Viral Hepatitis in Oregon

MAY 2015

Oregon Health Authority
PUBLIC HEALTH DIVISION
Acute and Communicable Disease Program

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Executive summary

Purpose

The purpose of Oregon's first viral hepatitis epidemiologic profile is to document the burden of disease associated with viral hepatitis in Oregon. This report focuses on chronic infection with hepatitis B (HBV) and hepatitis C virus (HCV) because they cause the greatest morbidity and mortality. The goals are to:

- Increase public and professional awareness of screening recommendations for treatment of HCV;
- Provide useful data to local health departments, other state agencies, and health care providers and systems for planning purposes; and
- Inform policies for viral hepatitis prevention and care.

The Acute and Communicable Disease Prevention (ACDP) Program in the Public Health Division of the Oregon Health Authority (OHA) developed this profile in collaboration with an advisory group made up of both internal partners and external stakeholders. The advisory group included other OHA programs and state agencies, local health departments, academic partners, health systems, community-based agencies and community members. This group was instrumental in guiding the report's organization and design. From the outset, our goal was to develop a report to be used for education and planning.

This report is divided into three sections. The chapters in each section are organized to stand alone, so some sections repeat information.

The first section provides an overview of chronic hepatitis due to HBV and HCV, starting with chapters covering prevalence, natural history of the two viruses and risk factors for infection. A third chapter discusses CDC's rationale for its recent recommendation for a one-time HCV screening of all persons born between 1945 and 1965.

The middle section describes the burden of disease in Oregon, providing data on the incidence of acute and chronic viral hepatitis, hospitalizations, liver cancer, liver transplant, and mortality. This section generally focuses on the most recent five years of available data.

The last section has chapters that discuss different populations at high risk or with special needs: Asians and Pacific Islanders (PIs), blacks and African Americans, American Indians and Alaska Natives (AI/ANs), persons who inject drugs (PWIDs), and incarcerated populations.

The hepatitis A virus (HAV), HBV and HCV are the three most common causes of viral hepatitis. Each has a distinct mode of transmission, populations affected, prevention strategies and treatments although there is some overlap between the viruses.

Findings

Hepatitis A

From a high of nearly 3,000 cases reported in 2005, new infections (acute cases) due to hepatitis A virus (HAV) have declined with the availability of HAV vaccine, averaging only 20 cases a year between 2009 and 2013. In the past five years, infections were rare in children, and occurred most commonly in persons aged 30–59. HAV is transmitted by eating contaminated foods or having close contact with another person with HAV. International travelers or household contacts of travelers have been most commonly affected in the past five years.

Hepatitis B

Similarly, Oregon's case counts of acute HBV have fallen dramatically since universal vaccination of infants began in 1991. Between 2009 and 2013, only 2% of acute HBV cases occurred in persons under 20 years of age. Just over half (53%) of cases occurred in persons in their 40s and 50s. Men in this age group were twice as likely to be infected as women were. Sexual transmission, injection drug use and potential health care exposures were the most commonly identified risk factors.

In contrast, rates of chronic infection with HBV have varied little over time. The OHA received an annual average of 440 laboratory reports consistent with chronic HBV between 2009 and 2013. Seventy-five percent of cases were foreign-born, with the highest rates seen in Asians and Pacific Islanders (PIs), who had rates 41 and 44 times higher, respectively, than whites in Oregon, followed by blacks and African Americans, whose rate is 21 times higher than that of whites.

Hepatitis C

Rates of acute infection with HCV (for which no vaccine is available) between 2009 and 2013 were stable over the same period. HCV infections were most common in younger adults; nearly half of the cases were in persons less than 30 years of age. Injection drug use was the predominant route of transmission, accounting for 64% of interviewed cases. The average rate of acute HCV in Oregon was 50% higher than the national rate in 2007–2011. The highest rates were in AI/ANs (2.1 cases/100,000), who had rates three times higher than whites (0.6 cases/100,000) and blacks and African Americans (0.6 cases/100,000) in Oregon.

The volume of laboratory reports of positive HCV tests is more than 10 times higher than for chronic HBV, averaging 5,087 reports per year in the last five years. The majority of cases are male (61%) and over the age of 40 (79%); both AI/ANs and blacks and African Americans had rates of positive HCV laboratory reports that were twice as high as in whites. Like acute cases, the majority of persons interviewed reported injection drug use at some point in their lives.

Hospitalizations

Between 2008 and 2012, 3,917 persons with HCV were hospitalized and had a discharge diagnosis consistent with advanced liver disease. The number of hospitalizations averaged 783 per year, and the average length of stay was five days. Only 8% occurred in persons under the age of 45 years, while 70% occurred in persons aged 50–64. Two-thirds occurred in men. The most common liver-related discharge diagnoses were cirrhosis (75%) and decompensated cirrhosis (76%), followed by liver cancer (15%), chronic liver disease (22%) and liver transplant (3%).

Liver cancer

Between 1996 and 2012, 3,395 cases of hepatocellular carcinoma (HCC) were reported to the Oregon State Cancer Registry (OSCaR). Of those, 959 (28%) were attributable to chronic viral hepatitis; 196 (6%) were in persons reported to the Oregon Health Authority with chronic HBV (reported between 1988 and 2012); and 763 (22%) had chronic HCV (reported 2005–2012). By the year 2012, 8% of liver cancer cases had chronic HBV, while 47% had chronic HCV. The highest rates of HBV-associated liver cancer were seen in Asians and Pacific Islanders and in blacks and African Americans; for HCV-related liver cancer, the highest rates were seen in American Indians and Alaska Natives, and blacks and African Americans.

Liver transplants

Between 2009 and 2013, 169 liver transplants were performed at Oregon Health & Science University (OHSU), which translates into 34 cases annually. Of those, between one and two were attributable to chronic HBV each year. An average of 18 liver transplants were performed annually on patients with chronic HCV, which accounted for 54% of liver transplant cases.

Mortality

Deaths from HCV in Oregon have risen steadily over the last decade, surpassing the death rate from HIV in 2000, and averaging 441 deaths annually in Oregon during the last five years (2009–2013). The mortality rate from HCV is more than six times higher than mortality from HIV in Oregon. HCV mortality was also 81% higher in Oregon than in the United States as a whole. Most deaths (71%) were in men and persons aged 45–64 (79%). There were marked racial disparities; AI/ANs (17.4 deaths/100,000) and blacks and African Americans (16.1 deaths/100,000) had roughly twice the mortality rate of whites (8.9 deaths/100,000).

