

Alcohol Consumption among the Elderly in a General Population, Erie County, New York

ABSTRACT

Objectives. Relatively few studies of drinking among the elderly have been completed despite the growing proportional representation of the elderly in the US population. This study sought to estimate the prevalence of and to observe whether active or health-oriented lifestyles are associated with heavy drinking among the elderly.

Methods. Random-digit dialing telephone interviews were conducted with 2325 Erie County, New York, general population residents aged 60 years or older.

Results. The prevalence of heavy drinking was 6%. Adjusted analyses showed positive associations between heavy drinking and being male, having suburban residency, and currently using cigarettes. Negative relationships were observed between heavy drinking and socioeconomic status, rural residency, and degree of health orientation. Age and level of active lifestyle were not significant contributors to the model.

Conclusions. Of the studied variables, health orientation offers the greatest opportunity to address heavy drinking among the elderly. (*Am J Public Health.* 1996;86:978-984)

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Introduction

By the year 2020, the elderly will account for 52 million people in the United States and, with the aging of the baby boomers, about 66 million by the year 2030.¹ The increasing proportion of persons 60 years and older in the population and the trend in increasing life expectancies warrant attention to alcohol problems among the elderly. Yet despite the documented economic impact of such behavior, relatively few studies of problem drinking among this population have been completed.²

The longitudinal and cross-sectional studies that have investigated elderly respondents generally show a decline in alcohol consumption with increasing age.³⁻¹¹ Various reasons have been advanced to explain this decline.¹² A differential mortality effect may partially explain the declining percentage of drinkers, particularly heavy drinkers, with age seen in cross-sectional studies. However, the observed drinking decline appears in most longitudinal studies as well and thereby supports the proposition that most drinkers indeed lower their consumption with age. It has been offered that the declining prevalence of heavy drinking with age may reflect antialcohol attitudes of Americans influenced by Prohibition. However, the stability of age patterns of drinking since the 1940s depreciates the explanatory value of a Prohibition cohort effect. Also, the drinking decline with age occurs in Western countries that did not experience Prohibition.^{12,13}

Elderly respondents commonly cite poor health as a reason for their decreased drinking.¹⁴⁻¹⁶ Also, the Alameda County Aging Study found that good physical functioning in elders is associated with moderate drinking.¹⁷ Yet other researchers have observed that elders who

retain their physical capabilities are the most likely to be heavy drinkers.^{18,19}

Other frequently given reasons for decreased drinking are changes in socializing patterns owing to maturation, social affiliation with persons who drink less, and^{14,15} lessened exposure to alcohol-encouraged social circumstances.¹⁰ The antithesis is that an active or leisure-oriented lifestyle may be associated with heavy drinking among the elderly.²⁰

An increased concern about health may contribute to reduced alcohol consumption. The Centers for Disease Control's Behavioral Risk Factor Surveys showed that health-enhancing behaviors tend to cluster together; for example, women who exercise and fasten their seat belts are less likely to smoke or drink heavily.²¹

Some studies that have examined drinking among the elderly were based on small samples, clinical samples, convenience or volunteer samples, or samples restricted to men.^{3-7,22} Often the elderly were not the major focus of the study, and measurement of study factors was not adapted for use among them. The current study addresses some of these methodological issues while seeking to (1) demographically characterize elderly drinkers, (2) determine the prevalence of heavy drinking among them, and (3) observe whether active and health-oriented lifestyles are associated with heavy drinking among the elderly.

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Methods

The probability sample of 2325 Erie County, New York, residents aged 60 years and older was interviewed between May 1990 and July 1991 using computer-assisted telephone interviewing.²³ The sample was identified by the random-digit dialing of telephone numbers that were stratified into 10 geographic districts within the county by proportional allocation. The sample was generated by attaching a random four-digit suffix to the designated central office code numbers specific to the county. The percentage of completed interviews in each stratum was approximately equal to that of the total telephone numbers in the frame from each district.

Only one elderly resident per household could be included. When a household contained two or more age-eligible persons, one person was randomly selected by means of a random selection chart. Once the selection of an eligible household resident was made, calls were continued until an interview or two direct refusal calls were obtained.

