

# Alcohol and Highway Safety: Special Report on Race/Ethnicity And Impaired Driving



U.S. Department of Transportation  
**National Highway Traffic Safety  
Administration**



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Technical Report Documentation Page

1. Report No. <b>DOT HS 811 336</b>	2. Government Accession No.	3. Recipient's Catalog No.	
4. Title and Subtitle <b>Alcohol and Highway Safety: Special Report on Race/Ethnicity and Impaired Driving</b>		5. Report Date <b>December 2010</b>	
		6. Performing Organization Code	
7. Author(s) <b>Eduardo Romano, Robert B. Voas, and John C. Lacey</b>		8. Performing Organization Report No.	
9. Performing Organization Name and Address <b>Pacific Institute for Research and Evaluation                  11720 Beltsville Drive, Suite 900                  Calverton, MD 20705-3111                  Phone: 301-755-2700 Fax: 301-755-2799</b>		10. Work Unit No. (TRAIIS)	
		11. Contract or Grant No. <b>DTNH22-02-D-95121</b>	
12. Sponsoring Agency Name and Address <b>National Highway Traffic Safety Administration                  1200 New Jersey Avenue, SE.                  Washington, DC 20590</b>		13. Type of Report and Period Covered <b>FINAL DRAFT REPORT                  8/25/2005 – 10/15/2007</b>	
		14. Sponsoring Agency Code	
15. Supplementary Notes <b>Dereece Smither was the COTR for this project.</b>			
16. Abstract  <p style="text-align: center;">                     This report reviews the state of knowledge of alcohol-impaired driving among major racial and ethnic groups living in the United States. Although it primarily focuses on the relationship between impaired driving and race/ethnicity, this review also covers patterns of alcohol use and misuse among various racial and ethnic groups within the United States.                 </p>			
17. Key Words <b>Race/Ethnicity; Acculturation; Alcohol Consumption; Impaired Driving; At-Risk Drivers; Health-Related Disparities</b>		18. Distribution Statement <b>Document is available to the public from the National Technical Information Service                  www.ntis.gov</b>	
19 Security Classif. (of this report) <b>Unclassified</b>	20. Security Classif. (of this page) <b>Unclassified</b>	21 No. of Pages <b>76</b>	22. Price

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## **List of Acronyms**

ALDH2-2	aldehyde dehydrogenase 2
Asians/PIs	Asians and Pacific Islanders
BAC	blood alcohol concentration
BRFSS	Behavioral Risk Factor Surveillance System
CDC	Centers for Disease Control and Prevention
CIR	crash incidence ratio
DMV	department of motor vehicles
DOJ	Department of Justice
DUI	driving under the influence
DWI	driving while intoxicated
FARS	Fatality Analysis Reporting System
g/dL	grams per deciliter
HIV/AIDS	Human Immunodeficiency Virus/ Acquired Immunodeficiency Syndrome
LCAT	Latino Council on Alcohol and Tobacco Prevention
NAS	National Alcohol Survey
NCADI	National Clearinghouse for Alcohol and Drug Information
NESARC	National Epidemiologic Survey on Alcohol and Related Conditions
NHSDA	National Household Survey on Drug Abuse
NHTSA	National Highway Traffic Safety Administration
NLAES	National Longitudinal Alcohol Epidemiologic Survey
NSDDAB	National Survey on Drinking and Driving Attitudes and Behavior
NSDUH	National Survey on Drug Use and Health
OMB	Office of Management and Budget
OWI	operating while impaired
PIRE	Pacific Institute for Research and Evaluation
RAIR	relative accident involvement ratio
RDD	random-digit dialing
SAMHSA	Substance Abuse and Mental Health Services Administration
SES	socioeconomic status
SWITRS	Statewide Integrated Traffic Records System
USDHHS	U.S. Department of Health and Human Services
VMT	vehicle miles traveled
YRBS	Youth Risk Behavior Survey

## 1. Executive Summary

The racial and ethnic composition of the U.S. population is rapidly evolving. This is of substantial importance to traffic safety specialists because there is extensive evidence that the risk of involvement in traffic crashes varies significantly across racial and ethnic groups. Protective and risk factors affecting some groups may not be relevant to others. To be effective, safety programs and educational messages to curb such risks need to be sensitive to the Nation's growing cultural diversity. This report reviews the state of the knowledge of alcohol-impaired driving among major racial and ethnic groups living in the United States. Although it focuses primarily on impaired driving, it also covers the precursor issue of the differences in ethnic drinking practices. Finally, this report explores the meaning of key concepts that define the problem—for example, the meaning of race, ethnicity, and acculturation; how these concepts are associated with health-related disparities; and how they relate to impaired driving.

### 1.1 Method

In conducting the literature review, we first reviewed documents available at relevant agencies, such as the National Highway Traffic Safety Administration (NHTSA), the National Institutes of Health, and the Centers for Disease Control and Prevention (CDC). Access to relevant documents was facilitated by Government officials in those agencies and through a search of the agencies' Web sites. We used EBSCO Information Services and Web search engines, such as PubMed and Google. As part of Pacific Institute for Research and Evaluation's Library and Information services, EBSCOhost provides access to a variety of databases covering many subjects through access to scholarly and peer-reviewed journals and other sources. Using EBSCOhost, we accessed the following indexes: *Biomedical Reference Collection: Corporate Edition*, *Medline*, *Nursing and Allied Health Collection: Comprehensive Edition*, *PsycARTICLES*, *Psychology & Behavioral Sciences Collection*, *SocINDEX with Full Text*, and other indexes. In searching EBSCOhost and PubMed, we used a variety of keywords: race, ethnicity, Whites, Blacks, African-Americans, Native Americans, Hispanics, Latinos, Latinas, Asian, Pacific Islanders, Mexican, Cuban, Chinese, Korean, health disparities, discrimination, acculturation, immigration, DWI, DUI, OWI, drinking, driving, alcohol, beer, facial flushing, motor vehicle, and crash. Google was used to search for documents not captured by previous sources, such as articles in foreign newspapers.

The materials selected for this report were from the most scientifically reliable publications: books, peer-reviewed articles, or agency-sponsored documents. Almost all the reviewed documents were published in the United States, but a few from other countries were included when appropriate, such as discussing driving patterns in Latin America or South Asia.

When our review of the literature revealed that research on a certain issue had produced a relatively large number of contradictory findings, we classified these contradictions according to the main sources of the inconsistencies and then summarized them in a table. If available, we also presented published guidelines to deal with contradictions or uncertainty (e.g., the Office of Management and Budget's [OMB's] guidelines for studies involving racial and ethnic groups).

Besides reviewing published material, we used data at our disposal concerning race/ethnicity and motor-vehicle fatal crashes to produce tables and graphs that illustrate and complement related findings in the literature (e.g., Table 1. Motor-vehicle crash fatalities and alcohol-related fatalities by year and race/ethnicity).

We discuss a select number of the reviewed studies in detail because they illustrate current thinking. The remaining studies support the points made in the selected studies.

## **1.2 Findings**

As a society, we have made progress in our understanding of the role that race and ethnicity play on impaired driving, but our knowledge is still limited. The need to understand this role has increased over the last 20 years, particularly during the last decade when efforts to produce culturally competent approaches to curb impaired driving became a required standard.

Earlier efforts to learn about differences in drinking and drinking-and-driving patterns focused on major racial/ethnic groups. These earlier efforts faced important limitations, however. Defining a racial/ethnic group was neither straightforward nor agreed upon. There exists a lack of consensus about what constitutes a race or an ethnicity, as well as how each group should be addressed (e.g., Hispanics or Latinos, American Indians or Native Americans). Further, these major groups are far from homogeneous, and within each group there is tremendous variability. Some of this within-group variation is associated with the country of origin (“Hispanics” could include Mexicans, Cubans, and Filipinos), tribal membership (e.g., Navajos, Hopis), immigration status, and acculturation level. Currently, researchers are struggling to establish common grounds among these groups while realizing that the large variation within them complicates the effort.

What can be agreed upon, so far, is that members of racial and ethnic minorities in the United States (particularly African-Americans, Hispanics, and Native Americans) are experiencing poorer physical health than their White counterparts. Some disparities affecting these groups are the prevalence of diseases, such as cancer, cardiovascular diseases, obesity, diabetes, human immunodeficiency virus/acquired immunodeficiency syndrome (HIV/AIDS), infant mortality, and alcohol-related injuries. Asians, on the other hand, are usually viewed as a “model minority.”<sup>1</sup> That stereotype, however, ignores the variation among Asian subgroups and the vulnerability some of these subgroups are facing (e.g., Varma, 2001).

Inequalities in socioeconomic status (SES), such as income and education, explain many health disparities in the United States (e.g., Braver, 2003; Feinstein, 1993; House et al., 1996; Varma, 2001), but SES alone cannot sufficiently explain them all. Furthermore, the direct relationship between low SES and poor health sometimes reverses, with recent immigrants of low SES showing better health indicators than Whites of comparable SES.

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<sup>1</sup> Although the term “model majority” is widely used to portray Asian-Americans as a hard-working group with relatively few alcohol and drugs problems, the use of the term “model minority” does not have a clear origin. After an extensive search of the Web, the authors of this review found that many sites claim that the “model minority” was first coined by sociologist William Petersen in 1966, in an article published in the *New York Times Magazine* titled “Success Story: Japanese-American Style” (Petersen, 1966).



Culturally based values and perceptions play an important role in shaping health-related disparities. For instance, African-Americans and Hispanics, more than Whites, believe their health depends upon fate and destiny (Lewis & Green, 2000), a finding that helps explain disparities associated with the lower effort to seek medical treatment or lower seat belt use among these groups. For members of some minority groups, factors such as the psychological and physiological toll of stress produced by racism and discrimination contribute to the health disparity problem.

There is strong consensus that alcohol abstention is high among Asians and low among Whites (Substance Abuse and Mental Health Services Administration [SAMHSA], 2000, 2004a, 2004b; 2005). Most researchers also agree that abstention rates are higher among African-Americans and Hispanics and lower among Native Americans. Similarly, there is consensus that rates of binge drinking and heavy drinking tend to be high among Native Americans, followed closely by Hispanics and Whites, with Asians showing the lowest rates of binge drinking and heavy drinking.<sup>2</sup>

The literature shows some conflicting results for African-Americans, however. Some reports indicate African-American drinkers show relatively low rates of binge drinking and heavy drinking; other reports show rates comparable to (or higher than) those for Whites or Hispanics. These latter studies postulate the notion of “two worlds” of alcohol use among African-Americans and Hispanics: a large majority of individuals engages in relatively light drinking and a much smaller group engages in heavy drinking and binge drinking.

Digging deeper, there is a large variation in drinking patterns within each group. These patterns vary by country or tribal origin (e.g., Vietnamese-Americans, Mexican-Americans, or Navajos being cited as drinking more than Filipino-Americans, Cuban-Americans, or Hopis); by gender (women drinking less than men); by age (for Whites, heavy drinking decreases abruptly from their 20s to their 30s, whereas the opposite trend occurs among African-Americans, particularly men); by acculturation level (e.g., more-acculturated Latinas consume more alcohol than less-acculturated ones); and even by genetic factors (e.g., facial flushing—a physiological reaction to ingestion of alcohol among Asians). There are a myriad of suggested reasons for the observed disparities in drinking patterns among and between these groups. Some of them include the low SES of many members of these groups; the perception by African-Americans and Native Americans of heavy drinking as an ethnic characteristic, closely related to the “Black” (for African-American) or “Indian” (for Native American) way of life; *machismo* (particularly for Hispanic males); religiosity; social disorganization (such as family breakdown); and experiences with discrimination (drinking to reduce stress and relieve tension).

We also found that Native American and White drivers are consistently reported among those most at risk for alcohol-impaired driving, whereas Asians are among the least vulnerable. For Hispanics and African-Americans, the picture is less clear: arrest data and crash data show an overrepresentation of both groups in impaired-driving events, whereas self-report data from national surveys show lower rates of impaired driving for these groups.

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<sup>2</sup> Binge: 5+ drinks on the same occasion on at least 1 day in the past 30 days. Heavy: 5+ drinks on the same occasion on each of 5 or more days in the past 30 days.

A picture this general is affected by several modifiers. Age, gender, and marital status play a similar role across racial/ethnic groups, with impaired driving being more prevalent among young, single males. However, gender-related differences in impaired driving are larger among Hispanics than among Whites.

Differences in impaired-driving rates among racial/ethnic groups have been related to variations in the way members of different racial/ethnic groups perceive the risk associated with drinking and driving. Hispanics are less likely to consider driving while intoxicated (DWI) a safety problem, or believe they will be arrested or punished, or both. Fatalism (the perception by a driver that the driver has no control over the likelihood of a crash), which has been reported to be higher among Hispanics and African-Americans than among other groups, also has been suggested as a contributor to the DWI problem. Machismo has also been suggested as the reason for the much greater prevalence of impaired driving among Hispanic males (than among Hispanic females). There is no clear evidence to support this hypothesis, however.

Vulnerability to impaired driving varies geographically, being higher around alcohol outlets, with increasing density in low-income neighborhoods. Similarly, the Mexican/U.S. border is a region in which Hispanics returning from Mexican bars are at a high risk of impaired driving. Rural settings are also a contributing factor to DWI. This factor might be particularly relevant to Native Americans living on “dry” (no alcohol allowed) reservations.

Peer-reviewed studies on whether policy changes differentially affect impaired driving in minority populations are rare. There is consensus, however, about the need to develop culturally sensitive messages—although there is no clear understanding of what these messages must say. Some suggestions provided by the literature are the use of peers and friends to disseminate positive information among Hispanic and White teenagers (the usefulness of this procedure is not as clear among Asians); the need to include law enforcement officers in prevention programs, although for some groups this inclusion may generate some level of rejection; the need to use a language that is spoken by the target audience and is simple and jargon-free; the need to find adequate channels of communication for the target audience; and the need to incorporate the way drinking alcohol is perceived in the culture of the targeted audience.

## 2. Introduction

The number of alcohol-impaired driving crashes has decreased substantially since 1982, when accurate recordkeeping of alcohol involvement began. The number of alcohol-impaired driving fatalities in 2006 was about 36 percent lower than in 1982 (Table 1). This beneficial trend has been attributed to the implementation of a battery of effective measures, such as safer vehicles and roads, sobriety checkpoints, .08 grams per deciliter (g/dL) blood alcohol concentration (BAC) laws, minimum legal drinking age laws, zero-tolerance laws for young drivers, and court-monitoring programs (e.g., Voas, 2000).

**Table 1. Alcohol-Impaired Driving Fatalities in Motor Vehicle Traffic Crashes by Year and Race/Ethnicity**

Year	Fatalities											
	Total		African-Americans		Asians/Pacific Islanders		Hispanics		Native Americans		Whites	
	N	% Imp-Driv	N	% Imp-Driv	N	% Imp-Driv	N	% Imp-Driv	N	% Imp-Driv	N	% Imp-Driv
1982	21,113	48										
1983	20,051	47										
1984	19,638	44										
1985	18,125	41										
1986	19,554	42										
1987	18,813	41										
1988	18,611	40										
1989	17,521	38										
1990	17,705	40										
1991	15,827	38										
1992	14,049	36										
1993	13,739	34										
1994	13,390	33										
1995	13,478	32										
1996	13,451	32										
1997	12,757	30										
1998	12,546	30										
1999	12,555	30	1,155	29.1	102	18.6	1,439	36.3	289	44.9	7,047	30.1
2000	13,324	32	1,297	31.9	117	20.6	1,254	36.3	300	49.3	6,928	30.3
2001	13,290	31	1,426	32.4	113	21.6	1,762	38.3	277	47.7	7,534	30.4
2002	13,472	31	1,425	31.0	109	19.2	1,855	37.7	306	46.9	8,400	31.1
2003	13,096	31	1,401	29.8	116	20.0	1,861	36.2	285	43.8	8,314	30.1
2004	13,099	31	1,421	31.4	111	19.8	1,874	36.2	286	45.5	7,724	29.5
2005	13,582	31	1,415	31.6	130	21.1	2,071	37.6	317	50.7	7,892	30.1
2006	13,491	32	1,388	30.8	128	22.7	1,941	35.9	338	48.1	7,601	30.6

Source: PIRE computations based on FARS data. Fatalities include all types of road users (i.e., all records showing variable inj\_sev = 4 are included). Variables "Race" and "Hispanic" in FARS were used to define race/ethnicity. Information on race and ethnicity was absent from FARS before 1999. Racial/ethnic groups other than Hispanic are considered non-Hispanic. Because information on race/ethnicity was not provided for all fatally injured victims, adding fatalities for separate racial/ethnic groups does not match the total number of fatalities (i.e., column "N" for "Total" also includes records with missing race/ethnic information). BAC information was provided by FARS either through a direct measurement or through multiple imputations. A motor vehicle crash is considered to be an alcohol-impaired driving crash if at least one driver or motorcycle rider involved in the crash is determined to have had a BAC level of .08 g/dL or higher.