Recommendations

Until recently, Oregon has largely underappreciated the impact of viral hepatitis on the health outcomes of those infected, the considerable burden hepatitis B and C place on health systems, and the significant health disparities experienced by disproportionately affected communities and populations. Actions are needed to increase awareness, prevent transmission, and support access to care and treatment. Otherwise, Oregonians will continue on the trajectory of disproportionate rates of viral hepatitis, advanced liver disease and death. The economic costs and burden of viral hepatitis on health care and social services will increase and the opportunity to decrease human suffering will be lost.

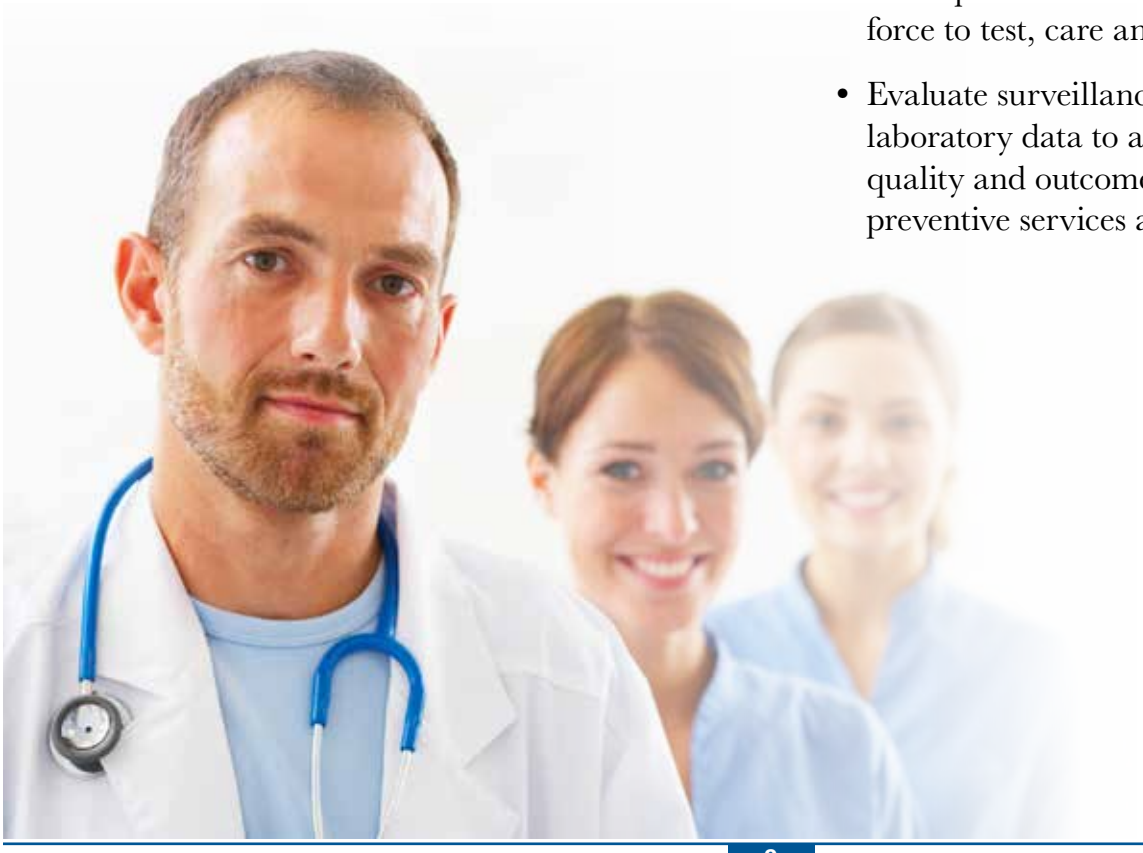
While the size and impact of viral hepatitis in Oregon looms large, public health actions and evidence-based strategies can support the prevention of new infections, improve health outcomes, decrease community and population health disparities, and decrease future medical care costs. Oregon needs to comprehensively address viral hepatitis through community partnerships and strategic actions across multiple state and local systems. Public health recommendations for addressing the problem of chronic viral hepatitis in Oregon include the following:

Assessment

- Monitor trends in hepatitis incidence and prevalence, liver cancer and mortality.
- Investigate epidemiologic trends, respond to outbreaks and study health disparities.

Policy development

- Develop evidence-based policies to prevent viral hepatitis, identify persons early in their infection and link them to care and treatment.
- Target populations with increased prevalence, immediate risks of advanced liver disease, and ongoing transmission risks.
- Support efforts to address opiate dependency and prevent it from progressing to injection drug use.
- Conduct culturally appropriate education to raise awareness about viral hepatitis, its risks and the benefits of testing, care and treatment.
- Develop culturally appropriate health promotion interventions to reduce barriers to testing, care and treatment.



Assurance

- Enforce laws and regulations that mandate hepatitis surveillance, promote health care safety and expand access to hepatitis testing and other preventive services.
- Support equitable syringe access and education about safe injection practices and safe syringe disposal through local health departments, community-based organizations and pharmacies.
- Ensure priority access to drug and alcohol treatment programs for people with viral hepatitis.
- Promote linkage to care by integrating viral hepatitis services with other public health services; collaborate with substance treatment and health care providers to promote hepatitis testing and ensure appropriate care; provide surveillance data to support registries linking infected individuals to care.
- Train public health and health care work force to test, care and treat for HCV.
- Evaluate surveillance, clinical and laboratory data to assess accessibility, quality and outcomes of hepatitis preventive services and care.

Background

Overview of chronic HCV infection in the United States

Hepatitis C virus (HCV) is common in the United States; data from a recent national study conducted from 2003 to 2010 suggest that 3.6 million Americans (1.3%) have ever been infected with HCV, and 1.0% (corresponding to 2.7 million Americans) are chronically infected with HCV.[2] Infected persons were more likely to be aged 40–59, male, non-Hispanic black, and to have less education and lower family income. Risk factors included history of injection drug use and having a transfusion before 1992. Of note, 49% of persons with HCV infection did not report either risk factor, suggesting that screening strategies based purely on risk factors may be ineffective.

