2007 DISEASE PROFILE

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

U.S. Department of Health and Human Services
Centers for Disease Control and Prevention

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INTRODUCTION

INTRODUCTION

The National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention (NCHHSTP) of the Centers for Disease Control and Prevention (CDC) continues to recognize the value of establishing an integrated approach to disease control and prevention. Identifying patterns and trends in the populations affected by more than one of the diseases within the purview of the center creates efficiencies at the federal level and helps public health practitioners at all levels improve upon their efforts to prevent, control, and treat disease.

Of the five divisions in NCHHSTP, four (i.e., the Division of HIV/AIDS Prevention, the Division of Viral Hepatitis, the Division of STD Prevention, and the Division of Tuberculosis Elimination) publish yearly surveillance reports on the infections and diseases in their respective programs. In addition to these reports, NCHHSTP published its inaugural *2006 Disease Profile* in 2008 as a first step toward an integrated approach to the prevention of human immunodeficiency virus (HIV)/acquired immunodeficiency syndrome (AIDS), viral hepatitis, sexually transmitted diseases (STDs), and tuberculosis (TB). This profile not only gathered program-specific data into a single publication but also highlighted the disease trends and relationships stratified by selected demographic groups and risk categories. The *2007 Disease Profile* reflects NCHHSTP's continuing commitment to enhancing its mission through better integration of center-based data and programs.

Background

As evidenced by the data collected from NCHHSTP-established surveillance systems, millions of persons in the United States are affected by HIV/AIDS, viral hepatitis, STDs, and TB. These disease-specific systems regularly receive data on new infections, which are used in calculating disease incidence and prevalence and the burden of disease among various population groups. Moreover, they provide the public health community with information essential for directing prevention and control efforts. In addition, data from enhanced public health surveillance and epidemiologic studies expose relationships among these diseases, most notably between HIV infection and some STDs, hepatitis B and C, and TB. These relationships have implications for the prevention of new infection and the progression of disease. For example, persons who are coinfected with HIV and hepatitis B may be more difficult to treat and more likely to pass on either infection by engaging in risky behaviors. It is therefore important to examine the data for patterns and trends and identify where the data intersect, which can guide programmatic efforts for a more effective public health response. Ultimately, this effort will be enhanced through the development of a standard system that conducts surveillance of multiple diseases.

Data Integration

Even before NCHHSTP identified program collaboration and service integration as one of its top priorities, the center began to implement additional, enhanced data collection systems that were designed to facilitate the collection, analysis, and use of integrated data. A number of these systems, at various stages of development and implementation, are described below.

Recognizing the need to build upon the relationships identified through traditional surveillance systems and research, NCHHSTP's Division of HIV/AIDS Prevention outlined plans for a project that would identify occurrences of coinfection. In 2007, the Medical Monitoring Project (MMP) was developed to collect information regarding coinfection with HIV. Cosponsored by CDC, the National Institutes of Health, and the Health Resources and Services Administration, the MMP was designed to increase

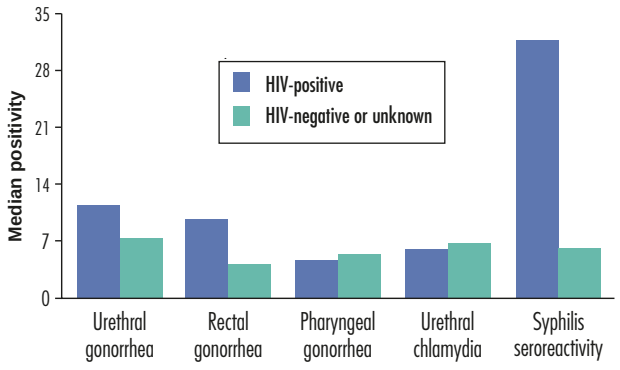
understanding and knowledge regarding the experiences and needs of persons who receive care for HIV infection in the United States. The project encompasses two components: a personal interview and medical record abstraction. These data should provide insight into coinfection with HIV and other laboratory-confirmed diseases (other STDs, TB, and viral hepatitis), including characteristics of the affected populations.

It is anticipated that the MMP will help inform HIV and STD prevention and control activities (e.g., providing increased HIV testing in areas with high rates of STDs and incorporating STD screening into HIV prevention programs) and ultimately improve the health of the persons affected by these diseases. Data obtained through MMP regarding opportunistic infections (including TB) that occur with HIV infection also can be examined to better understand disease relationships and to highlight additional opportunities for prevention (e.g., the creation of integrated education and screening initiatives).

Other NCHHSTP initiatives contribute to an integrated approach. In 1999, the Division of STD Prevention established the National MSM (men who have sex with men) Prevalence Monitoring Project to assess the prevalence of, and trends in, STD and HIV infections, including the behaviors that increase the risk for men who have sex with men (MSM). The project routinely collects demographic data such as age and race/ethnicity, and information about STD symptoms from MSM attending STD clinics in 7–10 U.S. cities. In addition, test-result positivity is documented for several STDs, including chlamydia, gonorrhea, syphilis, and HIV infection. For example, in 2007, of MSM who had evidence of infection with one of the three reportable STDs, many were coinfected with HIV (Figure 1).

Another data-integration effort by the Division of STD Prevention is the Gonococcal Isolate Surveillance Project—a collaborative project involving selected STD clinics in various locations, regional laboratories, and CDC. Established in 1986 to monitor trends in antimicrobial susceptibilities of *Neisseria gonorrhoeae*, the project collects HIV coinfection data, along with information on age, race/ethnicity, sexual orientation, and symptoms, from men attending STD clinics.

Figure 1. MSM Prevalence Monitoring Project: gonorrhea, chlamydia, and syphilis among men who have sex with men, by HIV serostatus—STD clinics, 2007



Implementation of the STD Surveillance Network (SSuN) further illustrates the NCHHSTP surveillance activities that are being conducted to understand the relationships between STDs and other infectious diseases and related program services. SSuN was established in 2005 as a network of six collaborating state and local health departments to monitor trends in STDs and related risk behaviors and to respond promptly to emerging diseases and associated risk behaviors. In 2008, this network was expanded to include 12 geographically diverse health departments that conduct both STD clinic-based and population-based surveillance. Through SSuN, participating health departments obtain information about STDs, HIV, risk behaviors, and services (i.e., treatment, vaccination, HIV testing).

NCHHSTP's Division of Tuberculosis Elimination also collects and compiles data in an effort to understand the relationships between diseases. For instance, because HIV-infected persons are known to be disproportionately affected by TB, coinfection data are collected through several mechanisms. For example, the National TB Surveillance System collects information on reported HIV infection status among persons with confirmed TB for 49 states and the District of Columbia. Data are obtained through patient interviews conducted by state and local TB programs. Through this surveillance system, additional HIV-related information is collected about TB patients whose HIV serostatus is unknown; these data include whether testing was offered, whether testing was refused, whether testing yielded

indeterminate or missing results, or whether data were missing.

The inclusion of HIV-related questions on CDC's TB surveillance data form has assisted with the collection and reporting of HIV-TB coinfection data. Since 1993, this form has enabled public health practitioners at state and local levels to obtain HIV-testing information from patients with verified TB. Efforts to collect these data, as exemplified by the National TB Surveillance System, have facilitated optimal case management and have enabled the development of more specifically targeted TB screening and prevention services.

More recently, efforts to match viral hepatitis surveillance data with data from AIDS surveillance have been carried out. The Connecticut Department of Public Health has conducted AIDS surveillance since 1982 and has conducted chronic hepatitis C surveillance since 1994. In 2007, the two surveillance databases were matched to measure coinfection and to describe the characteristics of these cases. In 2008, Oregon and Colorado followed this example and in collaboration with CDC, conducted similar matches. Methods and results from the three sites are expected to be published later this year.

About the 2007 Disease Profile

The *2007 Disease Profile* outlines the patterns and trends for HIV/AIDS, viral hepatitis, STDs, and TB and highlights the interrelationships of diseases and populations in the United States.[1] Similar to the 2006 profile, the 2007 profile is intended to raise awareness of the relationships among these diseases and demonstrate the usefulness not only of bringing together, in one report, the data from separate systems but also of developing new surveillance systems to describe populations affected by multiple diseases.

To this end, the profile includes a chapter dedicated to a special population currently affected by more than one of the diseases within the purview of NCHHSTP. The *2007 Disease Profile* focuses on reproductive-aged women (i.e., those aged 15–44 years), a population that has experienced important disparities, particularly in terms of sociodemographic characteristics other than age.

[1]In this document, the term Hispanic is used to refer to persons who identify their ethnicity as "Hispanic or Latino."

HIV/AIDS

About HIV/AIDS

Human immunodeficiency virus (HIV) is a retrovirus that affects the immune system of infected persons by destroying T cells, a type of white blood cell on which the body relies to fight infection. Although initial infection with HIV can result in flulike symptoms (e.g., fever, chills, and swollen glands) about 2 weeks after virus transmission, HIV-infected persons typically have no symptoms for many years. As HIV infection progresses, infected persons begin to show signs and symptoms of a weakened immune system; they often become sick with diseases that reflect loss of the ability of the body to fight infection (e.g., shingles, tuberculosis, oral or vaginal thrush, herpes simplex virus, and Kaposi sarcoma). When HIV-specific opportunistic infections or conditions develop or the immune system is suppressed below a specific level, HIV-infected persons are considered to have acquired immunodeficiency syndrome (AIDS).

HIV is fragile and cannot persist outside the body. Because the virus is mainly found in blood, semen, and vaginal fluid, it is not transmitted through casual contact. Instead, the virus is transmitted primarily through having sex (anal, vaginal, or oral) with someone infected with HIV, sharing needles and syringes with someone infected with HIV, and being exposed (as a fetus or an infant) to HIV before or during birth or through breastfeeding. Persons who receive blood, blood products, or organs from persons with HIV infection can also become infected; however, this type of transmission is now rare in the United States because the U.S. blood supply has, since 1985, been routinely screened for HIV.

No vaccine is available to protect persons from becoming infected with HIV. However, antiretroviral drugs can be used to reduce the viral load of HIV in the body and delay the progression of HIV infection to AIDS. Treatment with antiretroviral drugs can prolong life expectancy and quality of life. Also, the timely use of appropriate antiretroviral regimens can drastically reduce the likelihood of HIV transmission from infected mothers to their newborn children and the likelihood of transmission associated with occupational exposure (e.g., needlesticks).

Tracking HIV/AIDS

HIV/AIDS surveillance can help inform disease prevention and control efforts at local, state, and national levels by determining the burden of disease. To obtain an accurate measure of the HIV/AIDS epidemic, surveillance must be conducted for both HIV infection and AIDS. In the absence of HIV data, determining the annual number of newly diagnosed cases of AIDS in a specific population does not present a complete picture of the burden or the impact of the disease because many other persons have been infected with HIV, but symptoms have not yet developed.

Since recognition of the HIV/AIDS epidemic in 1981, states have conducted AIDS surveillance by using a standardized, confidential name-based reporting system; each state removes all personally identifying information from each case report before transmitting the information to CDC's HIV/AIDS Reporting System. In 1994, CDC began integrating HIV diagnosis reporting with AIDS reporting, and 25 states started reporting HIV diagnoses to CDC. Over the years, additional states implemented HIV infection reporting. By 2004, all states had adopted some type of system enabling them to collect and report data on cases of HIV infection, regardless of whether these cases had progressed to AIDS. These data were reported as HIV/AIDS cases. The term *HIV/AIDS* refers to three categories of HIV diagnoses collectively: (1) a diagnosis of HIV infection without a later diagnosis of AIDS; (2) a diagnosis of HIV infection and then a later diagnosis of AIDS; and (3) concurrent diagnoses of HIV infection and AIDS

HIV/AIDS: Key Findings

- In 2007, a total of 42,655 new diagnoses of HIV/AIDS (i.e., HIV disease, regardless of progression to AIDS) were made in the 34 states that had been conducting confidential name-based HIV infection reporting since 2003.[1]
- The rate of new HIV/AIDS diagnoses for 2007 in the 34 states was 21 cases per 100,000.
- In 2007, the rate of AIDS diagnoses[2] was 12 cases per 100,000.
- From 2003 through 2007, the number of AIDS diagnoses decreased 62% among children aged <13 years.
- In 2007, 15% of the HIV/AIDS diagnoses and 19% of the AIDS diagnoses were for persons aged 40–44 years.
- About half (51%) of all HIV/AIDS diagnoses in 2007 in the 34 states were made for African Americans (rate, 77 cases per 100,000). The rates of new diagnoses among other races/ethnicities were 35 cases per 100,000 among Native Hawaiians/other Pacific Islanders,[3] 28 cases per 100,000 among Hispanics, and 9 cases per 100,000 among whites.
- The rates of AIDS cases diagnosed in 2007 in the 50 states and the District of Columbia were also higher among African Americans (47 per 100,000), Native Hawaiians/other Pacific Islanders (18 per 100,000), and Hispanics (15 per 100,000) than among whites (about 5 cases per 100,000).
- From 2003 through 2007, the number of newly diagnosed AIDS cases decreased among African Americans, American Indians/Alaska Natives, and whites; remained stable among Hispanics; and increased among Asians and Native Hawaiians/other Pacific Islanders.
- About three-fourths of the cases of HIV/AIDS and of AIDS diagnosed in 2007 occurred among men.
- Men who have sex with men (MSM) and persons exposed to HIV through high-risk heterosexual contact (i.e., heterosexual contact with someone known to have, or to be at high risk for, HIV infection) accounted for 85% of all cases of HIV/AIDS diagnosed in 2007.
- From 2003 through 2007, the number of diagnosed AIDS cases decreased 14% in the northeastern region of the United States and 5% in the South and the West.
- The number of AIDS-related deaths decreased 17% from 2003 through 2007.
- In 2007, a total of 455,636 persons in the 50 states and the District of Columbia were living with AIDS; this number increased steadily from 2003 through 2007.

[1] CDC used surveillance data from the following states to obtain 2007 HIV/AIDS estimates: Alabama, Alaska, Arizona, Arkansas, Colorado, Florida, Georgia, Idaho, Indiana, Iowa, Kansas, Louisiana, Michigan, Minnesota, Mississippi, Missouri, Nebraska, Nevada, New Jersey, New Mexico, New York, North Carolina, North Dakota, Ohio, Oklahoma, South Carolina, South Dakota, Tennessee, Texas, Utah, Virginia, West Virginia, Wisconsin, and Wyoming.

[2] AIDS estimates for 2007 include data from all 50 states and the District of Columbia.

[3] Use caution when interpreting rates for Native Hawaiians/other Pacific Islanders because the number of cases is low and the population group is small.

(i.e., diagnoses of HIV infection and AIDS within the same calendar month). However, by 2007 only 39 U.S. reporting areas (34 states and five U.S.-dependent areas) were considered mature (i.e., they had collected name-based HIV infection data long enough to obtain accurate estimates). Therefore, for 2007, CDC analyzed HIV surveillance data from only these 39 reporting areas. AIDS estimates, however, include data from all 50 states and the District of Columbia.

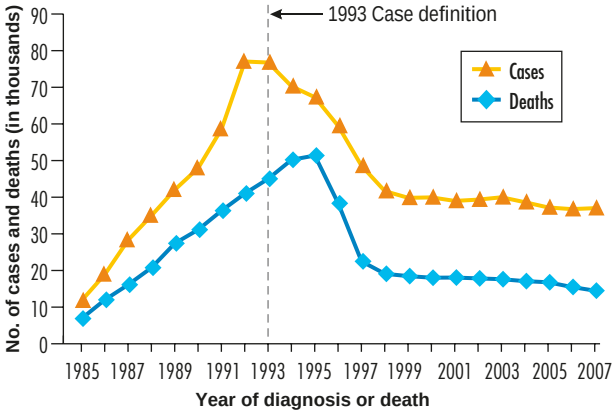
The time that elapses between the initial diagnosis of HIV/AIDS cases and the reporting of cases to state and local health departments varies. Because cases reported during a given period could have been diagnosed before the year of report, the estimated

(statistically adjusted) numbers of diagnosed cases are more useful than the reported numbers of cases in characterizing the impact of HIV/AIDS in the United States for a particular period. In this chapter, the data are not reported case counts; they are estimates resulting from statistical adjustments to account for reporting delays and missing risk-factor information (the numbers have not been statistically adjusted for incomplete reporting).

National Snapshot

In 2007, an estimated 42,655 new cases of HIV/AIDS (i.e., HIV disease, regardless of progression to AIDS) were diagnosed in 34 states; this number represents a 15% increase over the 37,193 cases diagnosed in 2006. The rate of new cases of HIV/AIDS diagnosed in these states in 2007 was 21 cases per 100,000. For AIDS, the number of cases diagnosed in the 50 states and the District of Columbia in 2007 was 35,962 (rate, 12 cases per 100,000). The annual number of AIDS diagnoses declined from 2003 through 2006 (Figure 2) but increased slightly from 2006 through 2007.

Figure 2. AIDS cases and deaths among adults and adolescents—United States and dependent areas, 1985–2007



Note: Data have been adjusted for reporting delays.

In addition to estimating the number of newly diagnosed cases of disease, CDC estimated the number of persons living with HIV/AIDS and AIDS at the end of 2007. From 2004 through 2007, the number of persons living with HIV/AIDS increased in the 34 states: 551,932 persons were living with HIV/AIDS in 2007, compared with 475,688 in 2004. The number of persons living with AIDS also increased. CDC estimated that in the 50 states and the District of Columbia, the number of persons living with AIDS increased from 393,200 at the end of 2004 to 455,636 at the end of 2007.

Geographic Trends

Understanding the temporal trends and geographic distribution in HIV/AIDS diagnoses has been complicated by several factors, including state-to-state variations in the completeness and methods of reporting (particularly for diagnoses of HIV infection). Because data on diagnoses of HIV infection (regardless of progression to AIDS) have only recently begun to be collected routinely in many states, determining state or regional trends in HIV infection has been difficult. However, geographic differences and trends in the prevalence of AIDS can be determined annually, as all 50 states, the District of Columbia, and dependent areas have been reporting AIDS data since the early 1980s.

AIDS data are analyzed by geographic region to help identify areas in need of specific public health interventions. CDC has estimated that during 2003–2007, more persons in the southern United States were living with AIDS than in any other part of the country, followed by persons in the Northeast. In 2007, about 184,000 and 131,000 persons were living with AIDS in these regions, respectively. For several years, the numbers of persons living with AIDS have remained lower in the Midwest than in any other region. In 2007, the rates for persons living with AIDS varied substantially by U.S. reporting area: the lowest rate for adults and adolescents (i.e., persons ≥13 years of age) was that for the U.S. dependent area of American Samoa (2 cases per 100,000), and the highest rate was that for the District of Columbia (1,751 cases per 100,000). The rates for children (< 13 years of age) living with AIDS also varied, ranging from zero cases per 100,000 in several reporting areas to 30 cases per 100,000 in the District of Columbia.

The number of persons living with HIV/AIDS (regardless of progression to AIDS) at the end of 2007 has been estimated for each of the 34 states. Among those states, New York had the highest number of

residents living with HIV/AIDS, followed by Florida and Texas.