However, progress on all types of alcohol-related crashes (fatal, nonfatal, property damage only) has stalled over the past decade (e.g., Stewart, Fell, & Sweedler, 2004). Future progress will require efforts that are more specialized and that have an increased focus on the needs of drivers most vulnerable to alcohol-related crashes.

There is clear evidence about the existence of disparities in the involvement of racial and ethnic groups in alcohol-impaired driving crashes. Table 1 illustrates these disparities for fatal crashes. Table 1 also illustrates the scarcity of data on the role of race/ethnicity in fatal crashes and the recentness of efforts to remedy this limitation and acquire reliable data. The large and increasing diversity of our Nation and our traditional values in favor of social equity suggest that efforts to reduce racial/ethnic disparities in impaired driving could result in further benefits for our society.

Early studies on the subject revealed that race and ethnicity are related to several safety problems, such as seat belt nonuse, risky driving, and impaired driving. For instance, drivers from African-American, Hispanic, or Native American backgrounds were found to be more vulnerable to impaired driving than their White counterparts (e.g., Massie, Campbell, & Williams, 1995; Davies & Griffin, 1996; Massie, Green, & Campbell, 1997; Grunbaum et al., 2002; Statewide Integrated Traffic Records System [SWITRS], 2001). This vulnerability is associated with factors other than differences in SES (Braver, 2003). Interestingly, the relative vulnerability of these groups to impaired driving is somewhat contrasted with their relative susceptibility to consumption of alcohol. As mentioned, alcohol consumption is relatively high among Whites.

Thus, current research is yielding a complex picture with contradictory results. It has become increasingly clear that there is a large variation in culture, norms, and behavior within each racial/ethnic group that is larger by far than the observed variation between groups. Age, gender, country of origin, immigration status, and acculturation level are only a few of the many factors that interact with SES in adding complexity to this issue and blurring our understanding of the role of race/ethnicity on impaired driving.

The goal of this report was to review the literature on the role of race and ethnicity in impaired driving. We inserted this review within the broader fields of health-related disparities and alcohol abuse to report on current findings in the literature on which researchers consistently agree and disagree. In this report, we also suggest possible explanations for those factors that produce disagreement.

The remainder of this document is organized as follows. Section 3 reviews in detail the concepts of race and ethnicity. Guidelines developed by OMB are presented, and problems and limitations associated with these concepts are discussed. Section 4 provides an overview of health-related factors affecting racial/ethnic groups in the United States. This overview includes the introduction of the concept of health disparity, the introduction of some of the health-related conditions for which racial/ethnic disparities have been detected, and a brief description of some of the factors promoting these disparities. Section 5 discusses differences in alcohol consumption across racial/ethnic groups. Important mediators for the role of race/ethnicity on alcohol consumption (e.g., age, gender, acculturation, SES) are introduced and described. Section 6 reviews the role of race and ethnicity on impaired driving. This section begins with a broad

overview of the status and trends involving the prevalence of impaired driving across major racial/ethnic groups. Relevant mediators and modifiers to the role of race/ethnicity on impaired driving are also discussed. Section 7 reviews some of the main components that culturally competent prevention programs should include. References follow.

### **3. Race and Ethnicity: Concept and Measurement**

#### **3.1 Defining Race/Ethnicity**

There is no consensus regarding the definition of racial/ethnic groups (i.e., whether they reflect biological characteristics, ancestry, geographic origins, or sociocultural membership); therefore, the distinctions between specific racial/ethnic identifiers (e.g., Hispanic, White) are not universally understood or accepted. According to Hahn and Stroup (1994), there is ambiguity regarding the criteria of group membership, which results in fuzzy group boundaries rather than specific and mutually exclusive racial and ethnic categories. In addition, inconsistencies in racial/ethnic classification can occur across data sets because of differing methods of data collection (i.e., self-identification on survey, interviewer's observation, reports by next of kin, or archival data) (McKenney & Bennett, 1994). To address these issues, in 1997 the OMB established five minimum categories for collecting and analyzing data on race—American Indian or Alaska Native, Asian, Black or African-American, Native Hawaiian or Other Pacific Islander, and White—and two categories for data on ethnicity—Hispanic or Latino and Not Hispanic or Latino (OMB, 1997). However, perhaps related to sample-size restrictions, research on traffic crashes has usually focused on the following five racial/ethnic groups: American Indians or Native Americans, African-Americans or Blacks, Asians and Pacific Islanders (Asians/Pis), Hispanics or Latinos, and Whites (with all groups other than Hispanics being non-Hispanics). In this report, we focus on these five groups. Herein, we refer to any group other than Hispanic or Latino as non-Hispanic, and we use labels, such as African-American and Black, Hispanic and Latino, or Native American and American Indian interchangeably.

#### **3.2 Self-Identification**

Many individuals have trouble identifying themselves with a racial and ethnic group as understood by health researchers (Beal et al., 2006). For instance, Moscou, Anderson, Kaplan, and Valencia (2003) reported that about 30 percent of hospital patients described themselves differently from the race/ethnic category shown on their hospital registration forms. A recent national survey of Hispanics (Brodie, Suro, Steffenson, Valdez, & Levin, 2002) found that, when asked how they would describe themselves, about half (54%) indicated they primarily identify themselves with their parents' country of origin and about a quarter (24%) preferred "Latino" or "Hispanic."

#### **3.3 Heterogeneity Within Racial/Ethnic Groups**

Racial/ethnic groups are not homogeneous. Therefore, the use of simplistic categorical labels to refer to heterogeneous ethnic/cultural groups (referred to as "ethnic gloss," by Trimble, 1991) may yield misleading results when these labels are used by researchers and policy-makers. Important variation in rates of alcohol consumption occurs within racial/ethnic groups by gender,

acculturation level, or country of origin. Asian-Americans as a whole are considered less vulnerable to alcohol consumption than other groups (e.g., SAMHSA, 2001-2005), but this consideration overlooks the tremendous variation that exists among Asian-Americans, who in the United States are represented by more than 28 countries of origin (National Clearinghouse for Alcohol and Drug Information [NCADI], 1997). Further, the immense variability of Asian-American groups has caused the “invisibility” of certain Asian-American groups (a term coined by Srinivasan & Guillermo, 2000) from health-related data sets, for some data collectors routinely fail to properly include or describe many of those subgroups (Srinivasan & Guillermo, 2000). On the other side of the alcohol stereotype, Native Americans are usually considered highly vulnerable to alcohol consumption, but this generalization frequently fails to note that there are more than 500 tribes of Native Americans for whom patterns of alcohol use vary significantly (May, 1982; Mancall, 1995). Differences in alcohol consumption and associated risk factors also occur among African-Americans and Hispanics and African-American and Caribbean-American Black adolescents (e.g., Epstein, 2002; Aguirre-Molina & Caetano, 1994; Voas, Tippetts, & Fisher, 2000b). As Caetano, Clark, and Tam (1998) warned: “Studies often do not take into consideration the variability that exists within each ethnic group, resulting in inaccurate generalizations” (p. 1).

### **3.4 Acculturation**

As with race/ethnicity, the concept of acculturation—the extent to which ethnic group members participate in the cultural traditions, values, and practices of the U.S. society (Snowden & Hines, 1998, cited by Caetano & Clark, 2002)—is not easy to define. First addressed by Redfield, Linton, and Herskovits in 1936, the acculturation concept evolved from being one-dimensional (i.e., the continuous, intergenerational moving from one culture into the values of another culture until complete assimilation) to its current complex, multifaceted version in which complete assimilation may never occur (Trimble, 2002), and simultaneous identification with two cultures is possible (Phinney, 2002).<sup>3</sup> The complexity of the acculturation concept is enhanced by several factors acting at the individual level, such as forced versus voluntary migration and degree of similarity between the original and new culture (Balls Organista, Organista, & Kurasaki, 2002).

The acculturation construct may have different characteristics when applied to racial/ethnic groups such as Asians, Hispanics, African-Americans, or Native Americans. For many Asians and Hispanics, the concept of acculturation is closely related to the amount of time since immigrating to the United States (e.g., Chun & Akutsu, 2002). However, although immigration is an important determinant of the acculturation process for many Blacks in the United States, particularly those of Caribbean origin (e.g., Ghazal Read, Emerson, & Tarlov, 2005), acculturation for this group may relate more to “the principle of return” in which individuals return to the values and customs of their culture of origin (Landrine & Klonoff, 1996). Herd and Grube (1996) found that for African-Americans, greater awareness or ethnic identity and involvement in African-American social networks predicted more conservative drinking norms and higher levels of religiosity.

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<sup>3</sup> Complete assimilation occurs when immigrants’ cultural identities are no longer different from that of the majority in the host country (Chapman & Perriera, 2005).

Measuring acculturation is not a straightforward process. Typically, for Hispanics, acculturation measures adopt the form of scales constructed from a combination of variables that cover relevant domains of the acculturation concept (Zane & Mak, 2002). Some variables that represent these domains are place of birth, language use, language preference, language proficiency, actual or perceived group identification, types of food eaten, types of music preferred, media consumed, and many others. Of all these categories, language was the preferred and most common indicator of acculturation for Asians and Hispanics, accounting for the majority of the variance in acculturation constructs (Zane & Mak, 2002; Marin & Gamba, 1996; Marín, Sabogal, Marin, Otero-Sabogal, & Perez-Stable, 1987). For African-Americans, scales, such as the African-American Acculturation Scale (Landrine & Klonoff, 1994), assess the extent to which the subject knows about and engages in African-American culture. Items include adherence to cultural traditions, daily cultural activities, social affiliation, perceived discrimination, spirituality, and cultural beliefs (Zane & Mak, 2002).

### **3.5 Self-Report versus Archival Data**

Research has shown that self-reported information tends to underreport actual substance use, particularly for young Hispanics and African-Americans (Johnson & Bowman, 2003). In comparing self-reported rates of drinking and driving with official statistics, differences have been found for some racial/ethnic groups. For instance, using archival data, Harper, Marine, Garret, Lezotte, and Lowenstein (2000) found that Hispanics have a higher rate of alcohol involvement in motor-vehicle crashes than their White counterparts. However, based on self-reported drinking-and-driving behavior, some studies have shown that Hispanics underreport drinking and driving more frequently than Whites do (Ross, Howard, Ganikos, & Taylor, 1991; Jones & Lacey, 1998; Bond & Cherpitel, 2004).

### **3.6 Racial Profiling**

The possible targeting of minority populations through law enforcement profiling has become a sensitive issue, particularly since 1998 when the U.S. Department of Justice (DOJ) investigated several State and local law enforcement departments that allegedly had discriminated in traffic and crime enforcement in general (e.g., *United States v. New Jersey*, 1999; and *U.S. Department of Justice v. Montgomery County, Maryland*, 2000). Besides its negative social connotations, racial profiling may bias the accuracy of arrest data for researchers. In particular, it has been argued that Hispanics and African-Americans are overrepresented in drinking-and-driving studies because of the stronger presence of law enforcement in areas where Hispanic-Americans and African-Americans, compared to Whites, tend to drink and drive (Hyman, Helrich, & Besson, 1972; Caetano, 1984; Caetano & Clark, 1998; Herd, 1994; Lapham, Skipper, Chang, Barton, & Kennedy, 1998; Wallace, 1999). Studies of impaired driving among minority groups based on arrest data might be biased if the data were subject to racial profiling.

A few years after DOJ initiated its investigation on racial profiling, more than 20 States passed legislation that prohibited racial profiling or mandated data collection on stops and searches or both (Racial Profiling Data Collection Resource Center, 2008). In his February 27, 2001, address to a Joint Session of Congress, President George W. Bush declared that racial profiling is “wrong and we will end it in America” (U.S. Department of Justice, p. 1). However, the progress currently achieved, in particular after September 11, 2001, is still debatable (Racial Profiling Data Collection Resource Center, 2008).

Lange, Johnson, and Voas (2005) pointed out that most studies estimate the prevalence of racial profiling by law enforcement officers by comparing the racial/ethnic distribution of traffic violators stopped by law enforcement officers with the racial/ethnic distribution of all drivers. The authors argued that such comparisons may not be valid because they are based on the assumption that racial/ethnic distributions for traffic violators and nonviolators are identical. Lange and colleagues tested the validity of the assumption that the distributions would be the same. In 2000-2001, they collected race/ethnicity data at tollbooth exits on all drivers using the New Jersey Turnpike. In addition, they gathered data on the racial/ethnic distribution of drivers who exceeded the speed limit as measured by roadside automatic radar speed recorders. Their data were then compared with the race/ethnicity of speed limit violators cited by the police. They found that the proportion of Black drivers speeding was the same as the proportion cited by the police; however, the proportion of Blacks in both of groups was higher than the proportion of that racial group in the total driver population using the Turnpike. This gave the appearance that profiling was occurring when the police were actually citing Blacks at the same frequency as they were speeding.

### **SUMMARY**

There is evidence suggesting that race and ethnicity play an important role in shaping the prevalence of health-related disparities, such as those associated with impaired driving. There is no consensus, however, about what constitutes a racial or an ethnic category, or on how each group should be named (e.g., Hispanics or Latinos, American Indians, or Native Americans). In 1997, OMB addressed this issue by differentiating between the concept of race (e.g., Asian, Black, Native American, and White) and ethnicity (Hispanic and non-Hispanic). In this report, we follow the basic 1997 OMB guidelines. We refer to any group other than Hispanic or Latino as non-Hispanic, and we use labels such as African-American and Black, Hispanic and Latino, or Native American and American Indian interchangeably.

Aside from agreeing on proper group naming and ethnic membership definitions, traffic safety researchers concerned with racial/ethnic issues must address other analytical considerations. Researchers must isolate culturally related behavior from other confounding factors (such as SES, gender, or age). Other sources of bias inherent to the building of the racial/ethnic construct include confounding factors such as the large heterogeneity that exists within each racial/ethnic group that must be considered. Some of this within-group variation is associated with country of origin (e.g., Mexicans, Cubans, Chinese, and Filipinos), tribal membership (e.g., Navajos, Hopis), immigration status, and acculturation level. The source of the data used in the impaired-driving field may also affect the outcome of racial/ethnic studies, with self-reported information underreporting actual substance use, particularly for Hispanics and African-Americans. In addition, researchers must acknowledge the possibility of racial profiling by law enforcement officers, which may bias the outcome of racial/ethnic studies on impaired driving based on arrest data.



