ALCOHOL ALERT

NATIONAL EPIDEMIOLOGIC SURVEY ON ALCOHOL AND RELATED CONDITIONS

Alcohol-related consequences run the gamut. Yet many health care providers see only the most severe cases—such as patients suffering from advanced alcohol-related liver disease or those with a history of alcohol dependence. Seeing only the severe end of the spectrum of alcohol-related consequences provides a shortsighted view, however, and not a true picture of how alcohol abuse and dependence influence the population as a whole.

Epidemiology, one of the foundations of public health, provides this broader view. Alcohol epidemiology gives specific information on the distribution of alcohol use, abuse, dependence, and other consequences in the population as well as related risk factors.

Such information is vital. By identifying those subpopulations at greatest risk for a particular alcohol-related problem, public health professionals can target their prevention strategies to intervene early, before these problems fully develop. Likewise, having a better understanding of the link between alcohol use and other drug use and/or psychiatric disorders can help treatment providers design more targeted screening and more effective treatments for their patients. Long-term epidemiologic data can help treatment providers to appreciate the natural history of alcohol use disorders (AUDs) and, thus, tailor and improve treatment.

In 2001–2002, the National Institute on Alcohol Abuse and Alcoholism (NIAAA) conducted the first wave of the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC), the largest and most ambitious survey of this type conducted to date. The second wave of the

survey took place from 2004 to 2005. The result is a detailed and comprehensive dataset related to alcohol and a range of comorbid disorders. This *Alcohol Alert* showcases NESARC, including a brief history of the methods used to conduct this groundbreaking survey, selected findings, and discussion of how this information can be put into everyday practice.

NESARC'S UNIQUE DESIGN

NESARC contained an extensive battery of questions about present and past alcohol consumption, AUDs, and the use of alcohol treatment services. NESARC also included similar questions related to tobacco and illicit drug use (including nicotine dependence and drug use disorders) as well as questions designed to determine a wide variety of psychiatric disorders such as major depression, anxiety disorders, and personality disorders. Information was collected in face-to-face computer-assisted interviews conducted in the participants' homes.

NESARC is unparalleled in a number of ways—for example, its size. Wave 1 surveyed a total of 43,093 people. Sample size is important because the larger the sample size, the more accurate the findings. NESARC's unusually large sample size also made it possible to achieve stable estimates of even rare conditions. Response rate is equally important. A high response rate is key to legitimizing the results of the survey. In recent years, survey researchers have struggled to achieve satisfactory response rates (1). The

"NESARC contained an extensive battery of questions about present and past alcohol consumption."

response rate for NESARC is 81 percent, very high by the standards of recent large-scale national surveys.

NESARC participants came from all walks of life and a variety of ages. They represented all regions of the United States and included residents of the District of Columbia, Alaska, and Hawaii. In addition to sampling people living in traditional households, NESARC investigators questioned military personnel living off base and people living in a variety of group accommodations such as boarding or rooming houses and college quarters. By including these different types of housing, the investigators were able to obtain data on people not typically captured by household surveys.

To ensure that minority and special populations were well represented in the sample, NESARC oversampled Blacks, Hispanics, and young adults ages 18–24. As a result, the survey produced enough minority respondents to answer questions of race/ethnic disparities in comorbidity and access to health care services.

NESARC's unique design has resulted in a rich dataset. Analyses using these data have only just begun, but the initial 50 peer-reviewed publications provide valuable insights into the breadth and depth of this dataset as well as some of the critical research questions that are being answered using this information. Selected findings and their implications are highlighted here.

SELECTED FINDINGS FROM NESARC

The Magnitude of the Problem and Trends over Time— AUDs are common and disabling disorders in the United States, yet current information on the prevalence of these disorders and how they have changed over the past decade has been lacking. In a landmark analysis performed using the data from NESARC and its predecessor survey, the 1991–1992 National Longitudinal Alcohol Epidemiologic Survey (NLAES), researchers were able to examine for the first time trends in alcohol abuse and dependence between 1991–1992 and 2001–2002 (2). They found that alcohol abuse increased from 3.03 percent to 4.65 percent, whereas dependence declined from 4.38 percent to 3.81 percent.

When the researchers looked closer, they found that increases in alcohol abuse were found in both men and women, particularly among young Blacks and Hispanics. Rates of dependence increased among men overall, young Black women, and Asian men. However, there was a decrease in the overall rate of dependence. This finding is not surprising, as most measures of alcohol consumption have declined slightly over this time period. The reasons behind this rise in rates of abuse and dependence among minority young adults are unclear and will need further investigation. This study underscores the importance of monitoring prevalence and tracking trends in alcohol abuse and dependence as a means of better targeting prevention strategies to those individuals who need them most.