The majority of those infected will experience no symptoms at the time of infection, and although the first screening test was developed in 1989, more than half of persons infected with HCV are unaware of their infection.[3] It is generally accepted that 25% to 30% of those infected will develop cirrhosis 20 to 30 years later.[4] Once cirrhosis is present, the estimated annual rate of developing any complication is 6.4%; the risk of developing hepatocellular carcinoma (HCC) is 3.4% per year, and the death or transplantation rate is 4.6% per year.[5] The rate of progression to cirrhosis or liver cancer can be influenced by several factors: age of more than 40 years at the time of initial infection, male gender, alcohol use, and presence of other underlying medical conditions (nonalcoholic steatohepatitis, hemochromatosis and co-infection with HIV or HBV).[4]

The number of new infections occurring annually peaked in the late 1980s, when CDC estimated more than 200,000 cases occurred each year in the United States. In 2011, the most recent year for which national estimates are available, there were an estimated 16,000 new infections after accounting for asymptomatic, undetected and unreported infections.[6]

Although the number of new infections has dropped, morbidity and mortality remain high in the age group most commonly affected by HCV. In one study of patients enrolled in four HMOs in the United States, 13% of patients with HCV were hospitalized each year.[7] Deaths from HCV increased 50% from 1999 to 2007, while HIV deaths declined during that time; nationally, HCV deaths became more common than HIV in 2007, and 73% of the deaths occurred in persons aged 45–64.[8]

Before universal antibody screening of blood donors began in 1992, many HCV infections were acquired through blood, tissue and organ donation. Although this source of infection accounts for many of the estimated 3 million Americans in the baby boom generation with chronic HCV, effective interventions to screen blood, tissue and organs prior to donation have dramatically reduced the risk.[9] Unfortunately, transmission in health care settings still occurs. A well-publicized outbreak in a Las Vegas gastroenterology practice, attributed to contamination of single-use medication vials that were used for multiple patients, led the CDC to review known outbreaks of HCV in health care

settings.[10] The authors identified 33 outbreaks in nonhospital health care settings between 1998 and 2008: 12 in outpatient clinics, six in hemodialysis centers, and 15 in long-term care facilities. The outbreaks resulted in 448 persons acquiring HBV or HCV infection. In each setting, the mechanism of infection was patient-to-patient transmission through failure of health care personnel to adhere to fundamental principles of infection control and aseptic technique, including reuse of syringes and lancing devices.[11]

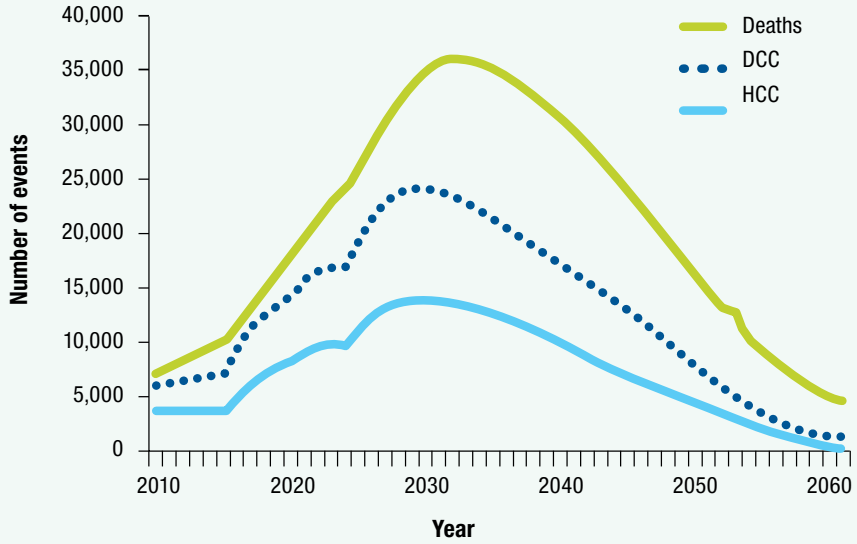
In the past two decades, the predominant route of infection in developed countries has been injection drug use, with young persons who inject typically acquiring HCV infection within 3.4 years of injection initiation.[12] In 2011, 60% of persons reported to CDC with acute HCV reported injection drug use. However, this is likely an underestimate because many persons with acute HCV are not interviewed or are not willing to answer questions about risk.

Although overall trends in incidence of acute HCV have declined over the last two decades, a recent disturbing trend is the emergence of a new cohort of young PWIDs who are acquiring HCV. These new injectors share certain characteristics that are atypical of PWIDS at risk for HCV described previously; they are usually less than 25 years old, white, reside in rural areas, and have typically used oral prescription opiates prior to initiating injection drug use.[13,14]

HCV is rarely transmitted between heterosexual partners. Cases have been reported in men who have sex with men (MSM). The risk of sexual transmission in heterosexual women with HIV is higher than in women not infected with HIV.

HCV-associated disease is the leading indication for liver transplantation in the United States and accounts for 50% of liver cancer cases.[15] Liver cancer and cirrhosis have been increasing among persons infected with HCV, and these outcomes are projected to increase substantially in the coming decades if left untreated.[16] Forecasts predict that in 2030, there will be 14,300 cases of liver cancer in the United States attributable to HCV. There will also likely be 3,100 liver transplants and 34,900 deaths.

Figure A. Future burden of HCV-related morbidity and mortality in the United States



DCC is defined as decompensated cirrhosis and HCC as hepatocellular carcinoma.
Adapted from Ward JW.[17]

Recommendations for HCV screening

Facts at a glance

- 81% of U.S. residents infected with HCV were born between 1945 and 1965.
- At least 50% of persons infected with HCV are unaware of their infection.
- HCV testing, followed by appropriate care and treatment, can reduce risk for liver cancer by 70% and mortality by 50%.
- In terms of cost effectiveness, screening followed by treatment ranks favorably with screening for breast cancer and high cholesterol.

Baby boomer recommendation

Since 1998, the CDC has recommended HCV testing for persons at high risk for HCV (see box).[18] However, 15 years after these recommendations were published, the CDC estimates that approximately 50% of those infected have not been tested for HCV.[3] Given the limited effectiveness of this risk-based strategy, in 2013, CDC recommended an additional testing strategy: a one-time screening of all persons born between 1945 and 1965.[19]

The focus on this age group is based on results of periodic studies looking at prevalence of HCV in the United States. The most recent study of the U.S. non-institutionalized civilian population between 2003 and 2010 found that 1%, or 2.7 million persons, are chronically infected with HCV, and 81% of all cases were born between 1945 and 1965.[2] The high prevalence of HCV among persons in this birth cohort reflects the substantial number of incident infections throughout the 1970s and 1980s and the persistence of HCV as a chronic infection. Implementation of this one-time screening is expected to identify 800,000 persons currently unaware of their infection and potentially avert 120,000 U.S. deaths.

