Prevalence of Current DSM-IV Alcohol Use Disorders in Short-Stay, General Hospital Admissions, United States, 1994

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Background: This study provides, to our knowledge, the first national prevalence estimates of Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV), alcohol use disorders based on a structured, diagnostic instrument for inpatient admissions to US general hospitals. Existing prevalence estimates for inpatient admissions came from studies conducted in 1 or 2 hospitals and therefore do not support national inference.

Methods: A multistage probability sample was designed to represent acute care admissions to nonfederal, short-stay, general hospitals in the contiguous United States; 2040 admissions (1613 males and 427 females) in 90 hospitals participated.

Results: An estimated 1.8 million (95% confidence interval, 1.3-2.2 million) annual hospital admissions met the criteria for a current (ie, in the past 12 months) DSM-IV alcohol use disorder. Overall prevalence was estimated to be 7.4% (95% confidence interval, 5.6%-9.1%). Among current-drinking admissions, estimated prevalence was 24.0% (95% confidence interval, 18.7%-29.4%), and males and females had similar rates. Pairwise comparisons showed significant elevations in the prevalence of alcohol use disorders in current-drinking admissions who were younger, black, unmarried, of a lower socioeconomic status, on Medicaid or without health insurance, smokers, or drug users. Prevalence of alcohol use disorders was also significantly higher in current-drinking admissions in hospitals that were government owned, had medical school affiliations, or had a high number of emergency department visits per day.

Conclusions: The prevalence of alcohol abuse or dependence in current-drinking admissions was substantial, suggesting that hospitalization offers a unique opportunity to identify alcohol use disorders. Further research is needed to determine factors that may be associated with significant pairwise results, especially for race or ethnicity. We recommend alcohol screening of all hospitalized drinkers, followed, as appropriate, by diagnostic evaluation and referral or intervention.

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This article reports findings from the 1994 National Hospital Prevalence Study, the first survey of admissions to short-stay, US general hospitals that used an established diagnostic instrument to estimate the prevalence of current (ie, in the past 12 months) alcohol use disorders (alcohol abuse and alcohol dependence) as defined by the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV).1

Because the health effects of alcohol are so broad, alcohol epidemiology focusing on prevalence in hospital admissions is particularly important. Alcohol-related morbidity includes not only alcohol abuse and dependence but also damage to the liver, pancreas, gastrointestinal tract, heart, and central and peripheral nervous systems.2 Alcohol-related intentional and unintentional injuries also present significant health problems. In addition to disorders directly caused by alcohol, the effect of heavy drinking can be seen in disorders such as hypertension, impaired immune function, cardiac arrhythmias, and cerebrovascular disease.

Previous hospital-based research indicated the need to estimate the prevalence of alcohol use disorders in a national sample. Most previous research1-9 was conducted in 1 or 2 hospitals or in selected departments in a single hospital. Limitation in the geographic scope and in the characteristics of hospitals and patients made generalization of findings uncertain. Previous hospital prevalence studies also reported inpatient rates of alcoholism that were high and variable, ranging from approximately 7%-9% to approximately 28%.7

In addition, most previous research1-7,9 relied on screening instruments to iden-
tify alcoholism. Use of a diagnostic instrument would provide more accurate estimates of prevalence. Although screening instruments represent an excellent mechanism for identifying individuals at risk for alcoholism, they do not provide enough information to render a DSM-IV diagnosis. Furthermore, based on their sensitivity and specificity, screening measures yield false-positive and false-negative results, the magnitude of which varies with the particular screening test and with prevalence in the population screened.

Because previous research reported that physician detection rates of screen-positive alcoholism in hospital inpatients was less than adequate, estimating the prevalence of diagnosable alcohol use disorders in hospital admissions and subgroups of hospital admissions was needed to apprise physicians as to where their attention might best be focused. This is especially relevant because studies have shown the effectiveness of brief alcohol intervention in general hospital admissions.

Thus, the present research seeks to provide information about the prevalence of DSM-IV alcohol use disorders in admissions to short-stay, US general hospitals and to estimate the prevalence according to person and environmental characteristics.

