R-2867-AF

The Control of Alcohol Problems in the U.S. Air Force

David J. Armor, Bruce R. Orvis,
Polly Carpenter-Huffman, J. Michael Polich

December 1981

Rand

PROJECT AIR FORCE

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Library of Congress Cataloging in Publication Data
Main entry under title:

The Control of alcohol problems in the U.S. Air Force.

"R-2867-AF."
Bibliography: p.
1. United States. Air Force--Sanitary affairs.
2. Liquor problem--United States. 3. Alcoholics--
Rehabilitation--United States. I. Armor, David J.
II. Rand Corporation. III. United States. Air Force.
[DNLM: 1. Alcoholism--Prevention and control--United
States. WM 274 C764]
UH630.C66 358.4'1345'0973 81-23537
ISBN 0-8330-0384-4 AACR2

The Rand Publications Series: The Report is the principal publication documenting and transmitting Rand's major research findings and final research results. The Rand Note reports other outputs of sponsored research for general distribution. Publications of The Rand Corporation do not necessarily reflect the opinions or policies of the sponsors of Rand research.

Published by The Rand Corporation

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A Project AIR FORCE report
prepared for the
United States Air Force

Rand
SANTA MONICA, CA. 90406

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PREFACE

In 1976, the U.S. Air Force asked The Rand Corporation to conduct an evaluation of its Alcohol Abuse Control Program. Over the next 5 years, Rand studied the prevalence of alcohol problems in the Air Force, assessed the effectiveness of prevention and rehabilitation control efforts, and conducted a cost-benefit analysis of the program as a whole. Detailed results of these investigations have been published in three separate reports.[1] The present report summarizes and highlights major findings of the evaluation and sets out several policy options that might enhance program effectiveness and efficiency. The study was conducted in Rand's Resource Management Program under the Project AIR FORCE title, "The Cost Effectiveness of the Air Force Substance Abuse Program."

[1]See J. Michael Polich and Bruce R. Orvis, *Alcohol Problems: Patterns and Prevalence in the U.S. Air Force,* The Rand Corporation, R-2308-AF, 1979; Polly Carpenter-Huffman et al., *The Effectiveness of Air Force Alcohol Education Seminars,* The Rand Corporation, R-2727-AF, 1981; and Bruce R. Orvis et al., *Effectiveness and Cost of Alcohol Rehabilitation in the United States Air Force,* The Rand Corporation, R-2813-AF, 1981.

SUMMARY

Since 1970 there has been growing recognition of alcohol abuse and alcoholism as important health and social problems. The Air Force's young, single male population is particularly vulnerable to alcohol abuse. To combat this problem, the Air Force has mounted a comprehensive Alcohol Abuse Control Program designed to reduce the incidence of alcohol problems and rehabilitate personnel who experience them. This study evaluates the effectiveness and efficiency of this control program, including both prevention and rehabilitation initiatives.

Our study estimates that in 1977 14 percent of Air Force personnel experienced serious alcohol problems, such as alcohol dependence and alcohol-related work impairment, medical problems, and violations of the law. Although this rate is significant, it is no higher than the rate found in civilian populations of similar demographic composition. Therefore, although alcohol problems are worth controlling, there is no reason to suspect that Air Force experience exacerbates their incidence.

The major Air Force prevention effort consists of Education Seminars, which are small 4-hour classes aimed at increasing the participants' knowledge about alcohol abuse and Air Force programs and encouraging responsible drinking behavior and attitudes. Our study found no evidence that these seminars have a significant long-term impact on drinking behaviors or on relevant attitudes or knowledge. We did find, however, that Air Force personnel are well-informed on relevant issues and generally have positive attitudes toward Air Force control programs.

Perhaps our most important finding is that only about 10 percent of Air Force personnel with serious alcohol problems are identified and referred for rehabilitation. A major reason appears to be that both supervisors and medical staff are reluctant to identify persons known to have alcohol problems affecting their work or health.

Most persons who are referred to a rehabilitation program show substantial improvement after treatment. Moreover, the Air Force emphasis on local outpatient counseling appears justified because it works as well as inpatient treatment, even for more impaired clients. Therefore, the Air Force rehabilitation program appears effective in meeting its objective.

Our cost analysis shows that in 1977 the economic impact of alcohol abuse was $62 million. Although this amount seems large, it is small compared with the Air Force budget of that year, which was more than $30 billion. Therefore, efforts to enhance the Control Program (such as increased identifications) must be balanced against the importance of alcohol abuse compared with other personnel problems.

The cost analysis suggests that even for more impaired abusers, local outpatient techniques are more cost-effective than inpatient treatment. Alcohol Awareness Seminars, an 8-hour educational intervention, also appear to be more cost-effective than outpatient counseling for less-impaired abusers. Therefore, program efficiency might be enhanced by eliminating Education Seminars and increasing emphasis on Awareness Seminars for less-impaired alcohol abusers. In particular, if identification rates are increased, we believe that larger caseloads can be handled without increased expenditures by more extensive use of short-term counseling and educational interventions.

The most difficult problem may be to increase the number of persons identified for treatment. One way is to have stronger command support for identification activities; another is to

provide stronger incentives for supervisor and medical staff referrals. Emphasis on Alcohol Awareness Seminars rather than on formal treatment might help; placing more stress on identification activities in supervisor performance reviews is another possibility. On the other hand, steps to increase identifications must be balanced against the relative importance of alcohol problems and the dangers of unfairly infringing on the privacy of personnel who have no serious alcohol problems.

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I. INTRODUCTION

Excluding its unsuccessful experiment with Prohibition, the United States had no comprehensive national policy on alcoholism until 1970. Although by this time alcoholism was viewed as a health rather than a moral problem, largely because of the work of Jellinek (1960), most people still equated alcohol problems with "skid row" alcoholism. This misconception was firmly challenged in the late 1960s by several national studies of problem drinking which claimed that approximately 1 out of every 10 adults had a significant alcohol problem (Cahalan, 1970; Cahalan and Room, 1974).

The evolution of more informed and sophisticated views of alcohol problems contributed to the creation of the National Institute of Alcohol Abuse and Alcoholism (NIAAA) in 1970. NIAAA quickly became the national focal point for the prevention, treatment, and study of alcohol problems. In its second report to Congress, NIAAA estimated that the economic impact of alcohol abuse in the United States had reached the staggering figure of $25 billion per year (DHEW, 1974).

The growing national effort to combat alcohol problems was paralleled by the development of alcohol abuse control policies in the Air Force and other services. Military populations are overrepresented by young, single males—precisely those persons most susceptible to alcohol abuse in the general population. Reinforced by DOD directives, the Air Force established an Alcohol Abuse Control Program in 1973 and implemented this program at 140 Air Force installations worldwide. The program is administered by Social Actions offices at each base.

The objective of the Air Force Control Program is to reduce the incidence of alcohol abuse and to restore alcohol abusers to effective functioning meeting Air Force standards. The program includes prevention activities for the total Air Force population and rehabilitation services for identified alcohol abusers. Rehabilitation includes outpatient counseling at local bases and inpatient treatment at 10 regional hospitals.

Air Force Headquarters staff initiated the Rand study to assist it in determining the prevalence of alcohol abuse and in assessing the effectiveness of the control program. In 1976, the General Accounting Office, using Army and Navy data, reported to the Congress that alcohol abuse was far worse in the military than in the civilian sector, and asserted that it affected up to 35 percent of enlisted personnel. Since there were no comparable Air Force data, the GAO implied that the Air Force problem was equally severe (GAO, 1976). The Congressional staff, in turn, questioned the Air Force's primary reliance on local outpatient rehabilitation, contrasting it with the Navy's use of professional inpatient treatment. The Air Force's position was that local rehabilitation was both less expensive and less disruptive to the performance of duty than inpatient treatment and that it should be used whenever possible. Congressional staff were nonetheless concerned that outpatient care might be less cost-effective in the long run.

To address these policy issues, Rand designed a study focusing on the following questions:

1. What is the prevalence and cost of alcohol problems in the Air Force, and how do they compare with civilian rates?
2. How effective is the prevention program?

3. How effective is the rehabilitation program?
4. Are these programs cost-effective?
5. How does the cost-effectiveness of inpatient treatment compare with local outpatient counseling?

