2010

# EPIDEMIOLOGIC PROFILE

## Asians and Native Hawaiians and Other Pacific Islanders

National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention

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**Note to the reader**: Because this document is provided as Web-based material, the project staff have tried to make it as compact as possible to facilitate copying and redistribution. For this reason, many reference tables that are not necessary for the mainstream flow of information have been placed in an Appendix at the end of the document. This allows readers to choose to have access to all the available documents or just to the mainstream report, in order to meet their informational needs.

# *Epidemiologic Profile 2010*: Asians and Native Hawaiians and Other Pacific Islanders

# GLOSSARY

ACIP—Advisory Committee on Immunization Practices. Selected by the Secretary of U.S. Health and Human Services, the 15-member ACIP provides advice and guidance to the public health and clinical practice communities about controlling vaccine-preventable diseases.

ACS—The American Community Survey, the nation's largest annual ongoing demographic survey administered by the U.S. Census Bureau, provides communities with the current information they need to plan investments and services, including data on educational attainment, income, health insurance, commuting, and housing characteristics.

API—Asian/Native Hawaiian and Other Pacific Islander or Asian/NHPI. API represents the combined racial group of Asian or Native Hawaiian and Other Pacific Islander.

ART—Antiretroviral treatment. The clinical use of antiretroviral agents in the treatment of adults and adolescents who are infected with the HIV.

Asian—Racial group profiled in this report. This group is defined as "A person having origins in any of the original peoples of the Far East, Southeast Asia, or the Indian subcontinent including, for example, Cambodia, China, India, Japan, Korea, Malaysia, Pakistan, the Philippine Islands, Thailand, and Vietnam."

CHeCS—Chronic Hepatitis Cohort Study. A long-term cohort study that comprehensively examines the clinical characteristics, treatment rates, behavioral qualities, and outcomes of patients for chronic hepatitis B and C infections.

Emerging Infections Program—A CDC-based network that involves state and local health departments and academic institutions in population-based surveillance for acute hepatitis A and acute and/or chronic hepatitis B and C in the United States

GISP—Gonococcal Isolate Surveillance Project. Established in 1986 to monitor trends in antimicrobial susceptibilities of strains of *N. gonorrhoeae* in the United States in order to establish a rational basis for the selection of gonococcal therapies. GISP is a collaborative project among selected STD clinics, five regional laboratories, and CDC.

HIV and AIDS—Human immunodeficiency virus (HIV) and acquired immune deficiency syndrome (AIDS). A person with HIV infection may be diagnosed with AIDS, which usually occurs late in the disease course of HIV infection.

IPP—Infertility Prevention Project. Program that funds chlamydia and gonorrhea screening and treatment services for low-income, sexually active women attending family planning, STD, and other women's healthcare clinics.

*M.africanum—Mycobacterium africanum.*

*M.bovis—Mycobacterium bovis*.

*M tb—Mycobacterium tuberculosis*. A bacterium that causes tuberculosis.

MDR TB—Multidrug-resistant Tuberculosis.

MSM—Men who have sex with men. A term used in CDC surveillance systems to indicate males who ever had sex with another male, without regard to the nature of the sexual contact (e.g., oral or anal) or to how an individual may self-identify in terms of their sexuality.

MIC—Minimal inhibitory concentration. The lowest antibiotic concentration that prevents bacterial growth.

MMP—Medical Monitoring Project. A CDC surveillance system of HIV-infected persons receiving medical care.

Multiple race—A person self-identifying with more than one race group.

NETSS—National Electronic Telecommunications System for Surveillance. Computerized public health surveillance information system providing CDC with weekly data regarding cases of nationally notifiable diseases.

Native Hawaiian and Other Pacific Islander—Racial group profiled in this report. This group is defined as "A person having origins in any of the original peoples of Hawaii, Guam, Samoa, or other Pacific Islands."

*N. gonorrhoeae—Neisseria gonorrhoeae*. A bacterium that causes gonorrhea.

NHBS—National HIV Behavioral Surveillance System. A CDC surveillance system that collects information from groups at high risk for HIV infection.

NHIS—National Health Interview Survey is a cross-sectional household interview survey administered by the CDC's National Center for Health Statistics to monitor the health of the U.S. population

NHPI—Native Hawaiian and Other Pacific Islander: racial group profiled in this report.

NNDSS—National Notifiable Diseases Surveillance System.

Non-Hispanic American Indian or Alaska Native (Non-Hispanic AIAN)—A person having origins in any of the original peoples of North America, and who maintains cultural identification through tribal affiliation or community recognition.

Non-Hispanic Asian—see Asian.

Non-Hispanic black—A person having origins in any of the black racial groups of Africa.

Non-Hispanic Native Hawaiian and Other Pacific Islander (Non-Hispanic NHPI)—see Native Hawaiian and Other Pacific Islander.

Non-Hispanic white—A person having origins in any of the original peoples of Europe, North Africa, or the Middle East.

NTSS—National Tuberculosis Surveillance System.

OMB—U.S. Office of Management and Budget. A component of the Executive Office of the President of the United States, OMB established standards for the collection of race and ethnicity information.

Primary and secondary (P&S) syphilis—Primary syphilis. A stage of infection with *Treponema pallidum* characterized by one or more chancres (ulcers); chancres might differ considerably in clinical appearance. Secondary syphilis: A stage of infection caused by *T. pallidum* and characterized by localized or diffuse mucocutaneous lesions, often with generalized lymphadenopathy. The primary chancre may still be present.

QRNG—Fluoroquinolone-resistant *N. gonorrhoeae*. Defined as *N. gonorrhoeae* resistant to ciprofloxacin (minimal inhibitory concentration [MIC] >1.0 µg/mL by agar dilution or disk diffusion zone size <27 mm) or ofloxacin (MIC >2.0 µg/mL or disk diffusion zone size <24 mm) by the National Committee on Clinical Laboratory Standards.

STD—Sexually transmitted diseases are infections that are spread primarily through person-to-person sexual contact; some STDs, however, can be transmitted nonsexually, such as transmission from mother-to-child during pregnancy and childbirth or through blood products.

SSuN—STD Surveillance Network. In 2005, CDC established SSuN as a dynamic STD surveillance network comprised of local enhanced STD surveillance systems that follow common protocols for the purpose of improving the capacity of national, state, and local STD programs to detect, monitor, and respond rapidly to trends in STDs through enhanced collection, reporting, analysis, visualization, and interpretation of disease information.

TB—Tuberculosis.

*Treponema pallidum*—Bacterium that causes syphilis.

Unprotected insertive anal intercourse—Insertive anal intercourse without a condom or with condom breakage.

USPSTF—U.S. Preventive Services Task Force. An independent panel of non-federal experts in prevention and evidence-based medicine. The USPSTF conducts scientific evidence reviews of a broad range of clinical preventive healthcare services (such as screening, counseling, and preventive medications) and develops recommendations for primary care clinicians and health systems.

Viral Hepatitis—A term used collectively to refer to a group of viruses that can cause inflammation of the liver. In the United States, hepatitis A, B, and C are most commonly reported.

XDR TB—Extensively Drug-resistant Tuberculosis.

# CONTENTS

# BACKGROUND

This *Epidemiologic Profile* is the first compilation of infectious disease-specific data in a single report that focuses on two racial groups in the United States: the Asian population and the Native Hawaiian and Other Pacific Islander population. It has been produced by the National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention at the Centers for Disease Control and Prevention (CDC), and each Division represented in the National Center participated in the development of the report. The U.S. Census Bureau contributed to the chapter that describes Asian and Native Hawaiian and Other Pacific Islander populations who reside in the United States.

Human immunodeficiency virus (HIV), viral hepatitis, sexually transmitted diseases (STDs), and tuberculosis (TB) share common risk factors, intersect as co-infections, and interact to increase transmission and complicate treatment. Men who have sex with men are at high risk for acquiring STDs and HIV. Persons who inject drugs and share their syringes are at risk for acquiring HIV and viral hepatitis. And TB takes advantage of a person's impaired ability to fight infection or of poor living conditions to spread from person to person. A person infected with one disease may increase their chance of becoming infected with another disease (i.e., co-infection). For example, STDs that cause skin ulceration or mucosal inflammation allow HIV infection to occur more easily. Longstanding, untreated HIV infection is associated with waning immunity and increased risk of TB infection. Additionally, co-infection may make treating the primary infection more difficult. Viral hepatitis complicates HIV co-infection as both diseases progress faster, and treatment may be more difficult as drug-drug interactions may occur or drug resistance may develop.

Although Asians and Native Hawaiians and Other Pacific Islanders currently comprise about 5% of the U.S. population, the percentage of Asians and Native Hawaiians and Other Pacific Islanders among persons with these selected diseases varies dramatically. For example, for hepatitis B and tuberculosis, Asians make up a disproportionately large percentage of cases (~25%), in excess of their representation in the U.S. population. For STDs and HIV, Asians and Native Hawaiians and Other Pacific Islanders comprise a small percentage of cases (<5%), less than their representation in the U.S. population.

Among Asians and Native Hawaiians and Other Pacific Islanders, additional risk factors need to be considered. Persons born in a country outside the United States (foreign-born[a]) with endemic diseases are more likely to be infected with these diseases even if they currently reside in the United States. For foreign-born persons, age at immigration and fluency of English may determine how challenging it will be to contact, educate, and treat these individuals and their infection. Identifying and addressing stigmatized risk behaviors for disease acquisition among Asians and Native Hawaiians and Other Pacific Islanders, however, may be particularly challenging because of social and cultural customs within each racial group that suppress acknowledgment of these risks and individual perception of risk. This unwillingness to acknowledge such problems is exacerbated by a societal stereotype of Asians and Native Hawaiians and Other Pacific Islanders that depicts them as being at low risk so that healthcare providers do not conduct disease testing or ask important questions of patients from these groups.

In 1977, the Office of Management and Budget (OMB) set forth a Statistical Policy Directive that established standards for the collection of race and ethnicity that included: white, black, American Indian or Alaskan Native, Asian or Pacific Islander, and Hispanic origin.[b] In 1997, after a review of its directive, OMB announced a

[a] The definition of "foreign-born" varies somewhat; each chapter that uses the term defines it.

[b] http://www.whitehouse.gov/omb/fedreg_race-ethnicity/.

revision to its standard for collection of race and ethnicity.[c] A minimum of five race categories were included: American Indian or Alaska Native, Asian, black or African American, Native Hawaiian or Other Pacific Islander, and white. Two categories of ethnicity were also used: Hispanic or Latino and not Hispanic or Latino (non-Hispanic). Surveillance programs at CDC began implementing the new directive in partnership with local reporting jurisdictions. At the time of this report, most CDC disease-specific surveillance programs include categorization of the Asian population and the Native Hawaiian and Other Pacific Islander population as separate racial groups. Some disease programs continue to report for a combined Asian/Native Hawaiian and Other Pacific Islander (API) racial group, however. When possible, chapter authors have reported Asians and Native Hawaiians and Other Pacific Islanders separately. In some instances, case numbers were too small to allow meaningful statistical analysis or data collection processes did not allow separation of Asians from Native Hawaiians and Other Pacific Islanders; in these instances, results are reported in the grouped category "API." For trend analyses that span the timeframe in which the directive was implemented, Asians and Native Hawaiians and Other Pacific Islanders are combined as "API" to bridge to data collected under the 1977 OMB directive.

The most currently available national surveillance data have been used for this report. Interested parties should consult annual surveillance reports produced by each Division and made available on CDC's website.[d] When possible, 2010 data have been used, but depending on the data source and type of analysis, older data have been used to provide a more comprehensive picture of Asians and Native Hawaiians and Other Pacific Islanders affected by TB, viral hepatitis, STDs, and HIV.

This report complements the annual surveillance reports produced by each disease-specific program by bringing selected information together in a single report that profiles non-Hispanic, single race Asians and Native Hawaiians and Other Pacific Islanders. It also complements the *2007 Disease Profile*,[e] which suggested ways to integrate data and prevention resources. By focusing on Asians and Native Hawaiians and Other Pacific Islanders, this *2010 Epidemiologic Profile* provides information to maximize population-specific prevention and disease-specific control efforts.

[c] http://www.whitehouse.gov/omb/fedreg_1997standards/.

[d] TB: http://www.cdc.gov/tb/statistics/reports/2010/default.htm; Hepatitis: http://www.cdc.gov/hepatitis/Statistics/2009Surveillance/index.htm; STD: http://www.cdc.gov/std/stats10/default.htm; HIV/AIDS: http://www.cdc.gov/hiv/surveillance/resources/reports/2010report/index.htm.

[e] http://www.cdc.gov/nchhstp/Publications/NCHHSTP_Disease_Profile_2007.pdf.

# CHAPTER 1: ASIANS AND NATIVE HAWAIIANS AND OTHER PACIFIC ISLANDERS IN THE UNITED STATES

## INTRODUCTION

Data from the U.S. decennial census provide a rich description of Asians and Native Hawaiians and Other Pacific Islanders who reside in the United States. These data set a foundation upon which readers can compare subsequent disease-specific prevalence estimates to evaluate whether Asians or Native Hawaiians and Other Pacific Islanders are overrepresented for a particular disease or if other demographic- or race-specific factors play a role in disease acquisition, disease control, or prevention efforts.

Because Asians and Native Hawaiians and Other Pacific Islanders are a diverse, heterogeneous group, readers should be cautious about drawing inferences about specific subpopulations within these groups.

## POPULATION DATA SOURCES

The U.S. Census Bureau's annual surveys and decennial census provide data that are used to enumerate the number of people residing in the United States and to describe the demographic, social, economic, and housing characteristics of the U.S. population and its trends. The decennial census, in which each person residing in the United States is counted, occurs every 10 years, most recently in 2010. Basic demographic information, which includes sex, race, and ethnicity, is collected in the decennial census.

Between decennial censuses, the U.S. Census releases intercensal estimates each year to provide U.S. population estimates by basic demographic factors. To provide a description of the mid-year 2010 U.S. population by state, age, sex, race, and ethnicity, 2009 Vintage Estimates have been used in this report.[f]

The Census' American Community Survey (ACS) is an annual, nationwide survey that includes a sample of all U.S. residents. The ACS collects more detailed information such as nativity (country of birth), income, education, and language spoken at home. The most current ACS data at the onset of this research were from 2009. To determine nativity for foreign-born Asians, three years of ACS data have been used, 2007–2009.

The U.S. Census collects race and Hispanic origin information following the guidance of the U.S. Office of Management and Budget's (OMB) 1997 *Revisions to the Standards for the Classification of Federal Data on Race and Ethnicity* (*1*). Starting in 1997, OMB required federal agencies to use a minimum of five race categories: American Indian or Alaska Native, Asian, black or African American, Native Hawaiian or Other Pacific Islander, and white. Respondents are instructed to select from as many of those designations as they feel apply to them, but if they are unable to identify with any of these five race categories, OMB has approved the U.S. Census Bureau's inclusion of a sixth category—Some Other Race—on the Census 2000 and 2010 Census questionnaires (*2*).

In addition to race, ethnicity (i.e., Hispanic/Latino origin) is also collected. Persons of Hispanic ethnicity may be of any single race or combination of races. For the Census Bureau's surveys, identification of race and ethnicity is by self-report.

[f] Vintage population estimates are produced each year by the U.S. Census Bureau on the basis of the most recent decennial census. Vintage 2009 estimates were created in 2009 on the basis of the 2000 decennial census. At the time this report was being prepared, some demographic characteristics from the 2010 Census were not available.

## POPULATION GROUPS IN THIS REPORT

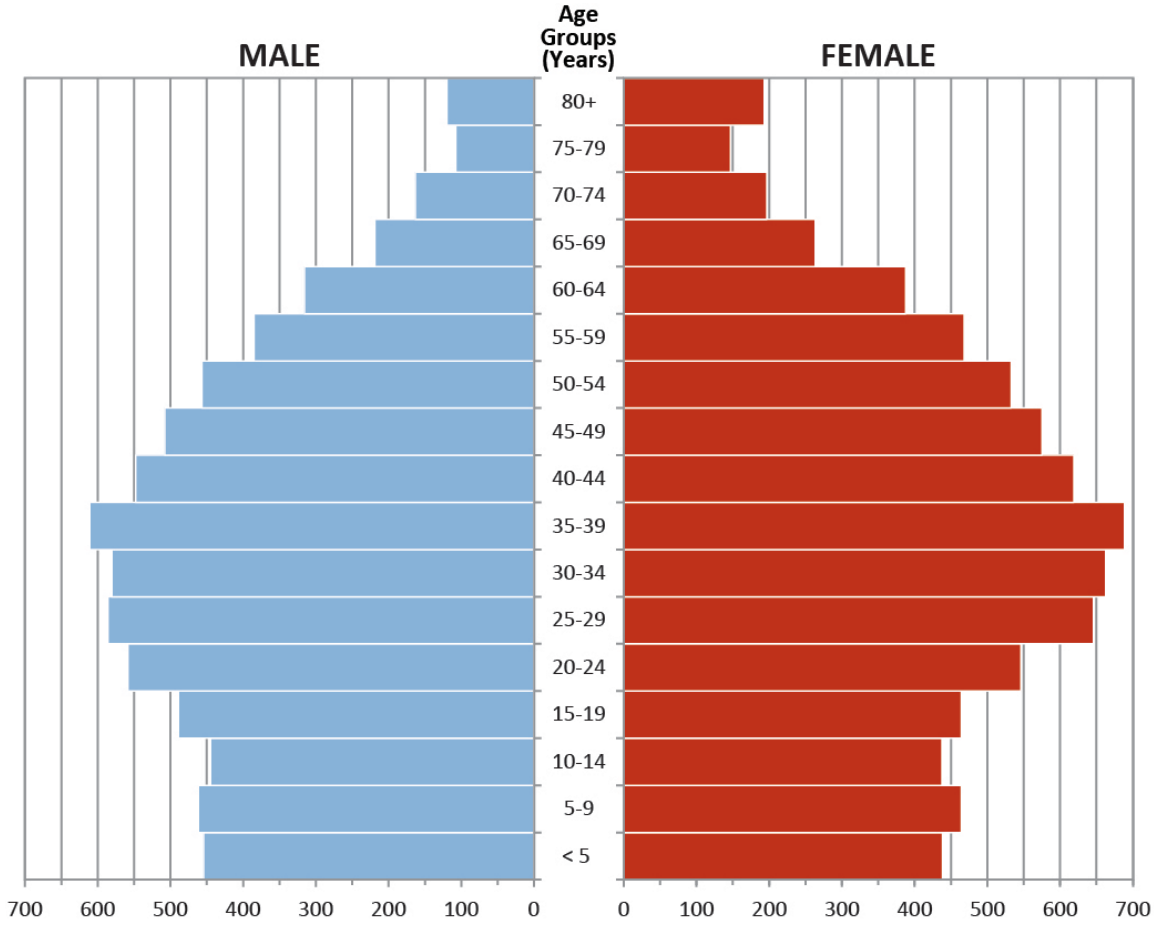
According to the 2010 Census, 308.7 million people reside in the United States, reflecting a 9.7% increase from Census 2000. People who listed Asian as their only race and were not of Hispanic origin made up 4.7% (14,465,124) of the U.S. population. Between 2000 and 2010, numbers of non-Hispanic Asians increased 42.9% (*2*). People who listed Native Hawaiian or Other Pacific Islander as their only race and were not of Hispanic origin made up 0.2% (481,576) of the U.S. population. From 2000 to 2010, numbers of non-Hispanic Native Hawaiians and Other Pacific Islanders increased by 36.2% (*2*). See Appendix for Table A1.

For the remainder of this chapter, non-Hispanic single race Asians or Native Hawaiians and Other Pacific Islanders residing in the United States will be profiled.

### Asians

The term "Asian" is defined by OMB as designating people with origins from the Far East, Southeast Asia, or the Indian subcontinent, including countries such as Cambodia, China, India, Japan, Korea, Malaysia, Pakistan, Philippines, Thailand, Vietnam, or other Asian countries (*2*). The age distribution of Asians who reside in the United States in 2010 is shown in Figure 1. Among the almost 15 million non-Hispanic Asians who resided in the United States in 2010, 48% were male. The median age for males was 30–34 years, compared with 35–39 years for females.

**Figure 1. Age distribution of Asians in the United States, 2010***



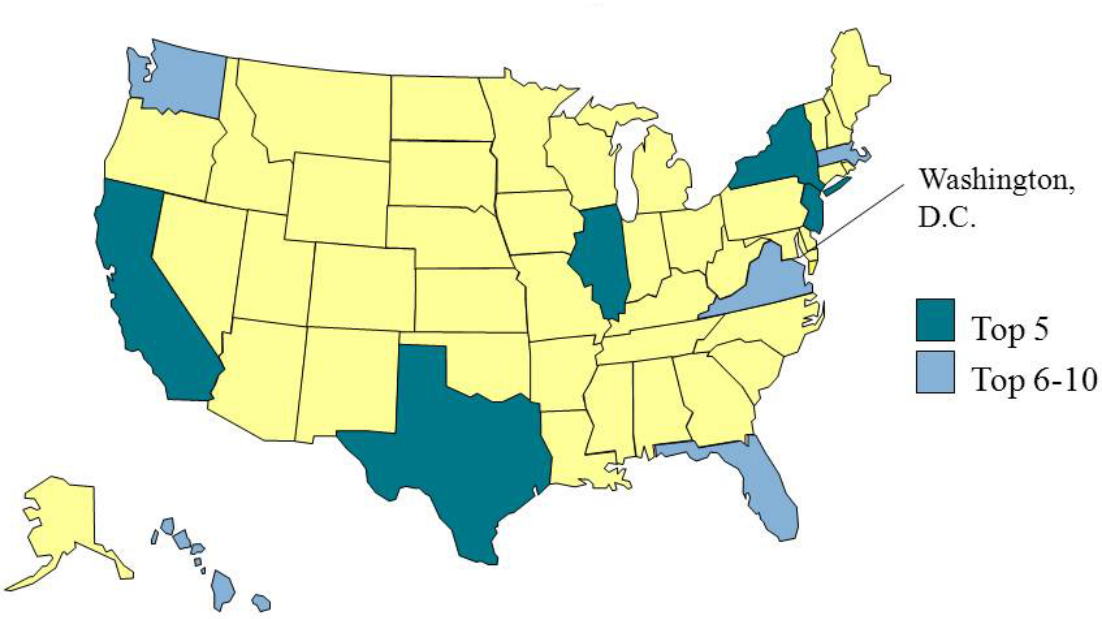

* Based on intercensal estimates.

**Table 1. Percentage distribution of Asians, by sex and age group, 2010***

| | Male | Female |
|---|---|---|
| **Age group, years** | **%** | **%** |
| <5 | 6.5 | 5.7 |
| 5–9 | 6.6 | 6.0 |
| 10–14 | 6.4 | 5.7 |
| 15–19 | 7.0 | 6.0 |
| 20–24 | 8.0 | 7.1 |
| 25–29 | 8.4 | 8.4 |
| 30–34 | 8.3 | 8.6 |
| 35–39 | 8.7 | 8.9 |
| 40–44 | 7.8 | 8.0 |
| 45–49 | 7.3 | 7.4 |
| 50–54 | 6.5 | 6.9 |
| 55–59 | 5.5 | 6.1 |
| 60–64 | 4.5 | 5.0 |
| 65–69 | 3.1 | 3.4 |
| 70–74 | 2.3 | 2.5 |
| 75–79 | 1.5 | 1.9 |
| ≥80 | 1.7 | 2.5 |

* Based on intercensal estimates.

**Figure 2. Distribution of Asians, top 10 states, 2010**



### GEOGRAPHIC DISTRIBUTION OF ASIANS

According to the 2010 Census, the top ten states with the largest populations of Asians are California, New York, Texas, New Jersey, Illinois, Hawaii, Washington, Florida, Virginia, and Massachusetts (see Figure 2).

The 2010 Census showed that the five metropolitan or micropolitan statistical areas[g] with the largest Asian population were the New York-Northern New Jersey-Long Island, New York-New Jersey-Pennsylvania Metro Area (1,860,840); the Los Angeles-Long Beach-Santa Ana, California Metro Area (1,858,148); the San Francisco-Oakland-Fremont, California Metro Area (994,616); the San Jose-Sunnyvale-Santa Clara, California Metro Area (566,764); and the Chicago-Joliet-Naperville, Illinois-Indiana-Wisconsin Metro Area (526,857). See the Appendix for Table A2, which shows the 20 metro/micro areas with the largest Asian populations in the United States.

### OTHER CHARACTERISTICS OF ASIANS

According to the 2009 ACS, 9 million or 63% (9,152,456/14,465,124) of Asians were foreign-born,[h] and accounted for 24% of all foreign-born individuals in the United States. Of foreign-born Asians, approximately 4.2 million (46%) were male and 4.9 million (54%) were female. Using 2007–2009 ACS data, the top countries of birth for foreign-born Asians in the United States were, in descending order, China (including Hong Kong, Macau, Paracel Islands, and Taiwan), Philippines, India, Vietnam, and Korea.

Of 12.7 million Asians ≥5 years of age, 77% spoke a language other than English at home, and of these, over one-third reported that they spoke English "not very well."

Using 2009 inflation-adjusted dollars, median household income was $68,900, and per capita income was $30,000 for Asians. Among Asian families, 9% had incomes below the poverty threshold.[i] In 2009, 17.2% of Asians did not have health insurance (*3*). Seven percent of Asians lived in overcrowded conditions,[j] compared with 3% for the U.S. population. Additionally, 89% of Asians had one or more vehicles available at their home which was comparable to 91% of the U.S. population.

Educational attainment among Asians is shifted toward advanced degrees in comparison with the overall U.S. population, with 50% of Asians ≥25 years of age having at least a bachelor's degree, as do 28% of the general U.S. population. More specifically, 30% of the U.S. resident Asians had a bachelor's degree, and 20% had a graduate or professional degree, compared with 18% and 10%, respectively, for the general U.S. population.

