

Hepatitis

(Focus on Hepatitis C)

Summary

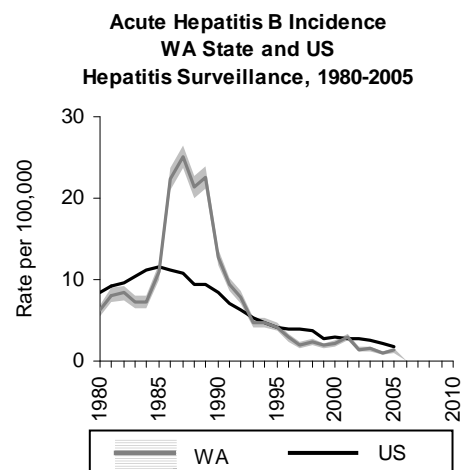
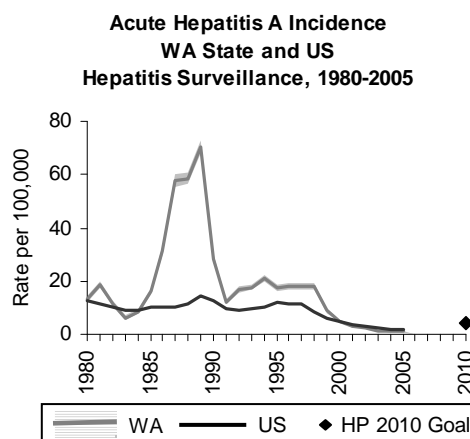
Hepatitis C is a viral infection of the liver. It is the most common bloodborne pathogen in the United States and the most common reason for liver transplant. It is transmitted primarily through exposure to infected blood. Injection drug users are particularly at risk of infection. While rates of acute hepatitis A, B, and C infection have dropped significantly since the mid-1990s, rates of recently diagnosed chronic hepatitis C infection remain high. During 2004–2006, the rate of newly diagnosed chronic hepatitis C cases in Washington State was 81 per 100,000 per year. Both nationally and in Washington, chronic infection occurs more often in males than females. Most people are 35–64 years old at the time of diagnosis. While there are vaccines to prevent hepatitis A and B, there is no vaccine to prevent hepatitis C infection. Affected people can take steps to prevent transmission of the virus. Many people with chronic hepatitis C are unaware of their infection, and those with known risk factors should be tested.

Time Trends

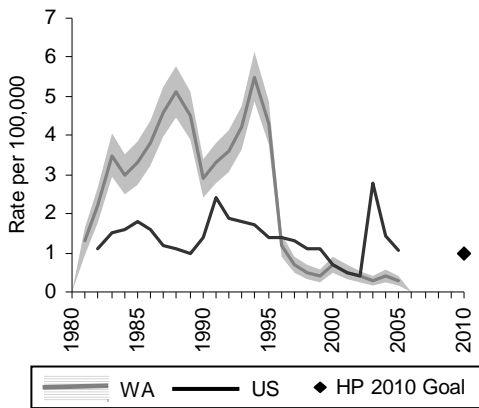
Infections from acute hepatitis A, hepatitis B, and hepatitis C have decreased considerably over the past 15 years. Rates of new infections of hepatitis A and hepatitis B have dropped primarily because people can be immunized against those diseases. Researchers believe the drop in acute hepatitis C infections has resulted from the use of needle exchange programs and other behavior changes to prevent the transmission of HIV. In 2003–2005, Washington's rates of acute hepatitis A, B, and C were 1.1, 1.3, and 0.3 per 100,000, respectively.

Definition: A viral infection of the liver manifested variously as an asymptomatic condition, mild to severe liver disease, or fulminating fatal condition. Symptoms from acute infection are also the symptoms from acute hepatitis A or B: tiredness, loss of appetite, nausea, abdominal discomfort, dark urine, clay-colored stool, muscle and joint pains, and jaundice. About 60% to 85% of individuals with acute hepatitis C infection develop chronic infection, and about 20% of individuals with chronic infection will progress to cirrhosis or liver cancer over a period of 10 to 20 years. Acute infection is primarily from exposure to infected blood and occurs most often through injection drug use. Infection occurs less frequently through sexual activity, occupational exposures, from an infected mother to her baby during birth, or other means. (ICD-9 CM codes 070.41, 070.44, 070.51, 070.54, 070.70, 070.71; ICD-10 codes B17.1 and B18.2)

