (0.4)
O3	2.3 (1.1)	0.1 (0.1)	0.0 (**)	0.4 (0.3)	0.9 (0.4)
O4-O10	1.1 (0.6)	0.6 (0.4)	2.1 (1.1)	1.4 (0.4)	1.2 (0.3)
Total	12.1 (1.5)	6.8 (0.8)	7.6 (1.4)	3.3 (0.5)	7.7 (0.7)

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

* There are no warrant officers in the Air Force.

** Informative standard error not available but is expected to be very close to zero.

Source: Questions 41c, e, f, i, and j.

* The dependence syndrome, discussed on the first page of this chapter, is based on the disease concept of alcoholism, but several of the symptoms also can result from the episodic heavy drinking pattern that is characteristic of young adults, especially males. Because blackouts, tremors, and shakes (which can result from alcohol-induced dehydration) occurred more often primarily among E1-E6's in the Army than in the other Services, more Army personnel met the dependence criterion. These findings should not be trivialized, but they do not necessarily mean that more military personnel are incipient alcoholics.

D. Alcohol Problem Categories

Alcohol use problem categories were constructed using information about serious consequences experienced during the past 12 months (i.e., work impairment, physical damage, social disruption, other consequences), alcohol dependence status, and average daily consumption of alcohol. Military personnel are classified as

- "not affected"--they experienced no problems, are not alcohol dependent, and drink less than 5 ounces of alcohol a day;
- "adverse effects, not dependent"--they are not dependent but experienced one or more problems, or they drink 5 or more ounces a day; or
- "dependent"--they are classified as alcohol dependent and may have experienced problems.

Table 6.8 presents general drinking characteristics, work-related characteristics, serious consequences, and drug-related characteristics among military personnel classified by the alcohol use problem categories. The vast majority of military personnel (82 percent) are "not affected" by alcohol use, about 10 percent experienced adverse effects but were not dependent, and about 8 percent are alcohol dependent. Consistently, far more alcohol dependent personnel experienced serious negative effects on work and social relationships and are by far the heaviest drinkers and drug users. Judging by the drinking characteristics, the frequency and quantity of drinking increase across the alcohol use problem categories. For instance, only 6 percent of those not affected but half of the dependent personnel are heavy drinkers.

Sociodemographic characteristics are examined in Table 6.9 for each of the alcohol use problem categories. For the total DoD, alcohol problems are more prevalent among males; among those with less than a high school education; among those aged 17-20; among those not married; among E1-E3 personnel; and among those on active duty 4 years or less. Alcohol dependence occurs least often among Air Force personnel. Differences among regions and race/ethnic groups are small, although whites are slightly more likely to have experienced problems.

Table 6.8. Drinking Characteristics for Alcohol Use Problem Categories - Total DoD

Drinking Characteristics	Alcohol Use Problem Category			
	Not Affected ^a	Adverse Effects Not Dependent ^b	Dependent ^c	
<u>General Drinking Characteristics</u>				
Mean ounces ethanol consumed daily	(0.6) (-)	3.1 (0.2)	4.6 (0.4)	
Drinking Levels: Abstainer (percent)	16.3 (0.7)	1.5 (0.5)	0.1 (0.1)	
Infrequent/Light (percent)	20.0 (0.7)	7.3 (1.4)	10.8 (2.4)	
Moderate (percent)	35.0 (0.6)	17.8 (1.5)	8.0 (1.7)	
Moderate/Heavy (percent)	23.1 (0.7)	40.3 (2.1)	31.0 (5.7)	
Heavy (percent)	5.6 (0.4)	33.1 (2.3)	50.2 (5.5)	
<u>Work-Related Characteristics</u>				
Percentage agreed with "there are times at work when I need a drink"	81.3 (0.5)	78.7 (1.7)	81.7 (3.3)	
Mean days used alcohol before or during work in past 30 days	0.2 (-)	1.1 (0.1)	3.0 (0.4)	
Mean days lost from work because of drinking in past 12 months	0.1 (-)	1.4 (0.2)	4.7 (0.7)	
Percentage reported productivity loss due to alcohol	17.8 (0.9)	59.8 (3.3)	81.4 (2.7)	
<u>Drinking-Related Serious Consequences in Past 12 Months</u>				
2 or more serious consequences (percent)	0.0 (0.0)	35.0 (-)	42.0 (0.1)	
Work impairment (percent)	0.0 (0.0)	31.3 (3.1)	40.7 (5.3)	
Physical damage (percent)	0.0 (0.0)	24.3 (2.2)	31.7 (5.7)	
Social disruption (percent)	0.0 (0.0)	44.7 (2.3)	38.2 (5.3)	
<u>Drug-Related Characteristics</u>				
Mean number of kinds of drugs used in past 30 days	0.1 (-)	0.4 (0.1)	0.8 (0.1)	
Percentage "frequent" Marijuana users (used 11 or more days in the past 30 days)	0.8 (0.2)	4.2 (1.2)	10.0 (2.0)	
<u>Total</u> (percent)	81.8 (1.0)	10.5 (0.6)	7.7 (0.7)	

Note: Table entries are means or percentages as indicated with standard errors in parentheses.

-Estimate rounds to zero.

^aExperienced no consequences (work impairment, physical damage, social disruption, other consequences, had average ethanol consumption in range 0-4.9 ounces/day and were not dependent.

^bExperienced one or more serious consequences but were not dependent or consumed 5 or more ethanol ounces/day but were not dependent.

^cExperienced any of four symptoms due to drinking: blackouts, shakes, impaired control, or morning drinking.

Source: Questions 211, 34-36, 37c-h, 44a-c, e-h, m,n,l, 52a-j.

Table 6.9. Alcohol Use Problem Categories by Sociodemographic Characteristics - Total DoD

Sociodemographic Characteristics	Alcohol Use Problem Category		
	Not Affected ^a	Adverse Effects Not Dependent ^b	Dependent ^c
Sex			
Male	80.7 (1.0)	11.0 (0.7)	8.3 (0.7)
Female	92.8 (1.1)	5.4 (1.1)	1.8 (0.5)
Race/Ethnicity			
White	80.8 (1.3)	10.7 (0.8)	8.5 (0.9)
Black	84.2 (1.2)	10.4 (1.0)	5.4 (0.8)
Hispanic	84.9 (1.8)	8.9 (1.2)	6.2 (1.5)
Other	83.8 (4.0)	10.0 (3.0)	6.3 (2.3)
Education			
Less than high school graduate	57.9 (6.1)	19.1 (5.2)	23.0 (4.2)
High school graduate or GED	74.6 (1.4)	13.6 (0.7)	11.8 (1.2)
Some college	85.6 (0.9)	9.5 (0.7)	4.7 (0.6)
College graduate or higher	95.6 (0.6)	3.2 (0.6)	1.2 (0.2)
Age			
17-20	64.7 (3.2)	16.2 (1.8)	19.1 (2.8)
21-25	78.1 (1.0)	13.5 (0.9)	8.4 (0.8)
26-30	87.6 (1.1)	8.2 (0.7)	4.2 (0.8)
31 or older	92.8 (0.5)	4.8 (0.5)	2.4 (0.3)
Family Status			
Not married	73.4 (1.5)	14.0 (1.0)	12.7 (1.3)
Married, spouse not present at duty station	79.7 (2.7)	10.8 (1.9)	9.6 (2.3)
Married, spouse present at duty station	89.5 (0.7)	7.4 (0.6)	3.1 (0.3)
Pay Grade			
E1-E3	70.8 (2.2)	14.1 (1.3)	15.1 (2.0)
E4-E6	81.4 (0.9)	11.7 (0.7)	6.9 (0.6)
E7-E9	92.9 (0.5)	5.3 (0.5)	1.8 (0.2)
W1-W4	95.3 (0.7)	3.7 (0.7)	1.1 (0.4)
O1-O2	94.1 (0.8)	5.1 (0.8)	0.8 (0.4)
O3	96.1 (1.0)	2.9 (0.8)	1.0 (0.4)
O4-O10	97.3 (0.4)	1.6 (0.3)	1.2 (0.3)
Time on Active Duty			
1 year or less	74.9 (4.4)	10.5 (1.7)	14.6 (4.2)
>1-2 years	73.4 (2.3)	12.5 (1.4)	14.1 (2.0)
>2-3 years	76.4 (2.1)	13.1 (1.4)	10.5 (1.3)
>3-4 years	68.8 (5.8)	20.8 (4.7)	10.5 (2.3)
>4-9 years	85.3 (0.8)	9.9 (0.8)	4.9 (0.5)
10 years or more	92.2 (0.5)	5.5 (0.5)	2.3 (0.3)
Region			
Americas	82.6 (1.2)	10.5 (0.8)	6.9 (0.8)
North Pacific	79.7 (1.0)	10.9 (1.0)	9.5 (1.4)
Other Pacific	82.2 (1.9)	11.0 (0.6)	6.8 (1.5)
Europe	78.7 (2.4)	10.1 (0.6)	11.2 (2.1)
Service			
Army	77.6 (2.1)	10.3 (0.8)	12.1 (1.6)
Navy	80.5 (1.7)	12.6 (1.7)	6.8 (0.8)
Marine Corps	74.9 (2.3)	17.4 (2.2)	7.7 (1.5)
Air Force	89.8 (1.1)	6.8 (0.6)	3.4 (0.5)
Total DoD	81.8 (1.0)	10.5 (0.6)	7.7 (0.7)

Note. Data are row percentages with standard errors in parentheses.

^aExperienced no consequences (work impairment, physical damage, social disruption, other consequences), had average ethanol consumption in range 0-4.9 ounces/day and were not dependent.

^bExperienced one or more serious consequences but were not dependent or consumed 5 or more ethanol ounces/day but were not dependent.

^cExperienced any of four symptoms due to drinking: blackouts, shakes, impaired control, or morning drinking.

Source: Questions 2-5, 6-10.

E. Comparing Negative Effects of Alcohol and Drug Use

If negative effects are primarily associated with one substance, it follows that that substance should be the focus of prevention, intervention, and treatment efforts. The findings in this study clearly show that alcohol use is more common than drug use and much more likely to result in negative consequences (Table 6.10). For instance, 24 percent of military personnel experienced productivity loss because of alcohol use, less than 1 percent because of drug use, and less than 3 percent because of both alcohol and drug use. Similar findings are apparent for work impairment, physical damage, social disruption, and other consequences.

Table 6.10. Comparing Negative Effects of Alcohol and Drug Use

Measure	Service				Total DoD
	Army	Navy	Marine Corps	Air Force	
<u>Work Impairment</u>					
Alcohol only	5.3 (1.0)	7.4 (1.9)	7.9 (1.2)	3.1 (0.4)	5.4 (0.7)
Drug only	1.7 (0.4)	2.2 (0.5)	0.9 (0.4)	+ (+)	1.4 (0.2)
Alcohol & drug	1.6 (0.4)	+ (+)	0.8 (0.4)	+ (+)	1.0 (0.2)
<u>Physical Damage</u>					
Alcohol only	5.7 (1.3)	3.9 (0.8)	7.1 (2.0)	2.7 (0.5)	4.5 (0.6)
Drug only	+ (+)	0.0 (**)	+ (+)	+ (+)	+ (+)
Alcohol & drug	+ (+)	+ (+)	+ (+)	+ (+)	0.3 (0.1)
<u>Social Disruption</u>					
Alcohol only	8.8 (1.6)	7.0 (0.7)	8.5 (1.0)	3.6 (0.4)	6.7 (0.6)
Drug only	+ (+)	+ (+)	+ (+)	+ (+)	0.3 (0.1)
Alcohol & drug	+ (+)	+ (+)	+ (+)	+ (+)	0.7 (0.2)
<u>Other Consequences</u>					
Alcohol only	4.8 (0.9)	3.8 (0.7)	3.6 (0.6)	1.7 (0.3)	3.5 (0.4)
Drug only	0.9 (0.2)	1.6 (0.5)	+ (+)	+ (+)	0.9 (0.2)
Alcohol & drug	0.8 (0.2)	+ (+)	+ (+)	+ (+)	0.4 (0.1)
<u>Productivity Loss</u>					
Alcohol only	23.9 (1.1)	32.5 (1.9)	24.9 (2.4)	18.1 (1.0)	24.4 (0.8)
Drug only	1.0 (0.2)	+ (+)	+ (+)	+ (+)	0.8 (0.2)
Alcohol & drug	3.3 (0.7)	2.7 (0.7)	+ (+)	1.3 (0.7)	2.6 (0.5)

Note: Tabled values are percentages with standard errors in parentheses. Data entries are percentages of individuals reporting one or more occurrences of work impairment, physical damage, social disruption, other consequences or productivity loss as defined in Tables 6.1 (alcohol) and 6.3 (drugs).

+Fewer than 20 respondents.

**Informative standard error not available but is expected to be very close to zero.

F. New Measures of Negative Effects

Several items originally developed by Polich and Orvis (1979) were modified, and new items (primarily from general population surveys) on negative effects and dependence were added. (Appendix D, Table D.26 presents new alcohol negative effects items.)

In analyzing the 1985 data, we wanted to incorporate the new and modified items into the analysis of negative effects of alcohol and drug use and to construct indexes that summarized all the dimensions of negative effects, using the best sets of both old and new items. To identify the independent dimensions, we conducted factor analyses and used these results to construct new alcohol and drug use negative effects measures.

1. Alcohol Use Negative Effects Indexes

The factor analysis identified four independent dimensions of alcohol-related negative effects: work-related, legal, physiological, and general. Summary indexes were constructed by summing the frequencies (in days per year) or number of occurrences of the items noted below which defined the dimensions.

- Work-Related Negative Effects: was less able to concentrate on work, paid less attention to supervisor, lowered performance at work, late for work or left early, drunk or high while working, had trouble on the job, and found it harder to handle own problems.
- Negative Legal Consequences: received UCMJ punishment, was arrested for driving under the influence, incarcerated, and had trouble with the police.
- Adverse Physiological Effects: kept on drinking after promising self not to, got drunk, experienced blackouts, tossed down drinks for quicker effect, tremors or "shakes," impaired control, got sick from drinking, stayed drunk for more than a day, engaged in morning drinking, skipped regular meals, and involved in fighting.
- General Negative Effects: did not come to work, hurt in on-the-job accident, experienced illness that kept the person from duty 1 week or longer, did not get promoted, arrested for nondriving drinking incident, spouse left, had to be detoxified, and had to have emergency medical help.

These new measures are highly congruent with earlier measures, although the items within each measure differ. The first index combines elements of the earlier work impairment and productivity loss indexes, while the new

adverse physiological effects measure is similar to the earlier dependence measure. The negative legal consequences measure, however, is an independent subset of effects, mostly from the earlier measure of social disruption but incorporates illegal activity and trouble with the police in the new measure.

The relationships between these new indexes and the alcohol problem category measure and drinking level are presented in Table 6.11. For alcohol problem categories, the mean score on every new index is, as expected, higher among persons who experienced adverse effects or dependency than among personnel not affected. With the exception of the negative legal effects index, personnel classified in the dependent alcohol problem category have scores three to five times higher than those who were nondependent but adversely affected, and six to nine times higher than the average for the total DoD.

Some negative effects were experienced by all drinkers, but mean scores on the new indices are notably higher for heavy drinkers than for personnel classified in other drinking levels.

Table 6.11. Means of Alcohol Negative Effects Indexes by Alcohol Problem Categories and Drinking Levels

Indicator	Alcohol Negative Effects Indexes			
	Work	Legal	Physiological	General
<u>Alcohol Problem Category</u>				
Not affected	1.1 (0.1)	- (-)	23.4 (1.1)	- (-)
Adverse effects, not dependent	9.7 (1.8)	0.6 (0.1)	93.2 (4.7)	0.5 (-)
Dependent	31.1 (4.5)	0.6 (0.1)	488.3(38.1)	2.6 (0.6)
<u>Drinking Level^a</u>				
Infrequent/Light	3.0 (0.9)	0.1 (-)	37.1 (8.8)	0.3 (0.1)
Moderate	1.2 (0.2)	0.1 (-)	22.6 (2.1)	0.1 (-)
Moderate/Heavy	4.1 (0.5)	0.1 (-)	70.7 (3.8)	0.1 (-)
Heavy	17.9 (2.6)	0.4 (0.1)	259.5 (21.9)	1.3 (0.3)
<u>Overall Mean</u>	4.8 (0.6)	0.1 (-)	72.0 (4.7)	0.3 (0.1)

Note. Entries are mean scores with standard errors in parentheses.

^aAbstainers are omitted because effects apply only to drinkers.

-Estimate rounds to zero.

2. Drug Use Negative Effects Indexes

Factor analysis identified three dimensions of negative effects of drug use: family or job, disruptive behaviors, and general. Three summary indexes were constructed by summing frequencies (in days per year of occurrences of the items that defined the dimensions).

- Negative Family or Job Effects: lowered performance at work, did not come to work, high or strung out while working, had serious money problems, had trouble on the job, had health problems, drove unsafely, neglected family responsibilities, found it harder to handle own problems, had a relative or friend warn that drug use should be cut down.
- Disruptive Behaviors: was called in during off-duty hours and reported while high or strung out, fighting, had heated arguments with family or friends, and got into loud argument in public.
- General Negative Effects: hurt in on-the-job accident, did not come to work, positive on urinalysis, experienced illness that kept the person from duty 1 week or longer, did not get promoted, received a lower-than-expected performance rating, received UCMJ punishment, arrested for driving under the influence of drugs, arrested for nondriving drug incident, incarcerated, hurt in an accident, had an accident causing injury to others or property damage, hit spouse, hit children, fighting, spouse threatened to leave, spouse left, had to be detoxified, had auto accident as driver, had trouble with police, and had to have emergency medical help.

As with the new alcohol indexes, the new drug indexes show some commonalities with earlier measures. The new negative family or job effects measure combines elements of the earlier social disruption and work impairment measures.

Table 6.12 presents the mean scores on these indices for marijuana only users and for any other pattern of drug use (including marijuana plus other drugs). As shown, negative effects for all dimensions are significantly higher for other drug use than for marijuana alone.

Table 6.12. Means of Drug Use Negative Effects Indexes by 12-Month Drug Use

Drug Use	Drug Use Negative Effects Indexes		
	Family/Job	Disruption	General
Marijuana use only	1.2 (0.2)	0.2 (0.1)	0.6 (0.2)
Any other drug use ^a	8.7 (1.3)*	3.1 (1.0)*	2.1 (0.6)*
Overall Mean	5.9 (0.8)	2.1 (0.6)	1.5 (0.4)

Note: Entries are mean scores with standard errors in parentheses. Nonusers are omitted because effects apply only to drug users.

^aIncludes marijuana use and other drug use (though not necessarily simultaneously) during the past 12 months.

* Estimate is significantly different from marijuana only estimate at the 95 percent confidence level.

Additional analyses of these new measures are presented in chapter 7.

G. Summary and Conclusions

This chapter has examined negative effects associated with alcohol and drug use. Traditional measures of negative effects include work impairment, physical damage, social disruption, other consequences, productivity loss, and dependence. Comparisons between 1982 and 1985 were made, and trends in productivity loss since 1980 were presented. New measures were developed that better represent the dimensions of negative effects. Results show that problem rates are lower now than in 1982 and that the major substance abuse problem is alcohol.

1. Alcohol Use Negative Effects

- The majority of personnel do not experience negative effects from use of alcohol. Still a significant percentage indicate problems resulting from use. About 27 percent report productivity loss due to alcohol use, whereas less than 10 percent report work impairment, physical damage, social disruption, other consequences, or dependence.
- Overall, alcohol use negative effects experienced over a 12-month period declined significantly from 1982 to 1985 for work impairment, social disruption, and productivity loss.

There were no significant changes in estimates of physical damage, other consequences, or dependence.

- For the individual Services, significant declines occurred for the Army on work impairment and productivity loss; for the Navy on social disruption, productivity loss, and dependence; for the Marine Corps on work impairment and social disruption; and for the Air Force on work impairment, social disruption, and productivity loss.
- The negative effects of alcohol use are concentrated among E1-E3 personnel and, secondarily, among E4-E6 personnel.
- Trends from 1980 to 1985 in productivity loss due to alcohol use show increases from 1980 to 1982 and decreases back to 1980 levels in 1985. Thus, progress has been made since 1982, but no overall gains have been made since 1980.
- Alcohol use problem categories are related to alcohol consumption. Personnel classified as dependent drink the most and show the highest work loss followed by those who experience adverse effects and those who are not affected.

2. Drug Use Negative Effects

- Most personnel do not use drugs and, consequently, only a few experience drug use negative effects.
- Overall, drug use negative effects declined significantly from 1982 to 1985 for work impairment, physical damage, social disruption, and productivity loss. There was no significant change for other consequences.
- Among the Services, the Army showed significant 1982-1985 declines for all five negative effects measures; the Navy for work impairment, physical damage, and productivity loss; the Marine Corps for work impairment; and the Air Force for work impairment, social disruption, and productivity loss.
- As with alcohol use, most drug use negative effects are concentrated in the lower pay grades.
- Trends in drug-related productivity loss for E1-E5's* show consistent declines across all Services from 1980 to 1985.

*Comparisons were restricted to E1-E5 pay grades because Burt and Biegel (1980) reported only these data.

3. Dimensions of Negative Effects

New measures for alcohol use and for drug use were developed based on the independent underlying dimensions of the negative effects items. For alcohol use, four summary indexes of negative effects were constructed. These indexes covered work, legal, physiological, and general effects. For drug use, the three summary indexes of negative effects that were developed covered family or job, disruptive behaviors, and general effects.

- The new alcohol indexes are related to the alcohol problem categories and drinking levels in a manner consistent with expectations. Personnel classified as dependent or as heavy drinkers show the highest scores on the new measures.
- The new drug indexes are related to drug use patterns. Marijuana only users experience some minor negative effects of drug use; users of other drug patterns consistently show greater negative effects.

Overall, these findings reveal that although the impact of alcohol and drug use on the productivity, health, and social relationships of military personnel declined between 1982 and 1985, substance use continues to have negative consequences for military personnel. The negative effects are substantially more widespread for alcohol use than for drug use. They are particularly prevalent for E1-E3 personnel, about half that level for E4-E6 personnel, and minimal for other pay grades. Alcohol-related consequences are particularly high among alcohol dependent persons and substantially higher among heavy drinkers than other drinkers.

7. MULTIVARIATE ANALYSES

Analyses presented in prior chapters of this report have examined a variety of aspects of alcohol and drug use behavior and explored the effects of numerous variables associated with them. These analyses provide useful and important information about alcohol and drug use and their consequences. However, they are limited by the fact that they have examined the effects of one or two variables (e.g., Service, region, pay grade) but have generally not controlled for effects of other relevant variables (e.g., demographic variables such as age, education, marital status or attitudinal and behavioral variables). The investigation of the effects on drug and alcohol use of several variables simultaneously is achieved most easily by the use of sophisticated multivariate statistical techniques such as multiple regression analysis.

We begin by describing the measures used in the analyses. This is followed by a brief discussion of regression analysis as an analytical tool. Next is a report of the results of regression analyses that examine the following criterion (dependent) measures: effects of drug and alcohol use on general negative events; heavy drinking; adverse consequences due to alcohol use; drug use during the past 30 days; and adverse consequences due to drug use.

A. Definitions and Measures

The measures for the regression analyses are discussed in two groups: dependent or criterion variables and independent or explanatory variables.

1. Dependent Variables

The dependent variables for the regression analyses include two measures of negative behaviors not necessarily associated with drinking or drug use (general negative behaviors, legal incidents), a measure of heavy drinking, four measures of negative effects due to drinking (work, legal, physiological, general), two measures of drug use (marijuana only use, other drug use patterns), and three measures of drug use negative effects (family/job, disruptive, general).

a. Negative Behaviors. Factor analyses of 25 items dealing with negative events (questions 21a--n, 22a--k) were conducted and produced two underlying dimensions: general negative behaviors and legal incidents.

Composite measures were formed by summing frequencies of occurrences of the events during the past 12 months. The two measures consisted of the following items.

- General Negative Behaviors--heated arguments with family or friends, trouble on the job, health problems, neglected family responsibilities, serious money problems, found it harder to handle problems, got into loud argument in public.
- Legal Incidents--received UCMJ punishment, was arrested for a driving violation, arrested for incident not related to driving, spent time in jail, stockade, or brig, hit children for reason other than discipline, driver in motor vehicle accident, had trouble with the police.

For these measures there was no attribution to drug or alcohol use as the reason for the occurrence of the events. Regression analyses of these indexes focused on the effects of drug use and alcohol use on these events.

b. Heavy Drinking. A dichotomous (0,1) variable was created from the drinking level variable. Heavy drinkers were coded as 1, and all others were coded as 0. The regression analysis estimates the probability of heavy drinking.

c. Negative Effects Due to Drinking. The four new indexes of negative effects due to drinking described in Chapter 6, were used as dependent variables in the regression analyses. These indexes are based on results of factor analyses: work effects, legal effects, physiological effects, and general effects.

d. Drug Use. Two measures of drug use were constructed: marijuana only use versus nonuse and patterns of any other drug use (including marijuana and other drugs) versus nonuse. These measures were dichotomized into 0,1 variables, and the analyses estimate the probability of drug use.

e. Negative Effects Due to Drug Use. Three new measures of negative effects due to drugs were described in Chapter 6. These measures are based on results of factor analyses: family/job effects, disruption effects, and general effects. Regressions examine each of these measures.

2. Independent Variables

Independent variables fall into two groups broadly described as sociodemographic variables and as psychological/behavioral variables.

a. Sociodemographic Variables. Eight sociodemographic variables were used in the regression analyses. They were Service, race/ethnicity, sex, education, family status, region, pay grade, and age of respondent. For the analyses, the coding of the independent variables determined the comparisons which 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 a high school diploma. 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 for all analyses except those for drug use. Drug use analyses compared E1-E3s and E4-E6s to E7-E9s. Age retained its original coding of years.

b. Psychological/Behavioral Variables. Besides the sociodemographic variables, a number of psychological/ behavioral indicators were also studied to help understand relationships surrounding drug and alcohol use. Several indices were created based on factor analyses among sets of items in the questionnaire that assessed attitudes, beliefs, norms, and behavior of participants. Seven indices are discussed: The Drinking Beliefs Index, the Drinking Climate Index, the Drinking Motivation Index, the Beliefs about Drug Use Prevention Index, Drug Treatment Climate Index, Beliefs About Drug Prevalence Index, and Beliefs About the Harmful Effects of Drugs Index.

For the items in all of the indexes except the Drinking Motivation Index (discussed in detail below), respondents answered in terms of a five-point scale anchored with strongly agree (scored 5) and strongly disagree (scored 1) response options. Index scores were computed by summing item scores, after appropriate reverse scoring for items with phrasing opposite that of the index. Items composing each drinking index and the possible range of scores for each index are presented in Figure 7.1. In Figure 7.2, similar information is presented for the four drug-related attitudinal indexes.

• Drinking Beliefs Index. The Drinking Beliefs Index was constructed from the five items. High scores on the index indicate beliefs which are not supportive of alcohol use.

Figure 7.1. Drinking-Related Attitudinal Indexes

Index	Items Comprising Index
<u>Drinking Beliefs Index</u> (Range = 5-25)	
	• Drinking might 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. • Drinking might interfere with my work.
<u>Drinking Climate Index</u> (Range = 8-40)	
	• Seeking help for a drinking problem will damage one's military career. • 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. • The personnel at this installation sincerely try to help people who have a drinking problem.
<u>Drinking Motivation Index</u> (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.

Figure 7.2. Drug-Related Attitudinal Indexes

Index	Items Comprising Index
<u>Beliefs About Drug Use Prevention</u> (Range = 6-30)	• Urinalysis testing reduces drug use in the military. • The military's drug education program has helped me make better decisions about using drugs for nonmedical purposes. • Urinalysis testing has prevented drug use in my unit. • Education about drugs at this installation helps keep people from using drugs. • The military's urinalysis tests for drugs are reliable. • The personnel at this installation sincerely try to help people who have a drug problem.
<u>Drug Treatment Climate</u> (Range = 5-25)	• Disciplinary action will be taken against any person identified as having a drug problem, even if no drugs are found. • Seeking help for a drug problem will damage one's military career. • 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.
<u>Beliefs About Drug Use Prevalence</u> (Range 3-15)	• There's always a party somewhere at or near this installation where drugs are being used. • Some people get away with using certain drugs because the urinalysis tests won't detect those drugs. • At parties or social functions at this installation, it's easy to get away with using drugs.
<u>Beliefs About Harmful Effects of Drugs</u> (Range = 13-15)	• Using drugs might interfere with my health or physical fitness. • Using drugs might mess up my mind. • Using drugs is about the only recreation available at this installation. • Using drugs might interfere with my work. • I might use (more) marijuana if it were easier to get. • There are some times at work when I need an "upper". • I favor being able to use marijuana when I'm off duty. • The emphasis on detection and discipline in my Service's drug program hurts morale. • Anyone detected using marijuana should be discharged. • People I associate with off-duty think that I should not use marijuana. • 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. • Most of my friends use drugs, at least marijuana.

- Drinking Climate Index. The Drinking Climate Index was constructed from eight items. 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.

- 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 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 which 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.

- Beliefs About Drug Use Prevention. The index of Beliefs About Drug Use Prevention consists of responses to six items concerning attitudes about the deterrent effects of military drug education and urinalysis programs. High scores indicate that drug education and urinalysis programs are perceived to be effective deterrents.

- Drug Treatment Climate. The Drug Treatment Climate Index consists of responses to five items concerning respondents' perceptions of barriers to seeking treatment for drug problems. Those who believed that there are barriers to seeking treatment for drug problems had high scores.

- Beliefs About Drug Prevalence. The Beliefs About Drug Prevalence Index consists of responses to three items concerning respondents' perceptions of the ease of availability of drugs or prevalence of use. High scores represent beliefs in the widespread use and availability of drug use.

- Beliefs About Harmful Effects of Drugs. This index consisted of 13 items listed below which collectively dealt with beliefs about the harmful effects of drug use on physical fitness, health, and work, and associated attitudes and norms about not using drugs. A high score indicates low tolerance for drug use.

B. Analytical Approach of Regression Analysis

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. The size of the estimated regression parameters associated with each variable indicates the importance of that

variable in predicting the criterion variable. Thus, for example, regression analysis could be used to examine the question of how much drug use behavior can be explained by sociodemographic characteristics of military personnel and which sociodemographic variables are most important.

The advantage of regression analysis over two-way descriptive tables presented in earlier chapters is that we can examine the effects of variables of particular interest (e.g., drinking levels) on outcome measures (e.g., negative work effects) while controlling for the effects of the remaining variables in the model. We cannot tell if the relationship between variables portrayed in a two-way table is the result of the relationship of the two variables to other variables. A good example is the bivariate relationship between drinking levels and negative work effects. The strong relationship between the two variables shown in a two-way table could be due to the fact that age, pay grade, education level, and other factors not considered in the analysis are related to both drinking level and negative work effects. The fact that younger people both drink more and are more likely than older people to engage in behavior having negative effects could at least partially explain the large relationship between drinking level and negative work effects. Regression analysis helps us address problems of this kind.

Five sets of regression analysis are discussed in this chapter. Three sets of these analyses (negative behaviors, negative effects due to drinking, negative effects due to drug use) follow a hypothesis testing approach that focuses solely on the effects of drinking levels and drug use patterns on the dependent measures. Other independent variables in these analyses (e.g., age, rank, educational level, psychological/behavioral characteristics) are used as control variables to adjust the effects of drinking levels and drug use; their effects are of secondary interest. The other two sets of regression analyses are concerned with predicting heavy drinking and drug use patterns. In these analyses, the effects of all variables in the regression models are of interest. For the sake of completeness, the effects of all variables in each regression analysis will be presented, but the effects of those variables of primary interest will be boxed for the reader's convenience.*

*In the analyses that follow, there are two types of regression parameter estimates, those associated with continuous variables (e.g., age and psychological/behavioral scale scores) and those associated with categorical variables (e.g., pay grade and Service). There is a single estimated parameter associated with each continuous variable which indicates the amount and direction of change of the dependent variable for each scale value increase in the associated independent variable. For categorical independent variables, one level of the variable is (arbitrarily) excluded, and the estimated parameters are differences in the effects of the retained levels with the excluded level.

C. Negative Behaviors

This section describes results of two regression analyses, the first for general negative behaviors and the second for legal incidents. For both analyses, the primary interest is to examine the effects of drinking levels and drug use on these measures while controlling for the effects of socio-demographic and psychological/behavioral variables. Since emphasis is on drinking and drug use variables, effects of the other control variables will not be discussed. Independent variables used in the models for both analyses were Service, race/ethnicity, sex, education, family status, region, pay grade, age, drinking level, and drug use. Both analyses were based upon the total sample of 17,235 respondents who had complete data on the independent and dependent variables.

1. General Negative Behaviors

Table 7.1 presents the estimated model parameters from the regression analysis of general negative behaviors. The R^2 for predicting general negative behaviors from the independent variables was .089 which means that 8.9 percent of the variation in general negative behaviors can be explained by the independent variables. The overall model was statistically significant at the .0001 level.

The differential effects of drinking levels and drug use were highly significant (drinking levels at .0001 level; drugs at .01 level). Means adjusted for effects for all other variables in the regression model are presented in Table 7.2. For drinking levels, the effect of the abstainer group (mean = 3.96) was smallest, and the effect of the heavy drinker group was largest (mean = 6.87). The difference in effects (2.9) between these two extreme groups was statistically significant at the .0001 level. The effects of the remaining three drinking level groups were also statistically higher than the abstainer group, but the differential effect of heavy drinking was, on the average, about three times greater than the differential effects of the remaining three drinking groups.

The differential effects of drug use patterns on general negative behaviors were also large and were significant at the .01 level. The effect of marijuana only use (mean = 4.67) was 1.4 general negative behaviors higher than nondrug use (mean = 3.25) and the effect of any other drug use (mean = 7.34) was 4.1 general negative behaviors higher than nondrug use (mean = 3.25).

Table 7.1. Parameter Estimates of Regression Models for Predicting
General Negative Behaviors and Legal Incidents

Independent Variables	General Negative Behaviors	Legal Incidents
<u>Service</u>		
Army versus Air Force	1.263***	.137***
Navy versus Air Force	.914***	.117**
Marines versus Air Force	.772	.351*
<u>Race/Ethnicity</u>		
Black versus White	-.479	.094
Hispanic versus White	-.523	-.019
Other versus White	-.650	.144
<u>Sex</u>		
Male versus Female	-.975*	.205**
<u>Education</u>		
High School or Less versus Beyond High School	.074	.121**
<u>Family Status</u>		
Single versus Married, spouse present	-.479	.085
Married, spouse not present versus Married, spouse present	-.138	.289
<u>Region</u>		
Americas versus Europe	-.452	.068
North Pacific versus Europe	-.281	-.101
Other Pacific versus Europe	-.582*	.001
<u>Pay Grade</u>		
E1-E3 versus 04-010	.639	.242*
E4-E6 versus 04-010	.871**	.119*
E7-E9 versus 04-010	.363*	-.035
W1-W4 versus 04-010	-.424	-.110*
O1-O3 versus 04-010	-.261	.027
<u>Age</u>	-.067**	.000
<u>Drinking Level</u>		
Heavy versus Abstainer	2.904***	.507*
Moderate/Heavy versus Abstainer	1.165***	.009
Moderate versus Abstainer	.629*	-.015
Infrequent/Light versus Abstainer	.919**	.023
<u>Drug Use Pattern</u>		
Marijuana Only versus Non-Use	1.414**	.481*
Other Use versus Non-Use	4.091**	1.338***

Note: Entries are parameter estimates which reflect counts of negative behaviors and legal incidents encountered during the past 12 months.

*p < .05

**p < .01

***p < .001

Taken together, results of this regression analysis show large effects of both drinking and drug use on general negative behaviors after controlling for a number of important independent variables. While any level of alcohol or drug use is associated with more general negative behaviors compared to nonuse, heavy drinking and other drug use (besides marijuana only) show exceptionally high levels of general negative behaviors. The additive form of the regression model implies that persons who are both heavy drinkers and use drugs other than marijuana only would be expected to exhibit $2.9 + 4.1$ or about 7.0 more general negative effects than persons who do not drink or use drugs.

2. Legal Incidents

Table 7.1 also presents the estimated model parameters from the regression analysis of legal incidents, and Table 7.2 presents the adjusted mean scores for legal incidents for drinking levels and drug use patterns. The R^2 for predicting legal incidents was .087 and was significant at the .0001 level.

Like the previous regression analysis, there were significant effects for drinking level and drug use. Heavy drinkers (mean = 1.50) experienced .507 more legal incidents than abstainers (mean = .99), a differential effect statistically significant at the .01 level. Personnel in the remaining three drinking levels were virtually identical to abstainers. The differential effects of drug use were even greater and more significant ($p < .001$) than those of drinking. While marijuana users (mean = .97) experienced an effect that was .48 legal consequences higher than the nonusers (mean = .49), the other user group (mean = 1.83) experienced an effect that was 1.338 legal incidents higher than the nonuser group. The former differential effect was significant at the .05 level, while the latter differential effect was significant at the .001 level.

As in the previous regression analysis, the model suggests that individuals who both drink heavily and use drugs other than marijuana only would experience an increase of $.51 + 1.3$ or 1.84 legal incidents over that expected for persons that neither drink nor use drugs.

These two analyses indicate that heavy drinking and other drug use have strong effects on the number of general negative behaviors and legal incidents experienced by military personnel. Heavy drinkers and those who use drugs other than marijuana only are important groups to target for change through education and prevention programs.

Table 7.2. Adjusted Means of General Negative Behaviors and Legal Incidents and Drug Use Categories for Different Drinking Levels and Drug Use Categories

Substance	General Negative Behaviors	Legal Incidents
<u>Drinking Level</u>		
Abstainer	3.96	0.99
Infrequent/Light	4.88 ^a	1.02
Moderate	4.59 ^a	0.98
Moderate/Heavy	5.13 ^a	1.00
Heavy	6.87 ^a	1.50 ^a
<u>Drug Use Pattern</u>		
No use	3.25	0.49
Marijuana only	4.67 ^b	0.97 ^b
Any other use ^c	7.34 ^b	1.83 ^b

Note: Entries are mean scores of the number of occurrences of general negative behaviors and legal incidents that have been adjusted for effects of all other variables in the regression model.

^aSignificantly greater than abstainers.

^bSignificantly greater than nonusers.

^cAny drug use pattern besides marijuana only, including use of marijuana and other drugs.

D. Heavy Drinking

The analyses of negative behaviors indicate clearly that heavy drinkers are likely to experience substantially more negative behaviors than personnel in other drinking levels. This suggests that it is important to better understand the factors associated with heavy drinking. This section reports results of a regression analysis predicting heavy drinking. Independent variables in the model were Service, race/ethnicity, sex, education, family status, region, pay grade, age, drinking motivation, drinking climate, and drinking beliefs.

The dependent variable was coded 1 if the respondent was a heavy drinker and 0, otherwise, which means that the estimated regression parameters reflect changes in the probability of heavy drinking.

Results of the regression analysis for heavy drinking are presented in Table 7.3. The R^2 for predicting probability of heavy drinking was .15 which was significant at the .0001 level. Overall, the model showed significant effects for sociodemographic variables (race/ethnicity, sex, education, family status, paygrade) and for psychological variables (drinking motivation, drinking climate, and drinking beliefs).