## Native Hawaiians and Other Pacific Islanders

The OMB definition of "Native Hawaiian or Other Pacific Islander" refers to people from Guam, Hawaii, Samoa, or Other Pacific Islands (*2*). The age distribution of Native Hawaiians and Other Pacific Islanders who resided in the United States in 2010 is shown in Figure 3.

Among the almost 500,000 Native Hawaiians and Other Pacific Islanders residing in the United States in 2010, 50% were male. The median age for males and females was 30–34 years (see Figure 3 and Table 2).

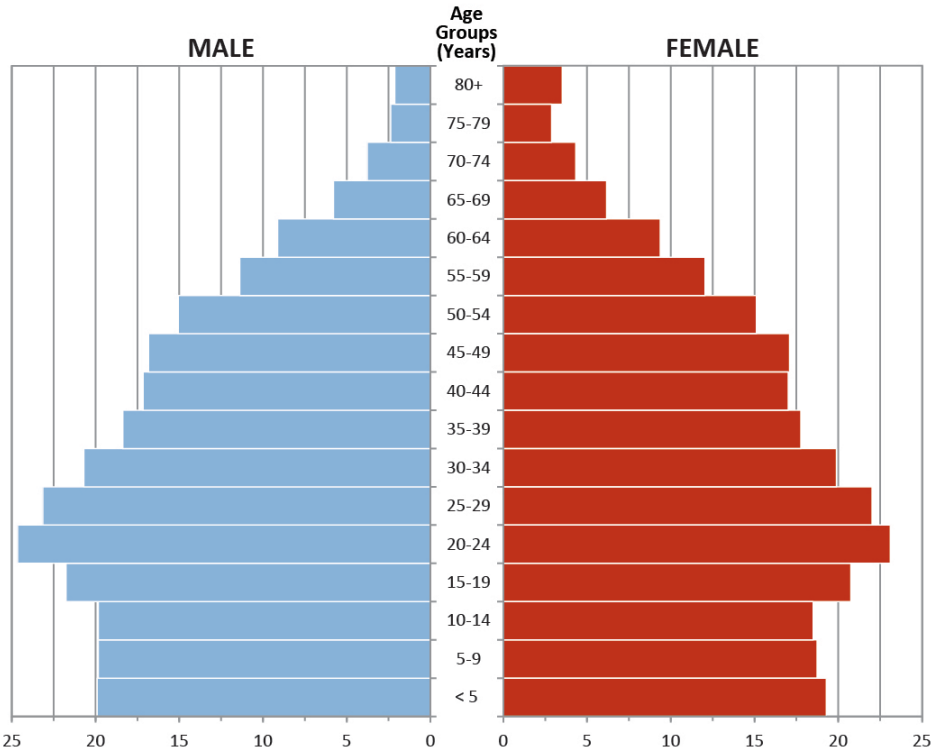
[g] A metropolitan statistical area (Metro Area) contains a core urban area of 50,000 or more population, and a micropolitan statistical area (Micro Area) contains an urban core of at least 10,000 (but less than 50,000) population (http://www.census.gov/population/metro/).

[h] Not a U.S. citizen at birth.

[i] Each year the Office of Management and Budget establishes the poverty threshold for the nation. It is based on the Consumer Price Index and takes into consideration family size and the number of children. The 2009 poverty threshold is based on family size, the number of children, and whether the head of household for 1- or 2-member households is elderly. For more information, see http://www.census.gov/hhes/www/poverty/data/threshld/thresh09.html.

[j] On the basis of the number of household members divided by the number of rooms in the home, >1.0 persons/room is considered overcrowding.

**Figure 3. Age distribution of Native Hawaiians and Other Pacific Islanders in the United States, 2010***



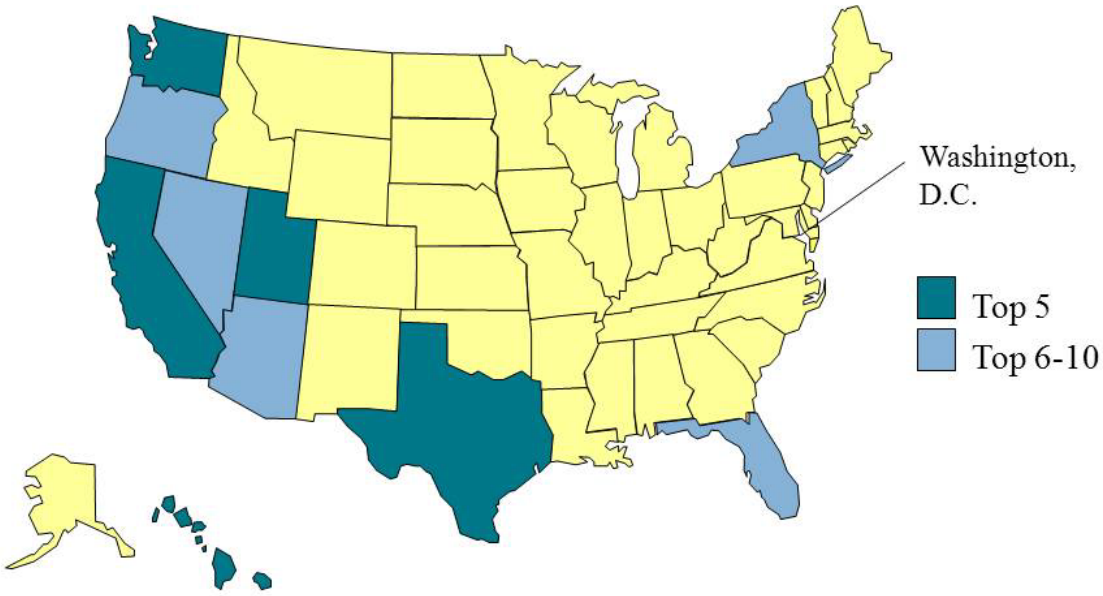

* Based on intercensal estimates.

**Table 2. Distribution of Native Hawaiians and Other Pacific Islanders by sex and age group, 2010***

| | Male | Female |
|---|---|---|
| **Age group, years** | **%** | **%** |
| <5 | 7.9 | 7.8 |
| 5–9 | 7.9 | 7.6 |
| 10–14 | 7.9 | 7.5 |
| 15–19 | 8.6 | 8.4 |
| 20–24 | 9.8 | 9.3 |
| 25–29 | 9.2 | 8.9 |
| 30–34 | 8.2 | 8.0 |
| 35–39 | 7.3 | 7.2 |
| 40–44 | 6.8 | 6.9 |
| 45–49 | 6.7 | 6.9 |
| 50–54 | 6.0 | 6.1 |
| 55–59 | 4.5 | 4.9 |
| 60–64 | 3.6 | 3.8 |
| 65–69 | 2.3 | 2.5 |
| 70–74 | 1.5 | 1.7 |
| 75–79 | 0.9 | 1.2 |
| ≥80 | 0.8 | 1.4 |

* Based on intercensal estimates.

**Figure 4. Distribution of Native Hawaiians and Other Pacific Islanders, top 10 states, 2010**




## Geographic Distribution of Native Hawaiians and Other Pacific Islanders

The top ten states with the largest population of Native Hawaiians and Other Pacific Islanders were California, Hawaii, Washington, Texas, Utah, Nevada, Oregon, Arizona, Florida, and New York (see Figure 4).

The 2010 Census showed that the five metropolitan or micropolitan statistical areas with the largest Native Hawaiian and Other Pacific Islander population were the Honolulu, Hawaii Metro Area (86,235); the Los Angeles-Long Beach-Santa Ana, California Metro Area (30,821); the San Francisco-Oakland-Fremont, California Metro Area (29,761); the Seattle-Tacoma-Bellevue, Washington Metro Area (27,275); and the Hilo, Hawaii Micro Area (20,970). The 20 metro/micro areas with the largest Native Hawaiian and Other Pacific Islander populations are shown in the Appendix in Table A3.

## Other Characteristics of Native Hawaiians and Other Pacific Islanders

Over 90,000[k] or 0.2% of all foreign-born[h] persons in the United States were Native Hawaiians and Other Pacific Islanders, according to the 2009 ACS. Of this total, males slightly outnumbered females, comprising 52% (47,600) of the Native Hawaiian and Other Pacific Islander population in the United States.

Of almost 400,000 Native Hawaiians and Other Pacific Islanders ≥5 years of age, 43% spoke a language other than English at home and of these, just over one-tenth reported they spoke English "not very well."

Using 2009 inflation-adjusted dollars, median household income was approximately $53,500, and per capita income was $20,000 for Native Hawaiians and Other Pacific Islanders, compared with $50,000 and $26,000,

[k] 19% (91,545/481,576) of Native Hawaiians and Other Pacific Islanders were foreign-born.

respectively, for the general U.S. population. Among Native Hawaiian and Other Pacific Islander families, 12% had incomes below the poverty threshold. In 2009, 17.3% of Native Hawaiians and Other Pacific Islanders did not have health insurance (*3*).

Sixteen percent of Native Hawaiians and Other Pacific Islanders lived in overcrowded conditions, compared with 3% for the overall U.S. population. Additionally, 91% of Native Hawaiians and Other Pacific Islanders had one or more vehicles available at their home, which was comparable with the percentage for the overall U.S. population.

Educational attainment among Native Hawaiians and Other Pacific Islanders differed from that for the overall U.S. population. Among Native Hawaiians and Other Pacific Islanders ≥25 years of age, 51% had a high school education or less, and 14% had a bachelor's degree or higher, compared with 43% and 28%, respectively, for the overall U.S. population. More specifically, 14% of Native Hawaiians and Other Pacific Islanders had not completed high school (compared with 15% of the overall U.S. population), 37% (compared with 29% of the overall U.S. population) had a high school diploma or equivalent, 35% (29% U.S.) had some college or an associate's degree, 10% (18% U.S.) had a bachelor's degree, and 4% (10% U.S.) had a graduate or professional degree.

## DISCUSSION

The reader should consider several important issues that impact the interpretation or integration of census versus surveillance data. U.S. Census data, notably those for race, are generally collected by self-report, whereas disease surveillance data are frequently collected from secondary data sources such as medical records. As such, surveillance data may reflect a healthcare provider's interpretation of a patient's race and ethnicity, which may be different from the way in which the patient would self-identify.

The infectious diseases reported in the *Epidemiologic Profile 2010* are usually based on case data defined by a combination of race/ethnicity concepts. For example, the surveillance data reflect Asians and Native Hawaiians and Other Pacific Islanders who are single race and not of Hispanic origin. U.S. Census data provide information about Asians and Native Hawaiians and Other Pacific Islanders who are not of Hispanic origin, as well as for those who are of Hispanic origin. Currently for Asians who reside in the United States, exclusion of those who are of Hispanic origin is a reasonable analytic decision, since only approximately 1% of Asians are of Hispanic origin, but for Native Hawaiians and Other Pacific Islanders approximately 11% are of Hispanic origin (*2*). Additionally, the use of single-race data for Asians and especially for Native Hawaiians and Other Pacific Islanders, which are often used by surveillance for disease reporting, may be an oversimplification of the racial composition of these populations. Among non-Hispanic Asians who reside in the United States, if Asian in combination with any other racial group were included, the population would increase by 14%. And the group designated as Native Hawaiians and Other Pacific Islanders would increase by 53%. For consistency, U.S. Census data reported in this chapter were restricted to those of a single race and of non-Hispanic origin.

Excluding about one-half of Native Hawaiians and Other Pacific Islanders from the description of members of those groups who reside in the United States may negatively alter the reference population the reader is using as a base of comparison. Furthermore, this comparison is exacerbated by the fact that Census data used for Native Hawaiians and Other Pacific Islanders originated from those people who reside in the United States—not in U.S. territories or other dependent areas, many of which are in the Pacific Region.

Asians and Native Hawaiians and Other Pacific Islanders are diverse, heterogeneous groups, and therefore readers should be cautious when drawing inferences about racial subpopulations. New data standards recently adopted by the U.S. Department of Health and Human Services will

help provide more granular information on race in the future, but the stability and reliability of ever-smaller estimates may overcome the intended benefit (*4*). Additionally, the motivated reader could explore racial subgroups by selecting subgroups of interest and using data from the U.S. Census Bureau's American Community Survey, Asian Population: 2010 Brief, and Native Hawaiian and Other Pacific Islander: 2010 Brief (*5*,*6*).

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# CHAPTER 2: TUBERCULOSIS

## OVERVIEW

Tuberculosis (TB) is an infectious disease caused by *Mycobacterium tuberculosis*, although other mycobacteria species (e.g., *M. bovis* and *M. africanum*) also can cause disease. Most commonly, TB is spread when the germs of persons with infectious TB disease are released into the air (e.g., through coughing, sneezing, and talking) and are inhaled by another person. The symptoms of TB disease include lethargy, weight loss, fever, and night sweats.

TB disease can occur anywhere in the body; however, most disease occurs in the lungs. If the disease affects the lungs, other symptoms can include coughing, chest pain, and coughing up blood. Latent TB infection must be distinguished from active TB disease. The term *latent TB infection* is used to describe infection with inactive TB germs. Persons that have latent TB infection have been exposed to the disease and have been infected but have no symptoms. These persons are not infectious, although they are at risk of the eventual development of active disease. In general, persons with active TB (or TB disease) are symptomatic and can transmit the infection to others.

According to the 1999–2000 National Health and Nutrition Examination Survey, a group of health surveys conducted each year among U.S. populations, more than 11 million persons have latent TB infection (*1*). An estimated 5%–10% of persons with latent infection will eventually develop active TB disease. In addition, persons infected with human immunodeficiency virus (HIV), who also have TB disease, are more likely to die without treatment (*2*). In 2009, 547 persons died of TB disease, representing a rate of 0.2 deaths per 100,000 population (*3*).

Most persons with TB disease can be treated with a 6- to 12-month course of multidrug therapy; however, some cases are caused by organisms that are resistant to these medications. Multidrug-resistant TB (MDR TB), as defined by the World Health Organization, is TB that is resistant to at least two of the first-line drugs used to treat the disease (i.e., isoniazid and rifampin) (*4*). MDR TB complicates public health efforts to control disease. Other cases of MDR TB are caused by organisms that are resistant not only to first-line antibiotics, but also to the best second-line drugs—fluoroquinolones and at least one of three injectable drugs. This subtype of MDR TB, known as extensively drug-resistant (XDR) TB, occurs very rarely in the United States (*5*). Less than 6 cases of XDR TB have been reported annually for the years 2003–2009, whereas approximately 100–130 cases of MDR TB were reported each year during the same period (*3*).

## TUBERCULOSIS DATA SOURCES

The Division of TB Elimination at CDC conducts TB surveillance which provides national, state, and local level data that helps to inform prevention and control efforts. Each year, as part of the National Tuberculosis Surveillance System (NTSS), all 50 U.S. states and several other reporting areas (i.e., the District of Columbia, New York City, Puerto Rico, and other U.S.-affiliated areas in the Pacific and Caribbean) routinely report new cases of TB disease to CDC. TB data are then examined by race/ethnicity, age, and sex to determine how various populations are affected by this disease.

Data are also examined for other risk factors known to be associated with TB (e.g., birth in a country with high rates of TB or HIV infection, residence in correctional and long-term care facilities, homelessness, and drug and alcohol abuse). In an effort to more effectively monitor TB caused by drug-resistant strains, CDC also gathers information regarding drug susceptibility testing for culture-confirmed cases.

Race/ethnicity is a risk factor for TB disease, and reporting of race/ethnicity has changed since 1953 when standardized TB reporting first began. In 1985, the NTSS first reported national

counts and rates for Asians and Pacific Islanders as a combined racial group. In 2003, all federal agencies, under the direction of the U.S. Census Bureau, began reporting separate population estimates for persons of Asian descent and for persons of Native Hawaiian and Other Pacific Islander descent (NHPI) (*6*). That year, the Division of TB Elimination began reporting cases by separate non-Hispanic Asian or non-Hispanic NHPI race/ethnicity.

## SNAPSHOT

### Population Trends in Race/Ethnicity

The rate of tuberculosis (new cases per 100,000 population) among Asians or Native Hawaiians and Other Pacific Islanders (API) has always been higher than the rate for whites or that reported for all TB cases. The total number of TB cases reported in the United States in 2000 was 16,309, a rate of 5.8 new cases for every 100,000 population (5.8/100,000) (*3*). In the same year, persons of non-Hispanic API race had a rate of 31.3 per 100,000 population, more than 6 times the overall TB rate and more than 16 times that reported in non-Hispanic whites (1.9/100,000). In the decade since, the case rate for TB in the United States has fallen to 3.6 per 100,000 population, and to 0.9 per 100,000 members of the non-Hispanic white population in 2010.

Following the implementation of the new race/ethnicity reporting standards in 2003, the TB case rate for non-Hispanic Asians was 29.9 per 100,000 population. In 2010, the rate had declined 25% to 22.4 per 100,000 population (see Figure 5). For non-Hispanic NHPI, the 2003 TB case rate was 16.2 per 100,000 population, but had risen 28% to 20.8 per 100,000 population in 2010. This represents a higher rate than that for all other races combined (2.7/100,000) and for non-Hispanic whites (0.9/100,000) in 2010 (see Figure 5). In 2010, Asians represented 28% of all reported TB cases (n=3,143), behind Hispanics (29%, n=3,236), and NHPI represented 1% of all reported TB cases (n=95).

Some reporting areas report more TB cases among persons of Asian or NHPI descent than others. The areas reporting the most TB cases among Asians from 2006 to 2010 are California (n=5,779, 45% of total cases), New York City (n=1,435, 34% of total cases), Texas (n=1,035, 14% of total cases), and New Jersey (n=777, 35% of total cases). States with the highest percentage of Asians among all their TB cases are Hawaii (n=441, 75%), followed by California, New Hampshire (n=29, 39%), and Virginia (n=531, 36%). States reporting the most TB cases among NHPI from 2006 to 2010 are Hawaii (n=105, 18% of total cases), California (n=67, 0.5% of total cases), and Washington (n=55, 4% of total cases).

### U.S. or Foreign Birth

The Centers for Disease Control first collected information on origin of birth (nativity) among persons with TB in 1993, and those born outside the United States have outnumbered U.S.-born persons with TB since 2001. In 1993, 29% of all TB cases affected the foreign-born; in 2010, 60% of all cases were among foreign-born. Among Asians (n=26,493) with reported TB from 2003 to 2010, 95% were foreign-born. Foreign-born, non-Hispanic Asians represent the group with the highest proportion of TB cases among members of all racial/ethnic groups reported in the United States. This proportion remained steady throughout the years, with 94% of all Asian cases affecting foreign-born persons in 2003, and 92% in 2010 (see Figure 6). The top four countries of origin among foreign-born Asians with TB were the Philippines (26%), Vietnam (19%), India (17%), and China (12%).

Contrasted with Asians, the proportion of TB cases among foreign-born NHPI (total cases = 568) from 2003 to 2010 has been much lower, 19%. Most NHPI with TB are U.S.-born (80% are U.S.-born; country of birth is unknown for 1%). The NTSS collects incident TB cases from the U.S.-affiliated Pacific Islands of Guam, Palau, Northern Mariana Islands, American Samoa, Marshall Islands, and the Federated States of Micronesia. The foreign-born cases listed here are reported from the 50 states and

the District of Columbia. The proportion of foreign-born among NHPI ranged from 9% in 2009 to 27% in 2006 (see Figure 7). Among all reported NHPI TB cases, 60% (n=338) were reported as U.S.-born and were from one of the six U.S.-affiliated Pacific Islands. The foreign-born NHPI (n=109) were reported most often from Fiji (n=33, 30%), Tonga (n=20, 19%), and the Philippines (n=14, 13%).

### Sex and Age

Overall, there were consistently more males reported with TB than females for most racial/ethnic groups. From 2003 to 2010, males comprised 55% of all Asians and 50% of all NHPI reported to have TB. The rate among Asian males in 2010 was 26 per 100,000 population (n=1,786), and 19 per 100,000 population (n=1,344) for females. Tuberculosis rates for males under age 15 were lower than those for older Asians (3.8/100,000 for under age 5, 2.9/100,000 for 5–14 years of age), but the rate increased to a high of 76 per 100,000 population among males ≥65 years of age (see Figure 8). Rates were slightly higher for females than for males in the younger age groups (4.2/100,000 for ages 5 and under, 3.8/100,000 for 5–14 years of age) and rose to a high of 34 per 100,000 population for Asian females ≥65 years of age.

From 2003 to 2010, 50% of all NHPI reported to have TB were male. In 2010, the highest rate among NHPI males occurred in the 15–24-year age group (38/100,000), and the next highest rate occurred among children <5 years (21/100,000) (see Figure 9). Among females, similar patterns were seen, with the highest rates among children <5 years of age (44/100,000) and those 15–24 years of age (37/100,000).

### Other Considerations

Beyond race/ethnicity, sex, age, and origin of birth, other factors can disproportionately affect persons with TB. For example, TB occurs more often in persons infected with HIV because HIV weakens the immune system, greatly increasing the likelihood of progression from latent to active TB disease. Other risk factors such as homelessness, living in a long-term care facility or corrections facility, alcoholism and drug abuse can increase someone's likelihood of developing active TB disease. Asians and NHPI with TB typically have lower rates of infection than the national average for persons in all these risk categories. One exception to this is MDR TB. From 2003 to 2010, Asians with TB had nearly twice (1.6%) the percentage of MDR TB as all cases of TB (0.9%) and nearly three times the rates for non-Hispanic whites (0.6%). The rate of MDR TB among NHPI (0.5%) is lower than the national percentage. About 6% of Asians with TB, the vast majority being foreign-born, were reported to have a history of TB disease, as did <5% of all persons reported to have TB disease. In the United States in 2010, among persons with no history of TB disease, 1.2% were diagnosed with MDR TB, whereas 4.9% of persons with a history of TB disease were reported to have MDR TB. This pattern is similar among Asians, in that 7% of persons with a history of TB were reported with current cases of MDR TB (a rate four times higher than that for persons with no history of TB).

## DISCUSSION

The number of tuberculosis cases diagnosed among Asians is declining in the United States. This may be due to the decline in recent years of TB cases among foreign-born persons, particularly since 2008 when the number of cases among the foreign-born began to decline in the United States, along with the overall rate of TB cases per 100,000 in the general population that had been declining for many years. The reasons for this change in trend may reflect better overseas pre-immigration screening procedures for persons relocating to the United States or the fact that fewer foreign-born persons are relocating to the United States in a time of economic recession (*7,8*). Because U.S.-resident Asians with TB are predominately foreign-born, this seems a likely explanation for their reduction in rate and numbers in the United States. However, in 2010, Asians still have the second highest rate of TB among all racial/ethnic groups, second only to Hispanics. Certain minority populations continue to be disproportionately affected by TB. Asians are

also more likely to have MDR TB than members of other racial/ethnic groups. Certain factors are associated with this pattern, such as having had previous treatment with anti-TB medications and being foreign-born. Persons who have been treated in the past for TB are more likely to develop MDR TB. According to the World Health Organization, 15% of previously treated patients have MDR TB, which is five times higher than the global average of 3% in new patients diagnosed with TB (9). Asians with TB emigrate from areas of the world where TB is prevalent and, therefore, are more likely to have a history of TB treatment.

Recent trends in TB rates among NHPI are difficult to assess. Persons of NHPI descent with TB are small in number compared with members of all other racial/ethnic groups. Fewer than 100 cases are diagnosed in the United States every year. For example, in 2010, 95 cases of TB were diagnosed in the United States.

Tuberculosis incidence is disproportionately higher in minority racial/ethnic groups in the United States. Ongoing surveillance and improved TB control and prevention activities, especially among disproportionately affected populations, are needed to eliminate TB in the United States.

**Note**: In all the figures that accompany this chapter, all races are non-Hispanic. Starting in 2003, persons reported race as Asian only or Native Hawaiian and Other Pacific Islander only. Prior to 2003, these persons were reported as one category as a combined Asian or Native Hawaiian and Other Pacific Islander, API.

