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ABSTRACT

This second report to the Congress of the United States on Alcohol and Health concentrates on highlighting certain advances in knowledge gained about uses and misuses of alcohol in the last few years. It does not attempt to address all aspects of knowledge, and deliberately bypasses those areas in which new information may be developing but has not yet reached a sufficiently reportable level. This report offers: (1) an authoritative guide to understanding what scientists and scholars are currently studying and reporting, (2) a picture of current realities, and (3) a basis for thinking about problems related to alcohol and their possible solution. This publication is not an authoritative guide for solving moral issues which belong in the realm of personal decision. Emphasis is given to the important and expanding role of the National Institute on Alcohol Abuse and Alcoholism, and its progress toward "programs for people." The legislative mandate for the states to produce a working, viable plan for the provision of alcoholism services has now been implemented in every state of the union, and this mandate is viewed as the most significant progress made in recent years to provide effective, quality treatment to every alcoholic person who needs it. (Author/PC)

U. S DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
Public Health Service

Second Special Report to the U.S. Congress on

ALCOHOL & HEALTH

Preprint Edition.
June 1974

NEW KNOWLEDGE

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Errata Sheet

Title Page, Editorial Staff, L. 2: D. Spiegler instead of L. Spiegler

p. 34, L. 4: delete

p. 37, Para. 1, L. 5: (11) instead of (12)
Para. 3, L. 3: (10) instead of (11)

p. 44, Para. 1, L. 5: insert (4)

p. 45, L. 5: (11) instead of (12)
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L. 10: (11, p. 444) instead of (12, p. 444)

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L. 6: (9) instead of (5)

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Para. 2, L. 5: (6, 16) instead of (19, 20)
L. 6: (11) instead of (21)
L. 7: (23) instead of (22)
L. 11: (24) instead of (23)

p. 102, ref. (15) Lieber instead of Liber
ref. (15) Lundquist instead of Luncuist

p. 110, Para. 1, L. 4: (16) instead of (17)
L. 4: (35) instead of (38)
L. 5: (33) instead of (35)
L. 5: (29) instead of (31)
Para. 5, L. 3: (29) instead of (31)

p. 111, In the key, L. 4: 20-49 oz. instead of 20-9 oz.

p. 123, ref. (24) L. 10: Longevity instead of Logevity

p. 124, Para. 1, L. 8: eliminate "and Huxley"
L. 14: (16) instead of (17)
L. 18: (10, 12) instead of (10, 13)
Para. 4, L. 2: (7, 18) instead of (7, 19)

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L. 8: (17) instead of (18)

Para. 4, L. 2: insert after potassium ions: into cells
L. 2: insert (8, 15)
L. 5: insert (1, 14)

p. 128, Para. 1, L. 8: (33) instead of (28)
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L. 11: (5) instead of (10)

p. 132, Para. 1, L. 8: (23) instead of (41)

p. 138, Para. 5, L. 9: (4) instead of (,4).

p. 141, Para. 1, L. 3: 0.10 percent instead of 100 mg/100 ml.

p. 145, Para. 2, L. 10: psychodrama instead of psychodrams.
Para. 4, L. 5: insert "a community" after comma preceding "oriented".

p. 148, Para. 5: delete line 6.

p. 149, Para. 5, L. 9: enlisted instead of enclisted

p. 199, Para. 4, L. 7: (25) instead of (24)

p. 200, Para. 1, L. 4: insert (1)

p. 203, Para. 5, L. 3: insert (11)

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DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
Public Health Service
Alcohol, Drug Abuse, and Mental Health Administration
National Institute on Alcohol Abuse and Alcoholism

FOREWORD

There was a time not many years ago when alcohol abuse and alcoholism were not considered important problems. As a Nation, we turned our backs on what we now recognize as a serious problem. Both as a government official and a citizen, I am pleased to say that Americans are no longer ignoring the unfortunate consequences that result from the misuse of alcohol.

This Second Special Report to the U.S. Congress on Alcohol and Health, focussing on new knowledge developed in the past few years, marks another step forward in our understanding of the use and misuse of alcohol. I am concerned by the extensive use of alcohol by young people. I am reassured that the majority of Americans consume alcohol with no adverse effects. The Report has implications throughout our Department, touching on many aspects of education and welfare as well as health.

We have in the past several years inaugurated an educational program aiming at the prevention of alcohol misuse and thus designed to reduce the incidence of new cases of alcoholism. Activities described in this Report, such as encouraging insurance payments for the treatment of alcoholism, promise new lines of help for those who already have this illness. We also plan to continue our study and research, and to keep before the public an awareness of this problem.

In this new Report, we recommend new approaches to alcohol and alcoholism, emphasizing particularly actions and programs involving the partnership of private enterprise and citizen groups. We need to seek out the causes of this illness that develops in a sizeable minority of alcohol consumers, and to search out measures of preventing it. We also need to develop more effective tools for preventing alcoholism and for constructively coping with this health and social problem.

Caspar W. Weinberger
Secretary of Health, Education, and
Welfare

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PREFACE

Alcoholism and alcohol abuse is one of our most serious health problems. Although the use of alcoholic beverages is harmless to most people and apparently beneficial for some, alcoholism is an illness that plagues some 9 million Americans directly, and many times that number when one considers the effects on families and others. It is an illness, as this Report demonstrates, that can engender other serious diseases--such as cardiomyopathy, cancer, cirrhosis--and can shorten the lifespan of its victims by many years. And yet, it did not become a national health priority until a few years ago. The National Institute on Alcohol Abuse and Alcoholism was created in 1970 as a result of this awareness and leads Federal efforts in this area. It has since that time inaugurated new programs ranging from treatment in poverty and industrial settings to State formula grants, to community assistance, as well as a number of other services, research, and training functions. These programs have stimulated a rising tide of interest and concern for alcoholic people. But it is not enough, and we cannot rest complacent when there is so much more to be done.

How does such an outstanding and clearly fundamental need fit into an overall national health strategy? The solution is that the treatment of alcoholic people and the prevention of alcoholism ultimately must be assumed by the same people who are treating every other kind of illness in our health care and human service systems. Physicians, nurses, social workers, professionals of all kinds, and others involved in and committed to health care must all assume their proper responsibility for alcoholic people in exactly the same way they would take care of a person with any other kind of illness. A major accomplishment in this direction was achieved with the recent signing by the President of a comprehensive alcoholism and alcohol abuse act, Public Law 93-282,* which prohibits hospitals receiving Federal funds from discriminating in any way in the admission of patients suffering from alcoholism.

I am also encouraged by the growing recognition both inside and outside the health care system of the importance of alcohol misuse and alcoholism. Recently, two separate Presidential Commissions--The National Commission on Marihuana and Drug Abuse and the President's Science Advisory Committee--issued reports on drug abuse and chemicals, respectively. The main common finding was that the problems of alcohol overshadow the importance of any other kind of drug.

It is fitting, then, that the new Alcohol and Health Report should appear at this time. This Report brings together under one cover a comprehensive review of the new directions that are being taken to understand and to deal with alcohol misuse and alcoholism, and underscores our contention that the time has come to bring the treatment of alcoholism into the mainstream of our Nation's health care system.

Charles C. Edwards, M.D.
Assistant Secretary for Health

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*Comprehensive Alcohol Abuse and Alcoholism Prevention, Treatment and Rehabilitation Act Amendments of 1974.

FINDINGS

- Alcoholism and alcohol abuse continue to occur at high incidence rates within the American society.

- The proportion of American youth who drink has been increasing so that, currently, it is almost universal. The highest scores on an index of possible problem-drinking behaviors were recorded in the youngest age group for which data are available, the 18-20 year olds.

- The public suffers from much ignorance concerning alcohol and from ambivalent feelings toward it. Worse yet, heavier drinkers know less about alcohol than do lighter drinkers or abstainers. In general, American attitudes about drinking are marked by confusion and dissent.

- The economic cost associated with misuse of alcohol is estimated at $25 billion a year.

- The U.S. system of alcohol controls is a chaotic relic. It provides little support in mitigating alcohol problems and may induce a counterproductive ambivalence among the public.

- The excessive use of alcohol, especially when combined with tobacco, has been implicated in the development of certain cancers. Non-white men appear to be especially susceptible.

- Heavy drinking during pregnancy can adversely affect the offspring of alcoholic mothers. The significance of heredity in alcoholism is as yet unresolved.

- The development of a new animal model of liver cirrhosis gives promise of resolving the problem of cause in one of the severest damages suffered by alcoholic people, and may contribute to more effective treatment, and prevention.

- Moderate consumption of alcohol is generally not harmful. In some cases, such as among the elderly, it may have beneficial physical, social or psychological effects.

- The non-excessive use of alcohol does not appear to adversely affect the over-all mortality rate or the mortality from a specific major cause of death, coronary heart disease. In fact, the mortality of drinkers is lower than that of abstainers and ex-drinkers.

- How alcohol intoxicates and how alcohol addiction develops are outstanding fundamental questions that require intensive research in several disciplines.

- Alcoholism is a treatable illness, but different treatments are required by different individuals. Increasingly, individual treatment needs can be determined on the basis of valid studies or clinical experience.

- Early identification and treatment are seriously constrained by the fact that the United States lacks a national consensus on what constitutes responsible use of alcohol. Furthermore, the current lack of parameters with regard to comparatively safe versus unsafe drinking patterns provides an inadequate and ineffective clinical base for the diagnosis of alcoholism.

- Although the accessibility and quality of alcoholism treatment services are improving, there remains a serious deficit of such services, and only a small portion of alcoholic people are receiving the services required. Moreover, the bulk of treatment services which are available, are designed to respond to late-stage alcoholism and do not meet the needs of people whose alcoholism is identified at earlier stages of the illness.

- Major strides can be made in providing adequate treatment for alcoholism with proper and efficient utilization of resources and personnel. This requires continuation and expansion of the roles played by the private and voluntary sectors of society.

- Treatment programs supported by business and industry can be especially effective in earlier identification of employees with alcohol problems, and such programs report the highest rates of recovery.

- Third-party coverage for alcoholism treatment costs is essential, and feasible, to provide adequate services for all who require such treatment.

RECOMMENDATIONS

On May 14, 1974, the President signed Public Law 93-282, continuing and giving renewed emphasis to the Nation's settled commitment to deal with alcohol abuse and alcoholism as initially expressed by the Comprehensive Alcohol Abuse and Alcoholism Prevention, Treatment, and Rehabilitation Act of 1970. The new amendments build on the experience since 1970 and sharpen that comprehensive commitment:

> "It is the policy of the United States and the purpose of this Act to (1) approach alcohol abuse and alcoholism from a comprehensive community care standpoint, and (2) meet the problems of alcohol abuse and alcoholism not only through Federal assistance to the States but also through direct Federal assistance to community-based programs meeting the urgent needs of special populations and developing methods for diverting problem drinkers from criminal justice systems into prevention and treatment programs."

Based on this legislative mandate and the findings of this Report, the Secretary of Health, Education, and Welfare recommends--

. THAT THE GROWING STORE OF KNOWLEDGE ABOUT ALCOHOL AND ALCOHOLISM BE MADE MORE READILY AVAILABLE FOR USE BY SPECIALISTS AND THE PUBLIC.

The need to systematize and process the growing world-wide experience, study, and research so that it will be available to scholars, researchers, legislators, educators, administrators, professionals, and all citizens is critical. The further development of the National Clearinghouse for Alcohol Information, in collaboration with appropriate academic and other sources, should therefore be pursued energetically.

. THAT EDUCATIONAL RESOURCES FOR PROFESSIONALS AND SCHOOLS BE EXPANDED AND DEVELOPED.

The rehabilitation of problem drinkers and alcoholic people requires the help of a wide variety of professional and allied personnel with special skills and understanding. Resources for the training and accreditation of such specialized personnel should be identified in model form, and States or regional consortiums should be encouraged to adopt these approaches as appropriate to their own needs.

The long-range prevention of alcohol misuse depends in part on the transfer of both knowledge about alcohol, and the understanding of its use and nonuse, to the younger generation. Schools throughout the Nation have an important role in this process. Suitable modules of alcohol education should be developed by the National Center for Alcohol Education and Regional Centers. State and local school systems can adapt these modules for their curriculums.

- THAT EFFORTS TO DECRIMINALIZE AND INSTEAD PROVIDE COMMUNITY CARE FOR ALCOHOLISM AND PUBLIC INTOXICATION BE REDOUBLED.

  The Uniform Alcoholism and Intoxication Treatment Act recommended to the States by the National Conference of Commissioners on Uniform State Laws and by the Secretary of Health, Education, and Welfare, provides a model for States to decriminalize and establish the legal framework within which to approach alcoholism and public intoxication from a community care standpoint. This action has been recommended by the courts, Presidential Commissions, and professional organizations. A special grant in Public Law 93-282 to States that adopt this legal framework and approach is a fundamental recognition by Congress and the Administration of its importance.

- THAT THE NEW LAWS PROTECTING THE PRIVACY AND CONFIDENTIALITY OF ALL CITIZENS WITH DRINKING PROBLEMS BE STRICTLY AND IMMEDIATELY ENFORCED.

  Public Law 93-282 amends section 333 of the Alcoholism Act to provide the first comprehensive approach to the issue of confidentiality and privacy for people with drinking problems.

- THAT EFFORTS BE SPEEDED UP TO ASSURE QUALITY CARE FOR AND TO REDUCE THE CARNAGE AMONG SPANISH SPEAKING AMERICANS, INDIANS AND OTHER NATIVE AMERICANS, YOUNG BLACK MEN, AND HIGHWAY TRAVELERS.

- THAT THE VALUES OF EARLY IDENTIFICATION AND TREATMENT PROGRAMS IN BUSINESS AND INDUSTRY BE GENERALLY RECOGNIZED THROUGHOUT THE COUNTRY.

  The magnitude of the cost to the Nation's economy stemming from problem drinking and alcoholism is staggering. It is imperative to encourage the wider establishment, in Government as well as in the private sector, of the types of program that, with the cooperation of labor and management, have successfully restored substantial majorities of affected personnel to health and normal function. The economic benefits of effective early identification and treatment programs demonstrably outweigh the cost, and the human benefits are beyond valuation.

- THAT QUALITY AND COMPREHENSIVE CARE BE EXTENDED TO ALCOHOLIC PEOPLE THROUGH COVERAGE UNDER HEALTH AND DISABILITY BENEFITS AND THE ESTABLISHMENT OF STANDARDS FOR CARE.

  Total coverage for the treatment of alcoholism through traditional and other third-party payment plans should continue to be studied. The application of such coverage in both general and special therapeutic settings should be explored, with particular consideration to the continuum of health and human-service needs of alcoholic people in the process of recovery and rehabilitation. Standards and certification for such care are crucial to insurance coverage and to the quality of care that can be obtained by alcoholic people.

. THAT NEW AND REVISED POLICIES AND GUIDELINES GOVERNING THE DISTRIBUTION AND SALE OF ALCOHOLIC BEVERAGES BE DEVELOPED.

Current laws and regulations need to be reevaluated to determine whether they are fulfilling their intended purposes. To the extent that they are not, a set of model codes of alcohol-beverage control should be formulated, which States and communities may adopt with modifications to suit their own needs.

. THAT IT BE RECOGNIZED THAT THE MULTIPLICITY AND EXTENT OF ALCOHOL-RELATED PROBLEMS CANNOT BE THE EXCLUSIVE RESPONSIBILITY OF THE FEDERAL GOVERNMENT. ACCORDINGLY WE SHOULD FIND WAYS--

To strengthen the involvement and the role of private enterprise in reducing the problems of alcohol abuse and alcoholism;

To enhance the role of voluntary agencies, and support by State and local governments, in activities related to the care of the afflicted, and in contributing to preventive efforts.

. THAT EFFORTS BE MADE TO INTENSIFY THE STUDY OF THE RELATION OF ALCOHOL USE TO--

Cancer
Heart disease
Liver disorders
Pregnancy and fetal health
Aging
Longevity and mortality
Brain function and the addictive process.

. THAT A NEW NATIONAL CONSENSUS CONCERNING WHAT CONSTITUTES RESPONSIBLE USE AND NON-USE OF ALCOHOLIC BEVERAGES BE FORMULATED AND ARTICULATED.

Current concepts and mores concerning the use and non-use of alcoholic beverages are confused, inconsistent, and sometimes destructive. Knowledge about the use and misuse of alcohol needs to be shared more widely and continually so that citizens and especially our young people are given the opportunity to base their decisions to drink or not to drink on the best information that is available. In addition, new and alternative recreational and social settings may be considered in which drinking will be a coincidental function rather than the main reason for people frequenting them.

INTRODUCTION

The First Special Report to the Congress of the United States on Alcohol and Health described broadly certain existing areas of knowledge about alcohol, its historical and contemporary uses and misuses, drinking and problem drinking, theories of the causes of alcoholism and its treatment. Effects of alcohol on on the nervous system and the legal status of intoxication and alcoholism were reviewed in detail.

This Second Special Report concentrates on highlighting certain advances in knowledge gained in the last few years. It does not attempt to address all aspects of knowledge and deliberately bypasses those areas in which new information may be developing but has not yet reached a sufficiently reportable level. Where the new knowledge that is reported rests on prior foundations, reference is made to the older sources; and, where pertinent, reference is made to the First Report. This Second Report, thus, does not supersede its predecessor nor renders it obsolete. Rather, it should be used in conjunction with the First Report and as a fresh supplement to it.

The very fact that this Report highlights new scientific findings warrants a word of caution. Scientific advances are made in discrete steps, each of which must be duplicated and repeated many times before we are certain that it is valid, and how it should be interpreted, and when it may be used. As we respect the rights of people to make their own interpretations and decisions, and to accept their own risks based on the best available knowledge, it is an ethical imperative to interject here a word of caution about the limitations of applying broad findings based on statistical populations to specific decision-making by individuals. A scientific truth concerning a population, represented by a statistical average, may be inapplicable or even invalid for many individuals within that population. One striking example is the finding that the life span of ex-drinkers and abstainers is shorter than that of drinkers. It would be a gross error to interpret this as an indication that the ex-drinker should resume drinking--indeed, a possibly fatal error. That ex-drinker may be someone who has an illness that has made alcohol intake dangerous--especially if that illness is alcoholism. Similarly, it would be an error for any individual to assume, since the findings indicate that moderate drinking is beneficial to some people, that this benefit can outweigh the ethical and health values which abstinence represents for them as a way of life. In sum, this Report is an authoritative guide to understanding what scientists and scholars are studying and reporting at this time, a picture of current realities, a basis for thinking about problems related to alcohol and their possible solution. It is not an authoritative guide for solving moral issues which belong in the realm of personal decision.

This Second Report reflects the knowledge gained for the battle against the misuse of alcohol since the inception of the National Institute on Alcohol Abuse and Alcoholism (NIAAA). Three years is minuscule in the long history of man's relation with alcohol, but these were years of notable progress. The energies and resources of a Nation were finally mobilized in concert among the Federal, State, local, private, and volunteer sectors. This is most outstandingly reflected in the passage of Public Law 93-282, The Comprehensive Alcohol Abuse and Alcoholism Prevention, Treatment, and Rehabilitation Act Amendments of 1974, which was signed into being by President Nixon on May 14.

In all of its work over the past three years, the National Institute on Alcohol Abuse and Alcoholism has been fortunate in having an extremely dedicated National Advisory Council which has unstintingly given of its time in providing the Institute's Director and his staff with valuable counsel and guidance as NIAAA has evolved and implemented its programs. In this Nation's progress toward overcoming many of our problems stemming from the misuse of alcohol, the work of numerous voluntary organizations has been of paramount importance. These organizations range from those such as the National Council on Alcoholism, Alcoholics Anonymous, and the Alcohol and Drug Problems Association of North America, which have since the very inception been in the forefront of the battle, to those which have more recently, but nevertheless no less energetically, become involved.

What we have learned can, perhaps, be seen not only in a recitation of newly discovered facts but also in terms of what has been accomplished and how understanding has developed.

Progress Toward Programs for People

As we have stated in From Program to Person: Working Papers of the National Institute on Alcohol Abuse and Alcoholism, "The highest priority of the Institute, from the beginning, has been to make effective, quality treatment available to every alcoholic person who needs it. . ."

We believe that significant progress has been made toward this goal. The legislative mandate for the States to produce a working, viable plan for the provision of alcoholism services has now been implemented in every State of the Union. The individual States have benefited from the service, research and demonstration programs that have been mounted with NIAAA underwriting and assistance, and have now begun to take over these efforts on their own. The Institute has ensured that consultants and program resources are available in every State, as well as at the National level, capable of providing technical expertise in the developing of a wide diversity of services, encompassing community and local interests, industrial and occupational settings, poverty and minority programs.

At the community level the NIAAA has directly supported the development of almost 500 currently operating alcoholism treatment programs. Their work is being systematically monitored so that the long-range effectiveness of various treatment modalities can be reliably evaluated. Through its Formula Grant Program to State Governments, the NIAAA indirectly supports many hundreds of other alcoholism treatment and prevention projects.

Recently the NIAAA has also launched a series of special-population programs in addition to those already functioning for American Indians and Alaskan natives. They include projects to bring aid and rehabilitation to alcoholic people in certain hitherto neglected segments of our society: Blacks, Spanish-speaking Americans, migrant farm workers, women, and persons caught up in the criminal-justice system.

Early identification of alcohol problems is increasingly recognized as vitally important. The earlier an individual's difficulties with alcohol are discovered, the more anguish is spared, the better the prognosis, and the less expensive the treatment. An entire chapter of this Report is devoted to occupational alcoholism programs, seen as a major mechanism for achieving earlier identification. Drinking-driver programs, such as the Alcohol Safety Action Projects initiated by the Department of Transportation within the past three years in concert with alcoholism treatment programs, appear to offer another promising approach.

We speak easily of the problems of alcoholism and treatment techniques in response to them. But much information is lacking that is needed to develop sound programs on a national scale. For example, an estimate of the economic costs associated with alcohol misuse is important for perspective in assigning national priorities. The first thorough estimate, based on all currently available information, is only just now available. The cost for the sample year of 1971 exceeds $25 billion. Other kinds of information are worth particular mention.

(1) Data are now available in increasing quantity describing the operations of treatment programs. It is becoming possible to relate changes in client status to such factors as staffing patterns, treatment delivery system, unit costs, etc.

(2) A series of consistent, periodic surveys are being conducted to examine the attitudes, opinions, and knowledge of the general public. This is essential to the implementation of workable community programs.

The flow of information has not, however, been unidirectional. The NIAAA, other Government agencies, and the private sector have all been using the mass media to present the case against alcohol misuse. Alcoholism is increasingly newsworthy; items of significance to alcoholism are seen more and more in the news. A new resource for public and scientific information has been established, the National Clearinghouse for Alcohol Information. And there are many other activities aimed at increasing public information. All this seems to be taking effect. Thus, surveys indicate an increasing general awareness; the National Clearinghouse is receiving a tremendous and increasing number of requests for information.

This Report, while focusing on many of the more positive aspects of our progress toward combating the misuse of alcohol, also highlights a number of the areas where we must redouble our efforts. One such area of considerable alarm is the misuse of alcohol by many of this Nation's youth. If we are ever to be truly successful in our efforts, we need to bring about considerable changes in the attitudes and behavior of our younger citizens with regard to the use of alcohol.

The Private Sector--A New Role

We are looking to the Nation's private sector to play a more meaningful leadership and advocate role in our endeavors, to demonstrate its social concern, and join in partnership with the alcoholism movement.

We are looking to the Nation's health insurers to make third-party payments become as much a part of alcoholism treatment as they are of other health care. We are developing the necessary standards for the accreditation of paraprofessional personnel and facilities. We will give the health insurance industry the necessary tools; but the industry must supply the necessary willingness and commitment.

We are looking to the private enterprise system to actively enter the alcoholism treatment field. Through improvements in health coverage, and through demonstrating feasibility, we are convinced that high quality alcoholism treatment can be expanded significantly through the Nation's effective system of free enterprise.

We are looking to private industry to join our ranks and further its own self-interest at the same time, by committing itself to developing occupational alcoholism programs. We are asking it to stop killing its alcoholic employees with kindness by ignoring or covering up alcoholism problems. We are asking for the opportunity to show that every dollar invested in such a program will yield multiple-dollar savings in return. And we are asking for the chance to demonstrate that the motive for profit need not conflict with compassionate concern.

We are asking the liquor industry to demonstrate more aggressive leadership and initiative in the alcoholism area. It should be a full and willing partner. It is the liquor industry that can push for and even demand meaningful changes in common business and social practices that add to alcohol-related problems.

The Enhancement of Health

The word "prevention" is commonly used in speaking about alcoholism. What we mean by prevention is helping people to avoid the harmful effects of behavior related to taking alcohol. Although we should continue to talk about prevention, since the word is in common usage, we should also recognize that this is in some sense an unfortunate term. For many people "prevention" connotes a series of negatives about behavior: avoidance, stopping, cutting off. We believe a more positive concept of prevention needs to be promulgated throughout this Nation. This positive concept of prevention should focus on describing and promoting those attitudes and behaviors which best serve to curtail the destructive use of alcohol in our society. This Report clarifies in some degree the role of alcohol misuse and alcoholism in certain malignant diseases, such as cancer and cirrhosis, as well as their contribution to mortality. But it also presents recent evidence in several areas indicating that there are no adverse and there may be some beneficial effects of alcohol intake: the mortality and heart disease data suggest this; and alcohol consumption was related to feelings of health and well-being among non-institutionalized elderly persons, and to physical and psychological improvement among institutionalized elderly people.

The use of the word "prevention" also implies to some people that we know the etiology or cause of problems, or of an illness. In the case of alcoholism, the best current knowledge suggests that there is no unitary cause. That is, the principle that one cause leads to one effect does not apply here. Similarly, there is no single constellation of symptoms defining alcoholism. Therefore, there are multiple problems to "prevent."

Despite this diversity, we have argued for a long-term unitary goal: a society which embodies the concept of integrated drinking for those who choose to drink. According to the best contemporary knowledge, integrated drinking exists in a society that has (1) evolved a substantial agreement in its membership about the values, norms, and practices that regulate the use of alcohol, and (2) subordinated drinking to other activities, such as family, religious and recreational pursuits, rather than using alcohol as the prime organizing attraction of a social activity. Such a society shows comparatively few problems with alcohol. This is, currently, not the case in the United States. As a result of our complex National history, a plethora of attitudes and practices surround and confound alcohol use. They arose from ethnic and religious disparities with related differences in mores, customs, beliefs, values, and sanctions about drinking.

Nevertheless, change is feasible. Drunkenness was a problem among the ancient Hebrews. Yet temperate drinking became the established norm among Jews when their national culture was reformed around 525-350 B.C. and remains so today. In this century, both France and Denmark, to select two examples, showed marked and rapid change in drinking patterns. Early data from the Alaskan native alcoholism programs indicate that mere provision of leisure time alternatives to drinking, e.g., community centers, markedly and quickly reduces the incidence of alcohol problems.

The National Institute on Alcohol Abuse and Alcoholism is beginning the task of creating a new national drinking environment based on facts and a feeling of responsibility with regard to alcoholic beverages. In pursuit of the creation of this new environment, the following guidelines are proposed:

-- The general public should understand the facts about alcohol and its effects on the human body. More people should realize that, among other things, alcohol is an anesthetic drug capable of causing euphoria, sedation, unconsciousness, and death, as well as adverse social effects.
-- The proper use of alcohol can be socially, psychologically, and physically beneficial.
-- The decision to drink or not to drink should be a personal, private decision. However, anyone choosing to drink has a responsibility not to destroy himself or impair his relation with society.
-- Those who drink should respect the decision of the proportion of the population in this country who choose not to drink.
-- People who serve alcoholic beverages should recognize their responsibility. Bartenders who refuse to sell drinks to an inebriated customer, and hosts who do not push unwanted or "loaded" drinks on guests, are acting responsibly and contributing to a healthy drinking environment.
-- Those who drink should not get intoxicated.
-- More people must come to understand that adults are significantly responsible for the drinking habits of youth, because the examples set by adults have a great influence on the subsequent drinking attitudes and practices of young people.
-- The general public must begin to realize that the line between alcohol misuse and alcoholism is mostly a matter of degree and consequence; and, therefore, there is a direct link between irresponsible attitudes toward drinking and the problem of alcoholism.

More must be done than work for eventual cultural change. There are now, and always will be specific subpopulations for whom the risks or possible manifestations of alcoholism require focused prevention programs. Children of alcoholic parents provide one example. There is evidence to suggest a familial factor in alcoholism. Therefore, special efforts should be made on their behalf.

A final example of need for immediate action, this time aimed at the total population, is represented by alcohol control agencies and policies. Unlike most other developed countries, ours does not have a National policy on the manufacture and sale of alcoholic beverages. With the exception of Federal statutes on exports and imports, licensing of manufacturers, interstate commerce, and taxation, each State has "full and complete authority over the manufacture, distribution, and sale of alcoholic beverages within its borders."

Consequently, alcoholic beverage control in the U.S.A. is a hodge-podge. The structures and functions of the control agencies vary from State to State. Some are comprised only of a single elected official while others consist of a board appointed by the governor. Some agencies have their own enforcement staffs while others must rely upon State and local police for enforcement. Even legal definitions of what constitutes an alcoholic beverage vary among the States. For example, 3.2 percent beer by weight in some States is regulated but is not considered an intoxicating beverage, while in one State the term alcoholic beverage refers to those containing more than 14 percent ethyl alcohol by volume, and in another, beer containing less than 5 percent alcohol by weight and wine containing 21 percent or less alcohol by volume are considered neither alcoholic nor intoxicating.

Although specific regulations vary from State to State, alcoholic beverage control agencies generally employ similar methods. Specific types of control include hours of sale, age of purchasers, separation of licenses (on-premise and off-premise), and limitations on advertising. Although these controls were conceived and implemented primarily to stabilize and regulate the beverage alcohol industry, their potential applicability to prevention is evident.

Currently, there exists a mutual lack of understanding among the alcohol control agencies and agencies involved in preventing alcohol-related problems as to the role the other can play in their operations. Few of the alcohol

control agencies coordinate their activities with those of other agencies, even within their own State, involved in combating alcohol-related problems. Conversely, social or Government agencies associated with alcohol problems have shown little interest in including alcohol control board personnel in planning conferences or programs which aim to reduce problem drinking. The reason for this separation appears to be a notion prevalent on each side that the other has little to contribute or is not interested in contributing to its functions.

The National Institute on Alcohol Abuse and Alcoholism is striving to break down the barriers between all Government and private agencies that prevent cooperation for the achievement of a healthier society--a society with such healthier attitudes toward drinking as will result in personal responsibility and social integration of the use and nonuse of alcohol.

Alcohol problems viewed from any perspective cause grievous pain: hurt to the afflicted person, his family, and society. The mission of the National Institute on Alcohol Abuse and Alcoholism from its creation by Public Law 91-616 in 1970 and its establishment on May 6, 1971, has been to provide that help, to treat the people who are suffering, and to prevent the tragedies arising from the effects of alcoholism. As an illness, alcoholism is devastating; the source of accidents and poor health; a contributor to the disruption of families; a well of human misery. Something is being done about it.

Morris E. Chafetz, M.D.
Chairman of the Task Force

Chapter I

ALCOHOL USE AND MISUSE BY ADULTS AND YOUTH

There is an absence of clear definitions of problem drinking and alcoholism, but universal agreement that they represent a source of grave concern for our society. The number of Americans whose lives alcohol has adversely affected depends on definition: those under active treatment for alcoholism by public or private agencies are probably in the upper hundreds of thousands. but there may be as many as 10 million people whose drinking has created some problem for themselves or their families or friends or employers, or with the police, within the past year.

Alcohol Consumption in the United States

It is necessary to know some basic facts about drinkers and the kinds and amounts of alcohol they consume to appreciate the impact of drinking on contemporary American society. It is useful also to compare the United States with other countries. For, as will be evident from a consideration of the facts presented here and in later chapters, "enough alcohol consumed in any form will ensure trouble for any group or nation," (62). Yet alcohol alone may not cause health or social problems, even in a universally drinking society, and the type of drink may not matter as much as the patterns and purposes of drinking.

Historically, marked shifts in the amount and patterns of consumption have occurred over relatively short periods in some countries. Some of these shifts have been reactions to national crises, such as war, or have been effected by deliberate governmental policies. Such rapid changes, however, tend to be temporary. Enduring changes in drinking attitudes and behavior, for which no external cause may be obvious, can require generational time spans. Three such documented examples are the shift in ancient times from heavy drinking and drunkenness to moderate drinking and sobriety among the Hebrews (35); and in American history the shift from nearly universal drinking to widespread abstinence by a substantial part of the population during the first half of the 19th century (26).

The amounts of tax-paid alcoholic beverages (distilled spirits, wines, and beers) apparently consumed in the United States in 1972 by the average drinking-age person are shown for each State, the District of Columbia, and the entire country in Table 1. The consumption portrayed in this and all later tables and figures actually represents only the tax-paid quantities of alcohol that enter--and not those that leave--consumer outlets. Temporary stocking up or inventory overloads may distort the apparent consumption in any one year.

The anomalously high amounts attributed to the District of Columbia may be due to several factors. The District is not a State, where high and low purchase and consumption rates in urban and rural areas balance each other, but a metropolis where a high rate of sales is expected. It is also a tourist and convention center, which implies a high drinking rate. And its low prices attract a vast suburban and transient population to purchase their supplies there.

Another caution applies to comparisons among States. Some States attract thousands of vacationers, tourists, and convention-goers from other areas where prices of spirits are as much as 35 to 40 percent higher. Examples are Nevada, which has the second highest consumption rate, and New Hampshire and Vermont, vacation states where prices of spirits are substantially lower than

in the neighboring States. Car-driving transients stock up while visiting such low-price States, thus artificially inflating the apparent consumption of those States, at the same time underestimating the true consumption in their own States.

Somewhat more realistic indices of apparent consumption are shown in Figures 1a and 1b, in which apparent consumption is divided among the populations of larger geographic units (Bureau of the Census regions) than States. These data show the consumption, per drinking-age person, as the absolute alcohol contained in the various beverages (Figure 1a) and the proportion of the total absolute alcohol contributed by each major class of beverage (Figure 1b).

Interesting and perhaps important differences between areas come to light in these figures. At one extreme, inhabitants of the South Central region consume the least alcohol while those in the Pacific and New England regions consume the most. An interesting trend is that the Mountain region rate is not far behind that of the Pacific and New England regions. The Mountain region has traditionally had a relatively low consumption rate, but that rate has been increasing steadily and is now the third highest among the regions.

As for different classes of beverages (Figure 1b), at one extreme the residents of the West South Central region drink mostly beer (55 percent of the alcohol in that form), while at the other extreme the New England and the South Atlantic regions favor distilled spirits (49 percent) in that form. Only the Pacific region obtains a substantial portion of its alcohol (20 percent) from wine. In the United States as a whole the largest proportion of alcohol consumed is in the form of beer (46 percent of the total), followed by distilled spirits (42 percent) and wine (12 percent).

International Comparisons

Today's American drinking-age population consumes not much more than half as much distilled spirits per capita as a century and a quarter ago. As absolute alcohol, distilled spirits accounted for almost 90 percent of the total consumed in 1850, but for less than half in recent years (23). Although overall per capita consumption today is about the same as in the mid-19th century, these proportions reflect the long-term shift from distilled spirits to less concentrated beer and wine. Most of this change was completed by the last years of the 19th century. It is likely, too, that a much larger portion of the spirits was consumed undiluted in the past times than nowadays, when ice and mixers are available and popular.

The same long-term shift has also occurred in many other countries with a tradition of heavy spirits consumption, but in them the popularity of lighter beverages and particularly of beer has continued to increase in recent times. Comparing the consumption trends in the United States with those in other industrialized countries in recent decades (Table 2), it is apparent that in some respects the United States is reflecting overall trends but in others it is not.

In the last few years, American wine consumption, though it still accounts for only a minor part of the overall consumption of absolute alcohol, has been increasing more rapidly than the consumption of other alcoholic beverages. Moreover, Americans now drink more table wine (containing about 13 percent alcohol) than the stronger fortified wines (about 20 percent alcohol) which used to account for more than half of the U.S. wine consumption. This trend is also occurring in a number of other countries, particularly in those where wine has not been the traditionally most favored drink. In fact, 12 of the 16 European and British Commonwealth countries shown in Table 2 outranked the United States in the period from the late 1950s to around 1970 in their percentage increase in wine consumption. The general consumption of alcoholic beverages increased enough in the same period in some of the other countries so that the United States is now outranked by 8 out of the 16 other countries in average annual percentage increase in overall consumption.

On the other hand, the United States now outranks all but 1 of the 24 other countries from which reports are available in per capita consumption of distilled spirits, having surpassed even most of the reporting Eastern European countries (23). Although proportional increases in spirits consumption have

TABLE 1

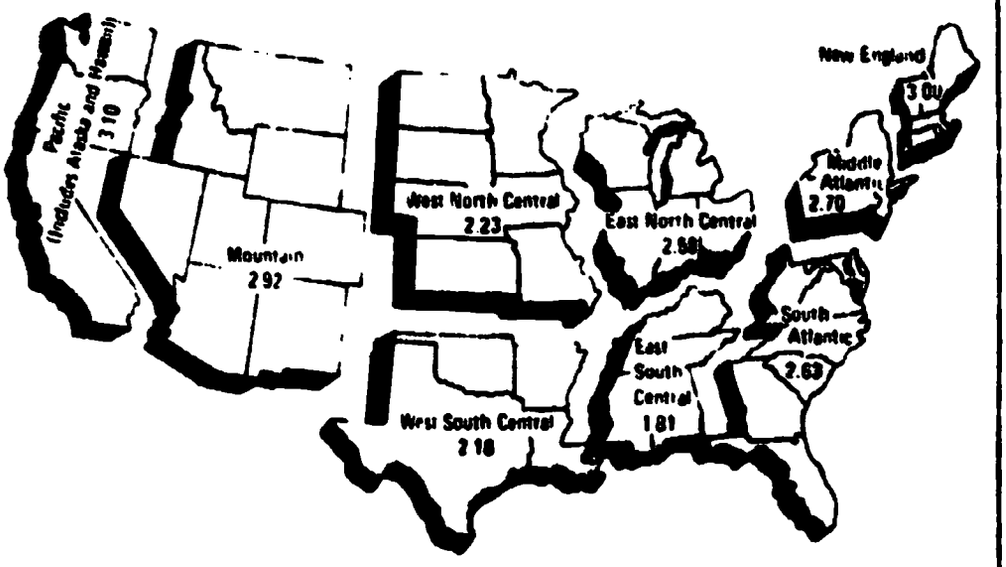
APPARENT CONSUMPTION,[a] BY STATES, OF EACH MAJOR BEVERAGE CLASS, AND OF ABSOLUTE ALCOHOL FROM EACH CLASS, IN U.S. GALLONS PER PERSON IN THE DRINKING-AGE POPULATION,[b] U.S.A. 1972

State	Distilled Spirits	Absolute Alcohol	Wine	Absolute Alcohol	Beer	Absolute Alcohol	TOTAL Absolute Alcohol
Alabama	1.86	0.80	0.63	0.09	16 93	0.76	1.65
Alaska	5 06	2.18	2.93	0.43	27.87	1.25	3.86
Arizona	2.61	1.12	2.46	0.36	34.70	1.56	3.04
Arkansas	1.38	0.59	0.95	0.14	17.66	0.79	1.52
California	3.17	1.36	4.66	0.68	26.60	1.20	3.24
Colorado	2.95	1.27	2.64	0.38	29.61	1.33	2.98
Connecticut	3.26	1.40	2.43	0.35	21.81	0.98	2.73
Delaware	3.79	1.63	1.87	0.27	28.15	1.27	3.17
Florida	3.69	1.59	2.36	0.34	28.99	1.30	3.23
Georgia	2.69	1.16	1.11	0.16	20.64	0.93	2.25
Hawaii	2.56	1.10	1.91	0.28	24.43	1.10	2.48
Idaho	1.80	0.77	1.94	0.28	30.65	1.38	2.43
Illinois	3.16	1.36	2.18	0.32	27.36	1.23	2.91
Indiana	1.72	0 74	0.88	0.13	22.76	1.02	1.89
Iowa	1.63	0.70	0.56	0.02	25.27	1.14	1.86
Kansas	1.59	0.68	0.57	0.08	21 32	0.96	1.72
Kentucky	1 93	0.83	0.70	0.10	22.39	10.1	1.94
Louisiana	2.04	0.88	2.20	0.32	28.11	1.26	2 46
Maine	2.35	1.01	1.68	0.24	29.92	1.35	2.60
Maryland	3.37	1.45	2.10	0.30	28.68	1 29	3.04
Massachusetts	3.18	1.37	2.54	0.37	26.50	1.19	2.93
Michigan	2.51	1.08	1.92	0.28	31.25	1.41	2.77
Minnesota	2.85	1.14	1.41	0.20	25.68	1.16	2.50
Mississippi	1.82	0.78	0.82	0.11	21.93	0.99	1.88
Missouri	2.18	0.94	1.34	0.19	25.66	1.15	2.28
Montana	2.52	1.08	1.14	0.16	34.95	1.57	2.81
Nebraska	2.42	1.04	1.10	0.16	28.81	1.30	2 50
Nevada	8.26	3.55	5.23	0.76	41.86	1.88	6 19
New Hampshire	7.41	3.19	2.67	0.39	40.93	1.84	5.42
New Jersey	3 14	1.35	2.90	0.42	25.32	1.14	2.91
New Mexico	2.38	1.02	2.42	0.35	32.08	1.44	2 81
New York	2.93	1.26	3.06	0.44	25.78	1.16	2.86
North Carolina	2.08	0.89	1.50	0.22	18 33	0 82	1.93
North Dakota	2.80	1 20	1.15	0.17	29.26	1.32	2.69
Ohio	1.84	0.79	1.40	0.20	38.33	1.72	2.71
Oklahoma	1 79	0.77	1.05	0.15	19 67	0.88	1.80
Oregon	2.13	0.92	3.29	0.48	28.15	1.27	2.67
Pennsylvania	1.88	0.81	1.50	0.22	28.66	1.29	2.32
Rhode Island	2.77	1.19	2.97	0.43	30.62	1.38	3.00
South Carolina	2.95	1.27	1 52	0 22	21.17	0.95	2.44
South Dakota	2.19	0.94	1.15	0.17	23.44	1 05	2.16
Tennessee	1.50	0.64	0.79	0.11	22.09	0.99	1.74
Texas	1.76	0.76	1.42	0.21	31.95	1.44	2 41
Utah	1.37	0.59	1.05	0.15	18.15	0.82	1.56
Vermont	4.41	1.90	3.15	0.46	34.78	1.56	3.92
Virginia	2 35	1.01	1.51	0.22	22.29	1.00	2.23
Washington	2.36	1.01	3.03	0.44	28.05	1.26	2.71
West Virginia	1.74	0.75	0.69	0 10	20.00	0.90	1 75
Wisconsin	3.04	1.31	1.87	0.27	39.73	1 79	3.37
Wyoming	2.81	1.21	1.36	0.20	32.10	1.44	2 85
District of Columbia	9.91	4.26	6.31	0.91	30.56	1 37	6.54
U.S.A.	2 60	1.12	2.16	0.31	26.62	1.20	2.63

(a) For comparative purposes only. Amounts calculated according to tax-paid withdrawals.
(b) Age 15+

The Pacific and New England regions consume the greatest amount of alcohol, while the East South Central region consumes the least.

Figure 1a. APPARENT CONSUMPTION[a] OF ABSOLUTE ALCOHOL, IN U.S. GALLONS PER PERSON IN THE DRINKING-AGE POPULATION,[b] BY REGION, U.S.A. 1972

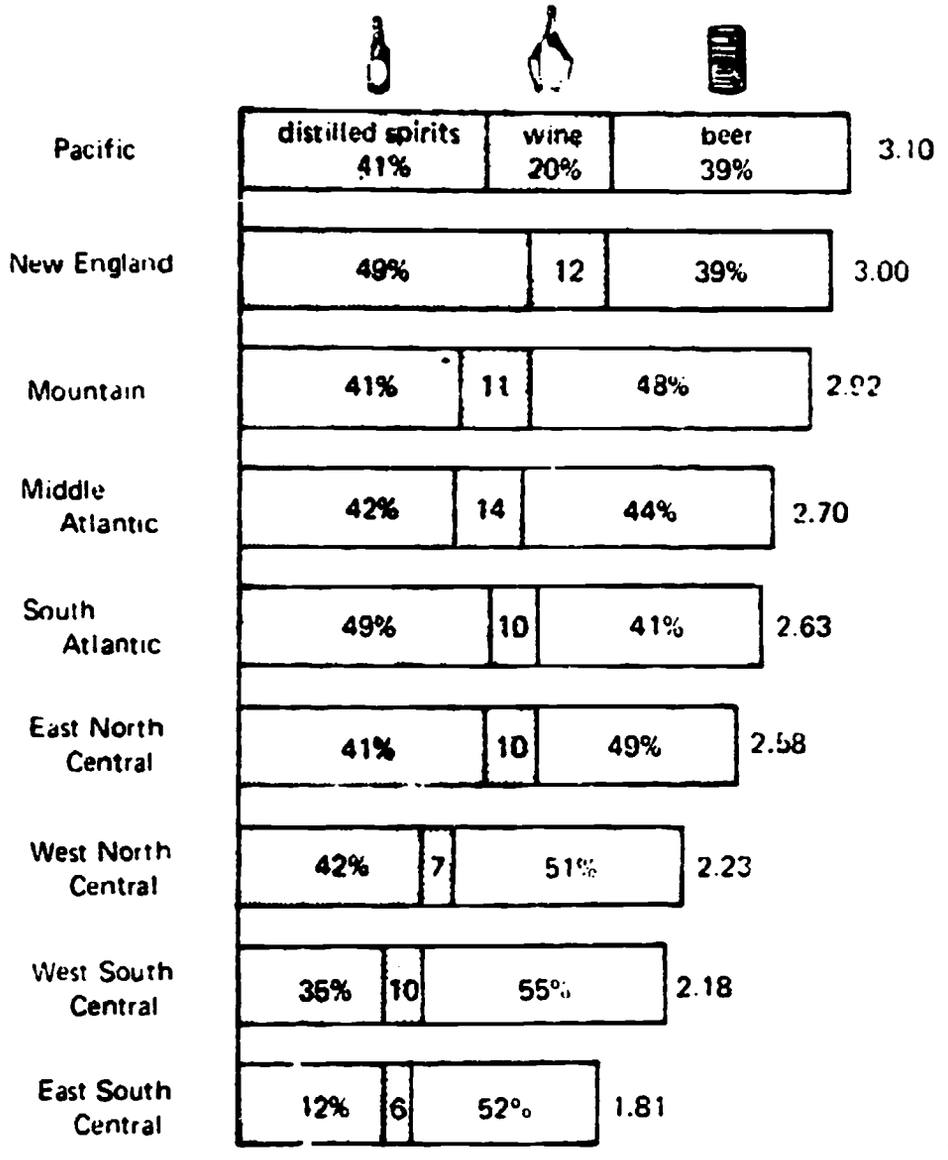


Note: The regions are the standard regions of the U.S. Census Bureau.
(a) For comparative purposes only. Amounts calculated according to tax paid withdrawals.
(b) Age 15+

Inhabitants of the West South Central region consume only 35% of absolute alcohol from spirits and 55% from beer, while South Atlantic States consume 49% from spirits and 41% from beer.

The Pacific Region stands out by taking 20% of its alcohol in the form of wine.

Figure 1b. APPARENT CONSUMPTION[a] OF ABSOLUTE ALCOHOL FROM ALL ALCOHOLIC BEVERAGES, IN U.S. GALLONS PER PERSON, IN THE DRINKING-AGE POPULATION,[b] AND PERCENT OF EACH MAJOR BEVERAGE CLASS, U.S.A. 1972



The regions are the standard regions of the U.S. Census Bureau.

(a) For comparative purposes only. Amounts calculated according to tax-paid withdrawals.

(b) Age 15+

TABLE 2
PERCENT OF INCREASE OR DECREASE IN ALCOHOL CONSUMPTION IN 17 COUNTRIES FROM LATE 1950s TO EARLY 1970s[a]

Country	Dates of data	Percentage increase (+) or decrease (−) in consumption of: Spirits	Wine	Beer	Total
France	1955 - 1968	20%	−18%	3%*	−9%
Italy	1957 - 1969	80	−8	149	1
W. Germany	1957 - 1970	66	85	54	61
Switzerland	1950/55 - 1966/69	38	11	6*	13
Australia	1955/56 - 1969	25	45	8	15
Belgium	1956 - 1967	42	3681	12*	33
New Zealand	1956 - 1967	−11	158	13	13
U.S.A.	1958 - 1971	42	45	20	32
Denmark	1956 - 1969	115	49	44	54
Canada	1956 - 1969	−27	79	101	17
United Kingdom	1957 - 1970	35	189	9	20
Sweden	1957 - 1970	-5	71	93	26
Ireland	1956 - 1970	65	103	29	41
Netherlands	1956 - 1969	31	186	137	83
Finland	1955 - 1969	−2	37	357	50
Norway	1957 - 1970	23	64	52	42
Iceland	1952 - 1971	31	102	21	33

[a] Source of Data: Keller and Efron (36); Efron, Keller and Gurioli (23). The time-period between observations in these two reports ranged from 11 to 19 years; changes in all countries were reduced to a ten-year rate by arithmetical interpolation. Countries are listed in order of their total consumption at the latest report.

*Includes cider.

been higher in several other countries in recent years, the United States is somewhat exceptional in its overall high level of spirits consumption, compared to the general 20th-century trend toward beer drinking (59,60) in industrialized countries with a history of heavy spirits consumption.

Whether the alcohol strength or other properties of the average beverages affect the damage that may be caused by a given amount of absolute alcohol is now under new study. Most governments, including those in the United States, have long placed a higher tax on spirits per unit of absolute alcohol than on lighter beverages (1), and this tax differential has often been explicity intended to discourage the consumption of stronger beverages. There is some evidence that cirrhosis (61) and other alcohol-related health problems are more associated with drinking spirits and wine than beer, and considerable evidence supporting this hypothesis has recently been assembled in a report commissioned by the Canadian Brewers Association (1). On the other hand, there are indications that some forms of cancer may be associated with beer drinking, though the nature of the relationship is unexplained (29). It appears likely that at least some of the differences are related more to the manner of use than to the alcohol content or chemical composition of the types of beverage. As for alcoholism itself, some investigators (21) have argued against any association with specific beverages, noting that the beverages chosen by alcoholic persons tend to match those of the country in which they live.

Another way in which the United States differs from other industrialized countries is in the proportion of the adult population that reports not drinking at all, and in the apparent relative stability of this proportion. About one-third of American adults have not consumed any alcohol in the last year, while European and Australian surveys have revealed abstinence rates of 3 to 32 percent, with a modal value in nine countries of 15 percent (38). Furthermore, the abstinence rate in the United States appears to have been holding steady in recent years but to have been declining in other countries with a strong tradition of abstinence (49).

The United States also differs from most countries from which data are available in the relatively small proportion of their money its consumers spend on alcoholic beverages (23, 63, 64). This is partly due to the higher per capita spendable income in the United States, of course, but it also appears that American special taxes on alcohol are below the median in European countries (1). Consequently, the price of alcoholic beverages in the United States is relatively low by international standards (10).

The international statistical comparisons that can be made give a mixed perspective of the position and trends in the United States. There appears to have been an over-all trend in most countries toward increased consumption in the last 15 years or so, but there are a number of characteristics of consumption in the United States that set it apart from other countries

It should be borne in mind that statistics about the consumption of alcoholic beverages are available on less than half the world's population. There are none, for example, from two such large countries as China and the Soviet Union. One investigator (60) has pointed out that Europe, Japan, the United States, Chile, and Argentina, which have a quarter of the world's population, together consume four-fifths of the reported consumption. Although the consumption elsewhere can only be guessed at, it seems likely that the foregoing comparisons involve most of the relatively heaviest-drinking countries, and that the per capita consumption in the United States, is above the world median, as well as in the 12 reporting countries that exceed it.

Drinking Practices

The results of the 1964-65 survey of American drinking practices, hereafter referred to as the ADP survey (12), were reported in the First Special Report on Alcohol and Health (62). Since then a number of nationwide surveys have been conducted on behalf of the National Institute on Alcohol Abuse and Alcoholism. Among them have been:

--Four surveys conducted at 6-month intervals from September 1972 through January 1974 by Harris and Associates (28). Each survey included a nationwide cross-section of 1,600 persons representative of the country's population 18 years of age or older.

--A survey of 14,000 students in grades 7 through 12 in the contiguous United States, representing a national probability sample of American students. They filled out a questionnaire on drinking practices and attitudes for the Research Triangle Institute in the spring of 1974.

Most of the following information in this chapter is drawn from these surveys. The analysis of the findings is still in progress and the details reported herein are preliminary.

As Figure 2 shows, the 1964-65 ADP survey revealed that 47 percent of the adult population drank less than once a month and 53 percent drank once a month or more. The recent Harris surveys indicate that the percentage of adults who drink at least once a month has risen slightly, so that about 57 percent of the adult population now falls within this category. The 1974 Gallup survey of adults, 18 and older, indicates that 68 percent of the population drinks alcoholic beverages (24). This proportion represents an increase of 4 percentage points from their previous survey taken five years ago in 1969. These figures may reflect a combination of several things: differences in sample methodology (quota versus household), age (18+ versus 21+), the measures used in reporting drinking, and an actual change in National drinking habits.

The increased proportion of adults who drink at least once a month may indicate that a number of abstainers are joining the drinking population. On the other hand, analysis of the results of five surveys during the period 1964-71 shows that the proportion of abstainers had remained relatively constant during that 7-year period (49).

Although the reporting scheme used in the Harris surveys does not permit the differentiation of infrequent drinkers from abstainers, the 1974 survey was conducted during a period which included holidays, when many infrequent drinkers choose to drink. The proportion of adults in this latter survey period who chose not to drink may provide a more accurate reflection of the current rate of abstainers, which approximates the percentage found in the 1964-65 ADP survey.

Trends in Teen-age Drinking

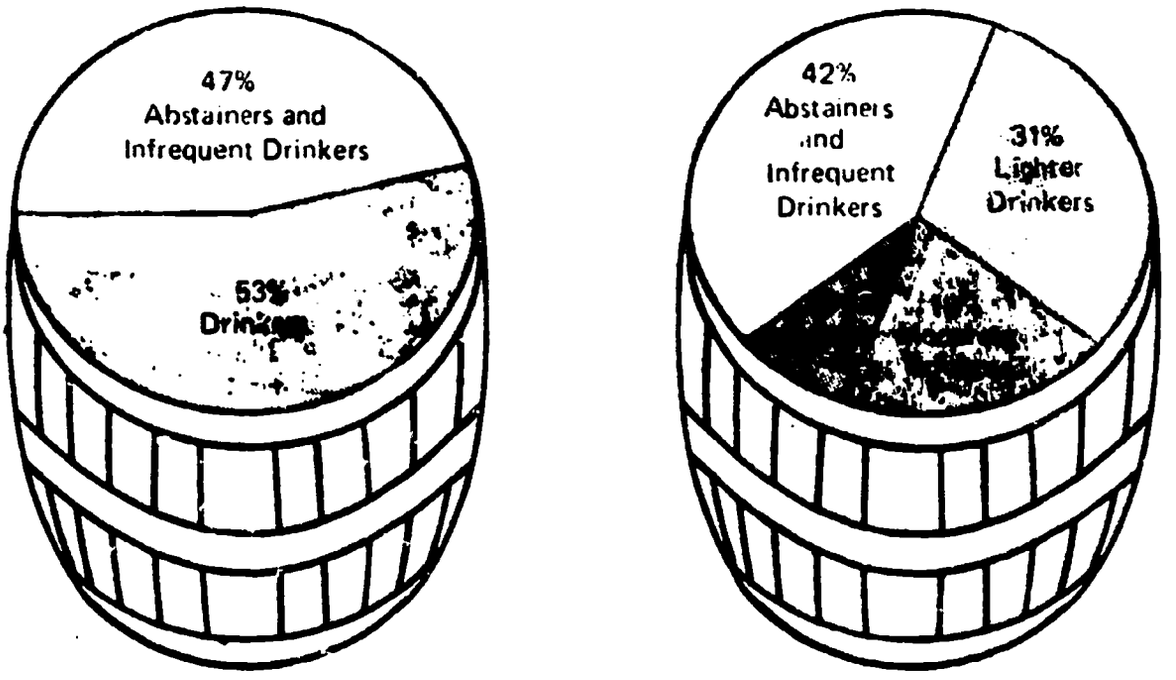
Surveys of adults leave out a sizable portion of drinkers. Numerous studies of younger populations, mostly in high-school, reveal that a substantial proportion of teen-agers drink (5 , 42). Estimates based on an aggregation of such surveys show that, in recent years, from 71 to 92 percent of high-school students have at least tried alcoholic beverages (5). In view of the known importance of drinking in the American life style, it comes as no surprise that a vast majority of teen-agers have been introduced to alcohol.

Preliminary findings from the 1974 national survey of junior and senior high-school students indicate that among seventh graders, 63 percent of boys and 54 percent of girls have had a drink. As Figure 3 indicates, the proportion of teen-age drinkers increased with grade to 93 percent of twelfth-grade boys and 87 percent of twelfth-grade girls.

As may be seen in Figure 4, the frequency of drinking also increased with age. Beer is the most preferred beverage, though this is more apparent among boys than girls. Among boys, weekly beer consumption increased from 10 percent among seventh graders to 42 percent among twelfth graders. Half of the boys reported consuming two or less drinks per drinking occasion, compared to one or less per occasion among girls. Generally, the quantity of alcohol consumed at any one time by both boys and girls increased with school grade for all beverage types.

Preliminary estimates of non-alcoholic drug use among teen-agers indicates that marijuana ranks second to alcohol with respect to the frequency of use. Approximately 40 percent of senior high-school boys and 36 percent of senior high-school girls reported having used marijuana. These proportions

Figure 2. PERCENT OF DRINKERS AND TYPES OF DRINKERS AMONG ADULTS[a] U.S.A.



ADP Survey
1964-65

Harris Survey
1972-74

[a] The ADP Survey includes adults age 21+ whereas the Harris Survey includes adults age 18+. In the Harris Survey, type of drinker is based upon a quantity-frequency index score which equals the average ounces of absolute alcohol consumed per typical day.

- Abstainers & Infrequent Drinkers – Drink less than once a month or not at all.
- Drinkers – Drink once a month or more.
  - Lighter drinkers – Drink at most 0.22 ounces absolute alcohol per day.
  - Moderate drinkers – Drink 0.22 to 1.0 ounces absolute alcohol per day.
  - Heavier drinkers – Drink 1.0 or more ounces absolute alcohol per day.

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Figure 3. PERCENT OF TEENAGERS WHO HAVE EVER HAD A DRINK OF WINE, BEER, OR LIQUOR, BY GRADE AND SEX. 1974

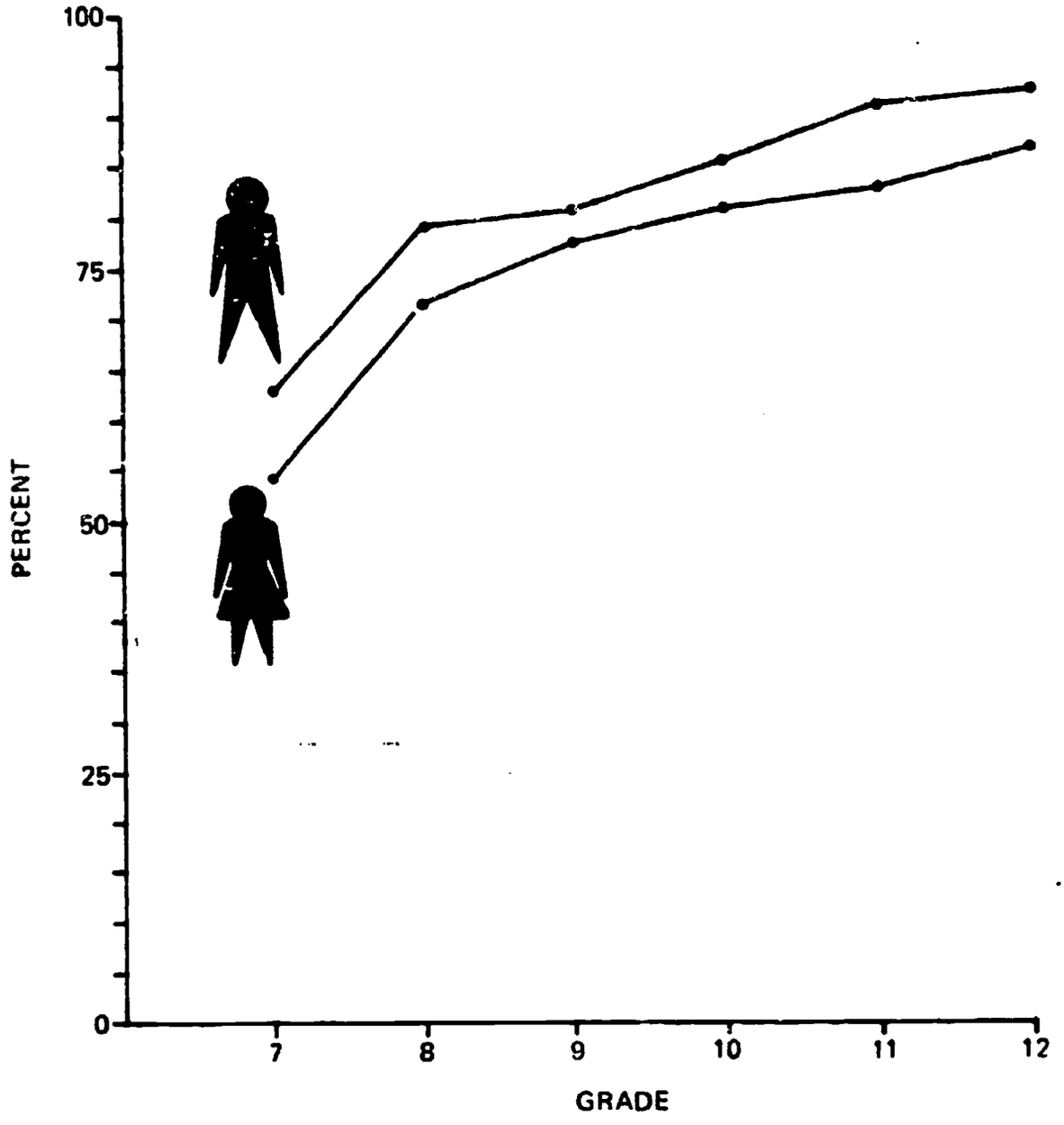
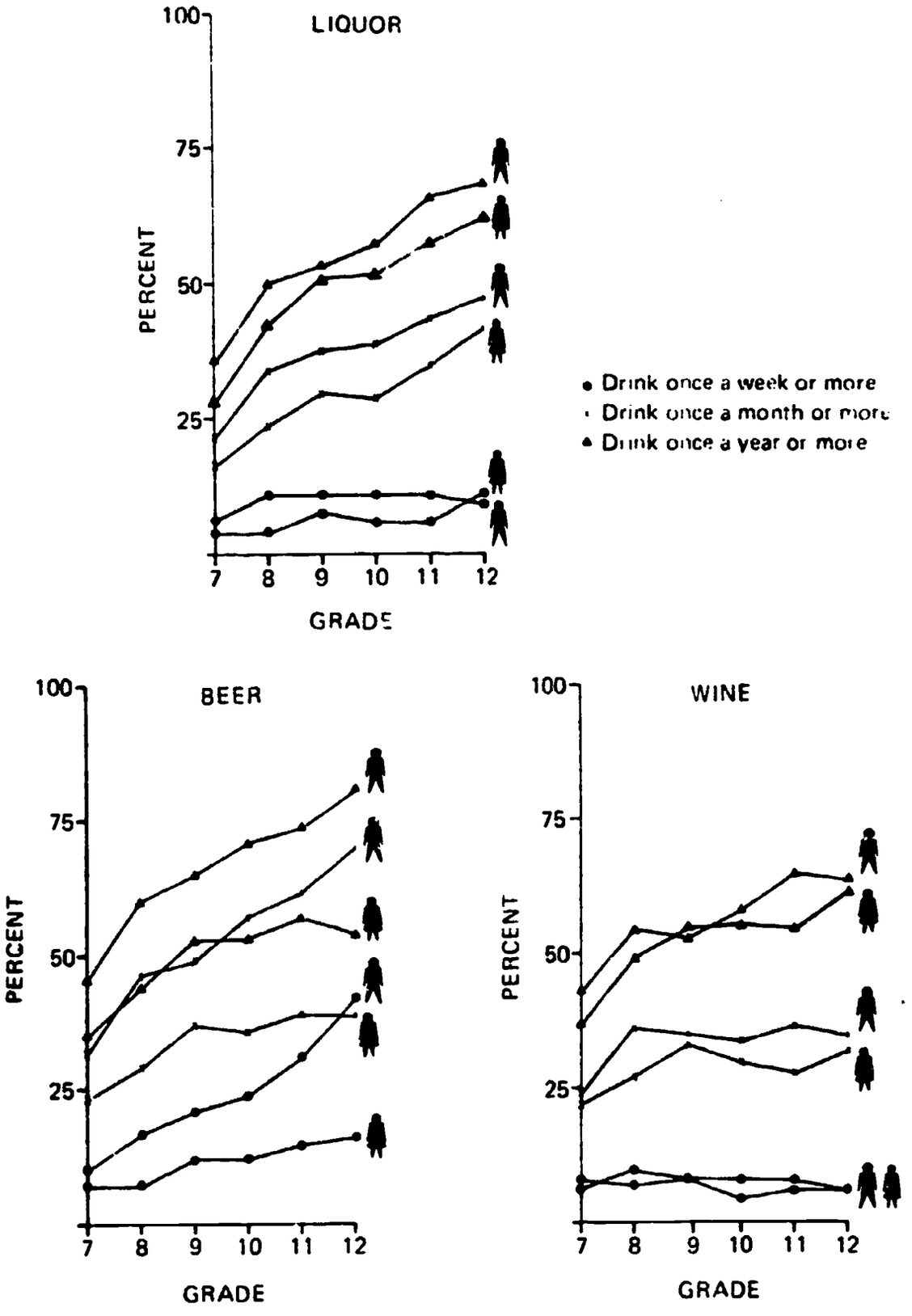


Figure 4. PERCENT OF DRINKERS AMONG TEENAGERS BY SEX, GRADE, FREQUENCY OF DRINKING AND TYPE OF BEVERAGE. 1974



are somewhat higher for Northeastern regions of the United States and considerably lower for Southern regions. The use of alcohol was more prominent among marijuana users. Among teen-agers who report marijuana use, approximately 92 percent drink alcohol. In contrast, among teen-agers who drink, approximately 34 percent have used marijuana.

In comparison to marijuana, much smaller proportions of teen-agers reported having used other non-alcoholic drugs. Approximately 12 percent of senior high-school boys and 9 percent of senior high-school girls used hallucinogens and amphetamines. Less than 3 percent of the sample reported use of hard drugs such as heroin or cocaine.

There is, however, little information about drinking by school drop-outs, and studies which have examined these populations indicate that the drop-out population has a higher proportion of drinkers than does the regular school population (45). For these reasons the amounts of teen-age alcohol consumption are probably underestimated.

The findings from annual surveys conducted in California (54) from 1968 to 1973 indicate an increase in the proportion of students who began drinking during each previous year (52 percent of seventh-grade boys in 1969 versus 72 percent in 1973). Seventh-grade girls show similar trends (38 percent in 1969 versus 67 percent in 1973).

A survey of students in grades 7 through 12 in Duval County, Florida (22), also showed increases in the number of students who reported using alcoholic beverages. The numbers who drank once a week (24 percent) and once a month (28 percent) also increased.