1. Sociodemographic Effects

Race/ethnicity showed an overall statistically significant effect on the probability of heavy drinking although none of the individual contrasts tested in Table 7.3 was significant. The other race/ethnicity group had the largest effect on the probability of heavy drinking, while the Hispanic group had the smallest effect. The significant effect for sex showed that the probability of a male being a heavy drinker is .058 higher than the probability of a female being a heavy drinker after adjusting for the remaining independent variables. The effect of having a high school education or less on the probability of heavy drinking was .029 higher than the effect of having education beyond high school.

Family status showed that single personnel had an adjusted probability of heavy drinking that was .046 higher than married personnel living with their spouse. Enlisted personnel had a significantly higher adjusted probability of heavy drinking than officers ($p < .0001$). For example, the adjusted probability of heavy drinking for the E4-E6 pay grade was .074 higher than for senior officers (O4-O10).

2. Psychological Effects

All three of the psychological variables were significantly related to heavy drinking. The significant regression coefficient associated with drinking motivation indicates that an increase of one point on the drinking motivation scale is associated with a .147 increase 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. Personnel perceiving a favorable drinking climate were significantly more likely to be heavy drinkers than those perceiving a less favorable drinking climate, although the

Table 7.3. Parameter Estimates of Regression Model for Predicting Heavy Drinking

Independent Variables	Heavy Drinking
<u>Service</u>	
Army versus Air Force	.0324
Navy versus Air Force	.0107
Marines versus Air Force	.0314
<u>Race/Ethnicity</u>	
Black versus White	-.0229
Hispanic versus White	-.0269
Other versus White	.0460
<u>Sex</u>	
Male versus Female	.0577***
<u>Education</u>	
High School or Less versus Beyond High School	.0285*
<u>Marital Status</u>	
Single versus Married, spouse present	.0457***
Married, spouse not present versus Married, spouse present	.0329
<u>Region</u>	
Americas versus Europe	-.0250
North Pacific versus Europe	-.0070
Other Pacific versus Europe	.0031
<u>Pay Grade</u>	
E1-E3 versus 04-010	.0569**
E4-E6 versus 04-010	.0739***
E7-E9 versus 04-010	.0597***
W1-W4 versus 04-010	.0167
O1-03 versus 04-010	-.0101
<u>Age</u>	-.0005
<u>Drinking Motivation</u>	.1475***
<u>Drinking Climate</u>	.0037**
<u>Drinking Beliefs</u>	-.0109***

Note: Entries reflect differences in probabilities of heavy drinking between indicated groups after adjustments for remaining variables in the model.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

associated regression coefficient was relatively small (.004). The significant ($p < .0001$) estimated regression parameter associated with drinking beliefs indicates that an increase of one point on the drinking belief scale results in a .011 decrease in the probability of heavy drinking.

Overall, the results of the regression analysis suggest that single enlisted males, who did not continue their education beyond high school, who are highly motivated to drink, who perceive a favorable drinking climate, and who do not believe in the harmful effects of drinking have a much higher probability of engaging in heavy drinking than their counterparts. Both demographic and psychological variables are related to heavy drinking.

E. Alcohol Use Negative Effects

This section describes results of four regression analyses of negative effects resulting from alcohol use. The four analyses use as dependent measures the new negative effects indexes presented in Chapter 6: work effects, legal effects, physiological effects, and general effects. Independent variables for all four analyses were Service, race/ethnicity, sex, education, family status, region, pay grade, age, drinking level, drinking motivation, drinking climate, drinking beliefs, and age at first regular use of alcohol.

Because the primary interest in these analyses is to understand the role of drinking level while controlling for the effects of other variables, only the effects of drinking levels will be discussed. Since negative effects apply only to those who drink, abstainers were excluded from the analyses.

Table 7.4 presents the estimated model parameters for the regression analyses, and Table 7.5 presents the adjusted mean scores for negative effects for drinking levels.

1. Work Effects

The R^2 for predicting negative work effects was .186, which was significant at the .0001 level. The effects associated with drinking levels were significant at the .001 level. The effect for heavy drinkers (mean = 11.62) was 7.74 work effects higher than the effect for light drinkers (mean = 3.88). The effects for moderate and moderate/heavy drinkers were each 2.44 effects less than for light drinkers (Table 7.4). The large difference between heavy drinkers and other drinking levels is also shown in Table 7.5 where adjusted mean scores are presented.

Table 7.4. Parameter Estimates of Regression Models for Predicting Alcohol Use Negative Effects Indexes

Independent Variables	Alcohol Negative Effects Index			
	Work	Legal	Physio-logical	General
<u>Service</u>				
Army versus Air Force	1.034	.039	26.182***	.197
Navy versus Air Force	2.344***	.038	4.303	-.060
Marines versus Air Force	1.778	.077*	11.465	.006
<u>Race/Ethnicity</u>				
Black versus White	-2.103**	.033	-6.795	.238
Hispanic versus White	-1.080	-.001	-27.658**	.207
Other versus White	-1.564	.155	17.000	.618
<u>Sex</u>				
Male versus Female	1.464*	.054	20.310***	-.091
<u>Education</u>				
High School or Less versus Beyond High School	.130	.021	1.771	.058
<u>Family Status</u>				
Single versus Married, spouse present	2.607***	.057***	11.698	.147*
Married, spouse not present versus Married, spouse present	.962	.052	16.647	.072
<u>Region</u>				
Americas versus Europe	-2.492	.027	-10.842	.185
North Pacific versus Europe	-2.288	-.030	-2.653	.004
Other Pacific versus Europe	-1.874	.039	-8.361	.075
<u>Pay Grade</u>				
E1-E3 versus 04-010	-2.337	.099*	10.260	.089
E4-E6 versus 04-010	-.581	.063*	2.906	.150
E7-E9 versus 04-010	-.715	-.010	-4.921	.029
W1-W4 versus 04-010	-1.935**	-.027	-21.531***	-.069
01-03 versus 04-010	-1.948	.004	-15.254	.089
<u>Age</u>	.004	.004	-.380	.029
<u>Age at First Regular Use of Alcohol</u>	-.363*	-.003	-4.511**	-.059
<u>Drinking Motivation</u>	8.482***	.158**	100.008***	.798*
<u>Drinking Climate</u>	.183*	.006*	2.305**	.044*
<u>Drinking Beliefs</u>	.309**	.003	1.243	.002
<u>Drinking Level</u>				
Heavy versus Infrequent/Light	7.745***	.225***	128.098***	.278
Moderate/Heavy versus Infrequent/Light	-2.437*	.007	-15.399*	-.464**
Moderate versus Infrequent/Light	-2.438**	-.016	-26.575***	-.274

Note: Entries are estimates which reflect counts of negative consequences experienced during the past 12 months.

* $p < .05$

** $p < .01$

*** $p < .001$

Table 7.5. Adjusted Means of Alcohol Use Negative Effects Indexes for Different Levels of Drinking

Drinking Level	Negative Effects Index			
	Work	Legal	Physio- logical	General
Infrequent/Light	3.88	0.11	47.88	0.49
Moderate	1.44 ^b	0.09	21.30 ^b	0.22 ^b
Moderate/Heavy	1.44 ^b	0.12	32.48 ^b	0.03 ^b
Heavy	11.62 ^a	0.33 ^a	175.98 ^a	0.77

Note: Entries are mean scores of drinking level for negative effects indexes that have been adjusted for effects of all other variables in the regression model.

^aSignificantly higher than infrequent/light drinkers.

^bSignificantly lower than infrequent/light drinkers.

2. Legal Effects

The second analysis examined legal effects due to drinking. The R^2 for predicting legal effects was .06 which was significant at the .001 level. As shown in Tables 7.4 and 7.5, drinking levels showed statistically significant differential effects. This was due to the large effect of heavy drinking relative to the effect of light drinking. The effect of heavy drinking (mean = 0.33) was .23 legal effects higher than the effect for infrequent/light drinking (mean = 0.11), a difference significant at the .001 level. As shown in Table 7.5, adjusted mean scores for moderate/heavy, moderate, and infrequent/light drinking were virtually identical.

This model illustrates the large impact of heavy drinking on legal effects relative to infrequent drinking. Although most drinkers experience relatively few legal effects due to drinking, heavy drinkers are far more likely to do so.

3. Physiological Effects

The third regression analysis examined negative physiological effects due to drinking. The dependent measure represented the number of days on

which the negative physiological effects of drinking occurred. The R^2 for predicting number of alcohol symptom days was .30 which was significant at the .00001 level.

The differential effects of drinking level were significant at the .0001 level (Table 7.4). The effect for heavy drinkers was 128.10 symptom days higher than the effect for infrequent/light drinkers. The effects for both moderate/heavy and moderate drinkers were significantly smaller than the effect of infrequent/light drinkers. Adjusted mean scores for physiological symptoms are presented in Table 7.5. Clearly, the heavy drinkers exhibit far more negative physiological symptoms than personnel in other drinking levels.

4. General Effects

The fourth regression analysis on alcohol negative effects examined the general negative effects index. The R^2 for predicting general consequences due to alcohol was .05 which was significant at the .0001 level. The pattern of effects for drinking levels was not as logically consistent as in the previous three regression analyses. Heavy drinking had the largest effect on general consequences, but the effect was not significantly higher than the effect for infrequent/light drinking (Table 7.4). The effects of both moderate/heavy and moderate drinkers were significantly smaller on general effects than the effects of light drinkers. Adjusted mean scores are presented in Table 7.5.

5. Summary of Negative Effects Due to Alcohol Use

The four regression analyses all indicated that heavy drinking was associated with significantly higher levels of negative effects than other drinking levels. The association was strong for the first three negative effects indexes and relatively weak for the general effects index. These results suggest that most of the negative effects from alcohol use are experienced by the small minority of military personnel who are heavy drinkers (i.e., about 12 percent).

Surprisingly, results also showed a general pattern for infrequent/light drinkers to experience more negative effects than moderate or moderate/heavy drinkers (Table 7.5). Although this finding initially appears nonintuitive, it is sensible if you consider that much of the drinking in the military occurs at parties and on weekends. On such occasions, infrequent/light drinkers may consume larger amounts than they normally drink and may consequently experience negative effects. In contrast, moderate and moderate/heavy drinkers have likely developed a greater tolerance for alcohol and experience few negative effects.

These findings suggest that education and prevention programs should target all drinkers, since all experience some negative effects, but particularly heavy drinkers. Efforts to control heavy drinking will have a large impact on reducing alcohol negative effects.

F. Drug Use

This section presents the results of two regression analyses for predicting drug use behavior. The first predicts users of marijuana only and the second predicts other drug use patterns (including marijuana and other drugs). Independent variables in the models were Service, race/ethnicity, sex, education, family status, region, pay grade, age, beliefs about harmful effects of drugs, beliefs about drug prevention efforts, drug treatment climate and beliefs about prevalence of drugs. The dependent variables were coded 1 if the respondent was a marijuana or other drug user and 0, otherwise. Thus, the estimated regression parameters reflect changes in the probability of drug use.

Analyses for this section and the following section on negative effects of drug use were restricted to enlisted personnel since drug use and associated negative effects were essentially zero for officers (see Tables 5.9, 5.10).

1. Marijuana Only Use

Table 7.6 presents the parameter estimates of the regression model for predicting marijuana only use. The R^2 for the overall model was .081 which was significant at the .0001 level and showed significant effects for Service, race/ethnicity, region, age, and beliefs about harmful effects of drugs. The effects of Service showed that the probability of marijuana use was .028 higher in the Army than in the Air Force. For race/ethnicity, the probability of use among blacks was .027 lower than among whites. The effect of region showed that personnel in the North Pacific were significantly less likely than personnel in Europe to use marijuana. The adjusted difference in probabilities was .022.

The significant estimated regression parameter associated with age indicated that a year's increase in age resulted in a decrease of .001 in the probability of being a marijuana user. Finally, beliefs about harmful effects of drugs showed that an increase of one scale point on the index resulted in a significant decrease of .006 in the probability of being a marijuana user.

Table 7.6. Parameter Estimates of Regression Models for Predicting the Probability of Marijuana Use and Other Drug Use for Enlisted Personnel

Independent Variables	Marijuana Only Use	Other Drug Use
<u>Service</u>		
Army versus Air Force	.0275**	.0185
Navy versus Air Force	.0039	.0297
Marines versus Air Force	.0164	.0277
<u>Race/Ethnicity</u>		
Black versus White	-.0267**	-.0327
Hispanic versus White	-.0019	-.0131
Other versus White	-.0203	-.0099
<u>Sex</u>		
Male versus Female	.0033	-.0038
<u>Education</u>		
High School or Less versus Beyond High School	.0002	-.0054
<u>Family Status</u>		
Single versus married, spouse present	.0100	.0261**
Married, spouse not present versus married, spouse present	-.0016	-.0059
<u>Region</u>		
Americas versus Europe	-.0044	.0204
North Pacific versus Europe	-.0218*	-.0042
Other Pacific versus Europe	-.0040	.0035
<u>Pay Grade</u>		
E1-E3 versus E7-E9	-.0102	-.0235
E4-E6 versus E7-E9	-.0088	-.0369***
<u>Age</u>	-.0013*	-.0021**
<u>Beliefs About Harmful Effects of Drugs</u>	-.0064***	-.0094***
<u>Beliefs About Drug Prevention Efforts</u>	-.0002	-.0043***
<u>Drug Treatment Climate</u>	-.0019	.0034
<u>Beliefs About Prevalence of Drugs</u>	.0115	.0327**

Note: Entries are parameter estimates that reflect differences in probabilities of marijuana use and other drug use between indicated groups after adjustments for remaining variables in the model.

* $p < .05$

** $p < .01$

*** $p < .001$

2. Other Drug Use

In this regression analysis, the probability that enlisted personnel used other drugs (besides marijuana alone) was predicted. The parameter estimates of the regression model in Table 7.6 (last column) show that the effects for family status, pay grade, age, and the psychological belief scales are significant.

The proportion of single personnel using other drugs was .026 higher than the proportion for married personnel living with their spouses. The effects of pay grade showed that the proportion of other drug users in the E4-E6 pay grade was significantly lower than the E7-E9 pay grade after adjusting for the remaining independent variables in the model. The effect for age indicated a .002 decrease in the proportion of other drug users for each yearly increase in age.

The three psychological belief scales were also important and significant predictors of other drug use. An increase of one point on the belief about the harmful effects of drug scale leads to a corresponding decrease of .009 in the probability of being an other drug user. An increase of one point in the beliefs concerning prevention scale results in a decrease of .004 in the probability of other drug use. Finally, an increase of one point in the belief about the prevalence of drugs scale leads to an increase of .033 in the probability of other drug use.

Overall, young personnel who are single, who believe that drug use is prevalent, that drugs are not harmful, and that prevention efforts on the base are minimal are more likely to be other drug users than their counterparts.

3. Summary of Regression Analyses Predicting Drug Use

The two regression analyses indicate that age and beliefs about the harmful effect of drugs are important predictors of both marijuana use and other drug use. Older personnel and those who believe in the harmful effects of drugs are less likely to use drugs than younger personnel and those who do not believe in the harmful effects of drugs. The three psychological belief variables are considerably more important in predicting other drug use than in predicting marijuana only use.

These results suggest that continued emphasis should be placed on education efforts that inform military personnel about the harmful effects of nonmedical drug use. The finding that belief variables are the most important predictors in the regression model implies that programs aimed at changing

beliefs may be useful in further decreasing drug use. Their level of effectiveness, however, depends on the strength of other factors that may encourage drug use (e.g., availability and cost of drugs, and normative pressures from peers to use drugs).

G. Drug Use Negative Effects

This section presents results from three regression analyses that examine negative effects due to drug use. The dependent variables for the analyses are the negative effects indexes described in Chapter 6: Family/job effects, disruptive effects, and general effects. The primary focus is on the effect of drug use pattern (marijuana versus other) on negative effects after adjusting for the remaining variables in the model.

Because drug use for officers was essentially zero, analyses reported here were restricted to enlisted personnel who reported drug use, a small subset of total respondents. Table 7.7 presents the parameter estimates for the analyses, and Table 7.8 presents adjusted mean scores for the indexes.

1. Family/Job Effects

The R^2 for predicting negative family/job effects due to drugs for the enlisted sample was .167 which was significant at the .0001 level. The effect of using marijuana (mean = 2.00) was 5.11 family/job effects lower than the effect of using other drugs (mean = 7.11). This difference was significant at the .01 level. Thus, users of drugs other than marijuana experience, on the average, more negative family/job effects due to drug use than marijuana only users.

2. Disruptive Effects

The R^2 for predicting disruptive effects due to drugs for the enlisted sample was .241 which was significant at the .01 level. The effect of other drug use (mean = 4.08) was 3.52 disruptive effects higher than the effect of marijuana only use (mean = 0.56) and was significant at the .05 level. Thus, other drug users experience more disruptive effects due to drugs than marijuana only users.

Table 7.7. Parameter Estimates of Regression Models Predicting Negative Family/Job Effects, Disruptive Effects, and General Negative Effects Due to Drug Use

Independent Variables	Negative Family/Job Effects	Disruptive Effects	General Negative Effects
<u>Service</u>			
Army versus Air Force	5.230	2.334	1.559
Navy versus Air Force	-.490	-1.422	-.829
Marines versus Air Force	2.798	-2.82	2.165
<u>Race/Ethnicity</u>			
Black versus White	-2.397	-1.717	2.377
Hispanic versus White	-4.251	-.438	1.758
Other versus White	13.262	8.336	13.333
<u>Sex</u>			
Male versus Female	2.296	.716	.959
<u>Education</u>			
High School or Less versus Beyond High School	1.510	.230	1.326
<u>Family Status</u>			
Single versus Married, spouse present	-.149	1.618	.703
Married, spouse not present Versus Married, spouse present	-1.772	.065	.922
<u>Region</u>			
Americas versus Europe	-1.265	-5.948	-1.175
North Pacific versus Europe	-2.793	-6.985*	-.367
Other Pacific versus Europe	-.801	-5.910	-1.436
<u>Pay Grade</u>			
E1-E3 versus E7-E9	4.498	3.119	5.123
E4-E6 versus E7-E9	4.539	.790	3.915
<u>Age at First Regular Drug Use</u>	.026	.042	.053
<u>Beliefs About the Harmful Effect of Drugs</u>	-.337	-.379*	-.122
<u>Belief About Drug Use Prevention Efforts</u>	-.430	-.018	.150
<u>Drug Treatment Climate</u>	.930	.288	.305
<u>Belief About Prevalence of Drugs</u>	4.446*	1.017	1.139
<u>Drug Use</u>			
Marijuana versus Others	-5.105**	-3.518*	-1.696**

Note: Entries are parameter estimates which reflect counts of negative effects experienced during the past 12 months.

* $p < .05$

** $p < .01$

Table 7.8. Adjusted Means of Negative Effects Indexes for Two Categories of Drug Use

Drug Use	Negative Effects Index		
	Family/Job	Disruption	General
Marijuana Only	2.00	0.56	3.54
Other Drug Use	7.11 ^a	4.08 ^a	5.24 ^a

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

^aSignificantly higher than marijuana only users.

3. General Effects

The R^2 for predicting general negative effects due to drugs for the enlisted sample was .141 which was significant at the .0001 level. The effect of drug use pattern was significant ($p < .01$). Marijuana only users (mean = 3.54) experienced 1.696 fewer general negative effects than other drug users (mean = 5.24) after adjusting for the remaining independent variables in the model. Thus, users of drugs other than marijuana only experience more general negative effects than users of marijuana only.

4. Summary of Negative Effects Due to Drug Use

Taken together, the three regression analyses on drug use negative effects show a clear pattern of results. Enlisted personnel who use drugs other than marijuana only experience significantly more negative family/job effects, disruptive effects, and general negative effects than marijuana only users.

These results suggest that these two classes of drug users--marijuana only users and other than marijuana only users--may represent distinct types of problems for the military. Marijuana only users present a discipline problem to the military for violation of laws but report experiencing relatively few serious negative effects. In contrast, users of drugs other than marijuana only present both discipline problems and impaired performance problems. Their use of drugs violates laws and results in a significant number of serious negative effects.

H. Summary and Conclusions

Multivariate regression analyses examined alcohol and drug use and negative behaviors and effects resulting from that use. Independent variables for the regressions included sociodemographic variables of Service, race/ethnicity, sex, education, family status, region, pay grade, and age of respondent; and psychological/behavioral indicators that assessed attitudes, beliefs, and norms.

Three sets of regression analyses (negative behaviors, negative effects due to drinking, negative effects due to drug use) focused solely on the effects of drinking levels and drug use patterns on the dependent measures. It was hypothesized that drug users and heavy drinkers would experience more general negative behaviors and more legal incidents than nonusers of drugs or lighter alcohol users. Other independent variables in these analyses (e.g., age, rank, educational level, psychological/behavioral characteristics) were used as control variables to adjust for the effects of drinking levels and drug use; their effects were of secondary interest. The other two sets of regression analyses were concerned with predicting heavy drinking and drug use patterns. All of the variables in these regression models were of interest. Key findings and conclusions from the analyses are noted.

1. Negative Behaviors

- Alcohol use and drug use increase the likelihood that military personnel will experience general negative behaviors and legal incidents. Substance users at greatest risk are heavy drinkers and drug users who use more than marijuana only.
- Personnel who use alcohol at any level experience significantly more general negative behaviors than abstainers, but the effect is most pronounced for heavy drinkers. Heavy drinkers also experience significantly more legal incidents than abstainers.
- Both marijuana only users and users of other drug patterns experience significantly more general negative behaviors and legal incidents than nonusers. Exceptionally high levels are experienced by users of drugs other than marijuana.

Results suggest that drinking (especially heavy drinking) and drug use (especially other than marijuana-only use) exacerbate problem behaviors experienced by military personnel. Reduction of heavy drinking and other than marijuana only drug use would significantly reduce the incidence of general problems.

2. Heavy Drinking

- Both sociodemographic and psychological variables are important in explaining the probability of heavy drinking.
- Sociodemographic characteristics that distinguish heavy drinkers are being single, male, and in pay grades E1-E9, and having lower educational levels.
- Psychological variables that distinguish heavy drinking from others are high: drinking motivation, beliefs about a favorable climate for using alcohol and receiving help for a problem (drinking climate) and beliefs that alcohol use does not affect work, health, or fitness (drinking beliefs).

Results suggest that since psychological variables (beliefs, attitudes, motivation) are related to heavy drinking, education and attitude change efforts may help reduce heavy drinking.

3. Alcohol Use Negative Effects

- Some negative effects from drinking are experienced by personnel in all drinking levels, but most of the negative effects are experienced by the small group of heavy drinkers (about 12 percent).
- The negative work, legal, and physiological effects of heavy drinking are strong. General negative effects are less predictable from drinking levels.
- Negative work effects and negative physiological effects are experienced most by heavy drinkers and secondly by infrequent/light drinkers. Higher effects for infrequent/light drinkers than for moderate or moderate/heavy drinkers may result from inexperienced drinkers consuming abnormally larger amounts at parties and on weekends.

Results suggest that education and prevention programs should target all drinkers. Efforts to control heavy drinking will be most effective in reducing the most serious alcohol negative effects.

4. Drug Use

- Both sociodemographic and psychological variables are important in explaining the probability of drug use.

- Age and beliefs about the harmful effects of drugs are important predictors of marijuana use and other drug use. Older personnel and those who believe in the harmful effects of drugs are less likely to use drugs than younger personnel or those who do not believe in the harmful effects of drugs.
- The psychological belief variables (harmful effects of drugs, drug prevention efforts, prevalence of drugs) are more important in predicting other drug use than in predicting marijuana only use. Users of other drugs are more likely than nonusers to favor drug use and believe that drugs not harmful, to indicate that drug deterrence is not effective, and to report that drugs are widely used and readily available.
- Service, race/ethnicity, and region are significantly related to use. The likelihood of marijuana use is greater in the Army than in the Air Force; among whites than among blacks; and in Europe than in the North Pacific.

Results suggest that continued emphasis should be placed on deterrence efforts such as urinalysis and on education efforts that inform military personnel about the harmful effects of nonmedical drug use.

5. Drug Use Negative Effects

- Since most military do not use drugs, only a very small group of personnel experience negative effects due to drugs.
- Among enlisted drug users, the use of other drugs (besides marijuana) leads to significantly more negative family/job consequences, disruptive consequences, and general negative consequences than use of marijuana only.

Results suggest that marijuana only users and other than marijuana users may represent distinct types of problems for the military. Marijuana only users present a discipline problem to the military for violation of laws, but experience relatively few serious negative effects. In contrast, users of drugs other than marijuana only present both discipline problems and impaired performance problems. Their use of drugs violates laws and results in a significant number of serious negative effects.

Regression analyses confirm that drug use and drinking levels are related to general negative behaviors and to negative effects of alcohol use and drug use. Heavy drinkers and users of drugs other than marijuana only experience

exceptionally high levels of negative behaviors and negative effects. Heavy drinkers are likely to be single enlisted males with lower educational levels who are highly motivated to drink and who believe that alcohol does not affect work, health, and fitness. Drug users are likely to be younger and white and to believe that drug use is not harmful. Psychological beliefs better predict the probability of heavy drinking and other drug use than sociodemographic factors.

The results of the regression analyses suggest that education and prevention programs focused on younger, single personnel and aimed at changing the beliefs concerning alcohol and drugs could pay significant dividends in reducing alcohol and drug use and the associated negative consequences.

8. ALCOHOL AND DRUG ABUSE POLICIES AND PROGRAMS

The Department of Defense has adopted a comprehensive set of policies and programs to monitor, regulate and/or lessen the abuse of alcohol and drugs by military personnel. The individual Services have instituted policies and programs that are consistent with DoD guidelines but responsive to their own problems and needs. This chapter examines DoD policies and programs on alcohol and drug abuse and the orientations of military personnel toward these policies and programs, including the awareness and participation in education and treatment programs and the acceptance of policies designed to limit use.

A. DoD Policies and Programs on Alcohol and Drug Abuse

The DoD alcohol and drug abuse policies and programs were designed largely in response to concerns over drug abuse during the Vietnam era. In 1967, DoD convened a task force to investigate drug abuse among troops in Vietnam. Congress specified that alcoholism be given the same attention as other drug problems in DoD's proposed drug program at the insistence of Senator Harold Hughes. As a result of the findings and recommendations of that task force, a policy was formulated that emphasized preventive drug and alcohol abuse education and law enforcement procedures focusing on early intervention (NIAAA, 1982).

In September 1971, Title V of the Military Selective Service Act (PL 92-129) mandated a program to identify and treat drug and alcohol dependent persons in the Armed Forces. The Secretary of Defense subsequently directed each Service to develop and implement its own prevention and treatment programs within policy guidelines set by Title V.

Alcohol has been and continues to be the primary drug of abuse in the military. The DoD directive of March 1972 (No. 1010.2) established policies concerning the prevention and treatment of alcohol abuse and alcoholism in the Armed Forces. The policy of DoD has been to prevent and discourage alcohol abuse through education, law enforcement, and community action; to rehabilitate and restore identified abusers; and to assist those who could not or would not be rehabilitated in making the transition to civilian life (NIAAA, 1982).

The August 1980, directive, "Alcohol and Drug Abuse by DoD Personnel" (No. 1010.4), superceded the 1972 directive. The goal of DoD is to be

free of the effects of alcohol and drug abuse; of the possession of and trafficking in illicit drugs by military and civilian members of the Department of Defense; and the possession, use, sale, or promotion of drug abuse paraphernalia. (p. 2)

Alcohol and drug abuse is incompatible with the maintenance of high standards of performance, military discipline, and readiness. Therefore, it is the policy of the Department of Defense to:

- assess the alcohol and drug abuse and drug trafficking situation in or influencing the Department of Defense;
- not induct persons into the Military Services who are alcohol or drug dependent and not hire persons who are alcohol or drug dependent if that dependency impairs job performance;
- deter and detect alcohol and drug abuse within the Armed Forces and defense community and drug trafficking on installations and facilities under the control of DoD;
- provide continuing education and training to commanders, supervisors, program personnel, and other military members and civilian employees and their families concerning this policy and effective measures to alleviate problems associated with alcohol and drug abuse;
- treat or counsel alcohol and drug abusers and rehabilitate as many as possible;
- discipline and/or discharge drug traffickers and those alcohol and drug abusers who cannot or will not be rehabilitated, in accordance with appropriate laws, regulations, and instructions;
- work in concert with national alcohol and drug abuse prevention programs, maintaining appropriate relationships with governmental and nongovernmental agencies;
- prohibit members of the Armed Forces, and DoD civilians while on the job, to possess, sell, or use drug abuse paraphernalia;
- prohibit the possession or sale of drug abuse paraphernalia by DoD resale outlets to include military exchanges, open messes, and commissaries, and by private organizations and concessions located on DoD installations (DoD Directive No. 1010.4, p. 2-3).

Consistent with this general policy, the Assistant Secretary of Defense (Health Affairs) is charged with responsibility for the development, coordination and supervision of the DoD alcohol and drug abuse prevention program.

The Office of the Secretary of Defense provides broad policy guidance, but responsibility for the implementation of such policies is delegated to the military Departments. Specific areas of policy attention are assessment, deterrence and detection, treatment and rehabilitation, and education and training.

1. Assessment

DoD policy requires the systematic assessment of the nature, extent, and consequences of alcohol and drug abuse within DoD. The analyses of the data from the continuing epidemiological surveys attempt to ascertain factors responsible for observed changes in alcohol and drug abuse, including changes in the general population and DoD programs. The goal is to enable DoD to assess the extent and nature of substance abuse problems in the military and to rapidly adjust policy and program responses to reduce the impact of substance abuse on the military.

DoD Directive No. 1010.3, "Drug and Alcohol Abuse Reports," outlines a system to gather information on the scope of drug and alcohol abuse; evaluate the urinalysis, treatment, and rehabilitation programs; supply data to reply to public, congressional, or other governmental agency inquiries, and to support budget requests for drug and alcohol abuse funds; and collect data to support changes intended to reduce or eliminate the drug and alcohol abuse problem. Accordingly, periodic reports are required on the results of urinalysis testing for drug abuse, drug or alcohol abuse awareness education or rehabilitation programs, drug-related military law enforcement activity, and legal or administrative disposition of drug abuse offenders.

2. Deterrence and Detection

The prevention component of DoD policy includes deterrence and detection efforts aimed at suppressing substance abuse, and education and training efforts (described below) to provide information and skills to help members avoid drug and alcohol abuse and to deal effectively with these problems among their subordinates. The DoD deterrence and detection policy and programs are described in DoD Directive No. 1010.1, "Drug Abuse Testing Program." The DoD drug testing program is designed to identify drug abusers in order to provide appropriate counseling, rehabilitation, or other medical treatment and to permit commanders to assess the security, military fitness, and discipline of their commands and to take appropriate action.

Deterrence and detection efforts begin before induction. Recruiters screen potential enlistees and reject those who are currently or were previously serious drug and alcohol abusers. After induction, background checks confirm the recruiters' findings. Recruits are medically evaluated, urinalysis tests are conducted, and documents are signed acknowledging understanding of DoD policy on substance abuse. In addition, commanders periodically conduct random urinalysis tests among all personnel.

Law enforcement includes breathalyzers, blood tests, and drug detection dogs to prevent substance abuse. The prevention of intoxicated driving by military personnel is governed by DoD Directive No. 1010.7, "Drunk and Drugged Driving by DoD Personnel." Intoxicated driving is incompatible with the maintenance of high standards of performance, military discipline, DoD personnel reliability, and readiness of military units and supporting activities. To reduce the incidence of intoxicated driving, this directive specifies a coordinated program of education, identification, law enforcement, and treatment. Education and training is provided for law enforcement, public information, emergency room, and safety personnel, and refresher training is provided for alcohol servers and sales personnel. Procedures are established for the suspension of driving privileges within each DoD Component, consistent with DoD policy and local needs.

3. Treatment and Rehabilitation

DoD operates a large drug and alcohol abuse treatment and rehabilitation program. Rehabilitation programs are tailored to the needs of the individual and range from intensive education seminars to inpatient hospital care. In fiscal year 1985 approximately 54,500 active duty personnel were treated for drug and alcohol problems. Approximately 9,000 were treated in 52 residential facilities and approximately 45,500 were treated in 400 nonresidential facilities.

Policy and programs are described in DoD Instruction No. 1010.6, "Rehabilitation and Referral Services for Alcohol and Drug Abusers." DoD seeks to identify personnel at risk for drug or alcohol abuse or alcoholism; and counsel or rehabilitate personnel by providing residential, nonresidential, consultive, and educational services. Those who are identified as drug or alcohol dependent are detoxified when appropriate, and referred for rehabilitation or discharged.

The rehabilitation program includes family involvement and aftercare. Alcohol and drug awareness programs are mandated for those who have lost their installation driving privileges as a result of intoxicated driving, received an official report, or refused to submit to a lawfully requested blood alcohol concentration test.

4. Education and Training

The second element of the DoD prevention program is education and training, as provided for in DoD Instruction No. 1010.5, "Education and Training in Alcohol and Drug Abuse Prevention." In educational activities, personnel are taught and learn about DoD alcohol and drug abuse prevention programs and resources. Training activities attempt to develop or improve the competence of health care professionals and paraprofessionals, including those responsible for alcohol and drug abuse prevention programs. DoD policy requires the education and training of all military commanders, military and civilian supervisors, and program personnel concerning DoD alcohol and drug abuse prevention policy and effective measures to alleviate problems associated with alcohol and drug abuse. Appropriate alcohol and drug abuse education is provided to other military and civilian members.

Education is provided for military personnel at initial entry, at permanent change of station (PCS) moves, during professional or military education, and after an alcohol- or drug-related incident. Education for enlisted personnel focuses on prevention and the legal consequences of abuse, while education for officers and commanders concerns the responsibilities of leaders in the alcohol and drug abuse prevention effort.

B. Programs of the Services on Alcohol and Drug Abuse

The individual Services are charged with establishing and operating alcohol and drug abuse programs prescribed by the DoD Directive on Alcohol and Drug Abuse by DoD Personnel and its supporting instructions. Based on the DoD philosophy of the incompatibility of alcohol and drug abuse with military service, the Services have implemented programs that focus on detection and discipline. They are not manpower conservation programs. The basic intent is zero tolerance or nontolerance (Marines), but the Services have moved with varying speeds toward this goal. Enlisted personnel are, in general, treated with greater leniency than officers. Urinalysis is believed to deter drug abuse, and other efforts focus on prevention and awareness training.

1. Army

The alcohol and drug abuse program of the Army began in 1971. At that time the management of the alcohol and drug abuse program was at the level of the local installation, and there were many halfway houses. Alcohol abuse was mostly ignored and was treated as a medical problem.

Following the 1980 directive, the Army's program focused on rehabilitation and the general strategy was one of centralized management and decentralized implementation. There are currently 190 Army counseling centers dealing with alcohol and drug abuse problems. These range from a 1- or 2-person office in some parts of Germany to a 40- to 50- person office at large installations such as Fort Hood. Alcohol is presently perceived to be the primary substance abuse problem. Alcohol cases constitute 66 percent of the current caseload. Alcohol use is legal and socially accepted, but on-duty impairment is not tolerated. The driving while intoxicated (DWI) policy has been strengthened as the DWI rate has increased--5,000 incidents per quarter.

Other than alcohol, the main drug problem in the Army now is marijuana; 97 percent of the positive urinalysis results are for marijuana. Most offenders are E1s-E4s. There are few drug addicts per se, and drug abuse is now considered to be a discipline problem. Drug abuse discharges are primarily misconduct discharges, while alcohol discharges are generally for rehabilitation failure.

DoD policy requires rehabilitation rather than an immediate discharge for alcohol or drug abuse. For nonmedical drug use, E1-E4s receive one chance to change their behavior and abide by Army policy. At the second offense, commanders process them for separation. In contrast, officers and NCOs are processed at the first offense.

The Army rehabilitation program has three tracks. Track 1 is limited to 30 days of educational awareness and group counseling, mostly for young marijuana users. Track 2 is a minimum of 30 days of nonresidential individual or group counseling and education, primarily for alcohol abusers. Track 3 is a maximum of 8 weeks of residential treatment and a 30-day nonresidential followup of counseling and educational awareness. About 60 percent are treated in Track 2, and about 75 percent of those are retained in the Army. Most participants enter these programs as a result of biochemical tests. The second most common route is referral from commanders. There are currently about 40,000 admissions per year into rehabilitation programs.

2. Navy

Navy drug and alcohol abuse prevention and control programs are founded on the policy of zero tolerance. The goal of a Navy free from drug and alcohol abuse is pursued through education, detection, and deterrence, and treatment and rehabilitation programs. Drug and alcohol education begins in officer and enlisted accession training and is included at follow-on service schools and other career points, in local command training programs, and is provided through 130 Navy Alcohol and Drug Safety Action Program (NADSAP) training sites. These programs emphasize the Navy's policy on individual and peer responsibility in preventing drug and alcohol abuse as well as highlighting the damaging effects of abuse on health and career.

The cornerstone of Navy detection and deterrence efforts is the urinalysis screening program. Five Navy Drug Screening Laboratories test over 1.8 million samples per year (including tests conducted for the Marine Corps) for marijuana, cocaine, PCP, amphetamines, barbiturates, and opiates. Of those who test positive, E1-E6 personnel are allowed a second chance to remain in the Navy if the commanding officer determines she or he possesses exceptional potential for future useful service; chief petty officers and officers are processed for discharge.

Treatment and rehabilitation programs operate within a three-level escalating structure to match appropriate treatment level to members' care requirements. Level I includes local command education and NADSAP attendance. Level II includes over 75 Counseling and Assistance Centers located worldwide that provide screening services and outpatient counseling. Level III offers residential rehabilitation at 30 facilities which treat over 6,000 patients per year.

3. Marine Corps

The goal of the alcohol and drug abuse program in the Marines is identification, treatment, and return to full duty. The Marines' philosophy is one of nontolerance of alcohol and drug misuse.

The Marines view urinalysis as an effective deterrent to drug abuse and have the goal of testing each member three times a year. They have portakit test equipment in the field to do preliminary urine screenings to make the best possible use of their 468,000 quotas to the Navy Drug Screening laboratories.

Individual responsible use of alcohol is the thrust of the alcohol program. To achieve this end, education is provided for all Marines throughout their time in service. This includes classes in recruit and officer training, formal schools on the unit level, and specialized leadership courses funded by the Headquarters.

The substance abuse program has three levels: education and identification, outpatient treatment and referral, and inpatient treatment at the rehabilitation facilities run by the Navy. Privates (E1s) to Sergeants (E5s) are normally retained after the first drug offense and are normally processed for separation on the second offense. To be retained after a third drug offense requires a waiver from the Commandant of the Marine Corps. Staff Sergeants (E6s) and above are normally processed for separation after the first offense.

4. Air Force

Alcohol and drug abuse programs in the Air Force are administered through the Social Actions office and emphasize education, drug testing, and drug and alcohol rehabilitation. The education program consists of accession training, newcomers' orientation, professional military education, and a senior officer's course.

The Air Force's drug testing program has the target of an average of one urinalysis test per individual every two years. The drug and alcohol rehabilitation program has residential and nonresidential elements. Air Force members enter the rehabilitation program through an evaluation process which is part of the nonresidential program. The first portion of the nonresidential program lasts approximately 6 weeks. Personnel requiring more extensive treatment of alcohol-related problems can be referred to one of 11 residential treatment centers offering 28-day treatment programs. Residential and nonresidential clients participate for up to one year in a follow-on support program. Most individuals return to full duties while participating in follow-on support. Personnel identified for minor drug offenses/abuse in the ranks of Airman Basic (E-1) through Senior Airman (E-4) may be retained if deemed appropriate by the unit commander. Personnel in the ranks of Sergeant (E-4) and above are normally discharged for any drug abuse.