Cost-effectiveness of screening and treating

Identifying persons with HCV is a critically important first step in public health efforts to reduce morbidity and mortality from HCV. HCV testing, followed by appropriate care and treatment, can reduce risk for liver cancer by 70% and mortality by 50%.[20,21] Studies have found that the cost per quality-adjusted life year (QALY) of the baby boomer screening recommendation using standard treatment (pegylated interferon + ribavirin) is comparable to other commonly recommended preventive services such as screening for high blood pressure, colon cancer and influenza vaccination of adults over 50 years of age. Screening followed by use of a first generation direct-acting agent (telaprevir) plus standard treatment is more expensive, but in terms of cost-effectiveness still ranks favorably with screening for breast cancer and high cholesterol.[22,23]

Summary of CDC recommendations for screening for HCV

HCV testing is recommended for those who:

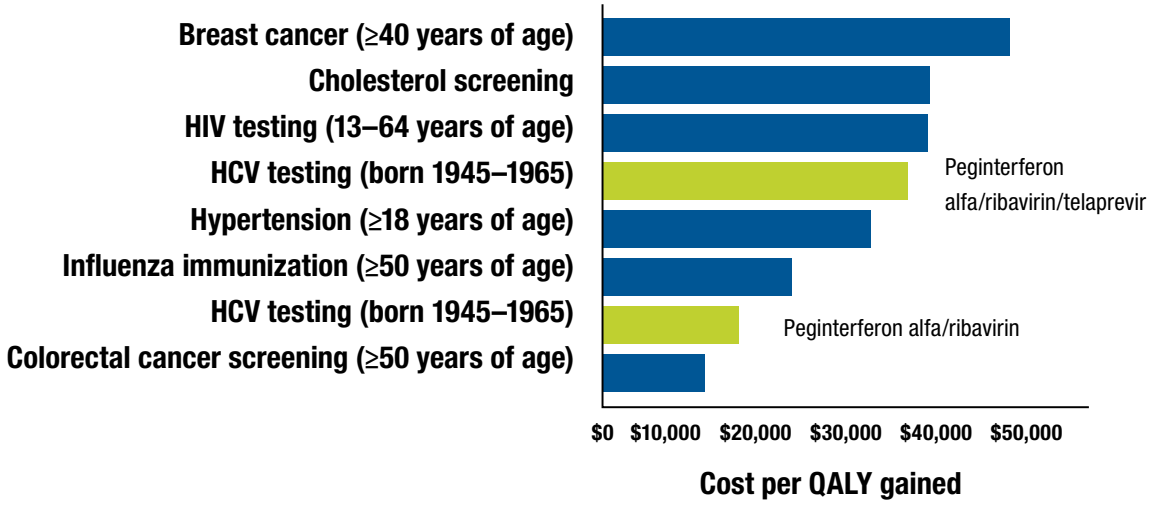
- Currently inject drugs;
- Ever injected drugs, including those who injected once or a few times many years ago;
- Have certain medical conditions, including persons:
  - » Who received clotting factor concentrates produced before 1987;
  - » Who were ever on long-term hemodialysis;
  - » With persistently abnormal alanine aminotransferase levels (ALT);
  - » Who have HIV infection.
- Were prior recipients of transfusions or organ transplants, including persons who:
  - » Were notified that they received blood from a donor who later tested positive for HCV infection;
  - » Received a transfusion of blood, blood components or an organ transplant before July 1992.

HCV testing based on a recognized exposure is recommended for:

- Health care, emergency medical and public safety workers after needle sticks, sharps or mucosal exposures to HCV-positive blood;
- Children born to HCV-positive women.

Added in 2012: one-time testing of persons born between 1945 and 1965 (without ascertainment of risk factors).

Figure B. Comparison of cost-effectiveness of HCV screening with other routine preventive services. QALY indicates quality-adjusted life year. Adapted from Ward JW.[17]



Overview of chronic HBV infection in the United States

CDC estimates that 700,000 to 1.4 million persons are living with chronic HBV infection in the United States. Like HCV, 65% do not know they are infected.[30,31] HBV is transmitted by percutaneous or mucosal exposure to the blood or body fluids of an infected person. This usually occurs through injection drug use, from sexual contact with an infected person, or from an infected mother transferring HBV to her newborn during childbirth. Transmission also can occur among persons who have prolonged but nonsexual interpersonal contact with someone who is HBV-infected (e.g., household contacts).[32]

The national strategy for preventing new HBV infection in infants and children includes routine screening of pregnant women and universal vaccination of children and adolescents. As a result, chronic HBV infection in infants and acute HBV infection in young people of all races and ethnicities have drastically decreased. Nationally, the number of new infections decreased 64% between 2000 and 2011. The 2,890 acute cases reported in the United States, after adjusting for asymptomatic infections and under-reporting, represent approximately 18,800 cases. These acute infections are most common in men and in persons 30–39 years old. Persons less than 20 years of age had the lowest rates. Acute HBV rates were highest in blacks and African Americans and lowest in Asians and Pacific Islanders (PIs) and in Hispanics.[6]

The risk for chronic HBV infection decreases with increasing age at infection. As many as 90% of infants who acquire HBV at birth become chronically infected. However, 30%–50% of children infected at 1–5 years of age become chronically infected. This percentage is smaller among adults, in whom approximately 5% of all acute HBV infections progress to chronic infection.[32] Approximately half of all chronic HBV infections in the United States occur among persons born in Asia or in Asian-Americans born in the United States to HBV-infected mothers.[30,33] In a study conducted by four HMOs that tracked patients with chronic viral hepatitis between 2006 to 2010, more than 9% of patients with chronic HBV were hospitalized each year and 2.1% required liver transplant during the five-year follow-up period.[7]

Like HCV, persons with chronic HBV are at risk for cirrhosis and end stage liver disease; an estimated 10% to 15% of patients will die from this complication. Twenty percent to 40% of men and 15% of women who are infected early in life develop liver cancer, and the risk increases with age, heavy alcohol use, smoking and increasing viral load.[34] The risk also increases in persons co-infected with HIV or HCV. The risks of HCC and cirrhosis are low in those under 35 years of age, but they rise rapidly in men over 40 and women over 50.