Out of the 8614 households containing an age-eligible potential respondent, 6419 (75%) respondents cooperated sufficiently to make it to the screening question. The main screening question defined a drink as 12 oz of beer, 4 oz of wine, one shot of liquor, or one mixed drink.²⁴ The respondents were asked if there was ever a time in their lives when they drank, on average, more than two drinks per day. All persons who answered affirmatively were eligible for study participation. Of the 6419 respondents who were screened, 1566 were screened positive, 1189 (76%) of whom granted an interview. Among the 4853 negative screens, one third were selected for participation on the basis of random selection tables. Thus, 3397 were randomized out; of the remainder, 1136 granted an interview and 320 refused. This produced a response rate of 78% (i.e., $1136 / [1136 + 320]$) for negative screens. The overall response rate was 66% ($[1189 + 1136 + 3397] / 8614$).

The average daily ethanol intake within the past 12 months was estimated by summing the beverage-specific products of the following equation: frequency of intake \times number of drinks \times ounces per drink \times percentage of alcohol by volume.²⁴ The percentage of alcohol by volume was 5% for beer, 14% for wine, and 45% for liquor. A drink equivalent was defined as 0.5 oz of ethanol. Respon-

dents who drank alcohol beyond just a taste during their lives were termed ever drinkers. Current drinkers drank alcohol during the 12 months before the interview. Heavy drinking was defined as a mean daily intake of more than 1.0 oz of ethanol (more than two drinks per day). This definition is in agreement with that used in a study of men and women aged 60 through 86 in which heavy intake was designated as more than 30 g of ethanol per day, the equivalent of more than two drinks per day.⁷ A nonheavy drinker drank an average of no more than 1 oz of ethanol per day during the 12 months before the interview. Abstainers were those who reported no alcohol intake during the 12 months prior to the interview.

Active lifestyle, health-oriented lifestyle, and socioeconomic status (SES) were composite variables. The active lifestyle variable, which indicated the respondent's degree of social activity and interaction, was adapted from the work of the Rehabilitation Indicators Project.²⁵ The items were frequency measures of activity, socializing, and attendance of various events (e.g., working on a hobby or craft, visiting with a friend or relative, going to a movie). Health orientation, adapted from Walker et al.,²⁶ measured the extent of engaging in good health practices, with a concentration on exercise, nutrition, and health responsibility (e.g., exercising vigorously, including fiber in the diet, checking oneself for signs of poor health). SES was derived as a composite of (1) average yearly household income; (2) the highest occupational prestige score (based on "usual lifelong" occupation), designated by the 1980 census occupation classifications,²⁷ between the respondent and the respondent's partner; and (3) the highest educational level attained between the respondent and the respondent's partner. Ninety-five percent of this sample reported ever being married, and two thirds of the sample were women. Thus, the contribution of the partner to the participant's SES was acknowledged to provide a rational SES assignment, particularly for the generations of women in this elderly sample. The *Health and Daily Living Form Manual* was the source of the medical conditions scale.²⁸ Respondents indicated whether they were currently experiencing certain illnesses (e.g., diabetes, chronic liver trouble, cancer).

Logistic regression analyses were used to clarify the relationship between heavy drinking and the independent vari-

ables observed in bivariate analyses. The independent variables included sex (0 = female, 1 = male), age, race (0 = African American, 1 = White), religion, marital status, place of residence, employment status, church attendance, smoking (0 = no, 1 = yes), number of persons in household, health-oriented lifestyle, active lifestyle, and number of current medical conditions. Dummy variables were used for categorical variables. The odds ratio (OR), an estimate of the relative risk for the dependent variable, was the multiplier for the change in risk for 1 unit of change in the independent variable. To ensure an accurate representation of the population from which the sample was derived, a weight inversely proportional to the selection probability was calculated for each case. The weighted sample size was equal to the true sample size.

Results

Table 1 provides a description of the 2325 elderly Erie County current residents interviewed in the survey. These individuals constituted a representative sample of the county's population aged 60 and older, with minor exceptions.²⁹ The sample was 66% female whereas the actual population of the county aged 60 and older was 59% female. The census race distribution of the county in the 60+ age range was 6.1% African American, 0.2% American Indian, and 0.2% Asian, compared with the study's 5% African American, 0.3% Native American, and 0.3% Asian. The study's Hispanic designation (1.6%) did not correspond to the census's "Spanish Origin" designation and thus could not be compared with census figures. To avoid numerous empty cells, all subsequent analyses that included race were restricted to African American and Whites. Study members ranged in age from 60 to 94, the mean being 69.5 years.