5. Program Summary

The individual Services have developed drug programs that follow DoD directives and instructions but are specific to their members' needs and consistent with the distinctive conditions of each Service. The Services

differ in the speed with which they have moved toward zero tolerance and in the severity of sanction. In the Army and Air Force, E1-E4s are allowed to remain in the Service after their first drug offense (e.g., a drug-positive urinalysis). The Marine Corps allows E1-E5s to remain. The Navy allows E1-E6s to remain. These policy differences may reflect Service differences in age of personnel, comparability of the pay grades, promotion rates, concepts of responsibility level, technical ranks versus supervisory ranks, and related factors.

6. Uses of These Data

Results of the 1985 Worldwide Survey can contribute to policy decisions regarding the provision of prevention and treatment programs for military personnel as well as preliminary assessment of the effectiveness of programs and policies of the individual Services. Allen and Mazzuchi (1985) summarized the results of the 1982 Worldwide Survey and commented on the impact the 1980 and 1982 surveys have had on military policy regarding drug abuse. They argued that the 1980 results prompted a reevaluation of drug and alcohol problems and policy issues. The data showed little evidence of drug dependence, and the military drug and alcohol abuse was characterized as a problem of discipline rather than addiction. Greater emphasis was placed on prevention, rather than on treatment, and particularly on the use of urinalysis as a deterrent. Policies and programs became more punitive toward identified abusers. Though the 1982 survey results seem to support the effectiveness of this policy change, they indicate that deterrence alone is not fully effective.

C. The Context of Substance Abuse Prevention Programs

Alcohol and drug abuse can be decreased by a variety of approaches, but effective prevention probably requires a multi-method approach. In this section we first discuss a prevention perspective and then address perceptions of acceptability and risk of substance use. This is followed by a consideration of orientations toward regulatory policies.

1. A Prevention Perspective

The public health model of substance abuse prevention specifies three points of access to prevention--the host (individual), agent (substance), and environment (Moore and Gerstein, 1981; West, 1984). Policies and programs oriented toward changing the host attempt to prevent abuse by altering the individual's knowledge, behavior, and attitudes about substance use (e.g., see Durell and Bukoski, 1984). Such programs include education programs that

impart knowledge about the negative effects of alcohol and drug use and smoking on health and possible legal ramifications. Military personnel participate in such informational programs at initial entry, at permanent change of station (PCS) moves, during professional or military education, and after an alcohol or drug-related incident. Education for enlisted personnel centers on knowledge and the legal ramifications of use, while education for officers and commanders additionally focuses on the responsibilities of leaders in the alcohol and drug prevention effort.

Other host-oriented prevention programs attempt to decrease substance abuse by creating a climate of nonuse or responsible use. Informational programs and health promotion efforts attempt to establish such a climate and to foster healthy lifestyles that preclude substance abuse. The recently instituted health promotion programs in the military should result in further declines in substance abuse. Their potential is investigated in the next chapter in analyses of the relation of health practices and substance use.

Prevention policies and programs directed toward the agent attempt to limit use by regulating the availability and context of use. Prevention policies of this nature for alcohol and cigarettes include regulating the hours of sale, restricting the type and number of outlets, keeping the prices of alcohol and cigarettes relatively high, enforcing minimum purchase ages, and limiting on-site and off-premise drinking. Agent-directed prevention policies for illicit drugs enforce the ban on the sale of drugs.

Prevention policies and programs may also attempt to lower the environmental risk associated with substance use, primarily alcohol use. Policies of this nature seek to decrease the likelihood of unintentional injuries occurring when people drink, primarily through safer road design, automobile construction and the like. These are important policies and practices but are probably less the focus of the military than of governmental organizations that oversee citizen and consumer safety.

2. Perceptions of the Acceptability and Risk of Substance Use

Basic orientations of military personnel such as the acceptability of substance use and how the effects of alcohol and drugs on health and productivity are perceived establish a climate of use or nonuse. Educational and informational programs can target such perceptions and beliefs. If military personnel are aware of the substantial risks associated with substance use or if use is made less acceptable, use should become less likely.

Table 8.1 presents the percentages who agreed or strongly agreed with several items about acceptability and risks. About one-third of military personnel feel that drinking is simply part of being in the military or that everyone is encouraged to drink at social functions at their installation; about half that many believe it is easy to use drugs at social functions at their installation. While these individuals are perhaps sizeable minorities, these percentages suggest that the majority of military personnel feel that drinking and drug use are not broadly accepted norms in the military.

From 81 to 84 percent of personnel know of the health risks associated with alcohol use or drug use. Only two-thirds see alcohol use as potentially interfering with work, although three-fourths see drug use as potentially doing so. Military personnel are less likely to feel that alcohol and drug use affect the readiness of their units. About 46 percent believe alcohol affects readiness, and 37 percent believe drug use lowers readiness. These perceptions may, however, be tied to knowledge about the level of use in the military.

There are few Service differences in perceptions of substance use acceptability and risk. There is some indication that Air Force personnel are more accepting of drinking and less accepting of drug use at social functions at their installations. They are also less likely than personnel in the other Services to believe that alcohol and drugs affect the readiness at the installation. These perceptions may be partially tied to the lower levels of substance use among Air Force personnel.

The perceptions of military personnel about norms of alcohol and drug use and toward the health risks associated with use seem to support a climate of reasoned use for alcohol and nonuse of drugs. These perceptions suggest that prevention programs now in place appear to have been effective. Somewhat troublesome, however, are the lower percentages who think alcohol and drug use could affect their work and the even lower percentages who think alcohol and drug use reduces military readiness. Perhaps these perceptions should be topics for subsequent educational efforts to create greater awareness of the effects of alcohol and drugs on military readiness and the effect drinking and drug use of others might have on the individual. These beliefs about the effects on readiness may reflect the perception that use levels are not debilitating or only affect a small percentage of personnel. If so, educational efforts could make personnel more aware of the potential effects of current use levels.

Table 8.1. Perceptions Relevant to Education Programs for Alcohol and Drug Abuse

Perception/Item	Service				Total DoD
	Army	Navy	Marine Corps	Air Force	
<u>Acceptability of Use</u>					
Drinking is part of being in the military	29.7 (1.5)	30.0 (1.6)	32.8 (2.7)	29.5 (1.4)	30.0 (0.8)
Everyone is encouraged to drink at social functions at this installation	34.4 (1.1)	33.6 (1.2)	32.7 (3.4)	37.3 (1.4)	34.9 (0.7)
It's easy to use drugs at parties or social functions at this installation	21.0 (1.9)	15.0 (1.3)	13.6 (3.4)	8.4 (1.0)	15.0 (0.9)
<u>Effects on Work and Readiness</u>					
Drinking might interfere with my work	62.1 (1.4)	63.7 (1.6)	60.0 (1.0)	61.6 (1.2)	62.1 (0.7)
Heavy drinking reduces the readiness of my unit	50.5 (1.3)	52.7 (1.8)	46.2 (2.0)	35.8 (1.5)	46.3 (0.9)
Using drugs might interfere with my work	70.2 (1.4)	74.0 (2.0)	71.3 (1.1)	78.1 (1.4)	73.7 (0.8)
Drug use reduces the readiness of units at this installation	41.7 (1.6)	39.2 (1.6)	40.1 (2.7)	28.5 (1.3)	37.0 (0.9)
<u>Effects on Health</u>					
Drinking might interfere with my health or physical fitness	80.2 (1.0)	83.2 (1.4)	80.8 (1.8)	80.3 (1.0)	81.0 (0.6)
Drugs might interfere with my health or physical fitness	80.9 (1.4)	85.8 (0.8)	80.5 (1.3)	86.2 (0.8)	83.7 (0.6)
Drugs might mess up my mind	69.5 (1.4)	72.5 (1.6)	69.8 (1.4)	78.2 (1.4)	72.9 (0.8)

Note: Data are percentages of respondents who agreed or strongly agreed with the item with standard errors in parentheses.

Source: Questions 42a,h; 49b,h,j; 60a,h; 76b,h,j.

3. Orientations Toward Regulatory Policies

Military policy regulates the availability of alcohol and drugs on base by setting the hours and prices of alcohol sales, policing the availability of drugs, enforcing DWI laws, and establishing the conditions of discharge for illicit drug use. Orientations toward these policies and perceptions of their effect on substance use are examined in Table 8.2.

Only about one in five military personnel feel that happy hours at their installation make drinking easy, and 12 percent feel that the relatively low on-base alcohol prices at the installation encourage drinking. One in five to one in four believe that it is easy to obtain marijuana or other drugs on or near the installation, but these perceptions were not related in questionnaire items to the perception of the effect of military policy on drug availability. Fully 90 percent see the certainty of arrest for a DWI offense on base, while 38 percent support military discharge policies for marijuana use (Table 8.2).

Few Service differences in these orientations are apparent. Air Force personnel, however, are less likely to think drugs are readily available, and Air Force and Marine Corps personnel are somewhat more supportive of discharge for marijuana use.

These findings indicate on the whole that military regulatory policies on alcohol and drug use have been effective, and most military personnel feel that regulatory policies have a substantial impact on availability or ease of use.

D. Awareness of Programs and Perceptions of Effects

The effectiveness of alcohol and drug education and prevention programs depends on awareness of such programs, their level of contact with personnel, particularly those in need of services, and program participants' perceptions of the helpfulness of such programs. To be effective, the programs must, therefore, reach the appropriate persons, but those persons must be ready to learn and to adopt the behavioral skills taught by such programs. Information on the level of awareness of drug programs at the installation (related items were not available for alcohol programs) and perceptions of the effectiveness of alcohol and drug education programs are presented in Table 8.3. Caution should be exercised in interpreting these data since personnel may be stationed at a location where all of these services are not provided.

Table 8.2. Orientations Toward Regulatory Policies

Orientations/Item	Service				Total DoD
	Army	Navy	Marine Corps	Air Force	
<u>Availability</u>					
Happy hours at this installation make drinking easy	20.1 (1.3)	20.7 (1.3)	20.4 (2.8)	23.7 (1.2)	21.4 (0.7)
Alcohol prices at this installation relative to off-base prices encourage drinking	11.7 (0.7)	13.5 (2.1)	11.4 (1.7)	11.9 (0.8)	12.1 (0.7)
It's easy to obtain marijuana on or near this installation	31.8 (2.2)	30.8 (2.2)	27.2 (4.8)	17.5 (2.1)	26.8 (1.3)
It's easy to obtain other drugs besides marijuana on or near this installation	24.5 (2.1)	26.0 (1.8)	23.2 (5.5)	13.1 (1.8)	21.3 (1.2)
<u>Arrest/Discharge</u>					
Driving on base while intoxicated is a sure way to get arrested	89.9 (0.9)	88.1 (0.5)	88.9 (1.6)	92.3 (1.1)	90.1 (0.5)
Anyone detected using marijuana should be discharged	34.8 (1.2)	33.9 (1.9)	41.9 (2.4)	45.5 (1.1)	38.5 (0.9)

Note: Data are percentages of respondents who said they agreed or strongly agreed with the item. Standard errors are in parentheses.

Source: Questions 42c, i; 49d; 55a, 67c.

Table 8.3. Perceptions of Alcohol and Drug Education and Treatment Programs

Perceptions of	Service				Total DoD
	Army	Navy	Marine Corps	Air Force	
<u>Awareness of Drug Programs at Installation</u>					
Drug education/information program	70.2 (1.7)	61.9 (2.1)	73.6 (1.6)	70.1 (3.2)	68.4 (1.3)
Drug counseling program	73.8 (2.3)	64.1 (2.0)	70.4 (1.7)	64.8 (3.5)	68.3 (1.5)
Drug referral office	62.6 (2.0)	51.7 (1.6)	54.2 (1.2)	49.1 (2.5)	55.0 (1.2)
Drug detoxification program	36.8 (2.4)	28.1 (1.8)	31.1 (4.4)	22.9 (2.0)	29.9 (1.3)
<u>Effects of Alcohol and Drug Education Programs</u>					
Alcohol education has helped me make better decisions about alcohol use	25.9 (1.2)	29.0 (1.4)	29.0 (1.4)	30.7 (1.1)	28.4 (0.7)
Drug education has helped me make better decisions about drug use	25.4 (1.3)	27.8 (1.5)	28.9 (2.5)	30.9 (1.3)	28.0 (0.8)
Education about drugs at this installation helps keep people from using drugs	26.7 (1.2)	31.6 (1.7)	36.1 (2.4)	29.9 (1.8)	29.8 (0.8)

Note: Entries are percentages with standard errors in parentheses.

Source: Questions 42d, 60e, 67e, 79.

Two-thirds of military personnel are aware of the existence of drug education or information programs and drug counseling programs at the installation; but only one-half are aware of the availability of a drug referral office, and less than one-third are aware of a drug detoxification program at the installation. Army personnel were in general more likely than personnel in other Services to be aware of the existence of the drug programs.

The majority of military personnel do not feel that military alcohol and drug education programs have been effective in helping them make better decisions or in deterring others from use. Less than one-third think the alcohol and drug education programs have had positive effects. Marine Corps personnel are somewhat more likely than other Service personnel to see the general deterrent effects, while Service differences are not large in responses to the items about personally making better decisions about alcohol and drug use.

These perceptions of the availability and effectiveness of alcohol and drug education and treatment programs suggest areas for targeting educational efforts. The military should better publicize the availability of programs and could improve the utility of educational programs.

E. Orientations Toward Urinalysis Programs

The substantial declines in drug use over the past five years are frequently attributed to the deterrent effects of the urinalysis testing system instituted in 1981. Responses to a series of items concerning urinalysis testing are presented in Table 8.4. Overall, military personnel agree that urinalysis has reduced drug use in the military (64 percent), and they believe that the urinalysis program has not hurt morale (81 percent). However, only 36 percent believe that the tests are reliable. This may stem from reports that specimens were mishandled by the testing laboratories and from the publicity associated with some discharges that were based on faulty tests. In view of the more rigorous standards and procedures that have been recently adopted (see DoD Directive No. 1010.1 Drug Abuse Testing Program), the Services may wish to consider ways to increase confidence of personnel in the accuracy and fairness of the testing program. About one-fourth of personnel indicate that the urinalysis testing program has kept them from using drugs. However, 70 percent say that they would not use drugs even if there were no urinalysis testing. Some believe that there are ways around the testing; one-fourth believe that some people use drugs that will not be detected by the tests, and 38 percent

Table 8.4. Orientations Toward Urinalysis Program

Perceptions of Urinalysis Testing	Service				Total DoD	
	Army	Navy	Marine Corps	Air Force	User	Nonuser
<u>Deterrent Effects</u>						
Reduces drug use in the military	60.7 (1.2)	69.8 (1.5)	68.3 (3.5)	63.2 (1.3)	64.4 (0.7)	50.6 (2.4) 66.5 (0.8)
Has prevented drug use in my unit	36.0 (1.9)	44.4 (1.6)	43.9 (3.6)	30.1 (1.9)	37.1 (1.0)	31.1 (2.1) 38.0 (1.1)
Has kept me from trying some drugs	24.5 (1.7)	29.1 (1.1)	23.1 (1.1)	16.9 (1.2)	23.2 (0.8)	38.7 (2.0) 20.8 (1.0)
I wouldn't use drugs even if there were no urinalysis testing	66.3 (1.6)	66.1 (2.9)	70.3 (3.4)	77.9 (1.4)	70.1 (1.1)	18.5 (1.3) 78.0 (0.7)
Some drug users curtail use when they think they will be selected for urinalysis	46.4 (1.6)	43.0 (3.0)	44.5 (3.4)	23.0 (1.6)	38.3 (1.3)	71.7 (2.3) 33.2 (1.1)
<u>Reliability</u>						
Tests are reliable	35.8 (1.5)	38.2 (1.4)	38.3 (3.4)	32.4 (1.5)	35.6 (0.8)	25.2 (2.2) 37.2 (0.9)
People get away with using certain drugs that can't be detected	32.6 (2.0)	34.2 (2.8)	33.9 (3.4)	15.8 (0.9)	28.1 (1.2)	50.8 (2.3) 24.6 (1.1)
<u>Effects on Morale</u>						
Emphasis on detection and discipline in my Service's drug program hurts morale	20.6 (1.4)	23.5 (1.9)	18.3 (4.8)	14.9 (1.2)	19.4 (0.9)	49.6 (2.4) 14.8 (0.7)

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.

Source: Questions 60, c, j; 67b, d, g, j; 76a, k.

think that drug users curtail their use when they think they will be selected for urinalysis.

Navy and Marine Corps personnel believe more in the deterrent effects of the urinalysis program than do personnel from the other active Services, for both the total military and their own unit. They are also somewhat more likely to accept the tests as reliable. Air Force personnel are less likely than personnel from the other Services to believe that there are ways around the system or that the emphasis on detection and discipline hurts morale. They are also more likely to state that they would not use drugs even if there were no urinalysis program and less likely to state that the program has deterred them from trying drugs. These perceptions partially reflect Service differences in the likelihood of drug use--Air Force personnel are less likely than other Services to use drugs, even when differences in sociodemographic composition of the Services are controlled.

The perceptions are also dependent on drug use; responses of users and nonusers differ substantially on several of the items. For instance, users are more likely than nonusers to state that urinalysis testing had kept them from trying some drugs, that it has curtailed use when they think they will be tested, that people get away with using drugs that cannot be detected, and that the program hurts morale. These results suggest that drug use would be greater if it were not for the program and that users are well aware of some of the problems inherent to urinalysis testing. Nonusers are somewhat more likely than users to feel that the tests are reliable and that the tests have reduced drug use both in the military in general and in their own unit.

In summary, most military personnel are supportive of the urinalysis testing program and feel that it has had significant deterrent effects. Some personnel, however, particularly users, are aware of the limitations of urinalysis testing. These findings suggest a continuing need for drug education programs to help prevent drug use. Overall, drug use has declined dramatically over the five years since this survey series began, partially as a function of societal changes in drug use but also as a function of the effectiveness of military policies and programs on drug use.

F. Participation in Alcohol and Drug Education and Treatment Programs

Participation in alcohol and drug general education programs is required of military personnel at accession, permanent change of station, and after an

alcohol or drug incident. Thus, military personnel participate in general education programs at least once during their military careers and potentially several times. Within the past year, 38 percent of total DoD personnel reported participating in alcohol education programs and 35 percent in drug education programs (Table 8.5). The percentage for alcohol programs is only slightly higher than the 35 percent who reported having participated in such programs in 1982. For both alcohol and drug programs, Marine Corps personnel were most likely to report participation (50 percent alcohol, 47 percent drugs), followed by Army (43 percent alcohol, 41 percent drugs), Air Force (37 percent alcohol, 35 percent drugs), and Navy (27 percent alcohol, 24 percent drugs).

These participation rates suggest the Services differentially emphasize drug and alcohol education. To the extent that education programs positively affect substance use behavior, it may be useful for the Services (particularly the Navy) to examine their education delivery system. The issue of the effects of the education program needs closer examination since most respondents believe that the programs have not helped them make better decisions about substance use (see Table 8.3). In any event, these figures illustrate the substantial investment of DoD in initial and continuing education efforts.

Few military personnel have received counseling or treatment for their alcohol or drug problems. Less than 10 percent of all active-duty personnel reported receiving counseling or treatment for their alcohol problems within the past year and only 3 percent for their drug problems. Counseling and treatment were primarily provided in military treatment programs rather than through a military medical facility, civilian medical facility, or civilian treatment program. Personnel in the Army, Navy, and Marine Corps were more likely than Air Force personnel to have received counseling or treatment but participation levels are, of course, closely tied to levels of use.

G. Barriers to Seeking Help for Alcohol and Drug Abuse

Military personnel may not readily seek help for their alcohol or drug problems because of their perceptions about the difficulty of receiving help, the effect on military careers, or the likelihood of disciplinary action. The Services have established guidelines for the management of personnel with alcohol and drug problems, and discharge is a possibility if the problems are not rectified. However, the Services offer a variety of services to rehabilitate those with problems.

Table 8.5. Participation in Alcohol and Drug Education and Treatment Programs

Substance/Programs	Service				Total DoD
	Army	Navy	Marine Corps	Air Force	
ALCOHOL					
Educational Programs					
Attended general education classes	43.1 (1.2)	27.4 (1.8)	50.0 (3.2)	36.8 (2.0)	37.9 (1.1)
Counseling and Treatment Programs					
Through military medical facility	4.0 (0.8)	3.9 (0.6)	3.8 (0.9)	3.1 (0.4)	3.7 (0.3)
Through military treatment program	8.6 (0.9)	10.9 (1.0)	7.9 (1.0)	5.1 (0.7)	8.1 (0.5)
Through civilian medical facility	0.8 (0.2)	0.5 (0.1)	0.4 (0.2)	0.2 (0.1)	0.5 (0.1)
Through civilian treatment program	1.5 (0.3)	1.7 (0.3)	1.9 (0.5)	1.3 (0.2)	1.6 (0.2)
Any counseling or treatment	10.0 (0.9)	12.4 (1.0)	9.6 (1.5)	6.5 (0.7)	9.5 (0.5)
DRUGS					
Educational Programs					
Attended general education classes	40.6 (1.2)	24.3 (2.2)	47.0 (2.7)	35.0 (2.1)	35.4 (1.1)
Counseling and Treatment Programs					
Through military medical facility	1.6 (0.4)	0.8 (0.4)	1.3 (0.4)	0.8 (0.2)	1.1 (0.2)
Through military treatment program	3.5 (0.4)	3.0 (0.4)	3.5 (1.7)	1.7 (0.3)	2.8 (0.3)
Through civilian medical facility	0.1 (0.1)	0.1 (-)	0.2 (0.2)	- (-)	0.1 (-)
Through civilian treatment program	0.2 (0.1)	0.3 (0.2)	0.6 (0.4)	0.2 (0.1)	0.3 (0.1)
Any counseling or treatment	4.1 (0.4)	3.2 (0.4)	3.9 (1.6)	2.0 (0.3)	3.2 (0.3)

Note: Entries are percentages with standard errors in parentheses.

-Estimate rounds to zero.

Source: Questions 43a-d, 56a-d, 78a,b.

Judging by the responses to specific items presented in Table 8.6 concerning barriers to seeking help, military personnel view the likelihood of disciplinary action to be the greatest barrier (58 percent for an alcohol problem, 68 percent for a drug problem). Second in importance is the likelihood of the commander finding out (44 percent for an alcohol problem, 47 percent for a drug problem), and third in importance is the damage to the military career (26 percent for an alcohol problem, 42 percent for a drug problem). Less important barriers were the risk of surprise searches if they seek treatment and difficulty getting off duty to attend counseling sessions. Overall, 46 percent of respondents viewed personnel at the installation to be helpful to people with drinking problems. Thirty-eight percent thought they were helpful to those with drug problems.

Military personnel were substantially less likely to see the factors noted in Table 8.6 as barriers to seeking help for alcohol problems than for drug problems. Thus, drug abusers may be less likely than alcohol abusers to seek help for their problems.

Some Service differences exist in perceptions of barriers to seeking help. Air Force personnel are more likely than personnel in the other active Services to see barriers to seeking help such as the likelihood of disciplinary action and the effects on the military career. In addition, Air Force personnel were less likely to see personnel as helpful in resolving their alcohol and drug problems. They were less likely to believe they would experience surprise searches for their alcohol use but thought it would be difficult to get off duty for counseling for either alcohol or drug problems. These findings suggest that Air Force personnel overall may be less likely than personnel in other Services to seek help for their alcohol and drug problems.

Alcohol and drug users were in general more likely than nonusers to be aware of the repercussions of use and were less likely to perceive military personnel to be helpful in resolving problems (drug problems only). Whether these perceptions indicate experience with the alcohol and drug treatment systems or simply a greater awareness of problems in seeking help, the percentages reported for users give a more informative view of military personnel's perceptions of the barriers to seeking treatment.

The likelihood of military personnel seeking help must be weighed in light of military policies on discharge and disciplinary action for alcohol and drug abuse. The policies encourage rehabilitation to full performance

Table 8.6. Barriers to Seeking Help for Alcohol and Drug Abuse

Substance/Item	Service				Total DoD	
	Army	Navy	Marine Corps	Air Force	User ^a	Nonuser
Alcohol Abuse						
If seek treatment, will later experience surprise searches	18.2 (1.3)	14.8 (1.2)	15.1 (1.2)	10.7 (1.0)	14.8 (0.7)	12.1 (0.7)
Personnel at installation try to help people who have drinking problems	47.8 (1.4)	49.0 (1.5)	54.0 (1.5)	39.5 (1.9)	46.2 (0.8)	46.2 (1.0)
Can't get help for drinking problem without commander finding out	47.0 (1.6)	40.8 (1.5)	48.5 (3.6)	40.5 (2.1)	43.6 (1.0)	39.9 (1.2)
Have trouble getting off duty to attend counseling sessions	17.1 (1.1)	16.6 (1.3)	12.9 (2.3)	5.8 (0.5)	13.2 (0.7)	11.7 (0.6)
Disciplinary action will be taken against a person (with a drinking problem)	57.1 (1.5)	55.6 (1.4)	57.4 (1.9)	62.0 (1.8)	58.2 (0.9)	60.3 (0.9)
Seeking help for a drinking problem will damage a military career	26.1 (1.5)	19.6 (1.4)	25.4 (2.0)	31.0 (1.4)	25.8 (0.8)	24.0 (0.9)
Drug Abuse						
If seek treatment, will later experience surprise searches	32.0 (1.6)	32.7 (1.9)	29.3 (1.7)	31.5 (1.1)	31.8 (0.8)	29.5 (0.8)
Personnel at installation try to help people who have drug problems	39.1 (1.7)	43.4 (1.6)	44.8 (0.6)	30.6 (1.5)	38.2 (0.9)	39.1 (0.9)
Can't get help for drug problem without commander finding out	46.1 (1.7)	47.7 (1.5)	50.4 (3.7)	46.6 (1.2)	47.0 (0.9)	45.2 (0.9)
Have trouble getting off duty to attend counseling sessions	13.6 (0.9)	13.4 (1.2)	12.4 (2.8)	5.9 (0.4)	11.1 (0.6)	9.9 (0.6)
Disciplinary action will be taken against a person (with a drug problem)	62.6 (1.6)	69.1 (1.5)	71.1 (2.2)	72.1 (1.2)	67.9 (0.8)	66.9 (0.9)
Seeking help for a drug problem will damage a military career	36.1 (1.4)	37.8 (1.7)	42.3 (2.7)	51.8 (1.2)	41.8 (0.8)	40.1 (1.0)

Note: Data are percentages of those who agreed or strongly agreed with the item and standard errors are in parentheses.

Source: Questions 42b, f; 49c, f, i, l; 50c, f; 76c, f, i, l.

^aFor alcohol items "user" refers to moderate/heavy and heavy drinking levels (i.e., those who use at heavier levels and are most likely to have problems that would require help). "Nonuser" refers to abstainer, infrequent/light, and moderate drinking levels. For drug items, "user" refers to any drug use during the past 12 months.

status rather than outright dismissal although that perception may not be held by personnel, especially in view of dismissal practices for drug offenses. This overview of barriers to seeking help indicates that some feel comfortable in seeking help even in the face of the likelihood of discharge for rehabilitation failure, but many may not.

H. Summary and Conclusions

This chapter examined alcohol and drug abuse policies and programs and survey data relating to them.

1. Policies and Programs

- The Department of Defense has adopted a comprehensive set of policies and programs to monitor, regulate and/or lessen the abuse of alcohol and drugs by military personnel. The Office of the Assistant Secretary of Defense (Health Affairs) provides broad policy guidance, but responsibility for the implementation of such policies is delegated to the Military Departments.
- Each of the Services has implemented programs to curb drug and alcohol abuse. The Programs vary somewhat among the Services, but all emphasize education, detection, and rehabilitation.

2. The Context of Substance Abuse Prevention Programs

- Policies and programs designed to prevent drug and alcohol abuse may be directed toward the host, agent, or environment. Programs directed toward the host include educational and informational programs and health promotion efforts; policies that are oriented toward the agent regulate the availability of alcohol and drugs; and procedures aimed at the environment seek to limit the risk associated with drug and alcohol use.
- Most military personnel feel that drinking and drug use are not generally accepted norms, and they know the associated health risks and effects on work.
- Most military personnel feel that regulatory policies have a substantial effect on alcohol and drug availability and ease of use.

3. Awareness of Programs and Perceptions of Effects

- Most personnel are aware of the existence of drug education or information and drug counseling programs at the installation;

fewer are aware of the availability of a drug referral office or detoxification program.

- Most personnel do not believe that military alcohol and drug education programs have helped them make better decisions about their use or deterred them from use.

4. Orientations Toward Urinalysis Programs

- The majority of military personnel believe that the urinalysis testing program has reduced drug use in the military (64 percent), but they do not believe that the tests are reliable; nonusers are somewhat more likely than users to believe urinalysis programs are effective.

5. Program Participation and Barriers to Seeking Help

- Within the past year, slightly more than one-third of military personnel participated in alcohol or drug education programs, 10 percent received counseling or treatment for alcohol problems, and 3 percent received counseling or treatment for drug problems. Some barriers exist to seeking help for alcohol and drug abuse, such as the perceived likelihood of disciplinary action, but many feel that personnel are helpful to those with alcohol or drug problems; the barriers to seeking help for drug problems are greater than those for alcohol problems.

These findings suggest that military policies and programs directed toward substance abuse have been effective in creating a climate of reasoned use of alcohol and nonuse of drugs. Military personnel are aware of the substantial risks of substance use and are not supportive of substance abuse.

It is generally believed that a multi-method approach that considers the host, agent, and environment is necessary to prevent substance use. Military policies and programs are broad-based and address these issues. The urinalysis program, gauging from the substantial declines in drug use since its implementation and the beliefs of military personnel in its deterrent effects, appears to have been highly successful. Educational programs also appear to be successful in creating a climate of reasoned use of alcohol and nonuse of drugs. They are also necessary to impart to new recruits the military perspective on substance use and to continuously reinforce this perspective.

There appear to be at least two points at which military substance abuse policies and programs could be improved. First, personnel do not in general

feel that educational programs help them make better decisions about alcohol and drug use. This issue should be evaluated to ascertain whether the programs are sophisticated and relevant to personnel needs. Second, military personnel feel that there are many barriers to seeking help for alcohol and drug use, particularly drug use. Although part of this reluctance to seek help is certainly related to military policy, participation might be made less threatening.

9. HEALTH PRACTICES AND SUBSTANCE USE

Many health problems can be prevented by good habits such as regular exercise and maintaining proper weight. The Department of Defense is developing and implementing health promotion programs designed to encourage healthy behaviors among military personnel, thereby decreasing productivity loss due to illness, improving military readiness, reducing costs for medical treatment and disability and, as a by-product, reducing substance abuse.

In this chapter we first review DoD health promotion policies and then discuss literature on health promotion programs. We examine the health practices of military personnel and the relationship of health practices to substance use and illness. Analyses of health practices and their relationship to substance use have not been conducted previously within the series of Worldwide surveys. Thus, these analyses may be a benchmark for assessing changes in the involvement of military personnel in health practices as health promotion programs are implemented. These analyses also provide a preliminary indication of the potential effectiveness of health promotion programs in decreasing alcohol and drug abuse, including smoking.

A. DoD Health Promotion Policies and Programs

DoD has long recognized the importance of healthy lifestyles for military performance and readiness. A comprehensive system of medical care has been provided for active duty members, retirees, and their dependents. A concentrated health promotion program, however, has been a very recent phenomenon. In 1979, the Subcommittee on Health Maintenance of the Armed Forces Epidemiological Board recommended that the Department of Defense develop ways to inculcate healthy lifestyles in the Armed Forces and in 1983 Defense Guidance contained a recommendation that a strategic plan be developed. A Health Promotion Conference in 1983 formulated recommendations for future health promotion initiatives and a Blue Ribbon Panel of public health experts that was convened in 1984 assessed current DoD efforts in this area and made recommendations for improvement.

Official DoD policy on health promotion is included in the 1986 DoD Directive (No. 1010.10) that outlines policy designed to improve and maintain military readiness and the quality of life of DoD personnel and other beneficiaries. Health promotion is defined as:

Any combination of health education and related organizational, social, economic or health care interventions designed to facilitate behavioral and environmental alterations that will improve or protect health. It includes those activities intended to support and influence individuals in managing their own health through lifestyle decisions and self-care. Operationally, health promotion includes smoking prevention and cessation, physical fitness, nutrition, stress management, alcohol and drug abuse prevention, and early identification of hypertension (DoD Directive 1010.10, 1986, p. 1).

Within this broad set of activities, the major aims of DoD policy on health promotion are to:

- Encourage military personnel, retirees, their families, and civilian employees to live healthy lives through an integrated, coordinated and comprehensive health promotion program.
- Foster an environment that enhances the development of healthful lifestyles and high unit performance.
- Recognize the right of individuals working or visiting in DoD occupied buildings to an environment reasonably free of contaminants.
- Disallow DoD Components' participation with manufacturers or distributors of alcohol or tobacco products in promotional programs, activities, or contests aimed primarily at DoD personnel.

The Assistant Secretaries of Defense for (1) Health Affairs, (2) Force Management and Personnel, and (3) Reserve Affairs coordinate and monitor this program. Each of the Military Departments will establish a comprehensive health promotion program that is consistent with DoD policy and that meets the needs of their respective Services .

These broad elements are to be included in the programs of the Services:

1. Smoking prevention and cessation programs shall 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.
2. Physical fitness programs shall aim to encourage and assist all target populations to establish and maintain the physical stamina and cardio-respiratory endurance necessary for better health and a more productive lifestyle.

3. Nutrition programs shall aim to encourage and assist all target populations to establish and maintain dietary habits contributing to good health, disease prevention, and weight control.

4. Stress management programs shall aim to reduce environmental stressors and help target populations cope with stress.

5. Alcohol and drug abuse prevention programs shall aim to prevent the misuse of alcohol and other drugs, eliminate the illegal use of such substances, and provide counseling or rehabilitation to abusers who desire assistance.

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

This health promotion policy thus places the military's alcohol and drug abuse programs within a broader comprehensive approach that seeks to encourage healthy lifestyles. Alcohol and drug abuse and smoking are inconsistent with these lifestyles. This broader approach together with programs specifically directed toward alcohol and drug abuse, should result in further decreases in substance abuse.

B. Effectiveness of Health Promotion Programs

Illness decreases productivity and increases health care costs, prompting many employers to institute health promotion programs. Health risks such as high blood pressure, smoking, inadequate exercise, poor nutrition, and obesity can result in productivity losses. These conditions are amenable to health promotion/disease prevention efforts (Fielding, 1984).

Behavioral risk factor surveys conducted in 28 states between 1981 and 1983 yielded national estimates of several risk factors. These studies indicate that 9 percent of adults are chronic heavy drinkers, 23 percent are overweight, 32 percent are current smokers, 4 percent have uncontrolled hypertension, and 58 percent do not use seatbelts (Gentry et al., 1985). These surveys also provide evidence that chronic heavy drinking is associated with not using seatbelts, being a current heavy smoker, being of normal weight or being overweight, having a sedentary lifestyle, exercising at least four hours a week, and doing heavy physical work. These associations suggest that multiple risk factor interventions may be effective (Bradstock et al., 1985).

There is also evidence that use of any of these substances--alcohol, drugs, cigarettes, or caffeine--increases the likelihood of use of others. Carmody et al. (1985), for instance, found co-occurrent use of cigarettes,

alcohol, and coffee among adults. They suggest that these behaviors may be elicited by the same psychological or situational factors, perhaps a risk-taking behavioral factor. Jessor (1984) and Hays, Stacy, and DiMatteo (1984) found similar support for a syndrome of problem behavior that included alcohol, cigarettes, and drugs. However, Hays et al. found that health behaviors were distinct from the "problem behaviors." Their findings suggest that encouraging healthy behavior and discouraging substance use require very different approaches.

Belloc (1973) and Breslow and Enstrom (1980) reported on the persistence of health practices in a longitudinal study of adults in Alameda County, California, and the relationship of health practices to mortality. They considered seven health practices: never smoking cigarettes, regular physical activity, moderate or no use of alcohol, 7-8 hours of sleep a day regularly, maintaining proper weight, eating breakfast, and not eating between meals. The individual practices were related to lower mortality rates, particularly for men, and differences in mortality rates were independent of physical health at the beginning of the study. Mortality rates also decreased as the number of health practices in which adults were engaged increased.

Taken together, these studies suggest that the longevity and well-being of military personnel can be substantially improved by health promotion programs that encourage involvement in healthy behaviors such as regular exercise, adequate sleep, and proper eating. Improvements in health may also result in declines in substance use. Some research suggests that substance use is independent of health practices and, thus, that health promotion programs that encourage healthy behavior will not be effective in discouraging substance use. Other research suggests that substance use and health practices occur together and, thus, that health promotion programs can be effective in preventing substance use.

C. Health Status and Health Practices

Understanding health promotion first requires an assessment of health status and health practices. This section examines these factors for active-duty military personnel.

1. Perceptions of Health

Table 9.1 presents general perceptions of military personnel about their health. As shown, the vast majority of military personnel are positive about their health. Overall, 95 percent describe their health as good or better, and 30 percent describe it as excellent. Over half state that their

Table 9.1. General Perceptions of Health

Item/Response	Service				Total DoD
	Army	Navy	Marine Corps	Air Force	
How Describe Own Health					
Excellent	31.0 (1.0)	24.6 (1.2)	41.0 (3.1)	31.6 (1.7)	30.5 (0.8)
Very good	39.7 (1.5)	43.5 (1.7)	35.3 (3.2)	41.3 (1.0)	40.7 (0.9)
Good	23.1 (0.8)	27.0 (2.2)	20.7 (2.5)	24.4 (1.6)	24.2 (0.8)
Fair or poor	6.2 (1.7)	5.0 (0.6)	3.0 (1.1)	2.8 (0.3)	4.6 (0.7)
Worry Caused by Health, Past Year					
Great deal	1.1 (0.2)	1.8 (0.3)	3.7 (0.6)	1.0 (1.2)	1.5 (0.1)
Some	17.1 (0.9)	14.8 (1.0)	13.0 (0.9)	13.8 (0.7)	15.2 (0.5)
Hardly any	28.2 (1.4)	32.7 (1.5)	26.5 (0.7)	28.1 (0.9)	29.1 (0.7)
None	53.6 (1.4)	50.7 (1.5)	56.9 (0.6)	57.0 (1.0)	54.2 (0.7)
Control Have Over Own Future Health					
Great deal	78.0 (1.4)	79.1 (1.2)	84.8 (1.2)	81.1 (1.1)	79.8 (0.7)
Some	18.8 (1.1)	18.7 (1.3)	12.6 (1.6)	17.3 (0.9)	17.7 (0.6)
Very little	2.2 (0.5)	1.3 (0.3)	2.2 (1.3)	1.4 (0.3)	1.8 (0.3)
None	1.0 (0.2)	0.9 (0.3)	0.4 (0.1)	0.3 (0.1)	0.7 (0.1)

Note: Entries are percentages with standard errors in parentheses.