Three surveys made in Toronto in 1968, 1970, and 1972 examined adolescents' changing alcohol use (56). In 1968, 46.8 percent of the students had used alcohol in the 6 months before the survey: this proportion increased to 60.2 percent in 1970 and 70.6 percent in 1972. These percentages were similar to those reported in San Mateo County, California, in 1972 (54). The shift in Toronto might be thought to reflect the lowering of the "legal age" in 1971 from 21 to 18 years. No such change occurred in California, however. In Toronto 41 percent of the students said they drank as often before the change in legal age as they did in 1972, but 20 percent reported an increase in their drinking. The 1962 survey of New York high schools (43) showed no apparent relationship between lower legal age and reported drinking frequency.

Several common findings emerge from surveys of drinking among junior and senior high-school students. Girls drink less than boys and drinking becomes more frequent with increasing age. The use of alcohol among girls has approached that of boys, though the proportion of girls who drink at least every week is smaller. There has been an increase in the proportion of drinking students at each grade level, and the greatest increases have occurred between 1970 and 1973.

Sociocultural Correlates of Drinking

Sociocultural factors previously found to be associated with whether and how much a person drinks continue to be strongly correlated with consumption patterns. Among such factors are sex, age, ethnic background, religious affiliation, education, socioeconomic status, occupation, and area of residence and degree of urbanization.

Sex

The proportion of adult women who drink has been increasing steadily since World War II, and the results of recent surveys indicate that this trend is continuing (62). About 47 percent of adult women now drink once a month or more. However, Figure 5 shows that men are nearly twice as likely to be moderate drinkers and three times as likely to be heavy drinkers in comparison with women. Figure 6 shows that most men in each group up to 65 years reported drinking at least once a month. The highest proportion of heavier drinkers occurred among men aged 18 to 20 and 35 to 39. Women aged 21 to 29 had the highest proportion of heavier drinkers.

Figure 5. PERCENT OF DRINKERS AND TYPES OF DRINKERS BY SEX U.S.A. 1972-1974

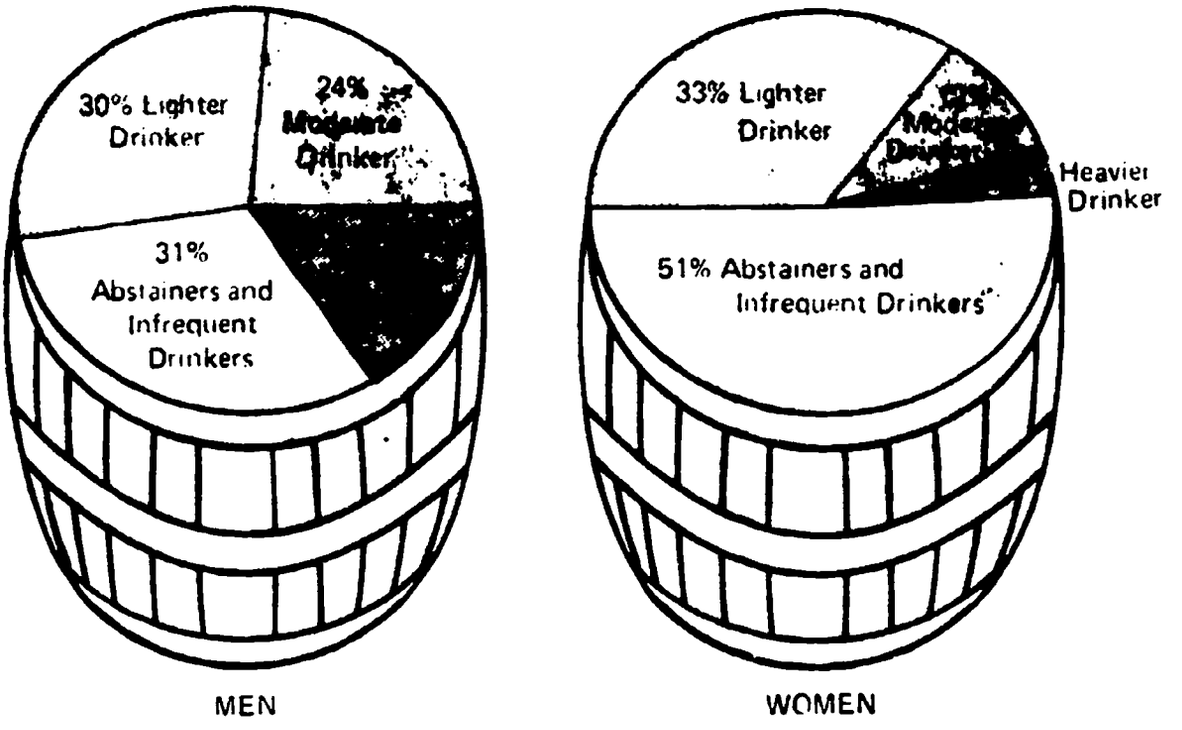
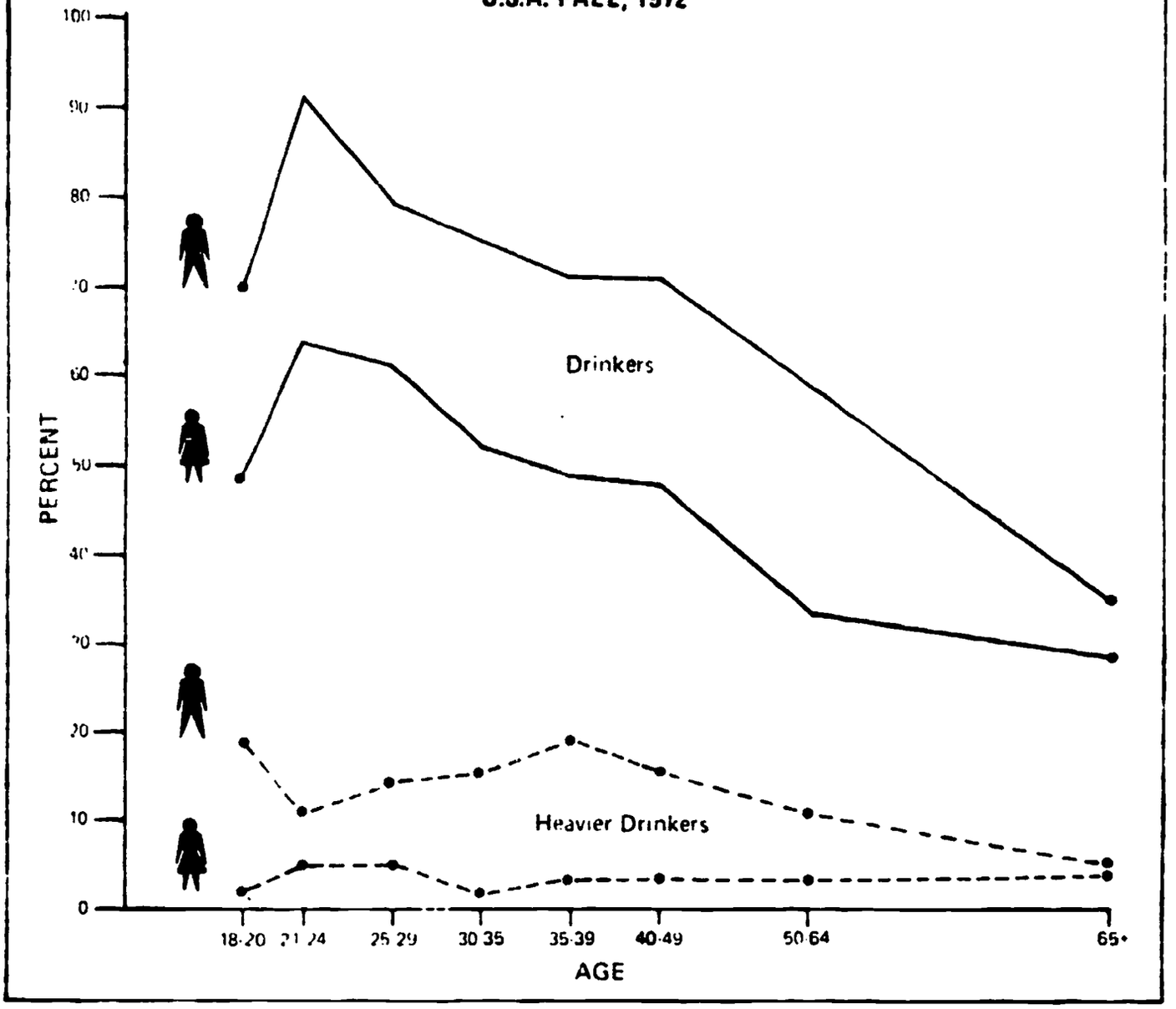


Figure 6. PERCENT OF DRINKERS AND HEAVY DRINKERS AMONG ADULTS, BY SEX AND AGE, U.S.A. FALL, 1972



Age

A larger proportion of drinkers is consistently found in the younger age groups (21 to 24 years) and larger proportions of abstainers are found among older persons. Despite the increase in young adults between ages 21 and 24 who drink once a month or more, heavier drinking among men is higher in the 18- to 20-year group than in the 21- to 24-year group.

Similar proportions of young adult drinkers and nondrinkers were reported in two recent nationwide surveys (2, 34). A 1970 survey of young men 1 year after high-school graduation revealed that 67 percent drank once a month or more (34). The survey results also showed an increase in the frequency of regular drinking (once a week or more) from 33 percent during high-school years to 44 percent the following year. It is interesting that the amount of regular drinking was higher among high-school students who joined the military (55 percent) than among those who entered civilian jobs (48 percent) or college (38 percent). The military sample not only started out with higher use rates than most other groups but also showed the highest rate of conversion from abstinence to use.

A 1971 Gallup survey (2) of a national sample of full-time college students revealed that 60 percent had drunk beer during the 30 days before the interview; 52 percent had drunk wine and 49 percent spirits. Consumption frequency had increased between ages 18 and 24 and was higher among men than women.

The overrepresentation of young adults in the drinking population was further corroborated by a survey of 2,938 Irish- and Italian-Americans (7). The use of large quantities of all beverages in both these populations declines consistently with age. The 18- to 20-year olds reported the highest levels of frequent consumption of five or six drinks at an occasion.

Ethnic Background

Alcoholism and problem-drinking rates tend to be low among groups whose drinking habits are well integrated with the rest of their culture. It is, therefore, not surprising that ethnic background and generational status are important determinants of drinking patterns in the United States. It has been reported (46) that Irish-Americans have more problem drinking than other Americans of the same social class, that little of their drinking is associated with important rituals, and that intoxication is often deliberately sought. Italian-Americans, on the other hand, have strong sanctions against drunkenness, apply little social pressure to participate in drinking, and usually consume alcohol with meals (39).

First-generation Italian-Americans drink frequently but have few alcohol-related problems (39), but later generations have higher rates of heavy drinking (31).

A recent survey (7) of the first-generation Irish- and Italian-Americans and their descendants shows that first-generation Italian-Americans generally confine themselves to daily wine drinking but later generations do not. Though distilled spirits consumption is higher among first-generation Italian-Americans than among Italians in Italy, they drink spirits more moderately than later generations.

Italian-Americans drink more frequently than Irish-Americans, but the latter take five or six drinks on a single occasion more often than the Italian-Americans, regardless of beverage type.

Further ethnic contrasts appear when age and sex differences are examined. In contrast to Italian-Americans, who show no consistent age trend, Irish-Americans drink wine less frequently as they grow older. Women in both samples are more often nondrinkers than men, and the consumption frequency of those women who drink is less than that of the men. Italian-American women tend to drink all beverages more often than Irish-American women, however, but Italian-American men drink only wine more frequently than Irish-American men. Men drink more on each occasion than women, but Irish-American men and women drink

more on each occasion than do Italian-American men and women, respectively. Although Irish-American men and women both drink more distilled spirits than Italian-American men and women, Irish-American women drink substantially more spirits than Italian-American women. The difference between Irish and Italian-American men is not so great.

Religious Affiliation

One of the most closely studied drinking control systems has been the degree and type of involvement with religion. Abstinence is distinctly more frequent among members of certain religious groups.

The ADP survey (12) revealed that there were relatively high proportions of drinkers and heavy drinkers among Catholics. Although Jews had the lowest proportion of abstainers among the three major religions, they had a very large proportion of light drinkers and the lowest proportion of heavy drinkers. Liberal Protestants showed a pattern rather similar to that of Catholics in proportions of drinkers, except that there were fewer heavy drinkers among the liberal Protestants. Conservative Protestants had the largest proportion of abstainers and the lowest proportion of heavy drinkers when the four groups were compared.

The 1972-74 surveys (28) indicate that the same basic relationship exists among the three major religions, but there appeared to be an increase in both light and moderate drinking among Jews and Catholics. The proportions of Protestants in these categories have remained about the same since 1965. The 1972-74 data show, however, that the proportion of respondents who said they had no religious affiliation is about double that in 1965. Thus, some changes within denominational categories may be accounted for by secularization.

One survey (7) of Irish- and Italian-Americans is of particular interest because both groups are largely Catholic but have different alcohol consumption patterns. Frequency of use of all alcoholic beverages was linked with the church attendance of both groups. Those who attended church more often were more likely to report infrequent drinking. There was also a very distinct inverse relationship between church attendance and the quantity of alcohol consumed per occasion: the more frequent the church attendance, the less alcohol consumed per occasion, regardless of type of beverage. This was true of both ethnic groups.

The relation between religious participation and drinking patterns of adolescents has received considerable attention in a number of studies (42). The frequency of church attendance has been viewed as a behavioral measure of involvement in the adult social control system and of exposure to conventional norms (30). In a longitudinal study of drinker status in adolescence, one group of investigators (32) reported that religiousness and frequency of church attendance were strongly related to abstinence.

On an index of religious participation, problem drinkers among high-school students in Mississippi tended to score lower than nonproblem drinkers in one study (25). Similar relationships were reported in a review of two nationwide surveys of American youth (42).

Education

As in 1964-65 (12), the amount of education is still strongly related to whether a person drinks and to the quantity consumed (28). The highest proportion of abstainers (62 percent) is found among persons with less than an 8th-grade education. The proportion of heavier drinkers increases fairly steadily from 6 percent of those with grammar-school education to 13 percent of those with postgraduate training. There are slightly more heavier drinkers among college graduates (15 percent) than among persons with postgraduate education, however.

The percentage of current drinkers among Irish and Italian-Americans increases with educational level, although there is a decrease among college-

educated Italian-Americans (7). These in both ethnic groups with the least education drink more often, but less per occasion, than those with the most education.

Socioeconomic Status

Recent surveys of adults (28) continue to substantiate the previously documented relationship between social class and alcohol consumption--proportionately more people on the lower socioeconomic levels are abstainers than on the upper levels. These surveys also reveal that moderate and heavier drinking increases as social class rises.

The results of surveys among adolescents generally agree with this finding. A recent study of Toronto junior and senior high-school students shows that alcohol use was highest among children whose fathers were professionals or managers (21). A nationwide survey of young American men (34) indicates that the wealthier among them increased their regular use of alcohol (once a week or more) by 21 percent after high school, compared to a 5 percent increase among the poorer men.

Occupation

The 1964-65 ADP survey (12) showed that as a group, farm owners had the lowest proportions of drinkers and heavy drinkers, whereas professionals and businessmen had the highest proportion of drinkers. Semiprofessional men who drink had the highest proportion of heavy drinkers, and among women who drink, service workers had the highest proportion of heavy drinkers.

A survey of 528 executives from among the 500 largest manufacturing companies and from each of the 50 largest banks, utilities, and transportation, merchandising, and life-insurance companies in the United States was conducted in 1972 (12). The results of this study strikingly showed that only 7 percent of the men were abstainers or drank less often than once a month, compared to 33 percent of all men in the country in the ADP survey. The proportion of heavy drinkers was considerably less than that found in the ADP national probability sample, however: 13 percent of the executives were classified as heavier drinkers compared to 21 percent of the men in the national sample. Most of the executives (48 percent) were moderate drinkers, but 17 percent said they worried that they were "doing too much drinking."

A study of 937 Baltimore blue-collar workers and their spouses (55) provides some interesting comparisons with national samples. Holding social class constant, the findings were compared to the 1964-65 ADP survey (12) and showed that there were fewer drinkers, more heavier drinkers, and about the same percentage of heavy-escape drinkers among the blue-collar workers and their spouses. It is noteworthy that a rather low proportion of the woman blue-collar workers (23 percent) drank, but of those who did, many were heavier drinkers (38 percent).

Two separate surveys, one of Army and the other of Navy drinking, were conducted in 1972 under contracts from the Department of the Army and the Bureau of Naval Personnel, respectively (13, 14). The Army study was based on a stratified random sample, but the Navy study was a pilot test of two methods of collecting data for a later large-scale study. Its findings were not considered representative of results from a probability sample of all Navy personnel.

The findings of the Army study indicated that both officers and enlisted men drank more than civilians of the same age. Officers got into trouble because of their drinking slightly less often than contemporary civilians, but enlisted men got into considerably more trouble than civilians of equal age.

Both heavy drinking and problem drinking declined with increasing age, rank, and length of service, except that older enlisted men continued to drink heavily and, in fact, drank much more than younger enlisted men.

Although findings in the Navy study were not representative of the Navy as a whole and should be interpreted with extreme caution, it appeared that in contrast to officers, larger proportions of enlisted men were both heavy and problem drinkers.

The proportions of abstainers versus drinkers did not vary much between the Army and Navy or between enlisted men and officers in either services. Only 3 percent of the Army enlisted men and 4 percent of officers, and 3 percent of Navy enlisted men and 2 percent of officers, were abstainers. These rates are substantially lower than those among civilian men, of whom 23 percent were abstainers (12).

A study of 169 persons 65 years and older in the East Harlem section of New York City in 1973 (33) revealed that nearly half of the 113 women and 56 men, ranging in age from 65 to 96, lived alone. Most of them were retired (only 16 percent still held jobs), and their major sources of income were social security and other pensions. The area was the home of working-class Whites, Blacks, and Puerto Ricans, and had a variety of social problems typical of poor urban areas such as high crime and unemployment rates.

Most of these older persons were not in particularly good health and, therefore, spent their time largely in rather quiet pursuits such as television watching, reading, visiting, or shopping, but nevertheless they reported a surprisingly high level of physical mobility both indoors and out.

About half of these elderly people drank alcoholic beverages, but only two could be considered problem drinkers. This is nearly identical with the proportions reported in national probability samples among people in the same age range (12, 28). Although their drinking frequency varied considerably, there was very little difference among the respondents in the amount they drank per occasion--most had one or two drinks each time. The more frequent drinkers were somewhat younger, in better health, of European ancestry, and reported considerable psychological well-being. Holding health factors constant, it was found that Protestants and Catholics in good health were almost alike in the frequency of reported drinking, but that of those who were in poor health, Catholics reported a slightly higher frequency of drinking.

Residence

Alcohol consumption varies considerably by geographic region in the United States. There are proportionately more drinkers in New England and the Middle Atlantic and Pacific Coast States than elsewhere.

Although earlier studies (12) disclosed that heavier drinking was also more prevalent in these highly urbanized areas, it appears from more recent surveys (28) that previously strong regional contrasts may be decreasing, even though the basic distinctions still exist. It now seems that the proportion of heavier drinkers is increasing slightly in such traditionally "light" drinking areas as the Southeast and the Mountain States, and that it is decreasing slightly in the Coastal and Middle Atlantic regions. It is difficult to determine whether these shifts may be due to real changes in individual drinking habits or to the rather complex mobility patterns of the population as a whole.

Rural areas and small towns have larger proportions of abstainers, and cities and suburbs have proportionately more drinkers. Cities and suburbs continue to have almost double the proportion of moderate drinkers as small towns and rural areas. Whereas the 1964-65 ADP survey showed that the largest proportion of heavy drinkers lived in cities, the more recent surveys (1972-74)--using a lower quantity-frequency index for "heavy drinking"--classify equal proportions of suburban and city dwellers as heavier drinkers (12 percent each). Small towns and rural communities have smaller proportions of heavier drinkers (9 and 8 percent, respectively).

Contexts of Drinking

The presence of family or friends seems to be an integral part of the drinking milieu for most people. Indeed, it has been theorized that the term "social drinker" implies "that the drinking practices of normal drinkers are determined by the situations in which they find themselves. In other words, alcohol consumption is regarded as a property of social contexts rather than a property of individuals" (51). Elsewhere (50) it has been said that "drinking can be seen as seated in allegiancies in such social worlds, rather than in an

individual psychological dependence on drinking." In contrast to the gross estimates of the quantity and frequency of alcohol consumed over a specific period--for example, the past year--respondents will make rather discriminating estimates of how much should be consumed once the time, place, and actors are specified (50).

Knowledge of the contexts in which alcohol is consumed gives social meaning to the understanding of individual drinking patterns. Though personal characteristics such as social status, psychological need, and personal preference may determine the social contexts to which one exposes himself and in which he drinks, drinking behavior is also partly conditioned by the expected and sanctioned behavior within a particular drinking context (50).

An anthropologist who studied the environment of Papago Indians in southern Arizona observed (65), "Drinking in Papago culture has stemmed from a ritual-social context and carries with it the power to affirm affections and to seal friendships. Drinking what is offered is equally an affirmation of good will just as is offering it." Most Papago drinking is thus done in groups: the older men are likely to seek companionship on the farms where they work, the younger men are more likely to go to nearby towns or neighboring farms or camps. Although a man may lack money to buy drink for the group to share on a particular occasion, he is still able to participate but will be expected to contribute on another occasion. "Even when an individual has a good reason for stopping and may desire to do so, he may run into another group of friends and may get involved, either contributing anything he has left or counting on someone else," the anthropologist noted. "Several informants have conveyed ... how they are 'trapped' in an unavoidable situation; to handle it any differently would be insulting." Group drinking thus has a broader significance than simply consuming alcohol--the drinking context and expected norms within it represent an integral part of interpersonal relationship formation and maintenance.

The types of people with whom one drinks influence his own drinking behavior. People report drinking less volume than usual in social meetings with neighbors, people from church, or members of their own families, and more than usual with close friends (12). Alcohol is served most frequently in gatherings with fellow workers. Even the type of beverage consumed is partly determined by one's drinking companions, in that distilled spirits are thought of as "party drink" and are consumed more often with friends than with one's family.

The 1964-65 ADP survey showed that Americans drank more often in their own and friends' homes than in restaurants and bars. The 1973 survey (28) yielded similar findings, although the proportion of restaurant and bar drinking had declined since 1965. The influence of holiday seasons (Christmas, New Year's) on social drinking is partly revealed by the winter 1974 survey, which showed drinking to occur as frequently at parties and other special occasions (39 percent) as at home (38 percent).

Drinking in bars, taverns, and restaurants continues to be most prevalent among young adults (aged 18 to 29), although women are not as likely as men to drink in public places. Women of all ages drink most often at parties and other special occasions.

Drinking contexts are also influenced by region of the country and by degrees of urbanization. Respondents living on the East Coast drank most often at parties and on other special occasions, whereas those in the South and on the Pacific Coast usually drank at home. Midwesterners drank at home and at parties with almost equal frequency, but favored party and special-occasion drinking slightly. City residents drank most often at parties and on special occasions, but small-town residents usually drank at home. Residents of rural areas drank most often at parties and on other special occasions but nearly as often at home. Suburbanites drank at parties and at home with nearly equal frequency (29 and 30 percent). Bar, tavern, and restaurant drinking was more prevalent among East Coast and Midwest residents (9 percent in each group) than among those living in other parts of the country, but there was little difference in public drinking rates among residents of cities, suburbs, towns, and rural areas.

Where heavier drinkers consume alcohol is uncertain: one survey (44) found that alcoholic persons drank more often in public places and less at parties than did "heavy" and other drinkers in their sample, but in another survey (17) "heavy" drinkers were more likely to entertain at home than to go out. Still another investigator (18) found that "heavy" drinkers liked to frequent taverns. Of the respondents in the Harris survey (28) who were "heavy" drinkers, 45 percent consumed alcohol most often at home, but 20 percent said they drank in all three settings with equal frequency, whereas only 9 percent of the moderate and 4 percent of the light drinkers imbibed in all three places. These comparisons do not necessarily represent conflicting findings, and they cannot be interpreted with confidence, because the criteria for classifying a drinker as "heavy" are different among the several surveys.

Severe problem drinkers usually drank at home, but they drank more often at bars, taverns, and restaurants than those without problems or even with slight or moderate drinking problems (28).

The survey of Army officers and enlisted men (13) showed that more servicemen drank on Fridays and Saturdays than on weekdays and that very few drank before 4 p.m. on workdays or after 8 p.m. on the eve of workdays. Although most drinking took place in the men's quarters, the incidence of drinking in bars was relatively high, in that 49 percent of the commissioned and warrant officers and 51 percent of the enlisted men reported drinking in a bar at least once a month. Enlisted men were most likely to drink in bars at least once a week (27 percent), followed by warrant officers (22 percent) and commissioned officers (18 percent). Nevertheless, very few men ever drank alone, regardless of the drinking milieu.

The Navy survey (14) showed that enlisted men varied considerably in their drinking by day of the week, but that a larger proportion of officers than enlisted men drank on each day of the week. Saturday was the day when the highest percentages of officers and enlisted men drank. More officers than enlisted men drank in their own quarters and while women were present, but more of the officers were married and had their wives with them, as well as private quarters in which they could drink.

Business executives were asked in another study (16) on which of eight occasions it would not be improper to have one or more drinks, and on which of the same occasions they would probably have one or more drinks. As Table 3 shows, more executives felt it was proper to drink on each of various occasions than acknowledged they probably would drink on those occasions.

The social contexts in which adolescents drink are subject to a number of restrictions. Many teen-agers drink before they can legally buy alcoholic beverages or drink in licensed premises. Legal restrictions affect the context in which drinking takes place and the channels through which drink is obtained. Alcohol may be obtained illegally from licensed merchants in a permissive community, but in a restrictive community it is obtained illegally from unlicensed merchants (25). Studies of Scandinavian youth indicate that the main impact of rigid control is to increase the amount of out-of-doors drinking (9).

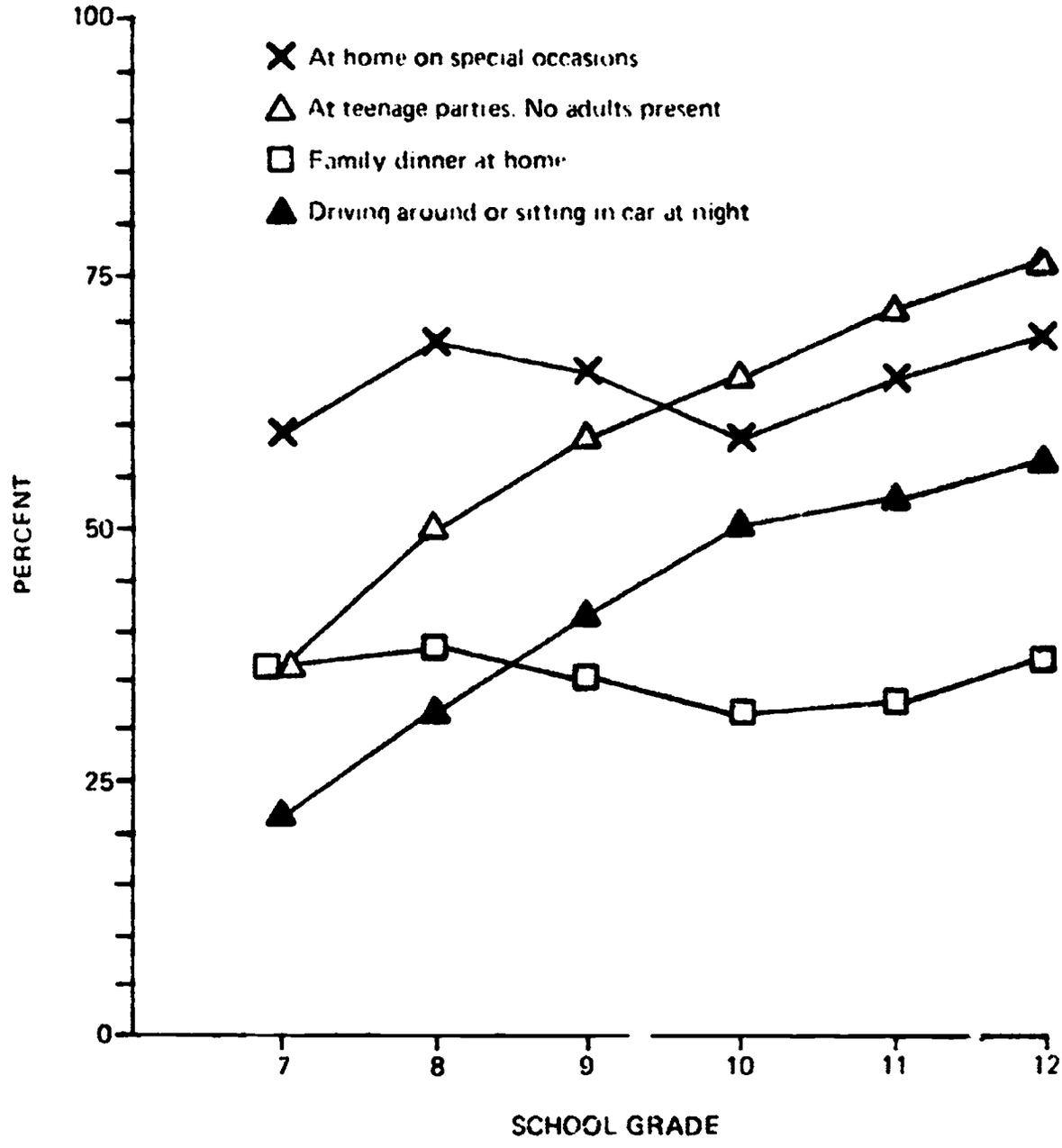
The occasions on which adolescents drink vary with age. Most teen-agers who begin to drink do so at home under parental supervision (5, 42). Much of this drinking occurs on holidays and other special occasions (5). As the teen-ager grows older, more drinking tends to take place outside the home and with less adult supervision. Indeed, the most likely places for teen-age drinking are those where adults are not present (33). The preliminary 1974 teen-age survey data in Figure 7 highlight these age trends. Sixty percent of seventh graders reported drinking at home with their parents on special occasions. The percentage of seventh graders who reported drinking away from home without parental supervision was considerably less (22 to 36 percent). Though the proportion of teen-agers at each grade who report drinking at home tends to remain the same, there is an increase in away-from-home drinking with increasing age. The percent of teen-agers who report drinking at night in cars increases through the tenth grade to 50 percent.

TABLE 3

PERCENT OF BUSINESS EXECUTIVES WHO DRINK IN SOCIAL CONTEXTS

OCCASIONS	% WHO SAY "NOT IMPROPER" TO DRINK	% WHO SAY WOULD DRINK ON OCCASION
Before Dinner	92	71
After Round of Golf	88	56
After-Theatre Party	83	56
After Dinner	74	34
Office Christmas Party	69	56
Business Lunch	60	34
Football Game	51	21
One-Day Sales Conference	48	32

Figure 7. PERCENT OF TEENAGE DRINKERS BY SCHOOL GRADE AND SETTING. 1974.



The quantity of alcohol consumed and drinking contexts were examined in a recent survey of students in Scotland (20). Parents often offer an alcoholic beverage in the home but for the younger child confine it to special occasions. Home drinking among boys decreased with age, as did drinking at home on special occasions. These trends were less pronounced among girls. Although the quantity of drink consumed at home increased with age among boys but not girls, ever greater quantities were consumed at each age level at friends' homes. There is a general tendency for older boys and girls to drink more in this setting than at home. Among boys, outdoors drinking became less frequent with rising age, while the frequency of drinking in pubs increased markedly.

In most social contexts, Irish-Americans tend not to drink more often than Italian-Americans (Table 4). The outstanding exception--in that it appears as the most isolated situation--is drinking at a bar alone. There are noteworthy differences also in drinking at meals and drinking at home alone. Social drinking tend to vary according to interpersonal closeness and group solidarity in both nationalities and among the Italians, by generations. The more socially isolated a person is, the less likely he is to report drinking, but the more primary-group involvement there is in a situation, the more likely a person is to drink, except for the Irish-Americans at meals. The Italian-American custom of drinking with meals decreases with generations, and though first-generation Italian-Americans give such reasons for drinking as improving the appetite or digestion, later generations of Italian-Americans emphasize pleasure as the reason for drinking at meals.

When respondents were asked about reasons for drinking in a variety of social contexts, it appeared that first-generation Italian-Americans were more swayed by external influences (drinking to conform) than were later generations of Italian-Americans.

Further ethnic data about the social contexts of drinking have resulted from a comparison of teen-agers in New York and Rome (40, 41). As table 5 indicates, most Italian teen-agers drink at home with other members of the family at meals. The Italians drink much more regularly and begin regular drinking at an earlier age than American teen-agers. Among the American teen-age sample only 5.5 percent of the respondents reported daily drinking, and they were almost entirely of Italian extraction. This is also reflected in solitary drinking which, among the Italians, occurred exclusively at meals when other family members happened not to be present.

The frequency of drinking at home by the American adolescents was less than that reported in Rome and decreased with age. Although the frequency of drinking at special family events increased with age among the Italians, it decreased with age among the Americans. Drinking during social encounters between the sexes (on dates) was reported only by the American teen-agers.

Drinking by adolescents in the Italian samples was associated primarily with family meals and snacks during the day. Among older teen-age boys, evening drinking was limited to social life. In contrast, drinking at dinner by American teen-agers was an occasional experience. Evening drinking included beer and distilled spirits, which were generally consumed away from home with friends.

Problem Drinking

Many of the difficulties in defining alcoholism apply equally well to definitions of problem drinking. A number of studies have sought to identify persons with potential and actual alcohol-related problems. Problem drinking is thought to encompass such features as frequent intoxication and binge drinking, symptomatic drinking (includes exhibition of signs attributed to physical dependence and loss of control), psychological dependence, and disruption of normal social behavior patterns (problems with spouse or relatives, friends or neighbors, employers, and the police). Alcoholism research once focused on the effects of excessive drinking on institutionalized persons, but recent studies have tended to deal with the problems and sociocultural characteristics of people in the general population.

TABLE 4

PERCENT OF IRISH-AMERICANS AND ITALIAN-AMERICANS BY COUNTRY OF BIRTH WHO DRINK IN SELECTED CONTEXTS

	IRISH-AMERICANS	ITALIAN-AMERICANS	
	USA	USA	ITALY
At a Wedding	92	93	93
On Family Occasions	84	90	93
At a Party	87	91	87
When Visiting a Friends's home	82	85	87
At a Bar with Friend	71	72	67
At Home Alone	40	38	55
At a Bar Alone	33	20	32
At Meals	44	59	87

TABLE 5

PERCENT OF TEENAGE DRINKERS IN ROME AND NEW YORK BY AGE AND CONTEXT

	Rome		New York	
	13-15 yrs.	16-20 yrs.	13-15 yrs.	16-20 yrs.
At home	95	93	74	22
Parties at home	4	0	24	5
Special family events	33	56	24	6
Parties away from home	53	67	42	51
With friends	21	30	33	38
With dates	0	0	3	17
Alone*	50	20	0	11.5
Breakfast	26	10	2	0
Lunch	73	79	0	0
Dinner	64	71	42	49
Afternoon	63	56	26	11
Evening	31	53	43	97

*Drinking alone entailed circumstances of meals separated from other members of the family and involved the use of wine for the Italian sample.

Surveys conducted in the 1960's analyzed various factors associated with alcohol-related problems (11, 12, 15). Findings from these studies indicate that the greatest number of alcohol-related problems were found among poorer men under 25 years, city residents, persons who had moved from rural areas or small towns to large cities, those with childhood disruptions such as broken homes, Catholics and liberal Protestants, persons who did not attend church, and single and divorced men (Chart 1).

Women were not as problem-prone as men, which is not surprising since more women are abstainers and, of those who do drink, many fewer are heavy drinkers. Whereas 43 percent of the men in the 1967 survey (15) reported experiencing one or more problems connected with drinking during the previous 3 years, only 21 percent of the women reported such problems. Of the sampled persons with more severe involvement (high problem-drinking scores), 15 percent of the men but only 4 percent of the women were affected.

While men in their early 20's most frequently had drinking problems, the proportion declining sharply among men in their late 50's, women most frequently had problems in their 30's and 40's, and there was also a sharp drop-off among those in the 50's. There are now several theories to explain why problems associated with drinking are more prevalent among younger people than among those over 50, but this fact is unlikely to be explained until results of longitudinal studies, which follow individuals over long periods, are available.

Recent surveys have examined the sociocultural correlates of drinking problems among men and women aged 18 years and older (28). The recent findings are consistent with those of the earlier surveys, but there are some differences in the areas of marital status , degree of urbanization, and age. Separated persons now have higher problem drinking rates than single and divorced persons, although the last two groups still have more serious problems than married or widowed persons.

As may be seen in figure 8, the 18- to 20-year-old group has the largest proportion of persons who had experienced some problem in connection with drinking (27 percent), followed by those aged 21 to 24 (18 percent) and those 35 to 39 (15 percent). The 18- to 20-year group was not included in the earlier surveys, in which the highest ratio of alcohol-related problems was reported among those aged 21 to 25.

Residents of cities were more problem-prone than residents of suburbs, towns, and rural areas in earlier surveys, but these residential differences are now fading. Proportions of those with the highest drinking scores are nearly the same in cities, suburbs, and towns, and only those in rural areas have slightly lower rates of problems.

The Military

A survey of drinking in the Army in 1972 showed that the highest rate of problem drinking among enlisted men was among those whose wives were not with them at their duty stations, who were not college graduates, and who were under 30 years old (13). The best single correlate of serious problem drinking among commissioned and warrant officers was whether the respondent's father had been a heavy drinker, and the second best was that his wife was not with him at his duty station.

Rates of drinking problems tended to decline as age, grade, and years in service increased. Marital difficulties were the most frequently reported problem, regardless of pay grade. Family separation was associated with sharp increases in reported drinking but not so sharp an increase in drinking problems.

Problems associated with drinking were much more common among enlisted men than among civilians or officers. The enlisted men were much more likely to suffer adverse social, health, and economic consequences of drinking and to manifest more uncontrolled drinking, belligerence when drinking, and problems with friends and neighbors, the job, the police, and finances. The specific problems of the officers were roughly similar to those of civilian men of the same age in both nature and extent.

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CHART 1a
PROFILE ANALYSIS OF PERSONS MOST LIKELY TO HAVE NO ALCOHOL-RELATED PROBLEMS 1973

Lowest rates of alcohol-related problems for respondents in the 1973 national survey were found among:

- Women
- Persons over 50
- Widowed and married persons
- Persons of Jewish religious affiliation
- Residents of rural areas
- Residents of the South
- Persons with postgraduate educational levels
- Persons who are mostly "wine drinkers"

CHART 1b
PROFILE ANALYSIS OF PERSONS WITH HIGH PROBLEM RATES 1973

Highest rates of alcohol-related problems for respondents in the 1973 national survey were found among:

- Men
- Separated, single, and divorced persons (in that order)
- Persons with no religious affiliation
- Persons who are beer drinkers as compared with those who are mostly hard liquor or wine drinkers
- Persons who were more likely (compared to other persons in the survey) to say:
  "Drunkenness is usually *not* a sign of social irresponsibility"
  and
  "Drunkenness is usually a sign of just having fun "

Figure 8. PERCENT OF PROBLEM DRINKERS AMONG ADULTS, BY AGE, U.S.A., SPRING, 1973

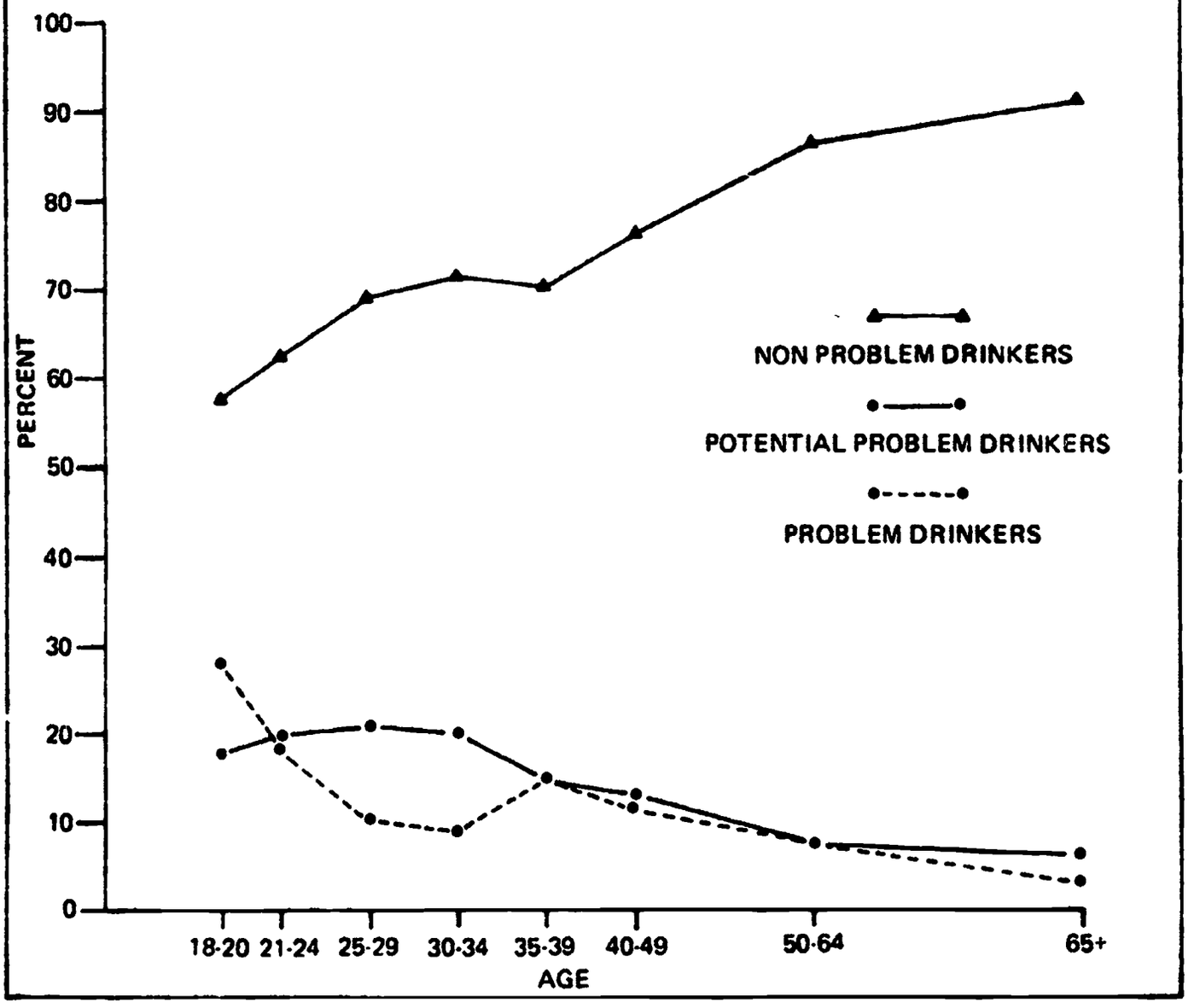
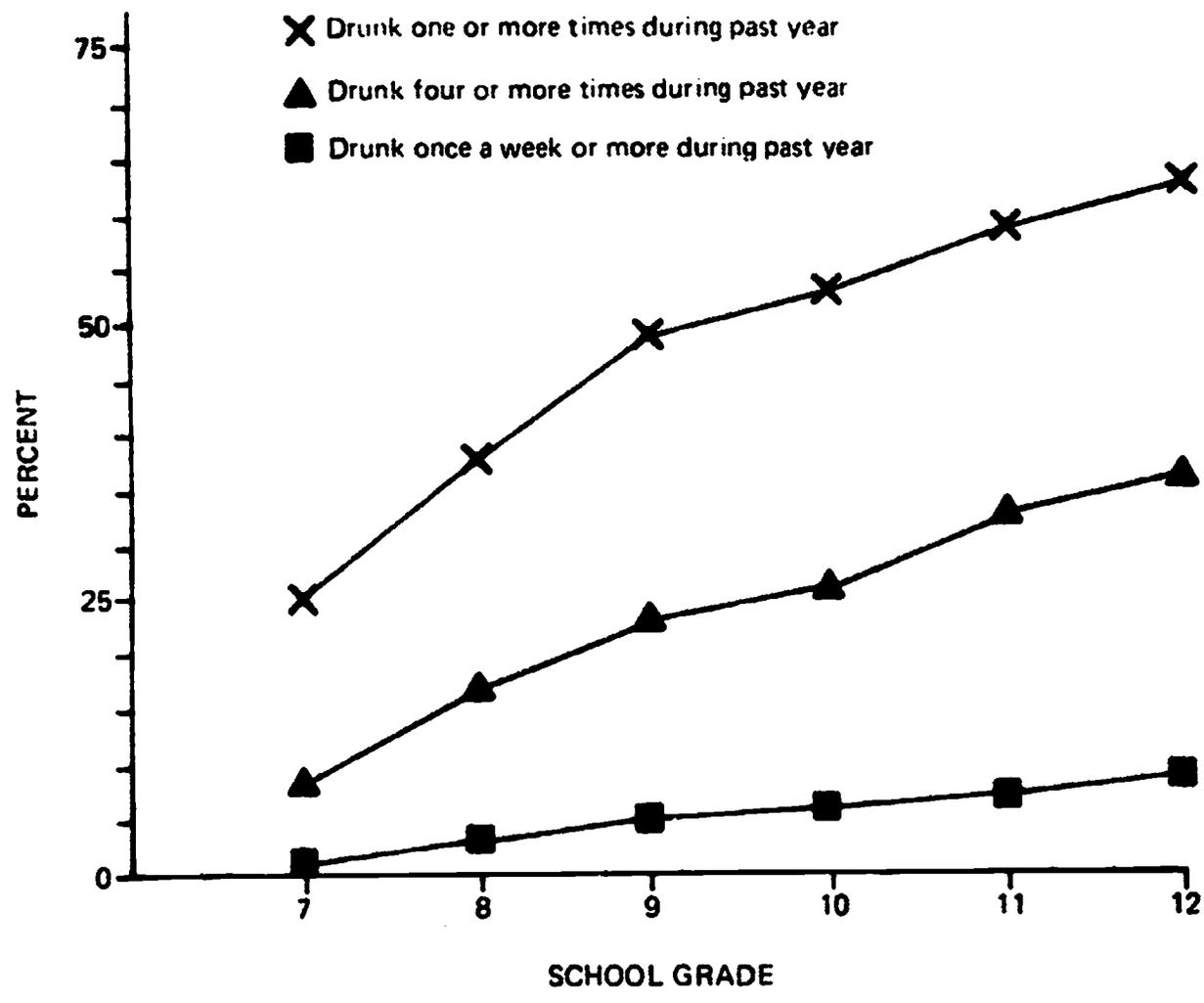


Figure 9. PERCENT OF TEENAGE DRINKERS WHO REPORT GETTING DRUNK BY FREQUENCY AND SCHOOL GRADE. 1974



The 1972 survey of drinking in the Navy (14) showed that enlisted men had more problems of every type, except marital, than officers, and that junior enlisted men had more problems of every kind except marital than senior enlisted men. Of the junior enlisted men, 15 percent reported that they had had job-related problems in the 3 years before the study, and 21 percent reported having been "high" or "tight" while on duty at least once during that time.

Adolescence

Reports of problems associated with teen-age drinking are obviously different from the meanings they carry for adults. If we adopt a problem-drinking criterion of getting high or tight at least once a week (11,15), preliminary estimates from the 1974 teen-age survey indicate that approximately 5 percent of the students are problem drinkers. Adopting the less conservative criterion of getting drunk four or more times a year yields an estimate of approximately 23 percent of the students exhibiting potential problem-drinking signs. As can be seen in Figure 9, the proportion of students who report getting drunk or very, very high increases with school grade level. Interestingly, only 2 percent of the students reported that drinking had been a problem for them during the past year, and this proportion did not vary with school grade level.

Other survey estimates of the proportion of adolescents who experience problems associated with drinking vary from 1 to 15 percent (42, 43), but the incidence of deviant drinking is decidedly higher among juvenile delinquents than among the general teen-age population (6, 48). This suggests that those who are antisocial or maladjusted misbehave typically in a variety of ways, one of which is overdrinking. For these reasons a number of investigators view adolescent problem drinking as one of a class of behaviors, commonly referred to as antisocial, that involve the potential for getting into trouble (8,30 , 32, 67).

A recent longitudinal study of 388 junior and senior high-school students (32) examined problem drinking within the framework of a number of behavioral, personality, and social variables in the children's lives. As might be expected, adolescent problem drinking was not an isolated behavior and the problem drinkers engaged in more deviant behavior than did the nonproblem drinkers. As for personality variables, the problem drinkers valued and expected achievement less but esteemed independence more than the nonproblem drinkers. They were also much more tolerant of deviant behavior. Socially, the problem-drinker girls were less compatible with their parents, and both boys and girls who were problem drinkers were more supportive of drinking by adolescents.

In view of these varied findings, problem drinking seemed to be a logical outcome in the lives of many of the adolescents. The longitudinal design of the study enabled the investigators to employ their sociopsychological framework to predict the shift from nonproblem to problem drinking over time. They believe that some of the variables could be used to identify individuals who would become problem drinkers a year later.

Using a social-learning theory of deviance based on both sociocultural and personality elements, another investigator studied the use of alcohol and narcotics in a sample of 1,179 8th-grade adolescents (8). A cluster-analytic technique allowed the identification of nine distinct types of adolescents, including two major kinds of deviant alcohol or narcotics users. The first was a personally-motivated student for whom the opportunity to procure drugs was crucial to whether he used them or not. The second type was motivated by peer pressures to conform and achieve status through the use of alcohol and other drugs: for this type, parental permissiveness about alcohol and other drug use was crucial to whether deviant use occurred or not.

Permissiveness is sometimes thought to be a contributing influence in the development of problem drinking among teen-agers. Drinking is less widespread among children and adolescents who live in environments that forbid the use of alcoholic beverages. There are some indications, however, that problem drinking is higher among youth in restrictive environments and lower in more permissive ones. The study of Mississippi high-school students (25)

indicates a relationship between parental disapproval of drinking and an increase in the percentage of adolescent problem drinkers. In a study of college students (58) drinking was found less widespread in colleges that frown on drinking, but the highest proportion of drinkers who reported having been "tight" or "drunk" occurred in the very same colleges.

Laws and other restrictions may thus bring young people together in trying to obtain alcoholic beverages and in drinking them, and so promote or intensify problem drinking by isolating it from regulating social controls. The restrictiveness may result in young persons being introduced abruptly to heavy drinking, instead of letting them gradually explore the effects of alcohol in socially protective environments.

Attitudes Toward Alcohol Use and Knowledge about Alcohol

Attitudes about alcohol use and about problem drinking are very closely aligned with a variety of religious, moral, and ethical values. As these more general beliefs and values vary among individuals and among population subgroups, and as they fluctuate individually over time, those that are connected with alcohol use have been adopted and carried along in a very haphazard fashion. The net result is that the public is left with a melange of ambivalent feelings about drinking and with some very real confusion about facts.

Although a majority of Americans do drink at least occasionally and although most people no longer feel that total abstinence is the only preventive measure against one's becoming a problem drinker or alcoholic, there is a vast pool of ignorance about what constitutes responsible drinking and what control, if any, the individual has over the possibility that he may develop serious alcohol problems. With such a climate of attitudes and erroneous information, it is not surprising that personal denial of problem drinking behavior is very common, and almost encouraged.

Exploration of the public's misconceptions regarding alcohol use is a very necessary step in terms of prevention. Indeed, attitudes toward alcohol use have been shown to have a significant relationship with actual problem drinking behavior and with heavier drinking (11, 12).

The ADP survey (12) found that although 75 percent of the total population agreed that drinking does more harm than good and that alcoholism is a serious problem, heavier drinkers were less inclined than others to agree to either of these questions. Abstainers were consistently more negative toward alcohol use, but also tended to have "a somewhat gloomier perspective than others on life in general." Women and persons of lower socioeconomic status more often agreed to the harmfulness of alcohol than did men and persons of higher socioeconomic status, but the latter two groups are also known to be more frequent and heavier drinkers than the former.

Cahalan (11) found that those persons who had more favorable attitudes toward drinking ("as measured by questions on whether good things can be said for drinking, whether the person scores high on the scale on the social utilities of drinking, and whether he enjoys drinking and getting drunk once in a while" page 155) were found to have higher scores on a scale of current problem drinking behavior. In fact, the attitudes were among the strongest of the predictors of problem drinking. The author does caution, however, against making any foregone conclusions about causality, as follows: "...it is well recognized that attitudes and behavior tend to be a reciprocal process, starting first with one or the other, and with each reinforcing the other as time goes on." (page 124)

More recent surveys (18) which attempted to investigate the public's actual knowledge of the effects of alcohol and the causes of alcoholism, as well as a variety of attitudes related to tolerance of alcohol use, found some rather inconsistent results which would indicate that in many areas a high degree of confusion, and most probably even denial, are still operating among the public.

Survey results indicated that only about 61 percent of the public can be considered fairly knowledgeable about the physiological effects of alcohol and that this percentage remained relatively constant over the four years in

which it was surveyed (28). For example, fully 40 percent of the population in the fall of 1971 incorrectly believed that drinking black coffee and dousing one's head with cold water would sober one up quickly and an additional 22 percent of those surveyed were "not sure" whether this was true or not. Those who tended to know more about the physiological effects of alcohol were the more highly educated and those with higher incomes, but such demographic factors as sex, age, and marital status had no relationship whatsoever with one's likelihood of being more knowledgeable.

A most striking finding was that abstainers, lighter drinkers, and those with no or few drinking problems were more likely to know about the effects of alcohol than were those who were heavier drinkers or problem drinkers. Since higher education by itself does relate both to heavier drinking and to knowledge of alcohol's effects, the fact that heavier drinkers per se do not know much is a contradiction that may result from denial on the part of heavier drinkers who will not acknowledge the negative effects of alcohol use. The inverse may be occurring with abstainers and lighter drinkers in that their more negative attitudes toward drinking in the first place may encourage them to agree with those questions which state harmful effects of alcohol use.

An attempt to determine whether the public considered alcohol to be a drug met with rather mixed results. More than half the survey population agreed that alcohol was a drug and that drunkenness was like an overdose of drugs. Proportions of those who agreed increased very steadily over the four surveys so that by January of 1974, 72 percent agreed with the former statement and 75 percent agreed with the latter. A final item in the series of three questions, "the host who encourages heavy drinking among his guests can accurately be described as a drug pusher" met with rather strong resistance from respondents in that only 19 percent agreed with this statement in the fall of 1972. An encouraging note, however, was that this percentage did increase steadily so that 34 percent agreed by January of 1974. Apparently, this was a rather sensitive area that could be applied in a much more personal fashion than the former two statements. The substantial increase in agreement over time (although far behind that of the other two concepts) may be in part due to the fact that this particular notion was presented as the focal point of an advertisement in NIAAA's media campaign, and increased exposure to the ad, "Harry, the Neighborhood Pusher," may have altered some opinions.

Generally, one's personal drinking habits were rather strongly related with agreement on these three items. The heavier drinkers and those with higher problem drinking scores were less willing to acknowledge that alcohol was a drug than were those who abstained, consumed lighter quantities of alcohol, or were non-problem drinkers. Acceptance of the drug qualities of alcohol was not related to any demographic factors such as education, age, and so forth.

Summary

The proportion of adults who consume alcohol once a month or more has risen slightly since the mid-60s, so that now about 57 percent of the population falls within this category, compared to 53 percent nearly a decade ago. Although sociocultural factors such as age, sex, ethnic background, religious background, education, occupation, and socioeconomic status continue to be strong predictors of whether and how much a person drinks, some regional differences in consumption patterns are beginning to disappear. Recent investigations of the social contexts in which alcohol is consumed have indicated that these contexts: such as the physical setting, the people involved, and the occasion for drinking, also strongly influence drinking behavior and amounts of alcohol consumed.

A 1974 Nationwide survey of teen-age drinking has found that approximately 42 percent of junior and senior high-school students drink alcoholic beverages once a month or more often. Other data indicated that in both sexes drinking becomes more frequent with increasing age, but that in every age group boys drink more and more often than girls. While most teen-agers who begin to drink do so at home under parental supervision, they most often drink in places where adults are not present.

Surveys during the mid- and late-60s have found that problem drinkers were oftener less-affluent men under 25, residents of cities, persons who had moved from rural areas or small towns to large cities, those with childhood disruptions such as broken homes, Catholics and liberal Protestants, persons who did not attend church, and single and divorced men. Surveys conducted in the early 1970s have found the same sociocultural correlates of problem drinking, with some exceptions in the areas of marital status, degree of urbanization, and age. Separated persons now have higher problem drinking rates than single and divorced persons. Residential differences in problem drinking proneness are now fading so that now only residents of rural areas have lower problem rates.

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Chapter II

ALCOHOL AND OLDER PERSONS

Older persons comprise a special population which has unique features of interest for the study of drinking. The incidence of drinking problems in this group is relatively low. Cahalan and his co-workers (3) have shown that with advancing age many people decrease their alcohol consumption. There are well documented reports, reviewed by Wallgren and Barry (12), of problem drinkers who became abstainers or, sometimes, moderate or controlled drinkers as they grew older. An important consideration from this perspective is that the proportion of older persons in the United States population has increased greatly in the last few decades (U.S. Census, 1970) and may be expected to continue increasing in future decades as medical advances continue to prolong life, and more so if the birth rate continues to decline. The care and welfare of the elderly is thus a growing social problem which is only partly and unsatisfactorily dealt with by the establishment of more nursing homes and by Medicare benefits.

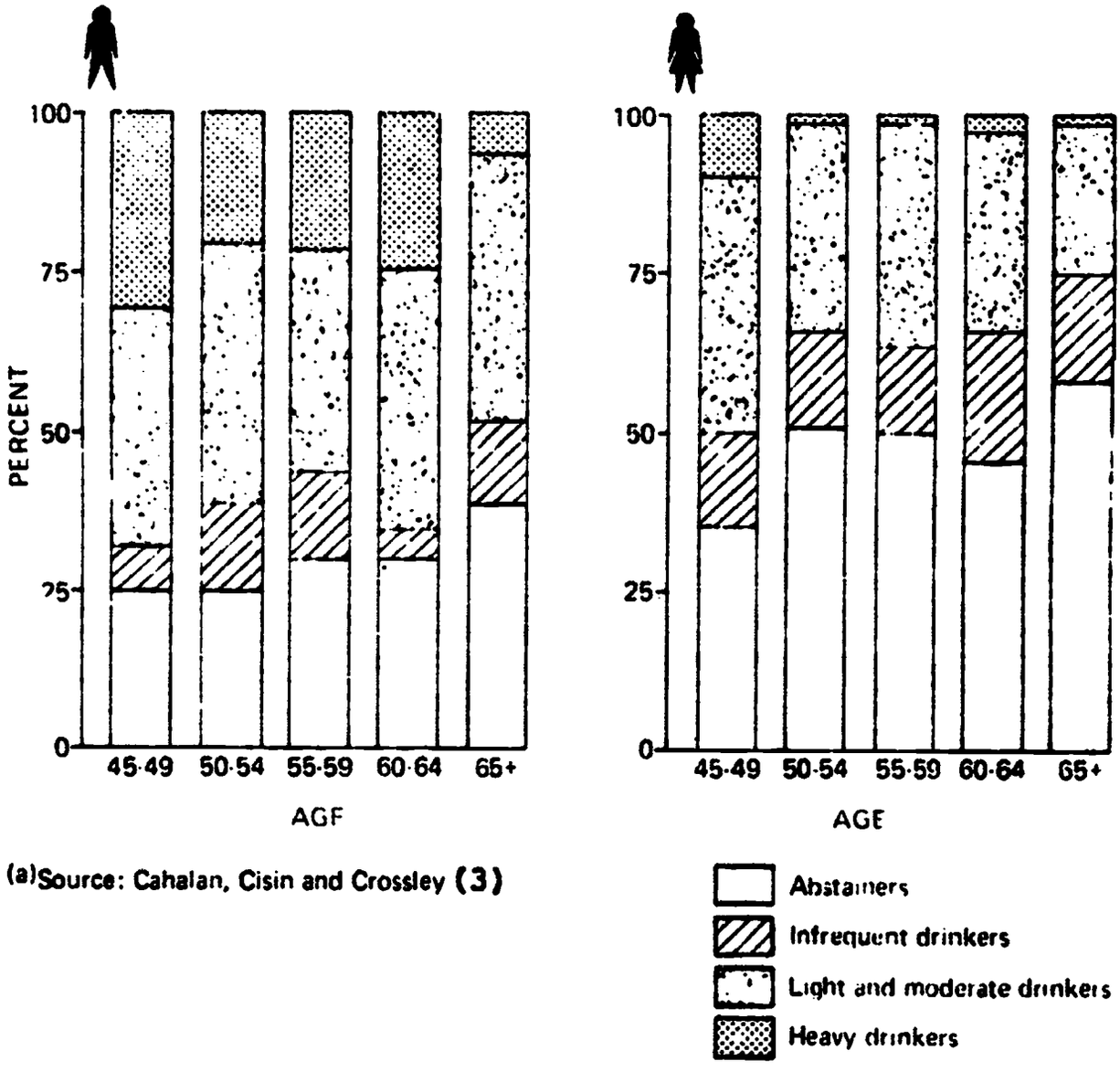
Until very recently, alcoholism research has devoted very little attention to the special population of older people. This may reflect a general tendency to ignore the difficult problems of aging in a youth-oriented society. However, three major research projects in the past few years have addressed this special problem. One was a survey of drinking practices in a population of older persons living in Manhattan Borough, New York City (8); another was a series of studies of problem drinking in older persons (4); the third was an experimental study of the physical and psychological effects of social drinking occasions during several weeks on the residents of a nursing home in Massachusetts (1). Most of what we now know about drinking and alcoholism in the special population of older people has been reported in these recent studies. Therefore, the present chapter primarily summarizes these three reports.

Drinking Practices

The drinking practices of American men and women at different ages were reported by Cahalan et al. (3) and summarized in The First Special Report to Congress on Alcohol and Health (11). A more detailed summary of the age differences from 45 years onward, according to sex, is shown in Figure 1. At all ages, more men than women drink and men drink more than women. But the proportion of heavy drinkers decreases substantially after the age of 49 in both sexes and with an added decline after 64 in men. The proportion of women abstainers increases substantially after 49 and again in both sexes after 64. In general, drinking in the oldest category decreases from a fairly stable level seen during the preceding 15 years.

A subsequent study by Cahalan and Room (4), on problem drinking, is limited to men under the age of 60, but it provides corroborative evidence for a decreasing amount of drinking with advancing age. The proportion of abstainers was 31% at age 55-59 compared to only 18% at age 50-54. The proportion of those with a high score on drinking problems (7 or more) was 17% at age 55-59 compared with only 11% at age 50-54. They found a striking difference when comparing the men at age 50-59 on the basis of socioeconomic status. Among those with the highest Index of Social Position, 32% drank heavily (problem or potential problem) and only 12% abstained. Among those with the lowest Index of Social Position, much higher proportions both drank heavily (51%) and abstained (28%). The same trends were found in the earlier survey by Cahalan et al. (3) but with less clear differentiation between the socioeconomic groups.

Figure 1. CUMULATIVE PERCENT OF ABSTAINERS AND TYPES OF DRINKERS AMONG ADULTS AGE 45-65+ BY AGE AND SEX(a)



(a)Source: Cahalan, Cisin and Crossley (3)

The higher proportion of abstainers and lower proportion of heavy drinkers among older Americans reflect a decrease in their drinking compared with their younger years. Cahalan et al. (3) found that among men aged 60 years or older, more than half were former drinkers, and about half of these former drinkers had stopped after the age of 44. Among women of 60 or older, most of the abstainers had never been drinkers but half of the former drinkers had stopped after the age of 44. Drinkers of both sexes frequently reported that they used to drink more than at present, but the quantity they customarily drank on an occasion declined even more sharply with advancing age than the frequency of drinking occasions.

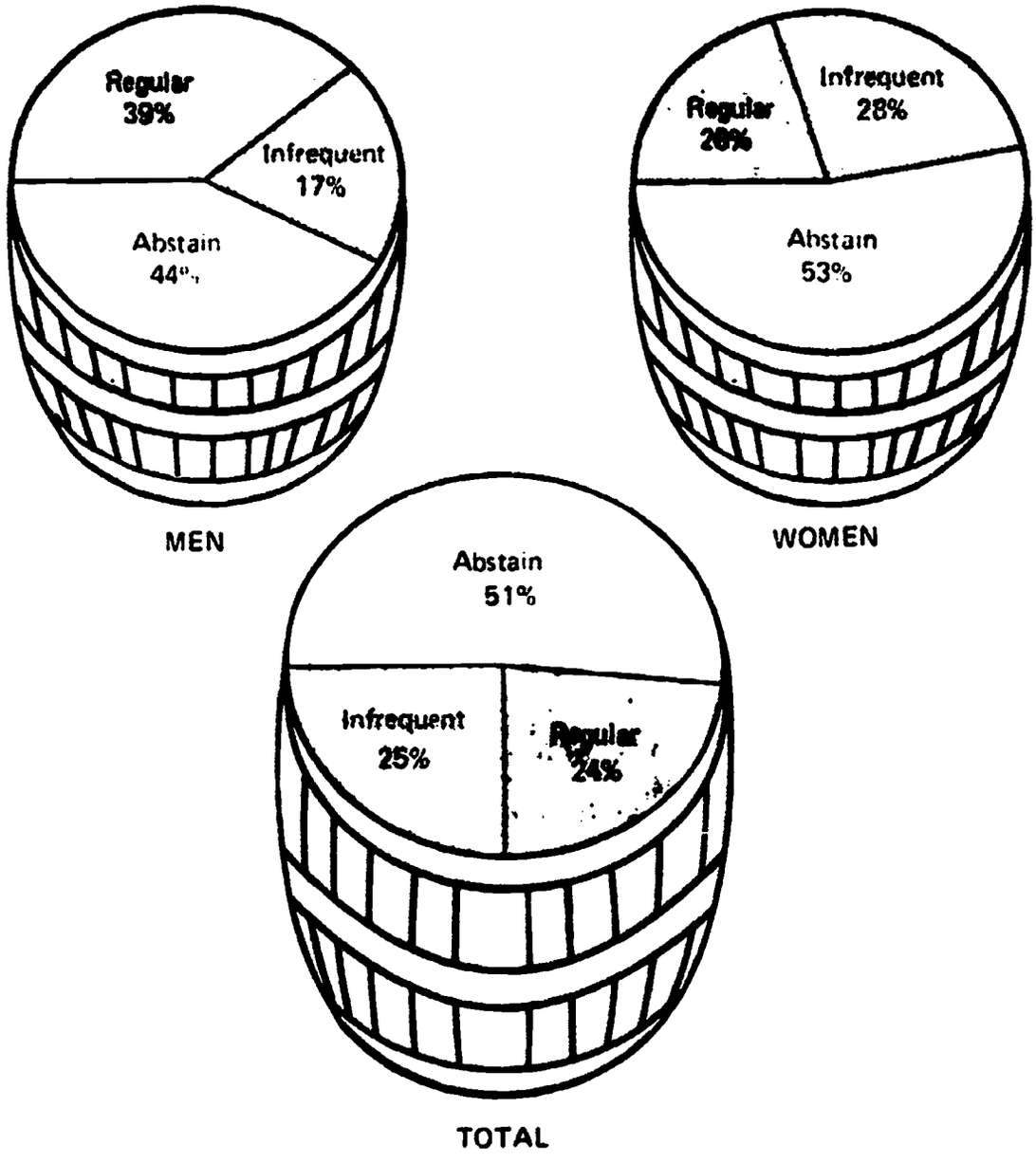
The people in the different age groups were studied at the same time, so that the older respondents were born in earlier years. Although many contemporary older people have given up drinking, the present middle-aged and young drinkers will not necessarily show the same trend of an increasing proportion of abstainers as they grow older. The cultural patterns into which contemporary older persons grew up included a strong temperance tradition, especially for women, and the period of national prohibition. Many people who took up drinking as a youthful rebellion against parental standards or prohibition, or in response to the repeal of prohibition, might have tended to return to their early traditions of abstinence as they grew older. It will not be possible to know until several decades from now whether the increase in abstinence is a general tendency among older persons, applying also to those who are reared in the more permissive contemporary traditions. Some indication that the drinking habits of older people do not change when the social traditions favor drinking is the finding of a low proportion of abstainers (12%) among Americans 50-59 years old in the highest social position category (4). But even though a well-established custom of drinking usually continues into old age, it seems likely that the amount of alcohol consumption decreases; the surveys, however, do not provide very good evidence on this for people aged 60 and older.