The demographics by drinking patterns are also shown in Table 1. Seventy-seven percent of the total sample reported ever drinking. Sixty-two percent of the sample—72% of the men and 57% of the women—were current drinkers, and 13% of the men and 2% of the women were current heavy drinkers. The overall prevalence of heavy drinking was 6% and did not vary with race.

A significant decline was observed in the percentage of current drinkers with age (χ^2 trend = 34.20, $P < .0001$); however, a concurrent decline in the percentage of heavy drinkers with age was not

TABLE 1—Sample Demographics, by Drinking Status: Erie County, NY, Residents Aged 60 or Older

	Total Sample ^a	Current Drinkers		Current Heavy Drinkers/Total Sample	
		No.	%	No.	%
Total sample	2325	1440	62	135	6
Sex					
Male	779	557	72	101	13
Female	1543	883	57	34	2
Age, y					
60–64	550	370	67	32	6
65–69	669	454	68	39	6
70–74	471	301	64	29	6
75–79	279	154	55	15	5
80+	208	98	47	7	3
Race					
White	2056	1326	64	116	6
African American	102	43	42	6	6
Religion					
Jewish	48	36	75	2	4
Catholic	1171	808	69	67	6
Protestant, evangelical or fundamentalist	332	185	56	20	6
Protestant, not evangelical or fundamentalist	414	248	60	22	5
Other	112	64	57	5	4
None	53	33	62	7	13
Church attendance					
Often/routinely	1541	980	64	71	5
Never/sometimes	780	461	59	66	8
Marital status					
Married	1294	885	68	81	6
Widowed	627	347	55	29	5
Divorced/separated	145	81	56	8	6
Never married	100	62	62	4	4
Socioeconomic status					
High	569	439	77	28	5
Upper middle	567	371	65	33	6
Lower middle	562	323	57	42	7
Low	572	310	54	33	6
Employment status					
Employed	357	263	74	22	6
Retired	1378	901	65	90	7
Disabled	106	47	44	5	5
Homemaker	233	131	56	4	2
Other	54	35	65	1	2
Residence					
Urban	1114	655	59	68	6
Suburbs	877	588	67	45	5
Rural	196	138	70	10	5
Health orientation					
Low	635	399	63	53	8
Medium	889	561	63	50	6
High	747	484	65	33	4
Active lifestyle					
Low	731	374	51	52	7
Medium	786	525	67	45	6
High	753	544	72	39	5
Medical conditions					
0	371	255	69	19	5
1	605	420	69	39	6
2	544	362	67	37	7
3	325	195	60	18	6
≥ 4	302	154	51	11	4

(Continued)

seen (χ^2 trend = 1.03, $P < .31$). SES was positively associated with current drinking (χ^2 trend = 72.61, $P < .0001$) although no relationship was observed for heavy drinking (χ^2 trend = 0.892, $P = .34$). Analysis showed heavy drinking to be negatively associated with level of health-oriented lifestyle (χ^2 trend = 9.35, $P = .002$), but likelihood of current drinking was not differentiated by level of health orientation (χ^2 trend = 0.65, $P = .42$). An active lifestyle was correlated with current drinking (χ^2 trend = 70.80, $P = .002$) but not with heavy drinking (χ^2 trend = 2.52, $P = .11$).

The results of the logistic regression analyses are in Table 2. Main effects with a significant positive association with heavy drinking were being male, having suburban residency, and currently using cigarettes. Negative relationships with heavy drinking were seen with SES, rural residency, and health orientation. Age was not a significant contributor to the model. Comparison of all current drinkers with abstainers revealed the inverse relationship between age and drinking observed by other researchers.^{6,7,10,15} Current and heavy drinking shared a negative association with level of health orientation. Unlike heavy drinking, however, current drinking was also associated with religion variables, employment status, and level of active lifestyle. Although an inverse relationship was observed between heavy drinking and SES, a positive association was seen for current drinking.