To answer these questions, Rand collected data at 20 Air Force installations worldwide. Information was compiled from formal surveys, official records, and personal interviews between 1977 and 1979. Since many of the study's findings are based on survey self-reports, official records were compared with survey results wherever possible.[1] In general, the comparisons supported the validity of our self-report measures.

The basic findings of the study are as follows: The prevalence data show that alcohol problems are common in the Air Force, but not as widespread as implied by the 1976 GAO report. In total, 14 percent of the active duty personnel experienced a significant alcohol problem in 1977, with about 5 percent of them showing symptoms of alcoholism. These findings are comparable to those for civilian populations with similar demographic compositions.

Alcohol problems cost the Air Force about $62 million per year (1977 dollars), most of which results from lost duty time and medical expenditures. This amounts to a cost of about $100 per person annually, the equivalent of about two lost workdays. Although $62 million is a sizeable figure in absolute terms, it is not large compared with the total Air Force budget of more than $30 billion in 1977.

Despite the prevalence of alcohol problems, the identification rate of persons with alcohol problems is low. Of the abusers estimated by the Prevalence Study, less than 10 percent entered an official rehabilitation program that year. Although it is difficult to pinpoint all the reasons for this finding, our data suggest that supervisors and medical personnel are reluctant to label others as alcoholics or problem drinkers.

The low identification rate is unfortunate, because we found the rehabilitation program to be effective for those referred to treatment. Moreover, less expensive outpatient methods were apparently as effective as inpatient treatment for a given level of impairment. For this reason, it is quite likely that, should the Air Force increase the number of persons identified for treatment, the larger caseloads could be handled within existing budgetary resources.

The remainder of this report discusses these findings and related policy options in greater detail. The findings have been organized into four sections: the prevalence of alcohol problems; the effectiveness of alcohol education; identification and treatment; and the cost-effectiveness of the control program. A final section discusses several policy options that emerge from the evaluation findings.

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[1]Special validity analyses were conducted in the Prevalence Study (Polich and Orvis, 1979), and in the Treatment Study (Orvis et al., 1981).

II. PREVALENCE OF ALCOHOL PROBLEMS

There is no universal agreement among experts on the exact conditions that define an alcohol problem. Such major events as arrest for drunk driving or hospitalization for an alcohol-related illness would signify alcohol problems on any list, but there are many other behaviors—such as frequent alcohol consumption or spending a lot of money on alcohol—whose significance is less certain. Moreover, for the classical concept of alcoholism, there is no single condition that provides a definitive diagnosis. Accordingly, the first task of the Prevalence Study was to develop conceptual and operational definitions of alcohol problems for the Air Force (Polich and Orvis, 1979).

Most definitions of alcohol problems fall into three general categories: (1) alcohol dependence or "alcoholism," generally defined as a state of addiction characterized by physical dependence and inability to control one's drinking (Jellinek, 1960; Edwards et al., 1977); (2) adverse consequences of drinking, or "drinking problems," such as health, job, family, or law enforcement disruptions (Cahalan and Room, 1974); and (3) heavy alcohol consumption, commonly defined as drinking more than 10 drinks[1] or 5 ounces of ethanol per day (Schmidt and de Lint, 1970).

Official Air Force definitions of alcohol abuse run parallel to these research definitions, emphasizing behaviors that interfere with successful attainment of the military mission. The official regulation (Department of the Air Force, 1974) distinguishes between (1) the state of alcoholism as "a psychological or physical dependence on alcohol," requiring a medical diagnosis, and (2) less severe problem drinking "that leads to misconduct, unacceptable social behavior, or to the impairment of duty performance, physical or mental health, financial responsibility, or personal relationships."[2]

This study proposes a definition of alcohol problems that is consistent both with recent research conventions and with existing Air Force policy. The definition recognizes two classes of alcohol problems:

1. *Alcohol dependence:* A chronic condition of impaired control over alcohol consumption, generally requiring the use of alcohol to prevent withdrawal symptoms.
2. *Nondependent problems:* Serious drinking-related problems in the areas of health, job, family, or law enforcement, but without chronic dependence symptoms.

The two categories are hierarchical: Dependent persons can have other serious problems, but nondependent persons cannot have high levels of dependence symptoms. The former group is considered more impaired than the latter and is expected to have higher rates of adverse consequences.

In order to operationalize these definitions for a prevalence assessment, decisions must be made about the specific symptoms and adverse consequences to be included in each category. To maximize the policy relevance of our definition, the most important principles guiding our selection process were that a problem should be unambiguously related to alcohol and

[1]A drink, defined as 1 ounce of hard liquor, a 12-ounce can or bottle of beer, or 4 ounces of table wine, contains approximately ½ ounce of pure alcohol (ethanol).

[2]Air Force policy on alcohol abuse, in effect during this study, is spelled out in Air Force Regulation 30-2 (Department of the Air Force, 1974).

that it should reflect a level of disruption serious enough to justify official intervention to protect the welfare of the drinker or other persons affected by the drinker.

Air Force prevalence rates were established by conducting a survey at 13 representative Air Force bases, including both United States and overseas locations. Questionnaires were administered in group sessions by Rand personnel during a series of site visits in the spring and summer of 1977. Approximately 3000 personnel were surveyed, representing an 89-percent response rate for sampled persons who were on base at the time of the visit.

The specific alcohol problems included in our definition are presented in Table 1, along with their Air Force rate in 1977. The first problem listed, alcohol dependence, comprises four interrelated behaviors central to traditional definitions of alcoholism: losing control over drinking, tremors or the "shakes," morning drinking, and memory lapses (blackouts). In keeping with the view of dependence as a chronic, repetitive condition, a person has to have experienced 48 or more of any of these episodes during the past year to be classified as alcohol dependent. As shown in the table, 4.6 percent of the Air Force met this condition in 1977.

The remaining conditions in Table 1 signify various nondependent problems. We have grouped serious adverse consequences into four main categories: work problems, health problems, interpersonal problems, and legal problems. With one or two exceptions, they are self-explanatory. Loss of work time includes four different measures: missing whole workdays,

Table 1

TYPES OF ALCOHOL PROBLEMS

Alcohol-Related Problem	Percent of Air Force Affected (1977)
Alcohol Dependence[a]	4.6
Nondependence Problems:	
Work	
Lower performance rating	1.5
Loss of 3 or more workdays	4.5
Health	
Illness lasting 1 week	1.2
Hospitalization	1.8
Two or more visits to physician	1.5
Accident, self-injury	1.5
Accident, other injury or property damage	1.9
Interpersonal	
Spouse left	0.6
Spouse threatened to leave	0.7
Fights	3.5
Legal	
DWI arrest	1.8
Nondriving arrest	1.3
Jail	1.6
Official punishment	1.9
Consumed over 5 oz ethanol per day	3.6

[a]Indicated by frequent symptoms of tremors, morning drinking, loss of control over drinking, and blackouts.

shortened workdays, lower proficiency, and being high on duty.[3] Also, we counted the interpersonal problem of having fights while drinking only if its frequency exceeded that of having fights while not drinking, to avoid the possibility that drinking may be incidental to a person's propensity to fight.

The last problem is average alcohol consumption exceeding 5 ounces of ethanol (about 10 standard drinks) per day. This quantity can be attained by daily drinking or by drinking larger amounts less frequently (e.g., a quart of hard liquor twice a week, or eight times a month). We do not consider heavy consumption per se to be a dependence symptom. However, persons drinking this amount have a high risk of developing a serious medical condition (especially liver disorders) if they continue this behavior for a number of years, and so we classified it as a nondependent problem.

PREVALENCE RATES

Based on the above conditions, Fig. 1 shows prevalence rates for the two main types of alcohol problems: alcohol dependence and nondependent problems within the past year. The sole requirement for the first category is presence of chronic dependence symptoms; the nondependent category includes all remaining persons who experienced one or more of the problems described in Table 1.