**Figure 5. Tuberculosis incidence by race/ethnicity, United States, 2003–2010**

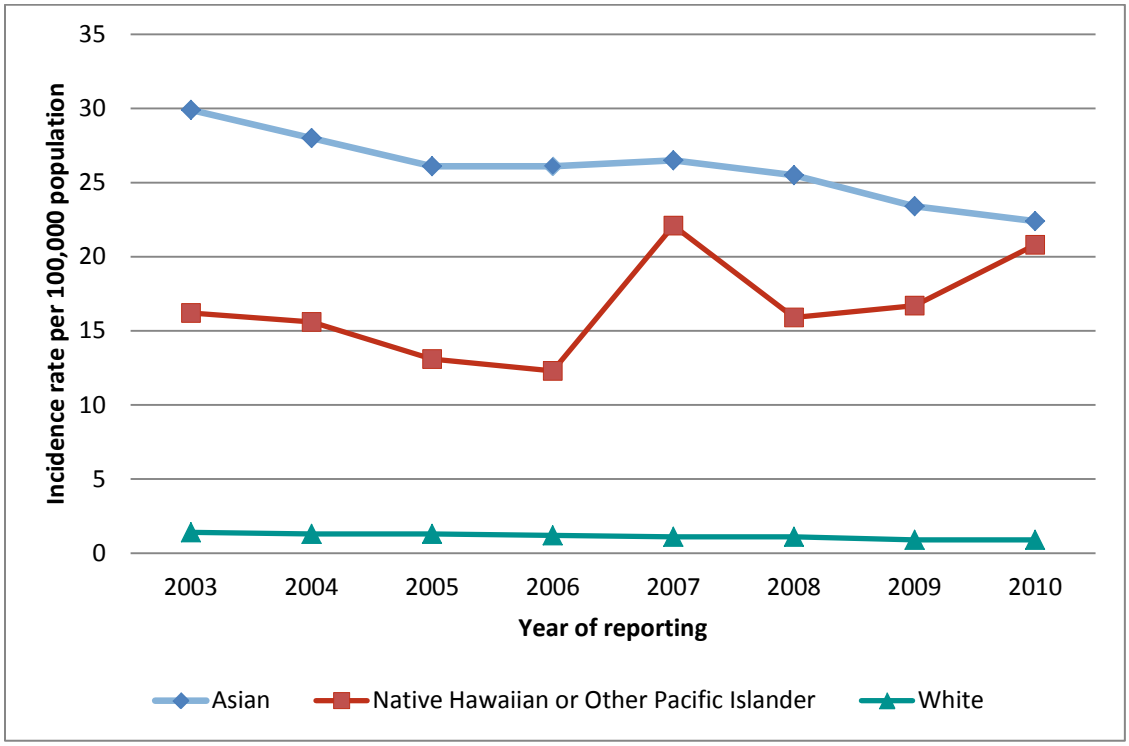


**Figure 6. Tuberculosis cases among Asians by nativity, United States, 2003–2010**

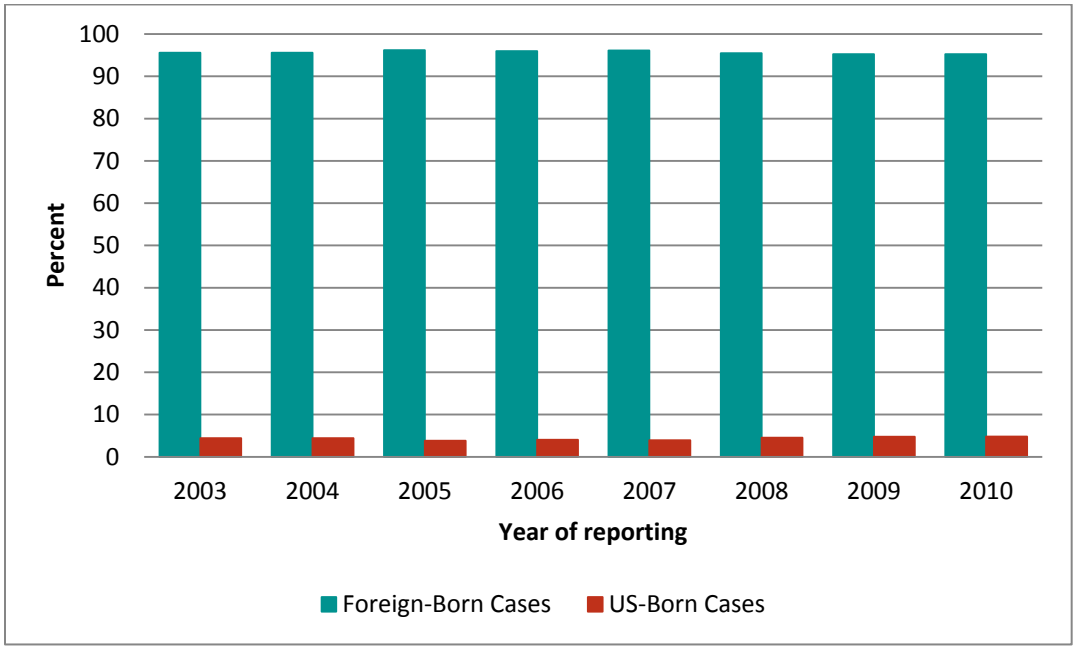



**Figure 7. Tuberculosis cases among Native Hawaiians and Other Pacific Islanders, by nativity, United States, 2003–2010**

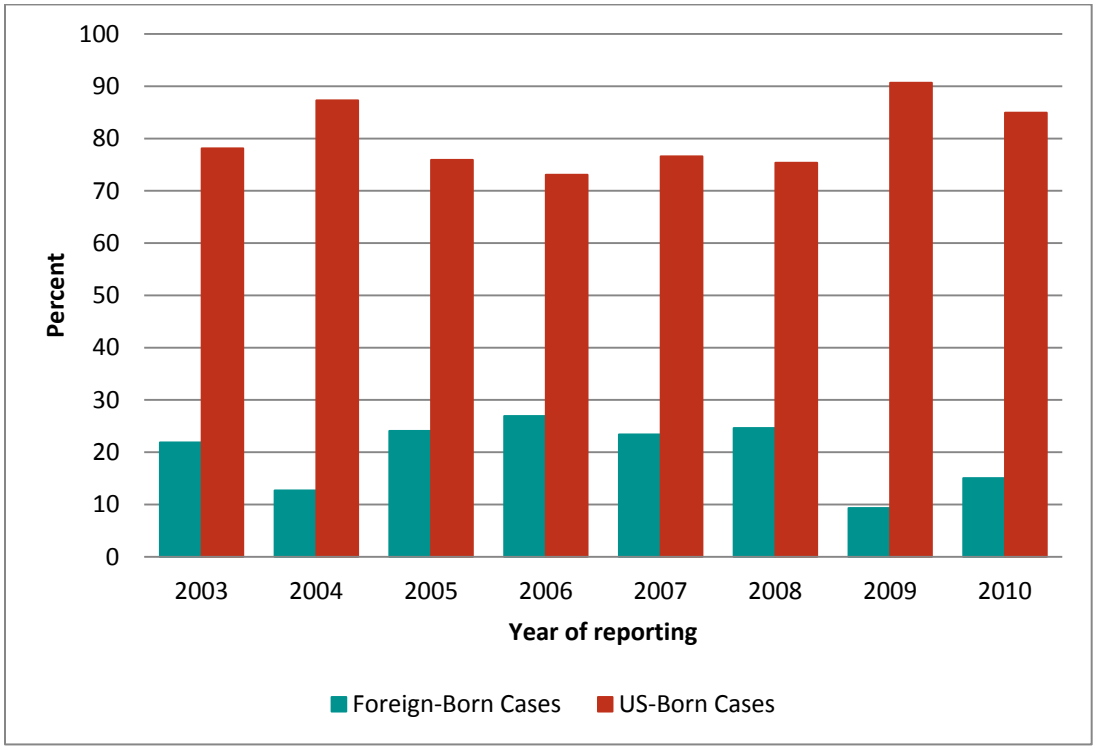


**Figure 8. Tuberculosis case rates and counts, by age group and sex, Asians, 2010**

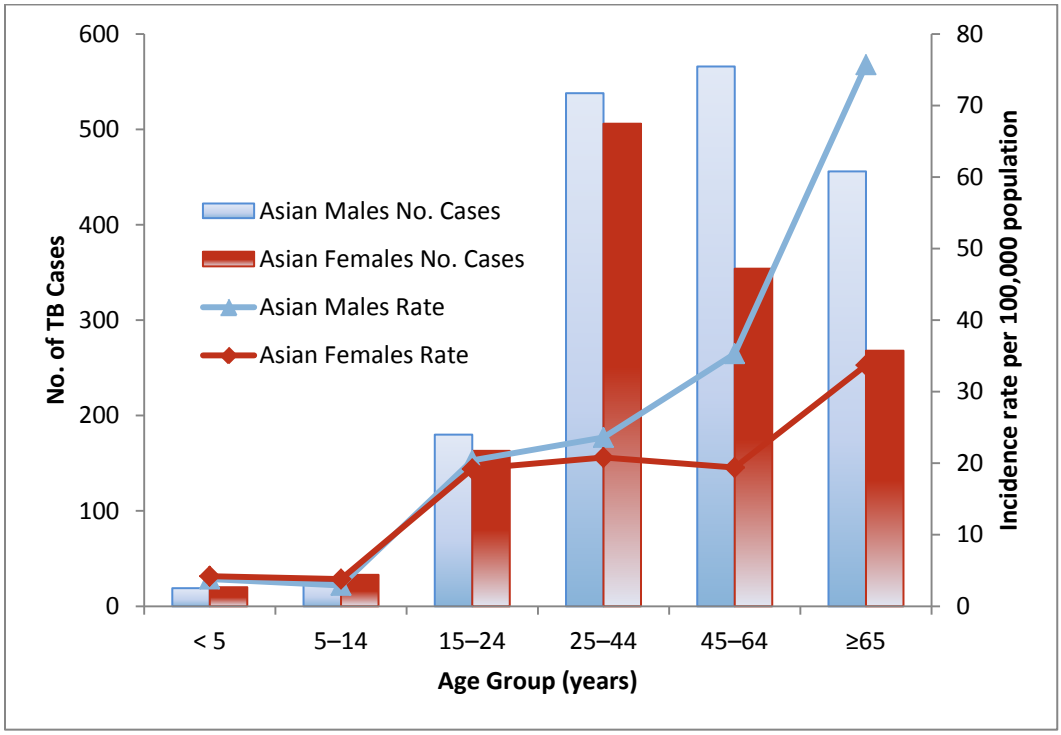
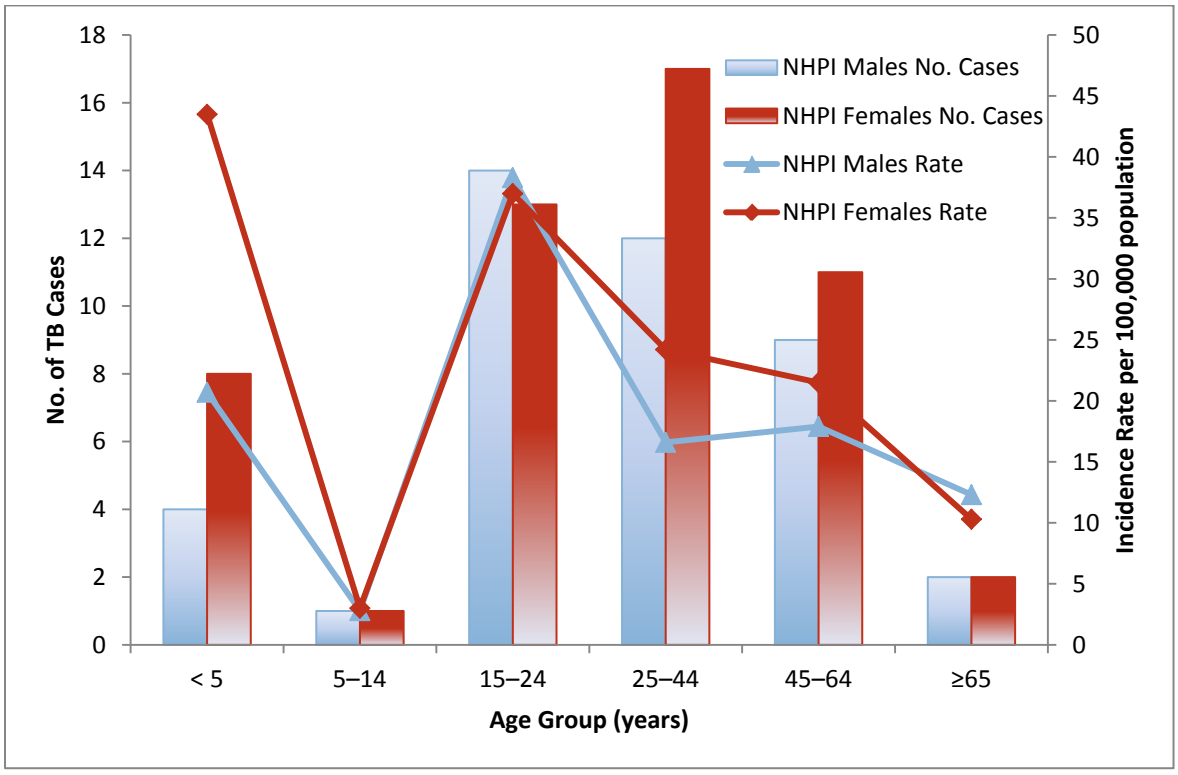



**Figure 9. Tuberculosis case rates and counts, by age group and sex, Native Hawaiians and Other Pacific Islanders, 2010**



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# CHAPTER 3: VIRAL HEPATITIS

## INTRODUCTION

Viral hepatitis is a term used collectively to refer to a group of viruses that can cause inflammation of the liver. Although a number of hepatitis viruses have been discovered, the most common types, which are also currently under surveillance in the United States, are hepatitis A, B, and C. Infection with any of these viruses can result in an acute infection that can cause short-term illness. However, infection with the hepatitis B and C viruses can develop into chronic infection that is associated with an increased risk of developing cirrhosis or liver cancer (*1*). While the risk of progressing to chronic hepatitis B virus infection is inversely related to the age at the time of initial infection and is diagnosed among about 10% of the adult U.S. population (*2*), 80% of adults who become infected with the hepatitis C virus will develop chronic infection (*3*).

Rates of new infection with acute hepatitis A, B, or C virus are at an all-time low primarily as a result of successful and effective prevention strategies (*1*). Historically, however, Asians or Native Hawaiians and Pacific Islanders (APIs) have been disproportionately affected by hepatitis B. These populations carry the highest burden of chronic infection. The morbidity and mortality burden associated with chronic hepatitis B and C continues to represent a substantial public health problem in the United States. During 2001–2006, the incidence of hepatocellular carcinoma, a type of liver cancer resulting from years of infection with viral hepatitis, was highest among APIs when compared with blacks, American Indians and Alaska Natives, and whites (*4*). A Markov simulation model predicted direct medical costs from 2010 to 2019 of about $10.7 billion from hepatitis C alone (*5*).

Chronic hepatitis B and C infections affect millions of Americans. However, due to the asymptomatic nature of the disease, many people do not realize they are infected until they develop liver-related complications many years after becoming infected (*6*). In 2010, the Assistant Secretary for Health for the U.S. Department of Health and Human Services, Dr. Howard Koh, dubbed the number of growing cases of chronic hepatitis B and C virus infections "the silent epidemic" because of the lack of awareness among the general public, at-risk populations, policymakers, and healthcare providers (*7*).

## VIRAL HEPATITIS DATA SOURCES

### National Surveillance of Acute Viral Hepatitis

The Division of Viral Hepatitis at CDC receives reports weekly of cases of acute and chronic viral hepatitis from the 50 state health departments and the District of Columbia health department—and occasionally from the territorial health departments—through the National Notifiable Diseases Surveillance System (NNDSS). The case reports include basic information, such as age, race/ethnicity, sex, date of onset, date of report, and county of residence. Patients of API descent are reported under one combined race category. Case reports include clinical data, laboratory results, and exposure history as optional extended data elements. Rates of acute, symptomatic viral hepatitis reported through this system are included in this report (see Figure 10 and Table 3) and are calculated using the U.S. Census Bureau population estimates.

### Study of Testing Practices and Infection Prevalence within U.S. Healthcare Organizations

Investigators from the Chronic Hepatitis Cohort Study (CHeCS) collected clinical and demographic information from medical and billing records of over 1.2 million persons enrolled at four integrated healthcare networks in the United States (Honolulu, Hawaii; Portland, Oregon; Detroit, Michigan; Danville,

Pennsylvania). Adults with one or more visits during 2006–2008 and 12 months or more of continuous follow-up during any period of enrollment before 2009 were included in the study. A total of 867,589 persons were included in the analysis. Of these, 7% (60,255) were Asian and 3% (28,531) were Native Hawaiian and Other Pacific Islander (NHPI). The categories of ever being tested for infection with the hepatitis B and C viruses and ever testing positive for these viruses were ascertained (*8*).

## Enhanced Viral Hepatitis Surveillance Sites

CDC currently funds ten sites for viral hepatitis surveillance through the Emerging Infections Program, a network involving CDC, state and local health departments, and academic institutions. The ten sites are funded to conduct enhanced population-based surveillance for acute hepatitis A and acute and/or chronic hepatitis B and C in the United States (*9*). During 2005–2007, the Emerging Infections Program included six sites that conducted surveillance and follow-up of acute hepatitis A, B, and C in a population of 29.8 million persons. The results from the study describing the number and rate of acute, symptomatic hepatitis among APIs during 2005–2007 (*10*) are included in this report (see Table 4).

## National Mortality Data

Death certificates from each state and the District of Columbia are compiled by CDC's National Center for Health Statistics to produce annual, national mortality data. Demographic information—such as age at death, race/ethnicity, and sex—and cause of death information, including viral hepatitis, are included in mortality data (*11*). The results from death certificate studies characterizing place of birth among hepatitis B decedents during 2000–2004 (*12*) and trends in hepatitis C mortality rates during 1995–2004 (*13*) are included in this report. Decedents born outside of the 50 states and the District of Columbia were considered foreign-born.

## Estimated Births to Hepatitis B Virus-Infected Mothers

Birth certificate data from 22 states in 2006 and hepatitis B virus infection prevalence estimates were used to estimate the number of births to women infected with the hepatitis B virus (*14*). U.S.- and Canadian-born women were categorized as non-foreign born. Women who were born elsewhere were considered foreign-born and were divided into global regions based on country of birth. The medical literature was consulted to obtain U.S.-derived prevalence estimates of hepatitis B virus infection for non-foreign-born mothers while regional seroprevalence estimates were obtained for foreign-born mothers (*15–17*). These prevalence estimates were used to calculate the number of estimated births to non-foreign-born and foreign-born hepatitis B virus-infected mothers.

In this chapter, cases of acute viral hepatitis among Asians and Native Hawaiians and Other Pacific Islanders reported through national surveillance are combined under a single race category, Asians or Native Hawaiians and Other Pacific Islanders (API), and Hispanic ethnicity is not examined separately from API race. For the CHeCS study, Hispanic ethnicity of Asians and Native Hawaiians and Other Pacific Islanders is not examined separately from race. All other special studies from which data are cited use mutually exclusive race/ethnicity categorization profiling non-Hispanic, Asians and Native Hawaiians and Other Pacific Islanders.

# HEPATITIS A

## About Hepatitis A

The hepatitis A virus is transmitted from direct contact with the stool or blood of an infected person or consumption of food or water that has been contaminated with fecal matter of an infected person. Symptoms such as jaundice, dark urine, and nausea are common (*10,18*). For U.S. residents, international travel to a hepatitis A-endemic country, household contact with a person with hepatitis A, injection drug use, being a man who has sex with other men, and international adoption of a child infected with

hepatitis A are all commonly reported risks factors for contracting the virus (*18*). Because hepatitis A only exists in an acute form, serious complications, such as death from infection, are rare. However, certain populations, such as the elderly and persons with chronic liver disease, are more likely to die if infected (*19*,*20*).

Since 1995, safe and effective vaccines have been licensed in the United States to prevent hepatitis A. The Advisory Committee on Immunization Practices recommends that children 12–23 months of age, persons traveling to countries where hepatitis A is endemic, men who have sex with men, illicit drug users, persons with chronic liver disease, and persons with occupational risks for infection receive hepatitis A vaccination (*19*). Additionally, post-exposure prophylaxis, with immunoglobulin, is available for persons who were recently exposed to hepatitis A and is over 85% effective in preventing infection if given within two weeks of exposure (*21*).

### Snapshot

During 2000–2009, the incidence of acute, symptomatic hepatitis A among APIs in the United States decreased from 2.1 cases per 100,000 population in 2000 to 1.0 cases per 100,000 population in 2009 (absolute rate change, 1.1 cases/100,000), although a slight increase was observed from 2007 to 2008 (see Figure 10). In 2009, acute, symptomatic hepatitis A among APIs identified by CDC's National Notifiable Diseases Surveillance System accounted for a total of 150 (7.5%) cases (see Table 3) (*1*).

Of the 1,156 cases of acute, symptomatic hepatitis A reported by six U.S. sites conducting enhanced hepatitis surveillance from 2005 to 2007, 79 were among APIs (see Table 4). The total incidence rate among APIs was 1.7 cases per 100,000 population, almost three times higher than blacks and two times higher than whites. In New York City, all of the 56 cases of hepatitis A occurred among Asians and yielded an incidence rate of 2.0 cases per 100,000 population.

### Sex and Age

In 2009, males made up 55% of acute, symptomatic hepatitis A infections occurring among APIs in the United States (see Table 3). The incidence rate per 100,000 population was highest among males when compared with females and among the younger age groups when compared with the older age groups. Persons 20–29 years of age had the highest incidence rate of 2.0 cases per 100,000 population.

## HEPATITIS B

### About Hepatitis B

The hepatitis B virus is transmitted through exposure of mucous membranes to blood or body fluids containing the virus. Modes of transmission include sexual contact and sharing needles or personal hygiene items such as toothbrushes or razors with a person infected with the hepatitis B virus (*22*). Perinatal transmission, which plays a critical role in sustaining a high prevalence of disease, occurs when an infected mother passes on the virus to her infant during the birthing process. Chronic infection develops for up to 90% of persons infected as infants compared with 25%–30% of persons who acquire their infection between 1–5 years of age and about 10% of persons infected at >5 years of age (*2*,*23*). In many developing regions of the world such as Southeast Asia, infection acquired in infancy or early childhood contributes greatly to the overall burden of chronic hepatitis B virus infection in those regions.

From 2007 to 2008, CDC estimated that there were approximately 25,000 births each year to women in the United States who were chronically infected with the hepatitis B virus. Of these, an estimated three-fourths were among women of API descent (*24*). However, infection at birth often can be prevented if the infant receives appropriate post-exposure prophylaxes, which are the hepatitis B immune globulin and the first dose of the hepatitis B vaccine, administered within 12 hours after birth (*22*).

In the United States, trends in the rate of acute hepatitis B have declined over time, largely in part due to recommendations of the Advisory Committee on Immunization Practices implemented in 1991 for a comprehensive national strategy to prevent the spread of hepatitis B virus infection (*25*,*26*). The strategy recommends routine testing of all pregnant women for hepatitis B virus infection, universal hepatitis B vaccination of infants beginning at birth, catch-up vaccination of previously unvaccinated children and adolescents, and vaccination and testing of adults who are at an increased risk for contracting hepatitis B virus infection. Adult populations at risk for acquiring hepatitis B include injection drug users, men who have sex with other men, healthcare workers, dialysis patients, household and sexual contacts of persons with hepatitis B, recipients of certain blood products, and persons with recent multiple sex partners (*26*). Despite public health efforts, hepatitis B vaccination coverage is low among U.S. adults who are at risk for acquiring infection. Results from the 2009 National Health Interview Survey indicated that only 51% of high-risk adults 18–49 years of age had received more than one dose of the hepatitis B vaccine. These data also showed that the age group 18–20 years had the highest vaccination coverage, and that coverage declined with increasing age among both high-risk and low-risk adults (*27*).

## Snapshot

During 2000–2009, the incidence of acute, symptomatic hepatitis B among APIs in the United States fell dramatically from 3.7 cases/100,000 population in 2000 to 0.7 cases/100,000 population in 2009 (absolute rate change, 3.1 cases/100,000) (see Figure 10). In 2009, the total number of reported cases among APIs identified by CDC's National Notifiable Diseases Surveillance System reached an all-time low of 98 (2.9%) cases (see Table 3) (*1*).

In the CHeCS study from 2006 to 2008, approximately 27% of Asians and 26% of NHPIs who had no prior documented infection with hepatitis B virus when they entered a health plan were later tested for infection (see Appendix for Tables A4 and A5). Since persons included in this study were limited to adults and most hepatitis B virus infections among APIs occur during birth or early childhood, the vast majority of APIs who tested positive for the hepatitis B virus were chronically infected. The proportion of healthcare-plan members who tested positive for hepatitis B virus infection ranged from 0.6% among whites to 4.2% among Asians (*8*). Infection prevalence was highest among the following groups: Asians (4.2%), NHPIs (2.5%), age group 50–59 years (1.9%), age group 40–49 years (1.7%), and blacks (1.2%). Investigators calculated the expected number of hepatitis B virus infections among health-plan members who participated in the study on the basis of race-adjusted national estimates of the prevalence of chronic hepatitis B virus infections for 1999–2006 (*28*). The number of hepatitis B virus infections that had been diagnosed among health-plan members was more than 25% lower than expected, suggesting that over a quarter of infected persons might not have been identified in the calculations, including APIs.

## Sex

In 2009, males made up 60% of acute, symptomatic hepatitis B infections occurring among APIs in the United States (see Table 3). The incidence per 100,000 population was 1.6 times higher for males than for females (0.8 vs. 0.5).

During 2006–2008, Asians in the CHeCS study were comprised of more females than males (59% vs. 41%) (see Appendix for Table A4). Of the Asian females who had been tested for the hepatitis B virus, 4.0% had at least one positive test. Of the Asian males who had been tested, 4.6% had at least one positive test.

Among NHPIs in the CHeCS study, there were more females than males (55% vs. 45%). Of the NHPI females who had been tested for the hepatitis B virus, 2.2% had at least one positive test. Of the NHPI males who had been tested,

3.0% had at least one positive test (see Appendix for Table A5).

### Age

In 2009, the incidence rate of acute, symptomatic hepatitis B among APIs was lowest among persons in the youngest age group, 0–19 years of age, an age group that is recommended for vaccination at birth or during early childhood (rate, 0.2 cases/100,000) (see Table 3). The highest incidence occurred among young adults and persons ≥80 years of age with rates of about 1 case per 100,000 population.

During 2006–2008, age groups among Asians in the CHeCS study <70 years of age were fairly evenly distributed (14.0%–18.8%) (see Appendix for Table A4). Asians 40–49 years of age and 50–59 years of age who had been tested for the hepatitis B virus tested positive for infection most frequently (5.0% and 5.8%, respectively) compared to other age groups; Asians ≥80 years of age tested positive less often than any other age group (2.2%).

The proportion of NHPIs <30 years of age in the CHeCS study was 26%, which was greater than any other age group (see Appendix for Table A5). NHPIs 40–49 years of age and ≥80 years of age most often had at least one positive test (3.5% and 3.4%, respectively), while NHPIs 70–79 years of age had the lowest proportion of positive tests (0.6%).