## 4. Health-Related Disparities in the United States

### 4.1 Introduction

In December 2005, the *National Healthcare Disparities Report* (U.S. Department of Health and Human Services [USDHHS], 2005) found that disparities related to race, ethnicity, and SES still pervade the American health care system. The differences among ethnic groups in alcohol-related crashes evolve from a variety of factors of which only a portion relate to limitations in opportunities. Some relate to language limitations or to lack of knowledge of U.S. traffic regulations or laws. Others relate to cultural attitudes toward alcohol or driving. Some differences are a product of residence location (urban locations have lower mileage fatality rates). Other differences result from socioeconomic differences—for example, lack of access to a vehicle or driving an older, less safe vehicle. Most research has focused on health disparities based on the concern for equal access to health facilities. This section reviews the concept of health disparity. It provides some examples of health disparities other than alcohol and discusses the factors that contribute to them (disparities on alcohol consumption and impaired driving are discussed in other sections).

### 4.2 Defining Disparity

In 2000, the CDC reported that “current information about the biologic and genetic characteristics of African-Americans, Hispanics, American Indians, Alaska-Natives, Asians, Native Hawaiians, and Pacific Islanders does not explain the health disparities experienced by these groups compared with the White, non-Hispanic population in the United States” (Centers for Disease Control and Prevention, n.d.). Disparities have been identified in a wide spectrum of health-related problems. Relative to Whites, members of racial and ethnic minorities in the United States (particularly African-Americans, Hispanics, and Native Americans) experience poorer physical health (Schultz et al., 2000; Hummer, 1996; Krieger, Rowley, Herman, Avery, & Phillips, 1993). Schulman and colleagues (1999) found that, in simulations with patients, identical requests for heart disease care received different recommendations based on the patient’s race and gender.

#### *a. Some Examples of Health-Related Disparities*

Some of these disparities include the prevalence of diseases such as cancer. The fatality rate for all cancers is 30 percent higher for African-Americans than for Whites; for prostate cancer, it is more than double the rates for Whites; and African-American women have a higher fatality rate from breast cancer despite having a mammography screening rate that is nearly the same as that of White women (CDC, 2005). Also, compared to White women, Hispanic women have higher rates of cervical, esophageal, gallbladder, and stomach cancers (USDHHS, 2005), as well as cardiovascular diseases, obesity, diabetes—especially among Mexican-Americans—(USDHHS, 2000), and HIV/AIDS. In fact, unadjusted prevalence estimates for the year 2004 showed that 82 percent of the new cases of AIDS were reported among African-American (67%) and Hispanic (15%) women (CDC, 2005). The age-adjusted rate of diabetes and HIV-related fatalities among Native Americans has increased 93 percent and 417 percent, respectively, between 1987 and 1999, compared with a 39 percent and 129 percent increase, respectively, for the whole United States (Indian Health Service, 1999; Jones-Saumty, Thomas, Phillips, Tivis, &

Nixon, 2003). Among Native Americans, the infant mortality rate remains 22 percent greater than for the United States. Regarding alcohol-related injuries, an analysis of patients admitted to an emergency room in California suggests that alcohol may play less of a role in injury among African-Americans than among Whites or Hispanics. The analysis showed that injured African-American patients were less likely than Hispanics and Whites to report heavy drinking before an injury (Cherpitel, 1998).

On the other side of the health-disparity problem, Asians are usually viewed as a “model minority,” with higher levels of education and income and lower substance abuse problems than other minorities (Varma, 2001). As Varma pointed out, however, “the model minority stereotype ends up diverting public attention from the existence of discrimination since it is assumed that the battle against discrimination has been won for Asians” (p. 9). Such a stereotype ignores the variation that exists among Asian subgroups (Mancall, 1995).

***b. Contributors to Health-Related Disparities***

The CDC’s Office of Minority Health pointed out that “[c]urrent information about the biologic and genetic characteristics of minority populations does not explain the health disparities experienced by these groups compared with the White, non-Hispanic population in the United States. These disparities are believed to be the result of the complex interaction among genetic variations, environmental factors, and specific health behaviors” (CDC, n.d., p. 1).

It is generally agreed that inequalities in SES, such as income and education, explain many health disparities in the United States. Population groups with poor health status tend to be those with the lowest SES (e.g., CDC, n.d.; House et al., 1996). Many of the health disparities observed among African-Americans, Hispanics, Native Americans, and Whites might be attributed to the larger proportion of members of the first three groups who have a low SES. The higher a group’s income level is, the greater the opportunity their members have to enjoy better housing, to live in safer neighborhoods, to access medical care more easily, and to engage in health-promoting behaviors (Williams, 2001). More than 50 percent of all causes of mortality for Native Americans may be linked to smoking, alcohol and other drug use, diet, sedentary lifestyle, and nonintentional injuries (McGinnis & Foege, 1993), with higher SES being correlated with better education and better access to risk information (Zambrana, Cornelius, Boykin, & Lopez, 2004).

SES alone, however, cannot explain some of the observed health disparities (e.g., Herd, 1994; Buka, 2002). Researchers have also recognized the contribution of factors such as the psychological and physiological toll of stress produced by racism and discrimination (e.g., Williams, 2001; Zsembik & Fennell, 2005) or the acquisition of negative health behaviors with acculturative processes (Amaro & de la Torre, 2002).

Furthermore, there are cases for which the direct relationship between low SES and poor health reverses. Paschall, Bersamin, and Flewelling (2005), after studying the 1999 National Household Survey on Drug Abuse (NHSDA), reported that college status was positively associated with heavy alcohol use among White young adults but inversely related among Blacks and Asians. Many studies have documented the superior health status of recent immigrants of

any racial/ethnic group versus their established counterparts (e.g., Popkin & Udry, 1998; Ghazal Read et al., 2005). For instance, Markides and Coreil (1986) were puzzled because southwestern Mexican-Americans, despite their high-risk SES profile, had less overall mortality rates and longer life expectancies at birth than Whites (albeit they were at a disadvantage in other health indicators, such as diabetes and infectious and parasitic diseases). A similar finding involving the relative superior health status of minority individuals was reported among African-American immigrants (Ghazal Read et al., 2005) and Asian immigrants (Marmot & Syme, 1976; Patel, Patel, Keith, Piotrowski, & Chi, 1997). Immigration and acculturation status have been postulated to be key explanatory variables for this phenomenon. Proponents of the “selectivity hypothesis” have argued that the better relative health status of some recent immigrants could be attributed to these individuals being the healthiest, most assertive, and most resilient subgroup in their communities (Marmot, Adelstein, & Bulusu, 1984; Rosenwaike, 1991; Palinkas & Pickwell, 1995).

Conversely, other studies have shown immigrants to be more vulnerable to certain health risks (e.g., smoking, alcohol abuse, and eating disorders). Cho, Frisbie, Hummer, and Rogers (2004) view these alternative findings as being consistent with the “selectivity hypothesis,” suggesting that immigrants may be healthier than their U.S.-born counterparts, but acculturative stress and SES limitations cause this advantage to deteriorate rapidly with time spent in the United States.

Culturally based values and perceptions also play a role in shaping health-related disparities. For instance, African-Americans and Hispanics, more than Whites, believe that their health is dependent upon fate and destiny (Lewis & Green, 2000). Individuals with external locus of control believe that their own behavior does not matter much and that rewards and consequences in life are generally outside of their control. For instance, the literature shows that many Hispanic women have a fatalistic approach to some of the risks they face (e.g., cancer), which leads to their disregard of risk-reducing measures (e.g., Luquis & Villanueva Cruz, 2006; Goldman & Risica, 2004). This fatalism has been found to contribute to disparities in seat belt use (e.g., Peltzer, 2003). Although it might also be partially responsible for perceived differences in drinking and driving among African-Americans, Hispanics, and other racial/ethnic groups, this possibility has not been clearly proven (Abraido-Lanza et al., 2007).<sup>4</sup>

Racial/ethnic health disparities related to quality of care have also surfaced. For instance, compared to Whites, Hispanics face larger delays in emergency care or less-than-optimal care during hospitalizations, or both (e.g., Henderson, Magana, Korn, Genna, & Bretsky, 2002; Bradley et al., 2004). Some of these disparities are accentuated by the perception of African-American or Hispanic patients that caregivers (e.g., hospital staff) do not respect or consider their preferences (Hicks et al., 2005). Bad experiences with caregivers promote negative attitudes toward health care: minority patients who feel they have been treated unfairly or disrespectfully by health care providers are less likely to follow doctors’ advice or seek followup care (Cooper-Patrick et al., 1999; Blanchard & Lurie, 2004).

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<sup>4</sup> For a review of the role of fatalism on health-related issues involving the Latino population, see Abraido-Lanza et al., 2007.

Lack of insurance coverage is another barrier to proper care. Minority groups are more likely than Whites to be uninsured (Monheit & Vistnes, 2000). According to Shi (2000), Hispanics are the most likely to be uninsured (35.4%), followed by Native Americans (27.3%), African-Americans (25.6%), and Asians (21.2%). Schmidt, Greenfield, and Mulia (2006) reviewed the last two National Alcohol Surveys (NASs) and reported that 41 percent of Hispanics and 28 percent of African-Americans with diagnosed alcohol abuse or dependence were uninsured, compared to 19 percent of Whites. These figures were higher than the overall uninsured rate for Hispanics and African-Americans that, according to the U.S. Census, was 34 percent and 20 percent, respectively, in 2006 (DeNavas-Walt, Proctor, & Mills, 2004).

Racial/ethnic health disparities involving alcohol-related problems have also been identified (e.g., Caetano & Clark, 1998; Caetano & Galvan, 2001; Stinson et al., 1998; Caetano, 2003). Caetano and colleagues (1998) pointed out that socioeconomic stress, which is often experienced by ethnic minorities, is one of the main factors explaining discrepancies in alcohol consumption among racial/ethnic groups. The authors added two other factors that help explain differences in the pattern of alcohol consumption: “acculturative stress, which is most typically felt by immigrants who are faced with the turmoil of leaving their homeland and adapting to a new society,” and “minority stress, which refers to the tensions that minorities encounter resulting from racism” (p. 234).

Caetano (2003) argued that alcohol-related mortality health disparities are exemplified by data on cirrhosis mortality, which have consistently shown that it is higher among African-Americans and Hispanics than among Whites. Caetano and Kaskutas (1995) and Grant and colleagues (2004) found that the age-adjusted prevalence of alcohol-related clinical problems is higher among Hispanic and White men than among African-American men. Among those who experience problems, however, African-American men (and Hispanic men) tend to experience multiple alcohol-related problems more often than White men (Galvan & Caetano, 2003). Martin, Tuch, and Roman (2003) suggested that personal experiences with ethnic- or race-based discrimination or both directly increase the likelihood of problem drinking. The authors argued that these experiences help foster the adoption of a set of beliefs about drinking as a way to reduce stress and relieve tension. Racial/ethnic disparities not only surface in alcohol consumption, but also in the types of alcohol-related care that they receive. For instance, Whites show higher rates of participation in mutual aid programs, such as Alcoholics Anonymous, than Hispanics or African-Americans (Grant, 1997; Arroyo, Westerberg, & Tonigan, 1998; Tonigan, Miller, Juarez, & Villanueva, 2002; Schmidt et al., 2006).

The next section discusses the specific patterns of drinking behavior that appear to underlie the observed alcohol-related disparities.

## **SUMMARY**

Members of racial and ethnic minorities in the United States, particularly African-Americans, Hispanics, and Native Americans, are experiencing poorer physical health than their White counterparts are. Among the disparities affecting these groups are the prevalence of cancer, cardiovascular diseases, obesity, diabetes, HIV/AIDS, infant mortality, and alcohol-related injuries. Asians, on the other hand, are usually viewed as a “model minority” because they do not display the same disparities. However, this stereotype ignores the variation among Asian subgroups and the vulnerability to health problems of some of these subgroups.

It generally is agreed that inequalities in SES, such as income and education, explain many health disparities in the United States. Racial/ethnic disparities related to health insurance coverage and quality of care have also surfaced. SES alone, however, cannot explain some of the observed health disparities. There are cases for which the direct relationship between low SES and poor health reverses, with low SES immigrants showing better health indicators than Whites of comparable SES.

Culturally based values and perceptions also play an important role in shaping health-related disparities. For instance, African-Americans and Hispanics are more prone than Whites to believe that their health is dependent upon fate and destiny, a finding that helps explain disparities associated with safety belt use. Researchers also recognize the contribution of factors such as the psychological and physiological toll of stress produced by racism and discrimination or the acquisition of negative health behaviors with acculturative processes.

## **5. Race/Ethnicity and Alcohol Consumption**

### **5.1 Overview**

Reports based on SAMHSA’s 2000-2005 National Survey on Drug Use and Health (NSDUH) have consistently indicated that Whites report the highest prevalence of lifetime and current (past year and past month) use of alcohol among adults (aged 18 and older) from all racial/ethnic groups. Table 2 shows this prevalence for the year 2003.

Rates of self-reported past month or past year alcohol use among individuals ages 18 and older are lowest for Asians/PIs and African-Americans, intermediate for Hispanics and Native Americans, and highest for Whites. Similar relative results among these racial/ethnic groups can be seen in other years of the NSDUH (SAMHSA, 2000-2005).<sup>5</sup> For multiracial groups (not shown in Table 2), their rates of current alcohol use were consistently high, close to the rates of Whites. Asians/PIs and African-Americans also report the lowest prevalence of current (past month or past year) alcohol consumption among youth aged 12 to 17 (less than 10%), whereas the rates for adolescents from other racial/ethnic groups are higher than 15 percent.

<sup>5</sup> To facilitate comparisons with other data sources, only year 2003 is shown in Table 2.

**Table 2. Prevalence of lifetime use, past year use, past month use, heavy drinking, and binge drinking across major racial/ethnic groups from four data sources**

Source	Year	Age	Measure	Afr. Amer.	Asian/ Pls	Hispanic	Nat. Amer.	White
NSDUH	2003	18+	Past year use	58%	57%	62%	67%	72%
			Past month use	42%	43%	45%	46%	58%
			Binge drinking	21%	12%	27%	32%	25%
			Heavy drinking	5%	2%	6%	11%	8%
<i>NSDUH stands for National Survey on Drug Use and Health</i>								
<i>NSDUH Binge: 5+ drinks on the same occasion on at least 1 day in the past 30 days</i>								
<i>NSDUH Heavy: 5+ drinks on the same occasion on each of 5 or more days in the past 30 days</i>								
<i>NSDUH reports mean proportion</i>								
BRFSS	2003	21+	Binge drinking	11%	*	18%	*	17%
			Heavy drinking	4%	*	4%	*	6%
<i>BRFSS stands for Behavioral Risk Factor Surveillance System</i>								
<i>BRFSS Binge: 5+ drinks on the same occasion on at least 1 day in the past 30 days</i>								
<i>BRFSS Heavy: 2+ per day (males) 1+ (females) drinks per day in the past 30 days</i>								
<i>BRFSS reports median proportions</i>								
Caetano & Clark (1998)	1984	18+	Heavy drinking (men)	15%	*	17%	*	20%
			Heavy drinking (women)	5%	*	2%	*	5%
Caetano & Clark (1998)	1995	18+	Heavy drinking (men)	15%	*	18%	*	12%
			Heavy drinking (women)	5%	*	3%	*	2%
<i>Caetano &amp; Clark Heavy: 5+ on the same occasion at least once a week</i>								
NLAES	1992	18+	Heavy drinking	17%	*	14%	*	*
<i>Dawson et al. (1995)</i>								
<i>NLAES stands for National Longitudinal Alcohol Epidemiologic Survey</i>								
<i>NLAES Heavy: 5+ on the same occasion at least once a week</i>								

\* denotes a group not included in the study; BRFSS = Behavioral Risk Factor Surveillance System; NSDUH = National Survey on Drug Use and Health; NLAES = National Longitudinal Alcohol Epidemiologic Survey

Table 2 also shows that, according to the NSDUH, heavy drinking and binge drinking tend to be more frequent among Native Americans, Hispanics, or Whites than among African-Americans or Asians. Similar relative results among these racial/ethnic groups can also be obtained from the Behavioral Risk Factor Surveillance System’s Web site ([www.cdc.gov/brfss/](http://www.cdc.gov/brfss/)). Thus, the picture depicted by the NSDUH and BRFSS shows three broad drinking patterns: (1) Native Americans and Whites, who tend to drink more often and consume a larger volume of alcohol per occasion than members of other groups; (2) African-Americans and Asians, who tend to drink less frequently and consume a lower volume per occasion than members from other groups; and (3) Hispanics, who tend to have intermediate rates of current alcohol consumption, but drink heavily on those occasions.