METHODS

SURVEY METHODS AND RESPONDENTS

Surveys are studies that provide estimates for a population of interest based on a sample drawn from that population. Accordingly, the National Hospital Prevalence Study used a complex, multistage probability sample designed to represent adult acute care admissions to nonfederal, short-stay, general hospitals in the contiguous United States. Eligible hospitals had to have 1500 or more annual nonmaternity admissions. Specialty (eg, psychiatric) hospitals were excluded. The primary purpose of the National Hospital Prevalence Study was to estimate the prevalence of alcohol use disorders as defined by the DSM-IV among inpatient admissions and subgroups of admissions.

A large pilot project informed the research design and procedures. The developmental phase also explored alternative numbers of primary sampling units (PSUs), hospitals, and male and female admissions. The selected design balanced precision and feasibility.

The sampling frame was the 1992 hospital facilities database compiled by the SMG Marketing Group. Three sampling stages were used. In stage 1, PSUs (geographic areas in the contiguous United States that contained eligible hospitals) were selected using probability proportional to size sampling. Size was defined as the annual number of nonmaternity admissions to eligible hospitals within each PSU. After identification of self-representing units (PSUs so large that they were selected with certainty), non–self-representing PSUs were selected. Developed 316 PSUs, from which 32 were selected; 2 of these were self-representing.

In stage 2, we selected a sample from the 537 eligible hospitals within the 32 PSUs selected in stage 1. Using probability proportional to size sampling, 192 hospitals (6 per PSU) were initially identified for possible recruitment to allow for nonresponse. The 6 hospitals were randomly ordered and released for recruitment sequentially with a goal of obtaining 3 participating hospitals per PSU. Ultimately, 143 hospitals were approached, and 90 agreed to participate (62.9%). There were no significant differences between participating and nonparticipating hospitals based on medical school affiliation, government ownership, for-profit status, presence of a psychiatric unit, level 1 trauma center status, number of nonmaternity admissions, staffed beds, patient-days, emergency department visits, average length of stay, US census region, or local population density.

In stage 3, we selected a sample of admissions from each hospital agreeing to participate in stage 2. Because our emphasis was on estimating prevalence in acute care, short-stay, adult admissions, we excluded admissions younger than 18 years, long-term care admissions, same-day admissions and discharges, and childbirth-only admissions. Although one study goal was to estimate the overall prevalence of alcohol use disorders in general hospital admissions, a major focus was to determine the prevalence in at-risk subgroups. Thus, to increase the number of at-risk admissions selected for interview, we used a strategy that combined different sampling rates by sex with an initial screening process for males. Because inpatient male adolescents were significantly more likely to screen positive for alcoholism than inpatient females, we sought a larger proportion of diagnostic interviews with males. Furthermore, to target individuals at risk, we first screened males by using the Alcohol Use Disorders Identification Test. Females were not screened because pilot work showed a rate of positivity too low to be cost-effective.

We obtained 24-hour hospital admission lists and used a hospital- and sex-specific systematic sampling procedure to select eligible admissions after a random start. At this initial phase, we selected females for interview and males for screening. In a second (interview) phase for males, we selected all screen-positive males and a sample of approximately 1-in-4 screen-negative males. To support unbiased estimation of prevalence, survey weights were applied to account for the different sampling rates used for females and for males at the initial screening phase and the interview phase.

Approval by the Institutional Review Board of Abt Associates, Cambridge, Mass (the contractor that designed and fielded this research) was obtained, as was hospital-specific institutional review board approval where required (n = 53). Data were collected from 1613 males (520 screened positive and 1093 screened negative) and 427 females who gave written informed consent. Across participating hospitals, response rates were 72.3% for the female interview sample, 75.3% for the male screening sample, and 84.0% for the male interview sample. Taking hospital response rate into consideration and weighting male and female results by their corresponding total number of interviews, the overall response was 41.0%. In multistage studies, multiplicative effects of nonresponse produce lower overall response rates even when component rates are relatively high. We therefore conducted additional comparative analyses to identify potential sources of bias in the study’s findings that could have resulted from differences between the sample and the target population. Supporting the representativeness of our sample, comparison of National Hospital Prevalence Study admissions with adult, nonmaternity discharges from the 1994 National Hospital Discharge Survey revealed no significant differences in proportions based on sex, age, or race. Survey weights also adjusted for nonresponse at the hospital and admission level to support unbiased estimation from the survey to the target population.