In 2010, the mortality rate for hepatitis B was 0.5 deaths per 100,000 population (n=1,792 deaths). Persons aged 55–64 (1.7 deaths per 100,000 population), Asians and PIs (3.0 deaths per 100,000 population) and males (0.8 deaths per 100,000 population) had the highest mortality rates by age, race/ethnicity and sex.[6]

Burden of disease from viral hepatitis in Oregon

Acute hepatitis A viral infections

An effective vaccine has caused rates of new infections (referred to as "acute cases) due to HAV to dramatically decline in recent years. From a high of nearly 3,000 acute cases reported in 1995 in Oregon, the annual number of acute cases of HAV dropped to under 100 in 2002. Fewer than 20 acute cases occurred annually over the last five years. HAV is often transmitted through eating contaminated foods or being in close contact with another person with HAV. Universal vaccination of children starting at age 1 year has significantly reduced the incidence in children in Oregon. The most common risk factor reported by cases during 2009–2013 was foreign travel (44%), most commonly to Latin America. Only 7% of cases during the period 2009–2013 occurred in persons under age 20, while 50% of cases were in persons aged 30–59. HAV risk among different racial and ethnic groups in Oregon varies only slightly.

Hepatitis A vaccination is recommended for the following:

- All children at age 1 year;
- Travelers to countries where hepatitis A is common;
- Family and caregivers of recent adoptees from countries where Hepatitis A is common;
- Men who have sex with men (MSM);
- Users of recreational drugs, whether injected or not;
- People with chronic or long-term liver disease, including hepatitis B or hepatitis C;
- Persons who work with HAV-infected primates or with HAV in a research laboratory;
- People with clotting-factor disorder.

Facts at a glance

- Routine vaccination of children has dramatically reduced the rate of HAV infection.
- The most common risk factor for HAV was foreign travel in the period 2009–2013.

Incidence of acute hepatitis A, Oregon, 1993–2013

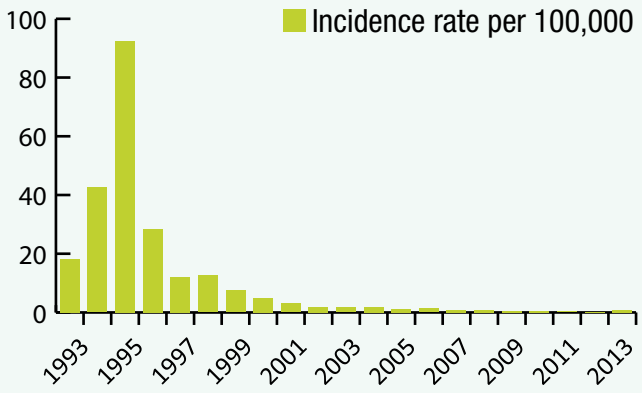


Figure 1 (See Table 1 in the Appendix section for details.)

Acute hepatitis B viral infections

Similarly, in the early 1990s, Oregon case counts of acute HBV topped 200 annually. However, counts have fallen dramatically since the universal vaccination of infants began in 1991. In the last five years, counts have averaged fewer than 40 cases a year. Acute HBV cases are rare in children and young adults in the post-vaccine era; in 2009–2013 fewer than 2% of cases occurred in persons under 20 years, and only 10% of cases occurred in persons in their 20s. Acute HBV cases were most common among persons in their 40s and 50s (53% of reported cases), and men in this age range were twice as likely to acquire infection as women were. Like acute HAV, there were no marked differences in rates of acute HBV by race or ethnicity. Behavioral risks for acute HBV included sexual transmission (16% of cases occurred in MSM and 31% in persons reporting multiple sex partners during the previous six months) and injection drug use (12%). Twelve percent of cases had a potential health care source such as dialysis, transfusion, other injection or surgery.

Hepatitis B vaccination is recommended for the following:

- Routine vaccination of all infants.
- Catch-up vaccination of children and adolescents who did not receive vaccination as infants.
- Sexual exposures
  - » Sex partners of chronic HBV carriers;
  - » Sexually active persons not in a long-term, mutually monogamous relationship;
  - » Persons seeking evaluation for a sexually transmitted disease;
  - » Men who have sex with men (MSM).
- Exposure to blood
  - » Current or recent person who injects drugs (PWIDs);
  - » Household contacts of HBV chronic carriers;
  - » Residents and staff of facilities for developmentally disabled persons;
  - » Health care and public safety workers with risk for exposure to blood;
  - » Persons with end-stage kidney disease;
  - » Persons with diabetes mellitus.
- Other groups
  - » International travelers to regions with high or intermediate levels of HBV infection in the population (prevalence> 2%);
  - » Persons with HIV infection.

Facts at a glance

- Similar to HAV, a vaccine given routinely to children and offered to high-risk adults has decreased the number of new infections.
- New infections with HBV were most common in people aged 40–59 years.
- Behavioral risk factors for acute HBV infection in adults in Oregon include sexual transmission and injection drug use.

Incidence of acute hepatitis B, Oregon, 1993–2013

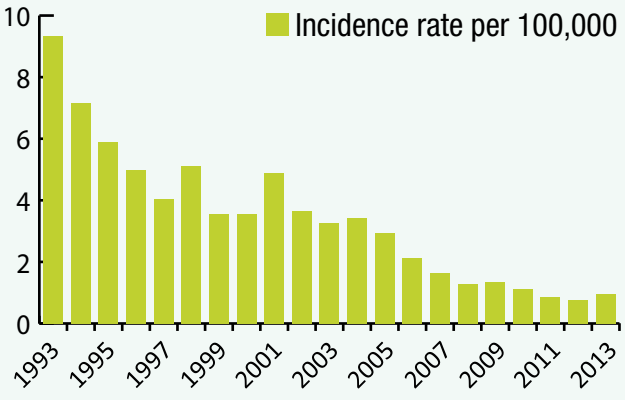


Figure 2 (See Table 2 in the Appendix section for details.)