One of the recent studies, by Johnson and Goodrich (8), was a survey of 169 People aged 65 years or older, living on the upper east side of Manhattan, in New York City. Most of them were from lower socioeconomic groups, living alone or in a small household. The study revealed that men tend to drink more often, and a larger average quantity on each occasion.

Figure 2 summarizes the drinking categories, for the 54 men and 112 women separately, and for both sexes combined. Comparing regular drinkers (daily, frequently, or occasionally) with the other categories, the sex difference is statistically significant. One of the largest sex differences was in the percentage of abstainers who had formerly drunk at least occasionally: 61% among the men and only 29% among the women. In comparison with the national survey data of persons aged 65 and over, summarized in Figure 1, the proportion of abstainers in the studied sample is slightly higher among men and slightly lower among women, but the correspondence is fairly close. In the Johnson and Goodrich sample the eastern urban location would be expected to decrease the proportion of abstainers but the predominantly lower social status would be expected to have the opposite effect.

The respondents were asked various questions about their activities and feelings in addition to their drinking. Their self-reported physical health was strongly associated with drinking: there was a greater likelihood of drinking among people in good health than among those in poor health. In Figure 3, the drinking behaviors of men and women are compared according to two health categories. The tendency for people in poorer health to drink less was stronger among women than among men. The drinking behaviors of active and less active respondents in the two health categories were also compared. High activity was defined as reported participation in 8 or more out of 16 activities, such as shopping, reading, playing games and social or cultural functions. Men were more active than women, but the sex difference was fairly small. As would be expected, highly active respondents were more likely to report good health. Figure 4 shows that regular drinking was preponderant among the highly active people in good health; abstinence was preponderant among the less active people, especially those whose health was only fair or poor.

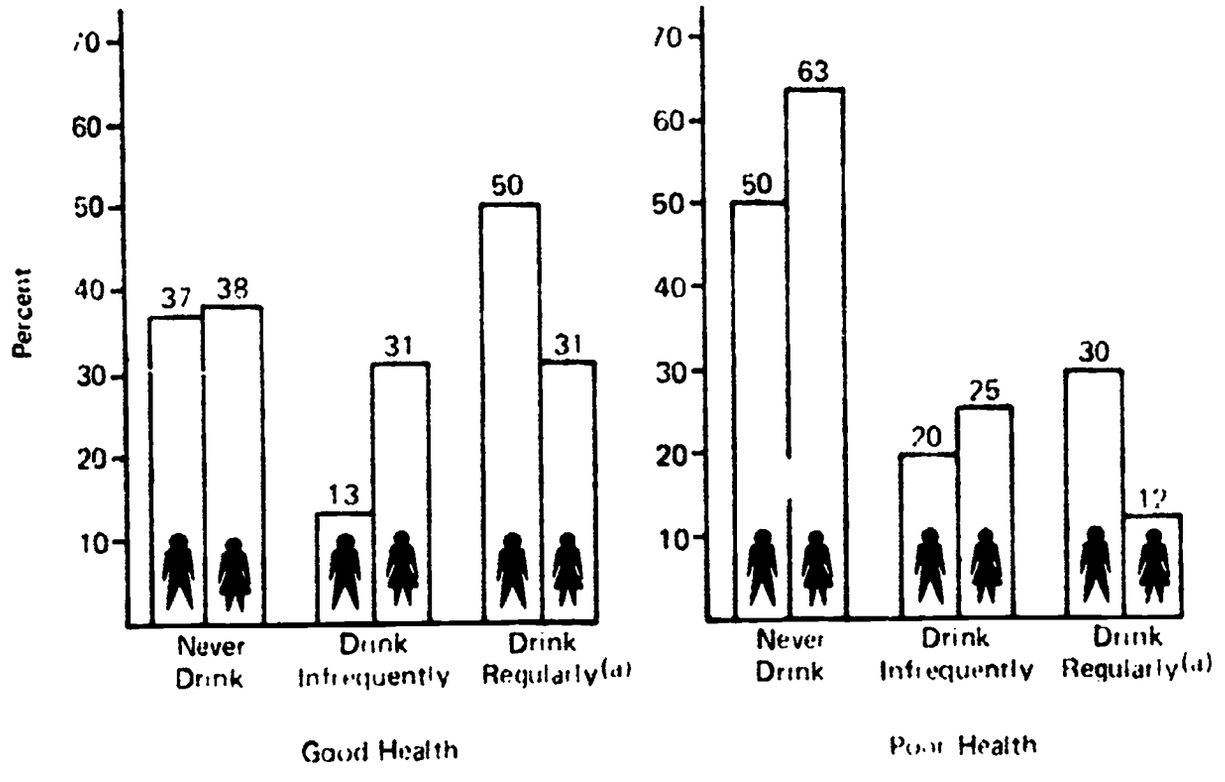
Figure 2. PERCENT OF ABSTAINERS AND TYPES OF DRINKERS[a] AMONG ADULTS AGE 65+, MANHATTAN SAMPLE[b]



[a]Types of drinkers were classified as follows:
Abstain– Never drank or formerly drank at least twice a year
Infrequent– Drink infrequently or not in last month
Regular– Drink daily, frequently or occasionally

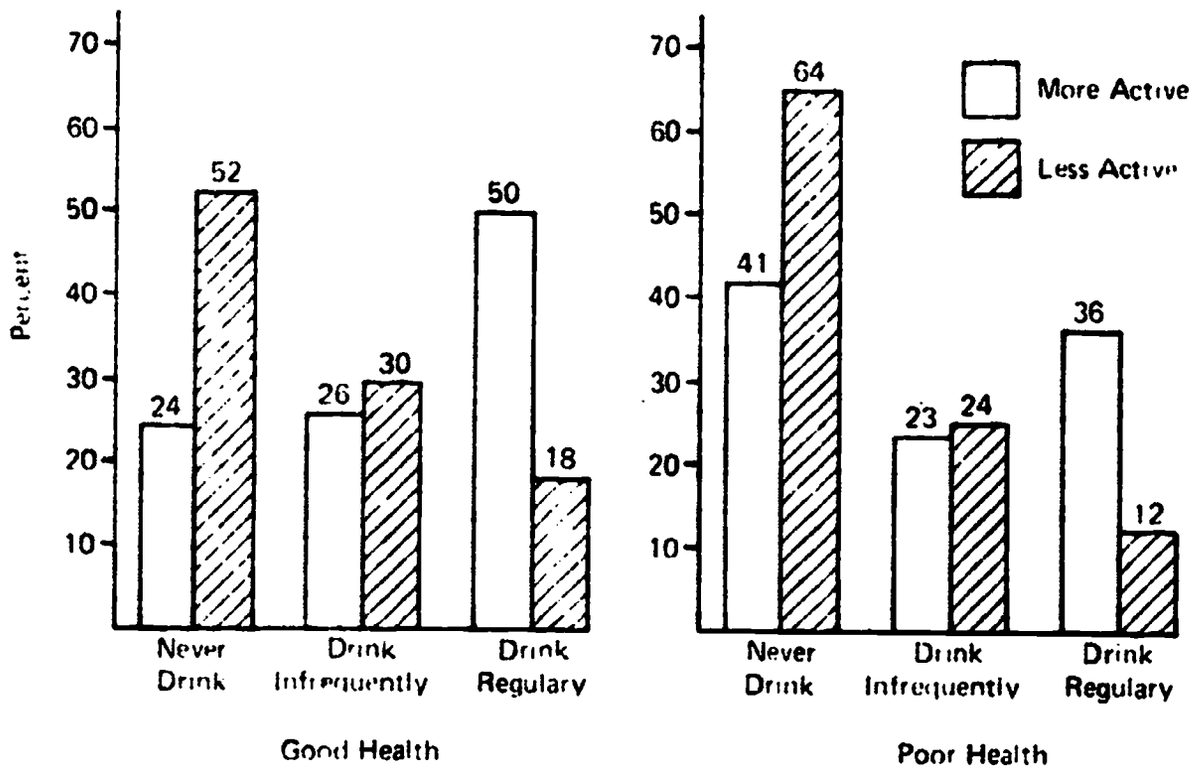
[b]Source: Johnson and Goodrich (8)

Figure 3. PERCENT OF ABSTAINERS AND TYPES OF DRINKERS AMONG ADULTS 65 YEARS AND OLDER BY SEX AND CONDITION OF HEALTH. UPPER EAST SIDE OF MANHATTAN



(a)Drink Regularly -- Drink daily, frequently, or occasionally

Figure 4. PERCENT OF ABSTAINERS AND TYPES OF DRINKERS AMONG ADULTS AGED 65 AND OLDER BY LEVEL OF ACTIVITY AND CONDITION OF HEALTH. UPPER EAST SIDE OF MANHATTAN



Some additional measures show a similar pattern of relationships with drinking. People who reported good psychological well-being and seeing friends tended to report good health, high activity, and regular drinking. Seeing relatives was less closely related to health and drinking, perhaps because more frequent contact with relatives can indicate infirmity or limitations on self-reliance. The measure of activity, shown in Figure 4, appeared to be the one most consistently related to drinking.

Among the 34 nondrinkers who formerly drank, 50% stopped because it made them sick or was thought to be bad for their health. However, past excessive drinking or physical damage does not appear to characterize most of these former drinkers. The proportion of them who reported good health (30%) was closely similar to the proportion (28%) among those who had never drunk.

In general, the amount of drinking was rather light among this sample of older persons. The drinking which did occur was part of a pattern of good health, psychological well-being, and an active social life. This probably reflects a greater enjoyment of drinking and ability to cope with the effects of alcohol. This pattern may also reflect the advantages of higher socio-economic status, which is associated with lower frequency both of abstaining and of heavy drinking.

The association of good health and high level of activity with drinking in this sample might be partly attributable also to beneficial effects of the drinking. The person who abstains may coincidentally refrain from some of the social and convivial activities which are associated with many drinking occasions. The men were more likely to drink regularly and also tended to report better health and a slightly higher level of activity.

A study of a nursing home and a residence for the elderly in Boston (1) yielded some data on drinking practices of older persons before they came to live in these institutions. The mean age (77 years) was substantially higher than in the Manhattan residential sample. Of the total Boston sample of 145, 72% were women. Drinking data were obtained from only 98 of these people and the investigators combined the sexes for the analysis of their findings. In this sample, 30% reported having drunk regularly, 50% rarely, and 20% never. These proportions agree closely with the sample shown in Figure 1, assuming that the drinking category did not include very many who had drunk at an earlier age and stopped prior to institutionalization. When current self-reported health was compared with former drinking practices, no significant differences were found. The sample included 8% who reported having stopped drinking on advice of a doctor.

A serious limitation of these surveys is their reliance on self-reports by the respondents. People may deceive themselves or the interviewer, especially about their former drinking practices. Objective, independent verification of the self-reports would be desirable and should be an important goal of future research. However, these studies have provided some new information about drinking by older persons, and at least preliminary inferences may be drawn from them.

Problem Drinking

Recent research on a small number of older persons with drinking problems has suggested some differences between older and younger persons with drinking problems. Rosin and Glatt (9) reported on a sample of 103 patients in England aged over 65 years. Contrary to the usual greater proportion of men than women among alcoholic persons, 60% of this sample were women. This reflects the over-representation of women among older people, but also suggests the possibility of a reduced survival of men among people with drinking problems. About two-thirds of this sample were characterized as long-standing problem drinkers, the rest as previously non-problem drinkers whose alcohol intake had been intensified by the effects of aging. Bereavement and retirement were suggested as the most common precipitating causes in the latter group.

Another difference from youthful people with drinking problems was that only about 15% of the older alcoholic persons evidenced severe, long-standing personality problems. By contrast, neuroticism and deviant personality are prevalent among young alcoholic people, as emphasized in a recent review by Barry (2) and further indicated in the study by Cahalan and Room ( ). Physical problems such as withdrawal illness, seem to have been infrequent in this sample of older people.

This finding is consistent with a number of anecdotal accounts of men and women in old age developing a drinking problem due to retirement, boredom or loneliness. Bacon* has recounted a study of alcoholism many years ago in Waterbury, Connecticut, which showed that one of the most numerous groups of alcoholic patients consisted of elderly women from Eastern European countries who had important matriarchal positions in their native countries but were isolated or disregarded in their contemporary American setting.

The relative increase in frequency of drinking problems among older women is further indicated by a study of Alcoholics Anonymous members by Maxwell and Williams, as reported in the study by Carruth et al. (5). Members aged 66 and over comprise a higher percentage among men than among women. This may indicate greater success in abstaining among the older men who joined the A.A. fellowship. Among members aged 61-65, 73% of the women but only 58% of the men had their first A.A. contact at age 50 or older. This again may reflect a preponderance of women among those whose drinking problem develops at a later age. However, the sex differences might alternatively be explained by a recent increase in the proportion of women of all ages among new members of A.A.

The report by Carruth et al. included a study of a sample of men, with a median age of 59, who had been designated by a social service or health agency as having had a drinking problem. By far the most of them (75%) had been heavy or moderate drinkers 3 and 10 years earlier, and the majority (60%) had become moderate or heavy drinkers at 30 years of age. The heavy drinking had apparently developed over a number of years rather than recently. At the time of the study 63% of these men were abstaining or drinking lightly. Most of them were employed and felt that their health was good. These characteristics of abstinence or diminished problem among a high proportion of the sample may be due to the fact that selection for the interview was based partly on accessibility and cooperativeness. The problems of aging, such as isolation and alienation, did not seem to be aggravated in this sample, but a reasonable life adjustment, characterized by mitigated legal and health problems, was predominant. However, in contrast to the sample of current excessive drinkers in old age reported by Rosin and Glatt (9), a high incidence of psychological problems, such as emotional upset, nervous breakdown, and depression was found. This fits in with the characteristics of more youthful problem drinkers, many of whom solve their drinking problem but continue to be troubled by their personality problems.

The study by Carruth et al. also includes a 15-year follow-up of men who had been hospitalized for alcoholism at a median age of 41 years. The mortality rate of the men whose median age was 56 was 31%, which is more than twice the expected rate in the general population. Interviews with 25 of the living patients or their relatives indicated that 6 were now abstainers, 10 had cut down their drinking drastically, and in general their difficulties had subsided, while 9 had as much of a drinking problem as ever. Among this last subgroup, physical and mental deterioration characterized the majority but other problems had generally subsided.

The study by Carruth et al. exemplifies and documents the results that have been reported in general surveys. Cahalan et al. (3) and Cahalan and Room (4) have reported a decreasing frequency of heavy drinking or drinking problems at older ages. This is partly attributable to early death and, thus, failure of people who had youthful drinking problems to appear in the elderly population. The recent evidence on mortality is summarized elsewhere in the present Report

*Bacon, S. D. Personal Communication.

(See Chapter V-4). In addition, there is evidence that some problem drinkers, especially men, become abstainers or moderate their drinking as they become older. The question of whether alcoholic people can decrease their drinking to a moderate or controlled level has been a controversial issue, but Wallgren and Barry (12) and Barry (2) have reviewed evidence that it can occur. (See also Chapter 6, pp. 81-82.) This is a rare occurrence among youthful people who drink excessively, but an apparent tendency for reduced alcohol consumption in old age seems to apply to those who formerly drank excessively as well as to moderate drinkers.

Physical and Psychological Effects

There is a great distinction between effects of heavy or excessive alcohol intake and moderate drinking. Excessive alcohol consumption increases mortality and produces various types of damage that have been summarized both in the present Report and in the First Alcohol and Health Report (11). However, there is no evidence of damaging effects even from the steady intake of moderate amounts and indeed mortality statistics reviewed elsewhere in this (Chapter V.4) Report suggest a possible beneficial effect.

In view of the indications that moderate drinkers live longer than abstainers, it seems possible that the beneficial effect of moderate drinking may apply especially to old age.

There is, however, little information on physical effects of alcohol specifically in older persons. If there are beneficial effects of moderate alcohol intake, the basis may be psychological rather than physical. Wallgren and Barry (12) noted that the widespread belief of beneficial effects of alcohol in acute heart conditions is due to the sedative effect, since alcohol causes no improvement of heart function directly. Older persons have a diminished capacity to drink large amounts because of slower metabolism in general and, thus, slower elimination (12, p. 99). Studies of voluntary alcohol consumption by several species of animals have indicated a lower intake, in proportion to body weight, at higher ages (12, p. 444). However, these studies generally compared different age groups of animals all introduced to alcohol at the different current ages. The question is not settled whether animals with continuous consumption of alcohol from an early age would decrease their consumption as they become older. In humans there is evidence of an increase in the rate of metabolism by heavy drinkers, and this ability disappears in old age only if liver damage occurs.

The study by Johnson and Goodrich (8) included questions about reasons for giving up alcohol. As noted previously, half of the 34 former-drinking abstainers said they had stopped because it was making them sick or was thought to be bad for their health. Although it was not stated in the responses to the questions, experienced observers noted a fear of the possible loss of motor control among people who were already experiencing that loss to some extent because of aging. Fear of the emotionally disinhibitory effects of alcohol, or desire to avoid it, may also be more prominent in older than in younger people. Among nondrinkers in the sample, including all 87 who did not drink, 30 said that one of the reasons for not drinking was that they did not like the way "other people" behaved after drinking.

Experimental studies have the capability of clarifying the precise effects of alcohol, isolating the role of alcohol from other conditions. Several studies have been done on effects of drinking in nursing homes for elderly people. These experiments are preliminary and do not positively identify the precise causative agent because the pharmacological effects of alcohol cannot be distinguished from the social situation associated with drinking. Nevertheless, the results are interesting and reasonably consistent.

The most convincing result has been reported by Chien (6) and Chien et al. (7). These two studies tested effects of beer drinking in nursing home patients. In the earlier study a group receiving beer in a pub setting showed greater behavioral improvement than the comparison groups who were given fruit punch or thioridazine in the pub or thioridazine in the ward. In the second

study, 64 patients received beer or wine in the pub setting or in the ward for 4 weeks after a 4-week baseline period of observations. Various rating scales showed improvement among the patients after the alcoholic beverage was introduced, whether in the pub or ward. A sub-group which was being treated with an antidepressant (doxepin) showed the greatest beneficial effect of the drinking.

A summary of other studies on drinking by geriatric nursing home patients (1) also generally indicated beneficial effects. The most impressive finding is that the provision of alcoholic beverages, introduced as an experimental procedure, has usually been continued after completion of the experiment. A number of nursing homes have recently adopted a policy of serving alcoholic beverages. There have been reports that the dosage of other medications can be reduced substantially in patients who drink small amounts of alcohol.

Another study (1) involved a more elaborate experiment than the preceding ones. Geriatric patients in a nursing home and at a minimal-care residence, both in the Boston area, were divided into a drinking and control group for 9 weeks, followed by another 9 weeks in which both groups could drink. A 1-hour cocktail party was made available, with free drinks for all those who chose to drink and had consent from their physician. Beer, wine, whisky, brandy, and cordials were all available. In the control condition only soft drinks were provided. The procedures included extensive tests of mental and physical functioning and also thorough physical examinations.

Under these conditions the amount of alcohol consumed was rather small. Median consumption by the non-abstainers was somewhat less than 1 drink per week although some participants partook almost daily. The abstinence rate in the minimum-care residence was 40% during the first 9 weeks but dropped sharply to 14% in the last 9 weeks. The rates during the comparable periods in the nursing home were 47% and 44%. Among the control patients, who had access to alcohol only in the last 9 weeks, fewer abstained and the amounts consumed were somewhat greater. Thus, there is a suggestion that these geriatric patients were persuaded to drink by the social setting and accessibility of alcohol. The physical examinations showed no ill effects on health from the use of alcohol in these quantities.

The drinking experiment gave evidence of psychologically beneficial effects in both institutions including improved sleep, morale, and general well-being. This occurred primarily in the latter half of the study possibly indicating that prolonged moderate use may be necessary to obtain positive results. Perhaps the best evidence of beneficial effects is the fact that after the experiment terminated, the cocktail parties--which had stimulated increased conviviality and activity, were continued at both institutions.

The experiment was beset with some difficulties caused by the experimental manipulations. The free cocktail parties were unusual and thought of as a temporary procedure; this may have inhibited full acceptance of their purpose. The formal procedure of gaining informed consent of the residents, as well as the physical examinations, also may have confounded the effects. At the minimum-care residence, the members of the control group not permitted alcohol communicated actively with members of the experimental group, due to the free access environment. Many of the control group members were resentful and boycotted the sessions. In addition, the people at the minimum-care residence were able to go out of the institution to bars if they chose; this supplemental drinking was not recorded or controlled and might also have had some confounding effect, although no incidents of alcohol abuse were ever observed. Continued research should control for these factors as well as investigate further the effects of functional status, of types of alcoholic beverages consumed, of the context of drinking, and of longer time spans.

Alcohol is more likely to be consumed by those older persons who are socially active and report themselves as being in good health. This appears true of both institutionalized and non-institutionalized individuals. With consumption levels moderate, no adverse effects on health are apparent. There is evidence that social and psychological benefits may be derived from moderate alcohol availability within a social setting. Furthermore, in some elderly persons, alcohol may be a desirable alternative to medication for maintaining the individual's physical comfort.

Problem drinking does occur among the elderly. The incidence is lower than among younger individuals and the causative factors may be somewhat different. Excessive drinking is less associated with deep-seated psychological problems. Rather, it appears more directly related to external factors concomitant with increasing age.

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Chapter III

ECONOMIC COSTS OF ALCOHOL-RELATED PROBLEMS

A recent study of the economic effects of alcohol-related problems estimated, for the year 1971, a loss to society of over $25 billion (3). The estimate (Table 1) was based on an analysis of six areas of social behavior which past or current research had explicitly or implicitly identified as sources of significant economic costs which might be related to misuses of alcohol.

One cost estimate was developed for the market value of the lowered production of adult male workers with alcohol problems. Also, the costs to society in the form of output required in 1971 because of the socially dysfunctional effects of alcohol misuse and alcoholism were estimated separately for motor vehicle accidents and for health problems. The study estimated that over $23 billion of the quantifiable costs occurred in these three areas. Finally, estimates were also prepared of the costs of alcohol-related programs, costs to the criminal justice system for alcohol-related offenses in 1971, and costs of the social welfare system related to alcoholism. An effort to assign a portion of the economic cost of fire losses to alcohol misuse did not succeed owing to the lack of adequate reliable data.

A comprehensive economic evaluation of the effects of the production and consumption of alcoholic beverages would take account not only of the costs to society associated with their misuse but also of numerous economic benefits arising from their use. This could not be accomplished in the present study. Thus, while health and medical costs of misuses have been calculated, the possible value of health-promoting uses has been left out of the account. A further limitation of its scope is that no account is taken of the value of personal and social gratifications from use, or of the emotional sufferings caused by misuse; no attempt has been made to measure these human effects in economic terms. The present study, thus, is limited to an attempt to quantify only the economic costs of alcohol misuses and alcoholism.

Economic cost was defined as "the value of output or production that must be forgone by society because of alcohol misuse and alcoholism" (3). Costs arise from the socioeconomic process of allocating limited resources to meet, through the production of goods and services, the unlimited wants of society. If economic resources are reduced by or reallocated to alcohol-related effects, the economic cost to society is the value of the output which the resources would have produced if it were not for alcohol misuse and alcoholism. The measurement of economic cost is greatly facilitated if the market prices are available for the resources which are either reduced or reallocated as a result of alcohol misuse. Because the general understanding of the relationship between alcohol and various behaviors is in a comparatively primitive state, however, estimates of the costs of some possibly significant aspects of behavior, could not be formed. As a result, the estimate of loss of about $25 billion in 1971 due to alcohol misuses may be conservative.

Methods

The study was a pioneering attempt to derive systematic quantitative economic cost estimates based on the observed behavior of people with alcohol-related problems. Ideally, cost estimation is a two-stage process: First, research identifies and quantifies specific behaviors which can be attributed to alcohol misuse and alcoholism. The behavioral data are then analyzed from an economic perspective. This process was followed as closely as possible.

TABLE 1

ECONOMIC COSTS OF ALCOHOL MISUSE AND ALCOHOLISM. 1971[a]

	Billions of Dollars
Lost Production	$ 9.35
Health and Medical	8.29
Motor Vehicle Accidents	6.44
Alcohol Programs and Research	0.64
Criminal Justice System	0.51
Social Welfare System	0.14
Total	$25.37

[a]Source: Berry et al. (3)

Two variations of the method were employed: (1) behavioral research on alcoholism was surveyed and the economic costs of that illness were estimated; and (2) cost studies of other alcohol-related behaviors were analyzed and a proportion of the costs was allocated to alcohol misuse and alcoholism.

The conclusions follow, separately for each of the six main cost areas.

Lost Production

The largest single area of economic cost--amounting to $9.35 billion--was the lost production of the goods and services which could be attributed to the reduced productivity of alcohol-troubled male workers.

The cost of lost production was estimated on the basis of observations of the difference in earnings of families with and without problem drinkers. The estimate was limited to a 1-year period (1971) for non-institutionalized men aged 21 to 59. A summary of the information and findings is presented in Table 2. The study includes, possibly for the first time, estimates of lost production derived from data on people with drinking problems in the general population rather than only those seen in treatment environments, and taking into account age and income as well as prevalence. It was not possible, however, to take into account other factors, such as ethnicity, region and parents' status, which may also be related to both income and drinking problems.

Another important aspect of the present lost-production estimate is that it was prepared from the perspective of society as a whole. Many individual firms and large organizations, including the Federal Government, have conducted studies on the relationship between employees' wages and their productivity and have generally employed alcohol misuse as a factor in lost production.

Pell and D'Alonzo (20) have clearly outlined the source of loss productivity among alcohol-troubled workers:

> The cost of alcoholism to industry is made up of several components, including loss of efficiency, absenteeism, lost time on the job, faulty decision making, accidents, impaired morale of co-workers, and the cost of rehabilitation programs. A large significant portion of the economic impact of alcoholism also includes premature disability and death, resulting in the loss of many employees in their prime who have skills that are difficult to replace.

However, the cost of production as estimated by an industry is necessarily limited. In general, it does not include the cost of the unemployed worker, or need it even consider the costs of the reduced productivity of alcohol-troubled workers if their wages are reduced correspondingly. Society, on the other hand, must include the costs of reduced production by all these individuals in its estimate of the costs of alcohol-related problems. Although the wider view was taken in the present study, the estimate is not completely general. The information about some groups within society is too inadequate to allow cost estimates based on their characteristics and behavior.

The lost or reduced production of women, and of alcoholic persons who are institutionalized or living on Skid Row, is not included in the $9.35 billion estimate.

The economic cost of the lost production among women is probably substantial. For several reasons, however, these costs cannot be easily calculated: (1) No reliable market prices are available which would indicate the value of women's services in household or non-market production. (2) There is no reliable estimate of the actual number of alcoholic women; estimates range from 900,000 alcohol addicts (10) to as many as 4.5 million problem drinkers (3). (3) There have been no systematic studies of the changes in the economic roles of family members under the impact of either an alcoholic wife or husband. Thus any estimate at this time of the cost of lost production among alcoholic women would be little more than conjecture.

Similar difficulties apply to any attempt to estimate lost production costs among institutionalized and Skid Row problem drinkers.

Health and Medical Costs

Treatment for alcohol-related conditions accounted for more than 12

TABLE 2

ECONOMIC LOSS DUE TO DIMINISHED PRODUCTIVITY OF MEN. 1971

Age of Head	Est. No. of Families (1000's)(a)	Percent of Families with Problem-Drinking Men(b)	Est. No. of Families with Problem-Drinking Men (1000's)	Mean Gross Deficit in Family Income of Problem-Drinking Men(b)	1968 Estimate of Economic Loss of Problem-Drinking Men (billions of dollars)
21-29	7,197	21%	1,314.9	$1,011	$1.329
30-39	10,744	13	1,243.1	1,860	2.312
40-49	11,506	12	1,228.8	2,356	2.895
50-59	10,063	11	974.1	1,565	1,524
				1968 Estimated Total	$8.06 Billion
				Adjusted 1971 Estimated Total(c)	$9.35 Billion

(a) Derived from Statistical Abstracts of the U.S. (2), Table 54, p. 41, 1971.
(b) From Cahalan and Room (6).
(c) To adjust for inflation, the 1968 estimated total of $8.06 billion was multiplied by the percentage increase in the Consumer Price Index of 16 percent between 1968 and 1971.

percent of the $68.3 billion health bill (9) for adult Americans in 1971. Approximately $8.29 billion was expended for alcohol-related health and medical problems, making this the second largest component of the economic costs of alcohol misuse, problem drinking and alcoholism.

Included in these costs are expenditures for the major types of health care and for medical construction, training, and education. These expenses are adjusted so that they reflect only the share attributable specifically to alcohol-induced problems. Account was taken of the costs for medical care that these patients would have been expected to incur even if they had not been impaired by alcohol, and these were excluded in arriving at the final estimate of $8.29 billion.

Of the $8.29 billion expended for alcohol-related health services, $5.3 billion was for hospital care; $0.9 billion for physicians' services; nearly $0.3 billion for drugs; and more than $1 billion for administration and construction. The $5.3 billion for hospital care is nearly 20 percent of the total hospital expenditures for adults in 1971.

Three independent sources of information were analyzed in the health-medical cost estimate. The literature on the relation between alcohol and medical care utilization was surveyed; the information system of the Nation's Alcoholism Treatment Centers was used to obtain data on hospital utilization by alcoholic patients; and field interviews were conducted among medical and health experts in the alcohol field to obtain estimates of health-care utilization by the general alcoholic population.

Expenditures for dental care were not included. Field interviews established that problem drinkers use fewer dental services than the general population. This appears to be reflected in the poorer dental health of alcoholic persons (16, 17).

Motor Vehicle Accident Costs

The third largest economic cost associated with alcohol misuse is that proportion of the costs of various types of motor vehicle accidents which can be attributed to that cause. It comes to $6.44 billion. A review of the literature suggested that the appropriate dividing line at which responsibility may be attributed to the presence of alcohol is the finding of a blood alcohol concentration of 0.05 percent or higher in the driver or pedestrian (5). In this section, therefore, "alcohol misuse" indicates such a finding.

Three types of accidents were studies: fatal, personal injury, and property damage.

Based on data supplied by the National Highway Traffic Safety Administration, alcohol misuse contributed to 43 percent of the non-pedestrian traffic fatalities (19,000 deaths) in 1971; 38 percent of the adult pedestrian fatalities (2,700 deaths); 14 percent of the personal injury accidents; and 6.8 percent of the property damage accidents. Thus, about 40 percent (21,700) of the motor vehicle deaths were believed attributable to alcohol in 1971. This estimate does not include non-adult pedestrian deaths or any sober adult pedestrians who may have been killed by drivers under the influence of alcohol.

When these accident proportions are applied to the National Highway Traffic Safety Administration's estimates of costs in each category, the cost of alcohol-related accidents can be determined as follows:

Fatal accidents	$ 3.56 billion
Injury accidents.	2.38 billion
Property damage	0.50 billion
Total	$ 6.44 billion

Other sections of the study, such as those on lost production and health and medical costs, undoubtedly include some expenditures which rightfully belong in the motor vehicle category. Double counting could not be avoided completely and this would inflate the estimate. On the other hand, care was taken to estimate these costs conservatively.

Program and Research Costs

The expenditures for alcohol and alcoholism-related programs, including diagnosis, treatment, rehabilitation, prevention, education, and research, were estimated to have totaled approximately $0.64 billion in 1971. Federal, state, and voluntary private agency budgets were reviewed to obtain these cost estimates.

The tremendous surge of interest in and awareness of the problems of alcohol since 1971 has resulted in increased program expenditures. Estimated Federal Government expenditures for alcoholism programs in 1971 were $127 million. Since that time, new agencies, including the National Institute on Alcohol Abuse and Alcoholism, have been created, and more funds are being allocated especially for alcoholism treatment programs, so that current expenditures are substantially greater.

Costs to the Criminal Justice System

The study estimated that violent and antisocial behavior linked to alcohol misuse cost the Nation's criminal justice system more than half a billion dollars in 1971. This amount represents a small but not inconsiderable proportion of the $10.5 billion expended by the police, courts, and correctional institutions in that year (21). These estimates, it should be noted, represent only the costs to the criminal justice system, not any costs of the crime to the victim or to the perpetrator.

No presumption was made that alcohol is the causal agent of any crime. Nonetheless, it is recognized that a certain proportion of all crime that comes to the attention of the authorities has some alcohol involvement. As the National Commission on Causes and Prevention of Violence (18) has put it, "No drug, narcotic, or alcoholic beverage presently known will, by itself, lead to violence. Nevertheless, these substances may, through misuse or abuse, facilitate behavior which may result in violence to persons or property."

Costs were determined first by reviewing the literature on alcohol and criminal behavior. The reports indicated that alcohol is frequently associated with certain violent crimes such as homicide, assault and rape. Other offenses, such as drunkenness, disorderly conduct, driving under the influence of alcohol, and vagrancy, were classified as 100-percent alcohol-related, but liquor-law violations were excluded entirely from this accounting, since they do not bear on alcohol misuse. In 1971, violent crimes associated with alcohol, and the 100-percent alcohol-related offenses, accounted for 3.6 million arrests, equal to 41 percent of all arrests.

Cost estimates were assigned on the basis of determining what percentage of the various crime categories could be attributed to alcohol. The number was then multiplied by average cost data for arrests, trials, and incarceration in each category.

Drunkenness, driving under the influence, disorderly conduct, and vagrancy were found to have cost $74 million in the year 1971. This is based on the finding that there were 3.3 million arrests for those offenses that year, and on an estimate (8) that police and court costs for each arrest came to $22.49 per offense. More than $71.4 million was expended for incarceration as a result of these nonviolent crimes. The estimate of police and court costs per arrest was based on findings in a study conducted for the City of Phoenix, Arizona (8), and to the extent that these costs may not be representative for the entire country the estimate would have to be modified. At the present time the Phoenix study is the only one that provides a basis for formulating a reasonable estimate.

An association with alcohol was recorded in 64 percent of all murders (26), 41 percent of all assaults (19), 34 percent of all forcible rape (1), and 29 percent of all other sex crimes (13).

Arrest and court costs for violent crimes were calculated as follows:

	Police Cost	Court Costs
	(In millions of	dollars)
Criminal homicide	$ 13.5	$10.8
Aggravated assault	209.5	15.5
Forcible rape	13.9	1.8
Totals	$236.9	$28.1

Nearly 35,000 persons were incarcerated for violent crimes associated with alcohol use during 1971. The estimated average cost of maintaining a person in prison is $6 per day (24) and in jail, $6.10 (25). When multiplied by the 34,805 alcohol-involved prisoners, the cost of the imprisonment is $208,830 per day or $76,222,950 per year. This assumes that each of these persons was in prison a full year.

In addition to these costs, and based on an estimate of the U.S. Office of Management and Budget (23), $25 million was assigned as the cost of crime prevention or alcoholism rehabilitation activities by the criminal justice system.

The total costs are summarized in Table 3.

Social Welfare System Costs

Alcohol-related expenditures by the social welfare system can be divided between two categories: social-services costs and transfer payments. Transfer payments represent a transfer of income to the needy in order to arrest the decline in the standard of living of one whose job may have been lost because of alcoholism. These payments, except for administrative costs, are not additional economic costs. They do not measure reduced or foregone output, which is measured directly by the amount of the total reduced earnings of workers. However, these income maintenance payments do have social and political significance, for they represent a financial burden to the taxpayer. If these payments were not socially mandated, the funds could have been used for alternative purposes, either by the taxpayer or the appropriate level of government. Income-maintenance payments attributable to alcoholism were estimated to be $2.2 billion in 1971.

Social-service costs which do meet the criterion of economic cost totaled some $135,100,000 during 1971. The social-service costs were incurred in the areas of child welfare and special welfare. This amount probably represents only a fraction of the economic cost of the weakening and, in some cases, the total disruption of the family structure under the impact of alcoholism.

Social and related research has begun to identify some of the destructive effects of alcoholism on the family. Some of these effects may have complex economic as well as social implications. Chafetz et al. (7) found marital instability in 41 percent of the families of alcoholic persons. As many as 15 to 20 percent of all applications to some family-service agencies involve a drinking problem (2), and the family court in New York City has been reported to estimate that 40 percent of the problems brought to it are directly or indirectly attributable to problem drinking (12).

Economic Cost of Fire

Preliminary research suggested that a considerable portion of the more than $4.5 billion (11) suffered in property loss and expended to combat fires in 1971 might be attributed to the misuse of alcohol. For example, one study (14) attributed more than 80 percent of all fire-related deaths in Memphis over an 8-year period to alcohol. Another study (15) tentatively concluded that "Alcohol was a major contributor in approximately 30 percent" of 89 fires in which fatalities occurred during a 2-year period. "Smoking was established to be the major ignition source in approximately 50 percent of the fires, but alcohol was present in significant quantities in 60 percent of the 'smoking' fires." The data are suggestive, but the existing studies are not extensive enough to allow the development of cost estimates attributable to alcohol misuse, and therefore such estimates were not included in the present study.

TABLE 3

SUMMARY OF COSTS TO THE CRIMINAL-JUSTICE SYSTEM

	Violent Crimes	100-Percent Alcohol-Related Offenses
Police		
Cost per case		$ 17.80
Total for alcohol-involved arrests	$236.9 million	$ 58.6 million
Court		
Cost per case		$ 4.69
Total for alcohol-involved procedure	$ 28.1 million	$ 15.4 million
Jail		
Cost per day per inmate		$ 6.10
Total for alcohol-involved inmates		$ 71.4 million
Prisons		
Cost per day per inmate	$ 6.00	
Total for alcohol-involved inmates	$ 76.2 million	
Other		
Crime prevention (alcoholism rehabilitation)	$ 25.0 million	
Total		$511.5 million

Summary

An awareness exists in society that the misuse of alcohol is pervasive and significant. Events such as broken families, mental anguish, accidents, physical pain, work not done, acts of violence, and personal degradation might comprise some of the entries on the debit or minus side of alcohol's social account. If alcohol could be linked conclusively as a causal factor in a certain number or proportion of unwanted social and personal occurrences, it would be possible to add up these events and thereby obtain a total measure of adverse consequences. At present, however, there is no general unit of account that would permit a meaningful summing of such diverse events as, for example, (a) so many disturbed children of alcoholic parents plus (b) a certain number of alcohol-induced suicides plus (c) the number of days missed by an alcohol-troubled worker. Nevertheless, many of the adverse social consequences of alcohol also have economic components. The present effort indicates that it is possible to aggregate certain adverse economic effects which might be related to alcohol and thereby obtain a limited but socially significant measure of the economic consequences of alcohol misuse and alcoholism. There are many reservations regarding the estimated costs of $25.37 billion in six areas, including health, traffic accidents, welfare payments, crime, and productivity. Nevertheless, both the number and the techniques for estimating it represent a distinct advance in understanding, as well as a foundation for continued study.

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Chapter IV

ALCOHOLISM: HEREDITY AND CONGENITAL EFFECTS

For about 100 years, scientists have been seeking a definitive answer to the question: "Is alcoholism hereditary?"

Some 30 years ago E. M. Jellinek (10) reviewed the controversial evidence up to then and concluded that, on the whole, the indications were against a direct heritability of alcoholism. Rather, it seemed to him, some people inherited a non-specific liability for developing personal trouble, and in some of them the trouble took the form of alcoholism. By that time, Anne Roe (17,18) had completed her analysis of the fate of 36 children of alcoholic parents who were taken away from their biological families when quite young and raised in foster homes. When examined in their 30s none of these people, of whom 70 percent were drinkers, showed any signs of trouble with alcohol. She concluded that alcoholism was probably not inherited, and that its more common occurrence in children raised by alcoholic parents must be an effect of the environment in which the children were reared.

Most of the research since then has been largely inconclusive, though several reports have suggested that the inheritance factor may be more important than had been thought in the 1940s (1,13,16,24). In a recent study (8), an American-Danish research team which concluded that there probably is a "genetic predisposition" for the severest form of alcoholism, but that this still remains to be proved.

The Danish collaborators in the study were Dr. Fini Schulsinger and Dr. Lief Hermansen, psychiatrists at the Psykologisk Institut in the Kommunehospitalet at Copenhagen. Their United States colleagues were Dr. Donald W. Goodwin, Associate Professor of Psychiatry and Dr. Samuel B. Guze, Professor of Psychiatry at the Washington University School of Medicine, and Dr. George Winokur, Professor and Head of the Department of Psychiatry at the University of Iowa School of Medicine.

The team's findings were challenged by other scientists within a few months of publication (22). The reaction suggests that the question of the possible role of heredity in causing alcoholism will remain unsettled for some time. But it is apparent that the American-Danish collaborators have moved science the closest it has ever been to an affirmative answer to the question of a hereditary link in alcoholism.

Family studies invariably have shown markedly higher rates of alcoholism among relatives than in the general population. The lifetime expectancy rate for alcoholism among people at large has been estimated to be about 3 to 5 percent among men and 0.1 to 1 percent among women (6). By way of contrast, Goodwin, the principal author of the American-Danish report, has cited studies indicating that alcoholism rates in sons of alcoholic parents may reach between 25 and 50 percent, and among daughters 3 to 8 percent (6).

One study reviewed by Goodwin found that persons manifesting "periodic" and "compulsive" alcoholism more frequently had alcoholic children than did those whose alcoholism presumably was less severe. The fact that home environments were equally good or bad in both groups suggested that alcoholism may have a "hereditary component."

Perhaps the most productive method for distinguishing environmental from hereditary factors in the occurrence of alcoholism, according to Goodwin, is to study individuals raised apart from their biological relatives. A comparison of 22 adopted children of nonalcoholic parents with 27 adoptees born to alcoholic parents found a higher percentage of the offspring of alcoholic

parents to be drinkers. But the size of the difference was insignificant and neither group had drinking problems. The researchers concluded, therefore, that there was no evidence in their work of a hereditary influence on drinking.

To pursue more definitively the question of inherited alcoholism, Goodwin and his collaborators took advantage of the existence in Denmark of a pool of 15,000 known adoptees most of whom were separated from their biological parents in early childhood and raised by nonrelatives. Such a research opportunity might not be found in the United States or in many other countries where adoption agency records are very difficult to obtain and little information is available about the drinking habits of individuals whose children are adopted.

The "proband" group in the Denmark-based investigation (8) consisted of 55 male adoptees with at least one biological parent who had been hospitalized primarily for alcoholism, had been separated from his biological parents during the first six weeks of life, had been adopted by nonrelatives, and had no known subsequent contact with the biological parents.

A comparison group (controls) consisted of 78 adopted males to whom the same criteria were applied as to the probands except that these people had no alcoholic biological parents. The groups were matched in approximate age at adoption and adult age. The mean age in both groups was 30, with a range of 25 to 45, at the time they were interviewed.

All adoptees were interviewed by a Danish psychiatrist, who was not told beforehand to which group each one belonged. The information obtained from each interviewee included data on demographic factors, adoptive parents, psychopathology in adoptees, drinking practices and problems, and a wide variety of other life experiences. The interview records were sent to Washington University in St. Louis for coding, card punching, and computer analysis, again without knowledge of any subject's history--whether he was a proband or control. Thus, the study was "blind" from start to finish.

Four categories of criteria were used to define moderate, heavy, and problem drinkers, and alcoholic persons. The moderate drinker was neither a teetotaler nor a heavy drinker. An individual was a heavy drinker if, for at least a year, he drank daily and had six or more drinks on one occasion at least twice a month, or had six or more drinks at least once a week for over a year, but reported no problems. A problem drinker was a heavy drinker with problems, but not enough of them to be classified as an alcoholic person; alcoholism was inferred if an individual met the criteria of heavy drinker and had alcohol-related problems in at least three of the following four areas:

1. Social disapproval of his drinking by friends and parents.
   Marital problems.
2. Job trouble.
   Traffic arrests.
   Other police trouble.
3. Frequent blackouts.
   Tremor.
   Withdrawal hallucinations and convulsions.
4. Loss of control.
   Morning drinking.

Of the 55 probands, 10 met the criteria for alcoholism and the group had nearly four times the alcoholism rate of the controls. Heavy and problem drinking occurred somewhat more frequently in the control group, but the difference was not statistically significant. Moreover, when members of both groups were ranked on a four-point scale from the mildest drinkers with the fewest problems to the heaviest with the most problems, the probands were found to have twice as many drinkers in the heaviest category as the adoptees with nonalcoholic biological parents.

Almost without exception, probands had more drinking problems than controls. The differences were statistically significant in five varieties of problems--hallucinations, inability to control drinking, morning drinking, amnesia, and tremor.

The two groups also differed significantly with respect to psychological treatment and hospitalization. Psychological treatment was defined as any type of therapy--verbal or pharmacological--administered by any health professional for mental or emotional problems. Nearly half the probands had received

psychological treatment, compared to one-quarter of the controls. Probands had five times the rate of psychiatric hospitalization, and six of the eight hospitalized probands but neither of the two hospitalized controls were alcoholic persons.

Of the 22 sons of alcoholic parents who had received psychological treatment nine were alcoholic persons, compared with only two of the 19 controls. This difference is statistically significant.

The study found no significant correlation between the drinking pattern of the adoptees and the presence of alcoholism in the adoptive parents. About 13 percent of the probands had an adoptive father who was an alcoholic person, compared with about 22 percent of the controls.

Goodwin et al. emphasize the fact that the occurrence of alcoholism among children of alcoholic biological parents was greater despite separation from those parents before the age of six weeks. The probands, they point out, were significantly distinguishable from the controls in only one respect other than alcoholism, and that was divorce. The probands were three times more likely to be divorced than the controls. The data suggest, Goodwin notes, that "divorce and alcoholism may perhaps be co-variants of a single or related genetic predisposition."

"The finding that, apart from divorce, only alcoholism significantly distinguished the two groups suggests there may be a specificity in the transmission of the disorder heretofore underestimated."

"Also, it is interesting that heavy and even problem drinking, as defined in this paper, fail to distinguish the two groups. If anything, there was somewhat more heavy and problem drinking in the control group than in the proband group, although the differences were not significant. This suggests that severe forms of alcohol abuse may have a genetic predisposition but that heavy drinking itself, even when responsible for occasional problems, reflects predominantly nongenetic factors."

Nevertheless the authors do not consider their findings to constitute proof of a "genetic predisposition" for alcoholism--only that such a predisposition now seems more probable than it had seemed heretofore.

Since publication of the initial report on the study, Goodwin has reported a follow-up study of drinking problems in adopted and nonadopted sons of alcoholic parents (5). This work was made possible by the fact that, in 20 cases in the original investigation, the adopted sons of alcoholic parents had brothers who were raised by their own parents and were available for interview. Data for this study were drawn from the original work and from interviews with 30 nonadopted and 20 adopted sons of 19 alcoholic biological fathers. To avoid bias, interviews also were conducted with 50 nonadopted controls selected from census records. Like the first investigation, this study was blind from beginning to end.

The comparisons showed that five men in each of the study groups were alcoholic persons according to the criteria used in the original research. The alcoholism rate among adoptees was higher than the rate among nonadopted brothers, but the difference was not statistically significant. Neither were there significant differences in the categories of moderate, heavy, or problem drinkers.

The primary finding of the second study was that sons of alcoholic parents were no more likely to become alcoholic persons if reared by their own parents than if separated from their biological families soon after birth and reared by nonrelatives. This was true, Goodwin notes, despite the fact that, as a group, the nonadoptees were older than their adopted brothers and, therefore, presumably further advanced into the age of risk for alcoholism.

The findings also suggested a relationship between the severity of alcoholism in parents and increased tendencies toward alcohol problems in the sons. Since there was no significant association of drinking pattern and length of exposure to alcoholic parents, it seemed possible that the severity of alcoholism in the parent may influence the drinking pattern of the children independently of home influence.

Further analysis of the new data, Goodwin (8) suggests, indicates that severe alcoholism may involve genetic factors not present in milder cases and,

therefore, may be more transmittable. He notes that alcoholism, not heavy drinking, differentiated adopted children of alcoholic parents from the adopted children of nonalcoholic persons in the first study. In short, he concludes, severe and classic forms of alcoholism in part may have a genetic basis, whereas heavy drinking, even with occasional problems, may have mainly psychological origins.

At least one other study supports the crucial finding of the follow-up to the original investigation. Schuckit and his co-workers (21) found a correlation between alcoholic parent and alcoholic children irrespective of personal contact with the parent. Commenting on this, Goodwin (5) writes:

"It is interesting to note how little environment appeared to contribute to the development of alcoholism in our sample of sons of alcoholics. This tends to contradict the oft-repeated assertion that alcoholism results from the interaction of multiple causes--social, psychological, biological, etc. This may be true of milder forms of alcoholism of certain 'species.' Conceivably, however, severe forms of alcoholism may be relatively uninfluenced by environment, given free access to ethyl alcohol."

The interpretation of the findings of the initial Danish-American study has been challenged by Dr. Alexander Tolor of the Institute for Human Development, Fairfield University and Dr. John S. Tamerin of the Silver Hill Foundation in New Canaan, Connecticut (22). Their critique is based on what they regard as inadequacies of method in assessing the psychiatric illnesses of adoptive parents and in classifying drinking behavior. Psychiatric illness, the critics note, was estimated on the basis of information from adoptees "who certainly cannot be considered objective judges." In addition, the general focus was on gross pathology in the adoptive parents, mainly on whether or not they had sought treatment.

Such a gross criterion, the challengers assert, "fails to take into account more subtle differences in the emotional climate" of the homes. Thus, the assumption of home-atmosphere equivalence in the two groups cannot be accepted.

As for the classification of drinking behavior, Tolor and Tamerin say:

"Whether or not the data reveal significant group differences depends entirely on how the problem drinker is operationally defined. Thus, while 18 percent of the probands were characterized as alcoholics, compared with five percent of the controls, there was a reverse trend with regard to the category 'problem drinker': 14 percent of the controls and nine percent of the probands were defined as problem drinkers. If we combine these two categories into one, which would conform with many authers' conceptions of alcoholism, 27 percent of the controls were either problem drinkers or alcoholics. This difference is not statistically significant.... If we then consider the heavy drinkers, we find a reverse trend: 36 percent of the controls but only 22 percent of the probands were heavy drinkers. The evidence, therefore, is far from being convincing in support of the genetic hypothesis."

In a response to the critique of Tolor and Tamerin, Goodwin (7) says that, with respect to the assessment of psychiatric illness, "subtle" differences between the two groups could not have been detected because it had not been possible to interview the adoptive parents, many of whom were no longer living.

The criteria for drinking categories and diagnoses, Goodwin states, were obviously arbitrary and could not have been otherwise. It was here, he adds, that the blindness of interviews was crucial. He gives assurance that the blindness was genuine and "therefore, however arbitrary the categories, assignment to them was made blindly and without possibility of observer bias."

"I was astounded when the printouts showed that practically the only difference between the offspring of alcoholics and the offspring of nonalcoholics was alcoholism," he concludes. "I really think, even with small groups, that it defies chance to believe that sons of hospitalized alcoholics would differ from sons of nonalcoholics only in being alcoholics, particularly since the category 'alcoholism' was defined in advance, with the criteria applied blindly."

Yet another reason for a cautious interpretation of the findings reported by Goodwin et al. arises from a source independent of the question of

alcoholism. In a review of the role of heredity in determining intelligence-quotient (IQ) scores, Layzer (14) has emphasized that in fact monozygotic twins reared apart from their biological parents are not the best material for studying the contribution of heredity but, rather, unrelated foster children reared together, or half-sibs reared in "statistically independent" environments. He demonstrated, moreover, that when the factor at issue is a plastic sort of human behavior, heritability cannot be calculated reliably unless the contribution of environmental conditions is eliminated: "The absence of significant effects arising from genotype-environment correlations is a necessary condition for the applicability of conventional heritability analysis to phenotypically plastic traits." Since alcoholism is probably even more than IQ a "plastic" type of human behavior (3), the role of heredity in its causation is indeed difficult to establish.

Heredity, in the sense of genetic transmission, is not the only way in which the alcoholism of parents may affect their offspring. That poorly nourished pregnant women give birth to children disadvantaged in health has been known a long time. Since alcoholic women tend to be malnourished, infants born to them are less healthy, less alert, and less well developed than other newborns.

The inferior condition of children of alcoholic parents was observed even in antiquity, and in the pre-modern medical era this was attributed to damage of the parental germ plasm by alcohol. That notion--blastophthoria--has long since been discounted (10), and the disadvanted state of newborn infants as well as the poorer development of older children of alcoholic parents came to be attributed to the poor intrauterine environment of the fetus and the postnatal lack of adequate care and nurture.

Recently, however, several reports in the U.S.A. and England have indicated an increased rate of birth of maldeveloped or malformed infants to alcoholic mothers, and the authors have suggested that the cause is direct fetal damage by alcohol (4,9,11,12).

It is difficult to comprehend how the small concentrations of alcohol that reach the fetus--they are not more than those in the blood of the mother--even in the case of heavy drinking, as by alcoholic people, could cause the sort of injuries and malformations described in these reports. Bianchine and Taylor (1974) have pointed out that at least one type of malformation reported in children of alcoholic mothers (2), Noonan's phenotype, has been observed in 32 cases, only one of which involved an alcoholic mother. But the matter is of great importance whether a direct effect of alcohol is the cause, or an indirect effect, or something unsuspected that makes some women who are liable to give birth to malformed infants also more liable to have developed alcoholism. The problem is one that can be studied by research in animals and no doubt will be pursued in a number of laboratories now that the question has been opened up. In the meantime it seems obvious that the consumption of large amounts of alcohol by pregnant women may in some way injure the fetus. Thus, intensive therapeutic work with pregnant alcoholic women seems to be an especially worthwhile endeavor. For while the numbers involved may not be large, the tragedy of injury to the unborn child is extraordinarily touching.

One unquestionable effect of heavy drinking by the pregnant woman is that as she becomes intoxicated so does the fetus, since alcohol passes to the fetus in approximately the same concentration as the mother reaches in her blood (23). Whether or not permanent injuries are incurred, the effects can be serious, especially immediately after birth. Women about to give birth are usually hospitalized and deprived of alcohol. If they have been on a bout, they are likely to suffer more or less severe withdrawal symptoms, sometimes even delirium tremens (15,20). Since the fetus underwent the same severity and duration of alcohol intoxication as the mother, the newborn too will show symptoms of an alcohol withdrawal syndrome and will require appropriate treatment just as the mother does. The observation of such symptoms in neonates opens up the possibility , based on the view that addiction is defined by withdrawal phenomena, that such infants are in fact born alcohol addicts, or that the prenatal addiction may establish a permanent addictive liability in the newborn child's central nervous system.

Undoubtedly the near future will see more and more study of the question of a possible hereditary predisposing factor that might contribute to the development of the life-style called alcoholism. In the meantime, the most that can be said safely seems to be that alcoholism may be a familial disease--a fact already suggested in the 18th century by the first great American physician, Dr. Benjamin Rush, who wrote (19) that it "resembles certain hereditary, family, and contagious diseases."

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Chapter V

SOME HEALTH CONSEQUENCES OF ALCOHOL USE

1. Alcohol and Cancer

Physicians have clinically observed an association between heavy drinking and certain types of cancer for many years. The fact that many patients with cancer of the mouth, pharynx, larynx, esophagus, and liver are found to have alcoholism or alcohol-related cirrhosis has stimulated research into the possible role alcohol might play in carcinogenesis, although attempts to produce cancer in animals by prolonged administration of alcohol have failed (25).

The first suggestion that there might be a relationship between alcohol and cancer was made in France in 1910, when Lamu (30) showed that the chronic intake of absinthe (containing 75% alcohol) was associated with carcinoma of the esophagus. Thereafter, however, the possible role of alcoholism in the development of cancer received little attention until four decades later. By 1950 the relationship between cigarette smoking and lung cancer was recognized, and this led investigators to take a closer look at the whole spectrum of personal habits in relation to the development of cancer. Drinking also came under scrutiny, and during the following decade several epidemiological studies seeking to explore a link between alcoholism and cancer were carried out.

In 1964 the World Health Organization (61) surveyed the research in alcoholism and cancer to that time and concluded: "The association between excessive drinking of alcoholic beverages and cancer of the mouth, the larynx, and the oesophagus has been demonstrated in several epidemiological studies. Animal studies have so far failed to support this. Alcoholism is, however often associated with other factors that may be pertinent, including dietary deficiencies, and its control may help to lower the incidence of oral, laryngeal, and oesophageal cancer."

Epidemiological studies thus disclosed the needs for accurate assessment of all personal habits, including the amount of alcohol intake. It is known to be a difficult task to establish reliably how much alcohol is consumed by heavy drinkers. Moreover, there is the confounding condition that people who drink heavily often also smoke heavily. The latter fact was first taken into account by Flamant (15), who assessed both factors and reported that hypopharyngeal and laryngeal cancer had a "very strong" relationship to both alcohol and tobacco use, while cancer of the esophagus and tongue had a "very strong" relationship to alcohol intake but only a "strong" relationship to smoking based on analysis of previous research (Table 1). The frequent coexistence of alcohol and tobacco use has made it difficult to identify the influence of each habit independently in relation to cancer; yet this question is critical in determining to what extent and how each may contribute to the development of cancer.

The means by which alcohol may exert a carcinogenic effect in man are unknown, but several have been suggested and are being studied. Among the possibilities are the effect of prolonged and repeated contact of body tissues with alcohol in various forms; the role of alcohol as a cocarcinogen with tobacco or as a trigger mechanism for a hypothetical viral cause; the consequences of alcoholism such as malnutrition, anemia, and poor hygiene; and the possible presence of carcinogenic substances in some alcoholic beverages. Each of these hypothesized mechanisms becomes important in consideration of the possible effect on specific sites and types of cancer.

TABLE 1

THE RELATIONSHIP BETWEEN CANCER AT VARIOUS SITES AND THE USE OF ALCOHOL AND TOBACCO[a]

Sites	Number of Cases	Relationship with use of alcohol	Relationship with use of tobacco	Sex Ratio (M:F)
Hypopharynx	4,225	very strong	very strong	28.0
Larynx	5,524	very strong	very strong	27.4
Esophagus	5,007	very strong	strong	16.6
Lung	4,616		very strong	11.8
Oropharynx	3,216	strong	very strong	11.6
Tongue	4,856	very strong	strong	9.3
Oral cavity (other sites)	4,145	strong	very strong	8.6
Lips	3,609		strong	8.1
Bladder and other urinary organs	962		strong	2.6

[a]Source: Flamant et al. (15)

Alcohol and Specific Sites of Cancer

Upper Aerodigestive Tract

Cancers of the upper aerodigestive tract (the mouth, pharynx, and larynx) appear to be related to heavy drinking in the United States and other parts of the world where these cancers occur with high frequency in men. Tobacco use and alcohol consumption each contributes separately to increased risk of cancer, and data suggest that heavy use of both has an additive and possibly even a synergistic effect in increasing risk (47). Laboratory experiments indicate that alcohol and tobacco augment the carcinogenic effect of 7-14-dimethylbenzanthracene in hamsters and mice (14, 53), giving some laboratory support for this epidemiological observation.

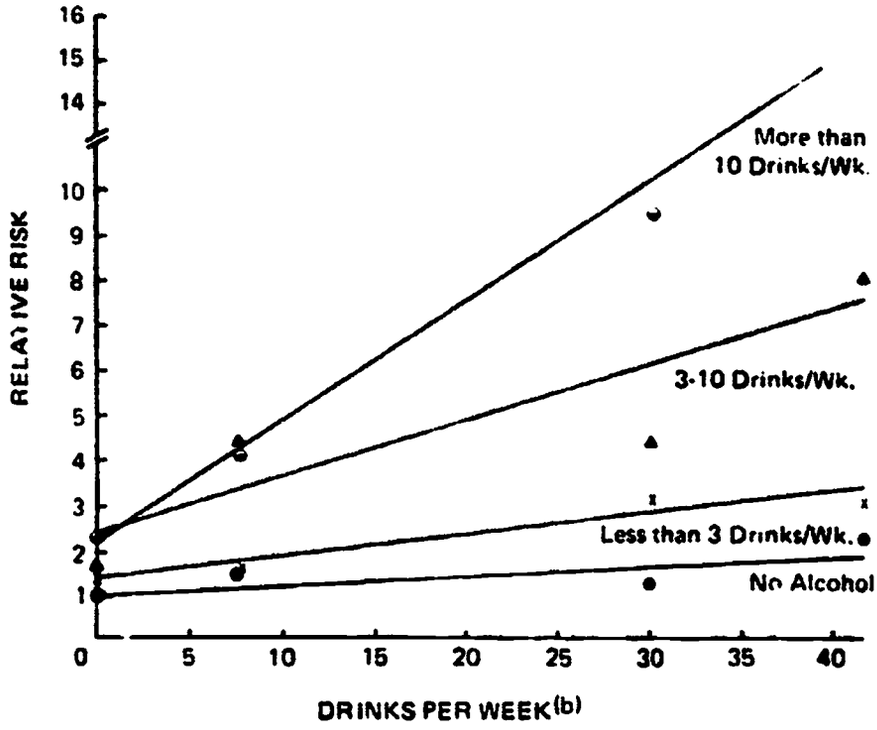
The use of tobacco in one form or another is the most important worldwide cause of mouth cancer (18). This has been demonstrated in many studies of tobacco chewing, snuff dipping, the chewing of betel (mixed betel nuts, tobacco, and lime), beedi smoking (Indian home-rolled tobacco), and cigarette, cigar, and pipe smoking. Risk is further increased among people who also drink heavily (63). It should be noted that while cancer of the lip has been specifically linked to clay and metal pipe smoking, cancer of the skin adjacent to the lips is related to exposure to the sun's ultraviolet rays and not to alcohol or tobacco use, demonstrating the specificity of discrete sites to different carcinogenic factors.

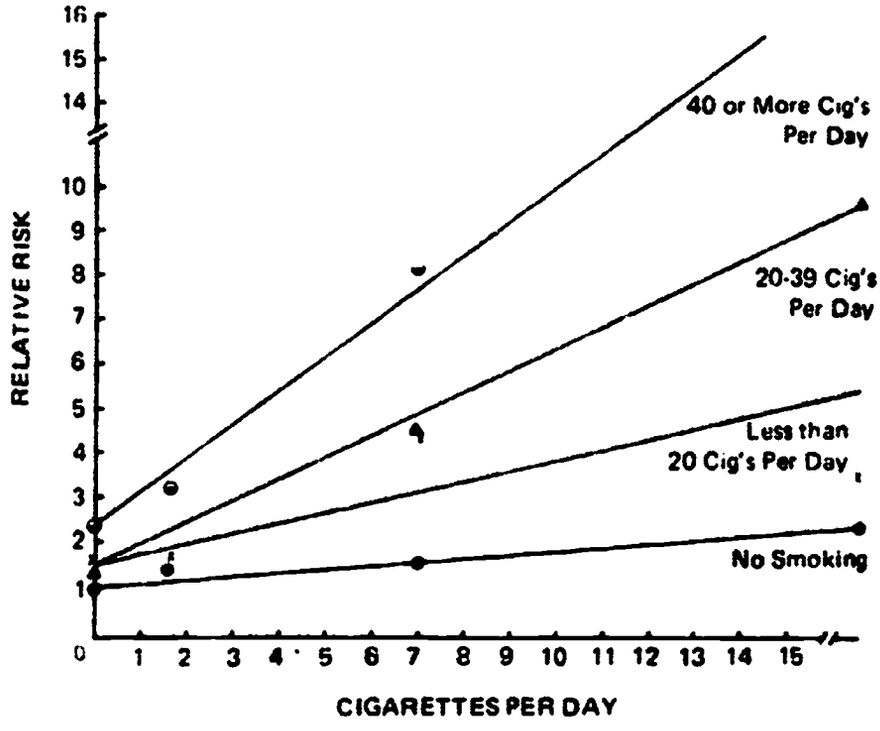
The roles of smoking and drinking in cancers of the upper aerodigestive tract have been difficult to separate due to the association of heavy drinking and smoking in the same individuals. One study (13) showed that 93 percent of the men and 91 percent of the women in a group of alcoholic outpatients were smokers, proportions far higher than in the general population. A recent preliminary report by Kissin et al. (27) revealed that patients who had primary cancers of the floor of the mouth, the hypopharynx, and the esophagus, had a higher drinking-to-smoking ratio than patients with primary cancers of the roof of the mouth, the larynx, and nasopharynx who smoked more than they drank. Since alcohol comes in closer contact with the "ingestion tract" and tobacco smoke comes in closer contact with the "inhalation tract," the authors suggest a possible differential causative relationship. In addition, patients with cancer of the ingestion tract had a greater use of distilled spirits than did patients with cancer of the inhalation tract.

Attempts to separate tobacco from alcohol as a risk factor in cancer of the mouth and pharynx require sophisticated epidemiological models. A four-level gradation for each exposure to alcohol and a matrix of 16 relative risk estimates were used in a study by Rothman and Keller (47). These estimates were plotted to permit inspection of either alcohol intake or cigarette smoking as the independent variable (Figure 1 and see Table 2). The increasing slope of relative risk for the higher levels of both drinking and smoking suggests the possibility of a synergistic effect, though based on this alone the simple additive model cannot be excluded. These findings support earlier reports (31, 32) that the relative risk of buccal and upper respiratory tract cancer among those who use both alcohol and tobacco was greater than the sum of either risk alone.

Toward the end of the 1950s Wynder and his colleagues in a series of studies (63, 64, 65, 66) found that patients with oral and laryngeal cancers were considerably heavier drinkers than control patients. By separating individual risk factors in oral cancer, the conclusion was reached (66) that "heavy drinkers" had roughly 10 times greater risk of developing cancer of the mouth than "minimal" drinkers. When amount of alcohol consumed increased, the relative risk of cancer of the mouth, extrinsic larynx, and esophagus was also increased (Figure 2), much more so with whiskey than beer and wine (69).

Figure 1. RELATIVE RISK OF ORAL CANCER ACCORDING TO LEVEL OF EXPOSURE TO ALCOHOL AND SMOKING (a)





Risk is expressed relative to a risk of 1.00 for persons who neither smoked nor drank.

(a) Source: Rothman and Keller (47).

(b) Plotted with conversion of drinking scale from ounces of alcohol per day to "drinks per week." Regression lines fitted by eye.

TABLE 2

RELATIVE RISK OF ORAL CANCER ACCORDING TO LEVEL OF EXPOSURE TO ALCOHOL AND SMOKING (a)

Ounces of Alcohol Per Day	Cigarette Equivalents Per Day			
	0	Less than 20	20-39	40 or More
No alcohol	1.00	1.52	1.43	2.43
Less than 0.4 oz.	1.40	1.67	3.18	3.25
0.4 – 1.5 oz.	1.60	4.36	4.46	8.21
More than 1.5 oz.	2.33	4.13	9.59	15.50

a) Source: Rothman and Keller (47).
Risk is expressed relative to a risk of 1.00 for per[illegible]o neither smoked nor drank.