Source: Questions 81, 82, 83.

health has caused them no concern over the past year, and almost one-third state that it has caused them hardly any concern. Eighty percent feel they have a great deal of control over their future health. Service differences in response to these items concerning general health status are minimal.

2. Health Practices

Good health is expected to be associated with positive health practices. To examine this relationship, we developed a health practices index consistent with that developed as part of the study of the physical health status of adult residents of Alameda County, California (Belloc and Breslow, 1972; Belloc, 1973; Breslow and Enstrom, 1980). That research examined the relationship between seven health practices and mortality rates to define behavioral criteria that dichotomized each of the practices as healthy or unhealthy. For instance, the smoking measure was dichotomized between those who had never smoked and those who had ever smoked because of the substantial difference in mortality rates among those two classes of persons. Their seven health practices included hours of sleep, eating breakfast, eating between meals, ideal weight, active exercise, drinking, and smoking.

The seven items included in the health practices index in this study are listed in Table 9.2. These items are roughly comparable to those used by Belloc and Breslow (1972), but the present survey did not collect information about eating between meals and, additionally, included an item on drug use. The criteria for the dichotomies are approximate to those in earlier studies. As shown in Table 9.2, 40 percent of military personnel meet the healthy behavior criterion for smoking, about one half meet the criterion for sleep, about two-thirds meet the criteria for alcohol use, exercise, and eating, and the majority meet the criterion for drug use and the weight standard. Except for smoking and sleep patterns, then, the majority of military personnel engage in healthy behaviors.

The Health Practice index was computed as the sum of the dichotomous (0,1) scores for each of the individual seven health practices and yielded a score ranging from 0 to 7. As shown in Table 9.2, military personnel are not likely to engage in all of the healthy behaviors. Only about 8 percent engaged in all seven behaviors, and an additional 23 percent engaged in six behaviors. Note that in this index score, each of the seven health practices is given equal weight, although they may have differential effects on overall health status and may be highly interrelated. The sum score, however, is a useful summary measure of health practices.

Table 9.2. Individual Health Practices and Scores on Health Practice Index

<u>Individual Practice</u>	<u>Percentage Meeting Criterion</u>	
Moderate alcohol use or less	62.5	(1.0)
No drug use in the past 12 months	85.8	(1.0)
Never smoked	40.8	(0.8)
Exercise twice a week or more	67.0	(1.1)
Eat two full meals a day at least 5 days a week	69.5	(1.0)
Sleep more than 6 consecutive hours a day at least 5 days a week	54.0	(1.0)
Meet Service's weight standard	92.9	(0.4)

<u>Scores on Health Practice Index</u>	<u>Percentage with Score</u>	<u>Cumulative Percentage</u>
0	0.04	0.04
1	0.55	0.59
2	3.02	3.61
3	11.73	15.34
4	23.48	38.82
5	30.15	68.97
6	23.09	92.07
7	7.94	100.00
Mean	4.73	

Note: Alcohol use (drinking levels) is defined in Figure 3.1. "Drug Use" is defined by responses to Question 77. "Never smoked" is a response to Question 18. "Exercise" is defined by responses to Questions 91a and 91c; "eating full meals" by responses to Question 91b; and "sleeping 6 hours" by responses to Question 91e. The weight standard question is 86. Each respondent was credited one point for each healthy behavior; the range of the resulting Health Practice Index, therefore, is 0 to 7. Standard errors are in parentheses.

Mean scores for the number of health practices engaged in by military personnel in the various pay grades and by Service are presented in Table 9.3. Overall, military personnel engaged in an average of 4.7 health practices during the past 12 months. Enlisted personnel had scores of 4.6 on the average, whereas officers had scores of 5.3 on average. Although these differences are small, officers are significantly more likely to engage in better health practices than enlisted personnel. Service differences are less substantial than the pay grade differences, but Navy personnel on the average engage in fewer health practices than personnel in the other Services.

Table 9.3. Health Practice Index Mean Scores for Pay Grades Within Service

Pay Grade	Service				Total DoD
	Army	Navy	Marine Corps	Air Force	
E1-E3	4.57 (0.1)	4.27 (0.1)	4.66 (0.1)	4.82 (0.1)	4.59 (0.1)
E4-E6	4.67 (-)	4.40 (0.1)	4.70 (0.1)	4.77 (0.1)	4.63 (-)
E7-E9	4.71 (-)	4.50 (0.1)	4.82 (0.1)	4.63 (0.1)	4.64 (-)
W1-W4	5.20 (-)	4.53 (0.1)	5.15 (0.1)	* (*)	5.10 (-)
O1-O2	5.38 (0.1)	5.22 (0.1)	5.38 (0.2)	5.61 (0.1)	5.45 (0.1)
O3	5.52 (0.1)	5.04 (0.2)	5.58 (0.2)	5.50 (0.1)	5.41 (0.1)
O4-O10	5.32 (0.1)	5.13 (0.1)	5.52 (0.1)	5.33 (-)	5.29 (-)
Total	4.75 (-)	4.46 (-)	4.76 (0.1)	4.90 (0.1)	4.73 (-)

Note: The seven individual behaviors comprising the Health Practice Index are defined in Table 9.2. Each respondent was credited one point for each healthy behavior; the range of the resulting Health Practice Index is 0 to 7. The data are Index means with standard errors in parentheses.

-Estimate rounds to zero.

*There are no warrant officers in the Air Force.

D. Health Practices and Substance Use

Health promotion programs are intended to improve health status, but they may also lower levels of substance use and abuse because such behaviors are inconsistent with a healthy lifestyle. Analyses described in this section

attempt to ascertain whether substance use and healthy lifestyles are indeed inconsistent and whether health promotion programs can result in decreased substance use.

The relationship between health practices and substance use is first examined in Table 9.4 which presents zero-order correlations between the frequency of use of alcohol, drugs, cigarettes, and coffee (caffeine) and the frequency of engaging in nine healthy behaviors. The behaviors include those from the health practices index as well as measures of work satisfaction and work activity and three measures of safe-driving practices. Overall the correlations are relatively low. Consistent with earlier research on "problem behaviors," there is some association among alcohol use, drug use, and cigarette use. However, coffee use is related only to cigarette use. The use of these substances is negatively related to healthy behaviors, as health promotion proponents would predict, but the correlations are generally lower than among the substances. Thus, healthy behaviors are associated with lower substance use involvement, but the relationships are not strong.

Substance use tends to be more highly related to certain risk behaviors such as driving unsafely or over the speed limit or not using seat belts than it is to healthy behaviors such as eating, sleeping, or exercise patterns (Table 9.4). This finding indicates that those who take risks are more likely to be substance users--especially if they are young. Both substance use and risk-taking behaviors are more likely among youth.

The relationship between health practices and substance use is further investigated in Table 9.5, which presents the average number of health practices for drinking levels, alcohol dependence, drug use, and cigarette smoking. Since the health practice index is comprised of substance use behaviors, the index was recomputed to avoid confounding the data reported in the table. Specifically, the index omitted the item that was being examined (e.g., drinking was omitted for the comparison of drinking levels, smoking for the comparison of cigarette use). Thus, the figures in Table 9.5 are scores from the modified index.

As shown in Table 9.5, for all indicators, substance users score lower on the (modified) Health Practice Index than do nonusers, and the number of positive health practices is lower among heavier than lighter users. Alcohol abstainers and nonsmokers have the highest number of positive health practices. These trends are apparent for the total DoD as well as each of the Services.

Table 9.4. Correlation Matrix for Health Practices and Substance Use

	Alcohol Use	Drug Use	Cigarette Use	Coffee Use	Exercise	Eat Regularly	Adequate Sleep	Proper Weight	Work Satis- faction	Work Activity	Drive Speed Limit	Drive Safely
Drug use	.25											
Cigarette use	.22	.11										
Coffee use	.07	-.05	.34									
Exercise	-.02	.03	-.11	-.10								
Eat regularly	-.02	.02	-.10	-.08	.21							
Adequate sleep	-.02	-.07	-.08	.02	-.13	-.06						
Proper weight	.02	-.02	-.01	-.03	-.07	-.07	-.03					
Work satisfaction	-.08	-.18	-.13	.04	.02	.06	.13	-.08				
Work activity	-.02	-.03	-.04	-.07	.34	.10	-.09	-.11	.12			
Drive speed limit	-.12	-.13	.03	.11	.05	.04	.02	-.03	.12	.05		
Drive safely	-.16	-.16	-.05	-.01	-.07	-.01	-.02	-.00	-.12	-.07	-.15	
Use seat belts	-.16	-.18	-.11	.08	-.01	.02	.09	-.02	.13	-.02	.29	-.02

Note: Entries are correlation coefficients.

Source: Questions 18, 22e, 23, 25, 26, 28, 29, 31, 52a-j, 84, 85, 86, 88, 91a-c, 91e, 92a-b.

Table 9.5. Modified Health Practice Index Scores and Substance Use

Item	Service				Total DoD
	Army	Navy	Marine Corps	Air Force	
<u>Drinking Levels</u>					
Abstainer	4.5 (0.1)	4.1 (0.1)	4.6 (0.1)	4.4 (0.1)	4.4 (-)
Infrequent/Light	4.3 (0.1)	4.0 (0.1)	4.5 (0.1)	4.3 (0.1)	4.2 (-)
Moderate	4.2 (0.1)	3.9 (0.1)	4.4 (0.1)	4.3 (0.1)	4.2 (-)
Moderate/Heavy	4.1 (0.1)	3.8 (0.1)	3.9 (0.1)	4.0 (0.1)	4.0 (-)
Heavy	3.6 (0.1)	3.5 (0.1)	4.1 (0.1)	3.7 (0.1)	3.6 (0.1)
<u>Alcohol Dependence</u>					
Dependent	3.5 (0.1)	3.1 (0.2)	3.4 (0.2)	3.2 (0.1)	3.4 (0.1)
Nondependent	4.2 (-)	3.9 (-)	4.3 (0.1)	4.3 (-)	4.2 (-)
<u>Drug Use Past 12 Months</u>					
Nonuse	4.0 (-)	3.7 (0.1)	4.0 (-)	4.0 (0.1)	3.9 (-)
Marijuana only	3.6 (0.1)	3.3 (0.1)	3.8 (0.4)	3.1 (0.1)	3.4 (0.1)
Any other use	3.3 (0.1)	3.4 (0.3)	3.1 (0.1)	3.6 (0.1)	3.4 (0.1)
<u>Cigarette Smoking Past 30 Days</u>					
Didn't smoke	4.6 (0.1)	4.4 (-)	4.4 (0.1)	4.7 (-)	4.6 (-)
About ½ pack/day	4.3 (0.1)	4.0 (0.1)	4.3 (0.1)	4.3 (0.1)	4.2 (-)
About 1 pack/day	4.2 (0.1)	3.9 (0.1)	4.1 (0.1)	4.1 (0.1)	4.1 (0.1)
1½ packs/day or more	4.0 (0.1)	3.6 (0.1)	4.0 (0.1)	3.8 (0.1)	3.8 (-)

Note: Drinking level is defined in Figure 3.1. Alcohol dependence is defined by responses to Questions 41c, e, f, i, and j. "Drug use" is defined by responses to Question 77. Cigarette smoking is defined by responses to Question 14. Since substance use measures were part of the Health Practice Index, the Index was recalculated without that measure for the data in this table (e.g., drinking was omitted from the index for the drinking level tabulation, smoking was omitted from the smoking tabulations, etc.) Thus, the index score for this table ranges from 0-6 rather than 0-7. The data are means for these variations of the Health Practice Index with standard errors in parentheses.

-Estimate rounds to zero.

Tables 9.4 and 9.5 show that health practices and substance use are negatively related. Although these relationships are not strong, this finding shows promise for the effectiveness of health promotion efforts in reducing substance use.

E. Health Practices, Substance Use and Illness

The relationship between substance use and health practices and three measures of illness--days hospitalized, number of doctor visits, and number of illnesses during the past 12 months--is presented in Table 9.6. As shown, substance users, particularly heavy users, and those who engage in fewer health practices were more likely to have experienced ill health within the past 12 months than others. Alcohol dependent persons and those who used drugs (except marijuana alone) were substantially more likely than others to become ill during the year. They experienced almost five illnesses on the average compared to much lower rates among other persons.

The number of doctor visits was particularly high among alcohol dependent persons, those who used drugs (except marijuana alone), those who smoked 1½ or more packs a day, and those who engaged in three or fewer positive health practices. The average number of doctor visits for those groups was greater than three. The number of doctor visits among heavy drinkers was also high, almost three within the past 12 months. Heavy drinkers, alcohol dependent persons, users of drugs (except marijuana alone), heavy smokers, and those engaging in three or fewer health practices were also more likely than others to be hospitalized during the year.

A direct causal link between substance use and health practices and illness is not suggested, although substance users and those with unhealthy lifestyles are, other things being equal, more likely to experience illness, doctor visits, and hospitalizations. Such illnesses may be a direct outgrowth of substance use or unhealthy lifestyles or may be indirectly related. Whatever the relationship, these analyses suggest that decreases in substance use and improvements in health practices can result in decreased illness and lost productivity associated with illness.

F. Summary and Conclusions

This chapter reviewed DoD health promotion programs, and examined the health practices of military personnel and the relationship of positive health practices to substance use and illness.

Table 9.6. Substance Use and Healthy Practices and Illness Scores

Substance/Responses	Days Hospitalized	Number of Doctor Visits	Number of Illnesses
<u>Drinking Levels</u>			
Abstainer	0.85 (0.2)	2.41 (0.2)	2.18 (0.2)
Infrequent/Light	0.77 (0.1)	2.60 (0.2)	2.31 (0.2)
Moderate	0.63 (0.1)	2.54 (0.1)	2.17 (0.2)
Moderate/Heavy	0.61 (0.1)	2.37 (0.1)	2.37 (0.2)
Heavy	1.03 (0.2)	2.97 (0.2)	3.85 (0.4)
<u>Alcohol Dependence</u>			
Nondependent	0.69 (0.1)	2.46 (0.1)	2.25 (0.1)
Dependent	1.20 (0.2)	3.63 (0.4)	4.92 (0.7)
<u>Drug Use Past 12 Months</u>			
Nonuse	0.64 (0.1)	2.46 (0.1)	2.20 (0.1)
Marijuana only	0.76 (0.2)	2.20 (0.2)	2.57 (0.3)
Any other drug use	1.56 (0.4)	3.61 (0.4)	4.96 (0.8)
<u>Cigarette Smoking Past 30 Days</u>			
Nonsmoker	0.64 (0.1)	2.41 (0.1)	2.28 (0.1)
½ pack/day or less	0.82 (0.2)	2.37 (0.1)	2.29 (0.2)
About 1 pack/day	0.68 (0.1)	2.56 (0.2)	2.56 (0.3)
1½ packs/day or more	0.99 (0.2)	3.16 (0.2)	3.11 (0.3)
<u>Healthy Practices Index Score</u>			
0-3	1.13 (0.2)	3.52 (0.3)	3.81 (0.4)
4	0.69 (0.1)	2.47 (0.1)	2.50 (0.2)
5	0.72 (0.1)	2.45 (0.1)	2.32 (0.1)
6-7	0.53 (0.1)	2.12 (0.1)	1.75 (0.1)
<u>Overall Mean</u>	0.73 (0.1)	2.54 (0.1)	2.45 (0.1)

Note: Data are mean scores for days hospitalized, number of doctor visits, and number of illnesses during the past 12 months with standard errors in parentheses. Drinking level is defined in Figure 3.1. Alcohol dependence is defined by responses to Questions 41c, e, f, i, and j. "Drug use" is defined by responses to Question 77. Cigarette smoking is defined by responses to Question 14. The seven individual healthy behaviors comprising the Health Practice Index are defined in the note on Table 9.2.

The three illness indicators are based on responses to Question 80.

1. DoD Health Promotion Policies and Programs

- The Department of Defense recently adopted a health promotion policy defined as "any combination of health education and related organizational, social, economic or health care interventions designed to facilitate behavioral and environmental alterations that will improve or protect health."
- The Services are to establish health promotion programs that include elements on smoking prevention and cessation, physical fitness, nutrition, stress management, alcohol and drug abuse prevention, and early identification of hypertension.

2. Health Status and Practices

- The vast majority of military personnel (95 percent) describe their health to be excellent, very good, or good and say their health has occasioned them little concern.
- Most military personnel engage in positive health practices; they average 4.7 of seven practices considered here; officers engage in a greater number of positive health practices than do enlisted personnel.

3. Health Practices, Substance Use, and Illness

- Substance use is negatively but weakly related to healthy behaviors. It is more strongly related to certain risk-taking behaviors such as not wearing seat belts.
- Substance users, particularly heavy users, engage in fewer positive health practices than nonusers.
- Substance users, particularly heavy users, and those who engage in fewer positive health practices report more illnesses, doctor visits, and days hospitalized within the past 12 months than nonusers.

These findings suggest that an emphasis on health promotion in the military can be effective in improving overall health status and decreasing substance abuse. The value of health promotion efforts is supported by the findings that personnel who are substance users or engage in fewer health practices have more frequent illnesses, and that substance users engage in fewer health practices.

Although these findings of positive effects of health promotion approaches are encouraging, the effectiveness of health promotion programs needs to be more completely evaluated. Current levels of health practices of military personnel provide a benchmark against which the impact of health promotion programs can be assessed as they are further implemented. Future Worldwide surveys can be used to track this progress at a general level, although in-depth studies of health status and health behaviors could provide more useful information.

Appendix A

Sampling Design

Appendix A

Sampling Design

A. Design Parameters

The key objectives of the study are identified and described in terms of,

- the population of inferential interest, defined in fully operational terms, and including any domains or subpopulations of major importance,
- the parameters or characteristics describing the population(s) that are of central concern, including descriptive, comparative, and relational parameters, and,
- the precision with which the parameters are required to be estimated.

With reference to the first point, the population of inferential interest to the 1985 Worldwide Survey is defined in terms of,

- all military personnel,
- excluding recruits and service academy cadets,
- who were on active duty status in August or September 1985,
- who were still in the military when scheduled for data collection during the period September through December 1985,
- except persons who were absent without leave at the time of data collection, and except persons who had a permanent change of station between the time the sample was selected (August) and the time of data collection.

The sampling design is based on estimating the 39 population parameters listed in Table A.1. The 1982 Worldwide Survey (Bray et al. 1983) provided initial estimates of the parameter values. Each parameter estimate was required by DoD to have a coefficient of variation of 0.05 or less.

B. First Stage Sampling Design

In the 1982 survey, the first stage frame was comprised of sampling units that were constructed of geographically proximal organizational units defined within each Service. In the 1985 survey, this frame was updated to account for organizational units that were inactivated, created, or moved in the interim. The 1985 first stage sampling units were constructed to have a minimum size determined using the rates at which 1982 sample persons

Table A.1. Population Parameters Used as the Basis
for the Sampling Design

Response Variable	Reporting Domain
Cannabis use during the preceding 30 days.	Army Navy Marine Corps Air Force E1-E4 01-03
Illicit drug use, other than cannabis, during the preceding 30 days.	Army Navy Marine Corps Air Force E1-E4
Alcohol use (average daily consumption of alcohol).	Army Navy Marine Corps Air Force E1-E4 E5-E6 E7-E9 W1-W4 01-03 04-06
Alcohol use (serious negative effects).	Army Navy Marine Corps Air Force E1-E4 E5-E6 E7-E9 01-03 04-06
Problem drinking.	Army Navy Marine Corps Air Force E1-E4 E5-E6 E7-E9 01-03 04-06

were available for group session questionnaire administrations. The minimum size of a sampling unit was set at 300 available sample persons. The construction of the first stage units (FSUs) varied in detail according to Service, as described below.

1. Construction of Army FSUs

The organizational unit used was the Army Location Code (ARLOC). The geographic identification available for ARLOCs identified the state, if the ARLOC was in the United States, or the country, otherwise.

The Army experienced an availability rate of .735 in the 1982 survey. Therefore, each FSU was required to have at least 409 active duty persons in order to meet the minimum size of 300 available persons.

FSUs were constructed using the following steps:

- a. Any unique ARLOC by State/country combination with at least 409 active duty persons was designated as a nucleus unit and, as such, constituted an FSU. All other ARLOC by State/country combinations were designated as satellite units.
- b. All satellite units that existed in 1982 were assigned to FSUs that contained their corresponding 1982 nucleus units.
- c. Satellite units that were not assigned to an FSU in Step b were assigned to an FSU located in their state or country.
- d. Satellite units not assigned in Steps b or c were located in states or countries that did not contain either nucleus units or assigned satellite units. These units were individually assigned to an FSU on the basis of geographic proximity.

The Army first stage frame consisted of 196 FSUs. It accounted for 770,647(99.2%) of the 776,762 active duty non-recruit personnel reported on the files received from the Army in April, 1985. The 6,115 persons not included on the frame had missing or unusable geographic identification.

2. Construction of Navy FSUs

The organizational unit used was the Unit Identification Code (UIC). The Geographic Location Code (GLC) available for UICs identified home port, county and state, if the UIC was based in the United States, or home port and country, if the UIC was foreign based.

FSUs were constructed as follows:

- a. UICs were first combined by GLC. Individual UICs were classified as either ashore or afloat and the quantity,

effective size = $0.63 [\text{ashore personnel}] + 0.25 [\text{afloat personnel}]$,

was computed. UIC-GLC combinations with an effective size of at least 300 persons constituted a 'nucleus place'.
- b. Nucleus place GLC codes were matched to the 1982 Navy frame and all the FSU codes associated with the 102 1985 nucleus places were retrieved. Each of the 129 distinct combinations of a 1985 nucleus place GLC code and a 1982 FSU code formed the core of a 1985 first stage unit.
- c. UICs not in the defined nucleus places were linked to the 129 established core units by a multi-step matching process incorporating the geographic codes and 1982 FSU codes. Any UICs not matched to a 1985 first stage unit core by this process were linked individually by a manual process to the most appropriate core unit. Following the initial assignment of UICs to the first stage units, summary listings were made showing the geographic composition of each defined FSU. These listings were reviewed and revisions of UIC FSU assignments were made as necessary to achieve reasonable geographic aggregations. Effective size measure sums were obtained for the resultant FSUs to certify that none of the units were so large as to be selected more than twice, given the planned sample allocations.

The Navy first stage frame consisted of 129 FSUs. It accounted for 559,304 (98.8%) of the 565,901 active duty non-recruit personnel reported on the files received from the Navy in April, 1985. The 6,597 personnel not included on the frame had missing or unusable GLC.

3. Construction of Marine Corps FSUs

The organizational units used were specified jointly by Monitor Command Codes (MCCs) and Reporting Unit Codes (RUCs). The geographic identification available for MCC-RUC combinations identified the state and county if the MCC-RUC was in the United States, or the country, otherwise.

The Marine Corps experienced an availability rate of 0.700 in the 1982 survey. Therefore, each FSU was required to have at least 429 active duty persons in order to meet the minimum size of 300 available persons.

First stage units were constructed as follows:

- a. If in 1982 a state, country, or oceanic area had all (or almost all) of its units in one FSU, all of its 1985 units were assigned to the corresponding FSU.

- b. If a state was not represented in 1982 but was in 1985, its units were assigned to an FSU associated with an adjoining state.
- c. If a state, country, or oceanic area was materially involved in more than one FSU in 1982, its units associated with any of those FSUs were assigned to the corresponding 1985 FSU.
- d. In each state in that category, a new unit that could not be assigned an FSU number based on its MCC was assigned either to an FSU that in 1982 had included a sizeable proportion of the units for that country, or to the state's residual FSU for counties with few marines.
- e. Units in newly-represented Central and South American countries were assigned to the 1982 FSU corresponding to the one used for those countries in 1982.
- f. Units in Australia, New Zealand, and the Indian Ocean were assigned to the FSU in the Philippines.
- g. Because of the scattered distribution of small numbers of Marines in the European region, no first stage units were constructed. Instead, MCCs/RUCs in Europe were associated with each of the nine Navy first stage units in Europe and the sample selected coincidentally with the Navy sample.

The Marine Corps frame consisted of 45 FSUs. It accounts for 188,630 (96.4%) of the 195,792 active duty non-recruit personnel reported on the files received from the Marine Corps in March, 1985. The 7,162 persons not included on the frame were excluded because of missing or incomplete geographic information.

4. Construction of Air Force FSUs

The organizational units used to construct first stage sampling units were Consolidated Base Personnel Offices (CBPOs) at specified geographic locations identified by state or country accordingly as the CBPO is located in the United States or is foreign based.

The Air Force experienced an availability rate of .727 in the 1982 survey. Therefore, each FSU was required to have at least 413 active duty persons in order to meet the minimum size of 300 available persons.

First stage units were constructed as follows:

- a. Any unique CBPO by State-Country combinations with at least 413 active duty persons was designated as a nucleus unit and, as such, constituted an FSU. All other CBPO by State-Country combinations were designated as satellite units.

- b. All satellite units that existed in 1982 were assigned to FSUs that contained their corresponding 1982 nucleus units.
- c. Satellite units that were not assigned to an FSU in Step 2 were assigned an FSU located in their state or country.
- d. Satellite units not assigned in Steps 2 or 3 were located in states or countries that did not contain either nucleus units or assigned satellite units. These units were individually assigned to FSU on the basis of geographically proximity.
- e. All FSU assignments were scanned for geographic proximity. If it was judged sensible to move a satellite unit into a different FSU, this was done.

A total of 128 first stage units comprised the Air Force component of the sampling frame. The frame completely accounted for all active duty personnel, less recruits and academy cadets, as of March, 1985.

5. Total DoD FSU Summary

Overall, the total DoD first stage frame consisted of 498 sampling units averaging 4,228 active duty 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 of the domains listed in Table A.1 and the costs of data collection and processing in the different geographic regions. The allocation of the first stage sample to the strata imposed on the frame is shown in Table A.2. Details of the sample allocation are given in Section E.

It should perhaps be noted that the geographic regions were constructed more on the basis of cost considerations than geographic principles. Geographers might object, for example, to the placing of Iceland in the Americas and North Africa in Europe.

C. Second Stage Sampling Design

The second stage design is more easily understood if the schedule followed in selecting the sample versus identifying sample persons is first explained. The sample was selected based on personnel counts current in March or April, 1985. Identification of the sample persons selected, on the other hand, took place some six months later, in August and September. While no organizational units were added or subtracted in the intervening period, the number of personnel (and, indeed, the individuals) in the sample organizational units did change.

Table A.2. Allocation of the 1985 Sample

Region	Service	Total Number of First Stage Sampling Units	First Stage Sample Size	Second Stage Sample Size (targetted)
Americas	Army	75	13	5,096
	Navy	106	9	3,798
	Marine Corps	39	4	1,556
	Air Force	93	11	4,356
	Total	313	37	14,806
North Pacific	Army	18	2	942
	Navy	5	2	816
	Marine Corps	3	2	894
	Air Force	5	2	782
	Total	31	8	3,434
Other Pacific	Army	4	2	942
	Navy	9	2	816
	Marine Corps	3	2	896
	Air Force	3	2	786
	Total	19	8	3,440
Europe	Army	99	6	2,478
	Navy	9	2	740
	Marine Corps ^a	0	0	58
	Air Force	27	2	796
	Total	135	10	4,014
Total Worldwide	Army	196	23	9,458
	Navy	129	15	6,170
	Marine Corps	45	8	3,346
	Air Force	128	17	6,720
	Total	498	63	25,752

^aMarine Corps personnel in Europe were classified into Navy first stage units.

At the time the second stage sample was selected, a roster could have been prepared that listed the active duty personnel in each organizational unit for each of the organizational units sampled at the first stage. Personnel could be listed in any convenient order and the lines on the roster could be numbered one, two, through M, the total number of persons on the list. A sample line selected at this time would correspond to a person.

A roster prepared seven months later for the same organizational units will likely contain either more or fewer lines than the earlier list. If the organizational unit has decreased in size, some of the line numbers on the first roster will not correspond to any name on the new roster. If the organizational unit has increased in size, the lines on the new roster can be numbered,

$$1, 2, \dots, M, M+1, M+2, \dots, 2M, \dots, M^*,$$

where

$$M^* = \text{the total number of persons on the new roster.}$$

If the value, M, is subtracted from the line numbers between M+1 and 2M, the value 2M from the line numbers between 2M+1 and 3M, and so on through M*, the line numbers on the original roster can be made to correspond with one or more line numbers on the new roster.

In this way, the line numbers on the original roster can be made to correspond to clusters of zero, one, two or possibly more persons on the new roster, thereby accommodating any changes in the personnel complement of an organizational unit. Probability assignments and randomization procedures were applied to the implied clusters of persons to select the (second stage) sample.

Accordingly, second stage sampling units were clusters of active duty personnel in August and September 1985. The number of clusters assigned to a sample first stage unit was determined as the number of persons in each of the organizational units making up the first stage unit in March or April 1985. Persons in each cluster were identified using the procedure described above.

The second stage frame was stratified by pay grade group, using the groups defined by the pay grades E1-E4, E5-E6, E7-E9, W1-W4 (excepting the Air Force which does not have warrant officer grades), 01-03 and 04-010.

The second stage sample was allocated to the strata within each first stage unit to provide a self-weighting sample at the level of pay grade groups within first stage strata, as closely as the actual numbers involved would permit.

D. Nonresponse Subsample

Nonresponse is registered whenever the information needed to compute an estimate, $\hat{P}(d)$, for reporting domain (d), is not obtained for an individual 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 sample estimate.

Using the above definition of response rate, the nonresponse bias associated with the parameter estimate, $\hat{P}(d)$, 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,
and,

$P(d)_N$ = the value of the proportion in the nonresponding population.

This equation clearly demonstrates that the magnitude of the bias depends on both the response rate and the differences between the responding and non-responding populations.

The purpose of the nonresponse (or phase two) subsample is to provide estimates of the parameter, $P(d)_N$, such that the biases can be removed from the estimate, $\hat{P}(d)$. In determining subsample allocations, this bias was estimated given an expected response rate to the initial (phase one) sample. The resulting subsampling fractions for enlisted pay grades (E1-E9) are shown in Table A.3. All warrant and commissioned officers who did not respond to the phase one sample were included in the nonresponse subsample.

E. Sample Allocation and Selection

1. Allocation of the Sample

The allocation problem can be stated in terms of determining,

- the number of second stage units to be selected per first stage unit,

Table A.3. Nonresponse Subsampling Fractions for Enlisted Personnel¹

Region	Service	Subsampling Fraction
Americas	Army	.33
	Navy	.90
	Marine Corps	.50
	Air Force	.50
North Pacific	Army	.33
	Navy	.75
	Marine Corps	.50
	Air Force	.50
Other Pacific	Army	.33
	Navy	.80
	Marine Corps	.55
	Air Force	.60
Europe	Army	.40
	Navy	.85
	Marine Corps	1.00
	Air Force	.80

¹All warrant and commissioned officers who were selected into, but did not respond to, the phase one sample were included in the nonresponse subsample.

- the number of first stage units to be selected,
- the number of nonrespondents to be included in the phase two subsample, and,
- the allocation of each to the first and second stage design strata, such that,
- the precision requirements set for the survey are met,
- for the least cost.

Equations were developed to describe the variable survey cost and sampling variances in terms of the various features of the design, the first and second stage sample sizes and the nonresponse subsampling fraction. The minimum cost allocations were then obtained by solving the equations simultaneously subject to the precision constraints.

A total first stage sample of 65 FSUs was allocated to the Services within geographic cost strata. Pay grade groups were disproportionately sampled. The officer grades were generally oversampled relative to the enlisted grades, reflecting the generally smaller drug and alcohol use domains in the former (thereby requiring a larger sample size for comparable levels of precision).

The solutions obtained following the procedures described in this section are real numbers. Since decimal fractions of sampling units cannot be selected, the solutions were rounded to whole numbers. Further, since variances are not estimable if fewer than two first stage units are selected in any first stage stratum, solutions rounding to less than this number were set to two.

The allocation of two first stage units to the Marine Corps in Europe was problematic¹ because of the few Marines (less than 2%) stationed there. Therefore, these personnel were associated with each of the nine Navy FSUs in Europe. This association was based on geographic proximity and the proportion of Marines within each FSU. The latter requirement was imposed to reduce the potentially large unequal weighting effects that could otherwise result from selecting Marines proportional to the distribution of Navy personnel.

The second stage sample allocations of Marines in Europe were proportional to the worldwide distribution of Marines. As a result, less than 2% of Marine Corps sample was allocated to Europe.

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 first stage unit. Notationally, denote by,

$$a = 1, 2, \dots, 15$$

the first stage strata. First stage sampling units listed in the frame are identified by the subscript,

$$i = 1, 2, \dots, N_1(a),$$

and in the sample by,

$$i = 1, 2, \dots, n_1(a).$$

The range of the subscript differentiates between units in the frame and units in the sample. The total first stage units 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,

$$b = 1, 2, \dots, 6.$$

Second stage units in each of the pay grade strata are identified by the subscript,

$$k = 1, 2, \dots, N_2(a, i, b),$$

denoting units in the second stage frame, or by,

$$k = 1, 2, \dots, n_2(a, i, b)$$

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 composite size measures, the objective is to make equal, for specified values of the a-subscript and the b-subscript, the expected frequencies with which second stage units 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 first stage unit from the a -th stratum in samples of size, $n_1(a)$, and,

$\pi(k!a,i,b)$ = the expected frequency of selecting the k -th second stage unit from the b -th pay grade stratum conditionally on the selection of the i -th first stage unit given the second stage sample sizes.

The value,

$$\pi(a,i) = n_1(a) \frac{S(a,i)}{S(a)},$$

where,

$S(a,i)$ = the size of the i -th first stage unit in the a -th stratum, and,

$$S(a) = \sum_{i=1}^{N_1(a)} S(a,i)$$

and the value,

$$\pi(k!a,i,b) = \frac{n_2(a,i,b)}{N_2(a,i,b)}, \quad k=1, 2, \dots, N_2(a,i,b).$$

Computing the composite size measures is equivalent to finding values,

$S(a,i)$ and $n_2(a,i,b)$, such that,

$$\begin{aligned} \pi(a,i,b,k) &= \pi(a,i) \pi(k!a,i,b) \\ &= K(a,b), \end{aligned}$$

a constant within values of the a -subscript and the b -subscript. The solutions are given by,

$$S(a,i) = \sum_{b=1}^6 f(a,b) N_2(a,i,b),$$

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 to be 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 targetted second stage sample sizes.

With reference to the values, $f(a,b)$, second stage units were allocated via the cost and variance equations to the pay grade group strata.

Given the values,

$S(a,i)$, $i = 1, 2, \dots, N_1(a)$,

$a = 1, 2, \dots, 15$,

and the stratum allocations in Table A.2, the first stage sample was selected with probability proportional to composite size and with minimum replacement (Chromy, 1979). The second stage sample sizes, $n_2(a,i,b)$, were then computed, and the second stage sample was selected with equal probability and without replacement. The distribution of the second stage sample is shown in Table A.4.

A total of 63 first stage units and 25,235 second stage units were selected in this manner. Marine Corps MCCs/RUCs in Europe were grouped by inspection with Navy first stage units. An additional 57 Marine Corps second stage units were selected from within the sampled Navy first stage units, with equal probability and without replacement from within the affected MCCs/RUCs.

Details of the weighting and estimation procedures are discussed in Appendix B.

Table A.4 Distribution of the Second Stage Sample

Region/Service	First Stage Unit	Second Stage Sample Size ¹						Total
		E1-E4	E5-E6	E7-E9	W1-W4	01-03	04-010	
<u>Americas</u>								
Army	001	72	114	114	27	27	38	392
	007	72	114	114	27	27	38	392
	024	72	114	114	27	27	38	392
	030	72	114	114	27	27	38	392
	033	72	114	114	27	27	38	392
	035	72	114	114	27	27	38	392
	053	72	114	114	27	27	38	392
	054	72	114	114	27	27	38	392
	057	72	114	114	27	27	38	392
	058	72	114	114	27	27	38	392
	061	72	114	114	27	27	38	392
	067	72	114	114	27	27	38	392
	074	72	114	114	27	27	38	392
			936	1,482	1,482	351	351	494
Navy	023	78	123	123	19	29	40	412
	025	78	123	123	29	29	40	422
	026	78	123	123	29	29	40	422
	027	78	123	123	29	29	40	422
	034	78	123	123	23	29	40	416
	055	78	123	123	23	29	40	422
	081	78	123	123	29	29	40	422
	094	78	123	123	29	29	40	422
	100	78	123	123	29	29	40	422
		702	1,107	1,107	239	261	360	3,776
Marine Corps	257	95	105	105	28	28	28	389
	338	95	105	105	28	28	28	389
	628	95	105	75	2	28	24	329
	905	95	105	105	28	28	28	389
	380	420	390	86	112	108	1,496	
Air Force	002	79	115	115	-	33	54	396
	005	79	115	115	-	33	54	396
	006	79	115	115	-	33	54	396
	020	79	115	115	-	33	54	396
	027	79	115	115	-	33	54	396
	047	79	115	115	-	33	54	396
	063	79	115	115	-	33	54	396
	068	79	115	115	-	33	54	396
	079	79	115	115	-	33	54	396
	083	79	115	115	-	33	54	396
	128	79	115	46	-	33	54	327
		869	1,265	1,196		363	594	4,287
Total		2,887	4,274	4,175	676	1,087	1,556	14,655

Table A.4. Distribution of the Second Stage Sample (cont.)

Region/Service	First Stage Unit	Second Stage Sample Size ¹						Total
		E1-E4	E5-E6	E7-E9	W1-W4	01-03	04-010	
<u>North Pacific</u>								
Army	080	83	134	134	33	33	48	465
	084	83	134	134	33	33	12	429
		<u>166</u>	<u>268</u>	<u>268</u>	<u>66</u>	<u>66</u>	<u>60</u>	<u>894</u>
Navy	107	89	133	111	16	23	29	401
	111	89	133	111	23	23	29	408
		<u>178</u>	<u>266</u>	<u>222</u>	<u>39</u>	<u>46</u>	<u>58</u>	<u>809</u>
Marine Corps	309	116	126	116	28	28	33	447
	929	116	126	116	28	28	33	447
		<u>232</u>	<u>252</u>	<u>232</u>	<u>56</u>	<u>56</u>	<u>66</u>	<u>894</u>
Air Force	116	79	131	110	-	38	33	391
	118	79	131	110	-	38	33	391
		<u>158</u>	<u>262</u>	<u>220</u>		<u>76</u>	<u>66</u>	<u>782</u>
Total		734	1,048	942	161	244	250	3,379
<u>Other Pacific</u>								
Army	094	83	134	134	33	33	54	471
	095	83	134	134	33	33	54	471
		<u>166</u>	<u>268</u>	<u>268</u>	<u>66</u>	<u>66</u>	<u>108</u>	<u>942</u>
Navy	118	89	133	111	23	23	29	408
	120	89	133	111	22	23	29	407
		<u>178</u>	<u>266</u>	<u>222</u>	<u>45</u>	<u>46</u>	<u>58</u>	<u>815</u>
Marine Corps	064	116	127	116	28	28	33	448
	588	116	127	90	10	28	31	402
		<u>232</u>	<u>254</u>	<u>206</u>	<u>38</u>	<u>56</u>	<u>64</u>	<u>850</u>
Air Force	111	79	132	111	-	38	33	393
	112	79	132	111	-	38	33	393
		<u>158</u>	<u>264</u>	<u>222</u>		<u>76</u>	<u>66</u>	<u>786</u>
Total		734	1,052	918	149	244	296	3,393

Table A.4. Distribution of the Second Stage Sample (cont.)