The drinking patterns described herein have also been reported by other researchers (e.g., French, Finkbiner, & Duhamel, 2002; Herd, 1990); however, other researchers question the relatively low involvement by African-Americans in heavy drinking and binge drinking. A high frequency of heavy drinking occasions among African-Americans has been reported by Dawson et al. (1995), Caetano and Kaskutas (1995), Caetano and Clark (1998), and Dawson (1998). In his review of the literature of alcohol consumption among minority groups, Wallace (1999) agreed with the latter characterization of African-American drinking patterns by reporting the

apparent paradox of African-Americans and Hispanics showing alcohol prevalence rates comparable to (or lower than) those of Whites, while being overrepresented in alcohol-related problems. The author subsequently postulated the notion that there are “two worlds” of alcohol use among African-Americans and Hispanics: a large group of relatively light drinkers and a much smaller group of heavy drinkers.

The research literature, however, depicts a more complex picture of drinking patterns across racial/ethnic groups. One element that adds complexity to this issue is time: drinking patterns among racial/ethnic groups are susceptible to evolution. In 1998, Caetano and Clark reported that the rate of abstinence between 1984 and 1995 remained stable among Whites but increased among African-Americans and Hispanics. Also, these authors reported that, for the same period, the rate of frequent heavy drinking (Table 2) decreased among White men (from 20% to 12%) and women (from 5% to 2%) but remained stable among African-Americans (around 15% for men and 5% for women) and Hispanics (around 17% or 18% for men and 2% or 3% for women).

Parallel trends were also observed in comparing age at onset of drinking among racial/ethnic groups. The Youth Risk Behavior Survey’s (YRBS’s) Web site ([www.cdc.gov/HealthyYouth/yrbs/index.htm](http://www.cdc.gov/HealthyYouth/yrbs/index.htm)) contains information from its survey on the percentage of children (9<sup>th</sup> to 12<sup>th</sup> grades) from three racial/ethnic groups who had their first drink of alcohol, other than a few sips, before age 13. Table 3 displays the retrieved information from 1991 to 2005.

**Table 3. Percentage of children (9<sup>th</sup> to 12<sup>th</sup> grades) from three major racial/ethnic groups who reported having their first drink of alcohol, other than a few sips, before age 13**

	1991	1993	1995	1997	1999	2001	2003	2005
White	33%	32%	30%	29%	30%	28%	26%	24%
African-American	31%	35%	36%	33%	35%	28%	31%	28%
Hispanic	32%	35%	40%	38%	35%	34%	30%	30%

Source: Youth Risk Behavior Survey (CDC, 2008, Table 51)

As shown in Table 3, the percentage of children who had their first drink of alcohol before age 13 decreased among Whites during the period under analysis, but it remained relatively stable among African-Americans and Hispanics.

Based on these findings and as concluded by Caetano and Clark (1998), African-Americans and Hispanics have become relatively more vulnerable to the occurrence of alcohol-related problems than their White counterparts. Thus, estimates of racial/ethnic disparities involving patterns of alcohol consumption may vary depending on the age in the respondent’s lifetime at which they were estimated.

Another important contributor to disparities in alcohol consumption is alcohol availability, which has been linked to the prevalence of alcohol-related crashes (Gruenewald, Millar, Ponicki, & Brinkley, 2000), violence (Gruenewald & Remer, 2006), and other problems (Treno, Alaniz, & Gruenewald, 2000; Freisthler, Gruenewald, Johnson, Treno, & LaScala,

2005). However, alcohol availability in minority communities (measured as outlet concentration) is more associated with the low SES status minority groups face than with culturally based racial/ethnic differences (Alaniz, Cartmill, & Parker, 1998; Gruenewald et al., 2000).

Drinking patterns among racial/ethnic groups are also mediated by age and gender. For instance, as indicated by the 2001 YRBS, alcohol use (both lifetime and past month) is less common among African-American youth than their White and Hispanic counterparts (Grunbaum et al., 2002). This pattern of lower alcohol consumption reverses with age, however. Caetano (1984) reported that, although for Whites, both the levels of drinking and the prevalence of alcohol-related problems decrease abruptly from their 20s to their 30s, the opposite tends to occur among African-Americans, particularly men.

Several other contributors to racial/ethnic disparities in patterns of alcohol consumption have been suggested. Many of these contributors were discussed in Section 4.2.b (e.g., SES and acculturative stress). Other contributors specific to some racial/ethnic groups (or that at least, demonstrate a larger effect on some groups than others do) are discussed next.

## **5.2 Contributing Factors to the Drinking Patterns of Racial/Ethnic Groups**

### ***a. African-Americans***

The relatively large rate of abstention among African-Americans has been attributed in part to the presence of several protective factors, such as greater religiosity (e.g., Caetano & Herd, 1984; Herd, 1988; Herd & Grube, 1996; Wallace, Bachman, & Laveist, 2003; Bowie, Ensminger, & Robertson, 2006), broader social support networks, and less disposable income to spend on alcohol (Watt, 2004). Chatters (2000) reported a higher level of religiosity among African-Americans than among any other racial/ethnic group. Herd and Grube (1996) argued that the finding that most African-Americans are affiliated with Baptist denominations (which are characterized by a lack of tolerance for alcohol) explains the higher rates of abstention shown by religious African-Americans. In addition, African-American women participate in religious activities to a greater degree than African-American men, which might be responsible for the higher rates of alcohol abstention found among African-American women (Collins & McNair, 2003).

As mentioned, most studies coincide in finding relatively high levels of alcohol abstention among African-Americans (e.g., Vega, Zimmerman, Warheit, Apsopori, & Gil, 1993; Amey, Albrecht, & Miller, 1996; Kandel, Chen, Warner, Kessler, & Grant, 1997; Herd, 1988; Caetano & Kaskutas, 1995; Dawson, 1998; O'Malley, Johnston, & Bachman, 1998; French et al., 2002; SAMHSA, 2000-2005). However, abstention rates vary across African-American subgroups. The low prevalence of alcohol consumption among African-Americans is particularly evident among women and adolescents. Collins and McNair (2003) reported that the majority of African-American women older than 40 do not consume alcohol. In an analysis of the 1975-2005 Monitoring the Future survey, Johnston, O'Malley, Bachman, and Schulenberg (2006) found that African-American students in grades 8 to 12 reported lifetime, annual, 30-day, and daily prevalence-of-use rates lower than those for their White or Hispanic counterparts.

Although most studies report a relatively low prevalence of alcohol consumption among African-Americans compared to Whites, most studies also report a relatively high occurrence of



heavy drinking among those African-Americans who drink (Barr, Farrell, Barnes, & Welte, 1993; Caetano & Kaskutas, 1995; Caetano & Clark, 1998; Dawson, 1998). Some authors view heavy drinking among African-Americans who drink as a direct consequence of the low SES of many African-Americans (e.g., Barr et al., 1993; Dawson, 1998) or as the product of social disorganization, such as family breakdown (Herd, 1987). Related to this picture, other researchers attribute this problem to experiences of discrimination. Martin and colleagues (2003) argued that personal experiences with discrimination encourage drinking as a way to reduce stress and relieve tension.

Despite their relatively high rate of abstention, African-Americans tend to be more vulnerable to alcohol-related problems than Whites, partly because of the higher frequency of heavy drinking among some African-Americans. For instance, Caetano and Kaskutas (1995) used data from the NAS to report that African-American men (as well as Hispanic men) tend to experience three or more alcohol-related problems more often than White men do. The overrepresentation of African-Americans in impaired driving will be discussed in Section 6.

**b. Asian-Americans**

Asian-Americans typically have been considered a “model minority,” with high rates of abstention and low rates of heavy alcohol use (e.g., NCADI, 1997; Caetano, 2003). For instance, as illustrated in Table 2, the 2003 and 2004 NSDUH show that Asians are less likely to have used alcohol during the past year or past month or to engage in binge or heavy alcohol use when compared to Hispanics, Whites, or Native Americans (SAMHSA, 2000, 2001, 2002, 2004a, 2004b, 2005). Further, the NSDUH also shows that Asian adolescents and young adults (51%) were more likely than young people from other racial/ethnic groups (43%) to perceive great risk of having five or more drinks of an alcoholic beverage once or twice a week (Table 4).

**Table 4. Risk perceptions of having four or five drinks of an alcoholic beverage nearly every day among youth aged 12 to 17: Percentages, 2003 and 2004**

	Great Risk		Moderate/Slight/No Risk			
	2003	2004	2003		2004	
Asian	71%	Asian 71%	Asian	29%	Asian	29%
Afr. Amer.	67%	Afr. Amer. 66%	Afr. Amer.	33%	Afr. Amer.	34%
Hispanic	59%	Hispanic 60%	Hispanic	41%	Hispanic	40%
Nat. Amer.	56%	Nat. Amer. 13%	Nat. Amer.	44%	Nat. Amer.	*
White	61%	White 61%	White	40%	White	39%
2 or more	62%	2 or more 64%	2 or more	39%	2 or more	36%

Source: National Survey on Drug Use and Health, 2003-2004. \* denotes a reduced sample size. (SAMHSA, 2005)

Although Asian-American youth tend to have a more accurate perception of the risks of heavy drinking and Asians of all ages have rates of alcohol consumption lower than those from other racial/ethnic groups, an important variation in alcohol consumption has been identified within this group. Dawson (1998) and Makimoto (1998) found that Vietnamese-Americans and Cambodian-Americans tend to drink much more than Chinese-, Japanese-, Korean-, and Filipino-Americans, a finding that O’Hare (1998) argues reflects the favorable (i.e., nonharming) perception that many Southeast Asian cultures have toward alcohol consumption (relative to other Asian cultures). The same relative characterization is depicted by Chi, Lubben, and Kitano

(1989) and Kitano and Chi (1989), although these authors reported that Japanese-Americans are frequent consumers of alcohol.

Among those who drink, heavy drinking among Asian-Americans follows the same pattern found for overall frequency of consumption: heavy drinking has been reported more frequently among Japanese-Americans, followed by Filipino-, Korean-, and Chinese-Americans (NCADI, 1997; SAMHSA, 2002).

As with the other racial/ethnic groups, gender is an important modifier of drinking patterns among Asians. The literature is consistent in reporting that Asian-American women consume much less alcohol than Asian-American men (Chi et al., 1989; Kitano & Chi, 1989; Hendershot, MacPherson, Myers, Carr, & Wall, 2005). Consumption is higher among Japanese- and Cambodian-American women (Kitano & Chi, 1989; D'Avanzo, Frye, & Froman, 1994) and lower for Korean- and Filipino-American women (Kitano & Chi, 1989).

One suggested explanation for the lower consumption of alcohol by Asian-American women is facial flushing (Ewing, Rouse, & Pellizzari, 1974; Zeiner, Paredes, & Christiansen, 1979; Johnson & Nagoshi, 1990). Facial flushing is a physiological reaction to alcohol ingestion caused by a gene (inactive aldehyde dehydrogenase 2 or ALDH2-2) that causes its carrier to metabolize alcohol differently from people who do not have this gene (this gene was found to occur in up to 85% of Asians versus up to 29% of Whites) (Chan, 1986). It has been argued that the flushing response may serve as a deterrent to drinking (e.g., Johnson & Nagoshi, 1990; Weatherspoon, Park, & Johnson, 2001; Collins & McNair, 2003). Researchers have found more than half of the women of Chinese, Korean, Filipino, and Vietnamese ancestry were abstainers (Chi et al., 1989). Other studies, however, found no relation between the flushing condition and lower alcohol consumption (Johnson et al., 1984). Collins and McNair (2003) argued that because acculturation and other factors modify drinking among Asian women in America, flushing is not the only determining factor in their drinking behavior.

Religiosity has also been suggested as a determinant for lower rates of alcohol consumption among Asians. Some researchers have argued that the low consumption levels among Asian-Americans are associated with the emphasis on conformity and harmony in Confucian and Taoist philosophies, which may induce a moderate style of living (and drinking) (Singer, 1974; Hsu, 1981; cited by Caetano et al., 1998). Luczak, Corbett, Oh, Carr, and Wall (2003) studied the protective role of religiosity (measured as attendance at religious services) on alcohol consumption among Chinese- and Korean-Americans, but after accounting for other factors, they found a protective role only for individuals affiliated with western religions.

The role of acculturation on drinking patterns among Asian-Americans is not entirely clear. Acculturation has been suggested as a factor that increases alcohol consumption among Asians/Pis (Hahm, Lahiff, & Guterman, 2003; Li & Rosenblood, 1994; Johnson, Nagoshi, Ahern, Wilson, & Yuen, 1987). Other researchers found, however, that the level of acculturation did not significantly predict alcohol consumption among Asian-Americans (Akutsu, Sue, Zane, & Nakamura, 1989; Chin, Lai, & Rouse, 1991, cited by Caetano et al., 1998). Hahm, Lahiff, and Guterman (2003) argued that the acculturation level does predict alcohol consumption among young Asians, but only among those with low emotional bonding with their parents (i.e., low parental attachment). As Caetano et al. (1998) argued, such different roles observed for

acculturation might be caused by the profound and rapid economic growth and social changes that many Asian countries are experiencing, which may have contributed to the observed variation in the role that acculturation plays on alcohol consumption among Asian-American immigrants.

**c. *Hispanics***

As mentioned, research studies consistently show that, compared to Whites, Hispanics report a lower frequency but higher volume of consumption. Further, the literature shows that, overall, Hispanics are less likely to abuse alcohol than Whites (e.g., Watt, 2004; Caetano & McGrath, 2005; Zemore, 2005). Considering drinkers alone, however, Hispanics, particularly Hispanic men (e.g., Caetano, 1983; Neff, 1986), were found to consume more drinks per year and to be impaired more often than Whites (Zemore, 2005).

Alcohol consumption among Hispanics varies by gender. Overall, Hispanic women tend to drink less frequently and have higher abstention rates than Hispanic men (e.g., Canino, 1994). One traditional explanation for the heavy drinking patterns observed among Hispanic men, particularly Mexican-Americans, is the concept of “exaggerated machismo.” Castro and Gutierrez (1997) argued that the original positive concept of machismo has been distorted into a concept that represents entitlement, sexual exploitation, and the right to drink. However, as Caetano and Mora (1988) pointed out: “This concept, which has been neither well defined nor measured empirically, implies that Hispanic men strive to appear strong and masculine and that the ability to drink large amounts of alcohol exemplifies their masculinity. To date, however, no convincing association between ‘exaggerated machismo’ and drinking patterns has been demonstrated” (p. 234).

The way gender affects alcohol consumption among Hispanics is also mediated by marital status and acculturation. Marital status influences drinking among Hispanics, particularly women, with being divorced or single found to be associated with heavier drinking among Mexican-Americans (Caetano, 1988).

As mentioned, there is evidence that acculturation plays a role in alcohol consumption among Hispanics (e.g., Marin & Posner, 1995; Marin, 1996a). Brown, Council, Penne, and Gfroerer (2005), using the 2000-2001 NSDUH, reported that immigrants who had been in the country for 5 or more years were more likely than recent arrivals to use alcohol in the past year or past month or to binge drink. Broadly speaking, evidence suggests that acculturated Hispanics tend to have drinking expectancies and attitudes toward excessive drinking similar to those of Whites (Marin, 1996b; Posner & Marin, 1996) and consume more alcohol than the less acculturated ones (Caetano, 1987; Otero-Sabogal, Sabogal, Perez-Stable, & Hiatt, 1995; Markides, Krause, & Mendes de Leon, 1998). But this evidence is weak and has been contradicted by other studies (Markides, Ray, Stroup-Benham, & Trevino, 1990; Neff, Prihoda, & Hoppe, 1991; Neff & Hoppe, 1992; Alaniz, Treno, & Saltz, 1999).