Population Trends

Race/Ethnicity, Sex, and Age

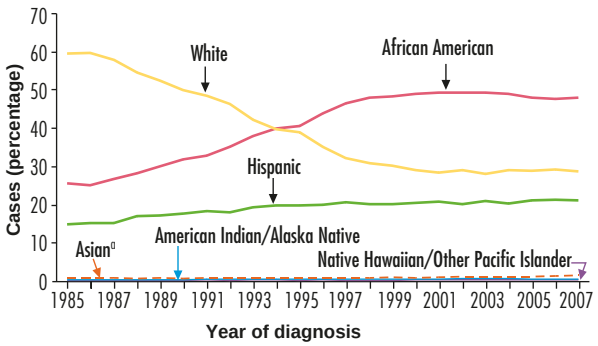
HIV/AIDS continues to disproportionately affect persons of some minority races/ethnicities. Half of all HIV/AIDS diagnoses in 2007 in the 34 states with mature HIV infection reporting systems were made for African Americans, for a rate of 77 cases per 100,000.

In 2007, the Asian/Pacific Islander category, used in earlier HIV/AIDS surveillance reports, was split into two separate groups (Asians and Native Hawaiians/other Pacific Islanders). Thus, disease burden for 2007 in some populations differs substantially from that described in previous reports. For instance, the second highest rate of HIV/AIDS was that for Native Hawaiians/other Pacific Islanders (35 cases per 100,000), followed by Hispanics (28 cases per 100,000), American Indians/Alaska Natives (13 cases per 100,000), whites (9 cases per 100,000), and Asians (almost 8 cases per 100,000). Caution should be used in interpreting the disease rates for Native Hawaiians/other Pacific Islanders because the number of cases is low and the population group is small.

Data regarding race/ethnicity also are collected and analyzed for diagnosed cases of AIDS. Despite a downward trend from 2003 through 2007, the highest rate of diagnosed cases of AIDS remained that among African Americans (47 cases per 100,000). Native Hawaiians/other Pacific Islanders—persons in the new category—were also disproportionately affected by AIDS in 2007 (18 cases per 100,000), as were Hispanics (15 cases per 100,000) (see Figure 3 for percentage of cases, 1985–2007). The AIDS diagnosis rates for other races/ethnicities remained relatively low: American Indians/Alaska Natives (7 cases per 100,000), whites (5 cases per 100,000), and Asians (4 cases per 100,000).

In 2007, about three-fourths of all diagnosed cases of HIV/AIDS and of AIDS occurred among men. From 2004 through 2007, diagnosed cases of HIV/AIDS increased 18% among men and 8% among women. During this same period, the number of diagnosed cases of AIDS decreased among both men and women.

Figure 3. AIDS cases among adults and adolescents, by race/ethnicity and year of diagnosis—United States and dependent areas, 1985–2007



Note: Data have been adjusted for reporting delays.
[a]Includes Asian and Pacific Islander legacy cases.

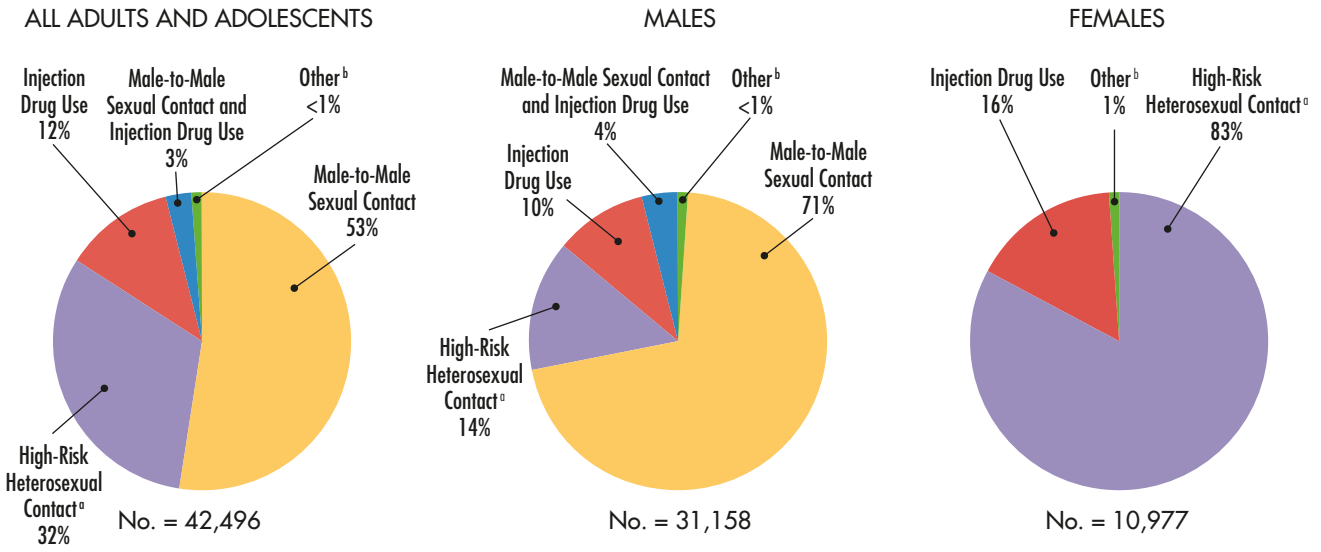
In terms of age, the number of diagnosed cases of HIV/AIDS in children (<13 years of age) decreased during 2004–2007; the number of diagnosed cases in persons aged 30–39 years also decreased. Conversely, HIV/AIDS diagnoses among persons 15–29 years of age and 40 years of age or older increased. In addition, persons aged 40–44 years accounted for the largest percentage of diagnosed HIV/AIDS cases (15%) during 2007 in the 34 states with mature HIV infection reporting systems.

Similar age trends were observed in AIDS cases, including decreases in the number of diagnosed cases among children. From 2003 through 2007, the estimated number of newly diagnosed AIDS cases decreased more than 60% among children (<13 years of age). Of all AIDS diagnoses in 2007, 19% occurred among persons aged 40–44 years.

Other Considerations

Beyond race/ethnicity, sex, and age, differences in HIV/AIDS diagnoses are associated with additional factors. For instance, most of the cases of HIV/AIDS diagnosed in 2007 in the 34 states occurred among MSM and persons engaging in high-risk heterosexual contact (Figure 4). These two populations accounted for 53% and 32%, respectively, of all diagnosed cases of HIV/AIDS. For AIDS, the number of

Figure 4. Transmission categories of HIV/AIDS among adults and adolescents—34 states, diagnosis during 2007



Note: Data include persons with a diagnosis of HIV infection, regardless of their AIDS status at diagnosis. Data from 34 states with confidential name-based HIV infection reporting since at least 2003. Data have been adjusted for reporting delays and missing risk-factor information.

[a]Heterosexual contact with a person known to have, or to be at high risk for, HIV infection.

[b]Includes hemophilia, blood transfusion, perinatal exposure, and risk factor not reported or not identified.

diagnosed cases remained stable from 2003 through 2007 among MSM and men exposed to HIV through high-risk heterosexual contact; the estimated number of cases also remained stable among females who were exposed through high-risk heterosexual contact, although minor fluctuations were observed by year.

Persons who inject drugs also are affected disproportionately by HIV/AIDS. In 2007, about 19% of all persons living with HIV/AIDS in the 34 states were classified as injection drug users (IDUs). However, from 2004 through 2007, the number of diagnosed HIV/AIDS cases decreased among female IDUs and among MSM who also injected drugs. From 2003 through 2007, a downward trend in the number of diagnosed AIDS cases was also observed among IDUs (including those who also identified themselves as MSM).

Infants and fetuses of HIV-infected mothers are also at risk of HIV infection. In 2007, nearly 90% of the HIV/AIDS diagnoses among children were due to infection from their HIV-positive mothers in utero, at birth, or through breastfeeding.

Factors that Affect Disease Prevalence

The typically slow progression of HIV infection to AIDS, along with the absence in many patients of symptoms associated with HIV infection, have challenged classic methods of determining the prevalence of infectious diseases. Collecting data regarding the true number of HIV infections is difficult because some HIV-infected persons have not yet been tested and thus have not received a diagnosis; others have yet to be reported to disease surveillance programs. Many states offer anonymous HIV testing; however, the results of anonymous tests are not reported to the confidential name-based HIV registries of state and local health departments. In addition, availability of, and access to, medical care can substantially affect the number of diagnosed cases in a specific population or geographic location. Therefore, the actual number of persons living with HIV/AIDS is likely higher than is reflected in surveillance data.

Using Surveillance Data to Improve Public Health

The implementation of integrated name-based HIV/AIDS reporting by state and local jurisdictions has now been completed. As of April 1, 2008, all 50 states, the District of Columbia, and five U.S. dependent areas (American Samoa, Guam, the Northern Mariana Islands, Puerto Rico, and the U.S. Virgin Islands) had established name-based HIV infection reporting.

CDC is engaging in activities to improve the quality and timeliness of HIV/AIDS data to help the agency reach its goal of reducing the number of new HIV infections in the United States. CDC developed an HIV testing algorithm that enables the further classification of cases of HIV as either longstanding or recently acquired. This algorithm, known as the serological testing algorithm for recent HIV seroconversion (STARHS), will enable CDC to more quickly discern trends in HIV incidence.[1] In partnership with state and local health departments, CDC has been working for several years to develop and evaluate a STARHS-based surveillance system. In 2002, a pilot program was instituted in five U.S. reporting areas, and as of January 2008, a total of 25 areas have been funded to conduct incidence surveillance by using the STARHS system. The monitoring of HIV incidence will be critical in evaluating progress toward reducing the number of new HIV infections in the United States and in allocating resources and evaluating the effectiveness of prevention programs.

[1] On August 2, 2008, new incidence estimates were released using new technology and methodology that more directly quantify the number of new HIV infections in the United States (http://www.cdc.gov/hiv/topics/surveillance/incidence.htm).

VIRAL HEPATITIS

Introduction

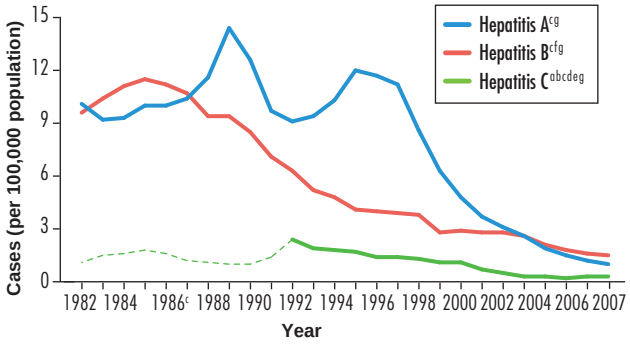
Infection with viral hepatitis is characterized by inflammation of the liver. Although several types of hepatitis viruses are known to cause illness, only hepatitis A, B, and C (infections caused by the hepatitis A virus [HAV], hepatitis B virus [HBV], and hepatitis C virus [HCV], respectively) typically affect persons living in the United States.

The rates of all three types of acute viral hepatitis have declined substantially over the past several decades, largely as a result of effective public health interventions (Figure 5). For instance, widespread childhood vaccination against hepatitis A and B has reduced the rates of these diseases to historic lows. In addition, the incidence of acute hepatitis C has declined over 80%, in part because of efforts to ensure blood safety through the testing of the U.S. blood supply and the delivery of behavioral interventions for injection drug users (IDUs). Despite these achievements, cases of acute viral hepatitis remain common, particularly among persons in specific populations (e.g., IDUs, men who have sex with men [MSM], international travelers, and persons with multiple sex partners) (Figure 6). Chronic HBV and HCV infections are a major cause of liver cirrhosis and cancer, which affect millions of persons living in the United States.

Tracking Viral Hepatitis

Each week, cases of acute viral hepatitis are reported to CDC through the National Notifiable Disease Surveillance System, an infectious disease tracking system that is used by health departments in all 50 states, the District of Columbia, and several U.S. territories. Additional data on cases of acute viral hepatitis have been collected through sentinel surveillance projects, including the Sentinel Counties Study of Acute Viral Hepatitis (1982–2006) and the

Figure 5. Incidence of acute hepatitis A, B, and C—United States, 1982–2007



[a] Non-A, non-B hepatitis became a reportable disease in 1982; until 1995, acute hepatitis C was reported as acute hepatitis non-A, non-B.

[b] Numbers and rates for hepatitis C/non-A, non-B hepatitis were unreliable for 1982–1991, reflecting the erroneous reporting of chronically infected persons as acute cases that occurred when testing for antibody to hepatitis C virus (anti-HCV) first became widely available.

[c] Excludes cases from New York City; data were not available for 1985–1986.

[d] Excludes hepatitis cases from New Jersey and Missouri for 2001.

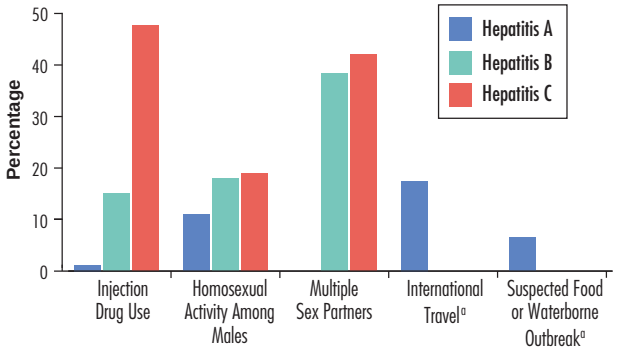
[e] Excludes cases from Missouri for 2002–2003.

[f] Excludes cases from Arizona for 2006.

[g] Excludes cases from District of Columbia; data were not available for 2007.

Data source: National Notifiable Diseases Surveillance System, 1982–2007.

Figure 6. Selected epidemiologic characteristics among persons with acute hepatitis A, B, and C—United States, 2007



Note: Percentage of persons that reported exposure (numerator) was based on the total number of persons that responded, either positively or negatively, to the specific exposure category (denominator).

[a] Persons with hepatitis B and C were not questioned about international travel or suspected food or waterborne outbreak as potential sources of infection.

Emerging Infections Program Enhanced Hepatitis Surveillance Activities (2005–present).

Surveillance of acute viral hepatitis provides data that can be used to (1) guide population-specific efforts to prevent new infections, (2) evaluate the effectiveness of these interventions, and (3) identify infected persons so that they can be provided with care and treatment services.

Using Surveillance Data to Improve Public Health

The surveillance data on hepatitis A, B, and C in the United States are useful for determining the burden of acute disease within specific populations, which, in turn, can inform public health interventions and ultimately improve health. For instance, hepatitis A surveillance data were instrumental in developing vaccine recommendations in the United States, such as hepatitis A vaccine recommendations for international travelers.

Data demonstrating both ongoing transmission of hepatitis B among unvaccinated adults who engage in high-risk sexual behaviors and low vaccine coverage in this population prompted the Advisory Committee on Immunization Practices and CDC to publish new guidelines in 2006 recommending that all adults in settings serving persons at risk (e.g., STD and HIV prevention centers and correctional facilities) receive hepatitis B vaccine. Surveillance data, together with data from maternal hepatitis B virus screening programs, led in 2005 to revising the recommendations regarding case management for infants in order to more effectively prevent perinatal transmission of hepatitis B virus infection. In addition, acute hepatitis C surveillance has detected HCV transmission in outpatient care settings, leading to public health investigations and interventions. Likewise, public health prevention efforts aimed at reducing needle sharing and other risky behaviors among IDUs have led to lower rates of acute hepatitis C in this population. In the future, surveillance systems that are integrated and more comprehensive, such as those that include tracking of both acute and chronic viral hepatitis infection, will help identify additional, previously undetected patterns of disease and better evaluate public health prevention programs.

Hepatitis A

Hepatitis A: Key Findings

- In 2007, a total of 2,979 acute symptomatic cases of hepatitis A were reported; the incidence rate was 1.0 case per 100,000, the lowest ever recorded. After underreporting was taken into account, this rate represents approximately 25,000 new hepatitis A virus (HAV) infections.
- In 2007, among the acute cases of hepatitis A reported with an identified risk factor, most were attributed to persons in specific populations at high risk: international travelers, men who have sex with men (MSM), injection drug users (IDUs), and persons in close contact with infected persons.
- In 2007, international travel was the most frequently reported risk factor for acute HAV infection (18%).
- Rates of acute hepatitis A among American Indians/Alaska Natives declined from 61.0 cases per 100,000 in 1995 to 0.5 case per 100,000 in 2007.

About Hepatitis A

Infection with HAV can cause acute illness characterized by tiredness, loss of appetite, nausea, abdominal discomfort, dark urine, clay-colored bowel movements, and jaundice (i.e., a yellowing of the skin and eyes). Children typically are asymptomatic or have milder symptoms than those in adults. Unlike HBV and HCV infections, HAV infections are not chronic. This disease is spread primarily through the ingestion of food or water that has been contaminated with the fecal matter of someone who is infected and through close, personal contact. Casual contact with an HAV-infected person is not usually associated with disease transmission.

Hepatitis A can be prevented through the use of the hepatitis A vaccine, which has been available since 1995. The hepatitis A vaccine is recommended for use in specific populations, including MSM,

IDUs, children at age 1 year, and persons traveling to countries where HAV infection is common. In addition to the vaccine, immune globulin can be administered to provide short-term protection against this virus.

National Snapshot

Anyone can be infected with HAV through common-source outbreaks (i.e., those involving multiple patients who were exposed to the virus through the same source, such as contaminated food) or as a result of an isolated event (e.g., exposure to an infected household member). Data from the National Health and Nutrition Examination Survey show that about one-third of persons living in the United States have been infected with HAV at some time.

In the United States, hepatitis A rates have varied cyclically, peaking approximately every 10–15 years; the most recent peak in morbidity was in 1995. The incidence of hepatitis A began to decline in 1995, after the introduction of licensed hepatitis A vaccines in the United States and the issuance in 1996 of the first public health recommendations for the use of vaccine in preventing transmission of HAV infection. In 2007, after 11 years of vaccine use, about 2,900 acute cases of hepatitis A were reported, for a historically low rate of 1.0 case per 100,000. Because many infections go unreported and others are asymptomatic, CDC estimated that 25,000 new infections occurred in 2007, most of them in groups at high risk, including MSM, IDUs, international travelers, and close contacts of infected persons.

Geographic Trends

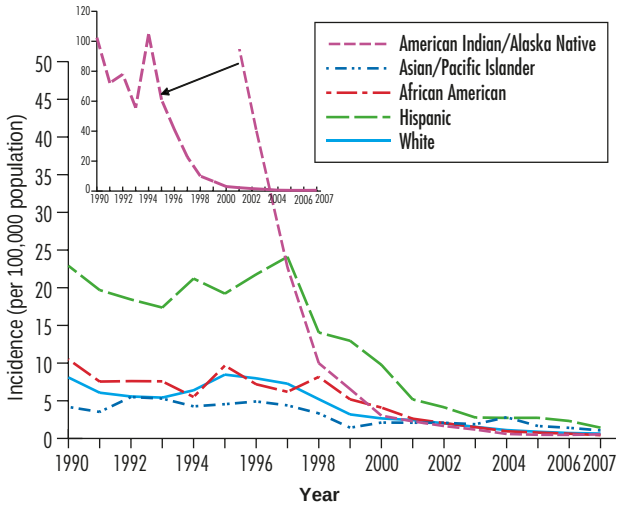
The rates of hepatitis A have varied by U.S. geographical region but have been highest in western states. However, the rates in these states began to decline after CDC recommended in 1999 that states with elevated rates implement routine childhood vaccination; the 2007 rates in these states were comparable with those in other regions of the country.