In most cases, we interviewed the admission directly. Because collateral information was not obtained, our prevalence estimates may be conservative. When authorized by the hospital, we used proxy respondents in 2 situations: when the admission was unable to respond and when the admission requested a proxy. Proxies (n = 232) were typically spouses or other...
close relatives. Admissions for whom proxies responded were less likely than self-responding admissions to satisfy diagnostic criteria for alcohol use disorders even when age and severity of illness were controlled (P = .02). When self-responders alone were considered, prevalence increased from 7.4% to 8.2%.

MEASURES

The Alcohol Use Disorder and Associated Disabilities Interview Schedule (AUDADIS) was administered in face-to-face, computer-assisted personal interviews by trained field interviewers. The AUDADIS is a standardized, structured interview providing symptom information for diagnoses of current DSM-IV alcohol abuse and alcohol dependence. Studies using the AUDADIS demonstrated diagnostic reliability in a general population sample and in a clinical sample, with coefficients of 0.76 and 0.74, respectively. In a study using the AUDADIS in a heavy-drinking community sample, validity of the DSM-IV alcohol dependence diagnosis was demonstrated, but results for the DSM-IV abuse diagnosis were mixed. The authors discussed these findings in terms of the DSM-IV abuse construct, not inadequacies in the AUDADIS.

Current DSM-IV alcohol abuse and alcohol dependence involve maladaptive patterns of drinking leading to clinically significant impairment in the same 12-month period. Dependence is present when 3 of 7 symptom complexes (eg, tolerance and withdrawal) are evident. Abuse is present when 1 of 4 problems (eg, impaired role fulfillment and use in hazardous situations) is present and when dependence has never been present. Because we lacked sufficient information to identify lifetime alcohol dependence, we modified the latter abuse criterion to “dependence was not currently present.” Therefore, alcohol dependence may be underestimated and abuse may be overestimated to the extent that current abusers were previously dependent. Overall alcohol abuse was 1.1%. Because we combined abuse and dependence into a single analytic category (alcohol use disorders), criterion alteration did not affect reported rates. The method used to render DSM-IV diagnoses from interview data has been published elsewhere.

We investigated the prevalence of alcohol use disorders in admissions according to person and environmental characteristics. Person variables included sex, age, race and ethnicity, marital status (married or cohabiting vs not), health insurance coverage (Medicaid or no health insurance vs health insurance or Medicare), socioeconomic status (occupation and education combined following the method of Hollingshead), smoking status (self-reported regular cigarette use before admission), and drug use (self-reported use of illicit drugs or use of prescription psychoactive drugs in a nonprescribed manner in the past 12 months). Informed by the literature, environmental variables included hospital ownership, medical school affiliation, size, and emergency services. Other environmental variables were hospital location characteristics that might represent stressors: population density (metropolitan statistical area status), crime rates, high school dropout rates, percentage living in poverty, and percentage foreign born. Results of prevalence analyses for race prompted us to include population racial characteristics among environmental variables. Secondary sources for environmental data were as follows: population data, the 1990 US decennial census; 1994 trauma centers, the American Hospital Association; all other hospital characteristics, the 1994 SMG Marketing Group hospital facilities database.

RESULTS

Table 1 gives the distribution of admissions in 3 categories—all admissions (n = 2040), current-drinking admissions (n = 966), and admissions having a current DSM-IV alcohol use disorder (n = 380)—according to person characteristics.

We estimate that 1.8 million (95% confidence interval, 1.3-2.2 million) annual hospital admissions met the diagnostic criteria for current DSM-IV alcohol use disorders. Most of these, conservatively estimated to be 1.5 million (95% confidence interval, 1.1-1.9 million), were alcohol dependent. As given in Table 2, the overall estimated prevalence of current alcohol use disorder was 7.4% (95% confidence interval, 5.6%-9.1%). When current-drinkers only were considered, overall prevalence was estimated to be 24.0% (95% confidence interval, 18.7%-29.4%).