Acute hepatitis C viral infections

Nationally, reported cases of acute HCV infection peaked in the 1980s when the CDC estimates more than 200,000 cases occurred.[35] Rates of acute cases have fallen dramatically since then, with 16,500 cases reported in 2011 in the United States. In contrast, the annual numbers of acute cases in Oregon have remained fairly stable since 1993, with an average of 25 acute cases per year between 2009 and 2013. After accounting for asymptomatic cases and under-reporting, these 25 cases likely represent 332 acute cases of HCV in Oregon each year because most new infections are not reported. Rates of acute HCV cases in Oregon were 50% higher than the national rate during 2007–2011 (2011 is the most recent year for which national data are available).[6] In contrast to acute HAV and HBV, acute HCV infection is common in younger patients: nearly half of cases occurred in persons under 30 years of age and 68% of cases were in persons under age 40. Compared to HBV, the number of new HCV infections was more evenly matched between men and women, with 56% of cases from 2009-2013 occurring in men. The highest rates of acute HCV in Oregon occurred in American Indians and Alaskan Natives (AI/ANs), with a rate of 2.1 cases per 100,000, compared to a rate of 0.6 cases for both whites and blacks and African Americans (no cases were identified in Asians or Pacific Islanders during 2009–2013). Rates of acute HCV were lower in Hispanics than non-Hispanics (0.2 cases/100,000 vs. 0.6 cases/100,000). Persons who injected drugs accounted for the majority of new infections (64%).

Facts at a glance

- Rates of acute HCV cases in Oregon were 50% higher than the national rate during 2007–2011.
- Injection drug use accounted for the majority of new HCV infections in Oregon.
- Rates of acute HCV in Oregon were four times higher in AI/ANs than in any other racial group.

Incidence of acute hepatitis C, Oregon, 2000–2013

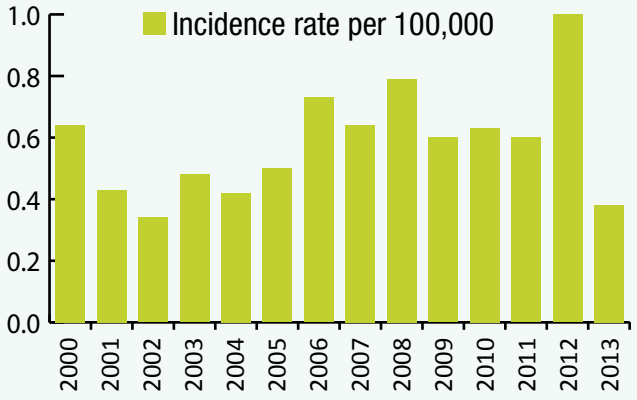


Figure 3 (See Table 3 in the Appendix section for details.)

Chronic hepatitis B viral infections

Annual numbers of laboratory reports consistent with chronic HBV have been stable at 440 cases for the past five years. The majority of cases were identified among persons aged 30–59 (64%). Among cases in their 20s and 30s, 52% occurred in females, while most chronic HBV cases (65%) over the age of 40 occurred in males. One-third of cases reported having contact with another person with hepatitis B, while fewer than 10% occurred in MSM or persons who inject drugs (PWIDs).

The majority of chronic B cases (75%) occurred in persons born outside of the United States. The highest rates were seen in Asians and PIs, who have rates 41 and 44 times higher than whites in Oregon (Asians, 131.4 cases/100,000; PIs, 139.8 cases/100,000; whites, 3.2 cases/100,000). The next highest rates were seen in blacks and African Americans, with a rate of 39.9 cases/100,000. Rates in Hispanics (2.7 cases/100,000) were lower than in non-Hispanics (10.0 cases/100,000).

Facts at a glance

- The majority of chronic HBV cases (75%) occurred in persons born outside of the United States.
- Asians and PIs had the highest rates, followed by blacks and African Americans.

Incidence of chronic hepatitis B, Oregon, 1993–2013

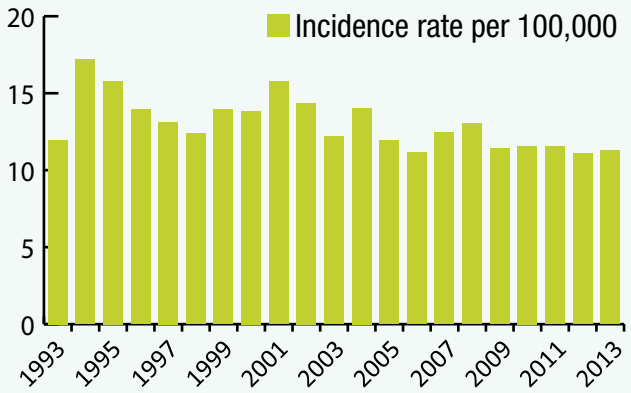
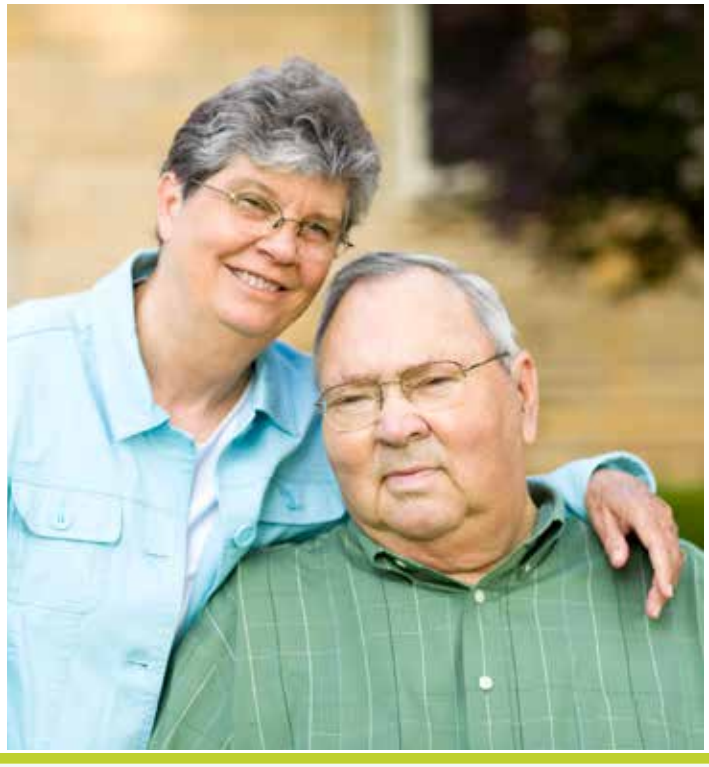


Figure 4 (See Table 4 in the Appendix section for details.)