### Median Household Income

Nearly 80% of Asian patients in the CHeCS study had a median household income between $30,000 and $74,999, according to census tract geocode data (see Appendix for Table A4). Overall, testing did not vary substantially by income bracket. Approximately 3.8%–4.5% of Asians in each income bracket who were tested for hepatitis B virus infection tested positive.

Similarly, about 82% of NHPIs in the CHeCS study had a median household income between $30,000 and $74,999 (see Appendix for Table A5). Approximately 1.2%–2.8% of NHPIs in each income bracket who had tested for hepatitis B virus infection tested positive.

### Mortality

From 2000 to 2004, the hepatitis B-related mortality rate per 100,000 population was about three times higher among foreign-born persons than among U.S.-born persons (1.0 vs. 0.3 per 100,000 population, respectively) (see Figure 11a). In APIs alone, average mortality rates were almost four times higher in APIs not born in the Unites States than APIs born in the United States (2.9 vs. 0.8 per 100,000 population, respectively) (see Figure 11b). During 1990–2004, average hepatitis B-related mortality rates per 100,000 population were highest among APIs compared to other racial/ethnic groups (*12*). In 2004, rates per 100,000 population were 8.5 times higher among APIs than among whites (2.0 vs. 0.2 per 100,000 population, respectively).

### Estimated Births to Infected Mothers

Foreign-born mothers represented about one-quarter of all registered births in 22 states in 2006 (*14*). Of the foreign-born mothers, 80.6% were infected with hepatitis B. Women born in regions highly endemic with hepatitis B accounted for 69.3% of all estimated hepatitis B virus-infected mothers. When stratified by region of birth, the highest proportion of foreign-born mothers with infection was from Southeast Asia (31.2%). Women born in the Pacific Islands accounted for 1% of foreign-born mothers with infection. Of the mothers born in the United States and Canada, regardless of hepatitis B virus infection status, API mothers accounted for 1.5%. However, of the U.S.- and Canadian-born mothers who were infected with hepatitis B, APIs accounted for 11.6% (*14*).

## HEPATITIS C

### About Hepatitis C

Hepatitis C virus infection, previously identified as non-A non-B viral hepatitis until 1995, is the most common infection spread through contaminated blood in the United States. An

estimated 3.2 million persons, representing 1.3% of the U.S. population, are chronically infected with the hepatitis C virus (*29*). Chronic hepatitis C virus infection is a major cause of liver disease (*18*). In addition, long-term infection with the virus is the main factor leading to liver transplantation. The major mode of transmission in the United States is injection drug use. Although there is no vaccine available for protection against the virus, the 1998 national recommendations for the prevention and control of hepatitis C provide guidelines for a) preventing transmission; b) identifying, counseling, and screening persons at risk; and c) providing proper medical evaluation and management of infected persons (*30*). About 20% of persons who become infected with the hepatitis C virus will spontaneously clear the virus (*3*).

## Snapshot

The incidence of acute, symptomatic hepatitis C among APIs in the United States from 2000 to 2009 is lower than the rates of acute, symptomatic hepatitis A and B among APIs for the same period. During 2000–2009, API-specific rates have varied and ranged from a high of 0.1 cases per 100,000 population in 2000 to less than 0.1 cases per 100,000 population in 2005 and 2007 (see Figure 10). In 2009, there were only 5 (0.6%) cases of acute, symptomatic hepatitis C among APIs identified by CDC's National Notifiable Diseases Surveillance System (see Table 3) (*1*).

In the CHeCS testing study during 2006–2008, approximately 15% of Asians and 14% of NHPIs did not have prior documented infection with hepatitis C virus at health plan entry and were later tested for infection (see Appendix for Tables A6 and A7). Asians were less likely than other racial/ethnic groups to test positive for hepatitis C virus infection (*8*).

Due to the small number of total API cases reported to the National Notifiable Diseases Surveillance System, API-specific rates for acute, symptomatic hepatitis C stratified by sex and age group could not be reported.

## Sex

During 2006–2008, 4.0% of Asian females in the CHeCS study who had been tested for hepatitis C had at least one positive test (see Appendix for Table A6). Asian males tested positive as frequently (4.8%) as their female counterparts.

Of the NHPI females who had been tested for the hepatitis C virus, 3.5% had at least one positive test. Of the NHPI males who had been tested, 5.4% had at least one positive test (see Appendix for Table A7).

## Age

During 2006–2008, Asians in the CHeCS study 50–59 years of age who were tested for hepatitis C virus infection tested positive most frequently (7.2%) compared to other age groups; Asians 30–39 years of age tested positive less often than any other age group (2.3%) (see Appendix for Table A6).

In the CHeCS study, NHPIs 40–49, 50–59, and 60–69 years of age tested positive most often (5.1%, 7.0%, and 6.5%, respectively) than other age groups (see Appendix for Table A7).

## Median Household Income

Like most participants in the CHeCS study, about 78% of Asians had a median household income (by census tract data) between $30,000 and $74,999 (see Appendix for Table A6). The proportion testing positive within each income bracket was highest among those with a median household income of $\geq$ $30,000, ranging from 4.7% among those earning $30,000–$49,999 to 4.0% among those earning $\geq$ $75,000 annually.

Approximately 82% of NHPIs in the CHeCS study had a median household income between $30,000 and $74,999 (see Appendix for Table A7). Of about 14%–15% of NHPIs belonging to each income bracket who were tested for hepatitis C virus infection, approximately 3.7%–5.7% tested positive.

## Mortality

In 2004, APIs had the lowest age-adjusted hepatitis C-related mortality rate per 100,000 population (rate, 1.9; 95% CI, 1.6–2.1) when compared with rates for other race/ethnic groups (*13*). From 1995 to 2004, there was a 24.9% total percent increase in the age-adjusted mortality rate among APIs and an average annual rate change of 0.05 deaths per 100,000 population per year (*13*).

## DISCUSSION

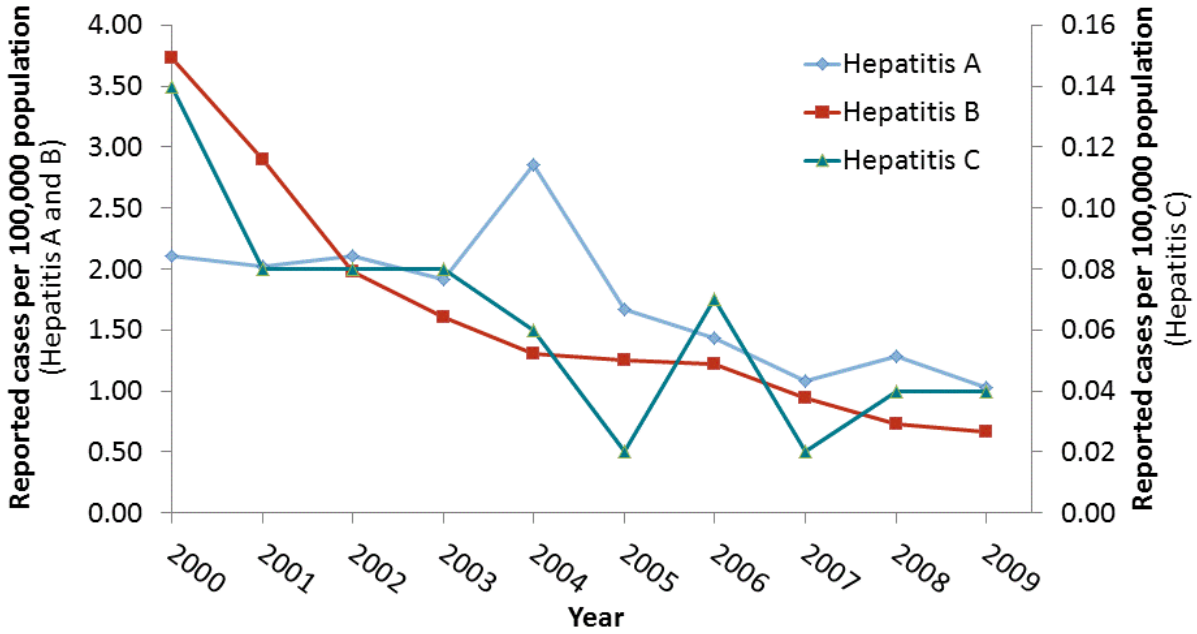
APIs residing in the United States are not disproportionately affected by acute hepatitis A, B, and C or chronic hepatitis C. Based on data from the National Notifiable Diseases Surveillance System, the 2000–2009 incidence rates of acute, symptomatic hepatitis A, B, and C among APIs have been on a downward trend. In 2009, APIs represented 7.5%, 2.9%, and 0.6% of acute, symptomatic hepatitis A, B, and C cases, respectively. In the CHeCS study, Asian health-plan members were less likely than other race/ethnic groups to have ever been infected with the hepatitis C virus.

Despite low and declining incidence rates, the data presented here highlight the substantial burden of disease and mortality attributable to chronic hepatitis B virus infection among APIs in the United States. Asians in the CHeCS study had the highest infection prevalence when compared with other race/ethnic groups in the health plans. Results from population-based surveys indicated that there were about 730,000 adults living with chronic hepatitis B from 1999 to 2006 in the United States, of whom 43% were foreign-born (*31*). Regions of the world, such as Southeast Asia, are considered highly endemic for hepatitis B. Infant and early childhood infections play a crucial role in sustaining a high prevalence in the region (*22*). Immigration from hepatitis B-endemic areas into the United States contributes to the growing U.S. burden of chronic hepatitis B. Hepatitis B-associated mortality is highest among APIs and the foreign-born.

Surveillance data from the National Notifiable Diseases Surveillance System are subject to limitations. First, because APIs are combined under a single race category on the case report form, assessment of disease occurrence within each race group is not possible. Second, only data on acute cases are validated and published. However, supplementing these data with other sources, such as the Emerging Infections Program, CHeCS, and the National Vital Statistics System, provides valuable information regarding the burden of viral hepatitis morbidity and mortality among APIs.

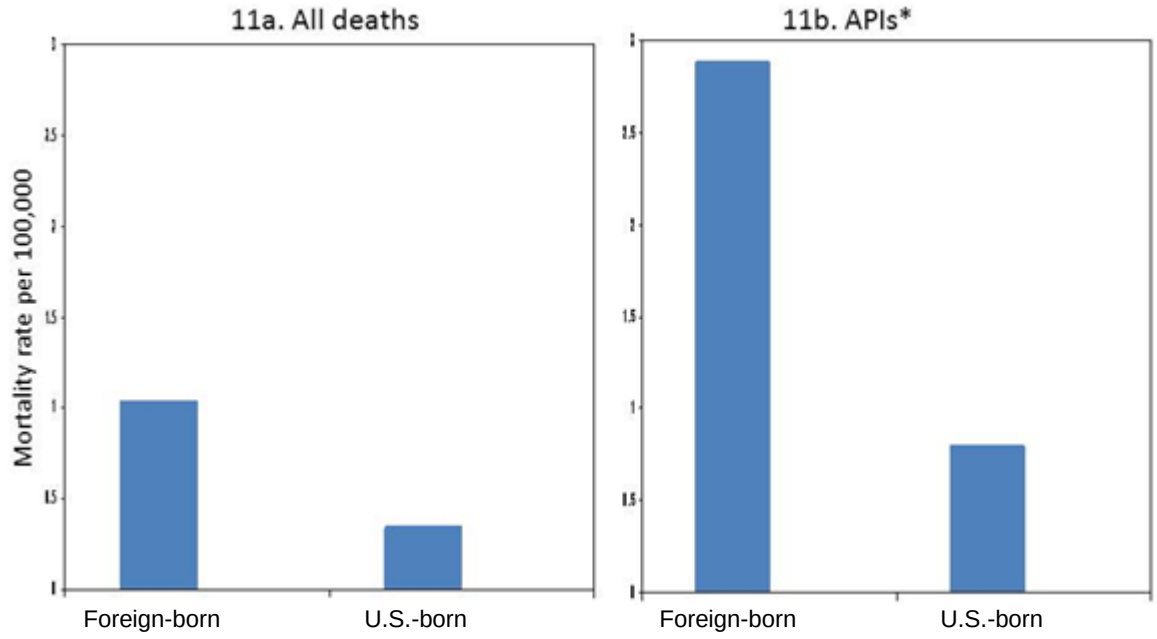
This report highlights the substantial burden of chronic hepatitis B virus infection among APIs, many of whom are unaware of their infection status. Given the data presented here, improved viral hepatitis surveillance, culturally appropriate public health campaigns, increased and wider testing and vaccination of persons at high risk, and linkage of infected persons to good quality care and treatment are needed in order to see measurable declines during this epidemic (*32*).

**Figure 10. Incidence of acute, symptomatic hepatitis A, B, and C among Asians or Native Hawaiians and Other Pacific Islanders (APIs), United States, 2000–2009**




Source: National Notifiable Diseases Surveillance System.

**Figures 11a and 11b. Average age-adjusted hepatitis B mortality rates by place of birth, United States, 2000–2004**




* Asians or Native Hawaiians and Other Pacific Islanders.

Source: Vogt TM, Wise ME, Shih H, Williams IT. Hepatitis B mortality in the United States, 1990–2004 [Abstract]. In: Final Program and Abstracts of the 45th Annual Meeting of the Infectious Diseases Society of America; San Diego, CA. October 4–7, 2007; Arlington, VA: Infectious Diseases Society of America; 2007. Abstract 731. https://idsa.confex.com/idsa/2007/webprogram/Paper23644.html. Accessed July 19, 2012.

**Table 3. Number of cases and incidence of acute, symptomatic hepatitis A, B, and C, by sex and age group among Asians or Native Hawaiians and Other Pacific Islanders, United States, 2009**

| | Hepatitis A | | Hepatitis B | | Hepatitis C* | |
|---|---|---|---|---|---|---|
| **Demographic characteristics** | **Number** | **Rate†** | **Number** | **Rate†** | **Number** | **Rate†** |
| **Overall** | 150 | 1.0 | 98 | 0.7 | 5 | <0.1 |
| **Sex§** | | | | | | |
| Male | 82 | 1.2 | 59 | 0.8 | — | — |
| Female | 67 | 0.9 | 38 | 0.5 | — | — |
| **Age group (years)¶** | | | | | | |
| 0–19 | 34 | 0.9 | 8 | 0.2 | — | — |
| 20–29 | 42 | 2.0 | 19 | 0.9 | — | — |
| 30–39 | 45 | 1.7 | 25 | 1.0 | — | — |
| 40–49 | 11 | 0.5 | 24 | 1.1 | — | — |
| 50–59 | 10 | 0.6 | 9 | 0.5 | — | — |
| 60–69 | 3 | 0.3 | 6 | 0.6 | — | — |
| 70–79 | 3 | 0.5 | 2 | 0.3 | — | — |
| 80+ | 1 | 0.3 | 4 | 1.2 | — | — |

* Data could not be produced due to the small number of cases.

† Rates are per 100,000 population.

§ One case of hepatitis A and one case of hepatitis B are not represented in sex category due to missing data.

¶ One case of hepatitis A and one case of hepatitis B are not represented in age group category due to missing data.

Source: National Notifiable Diseases Surveillance System

**Table 4. Number of cases and incidence of acute, symptomatic cases of hepatitis A, by race/ethnicity and reporting site,* United States, 2005–2007**

| Variable | Colorado | | Connecticut | | Minnesota | | New York State | | New York City | | Oregon | | Row Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | No. | Rate† | No. | Rate† | No. | Rate† | No. | Rate† | No. | Rate† | No. | Rate† | No. | Rate† |
| Cases reported | 120 | 0.8 | 121 | 1.2 | 155 | 1.0 | 86 | 0.7 | 566 | 2.3 | 108 | 1.0 | **1,156** | 1.3 |
| **Race/ethnicity** | | | | | | | | | | | | | | |
| American Indian/Alaska Native | 0 | 0.0 | 2 | 8.2 | 4 | 2.4 | 0 | 0.0 | 0 | 0.0 | 1 | 0.8 | **7** | 1.3 |
| **Asian/NHPI§** | **5** | **1.4** | **7** | **2.0** | **3** | **0.6** | **7** | **3.2** | **56** | **2.0** | **1** | **0.2** | **79** | **1.7** |
| Black | 1 | 0.2 | 4 | 0.4 | 7 | 1.1 | 4 | 0.4 | 40 | 0.7 | 0 | 0.0 | **56** | 0.6 |
| White | 76 | 0.7 | 62 | 0.8 | 91 | 0.7 | 66 | 0.6 | 114 | 1.3 | 79 | 0.9 | **488** | 0.8 |
| Hispanic | 31 | 1.1 | 39 | 3.3 | 28 | 4.7 | 8 | 1.8 | 219 | 3.2 | 20 | 1.8 | **345** | 2.7 |
| Multiple/other | 0 | 0.0 | 1 | 0.8 | 0 | 0.0 | 1 | 0.7 | 66 | 22.6 | 0 | 0.0 | **68** | 5.6 |
| Missing | 7 | — | 6 | — | 22 | — | 0 | — | 71 | — | 7 | — | **113** | — |

* Emerging Infections Program Hepatitis Surveillance Sites, 2005–2007.

† Rates are per 100,000 population.

§ Native Hawaiian and Other Pacific Islander.

Source: Klevens RM, Miller JT, Iqbal K, et al. The evolving epidemiology of hepatitis A in the United States. *Arch Intern Med* 2010;170(20):1811–1818. http://archinte.jamanetwork.com/article.aspx?articleid=226193. Accessed July 19, 2012.

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# CHAPTER 4: SEXUALLY TRANSMITTED DISEASES

## INTRODUCTION

Sexually transmitted diseases (STDs) are among the most common infectious diseases in the United States and are important causes of disease burden. Sexually transmitted diseases present enormous health and economic consequences. The Centers for Disease Control and Prevention (CDC) estimate that 19 million new cases of sexually transmitted infections occur annually in the United States, with nearly half occurring in persons 15–24 years of age (*1*). Direct medical costs associated with STDs in the United States are estimated at $15 billion annually (*2*). It is estimated that reported cases of STDs represent a fraction of the STD infections in the United States, likely reflecting limited screening and low disease reporting. Many sexually transmitted infections can be asymptomatic, causing no recognizable symptoms and hence go undiagnosed.

The spectrum of health consequences from STDs ranges from mild acute illness to serious long-term complications. Women and infants bear a disproportionate burden of STD-associated complications. Women are less likely to have noticeable symptoms and are likely to experience long-term consequences—such as tubal factor infertility, ectopic pregnancy, and chronic pelvic pain—if their STDs are not diagnosed and treated. STDs can also result in adverse outcomes in pregnancy, including spontaneous abortion, still birth, premature birth, and congenital infection. Sexually transmitted infections enhance the sexual transmission and acquisition of HIV infection (*3*). Improvement in the diagnosis, treatment, and management of STDs helps prevent disease sequelae and is an important component in a comprehensive HIV prevention strategy. This chapter will focus on three of the most commonly reported STDs: chlamydia, gonorrhea and primary and secondary (P&S) syphilis.

## SEXUALLY TRANSMITTED DISEASE DATA SOURCES

### National Surveillance of Chlamydia, Gonorrhea, and Syphilis

The Division of Sexually Transmitted Disease Prevention at CDC has been monitoring the prevalence of gonorrhea and syphilis since the early 1940s and began monitoring chlamydia in the mid-1980s. Currently, chlamydia, gonorrhea, and syphilis infections are reported from all 50 states, the District of Columbia, and U.S. dependent areas, including Guam, Puerto Rico, and the U.S. Virgin Islands. Nationally notifiable STD surveillance data are reported to CDC through the National Electronic Telecommunications System for Surveillance (NETSS). Most of the STD-related morbidity data are reported electronically, but a few areas—such as Guam and Puerto Rico—continue to report STD data through summary hard-copy forms. Reported cases of STD infections reflect the number of infections and not the number of people with STDs, since one person may account for more than one infection during a given reporting period.

In 2007 the Office of Management and Budget (OMB) released final guidance for the collection of data on race and ethnicity that allowed for a) individuals to self-identify their ethnicity, b) individuals to select one or more racial or ethnic categories and c) the expansion of reporting options to seven categories (American Indian or Alaska Native, Asian, black or African American, Hispanic, Native Hawaiian or Other Pacific Islander, white, and multi-race). Following a revision in the NETSS implementation guide in April 2008, jurisdictions reporting STD data were to collect race using these newly expanded racial/ethnic groups that included Asian and Native Hawaiian and Other Pacific Islander (NHPI). For purposes of data reporting, a combined race/ethnicity categorization has been used by STD

surveillance in which Hispanic/Latino may describe any racial group, and each of the five standard racial groups can include persons who are reported as being of a single race. Although many jurisdictions report STD data using this format, some jurisdictions have not had the capacity to adopt these new standards. Hence, for uniformity, race categories for the STD morbidity data and the 2000 U.S. Census Bureau data are bridged to the five race/ethnicity groups specified in the 1977 OMB standards, with Asian and NHPI reported as a single combined race group of Asian or NHPI (API). The counts presented in this report are summations of all valid data reported in reporting years 2000–2010, and hence reflect rates based on reported data only.

### STD Surveillance Network (SSuN)

In 2005, CDC established the STD Surveillance Network (SSuN) to improve the capacity of national, state, and local STD programs to detect, monitor, and respond rapidly to trends in STDs through enhanced collection, reporting, analysis, visualization, and interpretation of disease information. Currently, SSuN is composed of 12 collaborating sites in 11 states, which together encompass 115 counties and 42 STD clinics. There are two main activities within SSuN, a population-based component and a clinic-based component. The population-based surveillance activity includes extensive data collection on demographics, risk and sexual behaviors, and treatment on a random sample of patients with reported gonorrhea within the site's jurisdiction. The second activity involves the collection of demographic, behavioral, clinical, and laboratory information from all patients attending 42 STD clinics within the 12 jurisdictions.

### Gonococcal Isolate Surveillance Project (GISP)

GISP is a CDC-sponsored, sentinel surveillance system that monitors antimicrobial susceptibilities in *Neisseria gonorrhoeae* through ongoing testing of male urethral gonococcal isolates from a systematic sample of men at 25–30 STD clinics in the United States. The gonococcal isolates are tested against a range of antimicrobials to determine susceptibility to therapeutically important antimicrobial agents, and the results are linked to patients' epidemiologic data.

### Infertility Prevention Project (IPP)

IPP is a national program funded by CDC in collaboration with the Office of Population Affairs to prevent chlamydia infections and associated reproductive complications in women, as well as to monitor test positivity in participating clinics. IPP participating sites are located across the United States and include family planning clinics, STD clinics, community health centers, adolescent teen clinics, outreach settings, and youth detention facilities. Screening criteria and practices vary by clinic, but the majority of sites screen all females under 26 years of age and females ≥26 years of age with defined risk factors.

## CHLAMYDIA

### About Chlamydia

*Chlamydia trachomatis* infection is the most commonly reported condition in the United States, with more than 1.3 million infections reported in 2010 (*4*). Age is the strongest predictor of infection, with adolescent girls and young adult men recording the highest rates. Based on estimates from national surveys conducted during 1999–2008, chlamydia prevalence is 6.8% among sexually active females 14–19 years of age (*5*). Due to the high burden of disease and the lack of symptoms in most infected persons, CDC recommends annual chlamydia screening for all sexually active women 25 years of age or younger, and for women older than 25 years of age with specific risk factors such as a new sex partner or multiple sex partners (*6*). Chlamydia screening is one of the most cost-effective yet underused prevention services available (*7*). Although no formal national recommendations exist for screening young men for chlamydia, their roles in transmitting initial and recurrent infections to

women are important; a 2006 CDC consultation emphasized the importance of screening men in certain venues, such as STD clinics and corrections facilities (*8*).

*C. trachomatis* causes important diseases in men, women, and infants. The primary anatomic sites of infection in women are the uterine cervix and urethra and for men it is the urethra. Rectal infections, acquired through receptive anal intercourse, are also common, particularly among men who have sex with men (MSM). Chlamydia presents the greatest health threat in women, primarily through infection that ascends from the cervix to involve the uterus and fallopian tubes, resulting in pelvic inflammatory disease (PID) (*9*). Both clinically diagnosed PID and subclinical upper genital tract infection can result in tubal scarring, which increases the risk for infertility, ectopic pregnancy, and chronic pelvic pain. Chlamydial infection can lead to adverse health consequences for infants born to infected mothers, including conjunctivitis and pneumonia. Exposed infants can also develop symptomatic infections of the oropharynx, genital tract, and rectum. The occurrence of neonatal chlamydia represents a failure of prevention, since all pregnant women prior to delivery should be tested and treated if infected. Chlamydia, like other STDs, may increase risk for HIV acquisition and transmission (*10*).

## Snapshot

Chlamydia case rates among APIs have traditionally been lower than the rates for members of other race/ethnic groups. In 2010, the total number of reported chlamydia cases among APIs was 17,188, which accounted for approximately 2% of all reported chlamydia cases. During 2000–2010, chlamydia case rates among APIs increased from 99.5 cases per 100,000 population to 134.1 cases per 100,000 (see Figure 12). Although national chlamydia case report data suggests a continued increase in case reports in APIs and in all other race/ethnic groups, it is likely due to improvements in reporting, expanded use of increasingly sensitive test technology, and better screening of young, sexually active women ≤25 years of age.

### Sex and Age

Since 2000, chlamydia case rates among API females and males have been gradually increasing. Comparing chlamydia rates in 2010 to 2000, female morbidity has increased 26.3% and male morbidity increased 68.5%. Similar to other race/ethnicities, API females continue to have approximately three times the rate of infection of that for API males. Reported chlamydia rates for women greatly exceed those for men largely because screening programs have been primarily directed at women. In 2010, the highest rates of chlamydia among APIs are among females 15–19 years of age (661.3 per 100,000) and 20–24 years of age (994.6 per 100,000), and for males 20–24 years of age (275.0 per 100,000) and 25–29 years of age (170.6 per 100,000) (see Figure 13).