In terms of sex, the male-female ratio in all admissions was 2.6, whereas in current-drinking admissions it was 1.1. In terms of age, the Figure displays the estimated prevalence for all and current-drinking admissions in 4 age groups. The prevalence of current alcohol use disorder in current-drinking admissions was 44.1% for those aged 18 to 29 years, 35.7% for those aged 30 to 44 years, 28.1% for those aged 45 to 59 years, and 5.2% for those 60 years and older.

In Table 2, for all admissions and current-drinking admissions, pairwise tests of differences revealed significantly higher prevalence rates in admissions who were...
Disorders, Fourth Edition

among admissions in hospitals that were government owned, had medical school affiliations, or had high emergency department traffic. Among all admissions only, pairwise comparisons showed higher prevalence where the percentage of population foreign born was high and in metropolitan statistical area locations. For the estimated prevalence of alcohol use disorders among current-drinking admissions, pairwise tests of differences revealed significantly higher estimated prevalence rates for males than females. Among all admissions but not current-drinking admissions, estimated prevalence rates were significantly higher for males than females.

In Table 3, for all admissions and current-drinking admissions, pairwise tests of differences revealed significantly higher estimated prevalence rates among admissions in hospitals that were government owned, had medical school affiliations, or had high emergency department traffic. Among all admissions only, pairwise comparisons showed higher prevalence where the percentage of population foreign born was high and in metropolitan statistical area locations.

These findings show the magnitude of alcohol use disorders in hospital admissions. The 1.8 million general hospital admissions estimated as having current DSM-IV alcohol abuse or dependence in the present study is more than double the number discharged with first-listed diagnoses of acute myocardial infarction in 1994 and is on par with discharges having first-listed diagnoses of neoplasms in that year. The overall estimated prevalence of 7% was at the low point of estimates reported in the literature. However, the estimated prevalence of current DSM-IV alcohol use disorders among current-drinking admissions was 24% (primarily alcohol-dependent admissions), suggesting that hospitalization is an opportune time for case finding.

Despite a significantly lower prevalence of alcohol use disorders in females when all admissions were considered, the prevalence in current-drinking female admissions—23%—was not significantly different from that in current-drinking male admissions. This finding is important in light of research showing that vulnerability to alcohol-related health consequences occurs at lower levels of consumption in women than in men and that progression of alcohol dependence and alcohol-related brain and liver damage is more rapid in women than in men. Previous hospital prevalence research recommended that case-finding efforts focus on high-risk groups such as lower socioeconomic status males. Current findings indicate that drinking women cannot be overlooked in case-finding efforts.

Although alcohol abuse or dependence was significantly higher in younger (aged 18-44 years) than older admissions, the breakdown of age into 4 categories showed that 28% of current-drinking admissions aged 45 to 59 years and 9% of those aged 60 years or older had a current alcohol use disorder. This is important because even relatively modest drinking in older individuals may create problems owing to chronic illnesses and medication-alcohol interactions.

That estimated prevalence of alcohol use disorders in current-drinking black admissions was 45% compared with 21% in nonblack admissions indicates the need for concerted efforts at understanding and addressing this disparity. Previous investigations have reported higher alcohol-related cirrhosis death rates for blacks than for whites. Research has reported that black men experience higher rates of alcohol-related health problems than white men. Other research showed that blacks are more likely than whites to continue heavy drinking into middle age and that frequent heavy drinking was elevated in blacks and Hispanics compared with whites. Additional alcohol research is essential to determine factors that affect racial disparities in alcohol-related problems so that appropriate prevention and treatment activities can be formulated and relevant underlying factors can be addressed.

Findings of increased prevalence in unmarried and socioeconomically deprived admissions are consistent with previous hospital studies. In general, problem drinking tends to diminish with increasing age and marital responsibilities. Scientists have discussed the possible effect of sociocultural factors on findings relating to minority drinking. These factors, too, deserve further investigation in the context of alcohol use disorders in current-drinking hospital admissions.

