

Immigrants and Substance Use: Findings from the 1999–2001 National Surveys on Drug Use and Health

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Acknowledgments

This report was prepared by the Division of Population Surveys in the Office of Applied Studies (OAS), Substance Abuse and Mental Health Services Administration (SAMHSA), and by RTI International (a trade name of Research Triangle Institute), Research Triangle Park, North Carolina, under Contract No. 283-99-9018. Joseph C. Gfroerer led the work on this report at SAMHSA. At RTI, Janice M. Brown was the task leader for production of the report, Carol L. Council and Michael A. Penne were its co-authors, and Mary Ellen Marsden and Scott P. Novak provided review comments. Also at RTI, Joyce Clay-Brooks and Loraine G. Monroe provided word-processing support for the report; Diane G. Caudill prepared the graphics; Teresa F. Gurley, Kim Cone, and Pamela Couch Prevatt readied its files for the SAMHSA printer and the Web; and Richard S. Straw, K. Scott Chestnut, and Jason Guder provided copyediting and proofreading support. Final report production was provided by Beatrice Rouse, Coleen Sanderson, and Jane Feldmann at SAMHSA.

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Brown, J. M., Council, C. L., Penne, M. A., & Gfroerer, J. C. (2005). *Immigrants and substance use: Findings from the 1999–2001 National Surveys on Drug Use and Health* (DHHS Publication No. SMA 04-3909, Analytic Series A-23). Rockville, MD: Substance Abuse and Mental Health Services Administration, Office of Applied Studies.

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Originating Office

SAMHSA, Office of Applied Studies
1 Choke Cherry Road, Room 7-1044
Rockville, MD 20857

March 2005

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Highlights

This report presents information on the prevalence of alcohol, tobacco, and illicit drug use among immigrants aged 18 or older in the United States during 1999-2001. The data are based on the National Survey on Drug Use and Health (NSDUH), a project of the Substance Abuse and Mental Health Services Administration.

NSDUH is an annual survey of the civilian, noninstitutionalized population of the United States aged 12 years old or older. Conducted by the Federal Government since 1971, it is the primary source of statistical information on the use of illegal drugs by the U.S. population. Approximately 67,500 persons are interviewed each year. Estimates for immigrants in this report are based on data from adults in the 1999, 2000, and 2001 surveys who reported that they were born outside the United States. The sample includes 16,130 immigrants, representing 25 million people. Immigrant data overall and for 16 specific countries are compared with data from the sample of 116,629 U.S.-born adults, representing 174 million people.

Substance Use among All Immigrants Aged 18 or Older

- The rates of alcohol use were lower among immigrants than among U.S.-born adults. This was true for past year use (54.3 vs. 67.8 percent), past month use (39.5 vs. 52.4 percent), past month binge use (16.9 vs. 22.3 percent), past month heavy use (3.0 vs. 6.5 percent), and the average number of drinks per week among current drinkers (6.3 vs. 8.3).
- Among adult immigrants who were current drinkers, per capita alcohol consumption in the country of birth was associated with the current weekly alcohol consumption. Current adult drinkers from countries with higher per capita alcohol consumption had a higher average number of drinks per week within the past month.
- Rates of tobacco use were lower among immigrants than among U.S.-born adults. This was true for past year use (24.8 vs. 38.2 percent) and past month use (20.4 vs. 32.8 percent).
- Rates of illicit drug use were lower among immigrants than among U.S.-born adults. This was true for past year marijuana use (3.5 vs. 8.8 percent), past month marijuana use (1.7 vs. 5.1 percent), past year any illicit drug use (6.0 vs. 11.5 percent), and past month any illicit drug use (2.9 vs. 6.6 percent).
- Rates of substance use were associated with the length of time immigrants had been in the United States. An analysis adjusting for demographic differences showed that immigrants who had been in the United States for 5 or more years were more likely than immigrants who had been in the United States for fewer than 5 years to use alcohol in the past year or past month, to binge drink, to use marijuana in the past year or month, and to use any illicit drug in the past year or month. Tobacco use was not significantly associated with length of time in the United States.

Substance Use among Adult Immigrants from Selected Countries

- Estimates of substance use among immigrants from 16 selected countries revealed wide variation across these immigrant subgroups, even within geographic regions. These differences point out that comparisons based on broad regional groupings of immigrants, such as Latin Americans or Asians, can mask important within-region differences.
- Past month alcohol use rates among immigrants from the United Kingdom (67.5 percent) and Canada (64.5 percent) were significantly higher than the rate among U.S.-born adults (52.4 percent). Immigrants born in the Philippines (24.1 percent), Vietnam (26.4 percent), India (26.6 percent), and China (28.4 percent) had rates significantly below rates among immigrants from other selected Asian countries (Japan, 62.1 percent; Korea, 53.2 percent) and among U.S.-born adults.
- None of the 16 countries studied showed adult immigrant populations with past month tobacco use rates higher than the U.S. rate (32.8 percent). Among the Latin American countries studied, rates ranged from 12.1 percent among immigrants from Jamaica to 31.0 percent among immigrants from Puerto Rico. Similarly, there was wide variation among Asian countries, with Korean-born immigrants having a rate of 30.2 percent, while the lowest rates were found among those born in China (10.1 percent), India (10.2 percent), and the Philippines (13.5 percent). Immigrants from the United Kingdom (31.7 percent) and Germany (30.0 percent) had rates similar to the U.S.-born rate.
- Immigrants from several countries had rates of past month illicit drug use that were similar to the U.S.-born rate of 6.6 percent. These included Japan (8.0 percent), Puerto Rico (7.7 percent), Korea (5.8 percent), Jamaica (5.6 percent), Poland (5.3 percent), Germany (5.1 percent), and the United Kingdom (4.4 percent). Low rates of illicit drug use were found among immigrants from China, (0.2 percent), Cuba (0.5 percent), the Philippines (1.1 percent), and India (1.2 percent).

1. Introduction

1.1. Background

An estimated 13 percent of the U.S. adult population was born outside the United States. These diverse immigrant populations bring with them the cultural norms related to substance use that exist in their respective countries of origin. As they adapt to life in the United States, they also may be differentially exposed to substance use norms and social challenges (i.e., language barriers, unfamiliar customs, and discrimination). One of the consequences of adapting to new circumstances may be an increased rate of substance use. The heterogeneity of immigrant populations, even among those from the same general regions of the world (e.g., Latin America, Europe), highlights the need to study the factors that may contribute to differential substance use rates. A more comprehensive understanding of the variability among racial/ethnic groups will contribute to the identification of at-risk populations that can be targeted for prevention/early intervention programs. This report presents the first available nationally representative estimates of substance use among adult immigrants to the United States.

Immigrants are defined in this report as U.S. residents born outside the United States. A number of factors have been hypothesized to contribute to substance use among immigrants. Acculturative stress, or the challenge of assimilating into the dominant culture, has been implicated as a mechanism for increased substance use among immigrants (Alaniz, 2002; Castillo & Henderson, 2002). In addition, immigrants often face language and communication barriers, cultural differences, discrimination, lack of social support, difficulties related to access to health care, and poverty (Caetano, Clark, & Tam, 1998; Elder et al., 2000; Makimoto, 1998).

Substance use rates also may vary by length of time in the United States. Research findings on substance use patterns among immigrant populations are mixed, with some studies indicating that substance use increased with increased time in the United States (Alaniz, 2002; Caetano et al., 1998; Gfroerer & Tan, 2003; Ortega, Rosenheck, Alegria, & Desai, 2000). Other studies showed decreased substance use (Johnson, VanGeest, & Cho, 2002) and mental health problems (Escobar, Nervi, & Gara, 2000) over time and with increased levels of acculturation (Hines & Caetano, 1998). One explanation for these discrepant findings is the heterogeneity of immigrant populations. Even within subgroups of immigrants, there is wide variability in substance use patterns. For example, Randolph, Stroup-Benham, Black, and Markides (1998) found significant differences in the frequency and volume of drinking among Mexican-American, Puerto Rican, and Cuban-American populations, with Mexican-American and Puerto Rican men having higher rates of heavy drinking than Cuban-American men. Caetano (1988) reported that Mexican-American men drank less frequently but in higher volumes than other Latin American immigrant men.

Similarly, Makimoto (1998) demonstrated differences in drinking patterns among Asian Americans when comparing Chinese-, Japanese-, Korean-, and Filipino-American samples. Among adults, Japanese Americans had the highest and Chinese Americans had the lowest lifetime prevalence of drinking and heavy drinking. Alcohol abuse and dependence appear to be significant problems among Southeast Asians resettled in the United States, as a result of contributing factors, such as experiences of trauma during the refugee process and traditional

beliefs about alcohol as a health-promoting substance (Amodeo, Robb, Peou, & Tran, 1997). Other researchers have found that Asian Americans have shown a general increase in substance use patterns with length of time in the United States, and they have attributed the increase to the results of acculturation toward U.S. drinking norms (O'Hare & Van Tran, 1998).

The reasons for this variability in drinking patterns are not well understood. Alaniz (1998) found that alcohol availability and advertising were disproportionately concentrated in low-income racial/ethnic minority communities, with 5 times more alcohol advertisements in Latino neighborhoods than in predominantly white neighborhoods. Variability in use patterns may arise from differential access to alcohol and other drugs, cultural mores limiting or supporting use, varying degrees of psychological stress, or differences in the use of alcohol in the country of origin. The variability in alcohol use rates could be due to a differential amount of time that immigrant groups have been in the United States or to the younger average age of some of the individuals within the regional groupings.

Clearly, the heterogeneity of the immigrant population of the United States provides a challenge to the substance abuse prevention and treatment community and to early intervention programming. The mixed findings from research with immigrant and minority populations may point to the need for considering cultural values and acculturation in designing interventions. For example, if substance use increases with increased acculturation in some groups of immigrants, it may point to the need to intervene with new immigrants.

An initial step in understanding the substance use patterns of immigrant populations is to document the prevalence of substance use in a national sample of immigrants and to examine patterns among immigrants from different countries. It is important to examine the epidemiology of substance use in this population, regardless of whether prevalence rates are higher or lower than U.S. rates, in order to adequately address potential problems. It is also crucial to have data that can be related to specific countries of origin. The National Survey on Drug Use and Health (NSDUH), formerly the National Household Survey on Drug Abuse (NHSDA), is the only source available that provides large samples of immigrants from specific countries. This report examines past month and past year alcohol, illicit drug, and tobacco use among a large sample of immigrants from NSDUH data for the combined years of 1999, 2000, and 2001.

1.2. Summary of the NSDUH Methodology

Conducted by the Federal Government since 1971, NSDUH collects data by administering questionnaires to a representative sample of the population aged 12 or older through face-to-face interviews at their place of residence. This section briefly describes the survey methodology. A more complete description is provided in Appendix A.

NSDUH collects information from residents of households, noninstitutional group quarters (e.g., shelters, rooming houses, dormitories), and civilians living on military bases. Persons excluded from the survey include homeless people who do not use shelters, active military personnel, and residents of institutional group quarters, such as jails and hospitals.

Since 1999, NSDUH has been carried out using a computer-assisted interviewing (CAI) methodology. The survey uses a combination of computer-assisted personal interviewing (CAPI)

conducted by the interviewer and audio computer-assisted self-interviewing (ACASI). Use of ACASI is designed to increase the privacy of the interview and appears to increase the level of honesty in the reporting of illicit drug use and other sensitive behaviors.

The 1999, 2000, and 2001 samples employed a 50-State design with an independent, multistage area probability sample for each of the States and the District of Columbia. The eight most populous States (which together account for 48 percent of the total U.S. population aged 12 or older) were designated as large sample States (California, Florida, Illinois, Michigan, New York, Ohio, Pennsylvania, and Texas). For these States, the design provided a sample large enough to support direct State estimates. For the remaining 42 States and the District of Columbia, smaller, but adequate, samples were selected to support State estimates using small area estimation (SAE) techniques. The design also oversamples youths and young adults so that each State's sample is approximately equally distributed among three major age categories: 12 to 17 years, 18 to 25 years, and 26 years or older. To enhance the precision of trend measurements, half of the first-stage sampling units, or area segments, in each survey also are included in the subsequent survey. However, all households included in the sample each year are new.

In 2002, the name of the survey was changed to the National Survey on Drug Use and Health (NSDUH), and several improvements and modifications were made. Respondents were offered a \$30 incentive payment for participation in the survey, and quality control procedures were enhanced. These improvements resulted in changes in respondent reporting of substance use. Therefore, estimates from 2002 and later NSDUHs should not be compared with estimates from 1999-2001, shown in this report, for assessing trends in substance use. A discussion of survey methodology and results from the 2002 NSDUH are presented in OAS (2003).

1.3. Format of Report and Explanation of Tables

This report is divided into four chapters. Chapter 1 includes background information on substance use among immigrant populations and the methods for the current report. Chapter 2 provides descriptive information for the total immigrant sample used for this report. Chapter 3 focuses on alcohol, illicit drug, and tobacco use among all immigrants. The alcohol measures include past month weekly alcohol consumption, prevalence of past month alcohol use, past month binge drinking, past month heavy drinking, and past year alcohol use. The use of marijuana and other illicit drugs is detailed for past month and past year use. And past month and past year tobacco use rates are examined. Chapter 4 contains information on alcohol, illicit drug, and tobacco use for immigrants from countries with the highest numbers of immigrants in the United States. For ease of presentation, these selected countries have been broadly grouped in regional areas: Latin America, Asia, Europe, and Canada. Appendix A contains technical details about the survey methodology, Appendix B discusses the statistical methods and limitations of the data, and Appendix C provides detailed prevalence and standard error tables.

1.4. Description of the Sample

Analyses presented in this report are based on annual averages of the 1999 to 2001 NSDUHs for persons aged 18 or older. Persons born outside the United States were classified as foreign born, and others were classified as U.S. born on the basis of answers to the question, "Were you born in the United States?" Foreign-born respondents also were asked, "In what

country or U.S. territory were you born?" and "About how long have you lived in the United States?" The total sample of 132,759 adults across the three surveys represented 199 million adults in the United States, of whom about 13 percent were foreign born. The total sample size for U.S.-born adults was 116,629 representing 174 million adults. The total sample size for all immigrants aged 18 or older was 16,130 representing 25 million adults.

This report presents data for the estimated 25 million adult immigrants overall and by specific country of birth for countries with sample sizes sufficient to produce reliable estimates. These countries and their estimated proportions of all adult immigrants are Mexico (32.1 percent), the Philippines (4.2 percent), India (4.0 percent), Germany (3.3 percent), Puerto Rico (3.2 percent), El Salvador (2.8 percent), Canada (2.7 percent), the United Kingdom (2.2 percent), Cuba (2.1 percent), Korea (2.1 percent), Vietnam (1.9 percent), China (1.8 percent), Colombia (1.7 percent), Japan (1.5 percent), Jamaica (1.4 percent), and Poland (1.1 percent). Immigrants from these individual countries were grouped into four regions: *Latin America* (Mexico, Puerto Rico, Cuba, El Salvador, Jamaica, Colombia), *Asia* (Japan, Korea, China, the Philippines, Vietnam, India), *Europe* (Germany, United Kingdom, Poland), and *Canada*. These regional groupings of immigrants represent nearly 17 million adult immigrants, or 68 percent of the total adult immigrant population. The groupings considered here do not represent all countries within each region. Eighty-two percent of the total adult foreign-born population had been in the United States for 5 or more years.

1.5. Methods

1.5.1 Prevalence Estimation

The statistical package SUDAAN[®] (RTI, 2001) was used for the analyses to take into account the complex survey design of NSDUH. Prevalence estimates were computed for past month use of alcohol (any, binge, heavy), marijuana, any illicit drugs (marijuana, cocaine, heroin, hallucinogens, inhalants, and nonmedical use of prescription-type pain relievers, tranquilizers, stimulants, and sedatives), and tobacco. Past month use of each substance is defined as use of the substance at least one time during the 30 days prior to the interview. Binge alcohol use is defined as drinking five or more drinks on the same occasion (i.e., at the same time or within a couple of hours of each other) at least once during the past 30 days. Heavy alcohol use is defined as drinking five or more drinks on the same occasion on 5 or more days in the past 30 days. The past month weekly average number of drinks was calculated by multiplying the average number of drinks consumed per day in the past 30 days by the number of days drinking during the past month and dividing by 4.286, the number of weeks in a 30-day period, among past month drinkers. NSDUH includes a series of questions on the use of any tobacco product, including cigarettes, chewing tobacco, snuff, cigars, and pipe tobacco in the past 30 days. Cigarette use is counted if respondents reported smoking "part of or all of a cigarette."

NSDUH estimates considered to be unreliable due to unacceptably large sampling errors typically are not shown in reports. However, an exception is made in this report in the interest of presenting all data. Estimates with very large standard errors (SEs), normally suppressed, are indicated with an "*" beside them (see Section B.3.2 in Appendix B).

Tests of significance, such as *t* tests and chi-square tests, were conducted using Proc DESCRIPT and Proc CROSSTAB procedures, and linear and logistic regressions were conducted using the Proc REGRESS and Proc RLOGIST procedures. The terms "higher" or "lower" are used only when differences are statistically significant. Respondents with missing data for variables not subject to NSDUH imputation procedures were excluded from analyses.

1.5.2 Regression Analyses

Linear regression models were fitted to the data to assess the effect of per capita alcohol consumption in the country of origin on past month weekly consumption rates among immigrants from selected countries with controls for gender, age, family income, marital status, and length of time in the United States. Only immigrants from countries with known per capita alcohol consumption and who reported past month alcohol use ($N = 5,115$) were included in the model. Fitting a linear regression model to the outcome variable OBSERVED (defined as the numbers of drinks per week during the past 30 days) was first attempted. However, diagnostics for this model were poor, due to the skewed distribution of the outcome variable. The overall R^2 (proportion of variance explained by the model) was approximately 2 percent, and the distribution of the residuals was highly skewed. Consequently, a log transformation was attempted. The linear regression model with $\log(\text{OBSERVED})$ as the response variable achieved R^2 of over 10 percent, and the residuals' distribution was approximately normal. Although an R^2 of 10 percent is still considered low, this is a considerable improvement over the model where OBSERVED was modeled directly.

Logistic regression procedures were used for analyses based on all immigrants to the United States aged 18 or older to (1) determine the characteristics and predictors of alcohol, illicit drug, and tobacco use, and (2) examine the relationship between length of time in the United States and substance use patterns (e.g., binge drinking or heavy alcohol use). Odds ratio (OR) estimates derived from logistic regression procedures denote the estimated magnitude of an association between a binary outcome and a covariate. In this report, the *p* value equal to or less than 0.05 is considered statistically significant. The OR estimate greater than 1 indicates a positive association between the outcome of interest and the covariate; a value of less than 1 reflects an inverse association.

2. Demographic Characteristics of Immigrants

This chapter presents findings on the demographic characteristics of all immigrants in the United States aged 18 or older, including gender, age, educational attainment, current employment, household income, and government assistance. Comparisons are made between immigrants and U.S.-born persons and between immigrants who lived in the United States for fewer than 5 years and for 5 years or more. Age, gender, and years-in-U.S. data also are shown for specific countries of birth. These data can be particularly informative because comparisons of prevalence rates for substance use are affected by the differing demographic characteristics of comparison groups. In particular, immigrant groups that are primarily recent immigrants who are young (e.g., Mexico) may have higher substance use rates than those with older immigrants (e.g., Cuba) because rates of use generally are higher among younger persons.