### Trends among Women 15–24 Years of Age who Attend IPP Clinics

Data from prevalence monitoring activities indicates modest increases in chlamydia test positivity across all race/ethnic groups over the past ten years (see Figure 14). Non-Hispanic black females have consistently had the highest test positivity across all race/ethnic groups. Among API women, the median positivity is 6.5% (range: 6.0–7.9%), higher than among white women (median positivity of 4.8%, range: 3.6–5.5%) and Hispanic women (median positivity is 6.1%, range: 5.6–7.5%). Beginning in 2007, the majority of IPP sites were collecting information consistent with the revisions to the OMB directive for the collection of race and ethnicity. Examining IPP data from 2007 through 2010 reveals consistently higher chlamydia positivity rates among NHPI women than among Asian women. This highlights the importance of exploring potential differences in risk factors that might explain these differences in rates. Approximately 17% of tests per year in IPP have missing race/ethnicity so interpretation of the data may be difficult. Additionally, trends may be influenced by changes in diagnostic test

technology (e.g., expanded use of more sensitive laboratory tests) and screening coverage.

## GONORRHEA

### About Gonorrhea

*N. gonorrhoeae* infection is the second most commonly reported condition in the United States behind chlamydia. In 2010, there were 309,341 reports of gonorrhea cases, for an incidence of 100.8 per 100,000 population (*4*). From the mid-1970s to the mid-1990s, the rate of reported gonorrhea cases in the United States declined 74% following implementation of a national gonorrhea control program. Between 1996 and 2006, rates stabilized and between 2006 and 2010, gonorrhea rates decreased by 15.8%. Despite these apparent decreases, rates of infection remain high among certain subgroups, including adolescents, young adults, African American men and women, and gay and bisexual men. It is important to keep in mind that changes in screening practices, reporting practices, and use of diagnostic tests with different levels of sensitivity and specificity may influence the number of case reports of infection.

Men with *N. gonorrhoeae* infection often experience symptoms. Urethritis is the most common genitourinary manifestation in men and occasionally can be complicated by epididymitis. For women, gonococcal infections can cause cervicitis and/or urethritis, which may or may not be accompanied by clinical signs and symptoms. Gonorrhea remains a major cause of pelvic inflammatory disease and subsequent tubal-factor infertility and ectopic pregnancy among women (*9,11*). Because gonococcal infections among women are frequently asymptomatic, the U.S. Preventive Services Task Force recommends that clinicians screen all sexually active women, including those who are pregnant, for gonorrhea if they are at an increased risk. In addition, for both men and women exposed orally or anally, gonococcal infection can cause pharyngitis or proctitis, which is often asymptomatic. Especially among gay men and other MSM, these extragenital sites can be a reservoir for transmitting infection. Additionally, studies have suggested that gonorrhea can facilitate HIV acquisition and transmission (*3,12*).

Effective treatment of gonorrhea has been complicated by the ability of *N. gonorrhoeae* to develop resistance to antimicrobial agents. Emergence of gonococcal resistance to penicillin and tetracycline occurred during the 1970s and became widespread during the early 1980s. In the mid to late 1990s, resistance to fluoroquinolones was documented first in Asia, then emerged in the United States in Hawaii followed by other western states. CDC now recommends dual therapy for gonorrhea with a cephalosporin plus azithromycin or doxycycline. Recent increases in minimal inhibitory concentrations (MICs) to oral cephalosporins have been observed in the United States and are concerning as the emergence of resistance to cephalosporins would substantially limit treatment options for gonorrhea.

### Snapshot

In 2010, there were 2,314 reported cases of gonorrhea among APIs in the United States, resulting in a case rate of 18.1 per 100,000 population (see Figure 15). Comparing the single-year rates, gonorrhea case rates among APIs in 2010 have decreased by 23.9% since 2000 (23.8% versus 18.1%). Similar to chlamydia case rates, gonorrhea case rates among APIs have consistently been lower than all other race/ethnic groups. In 2010, the total number of reported gonorrhea cases among APIs accounted for approximately 1% of all reported gonorrhea cases. For comparative purposes, the rate for the black population in 2010 (512.2 per 100,000) was 28 times the rate for the API population.

#### Sex and Age

Unlike the gender distribution of reported chlamydia cases, gonorrhea is more evenly distributed among API males and females. For 2010, the rate for males was 20.1 cases per 100,000, whereas that for females was 16.1 cases per 100,000. However, when stratified by

age group, API females exceeded males, with infection rates for API females 5.5 times higher than those for males in the 10–14-year age group, and 2.3 times than those for males in the 20–24-year age group. Similar female to male ratios in these age groups are also seen among all race/ethnic groups. During 2000–2010, gonorrhea case rates decreased by approximately 25% among API males and females. A comparison of age groups indicates that the case rate of gonorrhea in 2010 is highest for the 20–24-year age group, followed by the rate for the 15–19-year age group. Differences by age groups are similar for both males and females.

## Gonorrhea among API MSM in STD Surveillance Network (SSuN)

With the exception of reported syphilis cases, most nationally notifiable STD surveillance data do not include information on sexual behavior. However, using SSuN's population component, we are able to access more complete information on sex of sex partners (complete for 92% of male GC patients interviewed in SSuN, compared with 6% of male GC patients reported through NETSS in 2010). In weighted analysis from the GC patients interviewed, we were able to develop national estimates for 2010 that indicate that Asians represent 1% of all GC cases in SSuN jurisdictions. However, MSM account for nearly 70% of the gonorrhea cases among API males, suggesting that MSM are at the highest risk for gonorrhea in this population.

Enhanced surveillance collected in STD clinic patients in whom sexual orientation data are more complete can also be used to supplement case report data. Figure 16 presents gonorrhea positivity by sex and sex of partner among API patients attending SSuN STD clinics in 2010. Only those SSuN sites that had >5 API MSM attending STD clinics were included. The median site-specific gonorrhea prevalence was 11.7% (range by SSuN site: 7.5%–20.0%) among API MSM compared to 2.3% (range: 0–2.9%) among API men who have sex with women only (MSW) and 1.1% (range: 0–2.9%) for API women.

## Gonorrhea Resistance in Gonococcal Isolate Surveillance Project (GISP)

Approximately 64,000 isolates were tested during 2000–2010.The percentage of gonorrhea isolates with fluoroquinolone-resistant *N. gonorrhoeae* (QRNG) by race/ethnic group in the United States during 2000–2010 is shown in Figure 17. Shortly after the emergence of QRNG in the United States, the prevalence of QRNG increased rapidly among gonococcal isolates in API and whites as compared to blacks. In 2000, 15.7 percent of isolates among API were QRNG compared to 0.6% in whites and 0.1% in blacks. Although the proportion of QRNG among API decreased in 2002 to 4.4%, the proportion of QRNG gonococcal isolates among API increased to 25.7% in 2010, demonstrating a nearly 6-fold increase. Among whites, the percentage of isolates with QRNG increased steadily to 26.5% in 2010. A similar, although less dramatic, increase was seen among blacks from 2000 to 2010 (0.1% to 7.4%).

The increase in QRNG led CDC, in 2007, to discontinue recommending any fluoroquinolone regimens for the treatment of gonorrhea. Third-generation cephalosporins are now considered one of the classes of antibiotics that are well-studied and effective against *N. gonorrhoeae* infections in the United States (*19*). Dual therapy with a cephalosporin (ceftriaxone is preferred) and either azithromycin or doxycycline is recommended by CDC for treatment of gonorrhea in adults (*20*). Recent GISP data has documented an increasing trend of gonococcal isolates in the United States with elevated cefixime MICs (≥0.25 µg/mL) from 0.2% in 2000 to 1.4% in 2010 and the percentage of isolates with elevated ceftriaxone MICs (≥0.125 µg/mL) has increased from 0.1% to 0.3% during 2000–2010. Although proportionally few isolates have exhibited elevated MICs for these antimicrobials, interesting observations are noted when stratified by race/ethnicity (see Figure 18). For example, the prevalence of isolates exhibiting decreased susceptibility to ceftriaxone (MIC ≥0.125 µg /mL) is considerably higher among API, 1.1% compared to 0.6% of whites and

0.2% blacks. Prevalence of isolates with elevated cefixime MICs (≥0.25 µg/mL) and azithromycin MICs (≥2.0 µg/mL) are higher among whites (4.2% and 1.5%) and APIs (3.2% and 1.1%, respectively) as compared to blacks (0.4% and 0.1%). This epidemiologic pattern of increasing percentages of GC isolates with elevated cephalosporin and azithromycin MICs is particularly concerning since it is similar to the pattern seen with GC and fluoroquinolone susceptibility shortly before fluoroquinolone-resistant GC strains emerged over a decade ago.

# SYPHILIS

## About Syphilis

Syphilis is a sexually transmitted disease caused by *Treponema pallidum* that, if untreated, has a long and complicated clinical course. Syphilis progresses through defined stages and can last for decades but is treatable with penicillin. Patients with the earliest symptomatic stages of syphilis (primary and secondary, or P&S, syphilis) are most likely to present for examination and subsequent treatment, with symptoms that include genital ulcers or a rash. Patients with P&S syphilis can transmit the disease sexually. P&S syphilis is followed by a long asymptomatic latent stage, followed by a late stage that may include serious complications such as cardiac or neurological manifestations. Latent syphilis cases are generally found through screening or partner notification, since the patient does not have any symptoms. Pregnant women with syphilis can transmit the infection to their child, which can cause miscarriage, stillbirth, and other serious consequences such as deafness, blindness, mental retardation, and neonatal death. In addition to the significant sequelae of syphilis infection, syphilis has been estimated to increase HIV transmission 2–9-fold and HIV acquisition 2–4-fold (*13*,*14*).

## Snapshot

In 2010, the total number of reported P&S syphilis cases (201) among APIs accounted for less than 2% of all reported P&S syphilis cases.

Although the total number of P&S syphilis cases for APIs was relatively low (compared to other races or ethnicities), case rates increased steadily during 2000–2009 (0.3/100,000 population to 1.7/100,000) before decreasing slightly in 2010 (1.6/100,000). The largest increase in case rates, 75%, was seen from 2001 to 2002 (0.4/100,000 compared with 0.7/100,000). Despite these apparent increases, the overall rate among APIs was the lowest among all races/ethnicities.

### Sex and Age

Surveillance data reveal that the overall increase in P&S syphilis rates among API from 2000 to 2010 largely reflects an increase in rates reported among males (see Figure 19). The P&S syphilis rates among API males steadily increased from a low of 0.6 per 100,000 population in 2000 to 3.1 per 1000,000 in 2010. The P&S syphilis rates among females have remained relatively stable since 2000. In 2000, the P&S syphilis rate in men was 3.6 times the rate in women; by 2010, the P&S syphilis rate in men increased to 15 times the rate in women. P&S infections are disproportionately found in males among other race/ethnic groups as well, an indication that syphilis transmission among MSM is a factor.

Unlike chlamydia and gonorrhea, syphilis is not predominant in a particular age group. In 2010, the P&S syphilis rates among API peaked in the 20–24-year-old age group for both genders (see Figure 20). After the peak, the P&S syphilis rates among females continue to decline with age, while among males rates peak for a second time in the 30–34-year-old age group. The higher rates among 20–24-year-old males is a trend that first became apparent in 2007.

### Sex and Sex of Partners

Beginning in the early 2000s, increasing cases of P&S syphilis were noted primarily among MSM. This increase represented a shift from the previous epidemiology of P&S syphilis during the 1990s, when syphilis primarily occurred among heterosexual men and women. In part because of this shift, CDC began collecting data on the sex of sex partners of reported P&S

syphilis cases in 2005. The percentage of cases of P&S syphilis among API during 2007–2010 by sex and sex of sex partner is shown in Figure 21. These data come from 31 states that reported sex of sex partner data for 70% or more of male cases of P&S syphilis for each of the years, accounting for 89% of male P&S syphilis in the United States in 2010. The percentage of cases was highest among API MSM, with percentages 6–7 times higher than among MSW and 12–19 times higher than among women, depending upon year.

## DISCUSSION

Americans of every age and every geographical, racial, cultural, and socioeconomic background are affected by STDs. Although each STD has a different magnitude of impact on various population groups, STD rates among Asians/Native Hawaiians and Other Pacific Islanders are often among the lowest for each of the notifiable STDs. However, the failure to recognize the diversity across API ethnic groups can contribute to perceptions of a 'model minority' whose successful acculturation into American society implies lack of need for sexual health services. APIs are a diverse group and classifying them within one race group lessens the importance of socioeconomic, cultural, and lifestyle variables in explaining variations among them. There are limited references to national STD data that separate Asians from Native Hawaiians and Other Pacific Islanders, but when these data are available, differences in rates have been noted. For example, IPP data demonstrated differences in chlamydia positivity rates among Asian women compared to NHPI women, which suggests additional studies are needed to assess individual and community-level risk factors that might help to explain some of these differences.

In addition to recognizing the diversity within the API community, it is also important to note that certain subpopulations within the API community, such as MSM and youth, are particularly affected by STDs. Based on case report and enhanced surveillance data, API MSM are disproportionately affected by gonorrhea and syphilis infections when compared with API MSW and women. Investigations of STDs and HIV among API MSM have found that they are more likely to engage in unprotected sex when they have not been in the United States for very long or do not identify as being gay/homosexual (*15,16*). Youth, particularly women, also suffer disproportionately from STDs regardless of race/ethnicity. Existing literature may provide some insight into the behavioral and contextual factors that may influence API adolescents and young adults' STD risk. Several researchers have concluded that API share certain cultural characteristics—such as sexual activity only within the context of marriage, the importance of family with an emphasis on propriety and social codes, and an absence of open discussions of sexuality—that may have significant impact on sexual health of APIs, particularly among youth (*17–21*). API youth appear to have a somewhat lower risk of STD acquisition than do other racial groups because a lower proportion engage in sexual activity (*22,23*). However, APIs who are sexually experienced do not differ in age at sexual debut or lifetime sexual partners as compared to white adolescents. Additionally, sexually experienced APIs are more likely than their white counterparts to have had multiple sex partners in the recent past (*24*). Data from the National Longitudinal Study of Adolescent Health found an overall 9% prevalence of any STD among API study participants, with a higher occurrence of STDs among young women compared with young men (13% vs. 4%) (*25*). And while national chlamydia and gonorrhea rates are higher in young women than young men among all racial/ethnic groups, API women may have broader and more racially diverse sexual networks than men, exposing them to more STDs (*19*).

The presence of antibiotic-resistant *Neisseria gonorrhoeae* is a public health concern in the management of the infection. Over the years, this organism has acquired resistance to a number of antibiotics, including penicillin and fluoroquinolones, and historically much of this resistance has first appeared in the Western Pacific and Southeast Asia regions. During the

1970s and 1980s, the emergence and widespread dissemination of strains of *N. gonorrhoeae* resistant to penicillin necessitated abandoning these antimicrobials as treatment for gonorrhea in the United States. In the mid-1990s, QRNG was first documented in Hawaii, likely due to importation from tourists and immigrants from the Western Pacific and Southeast Asia (*26*,*27*). Since 2001, several reports of possible cephalosporin treatment failures have been identified in Japan (*28*–*30*). Additionally, trends in decreasing gonococcal susceptibility to cephalosporins over time have also been described, primarily in Asia (*31*–*33*). Given the historical experience with *N. gonorrhoeae*, it is likely that resistance to cephalosporins will eventually develop first among Asians and Asian Americans. The ability to monitor emerging strains of antibiotic-resistant *N. gonorrhoeae* arising from Asia and Pacific regions may provide early warning signs for the continental United States.

Although APIs as a group appear to be at less sexual risk, substantial numbers of APIs engage in sexual activities that place them at risk for acquisition and transmission of STDs. Additionally, the possibility that APIs may develop risk profiles comparable to other groups once they initiate sexual activity reinforces the importance of providing them with the culturally sensitive information and skills they need to make informed decisions. Education, prevention, and treatment of STDs are important for the API population not only to prevent sequelae from STD infection, but also because of the relationship of STDs with HIV infection and transmission.

**Figure 12. Chlamydia case rates and counts among Asians or Native Hawaiians and Other Pacific Islanders (APIs), United States, 2000–2010**

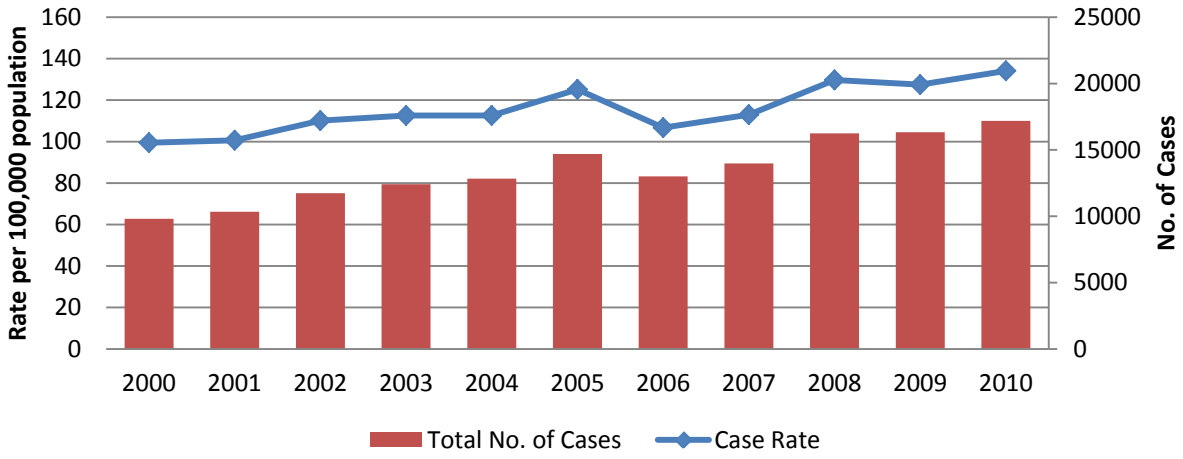


**Figure 13. Chlamydia case rates among Asians or Native Hawaiians and Other Pacific Islanders (APIs), by sex and age groups, United States, 2010**

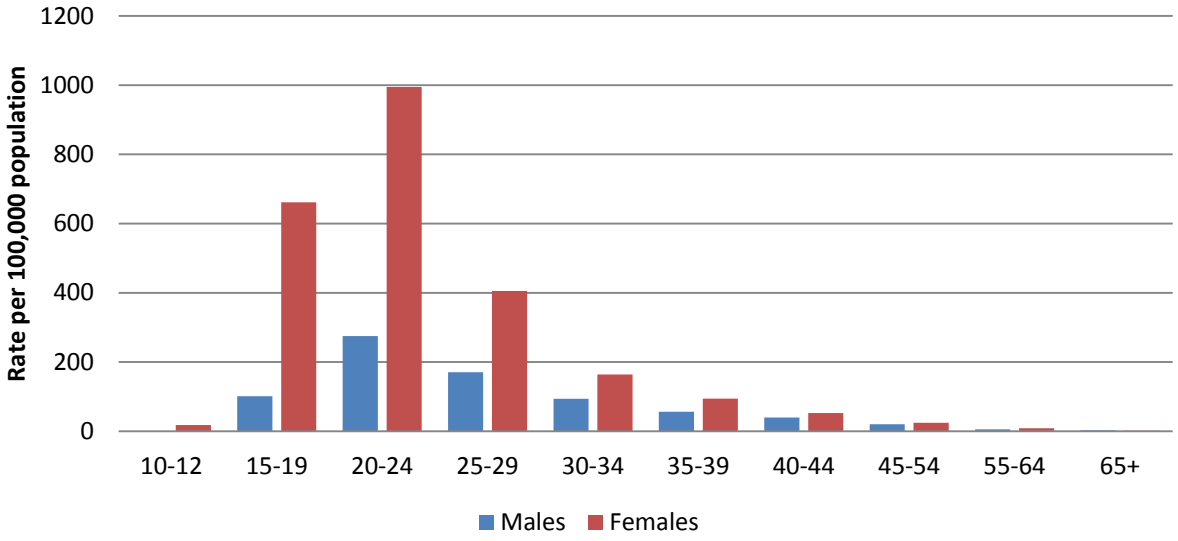
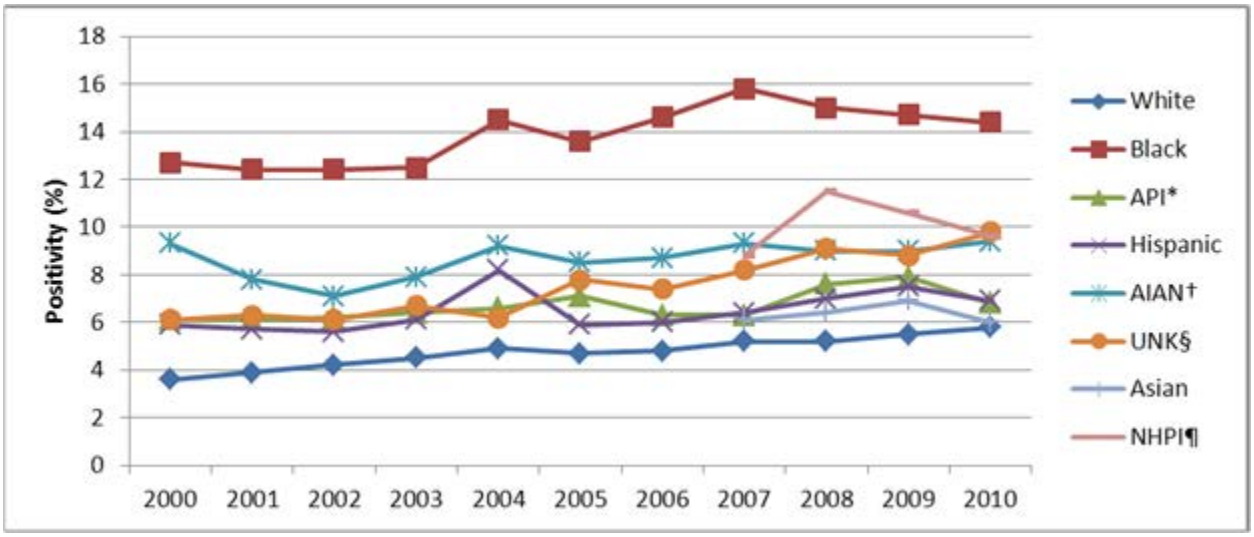



**Figure 14. Chlamydia positivity among 15–24-year-old women in Infertility Prevention Project clinics, by race, 2000–2010**




* API=Asian/Native Hawaiian and Other Pacific Islander; positivity rates for APIs are available from 2000 to 2006.

† AIAN=American Indian/Alaska Native.

§ UNK=Unknown race.

¶ NHPI=Native Hawaiian/Other Pacific Islander; positivity rates for NHPIs and Asians are available from 2007 to 2010.