The estimated 43% prevalence of alcohol use disorders among smokers in current-drinking admissions was not unexpected. Smoking was considered an important variable not only for its well-known adverse health effects but also because a synergistic relationship between smoking and drinking has been identified in the general population, suggesting potential prevention ramifications. Gulliver and colleagues found that for nearly half of smoking alcoholics, smoking was reduced by an average of 49% after alcoholism treatment.

Table 1. Weighted Distribution of Admissions to Short-Stay, General Hospitals According to Person Characteristics, United States, 1994

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>All (n = 2040)</th>
<th>Current Drinking (n = 966)</th>
<th>Current DSM-IV Alcohol Use Disorder (n = 380)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>46.0 (1.3)</td>
<td>67.8 (3.9)</td>
<td>69.1 (6.3)</td>
</tr>
<tr>
<td>Age, y</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18-29</td>
<td>8.3 (1.0)</td>
<td>15.0 (1.9)</td>
<td>27.4 (6.3)</td>
</tr>
<tr>
<td>30-44</td>
<td>17.9 (1.4)</td>
<td>26.3 (2.2)</td>
<td>38.9 (5.1)</td>
</tr>
<tr>
<td>45-59</td>
<td>20.5 (1.6)</td>
<td>21.9 (2.4)</td>
<td>25.8 (4.4)</td>
</tr>
<tr>
<td>60+</td>
<td>33.3 (2.4)</td>
<td>36.9 (3.6)</td>
<td>7.9 (2.0)</td>
</tr>
<tr>
<td>Black</td>
<td>12.6 (2.6)</td>
<td>12.1 (2.6)</td>
<td>22.4 (5.6)</td>
</tr>
<tr>
<td>Hispanic</td>
<td>6.6 (1.5)</td>
<td>8.0 (1.7)</td>
<td>11.1 (3.3)</td>
</tr>
<tr>
<td>Married</td>
<td>52.3 (1.9)</td>
<td>55.9 (2.8)</td>
<td>35.1 (3.7)</td>
</tr>
<tr>
<td>SES</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Upper</td>
<td>21.3 (1.6)</td>
<td>28.4 (1.8)</td>
<td>11.8 (2.5)</td>
</tr>
<tr>
<td>Middle</td>
<td>46.1 (2.2)</td>
<td>43.0 (3.6)</td>
<td>44.0 (6.5)</td>
</tr>
<tr>
<td>Lower</td>
<td>32.5 (2.7)</td>
<td>28.6 (3.9)</td>
<td>44.1 (5.3)</td>
</tr>
<tr>
<td>Medicaid or no insurance</td>
<td>12.2 (1.4)</td>
<td>12.6 (2.0)</td>
<td>22.5 (4.7)</td>
</tr>
<tr>
<td>Smoker</td>
<td>23.0 (1.6)</td>
<td>36.6 (3.5)</td>
<td>65.5 (5.8)</td>
</tr>
<tr>
<td>Drug user</td>
<td>10.9 (1.4)</td>
<td>24.3 (2.7)</td>
<td>54.7 (6.1)</td>
</tr>
</tbody>
</table>

Abbreviations: DSM-IV, Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition; SES, socioeconomic status.

*Percentages may not sum to 100% because of rounding.

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Comment

These findings show the magnitude of alcohol use disorders in hospital admissions. The 1.8 million general hospital admissions estimated as having current DSM-IV alcohol abuse or dependence in the present study is more than double the number discharged with first-listed diagnoses of acute myocardial infarction in 1994 and is on par with discharges having first-listed diagnoses of neoplasms in that year. The overall estimated prevalence of 7% was at the low point of estimates reported in the literature. However, the estimated prevalence of current DSM-IV alcohol use disorders among current-drinking admissions was 24% (primarily alcohol-dependent admissions), suggesting that hospitalization is an opportune time for case finding.