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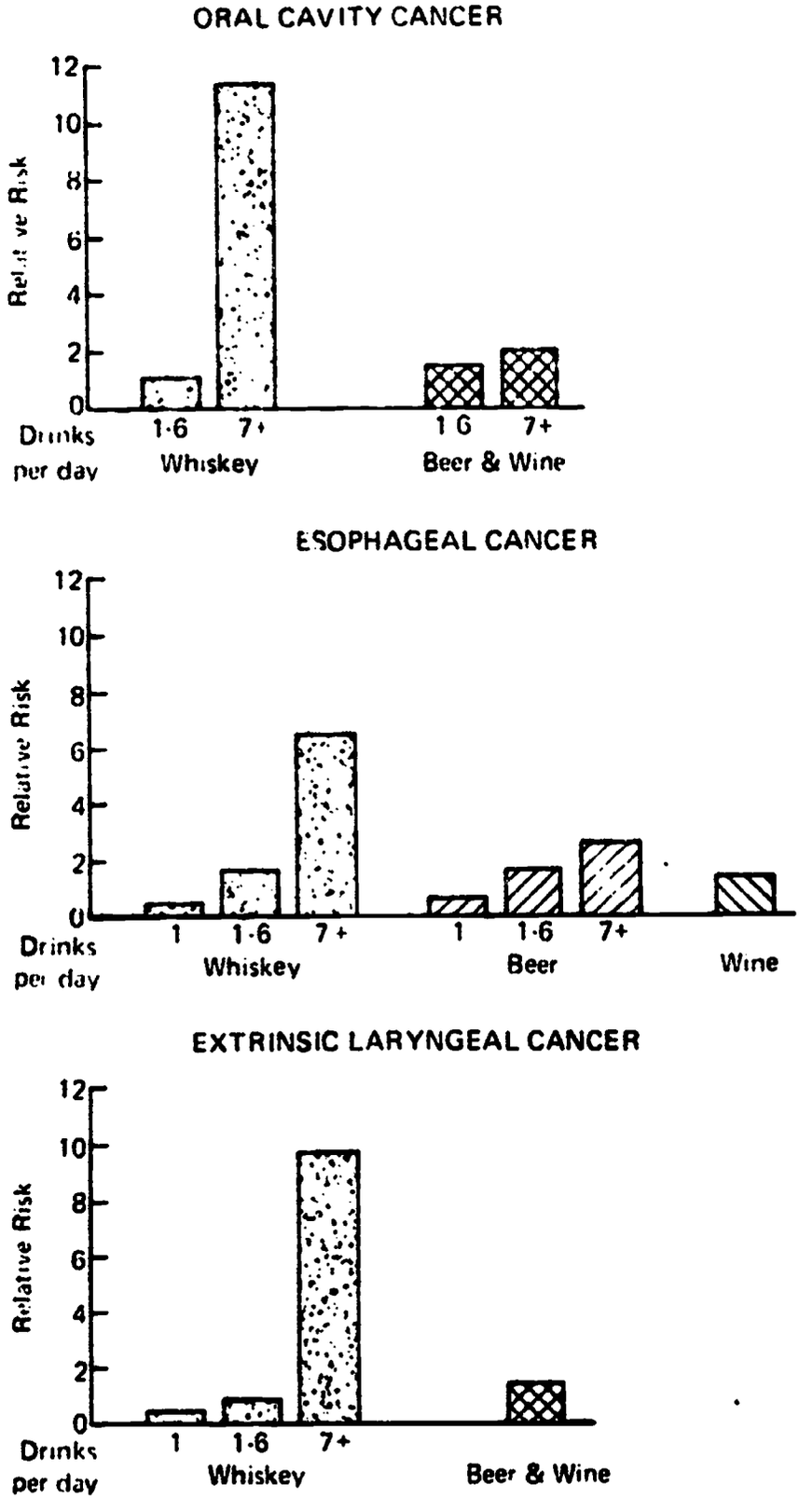
Figure 2. RELATIVE RISKS OF DEVELOPING CANCERS OF THE ORAL CAVITY, ESOPHAGUS, AND LARYNX BY TYPE AND AMOUNT OF ALCOHOL CONSUMED[a]



[a] Reproduced from Wynder and Mabuchi (69) by permission of Academic Press.

It has been suggested that the heavy smoking might initiate and the heavy drinking synergistically promote laryngeal cancer (69).

A case-control study of oral and pharyngeal cancer among veterans led Keller (24) to conclude that there is a strongly positive association between drinking more than 1.6 oz. of absolute alcohol per day plus smoking 40 or more cigarettes per day and cancers of the mouth and pharynx. Of the cancer patients in that study, 43 percent were classified as "heavy drinkers" (over 1.6 oz. of absolute alcohol per day) compared to 20 percent of the control subjects.

Other investigators (38,39,57,60) have reported an apparent association between drinking and cancer of the mouth, pharynx, larynx, and esophagus that persisted when control subjects were matched for tobacco use. Lung cancer was found to be associated with tobacco but not with alcohol use, while cancer of the stomach, which has been declining in recent years, was associated with neither alcohol nor tobacco use. No association was found between cirrhosis of the liver and cancer of the mouth, pharynx, larynx, or esophagus. From these epidemiological indications Terris and Keller (57) inferred that alcohol can act as a carcinogen or co-carcinogen on susceptible tissues of contact but not indirectly through impaired liver metabolism.

Research in France has provided important evidence on the relation of alcohol to cancer of several sites. Schwartz et al. (52) investigated 3,937 cancer patients according to the amount they drank and whether they suffered from alcoholism--diagnosed by the occurrence of tremors of the extremities, spider telangiectasis, and morning drinking. They also studied another group of 1,807 patients to determine the possible interaction of alcohol and tobacco. The results showed that patients with cancer of the mouth, hypopharynx, larynx, and esophagus drank considerably more than the control subjects, even after adjustment for tobacco use and age (Table 3). This relationship was particularly striking in cancer of the esophagus. Alcoholism was also significantly more common among patients with cancers of the same sites, and also with cancer of the tongue, even after adjusting for tobacco use and age.

Three prospective studies of the drinking patterns of alcoholic persons and their risk of developing cancer have been conducted in Canada, Norway, and the United States (Table 4). The first study, by Schmidt and de Lint (49), a follow-up of 5,000 men and 1,000 women treated at the Toronto Addiction Research Foundation between 1951 and 1963 showed that cancer of the upper aerodigestive tract occurred five times more frequently among the alcoholic persons than in the general Ontario population.

In a follow-up to the end of 1962 of 1,722 men who had been treated for alcoholism in Oslo, Norway between 1925 and 1940, Sundby (56) showed that the men faced a multifold increase in the risk of death from cancer of each of the upper aerodigestive tract sites, nearly the same increased risk from cancer of the larynx, and a smaller increased risk of death from lung cancer. No excess mortality from cancers of the stomach, pancreas, liver, or intestines was observed.

A comparison by Pell and D'Alonzo (43) of 900 alcoholic employees of an American corporation with an equal number drawn from among 75,000 non-alcoholic employees of the same company showed that the alcoholic employees had a nearly fourfold excess of cancer deaths (26 cases versus 7) involving the mouth, pharynx, esophagus, and lung.

In parts of Asia (particularly India), where drinking in the general population is relatively minimal and alcoholism is presumed to be rare, cancer of the mouth is among the most common neoplasms (Figure 3). Tobacco is thought to be the most potent carcinogenic factor. Prolonged exposure of oral tissues to tobacco may result in leukoplakia, lesions which have a high risk of malignant transformation and are generally considered to be precancerous (45). The heterogeneous nature of the etiology of upper aerodigestive tract cancer becomes clear when the worldwide incidence is considered, but heavy alcohol intake appears to be a significant contributing factor in the United States and other Western countries.

Malnutrition and anemia--conditions common in alcoholism--are also associated with increased risk of oral, hypopharyngeal, and esophageal

TABLE 3

ALCOHOL CONSUMPTION AND PERCENTAGE OF ALCOHOLIC PERSONS AMONG CANCER CASES AND NON-CANCER CONTROL GROUP. WORKERS IN THE PARIS AREA[a]

		Quantity Consumed				Percentage of Alcoholic Persons			
	Number of cases	Ounces of alcohol consumed daily[c]	Gross significance[b]	Significance[b] level after adjusted for: Tobacco	Tobacco and age	%	Gross significance[b]	Significance[b] level after adjusted for: Tobacco	Tobacco and age
Site of Cancer									
Tongue	43	5.2	•••	•		74	•••	•••	•••
Buccal cavity (other locations)	23	5.4	••	•	•	83	•••	•••	••
Oropharynx	34	4.9	••			56			
Hypopharynx		5.5	•••	•	•	62	••	•	•
Larynx	63	5.4	•••	••	•	61	••	•	••
Esophagus	100	5.3	•••	••	••	58	••	•	•
Control group	366	4.0				43			

(a) Source: Schwartz et al. (52)

(b) Significance levels are represented as follows:

- • $p < .05$
- •• $p < .01$
- ••• $p < .001$

(c) Each ounce of absolute alcohol is equivalent to 2 ounces of 100 U.S.-proof whisky.

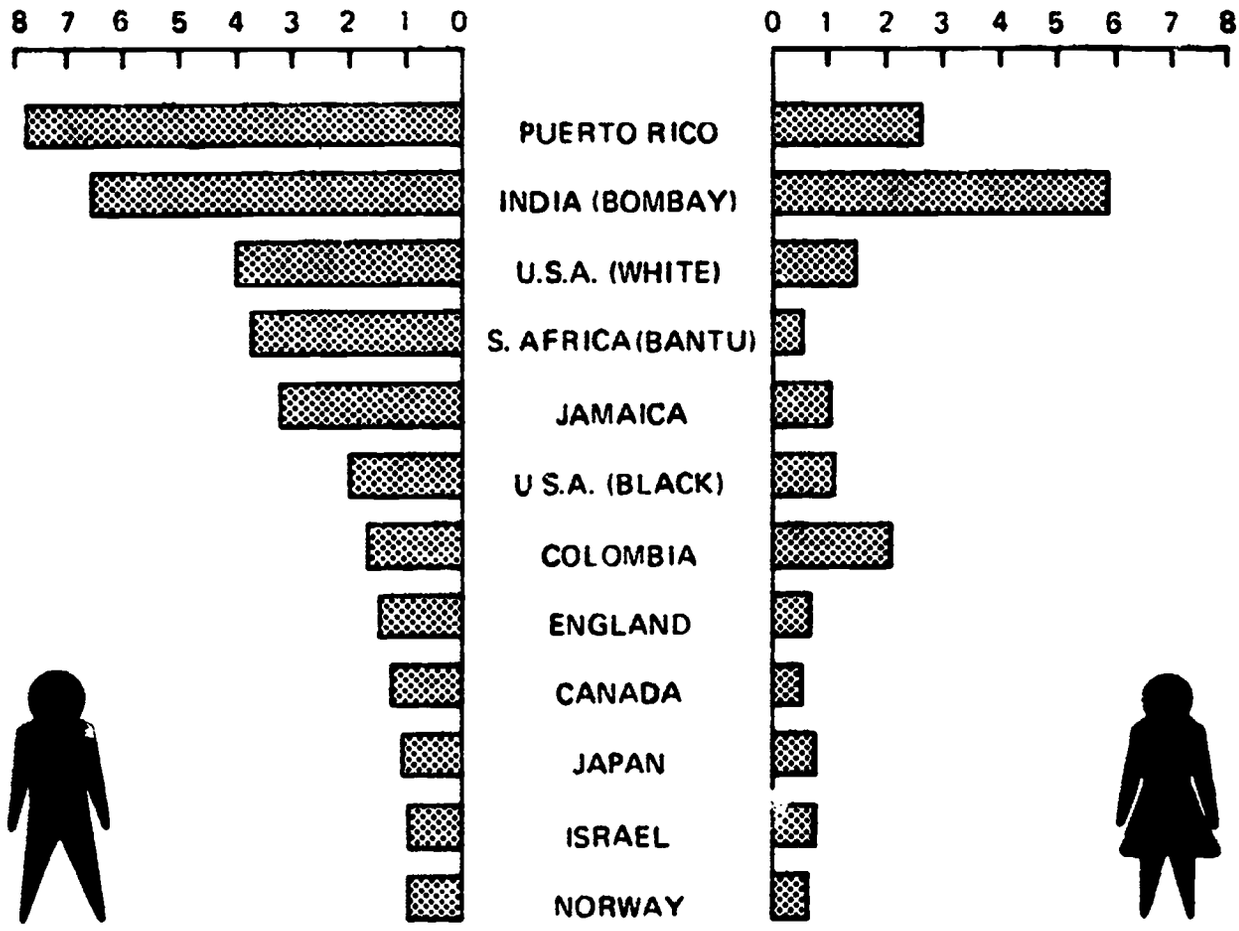
TABLE 4

NUMBER OF DEATHS FROM CANCER AMONG ALCOHOLIC PERSONS COMPARED WITH DEATHS IN MATCHED CONTROL GROUPS

Cause of Death	Schmidt & DeLint (Toronto)			Sundby (Oslo)			Pell and D'Alonzo (U.S.)		
	Deaths		Ratio	Deaths		Ratio	Deaths		Ratio
	Alcoholic Group	Control Group		Alcoholic Group	Control Group		Alcoholic Group	Control Group	
All Causes	639	315.2	2.03	1,061	496.9	2.14	102	32	3.22
Cancer (all forms)	77	58.1	1.33	118	85.5	1.38	26	7	3.71
Lung	30	13.9	2.16	19	5.4	3.54	5	2	2.50
Larynx	7	0.8	8.75	5	0.6	8.20	3	0	*
Oral(a)	6	1.7	3.53	22	1.7	12.94	3	0	*
Esophagus	6	1.3	4.62	40	3.4	11.82	1	1	1.00
Number of People	5,395 Men			1,722 Men			842 Men 57 Women		
Number of Person-years	34,445			34,951			4,250(b)		

(a) Mouth and esophagus combined
(b) Estimated
* Indeterminate

Figure 3. INCIDENCE OF ORAL CANCER BY COUNTRY AND SEX(a)



(a) Reproduced from Higginson and Muir (18) by permission of Lea & Febrger. Countries are listed in order of decreasing incidence of oral cancer in men.

cancer. This is evident in the relationship of Plummer-Vinson syndrome with hypopharyngeal cancer in Swedish women (67) and the increased incidence in that country of cancer of the mouth, pharynx, and esophagus with Plummer-Vinson syndrome related to iron and vitamin-B-complex deficiency in associated malnutrition (68). A separate study of American women with oral cancer (66) revealed a Plummer-Vinson-like syndrome of glossitis, brittle nails, and early loss of teeth, which appeared to be related to dietary deficiencies.

Eight carcinomas of the mouth, pharynx or larynx were found in a prospective study of 3,000 alcoholic persons, but none in 3,000 matched nonalcoholic control subjects (26). Significantly, the eight alcoholic patients who developed carcinoma had longer average smoking and drinking histories than the noncancerous alcoholic subjects. Duration of exposure to a carcinogenic factor and the latent period between exposure and development of cancer are important areas for study in understanding prevention.

It is of interest that despite the association of parotid gland swelling with excessive drinking, no association has been observed between parotid gland carcinoma and alcohol intake.

Esophagus

The highest incidence of cancer of the esophagus, a usually rapidly fatal disease, is reported in the eastern Iranian province of Mazanderan, in the adjacent Kazakhstan and Turkmenistan republics of the Soviet Union, certain parts of Africa, and in the Brittany region of France. Alcohol consumption in these areas varies from almost nil in Iran to very high in Brittany. The wide differences in esophageal cancer incidence between the sexes and between adjacent communities (58) indicate that external factors may be important. In Western countries, where esophageal cancer occurs mostly in men, excessive drinking is thought to be a major contributing cause, with tobacco use playing a synergistic role (62,68).

In the United States esophageal cancer death rates are now stable among White men but increasing among non-White men (Figure 4). The reasons for this striking increase among non-White men require study and a careful assessment of their drinking and smoking habits. Increased heavy smoking and drinking among non-White men together with improved living standards, changes in diet, and urbanization have all been suggested as factors requiring investigation.

A recent retrospective study by Lynch (36) revealed that while there were only 2.7 cases of esophageal cancer per 100,000 population in the United States in 1957, 69 percent of the patients with cancer of this site also had a history of alcoholism. A higher frequency of alcoholism among esophageal cancer patients than among those with cancer of the colon has also been reported (23).

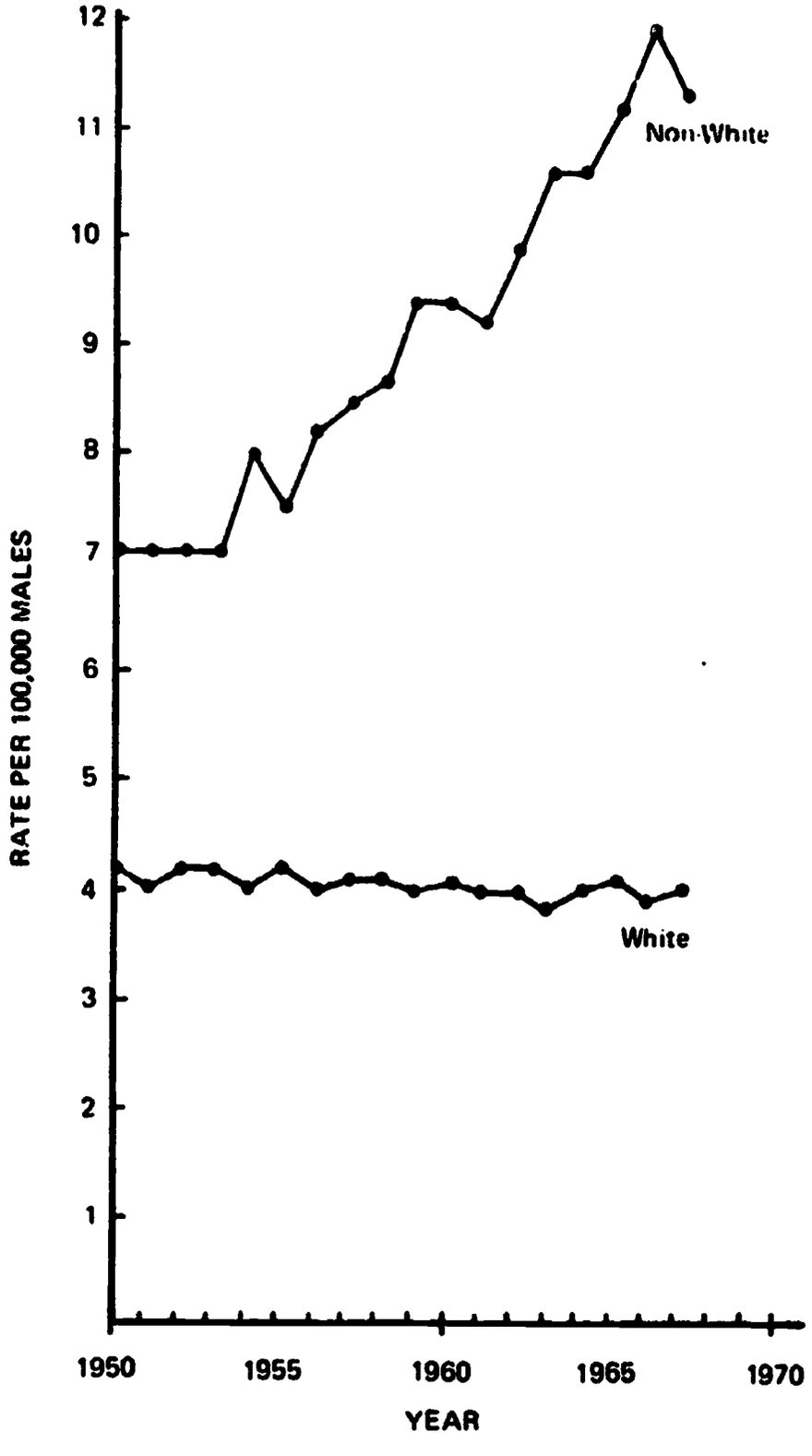
Several investigators have shown a relationship between heavy drinking, especially of whiskey or other spirits (58,62), and esophageal cancer after correction for age and tobacco use (15,52). Smoking was found to play a lesser role than alcohol in esophageal cancer (52). Smoking, in the absence of heavy drinking, appeared to have little or no effect on the development of esophageal cancer (62).

A correlation analysis in 41 states of the United States by Breslow and Endstrom (4) showed that alcohol consumption was related to increased risk of esophageal cancer mortality among both White men and White women.

Other environmental factors, however, may also play a role in the pathogenesis of esophageal cancer (27). An epidemiological analysis of mortality in the United States from esophageal cancer showed a significant correlation between urbanization and per capita cigarette and alcohol sales (50). After partial correlation coefficients were calculated to remove the effect of the other independent variables, urbanization still remained significantly correlated with esophageal cancer. Poverty and the particular hazards of certain occupations may also contribute heavily to risk (36). Bartenders, for example, have been found twice as susceptible to esophageal cancer as the general population (18).

Malnutrition may be a contributory factor in areas, such as parts of

Figure 4. MALE DEATH RATES FROM CANCER OF THE ESOPHAGUS. U.S.A. 1950-1967[a]



[a]Source: Burbank (5)

Asia, where the incidence of esophageal cancer is among the highest in the world but heavy drinking is relatively rare (27, 28).

Since malnutrition is widespread in Africa but esophageal cancer rates vary greatly there (9), it appears that other external factors must be playing a part.

In Sweden, iron and vitamin deficiency in women with Plummer-Vinson syndrome has been related to the development of esophageal carcinoma (1, 62, 67). In Puerto Rico, Martinez (39) found that in addition to suffering from malnutrition, 400 esophageal cancer patients also used more alcohol, tobacco, and hot beverages than control subjects.

In a case-control study of esophageal cancer in Singapore Chinese and certain Chinese dialect groups, De Jong (11) found that men with esophageal cancer drank more samsu, a strong local liquor, than others. The custom of drinking of all beverages, including coffee and tea, at "burning hot" temperatures appeared to be a stronger risk factor for both sexes, however.

In certain parts of France, Tuyns 68) has shown that mortality from esophageal cancer is more highly correlated with mortality from alcoholism than with mortality from cirrhosis. Since deaths from alcoholism occurred among those who drank primarily distilled spirits, the higher mortality among this group from esophageal cancer suggests that the alcohol strength of the beverage may more importantly influence the development of esophageal cancer than the quantity consumed by the individual, even when it was sufficient to cause cirrhosis. There was no Department in France with a high esophageal cancer rate that did not also have a high alcoholism rate. Yet alcoholism was not the sole factor since in three Departments (Ardennes, Haute-Savoie, and Savoie) no increased rate of esophageal cancer was found despite the high rate of alcoholism. This pattern suggested that alcohol may be the vehicle or solvent for a carcinogen present in certain spirits (those mainly used in western France) and not in others (those used in Savoie or Ardennes). It may thus be that the content of the specific beverage (alcohol as the solvent for carcinogens) is more important than the quantity consumed.

Brittany is a small geographic area of western France in which there is an extremely high incidence of esophageal cancer among men--over 50 cases per 100,000 population--but this varies widely within well-defined boundaries (59). This area, with a very high rate of alcoholism was chosen by the International Agency for Research on Cancer as an excellent place to study the effects of heavy drinking, particularly to determine why certain individuals develop cirrhosis while others develop esophageal cancer or psychiatric disturbances such as delirium tremens.

The esophagus is the most common site of cancer in men in certain regions of eastern and southern Africa (9). It has been suggested that some local alcoholic beverages made from maize, such as kachasu, contain carcinogens. Nitrosamines and the zinc content of the beverages have both been suggested as possible exogenous factors, but there are regions in Africa with high rates of cancer of the esophagus where neither of these contaminants is found in the local beverages (3, 7, 8, 40).

Primary Liver Cell Cancer (Hepatoma)

In Europe and North America, according to Higginson and Muir (18), the kind of person in whom primary cancer of the liver is most likely to develop is an alcoholic person with cirrhosis. A relationship clearly exists between liver cell cancer and alcoholic cirrhosis, though liver cell cancer is not common in Western countries. Some researchers have suggested, however, that it may be more prevalent in Europe than has been previously assumed (22). Worldwide, 60 to 90 percent of all liver cell cancer arises in cirrhotic livers. In areas where hepatoma is most common, viral hepatitis resulting in cirrhosis and subsequent neoplastic change has been implicated as one etiologically important factor (10,46).

In the United States, hepatoma incidence of 30 percent in alcoholic cirrhosis and only 11 percent in nonalcoholic cirrhosis was reported by Lee (33). Current evidence thus indicates that alcoholic rather than posthepatitic cirrhosis is the more important factor in liver cell cancer in the United States, though in other parts of the world this does not appear to be true. In Japan the association of hepatoma with post-hepatitic cirrhosis was far greater than with alcoholic cirrhosis (48). In Southeast Asia cholangiocarcinoma is associated with liver disease secondary to parasitic infestation (21).

The most critical element in the development of primary cancer of the liver, according to a review by Kissin and Kaley (27), seems to be the type of underlying liver pathology. Several investigators have found that cancer develops characteristically in livers with large nodular hyperplasia (41, 54), a stage of cellular regeneration that may occur in the healing process in cirrhosis. Cancer thus seems to occur in livers with marked regenerative activity, regardless of the cause. This agrees with the observation of Lowenfels (35) that patients with well-established cirrhosis who stop drinking may still develop tumors. Furthermore, a higher incidence of hepatoma was observed in mild and healed alcoholic cirrhosis than was observed during the severe acute stage of cirrhosis (48).

In Southwest Africa and Southeast Asia, where cirrhosis is uncommon, hepatoma is frequent, but in areas where the incidence of cirrhosis is highest (Chile, France, Mexico, the United States), hepatoma is rare, suggesting that some carcinogenic agent not related to cirrhosis is involved in the hepatomas of Asia and Africa (17). The most probable is aflatoxin, a toxin from the fungus Aspergillus flavus, which is often found as a contaminant of peanut meal (42). In Japan, many foodstuffs, as well as saké, are treated with these fungi to improve flavor. The association between ingestion of saké made from rice with cirrhosis of the liver and hepatoma has led Sakurai (18) to speculate that other toxic fungi may be operative in causing liver cancer.

Cancer of the Lung

The apparent relationship between heavy drinking and cancer of the lungs and air passages may be a statistical artifact. Heavy drinkers are frequently heavy smokers, but not all smokers drink heavily (27). Since heavy smoking is closely correlated with cancer of the lungs and bronchi, heavy smokers might be expected to drink more than control subjects. It has been suggested that a higher alcohol concentration in the alveoli and the bronchial system might potentiate the carcinogenic effect of tobacco, but data to support this postulate are not available.

Cancer of the Pancreas

In the last decade cancer of the pancreas has become the third leading cause of cancer death among men 34 to 54 years old in the United States, particularly among Black men (2, 27). Since Blacks in this age range work in certain industrial occupations in disproportionate numbers, and drink and smoke more than White men of the same age, it has been speculated (29) that these factors may be associated in causing this cancer. Some investigators believe that pancreatitis often associated with alcoholism may be the mechanism that closely links alcoholism and cancer of the pancreas (5). A prospective study of Japanese men, described below (19), has given preliminary indications that heavy drinking is related to increased mortality from pancreatic cancer, and researchers conducting a prospective study in Norway are finding a similar trend (22).

Cancer of the Large Bowel

Several investigators have postulated a relationship between cancer of the large bowel and heavy beer drinking, but the results of various studies have not consistently supported this hypothesis (16, 44, 55, 71). Breslow and Endstrom (4) have correlated the per capita consumption of cigarettes, spirits,

wine, and beer, in 41 of the United States, as estimated from tax receipts with the annual age-adjusted rates of death from cancers of 20 sites between 1950 and 1967. The strongest single association was between rectal cancer death and beer consumption. This finding is consistent with data from 20 other countries. To explain how beer rather than other alcoholic beverages could influence cancer of the lower bowel, Draser and Irving (12) have hypothesized that dietary constituents may influence bacteria and steroids in the gut and, thus, the concentration of possible carcinogens. Further study of the effect of heavy beer consumption on these factors is indicated by this correlational study. It is hazardous to draw conclusions from correlational data based on population samples because they cannot take into account the long latent periods of most cancers and the possibility of multiple and interacting agents. Nevertheless, data such as these warrant further research into the relationship between beer drinking and large-bowel cancer.

Cancer of Other Sites

Some investigators (43, 56) have found an association between alcoholism and prostatic cancer, but others have not (51, 70). Prospective epidemiological studies which consider alcohol among the significant variables are needed.

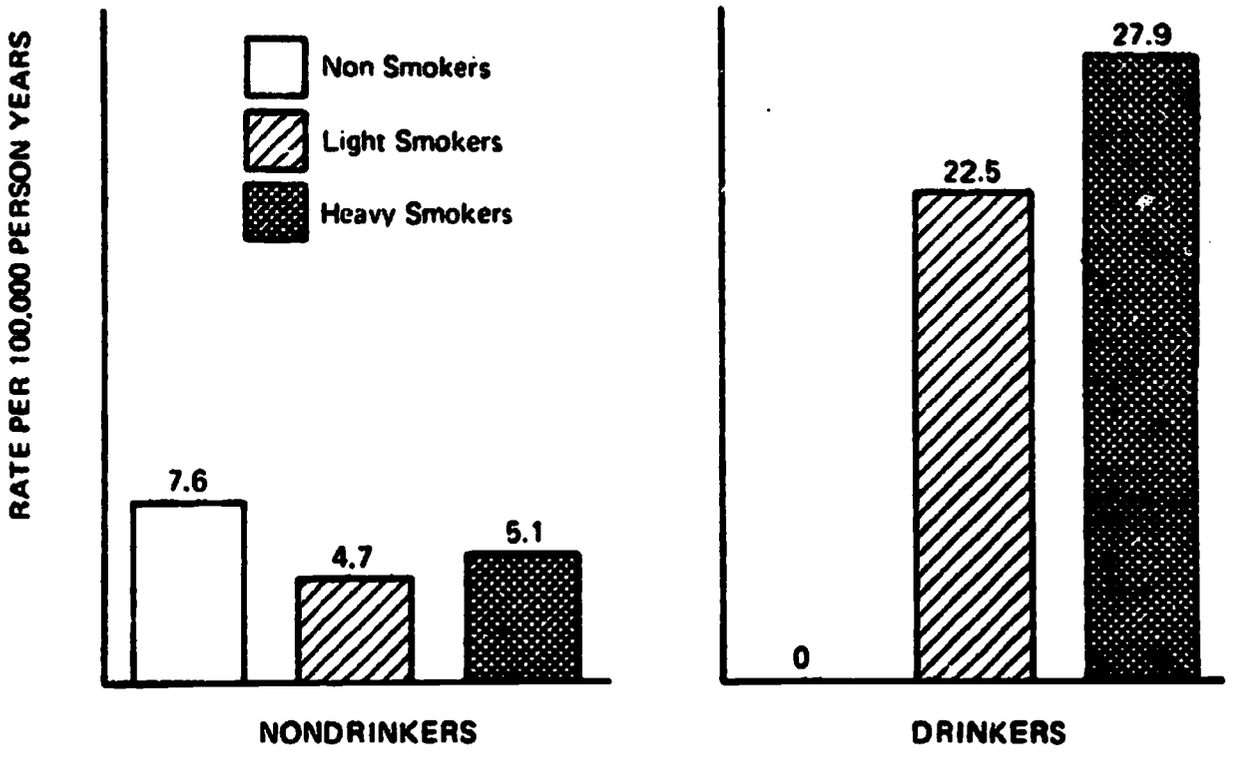
Since alcohol reaches the stomach in relatively strong solutions, the possibility of a link between drinking and gastric cancer has been explored. A study by MacDonald (37) revealed an excessive incidence of alcoholism in patients with cancer of the cardiac (upper) portion of the stomach. The greater ratio of men to women affected (Table 1) would also favor this possibility. Stomach cancer has been decreasing in recent years in the United States, even though there has been an apparent increase in the consumption of alcohol, especially in the form of spirits, and perhaps in the prevalence of alcoholism. Thus, other active factors may be responsible (34).

Mechanisms of Pathogenesis

The clear association between heavy alcohol consumption and cancer of the upper aerodigestive tract, esophagus, and liver, and its possible association with cancer of other sites, have led to intensive speculation about and study of possible carcinogenic mechanisms. The cause of cancer at any specific site is now generally viewed as probably involving the interaction of several factors; alcohol may be one of these factors in certain sites. Some of the possible mechanisms by which heavy drinking might increase the risks of cancer in specific body sites are:

- --Alcohol may act by augmenting the cancer-inducing effect of other agents, such as smoking. The combined effect of alcohol and tobacco may be more than the sum of the two--it may be synergistic. Thus, either heavy smoking or heavy drinking increases a person's risk of developing oral cancer, but the risk resulting from both together is greater than the sum of the risk of either one alone (47).
- --Ethanol itself, especially in strong solutions, may act as a direct irritant to mucosal cells, making them more vulnerable to other carcinogens, or it may serve as a solvent or vehicle for cancerogenic trace substances. Nitrosamines, aflatoxin, and other congeners present in the alcoholic beverages used in various parts of the world have been implicated as possible carcinogens.
- --Malnutrition associated with alcoholism, specifically as it affects the integrity of the mucosa, is a possible carcinogenic mechanism. Specific protein, iron, and vitamin deficiencies have also been suggested as perhaps important carcinogenic factors in the malnutrition of alcoholism.
- --By producing cirrhosis, alcohol may lead to an altered metabolism of carcinogens in the liver so as to enhance their carcinogenic effect. Some factor related to regeneration of liver cells during the healing process of cirrhosis has been suggested as a possible pathogenic mechanism by which hepatoma may develop in alcoholic patients with cirrhosis.

Figure 5. DEATH RATES FOR CANCER OF THE ESOPHAGUS IN MEN BY SMOKING AND DRINKING CHARACTERISTICS. JAPAN 1970 (a)



(a) Source: Hirayama (19). The number of person years observed varied from 19,000 to 95,000 in the several groups.

--In cancer of the upper aerodigestive tract, increased local exposure of tissues through a decrease in saliva volume and local pooling of saliva-containing carcinogens (such as tobacco tars) during intoxication--which would prolong exposure to a concentrated carcinogen--is a mechanism hypothesized by Kissin and Kaley (27).

Current and Future Research

The first large prospective study of the relation of alcohol to cancer is being carried out by Hirayama (19) in Japan, where 265,000 men aged 40 years and over were enrolled as a cohort in 1965. Smokers so far have a threefold higher risk of dying from lung cancer than nonsmokers and those who both smoked and drank have an even greater risk. Mortality from cancer of the pancreas and liver was also above expected levels, but of particular interest was the observation that smokers who did not drink showed no greater risk of esophageal cancer than nonsmokers, while those who both drank and smoked ran a threefold higher risk. No esophageal cancer deaths occurred among drinking, nonsmoking men; 22.5 deaths per 100,000 man-years occurred among drinking light smokers; and 27.9 deaths per 100,000 man-years among heavy-smoking drinkers (Figure 5).

It is important to note that not enough time may have elapsed for development of esophageal cancer among the nonsmoking drinkers. The latent period for environmentally related cancers is often 20 years or more, and since cigarette smoking in Japan is primarily a post-World War II phenomenon, the smoking factor may have had only a meager effect so far. It is difficult to assess the interaction of multiple factors at this early point in the study.

A large prospective study of a million people in the United States being conducted by the American Cancer Society (2) will become an important source of similar information about an American population. Both prospective and retrospective studies are hampered by the reluctance of people to report accurately how much they drink. Underestimation of intake may have biased previous studies, particularly retrospective ones in which the relationship of alcohol and cancer was known to be under examination. Prospective studies may be able to obtain more accurate data about drinking since a wide spectrum of questions about personal habits can be asked.

In addition to the large-scale prospective studies of alcohol and cancer in Japan and the United States, the World Health Organization's International Agency for Research on Cancer (IARC) in Lyons, France, with support from the U.S. National Institute on Alcohol Abuse and Alcoholism, has intensified its epidemiological research on the possible relationship of alcohol to cancer in its various forms and sites.

Prospective studies now under way in Norway may clarify some of the possible relationships and provide leads for more specific studies of cancer-promoting mechanisms involving alcohol. Preliminary results from studies in the United Kingdom of patients with alcoholic cirrhosis show a significant relationship between heavy drinking and primary liver cell cancer (22).

The IARC expects to complete these studies, as well as those in France mentioned previously, in 1974. Their findings and more definitive interpretation of the results may help clarify the role of alcohol among the spectrum of environmental variables related to the development of cancer.

In the future, investigators will have to begin improving the methodology of alcoholism and cancer studies. What is meant by "excessive," "heavy," and "light" drinking must be spelled out far more carefully. The form, amount, and duration of alcohol intake must be so defined as to be replicable in studies. Steady versus "binge" drinking also needs to be examined. The development of new questionnaires to assess alcohol intake must take these distinctions into consideration. The IARC (22) has suggested that a uniform way to report alcohol intake be developed and adopted internationally, perhaps as grams per day per kilogram of body weight or per body surface area. Duration of drinking could be expressed in kilogram-years, as cigarette smoking is expressed in pack-years.

Epidemiological research is urgently needed in several specific areas. Long-term prospective studies of alcohol consumption and the range of cancers that eventually appear in various populations should be undertaken. Follow-up investigations of cohorts of patients with alcoholism studied for drinking patterns and eventual cancers will provide useful information. The IARC suggests that methodological improvement would result from standardizing protocols for case and case-control studies.

Chemical analysis of the different alcoholic beverages consumed in various parts of the world is also urgently needed. Screening of spirits, wines, ciders, and beers for the presence of known active carcinogens such as polycyclic hydrocarbons, nitrosamines, mycotoxins and lactones will begin to provide leads about the nature of the alcoholic drink consumed and the disease that results (22).

The biological destructiveness of heavy drinking in the form of increased risk of cancer in several sites has received scant attention from the health professions, and in consequence the public has received little education about this particular hazard of excessive drinking. Understanding the psychological and social factors involved in excessive and prolonged drinking is important in finding ways to prevent certain cancers whose incidence has greatly increased in various groups.

Summary

Clinical and epidemiological studies have implicated the excessive use of alcohol, especially when combined with smoking, in the development of certain cancers. Cancers of the mouth, pharynx, larynx, and esophagus and primary cancer of the liver appear to be definitely related to heavy alcohol intake in the United States and parts of the world where these occur with high frequency in men. Heavy smoking and heavy drinking seem to be particularly implicated (perhaps exerting a co-carcinogenic effect) in mouth, pharynx, and larynx cancer where heavy intake of both has not only an additive but apparently a potentiating effect in increasing risk. Cancer of the esophagus is associated with heavy consumption of distilled spirits in the western countries. Primary liver cell cancer, while not a common cancer in the United States, is more often seen in persons with a history of chronic heavy alcohol consumption. Cancer of the pancreas may also be associated with alcoholism.

There is a rising incidence in the United States of cancer of the mouth, pharynx, larynx, esophagus, and pancreas in non-White men, and the relationship of this increase to alcohol use as well as smoking requires further investigation. On the other hand it remains to be clarified why there has been a decline in the rate of cancer of the stomach in the United States in recent years while the consumption of alcohol has apparently increased.

There are wide geographic and sex variations in the incidence of cancers thought to be linked to alcohol, particularly cancer of the esophagus, and these variations must be borne in mind in any study of the causes of those cancers. Research to determine whether certain alcoholic beverages may contain carcinogens and further study of the possible association of alcohol consumption to cancer of certain sites is of vital importance in assessing the role of alcohol as one additional environmental factor in the spectrum of exogenous agents in cancer.

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2. Alcohol and the Heart

Heart disease is the principal cause of death by illness in the United States. Although the causes of various heart diseases are not yet fully understood, concern about the possible role of alcohol as a cardiotoxin has been growing. However, there appear to be contradictory findings in two different phases of research on heart disease.

On the one hand, there is evidence that, unlike smoking or high blood pressure, alcohol is not a significant risk factor associated with heart attacks, more accurately termed coronary heart disease. Some of the evidence comes from autopsy studies of known alcoholic decedents compared to non-alcoholic populations (4,9). Other studies of non-alcoholic populations have indicated that moderate alcohol use is actually associated with a lower risk of heart attack, raising the question whether small amounts of alcohol may play a slightly "protective" role against coronary heart disease (3,8).

On the other hand, recent clinical studies as well as experimental work on cardiomyopathy, a disease of the heart muscle rather than of the coronary blood vessels, have indicated that even moderate amounts of alcohol can stress tissue of the cardium, or the main heart muscle. Numerous medical reports have verified the occurrence of fatalities due to cardiomyopathy in alcoholic persons, even where malnutrition, which formerly was a main cause of heart disease in alcoholic persons, was not involved. The disorder has therefore been commonly labeled alcoholic cardiomyopathy, although the mechanism whereby alcohol could cause the observed tissue damage has not been elucidated (1,5).

Such contrasting findings complicate preventive health care policies as well as physicians' advice to patients regarding alcohol use. However, the possibility of alcohol having both beneficial and harmful effects is not necessarily a contradiction. Cardiomyopathy and coronary disease are two distinct types of heart disease, involving different parts of the cardiovascular system. The recent knowledge about cardiomyopathy was reviewed in the First Report on Alcohol and Health (7). The following discussion will attempt to clarify the knowledge up to now about the relation of alcohol to coronary heart disease.

Coronary Heart Disease

For the past two decades the National Heart and Lung Institute has sponsored a number of studies that follow groups of persons for 10 to 20 years to discover those characteristics that predict heart attacks; some of these studies included alcohol use as a potential risk factor. The Framingham, Massachusetts, study was the earliest such effort (3). That study reported some association indicating that the incidence of certain types of heart attacks was less in drinkers than in nondrinkers. Two projects, the Tecumseh Health Study (6) and the Los Angeles Heart Study (2), have carried out special analyses of their data in the hope of shedding more light on the relationship between alcohol and coronary heart disease.

The Tecumseh Health Study began at the University of Michigan in 1959 with intensive physical examination of nearly the entire adult population of Tecumseh, Michigan, a small rural community 55 miles southwest of Detroit. These persons were followed for a period of 8 to 10 years, with additional physical examinations in 1962-65 and 1967-69. A special analysis of the Tecumseh data revealed fairly complicated relationships between alcohol use and coronary heart disease (6).

Alcohol use was measured when the study began in 1959; the incidence of heart disease was assessed throughout the 8 to 10 year study period. Figure 1 shows the incidence of coronary disease in men aged 45 to 59 at the start of the study. Persons who never drank have the same rates of coronary heart disease as those who drink at either lighter or heavier levels (8 events per 1000 person-years). On the other hand, persons who were former drinkers but who stopped drinking prior to the start of the study were more than three times likelier to experience a heart attack than the other three groups (25 events per 1000 person-years, combining both drinking levels). It should be noted that for the purpose of this analysis, lighter drinkers are those who consume 4 ounces or less of alcohol per week and heavier drinkers are those who consume more than 4 ounces of alcohol per week, 4 ounces being equal to about 10 ounces of distilled spirits. Heavier drinkers are not necessarily problem drinkers or alcoholic persons.

It is not clear at this time why the former-drinking group has a higher rate of coronary disease. Former drinkers did not differ from the other groups with regard to risk factors known to predict heart disease, such as blood pressure, blood cholesterol level, or cigarette smoking. A special inquiry about the reasons why these persons stopped drinking revealed 20 to 25 percent citing health reasons. It is possible, then, that the former-drinking group represents persons in poorer health than the other groups--in spite of similar blood pressure or cholesterol levels--leading to greater susceptibility to coronary disease.

Whether or not alcohol had caused their poorer health is not clear. The former lighter drinkers--persons who drank 4 ounces of alcohol per week or less--have coronary rates almost as high as the former heavier drinkers, yet there is no evidence that alcohol consumption at this level is physically damaging. Moreover, the heavier drinkers who had not stopped drinking show rates no different from those who never drank at all. Thus, if alcohol was the causal factor in the former-drinking group, it had an adverse effect only in this relatively small sub-population.

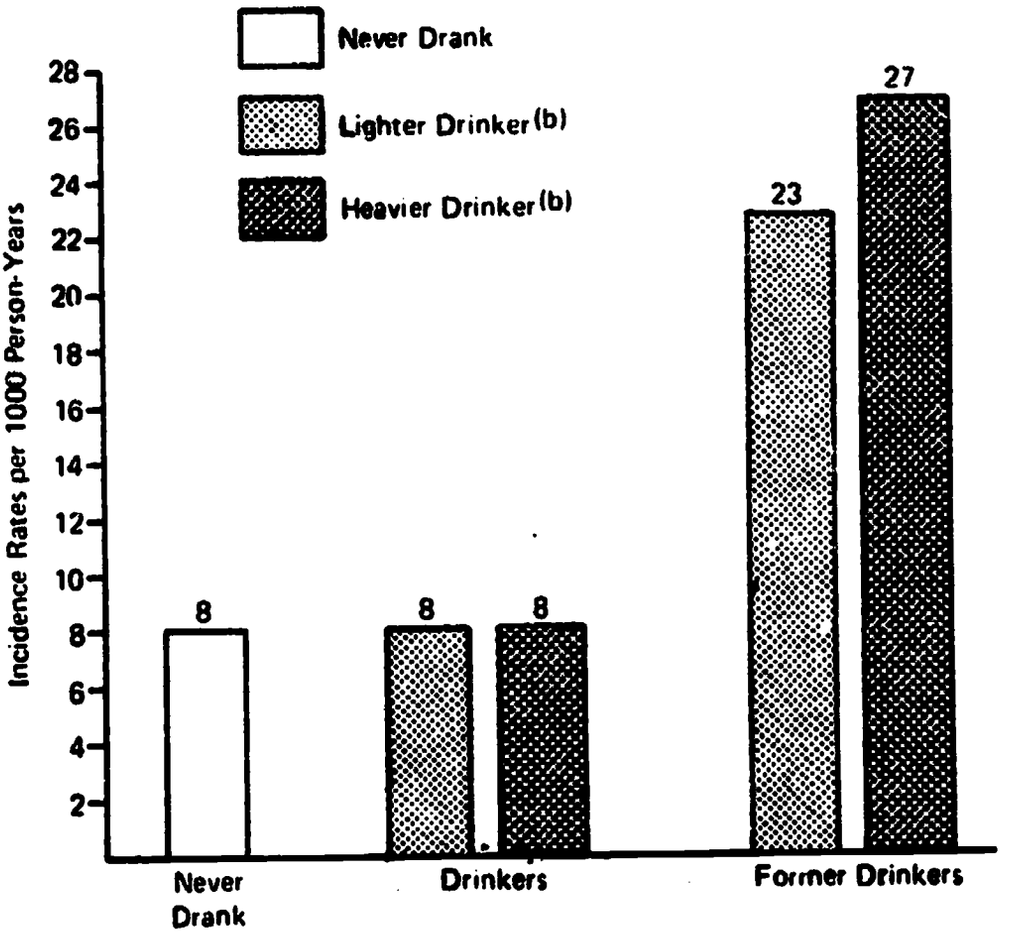
Another possible explanation of these results would be that the cessation of drinking itself causes the higher rates. This would imply that in an organism accustomed to alcohol, cessation of its use could cause coronary disease. But at present there is no known physiological basis for such an effect.

Many heart studies have established that certain characteristics are associated with higher risks of coronary heart disease; as mentioned earlier, three of the most consistent risk indicators are blood pressure, cigarette smoking, and cholesterol level. Middle-aged men with high levels of blood pressure, smoking or cholesterol are two to three times as likely to have heart attacks as those with lower levels. In an attempt to further clarify the relationship between alcohol and heart disease, the Tecumseh study examined coronary disease rates and alcohol consumption in both low-risk and high-risk persons.

Figure 2 shows the relation between coronary disease and alcohol use in lower-risk men according to blood pressure, smoking and cholesterol. The relationships are complex. There is no consistent pattern when the two classes of drinkers are compared with lifetime abstainers (never drank); but the rates are generally low in both those who never drank and in heavier drinkers. As in Figure 1, former drinkers have the highest rates except in the case of low cholesterol.

The results in the high-risk groups are shown in Figure 3. As was to be expected the rates are consistently higher than in the low-risk groups. Interestingly, the two drinking groups have lower rates than the never-drank and former-drinking groups of men with high blood pressure and men who are heavy smokers. But among men with high cholesterol levels, heavier drinkers have higher rates of heart disease than abstainers. The most striking relationships, however, are found in the former drinkers. Men with high blood pressure or with high cholesterol levels who stopped drinking have rates four to five times greater than most of the other groups. Only in the heavier smoking group is the rate of the former drinkers no greater than that of the

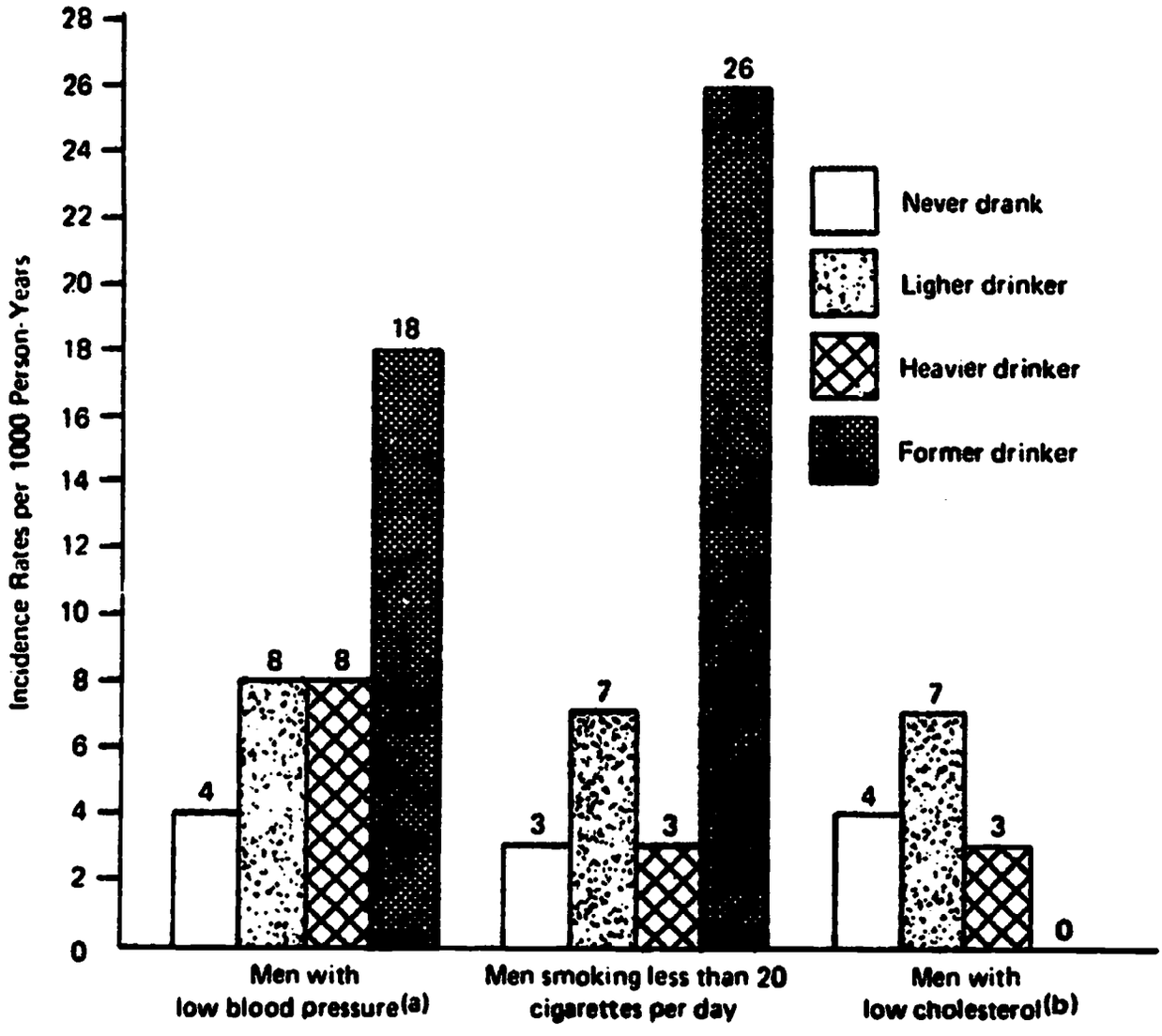
Figure 1. ALCOHOL USE AND CORONARY HEART DISEASE RATES IN MEN AGED 45-59 AT THE START OF THE TECUMSEH STUDY(a)



(a) Source: Tecumseh Health Study (6). Heart disease was defined as myocardial infarction or death by coronary heart disease.

(b) Lighter drinking was defined for this analysis as 4 ounces of ethanol per week (about 10 ounces of distilled spirits) or less; heavier drinking as any larger amount.

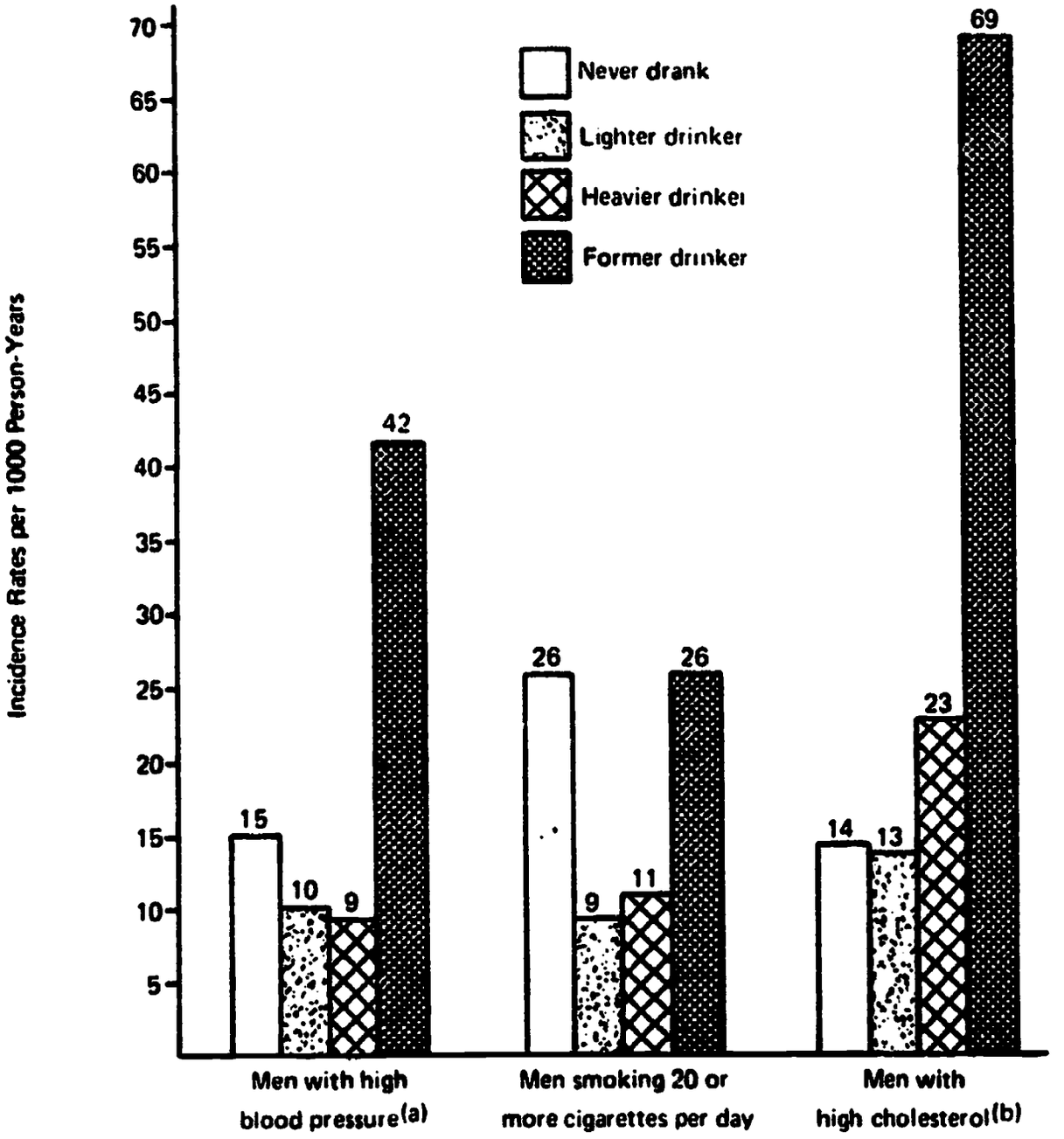
Figure 2. ALCOHOL USE AND CORONARY HEART DISEASE RATES IN LOW-RISK MEN AGED 45 TO 59



(a) Lower two-thirds of distribution (systolic pressure lower than approximately 150 mm.Hg)

(b) Lower two-thirds of distribution (approximately 250 mg. per 100 ml. or lower)

Figure 3. ALCOHOL USE AND CORONARY HEART DISEASE RATES IN HIGH-RISK MEN AGED 45 TO 59



(a) Upper third of distribution (systolic pressure higher than approximately 149 mm. Hg)

(b) Upper third of distribution (over approximately 250 mg. per 100 ml.)

abstainers. Since the reasons why they stopped drinking are unknown, however, no conclusions can be made about the exact role of alcohol in any of these differing rates.

The results of the Los Angeles Heart Study are in the same direction, indicating that alcohol is not a risk factor for coronary heart disease (2). The data showed some tendency for drinkers to have lower coronary rates than non-drinkers, but the relationship was not statistically significant. There was also some evidence consistent with the Tecumseh findings, that persons who decreased or stopped their drinking over the 12-year duration of the study had higher rates of coronary disease. Here again, the most likely explanation may be that persons in poorer health are more susceptible to heart disease and--perhaps on advice from a doctor--are also more likely to reduce their drinking or stop it altogether.

Summary

While the data reported here are by no means sufficient to establish a protective role for alcohol among persons with high coronary risk characteristics, for most persons the use of moderate amounts of alcohol does not seem to have detrimental effects leading to coronary heart disease. On the other hand, the higher rates of heart disease among former drinkers suggests a need for further research to discover the reasons why persons who stop drinking are more likely to have heart attacks.

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3. Alcohol and Liver Disorders

Cirrhosis of the liver is a major cause of incapacitating illness and premature death in alcoholic persons. Mortality from cirrhosis has risen to the point that in large urban areas cirrhosis represents the fourth largest cause of death between the ages of 25 and 45. In New York City it has been reported that cirrhosis, most of it probably originating from alcoholism, ranks third as a leading cause of death between the ages of 25 and 65 (11). Not all those affected with cirrhosis are alcoholic people, however, nor do all alcoholic persons develop cirrhosis. The exact relation between alcoholism and cirrhosis has thus remained something of a medical mystery and the subject of intense debate. In general, the concept has prevailed that excessive intake of alcohol by itself is not sufficient to produce cirrhosis and that other factors must play a key role.

Some investigators have believed that the major factor in the causation of cirrhosis was dietary deficiency. According to this theory, an adequate diet should prevent the severe chronic liver disorders seen in alcoholism. Moreover, observations in man have suggested that steatosis or fatty liver does not inevitably proceed to the crippling state of cirrhosis, but that an intermediary link of hepatitis--characterized by inflammation and necrosis of liver cells--is required to produce this change. Hepatitis, however, has not been produced in experimental animals. One result of this failure was that the role of diet in possible recovery, when this intermediate stage had been reached, could not be established.

Whatever may ultimately prove to be the pathogenic mechanisms leading to cirrhosis in alcoholic persons, it is important not to forget that a large proportion of these people will have serious vitamin and other nutritional deficiencies. Those concerned with the care and treatment of alcoholic patients should therefore continue to stress the importance of good nutrition as adjunctive therapy and should be on the alert for signs of nutritional deficiencies.

In recent years, a group of investigators, Doctors Lieber and Rubin and their associates, have carried out new experiments which give promise of clearing up some of the mysteries and problems surrounding the question of liver injuries due to alcohol.

The most common effect in the liver after alcohol intake, which may occur after intake of less than intoxicating amounts, is fatty liver--an accumulation of lipid or fat in varying portions of the liver cells. Rather large differences in the lipid content of the liver have been observed in alcoholic persons, in whom this type of liver disorder is most commonly encountered.

Fatty liver has been generally regarded as a subclinical disorder, in that it appears to have few functional effects (9) and is reversible upon cessation of alcohol intake (6). It is possible, however, that the classical fatty liver seen after an alcoholic bout may not be so innocuous as was previously supposed. Recently a syndrome of sudden fatty-liver deaths has been described (5), and it has been reported to be an important cause of sudden death in young individuals between the ages of 25 and 44. These deaths generally occur outside of a hospital and are usually unwitnessed. Also, in young women who have been drinking alcohol to excess and eating poorly, huge fatty livers may exceptionally result in fatal hepatic failure.

Aside from the mentioned exceptions, alcoholic hepatitis is a more serious condition than fatty liver both from the point of view of prognosis and from

the presenting clinical manifestations. It may show itself sometimes with dramatic symptoms but frequently is insidious (15). This condition involves an inflammatory reaction of the liver, alteration in the structure and function of its cells, the presence of necrosis, the appearance of alcoholic hyaline, and, finally, a diffuse fibrosis of the liver. These events, which by themselves can have significant mortality and morbidity, are generally considered to be precursors of the subsequent and most serious phase of alcoholic liver disease, cirrhosis (11).

Although the continuity between chronic fatty liver, hepatitis and cirrhosis has long been suspected, the question of the progression of these injuries has never been resolved. The difficulty was the absence of an effective animal model in which all the changes and the circumstances leading to them could be demonstrated. Rats, for example, the animals most often used in such experimental attempts, usually refuse to drink sufficient amounts of alcohol to develop liver injury if their diet is adequate. The aversion of rats to large amounts of alcohol was counteracted by the introduction of a new technique: alcohol was fed as an integral part of a nutritionally adequate totally liquid diet (2,7). With this procedure, the animals were forced to consume alcohol sufficient to produce a fatty liver despite adequate dietary intake.

Though the rats fed alcohol in liquid diets developed a fatty liver, they did not develop the severer forms of liver injury seen in alcoholic persons--hepatitis and cirrhosis. The experimenters wondered whether this failure might be due to the fact that the amount of alcohol which the rats could be induced to take even as part of their liquid diet was limited to36 percent of their total calories. This was equivalent to an intake of about half a pint of whisky daily by a man, and might be less than the average alcohol consumption of alcoholic persons. Of potential importance was also the fact that whereas in the human the development of cirrhosis requires 5 to 20 years of heavy alcohol intake, the rat only lives about 2 years. To overcome these difficulties, the experimenters turned to the baboon, a species which is long-lived and phylogenetically closer to man than the rat.

Altogether, 32 baboons were used in the study by Rubin and Lieber (12,13). The animals were housed in individual cages, and first were given a custom-made protein-rich biscuit diet with 34 percent of the total calories as protein. For half of the baboons, enough alcohol was added to their drinking water to make a solution of between 4 and 5 percent. Their food and fluid intake was measured daily. The other half of the animals, as controls, received the same amount of biscuits but instead of alcohol they were given a dextrin-maltose mixture in their drinking water. When the calories contained in the water-alcohol solution were added to the biscuits, the over-all composition of the diet was as follows: 20 percent of total calories as protein, 14 percent as fat, 30 percent as carbohydrate, and 36 percent either as alcohol or, for the controls, additional carbohydrates. The animals also received daily a multivitamin preparation, which provided more vitamins than the recommended amounts (4) for the baboon.

With this technique, the animals fed alcohol developed progressively a fatty liver, whereas the controls remained normal (8). The fatty liver produced resembled the human variety in all respects. With this level of alcohol intake, however, no hepatitis or cirrhosis developed, even when the dietary protein was restricted to 7 percent of total calories. In the control animals, when the protein intake was 7 to 20 percent of total calories, the structure of the liver remained normal, but after a reduction of the protein to 4 percent, the livers showed some lipid accumulation. The effect of alcohol in the experimental baboons, however, was no greater when the diet was deficient in protein than when it was adequate.

To increase the alcohol intake further, the liquid diet which had been developed for the rat was adapted for the baboon. Protein comprised 18, fat 21, and carbohydrate 61 percent of the total calories in the control diets. The alcohol-fed animals were given the same amount of the diet, except that alcohol replaced carbohydrates to the extent of 50 percent of total calories. The daily consumption of alcohol by the baboons varied from 4.5 to 8.3 grams

per kilogram of body weight. This is equivalent to between a pint and a quart of 100-U.S.-proof whisky a day for a man of average size.

All the animals maintained their weight during the study period. The 16 control animals given this diet showed a normal liver structure upon repeated biopsy, while all the animals fed alcohol developed a fatty liver, and almost half (7 of the 16) developed more severe lesions: 5 alcoholic hepatitis, and 2 cirrhosis (12,13).

Three of the baboons in the group fed alcohol died after 4 years. These deaths followed complications of alcohol withdrawal which had become necessary after they developed upper respiratory infections resulting in anorexia--loss of appetite. Post-mortem examination of these animals revealed no organic damage except in the livers. In two of these animals, however, the condition was a typical cirrhosis, identical with that seen in humans (13).

These dietary experiments, and the studies of biochemical changes that accompany them (8), help to elucidate the important role of alcohol itself in causing liver damage leading to the development of cirrhosis. The question why not all the animals developed hepatitis or cirrhosis is probably answerable by the time factor. Other recent studies (3) have shown that the development of liver disease, and the degree of its severity, depends not only on the amount of alcohol intake but also on the duration of the alcoholism. In some as yet undefined way alcohol either favors the progression of cirrhosis or interferes with its remission; thus, patients with cirrhosis who stop drinking live substantially longer than those who continue in their alcoholism (10).

Several important results emerge from the newly reported work on liver cirrhosis. First, the animal model developed by Lieber and DeCarli (9) has not only added new knowledge but opened the way to further studies that may finally clarify the mysteries that have surrounded the fatal disease of alcoholic cirrhosis. These experimenters believe that they have demonstrated that alcohol alone--though it may take something like a fifth of whisky a day for many years--can produce cirrhosis even when there is no dietary deficiency. This issue is not completely resolved, however. Heavy alcohol intake, especially in the form of strong solutions, causes severe damage in the gastrointestinal tract (1), including ulcers and changes in the fine structure of the mucosa (14). Indeed, bleeding from stomach ulcers or from ruptured varices due to portal hypertension secondary to cirrhosis is a major cause of death in alcoholic persons. In the baboon experiments it was not possible to carry out studies of absorption from the intestines (13). Thus, it remains a question whether, although these animals were fed an adequate diet, they did indeed absorb all the nutrients. There is no question that the new studies of effects of alcohol on the liver have significantly advanced the knowledge about one of the important diseases afflicting alcoholic persons. The development of an effective animal model has brought the world of experimental biology a long step nearer to the possible solution of the problems of cirrhosis, including the potential of prevention as well as better treatment.

Whatever the relation of malnutrition to alcoholic cirrhosis, it is now clear that persons without obvious signs of nutritional deficiency or other disease may have alcoholic hepatitis, and are at risk of developing cirrhosis if they continue to drink, but can fully recover if they stop drinking. The detection of the state of alcoholic hepatitis is thus, as the studies of Rubin and Lieber indicate, an important step in the prevention of alcoholic liver cirrhosis. Whether inadequate diet hastens the development of cirrhosis remains to be established. Indeed, it remains to be clarified why very many alcoholic persons develop a fatty liver, some develop clinical or subclinical hepatitis, and a small percentage develop cirrhosis.

A relationship of cirrhosis to cancer of the liver has been reported from several sources. This topic is dealt with in another section of the present Report.

The Metabolism of Alcohol in the Liver

Ethyl alcohol is metabolized in the liver by the action of the enzyme alcohol dehydrogenase (ADH). This process, which converts alcohol to

acetaldehyde, involves the removal of a hydrogen atom from the free nicotinamide-adenine dinucleotide (NAD^+) present in the liver, resulting in a larger proportion of reduced nicotinamide-adenine dinucleotide (NADH). The decreased ratio of NAD^+:NADH is thus the fundamental change produced in the liver by the conversion of alcohol to acetaldehyde. Since the enzyme that initiates the metabolic breakdown of alcohol, ADH, is available chiefly in the liver (17)--only insignificant amounts are found elsewhere in the organism--the introduction of alcohol into the organism taxes the liver particularly severely, compared to any other organ.