Region/Service	First Stage Unit	Second Stage Sample Size ¹						Total
		E1-E4	E5-E6	E7-E9	W1-W4	01-03	04-010	
<u>Europe</u>								
Army	100	78	119	46	5	27	3	278
	135	78	119	119	27	27	43	413
	136	78	119	119	27	27	43	413
	137	78	119	119	27	27	43	413
	190	78	119	92	14	27	17	347
	196	78	119	119	27	27	43	413
		<u>468</u>	<u>714</u>	<u>614</u>	<u>127</u>	<u>162</u>	<u>192</u>	<u>2,277</u>
Navy	126	84	145	84	12	17	23	365
	129	84	145	84	17	17	23	370
		<u>168</u>	<u>290</u>	<u>168</u>	<u>29</u>	<u>34</u>	<u>46</u>	<u>735</u>
Marine Corps	126 ²	7	13	9	1	1	4	35
	129 ²	12	4	2	-	2	2	22
		<u>19</u>	<u>17</u>	<u>11</u>	<u>1</u>	<u>3</u>	<u>6</u>	<u>57</u>
Air Force	092	79	121	105	-	33	60	398
	093	79	121	105	-	33	60	398
		<u>158</u>	<u>242</u>	<u>210</u>		<u>66</u>	<u>120</u>	<u>796</u>
Total		813	1,263	1,003	157	265	364	3,865
<u>Worldwide</u>								
Army		1,736	2,732	2,632	610	645	854	9,209
Navy		1,226	1,929	1,719	352	387	522	6,135
Marine Corps		863	943	839	181	227	244	3,297
Air Force		1,343	2,033	1,848	-	581	846	6,651
Total		5,168	7,637	7,038	1,143	1,840	2,466	25,292

¹A dash in any column indicates the pay grade group was not represented in the population at the first stage unit.

²Navy first stage units.

APPENDIX B

Sample Weighting and Estimation Procedures

Appendix B

Sample Weighting and Estimation Procedures

This appendix is composed of three sections. The first section describes the computation of the weights used for analysis. Next, the estimation of different statistics and their associated sampling variances is discussed. Finally, a description of the computer software used to produce the estimates in this report is presented.

A. Sampling Weights

Sampling weights were constructed to reflect the design used for the collection of the data. The weights are needed to compute unbiased linear statistics, at least in the absence of nonsampling errors. The sampling weight is the inverse of the expected frequency of selection of units into samples of specified size. Post-stratification and weighting class adjustments are made to control bias introduced by undercoverage and nonresponse. This section describes the procedure used to calculate the final analysis weights. It builds on the notation used in Appendix A. A general discussion of weighting procedures is given in Cox and Cohen (1985).

In Appendix A, the quantities

$\pi(h,i,j,k)$ = the expected frequency with which the k-th second stage unit (person) was selected within the j-th pay grade groups, i-th first stage unit, and h-th first stage stratum, given the first and second stage sample sizes used,

were defined. The sampling weights are the inverses of these quantities,

$$w(h,i,j,k) = [\pi(h,i,j,k)]^{-1}$$

The sum of the quantities, $\sum_{h,i,j,k} w(h,i,j,k)$, provides an estimate

of the total number of military personnel, excluding recruits and service cadets, in the military at the time of data collection. The sum of these weights, however, overestimated the number of personnel in the Navy. Post-stratification ratio adjustments were made to force the estimates to agree with the September 30, 1985 Department of Defense figures, within classes defined by service, region, and paygrade group.

Not everyone responded to the survey. Therefore, a subsample of those not responding was selected into the nonresponse (phase II) subsample. The subsampling fractions are given in Table A.3. Not everyone selected for the phase II subsample responded. For those persons who did respond, a weighting class adjustment was made such that the sum of the weights of these phase II respondents equals the sum of the weights of the phase I nonrespondents. The adjustments were made within classes defined by the h -th first-stage stratum, i -th first stage unit, and j -th paygrade group.

A distinction is made between sampling weights and analysis weights. The latter and the former are identical in the absence of nonresponse and other adjustments. The final analysis weight is denoted by $w_f(h,i,j,k)$.

Questionnaire data were collected only from those respondents who were eligible for the survey. The total number of eligible persons is estimated by summing the analysis weights over all persons completing a questionnaire. Note that the number of eligible persons is generally less than the total number of persons in the military. Table B.1 gives comparison by service and paygrade group of the total personnel in the military and the estimated number of persons who were eligible for the survey. Estimates in the report are based on counts of the estimated eligible personnel.

Table B.1 Comparison of Total Personnel and Eligible Personnel

Pay Grade	Service									
	Army		Navy		Marine Corps		Air Force		Total DoD	
	Total Personnel	Estimated Eligible Personnel	Total Personnel	Estimated Eligible Personnel	Total Personnel	Estimated Eligible Personnel	Total Personnel	Estimated Eligible Personnel	Total Personnel	Estimated Eligible Personnel
E1-E4	390,108	294,753 (30,824)	267,516	204,987 (35,383)	123,297	100,082 (16,436)	267,929	233,580 (31,220)	1,048,850	833,403 (58,748)
E5-E6	204,145	170,989 (8,868)	181,191	143,828 (12,224)	40,296	33,160 (2,768)	168,429	145,398 (9,230)	594,061	493,376 (17,890)
E7-E9	72,304	62,486 (4,081)	46,737	38,552 (3,514)	14,257	10,850 (1,105)	52,245	42,612 (2,988)	185,543	154,499 (6,259)
W1-W4	15,584	12,463 (2,318)	3,161	2,343 (345)	1,461	1,220 (383)	0	0 (0)	20,206	16,026 (2,375)
O1-O3	60,793	49,723 (3,419)	42,645	31,327 (3,250)	13,327	9,418 (1,962)	69,991	61,353 (15,136)	186,756	151,822 (15,975)
O4-O10	33,310	27,053 (5,227)	24,851	18,396 (2,140)	5,387	4,900 (1,493)	38,409	33,032 (8,648)	101,957	83,381 (10,465)
Total	776,244	617,467 (32,002)	566,101	439,433 (50,295)	198,025	159,630 (16,219)	597,003	515,976 (27,942)	2,137,373	1,732,507 (67,794)

Note: Total personnel is the number of persons, excluding cadets, midshipmen, and recruits who were on active duty as of September 30, 1985. 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.

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 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 domain parameters is also discussed, but the estimation of regression coefficients, a multivariate extension of the Taylor series linearizations for ratios, is not described.

1. Estimate of Population Totals

Let $w_f(h,i,j,k)$ 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_c , with the value of, c , identifying a particular response variable. The values obtained for the response variables are denoted by, y_c .

A population total is estimated by the quantity,

$$\hat{T}_c(h,i) = \sum_{h=1}^{15} n_1(h) \sum_{i=1}^6 n_2(h,i,j) w_f(h,i,j,k) y_c(h,i,j,k). \quad (1)$$

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,

$$\hat{T}_c(h,i) = \sum_{j=1}^6 \sum_{k=1}^{n_2(h,i,j)} w_f(h,i,j,k) y_c(h,i,j,k) \quad (2)$$

Then equation (1) can be rewritten as,

$$\hat{T}_c = \sum_{h=1}^{15} \frac{n_1(h)}{\sum_{i=1}^{n_1(h)} 1} \hat{T}_c(h,i) ,$$

and the sampling variance, assuming sampling with replacement at the first stage of the design, is estimated by,

$$\hat{\text{Var}}\{\hat{T}_c\} = \sum_{h=1}^{15} \frac{n_1(h)}{n_1(h)-1} \frac{n_1(h)}{\sum_{i=1}^{n_1(h)} 1} [\hat{T}_c(h,i) - A_c(h)]^2 \quad (3)$$

where,

$$A_c(h) = \frac{1}{n_1(h)} \sum_{i=1}^{n_1(h)} \hat{T}_c(h,i) .$$

2. Estimates of Population Proportions

Estimates of population proportions take the form of (combined) ratio estimates, denoted in general by,

$$\hat{R}_c = \frac{\hat{T}_c}{\hat{T}_{c'}} , \quad c \neq c' .$$

The numerator and denominator totals are individually estimated as described above. 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,

$$z_c(h,i,j,k) = y_c(h,i,j,k) - \hat{R}_c y_{c'}(h,i,j,k) \quad (4)$$

is computed and used in place of the y_c -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 of interest can be denoted by the indicator variable,

$$\begin{aligned} \delta(h,i,j,k) &= 1, \text{ if the } k\text{-th sample individual (in the } j\text{-th pay grade} \\ &\quad \text{group, } i\text{-th first stage unit and } h\text{-th first stage stratum)} \\ &\quad \text{is a member of the domain,} \\ &= 0, \text{ otherwise.} \end{aligned}$$

Obviously, the products, $\delta(h,i,j,k) y_c(h,i,j,k)$, when substituted for the y_c -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,

$$\text{Var}\{\hat{\theta}_1 - \hat{\theta}_2\} = \text{Var}\{\hat{\theta}_1\} + \text{Var}\{\hat{\theta}_2\} - 2 \text{Cov}\{\hat{\theta}_1, \hat{\theta}_2\},$$

where, $\hat{\theta}_1$ and $\hat{\theta}_2$ denote the two domain estimates. In terms of the previous formulas, the first stage level differences,

$$\begin{aligned} \hat{D}_c(h,i) &= \hat{T}_{c,1}(h,i) - \hat{T}_{c,2}(h,i), \quad i = 1, 2, \dots, n_1(h), \\ &\quad h = 1, 2, \dots, 15, \end{aligned}$$

can be computed and used in equation (3), noting that,

$$A_c(h) = \frac{1}{n_1(h)} \sum_{i=1}^{n_1(h)} \hat{D}_c(h,i),$$

to estimate the variance of the difference. Except as the necessary distributional assumptions may not apply, the quasi Student's t statistic,

$$t^* = \frac{\hat{\theta}_1 - \hat{\theta}_2}{[\text{Var}\{\hat{\theta}_1 - \hat{\theta}_2\}]^{1/2}},$$

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 most of the popular statistical software packages (e.g., SAS, SPSS, BMD) do not contain procedures for properly estimating the variance of survey statistics (e.g., means, ratios, totals, proportions, regression coefficients) obtained from a complex sample survey such as this. The analytical procedures in these packages assume that the data come from simple random samples. 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, 1981b), which RTI has implemented as part of SAS (SAS Institute, 1982), 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 SURREG, a linear regression package designed to appropriately estimate coefficients and their standard errors using data from a complex sample design (Holt, 1982). SURREG 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 SURREG 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). The Taylor linearization method utilized by SURREG 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 duty worldwide. Samples of 17,300 such military personnel clustered in 58 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 alcohol and drug use questionnaire.

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 5.1 shows that 13.4 percent of the military personnel in the 1985 sample reported having consumed no beverage alcohol in the past 30 days with a standard error of .6 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 12.2 percent and 14.6 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 1982 and 1985 in the percentages of all military personnel who are classified as heavy drinkers is estimated to be 2.1 percent (Table 5.1), and the 95 percent confidence limits for that difference have been computed to be ± 2.3 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 2.3 percent below the estimated difference and 2.3 percent above it. Since that range includes zero difference between the two years, it can be seen that at the 95 percent level the estimated difference is not significantly different from zero, or just "not significant." If the interval had been smaller, say ± 0.5 percent, the difference would have been "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, there are other factors 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 a confidence interval. This factor will be only three-fifths as large for 10 percent or 90 percent as 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 based on a simple random sample. In order to have the same confidence interval, 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

Selected Supplementary Tables

Table D.1. Frequency of Consuming Eight or More Cans, Bottles or Glasses of Beer in a Single Day During the Past 12 Months

Pay Grade/Frequency	Service				Total DoD
	Army	Navy	Marine Corps	Air Force	
E1-E3					
5-7 days a week	5.1 (1.3)	3.6 (1.7)	3.3 (0.7)	1.9 (0.7)	3.5 (0.6)
3-4 days a week	12.8 (3.6)	10.9 (3.3)	7.4 (3.2)	4.7 (1.0)	9.2 (1.6)
1-2 days a week	10.4 (1.9)	12.5 (2.9)	15.1 (1.8)	7.8 (1.3)	10.9 (1.1)
1-3 days a month	16.3 (1.7)	16.4 (1.9)	29.4 (4.0)	18.2 (2.8)	18.9 (1.4)
Less than monthly	25.3 (4.4)	29.7 (1.5)	18.9 (2.2)	29.4 (2.4)	26.6 (1.7)
Never	30.1 (3.1)	26.8 (3.9)	25.9 (7.5)	38.0 (2.8)	31.0 (2.2)
E4-E6					
5-7 days a week	3.7 (1.2)	2.1 (0.9)	1.9 (1.2)	0.8 (0.3)	2.3 (0.5)
3-4 days a week	4.3 (0.5)	6.5 (1.0)	4.2 (0.8)	2.4 (0.6)	4.4 (0.4)
1-2 days a week	8.0 (0.8)	9.1 (1.7)	7.2 (1.9)	4.7 (0.8)	7.3 (0.6)
1-3 days a month	14.7 (1.3)	16.1 (1.7)	17.5 (2.6)	12.7 (1.4)	14.7 (0.8)
Less than monthly	26.4 (0.8)	27.7 (1.4)	28.4 (4.4)	25.2 (1.1)	26.6 (0.7)
Never	42.8 (1.4)	38.5 (2.4)	40.8 (6.4)	54.2 (1.8)	44.7 (1.2)
E7-E9					
5-7 days a week	1.3 (0.5)	0.8 (0.2)	1.3 (0.4)	0.5 (0.2)	0.9 (0.2)
3-4 days a week	1.4 (0.4)	1.1 (0.3)	1.5 (0.7)	0.9 (0.4)	1.2 (0.2)
1-2 days a week	3.3 (0.4)	3.6 (0.6)	2.5 (0.1)	1.8 (0.3)	2.9 (0.2)
1-3 days a month	9.0 (0.9)	9.1 (1.3)	7.0 (2.2)	8.4 (0.8)	8.7 (0.6)
Less than monthly	24.9 (2.1)	28.6 (1.3)	24.3 (2.1)	19.9 (1.3)	24.4 (1.0)
Never	60.0 (1.6)	56.7 (1.4)	63.4 (3.5)	68.5 (1.2)	61.8 (0.9)
W1-W4					
5-7 days a week	0.1 (0.1)	0.3 (0.3)	1.1 (1.2)	* (*)	0.2 (0.1)
3-4 days a week	0.0 (**)	1.8 (1.0)	1.2 (1.0)	* (*)	0.4 (0.2)
1-2 days a week	2.1 (0.8)	3.5 (1.2)	0.0 (**)	* (*)	2.1 (0.7)
1-3 days a month	11.5 (2.5)	9.8 (2.9)	18.5 (4.4)	* (*)	11.8 (2.0)
Less than monthly	23.0 (2.9)	24.7 (1.7)	21.3 (4.9)	* (*)	22.1 (2.3)
Never	63.4 (2.0)	59.8 (3.3)	57.8 (2.5)	* (*)	62.4 (1.7)
O1-O2					
5-7 days a week	0.1 (0.1)	0.0 (**)	0.0 (**)	0.0 (**)	0.0 (**)
3-4 days a week	2.3 (1.1)	0.0 (**)	0.0 (**)	0.0 (**)	0.7 (0.4)
1-2 days a week	2.2 (1.2)	3.9 (1.6)	6.8 (1.8)	1.6 (1.0)	2.6 (0.7)
1-3 days a month	19.1 (4.5)	8.7 (3.9)	19.5 (3.9)	5.0 (1.0)	11.1 (2.0)
Less than monthly	22.5 (2.9)	27.1 (4.1)	23.0 (3.7)	21.1 (4.6)	22.8 (2.4)
Never	53.7 (3.4)	60.2 (5.4)	50.7 (1.6)	72.3 (5.5)	62.8 (3.5)
O3					
5-7 days a week	0.2 (0.2)	0.0 (**)	0.0 (**)	0.1 (0.1)	0.1 (0.1)
3-4 days a week	0.1 (0.1)	0.0 (**)	0.0 (**)	0.0 (**)	0.0 (**)
1-2 days a week	2.1 (1.1)	2.2 (1.1)	1.2 (0.9)	0.6 (0.5)	1.5 (0.5)
1-3 days a month	5.5 (1.2)	11.8 (4.0)	6.7 (2.7)	4.5 (2.0)	6.6 (1.3)
Less than monthly	24.7 (2.9)	20.4 (3.5)	18.8 (2.1)	14.8 (2.3)	19.7 (1.7)
Never	67.4 (3.1)	65.6 (4.3)	73.3 (3.9)	80.0 (3.4)	72.0 (2.2)
O4-O10					
5-7 days a week	0.1 (0.1)	0.0 (**)	0.0 (**)	0.2 (0.2)	0.1 (0.1)
3-4 days a week	0.0 (**)	0.0 (**)	0.0 (**)	0.1 (0.1)	0.1 (**)
1-2 days a week	0.2 (0.2)	0.1 (0.2)	0.7 (0.6)	0.9 (0.4)	0.5 (0.2)
1-3 days a month	3.3 (0.9)	2.7 (0.6)	1.2 (0.9)	1.8 (0.4)	2.5 (0.4)
Less than monthly	12.3 (1.9)	15.7 (1.4)	27.7 (6.9)	11.0 (1.5)	13.4 (1.1)
Never	84.1 (1.8)	81.5 (1.7)	70.4 (7.7)	86.0 (1.8)	83.4 (1.2)
Total					
5-7 days a week	3.3 (0.7)	2.1 (0.6)	2.3 (0.6)	0.9 (0.3)	2.2 (0.3)
3-4 days a week	5.5 (0.9)	6.4 (1.2)	5.1 (1.4)	2.4 (0.4)	4.8 (0.5)
1-2 days a week	7.2 (0.7)	8.6 (1.7)	9.9 (2.0)	4.6 (0.6)	7.0 (0.6)
1-3 days a month	13.6 (0.9)	14.6 (1.2)	21.3 (2.0)	12.1 (1.0)	14.1 (0.6)
Less than monthly	25.1 (1.1)	27.4 (0.9)	23.4 (2.0)	24.0 (1.2)	25.2 (0.6)
Never	45.3 (1.6)	40.9 (3.1)	38.0 (6.4)	55.9 (2.3)	46.7 (1.4)

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

*There are no warrant officers in the Air Force.

**Informative standard error not available, but is expected to be very close to zero.

Source: Questions 1, 2, 38.

Table D.2. Frequency of Consuming Eight or More Glasses of Wine in a Single Day During the Past 12 Months

Pay Grade/Frequency	Service				Total DoD
	Army	Navy	Marine Corps	Air Force	
E1-E3					
5-7 days a week	0.0 (**)	0.4 (0.4)	0.6 (0.5)	0.8 (0.5)	0.4 (0.2)
3-4 days a week	1.4 (0.5)	0.3 (0.2)	1.1 (0.4)	0.1 (0.1)	0.7 (0.2)
1-2 days a week	3.5 (1.1)	3.8 (2.3)	1.3 (0.5)	0.6 (0.3)	2.4 (0.7)
1-3 days a month	5.2 (0.9)	7.4 (1.5)	9.3 (2.0)	4.3 (1.4)	6.1 (0.7)
Less than monthly	17.2 (2.3)	23.6 (4.8)	12.6 (2.1)	17.3 (2.2)	18.1 (1.7)
Never	72.8 (2.6)	64.4 (7.3)	75.2 (3.7)	76.8 (3.2)	72.3 (2.4)
E4-E6					
5-7 days a week	0.6 (0.3)	0.0 (**)	0.0 (**)	0.1 (**)	0.2 (0.1)
3-4 days a week	1.7 (0.7)	0.3 (0.1)	0.5 (0.4)	0.1 (0.1)	0.8 (0.3)
1-2 days a week	1.7 (0.4)	0.7 (0.2)	1.4 (0.6)	0.5 (0.2)	1.1 (0.2)
1-3 days a month	4.8 (0.6)	5.5 (0.8)	5.5 (2.1)	3.1 (0.5)	4.6 (0.4)
Less than monthly	17.9 (1.1)	20.2 (1.8)	15.6 (3.1)	16.0 (2.0)	17.8 (0.9)
Never	73.4 (1.7)	73.2 (1.9)	77.0 (3.6)	80.3 (2.2)	75.6 (1.1)
E7-E9					
5-7 days a week	0.1 (0.1)	0.5 (0.3)	0.0 (**)	0.1 (0.1)	0.2 (0.1)
3-4 days a week	0.2 (0.1)	0.1 (0.1)	0.6 (0.3)	0.0 (**)	0.1 (0.1)
1-2 days a week	0.4 (0.1)	0.4 (0.3)	0.2 (**)	0.1 (0.1)	0.3 (0.1)
1-3 days a month	2.7 (0.5)	1.4 (0.5)	2.0 (1.5)	0.9 (0.3)	1.8 (0.3)
Less than monthly	8.5 (0.7)	12.8 (1.2)	12.7 (2.1)	11.0 (1.0)	10.5 (0.5)
Never	88.2 (0.8)	84.8 (1.3)	84.5 (3.2)	87.9 (1.1)	87.0 (0.6)
W1-W4					
5-7 days a week	0.0 (**)	0.0 (**)	0.0 (**)	* (*)	0.0 (**)
3-4 days a week	0.0 (**)	0.2 (0.3)	0.0 (**)	* (*)	0.0 (**)
1-2 days a week	0.1 (0.1)	0.4 (0.3)	0.2 (0.2)	* (*)	0.1 (0.1)
1-3 days a month	2.2 (0.9)	1.3 (1.0)	1.7 (1.3)	* (*)	2.0 (0.7)
Less than monthly	11.4 (2.3)	18.4 (3.0)	5.5 (2.8)	* (*)	12.0 (1.9)
Never	86.3 (2.4)	79.6 (2.9)	92.6 (1.9)	* (*)	85.8 (1.9)
O1-O2					
5-7 days a week	0.0 (**)	0.0 (**)	0.0 (**)	0.0 (**)	0.0 (**)
3-4 days a week	0.0 (**)	0.0 (**)	0.0 (**)	0.0 (**)	0.0 (**)
1-2 days a week	1.8 (0.8)	0.0 (**)	0.0 (**)	0.0 (**)	0.5 (0.3)
1-3 days a month	1.4 (1.2)	1.7 (1.6)	0.0 (**)	1.5 (1.0)	1.4 (0.6)
Less than monthly	19.5 (2.5)	15.8 (3.8)	12.9 (2.5)	9.6 (2.2)	14.0 (1.8)
Never	77.3 (3.4)	82.5 (3.9)	87.1 (2.5)	88.9 (2.3)	84.0 (2.0)
O3					
5-7 days a week	0.0 (**)	0.0 (**)	0.0 (**)	0.0 (**)	0.0 (**)
3-4 days a week	0.3 (0.4)	0.0 (**)	0.0 (**)	0.0 (**)	0.1 (0.1)
1-2 days a week	0.0 (**)	0.0 (**)	0.0 (**)	0.0 (**)	0.0 (**)
1-3 days a month	1.6 (0.8)	2.0 (1.2)	0.0 (**)	0.9 (0.5)	1.3 (0.4)
Less than monthly	13.1 (2.0)	18.0 (3.7)	11.7 (6.3)	16.4 (2.3)	15.4 (1.4)
Never	85.0 (2.0)	80.1 (4.2)	88.3 (6.3)	82.6 (2.2)	83.2 (1.5)
O4-O10					
5-7 days a week	0.0 (**)	0.2 (0.2)	0.0 (**)	0.0 (**)	0.0 (**)
3-4 days a week	0.1 (0.1)	0.0 (**)	0.0 (**)	0.0 (**)	0.0 (**)
1-2 days a week	0.0 (**)	0.0 (**)	0.0 (**)	0.2 (0.1)	0.1 (0.1)
1-3 days a month	0.3 (0.2)	0.4 (0.4)	0.3 (0.4)	0.3 (0.2)	0.3 (0.1)
Less than monthly	12.0 (1.9)	14.8 (2.2)	7.0 (3.7)	8.2 (1.0)	10.8 (1.1)
Never	87.7 (1.9)	84.6 (2.2)	92.6 (3.8)	91.3 (1.2)	88.7 (1.1)
Total					
5-7 days a week	0.3 (0.2)	0.2 (0.1)	0.2 (0.2)	0.2 (0.1)	0.3 (0.1)
3-4 days a week	1.2 (0.4)	0.2 (0.1)	0.7 (0.2)	0.1 (**)	0.6 (0.1)
1-2 days a week	1.8 (0.3)	1.4 (0.6)	1.1 (0.4)	0.4 (0.1)	1.2 (0.2)
1-3 days a month	4.1 (0.5)	5.1 (0.6)	6.5 (1.8)	2.8 (0.5)	4.2 (0.3)
Less than monthly	16.2 (0.9)	20.0 (1.7)	13.5 (1.2)	15.1 (1.4)	16.6 (0.7)
Never	76.3 (1.4)	73.1 (2.5)	77.9 (2.2)	81.4 (1.0)	77.2 (1.0)

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

*There are no warrant officers in the Air Force.

**Informative standard error not available but is expected to be very close to zero.

Source: Questions 1, 2, 39.

Table D.3. Frequency of Consuming Eight or More Drinks of Hard Liquor in a Single Day During the Past 12 Months

Pay Grade/Frequency	Service				Total DoD
	Army	Navy	Marine Corps	Air Force	
E1-E3					
5-7 days a week	1.2 (0.6)	3.3 (1.7)	0.9 (0.5)	0.5 (0.3)	1.5 (0.5)
3-4 days a week	3.5 (0.9)	2.6 (0.5)	3.6 (1.5)	2.3 (1.2)	2.9 (0.5)
1-2 days a week	8.4 (1.6)	6.5 (2.0)	10.4 (3.2)	3.3 (0.8)	6.8 (1.0)
1-3 days a month	17.4 (2.1)	19.4 (2.6)	20.5 (2.9)	12.5 (2.1)	16.9 (1.3)
Less than monthly	19.5 (2.0)	27.9 (1.7)	29.1 (1.9)	25.8 (1.8)	24.8 (1.0)
Never	49.9 (3.7)	40.3 (3.4)	35.5 (5.8)	55.6 (3.5)	47.0 (2.3)
E4-E6					
5-7 days a week	1.0 (0.3)	0.7 (0.2)	0.6 (0.3)	0.2 (0.1)	0.6 (0.1)
3-4 days a week	1.6 (0.4)	3.7 (2.2)	1.4 (0.8)	1.1 (0.3)	2.0 (0.6)
1-2 days a week	5.4 (0.9)	4.3 (1.5)	3.5 (0.7)	2.7 (0.4)	4.2 (0.6)
1-3 days a month	13.0 (1.3)	13.4 (2.0)	11.7 (3.3)	6.3 (0.9)	11.1 (0.9)
Less than monthly	21.8 (1.1)	28.1 (1.5)	25.7 (2.4)	21.8 (2.1)	23.8 (0.8)
Never	57.2 (1.9)	50.0 (2.8)	57.2 (5.6)	67.9 (2.3)	58.3 (1.4)
E7-E9					
5-7 days a week	1.1 (0.4)	0.5 (0.2)	0.0 (**)	0.3 (0.1)	0.6 (0.2)
3-4 days a week	1.1 (0.2)	0.1 (0.1)	0.2 (0.2)	0.1 (0.1)	0.5 (0.1)
1-2 days a week	3.0 (1.5)	0.8 (0.3)	1.0 (0.3)	0.6 (0.2)	1.7 (0.6)
1-3 days a month	5.1 (0.7)	4.7 (1.0)	3.8 (1.0)	3.3 (0.8)	4.4 (0.4)
Less than monthly	19.2 (0.9)	22.3 (2.0)	17.2 (2.2)	15.3 (1.5)	18.8 (0.8)
Never	70.6 (1.4)	71.5 (2.7)	77.8 (3.1)	80.3 (1.9)	74.0 (1.1)
W1-W4					
5-7 days a week	0.0 (**)	0.6 (0.4)	0.0 (**)	* (*)	0.1 (0.1)
3-4 days a week	0.1 (0.1)	0.2 (0.3)	0.0 (**)	* (*)	0.1 (0.1)
1-2 days a week	0.4 (0.3)	0.4 (0.4)	0.4 (0.3)	* (*)	0.4 (0.3)
1-3 days a month	4.0 (1.6)	5.1 (2.0)	2.8 (1.1)	* (*)	4.0 (1.3)
Less than monthly	15.0 (2.5)	23.9 (3.6)	8.1 (1.0)	* (*)	15.8 (2.1)
Never	80.4 (1.7)	69.9 (3.9)	88.7 (2.1)	* (*)	79.5 (1.6)
O1-O2					
5-7 days a week	0.0 (**)	0.0 (**)	0.0 (**)	0.0 (**)	0.0 (**)
3-4 days a week	0.5 (0.5)	0.0 (**)	0.0 (**)	0.0 (**)	0.1 (0.2)
1-2 days a week	0.5 (0.5)	0.6 (0.6)	0.6 (0.6)	0.1 (0.1)	0.4 (0.2)
1-3 days a month	6.6 (2.2)	3.2 (1.6)	2.6 (1.5)	2.4 (1.2)	3.9 (1.0)
Less than monthly	26.5 (2.6)	24.6 (5.7)	33.4 (2.8)	15.6 (2.7)	21.9 (2.1)
Never	65.9 (2.9)	71.6 (6.2)	63.4 (3.4)	81.8 (3.5)	73.7 (2.7)
O3					
5-7 days a week	0.3 (0.4)	0.0 (**)	0.0 (**)	0.2 (0.2)	0.2 (0.2)
3-4 days a week	0.0 (**)	0.0 (**)	0.0 (**)	0.0 (**)	0.0 (**)
1-2 days a week	0.0 (**)	0.1 (0.1)	0.0 (**)	0.2 (0.2)	0.1 (0.1)
1-3 days a month	2.7 (0.9)	1.0 (0.7)	0.0 (**)	1.2 (0.6)	1.6 (0.4)
Less than monthly	15.0 (2.9)	22.6 (5.4)	18.8 (2.8)	11.2 (2.2)	15.5 (1.9)
Never	81.9 (2.9)	76.2 (5.2)	81.2 (2.8)	87.2 (2.5)	82.6 (2.0)
O4-O10					
5-7 days a week	0.2 (0.2)	0.0 (**)	0.0 (**)	0.1 (0.1)	0.1 (0.1)
3-4 days a week	0.1 (0.1)	0.0 (**)	0.0 (**)	0.3 (0.2)	0.1 (0.1)
1-2 days a week	0.2 (0.2)	0.0 (**)	0.0 (**)	0.0 (**)	0.1 (0.1)
1-3 days a month	1.7 (0.7)	0.9 (0.6)	2.6 (1.0)	0.3 (0.2)	1.0 (0.3)
Less than monthly	10.3 (1.7)	13.5 (1.6)	19.1 (2.3)	8.3 (1.2)	10.7 (1.0)
Never	87.5 (1.5)	85.6 (1.6)	78.3 (2.3)	91.0 (1.5)	87.9 (1.1)
Total					
5-7 days a week	1.0 (0.2)	1.3 (0.5)	0.6 (0.3)	0.3 (0.1)	0.8 (0.2)
3-4 days a week	1.8 (0.3)	2.6 (1.2)	2.2 (1.0)	1.1 (0.3)	1.8 (0.4)
1-2 days a week	5.1 (0.8)	4.0 (0.9)	6.0 (1.9)	2.2 (0.3)	4.1 (0.4)
1-3 days a month	11.9 (0.9)	12.7 (1.7)	14.1 (2.7)	6.7 (0.9)	10.8 (0.7)
Less than monthly	20.2 (0.8)	26.5 (0.9)	26.3 (1.5)	20.4 (1.3)	22.4 (0.6)
Never	60.1 (1.5)	52.8 (2.6)	50.7 (5.7)	69.2 (2.0)	60.1 (1.3)

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

*There are no warrant officers in the Air Force.

**Informative standard error not available but is expected to be very close to zero.

Source: Questions 1, 2, 40.

Table D.4. Drinking Levels by Sociodemographic Characteristics - Army

Sociodemographic Characteristic	Drinking Level				
	Abstainer	Infrequent/ Light	Moderate	Moderate- Heavy	Heavy
Sex					
Male	14.0 (0.7)	17.0 (1.2)	28.7 (1.6)	25.5 (1.6)	14.7 (1.7)
Female	23.9 (4.7)	25.8 (3.8)	36.0 (5.7)	7.0 (1.8)	7.2 (2.5)
Race/Ethnicity					
White	13.2 (0.7)	16.7 (1.5)	28.1 (1.5)	26.0 (2.2)	16.1 (2.3)
Black	20.7 (2.6)	18.1 (1.5)	33.0 (2.9)	19.1 (1.5)	9.1 (1.0)
Hispanic	12.9 (1.9)	23.1 (4.0)	25.3 (2.0)	25.1 (3.0)	13.7 (2.5)
Other	10.5 (2.8)	20.2 (5.2)	35.9 (9.1)	18.6 (4.8)	14.7 (7.0)
Education					
Less than high school graduate	14.2 (9.3)	17.2 (6.7)	17.7 (5.7)	21.5 (6.2)	29.4 (7.1)
High school graduate or GED	12.7 (0.9)	17.5 (1.9)	24.5 (1.6)	27.2 (2.7)	18.1 (2.0)
Some college	17.8 (1.4)	17.2 (1.2)	32.7 (2.8)	20.7 (1.5)	11.7 (1.7)
College graduate or higher	16.3 (2.1)	19.6 (1.8)	40.2 (2.4)	20.0 (1.6)	3.9 (0.7)
Age					
17-20	12.3 (1.7)	19.5 (4.3)	19.0 (3.5)	26.6 (5.1)	22.5 (4.6)
21-25	12.2 (2.0)	16.8 (1.9)	29.2 (2.4)	24.5 (1.5)	17.3 (1.8)
26-30	13.7 (1.1)	16.8 (1.6)	34.5 (2.3)	24.3 (2.3)	10.7 (1.1)
31 or older	20.4 (1.7)	18.2 (1.0)	33.6 (1.3)	21.1 (1.2)	6.7 (0.6)
Family Status					
Not married	11.1 (1.2)	15.4 (2.2)	26.1 (2.4)	27.9 (2.9)	19.5 (2.7)
Married, spouse not present at duty station	10.4 (2.1)	17.7 (2.4)	25.2 (2.3)	26.3 (2.9)	20.3 (5.0)
Married, spouse present at duty station	18.9 (1.3)	19.8 (1.0)	32.8 (1.1)	20.1 (1.0)	8.4 (0.7)
Pay Grade					
E1-E3	10.0 (1.5)	18.4 (3.3)	23.6 (3.3)	26.5 (4.5)	21.5 (4.1)
E4-E6	16.3 (1.0)	17.0 (1.2)	28.1 (2.0)	23.5 (1.4)	15.1 (1.4)
E7-E9	21.4 (2.0)	17.2 (0.9)	31.7 (2.7)	22.4 (1.8)	7.2 (0.9)
W1-W4	15.6 (1.9)	20.8 (2.9)	35.1 (3.5)	24.4 (2.4)	4.0 (0.7)
O1-O2	12.5 (2.8)	13.5 (2.7)	43.5 (3.8)	24.6 (3.8)	5.9 (1.4)
O3	14.9 (2.5)	22.5 (4.1)	42.7 (3.1)	18.4 (1.7)	1.5 (0.7)
O4-O10	10.7 (1.9)	21.5 (1.7)	41.5 (3.3)	23.7 (2.8)	2.6 (1.0)
Time on Active Duty					
1 year or less	10.9 (2.6)	24.0 (5.9)	22.9 (4.1)	31.7 (7.6)	10.4 (2.3)
>1-2 years	12.0 (2.4)	14.3 (1.6)	26.2 (4.4)	22.8 (3.8)	24.7 (4.8)
>2-3 years	17.0 (4.1)	15.0 (2.9)	21.6 (2.9)	28.2 (2.9)	18.2 (2.8)
>3-4 years	12.3 (3.5)	14.6 (2.9)	27.1 (7.1)	21.5 (4.3)	24.5 (7.7)
>4-9 years	14.6 (1.3)	18.5 (1.6)	34.1 (1.8)	21.6 (1.4)	11.2 (1.0)
10 years or more	18.5 (1.3)	17.8 (1.0)	34.2 (1.8)	21.2 (1.3)	8.2 (1.0)
Region					
Americas	16.2 (0.9)	18.5 (1.6)	28.7 (1.4)	23.7 (2.0)	12.9 (1.7)
North Pacific	11.2 (1.7)	11.7 (0.8)	24.5 (5.0)	31.8 (6.5)	20.7 (2.4)
Other Pacific	11.9 (2.5)	15.0 (0.6)	34.2 (0.8)	25.7 (1.5)	13.1 (0.8)
Europe	12.4 (1.3)	17.1 (1.6)	31.1 (3.7)	23.2 (2.5)	16.2 (4.3)
Total Army	14.9 (0.7)	17.8 (1.1)	29.3 (1.4)	23.9 (1.5)	14.1 (1.6)

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 once/month at most and 1-4 drinks/occasion. Those in the Moderate category drink (a) at least once/week and 1 drink/occasion, (b) 3-4 times/month and 2-4 drinks/occasion, or (c) once/month or less and ≥5 drinks/occasion. Those in the Moderate-Heavy category drink at least once/week and 2-4 drinks/occasion or 3-4 times/month and ≥5 drinks/occasion. Those in the Heavy category drink at least once/week and ≥5 drinks/occasion.

Source: Questions 2-3, 5-10.