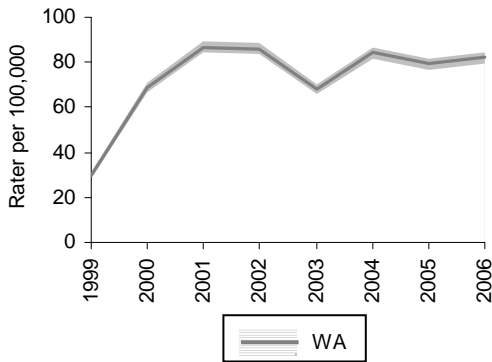
Chronic hepatitis C infection rates are significantly higher. For 2004–2006, there were 81 cases per 100,000 annually in Washington. Few states report chronic hepatitis C data to the federal government, so there are no national data to compare with Washington's rates.



**Acute Hepatitis C Incidence
WA State and US
Hepatitis Surveillance, 1981-2005**



**Chronic Hepatitis C Incidence
WA State
Hepatitis Surveillance, 1999-2006**



Year 2010 Goals

The *Healthy People 2010* goal for hepatitis A is no more than 4.5 new cases per 100,000. The goals for hepatitis B are age-specific: 400 infections in infants and children younger than two (national total), 2.4 per 100,000 in people 19–24 years old, 5.1 per 100,000 in people 25–39 years old, and 3.8 per 100,000 in people 40 years and older. The goal for acute hepatitis C is 1 new case per 100,000. Washington already meets the goals for hepatitis A and acute hepatitis B, and its infection rates for hepatitis B are too low to calculate reliable rates for age-specific subgroups.

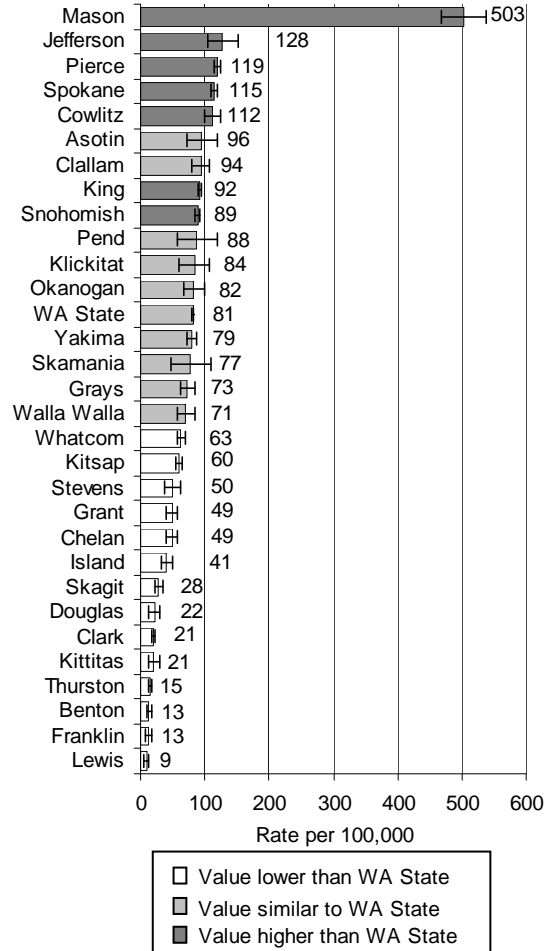
Hepatitis C is the most common bloodborne pathogen in the United States. It infects about 4.1 million people; 3.2 million people are living with chronic infection.² Nationally, surveillance

programs have been slow to develop, so the *Healthy People 2010* goal is to increase the proportion of chronic cases identified by state and local health departments. Chronic hepatitis C became a reportable condition in Washington State in December 2000.

Geographic Variation

Infection rates vary among Washington counties. It is not possible to determine if the differences are due to true differences in the number of infections or to differences in detection and reporting. Resources devoted to disease surveillance vary widely among counties, and this variability could result in different rates.

**Chronic HCV infection
County Data
Diagnosis Rate, 2004-2006**



For 2004–2006, nine counties had too few cases to calculate reliable rates. These were Adams, Columbia, Ferry, Garfield, Lincoln, Pacific, San Juan, Wahkiakum, and Whitman counties.