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The estimated 43% prevalence of alcohol use disorders among smokers in current-drinking admissions was not unexpected. Smoking was considered an important variable not only for its well-known adverse health effects but also because a synergistic relationship between smoking and drinking has been identified in the general population, suggesting potential prevention ramifications. Gulliver and colleagues found that for nearly half of smoking alcoholics, smoking was reduced by an average of 49% after alcoholism treatment.
Although most of the environmental characteristics investigated did not yield statistically significant results, prevalence estimates across environmental characteristics ranged from 18% to 34% in current-drinking admissions, suggesting substantial alcohol use disorders among current drinkers in all hospitals. In addition, findings of significant pairwise comparisons among environmental characteristics (government ownership, medical school affiliation, high emergency department traffic, high percentage foreign born, and metropolitan statistical area status), even as measured using secondary data, argue for further investigation of their relationship to prevalence.

In a comprehensive review, Soderstrom identified a “window of opportunity” for alcohol intervention in trauma patients since large proportions of emergency department patients, particularly those with injuries, have alcoholism. Our results suggest that hospitalization in general offers a similar window of opportunity. That nearly 1 in 4 hospital admissions who consumed alcohol had a diagnosable alcohol use disorder indicates that routine screening of hospitalized drinkers for alcohol problems would be productive and could have preventive and therapeutic effects for alcoholism and its consequences. Although not sufficient for rendering a DSM-IV alcohol use disorder diagnosis, screening represents an excellent mechanism for identifying individuals at risk so that further evaluation and appropriate referral or intervention can follow. Furthermore, screening of drinkers for alcohol problems could be accomplished during the routine history and physical that each inpatient receives, at little expenditure of time.

Routine screening of hospital admissions who use alcohol is especially important because of evidence that brief alcohol intervention in the hospital setting is effective. Studying problem drinkers on a medical unit of a general hospital, Chick et al found that an informational booklet and counseling by a nurse were associated with reduced alcohol-related problems 1 year later.
Moore et al\(^3\) found that hospital patients screening positive for alcoholism responded favorably to minimal physician interventions (eg, told diagnosis and advised patient to stop drinking; ordered consultation with alcoholism counselor or arranged for further treatment). Gentilello et al\(^4\) reported positive results for brief intervention in a trauma center in terms of reduced consumption and reduced risk of trauma readmission. Recent evidence also supports the cost-effectiveness of brief physician advice. In ambulatory medical settings, Fleming and colleagues\(^41\) found significant reductions in drinking measures and hospital days, and they estimated future savings of $4.30 in health care costs for every $1.00 spent in early intervention.

Methodologic issues in this research must be acknowledged. The relatively small sample size, especially of at-risk women, limited the analyses that were possible. Reliance on self-report as the sole basis for diagnosis and use of proxy respondents may have produced conservative prevalence estimates. The complex design featured different selection strategies for males and females that would have been biasing without the use of survey weights that were applied to support unbiased estimation of prevalence. These weights accounted for differences in probability of selection and adjusted for non-response.\(^12\),\(^15\),\(^19\) The multistage design contributed to a low overall response rate, but component response rates were adequate and comparative analyses supported representativeness. Although the data were collected in 1994, alcohol use disorders in patients continue to be of medical concern.\(^8\),\(^10\),\(^27\),\(^40\),\(^41\) However, more recent data would strengthen this research.

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**SUMMARY AND RECOMMENDATIONS**

These prevalence rates were derived from a sample designed to represent admissions entering nonfederal, short-stay, US general hospitals for acute care. Among current-drinking admissions, males and females were similarly affected, with nearly 1 in 4 satisfying the criteria for a current DSM-IV alcohol use disorder. Findings for current-drinking admissions aged 45 to 59 years and 60 years and older, as well as chronic illnesses in this group,\(^35\) indicate that older as well as younger admissions deserve attention. Prevalence rates for current-drinking black admissions were substantial, and previous research\(^2\),\(^36\),\(^37\) has indicated alcohol-related health differences between black and nonblack individuals. Thus, research into factors that

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**Table 3. Estimated Prevalence of Current DSM-IV Alcohol Use Disorders in Admissions to Short-Stay, General Hospitals According to Environment Characteristics, United States, 1994**