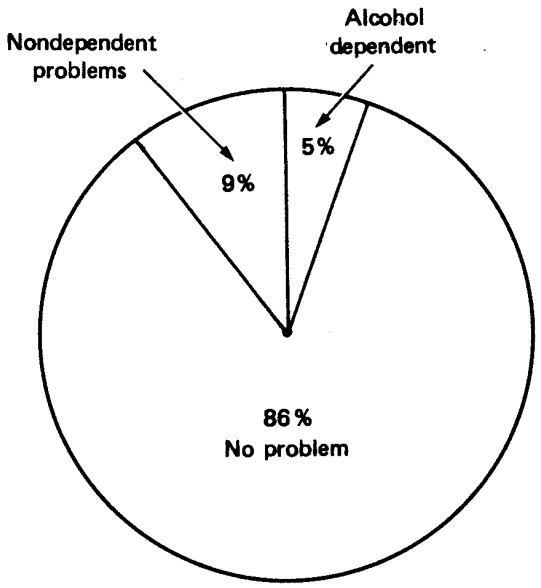


Fig. 1—Prevalence of alcohol problems in the Air Force (1977)

[3]The latter three were scored as losses of one-fourth of a day, and being high on duty was scored only to the extent it exceeded days of lower proficiency (to avoid double counting).

Nearly 14 percent of Air Force personnel had a serious alcohol problem in 1977. Most of these persons had a nondependent problem; the rest were alcohol dependent. Approximately 80 percent of the alcohol dependent cases also experienced one or more of the other conditions listed in Table 1. First-term personnel predominate the alcohol-abuse group. Of those having alcohol problems, nearly two-thirds are rank E1 to E4.

These prevalence rates indicate that alcohol problems constitute an important personnel issue for the Air Force, one deserving official recognition and attention. On the other hand, they do not indicate whether alcohol problems are more serious among Air Force personnel than among any other group with similar demographic characteristics. In particular, this rate is lower than the military rates published by the GAO (1976). This raises the important question of whether alcohol problems are more prominent in the Air Force than among comparable civilian groups.

MILITARY AND CIVILIAN COMPARISONS

There are two conditions for meaningful comparisons of alcohol problem rates among civilian and military groups. First, the definition of alcohol problems and the specific behaviors assessed must be the same for each group. Second, the populations should be *standardized* on those characteristics that affect alcohol problem rates and that differ among the various populations. Since military and civilian populations differ on such characteristics as sex, age, and marital status, all of which are correlated with alcohol problem rates, standardization is necessary before civilian-military differences can be interpreted with any degree of accuracy.

At the time of the Air Force Prevalence Study, there was no other research using our specific definition of alcohol problems. However, several relevant studies of "problem drinking" by Cahalan and his associates were available for comparative purposes. These included a 1969 national civilian survey, a 1972 Army survey, and a 1974 Navy survey (Cahalan, 1970; Cahalan et al., 1972; Cahalan and Cisin, 1975). To ensure comparability, Rand conducted a special Air Force survey using the Cahalan problem-drinking measures. In addition, we obtained the original Cahalan survey data and reanalyzed all four surveys, using the definition established in the Navy study.[4]

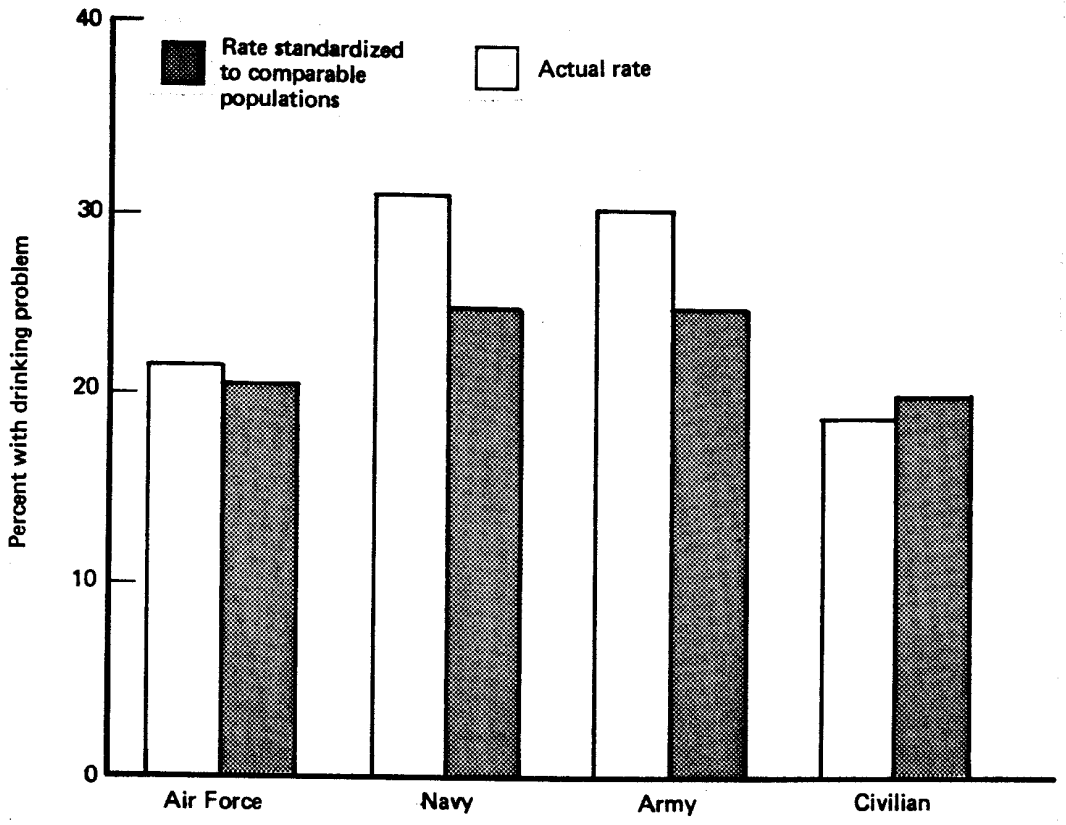
The definition of problem drinking embodied by the Cahalan measures differs in several ways from our own. As a result, the Cahalan problem-drinking rate will be used only for comparisons across groups and not for determining the absolute rate of alcohol problems in the Air Force. Problem-drinking rates using the Cahalan definition are shown in Fig. 2 for Air Force, Navy, Army, and civilian males between the ages of 21 and 59.[5]

The actual unstandardized problem rates are represented by the unshaded bars. The Cahalan problem-drinking rate for Air Force men is 22 percent, compared with 19 percent for civilian men. The Army and Navy rates are higher at 30 and 31 percent, respectively.

The shaded bars in Fig. 2 represent problem drinking rates after all four samples have been standardized so that they are equivalent in age, marital, education, and geographic composition (U.S. stations only for military groups). The effect of standardization is to reduce the differences among all rates, since military populations are overrepresented by demo-

[4]The four surveys span 8 years (1969 to 1977), but recent national studies reported by NIAAA suggest that alcohol problem rates were relatively constant between 1970 and 1977 (DHEW, 1978).

[5]This age restriction is imposed by virtue of the universe defined in the civilian study.



NOTE: Comparison population is restricted to males aged 21 through 59. The definition of problem drinking differs from that used in Fig. 1.

Fig. 2—Comparison of problem drinking in military and civilian populations

graphic groups with higher problem rates. In particular, the Air Force and civilian difference nearly disappears (21 and 20 percent, respectively), and the difference between the other services and civilians is reduced markedly (25 versus 20 percent, respectively). Even these 5-percent differences should not be given undue emphasis. Such small differences could be due to different survey times or to some uncontrolled background characteristics of the men themselves, rather than to Army and Navy experience.

It is important to note that the Air Force problem rate does not differ significantly from the civilian rate in either its raw or standardized form. Although this finding does not absolve the Air Force from dealing with alcohol problems among its personnel, it does imply that there is nothing unique about the Air Force experience that exacerbates the rate of alcohol problems.

III. EFFECTIVENESS OF ALCOHOL EDUCATION

Air Force programs to control alcohol abuse fall into the categories of prevention and rehabilitation. The primary objective of prevention is to reduce the incidence of alcohol problems in the general population. To achieve this goal, program efforts can take several forms, including diseminating more information about alcohol and its effects, changing attitudes about drinking, and discouraging risky drinking behaviors.