Population Trends

Race/Ethnicity, Sex, and Age

Some racial/ethnic populations have been affected disproportionately by HAV infection: the highest rates have been those for American Indians/Alaska Natives and Hispanics (Figure 7). However, the rates among American Indians/Alaska Natives began to decline dramatically in the mid-1990s (from 61.0 cases per 100,000 in 1995 to 0.5 case per 100,000 in 2007)—a reduction that can largely be attributed to the availability of the hepatitis A vaccine. The 2007 rates of hepatitis A among American Indians/Alaska Natives were comparable with the rates for other racial/ethnic populations. From 1997 to 2007, the hepatitis A rate among Hispanics decreased 94% (from 24.1 cases per 100,000 in 1997 to 1.4 cases per 100,000 in 2007). Further, the 2007 rate for Hispanics approached the rates for persons who were not classified as Hispanic.

Figure 7. Incidence of acute hepatitis A, by race/ethnicity and year—United States, 1990–2007



Note: Per 100,000 population.

Surveillance data, stratified by sex, also are used to determine the yearly rates of hepatitis. The rates of hepatitis A have typically been higher among males than females; in fact, during 1996–2002, rates among males were almost twice those among females. Although the 2007 rates for males (1.1 cases per 100,000) were higher than those for females (0.9 case per 100,000), the rates for males had, since 2002,

declined more than the rates for females, resulting in a smaller disparity by sex.

Rates also vary by age: for many years, the rates of hepatitis A were lower among children <5 years of age and adults ≥40 years of age compared with persons in other age groups. However, beginning in 1997, the disparity in rates by age group began to close; by 2007, the rates of hepatitis A showed little variation in terms of age groups (range, 0.5 to 1.3 cases per 100,000).

Other Considerations

Rates of hepatitis A vary by other factors as well. For instance, persons who frequently travel to developing countries, where infection with HAV is common, are at substantial risk of acquiring hepatitis A. In 2007, more cases of hepatitis A were associated with international travel (18%) than with any other risk factor; most of these cases occurred among persons who reported travel to Mexico or to Central or South America.

Hepatitis A continues to occur in populations at increased risk, such as MSM. In 2007, 11% of men who received a diagnosis of hepatitis A reported engaging in homosexual behavior (a decrease from the nearly 17% who reported engaging in this behavior during 2006). In 2007, the percentage of infected persons who reported sexual or household contact with a person infected with HAV, which has long been among the most frequently reported risk factors, was 8%.

Reported cases of hepatitis A among IDUs, a group that historically has been at higher risk of this disease, fluctuated from year to year. In 2007, 1% of reported hepatitis A cases occurred among IDUs; in 2004, 13% of these cases occurred among IDUs.

Hepatitis B: Key Findings

- In 2007, a total of 4,519 cases of acute hepatitis B were reported to CDC; after underreporting was taken into account, the estimated number of new infections was 43,000.
- In 2007, the rate of reported acute hepatitis B cases was 1.5 cases per 100,000, the lowest ever recorded.
- According to data from multiple sources, including the National Health and Nutrition Examination Survey, 800,000 to 1.4 million persons in the United States are chronically infected with hepatitis B virus.
- During 2000–2007, the rates of acute hepatitis B were higher in the South than in the Midwest, the Northeast, or the West.
- In 2007, the rate of acute hepatitis B among African Americans remained 2-fold (2.3 cases per 100,000) the rate among whites (1.0 case per 100,000).
- In 2007, the male-to-female ratio of acute hepatitis B cases was 1.6 (1.9 cases per 100,000 among men versus 1.2 cases per 100,000 among women).
- In 2007, the highest rate of acute hepatitis B was that among persons 25–44 years of age.
- From 1990 through 2007, the rate of acute hepatitis B among persons younger than 25 years decreased more than 90%.
- A large proportion of the acute hepatitis B cases reported during 2007 were attributable to high-risk sexual contact or injection drug use.

Hepatitis B

About Hepatitis B

Infection with HBV affects the liver. Infants and children aged <5 years are typically asymptomatic, as are 50%–70% of older children, adolescents, and adults. The symptoms of hepatitis B are similar to those of hepatitis A (i.e., tiredness, loss of appetite, nausea, abdominal discomfort, dark urine, clay-colored bowel movements, and jaundice). However, unlike hepatitis A, hepatitis B may lead to chronic illness, scarring of the liver (i.e., cirrhosis), liver cancer, liver failure, and death. HBV infection is transmitted when blood or other body fluid from an infected person enters the body of a person who is not infected, which can happen during unprotected sex, injecting drugs, or giving birth or can happen through daily exposures in a household. Lapses in infection

control may result in health care–related transmission in hospitals and other settings.

Hepatitis B can be prevented through vaccination with the hepatitis B vaccine, which has been available since 1981. The hepatitis B vaccine is recommended for routine use in persons ≤18 years of age, all persons who have a recognized risk factor for infection (e.g., MSM, IDUs, health care workers, persons with STDs or multiple sex partners, and sexual or household contacts of infected persons), all patients in health care settings where a high proportion of adults have risk factors for HBV infection (e.g., STD/HIV testing and treatment facilities), and all persons seeking protection from HBV infection. In addition to a dose of hepatitis B vaccine, which is recommended for all infants at birth, hepatitis B immune globulin provides additional protection to newborns of HBV-infected mothers. Although hepatitis B cannot yet be reliably "cured," medical management and antiviral therapy can prevent or delay more serious disease and death.

National Snapshot

In the United States, 800,000 to 1.4 million persons are living with chronic HBV infection. In 2007, more than 4,500 new cases of hepatitis B were reported to CDC; however, because many cases are not reported or are not detected (e.g., because of the absence of symptoms), CDC estimated that 43,000 persons were newly infected with HBV during 2007. The number of acute hepatitis B cases reported in 2007 was lower than that reported for 2006 (4,519 and 4,713 cases, respectively), and the 2007 rate—1.5 cases per 100,000—is the lowest ever recorded for this disease. Dramatic declines in the incidence of acute hepatitis B began in the mid-1980s, coinciding with the implementation of a national vaccination strategy to eliminate HBV transmission. Currently, recommendations include the universal vaccination of infants (beginning at birth), the prevention of perinatal HBV infection through routine screening of pregnant women and the provision of immunoprophylaxis to their infants, routine vaccination of children and adolescents, vaccination of adults in settings that serve adults at increased risk of HBV infection, and vaccination of all persons seeking protection against infection with HBV.

Geographic Trends

Rates of acute hepatitis B vary by U.S. geographical region. Prior to 2001, rates were higher in the South and West than in other parts of the country. Rates in all U.S. regions remained stable in 2006 and 2007 but continued to be higher in the South.

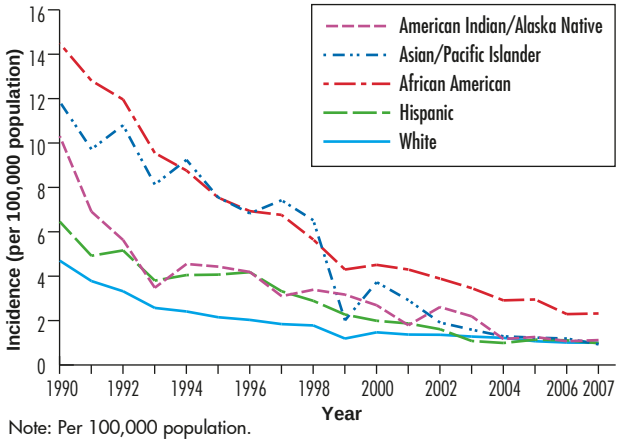
Population Trends

Race/Ethnicity, Sex, and Age

Progress has been made toward reducing health-related racial/ethnic disparities. Particularly notable has been the decline in the rate of hepatitis B among Asians/Pacific Islanders since 1990: by 2007, the rate was similar to that among Hispanics and whites. However, persons in specific racial/ethnic populations continue to be affected disproportionately by hepatitis B (Figure 8). Despite a decline in the incidence of hepatitis B among all racial/ethnic populations, the rate of acute hepatitis B among African Americans was 2-fold the rate among whites during 2007 (2.3 cases per 100,000 versus 1.0 case per 100,000, respectively).

The rates of hepatitis B also vary by sex: the rate of acute hepatitis B has been higher among men than women. This trend continued in 2007, as evidenced by a male-to-female ratio of 1.6 (1.9 cases per 100,000 among men versus 1.2 cases per 100,000 among women).

Figure 8. Incidence of acute hepatitis B, by race/ethnicity and year—United States, 1990–2007



Note: Per 100,000 population.

Persons in some age groups also are disproportionately affected by hepatitis B. In 2007, the highest rate was that for persons aged 25–44 years; the lowest rate was that for children aged <15 years. The rates of hepatitis B have decreased substantially among persons of all ages, but because children now routinely receive the hepatitis B vaccine, the rates among younger persons have declined more dramatically than those among older persons. Since 1990, the incidence of hepatitis B in children (<15 years of age) has declined 98%, the incidence among young adults (15–24 years) has declined 93%. Rates among adults aged 25–44 years declined 79%, and rates among adults aged ≥45 years declined 62%.

Other Considerations

Beyond the considerations of race/ethnicity, sex, and age, hepatitis B continues to affect some populations more than others. Among infected persons for whom information about exposures during the incubation period was available, approximately one-third reported engaging in at least one risky sexual behavior (6% had sexual contact with someone known to have hepatitis B, 37% had multiple sexual partners, and 18% engaged in homosexual activity). Injection drug use was reported for 15% of cases.

Perinatal (i.e., mother-to-child) transmission of HBV places newborn infants of infected mothers at increased risk of disease. A total of 83 cases of perinatal HBV infection were reported during 2007; because of incomplete testing and reporting, the number of cases of HBV infection in newborns is estimated to have been 10 times higher. In general, the rates of chronic infection in the United States are higher among foreign-born persons who emigrated from areas where HBV infection is endemic (e.g., Asia, Africa, and Eastern Europe).

Hepatitis C: Key Findings

- A total of 849 cases of acute hepatitis C were reported to CDC in 2007, for an overall rate of 0.3 cases per 100,000; the actual number of new infections (after accounting for asymptomatic cases and those that are not reported), is likely closer to 17,000.
- In 2007, an estimated 3.2 million persons in the United States were living with chronic hepatitis C infection.
- Rates of reported acute cases were highest among American Indians/Alaska Natives (0.48 case per 100,000) and lowest among Asians/Pacific Islanders (0.02 case per 100,000) in 2007.
- The difference in 2007 rates of acute cases reported among males and females (0.30 and 0.26 cases per 100,000, respectively) represented a male-to-female ratio that was similar to the 2006 ratio.
- In 2007, 48% of persons with a confirmed case of acute hepatitis C reported injection drug use. The percentage of hepatitis C virus (HCV)–infected persons who reported this behavior ranged from 38% in 1998 to 54% in 2007.

Hepatitis C

About Hepatitis C

HCV infection causes illness that affects the liver. This disease causes symptoms in only about 20% of infected persons, which are similar to those associated with all types of viral hepatitis (i.e., tiredness, loss of appetite, nausea, abdominal discomfort, dark urine, clay-colored bowel movements, and jaundice). In 55%–85% of infected persons, acute hepatitis C progresses to chronic infection. In 20% of chronically infected persons, liver disease develops and ultimately causes death in 1%–5% of cases. Alcohol abuse and HIV infection accelerate the progression of chronic hepatitis C. Like infection with HBV, HCV infection is transmitted when blood from an infected person enters the body of a person who is not infected; HCV may be spread through the sharing of needles during injection drug use and may also result from lapses in infection control in health care or other congregate living facilities (e.g., assisted living facilities). Infrequent sources of infection include transmission from mother to child during childbirth and from sexual contact. HCV infection is not spread through casual contact.

No vaccine is available to protect persons from becoming infected with HCV. However, several

treatment options exist for those already chronically infected with this virus; treatment with a combination of two drugs (i.e., ribavirin and interferon) is successful in about half of all patients infected with HCV type 1 and in 80% of those with types 2 or 3.

National Snapshot

A total of 849 acute cases of hepatitis C were reported to CDC in 2007 (rate, 0.3 cases per 100,000), representing a slight increase over the number reported in 2006. However, after asymptomatic cases and those that are not reported are taken into account, the actual number of new infections is likely closer to 17,000. Hepatitis C in its chronic form affects even more people in the United States; currently, an estimated 3.2 million are living with this persistent and often debilitating infection.

Geographic Trends

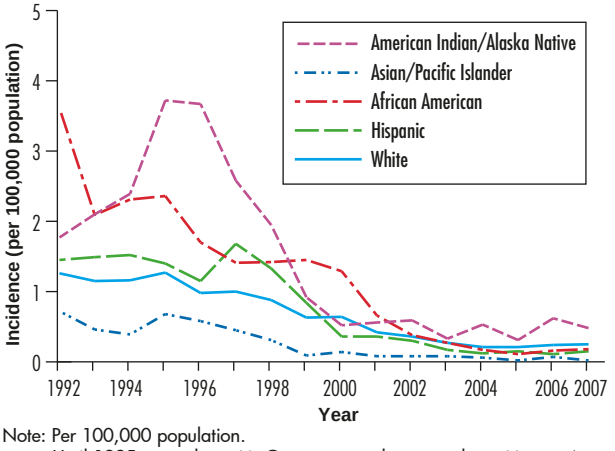
CDC does not examine geographic trends for acute hepatitis C because of the small number of cases that are reported each year.

Population Trends

Race/Ethnicity, Sex, and Age

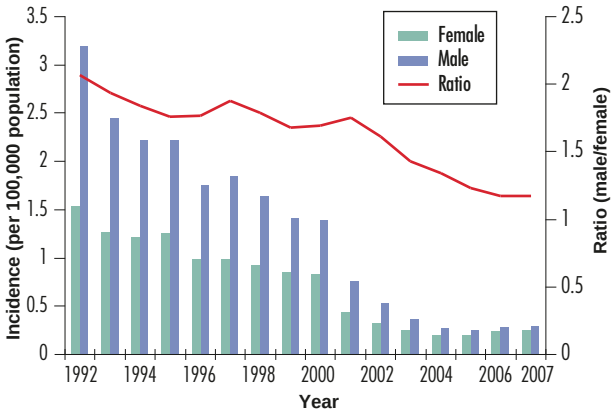
Similar to the trends in the incidence of acute hepatitis A and B, the incidence of acute hepatitis C has declined (since 1992), but unlike cases of acute hepatitis A and B, the incidence leveled in 2004, and a slight upturn in acute cases of hepatitis C was observed during 2005–2007. Beginning in 2004, rates began to plateau for all racial/ethnic groups except American Indians/Alaska Natives (Figure 9); 2007 rates were highest among American Indians/Alaska Natives (0.48 cases per 100,000) and lowest among Asians/Pacific Islanders (0.02 cases per 100,000). Although the rates of acute hepatitis C during 1992–2007 were higher for males than females, the difference began to narrow in 2001 (Figure 10). In 2007, reported rates of acute hepatitis C in males and females were 0.30 and 0.26 cases per 100,000, respectively, representing a ratio of male-to-female cases similar to the 2006 ratio.

Figure 9. Incidence of acute hepatitis C, by race/ethnicity and year—United States, 1992–2007



Note: Per 100,000 population.
Until 1995, acute hepatitis C was reported as acute hepatitis non-A, non-B.

Figure 10. Incidence of acute hepatitis C, by sex and year—United States, 1992–2007



Note: Until 1995, acute hepatitis C was reported as acute hepatitis non-A, non-B.
The bars indicate the rate per 100,000 (left y axis) by sex; the line is the ratio (right y axis) of the incidence rate among males compared to that among females.

The disease burden of hepatitis C also differs by the age groups of infected persons. From 1992 through 2007, the highest rates of acute hepatitis C were those among persons aged 25–39 years. Although rates for persons in this age group declined substantially during this period, the rate among persons in this age group remained the highest. Despite the downward trend, the 2007 rates, compared with 2006 rates, increased slightly among persons aged 25–39 years and 40 years

or older. Reports of hepatitis C in children younger than 15 years are rare.

Other Considerations

Hepatitis C continues to disproportionately affect populations at risk, most specifically those who engage in injection drug use. In 2007, nearly half of persons with acute hepatitis C reported injection drug use, an increase from the percentage of HCV-infected persons reporting this behavior during the preceding decade. In addition, because both HIV and HCV infections are transmitted through the use of injection drugs, at least one-third of HIV-infected IDUs are also infected with HCV; persons coinfected with HCV and HIV are more likely to experience liver damage and other complications as a result of HCV infection.

The perinatal transmission of HCV occurs in approximately 4% of infants born to infected mothers. This percentage increases for infants of mothers who are coinfected with HIV; approximately 20% of these newborns will become infected with HCV.

The risk of HCV transmission is low among long-term heterosexual sex partners of HCV-infected persons. However, the risk of transmitting HCV infection through sexual contact may be higher for other groups of persons; recent reports have described an increased incidence of HCV infection among HIV-infected MSM who engage in unsafe sexual practices.

SEXUALLY TRANSMITTED DISEASES

Introduction

Sexually transmitted diseases (STDs), including chlamydia, gonorrhea, syphilis, genital herpes, and human papillomavirus (HPV), substantially influence public health in the United States. These diseases negatively affect the lives of more than 65 million Americans, pose a significant economic burden, and contribute to other reproductive health problems (e.g., infertility, pelvic inflammatory disease [PID], and ectopic pregnancy).

Although progress has been made in the prevention, diagnosis, and treatment of STDs, the number of new infections continues to rise in specific populations. Approximately 19 million new cases of STDs occur each year, almost half of those among adolescents and young adults (i.e., persons aged 15–24 years).

Tracking STDs

STD surveillance data collected at national and local levels can be used to guide population-specific efforts to prevent new infections, identify infected persons, and ensure that persons with an STD diagnosis receive optimal treatment and education. Nationally notifiable STD surveillance data are compiled from reports sent by the STD control programs and health departments in the 50 states, the District of Columbia, selected cities, and U.S. dependencies.

Using STD Surveillance Data to Improve Health

The STD data collected through surveillance systems can be used to inform public health activities aimed at improving the detection of STDs, preventing disease transmission, and improving the lives of infected persons. In addition, understanding how activities aimed at improving case detection (e.g., expanded screening practices and the use of more sensitive tests) affect disease rates in specific populations also can lead to strengthened, better focused efforts to prevent and control disease.

Notifiable STDs

The Council of State and Territorial Epidemiologists, in collaboration with CDC and local public health departments, has determined that national surveillance data should be collected annually for several notifiable STDs (e.g., chlamydia, gonorrhea, and syphilis). These data are analyzed to identify statistical trends in the diseases; however, they represent only a small proportion of the true burden of STDs in the United States. Many cases of notifiable STDs are not diagnosed, and other cases of STDs for which reporting is not mandatory (e.g., trichomonas, herpes, and HPV) are believed to be much more common. The following sections provide an overview of the chlamydia, gonorrhea, and syphilis data obtained through surveillance at the national, state, and local levels during 2007.

Chlamydia

About Chlamydia

Chlamydia is an STD caused by the bacterium *Chlamydia trachomatis*. Although people infected with *C. trachomatis* usually are asymptomatic or exhibit only mild symptoms, chlamydia can cause substantial damage to the reproductive system of women. Untreated infection in women can lead to PID, which can cause permanent damage to the fallopian tubes, the uterus, and surrounding tissues. This damage can lead to an array of health problems, including infertility, chronic pelvic pain, and ectopic pregnancy.