The presented model reduced the chi-square of the likelihood of the observed results for heavy drinking by 14% and for current drinkers by 11%, although the chi-square values for comparison with hypothetical perfect models (2384 with 2043 *df* for drinkers; 790 with 2038 *df* for heavy drinkers) remained statistically significant. This report, however, limited its independent variables to demographics and active and health-oriented lifestyles. An analysis reported elsewhere, which included a broader assortment of predictor variables, found drinking patterns earlier in life to be significantly explanatory of current drinking.³⁰

Discussion

Because this sample was restricted to persons 60 years of age and older, it was appropriate to use measures of drinking and other behaviors developed for elderly respondents. Generally, studies have not focused on elders and have applied to all participants measures, case definitions,

and classifications standardized on the nonelderly. Also, variance in the definition of heavy drinking has made it difficult to state clearly the comparability of study findings. These methodological factors offer a partial explanation for the range of reported prevalence of current drinking among the elderly; that range is between 53% and 96% for men and between 43% and 88% for females.^{7,31-33} Moreover, whereas previous literature indicates that 2% to 10% of the elderly population drinks heavily,^{7,32,34-36} the current study reports 6% of the total sample to be heavy drinkers. As with the current drinking estimates, the prevalence rates of heavy drinking among men and women are comparable to those reported in a population-based survey similar in design and sample source to the present study.³²

The observed decrease in percentage of current drinkers with age coincides with findings in previous reports.^{11,37,38} However, age was not correlated with the probability of heavy drinking, a finding that has been observed by other researchers as well.^{4,39} Persons who continue heavy drinking through old age may be the remainder population exhibiting a survivor phenomenon.¹⁸ Unless these survivors are experiencing a type of threshold phenomenon, a decreasing proportion of heavy drinking due to mortality or morbidity would still be expected across advancing age categories. However, this trend was not observed. Also, in adjusted analyses, the number of current medical conditions did not discriminate heavy drinkers from the remainder of the sample. These findings suggest that heavy drinking is attributable to factors that affect the development and maintenance of drinking habits throughout life and that age is concomitant with these factors rather than a cause in itself.

Just as Smart and Liban⁴⁰ observed no significant association between religious participation and probability of alcohol problem symptoms or dependency among the elderly, this study found no significant association between church attendance and heavy drinking. Frequency of church attendance is undoubtedly affected by factors that preclude physical attendance. The presence of a number of current medical conditions and age in the logistic models, however, did not alter the finding. The study did not measure the degree of assimilation of religious stricture in the respondents' lives.

The number of current medical conditions was not correlated with heavy or

TABLE 1—Continued

	Total Sample ^a	Current Drinkers		Current Heavy Drinkers/Total Sample	
		No.	%	No.	%
Persons sharing household					
0	638	354	55	32	5
1	1117	797	71	73	7
2	257	150	58	14	5
≥ 3	116	72	62	3	3
Current cigarette smoker					
Yes	371	257	69	37	10
No	1821	1128	62	87	5

^aThe numbers in each total category and the corresponding percentages represent weighted numbers. Because of rounding errors, the weighted numbers in the status categories do not always equal the total number of cases.

current drinking. The enumeration of these conditions is not a direct measure of quality of life or degree of health, factors that may provide a more accurate assessment of the effect of health status on drinking behaviors of the elderly than do current medical conditions.

Adjusted analyses showed that the likelihood of heavy drinking increased as SES decreased, a relationship that has been reported by other researchers. Glynn et al.⁴ reported that lower SES men were twice as likely to drink three or more drinks per day than were higher SES men. Inverse relationships have also been observed between elderly problem or heavy drinking and components of the SES variable such as education.⁴¹

Present employment was associated with an increased likelihood of current drinking. It is probable that the relationship between current employment status and drinking is a correlate of health and quality of life. Some proportion of the elderly population is excluded from current employment because of illness or disablement, reasons observed in this study to be associated with a decreased likelihood of drinking. The elder subgroup that continues working may be experiencing lower rates of mortality and morbidity than those elders not employed. This "healthy worker effect" coincides with the Alameda County Aging Study, which, as previously noted, found good physical functioning in elders to be associated with moderate drinking.¹⁷

Previous investigations of health-related practices and health-status outcome have identified low-level alcohol use to be an independent predictor of decreased mortality and morbidity rates.⁴²⁻⁴⁴

Also, low alcohol intake tends to cluster with health-oriented behaviors.²¹ On the basis of this clustering effect, it was not unexpected to observe the inverse probability of current or heavy drinking.