Among the techniques for achieving these objectives, education is one of the most common. Education can be conducted through mass media such as television or periodicals and in face-to-face lectures or small-group discussions. Educational approaches confront people directly, appealing for change (or maintenance of safe practices) through informative and persuasive communications.

There are also indirect prevention techniques that seek changes in behavior through regulation of companies or agencies that produce, distribute, or sell alcoholic beverages. These techniques are more coercive than persuasive, since they limit access to alcohol. Outright prohibition of alcohol is the most extreme example; less extreme regulations are aimed at the price of alcoholic beverages, the manner in which they are produced and packaged, and the times at which they can be sold or consumed.

The Air Force prevention program includes both educational and regulatory components administered by Social Actions offices at each base. The largest component in both coverage and cost is the Education Seminar program, in which all active duty personnel participate. For this reason, the Education Seminar program was the major focus of evaluation (Carpenter-Huffman et al., 1981).

The Education Seminars provide education about drugs and alcohol. They consist of 4-hour classes attended by all active duty personnel within 60 days after permanent change of station (PCS), which occurs every 3 or 4 years on the average.[1] There are two types of seminars: the "Airman Seminar" for persons with rank E1 to E3 (including Senior Airmen), and the "Supervisor Seminar" for all other enlisted personnel and officers. The objectives of the two seminars differ somewhat.

The Airman Seminar provides information about the pharmacology of alcohol and about Air Force policies regarding alcohol abuse. It also pursues attitudinal and behavioral objectives by encouraging "responsible decisions" about alcohol use and support for rehabilitation programs.

The Supervisor Seminar focuses on a supervisor's responsibilities in the alcohol abuse control program rather than on his own drinking habits. Information is provided about Air Force rehabilitation options, and special emphasis is placed on the supervisor's actions regarding alcohol abusers, particularly the importance of identifying them for rehabilitation.

Two other Air Force prevention programs are noteworthy. The first is a 4-hour lecture during Basic Military Training (BMT) that describes Air Force policies and programs relating to drug and alcohol abuse. The second is a regulatory program started in 1976 called alcohol "deglamorization." The deglamorization program is a set of rules and guidelines pertaining to alcohol consumption on base. The rules limit "happy hours" for reduced-price drinks at base clubs, prohibit pro rata bars in which nondrinkers share costs of alcoholic

[1]For several years prior to 1976, the Education Seminar was given annually for all active duty personnel.

beverages, restrict advertising that encourages heavy drinking, and discourage heavy drinking at squadron parties.

SEMINAR EVALUATION DESIGN

The seminar evaluation was conducted as a field experiment at the 13 bases used for the Prevalence Study. Personnel scheduled to attend the Airman and the Supervisor Seminars were randomly divided into two groups. A "seminar" group first attended the seminar and then completed a survey questionnaire; a "control" group completed the survey questionnaire but did not attend the seminar. Both groups were resurveyed in a 6 months' followup by means of a similar group-administered questionnaire. The initial survey assessed short-term (immediate) seminar effects on knowledge and attitudes; the followup survey assessed longer-term effects on knowledge, attitudes, and behavior.

Approximately 1300 persons were surveyed initially and nearly 1000 were resurveyed at the followup. Respondents were divided about equally between seminar and control groups in both the Airman and Supervisor Seminars. Excluding persons who had changed bases, who had left the Air Force, or who were stationed in Europe (which was not revisited), the follow-up response rate was 90 percent.

RESULTS

We assessed seminar impact on attendees' knowledge about the effects of alcohol and Air Force alcohol abuse policies, on their attitudes toward excessive drinking and the Air Force program, and on their drinking behaviors. We also assessed seminar effect on supervisor knowledge, attitudes, and behaviors, including actions relating to subordinates with drinking problems.

There were no longer-term effects on any of the behavioral measures or on those problems counted in our overall definition of alcohol problems. Both the seminar and control groups reported an alcohol problem rate of about 7 percent 6 months after the seminars.[2] No significant effects were found for other drinking behaviors, including alcohol consumption or drinking to the point of intoxication.

Some might argue that brief educational interventions are not likely to cause major changes in behavior, particularly well-established drinking patterns. It might be more reasonable to expect changes in attitudes or knowledge, which in turn could affect behavior over the long run. However, we found few significant changes in attitude or knowledge at the 6-month point, including attitudes toward responsible drinking and the Air Force program. In particular, the seminars appear not to have lessened the stigma associated with entering the Air Force rehabilitation program, one of the more important attitudinal objectives. We note, however, that most respondents did not stigmatize persons undergoing treatment for alcohol problems; only 20 percent of all respondents felt that entering rehabilitation damages one's career.

Finally, there were few longer-term effects on measures of knowledge. Generally, we found that knowledge about Air Force policies regarding alcohol abuse was quite good; on

[2]This rate is half the rate shown in the Prevalence Study results, primarily because the period covered here is 6 months rather than 1 year.

most of the items assessed, 80 to 90 percent of all respondents knew the correct answers. This knowledgeability also characterized the Airman Seminar, which consists primarily of first-term personnel taking their first seminar. Thus there was little room for seminar effects.

We also found no evidence that the Supervisor Seminar affected supervisors' actions relating to subordinates with alcohol problems. These findings are highlighted in Table 2. We show two possible supervisor actions for subordinates whose drinking problems affect their work: telling them to cut down on drinking, and referring them to an Air Force program for assistance. Overall, supervisors reported that about 4 percent of their subordinates had alcohol problems that interfered with their work.[3] However, seminar attendance apparently had no impact on the supervisors' inclination to refer their subordinates for rehabilitation or to tell them to reduce their drinking.

Table 2

SUPERVISOR ACTIONS REGARDING SUBORDINATES WITH ALCOHOL-RELATED WORK PROBLEMS

Action	Supervisor Group[a]	
	Seminar	No Seminar
Initial Survey		
Referred subordinate to AF program	31	35
Told subordinate to cut down on drinking	86	79
Followup Survey		
Referred subordinate to AF program	38	46
Told subordinate to cut down on drinking	84	75

[a]Number of supervisors ranges from 101 to 147; number of subordinates ranges from 584 to 1200; and number of subordinates with alcohol-related work problems ranges from 19 to 58.

Table 2 also shows that supervisors who have subordinates with alcohol problems are much more likely to talk to them about these problems rather than refer them to treatment. Only about one-third of subordinates known to have drinking problems affecting their work are referred to an Air Force program. Therefore, even though our attitude measures indicate that the stigma of the Air Force alcohol program is low, the supervisors' behavior nonetheless suggests a reluctance to make formal identification and referral for treatment.

It must be emphasized that the lack of significant effects does not prove, beyond doubt, an absence of important seminar impact. In research of this type, we are limited by the number of measures that can be assessed, the length of the followup period, and the accuracy of self-reported behaviors. There is also the possibility of a "saturation" effect, whereby the repeated administration of the seminars over a period of years has produced changes in attitudes and knowledge to the point that a single seminar has no additional measurable impact. We tested this last possibility by assessing seminar effects for first-time attendees;

[3]This value of 4 percent work-related alcohol problems compares favorably with the 4.5 percent self-reported rate of work impairment shown in Table 1. Note that not all persons with alcohol problems (14 percent) have work impairment.

results were comparable to those for the total sample. It is possible, of course, that in this case the saturation effect was due to the 4-hour BMT instruction given prior to the first seminar.

Given these methodological limitations, acceptance of our results is partly predicated on their agreement with other evaluations of alcohol education. Few such evaluations have demonstrated lasting effects of education on behavior or attitudes. Some programs have been shown to improve knowledge about alcohol abuse when the initial levels of knowledge were low, but they normally devoted more time to education than Air Force seminars do. Common sense suggests that a single 4-hour session, attended once every 3 years, would do well to impart general information, much less change attitudes and behaviors involving deeply ingrained drinking habits. Moreover, given the closely-knit Air Force environment, general information about Air Force alcohol policies and programs is apparently widely disseminated irrespective of the seminar program.

This raises an important policy choice: Should the education effort be intensified by extending classroom time or providing more frequent seminars until significant impact is achieved? Or should other avenues of prevention be explored that might be more cost-effective? We address these questions after discussing the results of the treatment and cost studies.