As reviewed by Zemore (2007), the role of acculturation on alcohol consumption by Hispanic males is contradictory and unclear. Some reports suggest that more acculturated Hispanic men drink more frequently but less heavily than those who are less acculturated (i.e., more recent arrivals in the United States) (Hines & Caetano, 1998; Caetano & Mora, 1988). Some authors reported a pattern of drinking in which alcohol consumption increases with

acculturation level, but only up to a point, and then decreases for highly acculturated Hispanic men (Caetano, 1987; Polednak, 1997). Other studies even reported an inverse relationship, with more acculturated Hispanic men consuming less alcohol (Neff, Hoppe, & Perea, 1987; Neff & Hoppe, 1992). As Zemore (2007) pointed out, some of the confusion surrounding the role of acculturation comes from difficulties in separating the effect of acculturation from the effect of SES.

The role of acculturation on alcohol consumption among Hispanic women is much clearer. Working with a variety of data sets, several researchers have reported similar findings: as Hispanic women acculturate to the U.S. mainstream, they report more alcohol consumption (Caetano, 1987; Caetano & Mora, 1988; Mora & Gilbert, 1991; Otero-Sabogal et al., 1995; Marin, Posner, & Kinyon, 1993; Black & Markides, 1993; Alaniz et al., 1999; Zemore, 2005). Markides et al. (1998) found that acculturation and alcohol consumption were especially associated among young women. Along the same lines, Gilbert, Mora, and Ferguson (1994) reported that more acculturated Mexican-American women have higher expectations of the benefits of alcohol use than their less acculturated counterparts. The role of acculturation on drinking patterns among Hispanic women is also heavily mediated by education, income, and employment (Caetano, 1987; Corbett, Mora, & Ames, 1991). Thus, the role of acculturation on alcohol consumption is complex, and is heavily mediated by gender, age, country of origin, and SES—and it is still not well understood.

Patterns of alcohol consumption among Hispanics have also been shown to differ by country of origin, with most studies reporting that Puerto Ricans and Mexican-Americans drink more frequently, more heavily, and experience more problems than Cuban-Americans (e.g., Caetano, 1988; Randolph, Stroup-Benham, Black, & Markides, 1998; Nielsen, 2000). Epstein Botvin, and Diaz (2001) and Bettes, Dusenbury, Kerner, James-Ortiz, and Botvin (1990) also found differences in alcohol consumption among Dominicans and Puerto Ricans. As Caetano and his coworkers (1998) have pointed out, however, recent research has shown that most of these differences by country of origin take place among specific subgroups (e.g., gender, acculturation). Drinking patterns among Hispanics differ by country of origin, mostly among men (e.g., Gilbert, 1986; Marin & Posner, 1995; Caetano, 1997; Nielsen, 2000). Heavy drinking is higher among Hispanic males (Mexican-Americans and Puerto Ricans in particular) than among White males. Cuban-American males, on the other hand, have shown relatively moderate consumption that resembles that of Whites (e.g., Caetano, 1988; Aguirre-Molina & Caetano, 1994; Lee, Orsay, Lumpkin, Ramakrishnan, & Callahan, 1996; Randolph et al., 1998; Dawson, 1998; Nielsen, 2000; Brown et al., 2005). Alcohol use, abuse, or dependence tends to be much higher among Mexican-American men than among women (Vega, Sribney, & Achara-Abrahams, 2003). Mexican-American men were found to drink less often but more per occasion than their U.S. counterparts (e.g., Caetano & Mora, 1988). Markides et al. (1998) termed this consumption of large amounts of alcohol on special occasions by Mexican-American men as “fiesta drinking.” Mexican-American men have been found to be disproportionately affected by alcohol-related diseases and alcohol-related fatalities than their White counterparts (National Center for Health Statistics, 1987; Rosenwaike, 1987; Yoon, Yi, & Hilton, 2005).

Differences in alcohol consumption among Hispanics by country of origin are also moderated by age. Walker, Treno, Grube, and Light (2003) used a telephone survey to conclude that young Hispanics were at greater risk for drinking and driving than White adolescents.

Among Hispanic youth of different genders and from different countries of origin, Nielsen and Ford (2001) found no differences in alcohol use across the age range of 12 to 17. However, data from the NSDUH showed that among youth in that age group, a larger percentage of Cubans reported alcohol use in the 30 days preceding the survey than youth from other Hispanic groups (SAMHSA, 2005). This report on the prevalence of alcohol use among young Cubans contradicts previous reports that Cubans are one of the Hispanic groups with more moderate drinking patterns (e.g., Caetano, 1988; Brown et al., 2005). Reasons for this finding were not available. Research on alcohol consumption by Cubans, however, showed that their drinking patterns may vary depending on the time of arrival in the United States, with more recent Cuban immigrants showing both drinking patterns and SES closer to those of Mexicans and Puerto Ricans than those Cuban immigrants who came to the United States earlier (Randolph et al., 1998).

**d. Native Americans**

Although some reports contend that reliable estimates of substance use among Native Americans in the United States are unavailable (NCADI, 1998), a pattern of high quantity yet moderate frequency of alcohol consumption has been reported for this group (Stinson et al., 1998; Dawson, 1998; May & Gossage, 2001; Beals et al., 2003; O'Connell, Novins, Beals, & Spicer, 2005; O'Connell et al., 2006; SAMHSA, 2000-2005). Table 2 (p. 16) illustrates this finding with data from the 2003 NSDUH.

Heavy use of alcohol by Native Americans might be related to inadequate risk perception. Data from the NSDUH (Table 4) indicate that close to half of the surveyed Native American youth believed there was moderate to no risk in having four or five drinks of an alcoholic beverage nearly everyday. In his review of the literature, Caetano (2003) pointed to the misperceptions created by the "Firewater Myth," which suggests that Native Americans are predisposed to heavy alcohol consumption and are unable to control their drinking and their behavior when intoxicated. The author reported that this myth, which dates back to the times when British settlers reported the presumed insistence of Native Americans on drinking to the point of intoxication (e.g., Beauvais, 1992), still persists. Many people (including many Native Americans) consider heavy binge drinking to be representative of the "Indian way of drinking" (Duran & Duran, 1995, cited by Caetano et al., 1998). Some authors postulate that the high rates of alcohol consumption among Native Americans are related to the stress caused by "Historical Loss" or "Historical Unresolved Grief" (Brave Heart, 2000; Whitbeck, Chen, Hoyt, & Adams, 2004). Brave Heart and DeBruyn (1998) define "Historical Unresolved Grief" as "the loss of lives, land, and vital aspects of Native culture promulgated by the European conquest of the Americas" (p. 60).

As Caetano (2003) argued, however, the "Firewater Myth" is insufficient to explain, by itself, current drinking patterns among Native Americans. The author gave two reasons: (a) no evidence exists to demonstrate increased physiological or psychological reactivity to alcohol among Native Americans compared with other racial/ethnic groups (Garcia-Andrade, Wall, & Ehlers, 1996); and (b) as with other minority groups, there is a large variation of drinking patterns in this highly heterogeneous racial/ethnic group, with rates of alcohol use varying across tribes and over time (e.g., Spicer et al., 2003a; O'Connell et al., 2005). For instance, the Navajo tend to view social drinking as acceptable, whereas the Hopi consider drinking as irresponsible

(May, 1982; Mail & Johnson, 1993). Some tribes choose to make their reservations “dry” (i.e., prohibit alcohol); others choose to go “wet” (allow alcohol). Further, variation in drinking patterns has also been identified within tribes (Stubben, 1997).

Young Native Americans living on reservations have been found more prone to use alcohol than their urban counterparts (Beauvais, 1992), even if they were knowledgeable about the various adverse consequences of alcohol abuse (May & Smith, 1988). The picture is complex and not well understood, however. As with other minority groups, stress associated with racism and discrimination is a contributor to alcohol consumption among Native Americans (e.g., Mail, 1989). Acculturative stress could also contribute to the development of alcohol-related problems among Native Americans living outside the reservation. Spicer (1997) found that alcohol-related problems are particularly acute for urban (nonreservation) Native Americans, who are torn between their conflicting views of drinking as a defining marker of heritage and as destructive of much that they value. Enculturation—how much an individual is embedded in his/her own cultural traditions and practices (Whitbeck et al., 2004)—has been found to be negatively correlated to alcohol abuse (Spicer, Novins, Mitchell, & Beals, 2003b; Whitbeck et al., 2004). Torres Stone, Whitbeck, Chen, Johnson, and Olson (2006), who studied some Midwest Native Americans on reservations, agreed with this role of enculturation on drinking patterns among Native Americans and reported that traditional practices are important in increasing alcohol cessation among this group. However, the mechanisms for the role played by traditional practices, not only for cessation, but also for consumption in general, is unclear (Spicer et al., 2003b).

## **SUMMARY**

There is a strong consensus that alcohol abstinence is high among Asians and low among Whites. Most reports also agree that abstinence rates are relatively higher among African-Americans and Hispanics but lower among Native Americans.

Among those who drink, there is also consensus that rates of binge and heavy drinking tend to be high among Native Americans, followed closely by Hispanics and Whites, with Asians showing the lowest rates of binge and heavy drinking. For African-Americans, the literature shows some conflicting results. Some reports indicate African-American drinkers have relatively low rates of binge drinking and heavy drinking; others report rates comparable to (or higher than) those for Whites or Hispanics. These latter studies postulate the notion of “two worlds” of alcohol use among African-Americans and Hispanics, characterized by a large group of relatively light drinkers and a much smaller group of heavy or binge drinkers.

Besides these generalizations, the patterns of drinking within each of these groups vary greatly. There are variations by country or tribal origin (for instance, Vietnamese-Americans drink more than Filipino-Americans, Mexican-Americans drink more than Cuban-Americans, and Navajos drink more than Hopis); by gender (women drink less than men); by age (whereas for Whites, heavy drinking decreases abruptly from their twenties to their thirties, the opposite trend occurs among African-Americans, particularly men); by acculturation level; and even by genetic factors (e.g., facial flushing among Asians).

Some reasons suggested for the observed differences in drinking patterns are the low SES of many members of these groups; the perception by African-Americans and Native Americans that heavy drinking is an ethnic characteristic, closely related to the “Black” (for African-Americans) or “Indian” (for Native Americans) way of life; machismo (particularly for Hispanic males); religiosity; social disorganization (such as family breakdown); and experiences with discrimination (which induce the view that drinking is a way to reduce stress and relieve tension).

## **6. Race/Ethnicity and Impaired Driving**

This section discusses the prevalence of alcohol-impaired driving across racial/ethnic groups. First, we discuss limitations and constraints facing these estimates. Estimates of impaired driving across racial/ethnic groups are presented next. Other relevant contributors to the prevalence of impaired driving specific to each minority group are then discussed.

### **6.1 Impact of the Source of Data in Estimating Rates of Impaired Driving**

Knowledge about impaired driving is usually obtained from self-report national household or telephone surveys; roadside surveys; police, court, or department of motor vehicles (DMV) records; or crash data. All of these data sets have limitations. Self-reported information on impaired driving may be inaccurate because some minority groups tend to underreport this phenomenon. Robertson (1992) argued that self-reported seat belt use overstates actual use by more than 20 percent on average and that self-reported alcohol use is not predictive of the

percentage of fatally injured drivers. Most reports consistently show Hispanics, and to some extent African-Americans, underreport drinking and driving more frequently than Whites (Ross et al., 1991; Jones & Lacey, 1998; Bond & Cherpitel, 2004).

BAC measures taken at roadside surveys eliminate the limitations associated with self-reporting. Unfortunately, roadside surveys are expensive and therefore rare, limited to the 48 contiguous States, and restricted to weekends and nighttime hours (Voas, Wells, Lestina, Williams, & Greene, 1998; Lund & Wolfe, 1991).

Although police- and court-based data on alcohol-related traffic violations and arrests avoid the self-report limitations, information of this sort (a) is usually difficult to retrieve because of administrative limitations and privacy concerns (in some States, information on race/ethnicity is absent from arrest records); (b) only provides information on those drivers who have been stopped and identified by law enforcement officers (estimates of the proportion of impaired-driving trips that result in a DWI arrest vary from 1/1000 to 1/70) (Ross et al., 1991; Voas & Hause, 1987; Zador, Krawchuck, & Moore, 2000); and (c) may be subject to bias because of racial profiling.

Crash data (once adjusted by exposure) is free of many of these limitations. Until 1999, information on race/ethnicity had been absent from the Fatality Analysis Reporting System (FARS). However, estimates of impaired driving based on crash data must rely on a responsibility analysis of the crashes to attribute presumed causation. In addition, the validity of estimates on the prevalence of impaired driving based on crash data depends on proper accounting of other crash contributors. For instance, accounting for safety belt nonuse for evaluating the role of race/ethnicity on alcohol-impaired driving fatal crashes is important because seat belt nonuse increases the odds of such fatalities. Most researchers agree that African-Americans and Hispanics do not wear safety belts as often as Whites (e.g., Bolen, Rhodes, Powell-Griner, Bland, & Holtzman, 2000; Voas, Fisher, & Tippetts, 2002; Boyle & Vanderwolf, 2004). Therefore, if not properly accounted for, safety belt nonuse may bias estimates of impaired driving based on fatal crash data.

## **6.2 Controlling for Driving Exposure in Estimating Rates of Impaired Driving**

The method by which crash counts are adjusted for driving exposure may influence the estimates of the relative contribution of race/ethnicity to impaired driving. If one group of drivers shows a larger number of alcohol-impaired driving fatalities in a year than another group, it does not necessarily mean that the former group is more vulnerable to dying in an alcohol-impaired crash. If those drivers spent more time on the roads than any other group, then they might actually constitute a group of safer drivers.

The standard method in cause-of-fatality studies of comparing between-group incidence rates (underage versus adult, African-American versus White) is the use of population-based fatality rates (e.g., rates per 100,000 individuals). However, population-based normalizing metrics do not necessarily reflect crash-risk exposure because they do not account for differences in access to vehicles and driving frequency among other factors related to exposure to crashes among age, gender, and racial/ethnic groups.



Using the number of licensed drivers to normalize driver data could be considered a more appropriate analytical alternative. This metric allows the researcher to account for differences among racial/ethnic groups regarding access to a vehicle. However, this alternative fails to account for vehicle operation by unlicensed drivers. This limitation is highly relevant to this report because there are large differences in the proportion of licensed drivers in each racial/ethnic group. About 83 percent of Whites are licensed drivers, whereas only 65 percent of Hispanics, 64 percent of African-Americans, and 47 percent of Asian-Americans are licensed (Federal Highway Administration, 2003).

The most frequently used method of normalizing crash fatality data (including alcohol-related fatalities) for comparing subgroups of drivers has been the vehicle miles traveled (VMT) estimates for each relevant group (e.g., Braver, 2003). The VMTs are estimated by the Federal Highway Administration from data collected thorough the National Household Travel Survey. Unfortunately, when applied to subgroups, the VMT metric is not free of bias either. The VMT method does not provide for exposure to risks related to the quality of roads or vehicles or to the seasonal weather or urban/rural traffic conditions. Furthermore, although VMT estimates are provided by age, gender, and some racial/ethnic groups, the VMT approach does not provide separate estimates for the miles driven at zero BAC levels compared to the miles driven at positive BAC levels. Thus, because there is no estimate for miles driven while impaired, the same mileage estimate used to normalize total crashes must also be used for the relatively small percentage of driving with positive BAC levels. It is therefore likely that relatively small changes in the amount of sober driving could have a significant effect on the apparent VMT rate for alcohol-related crashes.