Level of active lifestyle is not a significant determinant of heavy drinking. Alexander and Duff²⁰ found that an active or leisure-oriented lifestyle was associated with current and heavy drinking among the residents of three retirement communities, almost 20% of whom were defined as heavy drinkers who drank an average of at least two drinks per day. The populations of retirement communities, however, are self-selected in that the residents choose a particular environment and assume lifestyles inherent to that environment. Thus, observations drawn from such a sample may not be readily generalizable. Yet, a prosocial tone connected with an active lifestyle, as well as church attendance and current employment, appears to be involved in an explanation of current drinking. In the current study, removal of abstainers from the denominator to distinguish heavy drinkers from nonheavy drinkers revealed an inverse relationship between active lifestyle and heavy drinking (OR = 0.85; 95% confidence interval = 0.47, 1.55).

Adjusted analyses showed urban residency to be associated with an increased probability of heavy drinking while rural residency was negatively related to heavy drinking. The relationship between residence and heavy drinking may reflect the physical availability of alcohol, with urban environments offering greater access to alcohol. Supposition about the effect of residence on drinking, however, is pre-

TABLE 2—Logistic Regression Analyses of Drinking Status, by Study Variables

	Current Drinkers vs Current Abstainers		Current Heavy Drinkers vs Remainder of Sample	
	Odds Ratio	95% Confidence Interval	Odds Ratio	95% Confidence Interval
Sex (0, 1-male)	1.26****	1.12, 1.42	2.61****	2.05, 3.32
Age	0.97***	0.96, 0.99	0.98	0.94, 1.01
Race	0.90	0.70, 1.14	0.96	0.60, 1.55
Religion				
Catholic	1.59****	1.25, 2.00	1.00	0.64, 1.56
Protestant, evangelical or fundamentalist	0.72*	0.55, 0.94	1.13	0.66, 1.92
Protestant, not evan- gelical or funda- mental	1.02	0.79, 1.32	0.90	0.54, 1.51
Jewish	1.69	0.90, 3.16	0.61	0.17, 2.23
Other	0.70	0.47, 1.04	1.03	0.46, 2.32
None	0.73	0.42, 1.27	1.56	0.70, 3.48
Church attendance	1.26***	1.11, 1.44	1.24	0.97, 1.58
Marital status				
Married	1.16	0.94, 1.43	1.27	0.81, 2.01
Widowed	0.91	0.74, 1.12	1.36	0.86, 2.16
Divorced/separated	0.76	0.55, 1.04	0.86	0.45, 1.64
Never married	1.25	0.88, 1.78	0.72	0.34, 1.55
Socioeconomic status	1.01***	1.01, 1.02	0.98*	0.97, 0.99
Employment status				
Employed	1.32*	1.01, 1.73	1.15	0.64, 2.10
Retired	1.19	0.97, 1.45	1.33	0.80, 2.20
Disabled	0.64*	0.44, 0.94	0.73	0.30, 1.78
Homemaker	0.94	0.70, 1.25	0.93	0.36, 2.45
Other	1.01	0.60, 1.68	0.78	0.20, 3.02
Residence				
Urban	0.78**	0.67, 0.92	1.38	0.98, 1.94
Suburban	1.01	0.85, 1.18	1.63**	1.14, 2.34
Rural	1.27	1.00, 1.62	0.45**	0.27, 0.74
Health orientation	0.64****	0.51, 0.80	0.55**	0.35, 0.85
Active lifestyle	3.44****	2.54, 4.66	1.29	0.73, 2.27
Current number of medical conditions	1.08	1.00, 1.16	1.02	0.89, 1.17
Persons sharing household	0.87*	0.77, 0.99	0.73*	0.53, 0.99
Current cigarette smoker	1.14	0.99, 1.31	1.33*	1.05, 1.68

* $P \leq .05$; ** $P \leq .01$; *** $P \leq .001$; **** $P \leq .0001$.

sented cautiously because of the small number of rural heavy drinkers.

Multiple persons in a household may prompt the expectation of increased levels of social factors related to alcohol consumption. Bivariate analyses, however, revealed that respondents living with three or more persons were more apt to report smaller numbers of close friends and relatives, lower SES, and lower active lifestyle levels than respondents living with one or two persons. The current study did not investigate circumstances of living arrangements or quality of relationships. However, the negative relationships

seen between the number of persons currently living in the respondent's household and the respondent's drinking patterns suggest that elderly individuals might have multiple housemates for practical rather than social reasons. The lessened emphasis on social aspects may translate into fewer opportunities or encouragements to imbibe.