Table D.5. Drinking Levels by Sociodemographic Characteristics - Navy

Sociodemographic Characteristic	Drinking Level				
	Abstainer	Infrequent/ Light	Moderate	Moderate/ Heavy	Heavy
Sex					
Male	9.4 (0.8)	18.8 (2.0)	29.2 (1.3)	29.5 (1.2)	13.1 (1.2)
Female	12.2 (2.6)	30.9 (3.7)	35.5 (3.9)	17.9 (3.1)	3.4 (1.4)
Race/Ethnicity					
White	8.0 (0.6)	20.1 (2.9)	29.7 (1.7)	29.0 (1.3)	13.1 (1.1)
Black	13.7 (3.0)	14.6 (3.6)	38.1 (5.8)	23.3 (3.3)	10.4 (2.9)
Hispanic	16.9 (6.3)	20.8 (3.5)	15.5 (3.1)	41.7 (7.2)	5.1 (2.3)
Other	17.8 (4.4)	27.9 (3.6)	28.1 (2.6)	14.7 (5.1)	11.4 (8.1)
Education					
Less than high school graduate	3.2 (2.5)	28.2 (13.3)	28.4 (8.9)	28.2 (7.8)	11.9 (6.3)
High school graduate or GED	9.3 (1.3)	18.9 (2.3)	27.1 (1.5)	29.1 (2.1)	15.7 (2.0)
Some college	10.0 (1.1)	21.4 (2.9)	28.7 (2.9)	29.8 (2.3)	10.1 (1.2)
College graduate or higher	10.8 (1.3)	19.5 (1.9)	42.9 (1.9)	23.0 (2.4)	3.8 (1.5)
Age					
17-20	3.4 (1.9)	18.2 (3.1)	21.1 (3.3)	42.9 (3.8)	14.5 (4.9)
21-25	7.1 (1.5)	20.4 (3.9)	27.8 (2.0)	28.8 (2.0)	16.0 (0.9)
26-30	12.5 (1.5)	17.2 (2.3)	38.1 (2.5)	23.3 (1.5)	8.9 (1.4)
31 or older	15.2 (1.6)	21.9 (1.4)	32.2 (1.8)	23.1 (1.7)	7.5 (1.0)
Family Status					
Not married	7.3 (1.6)	18.3 (3.5)	24.2 (1.4)	32.3 (1.9)	17.9 (1.6)
Married, spouse not present at duty station	9.2 (2.9)	23.0 (8.4)	31.1 (4.1)	30.7 (5.9)	6.0 (1.8)
Married, spouse present at duty station	12.4 (0.9)	21.2 (1.3)	35.9 (2.1)	23.7 (1.4)	6.8 (1.0)
Pay Grade					
E1-E3	5.2 (1.8)	20.4 (1.8)	23.1 (2.3)	38.0 (3.3)	13.3 (3.0)
E4-E6	10.8 (1.0)	19.7 (3.5)	29.4 (1.4)	25.5 (1.9)	14.5 (0.8)
E7-E9	15.1 (1.0)	21.5 (1.8)	30.5 (2.0)	25.0 (1.7)	7.9 (1.0)
W1-W4	18.1 (3.1)	15.6 (2.2)	30.4 (1.8)	27.3 (3.3)	8.6 (1.7)
O1-O2	16.4 (4.1)	17.7 (6.8)	42.1 (3.0)	21.7 (4.9)	2.1 (1.3)
O3	6.2 (2.1)	17.4 (4.5)	47.9 (5.0)	24.8 (4.1)	3.8 (1.6)
O4-O10	7.9 (1.0)	20.0 (2.3)	45.7 (3.0)	25.0 (2.2)	1.4 (0.6)
Time on Active Duty					
1 year or less	0.8 (0.7)	21.7 (5.5)	21.0 (7.3)	48.1 (7.2)	8.5 (4.3)
>1-2 years	8.6 (1.6)	20.4 (2.2)	23.1 (3.5)	35.2 (3.4)	12.7 (3.3)
>2-3 years	5.1 (2.3)	20.7 (7.9)	23.4 (2.8)	33.5 (3.7)	17.3 (3.0)
>3-4 years	8.7 (4.9)	15.6 (6.6)	33.9 (3.7)	25.0 (4.9)	16.9 (2.9)
>4-9 years	10.1 (1.1)	20.2 (1.4)	33.4 (2.1)	23.6 (1.2)	12.6 (0.9)
10 years or more	15.1 (1.3)	20.5 (1.3)	33.3 (3.0)	23.5 (2.1)	7.6 (0.9)
Region					
Americas	9.9 (1.0)	20.1 (2.3)	29.2 (1.2)	28.8 (1.3)	12.1 (1.2)
North Pacific	13.1 (0.7)	17.5 (1.2)	30.1 (2.9)	28.8 (5.1)	10.6 (0.3)
Other Pacific	11.4 (3.8)	17.7 (0.1)	31.3 (0.4)	26.3 (0.3)	13.2 (4.7)
Europe	5.1 (0.7)	20.8 (1.2)	32.9 (2.7)	27.6 (2.2)	13.5 (2.4)
Total Navy	9.6 (0.8)	19.9 (1.9)	29.8 (1.0)	28.5 (1.1)	12.2 (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 once/month at most and 1-4 drinks/occasion. Those in the Moderate category drink (a) at least once/week and 1 drink/occasion, (b) 3-4 times/month and 2-4 drinks/occasion, or (c) once/month or less and ≥5 drinks/occasion. Those in the Moderate-Heavy category drink at least once/week and 2-4 drinks/occasion or 3-4 times/month and ≥5 drinks/occasion. Those in the Heavy category drink at least once/week and ≥5 drinks/occasion.

Source: Questions 2-3, 5-10.

Table D.6. Drinking Levels by Sociodemographic Characteristics - Marine Corps

Sociodemographic Characteristic	Drinking Level				
	Abstainer	Infrequent/ Light	Moderate	Moderate/ Heavy	Heavy
Sex					
Male	11.0 (2.5)	13.4 (1.9)	29.3 (0.8)	30.2 (3.0)	16.2 (3.4)
Female	6.6 (2.6)	25.5 (9.4)	20.4 (12.0)	47.4 (20.1)	0.0 (**)
Race/Ethnicity					
White	9.0 (2.2)	12.6 (2.3)	28.0 (1.9)	34.5 (2.7)	15.8 (3.6)
Black	16.9 (6.2)	19.7 (2.4)	30.7 (3.6)	21.3 (5.6)	11.4 (2.9)
Hispanic	10.7 (3.9)	11.8 (4.8)	38.3 (9.3)	31.6 (7.4)	7.6 (2.1)
Other	15.9 (4.3)	18.4 (2.1)	20.0 (4.6)	9.5 (9.5)	36.1 (7.5)
Education					
Less than high school graduate	11.2 (11.1)	26.4 (11.4)	21.5 (15.0)	15.0 (5.7)	25.9 (10.6)
High school graduate or GED	11.3 (3.8)	13.4 (2.4)	25.0 (1.9)	31.9 (2.4)	18.4 (4.3)
Some college	9.5 (2.9)	14.4 (2.3)	34.5 (2.6)	30.5 (2.8)	11.2 (1.9)
College graduate or higher	10.2 (1.7)	13.7 (2.5)	43.2 (4.5)	30.2 (6.8)	2.7 (1.3)
Age					
17-20	10.6 (3.2)	10.5 (1.5)	21.8 (1.4)	32.0 (5.2)	25.2 (6.5)
21-25	6.9 (2.8)	13.4 (1.5)	28.4 (2.2)	37.0 (2.3)	14.3 (3.8)
26-30	14.3 (3.3)	21.0 (4.2)	33.6 (1.4)	22.1 (6.2)	8.9 (1.8)
31 or older	17.8 (1.6)	15.5 (2.3)	39.1 (2.9)	21.9 (2.8)	5.7 (0.7)
Family Status					
Not married	6.1 (2.1)	10.9 (1.9)	26.1 (1.7)	34.8 (4.2)	22.1 (5.6)
Married, spouse not present at duty station	17.7 (2.0)	28.8 (9.3)	19.9 (5.9)	22.1 (8.3)	11.6 (4.0)
Married, spouse present at duty station	16.1 (3.3)	15.1 (2.6)	35.1 (2.9)	27.4 (3.2)	6.4 (1.4)
Pay Grade					
E1-E3	8.5 (2.6)	13.1 (1.3)	25.2 (1.4)	29.5 (4.7)	23.6 (6.1)
E4-E6	11.2 (2.6)	13.9 (2.5)	28.7 (2.5)	35.5 (2.6)	10.6 (0.9)
E7-E9	23.5 (1.9)	17.0 (3.2)	34.1 (2.6)	17.4 (3.5)	8.0 (1.8)
W1-W4	17.3 (2.3)	18.6 (6.1)	28.2 (10.8)	26.4 (4.5)	9.5 (1.3)
O1-O2	10.8 (3.7)	11.9 (5.1)	34.7 (13.6)	38.6 (15.1)	3.9 (3.0)
O3	8.6 (4.1)	17.4 (1.6)	47.7 (4.3)	25.5 (6.7)	0.8 (0.8)
O4-O10	9.9 (2.8)	17.3 (4.9)	48.3 (2.8)	23.3 (5.0)	1.2 (0.9)
Time on Active Duty					
1 year or less	3.7 (2.4)	7.7 (2.9)	28.1 (13.4)	36.0 (13.6)	24.6 (2.4)
>1-2 years	6.9 (2.2)	10.2 (1.8)	26.3 (3.9)	33.1 (4.4)	23.4 (9.5)
>2-3 years	14.8 (7.1)	23.5 (7.1)	20.4 (7.0)	28.9 (8.2)	12.4 (3.2)
>3-4 years	4.0 (0.7)	7.2 (3.5)	34.1 (3.5)	31.4 (5.6)	23.3 (6.5)
>4-9 years	13.9 (3.5)	16.8 (3.5)	27.6 (1.2)	33.2 (5.8)	8.5 (1.4)
10 years or more	16.6 (2.2)	15.2 (2.4)	36.9 (2.8)	24.2 (4.4)	7.1 (1.0)
Region					
Americas	10.5 (3.0)	13.5 (2.0)	29.5 (1.4)	31.7 (2.6)	14.8 (4.2)
North Pacific	13.3 (2.5)	18.6 (3.2)	26.5 (1.5)	26.9 (2.9)	14.6 (1.3)
Other Pacific	9.1 (3.0)	10.8 (0.1)	29.8 (0.4)	29.3 (0.5)	21.0 (2.0)
Europe	10.7 (6.2)	14.2 (2.6)	14.9 (3.2)	29.6 (3.5)	30.6 (3.3)
Total Marine Corps	10.8 (2.5)	14.0 (1.7)	28.9 (1.1)	31.0 (2.2)	15.4 (3.3)

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 once/month at most and 1-4 drinks/occasion. Those in the Moderate category drink (a) at least once/week and 1 drink/occasion, (b) 3-4 times/month and 2-4 drinks/occasion, or (c) once/month or less and ≥5 drinks/occasion. Those in the Moderate-Heavy category drink at least once/week and 2-4 drinks/occasion or 3-4 times/month and ≥5 drinks/occasion. Those in the Heavy category drink at least once/week and ≥5 drinks/occasion.

**Informative standard error not available but is expected to be very close to zero.

Source: Questions 2-3, 5-10.

Table D.7. Drinking Levels by Sociodemographic Characteristics - Air Force

Sociodemographic Characteristic	Drinking Level				
	Abstainer	Infrequent/ Light	Moderate	Moderate- Heavy	Heavy
Sex					
Male	15.5 (1.0)	16.6 (1.1)	35.0 (1.0)	24.4 (1.5)	8.6 (1.0)
Female	18.9 (2.5)	26.7 (1.5)	36.0 (2.9)	15.1 (2.6)	3.2 (0.8)
Race/Ethnicity					
White	15.0 (1.0)	17.4 (1.2)	34.5 (0.8)	24.8 (1.3)	8.2 (1.1)
Black	19.3 (2.4)	16.6 (1.2)	39.5 (2.6)	17.3 (2.2)	7.2 (1.2)
Hispanic	9.0 (2.8)	23.2 (4.1)	35.6 (3.6)	25.1 (4.1)	7.1 (2.7)
Other	28.9 (4.6)	20.3 (5.7)	31.0 (5.9)	12.4 (3.1)	7.4 (2.6)
Education					
Less than high school graduate	+ (+)	+ (+)	+ (+)	+ (+)	+ (+)
High school graduate or GED	15.6 (1.7)	13.1 (1.1)	33.1 (2.2)	26.8 (2.5)	11.4 (1.4)
Some college	17.2 (1.4)	17.5 (1.2)	33.5 (0.8)	23.2 (1.5)	8.7 (1.2)
College graduate or higher	13.2 (1.3)	24.7 (1.8)	41.8 (1.6)	18.6 (1.6)	1.6 (0.5)
Age					
17-20	14.9 (3.0)	14.4 (3.9)	34.1 (4.2)	24.9 (2.9)	11.7 (1.9)
21-25	12.2 (1.8)	13.6 (1.6)	35.2 (1.8)	27.9 (3.0)	11.1 (1.1)
26-30	18.8 (2.1)	19.1 (1.7)	34.0 (1.4)	21.6 (0.9)	6.6 (1.4)
31 or older	17.9 (1.4)	22.0 (1.5)	36.2 (1.1)	19.2 (1.0)	4.7 (0.9)
Family Status					
Not married	12.0 (1.0)	13.6 (1.5)	34.4 (1.9)	27.2 (2.1)	12.8 (1.7)
Married, spouse not present at duty station	16.2 (2.8)	13.2 (2.8)	35.3 (2.6)	22.3 (3.4)	13.1 (4.7)
Married, spouse present at duty station	18.3 (1.5)	20.6 (1.1)	35.5 (1.2)	21.0 (1.4)	4.6 (0.6)
Pay Grade					
E1-E3	13.5 (2.4)	13.0 (1.6)	33.2 (3.2)	28.6 (3.1)	11.8 (1.5)
E4-E6	17.5 (1.1)	17.2 (1.0)	33.1 (0.6)	23.2 (1.3)	9.0 (1.4)
E7-E9	19.0 (1.9)	18.8 (1.0)	37.2 (1.6)	19.1 (0.9)	5.9 (0.9)
O1-O2	12.1 (2.8)	29.7 (2.9)	43.4 (1.6)	13.4 (2.7)	1.5 (1.0)
O3	19.2 (4.1)	22.2 (2.2)	40.2 (3.8)	17.7 (3.3)	0.7 (0.3)
O4-O10	9.4 (2.0)	23.7 (1.5)	42.5 (1.2)	23.2 (1.8)	1.2 (0.5)
Time on Active Duty					
1 year or less	12.8 (2.3)	15.3 (1.9)	40.7 (4.7)	21.8 (2.7)	9.4 (2.1)
>1-2 years	13.3 (2.9)	13.4 (2.8)	35.0 (3.7)	26.8 (3.7)	11.6 (1.8)
>2-3 years	14.2 (2.9)	15.7 (2.6)	30.1 (4.4)	29.3 (4.7)	10.8 (2.3)
>3-4 years	11.6 (2.5)	16.7 (3.5)	31.8 (3.8)	27.4 (4.3)	12.4 (2.5)
>4-9 years	18.1 (2.0)	16.7 (1.6)	34.6 (1.6)	23.0 (2.4)	7.5 (1.3)
10 years or more	17.1 (1.3)	21.7 (1.2)	36.3 (1.1)	20.0 (0.6)	5.0 (0.7)
Region					
Americas	16.8 (1.2)	18.0 (1.2)	35.6 (1.1)	22.6 (1.5)	7.1 (1.0)
North Pacific	12.4 (1.2)	18.6 (4.9)	33.4 (3.1)	25.0 (4.6)	10.6 (4.6)
Other Pacific	12.5 (3.0)	16.8 (2.8)	32.8 (1.0)	27.6 (9.8)	10.3 (3.0)
Europe	12.7 (0.2)	16.1 (3.3)	33.8 (1.2)	25.8 (1.7)	11.7 (3.9)
Total Air Force	15.8 (1.0)	17.7 (1.0)	35.1 (0.9)	23.4 (1.2)	8.0 (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 once/month at most and 1-4 drinks/occasion. Those in the Moderate category drink (a) at least once/week and 1 drink/occasion, (b) 3-4 times/month and 2-4 drinks/occasion, or (c) once/month or less and ≥5 drinks/occasion. Those in the Moderate-Heavy category drink at least once/week and 2-4 drinks/occasion or 3-4 times/month and ≥5 drinks/occasion. Those in the Heavy category drink at least once/week and ≥5 drinks/occasion.

*Fewer than 20 respondents.

Source: Questions 2-3, 5-10.

Table D.8. Drinking Levels Past 30 Days Among Enlisted Personnel -
Total DoD

Pay Grade	Drinking Level									
	Abstainer		Infrequent/ Light		Moderate		Moderate/ Heavy		Heavy	
E1	13.8	(3.7)	28.2	(8.1)	29.4	(7.0)	18.0	(3.3)	10.6	(3.7)
E2	7.6	(1.8)	13.2	(2.3)	26.8	(3.3)	38.1	(5.5)	14.3	(2.8)
E3	9.7	(1.3)	15.9	(1.2)	25.9	(1.9)	29.4	(1.9)	19.1	(2.2)
E4	12.3	(1.3)	17.5	(2.6)	26.3	(1.9)	27.7	(1.7)	16.1	(1.3)
E5	16.2	(1.1)	16.9	(0.9)	32.9	(1.2)	23.1	(0.9)	10.9	(0.7)
E6	17.2	(1.0)	18.6	(1.1)	32.3	(1.3)	22.0	(1.3)	9.8	(0.9)
E7	19.3	(1.2)	19.2	(0.9)	32.6	(1.2)	21.4	(1.1)	7.5	(0.7)
E8	20.5	(1.7)	17.4	(1.3)	33.2	(2.8)	22.6	(1.3)	6.3	(0.8)
E9	16.4	(2.9)	18.8	(2.6)	36.1	(3.5)	22.6	(1.8)	6.2	(1.4)
Total	13.6	(0.6)	17.4	(0.9)	29.2	(0.7)	26.2	(0.8)	13.6	(0.9)

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

Source: Questions 1-2.

Table D.9. Drinking Levels Past 30 Days Among Enlisted Personnel - Army

Pay Grade	Drinking Level									
	Abstainer		Infrequent/ Light		Moderate		Moderate/ Heavy		Heavy	
E1	13.4	(4.7)	37.8	(9.0)	23.2	(6.8)	16.2	(4.5)	9.4	(4.4)
E2	8.2	(3.1)	6.7	(2.5)	16.5	(5.8)	49.9	(12.2)	18.7	(5.7)
E3	9.3	(2.0)	15.6	(2.5)	27.2	(5.4)	19.7	(3.0)	28.1	(6.1)
E4	16.4	(2.1)	16.8	(2.4)	23.2	(3.2)	24.5	(2.5)	19.2	(2.4)
E5	15.6	(1.9)	17.3	(1.6)	32.8	(2.5)	21.1	(1.4)	13.2	(1.5)
E6	16.8	(1.9)	17.0	(1.7)	31.7	(2.4)	24.7	(2.8)	9.9	(1.6)
E7	21.0	(2.4)	18.5	(1.3)	29.7	(2.4)	22.5	(2.0)	8.4	(1.1)
E8	24.0	(3.2)	12.8	(2.0)	37.3	(5.6)	21.1	(2.3)	4.7	(1.0)
E9	16.3	(6.6)	21.0	(5.6)	33.2	(7.8)	25.5	(4.3)	3.9	(1.8)
Total	15.1	(0.8)	17.4	(1.3)	27.3	(1.5)	24.2	(1.7)	16.0	(1.8)

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

Source: Questions 1-2.

Table D.10. Drinking Levels Past 30 Days Among Enlisted Personnel - Navy

Pay Grade	Drinking Level				
	Abstainer	Infrequent/ Light	Moderate	Moderate/ Heavy	Heavy
E1	*	*	*	*	*
E2	2.9 (3.2)	17.6 (4.6)	35.0 (3.0)	36.7 (5.2)	7.9 (4.7)
E3	4.9 (1.4)	21.7 (2.1)	18.8 (2.7)	38.8 (3.6)	15.8 (2.6)
E4	5.6 (1.7)	21.8 (8.9)	26.7 (4.5)	28.1 (4.4)	17.8 (1.7)
E5	12.3 (2.1)	15.8 (1.3)	31.3 (2.2)	27.0 (1.5)	13.6 (1.0)
E6	16.5 (1.3)	21.4 (2.1)	31.1 (2.4)	20.0 (1.7)	11.0 (1.3)
E7	15.5 (1.6)	21.2 (2.4)	32.0 (2.6)	23.8 (2.0)	7.4 (1.5)
E8	13.2 (1.9)	23.6 (2.0)	26.9 (2.8)	27.1 (1.8)	9.2 (2.2)
E9	16.5 (3.1)	18.4 (4.9)	29.0 (3.7)	27.7 (2.5)	8.4 (2.4)
Total	9.6 (1.0)	20.1 (2.3)	27.7 (1.0)	29.0 (1.1)	13.5 (1.1)

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

* Fewer than 20 respondents.

Source: Questions 1-2.

Table D.11. Drinking Levels Past 30 Days Among Enlisted Personnel -
Marine Corps

Pay Grade	Drinking Level									
	Abstainer		Infrequent/ Light		Moderate		Moderate/ Heavy		Heavy	
E1	*		*		*		*		*	
E2	3.2	(2.5)	11.0	(2.1)	25.0	(5.7)	37.0	(12.5)	23.8	(6.0)
E3	10.5	(3.9)	13.6	(2.5)	26.0	(2.5)	27.5	(4.4)	22.4	(6.5)
E4	6.0	(2.6)	17.6	(3.3)	21.2	(2.7)	45.0	(4.3)	10.1	(1.8)
E5	13.9	(4.9)	9.7	(4.1)	35.5	(3.0)	29.3	(6.0)	11.6	(2.5)
E6	20.0	(4.3)	12.9	(2.4)	35.3	(4.7)	22.1	(3.8)	9.7	(1.8)
E7	22.5	(3.4)	14.8	(3.8)	33.1	(2.1)	20.2	(3.9)	9.4	(1.8)
E8	22.6	(3.8)	25.3	(5.8)	30.2	(3.3)	15.8	(3.9)	6.1	(1.6)
E9	30.7	(16.9)	9.9	(5.8)	48.2	(17.6)	6.1	(4.3)	5.1	(4.6)
Total	10.8	(2.7)	13.8	(1.8)	27.4	(0.8)	31.2	(2.4)	16.8	(3.6)

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

* Fewer than 20 respondents.

Source: Questions 1-2.

Table D.12. Drinking Levels Past 30 Days Among Enlisted Personnel -
Air Force

Pay Grade	Drinking Level									
	Abstainer		Infrequent/ Light		Moderate		Moderate/ Heavy		Heavy	
E1	11.8	(2.4)	3.9	(0.8)	56.7	(1.6)	19.0	(2.6)	8.5	(4.5)
E2	14.3	(3.1)	17.7	(4.8)	32.2	(4.3)	25.3	(5.3)	10.5	(3.1)
E3	13.4	(3.0)	12.5	(2.2)	30.8	(2.9)	30.6	(3.0)	12.6	(1.9)
E4	14.3	(2.2)	14.6	(2.6)	32.0	(1.8)	27.2	(2.5)	11.9	(2.5)
E5	20.3	(1.7)	19.0	(1.4)	33.8	(1.8)	20.5	(1.1)	6.4	(0.9)
E6	18.2	(2.4)	18.7	(1.8)	34.3	(2.0)	20.5	(1.9)	8.2	(1.7)
E7	19.2	(2.0)	19.4	(1.3)	37.3	(0.9)	18.1	(1.5)	5.9	(0.9)
E8	21.7	(3.4)	15.9	(1.8)	34.1	(4.1)	22.6	(2.7)	5.7	(1.3)
E9	12.0	(3.5)	20.0	(4.0)	41.6	(5.3)	20.2	(2.8)	6.2	(3.1)
Total	16.4	(1.1)	16.0	(0.8)	33.6	(1.1)	24.5	(1.3)	9.6	(0.9)

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

Source: Questions 1-2.

Table D.13. Marijuana Use During the Past 30 Days

Region/Pay Grade	Service				Total DoD
	Army	Navy	Marine Corps	Air Force	
Americas					
E1-E3	13.5 (2.5)	12.9 (2.8)	16.1 (5.4)	3.2 (0.9)	10.7 (1.5)
E4-E6	10.2 (1.4)	7.6 (1.1)	4.2 (3.2)	4.2 (1.8)	7.2 (0.8)
E7-E9	1.6 (0.6)	0.4 (0.2)	0.0 (**)	0.2 (0.1)	0.7 (0.2)
O1-O2	0.0 (**)	0.0 (**)	0.0 (**)	1.8 (1.2)	0.9 (0.7)
O3	1.4 (0.8)	0.0 (**)	0.0 (**)	0.3 (0.3)	0.6 (0.3)
O4-O10	0.0 (**)	0.2 (0.2)	0.0 (**)	0.1 (0.2)	0.1 (0.1)
Total	8.8 (1.3)	7.5 (1.3)	8.9 (3.8)	3.0 (1.0)	6.6 (0.8)
North Pacific					
E1-E3	19.0 (5.5)	4.9 (0.6)	2.2 (0.2)	1.8 (2.6)	7.0 (2.1)
E4-E6	7.1 (0.4)	2.0 (0.6)	1.8 (1.0)	2.4 (1.1)	3.8 (0.5)
E7-E9	0.0 (**)	0.6 (0.5)	0.0 (**)	0.6 (0.7)	0.3 (0.2)
O1-O2	0.0 (**)	+ (+)	+ (+)	0.0 (**)	0.0 (**)
O3	0.0 (**)	0.0 (**)	+ (+)	0.0 (**)	0.0 (**)
O4-O10	0.0 (**)	0.0 (**)	0.0 (**)	0.0 (**)	0.0 (**)
Total	8.0 (1.6)	2.3 (0.7)	1.7 (0.3)	1.7 (1.1)	3.8 (0.6)
Other Pacific					
E1-E3	12.9 (4.9)	13.0 (1.5)	6.2 (3.3)	3.2 (0.2)	8.8 (1.1)
E4-E6	16.5 (12.0)	6.4 (0.8)	7.5 (6.9)	0.9 (0.1)	7.7 (3.0)
E7-E9	0.8 (0.8)	0.0 (**)	0.8 (0.6)	1.5 (1.7)	0.6 (0.4)
O1-O2	+ (+)	+ (+)	+ (+)	+ (+)	0.0 (**)
O3	0.0 (**)	0.0 (**)	+ (+)	0.0 (**)	0.0 (**)
O4-O10	0.0 (**)	0.0 (**)	0.0 (**)	0.0 (**)	0.0 (**)
Total	12.1 (6.8)	6.5 (0.4)	5.7 (4.1)	1.5 (0.5)	6.4 (1.6)
Europe					
E1-E3	21.3 (7.4)	16.5 (2.7)	+ (+)	0.0 (**)	14.1 (4.3)
E4-E6	10.9 (2.5)	4.1 (1.8)	+ (+)	1.0 (0.7)	7.3 (1.7)
E7-E9	0.2 (0.2)	0.0 (**)	+ (+)	1.1 (1.1)	0.4 (0.3)
O1-O2	0.0 (**)	+ (+)	+ (+)	+ (+)	0.0 (**)
O3	0.0 (**)	0.0 (**)	+ (+)	0.0 (**)	0.0 (**)
O4-O10	0.0 (**)	0.0 (**)	+ (+)	0.0 (**)	0.0 (**)
Total	10.0 (2.3)	5.6 (0.6)	0.0 (**)	0.6 (0.5)	6.8 (1.5)
Total Worldwide					
E1-E3	15.3 (2.3)	13.0 (2.3)	13.8 (4.6)	2.8 (0.7)	10.9 (1.3)
E4-E6	10.5 (1.2)	6.9 (0.9)	3.9 (2.6)	3.5 (1.3)	7.0 (0.7)
E7-E9	1.1 (0.4)	0.3 (0.2)	- (-)	0.4 (0.2)	0.7 (0.2)
O1-O2	0.0 (**)	0.0 (**)	0.0 (**)	1.6 (1.1)	0.7 (0.5)
O3	1.0 (0.5)	0.0 (**)	0.0 (**)	0.2 (0.2)	0.4 (0.2)
O4-O10	0.0 (**)	0.1 (0.2)	0.0 (**)	0.1 (0.1)	0.1 (0.1)
Total	9.2 (1.1)	7.0 (1.0)	7.7 (3.2)	2.5 (0.8)	6.5 (0.6)

Note: Tabled values are percentages and represent prevalence estimates with standard errors in parentheses. Regional totals include W1-W4's.

-Estimate rounds to zero.

*Fewer than 20 respondents.

**Informative standard error not available but is expected to be very close to zero.

Source: Questions 1, 2, 52a.

Table D.14. Marijuana Use During the Past 12 Months

Region/Pay Grade	Service				Total DoD
	Army	Navy	Marine Corps	Air Force	
Americas					
E1-E3	25.4 (2.9)	22.3 (3.0)	20.3 (6.0)	7.0 (1.5)	18.3 (1.8)
E4-E6	16.0 (1.6)	13.5 (2.3)	7.1 (3.3)	6.9 (1.7)	11.8 (1.1)
E7-E9	2.3 (0.5)	0.7 (0.4)	0.4 (0.4)	0.3 (0.1)	1.1 (0.2)
O1-O2	0.8 (0.8)	3.5 (2.9)	0.0 (**)	1.8 (1.2)	1.8 (0.9)
O3	2.6 (1.3)	1.0 (0.9)	0.0 (**)	1.4 (1.2)	1.6 (0.7)
O4-O10	0.4 (0.3)	0.2 (0.2)	0.0 (**)	0.1 (0.2)	0.2 (0.1)
Total	15.0 (1.6)	13.2 (2.2)	11.9 (4.2)	5.3 (1.0)	11.2 (1.0)
North Pacific					
E1-E3	25.1 (11.1)	11.8 (2.3)	18.2 (3.5)	3.6 (5.3)	16.3 (4.0)
E4-E6	19.0 (4.4)	4.5 (0.8)	4.9 (0.9)	5.1 (1.4)	9.5 (1.4)
E7-E9	0.5 (0.5)	0.6 (0.5)	0.7 (0.8)	1.2 (1.4)	0.7 (0.4)
O1-O2	4.6 (4.7)	+ (+)	+ (+)	+ (+)	1.6 (1.6)
O3	3.7 (3.7)	0.0 (**)	+ (+)	0.0 (**)	0.9 (0.9)
O4-O10	0.0 (**)	0.0 (**)	0.0 (**)	1.8 (2.4)	0.6 (0.7)
Total	16.2 (5.5)	5.3 (1.5)	9.9 (1.9)	3.7 (1.6)	9.4 (1.8)
Other Pacific					
E1-E3	16.4 (3.0)	29.4 (3.8)	13.7 (4.0)	11.7 (0.3)	19.1 (3.4)
E4-E6	23.9 (10.4)	9.2 (1.5)	13.3 (7.7)	4.4 (1.5)	12.0 (2.7)
E7-E9	1.2 (0.4)	0.0 (**)	1.7 (0.6)	1.5 (1.7)	0.8 (0.4)
O1-O2	+ (+)	+ (+)	+ (+)	+ (+)	1.7 (1.4)
O3	0.0 (**)	0.0 (**)	+ (+)	2.0 (2.0)	0.8 (0.8)
O4-O10	0.0 (**)	0.0 (**)	0.0 (**)	0.0 (**)	0.0 (**)
Total	17.2 (6.3)	11.5 (2.4)	11.3 (4.2)	5.7 (0.6)	11.3 (1.9)
Europe					
E1-E3	26.5 (6.5)	24.3 (7.3)	+ (+)	13.0 (2.8)	21.8 (4.1)
E4-E6	15.5 (3.0)	9.5 (0.4)	+ (+)	6.9 (0.4)	12.6 (1.8)
E7-E9	0.4 (0.2)	0.0 (**)	+ (+)	1.1 (1.1)	0.5 (0.3)
O1-O2	1.6 (1.8)	+ (+)	+ (+)	+ (+)	1.2 (1.3)
O3	1.0 (1.0)	4.2 (5.2)	+ (+)	0.0 (**)	1.2 (1.0)
O4-O10	0.0 (**)	0.7 (1.3)	+ (+)	0.0 (**)	0.1 (0.1)
Total	13.7 (2.5)	10.6 (3.2)	15.1 (13.6)	6.5 (0.2)	11.4 (1.6)
Total Worldwide					
E1-E3	25.4 (2.5)	22.6 (2.5)	19.5 (5.0)	7.8 (1.3)	18.7 (1.5)
E4-E6	16.3 (1.4)	12.4 (1.9)	7.8 (2.7)	6.8 (1.3)	11.9 (0.9)
E7-E9	1.7 (0.3)	0.5 (0.3)	0.5 (0.3)	0.5 (0.2)	1.0 (0.2)
O1-O2	1.4 (0.8)	3.1 (2.6)	0.0 (**)	1.6 (1.1)	1.7 (0.8)
O3	2.2 (0.9)	1.5 (1.1)	0.0 (**)	1.0 (0.8)	1.5 (0.5)
O4-O10	0.2 (0.2)	0.2 (0.2)	0.0 (**)	0.2 (0.1)	0.2 (0.1)
Total	14.8 (1.3)	12.5 (1.8)	11.7 (3.4)	5.4 (0.8)	11.1 (0.8)

Note: Tabled values are percentages and represent prevalence estimates with standard errors in parentheses. Regional totals include W1-W4's.

* Fewer than 20 respondents.

** Informative standard error not available but is expected to be very close to zero.

Source: Questions 1, 2, 77a.

Table D.15. Any Drug Use Except Marijuana During the Past 30 Days

Region/Pay Grade	Service				Total DoD
	Army	Navy	Marine Corps	Air Force	
Americas					
E1-E3	10.1 (2.4)	14.4 (4.1)	11.8 (3.5)	4.8 (1.5)	9.9 (1.6)
E4-E6	6.9 (0.9)	9.2 (1.4)	5.0 (2.3)	3.7 (1.5)	6.4 (0.7)
E7-E9	2.1 (0.8)	0.7 (0.3)	2.9 (1.7)	0.6 (0.2)	1.4 (0.3)
O1-O2	0.0 (**)	0.0 (**)	0.0 (**)	1.6 (1.2)	0.8 (0.7)
O3	3.2 (1.1)	0.0 (**)	0.0 (**)	1.7 (1.2)	1.7 (0.6)
O4-O10	2.1 (0.8)	0.0 (**)	0.0 (**)	1.1 (0.4)	1.0 (0.3)
Total	6.5 (0.9)	8.7 (1.7)	7.4 (2.7)	3.3 (0.8)	6.2 (0.7)
North Pacific					
E1-E3	17.2 (7.6)	6.8 (2.2)	3.4 (1.5)	2.6 (1.4)	7.5 (2.5)
E4-E6	8.5 (3.1)	4.5 (0.8)	2.4 (2.3)	2.1 (0.8)	4.7 (1.1)
E7-E9	0.6 (0.6)	0.6 (0.5)	0.8 (0.7)	1.2 (1.4)	0.8 (0.4)
O1-O2	0.0 (**)	+ (+)	+ (+)	0.0 (**)	0.0 (**)
O3	0.0 (**)	0.0 (**)	+ (+)	0.0 (**)	0.0 (**)
O4-O10	0.0 (**)	0.0 (**)	0.0 (**)	5.4 (7.2)	1.8 (2.0)
Total	8.5 (3.8)	4.1 (0.7)	2.5 (1.7)	2.0 (1.0)	4.6 (1.2)
Other Pacific					
E1-E3	9.9 (0.5)	10.6 (2.1)	8.3 (1.7)	8.4 (0.1)	9.4 (1.0)
E4-E6	12.5 (7.1)	4.7 (1.7)	2.0 (1.2)	1.8 (1.3)	5.7 (1.9)
E7-E9	1.2 (0.4)	1.2 (0.2)	2.6 (-)	0.4 (0.5)	1.1 (0.2)
O1-O2	+ (+)	+ (+)	+ (+)	+ (+)	0.0 (**)
O3	0.0 (**)	0.0 (**)	+ (+)	0.0 (**)	0.5 (0.5)
O4-O10	3.3 (0.7)	1.1 (1.5)	0.0 (**)	0.0 (**)	1.2 (0.8)
Total	9.3 (4.3)	5.1 (1.6)	4.8 (0.9)	3.3 (0.2)	5.5 (1.2)
Europe					
E1-E3	18.8 (7.8)	12.0 (3.8)	+ (+)	2.8 (0.1)	13.0 (4.4)
E4-E6	3.5 (0.8)	5.8 (0.8)	+ (+)	2.1 (0.1)	3.5 (0.5)
E7-E9	1.2 (1.0)	0.6 (0.7)	+ (+)	1.1 (-)	1.1 (0.6)
O1-O2	0.0 (**)	+ (+)	+ (+)	+ (+)	0.0 (**)
O3	0.0 (**)	0.0 (**)	+ (+)	0.0 (**)	0.0 (**)
O4-O10	0.0 (**)	0.0 (**)	+ (+)	0.5 (0.7)	0.1 (0.2)
Total	5.5 (1.6)	5.8 (1.2)	3.1 (3.3)	1.8 (0.2)	4.6 (1.0)
Total Worldwide					
E1-E3	12.2 (2.4)	13.7 (3.5)	10.6 (3.0)	4.7 (1.3)	10.1 (1.4)
E4-E6	6.1 (0.7)	8.2 (1.1)	4.4 (1.9)	3.3 (1.1)	5.8 (0.6)
E7-E9	1.8 (0.6)	0.7 (0.2)	2.6 (1.4)	0.7 (0.2)	1.3 (0.3)
O1-O2	0.0 (**)	0.0 (**)	0.0 (**)	1.4 (1.1)	0.6 (0.5)
O3	2.2 (0.8)	0.0 (**)	0.4 (0.4)	1.1 (0.8)	1.2 (0.4)
O4-O10	1.4 (0.6)	0.1 (0.1)	0.0 (**)	1.2 (0.4)	0.9 (0.2)
Total	6.4 (0.8)	8.0 (1.4)	6.6 (2.3)	3.1 (0.6)	5.8 (0.6)

Note: Tabled values are percentages and represent prevalence estimates with standard errors in parentheses. Regional totals include W1-W4's.

-Estimate rounds to zero.

*Fewer than 20 respondents.

**Informative standard error not available but is expected to be very close to zero.

Source: Questions 1, 2, 52b-j.

Table D.16. Any Drug Use Except Marijuana During the Past 12 Months

Region/Pay Grade	Service				Total DoD
	Army	Navy	Marine Corps	Air Force	
Americas					
E1-E3	14.9 (2.0)	20.4 (6.1)	20.2 (7.6)	6.0 (1.4)	14.4 (2.4)
E4-E6	9.2 (1.3)	14.1 (2.9)	5.0 (2.4)	5.0 (1.8)	9.0 (1.2)
E7-E9	2.3 (0.8)	0.7 (0.3)	3.0 (1.7)	0.6 (0.2)	1.4 (0.3)
O1-O2	1.9 (1.4)	3.5 (2.9)	0.0 (**)	2.4 (1.1)	2.4 (0.9)
O3	3.2 (1.1)	0.0 (**)	0.0 (**)	2.1 (1.4)	1.9 (0.6)
O4-O10	2.4 (0.8)	0.0 (**)	0.0 (**)	1.4 (0.4)	1.3 (0.3)
Total	9.0 (1.1)	13.0 (3.3)	11.2 (4.8)	4.4 (0.9)	8.8 (1.2)
North Pacific					
E1-E3	19.9 (9.9)	8.8 (1.2)	15.2 (0.5)	2.6 (1.4)	13.1 (3.0)
E4-E6	12.5 (4.0)	4.6 (0.8)	3.5 (1.3)	3.7 (0.7)	6.7 (1.3)
E7-E9	1.1 (0.1)	1.4 (0.5)	0.8 (0.7)	1.9 (2.0)	1.3 (0.6)
O1-O2	3.9 (3.9)	+ (+)	+ (+)	+ (+)	1.4 (1.4)
O3	0.0 (**)	0.0 (**)	+ (+)	0.0 (**)	0.0 (**)
O4-O10	0.0 (**)	0.0 (**)	0.0 (**)	8.0 (5.5)	2.7 (1.3)
Total	11.5 (4.7)	4.7 (0.5)	8.0 (0.3)	3.2 (0.6)	7.2 (1.4)
Other Pacific					
E1-E3	9.9 (0.5)	19.3 (6.8)	14.7 (5.2)	11.2 (1.5)	14.5 (3.5)
E4-E6	14.9 (7.6)	6.1 (2.5)	5.8 (4.7)	3.5 (1.6)	7.6 (2.2)
E7-E9	1.2 (0.4)	1.6 (0.2)	2.6 (-)	0.4 (0.5)	1.3 (0.2)
O1-O2	+ (+)	+ (+)	+ (+)	+ (+)	1.7 (1.5)
O3	0.0 (**)	0.0 (**)	+ (+)	0.0 (**)	0.5 (0.5)
O4-O10	3.3 (0.8)	2.1 (3.0)	0.0 (**)	0.0 (**)	1.6 (1.1)
Total	11.0 (4.7)	7.8 (3.3)	9.0 (3.5)	4.9 (0.2)	7.9 (1.8)
Europe					
E1-E3	21.5 (7.3)	19.8 (8.5)	+ (+)	6.5 (1.4)	16.7 (4.5)
E4-E6	9.2 (2.6)	8.3 (0.2)	+ (+)	4.3 (0.8)	7.8 (1.5)
E7-E9	1.2 (1.0)	0.6 (0.7)	+ (+)	1.1 (-)	1.1 (0.6)
O1-O2	0.0 (**)	+ (+)	+ (+)	+ (+)	0.0 (**)
O3	0.0 (**)	4.2 (5.2)	+ (+)	0.0 (**)	0.8 (0.9)
O4-O10	0.0 (**)	0.0 (**)	+ (+)	0.5 (0.7)	0.1 (0.2)
Total	9.2 (2.7)	9.1 (3.3)	3.1 (3.3)	3.7 (0.5)	7.7 (1.7)
Total Worldwide					
E1-E3	16.4 (2.2)	19.9 (5.1)	19.2 (6.4)	6.2 (1.2)	14.7 (2.0)
E4-E6	9.5 (1.1)	12.4 (2.4)	4.7 (1.9)	4.8 (1.3)	8.6 (0.9)
E7-E9	1.9 (0.6)	0.8 (0.2)	2.6 (1.4)	0.7 (0.2)	1.4 (0.3)
O1-O2	1.5 (0.9)	3.1 (2.6)	0.0 (**)	2.2 (1.0)	2.0 (0.8)
O3	2.2 (0.8)	0.8 (0.9)	0.4 (0.4)	1.4 (0.9)	1.5 (0.5)
O4-O10	1.6 (0.6)	0.1 (0.1)	0.0 (**)	1.5 (0.3)	1.2 (0.2)
Total	9.2 (1.1)	11.9 (2.7)	10.6 (4.0)	4.2 (0.7)	8.5 (0.9)

Note: Tabled values are percentages and represent prevalence estimates with standard errors in parentheses. Regional totals include W1-W4's.