IV. IDENTIFICATION AND TREATMENT

The purpose of the Air Force rehabilitation program is to identify alcohol abusers, refer them to the appropriate rehabilitation component, and restore them to effective functioning meeting Air Force standards. The Treatment Study evaluated the extent to which the Air Force program meets these objectives (Orvis et al., 1981).

Identification for rehabilitation arises from several sources, including supervisors, medical personnel, police, and self-referral. Once identified, all abusers are evaluated by Social Actions staff and by mental health specialists at the base hospital. The evaluation provides a diagnosis of alcoholism, problem drinking, or "single isolated incidents." The first two diagnoses correspond broadly to our definition of alcohol dependence and nondependent problems; the third diagnosis corresponds to our nondependent category, provided the incident is sufficiently serious (see Table 1).[1] Following diagnosis, alcohol abusers are assigned to one of three treatments: the Alcohol Awareness Seminar, local outpatient counseling, or inpatient care at a regional Alcohol Rehabilitation Center (ARC).

Alcohol Awareness is primarily an educational intervention. It is a small discussion group, usually meeting for two sessions of 4 hours each, during which participants explore the impact of alcohol abuse on their lives and Air Force careers, discuss Air Force policies, and learn about treatment alternatives. Alcohol Awareness is normally used for "single isolated incident" cases, in which it may be the only intervention required. At most bases, persons who receive regular outpatient or inpatient treatment also attend Alcohol Awareness as a first step in the rehabilitation process. Usually, persons who attend only the Alcohol Awareness Seminars are not considered by the Air Force to be in formal rehabilitation.

Persons diagnosed as alcoholics or problem drinkers are admitted to the rehabilitation program and normally begin local outpatient counseling provided by trained Social Actions staff. Counseling is scheduled once or twice a week in group or individual sessions lasting 1 to 1½ hours. The group mode predominates at most bases, and the average length of treatment is 16 sessions lasting over a 3- to 4-month period.

Persons not responding to local counseling by Social Actions staff can be referred to an inpatient rehabilitation center (ARC). Also, severely impaired persons can bypass local counseling and be referred directly to an ARC. The ARCs are located at 10 regional Air Force hospitals and are generally supervised by mental health professionals (psychologists or social workers). All centers currently offer a 28-day treatment program consisting of individual and group therapy, optional AA meetings, educational lectures, relaxation therapy, and so forth. When our evaluation was carried out in 1977, two ARCs offered a 14-day aversive conditioning program that employed mild electric shock techniques; since that time both have been converted to 28-day programs. Most ARC clients receive outpatient counseling from Social Actions when they return to their base.

The predominant mode of rehabilitation is local outpatient counseling. In 1977, approximately 60 percent of all treated personnel received outpatient care without referral to an ARC. Another 15 percent received ARC treatment, and about 20 percent received Alcohol

[1]Some less serious incidents might cause referral to Social Actions, e.g., a food-throwing fight in a mess hall or a loud argument.

Awareness only. Our treatment evaluation examined the success of all three modes of intervention.

TREATMENT STUDY PROCEDURES

To evaluate the rehabilitation program, Rand staff collected detailed data at 20 program sites (Orvis et al., 1981). These included 13 local Social Actions programs at the sample bases and 7 ARCs, 4 of which were located at one of the 13 sample bases. Several types of data were collected. Persons entering rehabilitation between the summer of 1977 and the spring of 1978 completed self-administered questionnaires that covered their alcohol problem histories. A followup questionnaire was administered to active duty persons by Rand staff during a series of base visits in the winter and spring of 1979. Questionnaires were mailed to separated persons at their home addresses. Detailed information about treatment services was collected by Social Actions and ARC staff as clients progressed through rehabilitation, and supplemental information about treatment services was assessed by means of the client followup questionnaire. Finally, general program descriptions and rehabilitation staff backgrounds were obtained during site-visit interviews in 1977 and 1979.

Approximately 1000 clients completed questionnaires at admission to rehabilitation. Among persons remaining on active duty, 618 completed the followup questionnaire, a 93-percent response rate. Mail questionnaires were returned by 167 separated persons, a 67-percent response rate for those with valid home addresses.[2]

IDENTIFICATION

Over the past several years, the number of formal alcohol abuse identifications and the referral pattern have remained fairly constant. During 1977, approximately 6000 alcohol abusers were identified and formally entered into rehabilitation, with most receiving local outpatient counseling or inpatient treatment.[3] Commanders and supervisors were the largest referral source, accounting for nearly 40 percent of all identifications. Self-referrals and police incidents each accounted for just under 30 percent of identifications, while medical referrals constituted only 3 percent. Considering that medical complications are present in about one-fifth of alcohol problem cases, it seems clear from these data alone that medical personnel are referring only a fraction of the abusers they see.

Another 2000 persons were referred to Social Actions and received only the Alcohol Awareness Seminar (without formal admission to rehabilitation), bringing total identifications to about 8000 cases. Since the Air Force active duty population was about 565,000 in 1977, this means that the identification rate was only 1.4 percent compared with a problem rate (by our definition) of 14 percent. Therefore, the Air Force is only identifying about 10 percent of all alcohol abusers each year.

Is it possible that the Air Force program identifies only the more serious cases of impairment? This question is answered by Table 3, which shows identification separately for dependent and nondependent cases. The penetration rates, or fraction of the abuser population

[2]Current addresses could not be obtained for approximately 140 persons who had separated from the Air Force by the time of followup.

[3]Some commands consider Alcohol Awareness Seminars as formal rehabilitation.

Table 3

IDENTIFICATION OF PERSONS WITH ALCOHOL PROBLEMS, 1977

Persons with Alcohol Problems	Alcohol Dependent	Nondependent Problem
Number estimated in population	26,021	52,609
Number entering rehabilitation[a]	1,307	5,369
Penetration rate	5%	10%

[a]Including Alcohol Awareness. Persons not meeting our criteria for alcohol problems have been excluded from the rehabilitation sample (and from the prevalence sample by definition).

identified, show that in fact fewer dependent cases are identified than nondependent cases (5 and 10 percent, respectively).

Since alcohol problems can endure for several years, the Air Force need not have an annual penetration rate of 100 percent in order to treat all cases. Nonetheless, given that most alcohol problems occur in the first-term enlisted force, and that the first-term force turns over every 3 or 4 years, the annual penetration rate should be at least 20 to 30 percent to reach a substantial fraction of the alcohol problem population.

Although the reasons for this low penetration rate are undoubtedly complex, it is not due to lack of awareness among relevant Air Force personnel. In particular, we note again that supervisors appear to underidentify persons with alcohol-related work problems (see Table 2), and medical staff appear to underidentify persons with alcohol-related medical problems. The difficult issue is how to overcome the reluctance of these persons to identify alcohol abusers.

EFFECTIVENESS OF REHABILITATION

It would be beneficial to the Air Force if these identification rates could be raised, because our study shows that those who get treatment experience considerable improvement. At entry to treatment, 82 percent of the sampled clients met our definition of serious alcohol problems, as shown in Fig. 3. The majority, 66 percent, experienced nondependent problems, whereas 16 percent met the criteria for alcohol dependence. Most of the remaining persons had less severe problems than those covered by our definition.[4] It should be noted that this Air Force sample is less impaired than many civilian treatment samples, where the rate of alcohol dependence (or alcoholism) is generally much higher (Polich et al., 1981).

At followup, the sample had improved substantially: 69 percent reported no serious problems during the preceding 12 months. Improvement was greatest among persons remaining on active duty, with 73 percent having no serious problem at followup compared with 60 percent for separated personnel. Similar rates of improvement were shown for individual problem areas, such as work impairment, medical problems, and police incidents.

These rates of improvement are somewhat higher than rates commonly reported in the alcohol treatment literature (Polich et al., 1981). It must be stressed again, however, that the

[4]Some persons may also have completed the questionnaire incorrectly, either intentionally or unintentionally.