2.1. Overview

Among adults aged 18 or older, 12.7 percent of the estimated population in the United States for 1999, 2000, and 2001 were foreign born. Tables C.1 to C.5 in Appendix C present the demographic characteristics of immigrants in the United States by country of origin and by length of stay in the United States.

2.2. Gender

An estimated 48.6 percent of immigrants were male, similar to the 47.6 percent among U.S.-born persons. A larger percentage of immigrants residing in the United States for fewer than 5 years were male than those living in the United States for 5 years or more. The percentage who were male varied from 36.7 percent among immigrants from the Philippines to 54.9 percent among those from India.

2.3. Age

The percentage aged 18 to 25 among immigrants (14.2 percent) was similar to the percentage aged 18 to 25 among U.S.-born adults (14.6 percent). However, the U.S.-born population had a greater percentage of persons aged 50 or older compared with the foreign-born population (38.3 vs. 28.5 percent, respectively). An estimated 32.9 percent of all immigrants living in the United States for fewer than 5 years were between the ages of 18 and 25, while only 10.6 percent were in the 50 or older age group.

Among immigrants who had been in the United States for 5 years or more, only 10.1 percent were aged 18 to 25 and 32.4 percent were aged 50 or older. The younger age of the more recent immigrants has important implications for substance use rates given the higher prevalence of use among younger persons in general.

The youngest immigrant population was from Vietnam (average age 36.8), and the oldest was from Cuba (53.2).

2.4. Educational Attainment

In general, immigrants had lower educational levels than the U.S.-born population, regardless of their length of stay in the United States. Immigrants were more likely than U.S.-born persons to have less than a high school education (30.7 vs. 15.8 percent, respectively). Immigrants living in the United States for fewer than 5 years were equally as likely as immigrants who had been in the United States for 5 or more years to have less than a high school education (31.7 vs. 30.4 percent). More than 20 percent of both immigrants and U.S.-born persons indicated having college degrees. However, the percentage with less than a high school education ranged from 3.4 percent among Japanese immigrants to 66.2 percent among Mexican immigrants; the college graduation rate ranged from 4.6 percent (Mexico) to 71.1 percent (India).

2.5. Current Employment

Although the differences were small, immigrants were more likely to be employed full time and less likely to be employed part time compared with the U.S.-born population, regardless of their length of stay in the United States. Immigrants who had been in the United States for 5 or more years were equally likely to be unemployed (2.1 percent) as U.S.-born persons (2.2 percent) and less likely to be unemployed than immigrants who had been in the United States for fewer than 5 years (4.1 percent). The rate of unemployment varied from 0.3 percent (Japan, Korea, United Kingdom) to 4.8 percent (Jamaica, Colombia).

2.6. Household Income

Immigrants were more likely than U.S.-born persons to have household incomes of less than \$20,000 (28.2 vs. 19.9 percent, respectively) and less likely to have household incomes of \$75,000 or more (17.1 vs. 21.6 percent). More recent immigrants were more likely to have household incomes of less than \$20,000 than immigrants living in the United States for 5 or more years (44.3 vs. 24.7 percent). Overall, immigrants living in the United States for 5 or more years had incomes that were higher than those of newer immigrants, but not as high as those of U.S.-born residents. The percentage with incomes below \$20,000 ranged from 10.7 percent (Poland) to 45.1 percent (Puerto Rico).

2.7. Government Assistance

If at least one family member received Supplemental Security Income (SSI), cash assistance or noncash assistance (Temporary Assistance for Needy Families, TANF), or the family received food stamps, respondents were classified as receiving government assistance. Immigrants were more likely than persons born in the United States to receive government assistance (13.2 vs. 12.2 percent, respectively). Among immigrants, those living in the United States for 5 years or longer were more likely to receive government assistance (14.0 percent) than those living in the country for fewer than 5 years (9.4 percent). The rate varied from 3.6 percent (Japan) to 34.3 percent (Puerto Rico).

3. Substance Use among Immigrants

This chapter presents findings from the National Survey on Drug Use and Health (NSDUH) on the prevalence of use of alcohol, illicit drugs, and tobacco among all immigrants in the United States aged 18 or older from 1999 to 2001. Substance use among immigrants is examined by age and gender, and results are compared by the length of time in the United States with the rates for U.S.-born persons aged 18 or older in Tables C.6 through C.13. Demographic characteristics for all immigrants and for immigrants from selected countries are presented in Tables C.1 through C.5 in Appendix C.

3.1. Alcohol Use

3.1.1 Alcohol Prevalence Rates

Past month and past year alcohol use rates were examined for foreign-born individuals living in the United States and aged 18 or older and compared with prevalence rates for U.S.-born residents aged 18 or older. The prevalence rates of past month alcohol use, past month binge drinking, past month heavy drinking, and past year alcohol use were lower for foreign-born compared with U.S.-born individuals. Among all foreign-born persons, men had higher rates of use across all alcohol measures than women, and younger age groups (18 to 25, 26 to 49) had higher rates of use than older individuals (50 or older). Prevalence rates for past month and past year alcohol use for all immigrants and U.S.-born persons are shown in Table C.6 in Appendix C (also see Figures 1 and 2 later in this chapter).

The average number of drinks consumed on a weekly basis by current drinkers during the past month was calculated for U.S.- and foreign-born samples aged 18 or older. Foreign-born individuals drank fewer drinks on average each week than U.S.-born individuals (6.3 vs. 8.3 drinks). The weekly average was calculated by multiplying the average number of drinks consumed per day in the past 30 days by the number of days drinking during the past month and dividing by 4.286, the number of weeks in a 30-day period (see Table C.6).

3.1.2 Alcohol Use, by Length of Time in the United States

Alcohol use rates among immigrants aged 18 or older also were examined by length of time in the United States. There were no statistically significant differences in past month alcohol use (39.1 vs. 39.6 percent), past month binge drinking (18.8 vs. 16.4 percent), past month heavy drinking (3.8 vs. 2.9 percent), or past year alcohol use (53.6 vs. 54.4 percent) when comparing immigrants who had been in the United States for fewer than 5 years with those who had been in the United States for 5 or more years (see Table C.6).

3.1.3 Alcohol Use, by Use in Country of Birth

It was hypothesized that among immigrants who were current drinkers, a portion of the variability in alcohol consumption was due to drinking patterns in one's home country. Annual per capita alcohol consumption for the country of origin was determined for each immigrant respondent whose country was listed in the *Global Status Report on Alcohol* (World Health

Organization [WHO], 2001). This variable then was used as a predictor in a linear regression model, with the logarithm¹ of past month weekly alcohol consumption (number of drinks per week) among current drinkers as the response variable. Along with the aforementioned country of origin consumption variable, the following variables were entered as predictors in the model: gender, age, total family income, marital status, education, and length of time in the United States. Results indicated that drinking in the country of origin was a significant predictor of past month weekly alcohol consumption, as were marital status (unmarried), education (completed less than high school), and gender (male). The regression coefficient for the country of origin per capita drinking rate was 0.04. Transformed back to the original scale, the model predicts a rise of approximately 4 percent in the current consumption rate for every liter increase in the country of origin per capita drinking rate (Table C.7).

Per capita alcohol consumption was organized into countries that had rates similar to, higher than, or lower than U.S. rates. An analysis of variance (ANOVA) test then was performed to compare past month weekly consumption estimates for immigrants from countries with per capita alcohol consumption that was higher than, lower than, or similar to the per capita consumption for the United States (data not shown). Immigrants from countries with per capita rates that were similar to or lower than U.S. rates had significantly lower past month weekly alcohol consumption than U.S.-born persons, 5.7 and 5.9 drinks per week, respectively, when compared with the U.S.-born population (8.4 drinks per week). Past month weekly alcohol consumption was higher for individuals from countries with a higher per capita consumption rate than the U.S. rate, but consumption was still lower than among individuals born in the United States (7.0 vs. 8.4 drinks per week).

3.2. Illicit Drug Use

3.2.1 Marijuana

Past month marijuana use was lower among foreign-born individuals living in the United States (1.7 percent) than among U.S.-born persons aged 18 or older (5.1 percent). Past month marijuana use did not differ among immigrants living in the United States for fewer than 5 years (1.8 percent) compared with those who resided in the United States for 5 years or more (1.6 percent). However, past month marijuana use rates were significantly higher among immigrants aged 18 to 25 who had been in the United States for 5 years or more (6.5 percent) compared with immigrants aged 18 to 25 who had been in the United States for fewer than 5 years (3.1 percent). Past month marijuana use rates are shown in Table C.8 and Figure 1.

Marijuana use rates for the past year also were lower among foreign-born persons when compared with U.S.-born individuals (3.5 vs. 8.8 percent, respectively). As with past month use, there were no differences in past year marijuana use among immigrants based on whether one had been in the United States for 5 years or more (3.4 percent) or for fewer than 5 years (3.9 percent). Consistent with past month marijuana use findings, past year marijuana use rates were significantly higher among immigrants aged 18 to 25 residing in the United States for 5 years or more (12.0 percent) compared with immigrants aged 18 to 25 who had been in the United States

¹ A linear model where the weekly consumption rate was directly modeled resulted in poor diagnostics. In contrast, the final model where the logarithm of this rate was modeled performed considerably better.

for fewer than 5 years (7.0 percent). Past year marijuana use rates are shown in Table C.9 and Figure 2.

3.2.2 Any Illicit Drugs

Foreign-born persons living in the United States had lower rates of past month (2.9 percent) and past year (6.0 percent) any illicit drug use when compared with U.S.-born individuals (6.6 percent for past month and 11.5 percent for past year use) (Tables C.8 and C.9, Figures 1 and 2).

There was no significant difference among immigrants in past month illicit drug use by length of time in the United States, but there was a difference in past year illicit drug use. Immigrants who had been in the United States for fewer than 5 years showed a higher rate of past year illicit drug use (7.6 percent) than those who had been in the United States for 5 or more years (5.7 percent) (Table C.9).

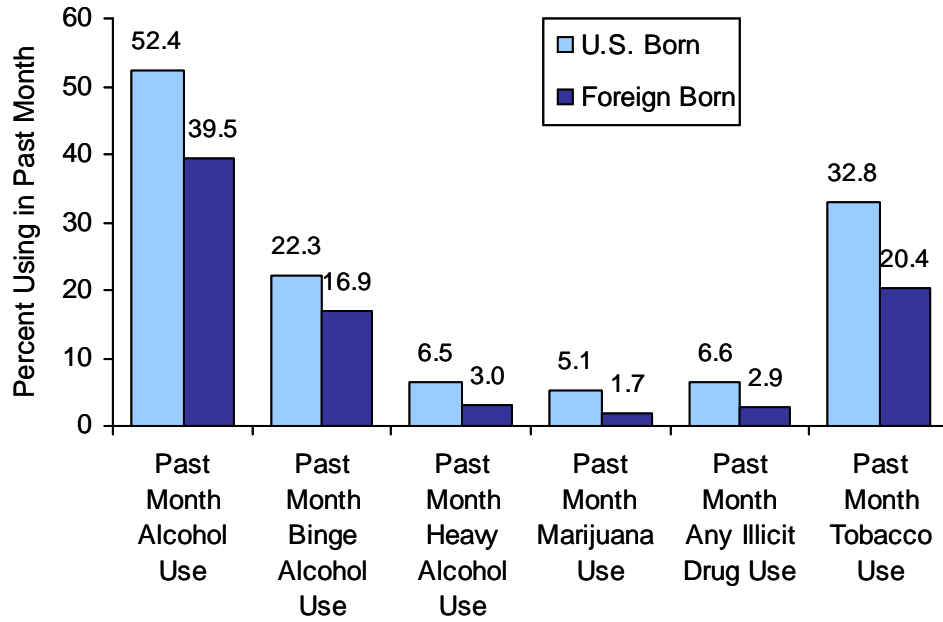
These findings are complicated by the demographic composition of the immigrant population. Among immigrants residing in the United States for fewer than 5 years, 32.9 percent were aged 18 to 25 while only 10.1 percent of immigrants living in the United States for 5 years or more were in this age group (Table C.2). Although a longer time residing in the United States was associated with lower past year illicit drug use overall, among persons aged 18 to 25 the prevalence rate was significantly higher for longer term residents (16.4 percent) compared with newer immigrants (12.2 percent) (Table C.9).

3.3. Tobacco Use

Tobacco use rates also were generally lower among immigrants than among U.S.-born persons aged 18 or older. Past month tobacco use prevalence was lower among foreign-born respondents living in the United States (20.4 percent) than among U.S.-born individuals (32.8 percent) (Table C.8, Figure 1). The past month tobacco use rate was higher for immigrants who had been in the United States for fewer than 5 years (22.6 percent) than for those who had been in the United States for 5 or more years (19.9 percent). Consistent with illicit drug use findings, the higher rate of use among newer immigrants is not unexpected given the higher proportion of persons aged 18 to 25 among those residing in the United States for fewer than 5 years. Both past month and past year tobacco use were higher among immigrants aged 18 to 25 who had been in the United States for 5 years or more compared with those who had resided in the United States for fewer than 5 years (Tables C.8 and C.9).

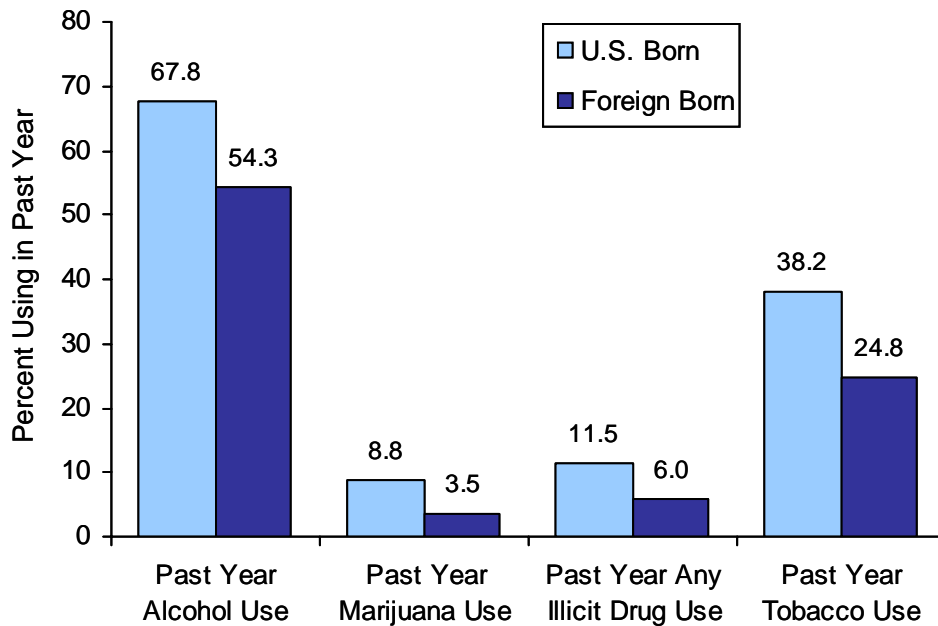
Similarly, the past year tobacco use rate was lower among foreign-born adults than among U.S.-born adults (24.8 vs. 38.2 percent) and lower among immigrants who had been in the United States for 5 years or longer (24.2 percent) compared with those who had been in the United States for fewer than 5 years (28.0 percent) (Table C.9, Figure 2).

Figure 1. Past Month Alcohol, Marijuana, Any Illicit Drug, and Tobacco Use among U.S.-Born and Foreign-Born Persons Aged 18 or Older Living in the United States



Source: SAMHSA, Office of Applied Studies, National Survey on Drug Use and Health, 1999-2001.

Figure 2. Past Year Alcohol, Marijuana, Any Illicit Drug, and Tobacco Use among U.S.-Born and Foreign-Born Persons Aged 18 or Older Living in the United States



Source: SAMHSA, Office of Applied Studies, National Survey on Drug Use and Health, 1999-2001.

3.4. Substance Use, by Age, Gender, and Length of Time in the United States

For adult immigrants, rates of substance use were generally higher among males than among females, and rates were higher among immigrants who had been in the United States for fewer than 5 years than among those who had been in the United States for 5 years or more. Prevalence rates also were generally higher among immigrants aged 18 to 25 compared with persons aged 26 to 49 or those aged 50 or older (see Tables C.6, C.8, and C.9, Figures 3 and 4). However, some subgroups differed from these general patterns.

Among males, the prevalence rates for past month and past year tobacco use were higher among persons who had been in the United States for fewer than 5 years. There were no differences in past month and past year alcohol use rates or past month and past year marijuana use rates among males by length of time in the United States.

For females, there were no differences in past month or past year alcohol or tobacco use by length of time in the United States. Past year marijuana and past year illicit drug use rates among females did not follow the same pattern as for males; rates were higher among females who had been in the United States for fewer than 5 years (3.3 and 6.3 percent) compared with females who had immigrated 5 or more years earlier (2.2 and 4.2 percent).

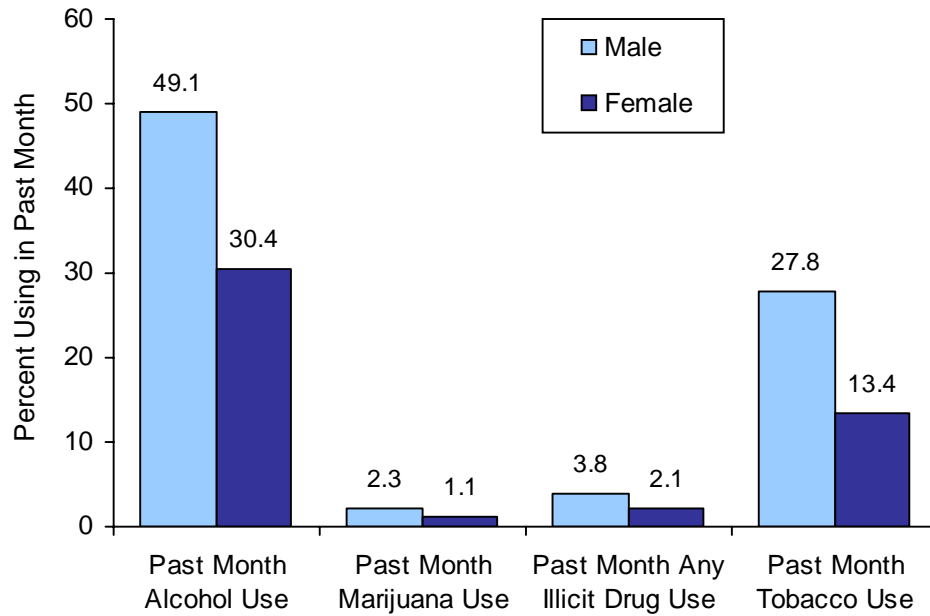
3.5. Predictors of Substance Use among Immigrants

This section reports the findings regarding predictors of alcohol, marijuana, illicit drug, and tobacco use among immigrants aged 18 or older. Modeling covariates included the following: duration in the United States, gender, age, and marital status.

For the alcohol use variables (Table C.10), younger ages were associated with an increased risk of alcohol use across all measures (i.e., past month use, binge drinking, heavy use, and past year use). Gender and duration of residence in the United States also were found to be associated with alcohol use. Males had higher odds of alcohol use compared with females. Being married was associated with lower odds of alcohol use compared with other marital statuses, as was living in the United States for fewer than 5 years compared with living in the United States for 5 years or more.