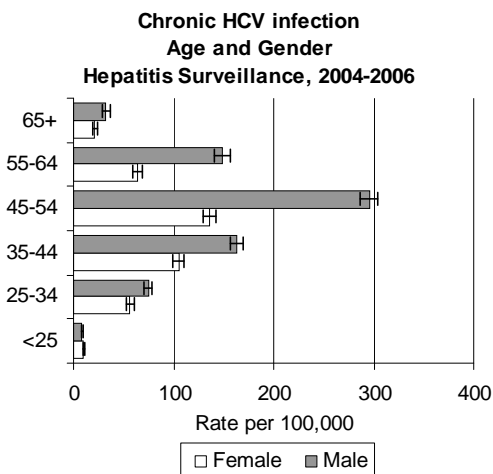
A county's rate can be influenced by the presence of a state correctional facility, because new cases from those institutions are counted as residents of the county in which the institution is located. For example, Mason County's exceptionally high rate of 503 cases per 100,000 is due primarily to cases that resulted from screening high-risk individuals at the Washington Corrections Center, which processes nearly all of the state's inmates before they are sent to other facilities.

Six counties have significantly higher rates than the state. These are Jefferson, Pierce, Spokane, Cowlitz, King, and Snohomish counties. Fourteen counties had significantly lower rates than the state. These are Whatcom, Kitsap, Stevens, Grant, Chelan, Island, Skagit, Douglas, Clark, Kittitas, Thurston, Benton, Franklin, and Lewis counties.

Age and Gender

In Washington, 64% of chronic hepatitis C cases reported during 2004–2006 were among males, and 36% were among females. The male rate was 102 per 100,000, and the female rate was 57 per 100,000.

Cases in children are uncommon. For all ages 25 and older, men have higher rates of infection than women. Eighty percent of new cases were among people ages 35–64, and those ages 45–54 had the highest rates.



These data are comparable to national data that show more infection among males. The recent National Health and Nutrition Examination Survey, conducted in 1999 through 2002, found the overall prevalence of antibody to hepatitis C

virus (HCV) was 2.1% among males and 1.1% among females.²

Race and Hispanic Origin

Significant numbers of Washington's chronic hepatitis C case reports do not identify race or Hispanic origin. For 2004–2006, 56% of reported cases did not include race or ethnicity. Reliable rates cannot be calculated for these subgroups.

Nationally, non-Hispanic blacks are disproportionately affected by chronic hepatitis C. Their overall prevalence of antibody to HCV is 3.0% compared to 1.5% among non-Hispanic whites and 1.3% among Mexican-Americans.²

Income and Education

Washington case reports do not include information about income or education. Nationally, people with less than a high school education have a 2.8% overall prevalence of antibody to HCV compared to 1.3% among those with more than a high school education. Prevalence of HCV antibody among people with incomes at or above two times the federal poverty threshold is 1.0%. It is 2.3% among people with incomes that are 100%–200% of the poverty threshold, and 3.2% among people with incomes less than 100% of poverty.²

Nationally, there is not a significant association between prevalence of HCV antibody and service in the U.S. armed forces. Among males 20 years or older, prevalence among those who served in the military is 2.8% (1.9-4.2) compared to 2.7% (2.1-3.3) among those without such service.²

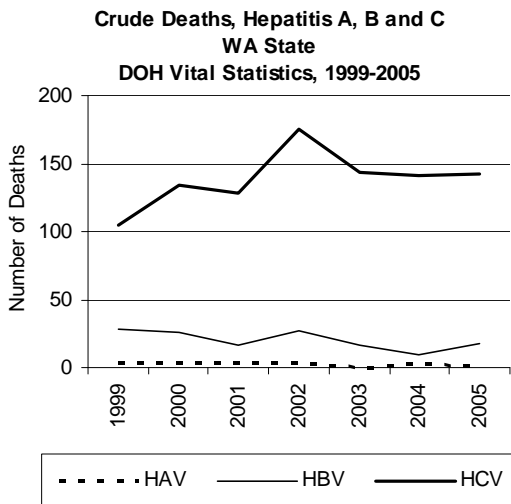
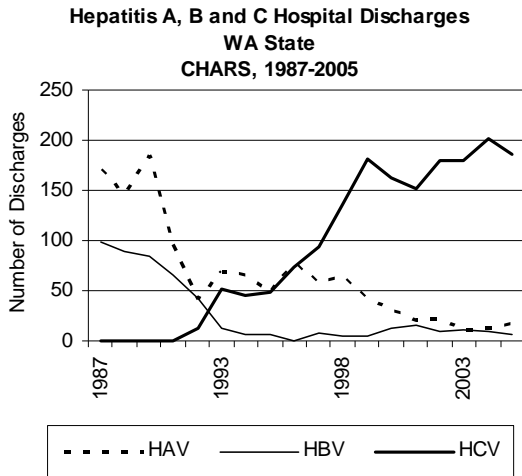
Other Measures of Impact and Burden

As the rate of new acute hepatitis A and B infections decreased over the last 15 years in Washington, so has the number of hospitalizations in which those conditions were the primary diagnosis. In contrast, the number of hospitalizations associated with hepatitis C has increased over the past 15 years.

