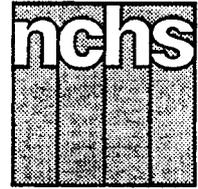


Advance Data



From Vital and Health Statistics of the National Center for Health Statistics

Exposure to Alcoholism in the Family: United States, 1988

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Highlights

About 43 percent of U.S. adults—76 million people—have been exposed to alcoholism in the family: they grew up with or married an alcoholic or a problem drinker or had a blood relative who was ever an alcoholic or problem drinker. Exposure was higher among women (46.2 percent) than among men (38.9 percent) and declined with age. Exposure to alcoholism in the family was strongly related to marital status, independent of age: 55.5 percent of separated or divorced adults had been exposed to alcoholism in some family member, compared with 43.5 percent of married, 38.5 percent of never married, and 35.5 percent of widowed persons. Nearly 38 percent of separated or divorced women had been married to an alcoholic, but only about 12 percent of currently married women were married to an alcoholic. These findings are highlights of an analysis of the 1988 National Health Interview Survey on Alcohol that is presented in this report.

The costs of alcoholism

The National Health Interview Survey on Alcohol was undertaken by the National Center for Health Statistics and the National Institute on Alcohol Abuse and Alcoholism to provide new information about one of this country's most serious public health problems. The medical, social, and economic costs of alcoholism in this country are enormous. In the late 1980's an estimated 10.5 million people in the United States exhibited some symptoms of alcoholism or alcohol dependence, and another 7.2 million abused alcohol but did not exhibit symptoms of dependence (1). Health consequences of alcoholism such as liver disease (2–4), cancer (5, 6), pancreatitis (7, 8), neurological disorders (9–11), and fetal alcohol syndrome (12, 13) have been well documented. About half of all traffic fatalities can be traced to drunk driving and studies have indicated that 54 to 74 percent of persons convicted of drunk driving

are alcoholics or problem drinkers (1).

The economic costs of alcoholism in the United States were estimated to be about \$128 billion in 1986, more than half of this accounted for by lost employment and reduced productivity (1). Assuming that drinking patterns remain constant, this figure is projected to rise to \$150 billion by 1995 (14). Finally, alcoholics use a disproportionate share of our health resources. Health care costs for untreated alcoholics have been found to be at least 100 percent higher than those for nonalcoholics (15). Further, it has been estimated that 20–40 percent of all U.S. hospital beds are occupied by persons whose health conditions are complications of alcohol abuse and alcoholism (1).

Alcoholism poses many risks, not only to the alcoholic but also to other family members. First, there is considerable evidence that both genetic and environmental exposure to alcoholism predispose individuals to become alcoholic themselves (16). Adoption studies (17, 18), twin



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studies (19, 20), and medical research with laboratory animals (21, 22) suggest that genetics plays a key role in the development of alcoholism. Longitudinal studies suggest that children who live with an alcoholic parent are at greater risk of becoming alcoholic than are children who do not live with an alcoholic parent (23, 24).

Because studies of environmental exposure in childhood are complicated by the serious methodological problem of assessing human behavior independent of genetic influences (25, 26), studies to date have been inconclusive about the specific environmental influences that may predispose an individual to alcoholism (1). Although researchers vary in the relative importance they give to the two factors, most agree that a combination of environmental and genetic exposure to alcoholism plays a role in development of the disease (24, 27, 28). Thus, persons who live with or are biologically related to an alcoholic are themselves at greater risk of becoming alcoholics than are persons in the general population.

Not only are family members of alcoholics more vulnerable to developing alcoholism themselves, they also are often subjected to many adverse social, psychological, physical, and economic conditions associated with alcoholism (29–31): economic hardship when the alcoholic cannot work or spends a disproportionate share of the family resources on alcohol; social isolation that often results from trying to hide the disease from family, friends, and colleagues; and medical consequences of alcohol-related physical and psychological abuse. All of these contribute to making alcoholism an even more pervasive health problem for this country than may be apparent from the statistics on alcoholics alone.

Because of the important consequences of exposure to alcoholism in the family, this report was prepared to provide an overview of the extent to which U.S. adults have been exposed to alcoholism or problem drinking in the family environment. Data are presented on

the percentage of the adult population who lived with an alcoholic or a problem drinker during their first 18 years of life, the percentage who married (or lived with as if married) an alcoholic or a problem drinker, and the percent who had at least one blood relative who was ever an alcoholic or a problem drinker. Estimates of the percentages of adults with one or more of these three types of exposure are also presented. Variations in exposure by sex, age, education, income, race, Hispanic origin, and marital status are shown and discussed.

Rates of alcohol use and associated problems differ substantially between men and women and among various age groups: men and younger persons have higher rates of alcoholism and alcohol abuse than do women and older persons (32–34). Because of this, exposure to alcoholism in the family may be quite different for men than for women and for persons at various ages. For example, because rates of alcoholism are higher for men, one would expect women to have higher rates of marriage to an alcoholic. Further, older persons who grew up during Prohibition may have lower rates of having been raised with an alcoholic than persons who grew up in an era when alcohol was more easily available. Because of these and other related factors, this report shows statistics on exposure to alcoholism for age and sex subgroups as well as for the total population.

Data and methods

This report is based on data from the 1988 National Health Interview Survey on Alcohol (NHIS–Alcohol), part of the ongoing National Health Interview Survey conducted by the National Center for Health Statistics (35). The NHIS–Alcohol was cosponsored by the National Institute on Alcoholism and Alcohol Abuse. Interviews for the NHIS are conducted in person by staff of the U.S. Bureau of the Census. For the basic NHIS, the sampling frame is the household. Information is collected on each member of the family (or

families) residing in the household, by proxy if the person is not at home at the time of the interview. For the NHIS–Alcohol, one adult per family was selected as the sample person for the sections related to alcohol use and problems. Self-response was required for the alcohol-related questions, with callbacks made as needed. A total of 43,809 adults ages 18 years and over were interviewed for the NHIS–Alcohol, representing a response rate of 90 percent of respondents identified as eligible during the basic household interview and about 85.5 percent of the total NHIS sample.

The survey contained many questions concerning alcohol consumption; the personal, medical, and social problems associated with alcohol use; and exposure to alcoholism and problem drinking in the family. All questions referred to “problem drinker or alcoholic,” but for brevity in this report, the term “alcoholic” refers to both. This report describes the prevalence of both environmental exposure to alcoholism through having lived with an alcoholic when growing up or in marriage and genetic exposure in terms of having had an alcoholic blood relative.