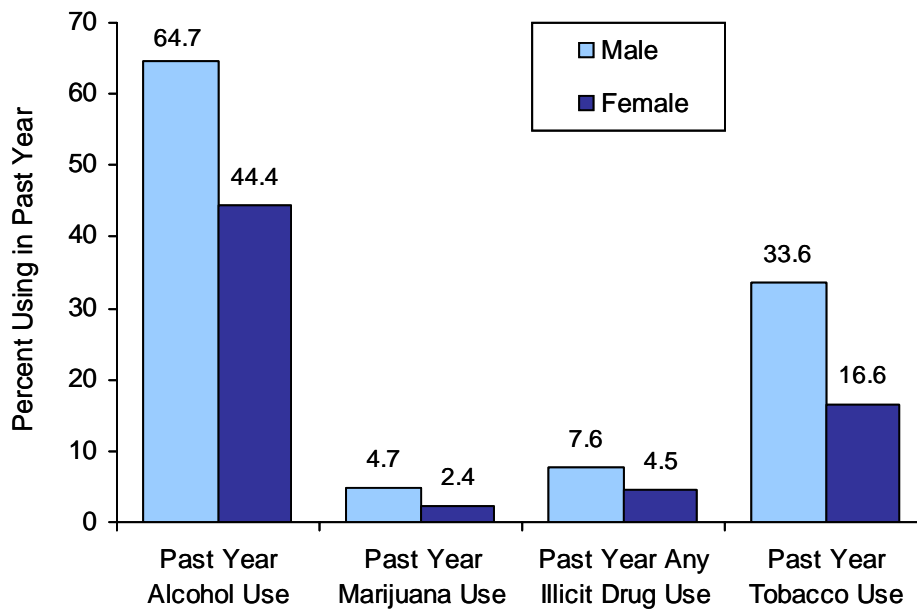
Similar patterns were found for past month and past year tobacco use, as well as for past month and past year marijuana and any illicit drug use among immigrants aged 18 or older (Tables C.11 to C.13). Males and younger age groups had higher odds of past month and past year marijuana and illicit drug use, while being married and living in the United States for fewer than 5 years both were associated with lower odds of use. Males and younger age groups also had higher odds of past month and past year tobacco use, and being married was associated with lower odds of use. However, duration in the United States was not associated with tobacco use. Thus, when controlling for age and other differences, longer duration of living in the United States is associated with higher use rates for alcohol, marijuana, and any illicit drug, but not tobacco.

Figure 3. Past Month Alcohol, Marijuana, Any Illicit Drug, and Tobacco Use among Male and Female Immigrants Aged 18 or Older Living in the United States



Source: SAMHSA, Office of Applied Studies, National Survey on Drug Use and Health, 1999-2001.

Figure 4. Past Year Alcohol, Marijuana, Any Illicit Drug, and Tobacco Use among Male and Female Immigrants Aged 18 or Older Living in the United States



Source: SAMHSA, Office of Applied Studies, National Survey on Drug Use and Health, 1999-2001.

3.6. Summary

Although a preliminary examination of the data appears to indicate that the rates for substance use across all immigrants were higher among immigrants who had been in the United States for a shorter amount of time, this finding is complicated by the variability in age and the gender composition of groups of persons immigrating fewer than 5 years ago or 5 or more years ago. When controlling for age, gender, and marital status, tobacco use rates showed no differences when considering length of time in the United States. On the other hand, the risks for alcohol, marijuana, and any illicit drug use were significantly lower among newer immigrants, a finding that is not as apparent when examining direct estimates. Although this finding deserves further examination, it also highlights the importance of including age-adjusted estimates when possible.

4. Substance Use among Immigrants from Selected Countries

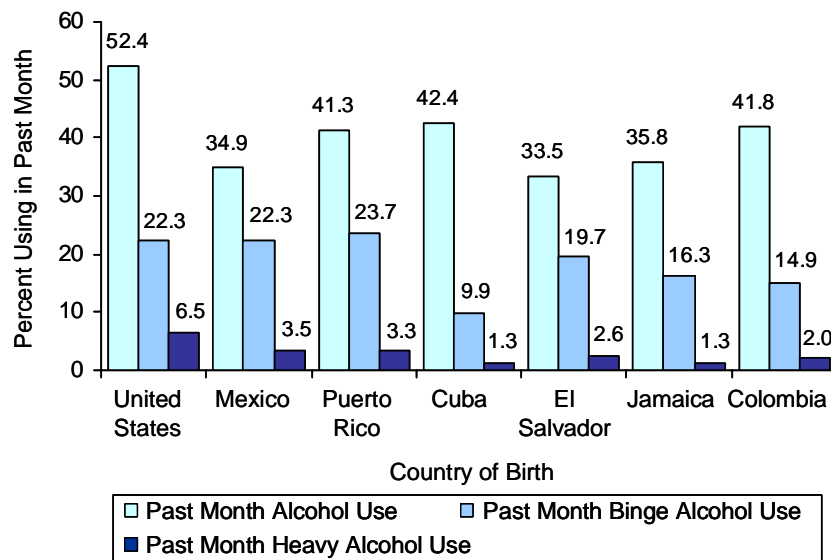
An accurate assessment of substance use patterns among immigrants requires going beyond national averages to the patterns of use among immigrants from individual countries of origin. Moving to this type of analysis underscores the importance of understanding the variability in substance use patterns among subpopulations of immigrants. This chapter presents findings on substance use patterns among immigrants from selected countries within four regions: Latin America, Asia, and Europe, as well as from Canada.

4.1. Substance Use among Immigrants from Selected Latin American Countries

4.1.1 Alcohol Use

Alcohol use patterns were examined among selected Latin American countries with the largest immigrant samples. Immigrants from Mexico, Puerto Rico, Cuba, El Salvador, Jamaica, and Colombia were examined (see Table C.3 for demographic characteristics). These individual countries were compared on past month alcohol use (any, binge, and heavy), on past year alcohol use, and on past month weekly alcohol consumption among current drinkers (see Table C.14). Figure 5 shows past month alcohol use comparisons for immigrants from these selected countries within the Latin American region and U.S.-born persons.

Figure 5. Past Month Alcohol Use among U.S. Residents Aged 18 or Older Who Are Either U.S.-Born Persons or Foreign-Born Persons from Selected Latin American Countries



Source: SAMHSA, Office of Applied Studies, National Survey on Drug Use and Health, 1999-2001.

A larger percentage of Cuban immigrants reported past month alcohol use (42.4 percent) than did immigrants from Mexico (34.9 percent). There were no statistically significant differences between these two groups and Puerto Rican (41.3 percent) or Colombian immigrants (41.8 percent) in past month alcohol use. However, Cuban (9.9 percent) and Colombian (14.9 percent) immigrants had lower rates of past month binge drinking when compared with Mexican (22.3 percent) immigrants. The 9.9 percent prevalence rate for binge drinking among Cuban immigrants was lower than among Puerto Rican (23.7 percent) and El Salvadoran (19.7 percent) immigrants. Cuban immigrants also had lower past month heavy drinking rates (1.3 percent) than immigrants from Mexico (3.5 percent). Immigrants from Puerto Rico had prevalence rates similar to Mexican immigrants with respect to binge drinking (23.7 vs. 22.3 percent) and heavy drinking rates (3.3 vs. 3.5 percent).

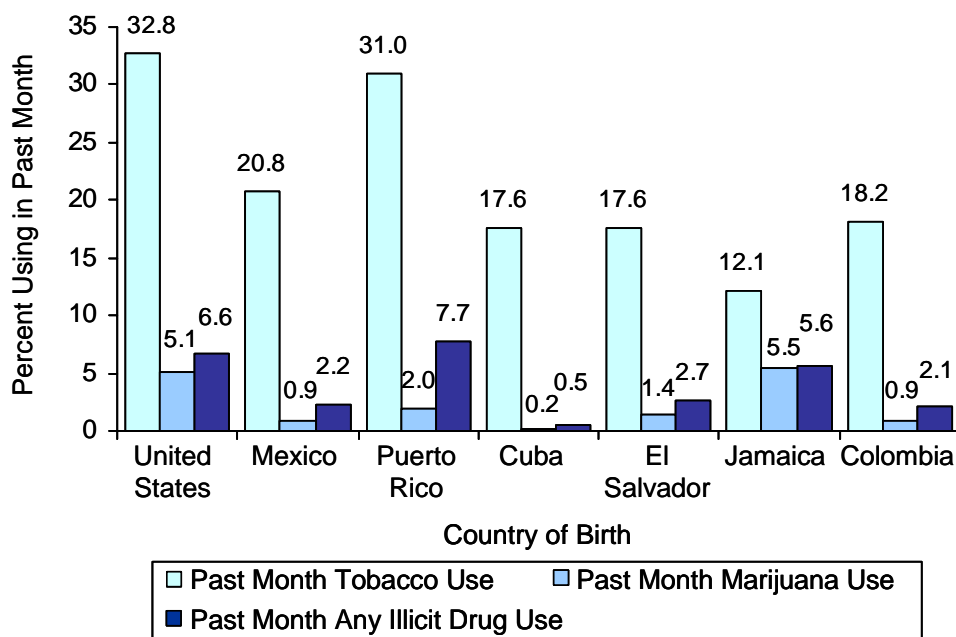
Mexican, Puerto Rican, and El Salvadoran immigrants had a higher average number of drinks consumed per week (8.1, 6.8, and 7.4 drinks, respectively) than Jamaican immigrants (2.8 drinks) or than immigrants from Cuba (3.3 drinks) (Table C.14). Thus, across most drinking measures, immigrants from Mexico, Puerto Rico, and El Salvador had higher prevalence rates than Cuban or Jamaican immigrants. Although a larger percentage of immigrants from Cuba reported drinking in the past month, they had a lower prevalence of both binge and heavy drinking, and they drank fewer drinks per week than most of the other selected Latin American immigrant groups. These differences in alcohol use rates may be partially explained by the older age of immigrants from Cuba, who were on average 53.2 years old compared with immigrants from Mexico (37.3 years), Puerto Rico (46.4 years), and El Salvador (38.6 years) (see Table C.1).

Immigrants from Mexico, Puerto Rico, and El Salvador had binge drinking prevalence rates (22.3, 23.7, and 19.7 percent, respectively) and past month weekly consumption amounts (8.1, 6.8, and 7.4 drinks, respectively) that were equal to those for U.S.-born adults (22.3 percent and 8.3 drinks). Immigrants from Cuba, Jamaica, and Colombia had past month weekly consumption rates and binge drinking prevalence rates that were lower than the rates for U.S.-born persons. These differential findings may be due to the age distributions of immigrants from the Latin American region. A higher percentage of immigrants from Mexico and El Salvador were among the younger age groups (18 to 25, 26 to 34) compared with immigrants from Cuba, Jamaica, and Colombia. With respect to length of time in the United States, immigrants from Puerto Rico and Jamaica who had been in the United States for 5 years or more drank less on a measure of past month weekly alcohol consumption compared with Puerto Rican and Jamaican immigrants living in the United States for fewer than 5 years (6.2 and 2.5 drinks vs. 15.9 and 7.9 drinks, respectively; see Table C.15). Past month weekly alcohol consumption was similar among immigrants from Mexico, Cuba, El Salvador, and Colombia who had been in the United States for shorter or longer periods of time.

4.1.2 Illicit Drug Use

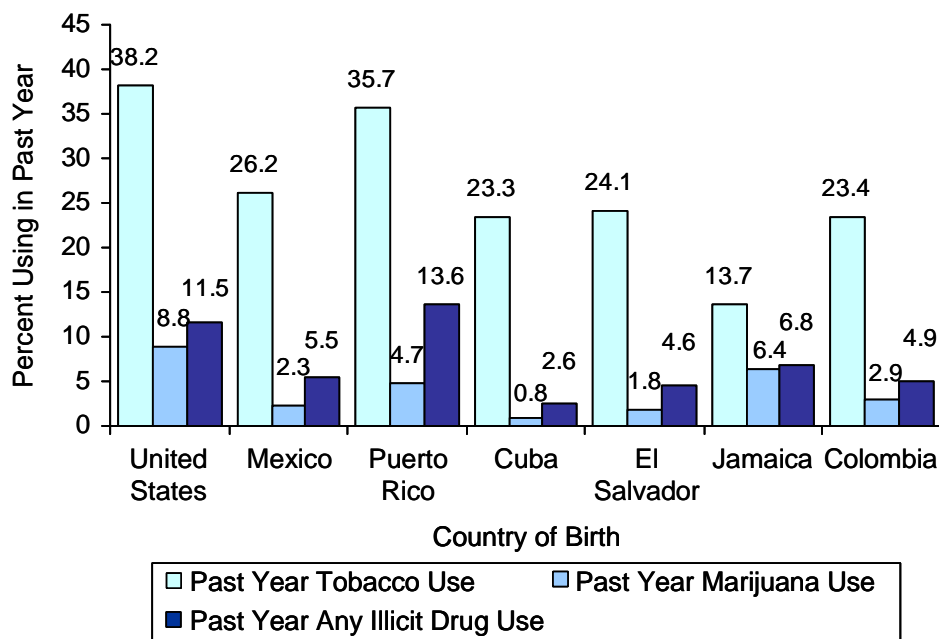
Figures 6 and 7 and Tables C.16 and C.17 show past month and past year illicit drug use rates for immigrants from selected countries within this region compared with the U.S.-born population.

Figure 6. Past Month Tobacco, Marijuana, and Any Illicit Drug Use among U.S. Residents Aged 18 or Older Who Are Either U.S.-Born Persons or Foreign-Born Persons from Selected Latin American Countries



Source: SAMHSA, Office of Applied Studies, National Survey on Drug Use and Health, 1999-2001.

Figure 7. Past Year Tobacco, Marijuana, and Any Illicit Drug Use among U.S. Residents Aged 18 or Older Who Are Either U.S.-Born Persons or Foreign-Born Persons from Selected Latin American Countries



Source: SAMHSA, Office of Applied Studies, National Survey on Drug Use and Health, 1999-2001.

4.1.2.1 Marijuana

Past month marijuana use rates were higher among immigrants from Mexico (0.9 percent), Puerto Rico (2.0 percent), El Salvador (1.4 percent), and Jamaica (5.5 percent) compared with immigrants from Cuba (0.2 percent). With the exception of Jamaica, immigrants from all other selected Latin American countries had prevalence rates for past month and past year marijuana use that were lower than the rates for U.S.-born individuals. Foreign-born U.S. residents from Mexico (2.3 percent), Puerto Rico (4.7 percent), and Jamaica (6.4 percent) had higher past year marijuana use rates than those from Cuba (0.8 percent) or El Salvador (1.8 percent).

4.1.2.2 Any Illicit Drugs

The prevalence rates for any illicit drug use for both the past month and past year were higher among persons immigrating from Puerto Rico (7.7 and 13.6 percent, respectively) when compared with past month and past year rates for persons from Mexico (2.2 and 5.5 percent), Cuba (0.5 and 2.6 percent), or Colombia (2.1 and 4.9 percent). Prevalence rates for past month and past year any illicit drug use among foreign-born persons from Puerto Rico equaled rates for U.S.-born persons, while immigrants from Mexico, Cuba, El Salvador, and Colombia had prevalence rates lower than those for U.S.-born individuals. Immigrants from Mexico (2.2 and 5.5 percent) and El Salvador (2.7 and 4.6 percent) had significantly higher prevalence rates than immigrants from Cuba (0.5 and 2.6 percent) on both illicit drug use measures.

4.1.3 Tobacco Use

Tobacco use prevalence rates (see Figures 6 and 7 and Tables C.16 and C.17) were higher among persons from Puerto Rico for both past month (31.0 percent) and past year use (35.7 percent) when compared with individuals from Mexico (20.8 and 26.2 percent), Cuba (17.6 and 23.3 percent), El Salvador (17.6 and 24.1 percent), Jamaica (12.1 and 13.7 percent), or Colombia (18.2 and 23.4 percent). Past month and past year tobacco use rates for immigrants from Puerto Rico were similar to rates for U.S.-born persons (32.8 and 38.2 percent). Immigrants from Mexico, Cuba, El Salvador, Jamaica, and Colombia had past month and past year tobacco use prevalence rates that were lower than those for persons born in the United States.

4.1.4 Summary

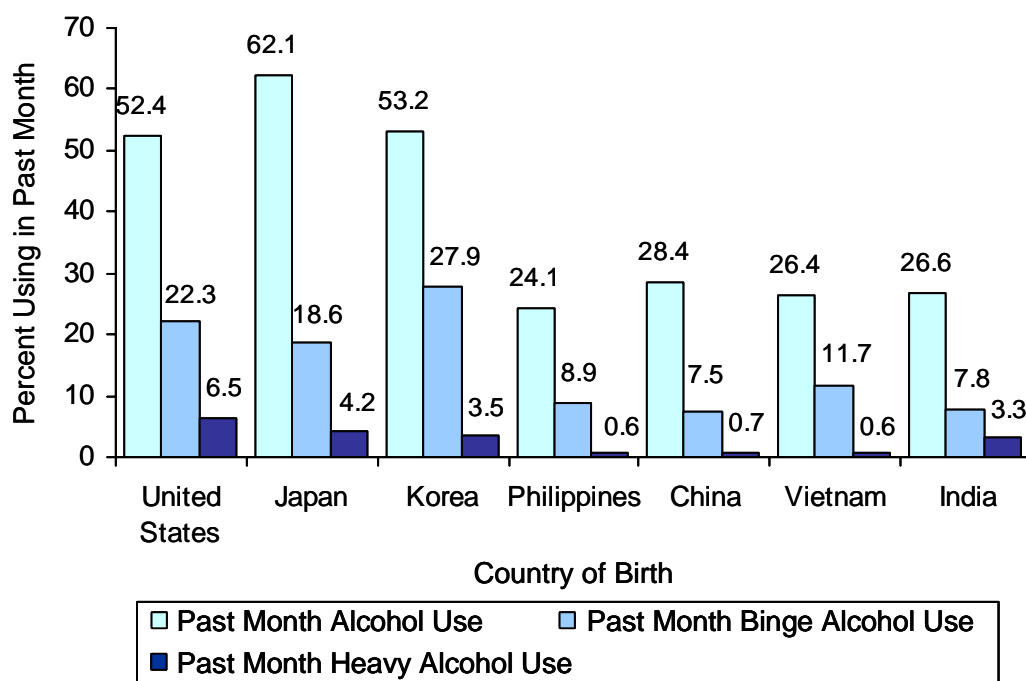
With the exception of past month alcohol use, immigrants from Cuba had lower prevalence rates across all measures of substance use (i.e., binge drinking, heavy drinking, marijuana use, any illicit drug use, and tobacco use). However, an examination of demographic characteristics reveals that more than half of the foreign-born persons from Cuba were aged 50 or older, partially explaining the observed lower substance use rates. Immigrants from Puerto Rico had prevalence rates that were equal to rates for U.S.-born persons for past month weekly alcohol consumption, past month binge and heavy drinking, and past month and past year tobacco and any illicit drug use.

4.2. Substance Use among Immigrants from Selected Asian Countries

4.2.1 Alcohol Use

Alcohol use rates and past month weekly consumption of alcohol were examined for the following individual Asian countries among respondents aged 18 or older: Japan, Korea, the Philippines, China, Vietnam, and India. Table C.4 shows the demographic characteristics for immigrants from individual Asian countries. Table C.14 and Figure 8 show past month alcohol use comparisons for Asian immigrants and U.S.-born persons.

Figure 8. Past Month Alcohol Use among U.S. Residents Aged 18 or Older Who Are Either U.S.-Born Persons or Foreign-Born Persons from Selected Asian Countries



Source: SAMHSA, Office of Applied Studies, National Survey on Drug Use and Health, 1999-2001.