To address some of these limitations, an alternative measure of exposure (the crash incidence ratio or CIR) has recently been suggested for the analysis of subgroups of alcohol-related crashes (Voas, Tippetts, & Fell, 2000a, Voas, Tippetts, & Taylor, 2002; Voas, Tippetts, & Fell, 2003; Tippetts, Voas, Fell, & Nichols, 2005). Instead of adjusting crash counts by imprecise measures of driving exposure such as the VMT, the CIR makes alcohol comparisons between groups with similar driving exposure (e.g., rural underage female drivers). Voas et al. (2007) showed that the CIR can be viewed as similar to the quasi-induced exposure technique known as the “relative accident involvement ratio” (RAIR) (Aldridge, Himmler, & Aultman-Hall, 1999; Stamatiadis & Deacon, 1995; Stamatiadis, Jones, & Aultman-Hall, 1999). Voas et al. (2007) applied the VMT and the CIR to the estimation of impaired driving across racial/ethnic groups and found very different outcomes depending on the normalizing approach used (see Section 6.4 for details about these findings).

### **6.3 Prevalence of Impaired Driving Across Racial/Ethnic Groups**

Table 5 provides estimates of the prevalence of impaired driving as a function of age, gender, and race/ethnicity obtained from 11 selected studies that used a variety of sources, including household surveys, telephone surveys, roadside surveys, and crash data.

**Table 5. Prevalence of impaired driving by race/ethnicity as estimated by 11 studies**

Source	Age	Measure	Years	Gender	Race/Ethnicity Group					Ref.
					Afr. Am.	Asian	Hisp.	Nat. Am.	White	
BRFSS	18+	Drink and drive in past month	1993	both	1.5%	*	1.9%	*	2.6%	1. Quinlan et al. (2005)
			1995	both	1.5%	*	2.3%	*	2.4%	
			1997	both	1.3%	*	2.3%	*	2.2%	
NAS	18+	Drunk enough to be stopped by police in past year	1995	males	14.0%	*	21.0%	*	22.0%	2. Caetano & Clark (2000)
				females	3.0%	*	6.0%	*	7.0%	
		Arrested for DUI in past year	1995	males	1%	*	4%	*	1%	
				females	0%	*	0%	*	0%	
		Ever in a car when driver drank too much in past year	1995	males	14%	*	15%	*	10%	
				females	13%	*	11%	*	10%	
NSDDAB	16-64	Drove within 2 hrs. of drinking in past year	1993-1997	both	16%	13%	17%	21%	28%	3. Royal (2000)
		Drove within 2 hrs. of drinking in past month	1993-1997	both	8%	6%	9%	10%	18%	
NESARC	18+	More than once, drove after too much alcohol in past year	2001-2002	males	3%	2%	3%	6%	5%	4. Chou et al. (2005)
				females	1%	1%	1%	2%	2%	
		Driving while drinking in past year	2001-2002	males	5%	4%	6%	9%	8%	5. Chou et al. (2006)
				females	2%	1%	1%	5%	3%	
NSDUH	16+	Drove within 2 hrs. of drinking in past year	1996	both	13%	*	17%	*	25%	6. Townsend et al. (1998)
	18+	Drove after too much alcohol in past year	2000	males	17%	14%	17%	21%	22%	7. Caetano & McGrath (2005)
				females	9%	7%	7%	15%	12%	
	21+	DUI (Alc & Drugs) in past year	2002-2003	both	13%	8%	13%	19%	18%	8. SAMHSA (2005)
16-20	DUI (Alc & Drugs) in past year	2002-2003	both	10%	13%	14%	28%	26%	9. SAMHSA (2004a)	
Roadside surveys	16+	BAC ≥ .05 g/dL	1973	both	17%	*	22%	*	13%	10. Voas et al. (1998)
			1986	both	14%	*	13%	*	7%	
			1996	both	9%	*	15%	*	7%	
		BAC ≥ .10 g/dL	1973	both	6%	*	3%	*	5%	
			1986	both	6%	*	4%	*	3%	
			1996	both	4%	*	8%	*	2%	
FARS	16+	BAC > .00 g/dL	1990-1994	both	37%	28%	41%	63%	38%	11. Voas et al. (2000b)
		.00 < BAC ≤ .08 g/dL	1999-2004	both	7%	3%	5%	4%	4%	12. Hilton (2006) (**)
		BAC > .08 g/dL	1999-2004	both	31%	23%	42%	54%	29%	

\* denotes not available; \*\* denotes number in table estimated from graph; BRFSS = Behavioral Risk Factor Surveillance System; FARS = Fatality Analysis Reporting System; NAS = National Alcohol Survey; NHSDUH = National Survey on Drug Use and Health; NESARC = National Epidemiologic Survey on Alcohol and Related Conditions; NSDDAB = National Survey on Drinking and Driving Attitudes and Behavior.

The first three rows in Table 5 report some findings by Quinlan and colleagues (2005) based on the 1993-1997 BRFSS, a random-digit dialing (RDD) telephone survey of adults ages 18 and older. The authors found that, in 1993, the percentage of respondents reporting any impaired driving in the month before the interview was larger for Whites (2.6%) than for either African-Americans (1.5%) or Hispanics (1.9%). Looking at trends, Quinlan et al. found that, although the prevalence of impaired driving in the month before the interview decreased for Whites from 1993 to 1997, the opposite occurred for Hispanics. By 1997, the percentage of Hispanics reporting past-month impaired driving was very close to that of Whites (about 2.3%). For African-Americans, the authors reported a more stable trend, with prevalence of last month impaired driving ranging from 1.5 percent in 1993 to 1.3 percent in 1997.

Caetano and Clark (2000) used the 1995 NAS (a RDD telephone survey sponsored by the National Institute on Alcohol Abuse and Alcoholism and conducted by the Public Health Institute) to investigate impaired driving across three racial/ethnic groups. Their findings agreed with those from Quinlan et al. (2005) for 1995: impaired driving in that year was more prevalent among Hispanics and Whites than among African-Americans (albeit the measure used in the Caetano and Clark study was being “impaired enough to be stopped by law enforcement officers in the past year” [p. 59]). This result was found for either males or females, with this measure of impaired driving being much less frequent among females of any racial/ethnic group.

Caetano and Clark also reported rates of self-reported DWI arrests and riding in a vehicle with a driver “who drank too much” in the past year. Compared with African-Americans and Whites, Hispanics were overrepresented in self-reported DWI arrests in the past year. Hispanics and African-Americans were also more likely than their White counterparts to ride in a vehicle with an impaired driver, a finding that may be confounded by the relatively lower income of African-Americans and Hispanics that reduces the rate of vehicle ownership and subsequently increases the average number of passengers per trip in these groups.

Royal (2000) pooled data from NHTSA’s 1993, 1995, and 1997 National Surveys on Drinking and Driving Attitudes and Behavior (NSDDAB) to gather a sample size large enough to make inferences on racial/ethnic groups. Using the measure “driving within 2 hours of drinking,” the author’s findings did not differ substantially from those coming from the BRFSS and NAS that were previously discussed: impaired driving was more frequent among White drivers than among African-American drivers, with Hispanic drivers showing rates that were either between those of Whites and African-Americans or close to the latter.

The study also shows Native American drivers and Asian-American drivers at the opposite extremes of the impaired-driving spectrum, from higher prevalence (Native Americans) to lower prevalence (Asian-Americans). Using “driving after too much drinking” or “driving while drinking” as measures of impaired driving—based on the 2001-2002 National Epidemiologic Survey on Alcohol and Related Conditions (NESARC) and the Chou et al. (2005, 2006) studies—produced results similar to those described herein.

Studies based on the SAMHSA’s NSDUH (formerly known as NHSDA) also found impaired driving more prevalent among Whites than among African-Americans, Hispanics, and Asian-Americans. Townsend, Lane, Dewa, and Brittingham (1998) and Caetano and McGrath (2005), using the 1996 and 2000 NSDUH, respectively, and reporting on “driving within 2 hours of drinking in past year” and “arrested for DUI in past year,” respectively, concurred in the finding that African-Americans, Asian-Americans, and Hispanics were less likely to be involved in drinking and driving than Whites, with Native Americans showing a prevalence closer to that of Whites. Similar findings were reported in SAMHSA’s own estimates of DWI (alcohol and drugs) based on the 2002-2003 NSDUH (SAMHSA, 2004a, 2005).

Thus, the broad picture coming from self-reported surveys shows impaired driving to be most prevalent among Whites and Native Americans, and least prevalent among Asian-Americans, with African-Americans reporting an intermediate but low prevalence of impaired driving. The picture for Hispanics is less clear. Some of these studies reported rates of impaired driving for Hispanics that are intermediate, between those of African-Americans and Whites (see

references in Table 5, numbers 1 [1993], 6, and 9); others suggest a higher prevalence closer to that of Whites (see references in Table 5, numbers 1 [1995 and 1997] and 2 [top row]); and still other studies suggest a lower prevalence of impaired driving among Hispanics, closer to that of African-Americans (see references in Table 5, numbers 2 [bottom row], 3, 4,5,7, and 8).

The roadside surveys provide a different picture. Using self-reported information on race/ethnicity, the roadside surveys show a much larger prevalence of impaired driving among African-Americans and Hispanics relative to Whites than has emerged in the self-reported alcohol consumption surveys. The 1973, 1986, and 1996, nationwide roadside surveys of non-crash-involved drivers (Lund & Wolfe, 1991; Voas et al., 1998) provided an estimate of the prevalence of drinking and driving on weekend nights in the 48 contiguous United States. Table 5 shows that according to the 1996 roadside survey, there was a large overrepresentation of Hispanics and African-Americans among drivers with BACs  $\geq .05$  g/dL. The 1996 survey showed that about 9 percent of African-Americans had BACs  $\geq .05$  g/dL and about 4 percent were  $\geq .10$  g/dL. For Hispanics, the percentages were 15 percent and 8 percent, respectively. The corresponding percentages for Whites were 7 percent and 2 percent, respectively.

The national roadside surveys show that the prevalence of drivers with BACs  $\geq .05$  g/dL has declined over time, and the decline has been steeper for Whites. This finding suggests a corresponding increasing relative overrepresentation of African-American and Hispanic drivers in impaired-driving occasions. The analysis by Voas et al. (1998) of this data set showed that, in 1996, the odds for an African-American driver to be at a BAC  $\geq .05$  g/dL were about the same as the odds for a White driver, but the odds for Hispanics were 1.7 times the odds for Whites. Furthermore, the prevalence of Hispanic drivers with BACs  $\geq .10$  g/dL has increased in absolute terms over the period under consideration. The increasing vulnerability of Hispanics to impaired driving measured by the national roadside surveys somewhat coincides with the self-reported information obtained by Quinlan et al. (2005). In estimating similar odds of impaired driving between African-American and White drivers, however, the roadside surveys seem to contradict Quinlan and his colleagues' 2005 study results and other self-reported surveys that find African-American and Hispanic drivers less prone to drink and drive than White drivers.

Earlier studies of crash data also suggested an overinvolvement of African-Americans and Hispanics in alcohol-related crashes. Waller, King, Neilson, and Turkel (1969) (not shown in Table 5) analyzed fatal crashes in California and found that 76 percent of all African-American drivers in the files had positive BACs, a percentage much larger than the corresponding 56 percent for Whites. The authors also reported that 65 percent of African-American drivers had BACs  $\geq .10$  g/dL, compared to only 46 percent for Whites. Using a more recent and comprehensive data set, Voas et al. (2000b) used the 1990-1994 FARS to investigate the role of drinking and driving on fatal crashes across racial/ethnic groups. As shown in Table 5, Native Americans had the highest percentage of alcohol-involved driver fatalities of any ethnic group (63%). Although not shown in Table 5, Voas et al. (2000b) investigated the prevalence of alcohol-related fatal crashes among Hispanics from different countries of origin. The authors found that among Hispanics, Cuban-Americans stood out for their low percentage of alcohol-related fatalities. Next to Native Americans, Mexican-Americans had the highest alcohol-related fatality rates among all four types of road users: drivers, passengers, pedestrians, and cyclists. This was true for both men and women. African-American drivers had rates of alcohol involvement close to those shown by White drivers, and those rates were even higher for groups

40 and older. Asians/PIs had distinctly lower rates of alcohol-related fatalities for all types of road users: drivers, passengers, pedestrians, and cyclists.

Using a more recent FARS data set, Hilton (2006) investigated the role of race/ethnicity on alcohol-related crashes. Table 5 shows that the results obtained by Hilton (2006) are similar to those obtained by Voas et al. (2000b). By differentiating alcohol-related fatalities by BAC level, Hilton illustrated how Hispanics and Native Americans are overrepresented in fatal crashes in which drivers had BACs  $\geq .08$  g/dL.

Results similar to those by Voas et al. (2000b) and Hilton (2006) were also obtained by Runge, Garrison, Hall, Waller, and Shen (2002, not shown in Table 5). Runge et al. (2002) studied the population of drivers who visited the emergency department following motor motorvehicle crashes. They reported that, compared to Whites, African-Americans were less likely to screen positive for alcohol abuse or alcohol dependence.

The studies reviewed herein indicate that the rates of impaired driving by Hispanics and African-Americans, relative to those of Whites, tend to be smaller when estimated based on self-reported surveys than when estimated from crash and BAC data. This supports the findings by Ross, Howard, Ganikos, and Taylor (1991) in their literature review of the impaired-driving problem in which they reported that the estimates of the prevalence of impaired driving among African-Americans differed according to the nature of the data set on which those estimates were based, being smaller when based on self-reported information than when estimated from archival data.

Although not shown in Table 5, arrest data also show a larger involvement of Hispanics and Native Americans in impaired-driving events. Chang, Lapham, and Barton (1996) used arrest data from Bernalillo County, New Mexico, to show that, compared with the county population counts, Native Americans and Hispanics were overrepresented in alcohol-related offenses. Similar findings were reported in other studies based on DWI arrests (Hyman, 1968; Hyman et al., 1972; Padilla & Morrissey, 1993). DWI arrest data compiled by the California Division of Motor Vehicles showed a much higher DWI arrest rate among young Hispanic males compared to other males in the same age groups (California DMV, 2005). James, Hutchison, Moore, and Smith (1993) found that Native Americans in Washington State were overrepresented in DWI arrests: they constituted 3.8 percent of the arrests, yet were only 1.5 percent of the general population. The authors concluded that Native Americans were two and a half times more likely to be arrested for DWI as White drivers. Similar results were obtained based on the 2000 SAMHSA's NSDUH (formerly NHSDA) by Caetano and McGrath (2005), who found that 12-month arrest rates for DWI were highest among men of mixed race (5%) and Native American/Native Alaskan men (3.2%). The overrepresentation of Native Americans and Hispanics in DWI arrests has also been corroborated by other researchers: James et al. (1993), Chang et al. (1996), Cherpitel and Tam (2000), Caetano and Clark (2000), the California DMV (2005), and Tashima and Helander (2000, 2003, 2005).