Alcohol has commonly been thought of as a totally "foreign substance" in man. Therefore the normal function of ADH in the livers of most mammalian species--the reason for its presence--was unknown. Recent work has made it clear, however, that alcohol is normally present in all mammals, and is continously produced in the intestinal tract by the action of microorganisms on soluble sugars (18). Judging from the rate of production of alcohol in the intestinal contents of the rat, it may be calculated that even a total abstainer would produce enough alcohol to equal that in about a quart of "3.2 percent beer" per day. The alcohol thus produced in the gut, however, does not reach man's brain, since ADH in the liver metabolizes almost 99 percent of it before it might move out into the general circulation. Only at the higher concentrations of alcohol introduced into the circulating blood by drinking alcohol in beverages is the ability of ADH to metabolize it temporally overwhelmed. Alcohol therefore passes from the portal into the systemic circulation and is thus distributed throughout the body. It can then act upon the other organs, including the brain, producing its well-known effects on brain function.

While liver ADH serves as the primary means for the breakdown of alcohol, at high alcohol doses secondary pathways for its metabolism become operative and can augment the liver's capacity. One such reaction involves the peroxidatic metabolism of alcohol to acetaldehyde through the action of another enzyme, catalase, as first proposed by Keilin and Hartree (19,20). While alternatives to the catalase pathway have also been proposed (21), the validity of these claims remains a matter of dispute among experts (22). What may be important, however, is that, unlike the primary ADH pathway for alcohol metabolism, the secondary pathway may be stimulated by chronic alcohol ingestion, and can be stimulated to increase the rate at which alcohol is metabolized by the addition of certain selected substrates (23). These findings are of more than academic interest, since this secondary pathway offers a potential mechanism for accelerating the metabolism of alcohol--which could conceivably be important in treating severe alcohol intoxication. The potential toxicity of such a procedure, however, will require careful evaluation before it could be recommended or even tried experimentally in human subjects, especially because of the known carcinogenic potential of the hydrogen peroxide generating agents which are required to stimulate the metabolism of alcohol by this secondary pathway.

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4. Alcohol and Mortality

The words "alcohol and mortality" are likely to conjure up some vivid images: the squeal of brakes and the sickening crash on the "drunk driving" TV messages; the derelict dying in a flophouse in a bout of delirium tremens; perhaps the young man dropping dead after gulping down a quart of whisky on a bet. All of these are dramatic ways of "dying of drink," and there are many others. But most people who die "before their time" because they drank too much do not die in such newsworthy ways. To assess the full relation between alcohol and mortality, we must look beyond the exemplary tales to the much larger number of deaths which are noted primarily only by those personally affected.

Causes of death are often indeterminate or multiple. Similarly, types and gradations of drinking behaviors are varied and numerous. It is reasonable to expect different patterns of drinking behavior to be associated with different patterns of mortality. In this discussion the main concern is to estimate the over-all excess or early mortality, in the general population, associated with particular drinking behaviors and characteristics. Results from clinical and other specially selected populations are used only to the extent that they contribute knowledge and understanding about patterns in the population at large.

The relationship between alcohol and death can be direct, as in the case of an overdose, or indirect, as in accidents, where the alcohol has produced a physical or mental state that puts the drinker more at risk. The relationship can be long-term, as in the physiological deterioration of the liver, or short-term, as in homicide or suicide under the influences of alcohol. In practice, different kinds of relations between alcohol and death will often be superimposed.

It should be noted that even when an association is found between a particular pattern of drinking and mortality it does not necessarily follow that the drinking caused death. The association may be due to some other factors which are common to both the drinking and the deaths. From the point of view of public policy the important issue is: would the excess mortality disappear if alcohol were removed from the situation? With the partial exception of the drunken-driving cases, much of the data on excess mortality is based on samples in which an elevated mortality is to be expected even in the absence of drinking.

The question of a general relation between drinking and increased risk of mortality has a long history (17). In the 19th century it took the form of whether there was a "safe level" of drinking, which would not cause disease. The common answer was "Anstie's limit": the equivalent of 1.5 ounces of absolute alcohol per day, i.e., three ounces of whisky, half a bottle of wine, or four glasses of beer. This quantity was to be taken only with meals and whisky was to be well diluted (1). This concern has more or less disappeared from view in the present century. In the heyday of the teetotal temperance movement, the issue became one of drinking versus nondrinking, and the question of a safe amount became irrelevant. Later the medical concept of alcoholism, as a specific disease defined by a loss of control over drinking, diverted attention from studying the risks of drinking by "normal" people to studying clinical samples. These two currents of thought produced characteristic forms of studies.

Insurance Studies: Drinking vs. Nondrinking

During the late 19th and early 20th centuries numerous studies were sponsored by insurance companies comparing the mortality of "total abstainers" with that of "drinkers" (23). The problem with these early insurance studies is that they lumped all drinkers together, thereby overlooking the possibility that some patterns of drinking might be highly associated with excess mortality and others not at all (24).

Since the end of prohibition, insurance-company studies have moved toward a different two-class comparison: "standard" policyholders vs. "substandard" policyholders, the latter being those whose records include adverse information about their drinking. Although the "substandard" group is sometimes subdivided by drinking patterns (21,26), the total group represents a small and relatively extreme part of the spectrum of drinking patterns. Again, the relation of moderate drinking to mortality cannot be determined, but the studies do yield useful information on the excess mortality associated with heavy drinking. As can be seen in Figure 1, mortality was uniformly greater in the groups judged substandard because of drinking habits (ranging from 2.14 to 4.54 greater mortality) than in the standard groups. The ratios are particularly high in what Menge (21) calls "spree drinkers," and in the younger age groups. It should be noted that a high mortality ratio does not necessarily indicate a very high actual rate of death. In the younger age groups death is still a relatively rare event.

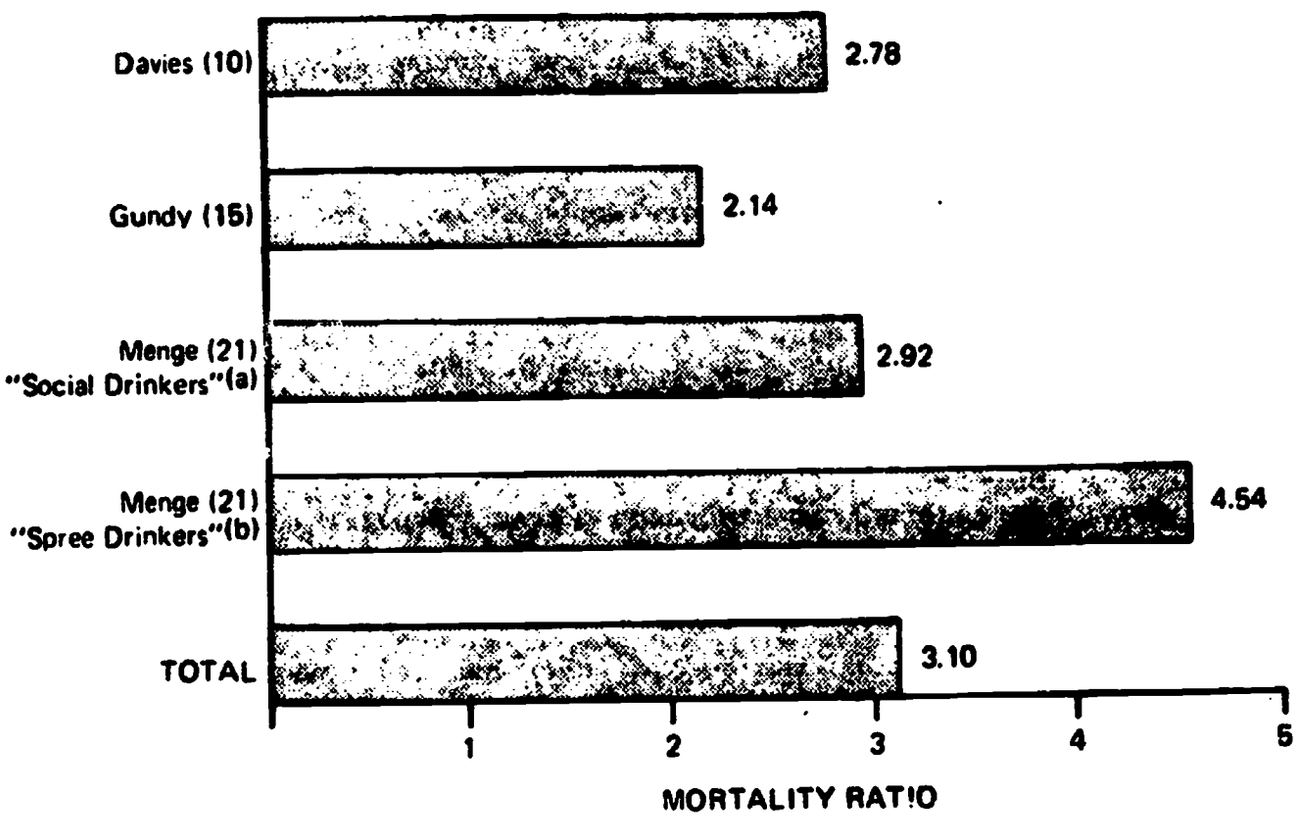
Several factors need to be borne in mind in interpreting the relevance of these studies to patterns in the general population. Insurance-company studies exclude segments of the population which do not seek life insurance, for example, people with lower income. The studies also exclude those who are rejected for insurance, including those whose drinking habits are considered too extreme for them to be insurable. These populations would be expected to have a higher mortality than the general population. Moreover, those who are selected as substandard for drinking habits may be substandard on other mortality-relevant factors. On the other hand, the "standard" population with which the "drinking habits" cases are compared is specially selected by the insurance company to have low mortality, that is, to be not "substandard." For these and other reasons, the results from insurance-company studies are likely to differ from those in the population at large.

Clinical Samples

The conception of alcoholism as a disease has led to several studies in recent years comparing the mortality experience of samples of persons who have been in treatment for alcoholism with that of the population in general. The data from such follow-up studies of alcoholic patients (8,13,31,34) are rather consistent. As can be seen in Figure 2, with one exception the mortality ratios fall within a relatively narrow range. As in the insurance studies, clinical populations show higher mortality ratios in the younger compared to the older patients. Figure 3 illustrates the finding that where women were studied, their rates were considerably higher than those of the men. This may reflect the tendency, commonly noted in the clinical literature, for women alcoholic patients to show more severe symptoms than men.

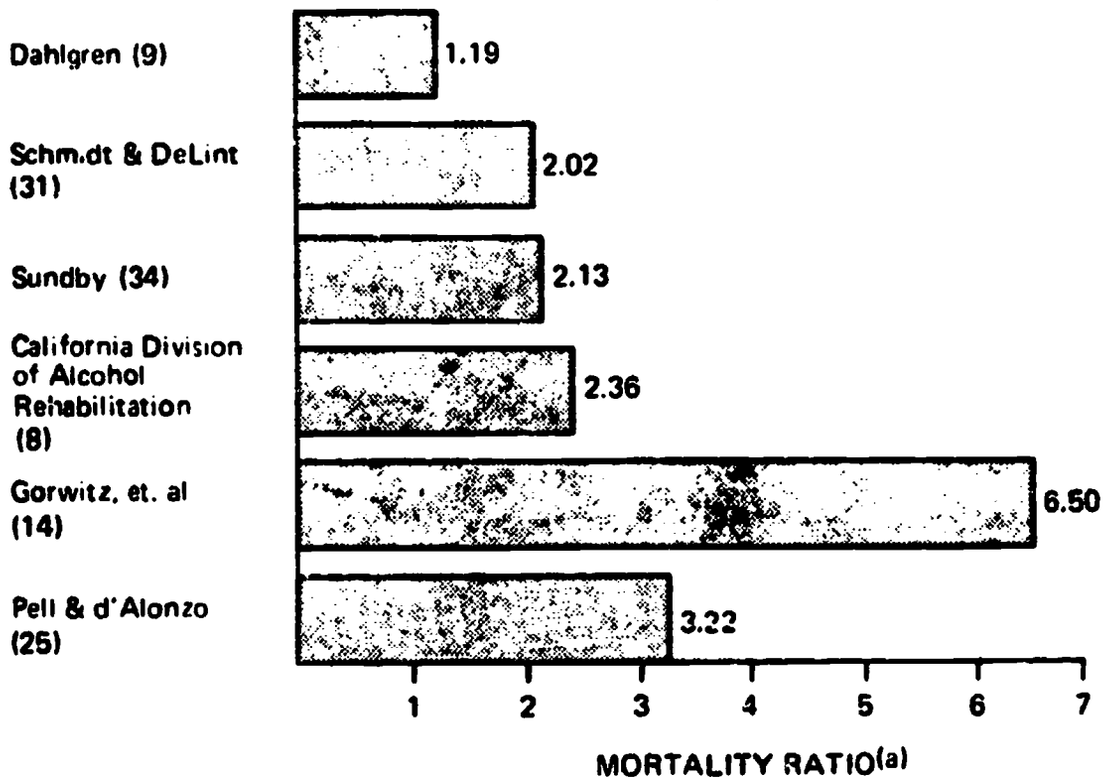
Results from clinical samples are not necessarily applicable to drinker categories in the general population. Obviously those who end up in treatment for alcoholism have a history of heavy drinking (27), but, beyond this, there is reason to believe that such persons are not a random selection of all heavy drinkers in the general population. Recent work by Cahalan and Room (7) suggests that certain drinking patterns are less likely to be associated with problems in general-population samples than in clinical samples; and that, in general, the clinical population of problem drinkers--those who come into treatment--is distinguished from other problem drinkers by the multiplicity and long duration of their problems. Differential clinical diagnosis by social class, race and sex have also been noted (4,14), and the likelihood of preferential admission on the basis of poor physical status is confirmed by Schmidt and

Figure 1. MORTALITY RATIOS COMPARING DEATH RATES IN "SUBSTANDARD" GROUPS TO DEATH RATES IN "STANDARD" GROUPS



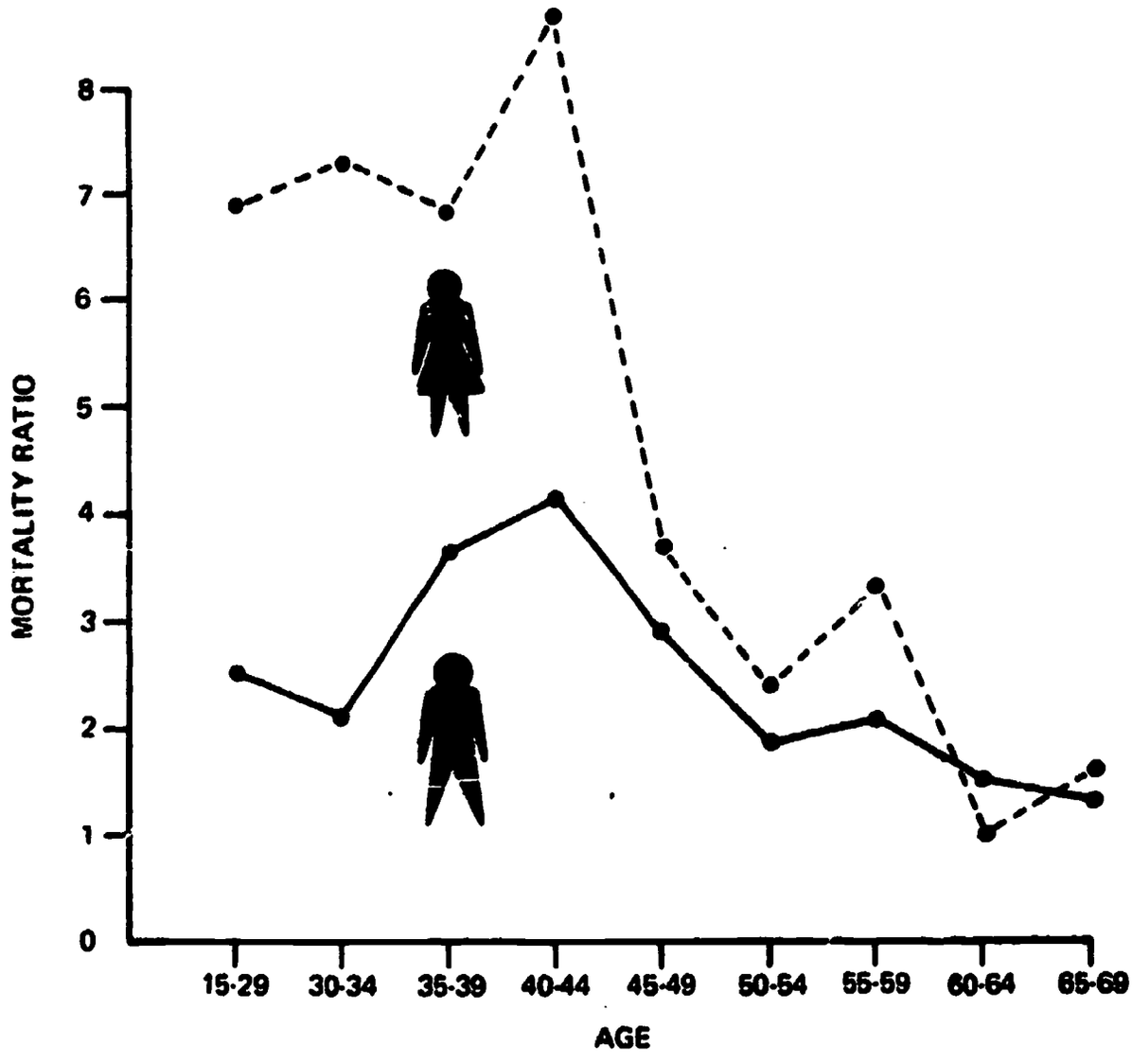
(a) Menge's "social drinkers": intoxicated at least 6 times a year for a day or evening only
(b) Menge's "spree drinkers": sometimes intoxicated for two or three days

Figure 2. MORTALITY RATIOS COMPARING DEATH RATES IN MALE CLINICAL SAMPLES TO DEATH RATES IN CONTROL GROUPS



(a) Mortality ratios were calculated as: $\frac{\text{Death rate in clinical sample}}{\text{Death rate in control group}}$

Figure 3. MORTALITY RATIOS COMPARING DEATH RATES OF MEN AND WOMEN IN CLINICAL SAMPLE TO DEATH RATES IN GENERAL POPULATION. ONTARIO[a]



[a] Source: Schmidt & DeLint (31)

deLint's data (31) showing an increased mortality upon initial entry to the patient population. Thus these individuals have not only drinking problems but serious physical problems that may precipitate their appearance at hospitals and clinics; their mortality rates, therefore, cannot be assumed to apply to all problem drinkers.

Berkson (3) pointed out that the ratio of multiple to single diagnoses in a hospital population is greater than that in the general population. It is likely, therefore, that clinical samples of alcoholic persons also have a greater probability of other diseases, and hence a greater risk of mortality. Additional selective factors which raise their mortality ratios are decreased recovery rates (19), higher readmission rates (12), and noncooperativeness as patients (4). Excess mortality associated with drinking problems, then, is likely to be considerably exaggerated in clinical samples because they are sicker not only than the general populations but also than those with equivalent drinking behavior who have not been hospitalized.

These special characteristics of clinical samples are to some extent mitigated in two of the studies shown in Figure 2. Pell and D'Alonzo (25) compared employees of a large corporation who were identified as alcoholic persons to other employees, thus combining some of the features of the insurance studies with those of a clinical study, in that all the employees were presumably selected for good health when hired. Dahlgren's study (9) included individuals reported for drinking problems to a Swedish Temperance Board, whether or not they had been institutionalized, and thus more nearly resembles a general population study. It is noteworthy that both Dahlgren's and Pearl's mortality ratios tend to be lower than those in samples drawn from alcoholism clinics.

The problems in extrapolating from the studies discussed so far to the population at large arise from the biased selection of the studied samples, and from the limitation of analysis to a single extreme class of drinking behavior. The ideal would be to study a community or other general population. Even short of this ideal, these crucial problems can to some extent be avoided. In this respect, Pearl's 1926 study (24) has never been transcended, although it has some defects of nonrepresentativeness and of reporting errors (11).

Pearl's classic study used broad clinical and court samples not limited to those identified as alcoholic persons. Pearl divided his drinkers into four main classes:

Moderate Occasional: persons who drink any form of alcohol (beer, wine, or spirits) but only in small amounts at any one time, never enough to become intoxicated, and less frequent than daily.

Moderate Steady: same as for Moderate Occasional except drinks daily.

Heavy Occasional: persons who get drunk occasionally, with intervening periods of either abstinence or moderate drinking.

Heavy Steady: persons who get drunk regularly and frequently.

This classification thus included both drinking frequency and drinking quantity dimensions. His results remain thought-provoking.

In general, Moderate drinkers had lower mortality rates than Abstainers--a result which provoked considerable controversy at the time. Among men, Moderate Steady drinkers also have lower mortality rates than Heavy Occasional drinkers. Although these two groups might well have the same over-all intake of alcohol in drinks per year, Heavy Occasional drinkers, who bunch up their drinks, tend to have a higher rate of mortality. Thus, among men of all ages the Moderate Steady drinkers appeared to have the most favorable mortality rate among all drinking categories. In the older age groups, the heavier drinkers come to have the lower mortality rates, a result which appears also in Dahlgren's and in Schmidt and deLint's studies (9,31). To some extent, heavy drinking may act as a selective device, so that early mortality of those of weaker constitution results in hardier survivors at advanced ages. However, it is also possible that heavier drinking at older ages is essentially an indicator of good health: those not in good health will have cut down their drinking prior to the initiation of the study.

Studies of the General Population

In recent years, a number of community health and mortality studies have started to yield data on the association of drinking patterns with over-all mortality in general populations, not specially selected either for health or for illness. These studies, such as those by Helgason (17), Tibblin (38), Shurtleff (35), Belloc (2) and Room and Day (31), have in general found associations between heavier drinking and mortality. Results from two of these studies are shown in Figures 4 and 5.

The study by Shurtleff (33) in Framingham, Massachusetts, measured drinking in terms of over-all volume of drinking per month, which tends to equate infrequent heavy and frequent light patterns of drinking. In this study, at all ages and for both sexes, the data tend to show an excess mortality in both abstainers and high-volume drinkers. The high-volume drinkers show the highest excess mortality at younger ages, while the abstainers show the highest at older ages.

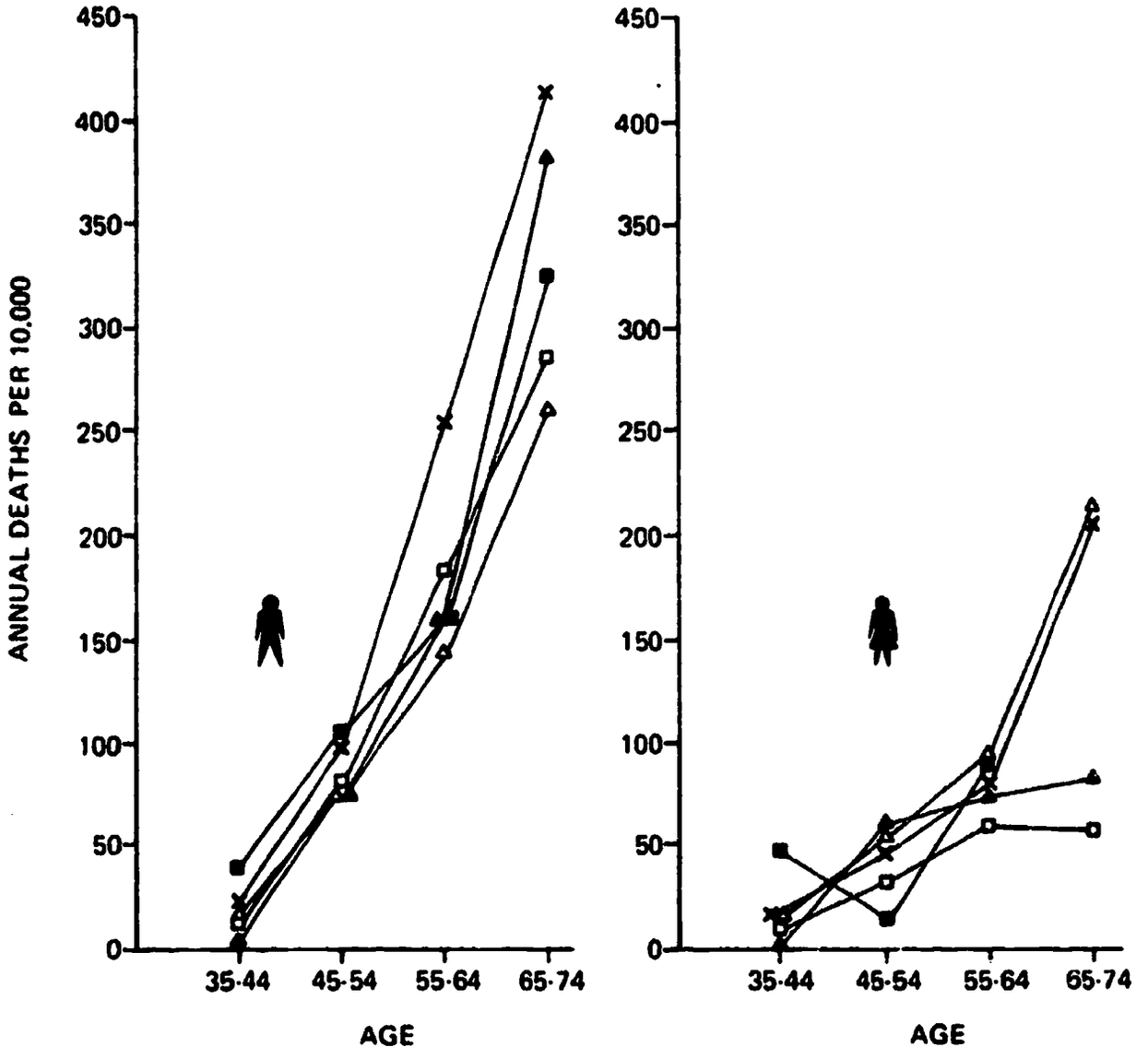
The study by Belloc (2) conducted in Alameda County, California, measured drinking in terms of the amount usually drunk per occasion of the type of beverage (beer, wine or spirits) usually drunk in the largest amount. The top category on this measure, then, includes those who usually drink 5 or more drinks of any beverage, whether they drink frequently or only on an intermittent basis, but only if they do not also drink that beverage more frequently at lesser amounts. The results from this study are less clear than those from Framingham. Heavier drinkers show a higher mortality among younger men, but for other sex and age groups the results vary without a clear pattern emerging, other than a slight tendency for light drinkers to show the lowest mortality on an age-adjusted basis.

Over-all, these two community studies show lower mortality ratios than were found in the insurance and clinical studies for heavy drinking versus other patterns. Reasons for higher ratios in insurance and clinical studies than might be expected in the general population have already been explored. However, there are some additional reasons why the Framingham and Alameda studies, in particular, might be expected to show lower ratios than would result from other methods of measurement. Neither study uses a measure of amount of drinking which isolates a pure group of relatively heavy drinkers. The top category in the Framingham data, as reproduced here, consists of those drinking approximately two drinks a day or more, which could include some frequent light drinkers. The top category in the Alameda data is fairly arbitrary, since it will include some infrequent drinkers but leave out many heavy drinkers who also often drink lightly. Furthermore, both studies, as has been usual in surveys of drinking practices, asked only about current patterns of drinking. It is possible that the generally higher mortalities of abstainers than of moderate drinkers are due in part to those who are now abstaining because of health problems, including those whose health had been damaged by drinking. Controlling for health status or asking for a history of drinking patterns might thus have given higher mortality ratios in the drinking population, and especially in the ex-drinkers.

Despite recent reports on alcohol-related mortality in general populations, the nature and strength of the relationship remains unresolved. Some preliminary findings from a study by Room and Day (31) are presented below. Since this study is specifically aimed at drinking behavior and problems, the relation between drinking patterns and increased mortality can be explored in much greater detail than in previous studies.

The analysis by Room and Day is based on four separate samples of the general population: two samples of adults in San Francisco, and two nationwide samples of adults. One of the San Francisco samples and one of the nationwide samples are limited to men aged 21-59. The pooled data are of course not representative of any particular U.S. population but can be described as reflecting patterns in the general U.S. population, with an overrepresentation of urban and younger men. It should be kept in mind that the samples exclude those not living in households and those who refused or were not found for interviewing, and that self-reports of drinking tend to under-

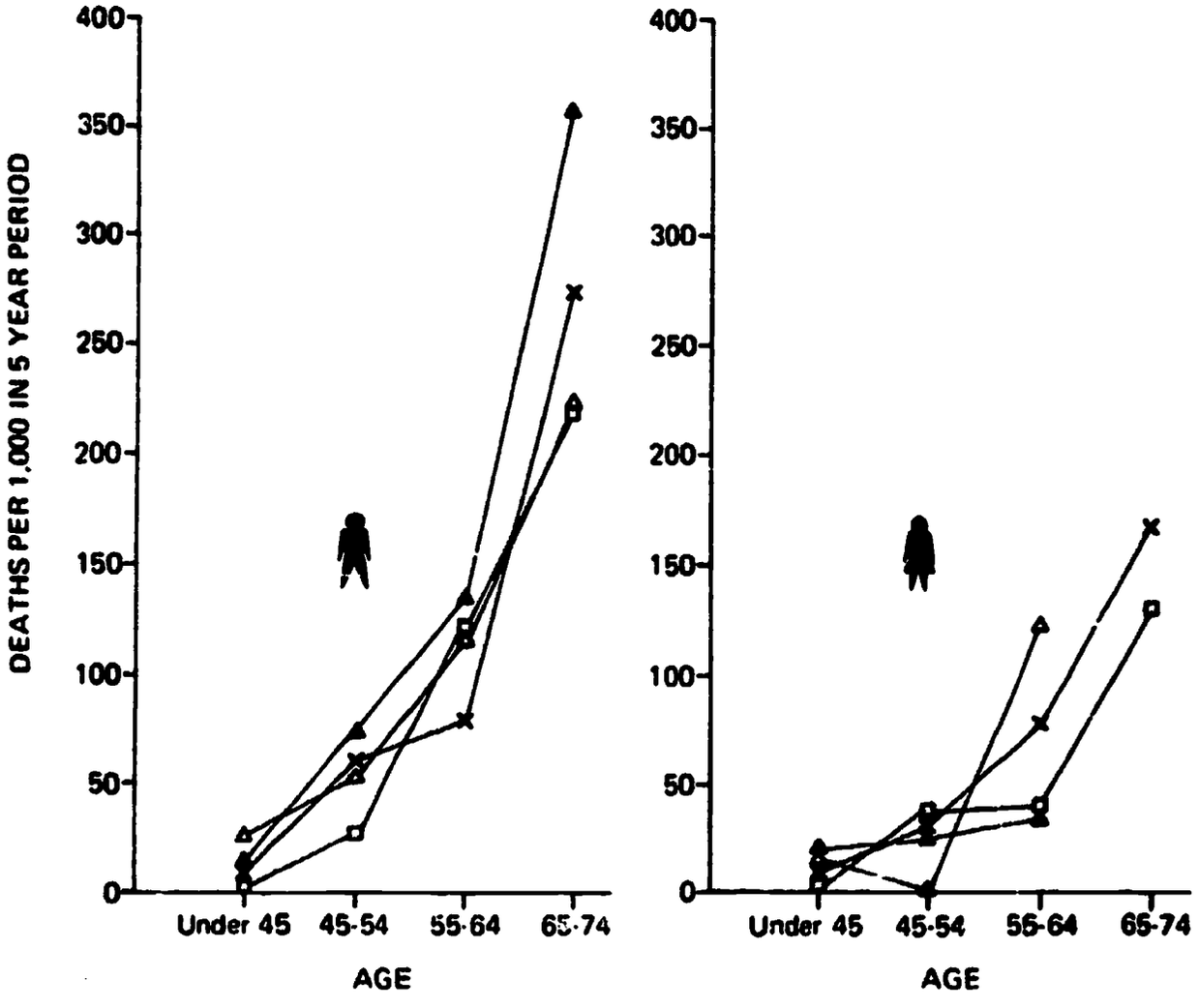
Figure 4. MORTALITY RATES BY DRINKING BEHAVIOR, SEX AND AGE. FRAMINGHAM, MASS.(a,b)



(a) Drinking behavior was classified according to the number of ounces of absolute alcohol consumed per month.

(b) Source: Shurtleff (33). Drinking categories used by Shurtleff have been combined in this figure to yield sufficient mortality data for stable results. Data are not shown for those age groups where there were insufficient numbers to compute.

Figure 5. MORTALITY RATES BY DRINKING BEHAVIOR, SEX, AND AGE.[a,b]



(a) Drinking behavior was classified according to the number of drinks consumed on an occasion, for the beverage usually drunk in the largest amount.

(b) Source: Bellor (2). Data are not shown for those age groups where there were insufficient numbers to compute.

report the recorded total U.S. consumption (28). The samples have been followed for varying lengths of time, ranging from 4 to 11 years, and the rates are therefore expressed in weighted person-years of experience. Since lost cases and those not traced for the whole period are treated as alive, the total mortality reported in this analysis is somewhat underestimated.

Figures 6-9 show the mortality rate of men and women at different ages in relation to four measures of drinking practices and problems. In terms of over-all frequency of drinking (Figure 6), the lowest mortality in each sex and age group is at an intermediate drinking level. Under age 60, the highest death rates occur at the highest frequency of drinking; above age 60, the highest death rates are among abstainers. As in previous studies, there is a consistent tendency for those who are currently abstainers to show a higher mortality than those who are currently moderate drinkers.

Figure 7 shows mortality rates by Frequent Heavy Drinking, a measure of the frequency with which the respondent drinks 5 or more drinks on an occasion. Among women over age 50 and men over 60, such relatively heavy drinking is so rare that mortality cannot be computed. Among those under 50, increased mortaltiy appears to be specific to those drinking 5 or more drinks 4 or more times a week, while among men in their 50s, those drinking such amounts 1 to 3 times a week seem to show some elevation of mortality.

Figures 8 and 9 show sex and age-specific mortality according to over-all measures of problems with drinking, one for problems during the "current" period (the last 1 to 3 years) and one for problems "ever" experienced (any time in the respondent's lifetime, including the current period). These over-all scores include measures of the severity of social and health problems associated with drinking, feelings of dependence on drinking, and behaviors indicating heavy and symptomatic drinking.

These results show some consistent tendencies with different measures of drinking practices and problems. The highest mortality ratios among heavy compared with light drinkers occur in the youngest cohort, although the absolute rates of death are much lower at younger than at older ages irrespective of amount of drinking.

As in previous studies, current abstainers have a generally higher mortality than light drinkers. Since the present series of studies included a question on the respondent's over-all estimate of his health, it is possible to test the extent to which this relationship seems to be due to abstinence because of perceived bad health.

Table 1 shows the mortality in men not in poor health; that is, in those who replied "excellent" or "good" or "fair" when asked about their over-all health. A report of poor health is indeed associated with subsequent mortality: among men under 60 in poor health, the mortality rate was 12%, while among the remainder it was 1%. It can be seen that the mortality of the most frequent drinkers (at least twice a day) is the highest, 2.7%. But the more moderate drinkers (less than once a week to daily) have mortalities ranging from 0.7% to 1.3%, while the mortality of abstainers is higher, 2.0%. It turns out that the removal of those in poor health from the other comparisons does not substantially affect the relative mortalities. Thus, even when the comparison is limited to those in good health, abstainers show a higher mortality than moderate drinkers. Furthermore, when the interrelationships of the measures of drinking among men under 60 not in poor health are cross-tabulated, the relation of higher mortality to frequency of drinking is quite specific to those who are frequent heavy drinkers. Likewise, higher mortality among those with an "Ever" Over-All Drinking Problems score is specific to those who show at least a medium score on Current Over-All Drinking Problems. It appears, thus, that those in the general population who had some problem associated with drinking in the past but have few or no current problems do not show an excess mortality.

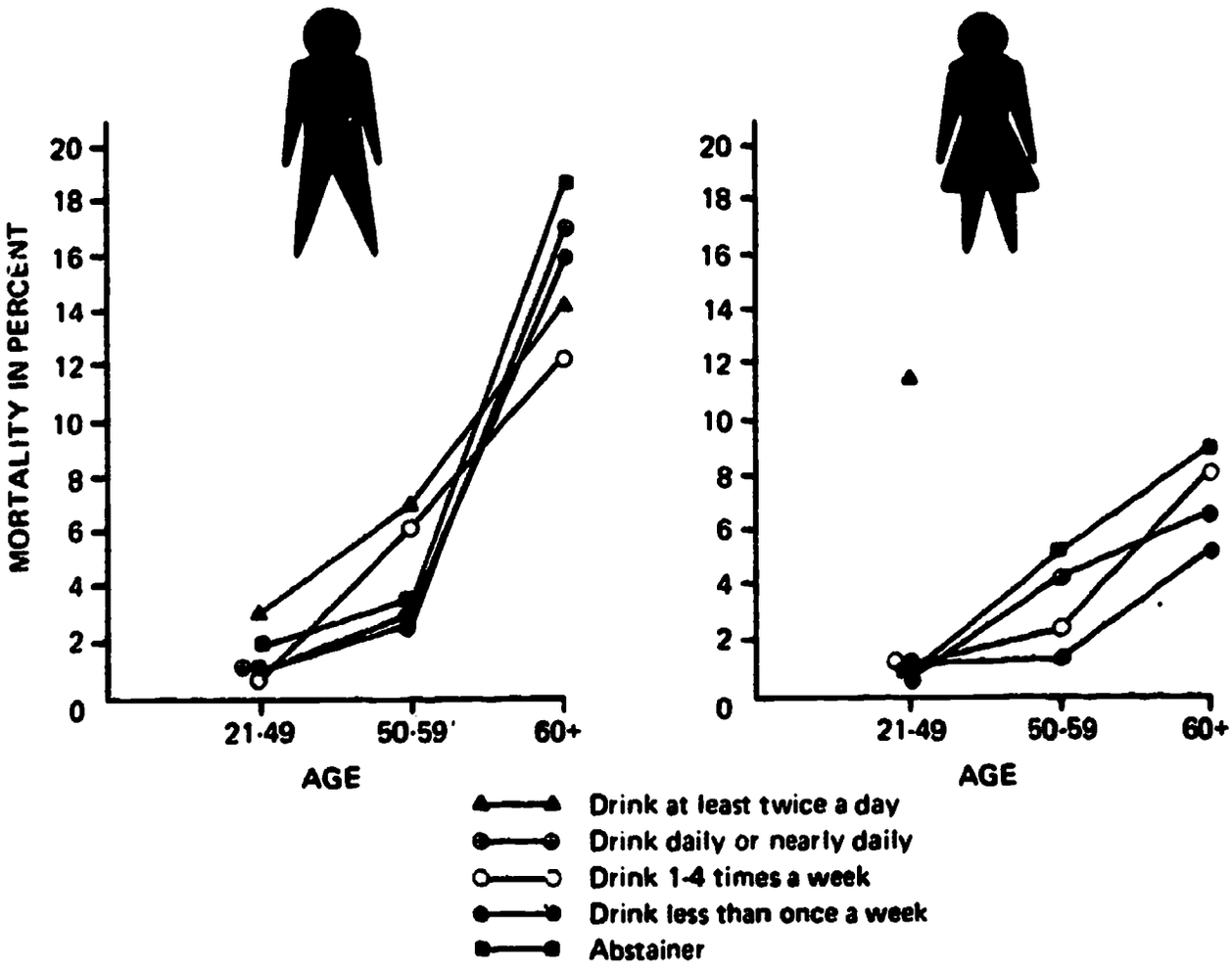
The data on mortality in the combined San Francisco and National samples thus consistently show excess mortality among those in the most extreme categories of frequent heavy drinking and of current drinking problems. These results are more reliable for men, since few women fall into these heavy drinking and problems categories. Even among men under 60, only 5% report frequent

TABLE 1

MORTALITY FOR DIFFERENT MEASURES OF DRINKING BEHAVIOR IN MEN UNDER AGE 60 NOT IN POOR HEALTH

		Percent Mortality
Over-All Frequency of Drinking		
At least twice a day		2.7
Daily or nearly daily		1.3
1-4 times a week		1.1
Less than once a week		.7
Abstainers		2.0
	Average	1.2
Frequency of Heavy Drinking (Drinking 5+ drinks in a day)		
At least 4 times a week		4.5
1-3 times a week		.9
All other		1.0
	Average	1.2
Current Over-All Problems Score		
High		1.9
Medium		1.8
Low		.8
None		.8
	Average	1.1

Figure 6. MORTALITY RELATED TO OVERALL FREQUENCY OF DRINKING, AGE AND SEX

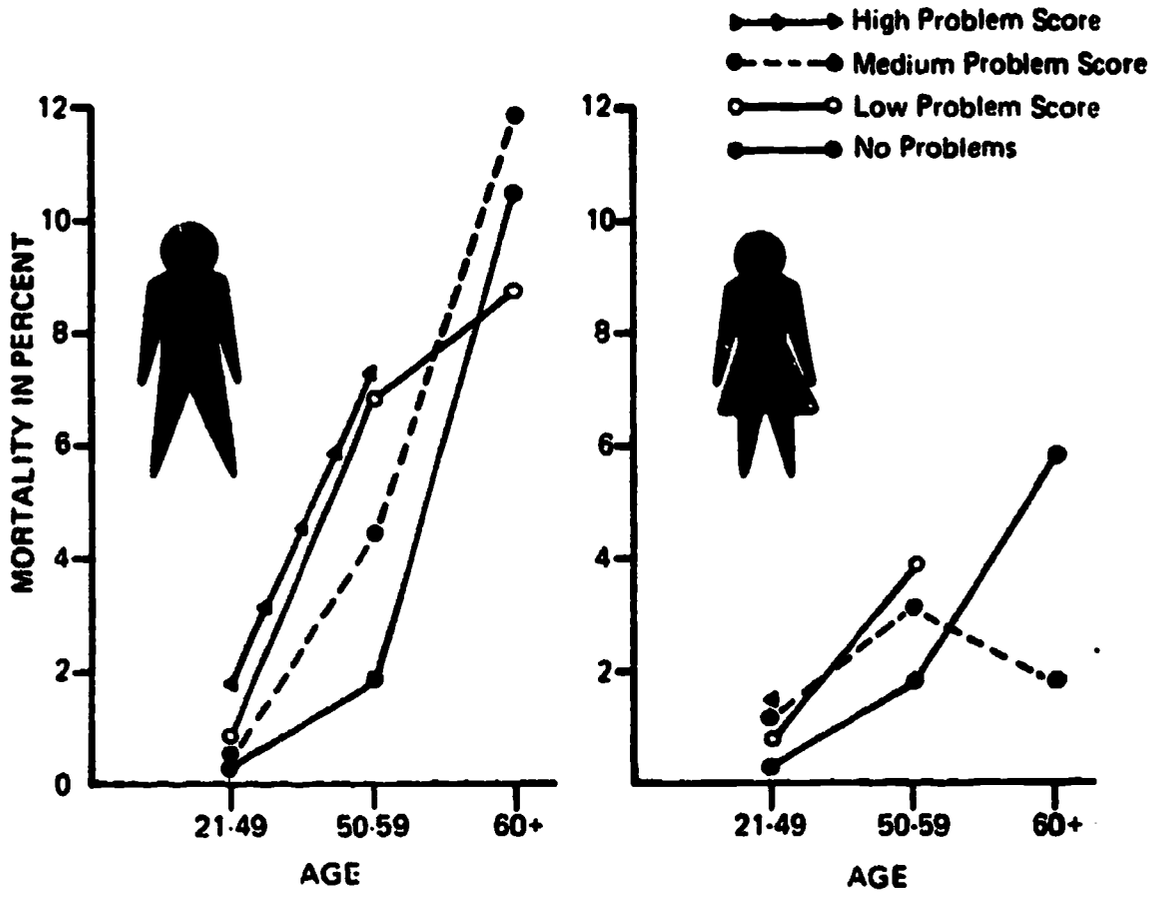


Data are not shown for those age groups with insufficient numbers to compute.

Figure 7. MORTALITY RELATED TO FREQUENT HEAVY DRINKING, AGE AND SEX

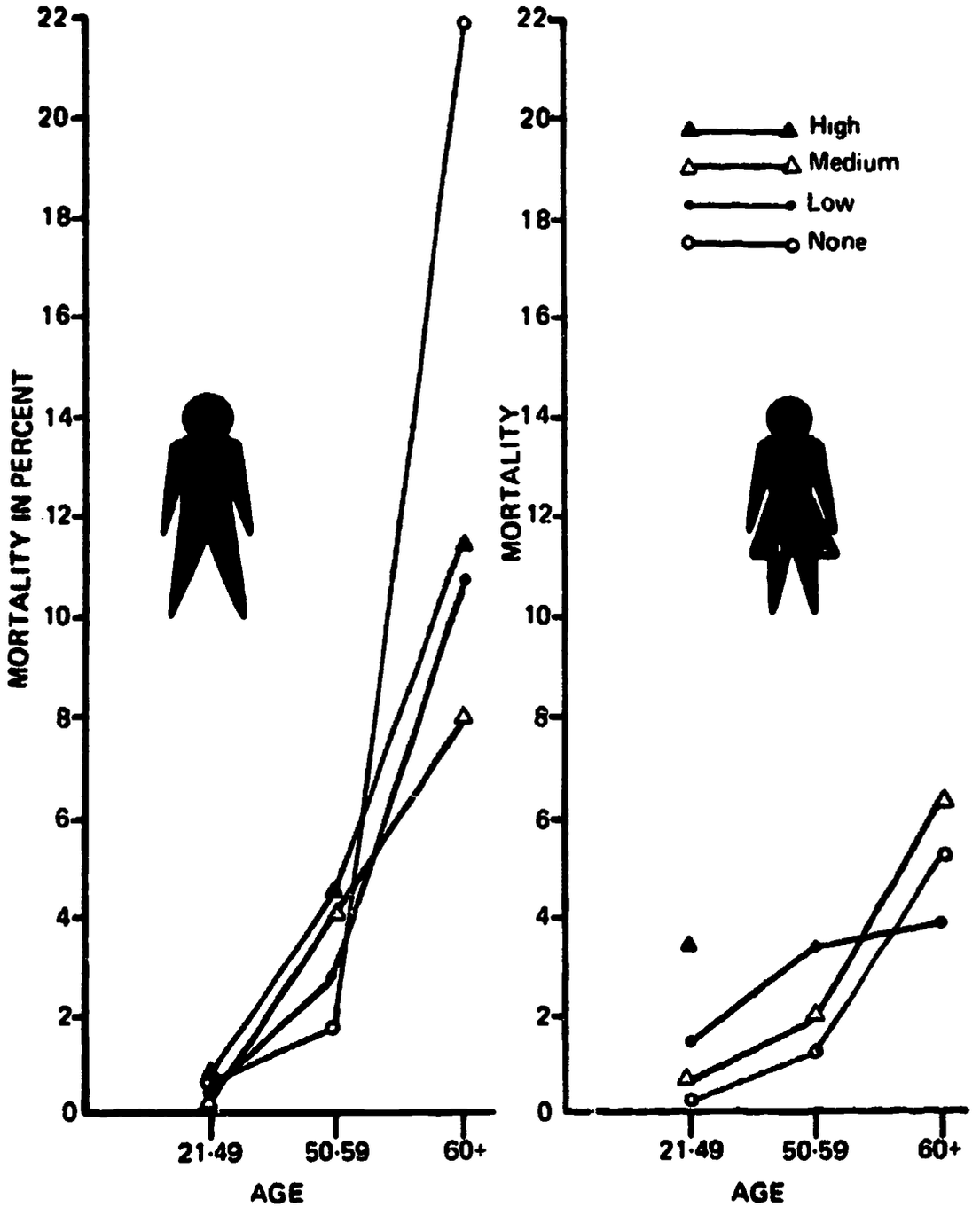
Data are not shown for those age groups with insufficient numbers to compute.

Figure 8. MORTALITY RELATED TO CURRENT OVER-ALL PROBLEMS SCORE, AGE AND SEX



Data are not shown fnr those age groups with insufficient numbers to compute.

Figure 9. MORTALITY RELATED TO LIFETIME OVER-ALL PROBLEMS SCORE, AGE AND SEX



Data are not shown for those age groups with insufficient numbers to compute.

heavy drinking and 7% high current over-all problems, so the mortality rates are based on relatively few deaths. Since the excess mortality is specific to the top category on Frequent Heavy Drinking and the Current Over-All Drinking Problems score, it is also possible that within that category the excess mortality is confined to those with patterns substantially above the minimum criteria for inclusion in the category.

The analysis thus far has not taken into account the possible confounding of the relation of alcohol to mortality with the relation of alcohol to other factors of status and life style which in turn are related to mortality. For instance, in other studies it has been shown that drinking problems are associated with low social status and with a tense and depressed mental state, and that heavy drinking is associated with heavy smoking. It is to be expected that each of these factors will be associated with an increased mortality. Thus there might be a large overlap in the "explanations" of early death afforded by the various factors. A series of regression analyses on men aged 21-59 showed that to a limited extent amount of smoking and amount of drinking overlapped in their prediction of early mortality. In the present studies amount of drinking was more predictive of mortality than smoking was.

Specific Causes of Death

The bulk of studies on the specific causes of alcohol-related deaths has been concerned with various kinds of violent deaths. A large number of suicides are alcoholic persons (18,20,30), and a number of suicides are committed under the influence of alcohol (37). Comparable statements can be made about other forms of violent death, including home accidents (24), motor vehicle accidents (5,32), accidents in general (6) and homicide (39).

Much attention has been paid to motor vehicle accidents, and sophisticated research designs have been developed to study the interrelationship of alcohol, automobiles, and fatalities. Zylman (40) has quoted data from the Grand Rapids study indicating that 36% of all adult pedestrians and 44% of all drivers killed have blood alcohol concentrations of 0.10% or more. Those who exhibit signs of heavy drinking are more likely to be involved in motor vehicle accidents than social drinkers (38).

These studies raise in a particularly acute form the problem of assessing the relationship between alcohol and mortality--the extent to which alcohol is actually responsible for the death. The true extent of excess mortality attributable to alcohol will only be known when mortality is measured in situations that are identical except for the presence or absence of alcohol.

Many of the earlier-mentioned insurance and clinical studies of general mortality also show mortality ratios by specific causes. Table 2 shows these ratios for those causes with a high ratio in at least one study of a heavy-drinking or alcoholic group. It can be seen that the ratios vary quite widely from study to study, and in some cases there is disagreement on whether the mortality is higher than in the control population. The over-all U.S. mortality rate from many of the causes is also shown in the table, to give some impression of the relative importance of the causes of death. A cause which shows a high mortality ratio may be rare enough to be a small risk even to the heavy drinker, while a mortality ratio only slightly greater than 1 may indicate a substantially increased risk to the heavy drinker for a very common cause of death. Thus, in spite of the relatively high mortality ratio for oral and upper respiratory cancer, the male heavy drinker--like anyone else--appears to have less to fear from that cause than from heart disease.

Summary

The results from the combined National and San Francisco general-population samples suggest a substantial excess in early mortality among frequent heavy drinkers and among those with a high current drinking-related problems score (31). However, the excess drinking-related mortality is mostly limited to these relatively extreme groups, who comprise only 2 or 3 percent of the total adult population. For unexplained reasons, abstainers also seem to have

TABLE 2

MORTALITY RATIOS COMPARING DEATHS AMONG HEAVY DRINKERS TO DEATHS AMONG CONTROL GROUPS BY SPECIFIC CAUSES (a)

	Calif. Div of Alcohol Rehab. (8)	Pell & D'Alonzo (25)	Sundby (34)	Dahlgren (9)	Schmidt & deLint (31)		Dawes (10)	Monge (21)	U.S. 1960 Over-All Mortality Rate per 100,000
					Men	Women			
Accidents	2.4			2.82	2.52	12.40	5.00[b]	1.03	51.3
Suicide			7.98	3.62	7.80	8.69	2.67	1.30	10.6
Accidents & Homicide			2.71				4.38	1.09	56.0
Diseases of digestive system				1.11			4.67		
Cirrhosis	7.0		9.88		11.49			4.5	11.3
Diseases of digestive system minus cirrhosis			1.54		0.69	0.95			
Ulcer					3.55	6.66			6.4
Malignancies		3.98		1.31			2.32	0.95	
Oral and upper respiratory			11.68		2.79	1.69			1.7
Arteriosclerotic and degenerative heart disease		2.09			1.79	4.10	2.63	1.33	307.4
Cardiovascular disease	0.58	2.28	1.96	1.04	1.14	2.43	1.33		
Tuberculosis			2.11	0.85				0.56	5.6
Diabetes			3.22						16.7
Chronic alcoholism						33.33			1.2

(a) The different methods of calculating mortality ratios are described in the original sources.
(b) Motor vehicle accidents only.

a higher early mortality than moderate drinkers. These results, in broad terms, are in concord with results from other general-population studies.

A preliminary analysis of the interaction of various habits and statuses associated with increased mortality suggests that the relation between heavy drinking and mortality is, if anything, stronger when other factors (age, health, smoking, tension, social status) are allowed for. But the prediction of mortality from amount of drinking remains less strong than in alcoholic populations seen in clinics and hospitals, suggesting the need for caution in extrapolating findings from the clinical populations to the alcoholic population at large.

All-in-all, the data on general mortality suggest that for amount of drinking, apparently unlike amount of smoking, there may be some kind of threshold below which mortality is little affected. In the absence of further evidence, in fact, the classical "Anstie's limit" seems still to reflect the safe amount of drinking which does not substantially increase the risk of early death.

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5. Alcohol and the Central Nervous System

Of all the many physiological, metabolic and pharmacological effects of alcohol that have been observed, the commonest and yet most important is that alcohol causes intoxication. Incredible as it may seem, however, there is no generally accepted explanation of how alcohol induces intoxication. It has been commonly assumed that alcohol exerts its fundamental effect upon the brain by interacting in some as yet undefined way with the nerve cell membrane. In this regard the theory of the conduction of nerve impulses proposed by Hodgkin and Huxley (6) stands for the time being as the central premise on which any explanation of the effects of alcohol on the brain can be based. The nerve cell membrane is pictured as an ion pump, moving sodium ions outside and potassium ions inside until a sudden increase in sodium permeability produces the change in transmembrane voltage which is the nerve impulse, and this theory is as fundamental to the understanding of alcohol effect on the brain as was the work of Theorell (17) in forming the basis for our much clearer picture of the effects of alcohol on the liver. The assumption that alcohol, like many other lipid-soluble anesthetics, interacts perhaps in a nonspecific manner to impair function, forms the underlying premise of most theories of the actions of alcohol upon brain during the present century (10,13).

It is of course possible that alcohol could impair cerebral function by interfering with some intracellular metabolic process within the cell, or by impairing the transmission of a nerve impulse from one nerve cell to another, a process involving the release of chemical substances such as acetylcholine or norepinephrine into a specialized area between nerve cells called a synaptic cleft (5). But at present, no definitive answer as to the mechanism whereby ethanol induces drunkenness or sleep can be given with certainity.

It seems obvious that without a firm understanding of the mechanism responsible for alcohol intoxication, theories attempting to explain alcohol addiction or withdrawal stand on even less certain ground . This ignorance calls for a major research effort in this fundamental area. It should be noted, however, that while pouring money into a problem will undoubtedly produce a great deal of scientific work, publications, and even new information, it will not inevitably lead to a fundamental understanding, particularly when, as in the present case, methodological inadequacies inhibit rapid progress. The only existing methodologies available now to examine this question are those of biochemistry and neurophysiology. Biochemistry is limited by its slowness in relation to the events of nerve conduction, and by its inability to deal practically with the anatomic complexity of brain. Neurophysiology is limited by its inability to provide a comprehensive explanation of the events which can be so elegantly observed both in time and space. It seems likely that a sustained approach, concentrating on the development of new methodologies, or the modification of existing ones to fit the present problem, could lead to a fundamental understanding of the mechanism of alcohol intoxication in a reasonable time. The achievement of this goal would be of central importance to the understanding of the actions of alcohol, to the treatment of alcoholic patients, and perhaps to the prevention of alcoholism.

A number of recent reviews have summarized the results of numerous studies of the effects of alcohol on brain or nerve (7,19). The widely accepted facts may be summarized as follows:

Effects on Brain Metabolism

The effects of alcohol on the brain are those shared by most other anesthetic agents. Thus alcohol at high doses induces up to a 30 percent decrease in brain oxygen consumption (2,12), while at the same time reducing glucose utilization (14). There is no apparent change in the efficiency of mitochondrial oxidative phosphorylation, in that the P/O ratio of brain mitochondria in vitro remain unchanged in the presence of high doses of alcohol (3,20). In the face of only small changes in the brain content of creatine-phosphate, ATP, ADP and inorganic phosphate (18), it seems likely that intoxicating doses of alcohol reduce the energy requirements of the brain, but do not interfere significantly with its energy producing systems. Alcohol does appear to change the brain content of certain intermediary metabolites, notably glucose, glocuse-6-phosphate, and citrate, but the significance of these changes is not clear.

Effects on Nerve Cell Transmission

The effects of alcohol on the magnitude of the voltage change during nerve cell conduction are contradictory, but most reports conclude that alcohol decreases the action potential by directly interfering with the changes in ion conductance (11). Several reports also indicate that alcohol can decrease the resting nerve cell potential (9).

Effect on Synaptic Function

Due to the structural complexity and small size of the synaptic region in nerves, no consensus exists as to the action of alcohol on synaptic functions. There is, however, a large literature on the effects of alcohol on brain contents of one or another neurotransmitter such as norepinephrine, serotonin, acetylcholine and gamma-aminobutyric acid (7). Unfortunately, this extensive literature leads to no firm evidence supporting the conclusion that the various changes measured in one or another neurotransmitter are in any way related to the fundamental action of alcohol upon the brain. This unhappy state results largely from the fact that it has so far not been possible to study neurotransmitters within the synaptic cleft where they are functionally active. Recent hypotheses attempting to implicate condensation products of acetaldelyde, a metabolic product of alcohol, with one or another neurotransmitter or its metabolites (4) are entirely speculative and so far without sound experimental or theoretical basis.

Alcohol and the Biochemistry of Membrane-Bound Processes

It has been known for some time that ethyl alcohol and higher alcohols can inhibit the active transport of potassium ions, including brain cells ( ). This transport, which forms the basis of nerve cell transmission, is thought to be the result of the enzyme called sodium-potassium adenosine trisphospatase (,). A number of technical difficulties remain to be overcome in the measurement and handling of this enzyme, but there are sufficient data now in hand to indicate that it may account for several of the known effects of alcohol on brain. Unfortunately the theoretical basis for understanding the control of membrane-bound enzymes-catalyzed chemical process is only in its infancy and will require simultaneous development for a reasonably complete understanding of the effects of alcohol on brain. It will only be with a sound fundamental understanding of the basic problem of how alcohol interacts with the brain that progress can be expected and central phenomena sorted out from the numerous epiphenomena which result from any change in a balanced living system. The evidence to date certainly demands further work on this system and time will tell whether sodium-potassium adenosine triphosphatase will provide the fundamental key to understanding alcohol effects on the brain in the way that an understanding of alcohol dehydrogenase has done for its effect on the liver.

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Chapter VI

ALCOHOL AND HIGHWAY SAFETY

Viewed broadly, a "highway accident" is an unexpected and unwanted event. However, research has revealed certain recurring patterns and common factors in crashes which indicate that they are not simply random happenings. Alcohol is one factor which has been found frequently related to crashes. The high economic cost of this association is discussed in Chapter III of this Report.

The contribution of alcohol misuse to highway crashes has been inferred from two different types of data: epidemiological and experimental. On the one side, alcohol has been implicated in fatal and serious-injury crashes--after the fact--by epidemiological studies (16,22,23,38,4 ,33,3 ,19, 36,45). In fact, there is evidence that the probability of being responsible for a fatal crash increases sharply as blood alcohol concentrations increase above those achieved by heavy social drinking (4,19,23,33). On the other side, how alcohol affects driving and driving-related behavior have been systematically studied in experiments with subjects performing contrived psychophysical, sensorimotor, and automobile driving tasks in laboratories and on closed courses or driving ranges (2, 8,17,24,32). However, no controlled study has yet been conducted to obtain systematic data on the actual influence of alcohol upon real-world driving behavior in its natural environment. From these epidemiological and experimental studies, it has been inferred that alcohol degrades a driver's capabilities--and, consequently, his actual driving performance--so that the probability of his being involved in a crash is increased. Because of its more direct relation to crashes, the epidemiological data will be discussed here in some detail.

Evidence of Alcohol Involvement in Highway Crashes

The primary source of epidemiological evidence is the amount of alcohol actually found in the body, referred to as the blood alcohol concentration (BAC). But neither the presence of alcohol in the body nor the magnitude of the BAC can be taken alone as conclusive evidence that alcohol caused or even contributed to an accident. Rather, special methods of sampling and collecting data have had to be developed to determine the role of alcohol. The main method is the "case-control" study.

To investigate the contribution of alcohol (or any other factor) to crashes, requires determining the extent to which drivers with alcohol are representative of drivers with similar alcohol exposure but not involved in the crashes. Thus, it is necessary to compare the distribution of BACs of drivers involved in crashes to those of "control" or "comparison" drivers randomly selected while driving past the same place as the crashes at equivalent times. Such sets of data make it possible to determine the similarities and differences between the two groups of drivers in terms of the proportions of each group with no alcohol and with different levels of BAC.

Before considering these questions it is useful to note that several ranges of BAC are usually distinguished in American conceptions and laws - differing, however, among jurisdictions. A BAC up to 0.05 percent (50 milligrams of alcohol per 100 milliliters of blood) is usually considered safe; the person is presumed to be unimpaired in his ability to drive. This BAC might be achieved by an average-sized man with two average drinks. Between 0.05 and 0.10 percent (50 to 100 mg of alcohol per 100 ml of blood) no presumption of impairment is made but the BAC may be presented in evidence in connection with other behavior of the driver to support a charge of being under the influence

of alcohol. (In some European jurisdictions, especially in Scandinavian countries, a BAC of 0.05 percent is considered legal evidence of impairment.) In some American jurisdictions a BAC of 0.08 percent is legally defined as evidence of impairment. In others, a BAC of 0.10 percent is the legal standard of impaired driving or intoxication. In nearly all jurisdictions a BAC of 0.15 percent (150 mg of alcohol per 100 ml of blood) or higher is regarded as prima facie evidence of intoxication.

Despite differences in many methodological details, the general findings from a number of different studies are generally compellingly consistent: drivers with high BACs are grossly over-represented in fatal and serious injury crashes in comparison with samples of uninvolved drivers. Furthermore, these findings were obtained in studies which range across the major types of driving experience in the United States, namely, in metropolitan areas in the Manhattan study (23), in urbanized areas in the Grand Rapids study (4), and in rural areas in the Vermont study (28). Similar findings have also been reported more recently from those Department of Transportation Alcohol Safety Action Projects which were designed to gather relevant data (47) as well as from the case-control studies conducted in other countries and reported by Stroh (36,37).

Alcohol and the Driving Population

Estimates of the BAC distribution in the driving population come from both roadside research surveys: case-control and non-case-control. The estimates obtained from the case-control studies, i.e., the Toronto, Manhattan, Grand Rapids, and Vermont surveys, (36,23,4 ,28) are deliberately biased in favor of drivers not involved in crashes, with presumably the same exposure as the drivers who crashed at the sites and times which were used to determine the survey points. The non-case-control studies involve survey points which do not necessarily correspond to previous crashes, but rather are selected for other reasons, such as an attempt to describe the driving population in a particular area on the basis of a 24-hour saturation sampling procedure (7), or simply to describe the nighttime driving population (10).

It is noteworthy that for general descriptive purposes, the results from both types of studies are essentially the same: a relatively small proportion of the driving population is found with presumptively impairing BACs, that is, in excess of 0.10 percent. To the extent that we can generalize from these various studies in order to characterize alcohol and the driving population (as in Figure 1), we can expect that at any given time, between 80 and 90 percent of drivers have no alcohol, 5 to 10 percent have low BACs (0.01 to 0.049 percent), 3 to 10 percent have medium BACs (0.05 to 0.099 percent), 0.5 to 3 percent have high BACs (0.10 to 0.149 percent) and that up to 1 percent have extremely high BACs (0.15 percent).

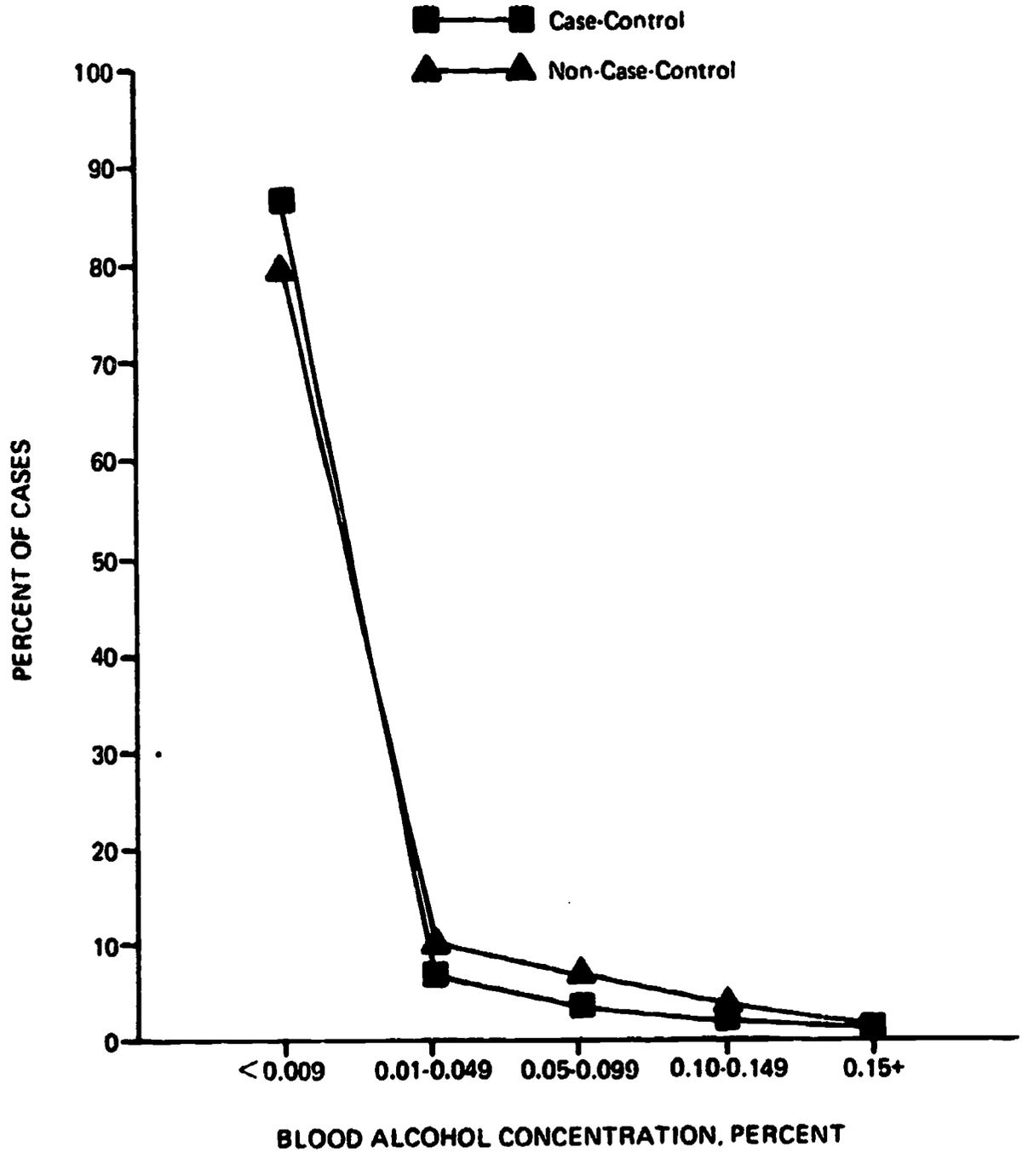
Alcohol and Non-Fatal Crashes

Despite probable under-reporting due to selective sampling and to legal and logistical problems, it seems safe to estimate that impaired drivers (0.10 percent or higher) are involved in 5 to 10 percent of the run-of-the-mill crashes, and between 10 to 35 percent of the serious injury crashes (30 , 4 ,36 , 16 ,28 , 6). Furthermore, injury to the driver is more likely after drinking, and both the probability and the severity of injury appear to increase as the amount of alcohol rises. The likelihood of being responsible for the crash is also greater if the driver has been drinking. Also, higher BACs are associated with higher proportions of drivers responsible for the crashes.