*Drinking Patterns/Risky Drinking—*Healthy People 2010, a national health promotion and disease prevention initia-

tive, is designed to increase the quality and years of healthy life of people living in the United States (for more information, see www.healthypeople.gov). One of the Healthy People 2010 goals regarding alcohol use is to reduce the proportion of adults who drink more than the recommended daily and weekly limits.

Researchers used NESARC and NLAES survey results to look at trends in drinking limits over the years (3) and to determine whether the goals set by Healthy People 2010 could be met.

The study found that the higher risk drinkers—those who exceeded either the daily or weekly recommended drinking limits[1]—saw a slight decrease in prevalence, declining from 32.1 percent to 29.3 percent between 1991–1992 and 2001–2002. On the other hand, more people exceeded the weekly (but not the daily) limits in 2001–2002. As an example, if a woman has two drinks a night every weekday and three drinks on both Saturday and Sunday night, she has not exceeded the maximum daily limit. However, she has had a total of 16 drinks over the course of the week, which does exceed the recommended maximum weekly limit. She may not be a particularly high-risk drinker, never drinking over the daily limit, but she belongs to a group of people who saw the greatest increase in prevalence—from 9.4 percent to 10.3 percent—in the 10-year period between the two surveys. Based on these findings, it will require significantly more effort to achieve the goals set by the Healthy People initiative.

In another study, researchers reported that the risks of meeting the criteria for both alcohol abuse and dependence were in direct proportion to how often people exceeded the daily drinking limits (4). When the researchers looked at the maximum number of drinks consumed on any given day and the overall number of drinks consumed per week, they found that these, too, were associated with an increased risk of AUDs. These findings have particular relevance for those involved in screening for alcohol problems, underscoring the importance of asking patients about both their daily and weekly alcohol consumption levels.

A group of people who are at particular risk from drinking is pregnant women or women who may become pregnant. Drinking during pregnancy can result in a wide range of alcohol-related consequences to the developing fetus (5). Caetano and colleagues (6) used NESARC data to examine the epidemiology of drinking among women of childbearing age. The researchers reported that drinking during pregnancy continues to be a problem among women of childbearing age. The researchers concluded that prevention efforts need to be developed that are more comprehensive and which better target women who are pregnant and those who may become pregnant who are drinking at high-risk levels.

*Underage Drinking—*People who begin to drink at a young age are at much higher risk of developing a problem

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[1] Daily limits are defined as no more than four standard drinks a day for men and no more than three a day for women. Weekly limits are no more than 14 standard drinks a week for men and 7 for women.

with alcohol later in life. This link between early drinking and later problems was first demonstrated using NLAES data. Researchers found that 45 percent of the people who began drinking before the age of 14 developed later alcohol dependence, compared with only 10 percent of those who waited until they were 21 or older to start drinking (7).

This initial analysis linked early drinking with later alcohol problems but did not address whether starting to drink at a younger age was associated with developing dependence at a younger age. Using NESARC data, the researchers were able to delve deeper. They found that people who began drinking at an early age not only were more likely to experience alcohol dependence in their lifetime but to develop that dependence within 10 years of beginning drinking, to become dependent before age 25, and to show signs of dependence during the year prior to the survey (8).

Early drinkers also experienced multiple episodes of dependence; that is, they had bouts of dependence followed by times of nondependence. This is a unique aspect of alcoholism and the primary reason this disease is classified as a chronic and relapsing condition. These findings on the risks of early drinking stress the importance of screening and counseling adolescents about alcohol use as well as implementing policies and programs that delay alcohol consumption.

Another problem associated with underage drinking—drinking and driving—has been extensively studied (9). But much less is known about other consequences of youthful drinking. French and Maclean (10) used NESARC data to study the effects of underage drinking on a variety of delinquency and criminal behaviors, including bullying people, stealing, vandalizing property, and other illegal acts. They found strong evidence that drinking alcohol is related to both delinquency and criminal activity with strong gender differences in the types of activities involved.

Young Adult Drinking—Research shows that people are most likely to drink the heaviest in their late teens and early twenties (11). In 2001–2002, about 70 percent of young adults, or about 19 million people, reported drinking in the year preceding this survey (12). NESARC data are helping to better define drinking among young adults. For example, Do college students drink more than their noncollege student peers? To answer this question, Dawson and colleagues (13) used NESARC data to estimate rates of heavy episodic (or binge[2]) drinking, alcohol abuse, and alcohol dependence among adults ages 18–29.