Deaths in Washington from hepatitis C also greatly exceed deaths from hepatitis A or B. About 140 deaths a year list hepatitis C as the underlying cause of death. Only about 14 deaths a year list hepatitis B as the underlying cause, and only one death a year lists hepatitis A.

Nationally, the future economic impact of chronic hepatitis C and its associated liver disease, liver cancer, and death will be significant. Researchers estimate up to \$10.7 billion in direct medical expenditures from chronic hepatitis C infection for

the years 2010 through 2019 (in 1999 dollars) and up to an additional \$75.7 billion in societal costs due to premature loss of life and productivity in individuals younger than age 65.³



Risk and Protective Factors

Hepatitis C virus is transmitted primarily through exposure to infected blood, most often when injection drug users share needles or other equipment.⁴ The prevalence of infection among injection drug users, particularly long-term users, is significantly higher than in the general U.S. population. Nationally, the prevalence of antibody to HCV is 58% among people with any history of injection drug use compared to 0.7% among individuals who have not used drugs or have used only marijuana.² Other studies have found prevalence to HCV antibodies among injection drug users (IDUs) in urban populations

ranging from 66% to 93%, with an average of 79%. Prevalence among IDUs in Seattle was 84%.⁵ In addition to sharing needles, IDUs can also transmit the virus by sharing drug preparation equipment such as water, cookers and cotton.⁶

Other routes of transmission include blood transfusion before 1992, solid organ transplant from infected donors, unsafe medical practices, occupational exposure to infected blood, birth to an infected mother, sex with an infected person, high-risk sexual practices, and possibly, intranasal cocaine use.⁴

The hepatitis C virus can be transmitted sexually though not as efficiently as other sexually transmitted diseases.⁴ The U.S. Centers for Disease Control and Prevention (CDC) does not classify it as a sexually transmitted disease. Prevalence is higher among people who have had multiple sex partners, were younger than 16 at first sexual intercourse, or have a history of genital herpes simplex.² On a national basis, CDC estimates about 60% of HCV infection is caused by injecting drugs, 15% through sexual contact, 10% through blood transfusion before current screening techniques, 4% through occupational means, 1% through nosocomial, iatrogenic, and perinatal routes, and 10% through unknown means.⁴

People who are older than 25 at the time of acute infection seem more likely to develop chronic infection than younger individuals.¹ Rates of chronic infection are lower in women, particularly younger women.¹ Individuals who have jaundice or other symptoms during acute infection develop chronic infection at lower rates than individuals who do not have such symptoms.¹ Blacks develop chronic infection at higher rates than non-Hispanic whites or people of Hispanic origin.¹ Blacks also have a lower sustained viral response to treatment.¹ People who are HIV positive or have suppressed immune systems also are more likely to develop chronic infection.¹

Intervention Strategies

Screening. Many people with chronic hepatitis C infection are not aware of their condition.⁷ Identifying them is a key element of a comprehensive prevention strategy because they can then learn how to prevent further transmission.⁴ If they are not vaccinated already, they should receive vaccinations against HAV and HBV to prevent additional liver damage. Also, they can work with their health care providers to evaluate chronic liver disease, learn about antiviral therapy options, and receive counseling to avoid substances, such as alcohol,

that could harm their livers and might increase the severity of HCV-related liver disease. CDC recommends that the following individuals get tested for hepatitis C:

- Injection drug users
- Recipients of clotting factors made before 1987
- Hemodialysis patients
- Recipients of blood and/or solid organs before 1992
- People with physical symptoms that may indicate liver problems
- Infants born to infected mothers (after 12–18 months old)
- Health care and public safety workers after known exposures

Behavioral interventions. There is no vaccine to prevent hepatitis C infection. Individuals can prevent or minimize the risk of transmission through certain behaviors, including not injecting street drugs or sharing syringes, water, or other drug preparation equipment and getting vaccinated against hepatitis A and B.⁴ People can also minimize the risk of transmission by not sharing personal care items that might have blood on them, such as razors or toothbrushes. Health care and public safety workers can minimize risk by always following routine barrier precautions, safely handling needles, and getting vaccinated for hepatitis B. Individuals who are having sex with more than one steady partner can reduce the risk of transmission by using latex condoms correctly every time and by getting vaccinated against hepatitis B.