Alcohol and Fatal Crashes

More complete data are available about fatal crashes than about other types. In general, about 45 percent (ranging from 40 to 55 percent) of all fatally injured drivers have BACs of 0.10 percent and a surprisingly large proportion of these drivers exceed the highest BACs found in the population-at-risk (13 ,25 ,23 ,26 ,33 ,42). However, in order to obtain a more accurate

Figure 1. DISTRIBUTION OF BLOOD ALCOHOL CONCENTRATION FROM THE CASE-CONTROL STUDIES IN CRASHES AND FROM NON-CASE-CONTROL STUDIES OF THE NOCTURNAL DRIVING POPULATION



portrayal of the contribution of alcohol to fatal crashes, it is useful to distinguish between multiple- and single-vehicle crashes and, more importantly, to determine whether or not the fatally injured driver was responsible for the crash.

When drivers fatally injured in multiple-vehicle crashes are considered as a separate subgroup (regardless of estimated responsibility for the crashes), approximately one-third (ranging from about one-quarter to one-half) have BACs of 0.10 percent or higher (13,27,23,33,42).

When drivers fatally injured in single-vehicle crashes are examined as a subgroup, between 55 and 65 percent have BACs of 0.10 percent of higher (13,27, 23,33,42). Since single-vehicle and multiple-vehicle crashes occur with approximately equal frequency (each represents about 40 percent of all fatal crashes, and pedestrian fatalities account for the remaining 20 percent), it is clear that a disproportionately large part of the high-BAC driver fatality problem is contributed by the drivers in single-vehicle crashes, an overrepresentation which becomes even greater when the dimension of responsibility is considered.

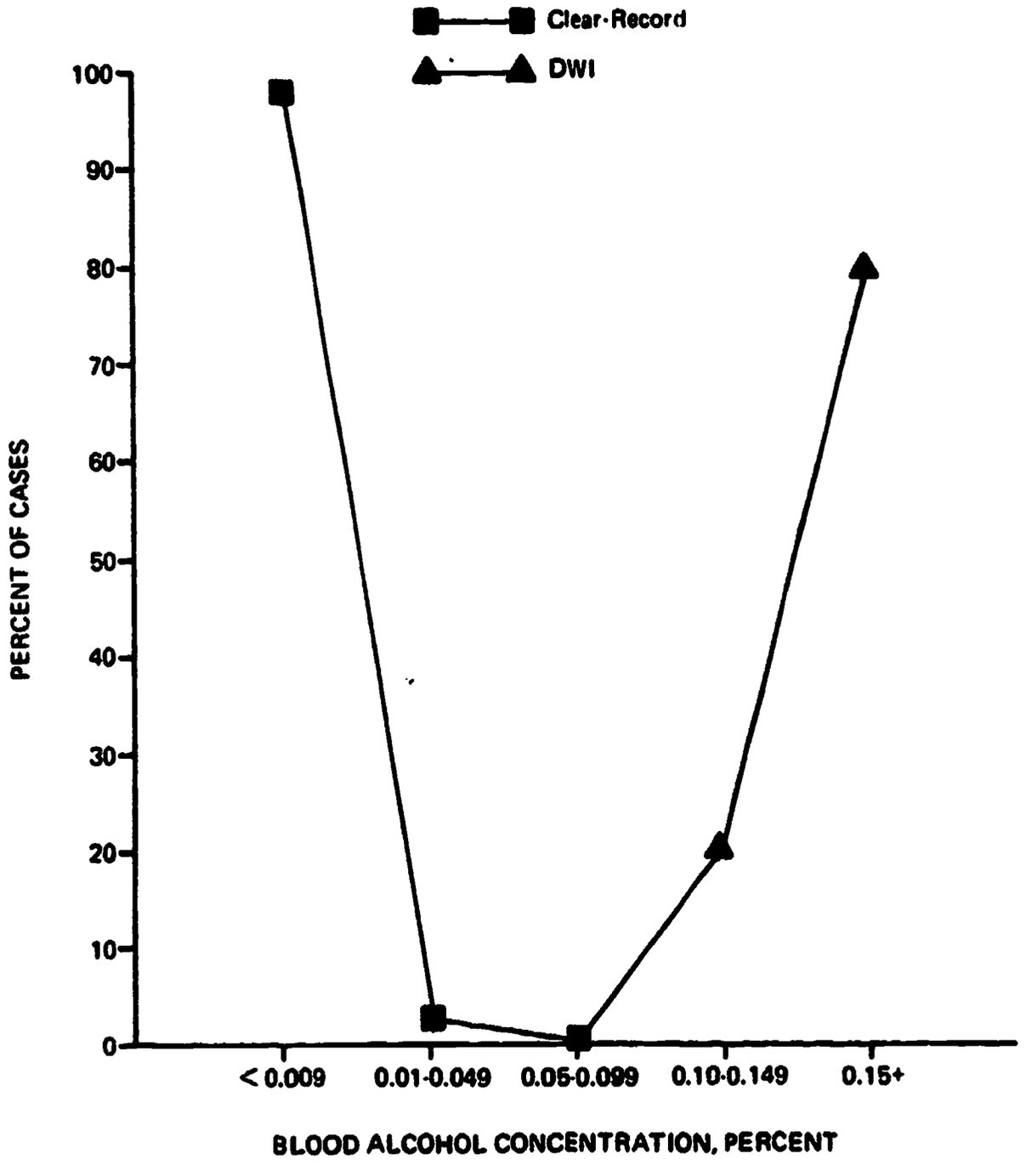
A useful system for assigning crash responsibility for research purposes was first reported by McCarroll and Haddon (23) and has been utilized in a number of studies since that time. In this system, a driver-vehicle combination is assumed to be responsible if: (1) it is the only vehicle involved (excluding collisions with pedestrians), (2) it has struck a non-moving vehicle, or (3) if it played an unambiguously major role in initiating the crash. If two vehicles were involved and both contributed substantially to the event, "responsibility" is treated as being unknown, contrary to the common practice among enforcement agencies. Zylman (46), based on a composite of studies by Neilson (27) and by Perrine et al. (33), has determined that about 43 percent of drivers designated as "responsible" had legally impairing BACs of 0.10 percent or higher, whereas only 10 percent of those designated as "not responsible" had BACs in this high range. Thus, if we were to construct a composite of all assumedly responsible driver fatalities in non-pedestrian crashes (i.e., all drivers from single-vehicle crashes, as well as from about two-thirds of the multiple-vehicle crashes according to the McCarroll-Haddon classification system), we would find that about 50 percent were legally impaired with BACs of 0.10 percent of higher.

Alcohol and DWI Drivers

Motorists who have been convicted of driving while intoxicated comprise a group of rather mixed composition in terms of the reasons they initially drew the attention of the police. The three major reasons are: deviant driving, involvement in a crash which is investigated by the police, and a complaint registered by some citizen. The general finding from all these studies is quite clear: the vast majority of drivers arrested for DWI usually have BACs in the extremely high range (0.15 percent of higher) and therefore can be presumed to have been very "drunk". A composite of the BAC distributions from these studies is presented in Figure 2, which is similar to distributions reported in several other countries such as Australia, Canada, England, Germany, the Netherlands, Sweden, and France. The average (median) BAC for the arrested DWIs in the four American studies is above 0.20 percent (20, 35, 33, 43)

A 180-pound man would have to consume 10 drinks within an hour on an empty stomach in order to reach the average BAC of these DWIs. Regarding the other end of the distribution, an extremely small proportion of arrested DWIs are found with BACs less than the minimum amount for legal impairment (0.10 percent), and a relatively small proportion (4 to 18 percent) are found with BACs in the lower range for legal impariment (0.10-0.149 percent). Hyman (20) has determined that two-thirds of the DWI drivers were found with BACs between 0.185 and 0.280 percent. Thus, it is quite clear that the vast majority of drivers arrested for this particular violation are being appropriately labeled as "driving while intoxicated" or "driving under the influence". It is also clear from the sheer magnitude of the majority of BACs among this group that a large proportion of DWIs must surely qualify as being labeled "problem

Figure 2. DISTRIBUTION OF BLOOD ALCOHOL CONCENTRATION IN CLEAR-RECORD CONTROL DRIVERS AND IN THOSE CONVICTED OF DRIVING WHILE INTOXICATED



drinkers" or "alcoholic persons". This statement is supported by the facts indicating a history of heavy drinking: (1) DWIs convicted in the lower half of the impairing range (from 0.10-0.199 percent) tend to be younger, on the average, than those in the upper half (0.20 percent or higher), and (2) that repeat DWI offenders tend to have significantly higher mean BACs (0.22 percent) than first offender DWIs (0.19 percent) (43).

Alcohol and Pedestrian Fatalities

The general finding is that about one-third (ranging from 28 to 43 percent) of fatally injured adult pedestrians have BACs of 100 mg/100 ml or higher (13, 15,27,33,42). There is a striking similarity between the BAC distributions for adults pedestrian fatalities and for drivers fatally injured in multiple-vehicle crashes. In fact, one investigator has recently attempted to evaluate the relationship between BAC and crash "responsibility" in collisions between vehicles and pedestrians by attempting to assign "responsibility" in a manner conceptually analogous to the scheme developed by McCarroll and Haddon (41). He found that adult pedestrians with BACs of 0.10 percent or higher were usually responsible for initiating the crashes. Waller (41) concluded that "when the pedestrian has alcohol in his system, it is the driver of the striking vehicle who is innocent rather than the pedestrian."

Figure 3 summarizes one of the most salient aspects concerning the distribution of BAC in the various segments of the driving population (including adult pedestrians). The average proportion of individuals in each group who were legally impaired (0.10 percent of higher) is indicated in Figure 3, in addition to the range of proportion reported in available studies.

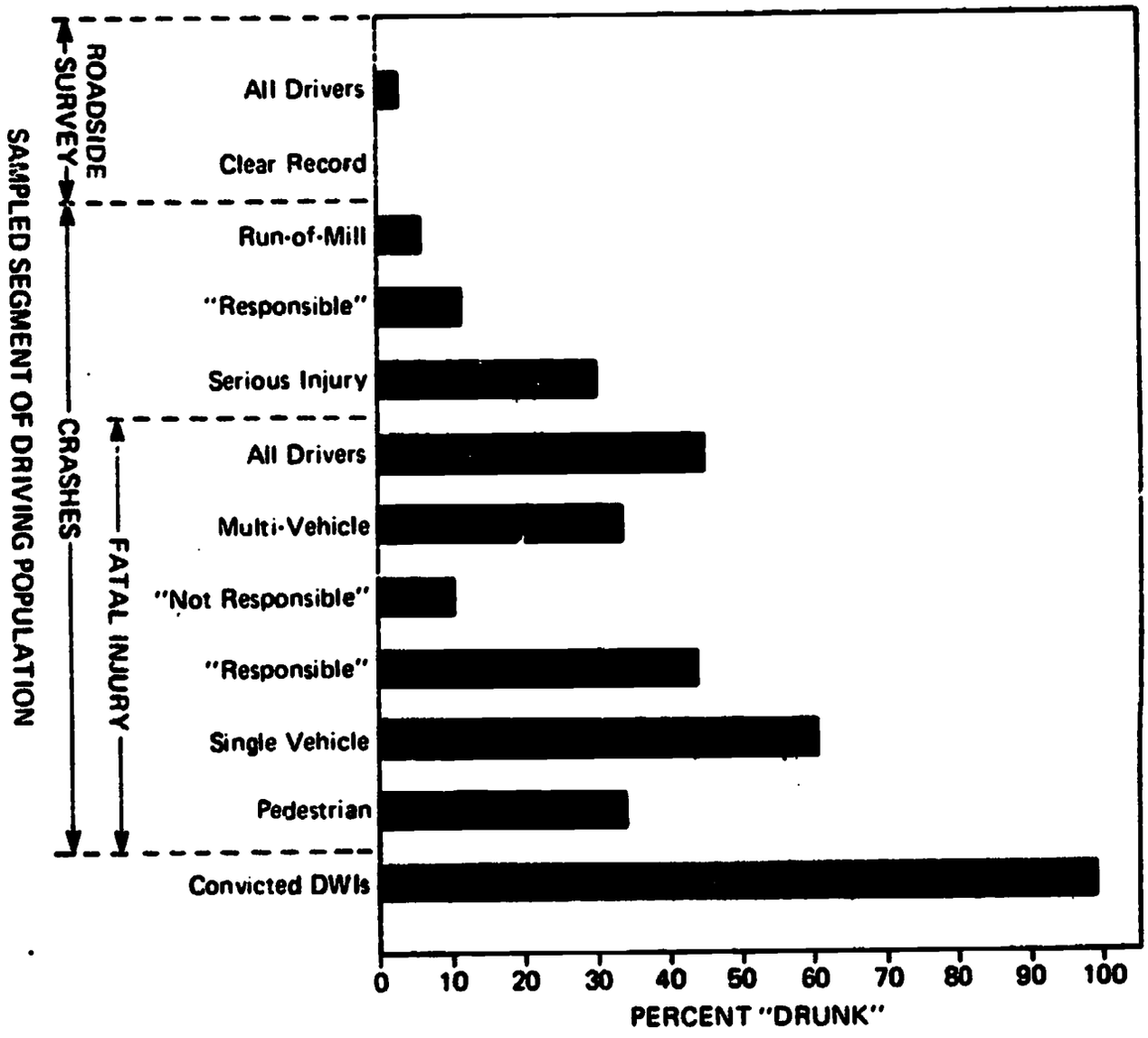
Crash Probability and Blood Alcohol Concentration

The relative probability of being involved in a crash can be inferred by comparing the BAC distribution of the population-at-risk (as indicated by the sample of "control" drivers obtained at corresponding times and places of crashes) with the BAC distribution of the drivers actually involved in these crashes for which the control drivers were sampled.

Hurst (18,19,) in his extensive review of five relevant studies (Evanston, Toronto, Manhattan, Grand Rapids, and Vermont) has calculated the relative probability of crashing with no alcohol (0 percent) equal to 1.0. The resulting relative hazard functions are shown in Figure 4 (adapted from Hurst (18,19), Figure 1). Hurst (18,19) has offered several tentative inferences derived from the data: (1) relative hazard or probability of crash involvement is steeper for the more urbanized populations, and (2) the incidence of more serious crashes has a greater acceleration than run-of-the-mill crashes, as shown by the right-hand portions of the curves in Figure 4, beginning in the region indicated by a BAC of 0.08 percent.

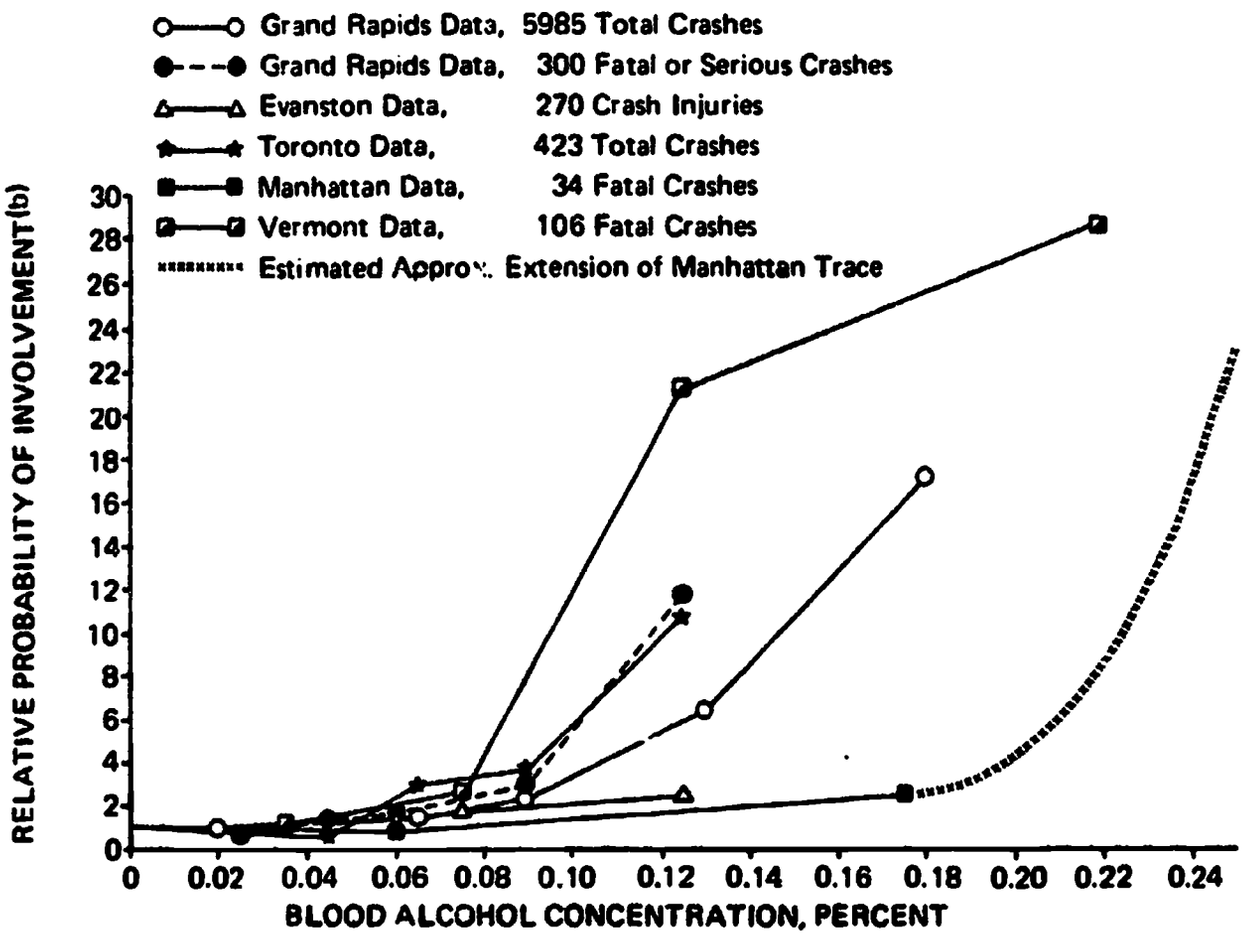
A more crucial issue concerns responsibility for initiating a fatal crash as a function of alcohol. By using the McCarroll-Haddon system discussed above with regard to alcohol and fatal crashes, the relative probability of being presumptively responsible for a fatal crash can be estimated for subsets of the fatally injured drivers in the two case/control studies which obtained relevant data for this purpose (the Manhattan and Vermont studies). Because of the larger sample size, the Vermont data are used in Figure 5 which shows the relative probability of being responsible for initiating a fatal crash (using the McCarroll-Haddon system) as a function of BAC (adapted from Perrine et al. (33), Figure 6-9). With reference to Figure 5, it can be seen that at low BACs (less than 0.05 percent), the probability of being responsible for a fatal crash is essentially the same among fatally injured drivers as it is among the control drivers exposed to similar circumstances of time and place, but not involved in a crash. However, at BACs between 0.05 and 0.10 percent, the relative probability of fatal crash responsibility begins to increase appreciably, such that at a BAC of 0.10 percent, a driver would be 7 times more likely to be responsible for having a fatal crash than he would with no alcohol. The relative hazard curve rises very sharply above this lower limit for a DWI

Figure 3. PERCENT OF "DRUNKEN" DRIVERS AND ADULT PEDESTRIANS IN VARIOUS SEGMENTS OF THE DRIVING POPULATION



"Drunk" = Blood alcohol concentration of 0.10 percent

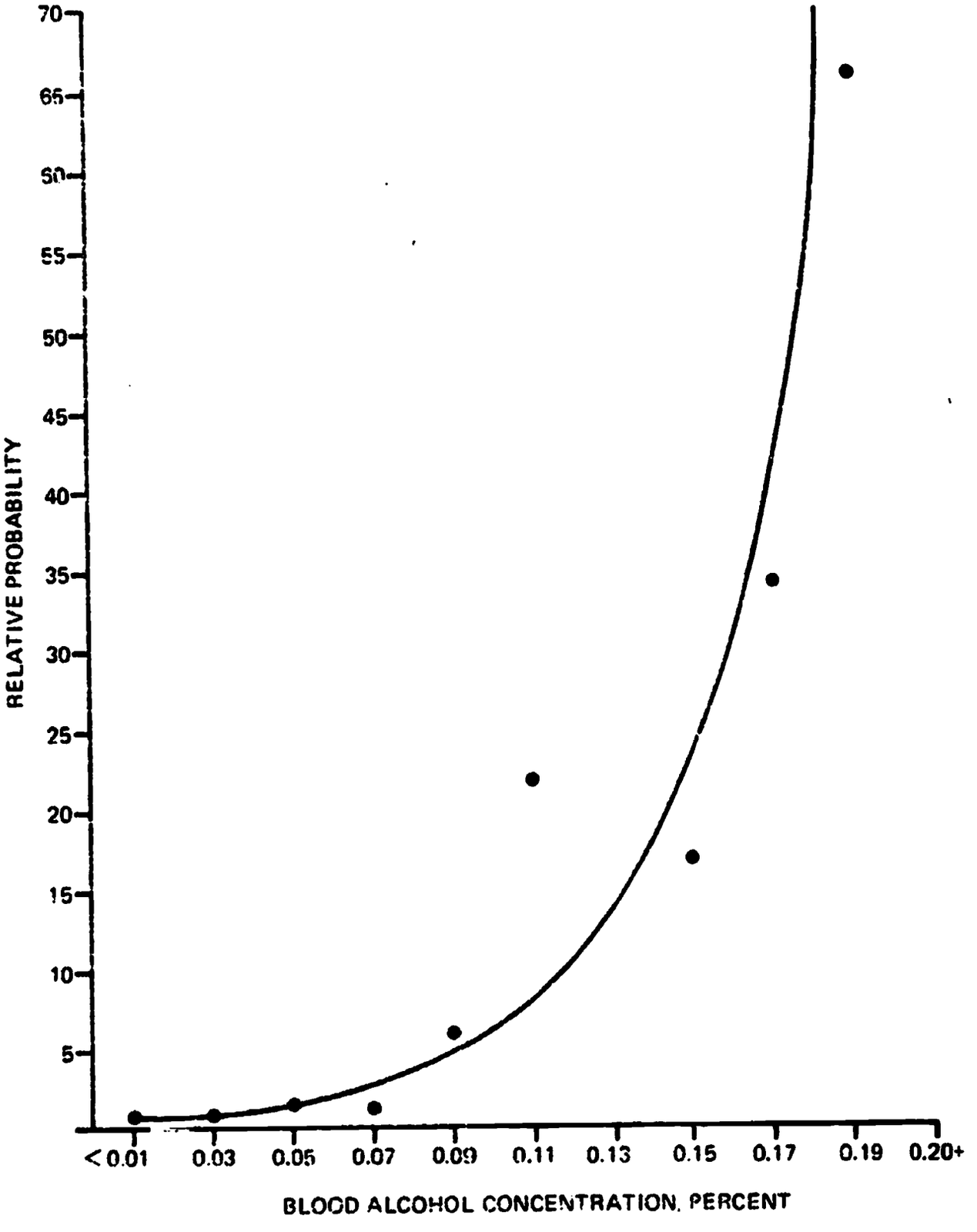
Figure 4. RELATIVE PROBABILITY OF CRASH INVOLVEMENT AS A FUNCTION OF BLOOD ALCOHOL CONCENTRATION[a]



[a]Source: Hurst (1973)

[b]1.0 = Relative probability at zero alcohol

Figure 5. RELATIVE PROBABILITY OF BEING RESPONSIBLE FOR A FATAL CRASH AS A FUNCTION OF BLOOD ALCOHOL CONCENTRATION [a]



(a) Source: Perrine et al. (1971)

violation in most states (0.10 percent), such that at a BAC of 0.15 percent a driver would be 25 times more likely to be responsible for a fatal crash, at 0.18 percent he would be 60 times more likely, and at 0.20 percent (namely, at the average BAC found among convicted DWIs and among fatally injured drivers who would have been eligible for a DWI conviction) he would be at least 100 times more likely to be responsible for a fatal crash than if he had not been drinking at all.

It should be noted that similar results were obtained in the Grand Rapids study for drivers assumed responsible (using another system) for all crashes, regardless of severity. A comparison of drivers assumed responsible for crashes in these three case-control studies (Grand Rapids, Manhattan, and Vermont) has been presented by Hurst (18,19). The implications of these studies are very clear: Concentrations of 0.08 percent or higher "are incompatible with safe driving, and the higher the concentration, the greater the incompatibility." Small increases in blood alcohol concentration above 0.08 percent result in "disproportionately large increases in crash risk" (33). For example, among fatally injured drivers in the Vermont study who were assumed to have been at fault, 52 percent had BACs of 0.08 percent or higher, whereas among those not at fault only 14 percent were at or above this same BAC.

Biographical Variables, Crashes, and Alcohol

Information has been obtained concerning the biographical and psychological characteristics of drivers who are involved in highway crashes or citations. Such information can be helpful in identifying problem drivers and designing appropriate countermeasures for the different subgroups. The relevant personality variables studied tend to fall into three general classes, the first is essentially demographic and the second two are essentially behavioral: (1) biographical background variables (sex, age, etc.), (2) driving variables (driving history, record, and drinking-and-driving patterns), and (3) drinking variables (in particular, patterns of alcohol use in terms of quantity, frequency, and variability of consumption). Each class is considered below separately, but in terms of each of the other two classes.

Biograhical variables. A number of studies have found significant relations between crashes, alcohol, and the following biographical variables: sex, age, marital status, and occupational level. Less consistent, but still potentially useful findings have been reported for such single and combined variables as race, ethnicity, religious affiliation educational level, socioeconomic status, social stability/instability, social mobility, leisure activities, and contact with social agencies (1,4,5,6,7,9,10,11,13,20,21,29,30,31,33,40,42,45,46).

Regarding sex, drinking-and-driving problems are clearly a predominantly male domain. In contrast to approximately equal representation in the adult population, males comprise a large proportion of licensed drivers (about two-thirds), a larger proportion of drivers sampled during roadside surveys (about 80 percent), a larger proportion of fatally injured drivers (about 90 percent), and virtually all convicted DWIs (about 98 percent) (9,10,33). However, a larger proportion of females are non-drinking drivers (about 90 percent) than are males (about 80 percent) (10). A recent study of alcohol usage in the nocturnal driving population (5) found that at night female drivers are underinvolved in single-vehicle crashes and are less likely to have been drinking than males, but when drinking they are more likely to be involved in crashes--and at relatively low BACs (0.05 percent). Since females are driving less at night and drinking less compared with males, Carlson (5) suggests that as with young male drivers, inexperience with drinking-and-driving probably results in the over-involvement in alcohol-related crashes.

Regarding age, the general finding is that younger drivers with alcohol who get into trouble on the highways do so at lower average BACs than do their middle aged or older counterparts (33). However, two extremely important additional factors must also be considered, namely, crash involvement and exposure. On the basis of his extensive review of the interrelations between age, alcohol, and crash involvement, Zylman (46) summarizes the data from a

number of studies showing that alcohol increases the probability of crash involvement among teen-agers much more than among drivers age 20 to 24, who are in turn at higher risk than those in the range from 25 to 69, whereas the probability of crash involvement again rises among drivers aged 70 or older. In his definitive study of the interrelations of age, exposure, and alcohol involvement in nocturnal crashes, Carlson (6) has developed a new method for assessing exposure which allows for a more accurate determination of the contribution of the other two factors. Regarding the reasons for the high crash involvement of drivers in the 16 to 25 age group, Carlson (6) concludes that these young drivers face two learning situations: first, learning to drive--with peak fatal crash involvement at age 18, and second, learning to drive after drinking--with peak alcohol-involved fatal crashes at age 21. These two learning situations result in crash involvement which is larger than can be attributed to exposure. Nevertheless, young drivers continue to have a disproportionately large number of crashes even after these two peaks in the learning period. Carlson concludes that the high crash involvement of drivers 16 to 25 corresponds to a high degree of night driving which he feels is the most significant single modifier variable after BAC itself. Thus, the apparent overrepresentation of youth in the subpopulation of fatally injured drivers--both with and without alcohol--is partially attributable to their lifestyle which involves night driving for recreational purposes.

Regarding marital status, married drivers are under-involved in drinking-and-driving problems relative to unmarried drivers (single, divorced, separated, or widowed) even when drivers under age 25 are excluded from analysis. Divorced and separated male drivers are especially over-involved in drinking-and-driving problems, as well as in alcohol usage in the nocturnal driving population (5 ,11,20,21,33,44).

Regarding occupational level, several studies have found that drivers from the lower levels are over-represented among those who have drinking-and-driving problems, especially DWI convictions. This pattern becomes even more pronounced when younger drivers (under age 25) are excluded from analysis.

Driving variables. A number of studies have found significant relations between alcohol, selected biographical variables, and the following driving variables: previous crashes, citations, suspensions, experience, and exposure (6,9 ,13,33,34,44). Regarding previous crashes, several investigators have found that drivers with alcohol-related problems (alcoholics, DWIs, and fatally injured drivers with high BACs) have a higher incidence of crashes than random samples of the driving population (9,13,33,34). In the most comprehensive of these studies, Clark (9) reported that the DWI sample had the worst crash experience, with two-thirds of the sample having one or more crashes and with the average number of crashes being nearly three times higher than the average among a random sample of licensed drivers. She concluded that the group which misuses alcohol in the driving situation and is convicted of DWI is also a high risk crash group prior to the incident which led to the conviction. In a related analysis of the Michigan data, Rosenblatt (34) found that hospitalized alcoholic drivers with high rates of non-crash-related driving convictions have high crash rates, and that the high crash rates are concentrated in the younger age categories. The interrelations of younger age and higher crash rates--both with and without alcohol--were examined by Carlson (6) who found analogous results in samples of non-alcoholic Michigan drivers, as discussed in the preceding subsection regarding age. Although serious injury crashes are the driving events which command the greatest amount of attention, they are statistically rare events which limits their utility for comparative and predictive purposes; therefore, it is desirable to examine deviant driving problems which occur with higher frequency, namely, convictions for serious driving violations.

Regarding driving convictions, several studies have indicated their utility as a more sensitive measure of deviancy than crashes (9, 13, 33). The number of convictions for all types of driving violations during the preceding six-and-one-half year period was analyzed by Clark (9), whereas the number of convictions for selected and more serious moving violations (e.g, excluding speeding citations) during the previous five year period was analyzed by Perrine et al. (33). Despite the technical and geographic differences between the two studies,

the DWIs in both Michigan and Vermont showed remarkable similarities on this as on other relevant variables. In both studies, the DWIs had significantly more previous driving convictions (excluding the one for which they were sampled) than the two approximations of the driving populations obtained respectively by a sample of licensed Michigan drivers and by a sample of case-control drivers interviewed on Vermont highways. More specifically, the Michigan DWIs had four times as many convictions and the Vermont DWIs had seven times as many convictions as the random samples of drivers. In fact, the Michigan DWIs averaged almost one conviction per year.

Driver fatalities in both studies also had more convictions for moving violations than the two random samples of drivers, but fewer than the DWI samples. Nevertheless, the driver fatalities with high BACs in Michigan were more similar to the DWIs in number of previous convictions, whereas those driver fatalities with no alcohol were more similar to the random sample of licensed drivers. Clark (9) also examined the Michigan samples for previous DWI convictions which were found in 1 percent of the random sample of licensed drivers, but in 12 percent of the DWI sample and in 16 percent of the hospitalized alcoholic drivers. Although the Michigan alcoholics, DWIs and high BAC driver fatalities were not exactly the same on all four driving variables studied, Clark (9) concluded that their similarities on these measures of driving deviancy indicate that these samples may well have been drawn from the same subpopulation of drivers.

From his analysis of the same large sample of Michigan alcoholics, Rosenblatt (34) concluded that the data on the crash-involved alcoholic drivers indicated that younger drivers with high rates of driving convictions represent a disproportionate part of the drinking-driver problem. Judging from the offenders' high rate of driving convictions, these individuals must already have been well known to the court, but were probably seen as driving violators rather than as problem drinking drivers since they were younger and had probably not developed the characteristics associated with alcoholism.

Regarding license suspensions, results similar to those for driving citations discussed above were obtained in the Vermont study (33). Since suspension or revocation of one's drivers license is seen as the most severe punitive measure short of being sent to jail, the relative effectiveness of this traditional alcohol countermeasure is especially worth examination. In the Vermont study, 14 percent of the case/control drivers had suffered one or more suspensions (during all years of driving), whereas 60 percent of DWIs had already experienced two or more previous suspensions (33). Hence, it can only be concluded that the overwhelming majority of individuals convicted for DWI were already well known to the courts and the Motor Vehicle officials.

In conclusion, these investigations of driving variables generally tend to support the popular assumption that past driving behavior is the best single predictor of future driving behavior. However, a major question which awaits further investigation concerns the extent to which this assumption holds within individual, as opposed to within group or subpopulation. In other words, with an event as relatively rare as a crash, to what extent can predictions be made which are specific to a given individual, as opposed to predictions which are based upon group membership?

Drinking variables. Perhaps because of the relatively sensitive and stigmatized nature of the topic, very few studies are available in which data concerning drinking patterns were obtained from drivers, especially in conjunction with BAC data. The extent of the drinking pattern information ranges from quick and simple questions about drinking only on the day of the survey (5,10) to studies in which questions were asked about potentially very sensitive alcohol topics (such as, frequency of "getting high" and of exceeding one's capacity, driving after drinking, having alcohol problems, hangovers, and blackouts (, 4) and in which very detailed questions were asked about frequency and quantity of usual consumption of the major alcoholic beverage types as well as typical occasions and places of drinking (30 ,33).

The Vermont study (33) has been selected for the purposes of the present discussion because it contains the most extensive alcohol data for the widest range of the driving spectrum. Furthermore, the Vermont study has the unique

advantage of being able to validate aspects of reported drinking patterns by comparing them with actual BACs in samples of driver fatalities, control drivers, and "clear-record" control drivers, as well as DWIs.

A drinking classification system based on reported usual frequency and quantity of alcohol consumption per occasion was developed in the Vermont study, to reflect the likelihood that a driver would attain an impairing amount of alcohol (33). The resultant Quantity-Frequency Index (QFI) for preferred beverage is based upon that beverage which was reportedly consumed most frequently and in largest quantity, regardless of whether it was beer, liquor, or wine. Regarding the fatally injured drivers, it should be noted that these data were obtained in interviews with next-of-kin. The QFI data were compared and cross-tabulated with selected biographical variables and driving variables, as well as with obtained BACs. A summary of the reported drinking patterns is presented in Figure 6, in which the proportions of roadblock control, clear-record, DWI, and deceased drivers are plotted as a function of a modified four-category (light, light-medium, medium, or heavy) QFI for preferred beverage (adapted from Perrine et al. (33), Figure 6-7). It is clear that, as a group, the DWIs are decidedly different in their self-reported drinking patterns from the other three samples, each taken as a group. The remainder of this subsection includes some of the more salient results of the QFI cross-tabulations with selected biographical variables, driving variables, and drinking and driving patterns.

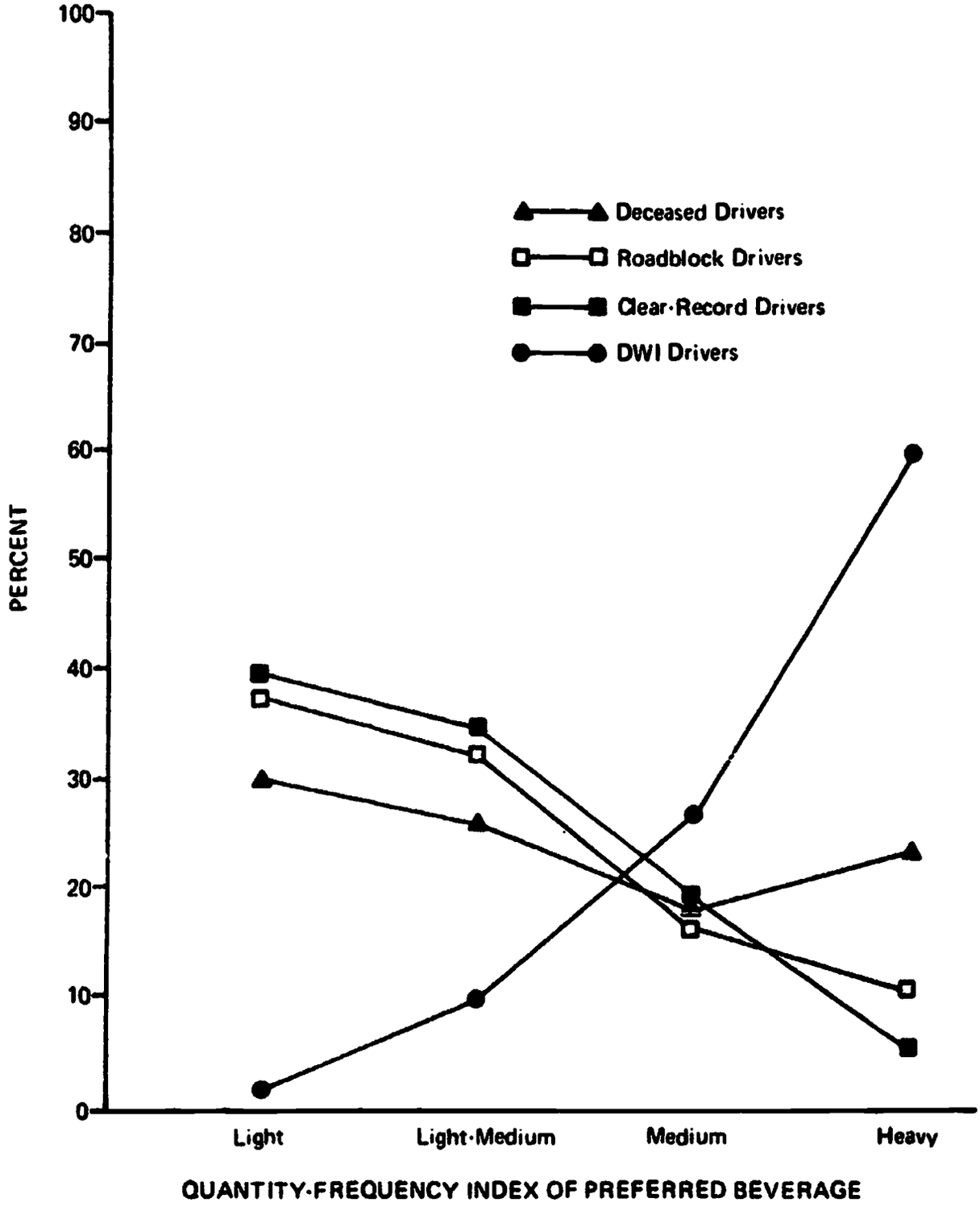
Regarding QFI and sex, the proportion of males to females increased as quantity and frequency of alcohol consumption increased. Regarding QFI and age, a surprisingly large proportion of the very young (i.e., teen-age) drivers could be categorized as heavy and frequent drinkers; and the quantity of alcohol typically consumed apparently decreased with increasing age. Regarding QFI and marital status, the proportion of married drivers decreased significantly as reported alcohol consumption increased. Although no significant differences were observed with occupational level, there was some evidence that drivers with heavy QFIs were more likely to have had a greater number of job changes during the five-year period immediately preceding the interviews.

Regarding QFI and drinking-and-driving patterns, two generalizations were offered by the investigators as evidence that the BAC sampled at one point in time during the study was a reliable indicator of usual patterns of driving after drinking: (1) the higher the frequency of driving after drinking, the heavier and more frequent the reported usual alcohol consumption, and vice versa; and (2) the lighter and less frequent the reported usual alcohol consumption, the lower the frequency of driving after drinking, and vice versa.

Regarding QFI and driving patterns, no clear-cut patterns of differences beyond those of the basic distributions were obtained from cross-tabulations of crashes or license suspensions by QFI. However, when convictions for driving violations were cross-tabulated by QFI, substantial deviations from the basic distributions within each sample were found, especially among the control drivers. Specifically, control drivers with higher QFIs tended to have more citations in the previous five years than control drivers with lower QFIs. Perrine et al. (1971) concluded that the number of previous citations would seem to be worth further examination as a basis for identifying drivers who may have an elevated likelihood of receiving a DWI or other moving citation.

The investigators also concluded from the analyses of the alcohol consumption data that these variables are in fact useful in differentiating across the spectrum of drivers. Further encouragement for the utility of these variables was felt to be provided by the relation of the reported alcohol consumption data (QFI) to the actual consumption data (BACs) and to the driving variables (both self-reported and official record-check information). Even further evidence of this utility resulted from a discriminant analysis of twelve selected variables. The four variables which were significant in discriminating between the clear-record drivers and the DWI drivers were, in order of importance: (1) the number of convictions for driving violations, (2) occupational level, (3) frequency of beer consumption, and (4) quantity of liquor consumption. On the basis of a discriminant function using these four variables, 95 percent of the clear-drivers and 87 percent of the DWIs could have been correctly classified.

Figure 6. PERCENT OF ROADBLOCK, CLEAR-RECORD, DWI, AND DECEASED DRIVERS WITH LIGHT, LIGHT-MEDIUM, MEDIUM, OR HEAVY QUANTITY–FREQUENCY INDEX FOR PREFERRED BEVERAGE[a]



[a] Source: Perrine et al. (1971)

Thus, it was possible to determine classification "hits" and "misses" on the basis of a weighted function which incorporated components from an individual's driving record, from his socio-economic status, and from his reported patterns of alcohol use.

One particularly noteworthy finding concerning type of beverage was reported in the Vermont study (33). Frequent and excessive use of beer was highly correlated with BACs of 100 mg/100 ml or higher. Thus, relative to fatally injured drivers with no alcohol, over twice as many with high BACs were reported to drink beer daily; and relative to control drivers with no alcohol, almost twice as many with high BACs reported that they drink beer daily. Among those who reportedly drank beer, 67 percent of DWIs and 80 percent of fatalities with high BACs were reported to drink it daily. On the basis of these findings, the investigators offered the following recommendation, "Since heavy beer drinkers were found to be over-represented among these crash and citation problem drinkers, (1) more research, administrative, and public education concern should be focused on the effects of beer, the frequent heavy users of beer, and the counteracting of the erroneous and contrived image of beer as a less harmful beverage than distilled spirits; and (2) eradication of the double standards for beer (as opposed to distilled spirits), which sanction and institutionalize the advertising and distributing of beer at a more permissive social level than distilled spirits (33).

Alcohol Countermeasure Programs

Having recognized the implications of the research results, the next step consisted of a search for ways to counter the problems stemming from the mixture of alcohol and driving. Earlier attempts at prevention and control have invoked stringent laws and gory slogans. These attempts have been neither successful nor systematically evaluated. As opposed to slogan campaigns and ad hoc solutions, programs of alcohol countermeasures are relatively rare and those which have been systematically evaluated are much more rare. Voas (39) lists only seven such studies: the Lackland Air Force Base Project (1) and the Alcohol Safety Action Program of the Department of Transportation in the United States, as well as programs in Great Britain, Sweden, Austria, Czechoslovakia, and Canada. Of these programs, the U.S. Department of Transportation's Alcohol Safety Action Program (ASAP) is clearly the most extensive and ambitious. The background, issues, and specific countermeasures of the ASAPs and some of the other countermeasure programs have recently been discussed and evaluated in a comprehensive review by Driessen and Bryk (12), which also lists more than 100 alcohol countermeasures. Because of the clear implication that a substantial number of drinking-drivers are problem drinkers, the NIAAA has established treatment programs in conjunction with some of the ASAP's. These fulfill two purposes: they take advantage of the case-finding potential of the ASAP's; and they attempt to reduce the highway carnage by attacking the drinking problems of the drinking-drivers.

Summary

The highway is the scene of a significant portion of the accidental deaths and injuries in the United States. A large percentage of these are associated with the use of alcohol. The risk of a driver or pedestrian being involved in a traffic accident whereby alcohol is consumed increases precipitously with the increased amount of alcohol in the body. Most people killed in traffic accidents after drinking have very high blood alcohol concentrations. It is known that many drinking drivers have a history of alcohol problems. Therefore, a focus on the relation of alcohol to highway safety will both reduce the highway carnage and identify problem drinkers who are in need of treatment.

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Chapter VII

TRENDS IN TREATMENT OF ALCOHOLISM

Significant progress toward improving the care provided for alcoholic people may be made not only by developing new and better treatments but also by bettering the systems under which care is delivered.

Treatments of alcoholism have tended to be based on one of two common policies. Some treatment centers, like some private practitioners, specialize in some single modality: disulfiram (Antabuse), or conditioned reflex, or behavior modification, or group therapy, or psychodrama, or individual counseling, or diet control, or any other of the dozens of possible techniques. The patient has to fit the treatment. If he does, he is helped. But if it was not suitable for him, the effort has mostly gone to waste. Other treatment centers have the opposite sort of policy. Their patients are exposed to a variety of methods in a saladlike mixture: group therapy, religious counseling, psychodrams, individual counseling, conjoint-spouse sessions, relaxation lessons, didactic lectures, disulfiram--and, often, Alcoholics Anonymous meetings. The idea is that "something" may work. Quite often, something does. This is sometimes evidenced by the fact that the patient continues to attend A.A. meetings after he is discharged.

The problem with both of these policies is the waste of human resources and the lack of economy. The single-specialty method wastes staff as well as patient resources in treating individuals not suited to the particular method. The multiple-method center wastes its resources in applying several unnecessary treatment modalities to each of its patients.

Recent national surveys have indicated that indeed a community alcoholism rehabilitation program needs to have a variety of methods and resources available (13, 29, 59, 114, 132). But to be effective does not require exposing every patient to all the possible treatments. Instead, adopting a social-systems approach (68, 123, 160, 162), oriented program should take into account the differences among the patients, as well as the interactions of the several components in the society, and systematically seek to fit the appropriate treatment to each individual.

This idea was already expressed by Bowman and Jellinek in their review of treatments of alcohol addiction more than 30 years ago (15). Its implementation on a broad scale, however, has become possible only recently with the movement toward community-oriented programs. Under such programs it is possible to match certain types of patients to the most suitable types of helping facilities or agencies or programs or methods of treatment. Undoubtedly, treatment programs could maximize their effectiveness by clearly identifying the type of alcoholic population they propose to serve, the goals most feasible for that population, and what methods can be expected most nearly to achieve those goals. Undoubtedly, success rates could be maximized if the expectations of a group of patients are sensibly matched to the helping resource. And, in this context, it would become possible to carry out tightly designed evaluations that would clearly measure the effectiveness of each program.

Programs for Alcoholic Populations

Alcoholic people have no uniform characteristics save their misuse of alcohol, and their patterns of alcohol misuse vary. To create successful treatment programs it is necessary to identify the characteristics of alcoholic subpopulations in order to arrive at appropriate methods and goals. Neither global characteristics nor exquisite and detailed research protocols are of immediate value to the clinician. The clinical worker needs relatively simple

predictive signs that may be readily applied in making treatment assignments. Data accumulated so far suggest some modest but reliable social and psychological indicators that together provide clinical profiles of specific alcoholic patterns of coping with life. These psychosocial variables are more predictive for treatment selection and success than the many drinking-pattern variables that have been studied for many years past (123, 125, 127, 128).

Alcoholic populations can be looked at from other perspectives. Several populations have been relatively ignored in treatment program planning. They merit more intensive study to create appropriate programs for them.

Sex and Age Groups

The presence, problems, and needs of alcoholic women have begun to receive wide recognition (84, 138). For example, data from NIAAA funded programs indicate that women who come to treatment are more likely to be working than housewives and started drinking at a later age than men, but became alcoholic in a shorter span of time. In contrast, relatively little attention has been given to alcoholism problems in different periods in the life cycle. The children of alcoholic people are at considerable risk of suffering developmental problems and of becoming problem drinkers themselves (20, 28), and prevention programs are needed for them. Adolescent drinking and problem-drinking behavior has been examined from all research standpoints, but clinical intervention programs are lacking (4, 52, 101). Much attention has been given to alcohol misuse in the middle years of life, but recent studies indicate that alcoholism presents special problems among the aged. Here again there has been little in the way of specific program development (53, 133, 141).

Ethnic Populations

Increased attention has been given to alcoholism problems among ethnic populations such as Blacks, Spanish-surnamed Americans, American Indians, and Native Alaskans. Research has been conducted on the epidemiology of alcoholism in ethnic groups. Now promising starts have been made to meet the treatment needs of persons with drinking problems in these populations (46, 139, 164).

To increase resources to meet the needs of the various ethnic groups noted above, the National Institute on Alcohol Abuse and Alcoholism has developed separate program guidelines that encourage the recognition and use of each group's unique cultural characteristics in developing treatment services and has supported these services through the award of project grants. Each applicant community is expected to assess its own needs, plan and implement services consistent with its own culture and perceptions, and maintain control over the administration of its program. Recent programs initiated by American Indians and Native Alaskans offer an example of such efforts.

Preliminary NIAAA data indicate that approximately 100 Indian Alcoholics Anonymous groups have been established by these programs--a significant achievement because Indians have traditionally shunned A.A. As many as half of the clients of Indian alcoholism programs are reported to have significantly improved their social functioning. From 15 to 20 percent of the clients have been assisted in finding jobs. These programs, staffed primarily by Indians without professional degrees, appear to have achieved notable results in a relatively short time.

The overwhelming response of Native Alaskans has been to build, remodel, or rent village centers in which a variety of constructive activities such as arts and crafts, youth and adult recreation, repair and sale of small machinery, employment and village and A.A. meetings can be carried out. The people of the Far North regard a variety of planned activities and the equipment required for them as their most urgent need and the most effective way to begin facing and overcoming their drinking problems.

Skid Row and the Public Inebriate

The alcoholism problems associated with Skid Row have received increased attention. It is now apparent that Skid Row alcoholism is atypical and unrepresentative of the national alcoholism problem. It is estimated that far less than 5 percent of alcoholic persons are on Skid Row (75). The fundamental problem of the people on Skid Row is that they are socially inept and isolated (110, 145, 160). Zimberg (164) found that among socially and economically deprived alcoholic persons abstinence was not associated with any particular treatment method but was significantly related to indices of social stability. Thus rehabilitation programs in such enclaves aimed at alcoholism reflect a failure to identify the actual rehabilitation needs of this population (54, 106), and are destined for failure--the classical low success rates. More suitable programs based on goals of social reclamation are now emerging (14, 77).

The NIAAA has started a program to assist community agencies in meeting the needs of the public inebriate population, particularly in metropolitan areas. The objective of the Public Inebriate Program has been to improve the health and life styles of persons with a chronic drunkenness problem, particularly Skid Row residents. The focus has been on providing food, clothing, shelter, medical care, and vocational assistance as well as alcoholism treatment services. Each of five initially funded projects has promoted a full range of alternatives for men and women at different levels of Skid Row acculturation.

Preliminary results indicate that Skid Row people are better and more effectively served when treated through a health-care system than through the criminal-justice system. The programs have tended to reduce the number of public inebriates and improve the health of those remaining on Skid Row. It appears that an intensive inpatient rehabilitation program is more effective for persons relatively new to Skid Row, while a transitional residence tends to be more advantageous therapeutically for those living on Skid Row who wish--at least initially--to adhere to its values.

Polydrug Addicts

A new population of multiple-drug addicts has begun to be visible. The widespread development of drug misuse and methadone treatment programs has changed the patterns of drug and alcohol use. Some narcotic addicts are now turning to alcohol as an alternative, legally available drug (83), and persons with mixed addiction syndromes are being seen in both drug and alcohol treatment centers (30, 51). In addition, other classes of drugs such as sedatives, stimulants, and minor tranquilizers are being obtained with physician prescriptions as well as extralegally (34). The widespread availability and use of such drugs is producing complicated syndromes which suggest the need to develop better drug-free treatment methods, better-supervised use of such drugs when medically indicated, better clinical methods of detecting multiple drug use, closer collaboration between drug and alcohol treatment programs, and new methods for intervention in the polydrug use pattern.

Discussion of the efficacy of and problems surrounding the combination of alcohol and drug treatment services in common programs has increased markedly in recent years (37), but clinical experience in joining the provision of treatment services for drug and alcohol misusers has so far met with mixed results (113, 117). The National Institutes on Alcohol Abuse and Alcoholism and on Drug Abuse have begun jointly to support a limited number of combined programs to determine the efficacy of this approach.

Treatment Components

A wide array of facilities, programs, and agencies now exists. They include alcoholism information and referral centers, general hospitals, mental hospitals, alcoholism rehabilitation hospitals, aversion conditioning clinics, detoxication programs, tuberculosis hospitals, partial hospitalization

programs, halfway and quarterway houses, vocational rehabilitation clinics, alcoholism outpatient clinics, private physicians, Alcoholics Anonymous, community human-service agencies, the police-court system, Skid Row agencies, business and industrial rehabilitation programs.

General Hospitals

One area where progress has been made is in the general hospital. The American Hospital Association is now beginning a national program to promote alcoholism programs in all general hospitals (1). Considerable effort is being made to include the resources of the general hospital in the total social system of care for alcoholic people (8, 18, 37, 93, 100). This includes the effort to change hospital admission policies so that alcoholic patients may be admitted to general wards with the diagnosis of alcoholism. Another type of utilization allows the hospital to provide medical care while nonprofessional community workers conduct an alcoholism program in specialized wards. A third approach is the development of professionally managed alcoholism wards. Yet another tack is the development of hospital alcoholism programs managed by professional alcoholism workers but conducted throughout the general hospital.

Current models developed by the American Hospital Association focus on functional alternatives. Thus, some large urban hospitals may operate hospital-wide programs and others support specialized alcoholism units. Many smaller hospitals may form consortiums with community agencies. A general-hospital alcoholism program will usually not offer definitive alcoholism treatment. It can provide treatment for the complications of alcoholism, serve as a diagnostic center, act as a funnel into the community alcoholism care system, and be a triage agency. In this way, the general hospital may become a catalytic resource in the community network of care.

Intermediate Care

Another major development is the intermediate care facility. The need for transitional care facilities in the community became evident many years ago in the wake of attempts to move alcoholic people on the way to rehabilitation from a total hospital milieu into community life. The movement has spread so widely that there is now a national organization of alcoholism halfway-house workers. Some of the larger programs now have a graded series of facilities--quarterway, halfway, and three-quarterway houses--to provide varied degrees of external support in the process of resocialization (3, 12, 26, 31, 35, 67, 96, 135, 136).

Although these efforts are sometimes given governmental support, they are usually nonprofit community programs supported by people in the alcoholism movement and are generally nonmedical and nonprofessional in nature. They may use professional personnel for adjunctive medical or psychological treatment, but the major focus is on the "therapeutic milieu" of life in the house. This movement has thus provided an important addition to the over-all social system of alcoholism care in meeting the needs of alcoholic people who formerly cycled through the legal system, mental hospitals, or welfare agencies.

The effectiveness of intermediate care programs appears to vary widely. In a recent survey, Baker (7) classified two major types. One he called "Shelter" programs, which provide a means for resocialization; the other he called "shackle" programs because they appeared to reinforce the alcoholic person's deviant role and perhaps even to use him.
the alcoholic person's deviant role and perhaps even use him.

The "shelter" programs tend to be nonprofit organizations, use community hospital facilities, have advisory and control boards, employ professional counselors in therapy whenever possible, maintain open business books, and welcome inspections. The "shackle" programs were characterized by profit making, attempts to supply medical care at cost, administration by an autonomous director, efforts to discourage any ties with professionals or professional organizations, attempts to maintain financial secrecy, refusal to accept any governmental aid contingent on inspections, and activities of questionable legality.

The major problem in placing the intermediate-care programs in perspective is financial stability. Most programs have been private and nonprofessional "shoestring" operations, but public subsidy is seen by some as a threat to the movement because it is thought to imply professional control and bureaucratic institutionalization. Many halfway-house proponents fear that those two possibilities would destroy the personal commitment and involvement that have underlain the movement.

This raises a basic issue, namely the advantages and liabilities of professional versus lay personnel (94, 146). The staff of most halfway houses are recovered alcoholic persons; they personify the movement's success. They create programs in which they offer a personal model to the incoming recruit. In one sense, this has been described as a reconstituted family, and it is doubtful that professionally oriented programs could create and maintain this living reality. Thus the challenge is to create professional support while maintaining lay investment of interest and resources.

Professional Attitudes

Numerous studies have shown that medical and mental-health professionals have tended to ignore the problems of alcoholism. Knox (81) pointed out in a recent review that even with the increased national attention given to alcoholism, this negative bias still persists. In a nationwide survey, Cahn (17) found that most alcoholism programs were given inadequate budgets, staff, and facilities, and that professionals of marginal competence were often assigned to them. These many shortcomings, for which the medical and mental health professions are to some extent responsible, perpetuate the lack of good alcoholism services.

If alcoholism programs are to attract and retain competent professional staff, adequate education will be required. In a review of professional curriculums, Einstein and Wolfson (39) found almost no curriculum time or content devoted to alcoholism. In the light of these findings the American Medical Association (2) has published strong recommendations for appropriate curriculum revision. The increasing participation in treatment programs of new workers without professional degrees--many of them people who have themselves recovered from alcoholism--is also helping to change professional attitudes toward alcoholism and its treatment (94, 146). These developments may herald major changes in professional attitudes and opinions that are vital to the successful conduct of treatment programs.

If help and rehabilitation are to be brought to an increasing multitude of problem drinkers and alcoholic people, then a larger and more varied code of professional and allied personnel must be enlisted to participate in the total process. This will undoubtedly require the creation of new resources for both specialized training and accreditation, to open up attractive career opportunities to people with suitable skills and, when necessary, to upgrade those skills. These new cadres will need to be taught how to work as members of interdisciplinary and interprofessional teams in helping alcoholic people. The trainers too must be enclisted and imbued with the ideology that alcoholic people can be rehabilitated through the effective use of teams of professionals and new types of undegreed professionals. The development of these training and accreditation resources is one of the pressing needs for the speedier alleviation of the Nation's alcoholism problem.

Treatment Methods

The present section will take note of several areas in which either substantially positive or negative reports have appeared recently.

Family Therapy

Group therapy was successfully introduced into alcoholism treatment long ago. In the past few years clinicians have reported the successful use of family treatment methods (27, 42, 47, 55, 69, 87, 102, 142), and this is the most notable current advance in the area of psychotherapy. As with most

psychotherapeutic innovations, however, there have been few empirical evaluations of these methods (16, 98, 149, 160, 161).

Steinglass and his colleagues (149) have been studying alcoholic persons and their families under a variety of circumstances. Observations have been made in homes as well as in a treatment unit, with only spouses present or with children present as well. The researchers were impressed by the important part alcohol played in the lives of all the family members. It often seemed to serve a positive role in the family despite the well-known problems associated with alcoholism. For example, families were observed in two conditions--when the alcoholic father was sober and when he had been given some alcohol to drink before the interview. There was a notable increase in laughter and direct communication in sessions before which the father had been drinking.

In view of the positive or adaptive role that alcohol can serve in the family, it becomes necessary to help families develop alternative living styles once the drinking stops. Alcoholic persons or their spouses often became more depressed for a time after drinking stopped. Other problems did not go away immediately and some seemed to become worse. Also, very few of the couples reported having many close friends. However, while associating with other couples during the inpatient phase of the experimental treatment program, they seemed happier and there was a decided increase of interpersonal interaction. Although alcohol was freely available in this program, there was relatively little drinking after the first day or two. When the couples returned home, however, they almost always temporarily resumed drinking or became aware of missing alcohol greatly if they abstained.

More follow-up information about these couples needs to be obtained and the number of couples treated is not large enough to justify definitive conclusions, but tentatively the researchers offer the following suggestions:

1. In treating alcoholism, attention should be given to family interactional factors in addition to individual problems.
2. Consideration should be given to the adaptive or positive functions that drinking served, so that the family may integrate these functions into their sober life through some other means, instead of having to give them up along with the alcohol.
3. Attention should be given to the families' extended social network. To this end multiple family groups as well as membership in A.A. and Al-Anon may be useful.

As a result of theoretical advances in family treatment, many alcoholism programs now routinely see the relatives of alcoholic patients. In some instances therapeutic efforts may be concentrated on a significant relative rather than on the problem drinker himself.

Drug Treatments

Many pharmaceutic agents have been tried in the treatment of alcoholism over the years. In general, when a new drug appears, it is greeted with enthusiasm. The initial clinical trials are usually uncontrolled and result in reports of modest to marked success. With experience, the clinical fervor decreases and finally well-controlled double-blind studies fail to substantiate the initial claims of the agent's efficacy. (This history is not unique to alcoholism.) The early success of most drugs tried in the treatment of alcoholism appears to have been due primarily to their placebo effects (154). The enthusiasm of the therapist, transmitted to the patient eager to be cured by a "magic bullet," engenders an enhanced capacity to respond affirmatively to their mutual aim--at least for a time. Thus, a recent comprehensive review (109), which included studies of antidipsotropics, aversives, ataractics, and hallucinogens, found no evidence of their therapeutic effectiveness in alcoholism. The reviewer concluded that "While the routine use of drugs remains unwarranted, the indications for critical research are strong."

In the face of such negative evidence, the continued use of drugs in the treatment of alcoholism comes into question.

An important aspect of drug therapy, however, is the general psychodynamic nature of the drug-giving and receiving transaction. It has been suggested that the "image" of a drug therapy program may be a propitious way to deal with some types of alcoholic patients. They can relate to a medical model of illness and experience a low level of emotional interaction with medical personnel. The concrete sense of "being treated," by being given medicine, may lead to a good therapeutic relationship with beneficent outcome. Drug treatment, then, may be producing not just a placebo response to the drug; it may constitute a treatment modality engendering a type of psychodynamic interaction, even when not consciously sought by the physician. Obviously the effectiveness of this technique does not rest on the specific drug but rather on the total transactional treatment program, in which the drug is an important symbol (77, 115).

In this context it is useful to review recent studies on the use of disulfiram (Antabuse). Critical reviews have found that mere indiscriminate prescription of this drug has not proved to be a successful treatment method (58, 89). But the use of disulfiram with selected alcoholic patients, for whom it serves as a positive ego reinforcer, or as a "chemical fence," aiding them day by day to avoid starting to drink, is effective as part of a positive treatment transaction (5, 92).

Kline (80) has recently reported that lithium administered to a group of men without symptoms of manic-depressive illness who had been hospitalized for detoxication reduced the number of later detoxications they required, although they continued to drink. If the results of this study are confirmed, lithium may prove a valuable tool in helping decrease the morbidity associated with alcoholism. However, lithium is a dangerous drug that can be used only under cautious medical supervision.

When careful experimental studies have been performed, other drug treatments have been found no more effective than placebos. Two highly publicized treatments whose apparent effectiveness has been seriously challenged are LSD therapy (91) and the antitrichomonad agent metronidazole (Flagyl) (61, 72, 129, 131). Various drug fads, such as multiple vitamins and anticonvulsants have failed to stand up to scientific scrutiny (72).

Detoxication

Concerted interest has been evident for some time in the development of new detoxication methods (140, 151), partly because of the realization that the detoxication schemes of the past were inadequate (54). Detoxication can be an effective first step in engaging alcoholics in a successful rehabilitation effort, and most detoxication programs do not require expensive and elaborate medical facilities (22, 49). Conservative use of ataractic medication usually prevents seizures (71, 155) without the use of diphenylhydantoin (Dilantin), which may be ineffective in the short run (134). The major problem in detoxication programs is not medical management but rather triage into a rehabilitation system and the provision of social supports. The authors of a nationwide survey of alcoholism services concluded (59): "Because many alcoholics would rarely if ever need inpatient care, provided other kinds of services were readily available, the community-based outpatient clinic can be legitimately considered the backbone of alcoholism services."

To date there has been understandable reluctance to separate detoxication services from medical facilities. Progress has been made, however, in distinguishing between alcoholics who require intensive medical care and those who require only nursing care or supervised observation. In a recent report, Feldman and his colleagues (45) published empirical data on 564 intoxicated persons who were consecutively provided ambulatory detoxication. Only half actually required definitive detoxication management, which was handled on an outpatient basis, and fewer than 18 percent required hospitalization for medical care. There were no fatalities among these patients. Thus there now seem to be three useful types of detoxication: intensive medical care, supervised observation in specialized centers, and ambulatory care. Recognition of this triad of possibilities should lead to greater flexibility and cost-effectiveness and more appropriate services in detoxication programs.

Behavior Modification

Another area of note is the continuing development of behavior modification methodology in the treatment of alcoholism. The behavioral approach is grounded on learning theory and experimental psychology (50, 159). Although a variety of methods has been reported, they all center on empirical treatment. That is, the behavior of the patient is analyzed and subdivided into discrete elements, the specific behaviors to be changed and the methods of intervention to be used are laid out and agreed on with the subject, and the results of the therapy are continually assessed as specific changes in the target behaviors.

Early work in behavior modification had a machine-like quality to it. The focus was on very simple behavior pieces in which the modification maneuvers were techniques like systematic desensitization, aversion therapy, combined aversion and relaxation, the use of chemical agents, covert sensitization, audiovisual aversion, and assertive training (9, 82). In the main, these trials suffered from lack of longitudinal follow-up. Although short-term gains were manifest, there were few data with which to assess the persistence of improvement. An exception is the now historical work of Voegtlin and his associates in aversive conditioning with the use of emetic drugs: they followed up substantial numbers of patients, some as long as 10 years (156, 157). Careful double-blind studies showed that some aversion techniques were no better than placebo procedures (33, 66), and there was little evidence that producing aversion to alcohol would in itself affect other dysfunctional behavior in the life of alcoholic people.

As behavioral methodology has matured more attention has been paid to the alcoholic person's psychodynamics, though there is a fundamental difference between the behavioral school and the adherents of psychodynamic psychotherapy. The latter is predicated on the idea that analysis and understanding of behavioral motivations can lead to changes in motivation and hence in behavior. The behavior-modification approach, in contrast, makes no assumptions about motivation or behavior, but seeks instead to describe both undesirable and desirable behavior. The subject participates in this "behavioral analysis," and treatment consists of a variety of behavior-rewarding, modeling, and guiding experiences.

Such programs usually try to modify drinking behavior itself, as well as other dysfunctional behavioral responses to life situations that might evoke destructive drinking. Not all these programs attempt to achieve abstinence. Some try to change patterns of behavioral adaptation to stress, and to increase control over drinking, possibly leading to less harmful drinking behavior (73. 159).

The behavioral modification programs are still experimental. Whether or not they will show any therapeutic success, they may yield a better understanding of alcoholic behavior. Work in this area includes the pioneering studies of Mendelson (104), Mello (103), Nathan (111,112), Sobell and Sobell (108, 143, 144), Paredes (119, 120), Cohen, Faillace, and their coworkers 23 24, 25, 44), and Gottheil and his associates (62-65) among others (21, 40, 88, 95, 99,105). These experimenters believe that their work is capable of being evaluated strictly, and rigorous evaluation in the long term will be essential before any conclusions can be drawn from it. In the meantime, therapists with vast experience in alcoholism including many of the behavior-modification experts, warn that alcoholic persons should not jump to unwarranted conclusions that they can safely experiment with controlled drinking.