Chlamydia: Key Findings

- Chlamydia infection remains the most commonly reported notifiable disease in the United States; in 2007, approximately 1,108,000 cases—the largest number ever reported to CDC for any condition—were reported by health departments in all 50 states and the District of Columbia.
- In 2007, the national rate of reported chlamydia was 370 cases per 100,000, which represents a 7.5% increase from 2006. This increase in reported cases can at least partly be attributed to the availability of more sensitive diagnostic tests and to the expansion of screening efforts.
- Female adolescents and young women (i.e., those aged 15–24 years) remain the population most affected by chlamydia. In 2007, case rates for females aged 15–19 and 20–24 years (3,005 and 2,949 cases per 100,000, respectively) were higher than the rates for any other population or risk group.
- In 2007, 48% of all reported chlamydia cases occurred in African Americans.
- During 2007, more cases of chlamydia were reported among African-American women than women in any other racial/ethnic group; the rate of chlamydia among African-American females was more than 7 times the rate among white females.
- The 2007 chlamydia rate among Hispanics was nearly 3 times the rate among whites.
- The 2007 chlamydia rate among American Indians/Alaska Natives decreased 7.2% compared with the 2006 rate (733 cases versus 790 cases per 100,000).
- Approximately 7% of females 15–24 years of age screened in family planning clinics and in selected prenatal clinics in 22 states and Puerto Rico tested positive for chlamydia.
- With the exception of the rate for American Indians/Alaska Natives, chlamydia rates increased in all racial/ethnic groups in 2007.

National Snapshot

Chlamydia is the most commonly reported notifiable disease in the United States, and it is the most commonly occurring bacterial STD. During 2007, health departments in all 50 states and the District of Columbia reported more than 1 million cases of chlamydia—a 7.5% increase over the number of cases reported during 2006. From the late 1980s (when public programs for the screening and treatment of chlamydia in women were established to avert cases of PID and related complications) through 2007, the rates of reported chlamydia infections among women increased every year. The continued increase in chlamydia case reports in 2007 most likely reflects a continued increase in screening for this infection, but it may also reflect a true increase in morbidity.

Geographic Trends

Historically, chlamydia rates have varied by U.S. geographic region. For the years 1998–2007, rates were similar in the Midwest, the West, and the South; rates were lowest in the Northeast. During 2006–2007, reported cases increased in all regions.

State-based chlamydia surveillance for 2007 revealed rates ranging from 156 (New Hampshire) to 745 cases per 100,000 (Mississippi). When cases were examined by metropolitan statistical area (MSA), the rate of chlamydia increased from the end of 2006 through the end of 2007 in the majority of the 50 most populated MSAs.

Population Trends

Race/Ethnicity, Sex, and Age

From 2006 through 2007, chlamydia rates increased for all racial and ethnic populations except American Indians/Alaska Natives (Figure 11). Rates were highest among African Americans; the chlamydia rate in this population was more than 8 times the rate among whites (1,399 and 162 cases per 100,000, respectively, in 2007).

Surveillance data reveal that chlamydia reports also vary substantially by sex. The rates of reported

Figure 11. Chlamydia rates, by race/ethnicity—United States, 1998–2007

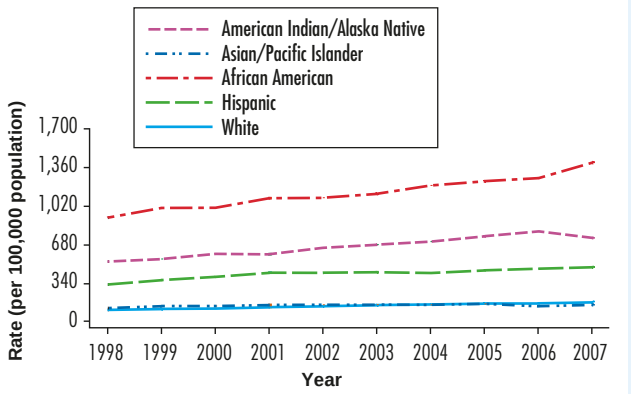
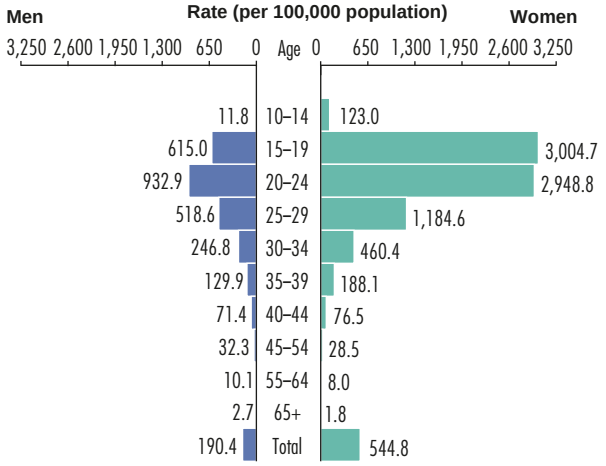


Figure 12. Chlamydia rates, by age and sex—United States, 2007



chlamydia infections in women are 3 times the rate of infection in men. Recent increases in reported cases can be attributed to expanded efforts to screen women for chlamydia, more sensitive tests, and more complete national reporting, but they may also reflect a true increase in morbidity. Highly sensitive tests, which have been used for the past several years, can be used to diagnose chlamydia noninvasively in symptomatic and asymptomatic men and women, resulting in increased detection of chlamydia infections. This increase is partially reflected in the 2007 data, which reveal a nearly 47% increase in the rate of chlamydia reported during 2003–2007 among men and a 20% increase among women for the same period.

Among females, the highest rates of reported chlamydia infection in 2007 were those among adolescents and young adults (3,005 cases and 2,949 cases per 100,000 females for those aged 15–19 and 20–24 years, respectively) (Figure 12). Increased rates in this population also likely reflect increased screening efforts. Among men, the highest rate was among those 20–24 years of age.

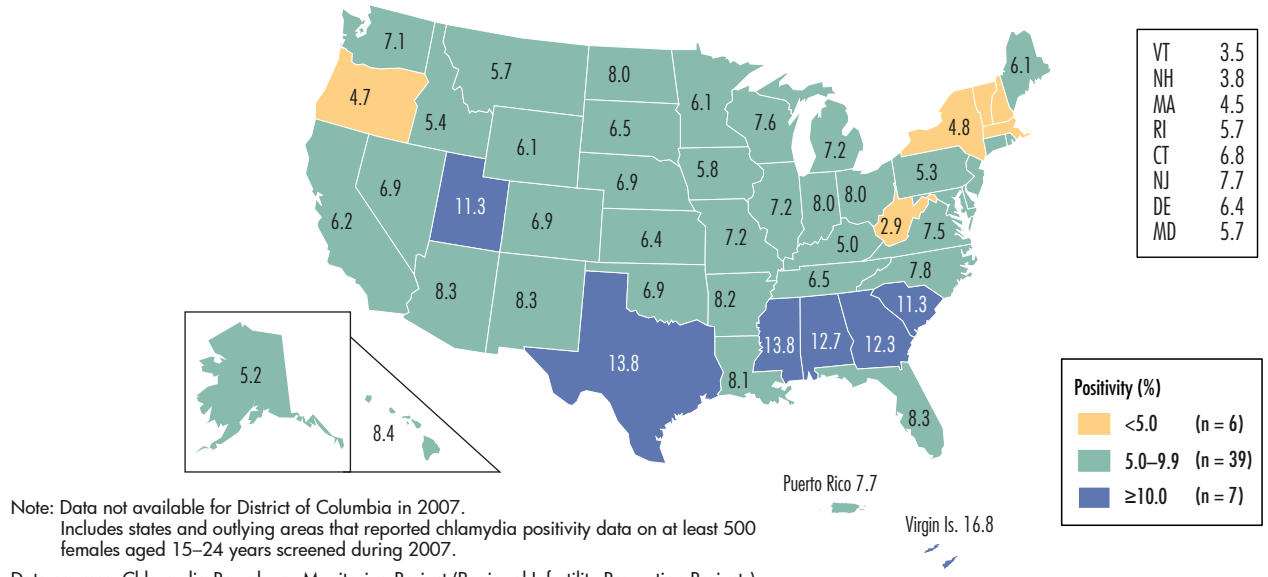
Other Considerations

Several surveillance efforts are being conducted to ascertain information about chlamydia in specific populations, particularly among populations that are known to be affected disproportionately by this disease. For instance, the National Job Training Program has been screening its entrants for chlamydia since 1990. This effort has enabled the collection of data for this population of economically disadvantaged persons aged 16–24 years, which can be used to help inform and improve public health interventions. According to National Job Training Program data, the state-specific median prevalence of chlamydia among females in 2007 was approximately 13%. The state-specific median prevalence among males was approximately 7%.

The Infertility Prevention Project is a screening program implemented in all 10 U.S. Department of Health and Human Services regions. As part of project activities, data are collected on chlamydia infections in groups at increased risk of STDs such as persons entering juvenile and adult corrections facilities. Overall, the data collected by participating juvenile detention and adult corrections facilities in 2007 reveal that for almost all age groups, females are more likely than males to test positive for chlamydia. In participating juvenile detention facilities across the country, substantial percentages of females aged 12–18 years tested positive for this STD (facility-specific median, 14.3%). Data from participating corrections facilities for adults also reveal a high percentage of positive chlamydia test results among females (facility-specific median, 9.7%), a percentage that decreases with age.

Because chlamydia can negatively affect fertility and prenatal health, the Infertility Prevention Project also collected data from family planning and prenatal care clinics. These data revealed that a substantial percentage of females aged 15–24 years tested positive for chlamydia in 2007 (state-specific median,

Figure 13. Chlamydia among females aged 15–24, tested in family planning clinics—United States and outlying areas, 2007



Note: Data not available for District of Columbia in 2007.
Includes states and outlying areas that reported chlamydia positivity data on at least 500 females aged 15–24 years screened during 2007.

Data sources: Chlamydia Prevalence Monitoring Project (Regional Infertility Prevention Projects); Office of Population Affairs; Local and State STD Control Programs; Centers for Disease Control and Prevention.

7.4% and 6.9% in participating prenatal clinics and family planning clinics [Figure 13], respectively). Variation by U.S. geographic region as well was found in the number of females testing positive for chlamydia. Those attending clinics in the South were more likely to test positive for this STD than were those attending clinics in other regions of the United States.

Chlamydia infection also is monitored among men who have sex with men (MSM) through a prevalence monitoring project that focuses on MSM. This project includes STD clinics in 7–10 U.S. cities that report information from clinical visits of men who report having sex with men. The participating clinics tested most MSM (clinic-specific median, 79%) for urethral chlamydia in 2007; a median of 7% tested positive for this STD.

Factors Affecting Rates

Although surveillance data reveal that statistical trends in chlamydia vary by geographic region, race/ethnicity, age, and sex, it is likely that several other factors contribute to chlamydia prevalence. For instance, the increase in reported chlamydia infections for the years 1998–2007 can be attributed to the expansion of chlamydia screening activities, the use of increasingly sensitive diagnostic tests, and an increased emphasis on case reporting from providers and private laboratories.

Gonorrhea

About Gonorrhea

Gonorrhea is a bacterial STD caused by *Neisseria gonorrhoeae*. Although persons infected with *N. gonorrhoeae* typically are asymptomatic or experience only mild symptoms, untreated gonorrhea can cause substantial health problems, particularly for women. In men, gonorrhea can cause epididymitis and prostatitis, but these are rare. Untreated gonorrhea in women can lead to PID, which can result in infertility and ectopic pregnancy.

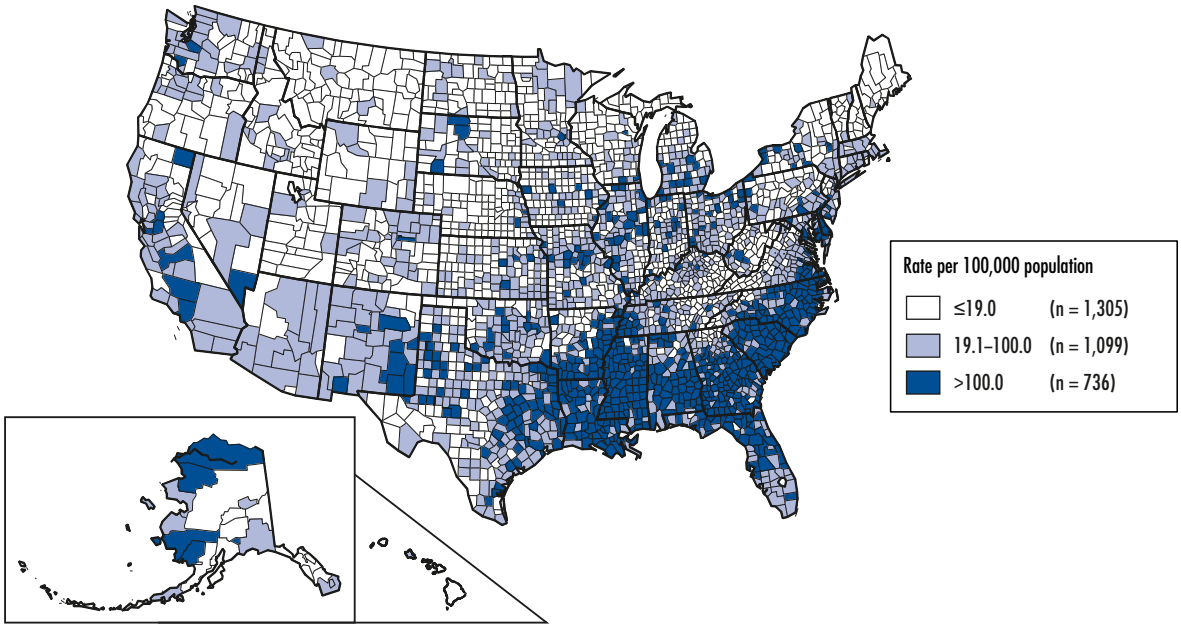
National Snapshot

Gonorrhea is the second most commonly reported notifiable disease in the United States. A total of 355,991 cases of gonorrhea were reported in 2007, and the overall rate was 119 cases per 100,000, representing a slight decrease from the 2006 rate.

Gonorrhea: Key Findings

- A total of 355,991 cases of gonorrhea were reported in 2007, a slight decrease from 2006.
- In 2007, rates of gonorrhea were highest in the southern region of the United States, at 156 cases per 100,000.
- Gonorrhea isolates collected in 2007 through the Gonococcal Isolate Surveillance Project (a sentinel surveillance project located in 28 STD clinics) revealed that resistance to fluoroquinolones is increasing; almost 15% of isolates demonstrated resistance to these drugs, compared with 14% in 2006.
- Rates of gonorrhea declined nearly 22% among American Indians/Alaska Natives during 2006–2007.
- In 2007, the rate of gonorrhea among African Americans was 19 times the rate among whites.
- The 2007 rates of gonorrhea were highest among young adults aged 20–24 years; rates among persons in this age group were 4 times the overall rate of gonorrhea in the United States.
- In 2007, the gonorrhea rate was slightly higher among women than men, at 124 and 114 cases per 100,000, respectively.
- Only seven states and Puerto Rico reported gonorrhea rates for 2007 that were lower than the *Healthy People 2010* objective (i.e., 19 cases per 100,000).

Figure 14: Gonorrhea rates, by county—United States, 2007



Note: The *Healthy People 2010* target for gonorrhea is 19.0 cases per 100,000 population.

Geographic Trends

Rates of gonorrhea vary by U.S. geographic region and by county. Most of the counties with more than 100 cases per 100,000 were in the South (Figure 14). During the years 2003–2007, rates were highest among persons living in the southern United States, followed by those living in the Midwest and the Northeast. In all U.S. regions, the gonorrhea rates for 2007, compared with the rates for 2006, remained stable.

When the 2007 data were broken down by state, only seven states (i.e., Idaho, Maine, Montana, New Hampshire, North Dakota, Vermont, and Wyoming) reported rates lower than the *Healthy People 2010*

objective of 19 cases per 100,000. When the data were examined by MSA, the overall rate among the 50 most populated MSAs remained essentially unchanged, at 129 cases per 100,000. None of these MSAs achieved the *Healthy People 2010* objective.

Population Trends

Race/Ethnicity, Sex, and Age

Gonorrhea rates vary substantially by age and by racial/ethnic population. In 2007, the rate of gonorrhea was highest among African Americans (Figure 15); the rate among African-American men was 26 times the rate among white men, and the rate among African-American women was 15 times the rate among their white counterparts. With the exception of African Americans, a population for whom rates increased almost 2% during 2006–2007, gonorrhea rates declined in all racial/ethnic groups. Despite the decreases, however, gonorrhea rates among American Indians/Alaska Natives and Hispanics were approximately 3 and 2 times, respectively, the rate among whites. Among racial/ethnic groups, the lowest rate of this disease was among Asians/Pacific Islanders.

For the years 2001–2007, gonorrhea rates were slightly higher among women than men (Figure 16). In 2007, the rate of gonorrhea in women was 124 cases per 100,000; the rate among men was 114. For both females and males, gonorrhea was reported more often among those in younger age groups (i.e., females aged 15–19 years and males aged 20–24 years) (Figure 17).

Several surveillance efforts are being conducted to gather information about gonorrhea in specific populations, particularly groups that are known to be affected disproportionately by this disease. For instance, the National Job Training Program has been screening its female entrants for several STDs, including gonorrhea, since 1990; since 2004, male entrants also have begun to be tested. This effort has facilitated the collection of data for a population of economically disadvantaged young men and women aged 16–24 years; these data can be used to help guide population-specific prevention efforts and other

Figure 15. Gonorrhea rates, by race/ethnicity—United States, 1998–2007

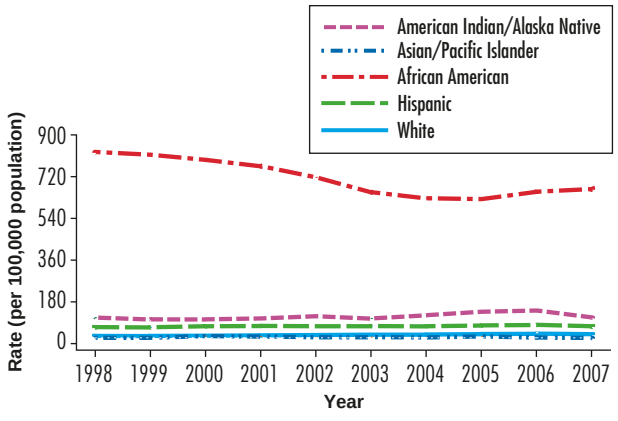
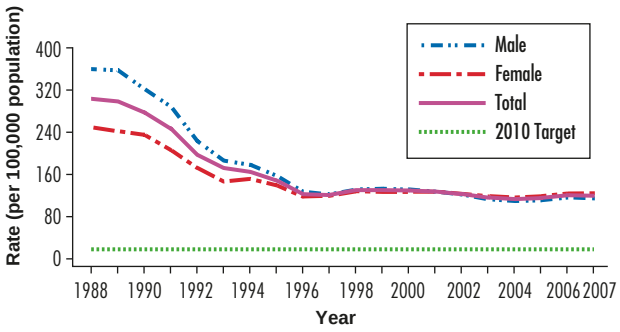
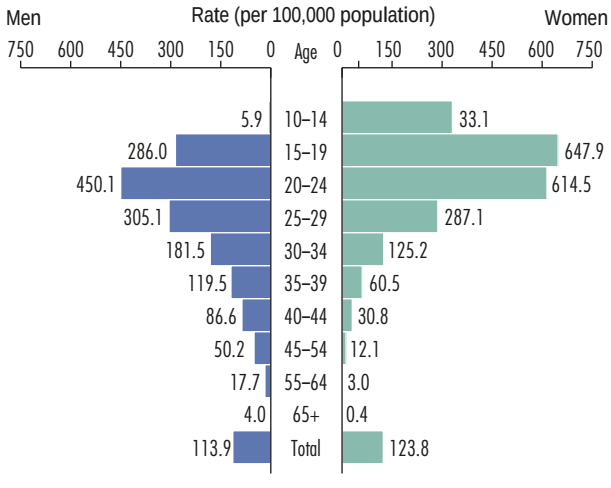


Figure 16. Gonorrhea rates, by sex—United States, 1988–2007



Note: The *Healthy People 2010* target for gonorrhea is 19.0 cases per 100,000 population.