Tattoos and body piercings are unknown risks. Current data indicate that people who have tattoos but no other risk factors are not at increased risk for HCV infection.⁴ During the past 20 years, less than 1% of people with newly acquired hepatitis C who were reported to CDC's sentinel surveillance system gave a history of being tattooed.⁴ Further studies are needed to learn more about these types of exposures and the settings in which they occur. The CDC is currently conducting a large study to evaluate tattooing as a potential risk.

People with hepatitis B or C infection should not donate blood, organs, or tissue.⁴

Substance abuse treatment. Current IDUs can greatly reduce their risk of infection as well as

the risk of transmitting the virus to others if they stop injecting.

Syringe exchange. People who inject street drugs can reduce their risk of infection and the risk of transmitting the virus to others by using clean syringes and drug preparation equipment.^{6,8} Studies have found that access to clean syringes and injection equipment does not increase the frequency of drug use or the creation of drug-using networks.^{9,10} In Washington, clean syringes and equipment are available in many counties through syringe exchange programs. In addition, access to clean syringes and equipment is enhanced by state laws that permit (but do not require) pharmacists to distribute syringes to individuals older than 18.¹¹

Treatment for chronic infection. Individuals with chronic infection should consult with their physicians to determine appropriate treatment.¹² The optimal treatment regimen for chronic hepatitis C is either a 24-week or 48-week course of pegylated alpha interferon and ribavirin.¹² Treatment is difficult and can result in serious side effects.¹² Successful treatment is defined as having an undetectable virus level for six months or more after stopping therapy.¹²

The duration and success of treatment depends largely on the virus genotype.¹² There are six different genotypes of the hepatitis C virus, three of which are common in the United States (genotypes 1, 2, and 3). Approximately 70%–80% of individuals with genotypes 2 or 3 respond successfully to combination treatment, while only about 40%–45% of individuals with genotype 1 do so.

Data Sources

National Notifiable Diseases Surveillance System
Washington State Department of Health. 2005
Communicable Disease Report

Washington State Department of Health chronic hepatitis disease surveillance database

For More Information

U.S. Centers for Disease Control and Prevention, Division of Viral Hepatitis. <http://www.cdc.gov/ncidod/diseases/hepatitis/>

National Institutes of Health, National Digestive Diseases Information Clearinghouse. <http://digestive.niddk.nih.gov/index.htm>

Division of Alcohol and Substance Abuse, Washington State Department of Social and Health Services. <http://www1.dshs.wa.gov/dasa/>

Washington State Hepatitis C Strategic Plan. http://www.doh.wa.gov/cfh/IDRH_Assessment/Documents/HCV_STRATEGIC_PLAN.pdf

Technical Notes

The Washington chronic hepatitis C data presented in this chapter reflect total unduplicated cases of infection reported by local health jurisdictions to the state surveillance system. They are presented by year of diagnosis and include cases classified according to the CDC's case definition as either "confirmed" or "probable." According to the CDC's 2005 case definition of chronic hepatitis C, a "probable" case is one that is anti-HCV enzyme immunoassay (EIA)-positive but is not verified by a more specific test. A "confirmed" case is verified by an additional assay, such as: 1) positive recombinant immunoblot assay for HCV; or 2) positive nucleic acid test for HCV; or 3) HCV genotype; or 4) a screening test with a high signal-to-cutoff ratio for the specific test (e.g. > 3.8 for EIAs). The national and state surveillance data for hepatitis A and acute and chronic hepatitis B and C underestimate actual disease prevalence because all of the conditions are underreported.^{13,14}

Endnotes

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10 Junge, B., Valente, T., Latkin, C., Riley, E., & Vlahov, D. (2000). Syringe exchange not associated with social network formation: results from Baltimore. *AIDS*, 10(14), 423-426.

11 Deibert, R. J., Goldbaum, G., Parker, T. R., Hagan, H., Marks, R., Hanrahan, M., & Thiede, H. (2006). Increased access to unrestricted pharmacy sales of syringes in Seattle-King County, Washington: structural and individual-level changes, 1996 versus 2003. *American Journal of Public Health*, 96(8), 1347-1353.

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