Transactional Analysis

A particular variety of group therapy, transactional analysis has become popular because both therapists and patients can easily understand it and because its emphasis on games, roles, and scripts is catchy and often therapeutically useful (147). The transactional analyst maintains that alcoholic

persons can be cured and expects to succeed with the majority of patients who are interested in changing their lives. Steiner, a leading practitioner in this school, writes (148): "It is clear that an assumption of chronicity and illness on the part of alcoholism workers will have the effect of generating chronicity and illness in the patient, while an assumption of curability will tend to generate cures. This latter point suggests that considering alcoholism a chronic illness ... may be potentially harmful to, and may in fact be promoting illness and chronicity in, large numbers of alcoholics."

The transactional analyst brings to bear what he considers three potent therapeutic techniques. First, by refusing to participate in the "game," he leaves the patient without incentive to play. Second, he assigns responsibility for alcoholic behavior to the patient. Finally, he tries to instill positive expectancy and hope in the patient. Care must be taken in transactional analysis to assure that the therapist and group members do not use the treatment sessions to vent their aggressions on other members who are not used to protecting themselves.

The idea that alcoholic persons are "playing games," or that they can be appropriately dealt with or effectively helped from this perspective, has been sharply challenged by therapists of other schools (36, 116) as well as by members of Alcoholics Anonymous (118).

Alcoholics Anonymous

A.A., historically, has probably been the most effective modality in helping alcoholic people achieve sobriety and remains outstandingly influential (97). Many methods are known to help alcoholic patients to stop the destructive drinking. A great many therapists regard A. A. as the most useful adjunct to any treatment, especially in helping to maintain the gains of the beginning of treatment. The importance of treating the entire family has been recognized in the formation of Al-Anon, Alateen,and Al-Atots as adjuncts to A. A. for adult relatives, teen-age sons and daughters, and younger children of alcoholic persons. An interesting recent development in several cities has been the establishment of clubs where alcoholics and their spouses can go for social events as well as modified group therapy. It is possible that this represents the trend noted elsewhere for couples and families to receive help together rather than separately, and the recognition that the issue in families is not how a "healthy" spouse deals with a "sick" partner but how they cope together with a mutual interactional problem in which alcohol plays an important role. These subsidiary groups do not teach nonalcoholic relatives how to manipulate the alcoholic family member. Instead, they concentrate on helping the relatives appreciate and deal with their own feelings toward alcoholism and the alcoholic person. As a byproduct of this experience, nonalcoholic family members assist in recovery rather than aggravate the illness (6, 42, 43, 49, 60).

Motivation of the Alcoholic

Several studies have shown that both professionals and laymen view the alcoholic as a person who "chooses" to drink and therefore entraps himself in his alcoholism (85, 86, 126, 150). Since the alcoholic person begot his alcoholism, the argument goes, it remains his responsibility and choice to lift himself out of it by his own bootstraps; accordingly, nothing can be done by way of therapeutic intervention for him until he undertakes his own rehabilitation.

It is paradoxical yet understandable that the alcoholic person is thought to act with intent and choice when, in fact, the essential characteristic of his illness is that he is disabled from directing his actions, especially where alcohol is concerned (75, 90). But the layman and professional alike see him as suffering from a self-"chosen" condition, and this gives rise to

the impression that an alcoholic person who does not deliberately "choose" treatment will not profit from it (130, 150).

It is notable that successful alcoholism programs are those that have an aggressive outreach (59). Alcoholic persons do respond to treatment alternatives when they are offered. Chafetz (19) clearly demonstrated that the failure of treatment does not lie in the patient's poor motivation but rather in failure to provide treatment alternatives and to maintain close contact with him.

Treatment Outcome

Evaluation is being increasingly recognized as critical for the continued expansion and improvement of treatment programs. Individuals and organizations with life-and-death power over such programs are requiring quantitative evidence of effective impact on clients as well as efficient and economical management. In general the treatment of alcoholism is often looked on with skepticism and pessimism.

Conventional wisdom has held that there was no very effective therapy for alcoholism and that differences among treatment methods were inconsequential. This attitude is undoubtedly due to the low rate of success reported in evaluations of various treatments. Most of those studies, however, have had serious methodological flaws which distort the record of actual effectiveness of treatment in alcoholism (123, 124).

The first major flaw is failure to discriminate between the rehabilitation potential of different alcoholic populations. For example, it is estimated that among alcoholic inhabitants of Skid Row a total rehabilitation rate of only 5 to 10 percent may be expected, but in business and industry problem drinkers have a high total rehabilitation potential, as high as 80 or 90 percent. Another facet of this flaw is cost-effectiveness. Very intensive therapeutic programs for excessive drinkers with low recovery potential will not show much success, but more modest programs for high-potential patients will usually have considerable cost-effectiveness.

A second flaw arises from the limited perspective of treatment personnel in evaluating their results solely on the basis of their own one-time experience with a patient. It is natural for a therapist or clinic, when a patient drops out before having shown definite signs of recovery, to write him off as a therapeutic failure. This assumes that the patient was not benefited at all. But as one commentator has noted (74), this assumption may be erroneous, for "most therapists' successes are built on the preceding therapists' failures. So your failure can be the next therapist's success; which means, you haven't accomplished nothing." In other words, evaluation based on what happened between time 1 of any treatment undertaking and any particular subsequent time X does not necessarily reveal the total effect of the therapeutic effort. The pay-off may be in having laid a necessary foundation for the success that will--again erroneously--be attributed exclusively to the next therapeutic effort. This error is partly responsible for the discouragement that some therapeutic personnel feel about the "low rate" of success with alcoholic patients.

A third flaw involves the target of treatment. Since excessive drinking is what appears to bring the alcoholic patient to treatment, rehabilitation programs have often focused solely on the drinking. This approach ignores other serious problems in the patient's life that may be influencing his drinking behavior and which, unless they are dealt with, may make recovery from the alcoholism impossible.

A fourth flaw concerns the criterion of success. Success can be measured effectively only in the light of specified goals. In turn, the definition of treatment goals is intimately related to the therapeutic needs of specific alcoholic populations and to the available methods of treatment. The differential definition of treatment goals in alcoholism, however, has only recently come under considerations (48, 123).

Historically, abstinence was the sole criterion by which the success of alcoholism treatment was measured (158). It was assumed that if a problem drinker achieved abstinence, whatever problems he had in other areas of his life would resolve themselves, or that they were in any case disconnected from the drinking problem. Empirical data do not support that assumption. Abstinent alcoholic persons do not always improve in other important areas of functioning. Gerard and co-workers (57), for example, found that a considerable number of totally abstinent former alcoholic clinic patients were overtly disturbed. Mere abstinence, thus, does not necessarily denote achievement of full emotional health.

It was assumed, however, that if an alcoholic person were not abstinent, he was not rehabilitated. But several researchers, beginning with Davies (32) in 1962, have shown that some problem drinkers apparently develop the capacity to change their drinking behavior and successfully adjust to life without becoming total abstainers (76,121 ,122 ,153).

Other confounding factors that bias the evaluation of treatment have been summarized by Miller and co-workers (107): the definition of alcoholism used by a treatment institution; the reputation of the program; rejection of some applicants; patients' failure to report after their acceptance; drop-outs; incomplete participation of some patients in treatment regimens; exclusions from study protocols; deaths; and patients who become untraceable or refuse to cooperate in follow-up studies. Failure to account for these variables produces skewed samples that flaw attempts to interpret the success of treatment.

In recent years a small number of treatment evaluation studies have taken these methodological problems into account. These studies, in general, indicate that various treatment programs are differentially successful, with improvement rates ranging from 50 to 75 percent (56, 78, 79, 91, 98, 125, 127, 135, 142,162). Emrick (41), in a review of 265 reports of psychologically oriented treatments of alcoholism, found that about two-thirds of the patients had improved, half of the improved having achieved total abstinence.

In another new development, the NIAAA has viewed the measurement of treatment outcome from the perspective of program management more than of treatment research. A centralized computer-based data collection system has been installed in about 20 percent of the treatment projects supported by NIAAA. One of its primary objectives is to gather information about changes in the clients that can be related to the program characteristics.

The system has collected data on over 40,000 clients in its first full year of operation. This sample size, tremendous in comparison to the usual evaluation study, provides one of the richest existing data bases on problem drinkers and alcoholic persons who have come into treatment. It includes a wide range of both socioeconomic and drinking-related characteristics of clients at intake, data on treatment services rendered, and progress and follow-up information for assessing outcome and change . At the present time, however, the average client has been enrolled in these programs only a short time, so that only some preliminary analyses are available.

To illustrate the data base, some characteristics of the clients at intake are shown in Table 1 from three different kinds of programs. It can be seen that the public inebriates have uniformly somewhat more severe indices of alcoholism problems than the other population. On the other hand, arrested drinking drivers referred to treatment by Alcohol Safety Action Projects are in the best condition, indicating the value of this approach for early identification of problem drinkers. The 6-month changes in these indices are shown in Table 2 for the program with the largest sample, the comprehensive Alcoholism Treatment Centers. It is noteworthy that the individuals who have remained in contact with the Centers at least 6 months showed milder levels at intake than did the total sample which includes those who dropped out earlier. Finally, Table 3 exhibits some data on the personnel who provide services at the Centers. Only 56 percent of their time was devoted to direct services to clients.

TABLE 1

CHARACTERISTICS OF CLIENTS AT TIME OF INTAKE TO DIFFERENT KINDS OF TREATMENT PROGRAMS COMPARED TO GENERAL U.S. POPULATION

	U.S. Population[a]		ATC Program[b]		ASAP/AC Program[c]	Public Inebriate Program
	Total	Drinkers	All Clients	DWI Clients	AC DWI Clients	All Clients
Heavy Drinking						
Average years	N.A.	N.A.	14.3	13.3	11.6	15.8
Prior Treatment						
Ave. no. of times (all clients)	N.A.	N.A.	0.9	0.4	0.2	1.7
Ave. no. of times (clients reporting prior treatment)	N.A.	N.A.	2.5	2.3	1.6	3.3
% no treatment	N.A.	N.A.	63.2%	84.1%	85.4%	48.5%
Ethanol Consumption (preceding month)						
Average ounces per day	0.4	0.8	7.2	2.5	1.4	8.3
Average days drank	N.A.	N.A.	14.9	10.2	9.9	14.6
% abstained	42.5%	0.0%	13.0%	21.7%	17.2%	13.6%
Behavioral Pattern (preceding month)						
Impairment index[d]	0.7	1.2	13.4	5.9	3.3	16.7
% quarreled	3.2%	5.6%	37.9%	23.3%	14.3%	39.9%
% drank on job	3.5%	6.1%	42.3%	19.4%	11.1%	46.5%
% missed work	0.5%	0.9%	43.1%	17.9%	9.4%	62.3%
Number of Intakes			13,251	2,613	1,711	2,239

[a] Data from Louis Harris & Associates national cross-sectional survey of U.S. population (1590 persons, age 18 and over).

[b] ATC stands for comprehensive NIAAA Alcoholism Treatment Centers.

[c] NIAAA Alcoholism Centers associated with Alcohol Safety Action Projects.

[d] The impairment index ranges from 0 for no impairment to 33 for maximum impairment.

TABLE 2

CHANGE IN CLIENT CHARACTERISTICS SIX MONTHS AFTER INTAKE TO NIAAA ALCOHOLISM TREATMENT CENTERS

	ALL CLIENTS			DWI CLIENTS[c]		
	Intake	6 Mos.	% Change	Intake	6 Mos.	% Change
Ethanol Consumption (during preceding month)						
Average ounces per day	6.3	1.6	75%	2.0	0.6	70%
Average days drank	13.7	5.3	61%	8.7	5.1	41%
% abstainers	15.4%	54.6%	355%	27.8%	49.9%	80%
Behavioral Pattern (during preceding month)						
Impairment index [a]	12.4	4.3	65%	5.5	1.7	69%
% quarreled	37.2%	14.8%	60%	21.6%	6.6%	69%
% drank on job	38.7%	16.1%	58%	15.6%	7.1%	54%
% missed work (1 or more times)	40.1%	14.8%	63%	17.6%	6.2%	65%
Employment Data (during preceding month)						
Average days worked (labor force)	12.4	14.9	20%	16.8	18.3	9%
% unemployed (labor force)	40.5%	25.4%	37%	17.8%	12.2%	31%
Average earned income (all clients)	$275	$313	14%	$430	$451	5%
Number of clients -- range for variables shown[b]	1443 to 1846			377 to 424		

(a) Impairment index ranges from 0 for no impairment to 33 for maximum impairment.
(b) Number of clients at intake and six months after intake is the same for any given variable.
(c) Driving while intoxicated.

TABLE 3

PROFILE OF STAFF AND DISTRIBUTION OF STAFF TIME AT NIAAA ALCOHOLISM TREATMENT CENTERS

PROFILE OF STAFF MAN-HOURS BY DISCIPLINE	Percent
Physicians	4
Nurses	14
Psychologists	3
Social workers	10
Alcoholism counselors	18
Other counselors – therapists	19
Administrative, non-health staff (a)	32
Total	100%

DISTRIBUTION OF STAFF TIME	
Direct Services to Clients	56
Indirect Program Services	13
General Administration	31
Total	100%

(a) Does not include other disciplines devoting time to administration

The potential exists, through the data system, to learn a great deal about the delivery of alcoholism services as they relate to specific measures of client status. Furthermore, the standardized data base serves as an adjunct to special studies in which, for example, a sample of clients may be interviewed one or two years after initial intake to augment the existing information with knowledge about longer-term changes in their condition, sequences of treatment services received from other resources, and so forth.

Summary

Although ill-defined treatment concepts and inadequately tested methods have impeded progress, significant advances in the treatment of alcoholism have been made. Current data show that alcoholism is treatable, though rates of reported success vary greatly. It has become increasingly evident, as Bowman and Jellinek (15) long ago theorized, that no one treatment modality can be successful with all persons who exhibit drinking problems. Because individual problems, needs and resources vary greatly, a variety of treatment strategies should be available in each community, and they should be utilized discriminatively by treatment personnel. The future availability of large comprehensive data bases for use in evaluating treatment outcomes should aid substantially in creating better treatment and rehabilitative services.

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Chapter VIII

PROBLEM DRINKERS ON THE JOB

One of the main goals of the alcoholism movement since the early 1940s has been to gain recognition, both among influential decision makers and by the general public, that alcohol problems are widely distributed throughout the social structure of the Nation. The task of erasing the Skid Row sterotype of "the alcoholic" has been difficult and is not yet completed.

Ample evidence now exists that the substantial majority of American problem drinkers are located in relatively stable familial and economic circumstances (8, 9, 19). But attempts to use the family as the locus for identifying the developing problem drinker have been unfruitful because of the diffuse emotional relationships that characterize family structure and process. Over the years, a growing amount of attention has been directed to the potential of the workplace as a locus for identifying the developing problem drinker.

Several large American industrial corporations launched alcoholism programs in the 1940s, with the goal of rehabilitating employees in whose skills the company had a considerable investment, as well as reducing the losses exacted by alcohol-related behaviors on the job (4, 6, 13). While these programs established their effectiveness fairly early, the diffusion of the concept of a company-based program for the identification and treatment of employed problem drinkers was relatively slow during the 1950s and 1960s. The National Council on Alcoholism invested considerable energy in making its local councils aware of occupational program concepts, but the resources necessary to launch a nationwide program to reach all employers and labor unions were not available to a voluntary organization. This leadership, however, greatly influenced the orientation of manpower and resources of the National Institute on Alcohol Abuse and Alcoholism following its inception in 1970.

The Bases of Occupational Programming

The special value in identifying problem drinking among employed persons is that work settings provide unparalleled potential for early and effective intervention. The employed problem drinker can be helped before his problem progresses to a point of deterioration where he becomes unable to do productive work and may need extensive inpatient care (15).

Experience has shown that successful early-identification programs for employed problem drinkers are based on five essentials:

1. A written policy which specifies the procedures for identifying and confronting employees who may have drinking problems, and including explicit recognition by the organization that alcoholism--more usefully called "problem-drinking" in the employment setting--is a health problem, and that employees with such problems will not be penalized for seeking help;
2. Specific channels within the work organization, including designation of a program coordinator, where identified problem-drinker employees are counseled and, if necessary, referred to appropriate resources in the community for help in dealing with their problem;
3. Training of managerial and supervisory personnel regarding their responsibilities in implementing the program;
4. Education of the entire work force concerning policy, procedures and the provision of help-without-penalty for problem drinking;

5. Cooperation between management and labor unions and other employee organizations in providing support for the program, its implementation and its continuity.

Proven Strategies

The early corporate programs, although few in number, have afforded an opportunity to develop strategies in the occupational area based on the results of experience. These strategies, recommended to organizations seeking clues for the successful operation of an occupational program, are (1) Recognition, (2) Documentation, (3) Confrontation, and (4) Offer of Assistance.

1. Recognition. In most instances, problem-drinking by an employee will become manifest in (a) impaired job performance, and (b) absenteeism, before the appearance of the severe classical symptoms of alcohol dependence. When supervision is competent, these early but repeated signs--poor work, or patterned or suspicious absenteeism, or both--are easily recognized in spite of efforts by the employee to conceal them.

2. Documentation of impaired performance sets the stage for intervention. Unlike most other social relationships, the link between the employer and employee is contractual. Repeated instances of inadequate job performance constitute a breach of this contract.

3. Confrontation. Problem drinking accompanied by impaired performance often occurs in employees who, having worked for years in one organization, have intense psychological as well as economic investments in their jobs. Confrontation of such an employee is a momentous event when fortified by documented inadequacy of job performance and the clear possibility that disciplinary action will be taken if he does not take steps to bring his performance back to an acceptable level, documented jointly by labor-management.

This confrontation usually precipitates a crisis, which can motivate the employee to do something about his problem. Often he responds by accepting the help offered by the organization rather than face possible adverse action that may shatter his central life role. In many instances the confrontation undermines the basic rationalization which enabled the employee to avoid recognizing his problem--the notion that his drinking did not affect his work. ("If I'm doing my job, I can't be one of those....")

4. Offer of Assistance. The amount and kind of assistance offered depend on the capability and circumstances of the employer. Implementing a program to identify and help the problem-drinking employee recover his health may necessitate an investment in new personnel and procedures, additional supervisory training, and employee education. If the program is correctly viewed as a means of regaining the productivity of skilled employees in whom the organization already has considerable investment, it is simply an addendum to typical company goals and assigned supervisory responsibilities. In many cases the program can be located in existing personnel or medical departments.

Ease and Cost of Setting Up the Program

Since the strategy primarily involves extending the existing organizational structures and goals rather than in inaugurating new operations, the employer's major need is for consultation and guidance in how to set up and maintain anti-problem-drinking activities. Occupational programming is therefore one of the most efficient and economical means of reaching a large number of problem drinkers, since the bare bones of the operation are often already supported by employers and labor organizations.

Despite its simplicity, managerial logic and relatively low cost, occupational programming to assist employed problem drinkers constitutes an innovation. As with most new approaches, the diffusion process across the national range of work settings is slow and not without pitfalls.

The Historic Approach

Before 1970, most occupational programming efforts were focused on the

supervisor's recognition of the signs and symptoms of alcoholism (11, 14), a logical approach if the perceived goal is to detect alcoholic employees and provide assistance to them. Thus training and education were primarily directed toward a description of the types of problem drinkers and symptoms of alcoholism, with emphasis on behavioral features to watch for.

Although such a strategy has benefited many organizations and successfully returned their employees to productivity (4, 7, 20), the approach was frequently impractical for several reasons.

First, the use of signs and symptoms for identification requires extensive supervisory training, and places supervisors in an unaccustomed role of diagnosticians. Because of the ambiguity of many symptoms of alcoholism, recognition can be delayed by an employee who manipulates the supervisor and provides rationalizations for his apparent problem drinking. Furthermore, many supervisors feel uncomfortable in a diagnostic function, leading them to cover up for an employee while attempting to handle the problem themselves (17).

Second, such a strategy requires the explicit designation of the company program as an alcoholism program. Supervisors and employees are often reluctant to utilize a resource which requires labeling that is regarded by some as derogatory and as leading to the stigmatization of employees processed through it (14).

Third, some employers have hesitated to adopt a visible "employee alcoholism program" lest the known existence of such a problem damage their relations with clients or the community.

Fourth, the strategy of an "alcoholism program" tends to foster the notion that a drinking problem emerges as a clearcut entity unaccompanied by emotional, marital, financial or legal problems. Thus program resources and staff are sometimes so narrowly geared that they cannot deal with the wide spectrum of personal difficulties that must be cleared away before the employee can return to full productivity.

The Troubled Employee--A New Approach

Because of resistance by some supervisors and problem-drinking employees to utilizing programs identified with the labels of alcoholism or problem drinking, the Occupational Programs Branch of the National Institute on Alcohol Abuse and Alcoholism began in 1972 to recommend the "troubled employee" approach under which a few companies had undertaken an innovative procedure for dealing with problem drinkers. Using this approach, supervisors are trained to identify impaired job performance as manifest in substandard work and excessive or patterned absence--without pinpointing or relating the cause to possible alcoholism. The training may include a background review of some features of problem drinking and other problems, but the supervisor is given responsibility only for observation of impaired performance--not diagnosis.

Such a strategy obviously also identifies underproductive employees whose primary difficulty is with something other than alcohol, although experience indicates that the bulk of those spotted through the troubled-employee approach have problems with alcohol in addition to their other difficulties. And many employers favor dealing with a range of problems associated with impaired performance rather than orienting a program exclusively to drinking problems. Thus, while the historic identification-of-symptoms-of-alcoholism approach often resulted in incomplete or delayed recognition of problem drinkers because of supervisor-subordinate "negotiation," the troubled-employee approach, by concentrating simply on substandard performance, has offered a speedier, less embarrassing method of identifying problem drinkers and others in need of help.

In addition, the troubled-employee approach builds on existing supervisory responsibilities, rather than requiring supervisors to learn new skills. Finally, by definition, the troubled-employee approach avoids the potentially stigmatic labels of "alcoholism" or "problem drinking" which can retard referral to sources of assistance.

Many employers and labor organizations still favor strategies geared to providing services specifically for problem drinkers, since the troubled-employee approach is not completely free of minor wrinkles. But it is noteworthy that almost all occupational programs, regardless of orientation, have abandoned the strategy of recognizing the signs and symptoms of problem drinking, and are training supervisors to use the impaired-performance criterion for identification.

One yet unsolved difficulty in the troubled-employee approach is the possibility that avoiding the term "alcohol" provides cover-up opportunities for problem-drinking employees and their supervisors. Another is that referral of numerous nonalcoholic troubled people may camouflage the ineffectiveness of a program in reaching problem drinkers.

Finally, a broader range of community referral outlets is needed to support an effective troubled-employee program, and such resources may be limited in many communities. So while this new approach represents the major emphasis in occupational programming, it is most practical to adjust the strategy to the environmental resources and needs of the local organization developing the program.

National Consultation for Occupational Programming

Where could local employers find the technical know-how to set up a troubled-employee program, supposing they understood the need to assist employees with drinking problems? It was recognized by 1972 that only the Federal Government could spark a suitably broad-based and substantial effort. A nationwide program was then initiated, offering 3-year grants of $50,000 a year to each State and Territory which would support two occupational program consultants: one to promote programs for troubled employees in private work organizations, the other in State and local government agencies. Nearly all States and Territories applied for the grants, and appointments were made within each State's designated alcoholism authority.

A 3-week training institute for the 106 new occupational program consultants was conducted by the National Occupational Alcoholism Training Institute (NOATI), involving intensive education in alcoholism, organizational behavior and labor-management relations. Since then, three 1-week institutes conducted by NOATI at 6-month intervals have provided advanced training in specialized problems experienced by the consultants themselves, and afforded them opportunities to share useful strategies.

Since the consultants are based in each State government's division responsible for over-all alcoholism programming, their operations reflect (1) the differing State structural arrangements, (2) variations in the levels of State acceptance and support of alcoholism activities, and (3) the diverse backgrounds of those recruited as occupational program consultants. Thus considerable variety has emerged in the pattern of activities because of differing opportunities for role shaping.

The consultants have four basic functions:

First, the consultants stimulate the interest of management throughout the State in installing a program to identify and assist employees who have drinking problems, and to provide these managements with advice and initial supervisory training assistance in launching such a program. Equally important is activating and maintaining the interest of appropriate labor organizations (1, 5, 16).

Second, the consultant works to sustain the continuity of programs already developed.

Third, the consultant disseminates occupational programming concepts to organized groups of management, personnel specialists and industrial medical professionals to assure their cooperation.

Fourth, the consultant develops rapport and a sharing of concepts with existing alcoholism treatment and counseling agencies in the locality, to keep them readily available for companies which implement programs.

All these activities are covered under the Federal grants, which include funds for travel and back-up support for the consultants, in addition to salary. In many instances States have allocated further funds for activities which exceed the grant.

Obviously the launching of nationwide occupational programming has required recognition of consultation in this field as a new type of profession. No existing occupation met the unique combination of skills needed for the work to be done. The position requires knowledge of alcohol problems and their treatment, consultative ability that is both persuasive and conducive to respect from the work world, and broad acquaintance with the functioning of diverse work organizations and their relationships with a range of organized labor groups. The relatively low turnover in the total consultants' group (about 25%, much of it representing recruitment into other occupational programming positions) indicates that an attractive new profession is emerging and producing job satisfaction for consultants and supervisors.

A professional organization in which practitioners can share arising problems and develop liaison with related professions is important in the professionalization process, and gains respect from both management and labor. To this end, the Association of Labor and Management Administrators and Consultants on Alcoholism (ALMACA) has been organized, embracing most of the occupational program consultants. ALMACA has an annual convention and maintains interaction and communication with its membership through newsletters and other publications.

Collateral Occupational Skills Needed

In addition to the consultants, several other sets of occupational skills are needed for effective implementation of problem-drinking-in-employment programs.

First is the need for individuals within work organizations who can function as program coordinators. This job includes sustaining training and educational activities for administrators and supervisors, encouraging support of management and labor, maintaining the system for identifying and referring problem employees for help, preserving access to treatment resources outside the organization, keeping systematic records for follow-up of individual cases and for monitoring program success, and administering whatever staff activities may be assigned to the program within the organization. In smaller companies, these responsibilities are frequently assigned as a collateral function to someone with skills in human relations and personnel management, or to a member of the medical department. Employees who are recovered alcoholic persons often work effectively as program coordinators. Obviously the position is pivotal in continuing the acceptance of the program and assuring its success. Training for it is included in some short-term schools of alcohol studies, and many program coordinators keep abreast of developments through membership in ALMACA.

A second set of crucial skills are those needed for diagnosis and referral of troubled employees who have been identified by their supervisors. This job--its usual title is "motivational interviewer"--requires the ability to recommend the problem employee to suitable therapy, either within the company or to the proper community agency. Through the exercise of warmth, humanity and a close understanding of the troubles of problem drinkers, the interviewer must convince the employee of the nature of his problem and persuade him to take action. Such a role demands rapport with and respect from community agencies that may be called upon as treatment resources, and complete understanding of the organization's operation, to enable playing the role of advocate with management, labor, and the employer, without being labeled a partisan for any single interest. These skills are somewhat similar to those used in the specialty of industrial social work, a profession well recognized in Europe but rarely included in professional social work training in the United States. In smaller organizations, the program coordinator is often required to carry out these diagnostic and referral tasks, placing extensive and complex demands on a single person.

Third are the skills necessary to provide guidance to employees in trouble. Treatment specialists in alcoholism have often been accustomed to dealing with unemployed or underemployed populations of alcoholic persons while the methods, expectations and follow-up procedures for assisting employed problem drinkers are different from the traditional strategies for working with public inebriates. What is needed is an empathetic approach which minimizes ego threat and labeling, and maximizes the continuity of the problem employee's job involvement. Of great importance is the employee's acceptance of this problem before he has experienced the losses and degradation of the Skid Row stereotype. The therapist must view the return to productive performance as a primary treatment goal, a difficult task unless one has had experience with employed problem drinkers. This set of skills likewise reflects the specialty of industrial social work, requiring knowledge of work organizations and labor union relationships, and the ability to work with supervisors and shop stewards in follow-up.

While in some very large companies treatment and counseling are provided by the work organization "in-house," sound occupational programming procedure emphasizes the use of existing community resources rather than developing new treatment facilities which may wastefully duplicate those already available.

Demonstration Projects

A brief description of some Federally funded projects will shed more light on the different types of structures in which occupational program activities function.

For example, at a county community mental health center, a team of trained experts offers consultative services to private and public employers in the county on the operation of programs for employed problem drinkers. Referrals from the work organizations, made in some instances with the assistance of the project team, are directed to the community mental health center where specialized treatment is available from professional counselors skilled in assisting employed patients. Both the consultative and treatment activities are funded in the demonstration project, along with a research arm which is monitoring both operations.

In another project, smaller employers have formed a consortium to make use of referral, counseling and treatment services which have been set up under the direction of physicians specializing in work with employed populations.

A third pilot project involves funding services which are made available to a wide network of city employees in various agencies.

Another project, under formula grant funds from the State, has consultative and motivational interviewing services delivered by union-based specialists, with program development written into labor-management agreements. The typical procedure for referral and follow-up is through a joint labor-management committee located within the company. Referrals are made to the committee, which then delegates one of its members to confront the problem employee and initiate assistance to him.

In addition to these and other demonstration projects, the Stanford Research Institute has evaluated the success of long-term established programs for problem-drinking employees in private industry (18). The same Institute is also monitoring the characteristics of the caseloads in the demonstration projects that offer referral and treatment for these employees. The results thus far indicate that strong support from top management is the most crucial ingredient in program development and continuity. With such support, the program concepts were disseminated to supervisors, who showed a readiness to identify and refer troubled employees. By contrast, some organizations were found to have only "paper programs" with few resources for training supervisors or offering real assistance. In these cases, it appeared that top management had shown little interest in the program, and perhaps supported it only for its public-relations value in illustrating corporate social responsibility.

Measuring Progress in Occupational Programming

Overall progress during 1972-73 can be measured in several different ways. First, is simply the extent to which employers across the nation have accepted the concepts of occupational programming for problem-drinking employees. A preliminary survey conducted in mid-1973 using the State-based consultants as key informants indicated that 621 occupational programs were at some stage of development in public and private work organizations. About 50% were started after the occupational program consultants began their work in mid-1972. About 60% of these new programs follow the troubled-employee approach, and the other 40% limit referral and counseling services to problem-drinking employees. This pattern is in contrast to programs started before the occupational program consultants began their work, when 75% had problem-drinking as their primary concern. Apparently the consultants are successful in diffusing the troubled-employee approach in programming.

In terms of the size of the organizations covered, 75% of the older programs are in companies with more than 1,000 employees, while about 50% of the new programs are in these large organizations. This points to increasing success of the consultants in dealing with smaller companies, which is significant because "small business" had previously been viewed as unreceptive to occupational programming.

About 65% of the new programs have written policy statements. The most rapid growth of new programs was found to be in the southeastern and north central sections of the country. A conservative estimate indicates that at least 2,600,000 people work in organizations with some degree of formalized assistance for problem drinkers and other employees whose work performance is substandard. These results are impressive in view of the special difficulties attending the launching of any nationwide program.

Another index of progress is seen in the results of two Executive Caravan surveys conducted by the Opinion Research Corporation (2, 3). These involve interviews with samples of executives in large industrial and business corporations representative of the major companies in the "Fortune 500."

Surveys regarding awareness of and attitudes toward occupational programming were made with samples of 528 executives in January 1972, and with 503 executives in January 1974. Since these large corporations employ a significant proportion of the American work force, progress in instituting occupational programs within them is important in terms of employee coverage. Further, it is likely that program adoption in these large companies may constitute opinion leadership through associations of executives, and may inspire others in the private business community to set up programs.

The 1972 survey indicated that 25% of the executives reported their organizations as having a program to identify and assist people with drinking problems. However, nearly half of these programs were reported to have only moderate or little support from top management, indicating the possibility that many were merely paper programs. In the 1974 survey, 34% of the executives reported the existence of a program for problem drinkers, and the proportion which lacked strong support from top management had shrunk to 30%. Thus it appears that not only have the occupational program consultants and other key organizations and groups been successful in initiating new programs in major corporations, they have also developed a strong base of managerial support for these innovations while simultaneously bolstering management support for programs that existed previously.

The Executive Caravan surveys also highlight a readiness to consider adopting a program, indicated by the fact that 80% of the executives in both surveys felt that assistance for problem-drinking employees is worth the investment. A similar proportion in both studies felt that company medical insurance plans should cover the cost of such help. While these positive attitudes are encouraging, they highlight one of the major tasks in the occupational consultant's role: obtaining access through the organizational structure to decision-making executives. The successful dissemination of program concepts needs personal contact with these high-level executives, for

only rarely can programs be stimulated solely through written materials or similar impersonal devices. In some instances, consultants set the stage for such executive access through work with voluntary community groups which include numbers of decision-making executives in their membership. A notable example is the achievement by State-based consultants of formal acceptance of occupational program concepts by the Michigan State Chamber of Commerce, which culminated in 1973 with the Chamber's publication of guidelines for program development that were distributed to its membership.

Other data from the 1974 Executive Caravan survey point to factors which are known to increase the readiness for program adoption among corporation executives. Whereas 34% of the respondents in the 1972 survey estimated that more than 2% of their work force were problem-drinkers, 50% of the 1974 respondents estimated a prevalence rate of at least 2%. Likewise, a significant decline was revealed in the proportion of executives who stated that alcohol was "not really a problem" in their organizations: in 1972, 46% held this attitude, while in 1974 the proportion had declined to 35%.

In this connection, the Stanford Research Institute study of established company programs (18) had shown that executives' personal acquaintance with a problem-drinker whose productivity had been damaged was a key element in effecting program adoption. Other evidence from the occupational program consultants confirms the importance of such direct personal experience in persuading decision-making executives of the value of programs to assist underproductive problem employees. About 40% of the 1974 Executive Caravan respondents said there were employees whom they saw on a regular basis who were problem drinkers. About two-thirds of those in the 1974 survey also stated they knew individuals in the management of their companies who presently or previously had drinking problems.

Reacting to another question in the Executive Caravan survey, 80% of the 1974 respondents said that the major organizational cost of problem drinking stems from poor job performance, and 70% indicated that absenteeism is also a major cost factor. This strengthens the emphases of occupational programming on using poor performance and absenteeism as the bases for identifying troubled employees.

Further description of the nature of occupational programs in this sector of major private American enterprise comes from the 1974 survey (3).

1. About 70% of the executives in companies having programs report that these are based in the personnel department; the rest are in the medical department.

2. Within these programs, 21% report the primary use of outside treatment resources, while 23% indicate resources in the medical department; 40% report that individual counseling is the primary mode of treatment.

3. The three predominant reasons for a company starting a program to assist problem-drinking employees were reported as (a) recognition of the adverse effects of problem drinking on productivity; (b) social consciousness on the part of management; and (c) specific awareness of a drinking problem within the company.

4. In companies where part or all of the work force is unionized, 60% reported strong or moderate union support for the occupational program. Only 13% reported union indifference and 27% were unaware of the union's attitude.

5. Only 12% reported that the services of the program are available to members of an employee's family who may have a drinking problem.

6. Nearly half reported that they personally knew an employee who has successfully recovered from a drinking problem through using the company's program.

7. Less than half (42%) reported that their company's program extends to troubled employees other than those with drinking problems. However, 52% of the executives in the total sample stated that they would be in favor of a policy offering appropriate help to all employees manifesting poor job performance, regardless of the type of personal problem involved.

8. Awareness of occupational programming concepts among about half of these executives is indicated by the fact that 48% of them had attended meetings or read materials dealing with programming principles. This pinpoints a

continued need for providing consultative and educational services for those who had not had such exposure.

Great importance has been attached to the involvement of unions and other labor organizations in occupational program development (1, 16). Union representatives have been included in the training of State-based occupational program consultants, and the cultivation of rapport with unions to gain their participation in company programs is a stated responsibility of the consultant. Occupational programming has been well accepted among national union leaders, and this cooperative attitude has been largely sustained at the local level (5).

A final mark of the program's success is its recognition in health insurance provisions. Coverage for the costs of treatment for problem drinking and other causes of job impairment is increasingly included in company medical insurance policies. The insurers' admission of problem drinking or alcoholism as a legitimate health problem which can be identified early in the work situation reflects to a considerable degree the occupational consultation and education effort now visible on a national scale.

Other Indices of Progress

Another indicator of the spread of occupational programming concepts is the existence of numerous occupational consultants funded by agencies other than NIAAA. These include consultants assigned to community mental health centers and those working under the auspices of local councils on alcoholism. An informal survey conducted in 21 States by the Occupational Programs Branch in December 1973 revealed a total of 254 full- or part-time occupational program consultants funded from sources other than the specific grants to the States and Territories (12).

Types of Innovative Activities

The success of 18 months of consultative activities in occupational programming is further reflected in increased local support for innovative projects spearheaded at the Federal level.

For example, in one western State, Federal grants to support occupational programming functioned as "seed money" and led to the assumption of responsibility at the State level. After the program's concepts and effectiveness were made known to State legislative decision-makers, they voted more than a million dollars in State funds for expansion of programming activities. Paralleling the Federal pattern of allocating grants to the States, this State distributes funds to each of its counties on the basis of justified needs and plans for development.

In another model program, occupational services are provided to the relatively small and widely dispersed State employee population in a sparsely inhabited State. Under a policy emphasizing the troubled-employee approach, the State has hired a full-time personnel management specialist with Government experience to administer the program. Efforts are underway to conduct supervisory and managerial training throughout the State government.

Programs have also been set up in large corporations with diversified operations located in numerous States, requiring the cooperation of several State-based program consultants. A number of such arrangements are currently serving the entire employee population of large multifunction corporations, with procedures adjusted to the demands of local subsidiaries.

In several municipalities, occupational programs now provide services to city employees, usually beginning with one or two departments, and expanding to cover the entire public employee network. In one city, consultants have put together a consortium of public employers at different levels, including several Federal offices, to make use of a central consulting and referral service.

As the world's largest employer, the Federal Government is in a position to provide leadership in innovative management techniques. The Comprehensive

Alcohol Abuse and Alcoholism Prevention, Treatment and Rehabilitation Act of 1970 (Public Law 91-616) includes a provision that occupational programs to give assistance to problem-drinking employees would be developed in all Federal civilian installations. The legislation was followed by guidelines from the U.S. Civil Service Commission (Federal Personnel Manual Letter 792-4) directing each executive department and independent agency to formulate a policy for diffusion to its local offices. By January 1974, most Federal departments and agencies had submitted occupational program policies to a special office in the Civil Service Commission designated to provide leadership for the over-all Federal occupational program. In some cases, guidelines have since been further modified to accommodate different functional or operational characteristics.

In ongoing studies of these Federal programs, two universities are currently examining the diffusion of policy guidelines and concepts to local branches in the southern and northeastern sections of the country. The studies will assess attitudes toward alcohol problems, and supervisory predispositions toward different strategies in managing the problem-drinking employee. From the beginning, the Federal employee alcoholism program has formally been restricted to problem drinkers, but in some departments it is being broadened to encompass all troubled employees. It is envisioned that most Federal civilian programs will eventually use the troubled-employee approach.

The U.S. Postal Service, at the time the Post Office Department, was the first Federal Government agency to implement a formal program aimed at assisting the recovery of the problem drinker. The Postal Service Program (PAR) was designed as a complete system encompassing the identification, treatment, education and follow-up of employees with a drinking or alcoholism problem. The program is "action" oriented rather than "clinically" oriented and uses as its foundation the full-time counseling services of recovered alcoholic persons. The PAR System, it has been reported (10), has effectively assisted 3 out of every 4 persons who took part in the program for a total of over 3,000, and is now being expanded to cover all installations in the Postal Service.

Considerable progress has also been made in the development of programs for both military and civilian employees of the Department of Defense. The several branches of the military have developed policy statements and plans for dealing with problem drinking which are oriented toward help rather than punishment or dismissal. The Department of the Army has instituted combined problem-drinking and drug-abuse programs at numerous installations in the U.S.A. and abroad, with emphasis on supervisory identification through impaired performance and the provision of on-base counseling. The Department of the Navy has progressed with basically two types of referral and treatment approaches. The first consists of regional rehabilitation centers to deal with problem drinkers who require a comprehensive treatment regimen. The second is comprised of "Dry Docks" located on Navy bases and designed for relatively brief treatment of identified problem drinkers. Both of these approaches include a strong emphasis on Alcoholics Anonymous as a major help resource and for follow-up maintenance.

Additional Needs and Problems

The first 18 months of national occupational programming have been marked by good progress, but numerous problems persist. Solutions will come partly from systematic monitoring of these early experiences in the field. Other problems require further research in the behavioral sciences.

A basic question remains: What factors in the consultative process contribute to the acceptance of occupational programming by executive decision-makers? The reply must examine the variety of consultative methods used, the point most advantageous for achieving entry into an organization, the emphases most persuasive in winning program adoption, and the amount of consultation necessary to inaugurate and continue an occupational program. It is likewise important to calculate the factors present when consultation does not produce the adoption of a program, or develops plans on paper with little or no

management support.

Further monitoring of success is needed, beginning with careful consideration of the criteria for meaningful evaluation. It is recognized that assessing the "penetration rate"--a name given by the professionals to the extent to which a program is successfully reaching the problem drinkers in the working population--will be a difficult task. A related need is for the improvement of methods of estimating the presence and prevalence of problem-drinking employees in a wide range of large and small businesses. Exploration of the value of different techniques to improve the penetration rate is necessary. Details of follow-up and evaluative tools for monitoring the progress of specific cases also remain to be worked out.

Greater insight into the way the identification and referral processes actually function within work organizations would aid in designing programs and in specifying the content of the supervisory training. There are no guidelines for assessing the characteristics of supervisors or problem employees which lead to rapid referral or to cover-up and delayed referral. The confrontation process itself needs further examination to discover the ingredients which impel a problem-drinking employee to seek help and actively participate in recommended treatment.

Further study of the efficacy of various community resources in counseling or treatment, and of the types of supervisory training most likely to produce the predisposition to carry out occupational policy guidelines, is also needed.

Occupational programming for problem-drinking employees is designed largely for organizations with enough employees to support a distinct personnel management or medical function. Of course many American workers are employed in small companies lacking these specialized divisions. Furthermore, small businesses generally have little "organizational slack" which could fill the gap when a troubled employee must leave the job for treatment or counseling. Therefore, further promotion of consortiums of small employers is needed, through which occupational program coverage could be introduced to the working members of the whole group. More information is also required on appropriate steps for developing community-based treatment and counseling, geared to the specific needs of employed problem drinkers.

It is likewise difficult to promote occupational program coverage for lower-status workers employed in agriculture or other industries where the employer's commitment and interest in employee welfare may be relatively low. Steps are currently being taken by NIAAA to encourage the initiation of demonstration projects for assistance to problem drinkers among migrant agricultural workers.

Problem drinking among upper-level executive, managerial and professional personnel can exact heavy costs in impaired decision-making and poor public relations. By the nature of their jobs, many of these individuals lack close supervision and perform work which is difficult to evaluate in the short term. Upper-level personnel also typically enjoy greater privacy and freedom of scheduling, which allows for the longer cover-up of a problem affecting their job performance. There is a tendency in most companies to accept occupational programming as applicable to rank-and-file workers, with little consideration of applying the same concepts to the upper echelons. The absence of organization-wide coverage by an occupational program can lead to charges of discrimination, particularly when the workers among whom the program is implemented are unionized. A strategy for identifying upper-echelon problem drinkers, and for referring them to helping programs, is a persistent need.

While early identification has proved an excellent method for secondary prevention, further consideration should be given to possible primary intervention in work organizations. Little is known about the work-related factors which may lead to or exacerbate a drinking problem before it has had an impact on work performance. Identification of such factors, and efforts to minimize their effects on employees, would be steps toward the primary prevention of problem drinking. Research strategies such as the careful construction of the experiential work histories of identified problem drinkers would be a move toward the inclusion of primary-prevention strategy in occupational programming.

Summary

The provision of guidance and services leading to the identification and prevention of problem drinking among employed persons has assumed a very significant role in battle to reduce alcoholism. These efforts, collectively labeled "occupational programming," are based on the premise that work organizations provide settings with unparalleled potential for the early identification of problem drinking. This kind of identification provides the opportunity for effective intervention to assist the employed problem drinkers before they progress to the point where they require extensive inpatient care or cannot be returned to productive work life at all. While the concepts are not new, the progress in implementing them is new. The number of new occupational programs, the improvement in attitude on the part of corporate executives, and the increase in the personnel and organizational resources for developing such programming, all reflect the advances made in the past few years.

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Chapter IX

ALCOHOLISM AND HEALTH INSURANCE

Despite recognition by the highest medical authorities throughout the world that alcoholism is an illness (2, 9 , 16,28), some segments of society have been slow to respond to its import as a major public health problem. One of the reluctant segments is the network of public and private agencies involved in providing insurance or other forms of financial compensation for health services. As a result, persons afflicted with the illness of alcoholism have often been denied the treatment-cost benefits provided for the health care needs of persons manifesting other--especially physical--diseases. In this respect alcoholism is comparable to other forms of emotional illness.

A recent examination of coverage for alcoholism in various forms of health insurance in the U.S.A. (13) revealed a spectrum of widely differing benefits and limitations under various policy restrictions. Some health insurance policies, for example, provided payments only for intensive treatment in strictly medical settings. Explicit exclusion of alcoholism from policy benefits was common.

Nevertheless, some insurance companies have recognized that actually they are often paying for the treatment of alcoholism, but under subterfuge diagnoses. There are signs of a growing sensitivity to the needs of alcoholic persons for health care services and for appropriate insurance type coverage. Recently the House of Delegates of the American Medical Association (1) formally resolved "that insurance companies and prepaid plans be urged to remove unrealistic limitations on the extent of coverage afforded for the treatment of alcoholism, recognizing that alcoholism is an illness."

Background

Traditionally, to the extent that alcoholism has been covered by insurance or other prepaid plans, it has been under the umbrella of mental health benefits. But third-party payments (payments made by an organization or agency retained by or acting for the patient for the payment of charges incurred) by public and private insurance companies, Medicare and Medicaid, for illnesses labeled as mental, and including alcoholism, have lagged far behind those for the forms of illness labeled as physical. Of significance in accounting for this discrepancy was the fact that in the late 1920s and early 1930s the public response to mental illness in general, and to alcoholism specifically, was to hide the condition, presumably because of the social stigma associated with it. The treatment of choice at that time, for the majority of emotionally ill patients, was to institutionalize them in "mental" hospitals, which were supported by the State governments (11).

Coverage for the treatment of mentally ill or alcoholic individuals through third-party reimbursement was therefore not needed, since the costs were subsidized by the tax dollar. Under these conditions, however, for the most part only those alcoholic persons who developed acute or chronic brain syndromes were admitted to the State mental hospitals--a small percentage of the total. The rest were treated privately or in private sanitariums at their own expense, or in general hospitals often under subterfuge diagnoses, or by non-medical modalities, including those of clinical psychology, religious counseling, lay therapies, and, from the mid-1930s on, Alcoholics Anonymous; or, for the most part, they went untreated until they became totally disabled.

As time went on, and as the commercial insurance companies had no specific exclusions for mental illness, including alcoholism, the States began submitting claims for the hospitalization of those patients who had insurance, in order to recover the institutional costs for the care of patients with mental illness or alcoholism. Insurance companies countered by adding to their coverage specific definitions of hospitals so as to exclude State mental hospitals. Even in the early 1950s, when outpatient coverage by health insurance companies for physical conditions was beginning to expand, there was no comparable expansion of mental health and alcoholism benefits (11).

The situation that currently exists in terms of mental health insurance coverage, which in most cases includes alcoholism, is a far cry from that of 20 years ago. At the present time approximately 63 percent of the civilian population have some form of private health insurance which covers the treatment of mental illness through hospitalization. About 61 percent have some coverage for physician in-hospital visits for mental conditions and about 38 percent have some coverage for physician office visits for mental conditions (25). Despite such seemingly extensive coverages, highly restrictive limitations often exist with regard to the type of facility in which the patient can be hospitalized, the length of stay, and for outpatient treatment, the number of visits, and the amount of reimbursement.

History of Federal Experience

Although some Federal agencies such as Social Rehabilitation Services and the Social Security Administration have been concerned with alcoholism services for populations under their jurisdiction, the major concern for health insurance coverage for alcoholism has been within the Department of Health, Education, and Welfare (DHEW) and more specifically, since its creation in 1970, in the National Institute on Alcohol Abuse and Alcoholism (NIAAA). DHEW's activities date back to before the establishment of the National Center for Prevention and Control of Alcoholism, the predecessor of NIAAA. At that time, an Advisory Committee to the Secretary of DHEW recommended that studies in the area of alcoholism be undertaken. One recommendation concerned the need to examine third-party reimbursements for alcoholism. In 1967, the National Center for the Prevention and Control of Alcoholism began accumulating data on inpatient coverage for alcoholism treatment under health insurance. A 1968 report released the following information (26):

1. Just over 60 percent of the general hospitals excluded the admission of persons needing alcoholism treatment.
2. About 40 percent of the Blue Cross-Blue Shield plans excluded alcoholism from coverage.
3. Independent health insurance plans had even greater exclusions for alcoholism than the Blue Cross-Blue Shield plans. Commercial insurance companies were not surveyed, but available information indicated that they were probably similar to Blue Cross and Blue Shield companies.

With the advent of the legislation that created NIAAA, the Comprehensive Alcohol Abuse and Alcoholism Prevention, Treatment and Rehabilitation Act of 1970, interest in the question of insurance coverage for alcoholism came to the forefront. NIAAA began to encourage programs for employed alcoholic persons and the necessity for employers to offer some type of insurance coverage for their alcoholic employees.

In the spring of 1972 NIAAA sponsored an update of the 1968 report. This study (13), released in the fall of 1972 (discussed in detail below), found that although there has been some improvement in health insurance coverage for alcoholism, it is still far behind benefits available for physical conditions. Of the companies that provided alcoholism coverage, the nature and extent of benefits varied widely.

Coinciding with the interests of NIAAA were those of the Public Policy Committee of the National Council on Alcoholism (NCA). This committee represented National voluntary efforts in developing public and private third-party payment mechanisms for the treatment of alcoholism. After the 1972 NIAAA study was released, a joint NCA-NIAAA committee was set up to act in an advisory capacity and to coordinate further efforts regarding health insurance coverage for alcoholism.

State Regulatory Activities

The McCarren Act of 1945 gave to the States the power to regulate the type and extent of insurance contracts, the cost of insurance and the conduct of the insurance company (i.e., policy, price and procedure). In recent years State legislatures have increasingly considered legislation which mandates that insurance companies provide benefits for the treatment of alcoholism.

A recent survey (14) has sought to determine what action toward health insurance coverage for alcoholism has been taken by the 50 State health insurance regulatory agencies. Responses from 47 States indicate that legislative efforts to achieve health insurance coverage for alcoholism are only beginning. The majority of State regulatory agencies favor health insurance coverage for alcoholism, but only 5 States (Illinois, Massachusetts, Minnesota, Washington, and Wisconsin) have passed some form of legislation mandating inclusion of benefits for alcoholism in group health insurance policies. Actual benefits provided by the enabling legislation in the 5 States range from no specification to a fixed number of inpatient days of care; only Massachusetts requires outpatient as well as inpatient care.

In 5 States (Alaska, Michigan, Mississippi, Nebraska, and Oregon) legislation concerning health insurance coverage for alcoholism is pending (14); in 4 of these, individual as well as group coverage will be required, and in 4, outpatient benefits will be required.

Personal visits by the survey staff to legislative officials in 8 States indicated that the health insurance industry has generally shifted from opposing coverage for alcoholism to providing information which would be of use in the preparation of legislation. Labor and management groups too have supported this type of legislation, and have not shown undue concern about treatment costs. Hospital and physician groups tend to favor legislation for alcoholism benefits which would limit coverage to hospital inpatient treatment by qualified physicians.

California has initiated a pilot occupational health insurance program for all State employees. The project is financed by State funds made available by legislation (SB 204) passed in October 1973. The insurance covers alcoholism as a primary diagnosis for employees, their spouses, and all family members. The Comprehensive Alcoholism Treatment Program is based on the NIAAA model. The benefits include 6 days of detoxication, 21 days in a general hospital or specialized alcoholism treatment center, 30 days in a recovery home or other residential facility, and 45 out-patient visits. All insurance carriers currently offering basic health care coverage to State employees have agreed to participate in the program. The experience gained during this pilot will be used in developing an ongoing alcoholism health insurance program to be included as part of the basic health care provided for all employees in public and private industry in the State.

At present, State legislation seems to be the most effective means of gaining adequate third-party payments for alcoholism treatment from the private health insurance industry. In the future, National health insurance may become the important means.

Developments in the Private Health Insurance Industry

At the present time, according to a Social Security Administration estimate (25), about 80 percent of the civilian population has some type of private insurance coverage for hospitalization. As noted above, however, alcoholism is often excluded, or limited under mental-health coverage, although at the present time the insurance industry is showing signs of becoming more responsive to the

needs of problem drinkers. A 1973 survey (18) indicated that in a representative sample of the U. S. population 66 percent favored health insurance coverage which would include treatment for drinking problems and alcoholism.

The 1972 study mentioned earlier (13) concerned available health insurance coverage for alcoholism. There are three major components in the U.S. private health industry:

1. Blue Cross and Blue Shield companies: Blue Cross is concerned with hospital services, Blue Shield with professional services. These nonprofit organizations operate in conjunction, through independent area plans, throughout the U. S. A.
2. Independent companies: These are a composite of employer-employee plans, community plans, private group clinics and dental service corporations, both nonprofit and profit-making.
3. Commercial insurance companies: These are life and casualty insurance companies as well as others whose activities are limited to the health area. Most are stockholder private enterprises.

Blue Cross and Blue Shield

At the present time Blue Cross and Blue Shield enrollees comprise an estimated 38% of the private health insurance enrollment (13). Approximately 75% of the Blue Cross plans have some kind of alcoholism coverage, and approximately 62% of the Blue Shield plans provide some type of alcoholism coverage (7).

Among those Blue Cross plans which do include alcoholism as a compensable illness, about half provide only a limited set of benefits, less than those afforded for other conditions (13). Limited benefits are usually in the range of 30 to 45 hospital inpatient care days. One of the most serious limitations of Blue Cross plans is that they generally cover only expenses incurred in a hospital recognized by the American Hospital Association and by the Joint Commission on Accreditation of Hospitals. Thus, care in many psychiatric or special alcoholism facilities, which do not meet hospital accreditation criteria, is not covered under these plans. Only about 9% of the Blue Cross plans cover psychiatric or special alcoholism facilities.

In April 1974 Blue Cross of Maryland (3, 4) announced that it was expanding its group health coverage to include the rehabilitation of alcoholic persons at private residential treatment centers. Coverage can be added to group health contracts for $0.45 a month for an individual, and $1.00 a month for husband and wife. Coverage is limited to a lifetime maximum of 60 inpatient days, restricted to 30 days per confinement per person. Semi-private room and board, medical and nursery services, and rehabilitation services are included. Both premium reduction and expansion of coverage to outpatient care are currently under consideration by this Blue Cross plan.

Independent Companies

Only a small number of independent insurance plans were surveyed in the 1972 study. The majority offered limited benefits for alcoholism, the most serious exclusion being services performed outside an inpatient setting (13). Among the independent plans reviewed which offered the most comprehensive alcoholism benefits to large employers of personnel in the U.S., both public and private, are the plans negotiated by the U.S. Civil Service Commission, the CHAMPUS program for the military, and the other plans for Federal employees.

1. The CHAMPUS Program. CHAMPUS (the Civilian Health and Medical Program of the Uniformed Services) is a Federally sponsored program and covers "nonmilitary hospital costs for dependents of active duty personnel and dependents of retired persons, and the wives or dependents of persons who died while on active duty or in retired status" (13). Although alcoholism seems to be cover-

ed under nervous, mental and "emotional" disorders, it is not specifically included or excluded in the CHAMPUS plan. CHAMPUS provides unlimited inpatient care (hospital and professional costs) as well as limited outpatient care. Claims for the treatment of alcoholism under CHAMPUS insurance have been dealt with favorably.

2. Federal Employees Plans. The U.S. Civil Service Commission has some 38 plans with insurance companies to cover Federal employees throughout the U.S.A. All of these include adequate outpatient and inpatient benefits for mental illness. None of the plans specifically exclude alcoholism, but only 27 of these plans refer to alcoholism in their policies. Any new Civil Service Commission plans must offer adequate coverage for alcoholism. Since alcoholism is generally included under "mental and nervous" conditions, the benefits provided vary widely. For example, plans range from 5 to 365 days of hospital care per year, although the majority provide only limited coverage: 5 to 30 days. At the present time, the Civil Service Commission, which administers the Federal Employee plans, does not keep a record of the number of persons who are diagnosed with alcohol-related illnesses or alcoholism. Again, benefits are usually provided only for confinement in the traditional medical-surgical setting.

Commercial Insurance Companies

While the 1972 study did not include a survey of commercial health insurance companies, reports produced by National Underwriters (13,22), gives some indication of the current alcoholism coverage by commercial insurance companies. Of some 280 different health insurance policies offered by 91 commercial companies, 8 percent specifically exclude benefits for alcoholism, while 9 percent limit alcoholism benefits. Others exclude or limit benefits for nervous or mental disease or disorders, but since the major categories are not mutually exclusive, there is no way to determine to what degree alcoholism is included in these categories.

Two commercial insurance carriers, Kemper Insurance, and Employers Insurance of Wausau, have initiated important changes in terms of assuring coverage for alcoholism.

The Kemper group, one of the country's largest insurance organizations, has expanded policy coverage (17) to provide for inpatient and outpatient treatment of alcoholism at hospitals and State-licensed alcoholism treatment facilities. This coverage will add no additional premium charge to their group policies. The Kemper Company recognized that many claims for a variety of illnesses are only subterfuges for alcoholism; the specific coverage should therefore help in earlier identification and treatment of this illness, averting more expensive treatment at a later stage.

Employers Insurance of Wausau is also increasing alcoholism coverage under its group health insurance policies (8), providing for both inpatient and outpatient treatment under approved programs. Employers Insurance makes its own inspection of alcoholism treatment programs and approves those which it considers acceptable under their policies. In conjunction with this, they have established a new consulting service on alcohol-related problems for policy holders.

Developments in Public Health Insurance Programs

Medicare

The Medicare Federal health insurance program provides specified coverage under the Social Security Act (Title XVIII) to qualified persons aged 65 and over. Nearly all of the approximately 20 million persons of that age are eligible (27). The two parts of the program consist of hospital insurance and supplementary medical insurance.

Medicare provides generous psychiatric benefits, including alcoholism, and hospital care in a general hospital setting, while care in a psychiatric hospital is quite limited. Medicare allows almost all services up to 90 days

in a particular benefit period. In addition, a lifetime reserve of 60 days would allow the patient to be continuously hospitalized for a period of 150 days. However, Medicare limits the benefits provided in a psychiatric hospital to 190 days during a person's lifetime (25).

Medicaid

The Medicaid program provides funds to States for health care for the categorically needy and the medically indigent, provided the State program meets certain standards. The types of services vary greatly, since Medicaid is primarily a State operation. Even though Federal matching money is available, many States do not include in their State plans coverage for mental health outpatient services through general hospitals, psychiatric hospitals, community mental health centers, or other services in non-residential settings.

At present only one State, Arizona, has no Medicaid program. States having Medicaid programs are required to include persons receiving financial assistance through programs for the aged, blind, disabled, and families with dependent children; also, other persons who would be eligible for financial assistance except that they do not meet certain State requirements. The States may also offer care to certain medically indigent persons under age 21 and other needy persons (25).

Medicaid funds are used for physician services, inpatient and outpatient hospital and nursing home services, and other related costs, as well as psychiatric services. Under Medicaid the State programs may not deny medical care to eligible persons on the basis of diagnosis, although the States may, and many do, place limits on the amount of care to be provided, such as the number of days of hospital care or the number of physician visits. If the patient goes to a general hospital, he is eligible for the total benefits allowed by State plans, but if he goes to a public mental hospital, he must be either over 65 or under 21 years of age to be eligible.

National Health Insurance

In recent years third-party mechanisms to finance all or part of the costs of health care have become increasingly important. For the first time in 1965, legislation (Medicare) provided publicly sponsored health insurance for a limited segment of the population. Since then, legislative proposals and enactments for health insurance in the U.S. Congress have been increasing.

More than a dozen proposals for various forms of National health insurance are pending before the U.S. Congress at the present time. Other proposals may be added in the near future. The proposals range from minimal to comprehensive coverage, and in many of them provision is made for the coverage of alcoholism under the aegis of mental health.

In a recent survey of a cross-section of U.S. households (18), the respondents were asked whether treatment of drinking problems and alcoholism should be included in a National health insurance program; 73 percent thought it should be included, 10 percent were not sure, and 17 percent felt that it should not be included.

It is expected that the results of whichever bill is passed will be a compromise. Under such a National health insurance program it is hoped that there will be adequate coverage for alcoholism; that the program which emerges will encourage not only the utilization of innovative non-traditional types of health care settings, such as community-oriented alcoholism treatment centers, but also the integration of alcoholism services into the mainstream of the health care delivery system; and that emphasis for alcoholism services will be placed on outpatient rather than inpatient care, in most stages a less expensive and more effective means of treating alcoholism (19).

Disability Insurance

Disability insurance is a means of providing income to the insured when normal work activities and income are interrupted due to accident or illness. The two types, public and private, seem to differ mainly in terms of the amount of payment and the length of time for which insurance can be collected.

Public disability insurance falls into two categories: Workman's Compensation, which provides income in the event of a work-connected accident or illness; and temporary disability insurance, which provides income when wage loss is caused by a non-work-connected disablement. At the present time, only 5 States (Rhode Island, California, New Jersey, New York and Hawaii) and Puerto Rico offer temporary disability. In all 50 States, however, Workman's Compensation is in effect, although there is considerable variation in the coverage offered for work loss due to alcoholism. The pertinent State statutes vary widely, "from mere existence of intoxication at the time of injury (as an exclusion from benefits) to intoxication being the sole cause of the injury" (13). To date only a few instances have been reported of compensation for injured workers who suffer from alcoholism or who develop other alcohol-related problems after and due to their injuries. In such cases, compensation benefits are paid for the alcohol-related problem.

Persons with private disability insurance are generally eligible for benefits if they have disabilities connected with alcoholism (13).

Developments in Health Maintenance Organizations

With the passage of the Health Maintenance Organization (HMO) Act of 1973, a new opportunity has become available to provide alcoholism services in a new health delivery system.

In general, an HMO is an organization which offers an organized system of health services to an enrolled group of persons for a fixed prepaid fee. All HMO's receiving Federal assistance under the Act must provide basic health services on a prepaid basis to an enrollment group which includes the various age, social and income groups within the area it serves; and, at their option, provide supplemental health services on either a prepaid or fee-for-service basis.

Some of the provisions of the Act relate specifically to alcoholism. Others do so by indirection, and are susceptible to varying interpretations.

The basic services which relate directly to the treatment of alcoholism are defined by the Act to include (1) short-term, outpatient evaluative and crisis-intervention mental health services; and (2) medical treatment and referral services (including referral to appropriate ancillary services) for the abuse of or addiction to alcohol.

The supplemental services which relate indirectly to the treatment of alcoholism include (3) mental health services not included as a basic service under (1) above; and (4) long-term physical medicine and vocational rehabilitation services.

Of the provisions cited, only item 2 specifically refers to alcoholism, while provisions 1, 3, and 4 are matters of interpretation. Regulations and guidelines specifying HMO involvement with alcoholism are currently under preparation.

Thus the inclusion of alcoholism services in the benefit package is required of all HMOs receiving Federal assistance. Information is not available at this time which would indicate how many of the current estimated 117 operational HMO's and of the 125 known HMOs in process of formation offer these services. There is no doubt, however, that most HMOs are currently treating alcoholism and alcohol-related problems, although many of these are being treated under other diagnoses. The question for the future is not whether HMOs will provide services for alcoholic persons, but whether they will provide an effective and adequate scope of services.

Currently, HMOs which offer alcoholism services must provide or arrange treatment services for those who request them. This is in contrast to other health insurance programs, whose commitment is only to pay for treatment once it has been received.

Insurance Coverage for Alcoholism Among U.S. Corporations

It has been estimated that well over half of the alcoholic persons in the U.S.A. are employed. Yet most of these persons are unable to work to their fullest capacity and may eventually even become unemployable if they are unable to resolve their alcoholism problems. These persons are thought to miss work about 2½ times as often as the general employed population. Without doubt alcoholism problems are responsible for the loss of capable and experienced employees, one of the most important resources of any company (20).

A survey (12) in 1972 by the National Council on Alcoholism sought to determine the extent of health insurance coverage for alcoholism among 21 U.S. corporations representing a total employee population of about a million. Only 1 corporation excludes alcoholism coverage for its employees, and 2 do not offer inpatient coverage. Approximately 40 percent of the corporations provide some type of outpatient coverage.

The 21 corporations use a combination of health coverages: approximately 14 percent, including both large and small firms, are self-insured; about 38 percent are insured by Blue Cross and Blue Shield; and almost 50 percent by other insurance companies. Three corporations use a combination of Blue Cross-Blue Shield and another insurance company; in each case the "other" insuror provides major medical coverage. About 40 percent of the corporations impose no limitations because of an alcoholism condition.

In another survey (6) 503 top executives in the largest U. S. corporations were asked whether they felt that company medical insurance plans should pay costs for help to employees with alcohol problems. While 3 percent had no opinion, and 15 percent felt it was not worth the cost, 82 percent thought the company should pay.

An effective alcoholism program for employees should provide coverage for the treatment of alcoholism similar to what is provided for other illnesses. A 1973 study (15) reported that when employees of Illinois Bell Company utilized the alcoholism benefits offered by their health insurance, and were successfully treated, claims for alcohol-related illnesses and accidents were markedly reduced. During the 5 years prior to their rehabilitation, alcoholic employees had 662 incidences of sickness disability. In the 5 years after rehabilitation, sickness disabilities were reduced to 356, saving the company an estimated $459,000 in wage replacements alone. There were 57 cases of on-duty accidents reported prior to rehabilitation, compared to only 11 cases after.

A study in 1970 of absenteeism by employees of a large corporation, comparing alcoholic and nonalcoholic persons, found that 63 percent of the absences by alcoholic employees were caused by respiratory infections and digestive and musculoskeletal disorders (23, 24). The alcoholic employees used up a greater amount of group hospitalization insurance, regardless of whether alcoholism treatment was included or excluded in the insurance policy. The reporting of secondary diagnoses, rather than the primary diagnosis of alcoholism, is common, so that when an employee is ill due to alcoholism and is admitted to a hospital for treatment, it is often reported as a respiratory ailment, gastritis, or a musculoskeletal disorder.

It is important to note that the funds paid out under group hospitalization coverage vary only slightly whether alcoholism is included or excluded in the contract (23).

Companies which currently offer alcoholism under their health benefits do not as yet find a need for increasing group hospitalization rates as a result of their claims. But due to the social stigma involved, employees are reluctant to take advanatage of this health benefit. Through utilization of the alcoholism provision, however, many previously unacceptable claims will become reimbursable.

Although two large insurance companies have recently included alcoholism benefits in their group hospitalization plans at no increased premium, some resistance on the part of private industry to acceptance of this benefit has been reported. In a survey of executives (6) early in 1974, 83 percent of those questioned did not consider alcohol misuse to be a very serious problem among their employees.