**Figure 15. Gonorrhea case rates and counts among Asians or Native Hawaiians and Other Pacific Islanders (APIs), United States, 2000–2010**

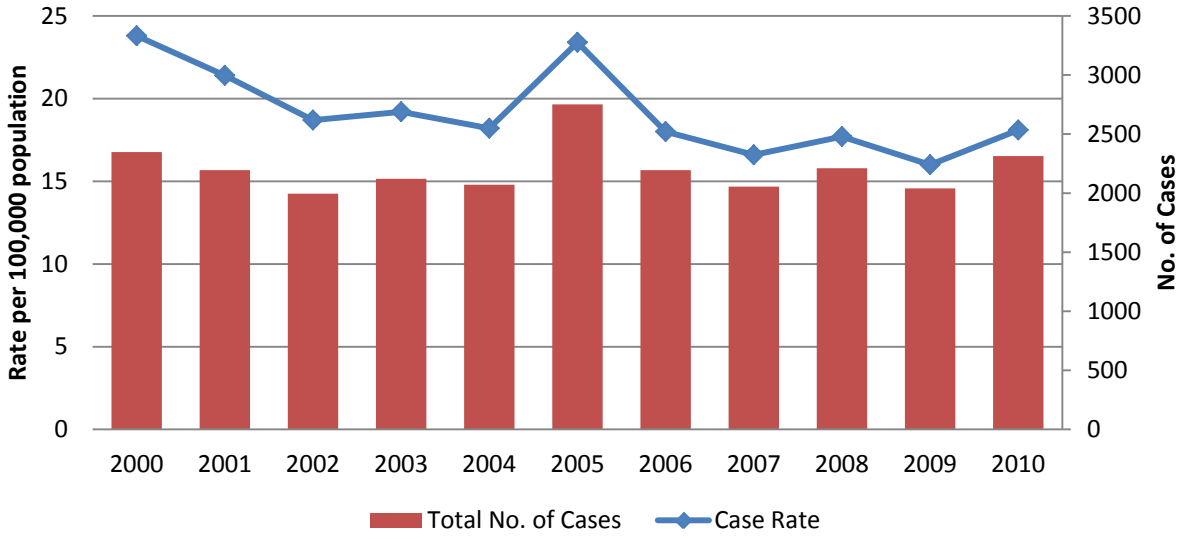
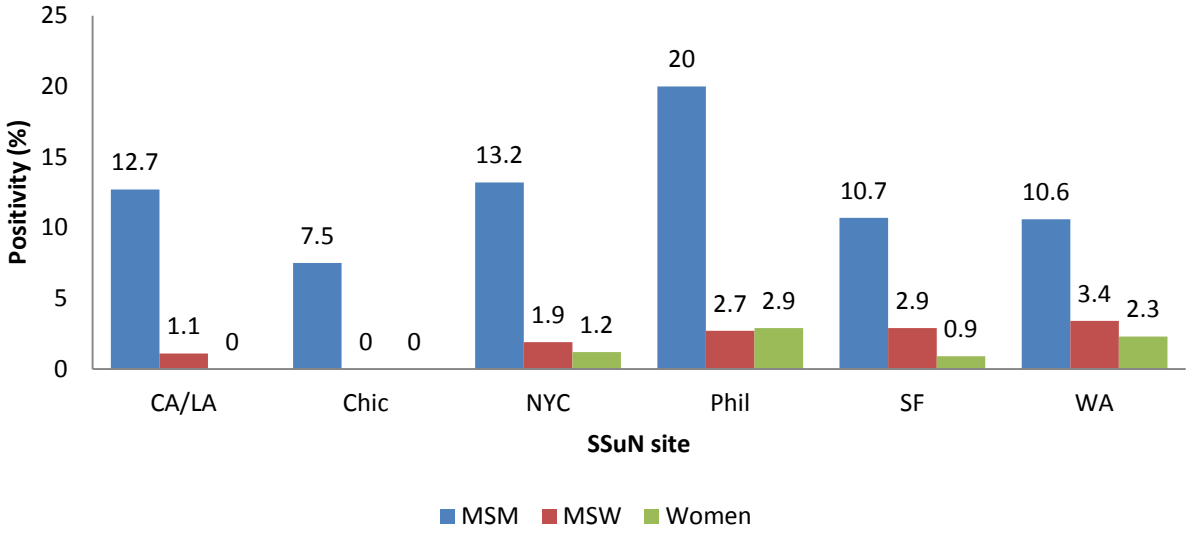


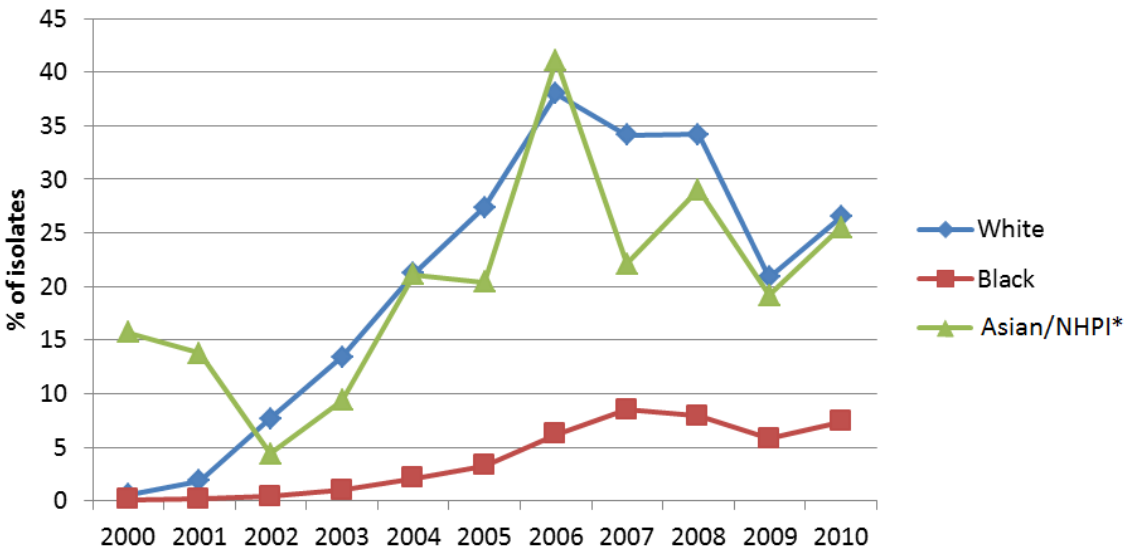

**Figure 16. Gonorrhea test positivity among Asian or Native Hawaiian and Other Pacific Islander (API) STD clinic attendees in STD Surveillance Network, by sex and sex of partners, 2010**




Note: Only sites with >5 MSM were included.

MSM=men who have sex with men; MSW=men who have sex with women only.

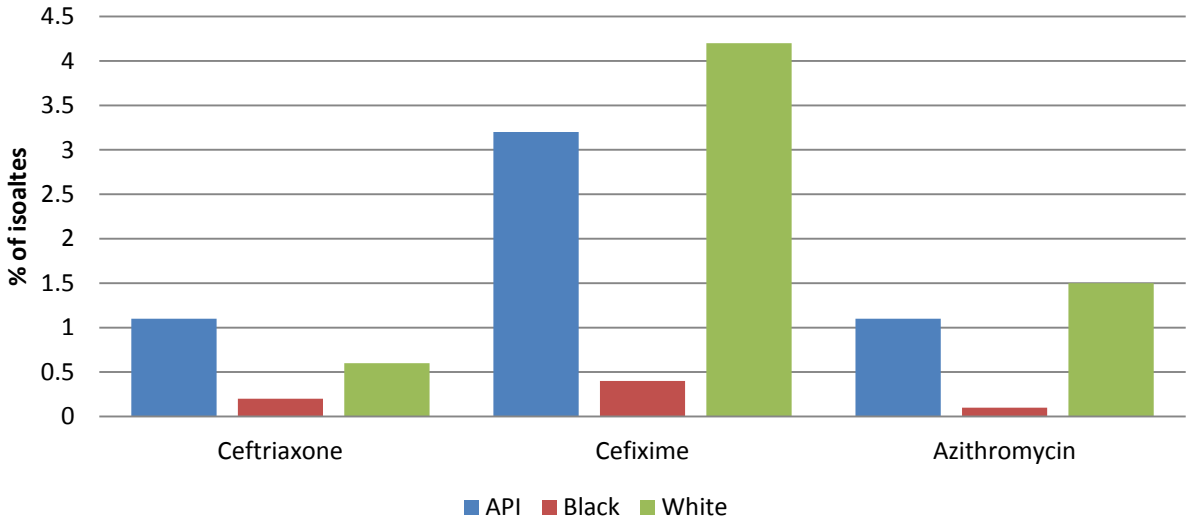
**Figure 17. Prevalence of QRNG among *Neisseria gonorrhoeae* isolates by year and race, GISP, 2000–2010**




* Native Hawaiian and Other Pacific Islander.

QRNG=Fluoroquinolone-resistant *Neisseria gonorrhoeae*; GISP=Gonococcal Isolate Surveillance Project.

**Figure 18. Percentage of gonorrhea isolates with cefixime MICs ≥0.25 µg/mL, ceftriaxone MICs ≥0.125 µg/mL, and azithromycin MICs ≥2 µg/mL by race/ethnicity—Gonococcal Isolate Surveillance Project, United States, 2010**




MIC=Minimal inhibitory concentration.

**Figure 19. Primary and secondary syphilis case rates by sex, Asians or Native Hawaiians and Other Pacific Islanders (APIs), United States, 2000–2010**

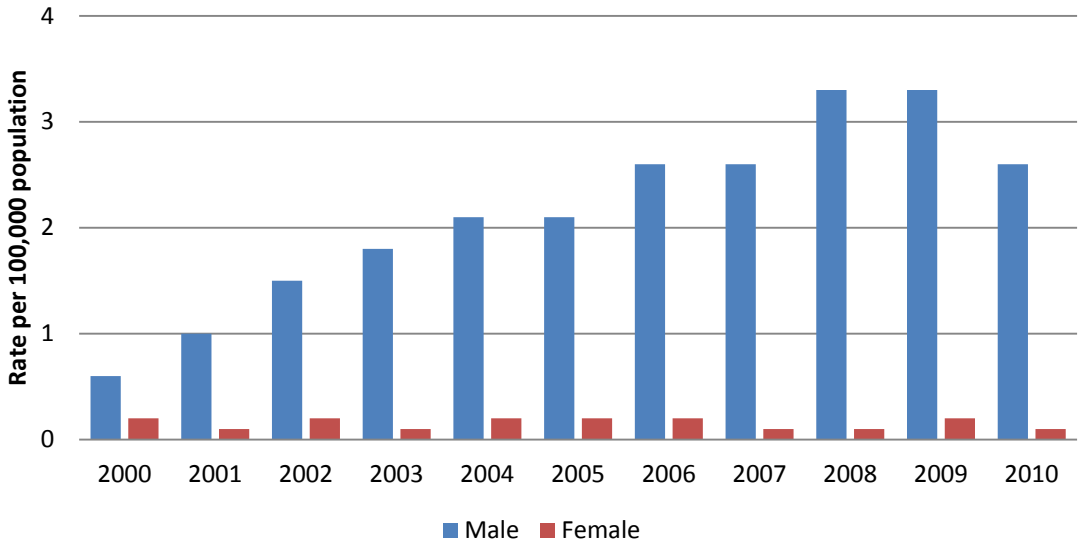



**Figure 20. Primary and secondary syphilis case rates by sex and age group, Asians or Native Hawaiians and Other Pacific Islanders (APIs), United States, 2010**

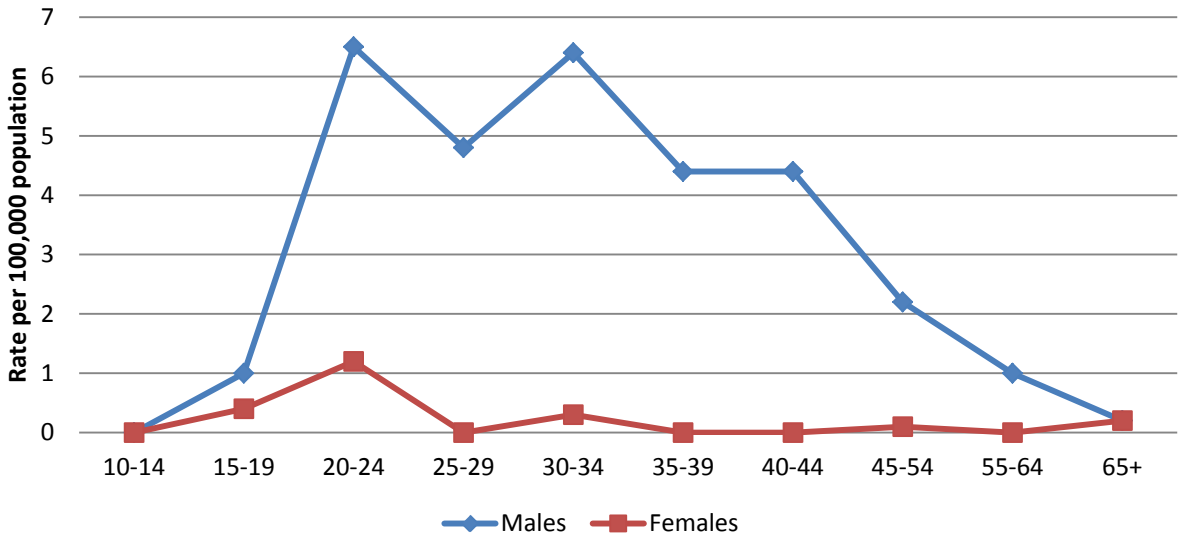
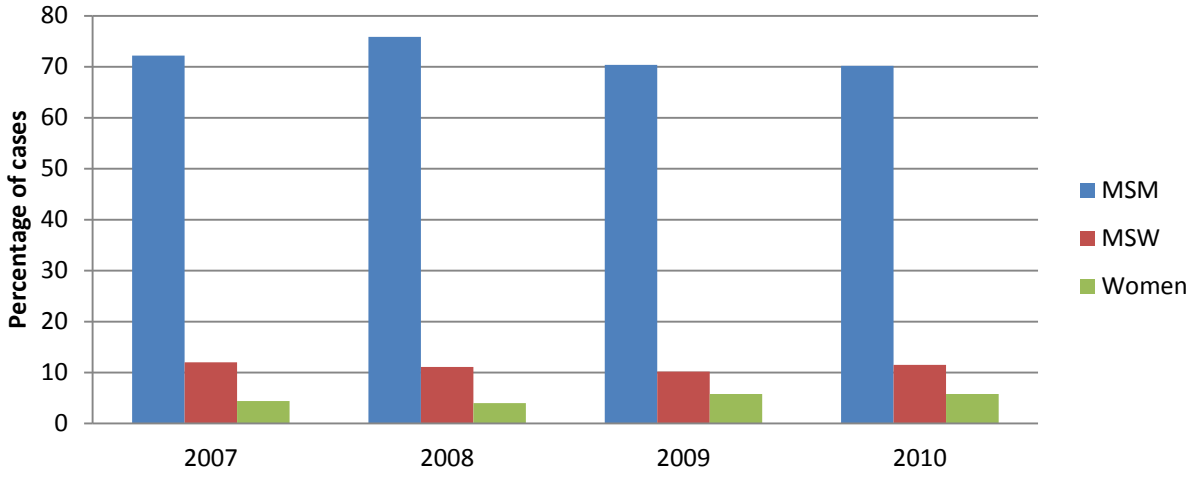


**Figure 21. Percentage of primary and secondary syphilis cases among Asian or Native Hawaiian and Other Pacific Islander (API) MSM, MSW, and women in 31 states*, 2007–2010**




* States reporting sex of sex partner for 70% or more of reported P&S syphilis cases among API males.
MSM=men who have sex with men; MSW=men who have sex with women only.

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# CHAPTER 5: HIV and AIDS

## OVERVIEW

Human immunodeficiency virus (HIV) can infect persons of any age and race. The virus is most commonly transmitted through sex with an infected partner; injection drugs using a contaminated syringe; perinatal exposure from an HIV-infected mother to child at birth or through breast feeding; or transfusion or organ/tissue transplantation from an infected donor. Initially, acute HIV infection may present as an influenza-like illness or other viral illness with a range of symptoms that usually last for a few days to several weeks and then resolve. Over time, however, there is progressive destruction of the immune system—specifically, CD4+ T-lymphocytes, a type of white blood cell that fights infection, are destroyed. When the number of CD4+ T-lymphocytes declines to very low levels, certain opportunistic infections, cancers, or other conditions that are associated with acquired immunodeficiency syndrome (AIDS) may develop. The spectrum of HIV infection—from acute infection to death, with or without the development of AIDS—is called HIV disease.

In the absence of a cure, efforts to prevent primary infection remain critical in controlling the HIV epidemic. Prevention measures are developed for specific at-risk populations, with the basic strategies of identifying HIV infection soon after infection, linking infected persons to care early during the course of infection and retaining them in care, and providing prevention services for both HIV-infected and HIV-uninfected persons. Because HIV infection is predominantly transmitted through sexual intercourse or injection drug use, a great deal of effort is focused on reducing these modes of HIV transmission with behavioral interventions (*1*). Recently, there also has been an increasing recognition of the role of antiretroviral treatment (ART) in HIV prevention; in addition to improving or maintaining the clinical status of and the quality of life for HIV-infected persons, ART can suppress HIV viral loads to levels that are associated with a substantial decreased risk for HIV transmission (*2–4*).

As prevention interventions are implemented or modified for maximal impact, it is important to monitor their effectiveness in terms of the trend in HIV infection rates, prevalence of HIV risk behaviors or health-seeking behaviors, and the clinical status of and quality of care received by HIV-infected persons. At the Centers for Disease Control and Prevention (CDC), surveillance systems that are central to monitoring key aspects of the continually evolving HIV epidemic include the National HIV Surveillance System, the Medical Monitoring Project (MMP), and the National HIV Behavioral Surveillance System (NHBS).

## HIV and AIDS DATA SOURCES

### Burden of HIV Disease

The Division of HIV/AIDS Prevention at CDC is responsible for monitoring the U.S. epidemic. AIDS diagnoses and deaths among persons with AIDS have been reported to CDC by all 50 states, the District of Columbia, and U.S. dependent areas since the 1980s. HIV reporting includes the diagnosis of HIV infection, irrespective of the stage of HIV disease. Confidential, name-based HIV reporting began in a limited number of states in the mid-1980s and has been implemented by the remaining reporting jurisdictions over time. By April 2008, all states, the District of Columbia, and six dependent areas had implemented such reporting. At the time of this report, 46 states and 5 dependent areas had mature (i.e., confidential, name-based reporting in place for at least 4 years) and stable HIV data through 2010 that could be used for the present analysis (*5*). These areas include: Alabama, Alaska, Arizona, Arkansas, California, Colorado, Connecticut, Delaware, Florida, Georgia, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Michigan,

Minnesota, Mississippi, Missouri, Montana, Nebraska, New Hampshire, New Jersey, New Mexico, New York, Nevada, North Carolina, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Utah, Virginia, Washington, West Virginia, Wisconsin, and Wyoming and 5 U.S. dependent areas (American Samoa, Guam, the Northern Mariana Islands, Puerto Rico, and the U.S. Virgin Islands[1]).

Beginning in January 2003, following the Office of Management and Budget (OMB) directive, the collection of data on race uses at least five racial groups, which include Asian and Native Hawaiian or Other Pacific Islander (NHPI). Two categories of ethnicity, Hispanic or non-Hispanic, are also used. For purposes of data reporting, a combined race/ethnicity categorization has been used by HIV surveillance in which Hispanics/Latinos may be of any racial group and each of the five standard OMB racial groups includes non-Hispanic persons who were reported with a single race. When Asians and NHPIs cannot be reported separately, a combined Asian/Native Hawaiian and Other Pacific Islander (API) group is used.

Surveillance data may not be complete—risk exposures for transmission categories may be missing or unknown (i.e., no risk factor reported or identified). In such cases, multiple imputation is used to assign risk exposure information to persons with HIV disease who are reported without this information (*5*).

The time from initial diagnosis of HIV until the case is reported to CDC is the reporting lag time and may be as long as 2 to 3 years (*5*). Statistical adjustments are made to the case counts to account for this delay and are reported as estimated numbers. Because of the delay for death ascertainment, an 18-month lag time is allowed so deaths described in this analysis are accounted for through June 2009. Thus, estimates for persons living with HIV or AIDS that used 2010 data are limited to the period ending December 31, 2009. Estimates based on data other than 2010 data are referenced.

Although adjustments are made to surveillance data for incomplete risk information and for delayed reporting, as noted above, the data do not include an adjustment to account for persons who are HIV infected and not reported, either because they are undiagnosed or tested anonymously.

Rates have been calculated using U.S. Census Bureau population estimates.

## MMP: HIV-Infected Persons in Care

MMP is a multi-site supplemental surveillance project developed to provide nationally and locally representative estimates of behaviors, clinical characteristics, and quality of care of HIV-infected persons who are receiving care. The project began with a pilot phase in 2005 and was fully implemented in 2007 (*6*,*7*).

MMP data are collected through interviews and medical record abstractions on an annual probability sample of persons in care for HIV infection in the United States. Details on the design and methods of MMP have been previously reported (*7*,*8*). Briefly, eligible persons are HIV-infected individuals ≥18 years of age who receive outpatient care at an HIV care facility from January through April during the year of an MMP cycle. Data collected through interviews focus on behavioral issues, including behaviors that may facilitate HIV transmission; health seeking behaviors; utilization of HIV-related medical and prevention services; and adherence to medication regimens. Data collected through medical record abstractions focus on clinical conditions that result from a person's HIV infection or medications taken, laboratory tests performed and their results, and the type and quality of HIV care and support services these individuals receive.

The MMP data presented in this report are from interviews conducted during the 2007 and 2008

[1] When AIDS cases were reported and data were available, data from the Republic of Palau have been included for a total of 6 U.S. dependent areas.

MMP cycles (data collected from June 2007 to April 2009) in 26 project areas: California; Chicago, Illinois; Delaware; Florida; Georgia; Houston, Texas; Illinois; Indiana, Los Angeles County, California; Maryland; Massachusetts; Michigan; Mississippi; New Jersey; New York; New York City, New York; North Carolina; Oregon; Pennsylvania; Philadelphia, Pennsylvania; Puerto Rico; San Francisco, California; South Carolina; Texas; Virginia; and Washington.

MMP collects information on race/ethnicity in accordance with the 2003 OMB directive. MMP also reports data on race/ethnicity using a combined categorization similar to that described above for the National HIV Surveillance System. For the MMP data in this report, however, the Asian and NHPI categories are combined because of the small number of MMP participants in each of these categories. In addition, several participants who reported being both Asian and NHPI are included in the descriptive analysis of API persons in care for HIV infection.

## NHBS: At-Risk Populations

NHBS is a behavioral surveillance system developed in recognition of the need for information on populations at high risk for acquiring HIV infection. The data presented in this report were collected in the 2008 NHBS cycle, which focused on men who have sex with men (MSM).

In 2008, NHBS project activities were conducted in 21 urban areas. These areas were selected based on high burden of AIDS and included approximately 60% of all prevalent urban U.S. AIDS cases in 2008 (*9*). Men were sampled using venue-based (e.g., bars, clubs, organizations, and street locations), time-space sampling methods (*10*). Those eligible for participation were ≥18 years of age, residents of the selected geographic area, and able to complete an in-person interview in English or Spanish. For this report, analyses were limited to men who reported having sex with another man in the 12 months preceding the interview. The interview consisted of questions about sex, drug use, HIV testing behaviors, and use of HIV prevention services. Respondents, regardless of self-reported HIV infection status, were also offered anonymous HIV testing, given the opportunity to receive their test results, and anonymously referred to care when appropriate.

Like MMP, NHBS collects information on race/ethnicity in accordance with the 2003 OMB directive. In addition, specific information on the ancestry of Hispanic participants is collected. For the NHBS data in this report, the Asian and NHPI categories were combined due to the small number of NHPI participants, which limits the ability to further categorize this group by different characteristics in a descriptive analysis.

## SNAPSHOT

### Persons with HIV Disease

In 2010, 818 (1.7%[m]) Asians and 67 (0.1%) NHPIs were diagnosed with HIV infection in 46 states and 5 dependent areas. The rate of HIV diagnoses for Asians has remained stable over time from 6.5 per 100,000 population in 2007 to 6.5 per 100,000 population in 2010 (see Figure 22). Among NHPIs, the rate of HIV diagnoses changed little from 21.3 per 1000,000 population in 2007 to 19.3 per 100,000 population in 2010 (see Figure 23). The estimated number of AIDS diagnoses in the United States, the District of Columbia, and 6 dependent areas for Asians and NHPIs in 2010 were 480 and 45, respectively, and contributed to an estimated cumulative total of 8,795 and 889, respectively, diagnosed with AIDS from the start of the epidemic.

At the end of 2009, there were 8,422 Asians and 620 NHPIs estimated to be living with HIV disease in the United States and 5 dependent areas. An estimated 5,112 Asians and 481 NHPIs were living with AIDS in the United States and 6 dependent areas at the end of 2009.

The geographic distribution of persons ≥13 years of age who were living with AIDS at the

[m] Of all HIV diagnoses in 2010.

end of 2009 varied by race. Among Asians, the top 10 states with the greatest number of persons living with AIDS were (in decreasing order) California, New York, Texas, Hawaii, Illinois, Washington, Massachusetts, Virginia, Florida, and New Jersey. Among NHPIs living with AIDS, states (in decreasing order) were California, Hawaii, Washington, Texas, Florida, then equally Nevada and Maryland, followed by equal numbers in New York and Pennsylvania.

### Sex and Age

The percentage of men and women ≥13 years of age living with HIV disease at the end of 2009 was similar for Asians and NHPIs: approximately 80% were men and 20% were women. Over 60% of HIV-infected Asians and NHPIs were 30–49 years of age. One percent or less of Asians and NHPIs living with HIV were <20 years of age at the end of 2009 (see Table 5).

Previously published data that examined the estimated annual percentage change for HIV diagnoses from 2001 to 2008 reported a significant average annual increase of 5.1% for API men (*11*). Among API women, there was no substantial change in the rate of HIV diagnoses during this period.

### Foreign-Born

Foreign-born status is based on country of birth and is defined as any birth that occurs outside the United States and its territories. A recent analysis of National HIV Surveillance System data from 46 states and 5 territories in which country of birth information was available estimated that 1,987 (64%) Asians who were diagnosed with HIV infection and reported to CDC from 2007 to 2010 were foreign-born (*12*). In contrast, 89 (32%) NHPIs diagnosed with HIV infection during the same period were reported as foreign-born (*12*).

Among APIs diagnosed with AIDS from 1999 to 2002, the most common countries of birth outside the United States were India, Vietnam, the Philippines, Thailand, and Cambodia (*13*).

### Transmission Category

Transmission categories are routes of HIV transmission that are believed to have led to HIV infection. Individuals may have more than one risk factor for HIV infection, but—for surveillance purposes—risks are categorized in a hierarchy so that each individual is classified into a single transmission category. The most commonly reported categories of HIV transmission in 2010 for Asians and NHPIs vary by age and gender. Among Asian men ≥13 years of age, sex with another man accounted for approximately 80% of cases and heterosexual contact for about 9%. Among NHPI men, sex with another man accounted for almost 85% of cases and heterosexual contact for approximately 6% of cases. For Asian and NHPI women, heterosexual contact was the most prevalent risk factor. Among Asian women, heterosexual contact accounted for over 85% and injection drug use for about 9% of cases. Among NHPI women, injection drug use accounted for over 15% and heterosexual contact approximately 80% of cases (see Table 6). Among Asian and NHPI children, <13 years of age, perinatal exposure was the most prevalent risk exposure.

### Stage at Time of HIV Diagnosis

Immune function, as assessed by CD4+ T-lymphocyte count at the time of HIV diagnosis, may be used to stage HIV infection and make general inferences of the length of time since HIV acquisition. Beyond the period of acute HIV infection, normal or nearly normal CD4+ T-lymphocyte counts in ART-naïve persons suggests the diagnosis of HIV infection was made early in the course of HIV disease; a low CD4+ T-lymphocyte count that meets the serological criteria for AIDS (<200 cells/μL) suggests longstanding HIV infection. CD4+ T-lymphocyte counts of persons diagnosed with HIV infection in 2007 and subsequently assessed for immune function within 12 months of diagnosis varied by race/ethnicity. The median CD4+ T-lymphocyte count for Asians was 182 cells/μL (interquartile range [IQR]: 67–358 cells/μL) and for NHPIs was 268 cells/μL

(IQR: 114–396), in contrast to 248 cells/μL (IQR: 99–434) for whites (*14*).