Immigrants from Japan (62.1 percent) and Korea (53.2 percent) had a higher prevalence of past month alcohol use than immigrants from the Philippines (24.1 percent), China (28.4 percent), Vietnam (26.4 percent), and India (26.6 percent). Korean and Japanese immigrants also reported a higher prevalence of past month binge drinking (27.9 and 18.6 percent, respectively) than immigrants from the Philippines (8.9 percent), China (7.5 percent), and India (7.8 percent). Immigrants from Korea had a higher prevalence of past month heavy drinking (3.5 percent) than immigrants from the Philippines (0.6 percent), China (0.7 percent), or Vietnam (0.6 percent).

A somewhat different pattern was observed for past month weekly alcohol consumption. Although Korean immigrants had the highest level of consumption, consuming on average 7.5 drinks per week, immigrants from Vietnam had the second highest past month weekly consumption rate of 5.1 drinks per week, followed closely by Filipino and Japanese immigrants

at 4.6 and 3.5 drinks per week on average, respectively. Past month weekly alcohol consumption was significantly lower for immigrants from China (1.5 drinks) when compared with Korean, Japanese, Vietnamese, and Filipino immigrants. For most Asian immigrant groups, past month weekly alcohol consumption was higher with longer time spent in the United States. Immigrants from Korea, Japan, Vietnam, and the Philippines showed higher levels of use, while immigrants from China and India reported no differences in past month weekly alcohol consumption with longer time spent in the United States (see Table C.15). China and India had the largest percentages of immigrants who had been in the United States for fewer than 5 years (32.7 and 40.5 percent, respectively), which may contribute to their lower alcohol use rates (see Table C.4).

When comparing rates for persons from individual Asian countries with rates for U.S.-born individuals, Korean and Japanese immigrants had prevalence rates for past month alcohol use and past month heavy drinking that were similar to those for individuals born in the United States. Across all alcohol use measures, rates for immigrants from China, Vietnam, India, and the Philippines were lower than the rates for the U.S.-born population.

4.2.2 Illicit Drug Use

Figures 9 and 10 and Tables C.16 and C.17 show past month and past year illicit drug use rates for immigrants from the Asian region compared with rates for the U.S.-born population.

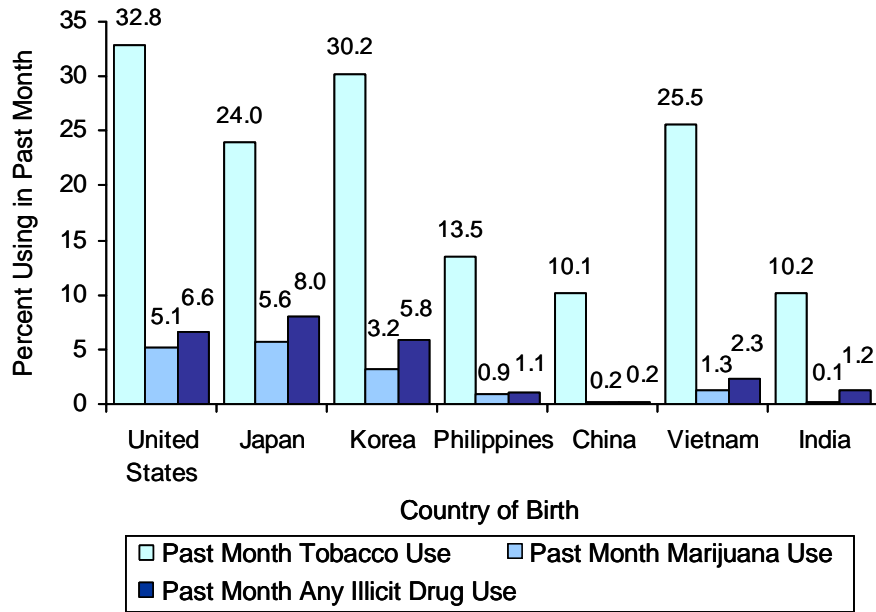
4.2.2.1 Marijuana

Prevalence rates for past month marijuana use were significantly higher among immigrants aged 18 or older from Japan (5.6 percent) and Korea (3.2 percent) when compared with adult immigrants from China (0.2 percent), the Philippines (0.9 percent), or India (0.1 percent). Further, past month prevalence rates for Japanese immigrants were higher than those for Vietnamese immigrants (1.3 percent). Past year marijuana use rates showed a similar pattern, with immigrants from Japan (9.9 percent) and Korea (4.9 percent) exhibiting higher rates than those from China (1.1 percent), the Philippines (1.3 percent), or India (0.3 percent). Japanese rates also exceeded those for Vietnamese immigrants (2.0 percent). Foreign-born persons from Japan and Korea had past month marijuana use rates that were similar to rates for U.S.-born persons.

4.2.2.2 Any Illicit Drugs

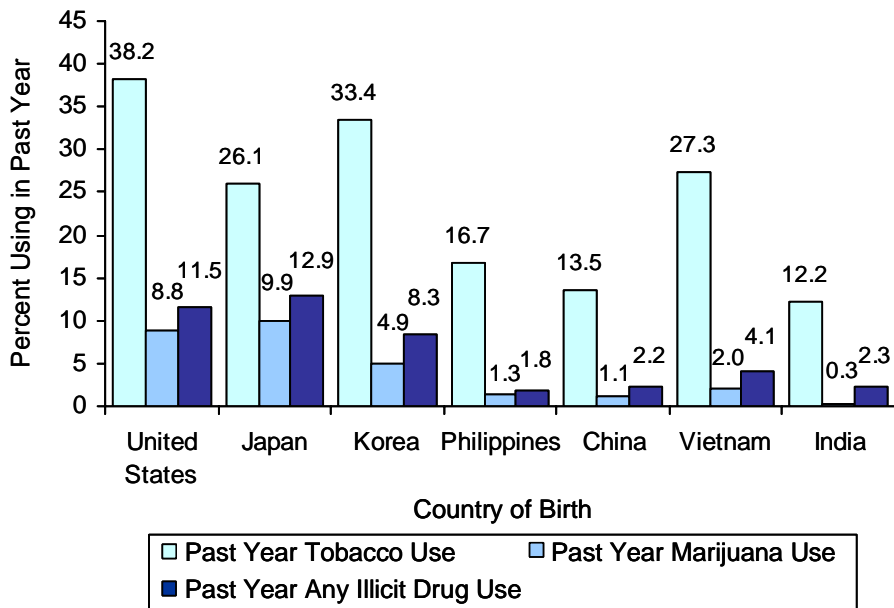
Past month and past year rates of any illicit drug use were higher among immigrants aged 18 or older from Japan (8.0 and 12.9 percent, respectively) and Korea (5.8 and 8.3 percent) when compared with adult immigrants from India (1.2 and 2.3 percent), the Philippines (1.1 and 1.8 percent), or China (0.2 and 2.2 percent). Japanese immigrants also had higher rates for past year use when compared with immigrants from Vietnam (4.1 percent). Foreign-born persons from the Philippines had higher rates of past month use of any illicit drug than did individuals born in China. Immigrants from Korea and Japan had past month and past year any illicit drug use rates that were similar to rates for U.S.-born individuals.

Figure 9. Past Month Tobacco, Marijuana, and Any Illicit Drug Use among U.S. Residents Aged 18 or Older Who Are Either U.S.-Born Persons or Foreign-Born Persons from Selected Asian Countries



Source: SAMHSA, Office of Applied Studies, National Survey on Drug Use and Health, 1999-2001.

Figure 10. Past Year Tobacco, Marijuana, and Any Illicit Drug Use among U.S. Residents Aged 18 or Older Who Are Either U.S.-Born Persons or Foreign-Born Persons from Selected Asian Countries



Source: SAMHSA, Office of Applied Studies, National Survey on Drug Use and Health, 1999-2001.

4.2.3 Tobacco Use

Past month tobacco use rates (see Figures 9 and 10 and Tables C.16 and C.17) were higher for immigrants aged 18 or older from Japan (24.0 percent), Korea (30.2 percent), and Vietnam (25.5 percent) compared with adult immigrants from the Philippines (13.5 percent) or China (10.1 percent).

For past year tobacco use, foreign-born persons from Japan (26.1 percent), Korea (33.4 percent), and Vietnam (27.3 percent) had higher rates than persons from China (13.5 percent). Past year tobacco use rates for individuals from Korea and Vietnam exceeded rates for persons from the Philippines (16.7 percent).

4.2.4 Summary

Clearly, there is wide variability among Asian immigrants in rates of substance use, with immigrants from Korea and Japan consistently showing the highest rates of alcohol use and Chinese, Vietnamese, Filipino, and Indian immigrants evidencing the lowest rates. Here again, demographic analysis provides some insight into a potential contributing factor for the observed higher rates. A higher proportion of immigrants from Korea and Japan were among the youngest age group, which consistently demonstrated higher rates of alcohol use among the immigrant sample and among U.S.-born populations. Tobacco and marijuana use rates followed this same pattern, with the countries comprised of the youngest age groups (Korea, Japan, and Vietnam) evidencing the highest rates of use.

4.3. Substance Use among Immigrants from Selected European Countries

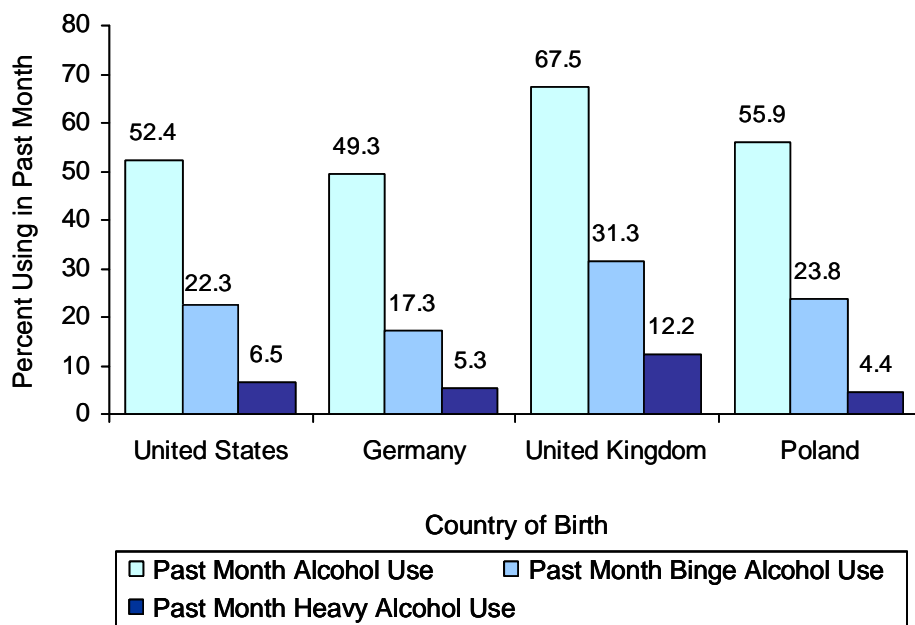
4.3.1 Alcohol Use

Alcohol use rates and past month weekly consumption among current drinkers were examined for three groups of European immigrants aged 18 or older. Immigrants from Germany, the United Kingdom (England, Scotland, Wales, and Ireland), and Poland were compared. Table C.5 shows the demographic characteristics for this regional grouping, and Figure 11 and Table C.14 show past month alcohol use comparisons for immigrants from these European countries.

Immigrants from the United Kingdom had higher rates of past month alcohol use (67.5 percent), past month binge drinking (31.3 percent), and past month heavy drinking (12.2 percent) when compared with German immigrants, whose past month alcohol use was significantly lower (49.3 percent), as were their rates for binge drinking (17.3 percent) and heavy drinking (5.3 percent). The past month heavy drinking rate for United Kingdom immigrants exceeded that for Polish immigrants (4.4 percent). Past month alcohol use (55.9 percent) and past month binge drinking (23.8 percent) for immigrants from Poland were similar to those for immigrants from the United Kingdom.

Past month weekly alcohol consumption amounts among current drinkers also were higher among immigrants from the United Kingdom (10.2 drinks) when compared with immigrants from Germany (5.3 drinks) and Poland (4.1 drinks). Immigrants from Germany who had been in the United States for 5 years or more had higher past month weekly consumption

Figure 11. Past Month Alcohol Use among U.S. Residents Aged 18 or Older Who Are Either U.S.-Born Persons or Foreign-Born Persons from Selected European Countries



Source: SAMHSA, Office of Applied Studies, National Survey on Drug Use and Health, 1999-2001.

rates (5.4 drinks) than those who had been in the United States for fewer than 5 years (3.6 drinks) (see Table C.15). Immigrants from the United Kingdom who had been in the United States for 5 years or longer had similar past month weekly consumption rates than those who had been in the United States for less time (10.0 vs. 11.5 drinks). Immigrants from Poland showed no differences in past month weekly alcohol consumption amounts whether they had been in the United States for 5 or more or fewer than 5 years (4.0 vs. 4.6 drinks).

Immigrants from the United Kingdom also had alcohol use rates that were higher than those for U.S.-born individuals. Their past month alcohol use (67.5 vs. 52.4 percent), past month binge drinking (31.3 vs. 22.3 percent), and past month heavy drinking (12.2 vs. 6.5 percent) rates all showed a pattern of higher use when compared with U.S.-born persons. Past month weekly consumption amounts were similar for immigrants from the United Kingdom (10.2 drinks) and U.S.-born individuals (8.3 drinks).

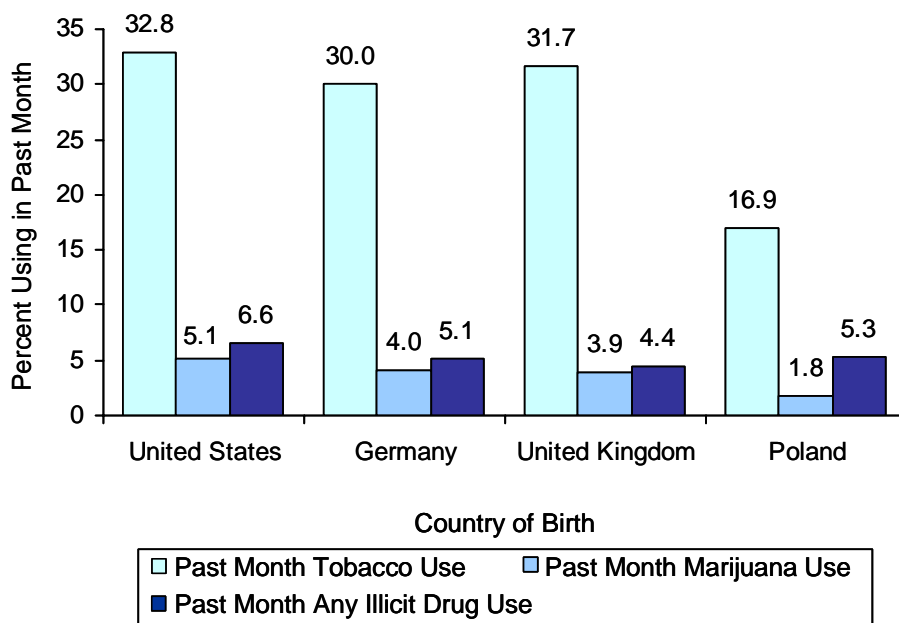
4.3.2 Illicit Drug Use

Past month and past year illicit drug use rates for immigrants from selected European countries are shown in Figures 12 and 13 and in Tables C.16 and C.17.

4.3.2.1 Marijuana

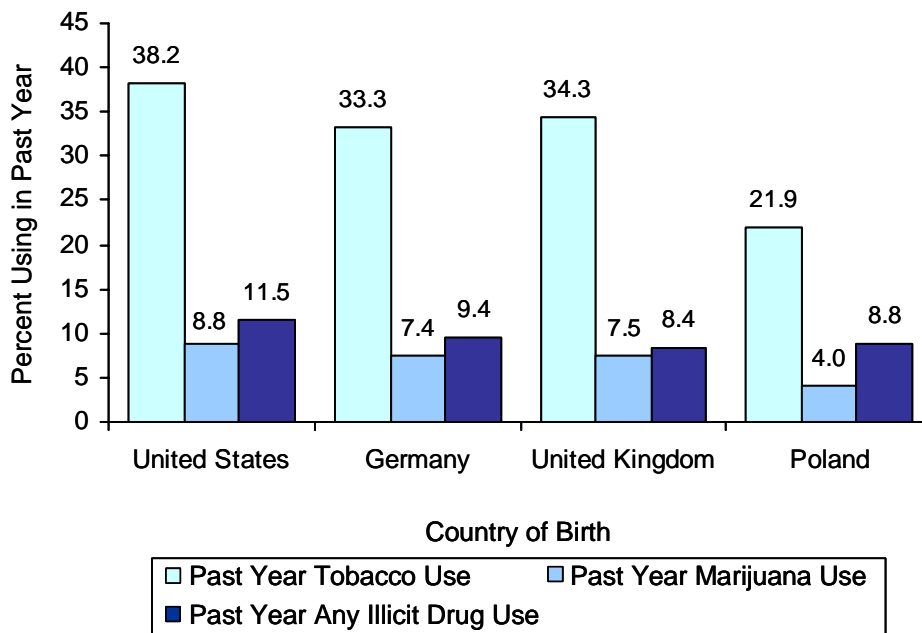
There were no significant differences in the rates for past month and past year marijuana use among immigrants from Germany (4.0 and 7.4 percent, respectively), the United Kingdom

Figure 12. Past Month Tobacco, Marijuana, and Any Illicit Drug Use among U.S. Residents Aged 18 or Older Who Are Either U.S.-Born Persons or Foreign-Born Persons from Selected European Countries



Source: SAMHSA, Office of Applied Studies, National Survey on Drug Use and Health, 1999-2001.

Figure 13. Past Year Tobacco, Marijuana, and Any Illicit Drug Use among U.S. Residents Aged 18 or Older Who Are Either U.S.-Born Persons or Foreign-Born Persons from Selected European Countries



Source: SAMHSA, Office of Applied Studies, National Survey on Drug Use and Health, 1999-2001.

(3.9 and 7.5 percent), and Poland (1.8 and 4.0 percent). The past year marijuana use rate for immigrants from Poland (4.0 percent) was lower than the rate for U.S.-born persons (8.8 percent).

4.3.2.2 Any Illicit Drugs

Past month and past year any illicit drug use rates were nearly identical for immigrants from Germany (5.1 and 9.4 percent, respectively), the United Kingdom (4.4 and 8.4 percent), and Poland (5.3 and 8.8 percent).

4.3.3 Tobacco Use

Past month and past year tobacco use rates for immigrants from selected European countries are shown in Figures 12 and 13 and in Tables C.16 and C.17. Past month tobacco use rates showed significant differences among selected European immigrants aged 18 or older, with immigrants from Germany (30.0 percent) and the United Kingdom (31.7 percent) yielding higher rates than Polish immigrants (16.9 percent). There were similar differences in past year tobacco use rates, with immigrants from Germany (33.3 percent) and the United Kingdom (34.3 percent) demonstrating higher rates than Polish immigrants (21.9 percent). Past month and past year tobacco use rates among immigrants from Germany and the United Kingdom were similar to rates for U.S.-born persons (32.8 and 38.2 percent).

4.3.4 Summary

Substance use rates among immigrants from selected European countries were equal to or higher than rates for U.S.-born persons for the use of alcohol and tobacco. With respect to alcohol use, the United Kingdom and Poland had the highest rates for past month use (any past month use and past month binge drinking). Tobacco use rates were highest for immigrants from the United Kingdom and Germany.