The researchers then looked at the relationship of these rates to student status and residence. They found that although rates of heavy episodic drinking were slightly

[2] NIAAA's National Advisory Council defines binge drinking as a pattern of drinking alcohol that brings blood alcohol concentration (BAC) to 0.08 gram-percent or above. For a typical adult this pattern corresponds to consuming five or more drinks (male), or four or more drinks (female) in about 2 hours.

METHODOLOGY

In survey research, measurement is an important issue. To make valid comparisons and report trends, researchers need to know what they are measuring and be able to measure the same thing consistently over time. This is particularly challenging when dealing with alcohol abuse and dependence, which historically are difficult to measure.

Scientists have used special measurement methods, including item response theory, to determine whether the diagnostic criteria[1] for alcohol abuse and dependence are grouped in clusters or arrayed along a continuum of severity (1). Their finding that the DSM–IV diagnostic criteria do form a continuum of severity calls into question the concept that alcohol abuse and dependence are different and distinct entities as well as the concept that abuse is a milder disorder than dependence. The authors suggest that the dependence criterion of drinking larger amounts or longer than intended occurs at the milder end of the continuum. Other criteria such as tolerance, withdrawal, impaired control, and serious social and occupational dysfunction fall toward the more severe end of the AUD spectrum. Work such as this will contribute significantly to subsequent revisions of the diagnostic criteria for the full range of alcohol use disorders.

To understand the validity of the DSM–IV alcohol abuse and dependence criteria, scientists also are using a special statistical technique called latent variable modeling, a useful technique for dealing with situations where variables of interest are not directly observed but must be estimated from a number of related variables. With such a model, they can measure latent variables such as AUDs and estimate their associations with factors such as medical and psychiatric conditions, treatment, and family history to determine the validity of the DSM–IV classification of alcohol abuse and dependence symptoms. The investigators found further evidence to support the validity of DSM–IV alcohol dependence in the general population (2), but support for the validity of DSM–IV alcohol abuse was less clear. These findings, too, will enhance the development of subsequent versions of the DSM.

[1] DSM-IV criteria, as defined by the *Diagnostic and Statistical Manual of Mental Disorders–Fourth Edition,* American Psychiatric Association.

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higher for college students than for non-college students, the greatest differences were related to where those young adults lived. For example, about a third of both college students and other college-age youth who lived with their parents or other relatives reported heavy episodic drinking in the past year. In contrast, 46.5 percent of college students living off campus and 51.8 of those living on campus reported heavy episodic drinking, as did 40 percent of other college-age youth living independently. The authors conclude that heavy episodic drinking and AUDs are common among all young adults, not just those attending college.

Comorbidity—The NESARC dataset, representing the largest and most ambitious comorbidity study ever conducted, offers researchers the opportunity to examine in detail the link between AUDs and other psychiatric problems—from pathological gambling and nicotine dependence to anxiety disorders and bipolar disorder.

Examples of some of the conditions examined so far include antisocial personality disorder and associated comorbidity (14), the prevalence and co-occurrence of alcohol and drug use disorders with axis I and II disorders[3] by race/ethnicity (15), sex differences in pathological gambling and co-occurring alcohol and drug disorders (16), past-year drinking and nonmedical use of prescription drugs (17), panic disorder and agoraphobia and comorbidity (18), lifetime comorbidity of mood and anxiety disorders and specific drug use disorders (19), prevalence and comorbidity of generalized anxiety disorder (20), prevalence and comorbidity of bipolar I disorder and axis I and II disorders (21), major depression (22), co-occurrence of personality disorders (23), psychopathology associated with drinking and AUDs (24), co-occurrence of mood and anxiety disorders and personality disorders (25), nicotine dependence and psychiatric disorders (26), and the prevalence and co-occurrence of substance use disorders and mood and anxiety disorders (27). Taken together, the findings from these papers highlight the high prevalence and diversity of comorbidity and underscore the need for clinicians to diagnose and treat comorbid conditions as well as AUDs.

Because NESARC included oversampling of minorities, it is now possible to examine the prevalence of comorbidity in subgroups that never before had been studied. For example, very few large national surveys have been able to examine the prevalence of psychiatric disorders among Asians and Native Americans in the United States. With NESARC, researchers have been able to study race/ethnic differences in the prevalence and co-occurrence of a variety of substance use and psychiatric disorders among Whites, Blacks, Asians, Native Americans, and Hispanics. Researchers reported that 12-month rates of most mood, anxiety, and substance use disorders generally were greatest among Native Americans and lowest among Asians. On the other hand, alcohol dependence was associated most strongly with anxiety disorders among Whites, Blacks, and Asians but not among Native Americans. More studies are needed to further identify

"The findings highlight the high prevalence and diversity of comorbidity."

and tease apart the risk factors underlying both prevalence and comorbidity in these different race/ethnic groups (28).