Figure 17. Gonorrhea rates, by age and sex—United States, 2007



public health interventions. National Job Training Program data from 2007 indicated that the prevalence of gonorrhea was higher among female entrants than among male entrants (state-specific median, 3.0% among females and 1.1% among males).

Other Considerations

Other surveillance efforts are being conducted to determine the burden of STDs, including gonorrhea, in specific populations. For example, as part of the Infertility Prevention Project, monitoring projects have been established to obtain information about gonorrhea in adolescents and adults detained in juvenile and adult corrections facilities (populations among whom STD rates are high). These projects have demonstrated that rates of gonorrhea are higher among females than among males in both types of correctional settings. Of adolescents detained in juvenile facilities and screened for gonorrhea during 2007, 5.3% of the female adolescents and 1.0% of the male adolescents tested positive. Of persons in adult corrections facilities who were screened for gonorrhea, 2.9% of women and 1.7% of men were found to have this STD.

Prenatal and family planning clinics engaging in screening efforts as part of this program in 2007 reported that the rates of women testing positive for gonorrhea varied only slightly from the rates reported during recent years; among females aged 15–24 years attending participating prenatal and family planning clinics, the median, state-specific rates of positive gonorrhea screening tests were 0.8% and 0.9%, respectively.

Gonorrhea infection also is monitored among MSM through the MSM prevalence monitoring project, which collects data from STD clinics in 7–10 U.S. cities. Project data from 2007 demonstrated substantial rates of urethral, rectal, and pharyngeal gonorrhea among MSM seeking care in these settings (clinic-based median: 8%, 7%, and 6%, respectively).

Factors Affecting Rates

Beyond population group, several other factors continue to be important in the prevention and control of gonorrhea. Drug resistance has a substantial impact on the treatment of persons who have gonorrhea.

Before 1999, fewer than nine quinolone-resistant *N. gonorrhoeae* isolates were reported each year through a national sentinel surveillance system. In recent years, however, this number increased dramatically; in 2007, a total of 891 isolates (almost 15% of the total) collected through participating sites were quinolone-resistant, compared with 843 (14% of the total) in 2006 and 581 (9%) in 2005.

Trends in drug resistance can be observed by region and population. Since 1999, quinolone resistance increased each year, first in Hawaii and the Pacific Islands, followed by western states, and then among MSM. By 2006, increases also were observed among heterosexuals and in every region of the country; in 2007, CDC no longer recommended fluoroquinolones for use in the treatment of gonorrhea and associated conditions, such as PID.

Changes and limitations in screening practices and testing also influence reported rates of gonorrhea and other STDs. For gonorrhea, data collected in 2007 may have been affected by a shift in reporting source. Reporting by STD clinics (versus other health care providers) has decreased. In 2002, more than 30% of gonorrhea cases were reported by STD clinics; in 2007, only 27% of cases were reported by these clinics, suggesting that cases of gonorrhea are increasingly being diagnosed in the private sector.

Syphilis: Primary and Secondary and Congenital

About Syphilis

Syphilis is an STD caused by the bacterium *Treponema pallidum*. This disease is characterized by clinical phases that are interspersed by periods of subclinical infection detected only by serologic tests. The primary stage of syphilis is marked by the appearance of one or more chancres, and the secondary, disseminated stage is often characterized by rash and mucous membrane lesions. Persons with latent syphilis are asymptomatic; if the infection progresses, it can lead to damage of internal organs (e.g., brain, nerves, and heart). Syphilis in pregnant women can result in the perinatal transmission of disease, causing congenital syphilis, which can be fatal to the infected fetus. Untreated congenital

Syphilis: Key Findings

- For 2007, the overall number of primary and secondary (P&S) syphilis cases reported in the United States was 11,466, representing an almost 18% increase over the number of cases reported in 2006 (9,756 cases).
- The 2007 rate of congenital syphilis (10.5 cases per 100,000 live births) represents a 15% increase over the 2006 rate of 9.1 per 100,000 live births.
- For congenital syphilis, 2007 rates among African Americans and Hispanics were approximately 14 and 7 times, respectively, the rate among whites.
- Men who have sex with men (MSM) accounted for approximately 65% of the reported cases of P&S syphilis in the United States during 2007; an estimated 4% of cases occurred among MSM in 2000.
- In 2007, P&S syphilis rates among women were highest among those aged 20–24 years (3.5 cases per 100,000); among men, the highest rates were among those aged 25–29 years of age (14.9 cases).
- Almost half (49%) of the cases of P&S syphilis reported in 2007 occurred in persons living in the South.
- Among African Americans, the overall rate of P&S syphilis in 2007—14.0 cases per 100,000—represents a 25% increase over the 2006 rate of 11 cases.
- African Americans continued to be disproportionately affected by P&S syphilis in 2007. The rate of reported cases in this racial group was 7 times the rate among whites. The rate for African-American women was 14 times the rate for white women, and the rate for African-American men was more than 6 times the rate for their white counterparts.
- Among American Indians/Alaska Natives, the P&S syphilis rate increased 6% from 2006 through 2007 (from 3.2 cases per 100,000 to 3.4 cases). Among Hispanics, the rate increased 23% from 2006 through 2007 (from 3.5 cases per 100,000 to 4.3 cases).

infection can also cause developmental delay, seizures, and death.

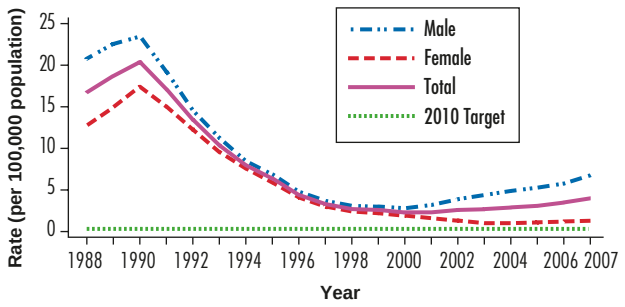
National Snapshot

Although syphilis rates decreased steadily in the United States during 1990–2000, rates have been increasing since 2001 (Figure 18). For 2007, the overall number of primary and secondary (P&S) syphilis cases reported in the United States was 11,466, representing a nearly 18% increase over the number of cases reported in 2006 (9,756 cases). Congenital syphilis rates, which prior to 2006 had been declining for more than a decade, increased 15% during 2006–2007. Rates of congenital disease typically mirror the trends among women.

Geographic Trends

Rates of P&S syphilis vary by U.S. geographic region and by county. In 2007, the rates of P&S syphilis

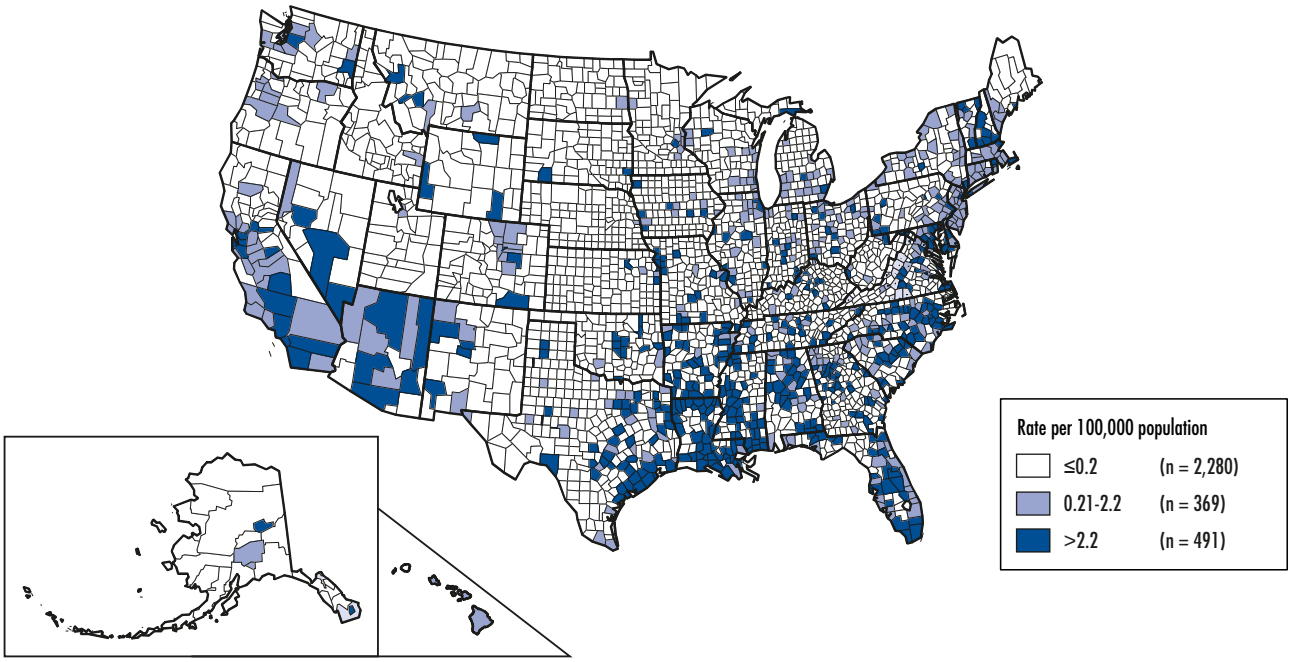
Figure 18. Primary and secondary syphilis rates, by sex—United States, 1988–2007



Note: The *Healthy People 2010* target for P&S syphilis is 0.2 case per 100,000 population.

were above the *Healthy People 2010* objective of 0.2 cases per 100,000 in 860 counties (Figure 19). These 860 counties (27% of the total number of counties in the United States) accounted for 99.9% of the total P&S cases reported in 2007. Since 1997, the highest rates of P&S syphilis have been reported in southern states. This trend continued for the period 2006–2007,

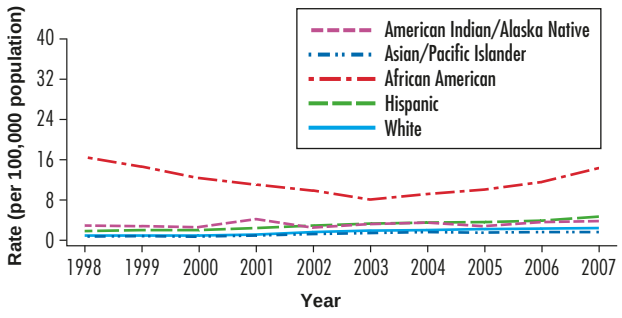
Figure 19. Primary and secondary syphilis rates, by county—United States, 2007



Note: The *Healthy People 2010* target for P&S syphilis is 0.2 case per 100,000 population. In 2007, 2,274 (72.4%) of 3,140 counties in the U.S. reported no cases of P&S syphilis.

when 49% of the total number of U.S. cases occurred among persons living in this region. Surveillance data from 2007 reveal that P&S syphilis rates in the South increased 21% over the previous year's rate (from 4.2 to 5.1 cases per 100,000, respectively), a trend that also was observed in other U.S. geographic regions: P&S syphilis rates increased 31% in the Northeast (from 2.6 to 3.4 per 100,000), 8% in the West (from 3.7 to 4.0 per 100,000), and almost 6% in the Midwest (from 1.8 to 1.9 cases per 100,000), a region in which rates had remained stable the previous year.

Figure 20. Primary and secondary syphilis rates, by race/ethnicity—United States, 1998–2007



Population Trends

Race/Ethnicity, Sex, and Age

P&S syphilis rates vary substantially by race and ethnicity and other demographic characteristics. With the exception of Asians/Pacific Islanders, all racial/ethnic populations experienced an increase in rates of P&S syphilis (Figure 20); during 2006–2007, the greatest increase (25%) was that among African Americans, but increases were also observed among Hispanics (23%), American Indians/Alaska Natives (6%), and whites (5%). African Americans continue to be disproportionately affected by P&S syphilis. Although the disparity in the syphilis disease burden between African Americans and whites has narrowed (from rates among African Americans that were 29 times the rate among whites in 1999 to 7 times the rate among whites in 2007), rates among African Americans still remain disproportionately high. Health disparities also persist in the Hispanic and American Indian/Alaska Native populations: the 2007 syphilis

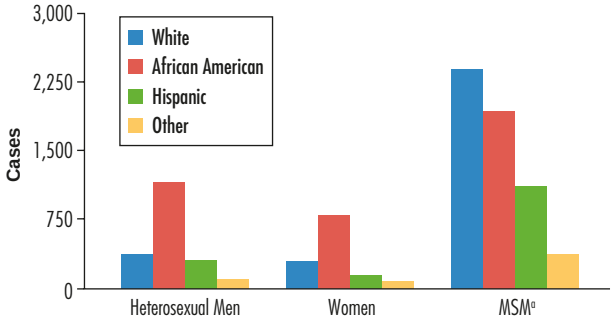
rates in both populations were approximately 2 times the rate among whites.

Surveillance data reveal that the overall increase in P&S syphilis rates between 2006 and 2007 primarily reflects an increase in the number of cases reported among males, although the P&S syphilis rate for females also increased during this period. The 2007 P&S syphilis rate among males was 6.6 cases per 100,000; the rate among females was 1.1 cases, representing an 18% and 10% increase over 2006 rates, respectively. The elevated rates of P&S syphilis among males can be largely attributed to increases in the number of cases reported among MSM, as 65% of all reported cases were in this population. The factors contributing to increased rates among females remain unclear.

P&S syphilis rates also vary by age. In 2007, P&S syphilis rates overall were highest among persons in the age group 20–44 years. When the data were examined by sex, the highest rate for men was among those aged 25–29 years, whereas the highest rate for women was among those aged 20–24 years.

The rates of P&S syphilis continue to vary by sexual orientation and race/ethnicity. Most of the cases of P&S syphilis occurred among MSM. Of heterosexual men with P&S syphilis, 60% were African American, 19% were white, 16% were Hispanic, and 5% were of other races/ethnicities (Figure 21).

Figure 21. Reported cases of primary and secondary syphilis, by sexual orientation and race/ethnicity—United States, 2007



Note: 21% of reported male cases with P&S syphilis were missing sex of sex partner information; 3% of reported males cases with sex of partner data were missing race/ethnicity data.
No imputation was done for race/ethnicity.

[a]MSM denotes men who have sex with men.

Other Considerations

To obtain information about syphilis prevalence in other populations, CDC collects data in a variety of settings. For instance, persons entering corrections facilities are routinely tested for P&S syphilis; the blood tests used for this data-collection effort measure seroreactivity, which indicates either current or past infection with *T. pallidum*. In 2007, corrections facilities in 16 states provided serologic data for syphilis: among persons, aged 12–18 years, entering a total of 13 juvenile corrections facilities, females were more likely to test positive for this STD (state-specific median: 0.2%) than were males (state-specific median: 0.1%). Similarly, among persons detained in correctional facilities for adults, women were more likely than their male counterparts to test positive for syphilis (state-specific median: 2.1% and 1.0%, respectively).

Syphilis surveillance data for MSM also are collected from the STD clinics in eight U.S. cities through the MSM Prevalence Monitoring Project. In 2007, of the 79% of MSM who received a nontreponemal serologic test for syphilis during a visit to a participating STD clinic, a median of 8% exhibited seroreactivity.

Factors Affecting Rates

After reaching a low in 2000, the numbers of case reports of P&S syphilis in men and women are increasing. Syphilis is now increasingly diagnosed in the private sector, generating concerns about the effectiveness of its detection and management. The evolving epidemiology, changing risk groups, and social environments pose challenges for elimination and STD program activities. Moreover, public health services face increasing pressures from rising demand and decreasing financial resources; and the social contexts of poverty, racism, homophobia, and socioeconomic discrimination continue to drive the concentration of the disease in those who engage in risky sexual behaviors, those who have poor access to care, or both.

Other STDs of Public Health Importance

Although state and local health departments routinely collect and report data on a few STDs, other STDs

continue to pose substantial public health challenges. For example, genital herpes and genital HPV infection are two STDs that have been recognized as negatively affecting the health of millions of persons living in the United States; at least 45 million Americans have genital herpes, and approximately 20 million are thought to be infected with HPV.

Genital Herpes

Herpes is an ulcerative disease caused by either herpes simplex virus type 1 (HSV-1) or type 2 (HSV-2), although most genital infections can be attributed to the latter. Most persons who have genital herpes are asymptomatic or have only minimal signs or symptoms. Symptoms associated with genital herpes include genital blisters that become ulcers as the disease progresses, flulike symptoms, and swollen glands, but many persons with genital herpes are less severely affected. Although HSV-1 and HSV-2 persist indefinitely in the body of an infected person, symptoms tend to lessen with time.

It is believed that genital herpes infection in most persons has not been diagnosed. According to the National Health and Nutrition Examination Survey for 1999–2004, the seroprevalence of HSV-2 among persons aged 14–49 years was 17% (95% CI: 15.8–18.3). Data obtained through the National Disease and Therapeutic Index, a probability sample survey of the clinical management practices of private physicians, indicate that the number of visits related to new cases of genital herpes has increased. Increasing numbers of visits related to genital herpes, as suggested by the survey data, may indicate increased recognition of infection.

Human Papillomavirus Infection

Genital HPV infection, which can be caused by more than 30 strains of the human papillomavirus, usually is asymptomatic; however, some infected persons have visible genital warts and precancerous changes in the cervix, vulva, anus, or penis. Very rarely, HPV infection results in anal or genital cancers.

Substantial breakthroughs in the prevention of HPV infection have been made in recent years. In 2006, the U.S. Food and Drug Administration approved an HPV vaccine, Gardasil, and the Advisory Committee on Immunization Practices recommended the routine vaccination of females aged 11–12 years with three doses of the quadrivalent HPV vaccine. Vaccination also is recommended for females aged 13–26 years who have not been vaccinated or who have not completed the full series. Gardasil is formulated to protect against four HPV types, which together cause 70% of cervical cancers and 90% of genital warts in the United States.

Several sources are used currently to monitor trends in HPV prevalence in the United States. Population-based data from the National Health and Nutrition Examination Survey were used to identify the prevalence of high-risk (associated with anogenital cancers) and low-risk (associated with anogenital warts) HPV in the civilian, noninstitutionalized female population in 2003 and 2004. The overall HPV prevalence was 26.8% among females aged 14–59 years. Sentinel surveillance data from 2003–2005 provided an estimated prevalence of high-risk and low-risk HPV types in women attending clinics in six U.S. cities; the high-risk HPV prevalence was 23.0%. Data from the National Disease and Therapeutic Index suggest that cases of genital warts, as measured by initial visits to physicians' offices, may be increasing. Other projects are currently being implemented by CDC to monitor the impact of the HPV vaccine on genital warts, precursors of cervical cancer, and cervical cancer.