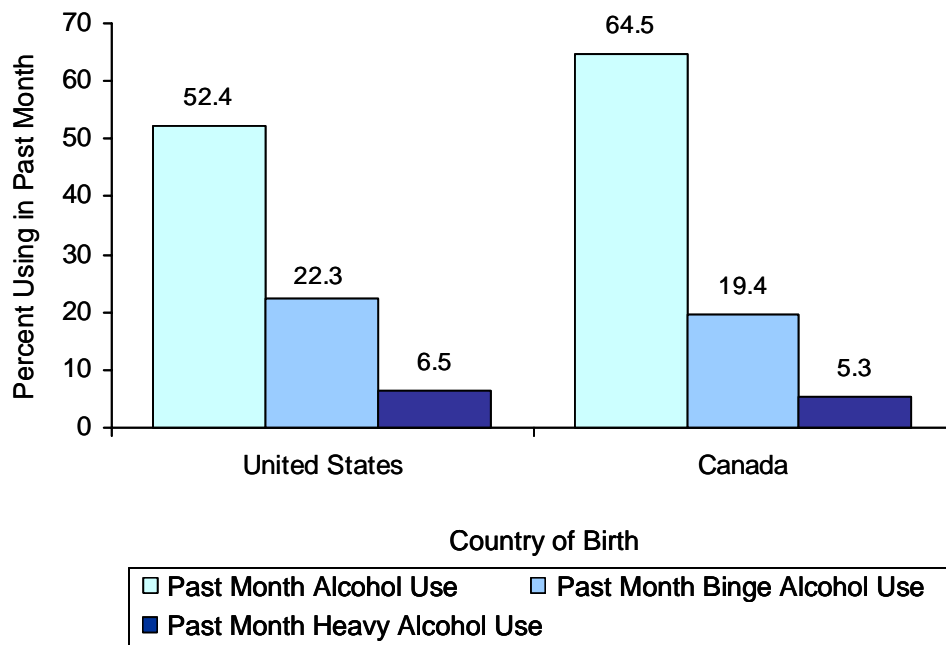
4.4. Substance Use among Immigrants from Canada

4.4.1 Alcohol Use

Alcohol use rates and past month weekly consumption of alcohol among current drinkers were examined for Canadian immigrants. Figure 14 shows past month alcohol use comparisons for Canadian immigrants and U.S.-born persons (see also Tables C.14 and C.15). Demographic characteristics for Canadian immigrants are shown in Table C.5.

Immigrants from Canada reported higher rates of past month (64.5 percent) and past year alcohol use (78.3 percent) than U.S.-born persons, whose rates were 52.4 percent and 67.8 percent. The average past month weekly consumption rate for immigrants from Canada (5.2 drinks) was lower than that for U.S.-born individuals (8.3 drinks). Immigrants from Canada showed a similar pattern of past month binge drinking and past month heavy drinking (19.4 and 5.3 percent, respectively) as U.S.-born persons (22.3 and 6.5 percent). Canadian-born persons living in the United States showed no differences in past month weekly alcohol consumption after being in the United States for 5 or more years.

Figure 14. Past Month Alcohol Use among U.S. Residents Aged 18 or Older Who Are Either U.S.-Born Persons or Foreign-Born Persons from Canada



Source: SAMHSA, Office of Applied Studies, National Survey on Drug Use and Health, 1999-2001.

4.4.2 Illicit Drug Use

Past month and past year illicit drug use rates for Canadian immigrants are shown in Figures 15 and 16 and in Tables C.16 and C.17.

4.4.2.1 Marijuana

Past month and past year rates for marijuana use were similar when comparing immigrants from Canada (4.3 and 7.1 percent, respectively) with U.S.-born persons (5.1 and 8.8 percent).

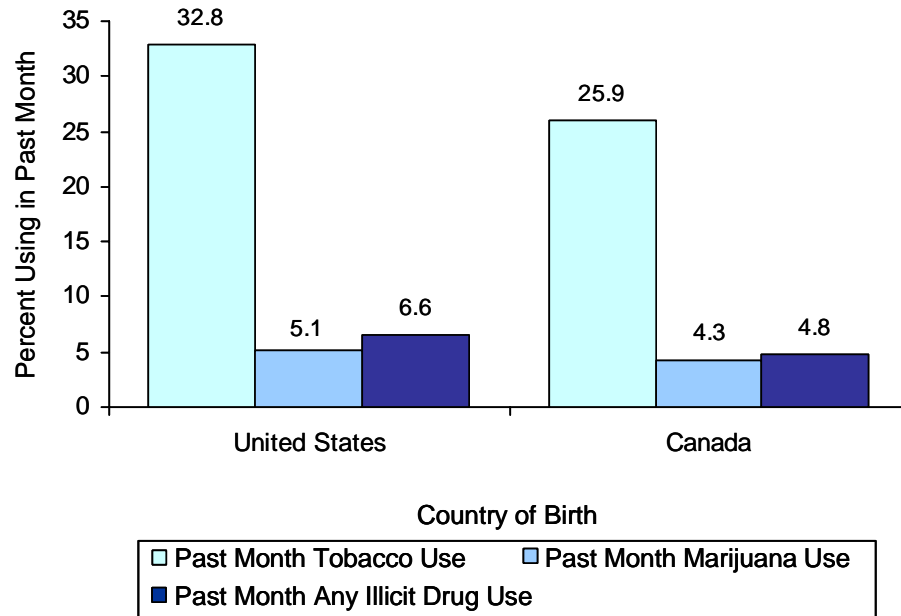
4.4.2.2 Any Illicit Drugs

There were no differences in past month or past year any illicit drug use rates when comparing Canadian immigrants (4.8 and 8.9 percent, respectively) with U.S.-born individuals (6.6 and 11.5 percent).

4.4.3 Tobacco Use

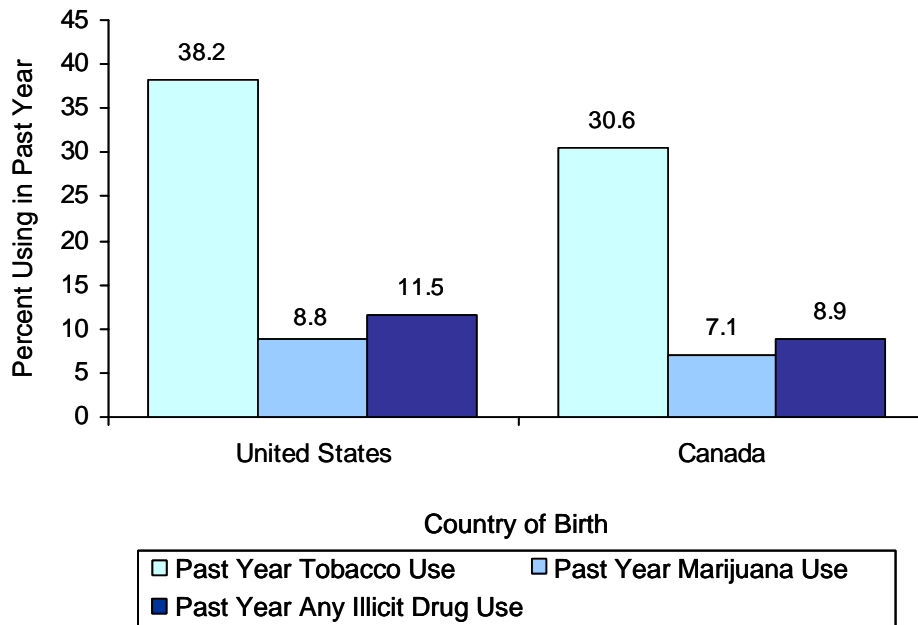
A comparison of the past month and past year tobacco use rates for immigrants from Canada and U.S.-born persons showed lower rates for the immigrant sample on both past month (25.9 vs. 32.8 percent) and past year use (30.6 vs. 38.2 percent) (see Figures 15 and 16 and Tables C.16 and C.17).

Figure 15. Past Month Tobacco, Marijuana, and Any Illicit Drug Use among U.S. Residents Aged 18 or Older Who Are Either U.S.-Born Persons or Foreign-Born Persons from Canada



Source: SAMHSA, Office of Applied Studies, National Survey on Drug Use and Health, 1999-2001.

Figure 16. Past Year Tobacco, Marijuana, and Any Illicit Drug Use among U.S. Residents Aged 18 or Older Who Are Either U.S.-Born Persons or Foreign-Born Persons from Canada



Source: SAMHSA, Office of Applied Studies, National Survey on Drug Use and Health, 1999-2001.

4.4.4 Summary

Although Canadian immigrants had higher past month and past year alcohol use rates than U.S.-born persons, other indices of alcohol, marijuana, and illicit drug use essentially mirrored substance use rates for U.S.-born persons. This may be a reflection of the close proximity of Canada to the United States or perhaps is due to the demographic similarities between the two countries. Education, employment, and household income rates for immigrants from Canada were similar to rates for U.S.-born individuals.

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Appendix A: Description of the Survey

A.1. Sample Design

The 1999, 2000, and 2001 National Survey on Drug Use and Health (NSDUH)² sample designs were part of a coordinated 5-year sample design to provide estimates for all 50 States plus the District of Columbia for the years 1999 through 2003. The coordinated design facilitates 50 percent overlap in first-stage sampling units between each 2 successive years.

For the 5-year 50-State design, eight States were designated as large sample States (California, Florida, Illinois, Michigan, New York, Ohio, Pennsylvania, and Texas), with samples large enough to support direct State estimates. For the remaining 42 States and the District of Columbia, smaller, but adequate, samples were selected to support State estimates using small area estimation (SAE) techniques.

States were first stratified into a total of 900 field interviewer (FI) regions (48 regions in each large sample State and 12 regions in each small sample State). These regions were contiguous geographic areas designed to yield the same number of interviews on average. Within FI regions, adjacent census blocks were combined to form the first-stage sampling units, called area segments. A total of 96 segments per FI region were selected with probability proportional to population size in order to support the 5-year sample and any supplemental studies that the Substance Abuse and Mental Health Services Administration (SAMHSA) may choose to field. Eight sample segments per FI region were fielded during the 2000 survey year. Of these, four segments were retained in the 2001 year and four new segments were added, bringing the number of segments per FI region back to eight.

These sampled segments were allocated equally into four separate samples, one for each 3-month period during the year, so that the survey was essentially continuous in the field. In each of these area segments, a listing of all addresses was made, from which a sample of addresses was selected. In these sample units (which can be either households or units within group quarters), sample persons were randomly selected using an automated screening procedure programmed in a handheld computer carried by the interviewers. Youths aged 12 to 17 years and young adults aged 18 to 25 years were oversampled at this stage. Targeted sample sizes for youths aged 12 to 17 in 2000 and 2001 were 25,000 and 22,500, respectively. Targeted sample sizes in both years for both groups, the young adults aged 18 to 25 and those aged 26 or older, were 22,500 in both years. Thus, the total targeted sample sizes were 70,000 and 67,500 in 2000 and 2001, respectively.

The survey covers (a) residents of households living in houses/townhouses, apartments, condominiums, and so on; (b) residents living in noninstitutional group quarters, such as shelters, rooming/boarded houses, college dormitories, migratory workers' camps, and halfway houses; and (c) civilians living on military bases. Although the survey covers these types of units (they are given a nonzero probability of selection), sample sizes of most specific groups are too small to provide separate estimates. Persons excluded from the survey include homeless people who do

² Prior to 2002, the survey was known as the National Household Survey on Drug Abuse (NHSDA).

not use shelters, active military personnel, and residents of institutional group quarters, such as correctional facilities, nursing homes, mental institutions, and hospitals.

A.2. Data Collection Methodology

The data collection method used in NSDUH involves in-person interviews with sample persons, incorporating procedures that would be likely to increase respondents' cooperation and willingness to report honestly about their illicit drug use behavior. Confidentiality is stressed in all written and verbal communications with potential respondents, respondents' names are not collected with the data, and computer-assisted interviewing (CAI), including audio computer-assisted self-interviewing (ACASI), is used to provide a private and confidential setting to complete the interview.

Introductory letters are sent to sampled addresses, followed by an interviewer visit. A 5-minute screening procedure conducted using a handheld computer involves listing all household members along with their basic demographic data. The computer uses the demographic data in a preprogrammed selection algorithm to select 0 to 2 sample persons, depending on the composition of the household. This selection process is designed to provide the necessary sample sizes for the specified population age groupings.

Interviewers attempt to immediately conduct the NSDUH interview with each selected person in the household. The interviewer requests the selected respondent to identify a private area in the home away from other household members to conduct the interview. The interview averages about an hour and includes a combination of computer-assisted personal interviewing (CAPI) and ACASI. The interview begins in CAPI mode with the FI reading the questions from the computer screen and entering the respondent's replies into the computer. The interview then transitions to the ACASI mode for the sensitive questions. In this mode, the respondent can read the questions silently on the computer screen and/or listen to the questions read through headphones and enter his or her responses directly into the computer. At the conclusion of the ACASI section, the interview returns to the CAPI mode with the interviewer completing the questionnaire.

No personal identifying information is captured in the CAI record for the respondent. At the end of the day when an interviewer has completed one or more interviews, he or she transmits the data to RTI International (a trade name of Research Triangle Institute) in Research Triangle Park, North Carolina, via home telephone lines.

In identifying foreign-born respondents for these analyses, three questions were utilized:

QD14 Were you born in the United States?

- 1 YES
- 2 NO
- DK/REF

QD15 [IF QD14 = 2] In what country or U.S. territory were you born?

COUNTRY OR US TERRITORY: _____

DK/REF

QD16 [IF QD14 = 2] About how long have you lived in the United States?

- 1 6 MONTHS OR LESS
- 2 MORE THAN 6 MONTHS BUT LESS THAN 1 YEAR
- 3 AT LEAST 1 YEAR BUT LESS THAN 5 YEARS
- 4 AT LEAST 5 YEARS BUT LESS THAN 10 YEARS
- 5 AT LEAST 10 YEARS BUT LESS THAN 15 YEARS
- 6 15 YEARS OR MORE

DK/REF

The first step in identifying foreign-born respondents was to note respondents who indicated that they were not born in the United States (QD14 = 2). Respondents who did not give a substantive answer (i.e., refused, answered "Don't Know," or responded with a nonexistent country) to QD15 were removed from the analysis. Given that comparisons between duration of time in United States were utilized, any respondents who failed to give an answer to QD16 also were removed from the analysis. Final sample sizes for these items among respondents aged 18 or older are presented in Appendix B, Section B.3.2.

A.3. Data Processing

Interviewers initiate nightly data transmissions of interview data and call records on days when they work. Computers at RTI direct the information to a raw data file that consists of one record for each completed interview. Even though much editing and consistency checking is done by the CAI program during the interview, additional, more complex edits and consistency checks are completed at RTI. Resolution of most inconsistencies and missing data is done using machine-editing routines developed specifically for the CAI instrument. Cases are retained only if the respondent provided data on lifetime use of cigarettes and at least nine other substances.

A.4. Statistical Imputation

For some key variables that still have missing values after the application of editing, statistical imputation is used to replace missing data with appropriate response codes.

Considerable changes in the imputation procedures used in prior surveys were introduced beginning with the 1999 CAI sample. Three types of statistical imputation procedures are used: (a) a standard unweighted sequential hot-deck imputation, (b) a univariate combination of weighted regression imputation and a random nearest neighbor hot-deck imputation (which could be viewed as a univariate predictive mean neighborhood method), and (c) a combination of weighted regression and a random nearest neighbor hot-deck imputation using a neighborhood where imputation is accomplished on several response variables at once (which could be viewed as a multivariate predictive mean neighborhood method). Because the primary demographic

variables (e.g., age, gender, race/ethnicity, employment, education) are imputed first, few variables are available for model-based imputation. Moreover, most demographic variables have a very low level of missingness. Hence, unweighted sequential hot deck is used to impute missing values for demographic variables. The demographic variables then can be used as covariates in models for drug use measures. These models also include other drug use variables as covariates. For example, the model for cocaine use includes cigarette, alcohol, and marijuana use as covariates. The univariate predictive mean neighborhood method is used as an intermediate imputation procedure for recency of use, 12-month frequency of use, 30-day frequency of use, and 30-day binge drinking frequency for all drugs where these variables occur. The final imputed values for these variables are determined using multivariate predictive mean neighborhoods. The final imputed values for age at first use for all drugs and age at first daily cigarette use are determined using univariate predictive mean neighborhoods.

Hot-deck imputation involves the replacement of a missing value with a valid code taken from another respondent who is "similar" and has complete data. Responding and nonresponding units are sorted together by a variable or collection of variables closely related to the variable of interest Y . For sequential hot-deck imputation, a missing value of Y is replaced by the nearest responding value preceding it in the sequence. With random nearest neighbor hot-deck imputation, the missing value of Y is replaced by a responding value from a donor randomly selected from a set of potential donors close to the unit with the missing value according to some distance metric. The predictive mean neighborhood imputation involves determining a predicted mean using a model, such as a linear regression or logistic regression, depending on the response variable, where the models incorporate the design weights. In the univariate case, the neighborhood of potential donors is determined by calculating the relative distance between the predicted mean for an item nonrespondent and the predicted mean for each potential donor, and choosing those within a small preset value (this is the "distance metric"). The pool of donors is further restricted to satisfy logical constraints whenever necessary (e.g., age at first crack use must not be younger than age at first cocaine use). Whenever possible, more than one response variable was considered at a time. In that (multivariate) case, the Mahalanobis distance (Manly, 1986) across a vector of several response variables' predicted means is calculated between a given item nonrespondent and each candidate donor. The k smallest Mahalanobis distances, say 30, determine the neighborhood of candidate donors, and the nonrespondent's missing values in this vector are replaced by those of the randomly selected donor. A respondent may only be missing some of the responses within this vector of response variables; in that case, only the missing values were replaced, and donors were restricted to be logically consistent with the response variables that were not missing.

Although statistical imputation could not proceed separately within each State due to insufficient pools of donors, information about the State of residence of each respondent is incorporated in the modeling and hot-deck steps. For most drugs, respondents were separated into three State usage categories for each drug depending on the response variable of interest; respondents from States with high usage of a given drug were placed in one category, respondents from medium usage States into another, and the remainder into a third category. This categorical "State rank" variable was used as one set of covariates in the imputation models. In addition, eligible donors for each item nonrespondent were restricted to be of the same State usage category (the same "State rank") as the item nonrespondent.

A.5. Development of Analysis Weights

The general approach to developing and calibrating analysis weights involved developing design-based weights, d_k , as the inverse of the selection probabilities of the households and persons. Adjustment factors, $a_k(\lambda)$, then were applied to the design-based weights to adjust for nonresponse, to poststratify to known population control totals, and to control for extreme weights when necessary. In view of the importance of State-level estimates with the 50-State design, it was necessary to control for a much larger number of known population totals. Several other modifications to the general weight adjustment strategy that had been used in past NSDUHs also were implemented for the first time beginning with the 1999 CAI sample.

Weight adjustments were based on a generalization of Deville and Särndal's (1992) logit model. This generalized exponential model (GEM) (Folsom & Singh, 2000) incorporates unit-specific bounds (ℓ_k, u_k) , $k \in S$, for the adjustment factor $a_k(\lambda)$ as follows:

$$a_k(\lambda) = \frac{\ell_k(u_k - c_k) + u_k(c_k - \ell_k) \exp(A_k x'_k \lambda)}{(u_k - c_k) + (c_k - \ell_k) \exp(A_k x'_k \lambda)},$$

where c_k are prespecified centering constants, such that $\ell_k < c_k < u_k$ and

$A_k = (u_k - \ell_k) / (u_k - c_k)(c_k - \ell_k)$. The variables ℓ_k , c_k , and u_k are user-specified bounds, and λ is the column vector of p model parameters corresponding to the p covariates x . The λ -parameters are estimated by solving

$$\sum_s x_k d_k a_k(\lambda) - \tilde{T}_x = 0,$$

where \tilde{T}_x denotes control totals that could be either nonrandom, as is generally the case with poststratification, or random, as is generally the case for nonresponse adjustment.