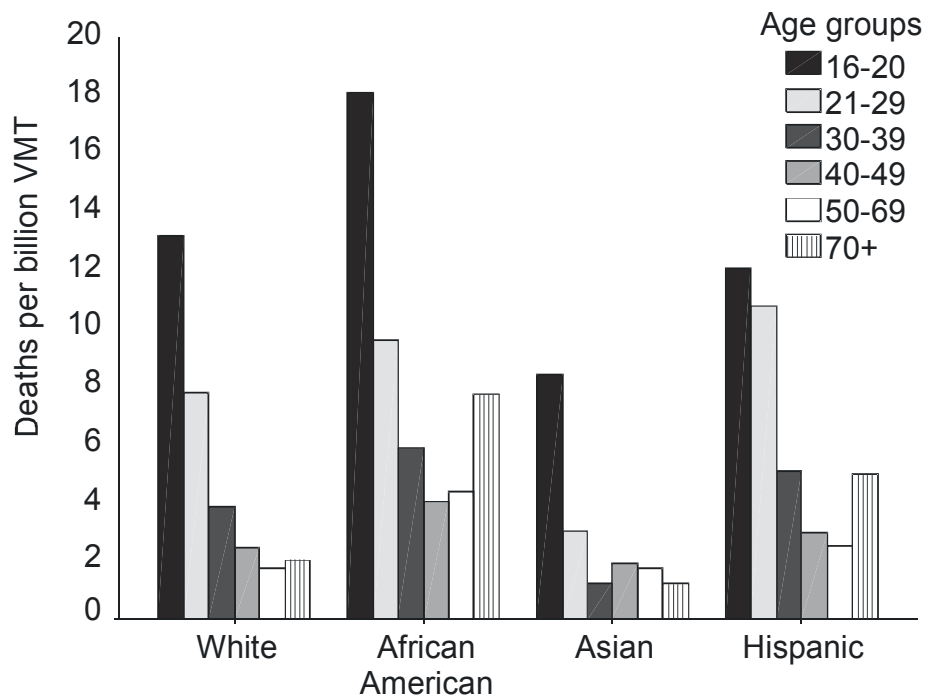
#### **6.4 Mediators and Modifiers to the Role of Race/Ethnicity on Impaired Driving**

The previous section reviewed the literature of impaired driving across racial/ethnic groups and focused on developing a broad picture of the relative prevalence of this problem

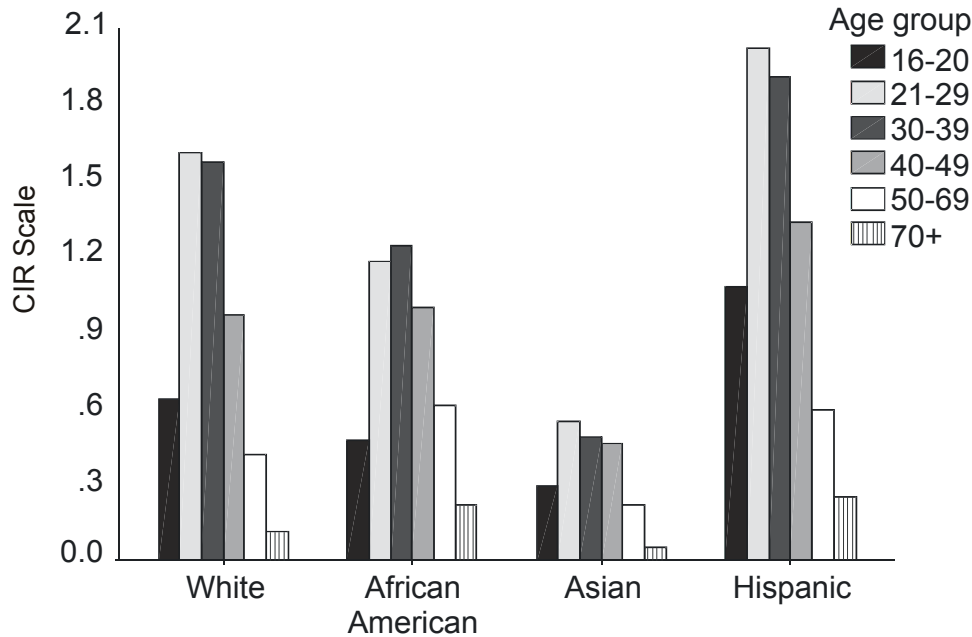
across these groups. Consensus and contradictions from multiple researchers were discussed. This section introduces factors that contribute to each aspect of the broad picture depicted in the previous section.

**a. Data and Measure of Impaired Driving Used**

As discussed earlier, the prevalence of impaired driving across racial/ethnic groups varies with the data source (self-reports versus archival records) and with the measure of exposure used. Recently, Voas, Tippetts, Romano, Fisher, and Kelley-Baker (2007) studied how the use of different normalizing measures affects the prevalence estimates for impaired driving across racial/ethnic groups. The authors applied different measures of crash exposure to their FARS-based study and found that, although both the VMT-based and CIR methods (see Section 6.2) suggest that Asians have lower alcohol involvement than any other group, they yielded different levels of involvement for Whites, African-Americans, and Hispanics. Based on VMT, both African-Americans and Hispanics had higher involvement than Whites did. Conversely, the CIR measure suggests that the risk for both Whites and African-Americans is substantially lower than for Hispanics. Figures 1 and 2 show the different outcomes.



**Figure 1. VMT-based measure (fatalities per VMT) of drinking drivers killed in crashes across racial/ethnic groups**



**Figure 2. CIR of drinking drivers killed in crashes by racial/ethnic groups and age**

Figure 1 shows that the use of the VMT-based measure produces a distribution in which the youngest drivers in each racial/ethnic group have the highest alcohol-related involvement ratios, with the risk per vehicle mile descending as age increases. The only exception to this pattern occurs among African-American and Hispanic older males who have higher involvement rates than the 50- to 60-year-old age groups. In Figure 2, however, the odds of being involved as a drinking driver denoted by the CIR show each racial/ethnic group falling into a pyramid pattern by age in which the drivers 16 to 20 are lower than the next two age groups covering male drivers 21 to 39. The findings of Voas and colleagues (2007) illustrates how reports on the involvement of racial/ethnic groups and subgroups in impaired-driving situations may yield different results depending on the normalizing measure used, which provides another possible explanation for some of the contradictions observed in the literature.

#### **b. Age, Gender, and Marital Status**

Age, gender, and marital status are well-known mediators of impaired driving, with most DWI offenders being young, male, and single (e.g., Chang et al., 1996; Kposowa & Adams, 1998; Caetano & McGrath, 2005). Despite recent reservations based on the measure used (see previous section), young Hispanic drivers have typically been found to be at a higher risk of impaired driving than their White counterparts. Studies based on survey data (Grunbaum et al., 2002) and police arrest data (Perrine & Arce-Quñones, 1994; Chang et al., 1996; Walker et al., 2003; California DMV, 2005) report that Hispanic adolescents and young adults are relatively more vulnerable to drinking and driving than their White counterparts. Using crash data normalized by VMT, Voas et al. (2007) reported that not only Hispanic youth, but also African-American youth are more vulnerable to impaired driving than their White counterparts (Figure 1). Figure 1 shows that African-American and Hispanic drivers ages 16 to 29 have a larger number of alcohol-related fatal crashes per VMT than their White counterparts. When Voas et al. (2007) used the CIR as the normalizing method (Figure 2), the prevalence of African-American

young drivers in alcohol-related crashes fell below that of Whites. In other words, the CIR-based results suggest that the odds of finding alcohol involvement in a fatal crash (compared to sober fatalities of the same racial/ethnic/age group) were lower for young African-American drivers than for their White or Hispanic counterparts.

Crash data have also been used to show a different vulnerability to impaired driving among males than among females, with males being more vulnerable than females across all racial/ethnic groups (SWITRS, 2001). Based on self-reported data, however, the gender gap related to impaired driving might be larger for Hispanics than for Whites. As illustrated in Table 5, Caetano and Clark (2000), using NAS data from 1995, indicated that White and Hispanic men had the highest rates of driving a vehicle after they were impaired enough “to be in trouble if stopped by law enforcement officers” in the previous 12 months (22% and 21%, respectively) in comparison with African-Americans (14%). The 12-month DWI arrest rate for Hispanic men was four times higher than the rate for Black and White men (4% versus 1%). In addition, Hispanic men had the highest rates of arrest for DWI in the past year (4%) in comparison with White (1%) and African-American (1%) men.

**c. *Country of Origin or Tribe***

As mentioned, there are differences in drinking-and-driving rates among Hispanics by country of origin. Aguirre-Molina and Caetano (1994) found that Mexican men were more likely than Puerto Rican and Cuban men to drink large quantities of alcohol while driving. Voas and his colleagues (2000b), differentiating among Hispanic subgroups (such as Puerto Ricans, Cuban-Americans, Mexican-Americans, and Central and South Americans), reported that the involvement rates in fatal motor-vehicle crashes that were alcohol-related varied among these Hispanic subgroups consistent with patterns of alcohol consumption reported in the literature.

Regarding differences in drinking-and-driving rates among Asian-Americans by country of origin, the literature is almost absent. The lack of information is explained somewhat by the perception of Asians as a model group. Evidence shows, however, a strong variation in rates of alcohol consumption among Asians from different countries of origin (e.g., Vietnamese- and Cambodian-Americans drink much more than Chinese-, Japanese-, Korean-, and Filipino-Americans) (Dawson, 1998; Makimoto, 1998). There is a need to investigate how these differences translate into impaired driving.

Among Native Americans, it has been shown that the prevalence of impaired driving varies across Indian nations. Sugarman, Warren, Oge, and Helgersen (1992) used the BRFSS to investigate the variations in the prevalence of drinking and driving and other problems among Native Americans between 1985 and 1989. The authors reported a large variation in the prevalence of drinking and driving across tribes, the highest being in the Northwest (e.g., 19.2 % for men and 8.1% for women in Montana) compared to the Plains (6.8% for men, 4.4% for women).

**d. *Social Drinking Setting***

The settings in which most drinking occurs differ for members of different racial/ethnic groups. Identifying the preferences of vulnerable individuals for private compared to public



drinking settings is therefore relevant to the design of effective prevention programs for these groups.

Using the NSDDAB, Royal (2000) found that among those reporting driving within 2 hours of drinking, African-American and Asian-American drivers were most likely to have drunk in someone else's homes, while Whites, Hispanics, and Native Americans were about equally likely to drink in bars, in restaurants, or in someone's home.

Chang et al. (1996) studied DWI offenders in New Mexico and found that bars (45%), private parties (29%), and homes (13%) were the three most frequently cited drinking locations before being arrested for DWI across all ethnic/racial groups. However, bars were the most frequently cited drinking settings by non-Hispanic Whites (53%), and parties and homes were most frequently cited drinking settings by Mexican nationals (34% and 19%). In addition, Mexican national men had higher reports of unplanned activity compared with Whites, who had a larger prevalence of drinking as a habit or routine. The authors also suggested that strong family ties among Hispanics and Mexican nationals might be a factor in remedial treatment. Similar results and suggestions were obtained by Caetano and Raspberry (2001), who suggested that preventive interventions with Mexican-Americans should center on the family as a means to minimize drinking at home and decrease the large number of drinks consumed on particular occasions by Mexican-Americans.

Chang et al. (1996) studied a sample of DWI offenders in New Mexico and found that educated and employed offenders tend to drink more in bars or lounges than at private parties. Age may affect the racial/ethnic preferences for drinking settings. Padilla and Morrissey (1993) studied Hispanics arrested for DWI offenses between 1990 and 1992 in California and found evidence suggesting that, among those offenders, both younger and older Hispanic men reported licensed liquor establishments as the place of their last drinks, and middle-aged Hispanic male offenders preferred to drink at home or at friend's homes. SES interacts with age in mediating the drinking setting.

***e. Risk perceptions***

From their recent review of the literature on risk-taking behavior among minority youth, Juarez, Walters, Daugherty, and Radi (2006) concluded that African-American and Hispanic drivers drink and drive more often than their White counterparts. Furthermore, it has been argued that Hispanics are overrepresented in DWI incidents because many of them are recent immigrants who are less prone than Whites to recognize the impairing effects of alcohol on the psychomotor abilities necessary for driving (Caetano & Clark, 1998) or are less likely to consider DWI a safety problem and/or to believe they will be arrested or punished for DWI (Cherpitel & Tam, 2000). In 1993, Beck and Bergman conducted focus group interviews with Hispanic teenagers in Maryland to explore their patterns of alcohol consumption. The authors found that some Latino parents actively promoted drinking among their sons as a sign of masculinity or machismo. Participants in 48 focus groups for a 1995 NHTSA-sponsored study indicated drinking among Hispanics might be motivated by the need to prove their manhood within the Latino culture: "Everyone thinks they can handle alcohol, especially men." "Men take it very personally. They get defensive. Men don't think they're going to crash. They're more concerned that cops will take away their license. It's an image thing." Many female focus group participants admitted that they hesitate to prevent men from driving impaired. One of the myths

is “I’m a better driver when I drink,” one Latino parent explained. “A lot of Hispanics think that way. It’s the macho male and the woman gives in to the man. Machismo causes this behavior” (NHTSA, 1995, p. 20). Similar results were obtained by focus groups in a 2001 study sponsored by the Latino Council on Alcohol and Tobacco Prevention (LCAT) and NHTSA (Science Applications International Corporation, 2005).

As mentioned in Section 4.2.b., fatalism may also blur the risk associated with impaired driving. The Motor Vehicle Occupant Safety Survey revealed that African-Americans (39%) and Hispanics (37%) were more likely to agree with the fatalistic statement that “if it was your time to die, you’ll die” (Boyle & Vanderwolf, 2004, Chapter 3). Education level also showed a relationship to fatalistic attitudes. According to Boyle and Vanderwolf (2004), people with more years of formal schooling tended to be less fatalistic, less ambivalent about the injury-reduction benefits of seat belts, and less self-conscious about going against group norms of nonuse.

The literature consistently shows that both Hispanics and African-Americans have a more permissive view about breaking laws and regulations than their White counterparts do (e.g., Sampson & Jeglum-Bartusch, 1998). For DWI laws, the relaxed approach to laws in general by some Hispanic groups might be associated (or exacerbated) by an inaccurate view of the effects of alcohol on a driver.

***f. Knowledge of Traffic Laws***

It has been argued that Hispanics are overrepresented in DWI incidents because many of them are recent immigrants who may have a lack of understanding of DWI laws, a problem that might be particularly severe among immigrants coming from countries in which DWI laws are not well-enforced (Caetano & Clark, 2000; Cherpitel & Tam, 2000; Caetano & McGrath, 2005). On the other hand, there is evidence suggesting that the drinking-and-driving problem might also be more severe among the more acculturated Hispanics. Acculturation may be a risk factor for repeat DWI convictions (Hunter, Wong, Beighley, & Morral, 2006).

Relevant to the understanding of driving attitudes of Hispanic, Asian, and other foreign-born drivers in the United States may be the driving behaviors typical in their countries of origin. Traffic reports coming from Latin America and Asia mention an alarmingly high incidence of motor-vehicle crashes showing a lethal combination of alcohol and pervasive risky driving, such as speeding, red-light running, or stop-sign violations (e.g., Mohan, 2004; Silveira, 2003; Odero, Garner, & Zwi, 1997). Reasons for such discouraging trends are diverse. They include inadequate driving skills, drinking and driving, and lack of proper law enforcement and punishment. For instance, it was estimated that, in 1996 in Buenos Aires, only about 1 in 6,000 red-light violators were apprehended (Luchemos por la Vida, 2001). Although drinking and driving seems to be a generalized problem in Latin America, it is rarely perceived as such (Elgueda, 2001).

Ferguson, Burns, Fiorentino, William, and Garcia (2002) surveyed a small sample of male drivers in Long Beach, California, to study whether the extent of Latino involvement in DWI situations reflects a lack of understanding of DWI laws rather than a disregard for them. Although not conclusive, the results showed that Mexican-American DWI offenders vastly overestimated the number of drinks required to make them unsafe drivers (8 to 10 drinks). The authors also report that fewer than half of Mexican-Americans were aware of the legal BAC

limit in California (.08 g/dL) compared with between 60 percent and 78 percent of Whites. Stiles and Grieshop (1999) examined Hispanic migrant farm workers' driving behaviors and knowledge of the laws to report that Hispanics, especially those who recently migrated to the country, may not be aware of U.S. traffic laws. A study based on a visual observation of race in three Virginia settings reported that non-White drivers were more likely to be red-light runners than their White counterparts (Porter & England, 2000). However, Romano, Tippetts, and Voas (2005) and Romano, Voas, and Tippetts (2006) found no difference between Hispanic and White drivers in the way they obeyed stop-sign and red-light regulations, although the authors found evidence that drinking and driving might be present more often among Hispanics who failed to obey those traffic signs.