TUBERCULOSIS

TUBERCULOSIS

About Tuberculosis

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 if they have pulmonary or laryngeal TB, they can transmit the infection to others. According to the 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. An estimated 5%–10% of persons with

Tuberculosis: Key Findings

- A total of 13,299 cases of tuberculosis (TB) were reported in the United States during 2007, representing a 3.3% decline in cases reported during the previous year.
- For the fourth year in a row, the largest percentage of TB cases (29%) occurred in Hispanics. For the first time, Asians (26%) matched African Americans (26%) as the second largest racial/ethnic group.
- African Americans born in the United States accounted for 45% of TB cases in U.S.-born persons and accounted for approximately 18% of the national case total.
- Asians born outside the United States accounted for 43% of TB cases in foreign-born persons and accounted for approximately 25% of the national case total.
- TB rates remained high among foreign-born persons in 2007; the TB case rate was 20.7 for those born in foreign countries compared with 2.1 per 100,000 for U.S.-born persons.
- The percentage of cases in foreign-born persons continued to increase and was 58% of the national case total.
- In 2007, 21 states reported more cases than they reported in 2006.
- California, Texas, New York, and Florida accounted for 48% of the national case total.
- In 2007, the case rate for adults aged ≥65 years was 6.8 cases per 100,000.
- Of all TB cases reported in 2007 (those for which initial susceptibility testing was performed and for which the person had no history of TB), 1.1% were multidrug-resistant (MDR)—a slight increase over the 1.0% of cases reported in 2006.
- In 2007, two cases of extensively drug-resistant (XDR) TB were reported.

latent infection will eventually have active TB disease. In addition, HIV-infected persons who also have TB disease are more likely to die, even with treatment. In 2006, the most recent year for which mortality data are available, 644 persons died of TB disease, representing a rate of 0.2 deaths per 100,000.

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) is TB that is resistant to at least two of the first-line drugs used to treat the disease (i.e., isoniazid and rifampin). 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. Only 2–4 cases of XDR TB have been reported annually for the years 2004–2007, whereas approximately 120 cases of MDR TB were reported each year during the same time period.

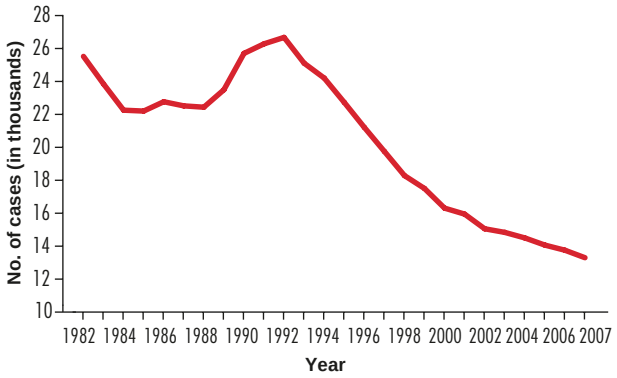
Tracking TB

TB surveillance carried out at the national, state, and local levels can help inform prevention and control efforts. Each year, as part of the National Tuberculosis Surveillance System, 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 human immunodeficiency virus [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.

National Snapshot

The number of TB cases reported in the United States began to increase steadily during the mid-1980s and reached a peak of more than 26,000 cases in 1992 (Figure 22). This surge was attributed to several factors, including the HIV epidemic, increases in TB cases among persons born in foreign countries, outbreaks in congregate settings (e.g., places where people reside in close proximity to one another), a deterioration of the TB services infrastructure, and the emergence of MDR TB. The implementation of more effective TB control programs began to reverse this trend in 1993: the rate of TB cases decreased an average of 6.6% per year from 1993 through 2002. Although the numbers of reported TB cases have continued to decline in recent years, the annual declines since 2002 have been smaller than those during the previous decade. In 2007, a total of 13,299 TB cases were reported, representing a 3.3% decline from the number of cases reported in 2006. The rate of TB (i.e., number of cases per 100,000) also gradually declined over the past several years, from 5.6 cases in 2001 to 4.4 cases per 100,000 in 2007.

Figure 22. Reported TB cases—United States, 1982–2007



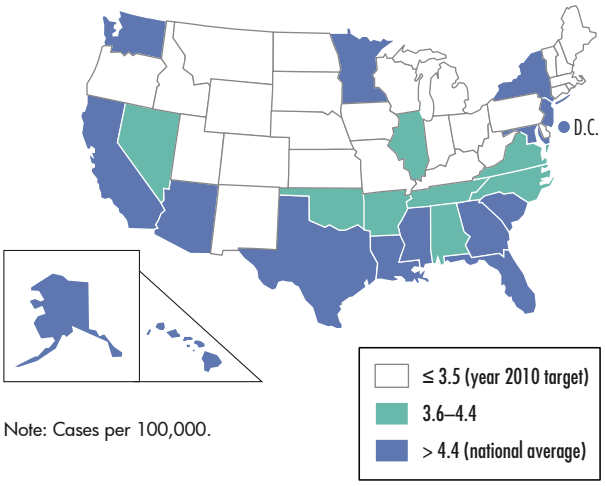
Note: Updated as of April 23, 2008.

Geographic Trends

Variations in the state rates of TB largely reflect the place of birth and the race/ethnicity of the people that reside in a specific geographic area of the country. For instance, the rates for several years have been disproportionately higher among American Indians/Alaska Natives, Asians, African Americans, Pacific Islanders, and Hispanics than among whites; therefore,

the rates of disease have been higher in states with substantial numbers of residents who are members of these races/ethnicities. In 2007, rates were highest in Hawaii, Alaska, California, Texas, New York, and the District of Columbia (Figure 23). In 29 states, 50% or more of the 2007 TB cases occurred among persons born outside the United States; in 13 states, foreign-born persons accounted for at least 70% of cases.

Figure 23. TB case rates—United States, 2007



Note: Cases per 100,000.

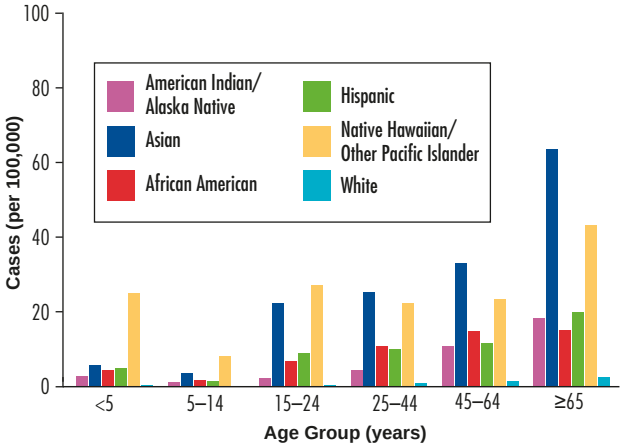
In 2007, a total of 26 states achieved the year 2000 Advisory Committee on the Elimination of Tuberculosis interim target of 3.5 cases per 100,000, reflecting an overall trend of decreasing numbers of active TB cases and rates. However, 15 states (along with the District of Columbia) reported rates above the 2007 national average of 4.4 cases, accounting for 67% of the national burden of disease. Despite having higher rates of TB, these 15 states and the District of Columbia have experienced decreases in annual disease rates since 1992.

Population Trends

Race/Ethnicity, Origin of Birth, Sex, and Age

The number of reported cases of TB in the United States is highest among persons of minority races or ethnicities (Figure 24). In 2007, 83% of the total number of reported cases occurred among persons who were Hispanic (29% of cases), African American (26%), Asian (26%), American Indian/Alaska Native (1%), or Pacific Islander (<1%). Since 2004, more

Figure 24. TB case rates, by age group and race/ethnicity—United States, 2007



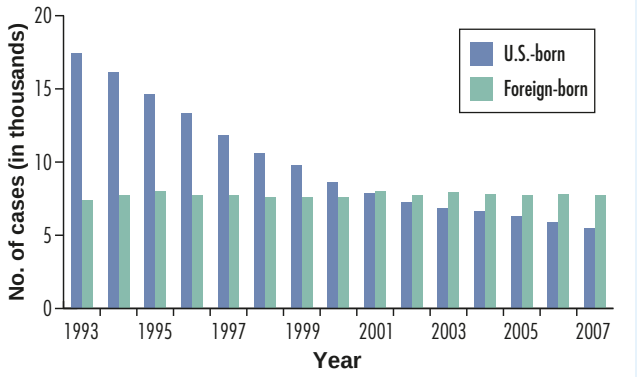
Note: Persons reporting two or more races accounted for less than 1% of all cases.

cases of TB have occurred among Hispanics than any other racial/ethnic group.

When examined by rate, the 2007 surveillance data reveal that Asians were most affected by TB; the rate for this group was 26.3 per 100,000. Further, the highest TB rate for each age group older than 24 years was the rate for Asians.

The disproportionate burden of TB in minority races/ethnicities can be attributed to several factors; however, one major factor is country of birth. Persons born in countries with high rates of TB who receive a diagnosis of TB in the United States may have acquired TB infection, or active TB disease may have developed, in their country of origin. The 2007 case rate of TB among foreign-born persons is almost 10 times the rate among persons who were born in the United States. In addition, of the total number of TB cases reported in 2007, 58% were among foreign-born persons, representing an increase from 1993, when 29% of cases were attributable to this population. Although the rates of TB are decreasing among all groups, data from 1993 through 2007 reveal that rates declined less among foreign-born persons (from 34 cases per 100,000 in 1993 to 21 cases in 2007) than among those born in the United States (from 7.4 cases in 1993 to 2.1 cases in 2007) (see Figure 25 for the number of cases, 1993–2007). Of the cases of TB among foreign-born persons, 62% occurred in persons born in Mexico (24%), the Philippines (12%), India

Figure 25. TB cases in U.S.-born vs. foreign-born persons—United States, 1993–2007



Note: Updated as of April 23, 2008.

(8%), Viet Nam (7%), China (5%), Guatemala (3%), or Haiti (2%), all of which have higher background rates of this disease than does the United States.

In 2007, the highest percentage of cases in U.S.-born persons were in African Americans (45%), followed by whites (33%) and Hispanics (16%). TB rates among African Americans have declined more (from 28.0 in 1993 to 9.3 in 2007) than the rates among their white counterparts (from 5.5 in 1993 to 2.4 in 2007), even though African-American TB patients are more likely than whites to have risk factors associated with TB, including homelessness, incarceration, HIV infection, and a recent history of substance abuse.

In 2007, TB rates were higher among males than females, regardless of age, although this difference widened with advancing age. Among children, the rates for both sexes were low, at <3 cases per 100,000. Among persons in older age groups (i.e., ≥45 years of age), the rates for men were at least double those for women.

In 2007, 33% of TB cases occurred among persons aged 25–44 years, followed by those aged 45–64 and ≥65 years (30% and 19%, respectively). During 1993–2007, rates declined among persons in all age groups; the most substantial decline (over 50%) occurred among persons >24 years of age.

Other Considerations

Beyond race/ethnicity, country of birth, sex, and age, several specific populations are known to be affected disproportionately by TB. For instance, the rates of TB are higher among persons infected with HIV. TB occurs more frequently in HIV-infected persons because HIV weakens the immune system, greatly increasing the likelihood of progression from latent to active TB disease. Although 2007 data on coinfection were not available at the time this profile was published, data collected from 1993 through 2006 (excluding California) reveal that coinfection with HIV and TB decreased substantially among persons of all age groups, particularly among those aged 25–44 years. In 2006, for those with reported HIV test results, approximately 7% of TB-infected persons of all ages and 12% of TB-infected persons aged 25–44 years were coinfected with HIV. Groups of TB patients at greater risk of HIV infection include injection drug users, homeless persons, African Americans, correctional facility inmates, and persons who abuse alcohol.

Because TB is an airborne disease (i.e., transmitted through the air after a patient with active disease coughs or sneezes), it is transmitted more efficiently to persons who are in close contact, for extended periods, with a person who has the active disease. Therefore, rates of TB have historically been high in groups of persons living in congregate settings, including correctional facilities, long-term care and residential facilities, and homeless shelters. To help inform TB prevention and control activities, data on persons in congregate settings are collected each year. In 2007, approximately 4% of the total number of reported TB cases were among persons living in correctional facilities, 2% were among persons living in long-term care facilities, and 6% were among persons who identified themselves as homeless.

TB rates are disproportionately high among persons who use illicit drugs. Although the relationship between TB and drug use is not completely understood, states routinely collect data regarding drug use (injected, ingested, or smoked) among persons with a diagnosis of TB disease. In 2007, of all reported TB cases, approximately 2% were among persons who reported having injected drugs within the 12 months preceding TB diagnosis; 8% of reported cases of TB were among persons who reported having ingested or smoked drugs.

Drug-resistant Tuberculosis

Drug resistance poses a challenge to public health efforts aimed at controlling and preventing TB disease. In 2007, drug resistance continued to affect some populations disproportionately. For instance, although the percentage of TB cases resistant to isoniazid had decreased during the preceding decade, the 2007 percentage of isoniazid-resistant cases in persons born in foreign countries remained twice the percentage of cases in persons born in the United States (9.4% versus 4.4%, respectively). Foreign-born persons emigrating from countries with high rates of MDR TB have increasingly contributed to the proportion of MDR TB cases in the United States. From 1993 through 2007, the percentage of all cases of MDR TB attributable to persons born in other countries increased from 26% (1993) to 80% (2007).

SPECIAL FOCUS:
WOMEN OF REPRODUCTIVE AGE

SPECIAL FOCUS: WOMEN OF REPRODUCTIVE AGE

The *2007 Disease Profile* highlights the health issues faced by reproductive-aged women, many of whom are affected by one or more of the diseases described in this report. In this chapter, we define *reproductive-aged women* as females who are 15–44 years of age. Although this age range is commonly used, it may vary slightly from that used in other reports and in other sections of this report; it does, however, encompass most females of reproductive age.

National surveillance data as well as data from other scientific studies have shown that reproductive-aged women, particularly those of some races/ethnicities (e.g., Hispanic) and within specific age subgroups (e.g., aged 15–19 years), bear an elevated burden of disease and remain in need of effective health interventions. Given that women in these subgroups continue to be affected disproportionately by more than one of the diseases within the purview of the National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention, this chapter concludes with a discussion of the disease-related health disparities faced by these women.

Diseases that affect reproductive-aged women are of particular interest, because many of these diseases can be transmitted to infants before (prenatal), during (perinatal), or after (postnatal) childbirth. For example, HIV infection can be transmitted from mother to child not only during pregnancy and childbirth but also (through breastfeeding) after childbirth. In addition, some of these diseases may lead to more serious health problems. Some untreated sexually transmitted diseases (STDs) in women can, for example, result in pelvic inflammatory disease and infertility.

Elevated rates for some of these diseases in reproductive-aged women relative to other populations, such as men or women of other ages, can be attributed to several factors, including biological, social, and behavioral factors, and structural and environmental factors such as limited access to high-quality health care. Women, compared with men, also are more likely to shoulder the burden of caring for others, including their children and elderly parents, and may neglect their own health in the process. Other factors, including racism and discrimination, are associated with the disease disparities among reproductive-aged women of some minority races/ethnicities or of lower socioeconomic status.

Understanding the effects of multiple diseases on the health and quality of life of reproductive-aged women can help to better direct prevention, education, and treatment efforts. Because women in this age group are often the primary decision-makers in their households for health-related issues, it is particularly important to reach these women with accurate health messages. Ensuring that women are well informed about the prevention of HIV/AIDS, viral hepatitis, STDs, tuberculosis (TB), and other infectious diseases increases the likelihood that health-related messages will reach other populations, including men, children, and the elderly. The identification of overlapping patterns and trends involving two or more of these diseases may therefore facilitate a more efficient and cost-effective approach to improving the health of reproductive-aged women and, when appropriate, their families.

HIV/AIDS

Although men accounted for almost three-fourths of the estimated number of HIV/AIDS diagnoses in 2007 from the 34 states with long-standing name-based HIV infection reporting, newly diagnosed cases are continuing to affect women disproportionately in some subpopulations. In 2007, most of the diagnoses of HIV/AIDS in females were among those aged 15–44 years.

HIV infection among women of reproductive age poses clinical and public health challenges. Similar to other diseases discussed in this chapter, HIV infection can be transmitted from a pregnant woman to her infant during pregnancy, childbirth, and breastfeeding. Approximately 25% of infected women who do not receive treatment and do not breastfeed transmit HIV infection to their infants during pregnancy or childbirth. Since the beginning of the AIDS epidemic in the early 1980s, AIDS has been diagnosed for more than 8,400 children who were perinatally infected with HIV; more than half of these children have died. Fortunately, antiretroviral therapy during pregnancy dramatically reduces the likelihood of mother-to-child transmission (from about 25% to less than 2%). This reduction underscores the importance of increasing the number of pregnant women who are tested for HIV.

Because reproductive-aged women are often the primary caregivers in their households, HIV/AIDS in this population can have far-reaching implications. HIV-infected women may have difficulty caring for their children and other family members, which can negatively affect the emotional and physical health of these persons. The social stigma associated with HIV infection can also affect women's health-related behaviors, including the decisions to get tested, seek treatment, and disclose their HIV serostatus to their sex partners.

CDC is involved in several activities aimed at preventing and controlling HIV/AIDS in women of reproductive age. For instance, the agency developed an initiative, Advancing HIV Prevention: New Strategies for a Changing Epidemic, that focuses on the following four major prevention strategies, all of which are applicable to reproductive-aged women: (1) making HIV testing a routine part of medical care, (2) using new models for diagnosing HIV infection outside traditional medical settings, (3) preventing new infections by working with HIV-infected persons and their partners, and (4) decreasing mother-to-child HIV transmission. CDC also has worked to identify effective HIV/AIDS interventions for groups of women who are at higher risk of disease, including young African-American women, pregnant women who live in inner-city neighborhoods, and women who are socioeconomically disadvantaged. In addition to these initiatives, CDC has supported grassroots projects aimed at preventing and controlling HIV/AIDS among women by awarding HIV-prevention funding to 22 community-based organizations. Further, the agency supports local demonstration projects that offer HIV testing to female partners of HIV-infected men, particularly in communities with large numbers of African Americans and Hispanics.

To reduce the incidence of perinatal HIV transmission, CDC has conducted enhanced perinatal surveillance activities for more than a decade. As part of those surveillance activities, CDC set several goals for reducing perinatal HIV transmission in areas with high prevalence. These goals are (1) to monitor the implementation of the recommendations of the U.S. Public Health Service for counseling and voluntary testing of pregnant women, the use of antiretrovirals to prevent perinatal HIV transmission, and the effect of implementation on the trends of HIV disease among children; (2) to establish a surveillance system to collect data that enable states to respond to selected requirements of the Ryan White CARE Act; and (3) to assist with timely evaluation of perinatal prevention efforts.

Understanding the patterns and trends in HIV infection among all reproductive-aged women, including those who are pregnant, is important for ensuring that these women receive prevention, education, and treatment, all of which will not only help improve the health of women in this age group but protect their partners and children from becoming infected.