The final weights, $w_k = d_k a_k(\lambda)$, minimize the distance function $\Delta(w, d)$ defined as

$$\Delta(w, d) = \sum_{k \in S} \frac{d_k}{A_k} \left\{ (a_k - \ell_k) \log \frac{a_k - \ell_k}{c_k - \ell_k} + (u_k - a_k) \log \frac{u_k - a_k}{u_k - c_k} \right\}.$$

This general approach was used at several stages of the weight adjustment process, including (1) adjustment of household weights for nonresponse at the screener level, (2) poststratification of household weights to meet population controls for various demographic groups by State, (3) adjustment of household weights for extremes, (4) poststratification of selected person weights, (5) adjustment of person weights for nonresponse at the questionnaire level, (6) poststratification of person weights, and (7) adjustment of person weights for extremes.

Every effort was made to include as many relevant State-specific covariates (typically defined by demographic domains within States) as possible in the multivariate models used to calibrate the weights (nonresponse adjustment and poststratification steps). Because further

subdivision of State samples by demographic covariates often produced small cell sample sizes, it was not possible to retain all State-specific covariates (even after meaningful collapsing of covariate categories) and still estimate the necessary model parameters with reasonable precision. Therefore, a hierarchical structure was used in grouping States with covariates defined at the national level, at the census division level within the Nation, at the State-group within census division, and, whenever possible, at the State level. In every case, the controls for total population within State and the five age groups (12–17, 18–25, 26–34, 35–49, 50+) within State were maintained. Census control totals by age, race, gender, and Hispanicity were required for the civilian, noninstitutionalized population of each State. The Population Estimates Branch of the U.S. Bureau of the Census produced the necessary population estimates.

Beginning with the 1999 survey, control of extreme weights through separate bounds for adjustment factors was incorporated into the GEM calibration processes for both nonresponse and poststratification. This is unlike the traditional method of winsorization in which extreme weights are truncated at prespecified levels and the trimmed portions of weights are distributed to the nontruncated cases. In GEM, it is possible to set bounds around the prespecified levels for extreme weights, and then the calibration process provides an objective way of deciding the extent of adjustment (or truncation) within the specified bounds. An additional step poststratified the selected person sample to conform with the adjusted roster estimates. This additional step takes advantage of the inherent two-phase nature of the NSDUH design. The final step poststratified the respondent person sample to external census data (defined within State whenever possible as discussed above). For more detailed information, see the *2001 NHSDA Methodological Resource Book* (RTI International, 2003).

As is standard in all NSDUH analyses that combine data across multiple years, the final analysis weights are divided by the number of years combined in order to produce an average population estimate across the years of interest. In the case of this report on immigrants and substance use, which combines data from the 1999 through 2001 surveys, the final analysis weights of each year are divided by 3.

Appendix B: Statistical Methods and Limitations of the Data

B.1. Target Population

An important limitation of National Survey on Drug Use and Health (NSDUH)³ estimates of drug use prevalence is that they are designed to describe only the target population of the survey (e.g., civilian, noninstitutionalized persons aged 12 or older). Although this population includes almost 98 percent of the total U.S. population aged 12 or older, it does exclude some important and unique subpopulations who may have very different drug-using patterns. The survey excludes active military personnel, who have been shown to have significantly lower rates of illicit drug use (Bray et al., 2003). Persons living in institutional group quarters, such as prisons and residential drug treatment centers, are not included in NSDUH and have been shown in other surveys to have higher rates of illicit drug use (Bray & Marsden, 1999). Also excluded are homeless persons not living in a shelter on the survey date, another population shown to have higher than average rates of illicit drug use.

B.2. Sampling Error and Statistical Significance

The sampling error of an estimate is the error caused by the selection of a sample instead of conducting a census of the population. Sampling error is reduced by selecting a large sample and by using efficient sample design and estimation strategies, such as stratification, optimal allocation, and ratio estimation.

With the use of probability sampling methods in NSDUH, it is possible to develop estimates of sampling error from the survey data. These estimates have been calculated for all prevalence estimates presented in this report using a Taylor series linearization approach that takes into account the effects of the complex NSDUH design features. The sampling errors are used to identify unreliable estimates and to test for the statistical significance of differences between estimates.

B.2.1 Variance Estimation

Estimates of proportions, such as drug use prevalence rates, take the form of nonlinear statistics where the variances cannot be expressed in closed form. Variance estimation for nonlinear statistics is performed using a first-order Taylor series approximation in RTI's SUDAAN[®] software package (Shah, Barnwell, & Bieler, 1996). The approximation is unbiased for sufficiently large samples and has proven to be at least as accurate as and less costly to implement than its competitors, such as balanced repeated replication or jackknife methods (Rao & Wu, 1985).

³ Prior to 2002, the survey was known as the National Household Survey on Drug Abuse (NHSDA).

B.2.2 Suppression Rules for Unreliable Estimates

In NSDUH reports, survey estimates considered to be unreliable due to large sampling errors generally are not shown. For this report, to give the most complete results possible, unreliable estimates are shown, with an asterisk beside each estimate. The number of unreliable estimates is small, and standard errors (SEs) are presented along with all estimates of substance use so readers can make their own assessment of the reliability. The criteria normally used for suppressing estimates are based on the relative standard error (RSE), which is defined as the ratio of the SE over the estimate, as well as on nominal sample size and on effective sample size. The criteria are summarized in Table B.1.

Table B.1 Summary of NSDUH Suppression Rules

Estimate	Suppress if:
Prevalence rate, \hat{p} , with nominal sample size, n , and design effect, $deff$	The estimated prevalence rate, \hat{p} , is < 0.00005 or ≥ 0.99995 , or $\frac{SE(\hat{p}) / \hat{p}}{-\ln(\hat{p})} > 0.175$ when $\hat{p} \leq 0.5$, or $\frac{SE(\hat{p}) / (1 - \hat{p})}{-\ln(1 - \hat{p})} > 0.175$ when $\hat{p} > 0.5$, or Effective $n < 68$, or $n < 100$, where Effective $n = \frac{n}{deff}$. Note: The rounding portion of this suppression rule for prevalence rates will produce some estimates that round at one decimal place to 0.0 or 100.0 percent but are not suppressed from the tables.
Estimated number (numerator of \hat{p})	The estimated prevalence rate, \hat{p} , is suppressed. Note: In some instances when \hat{p} is not suppressed, the estimated number may appear as a 0 in the tables; this means that the estimate is > 0 but < 500 (estimated numbers are shown in thousands).
Means not bound between 0 and 1, \bar{x} , with nominal sample size, n	$RSE(\bar{x}) > 0.5$, or $n < 10$.

Source: SAMHSA, Office of Applied Studies, National Survey on Drug Use and Health.

Proportion estimates (\hat{p}) within the range $[0 < \hat{p} < 1]$, rates, and corresponding estimated number of users were suppressed if

$$RSE[-\ln(\hat{p})] > 0.175 \text{ when } \hat{p} \leq 0.5$$

or

$$RSE[-\ln(1 - \hat{p})] > 0.175 \text{ when } \hat{p} > 0.5.$$

Using a first-order Taylor series approximation to estimate $RSE[-\ln(\hat{p})]$ and $RSE[-\ln(1 - \hat{p})]$, the following was obtained and used for computational purposes:

$$\frac{SE(\hat{p})/\hat{p}}{-\ln(\hat{p})} > 0.175 \text{ when } \hat{p} \leq 0.5$$

or

$$\frac{SE(\hat{p})/(1-\hat{p})}{-\ln(1-\hat{p})} > 0.175 \text{ when } \hat{p} > 0.5.$$

The separate formulas for $\hat{p} \leq 0.5$ and $\hat{p} > 0.5$ produce a symmetric suppression rule (i.e., if \hat{p} is suppressed, then $1 - \hat{p}$ will be as well). This ad hoc rule requires an effective sample size in excess of 50. When $0.05 < \hat{p} < 0.95$, the symmetric property of the rule produces a local maximum effective sample size of 68 at $\hat{p} = 0.5$. Thus, estimates with these values of \hat{p} along with effective sample sizes falling below 68 typically are suppressed. See Figure B.1 for a graphical representation of the required minimum effective sample sizes as a function of the proportion estimated.

A minimum nominal sample size suppression criterion ($n = 100$) that protects against unreliable estimates caused by small design effects and small nominal sample sizes is usually employed. Prevalence estimates also are normally suppressed if they were close to 0 or 100 percent (i.e., if $\hat{p} < 0.00005$ or if $\hat{p} \geq 0.99995$).

Estimates of other totals (e.g., number of initiates) along with means and rates (both not bounded between 0 and 1) were suppressed if $RSE(\hat{p}) > 0.5$ or if the sample size was smaller than 10 respondents.

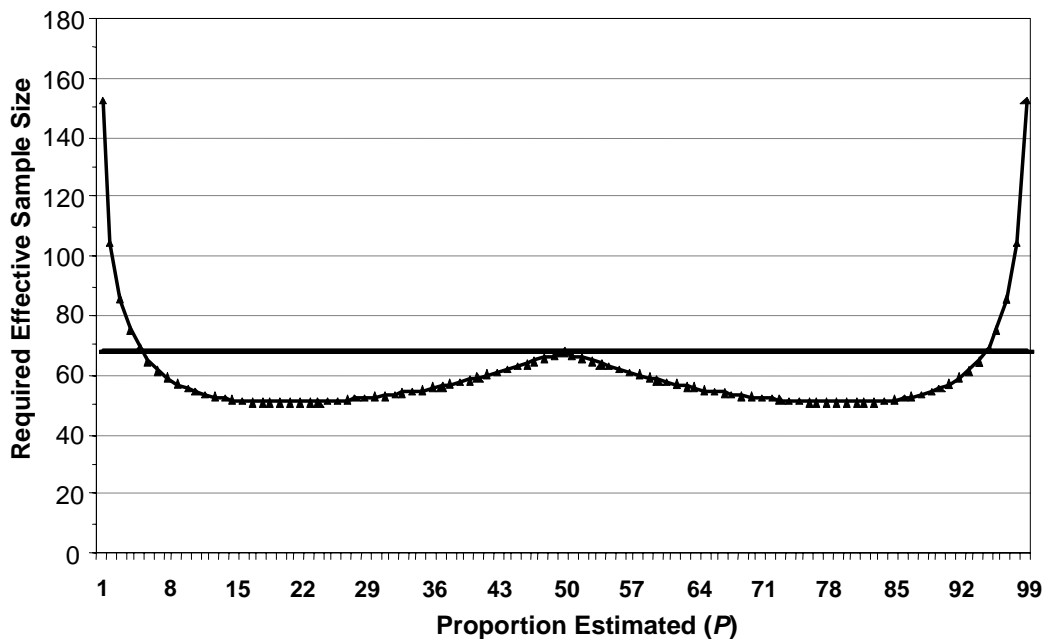
The typical suppression criteria for various NSDUH estimates are summarized in Table B.1. Values that would normally meet these criteria are noted with an asterisk (*) in the tables for this report.

B.2.3 Statistical Significance of Differences

This section describes the methods used to compare prevalence estimates in this report. Customarily, the observed difference between estimates is evaluated in terms of its statistical significance. "Statistical significance" refers to the probability that a difference as large as that observed would occur due to random error in the estimates if there were no difference in the prevalence rates for the population groups being compared. The significance of observed differences in this report is examined at the 0.05 level and below. In this report, the terms "higher" or "lower" are used only when differences are statistically significant at the 0.05 level or below. When comparing prevalence estimates, the null hypothesis (no difference between prevalence rates) can be tested against the alternative hypothesis (there is a difference in prevalence rates) using the standard difference in proportions test expressed as follows:

$$Z = \frac{\hat{p}_1 - \hat{p}_2}{\sqrt{\text{var}(\hat{p}_1) + \text{var}(\hat{p}_2) - 2\text{cov}(\hat{p}_1, \hat{p}_2)}},$$

Figure B.1 Required Effective Sample as a Function of the Proportion Estimated



Source: SAMHSA, Office of Applied Studies, National Survey on Drug Use and Health.

where \hat{p}_1 = first prevalence estimate, \hat{p}_2 = second prevalence estimate, $var(\hat{p}_1)$ = variance of first prevalence estimate, $var(\hat{p}_2)$ = variance of second prevalence estimate, and $cov(\hat{p}_1, \hat{p}_2)$ = covariance between \hat{p}_1 and \hat{p}_2 .

Under the null hypothesis, Z is asymptotically distributed as a normal random variable. Calculated values of Z can therefore be referred to as the unit normal distribution to determine the corresponding probability level (i.e., p value). The covariance term in the formula for Z will not always be 0. Estimates of Z , along with its p value, were calculated in SUDAAN[®], using the analysis weights and accounting for the sample design as described in Appendix A (RTI International, 2001). A similar procedure and formula for Z were used for estimated totals.

Using the published estimates and standard errors to perform independent t tests for the difference of proportions will usually provide the same results as tests performed in SUDAAN[®]. However, where the significance level is borderline, results may differ for two reasons: (1) the covariance term is included in SUDAAN[®] tests whereas it is not included in independent t tests, and (2) the reduced number of significant digits shown in the published estimates may cause rounding errors in the independent t tests.

B.3. Nonsampling Errors

Nonsampling errors can occur from nonresponse, coding errors, computer processing errors, errors in the sampling frame, reporting errors, and other errors not due to sampling. Nonsampling errors are reduced through data editing, statistical adjustments for nonresponse,

close monitoring and periodic retraining of interviewers, and improvement in various quality control procedures.

Although nonsampling errors can often be much larger than sampling errors, measurement of most nonsampling errors is difficult or impossible. However, some indication of the effects of some types of nonsampling errors can be obtained through proxy measures, such as response rates, and from other research studies.

B.3.1 Response Rates

Response rates for NSDUH were stable for the period from 1994 to 1998, with the screening response rate at about 93 percent and the interview response rate at about 78 percent (response rates discussed in this appendix are weighted). In 1999, the computer-assisted interviewing (CAI) screening response rate was 89.6 percent, and the interview response rate was 68.6 percent. A more stable and experienced field interviewer (FI) workforce improved these rates in 2000 and continued in 2001. Of the 171,519 eligible households sampled for the 2001 NSDUH main study, 157,471 were successfully screened for a weighted screening response rate of 91.9 percent (Table B.2).

In these screened households, a total of 61,557 sample persons aged 18 or older were selected, and completed interviews were obtained from 44,751 of these sample persons, for a weighted interview response rate of 72.3 percent. A total of 9,714 (16.9 percent) sample persons were classified as refusals, 3,876 (5.6 percent) were not available or never at home, and 2,216 (5.2 percent) did not participate for various other reasons, such as physical or mental incompetence or language barrier (Table B.3).

The overall weighted response rate, defined as the product of the weighted screening response rate and weighted interview response rate, was 60.4 percent in 1999, 67.7 percent in 2000, and 66.4 percent in 2001 for persons aged 18 or older. Nonresponse bias is a function of the weighted nonresponse rate and the difference in the characteristic of interest between respondents and nonrespondents in the population ($P_r - P_{nr}$). Assuming the quantity ($P_r - P_{nr}$) is fixed over time, the improvement in response rates in 2000 and 2001 over 1999 will result in estimates with lower nonresponse bias.

B.3.2 Inconsistent Responses and Item Nonresponse

Among survey participants, item response rates were above 98 percent for most questionnaire items. However, inconsistent responses for some items, including the drug use items, are common. Estimates of substance use from NSDUH are based on the responses to multiple questions by respondents, so that the maximum amount of information is used in determining whether a respondent is classified as a drug user. Inconsistencies in responses are resolved through a logical editing process that involves some judgment on the part of survey analysts and is a potential source of nonsampling error. Because of the automatic routing through the CAI questionnaire (e.g., lifetime drug use questions that skip entire modules when answered "no"), there is less editing of this type than in the paper-and-pencil interviewing (PAPI) questionnaire used prior to 1999.

Table B.2 Weighted Percentages and Sample Sizes for 1999 to 2001 NSDUHs, by Screening Result Code

Screening Result	1999		2000		2001	
	Sample Size	Weighted Percentage	Sample Size	Weighted Percentage	Sample Size	Weighted Percentage
Total Sample	223,868	100.00	215,860	100.00	203,544	100.00
Ineligible cases	36,026	15.78	33,284	15.09	32,025	15.40
Eligible cases	187,842	84.22	182,576	84.91	171,519	84.60
Ineligibles	36,026	100.00	33,284	100.00	32,025	100.00
Vacant	18,034	49.71	16,796	50.76	16,489	51.71
Not a primary residence	4,516	12.90	4,506	13.26	4,706	14.69
Not a dwelling unit	4,626	12.70	3,173	9.33	2,913	8.66
All military personnel	482	1.22	414	1.21	327	0.93
Other, ineligible	8,368	23.46	8,395	25.43	7,590	24.00
Eligible Cases	187,842	100.00	182,576	100.00	171,519	100.00
Screening complete	169,166	89.63	169,769	92.84	157,471	91.86
No one selected	101,537	54.19	99,999	55.36	90,530	52.11
One selected	44,436	23.63	46,981	25.46	43,601	25.94
Two selected	23,193	11.82	22,789	12.03	23,340	13.82
Screening not complete	18,676	10.37	12,807	7.16	14,048	8.14
No one home	4,291	2.38	3,238	1.82	3,383	1.90
Respondent unavailable	651	0.36	415	0.24	392	0.24
Physically or mentally incompetent	419	0.24	310	0.16	357	0.20
Language barrier—Hispanic	102	0.06	83	0.05	130	0.09
Language barrier—other	486	0.28	434	0.27	590	0.39
Refusal	11,097	5.92	7,535	4.14	8,525	4.93
Other, access denied	1,536	1.08	748	0.45	613	0.35
Other, eligible	38	0.02	7	0.00	9	0.00
Other, problem case	56	0.03	37	0.02	49	0.03

Source: SAMHSA, Office of Applied Studies, National Survey on Drug Use and Health, 1999, 2000, and 2001.

Table B.3 Weighted Percentages and Sample Sizes for 1999 to 2001 NSDUHs, by Final Interview Code, among Persons Aged 18 or Older

Final Interview Code	1999		2000		2001	
	Sample Size	Weighted Percentage	Sample Size	Weighted Percentage	Sample Size	Weighted Percentage
Total Selected Persons	57,872	100.00	60,719	100.00	61,557	100.00
Interview complete	41,322	67.41	46,008	72.92	45,751	72.29
No one at dwelling unit	1,473	2.25	1,498	2.16	1,474	2.12
Respondent unavailable	3,025	4.71	2,441	3.69	2,402	3.43
Breakoff	37	0.07	54	0.09	62	0.13
Physically/mentally incompetent	773	2.85	819	2.78	801	2.62
Language barrier—Spanish	153	0.13	99	0.09	172	0.18
Language barrier—Other	422	1.62	391	1.16	436	1.43
Refusal	9,468	19.41	8,654	16.22	9,714	16.92
Parental refusal	3	0.00	14	0.01	0	0.00
Other	1,196	1.55	741	0.89	745	0.88

Source: SAMHSA, Office of Applied Studies, National Survey on Drug Use and Health, 1999, 2000, and 2001.