-Estimate rounds to zero.

*Fewer than 20 respondents.

**Informative standard error not available but is expected to be very close to zero.

Source: Questions 1, 2, 77b-j.

Table D.17. Any Drug Use During the Past 30 Days

Region/Pay Grade	Service				Total DoD
	Army	Navy	Marine Corps	Air Force	
Americas					
E1-E3	17.9 (3.6)	18.7 (4.2)	18.4 (4.8)	7.0 (1.6)	14.9 (1.9)
E4-E6	12.1 (1.5)	11.0 (1.7)	6.6 (3.3)	5.9 (1.7)	9.5 (0.9)
E7-E9	3.1 (0.9)	1.0 (0.3)	2.9 (1.7)	0.8 (0.2)	1.9 (0.4)
01-02	0.0 (**)	0.0 (**)	0.0 (**)	1.8 (1.2)	0.9 (0.7)
03	3.6 (1.1)	0.0 (**)	0.0 (**)	1.7 (1.2)	1.8 (0.6)
04-010	2.1 (0.8)	0.2 (0.2)	0.0 (**)	1.1 (0.4)	1.1 (0.3)
Total	11.3 (1.6)	10.8 (2.1)	11.0 (3.8)	5.0 (1.1)	9.2 (1.0)
North Pacific					
E1-E3	21.7 (7.9)	10.8 (0.2)	4.4 (0.5)	4.4 (1.2)	10.1 (2.6)
E4-E6	13.6 (2.1)	4.5 (0.8)	4.2 (1.3)	3.7 (1.0)	7.2 (0.8)
E7-E9	0.6 (0.6)	0.6 (0.5)	0.8 (0.7)	1.9 (2.0)	1.0 (0.6)
01-02	0.0 (**)	+ (+)	+ (+)	0.0 (**)	0.0 (**)
03	0.0 (**)	0.0 (**)	+ (+)	0.0 (**)	0.0 (**)
04-010	0.0 (**)	0.0 (**)	0.0 (**)	5.4 (7.2)	1.8 (2.0)
Total	12.3 (3.3)	5.0 (-)	3.7 (0.8)	3.3 (0.5)	6.5 (1.1)
Other Pacific					
E1-E3	16.4 (3.0)	14.8 (4.1)	10.4 (2.1)	8.4 (0.1)	12.3 (1.3)
E4-E6	22.6 (13.6)	8.1 (1.5)	8.2 (6.9)	2.5 (1.1)	10.4 (3.4)
E7-E9	2.0 (1.3)	1.2 (0.2)	2.6 (-)	1.9 (2.2)	1.7 (0.6)
01-02	+ (+)	+ (+)	+ (+)	+ (+)	0.0 (**)
03	0.0 (**)	0.0 (**)	+ (+)	0.0 (**)	0.5 (0.5)
04-010	3.3 (0.7)	1.1 (1.5)	0.0 (**)	0.0 (**)	1.2 (0.8)
Total	16.5 (8.0)	8.0 (0.3)	8.2 (3.5)	3.8 (0.4)	8.8 (1.9)
Europe					
E1-E3	25.2 (7.0)	26.0 (4.9)	+ (+)	2.8 (0.1)	18.8 (4.5)
E4-E6	12.1 (2.8)	7.3 (1.4)	+ (+)	3.1 (0.6)	9.0 (1.8)
E7-E9	1.4 (0.9)	0.6 (0.7)	+ (+)	1.7 (0.6)	1.3 (0.6)
01-02	0.0 (**)	+ (+)	+ (+)	+ (+)	0.0 (**)
03	0.0 (**)	0.0 (**)	+ (+)	0.0 (**)	0.0 (**)
04-010	0.0 (**)	0.0 (**)	+ (+)	0.5 (0.7)	0.1 (0.2)
Total	11.5 (2.6)	9.4 (1.9)	3.1 (3.3)	2.4 (0.2)	8.7 (1.7)
Total Worldwide					
E1-E3	19.5 (3.0)	18.9 (3.5)	16.3 (4.2)	6.5 (1.3)	15.1 (1.6)
E4-E6	12.5 (1.3)	10.1 (1.4)	6.2 (2.7)	5.2 (1.3)	9.3 (0.8)
E7-E9	2.5 (0.6)	1.0 (0.3)	2.6 (1.4)	1.0 (0.2)	1.7 (0.3)
01-02	0.0 (**)	0.0 (**)	0.0 (**)	1.6 (1.1)	0.7 (0.5)
03	2.4 (0.8)	0.0 (**)	0.4 (0.4)	1.1 (0.8)	1.3 (0.4)
04-010	1.4 (0.6)	0.2 (0.2)	0.0 (**)	1.2 (0.4)	1.0 (0.2)
Total	11.5 (1.3)	10.3 (1.7)	9.9 (3.2)	4.5 (0.8)	8.9 (0.8)

Note: Tabled values are percentages and represent prevalence estimates with standard errors in parentheses. Regional totals include W1-W4's.

-Estimate rounds to zero.

*Fewer than 20 respondents.

**Informative standard error not available but is expected to be very close to zero.

Source: Questions 1-2, 52a-j.

Table D.18. Any Drug Use During the Past 12 Months

Region/Pay Grade	Service				Total DoD
	Army	Navy	Marine Corps	Air Force	
Americas					
E1-E3	27.8 (3.5)	27.3 (4.8)	24.7 (6.1)	10.3 (2.0)	21.9 (2.2)
E4-E6	17.8 (1.5)	17.5 (3.3)	9.6 (3.4)	8.3 (1.7)	14.2 (1.3)
E7-E9	3.7 (0.8)	1.3 (0.4)	3.4 (1.5)	0.9 (0.1)	2.2 (0.3)
O1-O2	2.8 (1.6)	3.5 (2.9)	0.0 (**)	2.7 (1.1)	2.7 (0.9)
O3	4.8 (1.2)	1.0 (0.9)	0.0 (**)	2.1 (1.4)	2.6 (0.7)
O4-O10	2.4 (0.8)	0.2 (0.2)	0.0 (**)	1.4 (0.4)	1.3 (0.3)
Total	16.9 (1.6)	16.7 (3.3)	15.0 (4.6)	7.1 (1.1)	13.6 (1.3)
North Pacific					
E1-E3	27.1 (12.5)	17.7 (1.5)	20.6 (1.0)	6.2 (3.9)	19.2 (4.1)
E4-E6	22.4 (5.1)	6.5 (0.1)	7.3 (1.4)	6.7 (2.1)	11.9 (1.7)
E7-E9	1.1 (0.1)	1.4 (0.5)	1.5 (0.1)	2.5 (2.7)	1.6 (0.7)
O1-O2	8.6 (0.8)	+ (+)	+ (+)	+ (+)	3.0 (0.5)
O3	3.7 (3.7)	0.0 (**)	+ (+)	0.0 (**)	0.9 (0.9)
O4-O10	0.0 (**)	0.0 (**)	0.0 (**)	8.0 (5.5)	2.7 (1.3)
Total	18.8 (6.1)	7.8 (1.0)	11.9 (0.2)	5.5 (1.7)	11.6 (2.0)
Other Pacific					
E1-E3	16.4 (3.0)	30.3 (2.4)	19.0 (4.1)	14.9 (0.5)	21.3 (2.7)
E4-E6	26.4 (11.6)	11.3 (2.6)	14.0 (7.6)	6.0 (2.6)	14.0 (3.1)
E7-E9	2.4 (0.9)	1.6 (0.2)	3.5 (1.2)	1.9 (2.2)	2.0 (0.6)
O1-O2	+ (+)	+ (+)	+ (+)	+ (+)	1.7 (1.5)
O3	0.0 (**)	0.0 (**)	+ (+)	2.0 (2.0)	1.2 (0.9)
O4-O10	3.3 (0.8)	2.1 (3.0)	0.0 (**)	0.0 (**)	1.6 (1.1)
Total	19.0 (6.8)	13.1 (2.6)	14.2 (4.1)	7.5 (0.4)	13.1 (2.0)
Europe					
E1-E3	29.9 (6.6)	33.9 (9.4)	+ (+)	13.8 (4.0)	25.6 (4.8)
E4-E6	16.8 (2.9)	12.8 (0.8)	+ (+)	9.1 (0.6)	14.4 (1.7)
E7-E9	1.6 (0.9)	0.6 (0.7)	+ (+)	1.7 (0.7)	1.5 (0.6)
O1-O2	1.6 (1.8)	+ (+)	+ (+)	+ (+)	1.2 (1.3)
O3	0.9 (1.0)	4.2 (5.2)	+ (+)	0.0 (**)	1.2 (1.0)
O4-O10	0.0 (**)	0.7 (1.3)	+ (+)	0.5 (0.7)	0.2 (0.2)
Total	15.2 (2.4)	14.5 (4.1)	18.1 (10.3)	7.8 (0.1)	13.2 (1.6)
Total Worldwide					
E1-E3	28.0 (2.9)	27.7 (4.1)	23.7 (5.2)	10.8 (1.7)	22.2 (1.9)
E4-E6	18.0 (1.3)	16.1 (2.6)	10.0 (2.8)	8.3 (1.3)	14.1 (1.0)
E7-E9	3.0 (0.6)	1.2 (0.4)	3.1 (1.2)	1.1 (0.2)	2.1 (0.3)
O1-O2	2.7 (1.2)	3.1 (2.6)	0.0 (**)	2.4 (1.0)	2.5 (0.8)
O3	3.6 (0.9)	1.5 (1.1)	0.4 (0.4)	1.5 (0.9)	2.2 (0.5)
O4-O10	1.6 (0.6)	0.3 (0.2)	0.0 (**)	1.5 (0.3)	1.2 (0.2)
Total	16.6 (1.3)	15.9 (2.7)	14.7 (3.8)	7.2 (0.9)	13.4 (1.0)

Note: Tabled values are percentages and represent prevalence estimates with standard errors in parentheses. Regional totals include W1-W4's.

+ Fewer than 20 respondents.

**Informative standard error not available but is expected to be very close to zero.

Source: Questions 1, 3, 77a-j.

Table D.19. Marijuana Use During Past 30 Days and Past 12 Months
by Enlisted Pay Grade

Pay Grade/Frequency	Service									
	Army		Navy		Marine Corps		Air Force		Total DoD	
<u>E1</u>										
Past 30 days	9.0	(3.1)	+	(+)	+	(+)	3.9	(0.8)	8.6	(2.3)
Past 12 months	32.0	(4.2)	+	(+)	+	(+)	7.9	(4.0)	26.4	(5.0)
<u>E2</u>										
Past 30 days	17.8	(5.3)	17.2	(3.2)	10.8	(3.6)	2.1	(1.4)	12.6	(2.1)
Past 12 months	23.3	(6.8)	28.1	(6.2)	16.7	(5.7)	7.2	(1.9)	19.4	(3.4)
<u>E3</u>										
Past 30 days	16.8	(3.5)	11.7	(2.6)	13.9	(5.0)	2.9	(0.7)	10.6	(1.5)
Past 12 months	23.7	(3.8)	20.5	(3.3)	19.3	(5.0)	7.9	(1.2)	17.2	(1.8)
<u>E4</u>										
Past 30 days	16.8	(2.2)	12.5	(1.7)	6.2	(4.8)	6.6	(3.1)	12.1	(1.4)
Past 12 months	24.3	(2.7)	20.1	(3.4)	11.1	(5.6)	12.0	(2.8)	18.8	(1.7)
<u>E5</u>										
Past 30 days	6.5	(1.2)	4.2	(1.0)	2.7	(1.2)	1.9	(0.2)	4.1	(0.5)
Past 12 months	11.2	(1.5)	9.9	(2.0)	6.6	(1.3)	4.2	(0.9)	8.1	(0.8)
<u>E6</u>										
Past 30 days	3.3	(0.7)	2.2	(0.7)	0.0	(**)	0.2	(0.2)	2.1	(0.3)
Past 12 months	7.0	(1.5)	4.2	(1.0)	0.7	(0.6)	1.1	(0.5)	4.4	(0.7)
<u>E7</u>										
Past 30 days	1.6	(0.5)	0.5	(0.3)	0.1	(0.1)	0.4	(0.2)	0.9	(0.2)
Past 12 months	2.4	(0.5)	0.6	(0.3)	0.8	(0.5)	0.6	(0.2)	1.3	(0.2)
<u>E8</u>										
Past 30 days	0.0	(**)	0.0	(**)	0.0	(**)	0.4	(0.4)	0.1	(0.1)
Past 12 months	0.2	(0.2)	0.5	(0.5)	+	(+)	0.4	(0.4)	0.3	(0.2)
<u>E9</u>										
Past 30 days	0.0	(**)	0.2	(0.2)	0.0	(**)	0.0	(**)	0.1	(0.1)
Past 12 months	0.0	(**)	0.2	(0.2)	0.0	(**)	0.3	(0.3)	0.2	(0.1)
<u>Total</u>										
Past 30 days	10.7	(1.2)	8.0	(1.1)	8.5	(3.6)	3.0	(0.9)	7.6	(0.7)
Past 12 months	17.0	(1.3)	14.0	(1.8)	13.0	(3.8)	6.4	(0.9)	12.8	(0.9)

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

+Fewer than 20 respondents.

**Informative standard error not available but is expected to be very close to zero.

Source: Questions 1, 2, 52A and 77A.

Table D.20. Use of Any Drug Except Marijuana During Past 30 Days and Past 12 Months by Enlisted Pay Grade

Pay Grade/Frequency	Service								Total DoD	
	Army		Navy		Marine Corps		Air Force			
<u>E1</u>										
Past 30 days	7.4	(3.3)	+	(+)	+	(+)	7.9	(1.6)	9.2	(2.8)
Past 12 months	15.0	(4.0)	+	(+)	+	(+)	7.9	(1.6)	15.6	(3.4)
<u>E2</u>										
Past 30 days	12.6	(3.6)	13.3	(3.7)	12.9	(2.2)	7.1	(2.5)	11.4	(1.8)
Past 12 months	14.0	(3.9)	23.3	(8.1)	20.3	(6.2)	9.7	(2.2)	16.3	(3.4)
<u>E3</u>										
Past 30 days	14.0	(3.3)	14.4	(3.9)	8.3	(4.0)	3.6	(1.2)	9.8	(1.7)
Past 12 months	18.1	(2.9)	19.2	(5.0)	16.5	(7.4)	4.9	(1.2)	13.9	(2.2)
<u>E4</u>										
Past 30 days	10.1	(1.4)	14.6	(1.9)	7.4	(4.6)	4.9	(2.5)	9.6	(1.1)
Past 12 months	15.3	(2.3)	20.5	(4.1)	8.0	(4.6)	7.6	(2.9)	13.9	(1.7)
<u>E5</u>										
Past 30 days	3.2	(0.6)	5.1	(1.0)	1.2	(1.1)	2.3	(0.5)	3.2	(0.4)
Past 12 months	5.5	(0.8)	10.3	(2.6)	1.3	(1.2)	2.9	(0.6)	5.6	(0.8)
<u>E6</u>										
Past 30 days	2.1	(0.4)	3.0	(0.7)	2.6	(2.5)	2.0	(0.6)	2.4	(0.3)
Past 12 months	3.5	(0.7)	3.6	(0.7)	2.6	(2.5)	2.5	(0.6)	3.2	(0.4)
<u>E7</u>										
Past 30 days	1.9	(0.8)	0.6	(0.3)	4.0	(2.3)	1.0	(0.2)	1.5	(0.4)
Past 12 months	2.1	(0.8)	0.7	(0.3)	4.1	(2.3)	1.0	(0.2)	1.6	(0.4)
<u>E8</u>										
Past 30 days	1.3	(0.8)	1.1	(0.6)	0.3	(0.3)	0.0	(**)	0.9	(0.4)
Past 12 months	1.3	(0.8)	1.3	(0.6)	0.3	(0.3)	0.0	(**)	0.9	(0.4)
<u>E9</u>										
Past 30 days	1.8	(1.4)	0.2	(0.2)	0.0	(**)	0.3	(0.3)	0.6	(0.4)
Past 12 months	1.9	(1.4)	0.2	(0.2)	0.0	(**)	0.6	(0.6)	0.7	(0.4)
<u>Total</u>										
Past 30 days	7.3	(0.8)	9.0	(1.5)	7.3	(2.5)	3.5	(0.7)	6.7	(0.6)
Past 12 months	10.5	(1.1)	13.3	(2.8)	11.7	(4.4)	4.8	(0.8)	9.7	(1.1)

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

+Fewer than 20 respondents.

**Informative standard error not available but is expected to be very close to zero.

Source: Questions 1, 2, 52b-j and 77b-j.

Table D.21. Any Drug Use During Past 30 Days and Past 12 Months by Enlisted Pay Grade

Pay Grade/Frequency	Service								Total	DoD
	Army		Navy		Marine Corps		Air Force			
<u>E1</u>										
Past 30 days	13.2	(3.9)	+	(+)	+	(+)	7.9	(1.6)	13.1	(3.0)
Past 12 months	32.5	(4.3)	+	(+)	+	(+)	11.9	(3.6)	29.2	(4.8)
<u>E2</u>										
Past 30 days	21.8	(6.2)	18.7	(3.4)	14.3	(2.4)	8.0	(2.8)	16.3	(2.3)
Past 12 months	25.7	(7.9)	28.9	(6.1)	26.1	(8.5)	10.9	(2.5)	22.7	(3.6)
<u>E3</u>										
Past 30 days	21.1	(3.8)	19.6	(4.1)	15.5	(5.5)	5.8	(1.4)	14.9	(1.9)
Past 12 months	27.1	(3.9)	27.6	(3.7)	20.8	(5.3)	10.7	(1.9)	20.9	(1.9)
<u>E4</u>										
Past 30 days	19.5	(2.4)	16.5	(2.3)	9.5	(5.8)	8.7	(2.9)	15.0	(1.5)
Past 12 months	26.3	(2.5)	24.5	(4.4)	14.3	(6.5)	13.2	(2.9)	21.3	(1.8)
<u>E5</u>										
Past 30 days	8.1	(1.3)	7.5	(1.5)	3.6	(1.7)	3.3	(0.4)	5.9	(0.7)
Past 12 months	12.9	(1.6)	14.8	(3.6)	7.4	(1.0)	5.8	(0.9)	10.6	(1.2)
<u>E6</u>										
Past 30 days	4.7	(0.8)	4.1	(0.6)	2.6	(2.5)	2.0	(0.6)	3.8	(0.4)
Past 12 months	8.3	(1.6)	5.6	(0.8)	3.3	(2.3)	3.1	(0.8)	5.9	(0.7)
<u>E7</u>										
Past 30 days	2.9	(0.9)	1.1	(0.4)	4.0	(2.3)	1.3	(0.2)	2.1	(0.4)
Past 12 months	3.6	(0.8)	1.2	(0.5)	4.9	(2.0)	1.4	(0.2)	2.5	(0.4)
<u>E8</u>										
Past 30 days	1.3	(0.8)	1.1	(0.6)	0.3	(0.3)	0.4	(0.4)	1.0	(0.4)
Past 12 months	1.5	(0.8)	1.8	(0.7)	0.3	(0.3)	0.4	(0.4)	1.3	(0.4)
<u>E9</u>										
Past 30 days	1.8	(1.4)	0.2	(0.2)	0.0	(**)	0.3	(0.3)	0.6	(0.4)
Past 12 months	1.9	(1.4)	0.2	(0.2)	0.0	(**)	0.6	(0.6)	0.7	(0.4)
<u>Total</u>										
Past 30 days	13.3	(1.4)	11.6	(1.8)	10.9	(3.5)	5.2	(0.9)	10.3	(0.9)
Past 12 months	19.0	(1.3)	17.8	(2.8)	16.2	(4.1)	8.4	(1.0)	15.4	(1.1)

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

+Fewer than 20 respondents.

**Informative standard error not available but is expected to be very close to zero.

Source: Questions 52a-j and 77a-j.

Table D.22. Drug Use During the Past 12 Months by Age for Males

Drug Use Past 12 Months	Age		Total
	18 - 25	26 - 39	
Marijuana	18.8 (1.4)	3.9 (0.4)	11.4 (0.9)
Cocaine	7.2 (0.9)	1.4 (0.3)	4.3 (0.5)
Amphetamines	5.6 (0.6)	0.9 (0.2)	3.3 (0.4)
LSD/Hallucinogens	5.7 (1.0)	0.4 (0.1)	3.1 (0.6)
Tranquilizers	2.9 (0.5)	0.5 (0.1)	1.7 (0.3)
Heroin/Other opiates	0.7 (0.2)	0.2 (0.1)	0.5 (0.1)

Note: Entries are percentages with standard errors in parentheses.

Source: Question 52.

Table D.23. Prevalence of Cigars, Pipe, and Smokeless Tobacco Use

Tobacco Type/Frequency	Service				Total DoD
	Army	Navy	Marine Corps	Air Force	
<u>Cigars/Pipe, Past 12 months</u>					
Didn't smoke	72.9 (1.1)	72.7 (1.7)	68.4 (2.0)	79.2 (1.4)	74.3 (0.7)
< once/week	21.5 (1.0)	23.5 (1.2)	27.4 (2.2)	17.1 (1.3)	21.3 (0.6)
1-4 days/week	2.1 (0.3)	1.9 (0.4)	1.8 (0.4)	2.1 (0.2)	2.0 (0.2)
5 or more days/week	3.5 (0.4)	1.9 (0.4)	2.3 (0.5)	1.6 (0.3)	2.4 (0.2)
<u>Smokeless Tobacco, Past 12 months</u>					
Didn't smoke	77.2 (1.3)	78.9 (1.1)	66.0 (3.5)	85.7 (1.6)	79.1 (0.8)
< once/week	13.5 (0.8)	12.6 (1.3)	14.3 (1.0)	8.6 (0.9)	11.9 (0.5)
1-4 days/week	3.0 (0.6)	2.2 (0.8)	5.7 (0.6)	1.8 (0.5)	2.7 (0.3)
5 or more days/week	6.2 (0.8)	6.3 (0.8)	14.1 (3.6)	3.9 (0.5)	6.3 (0.6)

Note: Entries are percentages with standard errors in parentheses.

Source: Questions 19, 20.

Table D.24. Consumption of Caffeinated Drinks

Item/Responses	Service				Total DoD
	Army	Navy	Marine Corps	Air Force	
Cups of Caffeinated Coffee Drunk/Average Day					
None	46.0 (1.6)	42.0 (1.8)	51.9 (1.9)	46.0 (1.8)	45.5 (0.9)
Less than 1 cup	12.8 (1.5)	11.4 (0.9)	10.3 (1.1)	9.8 (0.7)	11.4 (0.6)
1-2 cups	16.0 (0.9)	17.4 (1.1)	13.4 (2.5)	20.2 (1.2)	17.4 (0.6)
3-4 cups	13.0 (0.9)	14.7 (1.4)	12.8 (1.1)	15.2 (1.1)	14.1 (0.6)
5 or more cups	12.2 (0.9)	14.5 (1.2)	11.5 (0.8)	8.7 (0.7)	11.7 (0.5)
Cups or Glasses of Tea Drunk/Average Day					
None	67.2 (1.7)	64.3 (3.6)	70.8 (4.9)	59.5 (2.3)	64.5 (1.4)
Less than 1 cup/glass	13.8 (0.9)	15.6 (1.5)	12.1 (2.5)	18.0 (1.3)	15.4 (0.7)
1-2 cups/glasses	11.8 (0.8)	12.4 (1.5)	11.3 (2.9)	14.6 (1.0)	12.7 (0.6)
3-4 cups/glasses	4.7 (0.5)	5.5 (1.1)	2.8 (1.1)	6.1 (0.6)	5.2 (0.4)
5 or more cups/glasses	2.6 (0.4)	2.1 (0.6)	3.0 (1.5)	1.8 (0.3)	2.3 (0.3)
Cans, Bottles, Glasses of Caffeinated Soft Drinks/Day					
None	13.6 (1.3)	12.4 (1.0)	11.6 (1.4)	14.8 (0.8)	13.5 (0.6)
Less than one	24.2 (1.8)	26.1 (1.4)	23.1 (1.5)	27.3 (0.8)	25.5 (0.8)
1-2	41.6 (1.7)	39.9 (1.2)	44.4 (2.9)	41.8 (0.9)	41.5 (0.8)
3-4	15.3 (0.9)	17.4 (0.9)	16.2 (1.4)	13.6 (1.0)	15.4 (0.5)
5 or more	5.3 (0.8)	4.2 (0.4)	4.8 (1.1)	2.5 (0.4)	4.1 (0.3)

Note: Entries are percentages with standard errors in parentheses.

Source: Questions 88, 89, and 90.

Table D.25. Symptoms of Alcohol Dependence - Total DoD

Item Wording	Never	1-11 Times Per Year	1-3 Times Per Month	1-4 Times Per Week	5-7 Times Per Week
I awakened unable to remember some of the things I had done while drinking the day before.	72.6 (1.2)	18.7 (1.0)	5.2 (0.5)	3.0 (0.4)	0.5 (0.1)
My hands shook a lot after drinking the day before.	86.5 (0.8)	8.9 (0.6)	2.4 (0.3)	1.5 (0.2)	0.7 (0.2)
I had the "shakes" because of drinking	90.1 (0.7)	7.0 (0.6)	1.5 (0.2)	0.8 (0.2)	0.6 (0.2)
I could not stop drinking before becoming drunk.	84.5 (0.9)	9.1 (0.6)	3.5 (0.6)	2.1 (0.2)	0.8 (0.2)
I kept on drinking after promising myself not to	78.5 (0.9)	15.5 (0.8)	3.0 (0.3)	2.3 (0.2)	0.7 (0.1)
I stayed drunk for more than one day at a time	89.2 (0.6)	6.8 (0.3)	2.6 (0.4)	1.0 (0.2)	0.3 (0.1)
I took a drink the first thing when I got up for the day.	91.0 (0.6)	6.3 (0.5)	1.3 (0.2)	1.0 (0.2)	0.4 (0.1)
I got drunk or very high from drinking	42.6 (1.2)	30.3 (0.8)	15.2 (0.8)	10.4 (0.7)	1.5 (0.2)
I tossed down several drinks pretty fast to get a quicker effect	73.1 (1.4)	15.5 (0.8)	6.6 (0.6)	4.2 (0.4)	0.7 (0.1)
I was sick because of drinking	67.9 (1.0)	27.0 (1.0)	3.7 (0.3)	1.2 (0.2)	0.3 (0.1)
I skipped four or more regular meals in a row	93.3 (0.6)	3.9 (0.3)	1.3 (0.3)	1.3 (0.2)	0.3 (0.1)
I got into a fight where I hit someone	91.2 (0.8)	7.3 (0.7)	0.7 (0.1)	0.6 (0.2)	0.2 (0.1)

Note: Entries are percentages with standard errors in parentheses.

Source: Questions 41a-1.

Table D.26. New Alcohol Negative Effects Indicators

Indicator	Service				Total DoD
	Army	Navy	Marine Corps	Air Force	
Had serious money problems because of drinking	6.7 (1.4)	4.7 (0.6)	7.2 (2.5)	2.3 (0.3)	4.9 (0.6)
Heated arguments with family/friends because of drinking	9.3 (0.7)	7.2 (0.9)	10.0 (3.0)	5.4 (0.6)	7.7 (0.5)
Had loud argument in public because of drinking	7.9 (1.8)	4.2 (0.7)	6.2 (1.5)	2.1 (0.3)	5.1 (0.7)
Trouble on the job because of drinking	4.4 (1.2)	6.8 (1.9)	5.7 (1.9)	2.0 (0.4)	4.4 (0.7)
Had motor vehicle accident while driving after drinking	1.9 (0.3)	1.7 (0.3)	3.7 (1.0)	1.2 (0.2)	1.8 (0.2)
Drove unsafely because of drinking	10.9 (0.8)	15.3 (1.3)	13.4 (3.3)	10.1 (0.8)	12.0 (0.6)
Health problems because of drinking	2.6 (0.5)	1.8 (0.3)	4.1 (1.7)	1.2 (0.2)	2.1 (0.3)
Drinking interfered with family responsibilities	3.5 (0.6)	2.8 (0.3)	3.7 (1.0)	1.9 (0.2)	2.9 (0.3)
Trouble with police because of drinking	3.5 (0.6)	4.1 (0.5)	5.7 (1.3)	1.7 (0.2)	3.3 (0.3)
Harder to handle problems because of drinking	4.3 (0.8)	3.7 (0.6)	3.7 (1.4)	1.6 (0.2)	3.3 (0.4)
Required emergency medical help because of drinking	1.7 (0.5)	0.8 (0.3)	1.5 (0.5)	0.5 (0.1)	1.1 (0.2)
Relative/friend told me to cut down on my drinking	14.8 (1.4)	11.4 (1.3)	12.8 (1.2)	8.6 (0.7)	11.9 (0.7)

Note: Entries are percentages with standard errors in parentheses.

Source: Questions 45a-1.

Appendix E

Computation of the Average Daily Ethanol Consumption Index

Appendix E

Computation of the Average Daily Ethanol Consumption Index

The average daily ethanol consumption index used in this study measures both the typical drinking pattern of an individual over the past 30 days and the pattern of episodic higher 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 was to determine the frequency of consuming each beverage during the past 30 days (Q.23, 26, and 29). 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.1.

Table E.1. 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

^aFrequency of consumption of given beverage during past 30 days.

The second step in computing daily volume resulting from typical drinking days was to determine the typical quantity (Q_n) of each beverage drunk during the past 30 days on days when the given beverage was consumed (Q.25, 28 and 31). The codes used for the number of cans of beer, glasses of wine, and drinks of hard liquor are apparent for the smaller quantities. For larger quantities, the value used was 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 was specified as four ounces (standard wine glass). Two additional questionnaire items were employed to account for variations in the size of beer containers and strength of drinks

containing hard liquor (Q.24, 30). The respondent indicated the size can or bottle of beer he/she usually drinks (Q.24), with alternatives of 8, 12, or 16 ounce containers, and the number of ounces of hard liquor in his average drink (Q.30), 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 four-ounce size was used for wine glasses, the typical quantity for wine is simply four 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.27). If the respondent indicated fortified wine, the weight used for ethanol content was .18 (rather than .12).

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 eight or more cans, glasses, or drinks of beer, wine, or hard liquor in the last year (Q.38, 39, and 40) 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.2. 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).

Table E.2. Frequency Codes for Atypical High Consumption Days

Response Alternative ^a	Frequency Code (D)	Method of Calculation
About every day	338	6.5×52
5-6 days a week	286	5.5×52
3-4 days a week	182	3.5×52
1-2 days a week	78	1.5×52
2-3 days a month	30	2.5×12
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

^aFrequency of atypical high consumption days for given beverage during past year.

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 is 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.2, and the number of typical days, $365F$ minus the number of atypical days. If the respondent typically consumed eight 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 Q_n 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:

$$AQ_nF = \frac{5D + Q_n(365F - D)}{365}$$

where

AQ_nF 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 Q_n is greater than or equal to 5 for the given beverage).

Q_n 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.

Appendix F
1985 Survey Questionnaire



HEALTH
AFFAIRS

RCS #DD HAOIT, 1681

1985 DEPARTMENT OF DEFENSE SURVEY OF ALCOHOL AND NONMEDICAL DRUG USE 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 alcohol and drug abuse. There are a few other questions about health attitudes 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 QUESTIONNAIRE

- 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 clearly 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.

DAYS	
0	5
☒	☐
☐	☐
☐	☐
☐	☐
☐	☐
☐	☐
☐	☐
☐	☐
☐	☐

- Sometimes you will be asked to "Darken one circle on each line." For these questions, mark one 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
Smoke	☒	☐	☐
Drink	☐	☐	☒
Use drugs	☐	☒	☐

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 | ☐ O-4 |
| ☐ E-2 | ☐ E-7 | ☐ W1-W4 | ☐ O-5 |
| ☐ E-3 | ☐ E-8 | ☐ O-1 | ☐ O-6 |
| ☐ E-4 | ☐ E-9 | ☐ O-2 | ☐ O7-O10 |
| ☐ E-5 | | ☐ O-3 | |

3. 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

4. Are you currently serving on a ship at sea?

- ☐ Yes
☐ No

5. 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	☐ 7
☐ 8	☐ 8
☐ 9	☐ 9

6. 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

7. Are you:

- ☐ American Indian/Alaskan Native
☐ Black/Negro/Afro-American
☐ Oriental/Asian/Chinese/Japanese/Korean/
 Filipino/Pacific Islander
☐ White/Caucasian
☐ Other

8. 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

9. Are you male or female?

- ☐ Male
☐ Female

10. 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.

11. Is your spouse now living with you at your present duty location?

- ☐ Yes
☐ No
☐ I have no spouse

12. 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

13. 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 14

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

ENLISTED MOS or C.O. PS

0	0
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
J	J
K	K
L	L
M	M

WARRANT OFFICERS' MOS

0	0	0
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7
8	8	8
9	9	9
J	J	J
K	K	K
L	L	L
M	M	M

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** Please record all FOUR numbers of your current PRIMARY Designator.

ENLISTED NO RATING Please record all FOUR numbers of your current PRIMARY Navy Enlisted Classification (NEC) code

• 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 NEC/Designator/MOS/AFSC, record "0000"

MOS/AFSC/Designator/NEC

0	0	0	0
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9

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.

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

2-Letter RATING

A	A
B	B
C	C
D	D
E	E
F	F
G	G
H	H
I	I
J	J
K	K
L	L
M	M

3-Letter RATING

A	A	A
B	B	B
C	C	C
D	D	D
E	E	E
F	F	F
G	G	G
H	H	H
I	I	I
J	J	J
K	K	K
L	L	L
M	M	M

Now we would like to ask some questions about your use of tobacco.

14. Think about the days when you smoked cigarettes during 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

15. For about how many years have you smoked this many cigarettes per day (the number of cigarettes in Question 14)?

• First, enter the number of years in the boxes. Use both boxes. Write ONE number in each box

• Then, darken the matching circle below each box.

• If you have smoked this much for less than one year record "01"

• If you did not smoke in the past 30 days or you have never smoked cigarettes, record "00."

YEARS

0	0
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9

16. How many years altogether have you smoked or did you smoke cigarettes on a regular basis; that is, 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

• Then, darken the matching circle below each box

• If you have smoked regularly for less than one year record "01"

• If you have never smoked at least one cigarette a day for a week or longer record "00"

YEARS

0	0
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9

17. During the past 2 years, have you made a serious attempt to stop smoking cigarettes, that is, when you did not smoke any cigarettes for at least a week?

- ☐ Yes
- ☐ No
- ☐ Never smoked/Didn't smoke in the past 2 years

18. 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

19. 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

20. 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

21. 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

	7 or More	4-6	3	2	1	Never/ Doesn't Apply
I had an absence 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 rating than I expected on my efficiency report or performance rating.	☐	☐	☐	☐	☐	☐
I received (UCMJ) punishment (Court Martial, Article 15, Captain's Mast, Officer's Hours).	☐	☐	☐	☐	☐	☐
I was arrested for a driving violation.	☐	☐	☐	☐	☐	☐
I was arrested for an incident that could result in going to court.	☐	☐	☐	☐	☐	☐
I spent too much on groceries or fuel.	☐	☐	☐	☐	☐	☐
I was hurt in an accident or injury.	☐	☐	☐	☐	☐	☐
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 children 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.	☐	☐	☐	☐	☐	☐

22. 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

	7 or More	4-6	3	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 (whether or not you were 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.

23. 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

24. 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 (1 liter)
- ☐ Liter or quart (32 oz.) bottle or mug
- ☐ Some other size
- ☐ Didn't drink any beer in the past 30 days

25. 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

26. 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

27. 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 (such as sherry, port, vermouth, brandy, Dubonnet, champagne)
- ☐ Didn't drink any wine in the past 30 days

28. 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 1/2 bottle)
- ☐ 2 wineglasses
- ☐ 1 wineglass
- ☐ Didn't drink any wine in the past 30 days

29. 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

30. 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 1 1/2 ounces of hard liquor.

- ☐ 5 or more ounces
- ☐ 4 ounces
- ☐ 3 ounces (a "double")
- ☐ 2 ounces
- ☐ 1 1/2 ounces (a "jigger")
- ☐ 1 ounce (a "shot")
- ☐ Didn't drink any hard liquor in the past 30 days

31. 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

32. Listed below are some of the places where people drink beer, wine, and hard liquor. How often do you drink in each of the following places?

(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 quarters or place of residence (including ship)	☐	☐	☐	☐	☐	☐	☐
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 like at a sports event or picnic	☐	☐	☐	☐	☐	☐	☐

33. Listed below are some of the companions with whom people drink alcohol. How often do you drink with each of the following types of companions (regardless of whether or not they drink too)?

(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
With my spouse or the person I date	☐	☐	☐	☐	☐	☐	☐
Alone when no one else is around	☐	☐	☐	☐	☐	☐	☐
With close friends, military only	☐	☐	☐	☐	☐	☐	☐
With close friends, including civilians	☐	☐	☐	☐	☐	☐	☐
With co-workers	☐	☐	☐	☐	☐	☐	☐
With only acquaintances or strangers	☐	☐	☐	☐	☐	☐	☐

The next three 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.

The term "work day," 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.