Federal Actions Related to Third-Party Payments

Social Security Amendment of 1972

The Social Security Amendment of 1972 (P.L. 92-603, otherwise known as HR-1) increased the Medicare, Medicaid, and other Social Security benefits, and federalized certain other programs for the aged, blind and disabled. Four major areas of concern for alcoholism treatment in HR-1 are as follows:

It seems that an aged, blind or disabled individual is not eligible for HR-1 financial assistance if it has been determined that he is an alcoholic person and is not undergoing appropriate treatment.

Individuals who qualify for financial assistance under item 1 will receive their benefits through a third-party payee. Such a requirement of a representative payee implies that people once labeled as addicted are incapable of managing funds even if they are undergoing treatment for their problems.

Individuals eligible for disability benefits, including disablement by alcoholism, under HR-1 are also eligible for Medicare, thus enabling them to take advantage of the limited alcoholism treatment benefits offered under Medicare at the present time.

HR-1 establishes the Professional Standards Review Organization (PSRO) to be set up in local communities to review the quality and appropriateness of medical care received by Medicare and Medicaid patients. Since the local PSRO will be able to determine its own reimbursement standards for including inpatient and outpatient care, alcoholism coverage is possible. Thus, the PSRO provision of HR-1 is important in that it offers considerable potential for broadening alcoholism coverage through third-party reimbursement.

NIAAA Activities

In coopeartion with broad representation from the alcoholism field, NIAAA has tried to meet some of the inadequacies in the third-party reimbursement area. NIAAA has defined and scheduled a 2-year Operational Planning Objective (H-21) to increase coverage by private health insurance companies for alcoholism treatment. This objective should be instrumental in clarifying many of the issues involved and should be of help in reducing current health insurance exclusions or limitations related to alcoholism.

Under the aegis of H-21 a proposed model health insurance benefit package has been designed to reflect the current "state of the art" and tc act eventually as a guideline to companies providing alcoholism coverage in health insurance plans. It is important to note that this proposed benefit package, which will be made available in the future to all State alcoholism authorities, employers, trade unions, and the insurance industry, needs further testing before it can be implemented.

In addition, preliminary data on the costs of treating and caring for alcoholic persons have recently been compiled (Table 1).

Standards for alcoholism treatment services are either lacking or poorly defined. In an effort to resolve this problem, NIAAA has contracted with the Joint Commission on Accreditation of Hospitals to develop a Standards Manual for alcoholism treatment programs together with a procedure for ongoing surveys leading to accreditation. Through another contract, standards leading toward certification of non-degreed professional treatment staff are being formulated. It is expected that during the coming year a "certifying" body will work to gain acceptance of the standards and to implement the certification of non-degreed alcoholism counselors.

In an effort to stimulate health insurance coverage and third-party payments NIAAA is exploring the possibility of using incentive contracts with profit-making organizations. The Institute plans to demonstrate that contractual incentives can yield facilities of a nature satisfactory both to the alcoholic population and to health insurors covering this population. This should attract enough third-party payments to enable the contractor to become self-sustaining in a relatively short time. Contractor fees will be determined

by the level of third-party payments they are able to generate. For example, a contractor would receive the most profit if he were able to generate 25% of his total receipts from third-party payments by the end of the first 6 months of the contract, 50% by the end of the first year, and 75% by the end of the second and final year.

Other current NIAAA activities are the development of a model cost accounting system for use by alcoholism programs and an examination of legislation and licensure requirements for State facilities.

Alcoholism Care Costs

The costs of treating the several million Americans who manifest drinking problems cannot be supported by government funds alone. One of the more financially viable means to ensure that alcoholic people receive timely and appropriate care is through the mechanism of third-party reimbursement. Yet cost is often the reason used by various types of health benefit plans for not including alcoholism treatment in insurance plans. For example, data from the NIAAA Alcoholism Treatment Center Monitoring and Evaluation System (21) indicates that these Centers currently receive only 7% of their income from third-party reimbursement, of which approximately 2% is from private health insurance.

Determining alcoholism treatment costs is especially difficult because they vary greatly from program to program. A recent preliminary study (5) provides some information concerning the costs of different types of alcoholism treatment programs compared to a model benefit package (Table 1). It should be noted that the model benefit package does not represent a policy statement by NIAAA but is merely a practical measure, obtained by analysis of present treatment programs, to provide insurance companies with some basis for projecting a reasonable range of the costs of covering alcoholism treatment in all the settings in which it is delivered. NIAAA views the model benefit package as part of an experimental effort rather than as a plan that is ready for national implementation. In dealing with insurance companies and state insurance agencies NIAAA would urge recognition of the fact that selected aspects of the proposal have not been thoroughly tested.

The model benefit package projects, as the basis for treatment in each type of setting, the following maximum lengths of stay:

Inpatient emergency care	6 days
Inpatient care	14 days
Outpatient care	30 visits
Intermediate care, short term	30 days
Intermediate care, long term	60 to 90 days

The results of the study (5), obtained by site visits to 27 alcoholism treatment programs throughout the U.S.A., covering a total of over 60 treatment settings, are as follows (Table 1):

Inpatient Emergency Care. Within the inpatient emergency care modality, the general hospital treatment settings cost from over 2 to 10 times as much as settings in specialized alcoholism hospitals, other specialized hospitals, hospital-affiliated medical emergency care centers, and hospital-affiliated non-medical emergency care centers.

Inpatient Care. The specialized alcoholism hospital is the least costly of the four inpatient treatment settings.

Intermediate Care. The partial-hospitalization treatment setting costs more than twice as much as the other three settings--specialized alcoholism hospitals, recovery home or halfway houses, and other 24-hour non-medical residential centers.

Outpatient Care. Costs varied greatly in the three treatment settings analyzed (family or neighborhood alcoholism centers, hospital-based outpatient clinics, and community mental health centers), but costs in family and neighborhood alcoholism centers tended to be the lowest.

TABLE 1

MEDIAN COSTS OF ALCOHOLISM SERVICES

	Cost Per Day	Cost Per Stay
Emergency Care		
General Hospital	$171.56	$589.14
Specialized Alcoholism Hospital	57.70	230.84
Other Specialized Hospital	97.37	471.56
Hospital Affiliated Medical Emergency Care Center	78.55	149.15
Hospital Affiliated Non-Medical Emergency Care Center	16.39	53.01
Inpatient Care		
General Hospital	87.38	766.24
Specialized Alcoholism Hospital	33.78	270.21
Other Specialized Hospital	93.66	923.98
Hospital Affiliated Inpatient Care under Medical Supervision	117.00	1,173.71
Intermediate Care		
Partial Hospitalization	74.15	1,274.21
Recovery Home	12.66	681.02
Other 24 Hour Residential Center	21.08	735.17
Specialized Alcoholism Hospital	28.74	792.99
Outpatient Care		
Hospital Based Outpatient Clinic	20.07	60.23
Family or Neighborhood Alcoholism Center	5.12	190.10
Community Mental Health Center	32.22	300.87

A preliminary conclusion from this study is that it is reasonable and economical to provide care for alcoholism through the vehicle of the model benefit package in certain types of settings. However, it should be noted that the costs shown in Table 1 indicate trends rather than exact values. The number of sites in the different categories varied from 1 to 11. Eventually, further studies based on this model benefit package should provide valuable information to health insurance purchasers, labor unions, and insurance companies, and facilitate the design as well as the negotiation of alcoholism policy benefit provisions.

Summary

A number of factors affect third-party reimbursement for alcoholism treatment services. Public opinion is shifting to favor the inclusion of provisions for alcoholism in health insurance plans. The general population is becoming more cognizant (1) of alcoholism as an illness, (2) of the fact that it should be treated as an illness with both emotional and physical components, and (3) of the fact that health insurance companies can cover alcoholism just as they already include coverage for such illnesses as heart disease, cancer, diabetes, gastrointestinal disorders, etc. without incurring excessive additional costs.

The insurance industry is becoming somewhat more sensitive to the needs of alcoholic individuals. Nevertheless, the majority of health insurance policies which currently cover alcoholism limit related care to an accredited general hospital, thus excluding many types of more economical treatment programs. Certain health insurance companies are now taking the lead in beginning to bring about change within the industry. With increasing development by NIAAA in the areas of treatment effectiveness, cost data, licensing of facilities, certification of personnel, etc., it may be anticipated that health insurance companies will expand their benefits to meet the needs of alcoholic persons.

As State and Federal regulatory legislation addresses itself more substantially to insurance activities in the alcoholism field, significant changes are occurring. Currently a number of National health insurance proposals have been introduced in Congress which should have a profound effect on third-party reimbursement if enacted. The removal of financial barriers through National health insurance will almost certainly increase the demand for frankly labeled alcoholism services, including manpower and treatment resources, and many more alcoholic persons will become eligible for treatment.

At the present time the States have considerable authority over the activities of the health insurance companies. The States have the potential to enact effective and uniform statutes to regulate the alcoholism treatment services to be covered by the health insurance industry within each State.

For the alcoholic person considering treatment the availability of effective health insurance coverage can in many cases make the difference between seeking and not seeking help, and between seeking it sooner rather than later.

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Chapter X

THE ENHANCEMENT OF HEALTH

The ambivalence of Americans toward the use of alcohol in beverages has been described not only as a general cultural pattern but also in a number of American subcultures and ethnic groups. On the one hand, people condemn and shun the alcoholic person, but on the other they are uncritical of their own drinking-related practices. Those who drink tend to underestimate their consumption as well as the effects it produces. Many of those who do not drink pass harsh judgments upon those who do. At a minimum, people need to have information about the facts surrounding alcohol use, its physiology and effects, which many are startlingly lacking now. It also seems unlikely that alcoholism and its problems can be recognized as such until some general level of public discussion has been activated.

Meaningful discussion about alcohol-related behavior requires some common ground of understanding. One of the basic issues that provides the greatest challenge in this area can be stated as follows: How can that behavior be promoted which enhances well-being and human dignity? In other words, one way of looking at behavior related to the use of alcoholic beverages is to ask what can be done to best enhance the lives of both those who choose to drink and those who choose not to drink.

Since multiple factors seem to contribute to alcoholism, multiple approaches are necessary to promote human well-being and to enhance human dignity in order to prevent alcoholism. The causative factors in alcoholism operate within a specific environment. Thus, for example, it has become increasingly clear that a familial learning factor is important in the genesis of alcoholism in certain people. However, the expression of a familial factor only occurs when environmental circumstances permit it. This well-known phenomenon has recently been elaborated in relation to the sociology of medicine and of chronic diseases. Thus, we commonly speak of "the cause" of tuberculosis as being the tubercle bacillus. However, even knowing this, it remains to be specified why and under what circumstances some people get tuberculosis and others do not. Furthermore, it appears that tuberculosis was on the decline because of social factors, such as the relief of crowding and the improvement of housing conditions, even before the cause was known. In an analogous way we may hope substantially to improve the conditions surrounding alcohol-related behavior long before we are able to specify so-called "first causes." An Englishman, John Snow, proved that cholera could be prevented several centuries before the genesis of cholera was known. Alcoholism is not thought to be due to a single cause, but it can still be identified and prevented in the early stages of its development (4). To use another analogy, the cause of cancer is not known and, indeed, as with alcoholism, "It is not yet clear whether cancer is many diseases exhibiting a common pattern of general symptoms or one disease that is manifested in many forms" (23). Yet most cancers could be prevented with currently available modes of therapy if they could be detected very early in their development. In the same way, certain behavioral indicators should alert all of us to the incipience of alcoholism. If we could generally agree what is acceptable drinking-related behavior in specific environments, it would become possible to help the potentially alcoholic person to use alcohol more constructively, or not use it. There are crucial aspects of people's lives where interventions can assist them greatly.

Considering the multiple factors involved, several should be of the greatest importance in dealing with alcohol-related behavior. First are Americans' attitudes toward taking alcohol. Second come the actual sets of behaviors that people engage in, which are of course not always necessarily the same as their attitudes. A third major factor includes the laws and customs that contribute so much to our patchwork quilt of inconsistent drinking-related practices.

The patterns of consumption of alcohol, including the economics of the availability of alcohol and the availability of money to buy it, are certainly involved. The environments in which people live and work and drink, discussed in earlier chapters of this Report, are also critical in providing clues about the extent to which their behavior deviates from generally accepted norms.

Attitudes Toward Alcoholism

There is reason to believe that attitudes toward alcohol are changing. A small experimental Government prevention campaign has yielded a multiplied growth in free public exposure of some four to five times the dollar investment in radio television, magazine, newspaper, and outdoor advertising about alcoholism. One reason for this enormous public involvement is the fact that techniques of public advertising have been used effectively to catch and sustain attention. The effectiveness of this campaign has been measured independently by a public-opinion research organization. The data in the accompanying chart address some important questions: Where has this taken us? What good has it done? Is the public aware of the campaign? How have attitudes towards the use of alcohol changed? As can be expected from a limited experiment, the results are modest, but they are clear (10).

Data From A Survey of American Attitudes Toward Alcohol

	1971	Sept. 1972	March 1973	Sept. 1973	% Change 1971 to Sept. 1973
Heavy drinking is a very serious problem in the country today:	59%	64%	67%	72%	+22%
Alcohol is a drug:	61%	67%	71%	72%	+18%
There is no known cure for a hangover:	45%	52%	53%	50%	+11%
Drunkenness is usually like an overdose of drugs:	31%	38%	41%	43%	+39%
A host who encourages heavy drinking among his guests can be described as a					
- drug pusher:	19%	31%	33%	33%	+74%
- bad host:	50%	58%	56%	58%	+16%

It may reasonably be concluded that Americans' attitudes towards the use of alcoholic beverages have changed substantially over the last few years. Moreove since public information campaigns by voluntary organizations are continuing and growing in volume, it is likely that heightened public awareness of alcoholism as a major social problem will also be sustained.

The question now becomes one of taking constructive steps, founded on sensible planning principles in so far as possible, to capitalize upon the increased sensitivity of the public. Studies of public attitudes, including house to house surveys, are continuing (3), but in the meantime the information currently at hand must be used appropriately. Not only is it inimical to our democratic ideals to impose any sort of behavioral practices upon people, but it has been demonstrated in psychology that such demands are unlikely to lead to sustained behavior in a given direction. Indeed, there is evidence that even people living under authoritarian government manage to ignore official anti-alcohol propaganda which goes against long-ingrained popular practices (14). On the other hand, there is great possible value in stimulating open public discussion about the values and practices related to drinking that characterize various groups of Americans. In this way tacit assumptions can be scrutinized and mutual understanding achieved.

Among the essential requirements for increasingly meaningful and fruitful discussions by the people of this country is a continuing flow of reliable information. Worldwide study and research are consistently enriching the store of knowledge about alcohol and the effects of its use and misuse; this knowledge is vital for scholars and researchers. It needs to be gathered up, analyzed, evaluated, and processed systematically into bibliographies, abstracts, indexes and archives, so that it may be efficiently available to those who need it as background for their own work. Ready access to information about what has already been learned is especially useful in that it helps to avert needless duplication of researches, thus sparing both time and costs. Such organized data banks are valuable also for legislators, educators, program administrators, and those engaged in treatment and rehabilitation (13). Finally, a continually updated information bank can be the basis for valid communication to the people at large, through and by the mass media, allowing the formation of public opinion and attitudes rooted in well-founded knowledge. The National Clearinghouse for Alcohol Information was established in order to achieve this informational breakthrough and is already responding to a huge volume of inquiries. The collaboration of established university resources has also been enlisted to cope with the burgeoning problem which has often been referred to as the modern information explosion.

What accomplishment is envisioned from drawing informed attention to current practices, similarities and differences among a variety of American subcultures? To the degree that there is some consensus about what these sets of behavior are--which ones are helpful to people, and which potentially harmful--it is also possible to recognize when people are involved in them. Having such a potentially visible set of standards, without imposing any of them on any given person, would greatly enhance the early identification of both benefits and difficulties in the use of alcoholic beverages. This is a logical outcome of emphasis on early responsible use and non-use of alcoholic beverages and early detection of misuse. Furthermore, it provides the opportunity to set up a testable programmatic model which incorporates direct involvement of the American people in a dialogue with each other and with their Government. The expected outcomes might only minimally change the quantity of alcohol that Americans consume. But it should strongly affect our ability to drink for pleasure, or not drink; to experience the values of drinking, and to minimize the problems provoked by injudicious drinking.

Can Patterns of Drinking Change?

Societies can change over time. Drunkenness was a problem among the ancient Hebrews. Yet temperate drinking became the established norm among Jews when their national culture was reformed around 525-350 B.C. (12). Among Jews today, especially the religiously affiliated, drinking is an integral part of numerous religious observations; drinking is moderate and is rarely done for its own sake, but is considered appropriate when coincidental to ceremonies, festivals, celebrations, or meals (24). Among Italians, wine is viewed as a good, a

necessary part of a substantial meal, as well as an accompaniment of celebrations such as weddings, christenings, and holidays (15).

Changes in consumption patterns need not take generations. For example, in a recent 10-year period, France was the only major Western Nation to reduce its per capita consumption of alcohol, apparently in response to a national campaign calling for moderation in drinking ( ). Similarly, high taxation of distilled spirits in Denmark changed consumption patterns in that country during World War I to such an extent that even today beer is the alcoholic beverage most frequently consumed (21).

Another illustration derives from a study of adolescents that produced a typology of individuals among which were two with a particular proneness to deviant alcohol use. Moreover, the categories of individuals responded differently to alternative alcohol education programs. That is, some combination of educational materials and types produced a lessening of alcohol deviancy while other combinations produced an increase. The implication of this is that it is both necessary and possible to develop special prevention programs for special groups of people (2).

Because of their importance in the socialization process, schools are important conduits through which to convey alcohol information and education. The current trend is to include all school levels--elementary, junior high, and senior high--as target groups. This reflects lowering of the age at which young people are thought to be ready for alcohol education. Previously, almost all the emphasis was on senior high school students. Recent studies have revealed, however, that most adolescents are introduced to drinking at age 14 or 15. Junior high-school students have, therefore, increasingly become identified as target groups. Most recently, the growing belief that the family is decisive in the formation of attitudes about drinking has suggested that the school should get involved in alcohol education as early as possible (1). This belief is supported by indications that young children are more exposed to and aware of alcohol than had been previously recognized. Of course, it should be obvious to anyone who observes children that they learn to copy their elders from age 2 and even younger. They learn about taking alcohol in the same ways that they acquire other knowledge from the earliest years onward. A recent study of children between the ages of 6 and 10 in Scotland concludes: "The results... clearly support the expectation that children begin to learn about alcohol early in life, even before primary school. By age 6, a majority recognize the behavioral manifestations of drunkenness, and many are capable of identifying some alcoholic drinks by smell alone; they also perceive people in different social roles to like alcohol in different degrees. By the age of 8, most children have attained a mastery of the concept of alcohol, and in general, the rate at which children acquire a broad understanding in this sphere was greater than anticipated" (5).

Everyone agrees about the importance of education in relation to the prevention of alcoholism. However, there are many differences about what types of education may be effective and the degree of emphasis to place upon them. Since the Federal government, through the Department of Health, Education, and Welfare, has only recently begun to launch a major educational effort for the prevention of alcoholism, it is still too early to be sure what the results of such interventions will be. Accordingly, the NIAAA is proceeding on a pilot basis to encourage projects in this area. What can be said at this point is (1) education must be defined clearly with obtainable objectives; (2) the behavioral effects of the education must be measured as well as attitude changes and the grasp of information; (3) clear-eyed evaluation, including the assessment of unexpected results, is essential.

One more point is worth emphasizing. To achieve more effective education, whether in the schools or in the public arena, will undoubtedly require the development of additional and fresh resources to aid the educators, such as new manuals and new modules, as bases for new curriculums, that various school systems or leaders of adult groups can adapt to their own needs. A foundation for this is in process of being developed in the National Center for Alcohol Education.

Laws, Regulations, and Drinking Patterns

Discussions of the prevention of alcohol problems, many of which are related to the development of alcoholism, have often overlooked a universe that may offer outstanding potential for effective contribution: the regulations and regulators of alcoholic beverages. What their role has been in the past 40 years will therefore be dealt with here in some detail; and their potential role in promoting a healthier drinking environment in this country will be suggested, although necessarily in a most tentative fashion.

Although it is apparent that laws and regulations of alcohol are an expression of how a Nation feels about drinking practices of various kinds, only recently has attention been focused upon the intricate patchwork quilt of often inconsistent statutes and customs that prevail in the U.S.A. What is missing is knowledge of the nature of the contribution that this makes to the problems of alcoholism in this country. The real effects of different types of regulation are only now beginning to be questioned (6).

Through substantive legislation, the Alcoholic Beverage Control (ABC) authorities possess the power to regulate morals and ethics as well as to establish social policies concerning the consumption of beverage alcohol. This kind of control has been, in one way or another, a part of the development of law and government throughout the history of the United States. These agencies were created in an atmosphere of temperance and avoidance, to regulate out of existence the presumed causes of alcohol problems: mainly, the uncontrolled manufacture, sale and consumption of beverage alcohol.

Liquor control laws have their roots in antiquity and the development of variations in the means and methods of control can be traced through various stages of civilization to modern times (7). As a whole, liquor control is a heterogeneous mass of organizations and laws that exist in all developed nations, states and in most underdeveloped nations of the world. In broad terms, the organizations and laws have as their primary goals the regulation of the manufacture, sale, and consumption of beverage alcohol and the taxation of alcoholic beverages. Most developed countries have national policies on the manufacture and sale of alcoholic beverages, and many countries provide for local variations, especially in retail sales. The United States, on the other hand, has not had a national policy on the manufacture and sale of alcoholic beverages since 1933. There are Federal statutes governing the export and import of alcoholic beverages, but each State has full and complete authority over the manufacture, distribution and sale of alcoholic beverages within its borders.

The extent of the authority over alcohol that passed to the States in 1933 was the result of the Twenty-first Amendment to the United States Constitution which repealed Prohibition. Like many other nations, the United States has experimented with different systems of control. The Eighteenth Amendment and the National Prohibition Act (Volstead Act) marked the culmination of a movement that started in the middle of the 19th century. Effective organization of the antialcohol movement, persistent lobbying, the influence of World War I on the population, and an apparently growing concern over problems associated with excessive drinking were instrumental in National Prohibition becoming law.

The enactment of a law, however, is not synonymous with its popular acceptance or effective enforcement. By the middle of the 1920s the illegal production, distribution and sale of alcoholic beverages, and their widespread consumption, were well established. Popular support for Prohibition was clearly and conspicuously denied by the flourishing illicit trade. The growth and acceptance of moonshine, bootlegging and the speakeasy were not due to corruption on the part of public officials and law-enforcement personnel, although this was undoubtedly present. They became accepted institutions of the era because of the Prohibition laws. The lack of respect for law that developed cannot be disregarded in any evaluation of the National experiment to eliminate alcoholic beverages as an available commodity.

While broad generalizations should not be hastily formulated from one experiment, the experience with Prohibition clearly suggests that social policies which conflict with widely accepted societal practices and mores are, if not

doomed to failure, potentially dysfunctional to societal institutions including the broad area of law and justice. American experience over the last century and longer suggests that the availability of alcoholic beverages has broad public support.

The problem faced by the tripartite American system of representative democracy is how to control the problems associated with the consumption of beverage alcohol without destroying respect for the system that enacts, administers and adjudicates the controls and without over-burdening the system with adverse responses to the controls. It must be recognized also that societal customs that are deeply embedded in and part of accepted behavior patterns are not easily subject to change, certainly not in the short run, as was attempted through prohibition.

License and Monopoly States

In the United States the administration of alcoholic beverage control is shared or divided among many different authorities. The 50 States and the District of Columbia, when viewed as a whole, do not present a picture of regulation that is easily described except to say that it is disjointed, full of contradictions, marked by divergent statutory provisions, and lacking in concrete statements of purpose that can be related to functions and activities. If a foreign observer were to view this alcohol control system, he could not help but conclude that there is no logic to the system. If he were to look more closely at the plethora of laws, regulations, and unwritten policies, the foreign observer would probably throw up his hands in dismay at the lack of articulated and understandable policies, goals, and objectives that the control system is supposed to meet.

Alcohol control in the United States is a hodge-podge that, on the surface, does not exhibit any semblance of a policy coordinated to have impact on alcohol-related problems. Alcohol--the substance--is controlled, but not uniformly and in most instances without a concern for any positive, neutral or negative relationships between the controls and problems associated with the consumption of beverage alcohol--in contrast to problems associated with the merchandising of liquor.

The system of alcohol control in the United States is divided into two major types: license States and monopoly States. Thirty-two States and the District of Columbia, through regulatory agencies or offices that have different forms and functions, control the manufacture, distribution, and retail sale of alcoholic beverages by licensing all segments of the industry. In four of the license States local governments issue most retail licenses and in two States the local authorities issue some retail licenses without State approval. In many of the license States the local authorities may make recommendations on the issuance of retail licenses when applications are pending before the State ABC agency. There is no simple description of procedures for retail licenses. For example, in Minnesota the enabling legislation permits municipalities or counties to issue most on-premise licenses permitting sale for consumption where beverages are served, and off-premise licenses for sale in containers to be taken away, may be issued with State approval. But in municipalities having a population of 10,000 or less the municipality can own and operate both on-premise and off-premise establishments. Similarly, in South Dakota retail licenses must be obtained from both the State and local authorities, but following an affirmative local option election a municipality can own and operate its own on-sale and off-sale retail outlets to the exclusion of private licensees. The rationale for these and other deviations from exclusive State authority over the whole industry are unclear. There has obviously been a strong historical pattern among the States that has not fostered uniformity in many areas, including regulatory functions reserved to State authority; liquor control is no exception.

Eighteen States have monopoly systems of control which exclude private-sector involvement in the distribution of most alcoholic beverages, especially distilled spirits. Sixteen of the monopoly States operate both the wholesaling and retailing of distilled spirits. Most monopoly States also whole-

sale and retail wine and some monopoly States sell beer containing more than a given percentage of alcohol. As in the license States, there is no uniformity in the regulatory provisions. Two States, Mississippi and Wyoming, operate the wholesale part of the industry but issue private licenses for package stores. Again, the rationale for this divergence from the general picture of monopoly States is unclear. Provisions for the issuance of on-premise licenses also differ among the monopoly States.

The emotionalism that sometimes surrounds the question of alcohol consumption was in part the reason for most States acting to permit local referendums on the retail sale of alcoholic beverages. Thirty-eight States have provisions for various types of local option elections on retail sales. Local option allows the electorate of a political-geographical area to express their view on whether certain types of retail sales should be permitted or prohibited in that area. The usual practice is for a given percentage of the electorate to submit a petition requesting that a question or questions relative to retail sales be placed on the ballot. A few States permit the local government to place questions concerning the retail sale of beverage alcohol on the ballot, and in one State, Delaware, the General Assembly provides for local option elections on the request of a majority of assemblymen from a district. In Mississippi, before beverage alcohol can legally be sold in any county, a majority of the electorate in the county must vote in favor. Alabama does not differ significantly in this respect from Mississippi. In the last two and a half decades, the number of areas that have exercised local option provisions and voted to prohibit sales of alcoholic beverages has decreased markedly. In some States the provision for local option elections is seldom if ever exercised today.

Licensing

Governmental regulation of businesses, especially the alcoholic-beverage industry, is not a 20th-century phenomenon. Since the latter part of the 19th century, though, bureaucratic apparatuses to regulate industries have been established in the United States with greater frequency and with great attention to form.

In the area of alcohol control a number of administrative structures have been used. In some States the regulatory task has been assigned to existing departments, as in Colorado, where the Department of Revenue has the responsibility. Other states have created new liquor-control departments, as was done first in New Jersey. Additional States have created new divisions or bureaus within existing departments, as resulted in 1948 in New Jersey when the Department of Alcoholic Beverage Control was abolished and the Division of Alcoholic Beverage Control was established in the Department of Law and Public Safety. Still other States have opted for independent regulatory commissions. One State--Hawaii--has State legislation but no special agency; liquor control is assigned to county commissions.

Licensing and the State monopoly system were the main answers proposed in the earl, 1930s for alleviating the problems of the Prohibition and pre-Prohibition eras. In States that did not adopt the monopoly system, licensing was and still is the main control mechanism. Sixteen of the monopoly States combine State operation of package stores with licensing of on-premise establishments, and two monopoly States license all retail outlets. The eligibility requirements for licenses, State monopolization of sales for off-premise consumption, and the various restrictions on the number of licenses, are advanced as a means of controlling the problems associated with the retail end of the beverage industry, including intemperance. Restricting access to the industry and limiting the availability of retail outlets is presumed to reduce alcohol-related problems.

While licensing is considered "one of the two pillars supporting the structure of alcoholic beverage control" by the Joint Committee of the States to Study Alcoholic Beverage Laws ( ), it should not be assumed that licensing in the alcoholic-beverage industry is unique or different from licensing in other industries--what is unique is the industry. Licensing is used exten-

sively by governments to control access to professions, to control public gatherings, to authorize persons to conduct certain businesses, and for numerous other activities that governments have determined must be controlled. While access to the liquor industry on the retail level is limited by statute in all States, it does not follow that all licensing is aimed at limiting the number of licenses. In fact, most governmental licensing is structured so that applicants can obtain licenses as long as they meet specified statutory criteria

A license generally is "a permission or privilege to do what otherwise would be unlawful. It is an authorization to do that which, without the authority, would not be allowed" . . . essentially a governmental restriction upon private rights" which mandates obtaining the permission of a governmental body before participation in the restricted activity.

Licensing provides a means for governments to regulate those activities which legislative bodies have determined must in some way be restricted. It follows that the right of an individual or group to participate in certain activities must first be restricted before licensing is imposed as a form of regulation. In the case of alcohol it has been argued that the manufacture, sale, and consumption of beverage alcohol is potentially dangerous to the general public and therefore must be regulated. The States which adopted the monopoly system achieved part of this goal by completely or partly excluding private parties from engaging in the wholesaling or retailing of alcoholic beverages. License States, on the other hand, made it unlawful to own or operate any segment of the industry without first obtaining a license from the appropriate agency.

Licensing permits the State or its empowered agencies to determine who shall engage in one or another part of the business and under what conditions. It also provides the authority to inspect and regulate licensees. While substantial revenues are collected by States as excise taxes or profits from sales, revenue was not the main reason cited for enacting a license or monopoly system of control over the liquor industry. The main reason was the belief by the State legislatures that failure to enact a system of control when Prohibition ended would result in chaos. The statement by the then President of the New Jersey Senate, Emerson L. Richards, is an example of the concern expressed by State legislatures when Prohibition ended (19):

"You know generally the sentiment in New Jersey. It is a very wet State. What is wanted and desired is the control of liquor. We don't want past evils revived. There will be no complaint from the Legislature and the public action will be favorable if the matter is handled in a conservative way and the previous abuses prevented. The subject should be placed in the hands of a stronger State authority.

"The Problem is to devise a plan whereby a man wanting a drink can get it and at the same time prevent him from getting 'gloriously drunk' and acting in a manner harmful to himself and possibly injuring others."

Licensing, limiting the number of licenses, and monopoly control of off-premise sales are negative controls, as are all or nearly all of the controls established for the industry. Other types of controls include hours of sale, age of purchasers, separation of licenses for on-premise and off-premise consumption, prohibitions against "tied house" arrangements, minimum pricing, and limitations on advertising. The negative aspect of the controls arises from the fact that they are aimed at preventing, eliminating, or decreasing intemperance, and restricting licensees from engaging in or allowing on the licensed premises activities that the legislature or the control agency considers undesirable. Although most of the States, in their statements of legislative purpose, talk about promoting temperance or imply that the temperate use of alcoholic beverages is a legislative goal, their statutes and regulations, which outline the activities of the state ABC authority, do not provide for a positive role to further the goal of temperance. Whether temperance is obtainable by these means is not in fact known. The point is that licensing and the other controls established over the alcoholic-beverage industry are prohibitive in nature rather than promotional. Even if it be granted that the controls can be positive in effect, the fact remains that there are no concrete data to indicate that temperance has been promoted. McCarthy and Douglass commented in 1959 (9):

"It is possible that repeal of the Eighteenth Amendment solved some of the problems of the Eighteenth Amendment. It is certain that it solved few of the problems of intemperance. It is probable that the same comment could be made of the repeal of the earlier prohibitory laws. In the long years of attempts to control the problems of intemperance in the United States by moral suasion and by political prohibition of the manufacture and sale of alcoholic beverages, one fact remains clear. The problems are still with us. Only two States now have a partial statewide prohibition. All the States have the problems of intemperance."

It should be realized that the structure and management of either the license or the monopoly system has effects on economic and social practices. Basic to any system is a classification of the types of licenses and the requirements for obtaining them. The types of licensed activities, the number of licenses permitted, as well as the pricing and other control mechanisms can have a profound influence on such things as bootlegging. But it is necessary to go a step further. That is, does the licensing function or the retail off-premise monopoly practiced in 16 States provide anything more than a stable industry? Is there any amelioration or reduction of the problems associated with the consumption of beverage alcohol?

Liquor control has taken on many facets over the years. There have been attempts to control consumption by outright prohibition, limitations on purchases, State monopolies, prohibiting sale by the drink, controlling prices, sumptuary taxation, and limiting the number of outlets. Most of the evidence indicates that these measures have not proven to be of overriding importance in limiting alcohol-related problems (17).

State Control Provisions

The enormous problem faced by the State legislatures in their attempts to provide realistic liquor control is matched by the difficulties in any attempt to evaluate the functions and effectiveness of such control systems. The structures of the administrative agencies vary, and their functions differ. Fully 28 States provide for separate agencies to collect all or some of the taxes that are directly assessed against alcoholic beverages. In other States, the ABC authorities either collect the taxes or are part of a government department, such as a department of revenue, that collects the taxes.

Forty-five State ABC agencies have enforcement staff, although the number of enforcement personnel varies from 5 in Alaska to 254 in Pennsylvania; most States have fewer than 50. These numbers, however, can be misleading, because in most States local, county and State police perform control functions either by specific statutory assignment or incidentally to their regular duties. Not a great deal is known about enforcement levels, practices, and policies operationally in the United States. The lack of good information handicaps any objective evaluation and analysis of the effectiveness of liquor control provisions.

Definitions of Alcoholic and Intoxicating Beverages

The products controlled are malt, vinous and distilled alcoholic beverages. The legal definition of what constitutes an alcoholic beverage differs among the States, as do the beverages to which the laws apply. Forty States control alcoholic beverages that contain either any amount of ethyl alcohol or at least 1/2 of 1 percent of ethyl alcohol by volume. The remaining States differ in the minimum percentage of ethyl alcohol a beverage must contain to come under the law, and this percentage by volume ranges from 0.625 percent to 1.25 percent. Essentially the differences among the States are not very meaningful at these low levels of alcohol. The most confusing distinction has to do with the various definitions of intoxicating beverages and alcoholic beverages.

In a dozen or more States the terms "alcoholic beverage" and "intoxicating beverage" are not applicable to all classes of beverage alcohol because of legal distinctions in the State statutes. For example, beer containing 3.2 percent alcohol by weight (approximately 4 percent by volume) in some States is

regulated but is not considered an intoxicating beverage. Article XXVII, Section 4, of the Oklahoma Constitution prohibits the on-premise sale of alcoholic beverages but Section 2 of the same Article specifically exempts malt beverages that do not contain more than 3.2 percent alcohol by weight from the restriction. Kentucky makes a similar distinction except that it defines 3.2 percent beer as nonalcoholic, but only in "dry" counties that have voted to permit its sale. A number of other States also label low-proof malt beverages as nonintoxicating. In North Carolina the term alcoholic beverage refers to one that contains more than 14 percent alcohol by volume. One State, while regulating all alcoholic beverages no matter what their alcohol strength, declares certain beverages to be not only nonintoxicating but also nonalcoholic. Beer that does not exceed an alcohol content of 5 percent by weight (approximately 6.25 percent by volume) and wine that contains 21 percent or less alcohol by volume are declared to be both nonalcoholic and nonintoxicating in South Carolina. That is an extreme example of the semantic game-playing with alcohol words, but all these distinctions highlight a societal conflict over the use and even the labeling of alcoholic and intoxicating beverages.

It is interesting to note that four of the five States that do not issue licenses for the sale of distilled spirits in on-premise establishments permit the on-premise sale of beer or unfortified wine by declaring them to be nonalcoholic and, in some cases, nonintoxicating. The fifth State that does not issue licenses for the on-premise sale of distilled spirits to the general public, Utah, does permit the on-premise sale of beer containing up to 3.2 percent alcohol but defines it as an alcoholic beverage. On the other hand, Utah establishes State package stores on the premise of restaurants for the sale of "miniature" bottles to customers for immediate consumption.

Prices, Location, Hours, and Eligibility

Without regard to administrative structure, there are a number of similarities between the provisions of the alcoholic-beverage laws and the administration of the laws among the States. For example, 16 of the 18 monopoly States have effective control over the retail prices of most alcoholic beverages sold for off-premise consumption. At the same time 10 license States provide for a high degree of uniformity in prices by either requiring minimum price posting or by enforcement of "fair-trade" agreements. Retail prices, however, vary among the 26 States because of differences in mark-up percentages as well as taxes.

Another widespread form of control is prohibition of the sale of alcoholic beverages for either on-premise or off-premise consumption within a specified distance of certain public and private institutions, such as schools, churches, hospitals and, in some cases, a distance from prisons, state fair grounds, county court houses, and institutions of higher learning. Thirty-five States have locations and 12 make it discretionary for either the State ABC agency or the local governing body. In addition, most States for most types of retail license allow local zoning restrictions against the issuance of new retail licenses.

In terms of hours of sale at retail, an area long in dispute because of the suggested relationship between hours of availability and levels of consumption, all 50 States have some restrictions or permit local governments to establish opening and closing hours. But the similarity of the actual restrictions is not great. For example, some States restrict sales on Sunday, others make distinctions on Sunday sales among different classes of licenses, and some leave the question of Sunday sales to local governing bodies or local-option elections. Closing hours vary in some States from municipality to municipality because of local control; others set minimum closing hours and allow local governments to further restrict the hours of sale; and still others statutorily provide standard closing hours. Thus, Delaware prohibits on-premise sales from 12 midnight on weekdays to 9 a.m. the following morning, while Alaska requires on-premise establishments to be closed between 5 a.m. and 8 a.m.

Each State has established eligibility requirements pertaining to the individual or corporation applying for the license and, in most instances, the premises to be licensed must meet a number of requirements. Eligibility rules differ among the States but most require a licensee to be a United States citizen and to have reached the age of majority. In addition, most States will not

issue a retail license to an individual who has a recent criminal record. Some States restrict the number of retail licenses an individual or a corporation can obtain for separate establishments.

Restrictions on Persons

Most States make some restrictions on the sale of beverage alcohol to specified classes of people. Sales to minors are the most obvious example. But there are also restrictions on sales to insane or interdicted persons, persons of ill repute, and intoxicated persons. Enforcement of some of these restrictions is obviously difficult, but data on the level of enforcement are nonexistent.

Among the provisions of law that are frequently pointed to as important in promoting temperance is the "legal age" restriction. While a growing number of States recently have lowered the minimum age for the purchase of alcoholic beverages to 18, the majority still provide for a higher age at least for the purchase of distilled spirits and wine. As of the end of 1973, 20 States had set 18 as the minimum age for purchase: in 5 States it is 19, in 1 it is 20, and in 13 it is still 21. Nine States permit 18-year-olds to purchase specified light beverages such as beer containing up to 3.2 percent alcohol, and malt beverages or wine containing not over 14 percent. In these 9 States persons must be 21 to purchase all alcoholic beverages not specifically permitted for sale of 18-year-olds. One State allows persons who have reached the age of 19 to purchase unfortified wine and beer, but other alcoholic beverages may be sold only to those aged 21 or over. In Maryland the counties establish the minimum age, and most counties set it at 21 for the purchase of all alcoholic beverages, but a few permit sales to 18-year-olds and a few permit 18-year-olds to purchase beer and wine but not distilled spirits. Oklahoma allows women aged 18 to buy beer containing 3.2 percent alcohol, but men must be at least 21. In a few states, such as Texas, minors of any age can consume alcoholic beverages in on-premise establishments provided the minor is accompanied by his or her adult spouse, parent or guardian. Other states, such as Utah, statutorily prohibit minors from consuming as well as purchasing alcoholic beverages, and Utah prohibits anyone, including parents, from supplying beverage alcohol to a minor except for medicinal purposes.

Retail License Limitations

Retail license quotas have been one method of control adopted to affect alcohol consumption and related problems. License quotas, like restrictions on sale, are intended to have an impact on the availability of liquor. In addition, license quotas are meant to restrict competition. Where quotas are provided by statute, they are usually based on census data and one retail license is permitted per increment of population. There is no uniformity among population increments. Thirteen states and the District of Columbia give either the State ABC agency or local governments discretionary authority to enact retail license limitations. One State specifies quotas for certain counties and provides discretionary authority for the remainder of the counties. Thirty-four States and the District of Columbia, therefore, have some statutory provision either mandating retail license quotas or permitting the limitation of retail licenses.

There are only very limited data on the effect of retail license limitations on alcohol-related problems or even on consumption. Probably the most extensive study of license limitations was done by the Moreland Commission in New York State which examined the results of a moratorium on the issuance of off-premise licenses. The finding of the Commission was that there was no discernible change in consumption levels or patterns when a limitation on package stores was instituted (8).

Consumption and the Lognormal Curve

Certain studies in the last few years that bear on control over alcoholic beverages have focused on the distribution-of-alcohol-consumption theory. The proponents of the theory postulate that the consumption of absolute alcohol follows a pattern similar to economic curves for the consumption of other commodities: mean consumption is greater than median consumption and median consumption is greater than mode consumption. A small number of consumers raise the mean considerably while a large number of consumers, who represent the mode, are considerably below the mean consumption. The theory relates increasing mean consumption levels to increasing alcohol-related mortality, and therefore postulates that a reduction of average consumption levels of absolute alcohol will result in a reduction of alcohol-related deaths, and by implication, other alcohol-related problems. Some of the proponents of the theory have recommended the application of demand-price economics to reduce the mean consumption. According to the recommendations, taxes on all alcoholic beverages should be based on the absolute alcohol in the beverage and taxes should be increased to raise prices to a level that will reduce consumption.

Economic studies show a strong inverse relationship between purchase levels and price when the demand for a product is elastic; that is, purchase levels of a product are affected by changes in price when demand increases or decreases inversely at a greater rate than the percentage change in price. On the other hand, if demand is inelastic, moderate increases or decreases in price will not lead to corresponding changes in purchases. Demand elasticity is only an average and income is one of the determining factors affecting demand. Alcohol is assumed to be a commodity with a high demand elasticity by those who believe raising prices will reduce consumption.

Various studies have suggested that the price of alcoholic beverages relative to income is a determining factor in consumption levels. This is undoubtedly true at least for some drinkers, but to what extent is unclear because of the scarcity of hard data on the subject. On the other side of the argument are some studies that suggest that price-demand elasticity for alcoholic beverages is significantly below -1.0, the unitary level of elasticity (24). Unitary elasticity occurs when expenditures for a product are the same even though the quantity purchased has increased or decreased because of price changes. If the latter studies are valid, then a large decrease in consumption cannot be anticipated unless there is a radical change in the price structure of alcoholic beverages or in the taxes on them, or in disposable income.

One of the arguments against the pricing approach to beverage control is that it involves regressive taxation affecting low-income consumers disproportionately in comparison with higher-income consumers. A corollary argument is that the vast majority of drinkers who do not cause problems will have to pay higher prices for beverage alcohol because of a small percentage of problem drinkers. These two arguments question the equity of sumptuary taxation. An additional objection is raised concerning the elasticity of demand of those who can be classified as problem drinkers or alcoholic persons. Obviously the price-consumption-problems approach is aimed at the future reduction of problem drinkers, but the approach must assume that alcohol is the problem. While there are some statistics that tend to support this approach, the general neglect of research into the demand-price elasticity of beverage alcohol, especially in relationship to drinkers who consume far above the mean of absolute alcohol, makes any conclusions only speculation. For example, it can be anticipated that the demand-price elasticity for alcoholic persons will be low, but what will be the demand-price elasticity for other problem drinkers whose habits give signs of developing alcoholism? What level of tax increases on absolute alcohol relative to income levels will produce a desirable, measurable result? Which mean consumption level is the goal of the sumptuary taxation that is recommended? Since there are great disparities in income between rural areas and urban areas of the same State, and also within urban areas, would sumptuary taxation of absolute alcohol amount to prohibition for some economic strata of society?

Schmidt and de Lint (22) believe that "there is a substantial body of evidence that the logarithmic normal curve holds for drinking in populations which differ greatly from one another in attitudes toward drinking, beverage preferences, drinking habits and legislative controls. It appears, therefore, that for all practical purposes, the form of the distribution is unalterable." If their conclusion is correct, then the upper tail of the unimodal consumption curve, which encompasses the problem drinkers, represents drinkers who apparently are different only in the quantity of their alcohol consumption. Such a conclusion has implications for the development of primary prevention programs and for theories of causation of alcohol problems.

On the surface it would appear that primary prevention on the basis of the distribution-of-alcohol-consumption theory must include a method of controlling the availability of beverage alcohol to all consumers. In addition, it suggests that it is difficult or impossible to affect the problem drinkers without affecting the drinkers who comprise the vast majority of the median and the mode.

While the distribution-of-alcohol-consumption theory itself has some supporting data, knowledge of alcohol consumption patterns is still too meager to allow a conclusion based on a distribution curve. Prohibition is possibly a time-worn omen too often held up as the example of what increased taxation will produce, but it is not unimportant to examine when mass control of alcoholic beverages is considered. If it is impossible to obtain reliable data, at least a well-founded estimate as to what level of taxation relative to income will lead to the growth of illicit sources of alcohol should be formed. There appears to be a preference change among a part of the youth culture from hard drugs and even marihuana to alcohol in recent years. What level of taxation, if any, could have an effect on this phenomenon?

The prohibition and hard-drug questions are part of broader sociological, economic and anthropological questions. The most important question has already been mentioned, and that is the role of drinking in American society. The societal reaction to prohibition in the United States suggests that there is a need to examine and explore more thoroughly than has been done to date the possible reactions to attempts to control alcohol consumption by means of taxation. It cannot be overemphasized that knowledge about drinking is not yet at a level that allows broad-ranging policy decisions on controls over alcoholic beverages which would have sociological, psychological, economic, and political overtones.

Despite the foregoing comments, the researches detailing a theory that relates mean consumption to problem consumption constitute an important advance in current knowledge touching on beverage control as a method of primary prevention. But there has not been any research using United States data to allow a conclusion that consumption in this country is accurately described by the lognormal curve.

If the hypothesis were tested and proved, that the price-consumption-problems theory adequately describes United States consumption patterns, and has predictive reliability for levels of alcoholism and alcohol-related mortality and morbidity, and if it can be assumed that the implementation of the pricing or taxing policy suggested by the proponents of the theory will not lead to severe or social or law-enforcement problems such as the growth of an illicit beverage industry similar to what existed in this country during Prohibition, then legislation assigning discretionary taxing policies to ABC agencies might provide a major primary prevention tool. To embark on such an approach without first thoroughly exploring the validity of the theory, and the possible by-products of such a taxing policy, would be premature and even foolhardy. But the exploration of the theory for its predictive capabilities and as a primary prevention tool deserves serious consideration. On the surface at least it appears that enforcement of regulatory provisions and an industry-centered concept of stability have become ends for many if not most ABC agencies and this tendency is strengthened by the failure of most State legislatures to re-examine the mandates they have given ABC authorities.

A Coordinated Approach to Regulation

Merely providing a stable industry is not a sufficient goal if alcohol problems have continued to exist, and in many instances have grown, even though stability in one fashion or another has been achieved. An innovative approach to alcohol control would suggest a number of alternative activities and policies calculated to influence at least some of the alcohol problems, especially drunkenness. Within the parameters of their own operations, many ABC agencies have the means to detect licensees who serve apparently intoxicated customers. A concerted effort in this area could conceivably have an impact on the frequency with which licensees violated this prohibition. In addition, sanctions are seldom levied against bartenders who serve inebriated customers; the sanctions are against the licensee. The bartender is free to move from one licensed establishment to another without fear of being prohibited from working in a licensed establishment. A logical extension of the license privilege theory could be applied to the bartender as well. Yet the goal should not be the mere detection and punishment of violations, but an impact on a social problem.

What is needed, and possible, is an evaluation of the policies of ABC agencies in terms other than the incremental defense of existing policies. The myths about alcohol control are such that a coordinated, effective, social-problem oriented approach must include an in-depth specific analysis of the relationship between existing controls and alcohol problems. This requires, at least at the present time, the institution of the "root method," as opposed to the existing "branch method," of policy making. A first step might well include a broader range of cooperation with other governmental and nongovernmental agencies.

It is important that avenues for communication and coordination be opened between ABC agencies and other agencies of government that are in some way involved in dealing with problems related to the sale and consumption of beverage alcohol. In most States at present there is little or no cooperation on programs between the State ABC authority and other governmental organizations, especially in connection with drinking problems and alcoholism. The little cooperation that does exist is between the ABC agencies and other law-enforcement agencies on violations of control laws and regulations.

There is a need for ABC agencies regionally and nationally to begin to cooperate in formulating strategies that can be evaluated for their effectiveness on direct alcohol problems such as drunkenness, alcohol-related crimes of violence, and drinking-and-driving. Enforcement of restrictions against serving apparently intoxicated persons is an essential area where agreement and cooperation are necessary.

A multi-agency program against the drinking-driving problem, for example, would involve the ABC authority in a cooperative effort to determine where accidents occur (including pedestrian accidents), at what hours, and under what conditions. It would also be important to determine which people involved in an accident had been consuming beverage alcohol and where the drinking took place. A determination that a high percentage of those involved in drinking-driving accidents had done their drinking in on-premise establishments would provide a justification to supervise licensees more closely on sales to apparently intoxicated persons. Accident-location statistics would provide target areas for a coordinated program by the ABC agency, local authorities, and the State department of motor vehicles. If a rehabilitation program for offending drivers should appear to be necessary, then the Department of Health and other related departments and agencies could be involved.

It would be unrealistic to assume that ABC agencies could promote such a program without the support of other agencies. At the same time it would be necessary for governors and possibly the legislatures to sanction and support a cooperative effort that would lead the alcohol control authorities to intensify enforcement activities against offending licensees. Political or interest-group reaction to a concerted program by ABC agencies that encompassed a significant increase in license suspensions could not only have a

detrimental effect on the programs but would weaken the position of the agencies as regulatory bodies. To preclude such an eventuality, any new and broader activities that ABC authorities undertake with other agencies would require the active support of the State government.

Active involvement in alcohol-related problem solution does not necessarily require that the structures of ABC agencies be changed. The basic structures of the organizations are not faulty, but their isolation and tradition-bound approach to control have resulted in a lack of innovation. Nationwide, with few exceptions, there appears to be little involvement of alcohol control officials with outside agencies on alcohol problems. It should be made clear, though, that the ABC boards are not wholly responsible for their isolation from other alcohol-related programs. Generally, little interest has been shown by other agencies in including alcohol-control officials in planning, conferences, or programs aimed at problems of alcohol misuse. The rationale apparently is that the control officials and their organizations have nothing to contribute. The scope of the alcohol problems now being tackled by a multitude of governmental and nongovernmental agencies suggests that those agencies that control the distribution system and police the industry should be asked to participate fully in formulating programs to help solve and to help prevent the present problems. Without innovation most ABC boards will continue to survive, but they will remain isolated and in many ways their activities will be unrelated to the world outside the doors of the bar and package store.

The material presented in the preceding sections about public attitudes, education, and regulation and customs of alcohol use is intended to stimulate thinking about these issues. Helpful, innovative approaches to these problems may come from a wide variety of sources. The NIAAA feels that it is essential to promote rational debate about these ideas in order to formulate public policy that is open to scrutiny by the public it is meant to serve.

Standards of Responsible Drinking-Related Behavior

In order to set in motion a proposed public discussion about standards of responsible drinking-related behavior, a few plausible starting points are offered here for Americans to consider.

Some Suggested Guidelines for Responsible Use of Alcohol

- -- Make sure that the use of alcohol improves social relationships, rather than impairing or destroying them.
- -- Make sure the use of alcohol is an adjunct to an activity rather than being the primary focus of action.
- -- Make sure alcohol is used carefully in connection with other drugs.
- -- Make sure human dignity is served by the use of alcohol.

Warning Signs

There are clear indications of irresponsible drinking. Within that category there is a distinction between those who drink irresponsibly at times and those who have a drinking problem, but both kinds are social problems. The first are a danger to themselves and others when drinking; the latter are in serious trouble a good part of the time.

Any one or more of the following signs may indicate a drinking problem:

- -- Gulping drinks for the effect that rapid drinking produces.
- -- Starting the day with a drink.
- -- Drinking alone, from a desire to escape reality or boredom or loneliness.
- -- Alcohol-taking behavior criticized by an employer, spouse, or others, and absenteeism or impaired job performance because of drinking.

-- Rationalizing in regard to drinking behavior, characterized by such comments as "I just need one more to relax," or "How about one for the road?"
-- Marked personality and behavioral change after taking one or more drinks.
-- Frequent overdosing with alcohol, or drunkenness.
-- Experiencing "blackouts" -- alcohol-induced amnesia.
-- The psychological impact of hangovers to relieve discomfort and, thereby, perpetuate a vicious cycle: the more one drinks, the worse he feels, and the more one drinks.
-- Requiring medical or hospital attention or having frequent minor accidents or physical complaints, as a result of alcohol taking.

Encouraging Responsibility in Others

There are some actions one can take to encourage responsible drinking by others. For example:

-- Respect the person who chooses to take alcohol in moderation or who abstains; do not be insistent about "refreshing" or refilling, and keep down the amount of alcohol he drinks.
-- Provide food with alcohol at all times, especially proteins such as dairy products, fish, and meats.
-- Provide transportation or overnight accomodations for those unable to drive safely, recognizing that the host is just as responsible for preventing drunken driving as his guests.

Responsible drinking results from a combination of many factors, none of which is essential or sufficient by itself and all of which vary in importance from one individual to another.

But whatever the particular combination of influences--from self, family, associates or society--responsible drinking is the use of alcohol in ways which harm neither the individual nor society. Responsible drinking practices can prevent alcoholism in many people even if the reasons for drinking differ from person to person. For others, standards of common usage can serve to identify alcohol problems early.

The responsible use of alcohol is not the answer to all alcohol problems, nor is it meant to be so. However, if we were consistent in how we viewed behavior, we certainly could spot alcohol problems much earlier. Much of the causation of alcoholism remains unknown. There will always be persons who are unable, for various reasons, to sustain safe drinking practices regardless of how intense social and other pressures may be upon them. In such cases, abstinence is necessary in order for these individuals to protect their health and well being. Most alcoholic people are clearly included in this group, in addition to many whose alcoholism is as yet undetected. Nevertheless, the approach through responsible drinking practices is intended to aid the majority of people, both those who drink alcohol and those who choose not to drink, by reducing the incidence of problem drinking in the population as a whole.

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APPENDIX

PREVENTION OF ALCOHOLISM IN THE UNITED STATES UTILIZING CULTURAL AND EDUCATIONAL FORCES

Morris E. Chafetz

Only three-and-a-half years have passed since the Nation formally recognized alcoholism as a public health problem. Yet, since that last day in 1970 when President Nixon signed legislation mandating the creation of the National Institute on Alcohol Abuse and Alcoholism (NIAAA), a growing awareness has spread through the land of both the urgency and feasibility of mounting programs for the treatment and control of this disease. It is a medical truism, however, that almost no condition has ever been eradicated only by treating its casualties. Unfortunately, the field of alcoholism has long been mired in attempts to treat only the late-stage victims of the disease. Too little attention has been paid to identifying and treating persons exhibiting the first signs of developing alcoholism, and virtually no efforts have been designed to circumvent the onset of the disorder. Beyond this sorry state of affairs lies the effect of what I call the "contagion" factor in the production of alcohol misuse and alcoholism: the spread of irresponsible, unhealthy drinking behavior in the developing and learning young.

Studies do not indicate that our youth are in more massive danger of developing alcohol problems than their elders, nor that the clarion calls of the doom-seekers must be issued against the youth of today. My impression is that the vast majority of the present young generation will burgeon into responsible adulthood.

Yet, who can deny that we live in tense, anxious, frightening times! New conflicts arise before the old are resolved. Alcohol use, if not properly faced, may well lead to problems of increased magnitude. At NIAAA, our philosophy is that alcoholism, like many other illnesses, lends itself to many types of preventive measures. Techniques of secondary and tertiary prevention are discussed elsewhere. Therefore, in this paper I would like to explore my personal convictions about primary methods of preventing alcoholism--particularly those that will reduce the possibility of persons using alcohol to solve their life problems.

A recent report of a special Task Force of experts convened by NIAAA points out that the alcoholic condition is probably the product of many factors: genetic, biological, social, and psychological, each interacting in different ways in different individuals. It is my view that when an ill of man results from multiple causes, it is not sensible to seek a "magic bullet" approach. Rather, the approach to prevention of the illness should delineate its multiple causes and then attempt to minimize their destructive effects.

My major contention is that society has paid insufficient attention to an obvious fact: Certain cultures use alcoholic beverages and are little troubled with alcohol problems, while others suffer major alcoholic disturbances as a consequence of their drinking. Since all societies and cultures have problems, many groups have obviously developed ways of coping with the pains of life in a nonalcoholic manner and, presumably, in ways that have less destructive personal and social consequences.

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What I am suggesting is that the lessening of the American use of alcohol in problem-solving, whether the problem be social, emotional, or physical, will not remove the underlying causes but, hopefully, will shift the means of expression and solution to a less socially destructive area.

The universal popularity of alcohol lies in its ability to produce feelings of pleasure, and relief from fears and tensions, for most people in most cultures through most of the centuries. However, like many other Western cultures, our society is conflicted about the gratifying properties of this ubiquitous beverage; thus, we are confused as to what definition of responsible drinking versus unhealthy drinking we should hold true for ourselves and for others, and what we should transmit to our children. For too long, people in our society have been confused and guilty, wondering whether their use of alcohol was healthy or unhealthy.

We must keep in mind that the definition of an unhealthy state is socially determined, and that the proposition that disease exists will vary from culture to culture and from era to era. However, now that this Nation has recognized by Congressional action, as well as by a growing number of State laws, that alcoholism is a disease, experts in alcohol have an unparalleled opportunity to provide realistic guidelines for such determinations. Within a consensual frame of reference, the individual whose use of alcohol is beyond the societally defined limits, in a complex industrialized society such as ours, can recognize the signs of his disturbance, or have his illness recognized by those in his immediate environment.

Prime among the concerns of our society is that of alcohol excess. Indeed, the concern of society with most kinds of excess is an ancient one. Rules and regulations have been heaped one upon the other in an effort to protect man from himself--from his desires, his impulses, his excesses. In prohibition eras, any use of alcohol is excess; excess in Russia is different from excess in the United States. To a teetotaler, one drop of whisky is an excess; to someone in the field of advertising, where alcohol is part and parcel of the business ritual, a single martini is just a tease.

What are some of the symptoms of alcohol excess and, consequently, of an alcohol problem in the United States?

-- Anyone who by his own personal definition or by the definition of his immediate society (his family) has been intoxicated four times in a year has an alcohol problem.
-- Anyone who goes to work intoxicated has an alcohol problem.
-- Anyone who must drink in order to get to and perform his work has an alcohol problem.
-- Anyone who is intoxicated and drives a car has an alcohol problem.
-- Anyone who sustains bodily injury requiring medical attention as a consequence of an intoxicated state has an alcohol problem.
-- Anyone who comes into conflict with the law as a consequence of an intoxicated state has an alcohol problem.
-- Anyone who, under the influence of alcohol, does something he contends he would never do without alcohol has an alcohol problem.
-- For people with alcohol problems, treatment is obviously necessary and remains the highest priority.

Bearing in mind some of these points, what measures can we take to reduce the incidence of alcohol problems in our society? We have tried Prohibition, and it failed. We have tried campaigns of slogans, and they failed. We have tried educational programs based on fear, and they have failed. Therefore, I suggest we learn from other experiences and cultures.

We know, for example, that among cultures which use alcoholic beverages but are little troubled by alcohol problems the general tendency is for alcohol to be sipped slowly, consumed with food, and partaken of in the company of others in relaxed, comfortable surroundings. Drinking is taken for granted, and given no special significance, and no positive value is imputed to prowess in amounts consumed. Moreover, intoxication is abhorred.

Many Americans, however, drink liquor as they live life--rapidly and under tense circumstances. At those two indigenous American institutions--the cocktail party and the commuter bar--drinking is usually done standing, the alcoholic beverage is gulped rapidly with the barest minimum of food, and the general aim is to reach the desired end point of "being high." Even more significant is the fact that this pattern is condoned; in the United States, it is frequently all right to drink just for the purpose of getting drunk.

In this age of psychiatric sophistication, Americans conveniently forget that a state of drunkenness is a state of illness. Paradoxically, a dose of alcohol can be used as a form of self-medication.

From time to time, for example, we are called to perform an activity we wish to but cannot. Our conscious desire to perform is overwhelmed and incapacitated by unconscious restrictions. For many of these blocked responses liquor is an easy releaser; the hounding inhibitions melt quickly before its chemical presence. The actor may bring himself to the otherwise terrifying center stage; the lecturer can speak; the author can write; and the sexually frigid can respond. This group of liquor drinkers is growing because it seems that the demands of increasingly complex situations require alcohol to ease the way. Unfortunately, alcohol's alliance is fickle, and increased amounts may lead to states of intoxication and responses not appropriate for the circumstances. In an increasingly complex society, the danger of alcohol fulfilling a tranquilizing role must be guarded against.

Another common experience is to find people who use liquor to lift depression, to dull the inner pain, and dispel the sense of ugliness within them. Some find that liquor provides what they seek, and become fearful of giving up the bottle for fear that the pain will return. On the other hand, some patients find that alcohol actually deepens their depression. They respond to the deepened depression by imbibing more and more of the liquor, hoping to achieve the relief they seek.

Another kind of liquor user is the person who employs alcohol to blur his perceptions. When such an individual becomes aware that some socially forbidden impulses are coming too close to the surface, he may use alcohol heavily. In this circumstance, the alcohol may obliterate the discomforting feelings, or it may dissolve inhibitions to the point where he permits himself to act on his instincts.

One common type of liquor drinker is the individual who uses alcohol to sustain a psychological system of defenses. Here, the "blackout" phenomenon is usual. In other words, repressed unconscious desires become a reality when he is intoxicated, but he has no recollection when sober of what has transpired. People with a sober characterological attitude of complete kindness, nonexistent hostility, and abject passivity will, with liquor, become brutal, hostile, and aggressive. Once the effects of the liquor are gone, however, they undergo what appears to be a form of selective amnesia, as they express incredulousness at descriptions of their behavior while intoxicated.

Liquor for a certain segment of the population has one goal worth drinking for: oblivion. The inhabitants of this unhappy drinking state down their drinks in a state of bliss. To them, reality is terror, and a dream state of narcosis is the only way to continue.

Another liquor drinker is the individual who is more tolerable to his social unit when he is intoxicated than when he is sober. This syndrome is seen most often in configurations where nonalcoholic, extremely dominating mates or parents exist. One the one hand, the nonalcoholic mates or parents appear to suffer greatly as a consequence of the alcoholic state of the other. If treatment or extraneous events result in sobriety, however, the healthy members become proportionately more disturbed as the alcoholic member becomes less dependent on alcohol. What becomes clear is that the pathological drinking behavior of the alcoholic person was a cover-up for the disturbances in another.

Less obvious is that subgroup of individuals who, although heavily under the influence of liquor, do not seem so to the casual observer. This type of individual can carry on highly complicated business and social activities and seems to be none the worse for his drinking. Only when a fall in his blood alcohol level occurs, does he suddenly return to his original state of awareness. This person, when he regains his nondrinking self, has no inkling of people, places, or events that have transpired for hours, days, or weeks. Then, not only is he stunned by sudden situations, but innocent sharers of that "other" personality are confronted with a new individual in an old body.

The clinical syndrome of liquor drinkers I shall consider last is the one I feel contributes much to unhealthy alcohol use and may give us some clues to preventive measures: the cocktail party. At least in America (and I suspect it is spreading to other nations as well), the cocktail party epitomizes the essence of unhealthy drinking practice, unfavorable responses to liquor, and unrelating social behavior. The cocktail party is supreme in emphasizing man's emotional isolation from man; his isolation from what he does, thinks, and feels. People are brought together--many of them unknown to one another--to drink, to talk, to be gay. The drinking is done under circumstances that engender little of the pleasurable responses of relaxation and socialization that alcohol can provide.

The talk of the cocktail party emphasizes this. People do not listen; they do not care. All of us are familiar with the habitue of the cocktail party who, while pouring liquor into himself, pours into our ears the intimate details of his life he would never utter to a close friend. The reason for this is fairly obvious--we do not matter; we probably do not care. It is simpler to share intimate details of one's life with an individual with whom we are not emotionally involved than with those with whom we wish to continue our involvement. Words spoken at cocktail parties are often spoken to oneself rather than to another because excessive drinking creates a pharmacological barrier to emotional and social communication. Some people even think their heavy alcohol use encourages communication. But drinking that points in the direction of isolation, even in the midst of a crowd of persons, produces a liquor syndrome for perpetuating and intensifying alcohol problems.

If we are to make any headway in reducing these unhealthy ways in which alcohol is used psychologically and socially, we must come up with bold ideas that face the problem directly.

We know that the variety of influences that can mediate the imbibing of a definite amount of alcohol is innumerable. The psychological, physical, and social factors that determine our response to a given quantity of alcohol are not consistent from individual to individual, nor within the same person at separate times. Since responses to alcohol are unpredictable, it is easy to see why drinkers who use alcohol to achieve a delicate balance between feeling good and feeling sick often cross the border and suffer complications, and why the hairline or end-point difference between responsible drinking and unhealthy drinking is a tough target to hit.

The time has come for a redirection and reemphasis toward prevention of alcohol abuse and alcoholism and the development of healthy drinking patterns that is based on certain assumptions:

- -- Alcohol as a social instrument is available and is used by many large populations, and efforts to remove it have failed.
- -- In many cultures that experience minimal alcohol problems, alcohol is used early and often.
- -- Studies of drinking cultures without significant alcohol problems, combined with an understanding of the pharmacological action of alcohol, indicate that there are ways of drinking that do not result in alcohol problems.

-- Alcohol need not be used as a means of self-medication in physical, emotional, and social disturbances.
-- The social acceptance of intoxication implicitly or explicitly as a part of drinking behavior usually contributes to a high incidence of alcoholism.

On the basis of these assumptions, I believe that a practiced drinker with healthy attitudes toward alcohol will have a lower incidence of undesirable effects from alcohol than the unpracticed drinker with guilt and conflict about drinking.

Under ideal circumstances, children should learn healthy attitudes about drink in the familiar surroundings of their homes. And, indeed, when social units were small and information input was limited, social responsibilities such as these were centered in the family. Today, the dissolution of close, tightly knit social units, and the flood of information and stimulation provided by extensive, rapid communication no longer permit the family to provide social responsibility in all areas. In addition, many parents are too confused and guilty about their own drinking practices to transmit anything to their children beyond their own ambivalence.

I believe, therefore, that our educational institutions should provide theoretical information about alcohol and its use. This didactic material should be provided in the hygiene curricula of schools, with emphasis on the benefits, as well as the deficits, of alcohol. It should show how different the response will be when drink is consumed with food and while sitting in a relaxed atmosphere, in contrast to drinking without food and in tense circumstances; how the use of alcohol imparts meaningful experience when partaken of with another, while a drink alone is as uncommunicative as talking to oneself; and how intoxication is sickness and not strength.

Perhaps we ought to face some facts. The use of alcohol in our society is here to stay. Some cultures use it and have little of the aggravation and much of the benefit. Positive educational experiences can be beneficial in reducing but not eliminating problems.

By providing educational information within a didactic setting, and by integrating drinking experience with family use, immunization against unhealthy, irresponsible drinking behavior can be provided as a bulwark against alcoholism.

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