Chronic hepatitis C viral infections

In 2005, positive laboratory test results of HCV (referred to as "chronic" infections, likely representing persons who acquired HCV sometime in the past) became reportable in Oregon. Between 2009 and 2013, Acute and Communicable Disease Prevention received 25,437 reports of persons with positive laboratory HCV tests, with an average annual number of 5,087. Compared to acute cases of HCV, persons with positive laboratory reports were more likely to be male (61%) and over age 40 (79%). AI/ANs and blacks and African Americans had the highest rates of HCV laboratory reports in this time; their rates (127.7 cases /100,000 and 124.4 cases/100,000) were both more than twice the rate seen in whites during the same time (57.5 cases/100,000). The lowest rates were found among Hispanics (20.8 cases/100,000). Neither the OHA nor local health departments typically have resources to investigate persons reported with positive laboratory tests for HCV. However, a study conducted in Lane, Marion and Multnomah counties in 2011–2012 found that 77% of persons with positive laboratory reports who received follow-up investigation reported injection drug use.



Facts at a glance

- More than 5,000 persons with positive HCV tests are reported each year in Oregon.
- Rates of chronic HCV infection are twice as high in AI/ANs and in blacks and African Americans compared to whites.

Incidence of chronic hepatitis C, Oregon, 2005–2013

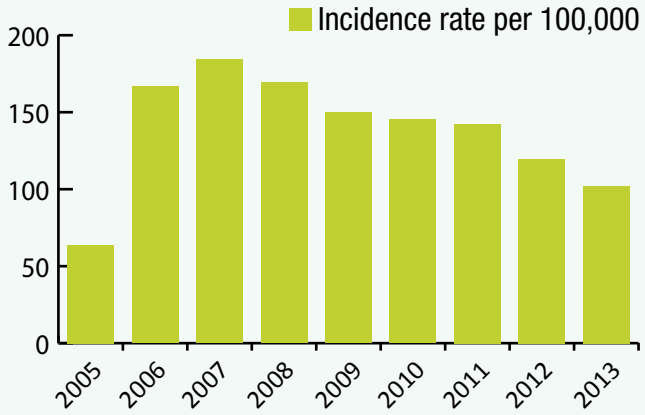


Figure 5 (See Table 5 in the Appendix section for details.)

Hospitalizations

Several published studies, looking at state Medicaid and managed care organization databases, have identified HCV hospitalization costs as the major driver of costs associated with the care of HCV.[36,37] One study using state hospital discharge data found that the cost of hospitalizations in which HCV was the primary discharge diagnosis tripled between 2007 and 2009; 70% of the costs were charged to government sources.[38]

For 2008–2012 (2012 is the most recent year for which Oregon data are available), 3,917 hospitalizations of HCV patients were identified who also had a discharge diagnosis consistent with advanced liver disease (chronic liver disease, cirrhosis, decompensated cirrhosis, liver cancer or liver transplant).* The number of hospitalizations in Oregon averaged 783 per year and ranged from 764 to 838 annually during this period; the average length of stay was five days. Only 8% occurred in persons under age 45 years, while 70% occurred in persons aged 50–64. Two-thirds of the HCV hospitalizations occurred in men. The most common liver discharge diagnoses were cirrhosis (75%) and decompensated cirrhosis (76%), followed by liver cancer (15%), chronic liver disease (22%) and liver transplant (3%).** A majority of HCV hospitalizations (62%) were in persons whose insurance payer was either Medicare or Medicaid. During this five-year period, the average charges per patient discharge were $26, 961, and the total charges per year for these hospitalizations averaged $21,149,111.

Facts at a glance

- In Oregon, from 2008 to 2012, 70% of HCV hospitalizations occurred in persons aged 50–64, and the average charges per hospitalization were $26,961.
- Most hospitalizations (62%) were in persons whose insurance payer was either Medicare or Medicaid.

Table 1. Lengths of stay and total charges related to HCV hospitalizations, by category of liver disease,* Oregon 2008–2012 (n=3,917)

Condition**	Mean length of hospital stay in days					Mean health care charges per admission
(n = 3,917)	2008	2009	2010	2011	2012	5-year average
Cirrhosis	4.6	4.5	4.4	4.1	4.1	$23,942
Decompensated cirrhosis	4.9	5.0	4.9	4.8	4.8	$27,234
Other chronic liver disease	4.7	5.0	4.1	4.4	4.1	$22,230
Liver cancer	5.3	5.5	4.6	4.1	5.7	$52,345
Liver transplant	5.7	11.7	7.1	4.9	5.1	$34,281
Total	**4.9**	**5.0**	**4.7**	**4.6**	**4.6**	**$26,961**

(See Table 48 in the Appendix section for details.)

* See Table 45 in the Appendix section for list of ICD9 codes used to classify patients as having chronic liver disease, cirrhosis, decompensated cirrhosis, liver cancer or liver transplant

**These categories are not mutually exclusive, because patients can have more than one discharge diagnosis consistent with advanced liver disease.

Liver cancer

Globally, hepatocellular carcinoma (HCC) is the main type of liver cancer associated with chronic viral hepatitis. It is highest in less developed countries; the highest incidence rates are in Eastern and Southeastern Asia, followed by Northern and Western Africa. In 2012, it was the fifth most common cancer in men and the ninth most common in women. It was the second most common cause of death from cancer.[39]

In the United States, liver cancer is not in the top 10 causes of new cases of cancer. However, U.S. liver cancer rates have doubled since the 1980s.[40,41] Liver cancer is predicted to be the fifth most common cause of cancer deaths in the United States in 2014 for men, and the ninth most common cause in women. This rate is largely due to a poor prognosis: The overall five-year survival rate is 16%.

Between 1996 and 2012, 3,395 cases of HCC were reported to the Oregon State Cancer Registry (OSCaR). Of those, 959 (28%) were attributable to chronic viral hepatitis: 196 (6%) were in persons reported to ACDP with chronic HBV (reported between 1988 and 2012), and 763 (22%) occurred in persons reported with chronic HCV (reported between 2005 and 2012). The proportion of cases due to chronic viral hepatitis each year has risen dramatically since 2005, when chronic HCV first became reportable in Oregon. Liver cancer in persons with HCV in Oregon undoubtedly occurred before 2005. However, because it was not reportable until 2005, liver cancer in persons with HCV would not have been detected by our surveillance systems. Because Oregon's liver cancer rates were rising before 2005, the increase is likely due to an increase in the prevalence of persons with long-standing HCV infection. By 2012, 8% of liver cancer cases had chronic HBV, while 47% had chronic HCV.