### MORTALITY

Cumulative deaths among Asians and NHPIs diagnosed and reported as having AIDS, from the start of the epidemic through 2009, have been estimated to be 3,203 and 363, respectively.

### PERSONS IN CARE FOR HIV DISEASE

Among 6,916 participants in the 2007 and 2008 MMP cycles, 94 (1%) were APIs. Of these, 55 (58.5%) were Asian, 77 (81.9%) were male, 65 (69.1%) were 35–54 years of age, 66 (70.2%) had completed some education beyond high school, and 48 (51.1%) had been diagnosed with HIV infection for ≥10 years (see Appendix for Table A8). A total of 38 (40.4%) participants were born outside of the United States; the country of birth varied greatly, with the most common being the Philippines (n=10) and Vietnam (n=5). In the 12 months prior to participating in MMP, nearly half (47.9%) of API participants reported receiving public assistance despite the fact that 85.1% of all API participants reported having health insurance or coverage.

Sixty-seven percent of API participants reported having their first visit for HIV medical care within 3 months following diagnosis. Among API participants, 87.2% reported being on ART during the 12 months before interview, 40.4% reported that their most recent CD4+ T-lymphocyte count was ≥500 cells/μL; 75.5% reported that their lowest CD4+ T-lymphocyte count was <500 cells/μL (see Figure 24); and 63.8% reported that their most recent HIV viral load was undetectable.

The ancillary services needs most commonly reported among API participants in the preceding 12 months were HIV case management services (40.4%), mental health counseling (30.9%), dental care (27.7%), social services (26.6%), and transportation assistance (26.6%). Among API participants who reported needs for the aforementioned ancillary services, <15% of those who needed HIV case management, 28.0% of those who needed mental health counseling, 24.1% of those who needed social services, 34.6% of those who needed dental care, and 20.0% who needed transportation assistance reported that they had not received these services at the time of the MMP interview.

In order to specifically assess risky behaviors and receipt of prevention services after HIV infection, the analysis below was restricted to participants whose diagnosis of HIV had occurred at least 12 months earlier. Among the 90 API participants diagnosed with HIV at least 12 months prior to interview, 60 (66.7%) reported being sexually active in the preceding 12 months. Among 50 participants who reported vaginal or anal intercourse in the past 12 months, 27 (54.0%) reported having had unprotected intercourse. Non-injection drug use in the previous 12 months was reported by 34 (37.8%) of API participants; of these, the most common drugs reported were marijuana (70.6%), amyl nitrate or "poppers" (20.6%), and crystal methamphetamine (14.7%). Although injection drug use at any time in the past was reported by 16 (17.8%) participants, <5% reported injection drug use in the preceding 12 months. Alcohol use was more common, with 57 (63.3%) API participants reporting any alcohol use in the previous 12 months and 11 (12.2%) reporting excessive alcohol use (≥5 drinks for men and ≥4 drinks for women in one day) in the preceding 30 days. Regarding prevention services, 45 (50.0%) API participants reported receiving free condoms, 22 (24.4%) reported participating in an individual-level intervention, and 6 (6.7%) reported participating in a group-level intervention in the past 12 months.

## Persons at Risk for HIV—MSM Participants of NHBS

For this report, we summarize the results from two descriptive analyses of 2008 NHBS data. The first characterizes API MSM who participated in NHBS and did not report a previous positive test result or diagnosis (i.e.,

those considered to be at risk for HIV infection) and the second describes the prevalence of HIV infection among API MSM who completed NHBS HIV testing and had a negative or confirmed positive test result.

## CHARACTERISTICS OF AT-RISK API MSM

Of 8,175 men participating in NHBS who reported having sex with another man in the 12 months preceding the NHBS interview, completed the interview, and did not report a previous HIV-positive test result or diagnosis (*15*), 258 (3.2%) were API. Among these, most were 25–39 years of age (65.8%), were born outside of the United States (57.0%), and had some education beyond high school (88.8%) (see Appendix for Table A9). Among those who were foreign-born, the most commonly reported country of birth was the Philippines (36.1%). While 90.7% of API MSM reported being gay, 8.5% self-identified as bisexual. Most (70.9%) reported having private health insurance, but a substantial percentage (23.6%) had no health insurance.

In the 12 months preceding the NHBS interview, 140 (54.3%) of API MSM participants reported having had unprotected anal or vaginal sex. Of the 134 MSM who reported having had unprotected anal sex with a male partner, 98 (73.1%) reported unprotected anal sex with a main male partner,[n] and 55 (41.0%) reported unprotected anal sex with a casual male partner.[o] Of the 18 API MSM who reported sex with both male and female partners, <30% reported unprotected anal sex with their male partners, and 44.4% reported unprotected vaginal or anal sex with their female partners.

When questioned about behaviors during their most recent sexual encounter with a male partner, 118 men reported sex with a main partner, and 140 men reported sex with a casual partner. Unprotected anal intercourse was reported by 37.3% of those who had insertive anal intercourse with a main partner and by 28.0% of those who had insertive anal intercourse with a casual partner. Unprotected receptive anal intercourse was reported by 44.0% of those who had receptive anal intercourse with a main partner and by 35.4% of those who had receptive anal intercourse with a casual partner (see Appendix for Table A10).

Alcohol use was prevalent, with 220 (85.3%) API MSM reporting current use, 25 (9.7%) reporting heavy use (consuming >2 alcoholic beverages per day on average during the 30 days before the interview), and 102 (39.5%) reporting excessive or "binge" drinking (i.e., consuming more than 5 alcoholic beverages at one sitting during the 30 days preceding the interview) (*15*). A total of 114 (44.2%) reported using non-injection drugs in the past 12 months, and 85 (32.9%) reported using alcohol or drugs during their most recent sexual encounter with a male partner (see Appendix for Table A10).

Among 235 participants who reported ever having been tested for HIV, 76 (32.3%) had not been tested during the past 12 months. Of the 158 participants who tested within the past 12 months, the most common testing venues were a private physician's office (28.5%), an HIV counseling and testing site (24.7%), and a public health clinic or community health center (19.0%). Among 99 API MSM participants who had not been tested for HIV in the preceding 12 months, the most common reported reasons for not getting tested were the belief that they were at low risk for HIV (74.7%), fear of finding out that they were infected (32.3%), concern that someone would find out the test results (24.2%), and not having the time to get tested (18.2%).

A total of 44 (17.1%) API MSM reported participating in any HIV prevention service or program in the preceding 12 months. By type of service or program, 32 (12.4%) participated in an individual-level intervention, and 16 (6.2%) participated in a group-level intervention.

[n] A main partner is defined as a sex partner with whom the participant feels committed to above anyone else (e.g., boyfriend, spouse, significant other, or life partner).

[o] A casual partner is defined as a sex partner with whom the participant does not feel committed to or does not know very well.

### PREVALENCE OF HIV INFECTION

This analysis examined data on men participating in NHBS who reported having sex with another man in the 12 months preceding the NHBS interview, completed both the interview and HIV testing for NHBS, and either had a negative or confirmed positive HIV test result (*16*). Data on participants who had indeterminate test results or who reported being HIV-positive but who had negative NHBS HIV test results were excluded to avoid the potential for misclassification of HIV infection status. Among the 8,153 MSM included in the analysis (*16*), 247 (3.0%) were API. Of the 247 API MSM, 25 (10.1%) had positive HIV test results. The HIV prevalence was highest among persons 30–39 years of age (18.4%) compared to those 18–24 (0%), 25–29 (6.7%), or ≥40 (<15%) years of age. The HIV prevalence was 11.3% among foreign-born and 8.6% among those born in the United States; 20.0% among those with high school education or less compared to 8.8% among those with more than high school education; 20.8% among those with an annual household income <$20,000 compared to 9.1% among those with income of $20,000–$39,999 and 7.0% among those with income of $40,000 or more; 15.0% among those with no insurance compared to 8.6% among those with private or public health insurance; and 17.5% among those who had never been tested for HIV or had not been tested in the past 12 months compared to 4.9% among those who had been tested in the past 12 months (see Appendix for Table A11). Among those testing positive for HIV, 11 (44.0%) did not report being HIV infected during the interview; of these, most (63.6%) had reported having never been tested previously or having been tested more than 12 months before the interview.

## DISCUSSION

### Persons with HIV Disease

The percentage of Asians and NHPIs who were diagnosed with HIV were lower than the percentages for members of other racial and ethnic groups in the United States during 2010. Asians comprised 4.7% of the U.S. population in 2010 and 1.7% of HIV diagnoses in 46 states and 5 U.S. dependent areas and NHPIs made up 0.2% of the U.S. population[p] and 0.1% of HIV diagnoses in 2010.

Although the relative number of Asian and NHPIs infected with HIV may be small in the United States, Asians, in particular, represent a heterogeneous group. The racial group of "Asian" includes a number of different ethnic populations from different parts of the world, with different languages and social norms. In addition, the majority of HIV-infected Asians in the United States are foreign-born and thus factors such as acculturation, language, and socioeconomic status may further compound the challenge to find and deliver the appropriate prevention messages to individuals in this heterogeneous group.

The median CD4+ T-lymphocyte count at the time of HIV diagnosis (182 cells/μL) for Asians suggests that most Asians were diagnosed late in the course of their infection and that there may have been missed opportunities to reduce HIV morbidity, mortality, and forward transmission. In addition, a telephone survey conducted among persons ≥18 years of age in the United States and 3 territories found that Asians, despite having similar HIV risks, were less likely to report having ever been tested for HIV when compared to all other races/ethnicity combined (*13*). Multiple cultural and social factors, including a lack of perceived individual risk, may contribute to the lower rate of HIV testing and to late HIV diagnoses among Asians (*13,17)*.

Little published information is available about NHPIs and HIV. Because of the methods adopted for surveillance in terms of race/ethnicity categorization, the actual number of NHPIs who are HIV-infected is higher than what has been estimated. Prior to 2003, a combined category of Asian and Native Hawaiian or Other Pacific Islander was used to report race. Current cumulative case counts for

[p] U.S. dependent areas' population not included.

Asians also include counts of NHPIs that cannot be separated from Asians prior to 2003. As a result, current cumulative estimates for NHPI are underestimates. Additionally, the majority of NHPIs self-identify as multiracial, as reported from U.S. Census Bureau data (see Chapter 1, page 17). Surveillance data, however, are most commonly derived from medical encounter information, which may include a subjective interpretation of race by healthcare providers and others.

HIV data do not represent all U.S. reporting jurisdictions. Not until 2013 will all local and state health department HIV cases be aggregated and summarized into national data. Until then, Hawaii, a state with large Asian and NHPI populations, is not included in HIV estimates. In the analysis that examined geographic distribution of Asians and NHPIs affected by HIV, the list of the top 10 states with the largest number of Asians and NHPIs was based on data for persons living with AIDS. Examination of the relative distribution of demographic and risk characteristics for persons diagnosed with AIDS from all reporting jurisdictions and the subset diagnosed with HIV infection from name-based reporting jurisdictions are similar (see Table 5), however. Our analysis provides interim information until 2013 when all reporting jurisdictions' data for HIV disease can be analyzed together.

National HIV Surveillance System data are limited to what data are collected and reported. Because of the need to create a standardized data collection form that all local and state health departments will use, important information for a risk group may not be collected. For example, racial ethnicities (e.g., Thai, Chinese, Korean, etc.) are not routinely collected. Although information about country of birth is collected, it is not known when HIV infection occurred (i.e., in the United States or the country of birth). The degree of acculturation as assessed by year of immigration to the United States and whether English is spoken at home—information that may help better target education and prevention efforts—is not routinely collected. Some studies have undertaken collection of such information but they are often limited to a region or state and cannot provide a national snapshot.

## Persons in Care for HIV Disease

API comprise a small percentage of HIV-infected persons in care in MMP, and this percentage is similar to the percentage reported among all persons diagnosed with HIV in 2007 or 2008 (*5*). However, we found 40.4% of the API population in MMP to be foreign-born, in contrast to over two-thirds of APIs diagnosed with HIV disease and reported from case surveillance. It is unclear whether this under-representation of foreign-born among API who are in care reflects a difference in engagement in care between foreign-born versus U.S.-born API rather than a difference in MMP participation. Nevertheless, language and cultural barriers to obtaining medical care among foreign-born API should be considered when designing interventions to link HIV-infected persons to care.

Over two-thirds of HIV-infected APIs who are in care entered medical care within 3 months of their HIV diagnosis. However, the degree of retention in care over time is unknown. More than half of these individuals had an HIV diagnosis for 10 or more years; many had advanced HIV disease (42.6% reporting their lowest CD4 count as <200 cells/μL) (see Figure 24). Nevertheless, among these APIs who were in care, a high percentage reported receiving ART and having an undetectable HIV viral load, indicators of successful engagement in HIV care.

Previous studies have shown that the prevalence of risky sexual behaviors decrease after individuals become aware that they are HIV-infected (*18*). Although the prevalence of unprotected vaginal or anal intercourse was high among the API MMP participants in this report, further investigation is needed to better understand these behaviors and the associated transmission risk. Nevertheless, given the importance of maintaining behaviors associated with low risk for HIV transmission over time, the reported participation in individual- or

group-level interventions appears low among the API MMP participants and suggests that greater efforts are needed to improve the availability and acceptability of these prevention services for these HIV-infected APIs.

Alcohol and drug treatment interventions have been used to enhance HIV prevention activities because alcohol and drug use are associated with engagement in risky sexual behaviors. Among the API participants of MMP, the prevalence of noninjection drug use in the preceding 12 months (37.8%) and excessive alcohol use in the preceding month (12.2%) were substantial. HIV care providers can play an important role in HIV prevention as well as in improving treatment adherence in their patients by screening for substance use problems, delivering prevention messages, and providing referrals for substance abuse treatment when appropriate.

The MMP findings are subject to several limitations. First, although MMP was designed to produce nationally representative data on all HIV-infected persons in care, it was not specifically designed to produce representative data for HIV-infected APIs. Thus, our reported results may not be generalizable to all HIV-infected APIs in care in the United States. Second, because the survey was conducted as an in-person interview, responses to some questions (e.g., drug use, sexual behaviors) are subject to social desirability bias. Finally, self-reported information, in general, and on CD4+ T-lymphocyte counts and HIV viral load results, specifically, are subject to the participant's ability to recall the clinical information.

## Persons at Risk for HIV: MSM Participants of NHBS

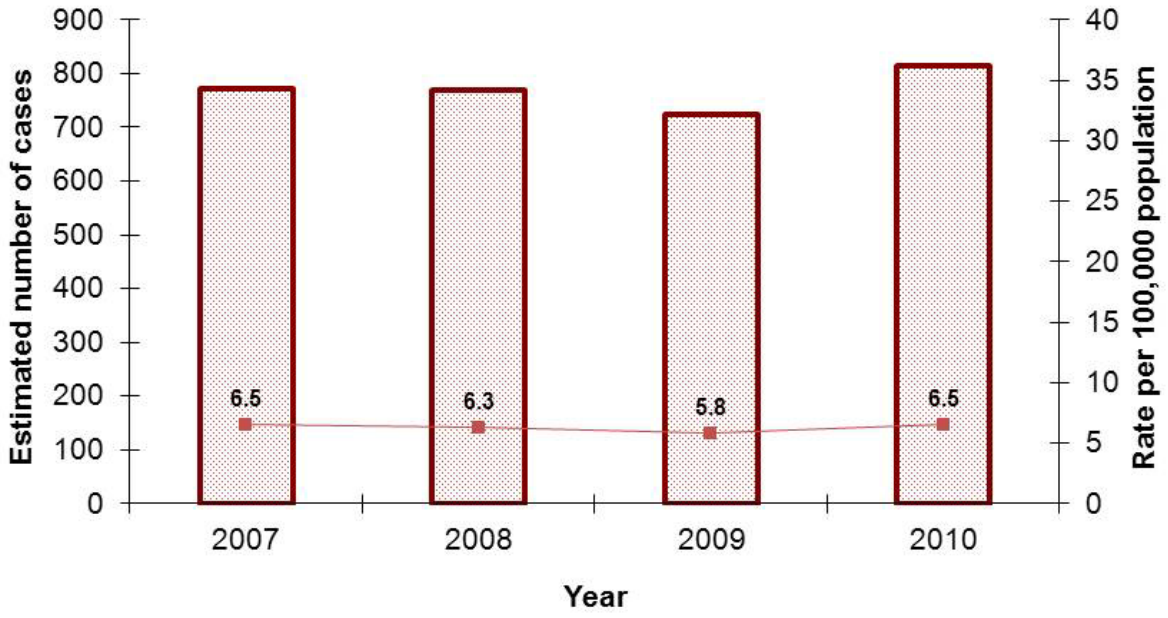
In the United States., MSM continue to bear the largest burden of HIV infection, and among APIs, this is also true (*5*,*13*). Therefore, efforts to reduce the risk for HIV infection among MSM remain a critical part of HIV prevention. Based on the NHBS data in this report, efforts to reduce HIV risk among API MSM should consider cultural and language issues facing API men, particularly because a large percentage of this population is foreign-born. In addition, prevention efforts may need to focus on API MSM with low socioeconomic status, as HIV prevalence is higher among API MSM of lower socioeconomic status.

As was observed with MSM of other race/ethnicity in NHBS (*15*), risky sexual practices and noninjection drug use were also commonly seen among API MSM. However, some of the highest risk behaviors, such as unprotected receptive anal intercourse with a casual partner or with a partner whose HIV status is positive or unknown, were less frequently reported among API participants than among all NHBS participants as a whole (*15*). The reason for this is not clear, but cultural and socioeconomic factors may explain some of these differences, particularly given the higher levels of education, household income, and insurance coverage seen among API participants, relative to NHBS participants in general (*13*). Higher educational attainment, higher income, and having health insurance indicate greater access to health resources, which may affect knowledge and behaviors.

Because of the high risk for HIV infection among MSM, CDC currently recommends that sexually active MSM get tested for HIV at least once per year (*19*). Although many API MSM in NHBS reported having been tested for HIV in the preceding 12 months, over one-third never tested or were tested more than 12 months before the interview. One of the most common reasons API MSM gave for not getting tested was a belief that they were at low risk for HIV infection, indicating the need for HIV education in this population. In addition, participation in individual- or group-level behavioral interventions, which have demonstrated effectiveness for reducing HIV risk behaviors, is reported by a small percentage of API MSM in NHBS. Because low participation rates have also been observed among MSM of other racial and ethnic groups (*13*), renewed effort to improve participation in these programs is needed.

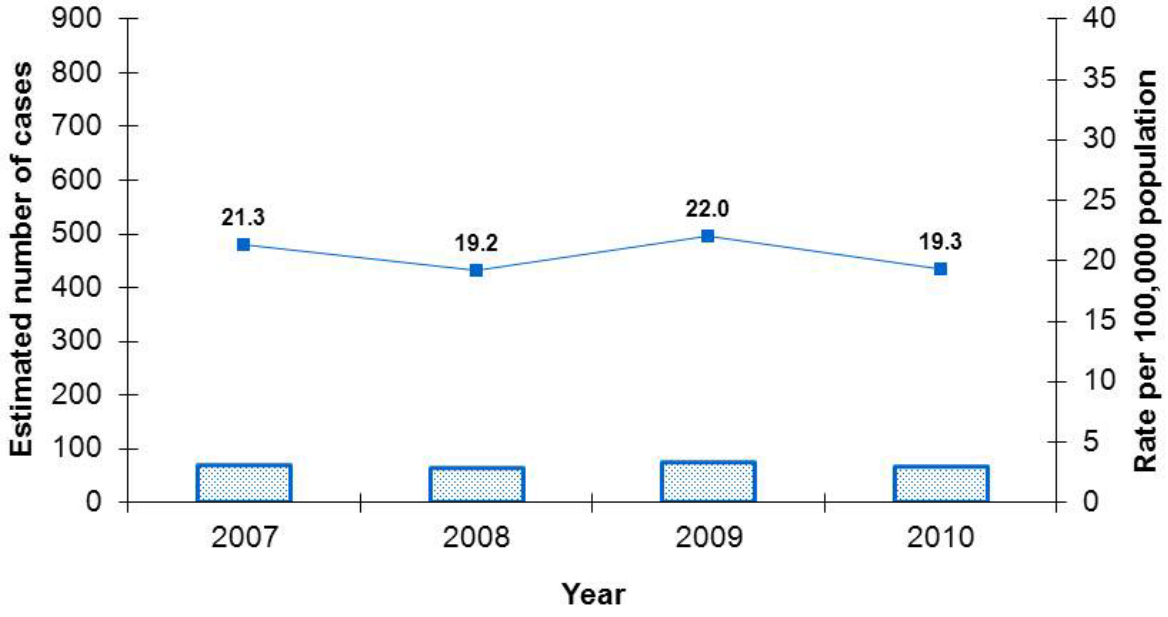
The NHBS results should be interpreted with caution, given a number of limitations. Although NHBS includes a large number of MSM participants, the participants were sampled and recruited at selected venues, and would, therefore, not include MSM who do not attend such venues. As a result, the NHBS data may not be representative of MSM in the participating urban areas or those in states or cities outside of these areas. Similarly, the NHBS data on API MSM may not be representative of API MSM at the local or national level. In addition, because of the relatively small number of API MSM, the results within categories or subgroups should be interpreted with caution. Lastly, no statistical test was done to assess differences between groups, but our descriptive analyses provide some baseline information that can be refined and added to over time.

**Figure 22. Estimated rate* of HIV diagnoses among Asians, 2007–2010**




* Per 100,000 population; Centers for Disease Control and Prevention. *HIV Surveillance Report 2010*, vol. 22. Page 17, Table 1A (46 states) data used. http://www.cdc.gov/hiv/topics/surveillance/resources/reports/. Published March 2012. Accessed April 6, 2012.

**Figure 23. Estimated rate* of HIV diagnoses among Native Hawaiians and Other Pacific Islanders, 2007–2010**




* Per 100,000 population; Centers for Disease Control and Prevention. *HIV Surveillance Report 2010*, vol. 22. Page 17, Table 1A (46 states) data used. http://www.cdc.gov/hiv/topics/surveillance/resources/reports/. Published March 2012. Accessed April 6, 2012.

**Figure 24. Self-reported lowest and most recent CD4+ T-lymphocyte counts among Asian and Native Hawaiian and Other Pacific Islander participants during the 12 months before interview—Medical Monitoring Project, United States, June 2007–April 2009**

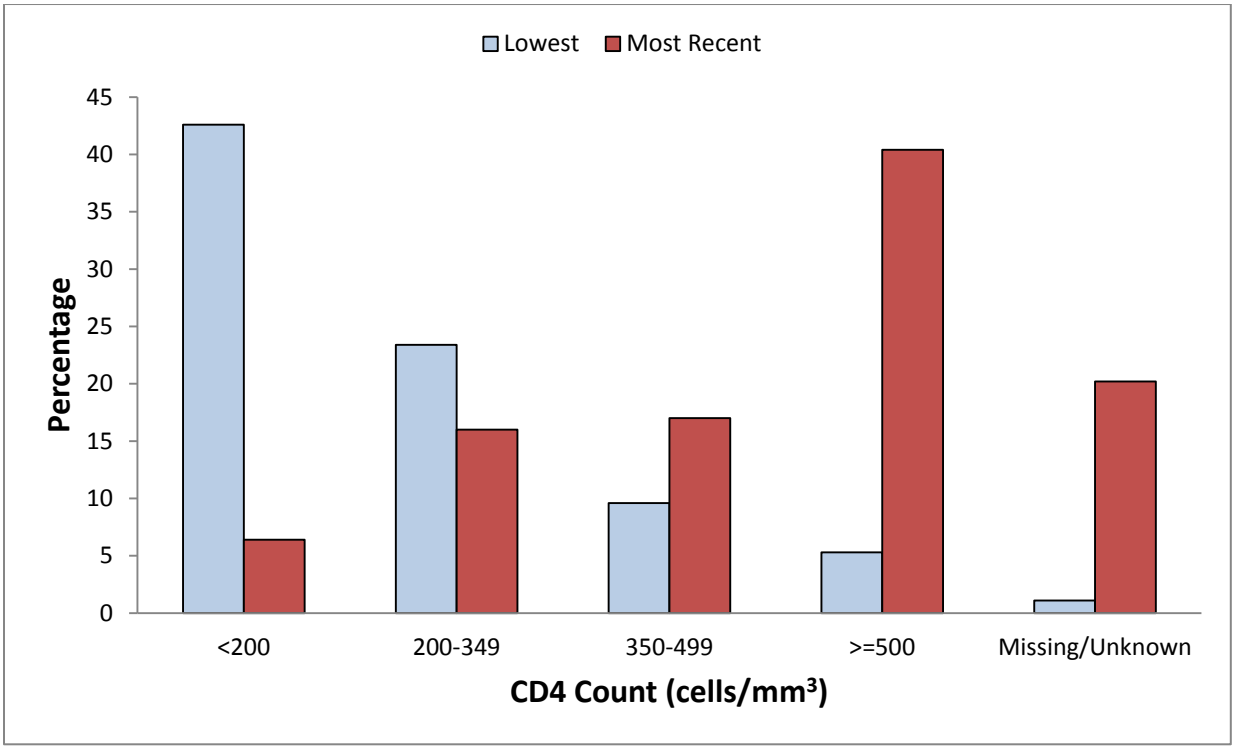


**Table 5. Age distribution of Asians and Native Hawaiians and Other Pacific Islanders living with HIV disease through December 31, 2009**

| | Asians | | | | Native Hawaiians and Other Pacific Islanders | | | |
|---|---|---|---|---|---|---|---|---|
| | HIV* | | AIDS† | | HIV* | | AIDS† | |
| Age group, years | Estimated number | % | Estimated number | % | Estimated number | % | Estimated number | % |
| <15 | 53 | 0.6 | 7 | 0.1 | 1 | 0.2 | 3 | 0.6 |
| 15–19 | 36 | 0.4 | 11 | 0.2 | 1 | 0.2 | 2 | 0.4 |
| 20–24 | 241 | 2.9 | 51 | 1.0 | 29 | 4.7 | 4 | 0.8 |
| 25–29 | 581 | 6.9 | 192 | 3.8 | 67 | 10.8 | 32 | 6.7 |
| 30–34 | 1,024 | 12.2 | 435 | 8.5 | 87 | 14.0 | 41 | 8.5 |
| 35–39 | 1,566 | 18.6 | 850 | 16.6 | 105 | 16.9 | 60 | 12.5 |
| 40–44 | 1,605 | 19.1 | 1,008 | 19.7 | 103 | 16.6 | 97 | 20.2 |
| 45–49 | 1,274 | 15.1 | 912 | 17.8 | 98 | 15.8 | 101 | 21.0 |
| 50–54 | 919 | 10.9 | 683 | 13.4 | 66 | 10.6 | 70 | 14.6 |
| 55–59 | 557 | 6.6 | 478 | 9.4 | 32 | 5.2 | 35 | 7.3 |
| 60–64 | 330 | 3.9 | 284 | 5.6 | 17 | 2.7 | 19 | 4.0 |
| 65+ | 237 | 2.8 | 200 | 3.9 | 14 | 2.3 | 17 | 3.5 |
| **Total** | **8,422** | | **5,112** | | **620** | | **481** | |

Modified from Tables 17b and 18b, Centers for Disease Control and Prevention. *HIV Surveillance Report 2010*, vol. 22. Pages 59, 62, 63. http://www.cdc.gov/hiv/topics/surveillance/resources/reports/. Published March 2012. Accessed April 6, 2012.