In addition, less logical editing is used because with the CAI data, statistical imputation is relied upon more heavily to determine the final values of drug use variables in cases where there is the potential to use logical editing to make a determination. The combined amount of editing and imputation in the CAI data is still considerably less than the total amount used in prior PAPI surveys. For the 2000 CAI data, for example, 3.2 percent of the estimate of past month hallucinogen use is based on logically edited cases and 5.4 percent on imputed cases, for a combined amount of 8.6 percent. The combined amount of editing and imputation for the estimate of past month heroin use is 5.0 percent for the 2000 CAI.

No statistical imputation was performed on the three questions utilized to identify foreign-born respondents; however, when possible, logic edits were implemented. The following displays the frequency distributions of the three questions of interest among the 133,192 respondents aged 18 or older from the 1999, 2000, and 2001 survey years.

QD14 Were you born in the United States?

1 = YES	116,591
2 = NO	16,339
3 = YES (Logically Assigned)	38
94 = DON'T KNOW	6
97 = REFUSED	74
98 = BLANK (NO ANSWER)	144

Logical skip patterns included only respondents who indicated being foreign-born to be routed through questions QD15 and QD16. All other respondents were logically edited as either legitimate skips (where QD14 = 1), or their assigned QD15 and QD16 values were maintained as the same as their QD14 responses (e.g., if QD14 = 97, then assigned values for QD15 and QD16 also will be 97). Hence, because the latter respondents were routed out of QD15 and QD16, their sample counts are excluded from the following distributions.

QD15 [IF QD14 = 2] In what country or U.S. territory were you born?

554 = At sea	1
555 = Abroad, country not reported	14
801 = Born on U.S. military base; outside U.S.	18
985 = BAD DATA Logically assigned	118
994 = DON'T KNOW	18
997 = REFUSED	18
998 = BLANK (NO ANSWER)	9

There were 16,339 respondents who answered 2 = No to QD14 and therefore proceeded to answer QD15. Of those 16,339, a total of 16,143 gave a substantive answer to QD15.

QD16 [IF QD14 = 2] About how long have you lived in the United States?

1 = 6 MONTHS OR LESS	690
2 = MORE THAN 6 MONTHS BUT LESS THAN 1 YEAR	728
3 = AT LEAST 1 YEAR BUT LESS THAN 5 YEARS	3,616
4 = AT LEAST 5 YEARS BUT LESS THAN 10 YEARS	3,433
5 = AT LEAST 10 YEARS BUT LESS THAN 15 YEARS	2,634
6 = 15 YEARS OR MORE	5,220
94 = DON'T KNOW	4
97 = REFUSED	7
98 = BLANK (NO ANSWER)	7

Hence, of the 16,339 respondents who answered 2 = No to QD14, a total of 16,321 gave a substantive answer to QD16.

Respondents who did not provide a substantive response to any of the QD14 to QD16 questions were excluded from the analysis. This accounts for a net loss of 433 respondents, in which 224 cases are from QD14 and an additional 209 cases are foreign-born respondents who did not give a substantive response to either QD15 or QD16 or both. The final sample sizes used in the analysis include 116,629 U.S.-born respondents aged 18 or older and 16,130 foreign-born respondents aged 18 or older.

B.3.3 Validity of Self-Reported Use

NSDUH estimates are based on self-reports of drug use, and their value depends on respondents' truthfulness and memory. Although many studies have generally established the validity of self-report data and the NSDUH procedures were designed to encourage honesty and recall, some degree of underreporting is assumed. No adjustment to NSDUH data is made to correct for this due to a number of studies addressing the validity of self-reported drug use data (e.g., Harrell, 1997; Harrison & Hughes, 1997; Rouse, Kozel, & Richards, 1985). The methodology used in NSDUH has been shown to produce more valid results than other self-report methods (e.g., by telephone) (Aquilino, 1994; Turner, Lessler, & Gfroerer, 1992). However, comparisons of NSDUH data with data from surveys conducted in classrooms suggest that underreporting of drug use by youths in their homes may be substantial (Gfroerer, 1993; Gfroerer, Wright, & Kopstein, 1997; Hennessy & Ginsberg, 2001).

Appendix C: Tables

Table C.1 Distributions of All Persons Aged 18 or Older, by Gender, Age, Length of Time in the United States, and Country of Origin: 1999–2001

Country of Origin	Sample Size	Population (in 1,000s)	Weighted			
			% Male	% Under Age 35	Average Age	% in U.S. <5 Years
Total United States						
Born in United States	116,629	173,976	47.6	30.3	45.4	N/A
Born outside United States	16,130	25,214	48.6	36.3	42.0	17.7
Selected Latin American Countries						
Mexico	5,181	6,759	53.9	48.1	37.3	21.1
Puerto Rico	515	862	42.1	22.7	46.4	6.7
Cuba	334	779	46.3	10.9	53.2	10.9
El Salvador	454	518	49.4	42.2	38.6	16.3
Jamaica	233	406	46.8	32.3	43.4	10.2
Colombia	267	411	48.3	28.9	43.4	19.9
Selected Asian Countries						
Japan	234	262	39.6	47.4	37.9	27.1
Korea	344	523	41.7	43.3	38.8	11.6
Philippines	675	1,519	36.7	21.9	48.1	10.7
China	291	589	46.4	31.3	44.8	32.7
Vietnam	310	530	49.6	47.6	36.8	4.2
India	647	1,060	54.9	43.4	39.6	40.5
Selected European Countries						
Germany	526	958	39.3	22.5	48.0	6.7
United Kingdom	359	723	44.5	25.1	47.0	12.2
Poland	171	323	45.3	25.9	46.5	5.4
Canada	439	683	43.5	25.6	50.3	21.7

N/A = not applicable.

Source: SAMHSA, Office of Applied Studies, National Survey on Drug Use and Health, 1999-2001.

Table C.2 Percentage Distributions of All Immigrants and U.S.-Born Persons Aged 18 or Older, by Length of Time in the United States and Demographic Characteristics: 1999–2001

Demographic Characteristics	All Immigrants	All Immigrants		U.S. Born
		<5 Years	≥5 Years	
Total	100.0	17.7	82.3	100.0
Gender				
Male	48.6	52.0	47.8	47.6
Female	51.4	48.0	52.2	52.4
Age Group				
18-25	14.2	32.9	10.1	14.6
26-34	22.2	34.5	19.5	15.8
35-49	35.2	22.0	38.0	31.4
50+	28.5	10.6	32.4	38.3
Adult Education				
< High school	30.7	31.7	30.4	15.8
High school graduate	23.4	19.6	24.2	34.9
Some college	18.6	17.1	19.0	25.3
College graduate	27.3	31.6	26.4	24.1
Current Employment				
Full-time	59.9	56.8	60.6	56.8
Part-time	10.1	9.6	10.2	12.4
Unemployed	2.4	4.1	2.1	2.2
Other ¹	27.6	29.5	27.2	28.5
Household Income				
< \$20,000	28.2	44.3	24.7	19.9
\$20,000 – \$49,999	40.1	34.7	41.3	39.7
\$50,000 – \$74,999	14.6	10.2	15.5	18.8
≥ \$75,000	17.1	10.8	18.5	21.6
Government Assistance²				
Yes	13.2	9.4	14.0	12.2
No	86.8	90.6	86.0	87.8

¹ Retired, disabled, homemaker, student, or "other."

² At least one family member received Supplemental Security Income (SSI), cash assistance or noncash assistance (Temporary Assistance for Needy Families, TANF), or the family received food stamps.

Source: SAMHSA, Office of Applied Studies, National Survey on Drug Use and Health, 1999-2001.

Table C.3 Percentage Distributions of Persons Aged 18 or Older from Selected Latin American Countries and the United States, by Demographic Characteristics: 1999–2001

Demographic Characteristic	Mexico	Puerto Rico	Cuba	El Salvador	Jamaica	Colombia	United States
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Gender							
Male	53.9	42.1	46.3	49.4	46.8	48.3	47.6
Female	46.1	57.9	53.7	50.6	53.2	51.7	52.4
Age Group							
18-25	19.9	9.1	3.1	17.7	13.5	12.3	14.6
26-34	28.2	13.6	7.9	24.5	18.8	16.6	15.8
35-49	33.2	34.2	37.5	44.0	33.6	44.3	31.4
50+	18.8	43.1	51.5	13.8*	34.1*	26.8	38.3
Adult Education							
< High school	66.2	45.9	32.8	58.7	27.0	22.5*	15.8
High school graduate	18.3	27.3	33.9	24.7	34.6	26.3	34.9
Some college	10.9	17.7	14.1	11.8	19.0	21.8	25.3
College graduate	4.6	9.2	19.1	4.8	19.3	29.4	24.1
Current Employment¹							
Full-time	61.2	52.6	58.0	70.9	69.6	64.7	56.8
Part-time	8.0	8.1	4.5	8.4	6.0	11.5	12.4
Unemployed	3.4	2.0	1.7	2.2	4.8*	4.8	2.2
Other ²	27.3	37.3	35.7	18.5	19.7	19.0	28.5
Household Income							
< \$20,000	42.9	45.1	31.6	28.8	16.8	35.5*	19.9
\$20,000 – \$49,999	46.4	40.2	40.6	52.6	44.8	36.3	39.7
\$50,000 – \$74,999	7.6	7.9	9.4*	14.1	17.7	12.3	18.8
≥ \$75,000	3.1	6.7	18.4	4.5	20.7*	15.8*	21.6
Government Assistance³							
Yes	17.5	34.3	20.5	13.9	8.6	4.4	12.2
No	82.5	65.7	79.5	86.1	91.4	95.6	87.8
Duration in United States							
< 5 years	21.1	6.7	10.9	16.3	10.2	19.9	N/A
≥ 5 years	78.9	93.3	89.1	83.7	89.8	80.1	N/A

* Low precision; estimate normally suppressed.

N/A = not applicable.

¹ Estimates for 2000 and 2001 are based on a revised definition of employment and are not comparable with estimates by employment published in prior NSDUH reports.

² Retired, disabled, homemaker, student, or "other."

³ At least one family member received Supplemental Security Income (SSI), cash assistance or noncash assistance (Temporary Assistance for Needy Families, TANF), or the family received food stamps.

Source: SAMHSA, Office of Applied Studies, National Survey on Drug Use and Health, 1999-2001.

Table C.4 Percentage Distributions of Persons Aged 18 or Older from Selected Asian Countries and the United States, by Demographic Characteristics: 1999–2001

Demographic Characteristic	Japan	Korea	Philippines	China	Vietnam	India	United States
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Gender							
Male	39.6	41.7	36.7	46.4	49.6	54.9	47.6
Female	60.4	58.3	63.3	53.6	50.4	45.1	52.4
Age Group							
18-25	22.9	14.2	7.3	6.8	15.9	11.6	14.6
26-34	24.6	29.1	14.6	24.5	31.7	31.8	15.8
35-49	35.1	36.3	34.3	36.0	41.7	31.1	31.4
50+	17.5*	20.3*	43.8	32.7	10.8*	25.5*	38.3
Adult Education							
< High school	3.4	9.5	7.1	6.4*	12.2	6.3	15.8
High school graduate	25.5	18.1	17.0	14.0	34.1	7.0	34.9
Some college	36.5	20.5	20.9	21.1*	25.1	15.7	25.3
College graduate	34.6	51.9	55.1	58.5*	28.6	71.1	24.1
Current Employment¹							
Full-time	51.4*	48.8	67.5	55.1	65.7	65.2	56.8
Part-time	15.7	15.9	10.5	10.8	9.4	8.9	12.4
Unemployed	0.3	0.3	1.4	1.3	1.6	1.1	2.2
Other ²	32.5*	35.0	20.7	32.8	23.3*	24.9	28.5
Household Income							
< \$20,000	27.9	19.4	12.0	15.6	21.3	13.2	19.9
\$20,000 – \$49,999	32.0	32.7	30.9	37.9	31.4	34.5	39.7
\$50,000 – \$74,999	12.1	22.7	27.4	23.3	24.4	21.9	18.8
≥ \$75,000	28.0*	25.2*	29.7	23.1	22.9*	30.4	21.6
Government Assistance³							
Yes	3.6	5.1	14.5	10.1*	16.1	5.1	12.2
No	96.4	94.9	85.5	89.9*	83.9	94.9	87.8
Duration in United States							
<5 years	27.1	11.6	10.7	32.7	4.2	40.5	N/A
≥ 5 years	72.9	88.4	89.3	67.3	95.8	59.5	N/A

* Low precision; estimate normally suppressed.

N/A = not applicable.

¹ Estimates for 2000 and 2001 are based on a revised definition of employment and are not comparable with estimates by employment published in prior NSDUH reports.

² Retired, disabled, homemaker, student, or "other."

³ At least one family member received Supplemental Security Income (SSI), cash assistance or noncash assistance (Temporary Assistance for Needy Families, TANF), or the family received food stamps.

Source: SAMHSA, Office of Applied Studies, National Survey on Drug Use and Health, 1999-2001.

Table C.5 Percentage Distributions of Persons Aged 18 or Older from Selected European Countries, Canada, and the United States, by Demographic Characteristics: 1999–2001

Demographic Characteristic	Germany	United Kingdom	Poland	Canada	United States
Total	100.0	100.0	100.0	100.0	100.0
Gender					
Male	39.3	44.5	45.3	43.5	47.6
Female	60.7	55.5	54.7	56.5	52.4
Age Group					
18-25	8.7	8.6	13.4	8.7	14.6
26-34	13.8	16.5	12.5	16.9	15.8
35-49	37.6	29.7	29.4	26.0	31.4
50+	39.9	45.2	44.7	48.4	38.3
Adult Education					
< High school	8.9	7.6	7.7	14.9	15.8
High school graduate	30.8	30.4	27.7	24.1	34.9
Some college	28.5	27.9	29.8	24.0	25.3
College graduate	31.8	34.1	34.7	36.9	24.1
Current Employment¹					
Full-time	54.7	59.0	50.2	49.5	56.8
Part-time	11.4	11.6	11.9	8.8	12.4
Unemployed	1.1	0.3	0.6	0.9	2.2
Other ²	32.9	29.1	37.3	40.8	28.5
Household Income					
< \$20,000	14.8	16.7	10.7*	13.4	19.9
\$20,000 – \$49,999	41.3	29.0	37.8	35.3	39.7
\$50,000 – \$74,999	18.9	18.6	26.0	20.4	18.8
≥ \$75,000	25.1	35.6	25.4	30.9	21.6
Government Assistance³					
Yes	7.1	6.6	6.0*	9.8	12.2
No	92.9	93.4	94.0*	90.2	87.8
Duration in United States					
< 5 years	6.7	12.2	5.4	21.7	N/A
≥ 5 years	93.3	87.8	94.6	78.3	N/A

* Low precision; estimate normally suppressed.

N/A = not applicable.

¹ Estimates for 2000 and 2001 are based on a revised definition of employment and are not comparable with estimates by employment published in prior NSDUH reports.

² Retired, disabled, homemaker, student, or "other."

³ At least one family member received Supplemental Security Income (SSI), cash assistance or noncash assistance (Temporary Assistance for Needy Families, TANF), or the family received food stamps.

Source: SAMHSA, Office of Applied Studies, National Survey on Drug Use and Health, 1999-2001.

Table C.6 Estimated Numbers and Prevalence (with Standard Errors) of Past Month and Past Year Alcohol Use, Past Month Binge and Heavy Drinking, and Past Month Weekly Alcohol Consumption among All Immigrants Aged 18 or Older, by Length of Time in the United States and Gender: 1999–2001

Sociodemographic Characteristic	Estimated Population (in 1,000s)	Past Month Alcohol Use		Past Year Alcohol Use		Past Month Binge Drinking		Past Month Heavy Drinking		Past Month Weekly Alcohol Consumption among Current Drinkers	
		%	SE	%	SE	%	SE	%	SE	Drinks	SE
Total Foreign Born	25,214	39.5	0.72	54.3	0.76	16.9	0.51	3.0	0.21	6.28	0.42
Gender											
Male	12,244	49.1	1.13	64.7	0.95	25.2	0.93	5.0	0.39		
Female	12,969	30.4	0.94	44.4	1.02	9.0	0.48	1.2	0.18		
Age Group											
18-25	3,570	41.1	0.88	58.0	0.87	24.7	0.75	5.3	0.39		
26-49	14,457	41.3	0.93	56.4	0.92	18.0	0.70	3.3	0.31		
50+	7,187	35.0	1.63	48.1	1.80	10.8	1.12	1.4	0.43		
Foreign Born in United States < 5 Years	4,466	39.1	1.44	53.6	1.58	18.8	1.06	3.8	0.50	6.88	0.97
Gender											
Male	2,323	48.6	2.01	65.0	1.90	27.4	1.76	5.6	0.88		
Female	2,144	28.9	1.97	41.2	2.12	9.3	0.95	1.8	0.41		
Age Group											
18-25	1,471	37.1	1.32	53.4	1.41	22.0	1.11	4.7	0.61		
26-49	2,522	39.7	1.79	54.1	1.92	17.3	1.30	3.5	0.72		
50+	474	42.3*	7.88*	51.9*	7.99*	16.6*	5.82*	2.3*	2.25*		
Foreign Born in United States ≥ 5 Years	20,747	39.6	0.79	54.4	0.85	16.4	0.59	2.9	0.24	6.21	0.47
Gender											
Male	9,921	49.2	1.28	64.7	1.13	24.7	1.07	4.8	0.44		
Female	10,826	30.7	1.02	45.0	1.11	8.9	0.56	1.1	0.21		
Age Group											
18-25	2,099	43.9	1.05	61.3	0.99	26.5	0.94	5.7	0.47		
26-49	11,935	41.7	1.02	56.9	1.00	18.1	0.77	3.3	0.34		
50+	6,713	34.5	1.64	47.9	1.83	10.3	1.15	1.4	0.43		
Born in United States	173,976	52.4	0.28	67.8	0.27	22.3	0.21	6.5	0.11	8.30	0.19
Gender											
Male	82,766	60.0	0.37	72.4	0.35	31.1	0.34	10.5	0.21		
Female	91,210	45.5	0.36	63.5	0.37	14.4	0.22	2.9	0.10		
Age Group											
18-25	25,320	60.0	0.32	77.3	0.26	40.1	0.32	14.4	0.25		
26-49	82,097	58.6	0.37	75.2	0.32	26.0	0.31	7.0	0.18		
50+	66,559	41.7	0.54	54.9	0.53	11.0	0.32	2.8	0.16		

* Low precision; estimate normally suppressed.

Source: SAMHSA, Office of Applied Studies, National Survey on Drug Use and Health, 1999-2001.

Table C.7 Linear Regression Model Results for Log-Transformed Past Month Weekly Alcohol Consumption among All Immigrants Aged 18 or Older Who Were Current Drinkers: 1999–2001

Model Covariates	β	SE	<i>p</i> value
Country Alcohol Consumption Rate¹	0.04	0.01	<0.0001
Gender			
Male	0.77	0.07	<0.0001
Female	0.00	0.00	--
Age Groups			
18-25	0.10	0.10	0.3051
26-49	0.03	0.09	0.7203
50 or older	0.00	0.00	--
Total Family Income			
<\$20,000	-0.03	0.11	0.7791
\$20,000 - \$49,999	-0.01	0.10	0.9092
\$50,000 - \$74,999	-0.11	0.11	0.3085
≥\$75,000	0.00	0.00	--
Marital Status			
Married	-0.38	0.07	<0.0001
Single (divorced/separated)	0.00	0.00	--
Adult Education			
<High school	0.36	0.09	<0.0001
High school graduate	0.30	0.09	0.0006
Some college	0.20	0.09	0.0214
College graduate	0.00	0.00	--
Duration in the United States			
<5 years	0.03	0.07	0.6147
≥ 5 years	0.00	0.00	--

Note: Past month weekly alcohol consumption was calculated by multiplying the average number of drinks consumed per day in the past 30 days by the number of days drinking during the past month among persons who had used alcohol in the past 30 days, and dividing by 4.286, the number of weeks in a 30-day period.