Hepatitis B

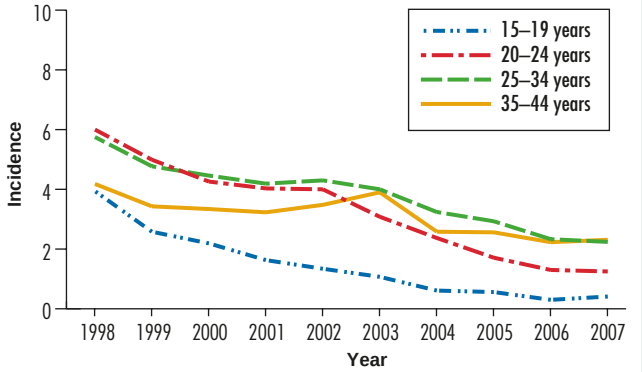
Chronic hepatitis B virus (HBV) infection is a serious problem among women of childbearing age. Although commonly unaware of their infections, women with chronic HBV infection can transmit the infection to their infant at birth. The infant's risk of HBV infection after mother-to-child transmission (perinatal transmission) is 70%–90% if the mother is positive for both hepatitis B surface antigen (HBsAg) and hepatitis e antigen (HBeAg). The infant's risk of HBV infection is less than 10% if the mother is positive only for HBsAg. Even if a child is not infected at birth, the child remains at risk of HBV infection through long-term interpersonal contact with an infected mother. According to some studies, a child's risk of HBV infection is approximately 40%

by 4 years of age simply by living in a household with a chronically infected person. Furthermore, the infant's risk of progression of the infection to chronic HBV infection is inversely related to his or her age at the time of infection. In almost all infected infants and a large proportion of infected children, the infection progresses to chronic HBV infection. By contrast, the infection progresses to chronic infection in only 0.5% to 2.0% of infected adults. Infants and children with chronic HBV infection are thus at the highest risk of liver failure, cirrhosis, and liver cancer, any of which may cause death.

Acute HBV infection is a reportable disease in all 50 states. States report cases of acute infection, including HBV, to CDC by using the National Notifiable Disease Surveillance System. The 2007 data for females aged 15–44 years showed a higher incidence of acute HBV infection among those aged 25–34 years (2.2 cases per 100,000) and 35–44 years (2.3 per 100,000) than among those aged 20–24 years (1.3 per 100,000) and those aged 15–19 years (0.4 per 100,000) (Figure 26). However, the incidence of acute HBV infection has declined for all age groups since the introduction, in the mid-1980s, of a comprehensive strategy for eliminating HBV infections in the United States. The decline during 1998–2007—greatest for the youngest age group (15–19 years) and least for the oldest age group (35–44 years)—suggests a cohort effect that is consistent with the ages at which females are most likely to be vaccinated.

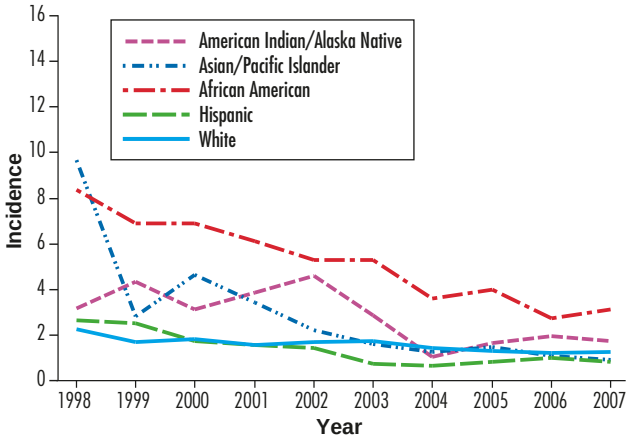
The 2007 race/ethnicity data from the National Notifiable Disease Surveillance System also showed

Figure 26. Incidence of acute hepatitis B among females aged 15–44 years, by age group—United States, 1998–2007



Note: Per 100,000 population.

Figure 27. Incidence of acute hepatitis B among females aged 15–44 years, by race/ethnicity—United States, 1998–2007



Note: Per 100,000 population.

a higher incidence of acute HBV infection among African-American women (3.1 cases per 100,000), followed by American Indian and Alaska Native women (1.75 per 100,000) (Figure 27). The lowest incidence was that among Hispanic women: 0.8 cases per 100,000. In terms of trends, the highest incidence in 1998 was that for Asian and Pacific Islander women (9.7 per 100,000), but by 2007, the incidence among these women showed the largest decline (0.9 cases per 100,000). White women experienced the smallest decline (45%) from 1998 through 2007, but the rate among white women was the lowest in 1998 (2.3 per 100,000), and it remained low in 2007. By 2007, the rate among African-American women had declined from 8.4 per 100,000 in 1998.

Among females aged 15–24, 25–34, and 35–44 years, the most commonly reported risk behavior was multiple sex partners (47.5%, 35.8%, and 37.4%, respectively). Injection drug use was the second most commonly reported risk behavior, followed by sexual contact with a person known to be HBV-positive. Sexual contact with an HBV-infected person differed little in terms of age group. The prevalance of injection drug use was higher among females aged 25–34 years (26.4%) than among those aged 15–24 years (14.3%) or those aged 35–44 years (15.2%).

Another factor that influences the incidence and prevalence of HBV infection is country of origin. Data from studies of foreign-born U.S. residents indicate that HBsAg seroprevalence corresponds to

HBV endemicity in their country of origin. That is, chronic infection is more common in persons born in areas where HBV infection is endemic (notably, Asia, Africa, and Eastern Europe) and who immigrate to the United States than in those born in the United States.

The Behavioral Risk Factor Surveillance System, a state-based telephone survey of adults aged 18 years or older, also collects hepatitis-related data on reproductive-aged women. According to the 2006 survey, of more than 65,000 women of childbearing age (18–44 years), approximately 52.2% reported receiving the recommended three-dose hepatitis B vaccination, 6.5% reported engaging in at least one behavior associated with increased risk of HBV infection, and 4.1% were pregnant at the time of the survey. Overall, the women who received the three-dose vaccine series did not differ by race/ethnicity. Of pregnant women, 53.5% (95% CI = 49.4–57.4) reported receipt of the three-dose hepatitis vaccine series. These data demonstrate the need to educate women of childbearing age, particularly those who are at increased risk of HBV infection, and pregnant women to ensure that they are properly vaccinated against HBV infection.

CDC's strategy for eliminating HBV infection among infants, children, and adolescents in the United States includes several recommendations. These include the universal screening of pregnant women for HBsAg during each pregnancy and the provision of immunoprophylaxis to infants born to infected mothers, including hepatitis B vaccine and hepatitis B immune globulin during the first 12 hours after birth. In addition, CDC recommends completion of the hepatitis B vaccine series and post-vaccination testing for immunity; routine vaccination of all infants with the hepatitis B vaccine series, with the first dose administered at birth; and completion of the hepatitis B vaccine series for all unvaccinated persons <19 years of age.

To promote strategies to prevent perinatal HBV transmission, CDC currently awards immunization funds to 64 state and local health departments. In 2006, an estimated 25,000 U.S. women screened during prenatal care showed signs of HBV infection (i.e., tested positive for HBsAg). Of babies born to HBV-infected women, approximately 98% received the necessary shots at the recommended times to prevent mother-to-child transmission. Although improvements in the prevention of HBV transmission from mothers to infants have been documented, gaps remain in the identification and public health management of HBsAg-positive pregnant women and their infants, as well as in the case management of the infants and household and sexual contacts. HBV-infected mothers need care to reduce the risk of premature death as a result of liver disease. Some infants of HBV-infected mothers do not receive recommended interventions: the result is that chronic HBV infection develops in approximately 800 children each year. Other family members are at increased risk of infection and should receive HBV screening and vaccination. To maximize the prevention of HBV infection, emphasis is placed on provider education to increase the number of pregnant women who are screened, program evaluation and capacity building to improve case management, and the implementation of electronic laboratory reporting to improve surveillance.

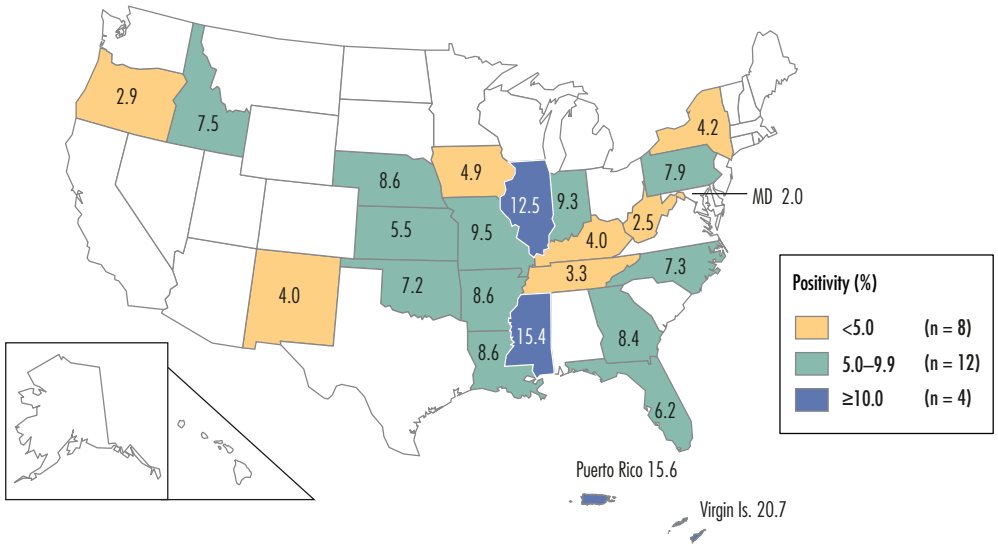
Strategies to prevent HBV infection, combined with case management procedures, are expected to contribute to the elimination of HBV infection in the United States. Surveillance of viral hepatitis, including acute and chronic infection, is a crucial part of this effort.

Sexually Transmitted Diseases

Reproductive-aged women, particularly those aged 15–24 years and those of minority races or ethnicities are affected disproportionately by several STDs. Unlike infected men, infected women can experience significant adverse health effects for decades.

In 2007, more than 800,000 cases of chlamydia infection in women were reported, making it the most commonly reported disease in the United States. Among states and territories participating in the Infertility Prevention Project (screening in selected prenatal clinics) in 2007, the percentage of female patients aged 15–24 years who tested positive was especially striking: range, 2.0% to 20.7% (Figure 28). Although the reported case rate for women was nearly 3 times the rate for men, this disparity can be attributed to more frequent screening for this disease among women. Because chlamydia in women is asymptomatic in up to 75% of cases, increased rates of chlamydia create difficulties for both prevention

Figure 28. Chlamydia among females aged 15–24 years, tested in prenatal clinics, by state—United States and outlying areas, 2007



Note: Includes states and outlying areas that reported chlamydia positivity data on at least 100 women aged 15 to 24 years during 2007. The District of Columbia and the following 28 states did not meet minimum inclusion criteria in prenatal clinics: Alabama, Alaska, Arizona, California, Colorado, Connecticut, Delaware, Hawaii, Maine, Massachusetts, Michigan, Minnesota, Montana, Nevada, New Hampshire, New Jersey, North Dakota, Ohio, Rhode Island, South Carolina, South Dakota, Texas, Utah, Vermont, Virginia, Washington, Wisconsin, and Wyoming.

Data sources: Chlamydia Prevalence Monitoring Project (Regional Infertility Prevention Projects); Office of Population Affairs; Local and State STD Control Programs; Centers for Disease Control and Prevention

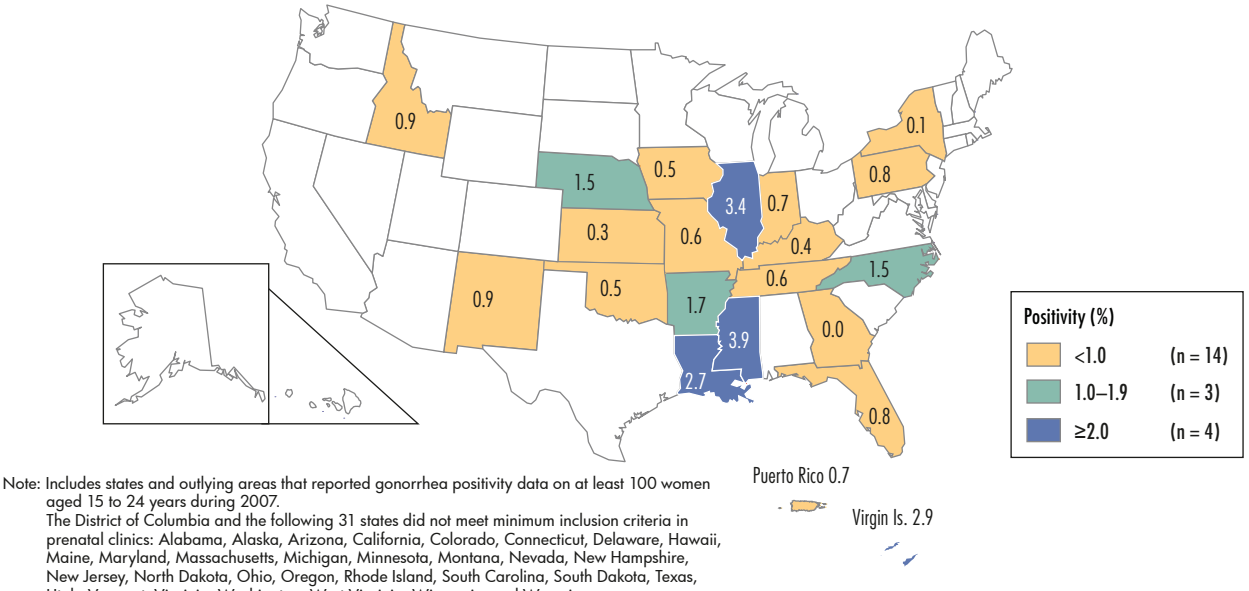
and treatment. Untreated chlamydia can lead to severe health complications for women; for example, in up to 40% of infected women, untreated chlamydia can cause pelvic inflammatory disease, which can have long-term health implications (e.g., infertility and ectopic pregnancy). Among reproductive-aged women, chlamydia also increases the risk for additional adverse health effects, including HIV infection. A woman who is infected with chlamydia, compared with a woman who is not infected, is 3 to 5 times as likely to become infected with HIV.

Gonorrhea is the second most commonly reported disease in the United States. Although rates of gonorrhea were similar among men and women for the years 2001–2007, the 2007 gonorrhea rate among women (approximately 125 cases per 100,000) remained higher than the *Healthy People 2010* objective of 19 cases per 100,000. In the states and territories participating in the Infertility Prevention Project in 2007, the percentage of females aged 15–24 years who tested positive ranged from <1% to 3.9% (Figure 29). Like chlamydia, gonorrhea is often asymptomatic and can have severe health consequences, such as pelvic inflammatory disease, for reproductive-aged women; therefore, the continued high rates in this population are especially concerning. To help control and prevent gonorrhea among reproductive-aged women, the U.S. Preventive Services Task Force recommends that clinicians screen all sexually active women who are at increased risk of gonorrhea infection, including those who are pregnant.

Historically, primary and secondary (P&S) syphilis has affected more men than women; however, rates among reproductive-aged women increased for the period 2004–2007. During 2006–2007, rates of P&S syphilis increased for each age subgroup within the broader group (15–44 years) of reproductive-aged women.

Chlamydia, gonorrhea, and P&S syphilis in reproductive-aged women have additional implications because these STDs can adversely affect the health of the pregnant woman and her newborn. Women infected with chlamydia can give birth to an infant who also is infected in the form of neonatal ophthalmia or neonatal pneumonia. Gonorrhea, too, can lead to ophthalmia in infants born to infected mothers. P&S syphilis in a pregnant woman can lead to congenital syphilis in her infant. The annual rates

Figure 29. Gonorrhea among females aged 15–24 years, tested in prenatal clinics, by state—United States and outlying areas, 2007



Note: Includes states and outlying areas that reported gonorrhea positivity data on at least 100 women aged 15 to 24 years during 2007.
The District of Columbia and the following 31 states did not meet minimum inclusion criteria in prenatal clinics: Alabama, Alaska, Arizona, California, Colorado, Connecticut, Delaware, Hawaii, Maine, Maryland, Massachusetts, Michigan, Minnesota, Montana, Nevada, New Hampshire, New Jersey, North Dakota, Ohio, Oregon, Rhode Island, South Carolina, South Dakota, Texas, Utah, Vermont, Virginia, Washington, West Virginia, Wisconsin, and Wyoming.

Data sources: Gonorrhea Prevalence Monitoring Project (Regional Infertility Prevention Projects); Office of Population Affairs; Local and State STD Control Programs; Centers for Disease Control and Prevention

of congenital syphilis increased substantially in 2006 (11%) and 2007 (15%). Those increases are most likely related to the increased number of cases of P&S syphilis in women of reproductive age. The 2007 rate of congenital syphilis remained 10 times the *Healthy People 2010* objective of 1.0 case per 100,000 live births.

As evidenced through several initiatives, CDC is committed to reducing the burden of these STDs among reproductive-aged women. CDC supports the Infertility Prevention Project, a collaborative screening program that was established in 1988 and implemented in all 10 Health and Human Services regions. This project monitors the trends in chlamydia and gonorrhea among reproductive-aged women who visit one of the participating public clinics. To gain additional insight into the incidence of chlamydia among females aged 15–25 years, CDC analyzed the 2000–2007 data from the Health Plan Employer Data and Information Set (HEDIS), reported by commercial and Medicaid health insurance plans; the results of this analysis were published by CDC in 2009.

Data from these projects have informed the development of targeted screening and intervention recommendations. For instance, the elevated rates of chlamydia among young reproductive-aged women, along with the associated and far-reaching health complications in this population, prompted CDC to recommend chlamydia screening for sexually active females <26 years of age and older women who are at increased risk.