The terms “problem drinker” and “alcoholic” were not defined for the respondent; thus, the meaning of these terms in this report is respondent defined. Although levels and patterns of alcohol consumption among those identified as alcoholics may differ and may or may not meet the clinical definition of alcoholism (36), as long as the drinking was considered alcoholic by the respondent, it is assumed in this report to have had a potentially significant effect on the respondent and the family unit.

Questions on exposure to alcoholism

Respondents to the NHIS–Alcohol were asked the following questions:

1. “When you were growing up, that is, during your first 18 years, did you live with anyone who was a problem drinker or alcoholic?”

2. "Have you ever been married to, or lived with someone as if you were married, who was a problem drinker or alcoholic?"
3. "Have any of your (other) blood relatives ever been a problem drinker or alcoholic?"

If there was an affirmative response to the first question, respondents were asked their relationship to the alcoholic they grew up with. If the alcoholic was a parent, they were asked whether this was a biological, adoptive, step, or foster parent. If the alcoholic was a brother or sister, they were asked whether this was a full, half, adoptive, step, or foster sibling. All other blood and nonblood relationships were specified, including cousins, aunts, uncles, and grandparents.

People who reported having grown up with an alcoholic also were asked how long they had lived with the (each) alcoholic. They might have lived with one for as little as a day or as long as their entire childhood, but most people who had lived with an alcoholic did so long enough for there to have been some impact on their life: more than 80 percent had lived with an alcoholic at least 5 years, and about one-half of those (more than 40 percent) had lived with an alcoholic their entire first 18 years. Having grown up with an alcoholic (data shown in table 1) can indicate either environmental and genetic exposure to alcoholism or environmental exposure alone.

The second question elicited information on exposure to alcoholism in any marriage-like relationship, whether legal marriage or not. These data, shown in table 2, indicate environmental exposure only.

The third question concerned blood relatives other than any the respondent grew up with. As with the first question, detailed information was obtained concerning the nature of the relationships. The data in table 3 combine information on blood relatives obtained in questions 1 and 3.

This report is limited to discussion of the prevalence of exposure to alcoholism in the family and does not show details on length

of exposure or relationship of the alcoholic to the respondent. For those interested in analysis of this detailed information, a public use data tape is available from the National Center for Health Statistics, Division of Health Interview Statistics, 6525 Belcrest Road, Room 850, Hyattsville, Maryland 20782.

Findings

Growing up with an alcoholic

Table 1 shows the percent of U.S. adults who reported that they had lived with an alcoholic at some time during the first 18 years of their life. Overall, 18.1 percent of adults said that they had lived with an alcoholic at some time during their childhood. Estimates were substantially higher for younger persons: 21.4 percent of persons ages 18–44 years and 16.5 percent of those ages 45–64 years reported such living arrangements, compared with 8.5 percent of adults ages 65 years and over. Although these age differentials were found for both sexes, they were significantly greater for women: women under age 45 years were about 3 times more likely to have lived with an alcoholic while growing up than were women ages 65 years and over; younger men were nearly twice as likely as older men to have grown up with an alcoholic.

Reports of having grown up with an alcoholic were most common among persons with 12 years of education (19.5 percent) and least common among college-educated individuals (16.5 percent).

Educational differences in family exposure to alcoholism were found among people under 45 years of age and were greater for women than for men. About 31 percent of younger women who had not completed high school had grown up with an alcoholic, compared with about 20 percent of younger women who had attended college. About 23 percent of younger men who had not graduated from high school had lived with an alcoholic while growing up, compared with about 16 percent of younger men who had attended college.

Overall, no significant income differences were observed. However, for people under 45 years of age, income variations paralleled those found for education: in this age group, 26 percent of those with less than \$10,000 annual income had grown up with an alcoholic, compared with 18.5 percent of those earning \$40,000 or more. The income differences were greater for women (29.9 percent of the lowest income group, compared with 21.1 percent of the highest income group) than for men (20.6 percent of the lowest income group, compared with 16 percent of the highest income group).

Some racial and ethnic differences in exposure to an alcoholic in the childhood home were noted. White persons were more likely than black persons to have grown up with an alcoholic (18.5 percent and 15.6 percent, respectively). This was true for both men and women in every age group (although the racial differences for men ages 65 years and over were not statistically significant).

The prevalence of having grown up with an alcoholic was about the same for Hispanic as for non-Hispanic persons (17.4 and 18.1 percent, respectively). Ethnic differences were statistically significant only for men 45 years of age and over and for women under 45 years of age: reports of having grown up with an alcoholic were more common among non-Hispanic than among Hispanic adults.

Separated or divorced respondents were somewhat more likely than married adults to have grown up with an alcoholic (22.0 percent versus 19.0 percent, respectively). Widowed persons were less likely than persons in any of the other marital status groups to have grown up with an alcoholic (9.5 percent). The largest marital status differences were found among women 18–44 years of age, with 29.2 percent of separated or divorced women having grown up with an alcoholic, compared with 24.9 percent of married women and 19.3 percent of women who had never been

married. The statistic for young widows (27.4 percent) was unreliable because of the small number of persons in this category. Within age groups, separated or divorced men did not differ significantly from married men in terms of prevalence of having grown up with an alcoholic.

Ever married to an alcoholic

At some time in their lives, 9.2 percent of adults have been married to, or lived with as if married to, an alcoholic or a problem drinker (table 2). This is about half the rate reported in table 1 for having grown up with an alcoholic (18.1 percent). Although the prevalence was slightly higher (11.1 percent) among persons 45–64 years of age, age variations in marrying an alcoholic were small.

Rates of exposure to alcoholism in a marriage were very different for men and women. The total prevalence for men was 3.6 percent, with no significant variation by age. A total of 14.3 percent of women had been married to an alcoholic at some time, with the prevalence highest (17.5 percent) among those 45–64 years of age.

Sociodemographic variations in the rate of having been married to an alcoholic were most notable for women. Across all age groups, less educated and low-income women were more likely than women in the higher education and income groups to have lived in an alcoholic marriage. Race differentials were also noted but varied by age. Of women under 45 years of age, white women were more likely than black women to have been married to an alcoholic (14.4 percent versus 9.2 percent, respectively). In the oldest age groups, however, the relationship was reversed: 17.9 percent of black women had been married to an alcoholic, compared with 11.2 percent of white women. Overall, Hispanic and non-Hispanic women did not differ significantly in their exposure to alcoholism in marriage, although non-Hispanic women under 45 years of age were slightly more likely than Hispanic women to report marriage to an alcoholic (13.8 percent versus

11.7 percent, respectively).