34. Think about the days you worked during the past 30 days. How often did you have a drink 2 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

35. 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

36. 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

NOW THINK ABOUT YOUR USE OF BEER, WINE, OR HARD LIQUOR OVER THE PAST 12 MONTHS – THAT IS, SINCE THIS TIME LAST YEAR.

37. 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 less able to concentrate on my work because of my drinking	☐	☐	☐	☐	☐	☐	☐	☐	☐
I paid less attention to my supervisor because of my drinking	☐	☐	☐	☐	☐	☐	☐	☐	☐
I worked below my normal level of performance because of drinking, a hangover, or an illness caused by 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 personal accident caused by drinking	☐	☐	☐	☐	☐	☐	☐	☐	☐
I was hurt in an on-the-job accident because of my 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 had trouble getting along with my co-workers because of my drinking	☐	☐	☐	☐	☐	☐	☐	☐	☐
I had problems adapting to new schedules or procedures because of my drinking	☐	☐	☐	☐	☐	☐	☐	☐	☐
I felt less loyal to my work unit 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.

38. 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

39. 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

40. 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

41. 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
I kept on drinking after waking up my first to	☐	☐	☐	☐	☐	☐	☐
I got drunk or very high from drinking	☐	☐	☐	☐	☐	☐	☐
I was/kept unable to remember some of the things I had done while drinking the day before	☐	☐	☐	☐	☐	☐	☐
I tossed down several drinks pretty fast to get a quicker effect	☐	☐	☐	☐	☐	☐	☐
My hands shook a lot after drinking the day before	☐	☐	☐	☐	☐	☐	☐
I could not stop drinking before becoming drunk	☐	☐	☐	☐	☐	☐	☐
Fuzzy or the worse of drinking caused vomiting, severe headaches, etc.	☐	☐	☐	☐	☐	☐	☐
I stayed drunk for more than one day at a time	☐	☐	☐	☐	☐	☐	☐
I took a drink the first thing when I got up for the day	☐	☐	☐	☐	☐	☐	☐
I had the "shakes" because of drinking	☐	☐	☐	☐	☐	☐	☐
I skipped four or more regular meals in a row because of my drinking	☐	☐	☐	☐	☐	☐	☐
I got into a fight where I hit someone when I was drinking	☐	☐	☐	☐	☐	☐	☐

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 when in home port.

42. 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 might interfere with my health or physical fitness	☐	☐	☐	☐	☐
Disciplinary action will be taken against any person identified as having a drinking problem	☐	☐	☐	☐	☐
Driving while intoxicated on-base at this installation is a sure way to get arrested	☐	☐	☐	☐	☐
The military's alcohol education program has helped me make better decisions about drinking	☐	☐	☐	☐	☐
Use of alcohol is against my religious beliefs	☐	☐	☐	☐	☐
Seeking help for a drinking problem will damage one's military career	☐	☐	☐	☐	☐
There are some times at work when I need a drink	☐	☐	☐	☐	☐
The heavy drinking I see reduces the military readiness of my unit	☐	☐	☐	☐	☐
The number of "happy hours" at this installation makes drinking easy	☐	☐	☐	☐	☐

43. 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	Don't Drink
Through a military clinic, hospital, or other military medical facility	☐	☐	☐
Through a military counseling center or other military alcohol treatment or rehabilitation program	☐	☐	☐
Through a civilian doctor, clinic, hospital, or other civilian medical facility	☐	☐	☐
Through a civilian alcohol counselor, mental health center, or other civilian alcohol treatment or rehabilitation program	☐	☐	☐

44. 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

	7 or More	4-6	3	2	1	Never/ Don't Drink
I was hurt in any kind of accident caused by my drinking	☐	☐	☐	☐	☐	☐
My drinking caused an accident where someone else was hurt or property was damaged	☐	☐	☐	☐	☐	☐
I had an illness connected with my drinking that kept me from duty for a week or longer	☐	☐	☐	☐	☐	☐
I didn't get promoted because of my drinking	☐	☐	☐	☐	☐	☐
I got a lower score on my efficiency report or performance rating because of my drinking	☐	☐	☐	☐	☐	☐
I received UCMJ punishment (Court Martial, Article 15, Captains 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 hit my spouse or the person I date because of my drinking	☐	☐	☐	☐	☐	☐
I hit my child(ren) 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 threatened to leave me because of my drinking	☐	☐	☐	☐	☐	☐
My wife or husband left me because of my drinking	☐	☐	☐	☐	☐	☐
I had to be detoxified because of my drinking	☐	☐	☐	☐	☐	☐

45. 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

	7 or More	4-6	3	2	1	Never/ Don't Drink
I had serious money problems because of my drinking	☐	☐	☐	☐	☐	☐
I had heated arguments with family or friends because of my drinking	☐	☐	☐	☐	☐	☐
I had trouble on the job because of my drinking	☐	☐	☐	☐	☐	☐
I was involved in a motor vehicle accident while I was driving after drinking (whether or not you were responsible)	☐	☐	☐	☐	☐	☐
I had health problems because of my drinking	☐	☐	☐	☐	☐	☐
I drove unsafely because of my drinking	☐	☐	☐	☐	☐	☐
My drinking interfered with my family responsibilities	☐	☐	☐	☐	☐	☐
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	☐	☐	☐	☐	☐	☐
I got into a loud argument in public because of my drinking	☐	☐	☐	☐	☐	☐
A relative or friend told me that I should cut down on my drinking	☐	☐	☐	☐	☐	☐

46. During the past 12 months, how much of a problem has drinking been to you?

☐ Quite a serious problem
☐ A considerable problem
☐ A mild problem
☐ Not a problem at all/Don't drink

47. Do you need help now for a problem related to your drinking?

☐ Yes
☐ No/Don't drink
☐ Don't know

48. 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 having nothing to do	☐	☐	☐	☐	☐
To increase my self-confidence	☐	☐	☐	☐	☐

49. 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	☐	☐	☐	☐	☐
There would be less drinking at this installation if the prices of beer, wine, and hard liquor were raised to match off-base prices	☐	☐	☐	☐	☐
My spouse or the person I date disapproves of my drinking	☐	☐	☐	☐	☐
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	☐	☐	☐	☐	☐
Drinking might interfere 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	☐	☐	☐	☐	☐
Drinking costs too much	☐	☐	☐	☐	☐
The personnel at this installation sincerely try to help people who have a drinking problem	☐	☐	☐	☐	☐

50. 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

51. 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 columns. 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	7
8	8
9	9

The next set of questions is about use and availability of drugs. First, we will 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 or other drugs combined with other drugs	Phencyclidine (PCP)
LSD, Other Hallucinogens	LSD, Mescaline, Peyote, DMT, Psilocybin
Cocaine	Cocaine
Amphetamines and Other Stimulants	Prekudin, Benzedrine, Biphettamine, Cylert, Desoxyn, Dextroamphetamine, Dexanym, Dexedrine, Didrex, Eskatrol, Ionamin, Methedrine, Obedrin-LA, Plegine, Pondino, Pre-Sate, Ritalin, Sanorex, Tanabate, Tepanil, Voranil
Sedatives and Other Depressants	Ativan, Meprobarbital, Librium, Valium, Atarax, Benadryl, Equanil, Libritabs, Meper-span, Miltown, Serax, SK-Lygen, Thorazine, Tranxene, Verstran, Vistanil, Xanax
Barbiturates and Other Sedatives	Seconal, Alurate, Anxobarbital, Amytal, Buticap, Butisol, Carbrital, Dalmene, Dorden, Eskabarb, Luminal, Mebaral, Methaqualone, Nembutal, Noctec, Nokudar, Optimal, Parest, Pentobarbital, Phenobarbital, Placidyl, Quaalude, Secobarbital, Sopor, Tunal
Heroin, Other Opiates	Heroin, Morphine, Opium
Analgesics, Other Narcotics	Darvon, Demerol, Percodan, Tylenol with Codene, Codene, Cough syrups with Codene, Dilaudid, Dolene, Dolophine, Lentine, 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

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 reasons other than a doctor said you should take them, such as 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.

52 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	☐	☐	☐	☐	☐	☐
Sedatives or other depressants	☐	☐	☐	☐	☐	☐
Barbiturates or other sedatives	☐	☐	☐	☐	☐	☐
Heroin or other opiates	☐	☐	☐	☐	☐	☐
Analgesics, other narcotics	☐	☐	☐	☐	☐	☐
Inhalants	☐	☐	☐	☐	☐	☐

53. Think about the days you worked (duty days) during the past 30 days. How often did you use each of the following drugs for non-medical purposes 2 hours or less before going to work, while you were working (on-the-job), during your lunch break, or during a work break?

(Darken one circle on each line)

	Every Work Day	Most Work Days	About Half My Work Days	Several Work Days	One or Two Work Days	Never in Past 30 Days
Marijuana or hashish	☐	☐	☐	☐	☐	☐
Cocaine	☐	☐	☐	☐	☐	☐
Amphetamines or other stimulants	☐	☐	☐	☐	☐	☐
Tranquilizers/depressants or Barbiturates/sedatives	☐	☐	☐	☐	☐	☐
Analgesics/narcotics or Heroin/other opiates	☐	☐	☐	☐	☐	☐
LSD/PCP/other hallucinogens or Inhalants	☐	☐	☐	☐	☐	☐

54. How often do you use alcohol (beer, wine, or hard liquor) within a couple of hours before or after using each of the following drugs?

(Darken one circle on each line)

	All of the Time	Most of the Time	About Half of the Time	Some of the Time	Never/ Don't Use Drugs Don't Drink
Marijuana or hashish	☐	☐	☐	☐	☐
Cocaine	☐	☐	☐	☐	☐
Amphetamines or other stimulants	☐	☐	☐	☐	☐
Tranquilizers/depressants or Barbiturates/sedatives	☐	☐	☐	☐	☐
Analgesics/narcotics or Heroin/other opiates	☐	☐	☐	☐	☐
LSD/PCP/other hallucinogens or Inhalants	☐	☐	☐	☐	☐

55. How easy is it to obtain each of the following drugs on or near your installation?

(Darken one circle on each line)

	Very Easy	Fairly Easy	Fairly Difficult	Very Difficult	Don't Know/ Don't Use Drugs
Marijuana or hashish	☐	☐	☐	☐	☐
Cocaine	☐	☐	☐	☐	☐
Amphetamines or other stimulants	☐	☐	☐	☐	☐
Tranquilizers/depressants or Barbiturates/sedatives	☐	☐	☐	☐	☐
Analgesics/narcotics or Heroin/other opiates	☐	☐	☐	☐	☐
LSD/PCP/other hallucinogens or Inhalants	☐	☐	☐	☐	☐

56. 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	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	☐	☐	☐

57. Which term best describes your use of marijuana or hashish during the last six months?

- ☐ Never
☐ Rarely
☐ Sometimes
☐ Frequently

58. Which term best describes your use of "hard drugs" such as heroin, cocaine, LSD, etc., during the last six months?

- ☐ Never
☐ Rarely
☐ Sometimes
☐ Frequently

59. The following statements describes 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.

(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 Use 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 was late for work or left work early 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
Using drugs might 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	☐	☐	☐	☐	☐
Urinalysis testing reduces drug use in the military	☐	☐	☐	☐	☐
I might use (more) marijuana if it were easier to get	☐	☐	☐	☐	☐
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	☐	☐	☐	☐	☐
There are some times at work when I need an "upper"	☐	☐	☐	☐	☐
The drug use I know about reduces the military readiness of the units at this installation	☐	☐	☐	☐	☐
There's always a party somewhere at or near this installation where drugs are being used	☐	☐	☐	☐	☐
Some people get away with using certain drugs because the urinalysis tests won't detect those drugs	☐	☐	☐	☐	☐

61. Listed below are some of the places where people use drugs for non-medical purposes. How often do you use drugs (any kind) in each of the following places?

(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 Use Drugs
My quarters or place of residence (including ship)	☐	☐	☐	☐	☐	☐	☐
Enlisted NCO or officer's 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 like at a sports event or bar	☐	☐	☐	☐	☐	☐	☐

62. Listed below are some of the companions with whom people use drugs for non-medical purposes. How often do you use drugs (any kind) with each of the following types of companions (regardless of whether or not they use drugs too)?

(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 Use Drugs
With my spouse or the person I date	☐	☐	☐	☐	☐	☐	☐
Alone when no one else is around	☐	☐	☐	☐	☐	☐	☐
With close friends, military only	☐	☐	☐	☐	☐	☐	☐
With close friends, including civilians	☐	☐	☐	☐	☐	☐	☐
With co-workers	☐	☐	☐	☐	☐	☐	☐
With only acquaintances or strangers	☐	☐	☐	☐	☐	☐	☐

63. 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

	7 or More	4-6	3	2	1	Never/Don't Use Drugs
I came up positive on a urinalysis test for drugs	☐	☐	☐	☐	☐	☐
I had an illness connected with my use of drugs that kept me from duty for a week or longer	☐	☐	☐	☐	☐	☐
I didn't get promoted because of my use of drugs	☐	☐	☐	☐	☐	☐
I got a lower score on my efficiency report or performance rating 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 was arrested for driving under the influence of drugs	☐	☐	☐	☐	☐	☐
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	☐	☐	☐	☐	☐	☐
My use of drugs caused an accident where someone else was hurt or property was damaged	☐	☐	☐	☐	☐	☐
I hit my spouse or the person I date because of my use of drugs	☐	☐	☐	☐	☐	☐
I hit my child(ren) because of 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 threatened to leave me because of my use of drugs	☐	☐	☐	☐	☐	☐
My wife or husband left me because of my use of drugs	☐	☐	☐	☐	☐	☐
I had to be detoxified because of my use of drugs	☐	☐	☐	☐	☐	☐

64. During the past 12 months, how much of a problem has using drugs been to you?

- ☐ Quite a serious problem
☐ A considerable problem
☐ A mild problem
☐ Not a problem at all/Don't use drugs

65. Do you need help now for a problem related to your drug use?

- ☐ Yes
☐ No/Don't use drugs
☐ Don't know

- 66 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					
	7 or More	4-6	3	2	1	Never/Don't Use Drugs
I had serious money problems because of my use of drugs	☐	☐	☐	☐	☐	☐
I had heated arguments with family or friends because of my use of drugs	☐	☐	☐	☐	☐	☐
I had trouble on the job 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 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 had to have emergency medical help 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 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
I favor being able to use marijuana when I'm off-duty	☐	☐	☐	☐	☐
The emphasis on detection and discipline in my Service's drug program hurts morale	☐	☐	☐	☐	☐
Anyone detected using marijuana should be discharged	☐	☐	☐	☐	☐
Urinalysis testing has prevented drug use in my unit	☐	☐	☐	☐	☐
Education about drugs at this installation helps keep people from using drugs	☐	☐	☐	☐	☐
The people I associate with off-duty think that I should not use marijuana	☐	☐	☐	☐	☐
Urinalysis testing for drugs has kept me from trying some drugs when I had the chance	☐	☐	☐	☐	☐
I am opposed to personnel in my Service using marijuana	☐	☐	☐	☐	☐
At any time anywhere	☐	☐	☐	☐	☐
Only if it affects their performance	☐	☐	☐	☐	☐
I would not use drugs even if there were no urinalysis testing	☐	☐	☐	☐	☐

- 68 Listed below are some of the places where people obtain drugs. How often do you obtain drugs in each of the following places?

(Darken one circle on each line)

	Frequently	Sometimes	Rarely	Never/Don't Use Drugs
Enlisted NCO or officers' club	☐	☐	☐	☐
Barracks or other on-base quarters	☐	☐	☐	☐
Homes of my close friends	☐	☐	☐	☐
At designated "drop" areas	☐	☐	☐	☐
Civilian stores or neighborhood	☐	☐	☐	☐
My unit area	☐	☐	☐	☐

69. Listed below are some of the kinds of sources where drugs are obtained. How often do you obtain drugs from each of the following sources?

(Darken one circle on each line)

	Frequently	Sometimes	Rarely	Never/ Don't Use Drugs
Former military personnel still in the area	☐	☐	☐	☐
Local civilians with access to base	☐	☐	☐	☐
Local civilians working on-base	☐	☐	☐	☐
Other civilians off-base	☐	☐	☐	☐
Fellow military personnel	☐	☐	☐	☐
My spouse or the person I date	☐	☐	☐	☐
Through the mail	☐	☐	☐	☐

70. 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	7
8	8
9	9

71. 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	7
8	8
9	9

72. 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. ONE number to a 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	7
8	8
9	9

73. About how old were you the first time you took a tranquilizer/depressant or a barbiturate/sedative for any non-medical reason?

- First, enter the age in the boxes. Use both boxes. ONE number to a box.
- If you have never used tranquilizers or sedatives 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	7
8	8
9	9

74. About how old were you the first time you used an analgesic or narcotic (including heroin) for any non-medical reason?

- First, enter the age in the boxes. Use both boxes. ONE number to a box.
- If you have never used analgesics or narcotics 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	7
8	8
9	9

75. About how old were you the first time you used LSD or PCP or any other hallucinogen or any inhalant?

- First, enter the age in the boxes. Use both boxes. ONE number to a box.
- If you have never used LSD or any other hallucinogen or any inhalant, 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	7
8	8
9	9

76. 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	☐	☐	☐	☐	☐
Using drugs might 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	☐	☐	☐	☐	☐
Some drug users I know stop or cut down their use when they think they may be selected for urinalysis	☐	☐	☐	☐	☐
My spouse or the person I date disapproves of my using 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 might interfere with my work	☐	☐	☐	☐	☐
There is no way to get help for a drug problem without one's commander finding out	☐	☐	☐	☐	☐
At parties or social functions at this installation, it's easy to get away with using drugs	☐	☐	☐	☐	☐
The military's urinalysis tests for drugs are reliable	☐	☐	☐	☐	☐
The personnel at this installation sincerely try to help people who have a drug problem	☐	☐	☐	☐	☐

77. When did you last use each type of drug listed below for non-medical purposes?

(Darken one circle on each line)

LAST USED THIS DRUG

	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	☐	☐	☐	☐	☐	☐	☐	☐
Anaesthetics, other narcotics	☐	☐	☐	☐	☐	☐	☐	☐
Inhalants	☐	☐	☐	☐	☐	☐	☐	☐

78. During the past 12 months, have you attended each of the following military programs?

(Darken one circle on each line)

	Yes	No
Class on general alcohol education	☐	☐
Class on general drug education	☐	☐
Class on the consequences about drug use	☐	☐
Class on the consequences about drug use	☐	☐

79. Are the following services available on-base at this installation?

(Darken one circle on each line)

	Yes	No	Don't Know
Drug education and information programs	☐	☐	☐
Drug treatment programs	☐	☐	☐
Drug counseling services	☐	☐	☐
Drug testing services	☐	☐	☐

The last set of questions deal mainly with health attitudes and behavior.

(Darken and circle on each line)

80. In the past 12 months,

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, flushed or sweaty, chills,

nausea or vomiting, stomach cramps, diarrhea,

muscle pains, or severe headaches?

40 or More	21- 39	12- 20	7-11	4-6	3	2	1	None
☐	☐	☐	☐	☐	☐	☐	☐	☐
☐	☐	☐	☐	☐	☐	☐	☐	☐
☐	☐	☐	☐	☐	☐	☐	☐	☐

81. In general, how would you describe your own health?

- ☐ Excellent
- ☐ Very good
- ☐ Good
- ☐ Fair
- ☐ Poor

82. Over the past year, has your health caused you:

- ☐ A great deal of worry
- ☐ Some worry
- ☐ Hardly any worry
- ☐ No worry at all

83. How much control do you think you have over your future health?

- ☐ A great deal
- ☐ Some
- ☐ Very little
- ☐ None at all

84. All in all, how satisfied or dissatisfied are you with your work assignment?

- ☐ Very satisfied
- ☐ Satisfied
- ☐ Dissatisfied
- ☐ Very dissatisfied

85. In your usual work day, aside from recreation and regular physical exercise, how active are you?

- ☐ Very active
- ☐ Moderately active
- ☐ Quite inactive

86. Do you meet your Service's weight standard?

- ☐ Yes
- ☐ No

87. What was the result of your performance on your last official physical fitness test?

- ☐ Unsatisfactory (failed)
- ☐ Satisfactory (passed)
 - ☐ MARINES ONLY
 - ☐ First Class Pass
 - ☐ Second Class Pass
 - ☐ Third Class Pass

88. On an average day, how many cups of caffeinated coffee do you drink?

- ☐ None
- ☐ Less than 1 cup
- ☐ 1-2 cups
- ☐ 3-4 cups
- ☐ 5 or more cups

89. On an average day, how many cups or glasses of tea do you drink?

- ☐ None
- ☐ Less than 1 cup or glass
- ☐ 1-2 cups or glasses
- ☐ 3-4 cups or glasses
- ☐ 5 or more cups or glasses

90. On an average day, how many cans, bottles, or glasses of soft drinks containing caffeine do you drink?

Examples of soft drinks with caffeine are Coca-Cola,

Pepsi, Dr. Pepper, Mello Yello, Mountain Dew.

Do not count "caffeine-free" varieties of these brands

- ☐ None
- ☐ Less than 1 can, bottle or glass
- ☐ 1-2 cans, bottles or glasses
- ☐ 3-4 cans, bottles or glasses
- ☐ 5 or more cans, bottles or glasses

Please turn the page and answer the last three questions.

91 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
A. Run, jog, bicycle, or briskly walk or hike for 20 minutes or more	☐	☐	☐	☐	☐	☐	☐
B. Eat at least two full meals in one day (count breakfast, if eaten)	☒	☐	☐	☐	☐	☐	☐
C. Engage for 20 minutes or more in other strenuous physical activity (e.g., handball, soccer, racquet sports, swimming laps, calisthenics, etc.)	☐	☐	☐	☐	☐	☐	☐
D. Eat breakfast	☐	☐	☐	☐	☐	☐	☐
E. Get six or fewer consecutive hours of sleep in one day	☐	☐	☐	☐	☐	☐	☐
F. Engage in mild physical activity (e.g., baseball, bowling, volleyball, other sports) more for the recreation than for the exercise	☐	☐	☐	☐	☐	☐	☐
G. Drive a civilian motor vehicle or a military car	☐	☐	☐	☐	☐	☐	☐

92. How often do you ...

(Darken one circle on each line)

	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 Drive or Ride
Drive <u>at</u> or <u>below</u> the speed limit on the highway?	☐	☐	☐	☐	☐	☐
Use your seatbelt when you drive or ride in a car?	☐	☐	☐	☐	☐	☐
Drive <u>at</u> or <u>below</u> the speed limit on city streets?	☐	☐	☐	☐	☐	☐

93. Now we are interested in how accurately you think the questions and the answers you've given reflect your

behavior. For each area identified below, please indicate how accurately your behavior has been pictured

by our questions. For example, people who think their behavior has been reflected very accurately would darken

the "7" circle. Others who think the information provided doesn't reflect their behavior at all accurately would

mark a number closer to "1." Darken one circle on each line

How accurately is your behavior reflected by the questions...

	My Behavior Is Not Reflected Accurately at All					My Behavior Is Reflected Very Accurately	
	1	2	3	4	5	6	7
About alcohol use	☐	☐	☐	☐	☐	☐	☐
About drug use	☐	☐	☐	☐	☐	☐	☐
About health and safety behavior	☐	☐	☐	☐	☐	☐	☐

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

Nucleus Installation:

Survey Phase

☐ I
☐ II

FSU

0	0	0
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7
8	8	8
9	9	9

REFERENCES

- AEDS. (1985). Apparent Consumption for Calendar Year 1983. Washington, DC: Alcohol Epidemiologic Data System.
- Allen, J., & Mazzuchi, J. (1985). Alcohol and drug abuse among American military personnel: Prevalence and policy implications. Military Medicine, 150 (5), 250-255.
- Beary, J.F., Mazzuchi, J.F., & Richie, S.I. (1983). Drug abuse in the military: An adolescent misbehavior problem. Journal of Drug Education, 13 (1), 83-93.
- Belloc, N.B. (1973). Relationship of health practices and mortality. Preventive Medicine, 2, 67-81.
- Belloc, N.B., & Breslow, L. (1972). Relationship of physical health status and health practices. Preventive Medicine, 1, 409-421.
- Black, S., Owens, K.L., & Wolff, R.P. (1970). Patterns of drug use: A study of 5,482 subjects. American Journal of Psychiatry, 127, 420-423.
- Blackmore, J. (1974). The relationship between self-reported delinquency and official convictions amongst adolescent boys. British Journal of Criminology, 14(2), 172-176.
- Bradstock, M.K., Marks, J.S., Forman, M.R., Gentry, E.M., Hogelin, G.C., & Trowbridge, M.D. (1985). The behavioral risk factor surveys: II. Chronic heavy alcohol use in the United States. American Journal of Preventive Medicine, 1(6), 15-20.
- Bray, R.M., Guess, L.L., Mason, R.E., Hubbard, R.L., Smith, D.G., Marsden, M.E., & Rachal, J.V. (1983). 1982 Worldwide Survey of Alcohol and Non-medical Drug Use Among Military Personnel (RTI/2317/01-01F). Research Triangle Park, NC: Research Triangle Institute.
- Bray, R.M., Schlenger, W.E., Craddock, S.G., Hubbard, R.L., & Rachal, J.V. (1982). Approaches to the assessment of drug use in the Treatment Outcome Prospective Study (RTI/1901/01-05S). Research Triangle Park, NC: Research Triangle Institute.
- Breslow, L., & Enstrom, J.E. (1980). Persistence of health habits and their relationship to mortality. Preventive Medicine, 9, 469-483.
- Burt, M.R., Biegel, M.M., Carnes, Y., & Farley, E.C. (1980). Worldwide Survey of Non-Medical Drug Use and Alcohol Use Among Military Personnel: 1980. Bethesda, MD: Burt Associates, Inc.
- Cahalan, D., & Cisin, I.H. (1975). Final report on a service wide survey of attitudes and behavior of naval personnel concerning alcohol and problem drinking. Washington, DC: Bureau of Social Science Research.

- Cahalan, D., Cisin, I.H., Gardner, G., & Smith, G. (1972). Drinking practices and problems in the U.S. Army, 1972. Washington, DC: Information Concepts.
- Carmody, T.P., Brischetto, C.S., Matarazzo, J.D., O'Donnell, R.P., & Connor, W.E. (1985). Co-occurrent use of cigarettes, alcohol, and coffee in healthy, community-living men and women. Health Psychology, 4(4), 323-335.
- Chromy, J.R. (1979). Sequential sample selection methods. Proceedings of the American Statistical Association, 1978. Washington, DC: the Association.
- Clark, W.B., & Midanik, L. (1982). Alcohol use and alcohol problems among U.S. adults: Results of the 1979 national survey. Alcohol and Health Monograph No. 1. Rockville, MD: National Institute on Alcohol Abuse and Alcoholism. (DHHS Pub. No. ADM 82-1190).
- Cochran, W.G. (1977). Sampling Techniques. New York: John Wiley and Sons.
- Cook, R.F., Hostetter, R.S., & Ramsey, D.A. (1975). Patterns of illicit drug use in the Army. American Journal of Psychiatry, 132, 1013-1017.
- Cox, B.G., & Cohen, S.B. (1985). Methodological Issues for Health Care Surveys. New York: Marcel Dekker.
- DoD. (1972, March). Directive No. 1010.2. Alcohol abuse by personnel of the Department of Defense. U.S. Department of Defense.
- DoD. (1979). Office of Drug and Alcohol Prevention. Department of Defense drug and alcohol abuse prevention planning objectives 1980-85. Department of Defense, Office of the Assistant Secretary of Defense (Health Affairs).
- DoD. (1980, August 25). Directive No. 1010.4. Alcohol and drug abuse by DoD personnel. U.S. Department of Defense, Deputy Secretary of Defense.
- DoD. (1980, December 5). Instruction No. 1010.5. Education and training in alcohol and drug abuse prevention. U.S. Department of Defense.
- DoD. (1983, August 10). Directive No. 1010.7. Drunk and drugged driving by DoD personnel. U.S. Department of Defense. (Revised 7 June 1985).
- DoD. (1984, December 28). Directive No. 1010.1. Drug abuse testing program. U.S. Department of Defense.
- DoD. (1985, March 13). Instruction No. 1010.6. Rehabilitation and referral services for alcohol and drug abusers. U.S. Department of Defense.
- DoD. (1985, September 23). Directive No. 1010.3. Drug and alcohol abuse reports. U.S. Department of Defense.
- DoD. (1986, March 11). Directive No. 1010.10. Health promotion. U. S. Department of Defense.

- Doleschal, E. (1970). Hidden crime. Crime and Delinquency Literature, 2(5), 546-572.
- Durell, J., & Bukoski, W. (1984). Preventing substance abuse: The state of the art. Public Health Reports, 99(1), 23-31.
- Edwards, G., Arif, A., & Hodgson, R. (1981). Nomenclature and classification of drug- and alcohol-related problems: a WHO Memorandum. Bulletin of the World Health Organization, 59(2), 225-242.
- Elliott, D., & Huizinga, D. (1984). The relationship between delinquent behavior and ADM problems (National Youth Survey Project Report No. 28). Boulder, CO: Behavioral Research Institute.
- Erickson, M.L., & Empey, L.T. (1963). Court records, undetected delinquency, and decision-making. Journal of Criminal Law, Criminology and Police Science, 54, 456-469.
- Fielding, J.E. (1984). Health promotion and disease prevention at the worksite. Annual Review of Public Health, 5, 237-265.
- Gentry, E.M., Kalsbeek, W.D., Hogelin, G.C., Jones, J.T., Gaines, K.L., Forman, M.R., Marks, J.S., & Trowbridge, F.T. (1985). The behavioral risk factor surveys: II. Design, methods, and estimates from combined state data. American Journal of Preventive Medicine, 1(6), 9-14.
- Gibson, H.B., Morrison, S., & West, D.J. (1970). The confession of known offenses in response to a self-reported delinquency schedule. British Journal of Criminology, 10, 277-280.
- Gold, M. (1966). Undetected delinquent behavior. Journal of Research in Crime and Delinquency, 3, 27-46.
- Gould, L.C. (1969). Who defined delinquency: A comparison of self-reported and officially-reported indices of delinquency for three racial groups. Journal of Social Problems, 16, 325-336.
- Greden, J.F., Frenkel, S.I., & Morgan, D.W. (1975). Alcohol use in the army: Patterns of associated behaviors. American Journal of Psychiatry, 132, 11-16.
- Haberman, P., Josephson, E., Zanes, A., & Elinson, J. (1972). High school drug behavior: A methodological report on pilot studies. In S. Einstein, & S. Allen (Eds.), Proceedings of the First International Conference on Student Drug Surveys. Farmingdale, NY: Baywood Publishing Company.
- Harris, J.E. (1979). Cigarette smoking in the United States, 1950-1978. In Smoking and Health: A Report of the Surgeon General. Washington, D.C.: U.S. Government Printing Office.
- Harwood, H.J., Napolitano, D.M., Kristiansen, P.L., & Collins, J.J. (1984). Economic costs to society of alcohol and drug abuse and mental illness: 1980 (RTI/2734/0001FR). Research Triangle Park, NC: Research Triangle Institute.

- Hays, R., Stacy, A.W., & DiMatteo, M.R. (1984). Covariation among health-related behaviors. Addictive Behaviors, 9, 315-318.
- Health: United States and Prevention Profile. (1983). Washington, DC: U.S. Government Printing Office.
- Herbold, J.R. (1986). Smoking habits of U.S. military personnel. Military Medicine, in press.
- Hindelang, M.J., Hirschi, T., & Weiss, J.G. (1981). Measuring Delinquency. Beverly Hills, CA: Sage Publications.
- Hodgson, T., & Meiners, M. (1979). Guidelines for cost-of-illness studies in the Public Health Service. Bethesda, MD: Public Health Service Task Force on Cost-of-Illness Studies.
- Holt, M.M. (1982). SURREGR: Standard errors of regression coefficients from sample survey data. Research Triangle Park, NC: Research Triangle Institute.
- Hubbard, R.L., Rachal, J.V., Craddock, S.G., & Cavanaugh, E.R. (1984). Treatment Outcome Prospective Study (TOPS): Client characteristics and behaviors before, during, and after treatment. In F.M. Tims, & J.P. Ludford (Eds.), Drug Abuse Treatment Evaluation: Strategies, Progress, and Prospects (Research Monograph 51). Rockville, MD: National Institute on Drug Abuse. (DHHS Publication No. ADM 84-1329)
- Jessor, R. (1984). Adolescent development and behavioral health. In J.D. Matarazzo, S.M. Weiss, J.A. Herd, N.E. Miller, & S.M. Weiss (Eds.). Behavioral Health: A Handbook of Health Enhancement and Disease Prevention. New York: John Wiley.
- Johnston, L.D., O'Malley, P.M., & Davis-Sacks, M.L. (1983). A Worldwide Survey of Seniors in the Department of Defense Dependent Schools: Drug Use and Related Factors, 1982. Ann Arbor: The University of Michigan, Institute for Social Research.
- Kandel, D.B., & Logan, J.A. (1984). Patterns of drug use from adolescence to young adulthood: I. Periods of risk for initiation, continued use, and discontinuation. American Journal of Public Health, 74(7), 660-666.
- Luce, B.R., & Schweitzer, S.O. (1977). The economic costs of smoking-induced illness. In M.E. Jarvik, J.W. Cullen, E.R. Gritz, T.M. Vogt, & L.J. West (Eds.), Research on Smoking Behavior (Research Monograph 17). Rockville, MD: National Institute on Drug Abuse.
- Luoto, T. (1983). Reducing the health consequences of smoking--a progress report. Public Health Reports, 98(1), 34-39.
- Mayer, J., & Filstead, W.J. (1979). The Adolescent Alcohol Involvement Scale. An instrument for measuring adolescents' use and misuse of alcohol. Journal of Studies on Alcohol, 40, 291-300.

- Midanik, L. (1982). The validity of self-reported alcohol consumption and alcohol problems: A literature review. British Journal of Addiction, 77, 357-382.
- Miller, J.D., Cisin, I.H., Gardner-Keaton, H., Harrell, A.V., Wirtz, P.W., Abelson, H.I., & Fishburne, P.M. (1983). National Survey on Drug Abuse: Main Findings 1982. Rockville, MD: National Institute on Drug Abuse.
- Moore, M.H., & Gerstein, D.R. (Eds.). (1981). Alcohol and Public Policy: Beyond the Shadow of Prohibition. Washington, DC: National Academy Press.
- Mulford, H.A., & Miller, D.E. (1960). Drinking in Iowa II. The extent of drinking and selected sociocultural categories. Quarterly Journal of Studies on Alcohol, 1 (21), 26-39.
- NCHS. (1985). Provisional data from the health promotion and disease prevention supplement to the National Health Interview Survey: United States, January-March, 1985. NCHS Advance Data, No. 113. Hyattsville, MD: National Center for Health Statistics.
- National Institute on Alcohol Abuse and Alcoholism. (1978). Third Special Report to the U.S. Congress on Alcohol and Health. Rockville, MD: the Institute. (DHEW Pub. No. ADM 78-569) .
- National Institute on Alcohol Abuse and Alcoholism. (1982). Alcohol and the Military. Rockville, MD: NIAAA, Alcohol Topics in Brief.
- National Institute on Alcohol Abuse and Alcoholism. (1983). Fifth Special Report to the U.S. Congress on Alcohol and Health. Rockville, MD: the Institute. (DHHS Pub. No. ADM 84-1291)
- Nurco, D.N. (1972). An ecological analysis of narcotic addicts in Baltimore. International Journal of Addictions, 7(2), 341-353.
- O'Donnell, J.A. (1969). Narcotics addicts in Kentucky (Public Health Service Pub. No. 1881). Washington, DC: U.S. Government Printing Office.
- O'Malley, P.M., Bachman, J.G., & Johnston, L.D. (1983). Reliability and consistency in self-reports of drug use. International Journal of the Addictions, 18, 805-824.
- Podolsky, D.M. (1985). Alcohol, other drugs and traffic safety. Alcohol Health & Research World, 9, 24-27.
- Polich, J.M., Armor, D.J., & Braiker, H.B. (1981). The course of alcoholism: Four years after treatment. New York: Wiley.
- Polich, J.M., & Orvis, B.R. (1979). Alcohol problems: Patterns and prevalence in the U.S. Air Force. Santa Monica, CA: Rand Corporation.

- Rachal, J.V., Guess, L.L., Hubbard, R.L., Maisto, S.A., Cavanaugh, E.R., Waddell, R., & Benrud, C.H. (1980). Adolescent drinking behavior: Vol. 1. The extent and nature of adolescent alcohol and drug use: the 1974 and 1978 national sample studies. Research Triangle Park, NC: Research Triangle Institute. (NTIS No. PB81-199267)
- Rachal, J.V., Hubbard, R.L., Williams, J.R., & Tuchfeld, B.S. (1976). Drinking levels and problem drinking among junior and senior high school students. Journal of Studies on Alcohol, 37(11), 1751-1761.
- Rachal, J.V., Williams, J.R., Brehm, M.L., Cavanaugh, E.R., Moore, R.P., & Eckerman, W.C. (1975). A National Study of Adolescent Drinking Behavior, Attitudes, and Correlates. Research Triangle Park, NC: Research Triangle Institute. (NTIS No. PB 246-002)
- Research Triangle Institute. (1985). Combatting Alcohol Abuse and Alcoholism: Toward a National Plan. Draft report submitted by the Research Triangle Institute to the National Institute on Alcohol Abuse and Alcoholism.
- Robins, L.H. (1974). The Vietnam drug user returns: Final report (Special Action Office Monograph, Series A, No. 2). Washington, DC: U.S. Government Printing Office.
- Rouse, B.A., Kozel, N.J., & Richards, L.G. (Eds.). (1985). Self-Report Methods of Estimating Drug Use: Meeting Current Challenges to Validity (Research Monograph 57). Rockville, MD: National Institute on Drug Abuse. (DHHS Pub. No. ADM 85-1402).
- SAS Institute Inc. (1982). SAS User's Guide: 1982 Edition. Cary, NC: SAS Institute Inc.
- Shah, B.V. (1981). RATIGEST: Standard Errors Program for Computing of Ratio Estimates from Sample Survey Data. Research Triangle Park, NC: Research Triangle Institute.
- Shah, B.V., Holt, M.M., & Folsom, R.E. (1977). Inference about regression models from sample survey data. Invited paper for the International Association of Survey Statisticians Third Annual Meeting, New Delhi, India, December.
- Smoking and Health: A Report of the Surgeon General. (1979). Washington, D.C.: U.S. Government Printing Office.
- Smoking and Health: A Report of the Surgeon General. (1984). Washington, D.C.: U.S. Government Printing Office.
- Stoloff, P.H., & Barnow, R.K. (1984). Alcohol and drug use in the Marine Corps in 1983. Alexandria, VA: Center for Naval Analysis.
- West, L.J. (1984). Alcoholism and related problems: An overview. In L.J. West (Ed.), Alcoholism and Related Problems: Issues for the American Public. Englewood Cliffs, NJ: Prentice-Hall, Inc.

Williams, J.R., & Gold, M. (1972). From delinquent behavior to official delinquency. Social Problems, 20(2), 209-229.

Williams, R.L., & LaVange, L.M. (1983). Standardized population comparisons for a sample survey. Proceedings of the American Statistical Association. Washington, DC: the Association.

Woodruff, R.S. (1971). Simple method for approximating variance of a complicated estimate. Journal of the American Statistical Association, 66, 411-414.