Misinterpretation of current traffic laws and regulations is not exclusive to Hispanics. Royal (2000) compared the knowledge that drivers from different racial/ethnic groups have about their State's BAC levels and found that, compared to Whites, African-Americans were the least likely to report that they knew the BAC limit in their State and were the least knowledgeable about this limit among all racial/ethnic groups.

Unfortunately, very little is known about how the reports coming from abroad translate into driving behaviors by mirroring the behavior of racial/ethnic groups in the United States. Although there is evidence showing that acculturation tends to increase alcohol consumption and the risk of alcohol-related crashes, Romano, Tippetts, Blackman, and Voas (2005) found that acculturation might reduce the risk associated with the nonuse of safety belts, at least among Hispanics. To add to the complexity of the picture, a recent study suggested the intriguing possibility that undocumented/unlicensed immigrants may be safer drivers than the licensed ones. Arce and Sherrets (2004) argued that, for undocumented Hispanic immigrants, the desire to go unnoticed and avoid law enforcement for fear of being cited for being unlicensed may provide a reason to drive safely.

***g. Rural/Urban Settings***

Research consistently shows that rates of fatal motor-vehicle crashes are higher in rural than in urban areas. For instance, a 2005 NHTSA report indicates that "considerably more crashes occur in rural areas than urban areas, and . . . rural crashes are more severe, cause greater injury, and pose a more difficult challenge to the highway safety community than do urban crashes" (Burgess, 2005, p. I). Individuals who live in rural areas are subject to a greater amount of road travel (i.e., more miles traveled) and are exposed to higher vehicle speeds (Schiff & Becker, 1996). Rural areas generally have higher motor-vehicle-related mortality rates than urban areas (Campos-Outcalt, Prybylski, Watkins, Rothfus, & Dellapenna, 1997). It is therefore reasonable to expect minority drivers living in rural areas are at a higher risk for traffic-related injuries.

Members of a racial/ethnic group living in a rural area may develop norms and behaviors that deviate from those of their urban counterparts. Some of those deviations might increase their risk of impaired driving. For instance, in their review of the literature, Dawkins and Williams (1997) reported that cultural norms in rural African-American settings tend to be more permissive toward alcohol consumption than those prevalent in urban settings. The authors further reported that such permissiveness in rural African-American settings would occur even if

the norms of the broader rural community were stricter, as long as the norms of public respectability are not violated.

Regarding Hispanics, Castro and Gutierrez (1997) reported that Hispanics living in rural areas often show an elevated “traditionalism” (the displaying of conservative values and norms, such as strong religiosity and family loyalty). Such traditionalism may play a protective role in reducing drinking and drinking-related problems among rural Hispanics. There is evidence, however, that such a protective factor may be effective, mostly for Hispanic women. Castro and Gutierrez (1997) reported that traditionalism among rural Hispanic women and children may induce them not to drink, but it does not preclude Hispanic men from doing so. These “traditionalist” men may perceive heavy drinking as a way to prove their manhood (Castro & Gutierrez, 1997).

The rural/urban dichotomy has a special relevance for Native Americans because the majority of rural Native American communities exist inside or close to reservations. Not surprisingly, Grossman, Sugarman, Fox, and Moran (1997), in an investigation of crash data from an unidentified State from 1986 to 1991, reported that nearly two-thirds of the crashes involving Native Americans occurred in rural areas. The corresponding figure for non-Native Americans was 40 percent. Further, Campos-Outcalt et al. (1997) reported that 45 percent of the excess mortality associated with alcohol-related crashes among Native Americans compared to non-Native Americans can be attributed to residences in rural areas. Native Americans who live in rural areas travel greater distances (more miles traveled) and at higher rates of speed than those in urban areas. Also, if alcohol is not legal on the reservation, they may be induced to drive some distance to the nearest outlet to drink, resulting in a risky drive back after drinking (CDC, 1992).

On top of this urban/rural dichotomy, geographical differences in the vulnerability of racial/ethnic groups to alcohol-related health disparities can be found. In their review of the literature, Dawkins and Williams (1997) argued that southern African-Americans may be proportionally more vulnerable to impaired driving and alcohol-related crashes than those in the north. This higher vulnerability is because comparatively more African-Americans than other ethnic minorities living in rural areas are in the southern States of the country. In Colorado, Harper et al. (2000), using crash data, found that, after adjustment for age, sex, and rural locale, Hispanic drivers had the highest rates of seat belt nonuse, illegal alcohol intoxication, speeding, and invalid licensure. However, in Florida where Cuban-Americans are predominant, Aty and Radwan (1998) found, based on crash data, that Hispanic drivers had a lower rate of involvement when compared with African-Americans and Whites.

Hispanics tend to be particularly at risk of drinking and driving near the border with Mexico (McKinnon, O'Rourke, Thompson, & Berumen, 2004). The minimum legal drinking age in Mexico is 18, and bars in Mexican border towns cater to American youth, who are encouraged to drink heavily by offers of low prices and tolerance of drunken behavior (Lange & Voas, 2000; Lange, Lauer, & Voas, 1999; Romano et al., 2004, Kelley Baker, Johnson, Voas, & Lange, 2000). Research has revealed that, on weekend evenings, thousands of youth (20 and younger) and young adults (21 to 25) residing in communities along the U.S. border go to Mexico to patronize all-night bars (Voas, Lange, & Johnson, 2002). Research has also shown that 40 percent of returnees between midnight and 6 a.m. have BAC levels higher than the .08 g/dL legal

limit, and many of these returnees then drive for more than an hour to reach their homes (Baker, 1997; Lange & Voas, 2000; Lange, Voas, & Johnson, 2002). According to one law enforcement officer in a Texas border town (NHTSA, 1995, p. 22): “DWI (driving while intoxicated) is our second biggest violation. Between one and four people are picked up during the week and each weekend seven to eight are picked up. Drinking might be due to family problems and people think there is nothing else to do in small towns but to drink. There are 16 to 18 bars in town and not much else to do. [Latino] high school kids cross the border to go to bars.” Because the negative effect of this weekend night drinking at Mexican bars spans across both young Latino and White border crossers, to be effective, strategies to deter heavy drinking by American visitors to Mexico should incorporate measures tailored to each of these groups (Romano et al., 2004).

The next section reviews culturally sensitive approaches to alcohol abuse prevention.

## **SUMMARY**

Information on the role of race/ethnicity on impaired driving shows Native American and White drivers are consistently among those most at risk for alcohol-impaired driving, whereas Asian-Americans are among the least vulnerable. For Hispanics and African-Americans, the picture is less clear, with arrest and crash data showing an overrepresentation of both groups in impaired-driving events, and data coming from national surveys showing lower rates of impaired driving for these groups.

This broad picture is also affected by several mediators and moderators. Age, gender, and marital status play similar roles across racial/ethnic groups, with impaired driving more prevalent among young, single males. However, gender-related differences in impaired driving seem to be larger among Hispanics than among Whites or African-Americans.

It has been suggested that variations in the rates of impaired driving are related to differences in the way members of different racial/ethnic groups perceive the risk associated with drinking and driving, with Hispanics less likely to consider DWI a safety problem or to believe they will be arrested or punished, or both. Fatalism (the perception by the driver that she/he has no control over the likelihood of a crash), which has been reported to be higher among Hispanics and African-Americans than among other groups, has also been suggested as a contributor to the DWI problem. It has also been suggested that machismo is an additional reason for the much greater prevalence of impaired driving among Hispanic males (than among Hispanic females). There is no clear evidence, however, to support this hypothesis.

Vulnerability to impaired driving varies geographically and is higher around alcohol outlets. The density of these outlets increases in low-income neighborhoods. Similarly, near the Mexican-U.S. border, Hispanics who return from Mexican bars are at a high risk of impaired driving. Rural settings also contribute to DWI. This factor might be particularly relevant to Native Americans living on “dry” reservations.

## **7. Culturally Competent Prevention Strategies**

Overall, most peer-reviewed studies evaluating the effect of policies to curb driving-related problems have focused on efforts promoting seat belt use (Greenberg-Seth, Hemenway, Gallagher, Ross, & Lissy, 2004; Greenberg-Seth, Hemenway, Gallagher, Lissy, & Ross, 2004; Cohn, Hernandez, Byrd, & Cortes, 2002). Peer-reviewed studies on whether policy changes differentially affect impaired driving among minority populations are rare. There exists, however, a more extensive literature that examines key characteristics that health-related programs should have to effectively reach different racial/ethnic groups. This section summarizes that literature.

There is consensus that, to be effective in reaching minority groups, health-promotion policies, such as those aimed to deter impaired driving, must be culturally competent—broadly defined as programs that are respectful of and responsive to the cultural and linguistic needs of the targeted population (Center for Mental Health Services, 2001; Betancourt, Green, Carrillo, & Ananeh-Firempong, 2003; Betancourt, Green, Carrillo, & Park, 2005). According to SAMHSA,

“cultural competence includes attaining the knowledge, skills, and attitudes to enable administrators and practitioners within systems of care to provide effective care for diverse populations, i.e., to work within the person’s values and reality conditions” (Center for Mental Health Services, 2001, Chapter 1). Translating these broad goals into operational programs is not straightforward, however. According to the National Center for Cultural Competence (<http://gucchd.georgetown.edu/nccc/framework.html#lc>), cultural competence requires that organizations, agencies, communities, etc., involved in health-promotion efforts have the following characteristics:

- They have a defined set of values and principles and demonstrate behaviors, attitudes, policies, and structures that enable them to work effectively cross-culturally.
- They have the capacity to (a) value diversity, (b) conduct self-assessment, (c) manage the dynamics of difference, (d) acquire and institutionalize cultural knowledge, and (e) adapt to diversity and the cultural contexts of the communities they serve.
- They incorporate the previous two items in all aspects of policy-making, administration, practice, and service delivery, and involve systematically consumers, key stakeholders, and communities.

Delgado (2005) summarized a review of the literature of alcohol treatment and prevention efforts among Latinos and pointed out that, for these programs to be structured around the needs of vulnerable minority populations, they must be free of conventional constraints (e.g., implemented beyond the 9 a.m. to 5 p.m., Monday to Friday schedule) and designed and delivered by trained individuals who understand the culture of the target population. Multicultural training has become a need for achieving cultural competence among programs targeting racial/ethnic minorities (e.g., Paulino, 1994; Miranda, 2005). Interestingly, in her review of the literature, Miranda (2005) pointed out that the concept of multicultural training no longer refers exclusively to White practitioners learning how to communicate and interact with minority groups, but also to improve intra-minority group communication (e.g., Puerto Rican practitioners learning about the needs and culture of Guatemalans). This suggests that finding an adequate vehicle for disseminating health-promotion information among minority groups is paramount to the success of prevention programs.

Focus groups conducted with Latino immigrants in 2001 by NHTSA and the LCAT found that newspapers may not be optimal for reaching Hispanics, given the limited educational levels among many Latinos; instead, television and fotonovelas (a series of still photography or drawings with balloon captions) may offer more efficient media (Science Applications International Corporation, 2005). In the 1995 NHTSA report, however, focus groups said that a common mistake is the assumption that all Hispanics want to speak Spanish. According to one participant, “This is patronizing and can be a turnoff.” The preferred language depends on age and acculturation, with recent immigrants more likely to prefer material in Spanish (NHTSA, 1995, p. 112). Nevertheless, messages regarding drinking and driving must be clear, consistent, and free of jargon, particularly because of the low literacy prevalent among some of the most deprived and vulnerable Hispanic groups (Science Applications International Corporation, 2005).

In finding proper vehicles to reach the targeted audience, it has been suggested that peers and friends could be used as conduits to disseminate positive information among Hispanic and White teenagers (Marin, 1996b; Beck & Bargman, 1993). That might not be the case with Asian-Americans and African-Americans, among whom the role of peers in alcohol and substance use might be relatively modest. Kim, Zane, and Hong (2002) studied Asian-Americans and Resnicow, Soler, Ahluwalia, Butler, and Braithwaite (2000) studied African-Americans. Both groups of researchers reported a particularly strong protective role of family for alcohol and substance use in these racial/ethnic groups.

Regarding Asian-American communities, NCADI suggests that programs should use messages and materials that emphasize the role of parents, family, and elders, and even involve them in some prevention efforts (NCADI, 1997). Beyond this advice, however, the large variation of languages and culture confronting the Asian/PI group practically precludes making another major generalization regarding this racial/ethnic group. Moreover, the NCADI handbook stresses the importance for program designers and practitioners to understand such cultural variations in designing prevention programs. The NCADI handbook also reminds program designers and practitioners to be aware of the large variety of religious beliefs among this group and the variations in their tolerance for alcohol use. Some Asian/PI cultures allow for moderate use of alcohol. NCADI therefore advises practitioners to be knowledgeable of traditional ethnic drinks, such as kava or sakau. Finally, NCADI emphasizes the need to use writers and editors from the targeted groups.

The need to include the participation of law enforcement officers is essential to the success of many impaired-driving programs. For instance, a key element in the success of NHTSA's *You Drink & Drive. You Lose* program is to "secure the commitment of top-level police management, State and local government" (NHTSA, 1999, p. 1). However, this need may be hampered by the lack of trust some minority communities have of police officers (Taslitz, 2003). In reviewing the literature, Taslitz (2003) suggested that the lack of trust may be particularly severe in some African-American communities. Taslitz (2003) indicated that some Latino communities also show lack of trust of enforcement officials. However, results from a nationwide study based on 48 focus groups suggested that most Hispanics respect Spanish-speaking officers (NHTSA, 1995).

For Hispanics, some aspects of the Latino culture that have been suggested as relevant to the design of effective prevention programs include *respeto* (respect), *confianza* (trust), the role of the family, and the value of a personal connection (e.g., Denman-Vitale & Murillo, 1999; Goldman & Risica, 2004; Burnett, Genao, & Wong, 2005; Miranda, 2005; Whetten et al., 2006). For instance, some alcohol-prevention programs for Hispanics (teenagers in particular) may benefit from the involvement of family members in the prevention efforts (Caetano & Raspberry, 2001; Epstein, Botvin, Baker, & Diaz, 1999). Also, Soriano (1994) suggested that some programs should take advantage of institutions already established in the Hispanic community, such as social clubs and churches.

Related to the need for trustworthy figures to deliver health-promotion messages is the role of priests in delivering positive interventions to Hispanics (Marin, 1996b) and African-Americans (Castro & Gutierrez, 1997). For Native Americans, promising prevention programs should establish a collaborative relationship with Native American authorities (community, tribal



and spiritual leaders, traditional healers) and allow for guidelines and participation in spiritual ceremonies, social events, and other traditional activities (Stubben, 1997; Jones-Saumty et al., 2003). The inclusion of older community members in prevention programs (Stubben, 1997; May & Moran, 1995), as well as a long-term commitment by practitioners with the tribal community, has been suggested as requisites for the success of prevention programs aimed at Native Americans (Stubben, 1997).

Finally, the legal status of vulnerable individuals shapes the pattern of help-seeking they will pursue (Delgado, 2002). Undocumented immigrants face steep barriers of access to care in many communities (Miranda, 2005; Strug & Mason, 2002). The legal status of the targeted populations must also be considered by policy-makers and practitioners in designing and implementing alcohol-related programs (Miranda, 2005).

### **SUMMARY**

Peer-reviewed studies on the extent to which policy changes differentially affect impaired driving in minority populations are rare. Although there is consensus about the need to develop culturally sensitive messages about legal and health policies, there is no clear understanding of what the content of such messages must include.

Some of the sparse suggestions provided by the literature include the use of peers and friends to disseminate positive information among Hispanic and White teenagers (but not as much among Asians); the need to incorporate law enforcement officers into prevention programs, although for some groups such inclusion may generate some rejection; and the need to use a language that is spoken by the target audience and is also simple and free of jargon. In addition, the literature suggests the need to find adequate channels of communication for the target audience and the need to incorporate the way drinking alcohol is perceived in the culture of the targeted audience.

## 8. References

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DOT HS 811 336  
December 2010



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