The relationship between marital status and marriage to an alcoholic was one of the most dramatic of all the sociodemographic variations studied. More than one-third (37.6 percent) of currently separated or divorced women but only 12.1 percent of currently married women had been married to an alcoholic at some time. The higher prevalence among separated or divorced women was found in each age group, peaking at 39.0 percent for women 45–64 years of age. Rates for widowed women were also higher than rates for married women: of women under 65 years of age, widows were about twice as likely as currently married women to have been married to an alcoholic. About 5 percent of women who had never been legally married reported having lived with an alcoholic in a marital-type relationship.

In this report, data are shown for three broad age groups for reasons of readability and statistical reliability. However, to assess whether the association between marital status and having been married to an alcoholic could be attributed to the age composition within these three broad groups, analyses were carried out for 10-year age groups; the results remained the same, still showing large differences by marital status in having been married to an alcoholic (data not shown). The most probable explanation of the statistical association between having been married to an alcoholic and being a separated, divorced, or widowed woman is that alcoholism in husbands causes marriages to end in divorce, separation, or widowhood.

For men, sociodemographic variations were, for the most part, unremarkable because of the fact that few men reported ever having been married to an alcoholic. However, as with women, separated or divorced men were more likely than married men to ever have been married to an alcoholic: 10.8 percent, compared with 3.0 percent of married men, with the highest prevalence (13.7 percent) found among

separated or divorced men ages 45–64 years.

Having an alcoholic blood relative

Table 3 shows the percent of adults who had had at least one blood relative who was an alcoholic. For this report, no attempt was made to distinguish between close relatives (parents, siblings, and children) and more distant relatives, although this information is available in the 1988 NHIS–Alcohol. Therefore, these statistics represent a measure of genetic exposure to alcoholism but may or may not include environmental exposure (that is, living in close contact with the alcoholic relative).

In 1988, 37.9 percent of U.S. adults had had at least one blood relative who was ever an alcoholic or a problem drinker. Rates were higher for persons under 45 years of age (41.9 percent) than for those ages 45–64 (36.5 percent) and those 65 years of age and over (26.0 percent). Women were somewhat more likely than men to have had an alcoholic blood relative (39.2 percent versus 36.5 percent, respectively). These sex differences were similar to those observed for having grown up with an alcoholic but were much smaller than the sex differences found for having been married to an alcoholic.

Overall, 35.2 percent of adults with less than 12 years of education had had an alcoholic blood relative, compared with 38.9 percent of those with 12 years of education and 38.5 percent of persons who had attended college. Although some educational differentials were noted among women, they were neither large nor consistent. No statistically significant educational differences were observed for men.

In most cases, exposure to alcoholism in a blood relative did not vary by income: 38.7 percent of all persons with an income of less than \$25,000 reported such exposure, compared with 39.5 percent of persons with incomes of \$25,000 or more.

White persons were more likely (38.6 percent) than were black persons (35.8 percent) and persons of other races (25.8 percent) to have had an alcoholic blood relative, although this was not found in all age groups for either men or women.

The largest and most consistent finding concerning sociodemographic differentials in exposure to alcoholism in a blood relative was in the contrast between Hispanics and non-Hispanics: 32.2 percent of Hispanic adults had had an alcoholic blood relative, compared with 38.4 percent of non-Hispanic persons. In every age and sex group, Hispanic persons were less likely than non-Hispanic persons to report having had an alcoholic blood relative, although the results for women 65 years of age and over were not statistically significant.

Separated or divorced adults were more likely than others to have had an alcoholic blood relative (42.3 percent), followed by married persons (39.1 percent), never-married persons (36.2 percent), and widows (26.5 percent). Although findings were not entirely consistent within age groups, some interesting associations may be noted. For instance, in the youngest age group, men and women who were separated or divorced were significantly more likely than never-married persons to report having had an alcoholic blood relative: 44.1 percent of separated or divorced men, compared with 34.4 percent of never-married men, and 48.3 percent of separated or divorced women, compared with 40.1 percent of never-married women.

Combined exposure

Table 4 shows the percent of adults who reported one or more of the several types of exposure to alcoholism in the family—while growing up, in marriage, or in a blood relative. This combined exposure represents the total known prevalence of exposure to alcoholism in the family. A total of 42.8 percent of adults reported some familial exposure to alcoholism. Prevalence

was higher among women (46.2 percent) than among men (38.9 percent) and among younger people than older people: 46.1 percent of persons under 45 years of age reported some exposure, compared with 31.4 percent of those 65 years of age and over.

Educational differentials for the total population were small: 41.2 percent of adults with less than 12 years of education had at least some type of exposure to alcoholism in the family, compared with 43.8 percent of adults with 12 years of education and 42.7 percent of those with more than 12 years of schooling.

As for education, income differences for the total population were small. About 46 percent of adults with incomes of less than \$10,000 had some type of exposure to an alcoholic in the family, compared with about 43 percent of adults earning \$40,000 or more. Analyses for men and women separately revealed consistent, statistically significant income differences only for persons under 45 years of age. In this age group, 44.4 percent of men with incomes of less than \$10,000 reported some exposure to alcoholism in the family, compared with 40.1 percent of men with incomes of \$40,000 or more. Low-income women under 45 years of age had among the highest rates of exposure—55.8 percent, compared with 48.3 percent for women with incomes of \$40,000 or more.

Overall, white and non-Hispanic persons were more likely than black and Hispanic persons to report exposure to alcoholism in the family, with some age variations. For races other than white and black, rates of exposure to alcoholism in the family appear to be substantially below those for black and for white persons, especially under age 45 years; these statistics should be interpreted with caution due to their large sampling errors.

Table 4 shows marked marital status differences in familial exposure to alcoholism: 55.5 percent of separated or divorced adults had been exposed to alcoholism in a family member, compared with

43.0 percent of married, 38.5 percent of never-married, and 35.5 percent of widowed persons. Although the patterns were the same for men and women (that is, separated or divorced persons had the highest rates and widowed persons had the lowest), the rates themselves were much higher for women. Overall, 61.3 percent of separated or divorced women had been exposed to alcoholism in a family member, compared with 45.8 percent of separated or divorced men.