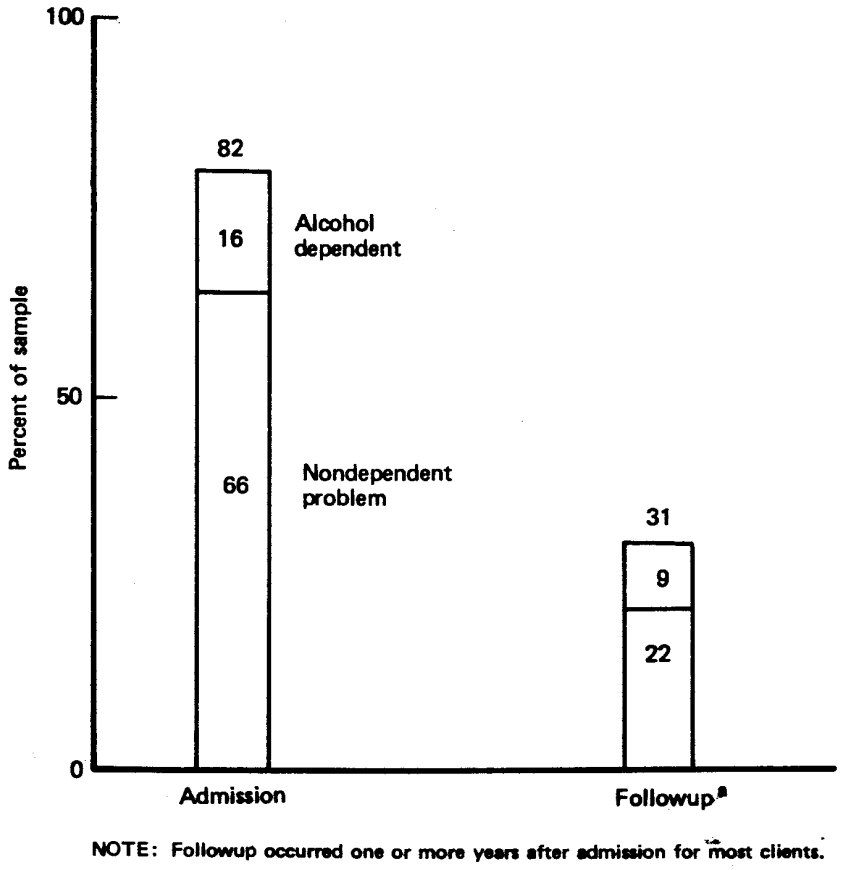


Fig. 3—Alcohol problem rates before and after treatment

sample as a whole is less severely impaired than most civilian treatment samples, and that somewhat higher improvement rates should therefore be expected.

We next turn to the relative effectiveness of the different treatment methods. Since inpatient ARCs receive a disproportionate share of more impaired persons, it is necessary to control for severity of impairment when comparing the three modes. In Fig. 4, we impose this control by examining improvement rates separately for alcohol dependent and nondependent cases. The analysis excludes persons not meeting our definition of serious alcohol problems at admission to treatment.

Among dependent cases, 65 percent of the inpatient sample show no serious problem at followup compared with 69 percent for local outpatient counseling, a difference that is not statistically significant. As expected, the number of alcohol dependent persons assigned only to Alcohol Awareness was too small to evaluate. For nondependent persons, we found no significant differences in the rate of improvement for ARC, outpatient, and Alcohol Awareness modes (61, 72, and 64 percent, respectively). It appears, then, that once we separate

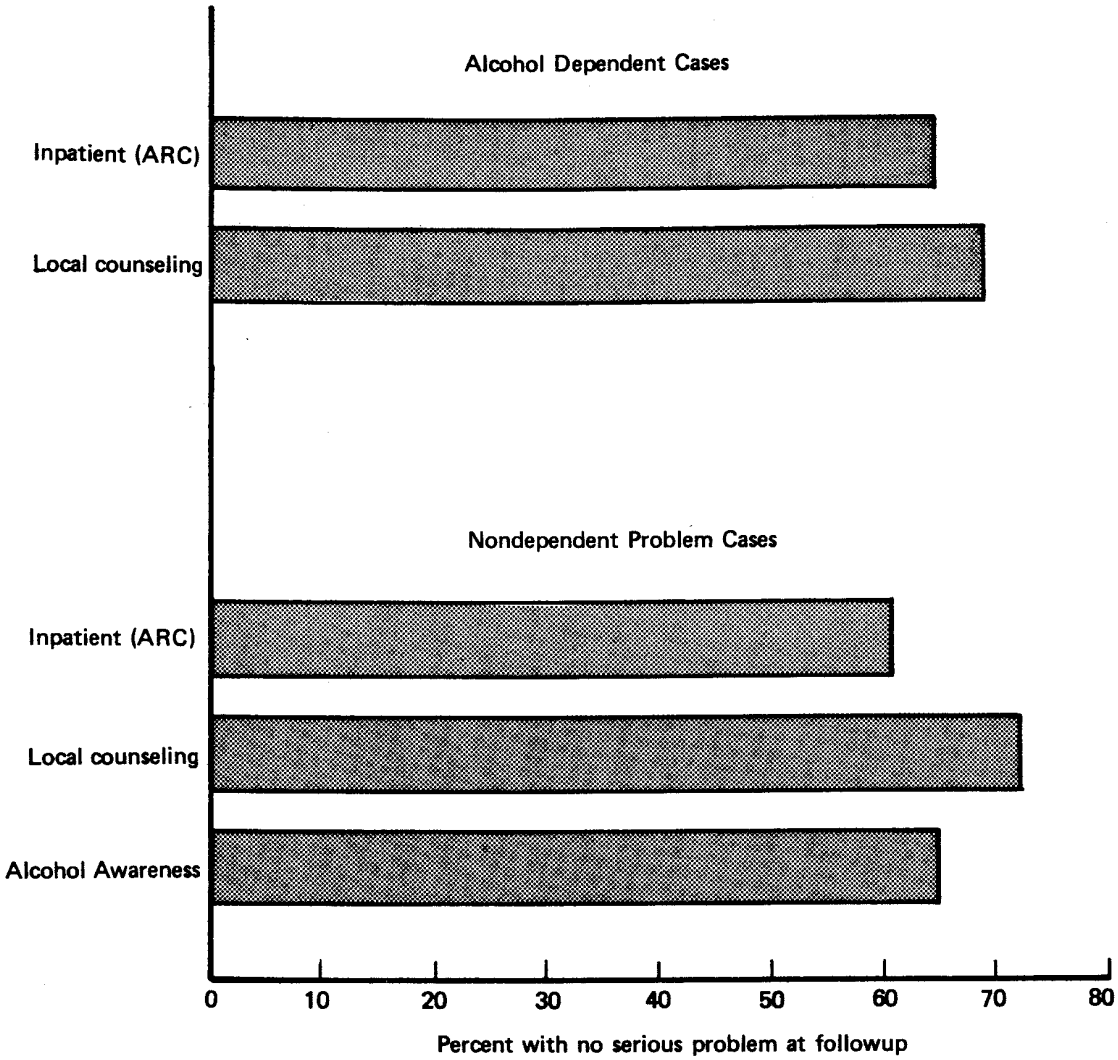


Fig. 4—Improvement rates by treatment mode

dependent and nondependent cases there are no important differences in improvement among the three treatment modes.

The study also investigated improvement rates for different lengths of treatment. We found that the two 14-day inpatient programs yielded about the same improvement rates as the 28-day programs, and that outpatient clients receiving less than the median number of counseling sessions fared as well as those receiving more than the median.

Since this study used a natural field design without randomized assignment, it is possible that within dependent and nondependent groups there were further differences in impairment that masked treatment effects (e.g., ARC dependent persons could be more impaired at admission than outpatient dependent persons). Indeed, this was the case to some extent. Therefore, we conducted a statistical analysis that adjusted improvement rates to reflect

initial impairment differences within the five groups shown in Fig. 4. The adjustment reduced the differences apparent in Fig. 4, again showing an absence of differential treatment effects among groups with the same initial impairment.

This statistical analysis does not establish, beyond doubt, that there are no treatment differences; only a well-controlled, randomized experimental design could provide more definitive evidence. However, the best evidence we can assemble at this time strongly suggests that inpatient and outpatient treatment modes are equally effective for dependent persons, while inpatient, outpatient, and Awareness Seminars are equally effective for nondependent persons. These results are consistent with several national civilian studies (Armor et al., 1978; Polich et al., 1981).