The relationship between cigarette and alcohol use is well documented; therefore, it was not surprising to find heavy drinking associated with current cigarette use.^{31,41,45} However, no significant association was seen for current

drinkers. A probable explanation for this lack of association lies in the nondifferentiation between never and former smokers. The inclusion of questions about lifetime cigarette use would have provided a more accurate assessment of the effect of cigarette use on the probability of current and heavy drinking. Also, a mortality differential by cigarette use within the sample's cohort could result in spurious conclusions about the association between cigarette use and drinking.

Although the population sample was derived from a single geographic area, the county is not so distinct as to severely limit the generalizability of the findings. Erie County is the 13th largest county in the United States.⁴⁶ It is principally urban and suburban, dominated by the cities and surrounding suburbs of Buffalo, Tonawanda, and Lackawanna. The distribution of the respondents' usual occupation throughout life (20% managerial/professional, 33% nonprofessional white collar, 11% service, 26% blue collar, 10% life-long homemaker) reflects the county's history of a diversified economy. The per capita income of Buffalo is similar to that of cities such as Baltimore, Philadelphia, and St. Louis.⁴⁶

Criticisms concerning the validity of questionnaire self-report of alcohol consumption have largely stemmed from comparisons between respondent diary and recall self-reports of alcohol intake. The strength of the criticisms about recall reports are tempered, however, by diary study limitations, such as the use of subjective rather than objective assessments of alcohol use, small sample sizes, and samples restricted to alcoholics in a clinical environment.⁴⁷⁻⁴⁹ In the current study, the use of diaries would have been impractical owing to the accompanying increased cost and time expenditures and the high degree of respondent compliance required over time. In addition, the hypotheses of the study were addressed at the group level of data analysis and did not require the level of individual detail obtained through diaries. Moreover, although concerns have been expressed about the applicability of recall measurements of alcohol use among elderly samples,⁵⁰ recall reports have been shown to provide adequate validity and reliability at the group level of analysis when comparative evaluations between recall and diary methods were done among the general population elderly.^{51,52}

The use of random-digit dialing to recruit the sample was supported by the fact that elderly persons are more likely to

have a telephone than are younger persons.⁵³ Despite increased random-digit dialing coverage, however, the elderly are less likely to participate in telephone surveys than are other age groups.^{54,55} The reported average response rates among the elderly, about 50% to 63%, are significantly lower than those for other age groups.⁵⁵⁻⁵⁷ In this regard, the study response rate of 66% proved to be above average. There are substantial reasons to believe that nonresponse bias was not a severe biasing factor in this study. As a pilot study for a proposed longitudinal follow-up, we attempted reinterviews with 179 of our original respondents and completed reinterviews with 123 of them. A comparison of the demographics and drinking patterns (from the original survey) of those who were available for a second interview with comparable data of those who were not available showed no statistically detectable differences except that the nonresponders were on average, 2 years older. Moreover, methodological research conducted by the National Institute of Drug Abuse⁵⁸ has tended to show that nonresponse is not a serious problem in drinking or drug surveys. When the institute's researchers located and interviewed (using a monetary incentive) a sample of those who had refused to participate in their annual national survey, the refusers proved to be almost identical on demographics and alcohol or drug use patterns to those who had granted an interview initially.

Telephone surveys also tend to over-represent those elderly individuals who are more likely to be highly educated, relatively healthy, and in the younger age groups.⁵⁶ Multivariate analyses controlled for the effects of these variables so that slight biases will not effect the statistical significance of other risk factors. Prevalence rates, however, will reflect these biases if they exist in the data.

Empirical research of data quality reveals no large-scale differential response effect by mode of collection (e.g., telephone call, face-to-face interview) that can be attributed to age. Mode differences that have been observed have generally been distributed equally across all age ranges; the elderly are no more susceptible than anyone else to mode effects in terms of level of missing data, response distributions, and number of answers to open-ended questions.⁵⁶ The evidence supports the use of telephone interviewing as a viable means of collecting data among the general population elderly.

In conclusion, the profile differences between current and heavy drinkers suggest different etiological mechanisms. However, measurement of current factors may not coincide with the presence or level of factors important in the development, maintenance, and adaptation of drinking patterns before age 60. Of the variables included in this report, level of health orientation offers the greatest opportunity to address heavy drinking among the elderly. □

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