Discussion

Tables 1–4 provide an overview of a significant public health problem in this country: environmental and genetic exposure to the disease of alcoholism in the family. This report deals only with perceived exposure to an alcoholic family member and not the actual prevalence of alcoholism. The definition of an alcoholic or a problem drinker was left entirely to the respondent and was undoubtedly influenced by the respondent's social and cultural life experiences and personal drinking patterns. Not all of the persons identified as alcoholics or problem drinkers by respondents will fit the clinical definition of an alcoholic. However, with the disease of alcoholism, perception that there is a problem is sufficient to set in motion a chain of events that may lead to a number of adverse outcomes for the family and social unit—regardless of the absolute level of alcohol consumption. In the words of sociologist W.I. Thomas, "If men define situations as real they are real in their consequences" (37).

Statistics on total exposure shown in this report may actually underestimate true exposure, for two reasons. First, they do not include exposure to nonblood relatives or friends, unless the respondent grew up with them. Although the impact of such relationships may be less than that of the family relationships described, they still can influence environmental exposure. Second, there is a tendency among families of alcoholics to deny that there is a problem until it becomes completely

unmanageable (31). Thus, some respondents who were exposed to less severe alcohol problems in a family member may have failed to report this exposure because they had not yet recognized alcohol as the source of family difficulties.

Significant age variations were found in exposure to alcoholism in the family—especially while growing up and, to a lesser extent, among blood relatives. Several explanations for these age differentials are possible. First, there may have been actual increases in the prevalence of alcoholic-type drinking among the younger generations, resulting in greater exposure. A recent study showed an increase in alcohol dependence over a 17-year period (38) and increases in heavy drinking among men and women under 35 years of age (39). Second, this increase could be due to changes over the past several decades in the stage at which alcoholic or problem drinking is identified. It used to be that alcoholism was not labeled as such until it reached an advanced stage, when the alcoholic got “falling-down” drunk, drank in the morning, couldn’t go to work, and ended up on “skid row.” Today, alcoholism is often recognized in its earlier stages, when the alcoholic cannot control his or her drinking but has not yet exhibited the more classic symptoms of the disease (40). Thus, changes in the stage at which alcoholism is recognized could account for some of the increased reported prevalence among the younger generations. A third explanation could be selective recall of events. Persons 65 years of age and over may not remember their childhood as clearly as younger persons, and memories of alcoholic drinking may not come readily to mind, especially if it was not labeled as such at the time.

Women reported higher rates of exposure to an alcoholic relative than did men, a finding consistent with those of other studies (41). One possible explanation for the sex difference is that women may more readily than men label drinking as alcoholic (41). Although this hypothesis cannot be tested directly

with the NHIS–Alcohol, it is possible to examine differences between men and women in the way they define light, moderate, and heavy drinking, which would shed some light on this issue.

Socioeconomic differentials in exposure to alcoholism were most consistent among persons under 45 years of age. In this age group, less educated and lower income adults were more likely than better educated and higher income persons to report having had an alcoholic family member when growing up, through marriage, or through blood. In the older age groups, socioeconomic differences were not as clear or consistent.

Racial differences also were most consistent among persons under 45 years of age. In this age group, white persons were consistently more likely than black persons to report exposure to an alcoholic relative. Among older persons (45 years of age and over), significant racial differences were found for some of the types of exposure, but not all; and frequently it was the black adults who had the higher rates.

Although it is clear that sociodemographic differentials are not the same across age groups, reasons for this finding remain obscure. In light of the complexity and progressive nature of the disease of alcoholism and the significance of the sociodemographic environment for the development, identification, and treatment of alcoholism, it may be that alcoholism or problem drinking is more likely to develop among different groups of people at different times in their lives or more likely to be identified as a problem at different life stages. Further study of these issues is needed.

Overall, Hispanic persons were less likely than non-Hispanic persons to report exposure to an alcoholic family member (table 4). These findings appear to contradict those of studies that have shown alcoholism to be a major problem in the Hispanic community (42, 43). The lower prevalence of reported exposure to alcoholism among Hispanics may reflect cultural differences in either

the perception or the labeling of alcoholism: because heavy drinking, particularly among Hispanic males, may be considered acceptable (43), it may be less likely to be perceived or labeled as “alcoholic or problem drinking.”

Marital status variations in exposure to alcoholism shown in this report suggest that alcoholism may play an important role in marital dissolution and premature widowhood in the United States. Certainly, exposure is very high across all marital status groups, but it is highest among separated or divorced persons: nearly 56 percent of separated or divorced persons had been exposed to alcoholism in the family at some point in their lives, compared with 43 percent of married persons. Nearly two-thirds of separated or divorced women and nearly half of separated or divorced men under 45 years of age had been exposed to alcoholism in the family at some time.

Of the three types of exposure studied, marital status differentials are most striking for marriage to an alcoholic. Separated or divorced men and women were three times as likely as married men and women to say they had been married to an alcoholic or a problem drinker. Separated or divorced persons also had higher rates of exposure to alcoholism while growing up or in a blood relative, but the magnitude of the differences was not as great as for marriage to an alcoholic. The statistics in table 2 on marriage to an alcoholic also show that widows under 65 years of age were about twice as likely as married women to have been married to an alcoholic (26 percent versus 13 percent, respectively).

The marital status findings suggest that a significant number of divorces as well as considerable premature widowhood may be the result, at least in part, of the effects of alcoholism. Although many marriages survive the effects of alcoholism, either because the alcoholic seeks help or because the family accommodates to the alcoholic drinking, it is clear that a large number of marriages dissolve in the face of alcoholism.

Conclusion

This report indicates that about 43 percent of U.S. adults have been exposed to alcoholism or problem drinking in the family. In some cases, this exposure is very direct, as when persons grow up in a family with an alcoholic, and frequently lasts a lifetime. Sometimes the exposure is to an alcoholic spouse and lasts for varying lengths of cohabitation. Finally, the exposure may be strictly by blood, with little or no social contact. In all three cases, however, the presence of alcoholism in a family member poses some risk, both for adverse social, psychological, and economic outcomes and for biological predisposition to the disease itself.

Of about 177 million adults 18 years of age and over in 1988, about 76 million were exposed to alcoholism in their family in some way. It should be noted that this report does not include exposure to alcoholism in nonbiological extended family members, such as in-laws or stepchildren. Nor does it address issues of exposure in nonfamily relationships such as in the workplace (employee, coworker, supervisor) or among friends who may play a significant role in a person's life. Finally, because the study was limited to adults, estimates of the numbers of people exposed to alcoholism do not include children who lived with or were biologically related to an alcoholic family member. It is clear from this study that statistics on numbers of alcoholics in this country—10.5 million—greatly underestimate the total number of people affected by the disease of alcoholism.