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>All Admissions (n = 2040)</th>
<th>Current-Drinking Admissions (n = 966)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Prevalence (95% CI), %</td>
<td>Contrast P Value</td>
</tr>
<tr>
<td>Hospital location</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Government owned</td>
<td>12.3 (8.8-15.8)</td>
<td>.004</td>
</tr>
<tr>
<td>Not government owned</td>
<td>6.3 (4.5-8.1)</td>
<td></td>
</tr>
<tr>
<td>Level 1 or 2 trauma center</td>
<td>11.1 (5.2-16.9)</td>
<td>.20</td>
</tr>
<tr>
<td>No trauma center</td>
<td>6.2 (3.7-8.8)</td>
<td></td>
</tr>
<tr>
<td>Medical school affiliation</td>
<td>9.7 (7.0-12.3)</td>
<td>.01</td>
</tr>
<tr>
<td>No medical school affiliation</td>
<td>4.7 (2.5-6.8)</td>
<td></td>
</tr>
<tr>
<td>High No. of ED visits per day</td>
<td>10.5 (8.0-13.0)</td>
<td>.01</td>
</tr>
<tr>
<td>Lower No. of ED visits per day</td>
<td>5.6 (3.4-7.8)</td>
<td></td>
</tr>
<tr>
<td>High No. of patient-days per year</td>
<td>10.0 (5.8-14.2)</td>
<td>.17</td>
</tr>
<tr>
<td>Lower No. of patient-days per year</td>
<td>6.1 (3.8-8.4)</td>
<td></td>
</tr>
<tr>
<td>Hospital location</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-MSA location</td>
<td>4.7 (3.2-6.2)</td>
<td>.01</td>
</tr>
<tr>
<td>MSA location</td>
<td>7.7 (5.8-9.7)</td>
<td></td>
</tr>
<tr>
<td>High % of population in poverty</td>
<td>7.1 (4.9-10.1)</td>
<td>.86</td>
</tr>
<tr>
<td>Lower % of population in poverty</td>
<td>7.8 (4.3-10.8)</td>
<td></td>
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<tr>
<td>High % of population foreign born</td>
<td>10.3 (7.2-13.3)</td>
<td>.02</td>
</tr>
<tr>
<td>Lower % of population foreign born</td>
<td>5.8 (3.7-8.0)</td>
<td></td>
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<tr>
<td>High % of population black</td>
<td>7.2 (5.0-9.5)</td>
<td>.90</td>
</tr>
<tr>
<td>Lower % of population black</td>
<td>7.5 (4.9-10.0)</td>
<td></td>
</tr>
<tr>
<td>High HS dropout rate</td>
<td>7.9 (4.9-10.9)</td>
<td>.78</td>
</tr>
<tr>
<td>Lower HS dropout rate</td>
<td>7.1 (3.9-10.3)</td>
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<tr>
<td>High violent crime rate</td>
<td>10.1 (6.2-14.1)</td>
<td>.13</td>
</tr>
<tr>
<td>Lower violent crime rate</td>
<td>5.9 (3.6-8.2)</td>
<td></td>
</tr>
</tbody>
</table>

Abbreviations: CI, confidence interval; DSM-IV, Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition; ED, emergency department; HS, high school; MSA, metropolitan statistical area.

*None of the environmental characteristics remained significant when the Dunnett C procedure for multiple comparisons\(^25\) was applied to these 22 contrasts. Sources for environmental data were as follows: population data, 1990 US decennial census;\(^28\) 1994 trauma centers, American Hospital Association;\(^29\) all other hospital characteristics, 1994 SMG Marketing Group hospital facilities database.\(^36\)
might account for the disparity is needed so that appropriate prevention and treatment efforts can be formulated and underlying factors can be addressed.

Overall, hospitalization represents a unique opportunity for identifying alcohol use disorders. Based on these findings, we recommend routine alcohol screening of all current-drinking hospital admissions, followed, as appropriate, by diagnostic evaluation and referral or intervention.

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REFERENCES