V. COST-EFFECTIVENESS OF THE CONTROL PROGRAM

A major study objective was to establish the cost-effectiveness of the alcohol control program and to investigate whether alternative approaches could improve efficiency. Cost-effectiveness seems especially important given the low identification rates discussed previously. If the Air Force improves identification methods, thereby increasing caseloads, rehabilitation capacity should be expanded in the most cost-effective manner.

The cost evaluation addresses two major issues (Orvis et al., 1981). First, we identified cost factors associated with alcohol problems and estimated the total dollar cost of alcohol abuse to the Air Force. Second, we used these cost factors to investigate the cost-effectiveness of the alcohol control programs, emphasizing the relative cost-effectiveness of inpatient treatment versus local outpatient counseling.

The purpose of this cost analysis is not to determine whether rehabilitation "pays" for itself in the form of dollar savings from reduced rates of alcohol abuse. Like many other Air Force medical and personnel programs, the alcohol program can be justified by its contribution to the general well-being of the Air Force population. Rather, the purpose of the cost analysis is to help policy planners by establishing the economic impact of alcohol problems, and by suggesting efficient intervention methods that might increase coverage and effectiveness for a given program cost.

COST OF ABUSE

Costs of alcohol problems were separated into five major categories: lost production (e.g., absenteeism); medical costs independent of alcohol rehabilitation; Air Force property damage; law enforcement; and the alcohol control program. Next, per-incident costs were determined from several primary and secondary sources (e.g., Pay and Allowance tables; cost of a hospital day; Social Actions budget figures). Finally, total costs were estimated by multiplying the per-incident cost times the frequency of a given incident determined by the Prevalence Study. One exception to this procedure occurred for Social Actions program costs, where total budget figures were available.[1]

The estimated cost of alcohol abuse to the Air Force was $62 million in 1977 (see Table 4). Lost production, including cost of alcohol-related separations, is the largest cost factor at $27 million. Medical costs, including alcohol-related fatalities, are nearly as high at $21.3 million. Most medical costs stem from hospitalization due to alcohol-related illnesses or injuries. The cost of the Alcohol Abuse Control Program accounts for slightly more than 10 percent of total costs.

Although these costs seem large in absolute terms, they were only a small fraction of the Air Force budget in 1977 (over $30 billion). The annual per capita cost is about $100 per active duty person, equivalent to about 2 lost workdays a year for every enlisted person in the Air Force.

It is important to note, however, that the relatively small number of persons with alcohol

[1]ARC treatment costs were estimated from special interviews with ARC staff, since budget figures were not available in the form needed.

Table 4

ESTIMATED COST OF ALCOHOL PROBLEMS, 1977

Cost Factor	Cost ($ millions)
Lost production	26.9
Medical	21.3
Property damage	5.3
Law enforcement	2.4
Alcohol control program	6.5
Total	62.4

problems (14 percent of the Force) account for 95 percent of the total costs of abuse, and therefore this group has much higher per capita costs. Alcohol dependent cases account for about half of all costs of abuse, with an annual per capita cost of about $1000. Nondependent cases have an annual per capita cost of $500. This difference in per capita cost reflects the greater impairment of dependent persons, and helps to justify their referral to more intensive (and hence more expensive) treatments.

We cannot be certain that all costs of abuse have been taken into account by this analysis, particularly indirect effects such as accidents or malfunctions caused by substandard performance of problem drinkers. For example, the property damage figure in Table 4 includes no major aircraft accidents due to alcohol. According to official Air Force records, no major alcohol-related aircraft accidents have been reported since 1971. This seems statistically unlikely, since the Air Force experiences about 100 major accidents per year. It is possible that official records are incomplete, since the determination of alcohol involvement relies heavily on interviews with associates and relatives. In any event, the cost figures in this section should be interpreted as minimum estimates.

COST-EFFECTIVENESS OF EDUCATION

Since the study found no significant effects attributable to the Education Seminars, there is no need for a formal cost-effectiveness analysis for this component of the program. Instead, we show costs for each component of the Alcohol Abuse Control Program, including prevention/education activities. This information will indicate the amount of resources available for other program activities, should the Air Force decide to alter the present education program.

Direct costs for the major components of the control program are shown in Table 5. Prevention activities account for a substantial fraction of all Social Actions expenditures ($2.3 out of 6.5 million). It should be noted that each of the Social Actions component costs includes a prorated share of central administration and support and base-level administration and support, which comprises 20 and 35 percent, respectively, of the total Social Actions budget. Therefore, under the current administrative structure only about half of the $2.3 million spent on prevention are direct costs available for alternative program activities.

The Education Seminar program itself accounts for about $660,000 per year in direct

Table 5

ALCOHOL CONTROL PROGRAM COSTS, 1977

Program Component		Total Direct Costs ($ millions)
Total Social Actions		5.4[a]
Prevention/education[b]	2.3	
Local outpatient counseling	2.9	
Alcohol Awareness Seminars	.2	
Alcohol Rehabilitation Center Inpatient Program		1.1
Total program		6.5

[a]Total Social Actions cost includes 20 percent centralized administration and support (Headquarters, evaluation, training) costs and 35 percent local administration and support costs, allocated proportionately to each program component.

[b]Includes drug abuse prevention. The Education Seminars combine both alcohol and drug education.

costs, excluding overhead. Most of the remaining prevention costs are divided among a large number of diverse activities, such as lectures, attending special meetings, and so forth. Although this figure is fairly small in absolute terms, it is a sizable fraction of total Social Actions direct costs and could be used to expand cost-effective rehabilitation services.

COST-EFFECTIVENESS OF REHABILITATION

The study showed that the rehabilitation program had a substantial impact on drinking behavior. The primary question relating to cost thus concerns the comparative cost-effectiveness of the three treatment modes, and in particular whether alternative emphases on these modes could improve effectiveness for a given cost. Because of the substantial difference in the cost of abuse between alcohol dependent and nondependent clients, the analysis was conducted separately for each group.

The per capita cost of the treatment modes varies considerably, from $60 for Alcohol Awareness to $3000 for 28-day ARC treatment (Table 6). Most important, local outpatient counseling is less than one-third the cost of the 28-day ARC treatment. It should be pointed out that ARC costs include the cost of outpatient counseling for those clients having both services (which most do), and outpatient counseling includes the cost of Alcohol Awareness for most clients.

One cost-effectiveness result can be obtained with no further formal analysis. Given that inpatient rehabilitation and outpatient rehabilitation appear equally effective for alcohol dependent cases, and that all three modes appear equally effective for nondependent cases, the most efficient treatment allocation would maximize the assignment of dependent cases to outpatient counseling and nondependent cases to Alcohol Awareness.

The Air Force Alcohol Abuse Control Program does emphasize outpatient approaches.

Table 6

PER CAPITA COSTS OF REHABILITATION, 1977[a]

Rehabilitation Mode	Direct Program Costs ($)	Indirect Costs[b] ($)	Total ($)
Alcohol Awareness	28	31	59
Outpatient counseling	649	280	292
ATC 14-day program	1172	824	1996
ATC 28-day program	1705	1352	3057

[a]ATC costs include outpatient and Awareness costs for clients receiving those services; outpatient costs also include Awareness costs.

[b]Pay and Allowance of clients while they are in treatment.

Nonetheless, nearly half of all dependent cases are now assigned to inpatient treatment, and only a fraction of nondependent cases receive just Alcohol Awareness; most nondependent cases receive outpatient counseling but some receive inpatient treatment. Therefore, we also conducted an analysis to estimate the absolute cost savings resulting from treatment. This analysis tells us the conditions under which a given treatment mode recovers its costs by savings arising from reduced levels of alcohol problems. Even though inpatient treatment may be more expensive than outpatient care, for some cases it might still be justified by the absolute savings it generates.

The techniques and assumptions used for this type of cost-effectiveness analysis are explained in detail in the Treatment Study (Orvis et al., 1981). It suffices to state here that the potential cost savings from treatment are estimated for the treated sample by comparing the cost of abuse before treatment with the reduced cost of abuse 1 year after treatment, and by making some assumptions about how long these first-year savings will last (assumed years of remission). The estimated savings rest on the further assumption that our sample, had it not been treated, would have continued to experience costs of abuse similar to the levels we observed in the pretreatment period.[2] These potential savings can be compared with treatment costs to arrive at the potential cost-effectiveness of each treatment method.