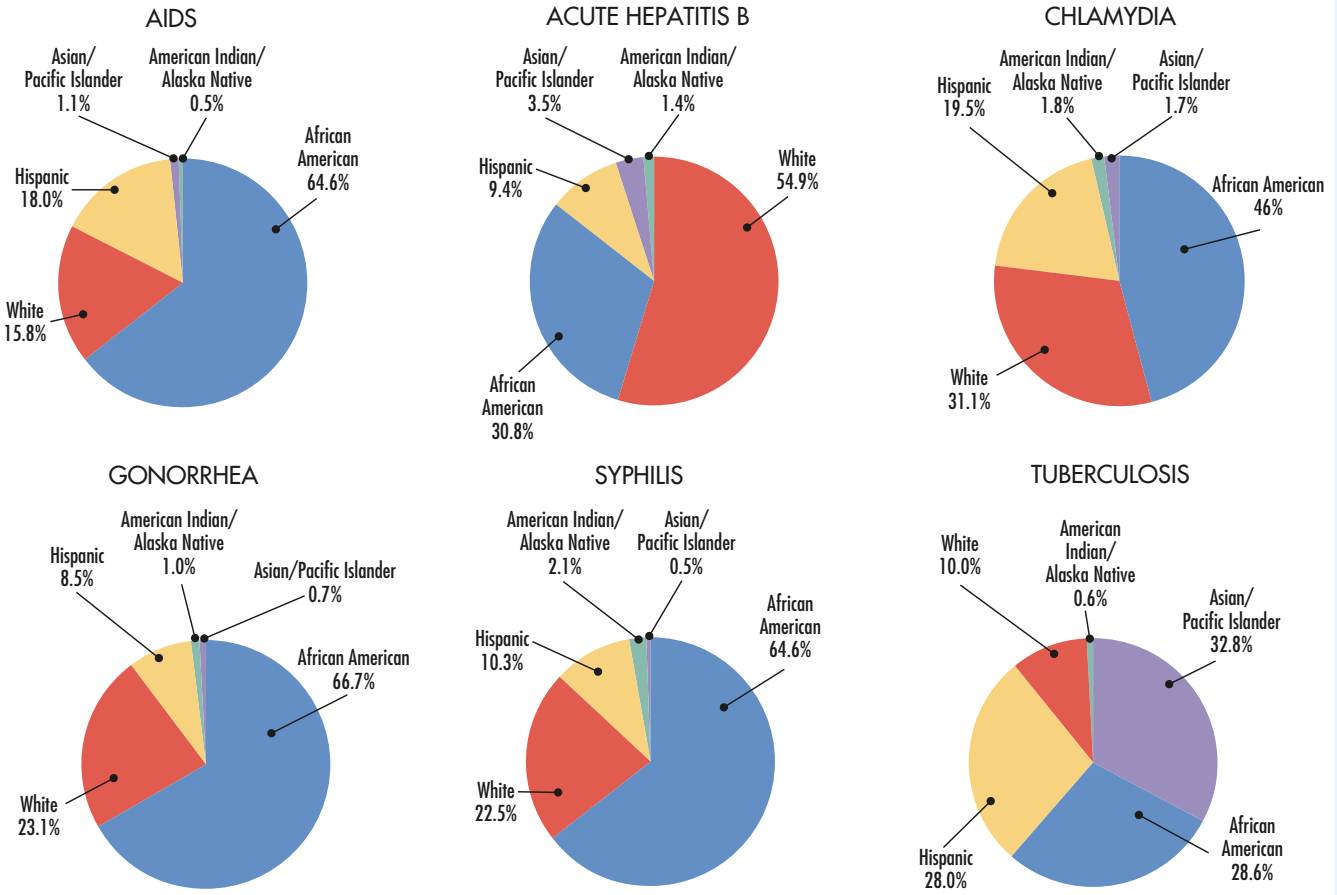
Tuberculosis

Although rates of TB in all age groups are higher for men than women, disease incidence differs among women of reproductive age. For instance, rates are higher among women of minority races or ethnicities and women born in certain foreign countries.

Health Disparities among Reproductive-Aged Women

Many of the diseases discussed in this chapter (HIV/AIDS, STDs, TB, and hepatitis B) disproportionately affect specific subsets of women within the broader focus population. The rates of disease in some subgroups, including women of minority races/ethnicities (Figure 30), younger or

Figure 30. AIDS, hepatitis B, chlamydia, gonorrhea, syphilis, and TB among among females aged 15–44 years, by race/ethnicity—United States, 2007



older women of reproductive age, and women born in certain foreign countries, are substantially higher than the rates of disease among reproductive-aged women in other demographic groups.

African-American Women

African-American women, compared with white women, face significant health disparities in rates of HIV/AIDS, other STDs, hepatitis B, and TB. Several factors are associated with increased rates of these diseases among African-American women, including lack of awareness of the activities that place them at risk of infection. For HIV/AIDS, these activities include unprotected sex with multiple partners or with men who have sex with both men and women, and injection drug use; the presence of other STDs (which increases the likelihood of becoming infected with HIV if exposed to the virus) also is associated with increased risk of HIV infection in these groups, because African-American women are affected disproportionately by several STDs. Likewise, HIV-TB coinfection increases the risk that latent TB infection will progress to active TB disease. Because the prevalence of HIV is high among African-American women, they are more likely to be affected by the adverse health outcomes associated with active TB.

For all of the diseases discussed in this profile, poverty is a significant social determinant of health for reproductive-aged women. One in four African Americans lives in poverty—a socioeconomic factor that has been directly associated with less frequent receipt of important health-related services (testing, treatment, education, and other types of interventions). Social and cultural trends and traditions also can affect transmission rates

among African-American women of reproductive age. Homophobia and stigma can cause some African-American MSM to identify themselves as heterosexual or not to disclose their sexual orientation, which may be a factor in HIV transmission, particularly for African-American women.

In 2006, HIV disease was the fourth leading cause of death among African-American women aged 25–34 years in the United States. In 2007, 65% of the women living with HIV/AIDS in the 34 states with mature HIV infection reporting systems were African American. In 2007, the most recent year for which data have been compiled, the rate of AIDS diagnoses for African-American women was 22 times the rate for white women. Of African-American women living with HIV/AIDS in 2007, three-fourths had been infected as a result of high-risk heterosexual contact (sex with an HIV-infected man). The second most common mode of transmission for this population was injection drug use.

Chlamydia, gonorrhea, and P&S syphilis also affect disproportionate numbers of African-American women. The rates of these three STDs among African-American females aged 15–44 years are about 6, 13, and 10 times, respectively, the rates among their white counterparts. For chlamydia, the 2007 rate among African-American females aged 15–34 years reflects a substantial increase over the 2006 rate. For gonorrhea, the 2007 rate among African-American females in this age group reflects a slight increase over the 2006 rate. For P&S syphilis, the 2007 rate was higher than in earlier years for all age subgroups of reproductive-aged women, except for the subgroup 15–19 years: for this subgroup, the rate remained stable.

In 2007, the incidence of acute hepatitis B among reproductive-aged women was highest among African-Americans: 3.1 cases per 100,000 in 2007. Although African-American women continue to be unduly affected by this disease, rates have declined 63% since 1998.

African-American women of reproductive age also are disproportionately affected by TB. In 2007, African Americans accounted for almost 30% of the TB diagnoses for females aged 15–44 years (white females accounted for 10%). Slightly more cases occurred among African-American and white women aged 36–44 years than among those who were younger (15–25 years).

Hispanic Women

For many of the diseases discussed in this profile, higher prevalence rates among women of reproductive age are common not only among African-American women but also among Hispanic women. The factors that contribute to health disparities among Hispanic women are numerous and can include socioeconomic status, cultural norms, the use of injection drugs, and coinfection with diseases that disproportionately affect Hispanic women.

One in five Hispanics lives in poverty. Thus, this population faces many socioeconomic challenges that can put them at increased risk of disease, including a lack of formal education, employment, transportation, and health insurance, all of which can compromise the receipt of high-quality health care, increase the likelihood of disease, and affect health outcomes. Cultural traditions and beliefs also affect health. For example, in the Hispanic community, the cultural concept *machismo*—the belief that all men should assume strong, protective, masculine roles as providers for their families—likely contributes to HIV transmission: the social pressures associated with this gender stereotype can cause men who have sex with men to hide their sexual behaviors from their female partners or fail to seek HIV testing. Machismo has been associated with other types of risky sexual behaviors, such as having unprotected sex with multiple partners that place women and men at higher risk of some STDs, including HIV infection.

Another contributor to disease prevalence is coinfection with diseases for which the rates among Hispanic women are high. For example, high rates of some STDs among Hispanics place these women at increased risk of HIV infection; similarly, elevated rates of HIV infection in this population can increase the likelihood that active TB disease will develop in Hispanic women who are coinfected with TB.

In 2007, Hispanic women accounted for 15% of females living with HIV/AIDS in the 34 states with mature HIV infection reporting systems, and in 2006, HIV disease was the fourth leading cause of death among Hispanic women aged 36–44 years. As is true

of HIV/AIDS in African-American women, most cases in Hispanic women were transmitted through high-risk heterosexual contact with HIV-infected men. The second most common mode of transmission for this population was injection drug use.

In addition to higher rates of HIV/AIDS, the 2007 rates of chlamydia, gonorrhea, and P&S syphilis were higher among Hispanic women of reproductive age than white women of comparable age. Specifically, the rates of chlamydia and P&S syphilis among Hispanic women were about twice the rates among white women, the rate of gonorrhea among Hispanic women was approximately 1.5 times the rate among white women. A comparison of the 2006 and 2007 data indicates that among Hispanic women of reproductive age (all age subgroups), chlamydia increased in 2007, and gonorrhea decreased. The rates of P&S syphilis fluctuated slightly, depending on the specific age subgroup.

Hispanic women of reproductive age also are affected by TB to a greater extent than white women. In 2007, among females aged 15–24 years, about 30% of reported cases of TB occurred among Hispanics, followed by 29% among those aged 25–35 years, and 23% among those aged 36–44 years. Percentages for white females in the same age groups were 8%, 8%, and 14%, respectively.

Country of Origin

Reproductive-aged women who live in the United States but were born in certain foreign countries are at substantially higher risk of TB than are U.S.-born women. The incidence of TB among these foreign-born women has been increasing since CDC began collecting these data in 1986. Of the total number of TB cases reported among reproductive-aged women in 2007, Hispanics and Asians (U.S.- and foreign-born) accounted for two-thirds of all cases. Although the 2007 rates were higher among U.S.-born Hispanic women (2.1 cases per 100,000) than among U.S.-born white women (0.5 per 100,000), Hispanic women who were born in the United States are at substantially lower risk of disease than women born in Latin American countries. Even more significant is the rate of TB among U.S.-born Asian women: the 2007 rate—3.0 per 100,000—was higher than the rates among Hispanic and white women.

Age Group

In addition to the racial/ethnic differences in disease rates among reproductive-aged women, there also are differences by age group. In 2007, younger women of reproductive age were disproportionately affected by each of the three most prevalent STDs. The highest rates of both chlamydia and gonorrhea were reported among females aged 15–19 years (3,005 cases and 648 cases per 100,000, respectively), followed closely by females aged 20–24 years. P&S syphilis also disproportionately affected younger women in 2007: of the reported cases in women, most occurred in those aged 20–24 years. A diagnosis of TB, however, was more likely for African American and white women at the upper end of the reproductive age range (36–44 years) than for African American and white females at the lower end (i.e., 15–35 years) of the age range.

Conclusion

As shown by these data, the burden of disease is greater among reproductive-aged women, particularly those of some races/ethnicities (e.g., African American, Hispanic), those who are foreign-born, and those of specific age subgroups. Interventions specific to these women are crucial to the prevention and treatment of these diseases: untreated, many of these diseases can not only lead to more serious health problems in these women but also can be passed on to their infants. Examining the data on these diseases collectively is useful in determining disproportionate disease burden and in identifying ways to more effectively promote prevention and provide treatment services to reproductive-aged women.

SELECTED BIBLIOGRAPHY

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Introduction

CDC. *2006 Disease Profile.* Atlanta, GA: U.S. Department of Health and Human Services, CDC; 2008:1–65. http://www.cdc.gov/nchhstp/Publications/.

HIV/AIDS

CDC. Epidemiology of HIV/AIDS—United States, 1981–2005. *MMWR* 2006;55(21):589–592.

CDC. Guidelines for national human immunodeficiency virus case surveillance, including monitoring for human immunodeficiency virus infection and acquired immunodeficiency syndrome. *MMWR Recomm Rep* 1999;48(RR-13):1–28.

CDC. *HIV/AIDS Surveillance Report, 2007.* Vol. 19. Atlanta, GA: U.S. Department of Health and Human Services, CDC; 2009:1–63. http://www.cdc.gov/hiv/topics/surveillance/resources/reports/.

CDC. Surveillance case definition for AIDS among adolescents and adults. *MMWR Recomm Rep* 1992;41(RR-17):1–17.

CDC. Twenty-five years of HIV/AIDS—United States, 1981–2006. *MMWR* 2006;55(21):585–589.

Hall HI, Song R, Rhodes P, et al. Estimation of HIV incidence in the United States. *JAMA* 2008;300(5):520-529.

Viral Hepatitis

Armstrong GL, Wasley A, Simard EP, McQuillan GM, Kuhnert WL, Alter MJ. The prevalence of hepatitis C virus infection in the United States, 1999 through 2002. *Ann Intern Med* 2006;144:705–714.

Bell BP, Kruszon-Moran D, Shapiro CN, Lambert SB, McQuillan GM, Margolis HS. Hepatitis A virus infection in the United States: serologic results from the Third National Health and Nutrition Examination Survey. *Vaccine* 2005;23(50):5798–5806.

CDC. A comprehensive immunization strategy to eliminate transmission of hepatitis B virus infection in the United States: recommendations of the Advisory Committee on Immunization Practices (ACIP); Part 1: immunization of infants, children, and adolescents. *MMWR Recomm Rep* 2005;54(RR-16):1–32.

CDC. A comprehensive immunization strategy to eliminate transmission of hepatitis B virus infection in the United States: recommendations of the Advisory Committee on Immunization Practices (ACIP); Part II: immunization of adults. *MMWR Recomm Rep* 2006;55(RR-16):1–33.

CDC. Prevention of hepatitis A through active or passive immunization: recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR Recomm Rep* 2006;55(RR-7):1–23.

CDC. Public Health Service inter-agency guidelines for screening donors of blood, plasma, organs, tissues, and semen for evidence. *MMWR Recomm Rep* 1991;40(RR-4):1–17.

CDC. Recommendations for identification and public health management of persons with chronic hepatitis B virus infection. *MMWR Recomm Rep* 2008;57(RR-8):1–20.

CDC. Surveillance for acute viral hepatitis—United States, 2007. *MMWR Surveill Summ* 2009;58(SS-3):1–27.

CDC. Update: prevention of hepatitis A after exposure to hepatitis A virus and in international travelers: updated recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR* 2007;56(41):1080–1084.

Gotz HM, van Doornum G, Niesters HG, et al. A cluster of acute hepatitis C virus infection among men who have sex with men—results from contact tracing and public health implications. *AIDS* 2005;19(9):969–974.

McQuillan GM, Coleman PJ, Kruszon-Moran D, Moyer LA, Lambert SB, Margolis HS. Prevalence of hepatitis B virus infection in the United States: the National Health and Nutrition Examination Surveys, 1976 through 1994. *Am J Public Health* 1999;89(1):11–13.

Thompson ND, Perz JF, Moorman AC, Holmberg SD. Nonhospital health care–associated hepatitis B and C virus transmission: United States, 1998–2008. *Ann Intern Med* 2009; 150(1):33–39.

Sexually Transmitted Diseases

CDC. Chlamydia screening among sexually active young female enrollees of health plans—United States 2000-2007. 2009;58(14):362-5.

CDC. Quadrivalent human papillomavirus vaccine: recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR.* 2007;56(RR-2):1–24.

CDC. *Sexually Transmitted Disease Surveillance, 2007.* Atlanta, GA: U.S. Department of Health and Human Services, CDC; 2008:1–168. http://www.cdc.gov/std/stats07/.

CDC. *Sexually Transmitted Disease Surveillance 2007 Supplement: Chlamydia Prevalence Monitoring Project Annual Report 2007.* Atlanta, GA: U.S. Department of Health and Human Services, CDC; 2009:1–29. http://www.cdc.gov/std/chlamydia2007/.

CDC. *Sexually Transmitted Disease Surveillance 2007 Supplement: Gonococcal Isolate Surveillance Project (GISP) Annual Report 2007.* Atlanta, GA: U.S. Department of Health and Human Services, CDC; 2009: 1–24. http://www.cdc.gov/std/GISP2007/.

Datta SD, Koutsky LA, Ratelle S, et al. Human papillomavirus infection and cervical cytology in women screened for cervical cancer in the United States, 2003–2005. *Ann Intern Med* 2008;148(7):493–500.

Datta SD, Sternberg M, Johnson RE, et al. Gonorrhea and chlamydia in the United States among persons 14 to 39 years of age, 1999 to 2002. *Ann Intern Med* 2007;147(2):89–96.

Dunne EF, Unger ER, Sternberg M, et al. Prevalence of HPV infection among females in the United States. *JAMA* 2007;297(8):813–819.

Joesoef MR, Mosure DJ. Prevalence of chlamydia in young men in the United States from newly implemented universal screening in a national job training program. *Sex Transm Dis* 2006;33(10):636–639.

Joesoef MR, Mosure DJ. Prevalence trends in chlamydial infections among young women entering the national job training program, 1998–2004. *Sex Transm Dis* 2006;33(9):571–575.

Joesoef MR, Weinstock HS, Kent CK, et al. Sex and age correlates of chlamydia prevalence in adolescents and adults entering correctional facilities, 2005: implications for screening policy. *Sex Transm Dis* 2009;36(2) (suppl):S67-S71.

U.S. Department of Health and Human Services. *Healthy People 2010: Understanding and Improving Health.* 2nd ed. Washington, DC: U.S. Government Printing Office; 2000: 1–76. http://www.healthypeople.gov.

Weinstock H, Berman S, Cates W Jr. Sexually transmitted diseases among American youth: incidence and prevalence estimates, 2000. *Perspect Sex Reprod Health* 2004;36(1):6–10.

Xu F, Sternberg MR, Kottiri BJ, et al. Trends in herpes simplex virus type 1 and type 2 seroprevalence in the United States. *JAMA* 2006;296(8):964-973.

Tuberculosis

Bennett D, Courval JM, Onorato I, et al. Prevalence of tuberculosis infection in the United States population: the National Health and Nutrition Examination Survey, 1999–2000. *Am J Respir Crit Care Med* 2008;177(3):348–355.

CDC. Prevention and control of tuberculosis in U.S. communities with at-risk minority populations: recommendations of the Advisory Council for the Elimination of Tuberculosis. *MMWR Recomm Rep* 1992;41(RR-5).

CDC. *Reported Tuberculosis in the United States, 2007.* Atlanta, GA: U.S. Department of Health and Human Services, CDC; 2008:1–131. http://www.cdc.gov/tb/statistics/reports/.

CDC. Targeted tuberculin testing and treatment of latent tuberculosis infection. *MMWR Recomm Rep* 2000;49(RR-6):8–9.

Special Population: Women of Reproductive Age

CDC. *2006 Disease Profile.* Atlanta, GA: U.S. Department of Health and Human Services, CDC; 2008:1–65. http://www.cdc.gov/nchhstp/Publications/.

CDC. *Behavioral Risk Factor Surveillance System Survey Data.* Atlanta, Georgia: U.S. Department of Health and Human Services, CDC; 2006. http://www.cdc.gov/brfss/technical_infodata/surveydata.htm.

CDC. Chlamydia screening among sexually active young female enrollees of health plans—United States, 2000–2007. *MMWR* 2009;58(14):362–365.

CDC. HIV/AIDS among African Americans. *CDC HIV/AIDS Fact Sheet* August 2008.

CDC. Recommendations for identification and public health management of persons with chronic hepatitis B virus infection. *MMWR Recomm Rep* 2008;57(RR-8):1–20.

CDC. Sexually transmitted diseases treatment guidelines, 2006. *MMWR Recomm Rep* 2006;55(RR-11):1–94.

Fleming DT, Wasserheit IN. From epidemiological synergy to public health policy and practice: the contribution of other sexually transmitted diseases to sexual transmission of HIV infection. *Sex Transm Infect* 1999;75(1):3–17.

Hader SL, Smith DK, Moore JS, Holmberg SD. HIV infection in women in the United States: status at the millennium. *JAMA* 2001;285(9):1186–1192.

Jarama SL, Kennamer JD, Poppen PJ, Hendricks M, Bradford J. Psychosocial, behavioral, and cultural predictors of sexual risk for HIV infection among Latino men who have sex with men. *AIDS and Behavior* 2005;9(4):513–523.

Levy V, Page-Shafer K, Evans J, et al. HIV-related risk behavior among Hispanic immigrant men in a population-based household survey in low-income neighborhoods of northern California. *Sex Transm Dis* 2005;32(8):487–490.

Millett G, Malebranche D, Mason B, Spikes P. Focusing “down low”: bisexual black men, HIV risk and heterosexual transmission. *J Natl Med Assoc* 2005;97(7)(suppl):52S–59S.