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Table 1. Percent of adults who lived with an alcoholic or a problem drinker at some time during their first 18 years of life, by selected characteristics: United States, 1988

Sex and characteristic	All ages		18-44 years		45-64 years		65 years and over	
	Percent	Standard error	Percent	Standard error	Percent	Standard error	Percent	Standard error
Both sexes								
Total ¹	18.1	0.25	21.4	0.33	16.5	0.42	8.5	0.37
Education:								
Less than 12 years	18.3	0.46	27.2	0.89	17.6	0.86	9.0	0.53
12 years	19.5	0.40	23.2	0.52	16.8	0.69	8.3	0.61
More than 12 years	16.5	0.32	18.1	0.42	15.5	0.66	7.6	0.70
Income:								
Less than \$10,000	19.6	0.55	26.0	0.98	17.4	1.15	9.2	0.64
\$10,000-\$24,999	19.1	0.43	24.2	0.61	16.7	0.81	8.5	0.55
\$25,000-\$39,999	18.6	0.47	20.8	0.60	16.2	0.79	10.1	1.10
\$40,000 or more	18.0	0.45	18.5	0.61	18.3	0.81	9.7	1.45
Race:								
White	18.5	0.27	22.0	0.36	17.3	0.46	8.6	0.40
Black	15.6	0.54	18.5	0.75	11.8	1.02	7.4	1.13
Other	15.0	1.65	17.0	2.20	10.9	1.92	7.7	3.00
Hispanic origin:								
Hispanic	17.4	0.86	19.7	1.11	13.7	1.70	4.9	1.46
Non-Hispanic	18.1	0.25	21.5	0.34	16.7	0.43	8.6	0.38
Marital status:								
Married	19.0	0.31	22.7	0.42	16.8	0.50	9.0	0.53
Widowed	9.5	0.50	25.9	4.15	12.7	1.16	7.8	0.53
Separated or divorced	22.0	0.63	26.3	0.89	17.7	0.97	10.2	1.28
Never married	16.3	0.49	16.8	0.53	14.0	1.41	6.0	1.16
Male								
Total ¹	16.5	0.31	18.6	0.46	15.7	0.56	9.0	0.57
Education:								
Less than 12 years	17.3	0.70	23.4	1.29	17.4	1.23	9.2	0.86
12 years	17.1	0.53	19.6	0.72	14.8	0.98	8.3	1.03
More than 12 years	15.5	0.46	16.3	0.57	15.4	0.89	9.1	1.15
Income:								
Less than \$10,000	17.9	1.00	20.6	1.54	18.9	2.13	10.3	1.31
\$10,000-\$24,999	17.4	0.59	21.4	0.86	14.9	1.14	9.2	0.88
\$25,000-\$39,999	17.0	0.64	18.7	0.82	15.3	1.16	9.2	1.51
\$40,000 or more	16.1	0.63	16.0	0.89	17.3	1.10	11.4	2.17
Race:								
White	16.9	0.34	19.2	0.48	16.1	0.62	9.1	0.61
Black	13.9	0.90	15.1	1.18	13.3	1.72	8.5	2.04
Other	14.2	2.88	15.9	3.81	10.1	3.04	6.1	4.11
Hispanic origin:								
Hispanic	16.1	1.29	18.8	1.66	10.4	2.37	4.4	2.21
Non-Hispanic	16.5	0.32	18.5	0.47	16.0	0.59	9.1	0.58
Marital status:								
Married	17.0	0.39	20.3	0.59	15.8	0.64	9.0	0.66
Widowed	9.4	1.18	19.0	9.90	9.9	2.90	8.8	1.27
Separated or divorced	19.0	0.94	21.4	1.35	16.9	1.58	11.0	2.36
Never married	14.7	0.72	14.9	0.77	14.3	1.98	8.2	2.42
Female								
Total ¹	19.5	0.33	24.1	0.43	17.3	0.56	8.2	0.44
Education:								
Less than 12 years	19.2	0.61	30.9	1.11	17.8	1.17	8.9	0.65
12 years	21.4	0.53	26.2	0.68	18.3	0.91	8.3	0.74
More than 12 years	17.6	0.44	19.9	0.57	15.6	0.92	6.4	0.84
Income:								
Less than \$10,000	20.6	0.67	29.9	1.12	16.5	1.32	8.7	0.74
\$10,000-\$24,999	20.5	0.58	26.8	0.78	18.1	1.04	7.9	0.66
\$25,000-\$39,999	20.3	0.65	23.0	0.83	17.1	1.20	10.9	1.62
\$40,000 or more	19.9	0.69	21.1	0.86	19.6	1.20	7.6	1.87
Race:								
White	20.0	0.35	24.7	0.48	18.4	0.62	8.3	0.47
Black	16.9	0.72	21.4	1.00	10.6	1.25	6.6	1.31
Other	15.8	1.55	18.3	1.99	11.4	2.45	9.1	3.57
Hispanic origin:								
Hispanic	18.6	1.11	20.6	1.33	16.5	2.63	5.3	1.94
Non-Hispanic	19.5	0.34	24.4	0.45	17.4	0.59	8.3	0.45
Marital status:								
Married	20.8	0.44	24.9	0.57	17.9	0.70	8.9	0.77
Widowed	9.5	0.54	27.4	4.58	13.2	1.24	7.6	0.58
Separated or divorced	23.8	0.78	29.2	1.09	18.2	1.22	9.8	1.43
Never married	18.2	0.69	19.3	0.75	13.7	1.95	4.7	1.21

¹Total includes unknown sociodemographic characteristics.