Consequences—The NESARC dataset also is helping to identify the wide range of problems that result from excessive alcohol use—from alcohol-related crashes to sexually transmitted diseases (STDs).

In 2005, approximately 40 percent of traffic fatalities in the United States were alcohol related (29). Despite the magnitude of the problem, there are serious gaps in our knowledge of the prevalence of drinking-and-driving behaviors in the general population. Using NESARC data, researchers have examined drinking-and-driving behaviors[4] in the general population. They found that in 2001–2002, 23.4 million, or 11.3 percent, of American adults ages 18 and older reported one or more drinking-and-driving behaviors (30). Age was inversely associated with risk—that is, younger respondents were more likely to be at risk, and men were three times more likely to engage in these behaviors than women. In addition, the data suggested that Native Americans, people who were widowed/separated/divorced or never married, and those with schooling beyond a high school education were all at greater risk for drinking-and-driving behaviors.

Treatment and Recovery—Perhaps one of the most practical uses of NESARC data will be in studying the treatment for and recovery from alcohol dependence in a large population. Because the survey was conducted in the general population, it provides a very different view from studies that have been conducted using clinical samples—that is, people already seeking help for their problems with alcohol.

Using NESARC, Dawson and colleagues (31) examined data on people who experienced the onset of alcohol dependence at some point before the year prior to the survey. In this sample, 25.0 percent were still alcohol dependent, 27.3 percent were in partial remission, 11.8 percent were in full remission but drinking at levels or patterns that put them at high risk for relapse, 17.7 percent were low-risk drinkers, and 18.2 percent were abstainers during the year prior to the survey.

It is interesting to note that only 25.5 percent of these respondents reported ever receiving treatment. Of this 25.5 percent, 3.1 percent participated in 12–Step programs, 5.4

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[3] Axis I: Clinical Syndromes—refers to clinical disorders (e.g., depression, schizophrenia, social phobia, or other conditions that may be a focus of clinical attention). Axis II: Developmental Disorders and Personality Disorders—includes developmental disorders that usually first appear during childhood, such as autism; and personality disorders (i.e., enduring, pervasive, inflexible patterns of inner experience or behavior that deviate markedly from cultural expectations, are stable over time, and lead to distress or impairment) such as paranoid, antisocial, and borderline personality disorders.

[4] Their analysis looked at driver-based behaviors (people who drove while drinking or after having too much to drink) as well as passenger-based behaviors (people who rode in a car with a drinking driver and those who rode as a passenger while drinking).

percent received formal treatment only, and the remaining 17.0 percent participated in both 12–Step and formal treatment programs (32).

In another study, Dawson and colleagues (33) looked at the influence of major life events—such as graduating from college, gaining employment, getting married, and becoming parents—on recovery from alcohol problems. The authors concluded that some of these transitional life events have a strong effect on recovery, whereas for others, failure to make the transition is associated with continued dependence.

This work shows that there is a wide range of recovery from alcohol dependence in the general population, from partial remission to full abstinence. It also shows that the track of this disease is not clear-cut—some people appear to recover from alcoholism without formal treatment. Others may cycle into and out of dependence throughout their lifetime despite repeated attempts to achieve sobriety.

Conclusion

NESARC is an example of a large, random, representative survey of adults living in the United States. This survey addressed all aspects of alcohol use—from determining when a respondent took his or her first drink to discovering whether he or she had experienced co-occurring mental health problems. NESARC data have several practical applications. They can help us to define the intricate relationship between alcohol use and comorbidity, to further characterize high-risk drinking patterns, to design better-targeted treatment approaches, and to monitor recovery from AUDs. Analyses with NESARC data have only just begun. As more researchers take advantage of the richness of this dataset, more knowledge will be gained, helping to advance prevention efforts and treatment interventions in the alcohol field.

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Resources

Source material for this *Alcohol Alert* originally appeared in *Alcohol Research & Health,* Volume 29, Number 2, 2006. For more information on recent advances in alcohol epidemiology, see also:

▶ ***Alcohol Research & Health,* Vol. 29, Number 2, 2006:** Includes reprints of articles from scholarly journals highlighting results of the NESARC survey. Other articles provide background on the NESARC survey, and describe how NESARC findings can be put into practice. Covers a range of topics, including the epidemiology of underage and young adult drinking, comorbidity, and treatment and recovery.

▶ **The NESARC Web site, at http://niaaa.census.gov/:** Contains information about NESARC, including news for users; information about survey goals, methodology, and confidentiality; a code book, questionnaire index, and data reference manual; and a list of publications based on the NESARC findings.

▶ **For these and other resources, visit NIAAA's Web site, www.niaaa.nih.gov**

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