Column totals may differ from sum of estimated age groups counts because of rounding.

* Data from 46 states and 5 U.S. dependent areas were used for these estimates.

† Data from 50 states, the District of Columbia, and 6 U.S. dependent areas were used for these estimates.

**Table 6. Transmission category among Asians and Native Hawaiians and Other Pacific Islanders living with HIV disease through December 31, 2009**

| | Asians | | | | Native Hawaiians and Other Pacific Islanders | | | |
|---|---|---|---|---|---|---|---|---|
| | HIV* | | AIDS† | | HIV* | | AIDS† | |
| Category | Estimated number | % | Estimated number | % | Estimated number | % | Estimated number | % |
| **Males** | | | | | | | | |
| Men who have sex with men (MSM) | 5,609 | 81.8 | 3,283 | 77.7 | 425 | 84.0 | 317 | 80.7 |
| Injection drug use (IDU) | 286 | 4.2 | 228 | 5.4 | 18 | 3.6 | 21 | 5.3 |
| MSM & IDU | 290 | 4.2 | 211 | 5.0 | 33 | 6.5 | 27 | 6.9 |
| Heterosexual contact | 618 | 9.0 | 446 | 10.6 | 28 | 5.5 | 26 | 6.6 |
| Other | 51 | 0.7 | 59 | 1.4 | 1 | 0.2 | 3 | 0.8 |
| *Subtotal* | 6,854 | | 4,226 | | 506 | | 393 | |
| **Females** | | | | | | | | |
| IDU | 127 | 8.6 | 90 | 10.4 | 17 | 15.2 | 14 | 16.9 |
| Heterosexual contact | 1,287 | 87.4 | 711 | 82.0 | 92 | 82.1 | 66 | 79.5 |
| Other | 60 | 4.1 | 65 | 7.5 | 2 | 1.8 | 3 | 3.6 |
| *Subtotal* | 1,473 | | 867 | | 112 | | 83 | |
| **Children** (<13 years) | | | | | | | | |
| Perinatal | 63 | 67.0 | 14 | 77.8 | 2 | 100.0 | 5 | 100.0 |
| Other | 31 | 33.0 | 4 | 22.2 | 0 | 0.0 | 0 | 0.0 |
| *Subtotal* | 94 | | 18 | | 2 | | | |

Modified from Tables 17b and 18b, Centers for Disease Control and Prevention. *HIV Surveillance Report 2010*, vol. 22. Pages 59, 62, 63. http://www.cdc.gov/hiv/topics/surveillance/resources/reports/. Published March 2012. Accessed April 6, 2012.

Column subtotals may differ from sum of sex- and risk exposure-specific estimated counts due to rounding.

* Data from 46 states and 5 U.S. dependent areas were used for these estimates.

† Data from 50 states, the District of Columbia, and 6 U.S. dependent areas were used for these estimates.

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# APPENDIX

**Table A1. Distribution of population groups in the overall U.S. population, 2010**

| Population Group | Number | Percent |
|---|---|---|
| Hispanic | 50,477,594 | 16.3 |
| Non-Hispanic | | |
| American Indian and Alaska Native | 2,247,098 | 0.7 |
| **Asian** | **14,465,124** | **4.7** |
| Black or African American | 37,685,848 | 12.2 |
| **Native Hawaiian and Other Pacific Islander** | **481,576** | **0.2** |
| White | 196,817,552 | 63.7 |
| Other race | 604,265 | 0.2 |
| Two or more races | 5,966,481 | 1.9 |
| **Total** | **308,745,538** | **100.0** |

**Table A2. Top 20 U.S. metropolitan or micropolitan statistical areas with the largest Asian populations, 2010**

| Rank | Metropolitan or micropolitan statistical area | Total population | Non-Hispanic Asian population |
|---|---|---|---|
| **1** | New York-Northern New Jersey-Long Island, NY-NJ-PA | 18,897,109 | 1,860,840 |
| **2** | Los Angeles-Long Beach-Santa Ana, CA | 12,828,837 | 1,858,148 |
| **3** | San Francisco-Oakland-Fremont, CA | 4,335,391 | 994,616 |
| **4** | San Jose-Sunnyvale-Santa Clara, CA | 1,836,911 | 566,764 |
| **5** | Chicago-Joliet-Naperville, IL-IN-WI | 9,461,105 | 526,857 |
| **6** | Washington-Arlington-Alexandria, DC-VA-MD-WV | 5,582,170 | 513,919 |
| **7** | Honolulu, HI | 953,207 | 410,019 |
| **8** | Seattle-Tacoma-Bellevue, WA | 3,439,809 | 389,309 |
| **9** | Houston-Sugar Land-Baytown, TX | 5,946,800 | 384,596 |
| **10** | Dallas-Fort Worth-Arlington, TX | 6,371,773 | 337,815 |
| **11** | San Diego-Carlsbad-San Marcos, CA | 3,095,313 | 328,058 |
| **12** | Philadelphia-Camden-Wilmington, PA-NJ-DE-MD | 5,965,343 | 293,656 |
| **13** | Boston-Cambridge-Quincy, MA-NH | 4,552,402 | 292,786 |
| **14** | Atlanta-Sandy Springs-Marietta, GA | 5,268,860 | 252,510 |
| **15** | Sacramento--Arden-Arcade--Roseville, CA | 2,149,127 | 250,690 |
| **16** | Riverside-San Bernardino-Ontario, CA | 4,224,851 | 249,899 |
| **17** | Minneapolis-St. Paul-Bloomington, MN-WI | 3,279,833 | 187,047 |
| **18** | Las Vegas-Paradise, NV | 1,951,269 | 165,121 |
| **19** | Detroit-Warren-Livonia, MI | 4,296,250 | 140,558 |
| **20** | Phoenix-Mesa-Glendale, AZ | 4,192,887 | 134,415 |

Source: 2010 Census National Summary File of Redistricting Data (Table P2, Race and Hispanic Origin).

For an explanation of metropolitan and micropolitan statistical areas, see http://www.census.gov/population/metro/.

**Table A3. Top 20 U.S. metropolitan or micropolitan statistical areas with the largest Native Hawaiian and Other Pacific Islander populations, 2010**

| Rank | Metropolitan or micropolitan statistical area | Total population | Non-Hispanic Native Hawaiian and Other Pacific Islander population |
|---|---|---|---|
| **1** | Honolulu, HI Metro Area | 953,207 | 86,235 |
| **2** | Los Angeles-Long Beach-Santa Ana, CA Metro Area | 12,828,837 | 30,821 |
| **3** | San Francisco-Oakland-Fremont, CA Metro Area | 4,335,391 | 29,761 |
| **4** | Seattle-Tacoma-Bellevue, WA Metro Area | 3,439,809 | 27,275 |
| **5** | Hilo, HI Micro Area | 185,079 | 20,970 |
| **6** | Salt Lake City, UT Metro Area | 1,124,197 | 15,686 |
| **7** | Kahului-Wailuku, HI Micro Area | 154,834 | 15,257 |
| **8** | Sacramento–Arden-Arcade–Roseville, CA Metro Area | 2,149,127 | 14,874 |
| **9** | San Diego-Carlsbad-San Marcos, CA Metro Area | 3,095,313 | 13,504 |
| **10** | Las Vegas-Paradise, NV Metro Area | 1,951,269 | 12,474 |
| **11** | Riverside-San Bernardino-Ontario, CA Metro Area | 4,224,851 | 11,694 |
| **12** | Portland-Vancouver-Hillsboro, OR-WA Metro Area | 2,226,009 | 9,812 |
| **13** | Phoenix-Mesa-Glendale, AZ Metro Area | 4,192,887 | 8,212 |
| **14** | San Jose-Sunnyvale-Santa Clara, CA Metro Area | 1,836,911 | 6,317 |
| **15** | Anchorage, AK Metro Area | 380,821 | 5,990 |
| **16** | Kapaa, HI Micro Area | 67,091 | 5,716 |
| **17** | Dallas-Fort Worth-Arlington, TX Metro Area | 6,371,773 | 5,431 |
| **18** | Fayetteville-Springdale-Rogers, AR-MO Metro Area | 463,204 | 5,000 |
| **19** | New York-Northern New Jersey-Long Island, NY-NJ-PA Metro Area | 18,897,109 | 4,859 |
| **20** | Provo-Orem, UT Metro Area | 526,810 | 3,832 |

Source: 2010 Census National Summary File of Redistricting Data (Table P2, Race and Hispanic Origin).

For an explanation of metropolitan and micropolitan statistical areas, see http://www.census.gov/population/metro/.

**Table A4. Selected characteristics for hepatitis B testing and testing positive among Asians in 4 health plans[*]**

| | Asian members in 4 health plans[†] | | Had at least one positive test (surface antigen or DNA[§]) among those tested[¶] | |
|---|---|---|---|---|
| | % Total | N | % Row | (n/N) |
| **Overall** | 100.0% | 60,097 | 4.2% | (671/16,044) |
| **Sex** | | | | |
| Female | 59.1% | 35,517 | 4.0% | (429/10,721) |
| Male | 40.9% | 24,580 | 4.6% | (242/5,323) |
| **Age group, years** | | | | |
| <30 | 15.5% | 9,282 | 3.3% | (84/2,548) |
| 30–39 | 17.2% | 10,316 | 3.8% | (152/4,022) |
| 40–49 | 17.9% | 10,764 | 5.0% | (151/3,024) |
| 50–59 | 18.8% | 11,299 | 5.8% | (153/2,661) |
| 60–69 | 14.0% | 8,438 | 4.1% | (78/1,902) |
| 70–79 | 9.1% | 5,442 | 3.2% | (36/1,110) |
| ≥80 | 7.6% | 4,556 | 2.2% | (17/777) |
| **Median household income[**]** | | | | |
| <$30K | 6.1% | 3,647 | 3.8% | (35/931) |
| $30–49K | 34.4% | 20,641 | 4.5% | (254/5,669) |
| $50–74K | 43.7% | 26,279 | 3.9% | (270/6,855) |
| ≥$75K | 13.0% | 7,834 | 4.5% | (103/2,272) |
| Not reported | 2.8% | 1,696 | 2.8% | (9/317) |

* The four health plans are Geisinger Health System, Danville, PA; Henry Ford Health System, Detroit MI; Kaiser Permanente-Northwest, Portland, OR; and Kaiser Permanente-Hawaii.

† Excluded in study if had a prior documented infection with hepatitis B at health plan entry.

§ Laboratory markers indicating the presence of circulating hepatitis B virus.

¶ The denominator used to derive the percent of prevalent positives was the number of Asian patients who were ever tested for hepatitis B.

** Census tract geocoding, defined as matching patient address information to census tract data, was used to obtain median household income information.

Source: Spradling PR, Rupp L, Moorman AC, et al. Hepatitis B and C virus infection among 1.2 million persons with access to care: Factors associated with testing and infection prevalence. *Clin Infect Dis* [in press].

**Table A5. Selected characteristics for hepatitis B testing and testing positive among Native Hawaiians and Other Pacific Islanders in 4 health plans[*]**

| | NHPI[†] members in 4 health plans[§] | | Had at least one positive test (surface antigen or DNA[¶]) among those tested[**] | |
|---|---|---|---|---|
| | % Total | N | % Row | (n/N) |
| **Overall** | 100.0% | 28,492 | 2.5% | (180/7,294) |
| **Sex** | | | | |
| Female | 55.0% | 15,667 | 2.2% | (99/4,596) |
| Male | 45.0% | 12,825 | 3.0% | (81/2,698) |
| **Age group, years** | | | | |
| <30 | 25.9% | 7,390 | 2.3% | (47/2,027) |
| 30–39 | 19.8% | 5,641 | 1.9% | (34/1,812) |
| 40–49 | 18.4% | 5,232 | 3.5% | (45/1,288) |
| 50–59 | 15.9% | 4,527 | 2.6% | (26/992) |
| 60–69 | 11.1% | 3,173 | 3.1% | (21/682) |
| 70–79 | 5.9% | 1,675 | 0.6% | (2/346) |
| ≥80 | 3.0% | 854 | 3.4% | (5/147) |
| **Median household income[††]** | | | | |
| <$30K | 5.3% | 1,514 | 1.2% | (5/411) |
| $30–49K | 34.9% | 9,942 | 2.2% | (55/2,509) |
| $50–74K | 47.4% | 13,516 | 2.8% | (97/3,488) |
| ≥$75K | 11.0% | 3,122 | 2.7% | (22/816) |
| Not reported | 1.4% | 398 | 1.4% | (1/70) |

* The four health plans are Geisinger Health System, Danville, PA; Henry Ford Health System, Detroit MI; Kaiser Permanente-Northwest, Portland, OR; and Kaiser Permanente-Hawaii.

† Native Hawaiian and Other Pacific Islander.

§ Excluded in study if had a prior documented infection with hepatitis B at health plan entry.

¶ Laboratory markers indicating the presence of circulating hepatitis B virus.

** The denominator used to derive the percent of prevalent positives was the number of Native Hawaiians and Other Pacific Islanders patients who were ever tested for hepatitis B.

†† Census tract geocoding, defined as matching patient address information to census tract data, was used to obtain median household income information.

Source: Spradling PR, Rupp L, Moorman AC, et al. Hepatitis B and C virus infection among 1.2 million persons with access to care: Factors associated with testing and infection prevalence. *Clin Infect Dis* [in press].

**Table A6. Selected characteristics for hepatitis C testing and testing positive among Asians in 4 health plans[*]**

| | Asian members in 4 health plans[†] | | Ever tested positive (antibody[§]) among those tested[¶] | |
|---|---|---|---|---|
| | % Total | N | % Row | (n/N) |
| **Overall** | 100.0% | 60,177 | 4.3% | (391/9,025) |
| **Sex** | | | | |
| Female | 59.1% | 35,559 | 4.0% | (213/5,289) |
| Male | 40.9% | 24,618 | 4.8% | (178/3,736) |
| **Age group, years** | | | | |
| <30 | 15.5% | 9,302 | 3.9% | (42/1,067) |
| 30–39 | 17.2% | 10,342 | 2.3% | (35/1,535) |
| 40–49 | 17.9% | 10,783 | 3.3% | (57/1,723) |
| 50–59 | 18.8% | 11,311 | 7.2% | (136/1,888) |
| 60–69 | 14.0% | 8,443 | 4.9% | (68/1,390) |
| 70–79 | 9.0% | 5,437 | 4.1% | (34/834) |
| ≥80 | 7.6% | 4,559 | 3.2% | (19/588) |
| **Median household income[**]** | | | | |
| <$30K | 6.1% | 3,649 | 2.8% | (15/545) |
| $30–49K | 34.3% | 20,666 | 4.7% | (144/3,048) |
| $50–74K | 43.7% | 26,312 | 4.5% | (176/3,891) |
| ≥$75K | 13.1% | 7,854 | 4.0% | (54/1,348) |
| Not reported | 2.8% | 1,696 | 1.0% | (2/193) |

* The four health plans are Geisinger Health System, Danville, PA; Henry Ford Health System, Detroit MI; Kaiser Permanente-Northwest, Portland, OR; and Kaiser Permanente-Hawaii.

† Excluded in study if had a prior documented infection with hepatitis C at health plan entry.

§ Laboratory marker indicating past or present infection with hepatitis C.

¶ The denominator used to derive the percent of prevalent positives was the number of Asian patients who were ever tested for hepatitis C.

** Census tract geocoding, defined as matching patient address information to census tract data, was used to obtain median household income information.

Source: Spradling PR, Rupp L, Moorman AC, et al. Hepatitis B and C virus infection among 1.2 million persons with access to care: Factors associated with testing and infection prevalence. *Clin Infect Dis* [in press].

**Table A7. Selected characteristics for hepatitis C testing and testing positive among Native Hawaiians and Other Pacific Islanders (NHPI) in 4 health plans[*]**

| | NHPI members in 4 health plans[†] | | Ever tested positive (antibody[§]) among those tested[¶] | |
|---|---|---|---|---|
| | % Total | N | % Row | (n/N) |
| **Overall** | 100.0% | 28,494 | 4.4% | (175/3,999) |
| **Sex** | | | | |
| Female | 55.0% | 15,667 | 3.5% | (78/2,211) |
| Male | 45.0% | 12,827 | 5.4% | (97/1,788) |
| **Age group, years** | | | | |
| <30 | 25.9% | 7,391 | 3.0% | (26/869) |
| 30–39 | 19.8% | 5,641 | 2.3% | (19/824) |
| 40–49 | 18.3% | 5,227 | 5.1% | (37/730) |
| 50–59 | 15.9% | 4,529 | 7.0% | (48/682) |
| 60–69 | 11.1% | 3,176 | 6.5% | (33/509) |
| 70–79 | 5.9% | 1,676 | 3.7% | (10/269) |
| ≥80 | 3.0% | 854 | 1.7% | (2/116) |
| **Median household income[**]** | | | | |
| <$30K | 5.3% | 1,514 | 5.7% | (13/230) |
| $30–49K | 34.9% | 9,950 | 3.7% | (50/1,361) |
| $50–74K | 47.4% | 13,516 | 4.4% | (86/1,940) |
| ≥$75K | 10.9% | 3,117 | 5.7% | (25/438) |
| Not reported | 1.4% | 397 | 3.3% | (1/30) |

* The four health plans are Geisinger Health System, Danville, PA; Henry Ford Health System, Detroit MI; Kaiser Permanente-Northwest, Portland, OR; and Kaiser Permanente-Hawaii.

† Excluded in study if had a prior documented infection with hepatitis C at health plan entry.

§ Laboratory marker indicating past or present infection with hepatitis C.

¶ The denominator used to derive the percent of prevalent positives was the number of Native Hawaiians and Other Pacific Islanders patients who were ever tested for hepatitis C.

** Census tract geocoding, defined as matching patient address information to census tract data, was used to obtain median household income information.

Source: Spradling PR, Rupp L, Moorman AC, et al. Hepatitis B and C virus infection among 1.2 million persons with access to care: Factors associated with testing and infection prevalence. *Clin Infect Dis* [in press].

**Table A8. Characteristics of Asian or Native Hawaiian and Other Pacific Islander (API) Participants of the Medical Monitoring Project, 2007–2009**

| Characteristics | N* | (%) |
|---|---|---|
| **Age group, years** | | |
| 18–34 | 19 | (20.2) |
| 35–44 | 29 | (30.9) |
| 45–54 | 36 | (38.3) |
| ≥55 | 10 | (10.6) |
| **Gender** | | |
| Male | 77 | (81.9) |
| Female | 14 | (14.9) |
| **Country of birth** | | |
| United States | 56 | (59.6) |
| Outside United States | 38 | (40.4) |
| **Education** | | |
| <High school | 13 | (13.8) |
| High school diploma or GED credential | 15 | (16.0) |
| >High school | 66 | (70.2) |
| **Health insurance or coverage, past 12 months** | | |
| Yes | 80 | (85.1) |
| No | 14 | (14.9) |
| **Received public assistance, past 12 months** | | |
| Yes | 45 | (47.9) |
| No | 49 | (52.1) |
| **Year(s) since HIV diagnosis** | | |
| <5 | 20 | (21.3) |
| 5–9 | 22 | (23.4) |
| ≥10 years | 48 | (51.1) |
| **Total** | **94** | **(100)** |

* Numbers might not add to total because of missing or unknown data.

**Table A9. Characteristics of Asian or Native Hawaiian and Other Pacific Islander (API) men who have sex with men participants[*] of the National HIV Behavioral Surveillance System (NHBS), 2008**

| Characteristics | N[†] | (%) |
|---|---|---|
| **Age group (interview data), years** | | |
| 18–24 | 46 | (17.8) |
| 25–29 | 77 | (29.8) |
| 30–39 | 93 | (36.0) |
| ≥40 | 42 | (16.3) |
| **Sexual identity** | | |
| Gay | 234 | (90.7) |
| Bisexual | 22 | (8.5) |
| **Race** | | |
| Asian | 199 | (77.1) |
| Native Hawaiian and Other Pacific Islander | 59 | (22.9) |
| **Country of birth** | | |
| United States | 111 | (43.0) |
| Outside United States | 147 | (57.0) |
| **Education** | | |
| Not more than high school diploma or equivalent | 29 | (11.2) |
| More than high school | 229 | (88.8) |
| **Annual household income** | | |
| <$20,000 | 47 | (18.2) |
| $20,000–$39,999 | 55 | (21.3) |
| $40,000–$74,999 | 79 | (30.6) |
| ≥$75,000 | 76 | (29.5) |
| **Health insurance or coverage, past 12 months** | | |
| None | 61 | (23.6) |
| Private only | 183 | (70.9) |
| Public only | 13 | (5.0) |
| **Total** | **258** | **(100)** |

* This analysis included API men who reported having sex with another man in the 12 months preceding the NHBS interview, completed the interview, and did not report being HIV positive.

† Numbers might not add to total because of missing or unknown data.

**Table A10. Among Asian or Native Hawaiian and Other Pacific Islander (API) men who have sex with men[*], number[†] and percentage reporting anal sex during their most recent sexual encounter with a male partner, by type and HIV status of partner and substance use during encounter, National HIV Behavioral Surveillance System (NHBS), 2008**

| | Insertive anal sex | | Receptive anal sex | | |
|---|---|---|---|---|---|
| **Characteristic** | **Total N (%)** | **Unprotected n (%)** | **Total N (%)** | **Unprotected n (%)** | **Total** |
| **Partner type** | | | | | |
| Main | 83 (70.3) | 31 (37.3) | 84 (71.2) | 37 (44.0) | 118 |
| Casual | 82 (58.6) | 23 (28.0) | 79 (56.4) | 28 (35.4) | 140 |
| **Partner's HIV status** | | | | | |
| Not infected | 93 (50.5) | 29 (31.2) | 89 (48.4) | 33 (37.1) | 184 |
| Infected or unknown | 31 (41.9) | 9 (29.0) | 26 (35.1) | 9 (34.6) | 74 |
| **Alcohol or drug use during most recent sexual encounter** | | | | | |
| Yes | 43 (50.6) | 14 (32.6) | 43 (50.6) | 13 (30.2) | 85 |
| No | 81 (46.8) | 24 (29.6) | 72 (41.6) | 29 (40.3) | 173 |
| **Total** | **124 (48.1)** | **38 (30.6)** | **115 (44.6)** | **42 (36.5)** | **258** |

* This analysis included API men who reported having sex with another man in the 12 months preceding the NHBS interview, completed the interview, and did not report being HIV positive.

† Numbers might not add to total because of missing or unknown data.

**Table A11. Prevalence of HIV infection, by selected characteristics of Asian or Native Hawaiian and Other Pacific Islander (API) men who have sex with men who were tested for HIV[*] as part of the National HIV Behavioral Surveillance System (NHBS), 2008**

| | Number tested for HIV[†] | Tested positive for HIV n (%) |
|---|---|---|
| **Age group, years** | | |
| 18–24 | 45 | 0 (0.0) |
| 25–29 | 75 | 5 (6.7) |
| 30–39 | 87 | 16 (18.4) |
| 40+ | 40 | <5 (<15) |
| **Country of birth** | | |
| United States | 105 | 9 (8.6) |
| Outside United States | 142 | 16 (11.3) |
| **Education** | | |
| Not more than high school diploma or equivalent | 30 | 6 (20.0) |
| More than high school | 217 | 19 (8.8) |
| **Annual household income** | | |
| 0 to $19,999 | 48 | 10 (20.8) |
| $20,000 to $39,999 | 55 | 5 (9.1) |
| $40,000 or more | 143 | 10 (7.0) |
| **Health insurance** | | |
| Private only | 170 | 12 (7.1) |
| None or public only | 76 | 13 (17.1) |
| **Previous HIV test** | | |
| Past 12 months | 143 | 7 (4.9) |
| Never tested or tested more than 1 year ago | 103 | 18 (17.5) |
| **Total** | **247** | **25 (10.1)** |

* This analysis included API men who reported having sex with another man in the 12 months preceding the NHBS interview, completed both the interview and HIV testing for NHBS, and either had a negative or confirmed positive HIV test result.

† Numbers might not add to total because of missing or unknown data.