Table 2. Percent of adults who have ever been married to an alcoholic or a problem drinker, by selected characteristics: United States, 1988

Sex and characteristic	All ages		18-44 years		45-64 years		65 years and over	
	Percent	Standard error	Percent	Standard error	Percent	Standard error	Percent	Standard error
Both sexes								
Total ¹	9.2	0.16	8.6	0.20	11.1	0.33	8.2	0.31
Education:								
Less than 12 years	11.1	0.35	12.1	0.64	11.8	0.69	9.3	0.49
12 years	9.9	0.28	9.6	0.33	11.9	0.57	7.4	0.53
More than 12 years	7.4	0.21	6.8	0.25	9.5	0.51	7.3	0.59
Income:								
Less than \$10,000	14.3	0.55	12.7	0.80	21.3	1.19	13.1	0.71
\$10,000-\$24,999	10.4	0.30	10.7	0.41	13.2	0.68	6.9	0.47
\$25,000-\$39,999	8.3	0.33	7.9	0.39	9.8	0.64	7.3	0.90
\$40,000 or more	7.0	0.29	6.2	0.34	8.4	0.58	8.1	1.25
Race:								
White	9.3	0.18	9.1	0.23	10.8	0.36	7.8	0.33
Black	8.8	0.41	6.4	0.42	13.5	1.00	12.7	1.13
Other	6.9	0.75	5.8	0.74	10.2	2.11	8.1	2.75
Hispanic origin:								
Hispanic	8.0	0.54	7.1	0.55	11.5	1.51	6.6	1.60
Non-Hispanic	9.3	0.16	8.8	0.21	11.1	0.34	8.3	0.32
Marital status:								
Married	7.6	0.18	8.2	0.26	7.8	0.34	4.9	0.36
Widowed	14.9	0.57	22.1	3.57	22.7	1.41	12.1	0.59
Separated or divorced	27.6	0.66	26.8	0.85	29.6	1.28	26.1	1.75
Never married	3.5	0.23	3.6	0.24	3.9	0.75	0.6	0.35
Male								
Total ¹	3.6	0.15	3.4	0.19	4.0	0.31	3.2	0.32
Education:								
Less than 12 years	3.7	0.33	5.0	0.65	3.3	0.54	2.3	0.39
12 years	3.5	0.24	3.4	0.30	4.2	0.54	2.7	0.54
More than 12 years	3.5	0.21	3.0	0.24	4.3	0.49	5.4	0.77
Income:								
Less than \$10,000	4.4	0.47	3.3	0.54	8.3	1.64	4.7	0.82
\$10,000-\$24,999	4.2	0.30	4.8	0.42	4.7	0.66	2.2	0.41
\$25,000-\$39,999	3.4	0.27	3.3	0.33	3.5	0.59	4.0	0.95
\$40,000 or more	3.0	0.27	2.4	0.34	3.5	0.49	5.9	1.43
Race:								
White	3.6	0.16	3.6	0.21	4.0	0.34	3.0	0.32
Black	3.6	0.43	2.9	0.52	4.8	1.05	5.0	1.15
Other	2.0	0.69	1.8	0.73	1.1	0.77	6.6	4.58
Hispanic origin:								
Hispanic	2.2	0.47	1.9	0.48	3.7	1.42	0.6	0.65
Non-Hispanic	3.7	0.16	3.6	0.20	4.1	0.32	3.3	0.32
Marital status:								
Married	3.0	0.17	3.2	0.24	2.9	0.31	2.4	0.34
Widowed	6.6	1.00	5.6	3.76	7.6	2.49	6.3	1.09
Separated or divorced	10.8	0.81	9.6	0.95	13.7	1.68	8.7	1.93
Never married	2.6	0.27	2.6	0.29	4.1	0.99	0.5	0.49
Female								
Total ¹	14.3	0.26	13.6	0.33	17.5	0.56	11.8	0.50
Education:								
Less than 12 years	17.5	0.57	19.1	1.04	19.7	1.18	14.3	0.79
12 years	15.0	0.42	15.0	0.52	17.5	0.89	10.3	0.80
More than 12 years	11.5	0.37	10.6	0.42	15.6	0.94	9.0	0.85
Income:								
Less than \$10,000	20.2	0.73	19.5	1.16	29.1	1.59	16.7	0.90
\$10,000-\$24,999	15.9	0.47	16.3	0.66	19.6	1.05	10.7	0.81
\$25,000-\$39,999	13.4	0.58	12.8	0.67	16.0	1.17	10.3	1.49
\$40,000 or more	11.4	0.51	10.1	0.59	14.1	1.12	10.8	2.04
Race:								
White	14.5	0.28	14.4	0.37	17.2	0.59	11.2	0.53
Black	13.0	0.62	9.2	0.62	20.4	1.62	17.9	1.73
Other	11.6	1.33	10.1	1.40	16.1	3.22	9.4	3.43
Hispanic origin:								
Hispanic	13.0	0.86	11.7	0.95	18.3	2.54	10.7	2.63
Non-Hispanic	14.4	0.26	13.8	0.34	17.5	0.56	11.8	0.51
Marital status:								
Married	12.1	0.32	12.6	0.41	12.9	0.63	8.0	0.70
Widowed	16.5	0.64	25.7	4.19	25.7	1.59	13.3	0.67
Separated or divorced	37.6	0.88	37.2	1.16	39.0	1.65	36.0	2.41
Never married	4.6	0.36	4.9	0.40	3.8	1.14	0.7	0.47

¹Total includes unknown sociodemographic characteristics.

Table 3. Percent of adults who have a blood relative who was ever an alcoholic or a problem drinker, by selected characteristics: United States, 1988