The potential cost savings from treatment are shown in Fig. 5. The savings are considerably higher for dependent cases than for nondependent ones, primarily because their pretreatment costs of abuse are higher (about $1000 versus $500, respectively); therefore dependent cases recover their treatment costs more quickly than nondependent ones.[3] Even so, the cost of 14-day inpatient treatment is offset for dependent cases only if remission—and hence cost savings—is assumed to last 3 or more years.

For nondependent persons, inpatient treatment is not likely to be cost-effective within reasonable remission periods. Outpatient counseling requires a 4-year remission period to

[2]This assumption probably leads to an overestimate of savings due to treatment, since several studies have shown that some persons with alcohol problems do improve without treatment, particularly when the problems are not severe (see Roizen et al., 1978; Armor and Meshkoff, in press).

[3]First-year savings are considerably less than pretreatment costs, even though improvement rates are high, because of the cost of alcohol-related separations during the first year.

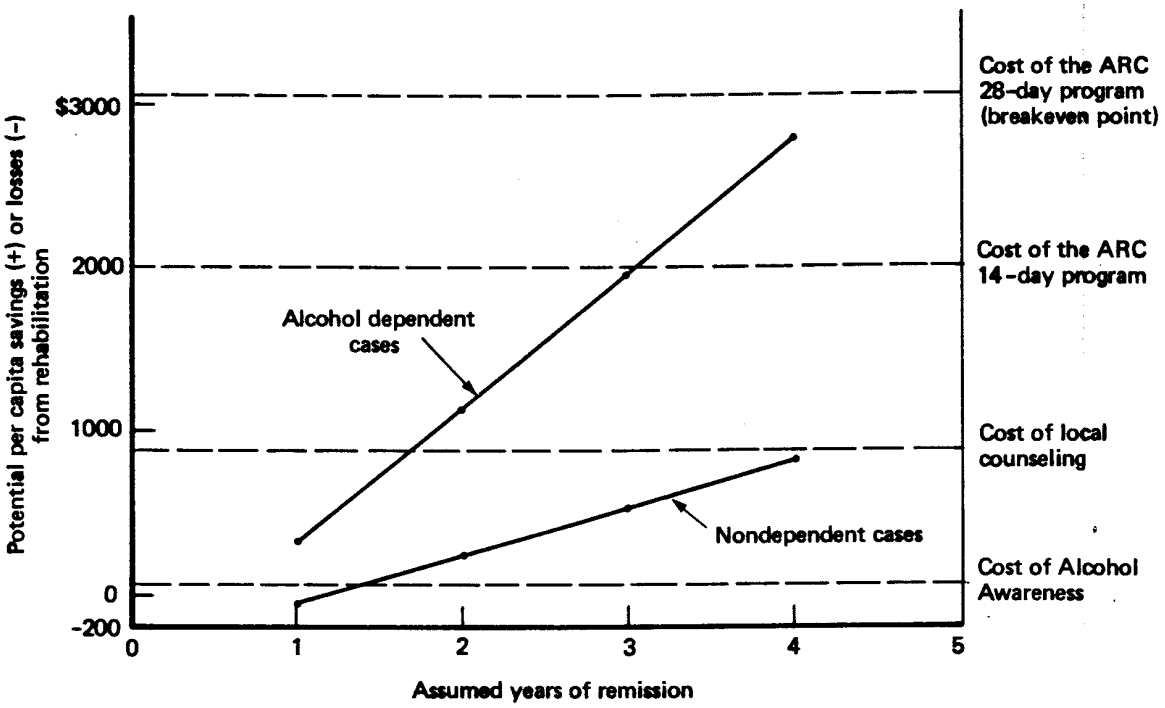


Fig. 5—Potential cost-effectiveness of rehabilitation

offset costs for nondependent clients, whereas Alcohol Awareness costs are offset after only 15 months of remission.

Although these cost-effectiveness results are based on a number of assumptions, several conclusions seem warranted. Outpatient care appears more cost-effective than inpatient care for dependent cases, and Alcohol Awareness appears more cost-effective than the other two methods for nondependent cases. Clearly, then, the efficiency of the rehabilitation program is enhanced to the extent that dependent clients are assigned to local counseling and nondependent clients are assigned to Alcohol Awareness.

VI. POLICY OPTIONS FOR THE AIR FORCE

Our findings provide a basis for evaluating several aspects of Air Force alcohol-abuse policy. In general the evaluation supports present Air Force policies, but it also suggests some areas for potential improvement. Accordingly, the final task is to bring the findings together and examine their policy implications. The purpose here is not to give detailed policy prescriptions, but rather to outline major options that might enhance program effectiveness.

The Prevalence Study suggests that alcohol problems affect about one of seven Air Force persons and are concentrated mainly among first-term enlisted personnel. While efforts to control alcohol problems therefore appear worthwhile, the seriousness of the problem should not be exaggerated. The majority of Air Force personnel are not at risk of developing alcohol problems, and the total economic impact appears to account for about two-tenths of 1 percent of the annual Air Force budget.[1] Moreover, the alcohol problem rate is apparently unaffected by the Air Force environment and would be expected among any group of persons, military or civilian, having the same demographic composition as Air Force personnel.

Air Force programs to control alcohol abuse seem adequate in purpose and scope, but effectiveness and efficiency might be enhanced in certain areas. The most important issue is that only about one in ten alcohol abusers is identified for treatment. Most alcohol incidents involving Security Police result in referrals, but supervisors and medical staff often fail to refer persons with known alcohol-related work or medical problems.

We do not have a specific formula for increasing identifications, but two general principles may be applicable. First, command support stressing the importance of identification should be evident at all command levels. Second, supervisors and medical staff may need more incentive to overcome social pressures that work against identification. Education might help, but stronger measures may be required, such as making identification a responsibility subject to performance evaluation. Any steps to increase identifications, however, must be balanced against the relative importance of the problem and the dangers of unfairly infringing on the privacy of Air Force personnel without alcohol problems.

The Air Force can improve program efficiency by emphasizing less costly but equally effective control programs. We recommend eliminating the Education Seminars and placing more emphasis on rehabilitation. In lieu of the seminars, alcohol abuse education could be combined with ongoing educational efforts during basic training, base introductory sessions, and Professional Military Education for supervisors. Resultant savings in staff time might be more profitably used in expanding Alcohol Awareness Seminars for persons identified as having potentially serious alcohol problems.

For nondependent alcohol abusers, Awareness Seminars appear to work as well as more intensive counseling or inpatient treatment. Indeed, we believe that identification itself provides great incentive for improvement among persons valuing their Air Force careers. In addition, supervisor identifications might be increased if the initial referral is to an Awareness Seminar rather than to full rehabilitation. At the very least, larger caseloads could be handled within existing budgetary resources if Awareness Seminars were given greater emphasis.

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[1]The cost of alcohol problems might rise with improved methodology for determining alcohol involvement in major aircraft accidents.

The Treatment Study (Orvis et al., 1981) confirms the Air Force policy of emphasizing local rehabilitation over inpatient treatment. Local rehabilitation appears as effective as inpatient treatment, even for dependent persons, and it is considerably less expensive. Moreover, to the extent that inpatient care must be used, it is likely that a 14-day program could be instituted without diminishing effectiveness.

Since the rehabilitation program appears effective overall, there is no need to recommend major changes at this time. If identifications and hence caseloads are expanded, however, we recommend increased use of outpatient care for dependent persons and Alcohol Awareness for nondependent persons.

Research of this type is not free of limitations. The findings and recommendations of this study are based on conventional research procedures widely used in the alcohol field, but they by no means guarantee certainty. The Treatment Study findings, in particular, are based on a nonexperimental field design. More definitive results concerning differential treatment effects would require a controlled experimental design using randomized assignment.

The recommendations herein stem from the best evidence available to date. Should any of them be adopted, they should be implemented within a framework allowing ongoing evaluation of their success. Such evaluation is central to improving the effectiveness and efficiency of future Air Force control programs.

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