¹ The rates for country of origin per capita alcohol consumption were found in the *Global Status Report* (World Health Organization [WHO], 2001). Only immigrants from countries with known per capita alcohol consumption were included.

Source: SAMHSA, Office of Applied Studies, National Survey on Drug Use and Health, 1999-2001.

Table C.8 Estimated Numbers and Prevalence (with Standard Errors) of Past Month Illicit Drug and Tobacco Use among All Immigrants Aged 18 or Older, by Demographic Characteristics: 1999–2001

Sociodemographic Characteristic	Estimated Population (in 1,000s)	Past Month Tobacco Use		Past Month Marijuana Use		Past Month Any Illicit Drug Use	
		%	SE	%	SE	%	SE
Total Foreign Born	25,214	20.4	0.57	1.7	0.12	2.9	0.20
Gender							
Male	12,244	27.8	0.92	2.3	0.20	3.8	0.33
Female	12,969	13.4	0.65	1.1	0.13	2.1	0.22
Age Group							
18-25	3,570	25.4	0.69	5.1	0.34	7.2	0.37
26-49	14,457	22.0	0.69	1.6	0.18	2.9	0.28
50+	7,187	14.8	1.24	0.1	0.07	0.9	0.34
Foreign Born in United States < 5 Years	4,466	22.6	1.24	1.8	0.29	3.2	0.40
Gender							
Male	2,323	31.5	1.90	1.9	0.40	3.4	0.51
Female	2,144	13.0	1.32	1.6	0.42	3.0	0.64
Age Group							
18-25	1,471	23.3	1.12	3.1	0.45	5.0	0.50
26-49	2,522	22.5	1.55	1.3	0.43	2.7	0.63
50+	474	20.9*	7.06*	0.0*	0.00*	0.1*	0.13*
Foreign Born in United States ≥ 5 Years	20,747	19.9	0.64	1.6	0.13	2.9	0.22
Gender							
Male	9,921	27.0	1.08	2.3	0.23	3.9	0.39
Female	10,826	13.5	0.70	1.0	0.14	2.0	0.23
Age Group							
18-25	2,099	27.0	0.87	6.5	0.46	8.7	0.53
26-49	11,935	21.9	0.76	1.6	0.20	3.0	0.30
50+	6,713	14.3	1.24	0.1	0.07	0.9	0.37
Born in United States	173,976	32.8	0.25	5.1	0.10	6.6	0.12
Gender							
Male	82,766	39.7	0.36	7.0	0.17	8.5	0.19
Female	91,210	26.7	0.32	3.4	0.10	4.9	0.14
Age Group							
18-25	25,320	46.4	0.29	16.0	0.24	18.4	0.25
26-49	82,097	37.4	0.36	5.4	0.17	7.2	0.20
50+	66,559	22.0	0.44	0.6	0.08	1.3	0.13

* Low precision; estimate normally suppressed.

Source: SAMHSA, Office of Applied Studies, National Survey on Drug Use and Health, 1999-2001.

Table C.9 Estimated Numbers and Prevalence (with Standard Errors) of Past Year Illicit Drug and Tobacco Use among All Immigrants Aged 18 or Older, by Demographic Characteristics: 1999–2001

Sociodemographic Characteristic	Estimated Population (in 1,000s)	Past Year Tobacco Use		Past Year Marijuana Use		Past Year Any Illicit Drug Use	
		%	SE	%	SE	%	SE
Total Foreign Born	25,214	24.8	0.63	3.5	0.17	6.0	0.26
Gender							
Male	12,244	33.6	1.02	4.7	0.29	7.6	0.45
Female	12,969	16.6	0.69	2.4	0.21	4.5	0.32
Age Group							
18-25	3,570	33.8	0.79	10.0	0.53	14.7	0.60
26-49	14,457	26.7	0.79	3.3	0.26	5.9	0.38
50+	7,187	16.7	1.33	0.6	0.24	2.0	0.51
Foreign Born in United States < 5 Years	4,466	28.0	1.26	3.9	0.39	7.6	0.58
Gender							
Male	2,323	38.1	1.91	4.5	0.58	8.8	0.86
Female	2,144	17.0	1.44	3.3	0.49	6.3	0.85
Age Group							
18-25	1,471	31.9	1.15	7.0	0.71	12.2	0.85
26-49	2,522	27.0	1.62	2.8	0.59	6.3	0.85
50+	474	21.1*	7.07*	0.0*	0.00*	0.1*	0.13*
Foreign Born in United States ≥ 5 Years	20,747	24.2	0.71	3.4	0.19	5.7	0.30
Gender							
Male	9,921	32.5	1.20	4.7	0.32	7.3	0.52
Female	10,826	16.5	0.75	2.2	0.23	4.2	0.35
Age Group							
18-25	2,099	35.2	1.03	12.0	0.68	16.4	0.77
26-49	11,935	26.6	0.89	3.4	0.29	5.8	0.42
50+	6,713	16.4	1.35	0.7	0.26	2.1	0.55
Born in United States	173,976	38.2	0.26	8.8	0.14	11.5	0.16
Gender							
Male	82,766	46.4	0.37	11.4	0.21	13.9	0.23
Female	91,210	30.9	0.33	6.5	0.14	9.2	0.18
Age Group							
18-25	25,320	56.0	0.30	27.1	0.29	31.8	0.30
26-49	82,097	43.6	0.36	9.5	0.22	12.6	0.25
50+	66,559	24.8	0.46	1.0	0.10	2.3	0.16

* Low precision; estimate normally suppressed.

Source: SAMHSA, Office of Applied Studies, National Survey on Drug Use and Health, 1999-2001.

Table C.10 Adjusted Odds Ratios of Alcohol Use among All Immigrants Aged 18 or Older: 1999–2001

Model Covariates	Past Month Alcohol Use			Past Month Binge Drinking			Past Month Heavy Drinking			Past Year Alcohol Use		
	Adjusted Odds Ratio	95% Confidence Interval		Adjusted Odds Ratio	95% Confidence Interval		Adjusted Odds Ratio	95% Confidence Interval		Adjusted Odds Ratio	95% Confidence Interval	
Intercept	0.41	0.34	0.49	0.07	0.05	0.09	0.01	0.00	0.02	0.72	0.59	0.87
Duration in United States												
< 5 years	0.86	0.75	0.99	0.83	0.69	0.99	0.90	0.64	1.27	0.81	0.69	0.94
5+ years	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Gender												
Male	2.21	1.96	2.51	3.43	2.94	3.99	4.08	2.93	5.69	2.31	2.08	2.57
Female	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Age Group												
18-25	1.22	1.02	1.46	2.55	1.98	3.28	2.71	1.46	5.03	1.43	1.20	1.71
26-34	1.49	1.24	1.79	2.40	1.84	3.14	2.52	1.32	4.81	1.69	1.43	2.01
35-49	1.21	1.01	1.45	1.50	1.13	1.99	2.14	1.06	4.30	1.28	1.07	1.53
50+	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Marital Status												
Married	0.86	0.75	0.98	0.82	0.70	0.96	0.53	0.38	0.73	0.84	0.74	0.95
Other	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Source: SAMHSA, Office of Applied Studies, National Survey on Drug Use and Health, 1999-2001.

Table C.11 Adjusted Odds Ratios of Tobacco Use among All Immigrants Aged 18 or Older: 1999–2001

Model Covariates	Past Month Tobacco Use			Past Year Tobacco Use		
	Adjusted Odds Ratio	95% Confidence Interval		Adjusted Odds Ratio	95% Confidence Interval	
Intercept	0.15	0.12	0.19	0.17	0.14	0.21
Duration in United States						
< 5 years	0.97	0.81	1.15	0.94	0.81	1.10
5+ years	1.00	1.00	1.00	1.00	1.00	1.00
Gender						
Male	2.53	2.19	2.92	2.58	2.25	2.96
Female	1.00	1.00	1.00	1.00	1.00	1.00
Age Group						
18-25	1.51	1.20	1.90	2.02	1.62	2.51
26-34	1.64	1.32	2.03	1.91	1.54	2.36
35-49	1.65	1.32	2.06	1.82	1.46	2.26
50+	1.00	1.00	1.00	1.00	1.00	1.00
Marital Status						
Married	0.58	0.50	0.68	0.59	0.51	0.68
Other	1.00	1.00	1.00	1.00	1.00	1.00

Source: SAMHSA, Office of Applied Studies, National Survey on Drug Use and Health, 1999-2001.

Table C.12 Adjusted Odds Ratios of Marijuana Use among All Immigrants Aged 18 or Older: 1999–2001

Model Covariates	Past Month Marijuana Use			Past Year Marijuana Use		
	Adjusted Odds Ratio	95% Confidence Interval		Adjusted Odds Ratio	95% Confidence Interval	
Intercept	0.00	0.00	0.01	0.01	0.00	0.02
Duration in United States						
< 5 years	0.51	0.35	0.75	0.57	0.45	0.72
5+ years	1.00	1.00	1.00	1.00	1.00	1.00
Gender						
Male	1.95	1.43	2.67	1.88	1.51	2.36
Female	1.00	1.00	1.00	1.00	1.00	1.00
Age Group						
18-25	32.92	10.04	107.89	13.48	6.08	29.89
26-34	19.99	5.80	68.87	8.10	3.67	17.85
35-49	12.57	3.44	45.88	4.86	2.14	11.03
50+	1.00	1.00	1.00	1.00	1.00	1.00
Marital Status						
Married	0.26	0.17	0.41	0.33	0.23	0.48
Other	1.00	1.00	1.00	1.00	1.00	1.00

Source: SAMHSA, Office of Applied Studies, National Survey on Drug Use and Health, 1999-2001.

Table C.13 Adjusted Odds Ratios of Any Illicit Drug Use among All Immigrants Aged 18 or Older: 1999–2001

Model Covariates	Past Month Any Illicit Drug Use			Past Year Any Illicit Drug Use		
	Adjusted Odds Ratio	95% Confidence Interval		Adjusted Odds Ratio	95% Confidence Interval	
Intercept	0.01	0.01	0.02	0.02	0.01	0.04
Duration in United States						
< 5 years	0.64	0.47	0.86	0.78	0.64	0.96
5+ years	1.00	1.00	1.00	1.00	1.00	1.00
Gender						
Male	1.74	1.31	2.31	1.65	1.34	2.02
Female	1.00	1.00	1.00	1.00	1.00	1.00
Age Group						
18-25	6.62	3.13	13.99	6.63	3.92	11.23
26-34	4.26	1.92	9.45	3.95	2.24	6.97
35-49	3.16	1.33	7.50	2.83	1.58	5.07
50+	1.00	1.00	1.00	1.00	1.00	1.00
Marital Status						
Married	0.41	0.29	0.56	0.47	0.37	0.61
Other	1.00	1.00	1.00	1.00	1.00	1.00

Source: SAMHSA, Office of Applied Studies, National Survey on Drug Use and Health, 1999-2001.

Table C.14 Estimated Numbers and Prevalence (with Standard Errors) of Past Month Weekly Alcohol Consumption, Past Month and Past Year Alcohol Use, and Past Month Binge and Heavy Drinking among Immigrants from Selected Countries within Selected Regions and the United States: 1999–2001

Country of Origin	Estimated Population (in 1,000s)	Past Month Weekly Alcohol Consumption among Past Month Drinkers		Past Month Alcohol Use		Past Year Alcohol Use		Past Month Binge Drinking		Past Month Heavy Drinking	
		Drinks	SE	%	SE	%	SE	%	SE	%	SE
Selected Latin American Countries											
Mexico	6,759	8.1	0.66	34.9	1.16	50.3	1.23	22.3	0.96	3.5	0.41
Puerto Rico	862	6.8	1.38	41.3	4.30	57.5	4.49	23.7	4.30	3.3	1.78
Cuba	779	3.3	0.29	42.4	3.20	56.4	3.02	9.9	1.87	1.3	0.42
El Salvador	518	7.4	1.61	33.5	4.54	48.9	5.09	19.7	4.16	2.6	0.84
Jamaica	406	2.8	0.65	35.8	5.42	62.1	4.83	16.3	4.41	1.3	1.14
Colombia	411	3.8	1.38	41.8	4.47	60.9	5.62	14.9	2.87	2.0	0.80
Selected Asian Countries											
Japan	262	3.5	0.46	62.1	5.40	69.9	5.49	18.6	3.96	4.2	2.25
Korea	523	7.5	2.93	53.2	5.12	63.1	5.09	27.9	4.94	3.5	1.02
Philippines	1,519	4.6	1.02	24.1	3.33	37.2	3.82	8.9	1.56	0.6	0.32
China	589	1.5	0.29	28.4	4.09	45.9	5.49	7.5	2.58	0.7	0.30
Vietnam	530	5.1	1.69	26.4	4.25	43.7	4.82	11.7	3.55	0.6	0.52
India	1,060	2.4	0.44	26.6	3.31	39.6	3.68	7.8	1.93	3.3	1.50
Selected European Countries											
Germany	958	5.3	0.81	49.3	3.72	72.5	3.20	17.3	2.55	5.3	1.39
United Kingdom	723	10.2	1.67	67.5	4.02	73.3	3.97	31.3	3.56	12.2	2.79
Poland	323	4.1	0.81	55.9	5.74	75.4	5.00	23.8	4.11	4.4	1.72
Canada	683	5.2	0.62	64.5	3.83	78.3	3.29	19.4	2.57	5.3	1.39
United States	173,976	8.3	0.19	52.4	0.28	67.8	0.27	22.3	0.21	6.5	0.11

Source: SAMHSA, Office of Applied Studies, National Survey on Drug Use and Health, 1999-2001.

Table C.15 Estimated Number of Drinks (with Standard Errors) for Past Month Weekly Alcohol Consumption among Immigrants from Selected Countries Who Were Past Month Alcohol Users, by Length of Time in the United States: 1999–2001

		NSDUH Past Month Weekly Alcohol Consumption Time Lived in the United States			
Country of Origin	Estimated Population (in 1,000s)	<5 Years		≥5 Years	
		Drinks	SE	Drinks	SE
Selected Latin American Countries					
Mexico	6,759	8.04	1.35	8.11	0.73
El Salvador	518	4.83	1.93	7.98	1.89
Puerto Rico	862	15.87	4.56	6.19	1.33
Cuba	779	3.28	1.76	3.35	0.31
Jamaica	406	7.89	3.24	2.48	0.59
Columbia	411	3.16	0.76	3.89	1.63
Selected Asian Countries					
Japan	262	2.32	0.53	4.10	0.60
Korea	523	2.46	0.51	8.16	3.34
Philippines	1,519	3.02	1.18	4.85	1.16
China	589	1.45	0.39	1.55	0.40
Vietnam	530	2.34	0.94	5.16	1.73
India	1,060	2.84	0.65	2.16	0.56
Selected European Countries					
Germany	958	3.56	1.01	5.43	0.88
United Kingdom	723	11.52	3.35	9.98	1.90
Poland	323	4.64	1.37	4.00	0.87
Canada	683	4.51	0.97	5.45	0.75

Source: SAMHSA, Office of Applied Studies, National Survey on Drug Use and Health, 1999-2001.

Table C.16 Estimated Numbers and Prevalence (with Standard Errors) of Past Month Tobacco Use, Past Month Illicit Drug Use, and Past Month Marijuana Use among Immigrants from Selected Countries within Selected Regions and the United States: 1999–2001

Country of Origin	Estimated Population	Past Month Tobacco Use		Past Month Marijuana Use		Past Month Illicit Drug Use	
		%	SE	%	SE	%	SE
Selected Latin American Countries							
Mexico	6,759	20.8	1.15	0.9	0.16	2.2	0.27
Puerto Rico	862	31.0	3.76	2.0	0.66	7.7	2.62
Cuba	779	17.6	2.20	0.2	0.10	0.5	0.24
El Salvador	518	17.6	2.94	1.4	0.55	2.7	0.80
Jamaica	406	12.1	3.41	5.5	2.53	5.6	2.53
Colombia	411	18.2	3.39	0.9	0.45	2.1	0.96
Selected Asian Countries							
Japan	262	24.0	4.27	5.6	1.92	8.0	2.97
Korea	523	30.2	4.89	3.2	1.03	5.8	1.89
Philippines	1,519	13.5	2.91	0.9	0.30	1.1	0.31
China	589	10.1	3.14	0.2	0.17	0.2	0.17
Vietnam	530	25.5	4.61	1.3	0.84	2.3	1.11
India	1,060	10.2	2.79	0.1	0.05	1.2	0.78
Selected European Countries							
Germany	956	30.0	3.13	4.0	1.22	5.1	1.34
United Kingdom	723	31.7	3.94	3.9	1.09	4.4	1.12
Poland	323	16.9	3.18	1.8	0.64	5.3	2.08
Canada	683	25.9	3.47	4.3	1.14	4.8	1.16
United States	173,976	32.8	0.25	5.1	0.10	6.6	0.12

Source: SAMHSA, Office of Applied Studies, National Survey on Drug Use and Health, 1999-2001.

Table C.17 Estimated Numbers and Prevalence (with Standard Errors) of Past Year Tobacco Use, Past Year Illicit Drug Use, and Past Year Marijuana Use among Immigrants from Selected Countries within Selected Regions and the United States: 1999–2001

Country of Origin	Estimated Population	Past Year Tobacco Use		Past Year Marijuana Use		Past Year Illicit Drug Use	
		%	SE	%	SE	%	SE
Selected Latin American Countries							
Mexico	6,759	26.2	1.23	2.3	0.26	5.5	0.42
Puerto Rico	862	35.7	3.89	4.7	1.29	13.6	3.27
Cuba	779	23.3	2.93	0.8	0.30	2.6	1.31
El Salvador	518	24.1	4.05	1.8	0.61	4.6	1.01
Jamaica	406	13.7	3.47	6.4	2.64	6.8	2.66
Colombia	411	23.4	3.88	2.9	1.07	4.9	1.48
Selected Asian Countries							
Japan	262	26.1	4.30	9.9	2.65	12.9	3.47
Korea	523	33.4	5.00	4.9	1.19	8.3	2.08
Philippines	1,519	16.7	3.05	1.3	0.34	1.8	0.42
China	589	13.5	3.66	1.1	0.57	2.2	0.91
Vietnam	530	27.3	4.57	2.0	0.98	4.1	1.38
India	1,060	12.2	2.83	0.3	0.19	2.3	0.96
Selected European Countries							
Germany	958	33.3	3.13	7.4	1.75	9.4	1.92
United Kingdom	723	34.3	4.02	7.5	1.61	8.4	1.73
Poland	323	21.9	3.62	4.0	1.04	8.8	2.47
Canada	683	30.6	3.58	7.1	1.35	8.9	1.66
United States	173,976	38.2	0.26	8.8	0.14	11.5	0.16

Source: SAMHSA, Office of Applied Studies, National Survey on Drug Use and Health, 1999-2001.