Sex and characteristic	All ages		18-44 years		45-64 years		65 years and over	
	Percent	Standard error	Percent	Standard error	Percent	Standard error	Percent	Standard error
Both sexes								
Total ¹	37.9	0.36	41.9	0.44	36.5	0.57	26.0	0.58
Education:								
Less than 12 years	35.2	0.65	44.2	1.12	34.0	1.07	26.4	0.79
12 years	38.9	0.50	42.5	0.62	37.7	0.86	25.2	0.94
More than 12 years	38.5	0.46	40.7	0.55	37.1	0.94	26.3	1.20
Income:								
Less than \$10,000	38.7	0.72	45.1	1.10	39.3	1.55	26.8	1.01
\$10,000-\$24,999	38.7	0.57	44.4	0.72	36.2	1.05	26.5	0.85
\$25,000-\$39,999	39.5	0.61	41.7	0.76	37.2	1.06	30.8	1.67
\$40,000 or more	39.5	0.61	40.8	0.81	39.3	1.03	27.4	1.93
Race:								
White	38.6	0.38	43.2	0.47	37.1	0.63	25.8	0.61
Black	35.8	0.86	37.8	1.14	33.7	1.57	29.1	1.69
Other	25.8	1.80	25.6	2.43	27.9	3.19	20.8	4.35
Hispanic origin:								
Hispanic	32.2	1.19	35.7	1.43	25.7	2.29	16.6	3.05
Non-Hispanic	38.4	0.36	42.5	0.44	37.2	0.60	26.2	0.59
Marital status:								
Married	39.1	0.43	43.5	0.52	36.7	0.68	27.2	0.84
Widowed	26.5	0.75	47.1	4.40	33.4	1.61	23.6	0.80
Separated or divorced	42.3	0.76	46.7	0.99	37.8	1.35	30.6	1.86
Never married	36.2	0.70	36.9	0.75	34.1	2.01	21.8	2.06
Male								
Total ¹	36.5	0.45	39.5	0.60	34.7	0.79	27.1	0.88
Education:								
Less than 12 years	35.7	0.99	41.6	1.60	34.7	1.61	28.8	1.31
12 years	37.0	0.70	39.9	0.91	34.9	1.32	25.3	1.61
More than 12 years	36.6	0.61	38.5	0.77	34.8	1.21	25.7	1.73
Income:								
Less than \$10,000	38.1	1.15	41.6	1.68	39.3	2.79	28.1	1.91
\$10,000-\$24,999	37.3	0.74	41.0	1.01	35.2	1.52	28.9	1.29
\$25,000-\$39,999	37.8	0.81	40.0	1.05	34.9	1.51	29.9	2.45
\$40,000 or more	37.1	0.83	38.8	1.14	36.1	1.36	25.3	2.81
Race:								
White	37.3	0.48	40.9	0.63	34.9	0.85	27.0	0.91
Black	34.7	1.30	34.6	1.70	37.3	2.39	29.6	2.83
Other	21.6	2.87	22.4	3.84	18.5	4.02	21.4	5.87
Hispanic origin:								
Hispanic	30.6	1.76	34.9	2.25	21.2	3.02	12.3	3.80
Non-Hispanic	36.9	0.45	39.9	0.60	35.6	0.82	27.5	0.89
Marital status:								
Married	37.3	0.55	41.8	0.74	34.9	0.89	27.6	1.03
Widowed	25.6	1.65	25.2	10.15	26.3	4.03	25.4	1.75
Separated or divorced	40.3	1.21	44.1	1.65	36.6	2.24	28.9	3.17
Never married	34.0	0.98	34.4	1.03	33.1	2.68	21.0	3.37
Female								
Total ¹	39.2	0.42	44.2	0.54	38.1	0.76	25.2	0.69
Education:								
Less than 12 years	34.9	0.75	46.8	1.33	33.4	1.39	24.6	0.96
12 years	40.5	0.65	44.8	0.82	39.8	1.15	25.2	1.09
More than 12 years	40.6	0.60	42.9	0.71	39.9	1.33	26.7	1.49
Income:								
Less than \$10,000	39.1	0.78	47.8	1.18	39.4	1.84	26.2	1.13
\$10,000-\$24,999	39.9	0.73	47.7	0.90	36.9	1.38	24.5	1.08
\$25,000-\$39,999	41.3	0.81	43.5	1.01	39.5	1.52	31.7	2.34
\$40,000 or more	42.2	0.84	42.8	1.03	42.9	1.57	29.9	2.84
Race:								
White	39.9	0.46	45.4	0.59	39.2	0.83	24.9	0.74
Black	36.6	1.00	40.5	1.31	30.9	1.79	28.8	2.05
Other	29.8	1.99	29.2	2.50	34.0	4.31	20.3	6.35
Hispanic origin:								
Hispanic	33.6	1.35	36.4	1.60	29.6	2.94	19.6	4.14
Non-Hispanic	39.6	0.44	44.9	0.56	38.7	0.80	25.3	0.70
Marital status:								
Married	40.8	0.54	45.0	0.68	38.7	0.92	26.7	1.21
Widowed	26.7	0.85	52.0	4.86	34.8	1.79	23.2	0.92
Separated or divorced	43.5	0.94	48.3	1.23	38.6	1.63	31.5	2.35
Never married	38.8	0.91	40.1	0.98	35.3	2.87	22.2	2.64

¹Total includes unknown sociodemographic characteristics.

Table 4. Percent of adults who lived with during their first 18 years, were ever married to, or had a blood relative who was an alcoholic or problem drinker, by selected characteristics: United States, 1988

Sex and characteristic	All ages		18-44 years		45-64 years		65 years and over	
	Percent	Standard error	Percent	Standard error	Percent	Standard error	Percent	Standard error
Both sexes								
Total ¹	42.8	0.38	46.1	0.46	42.3	0.60	31.4	0.63
Education:								
Less than 12 years	41.2	0.69	49.6	1.12	40.2	1.13	32.6	0.85
12 years	43.8	0.53	47.0	0.65	43.7	0.91	29.7	0.99
More than 12 years	42.7	0.48	44.4	0.58	42.3	0.96	31.5	1.21
Income:								
Less than \$10,000	46.1	0.77	51.0	1.24	49.6	1.45	35.1	1.15
\$10,000-\$24,999	44.2	0.61	49.7	0.77	43.0	1.12	31.4	0.90
\$25,000-\$39,999	43.8	0.63	45.5	0.79	42.4	1.08	35.5	1.76
\$40,000 or more	43.3	0.64	44.1	0.83	43.7	1.07	32.1	2.03
Race:								
White	43.5	0.40	47.6	0.48	42.7	0.66	31.0	0.66
Black	40.8	0.88	41.4	1.15	41.1	1.60	36.9	1.86
Other	29.4	1.89	28.8	2.48	32.7	3.36	25.6	4.53
Hispanic origin:								
Hispanic	36.3	1.23	39.3	1.46	31.3	2.35	20.5	3.20
Non-Hispanic	43.3	0.38	46.8	0.46	43.0	0.62	31.7	0.64
Marital status:								
Married	43.0	0.46	47.4	0.54	40.9	0.72	30.5	0.88
Widowed	35.5	0.83	57.8	4.36	45.5	1.78	31.5	0.88
Separated or divorced	55.5	0.75	58.7	1.03	52.1	1.46	47.4	2.02
Never married	38.5	0.70	39.3	0.75	36.5	2.04	22.4	2.09
Male								
Total ¹	38.9	0.46	41.7	0.60	37.5	0.81	29.8	0.89
Education:								
Less than 12 years	38.2	0.99	44.5	1.59	37.0	1.68	30.9	1.32
12 years	39.3	0.72	42.0	0.93	37.8	1.35	27.6	1.64
More than 12 years	39.0	0.63	40.7	0.79	37.6	1.25	29.9	1.75
Income:								
Less than \$10,000	41.2	1.16	44.4	1.73	43.7	2.67	31.2	1.95
\$10,000-\$24,999	40.3	0.77	44.5	1.04	38.1	1.53	31.0	1.31
\$25,000-\$39,999	40.0	0.82	41.9	1.06	37.6	1.55	32.8	2.54
\$40,000 or more	39.1	0.84	40.1	1.16	38.9	1.38	30.8	2.91
Race:								
White	39.7	0.49	43.2	0.63	37.7	0.88	29.6	0.93
Black	37.0	1.33	36.6	1.69	39.8	2.44	33.0	2.96
Other	23.5	2.87	24.4	3.80	19.0	4.04	25.9	6.79
Hispanic origin:								
Hispanic	32.4	1.76	36.6	2.24	23.6	3.13	12.9	3.81
Non-Hispanic	39.4	0.46	42.1	0.61	38.4	0.83	30.3	0.91
Marital status:								
Married	39.5	0.56	43.8	0.74	37.3	0.93	29.8	1.05
Widowed	30.2	1.76	30.6	10.43	30.1	4.13	30.2	1.92
Separated or divorced	45.8	1.25	49.4	1.69	42.2	2.33	34.9	3.39
Never married	35.9	0.97	36.3	1.01	35.6	2.79	21.4	3.40
Female								
Total ¹	46.2	0.46	50.4	0.56	46.7	0.79	32.6	0.77
Education:								
Less than 12 years	43.8	0.84	54.7	1.36	43.1	1.49	33.8	1.09
12 years	47.4	0.67	51.4	0.83	48.0	1.16	30.9	1.17
More than 12 years	46.5	0.62	48.1	0.73	47.9	1.34	32.9	1.54
Income:								
Less than \$10,000	49.0	0.82	55.8	1.27	53.2	1.77	36.8	1.28
\$10,000-\$24,999	47.6	0.78	54.7	0.94	46.8	1.47	31.7	1.22
\$25,000-\$39,999	47.6	0.83	49.2	1.04	47.2	1.53	37.9	2.50
\$40,000 or more	47.8	0.87	48.3	1.06	49.3	1.59	33.8	2.92
Race:								
White	47.0	0.50	51.9	0.61	47.4	0.85	32.0	0.82
Black	43.8	1.06	45.3	1.34	42.1	1.99	39.6	2.35
Other	35.2	2.31	33.8	2.83	41.6	4.55	25.3	6.51
Hispanic origin:								
Hispanic	39.6	1.43	41.6	1.67	38.0	3.10	25.8	4.30
Non-Hispanic	46.7	0.47	51.2	0.58	47.2	0.82	32.8	0.78
Marital status:								
Married	46.5	0.58	50.6	0.69	44.7	0.97	31.4	1.28
Widowed	36.6	0.92	63.9	4.68	48.5	1.89	31.8	1.00
Separated or divorced	61.3	0.90	64.3	1.19	58.1	1.67	54.5	2.50
Never married	41.7	0.91	43.2	0.98	37.6	2.84	22.9	2.67

¹Total includes unknown sociodemographic characteristics.

Technical Notes

The estimates presented in this report are based on data from the National Health Interview Survey (NHIS), an ongoing survey of households in the United States conducted by the National Center for Health Statistics. Each week, a probability sample of the civilian noninstitutionalized population of the United States is interviewed by personnel of the U.S. Bureau of the Census. Interviewers obtain information about the health and other characteristics of each member of the households included in the NHIS sample.

The NHIS consists of two parts: (a) a basic health and demographic questionnaire that remains almost the same from year to year and is completed for each household member and (b) special topic questionnaires that vary from year to year and usually are asked of just one person in each family. In 1988, the special topics included knowledge and attitudes about acquired immunodeficiency syndrome (AIDS), medical device implants, occupational health, alcohol, and child health. Data tapes from these surveys can be linked for investigation of cross cutting research issues.

The total sample interviewed for 1988 for the basic health questionnaire consisted of 47,485 households containing 122,310 individuals. The total response rate was about 95 percent, with proxy responses accepted for household members not home at the time of interview. For the National Health Interview Survey on Alcohol (NHIS-Alcohol), one adult per family 18 years of age or over was selected for interview, and self-response was required for all items. A total of 43,809 alcohol questionnaires were completed, representing 90 percent of respondents identified as eligible at the time of the household interview and an overall response rate of 85.5 percent (the product of the response rate for the basic questionnaire and the response rate for the special topic questionnaire).

The basic sampling unit for the NHIS is the household, and the response rate for the basic health and demographic section of the NHIS is based on number of households. A household may contain multiple families (persons related by blood, marriage, or adoption); in 1988, 97.8 percent of responding households contained only one family. In the basic NHIS, information was collected on all persons in each family residing in the household. For the NHIS-Alcohol (as with most NHIS special topic questionnaires), one sample person was selected from each family. For the purposes of calculating a response rate for the NHIS-Alcohol, the total number of families in the NHIS sample was estimated. For noninterviewed households, the number of families was assumed to be one. However, for households in which multiple families were identified, the total number of families was included in the denominator. Because the response rate for the basic NHIS is based on number of households, the denominator for calculating the response rate for the NHIS-Alcohol questionnaire (51,223) is slightly higher than that used for calculating the response rate for the basic health questionnaire (50,061). Item nonresponse was 0.9–2.4 percent for the questions discussed in this report.

The NHIS-Alcohol questionnaire was administered face to face, with telephone followup as needed. One section of the questionnaire, containing questions on the social and behavioral consequences of alcohol use, was self-administered because of its sensitive nature. Information on that section will be included in a future report.

Because the estimates shown in this report are based on a sample, they are subject to sampling error. The standard error is a measure of the sampling error. The standard errors shown in tables 1–4 of this report were calculated using SUDAAN (SURvey DATA ANalysis), developed by the Research Triangle Institute for analysis of complex

sample surveys. The procedure used was DESCRIPT, and the design was UNEQWOR (without replacement sampling with unequal probabilities of selection at the first stage).

All differences cited in this report are statistically significant at the 0.05 level. A *t*-test with a critical value of 1.96 was used to test all comparisons that are discussed. Lack of comment regarding the difference between any two estimates does not mean that the difference was tested and found not to be statistically significant.

Suggested citation

Schoenborn CA. Exposure to alcoholism in the family: United States, 1988. Advance data from vital and health statistics; no 205. Hyattsville, Maryland: National Center for Health Statistics. 1991.

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DHHS Publication No. (PHS) 91-1250