More than three-quarters of liver cancer cases linked to chronic viral hepatitis occurred in men for both HBV and HCV between 2008 and 2012. The main difference between the two hepatitis viruses lies in the age distribution. Nearly a third of cases of liver cancer in persons with HBV were detected below the age of 50, while fewer than 10% of liver cancer cases in persons with HCV

Facts at a glance

- The annual number of liver cancer cases in Oregon has doubled in the last 10 years. Chronic viral hepatitis caused more than half of the cases by 2012.
- More than half (60%) of liver cancer cases associated with HBV infection in Oregon were among APIs.
- In Oregon, AI/ANs were twice as likely to suffer from liver cancer or die from HCV as whites.

Cases of liver cancer by year, with and without chronic viral hepatitis, Oregon, 1996–2012 (n=3,395)

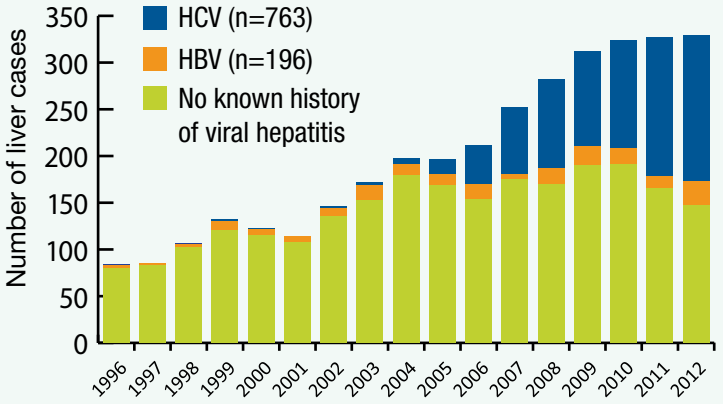


Figure 6 (See Table 49 in the Appendix section for details.)

Facts at a glance

- Half of liver transplants performed at OHSU in the past five years were due to HCV.

occurred before age 50; 53% of persons with liver cancer due to HCV were aged 50–59; and 33% were in persons aged 60–69. It is notable among cases of HBV-associated liver cancer that 59% of males were diagnosed before the age of 60, while only 33% of women developed liver cancer before the age of 60.

Most Oregon cases of HBV-associated HCC in 2008–2012 occurred in Asians and PIs (60%). The risk of HBV-associated HCC in Oregon was 32 times higher in Asians and PIs compared to white persons living in Oregon (6.3 cases/100,000 vs. 0.2 cases/100,000). The next highest rates were seen in blacks and African Americans (1.5 cases/100,000). For HCV, the highest rates of HCC were seen in AI/ANs (4.1 cases/100,000) and blacks and African Americans (5.1 cases/100,000), followed by whites (3.1/100,000) and Asians and PIs (2.7 cases/100,000).

Transplants

Major advances have occurred in antiviral therapy for chronic viral hepatitis. However, chronic infections with HBV and HCV remain a common indication for liver transplantation, most commonly for HCC or end-stage liver disease (ESLD). Over a 20-year period from 1985 to 2006, data on waiting list registrants in the United States obtained from the Organ Procurement and Transplantation Network indicated that 4% and 36% were classified to have HBV and HCV, respectively.[42] The number of waiting list registrations increased dramatically in the 1990s, from under 3,000 individuals in 1990 to 8,382 in 1999. It has stabilized at more than 8,000 individuals awaiting transplant annually. The most consistent trend during this time was the decline in transplants in the United States performed for the indication of ESLD. This is likely due to increasing use of antiviral medications for HBV during this time.

In the five-year period from 2009 to 2013, 169 liver transplants were performed at OHSU. This translates into 34 cases annually in Oregon. Of those, between one and two were attributable to chronic HBV each year, while 18 patients with chronic HCV had liver transplants each year, which accounted for 54% of liver transplant cases during those five years.

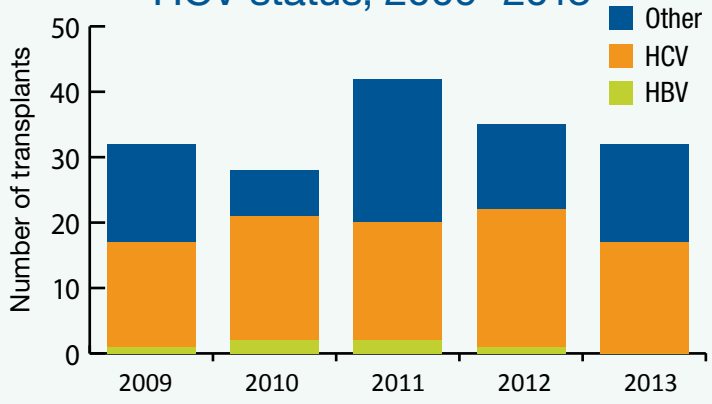


Figure 7 (See Table 54 in the Appendix section for details.)

Deaths

Analysis of 1999–2007 U.S. mortality data from the National Center for Health Statistics found that deaths from HCV in the United States increased significantly to 15,106 in 2007. However, deaths from HIV declined to 12,734 by 2007.[8] Factors associated with HCV-related deaths included chronic liver disease, HBV co-infection, alcohol-related conditions, minority status and HIV co-infection. Factors that increased odds of HBV-related death included chronic liver disease, HCV co-infection, Asian or Pacific Islander descent, HIV co-infection and alcohol-related conditions. In 2007, 59% of HBV deaths and 73% of HCV deaths occurred in persons aged 45–64.

Mirroring national trends, deaths from HCV in Oregon have risen steadily over the last decade, averaging more than 400 deaths annually in Oregon during the last five years. Oregon's HCV mortality rate during 2009–2013 is more than six times higher than Oregon's HIV mortality rate. HCV mortality is also higher in Oregon than in the United States as a whole; in 2011, the most recent year of available national data, the age-adjusted Oregon mortality rate was 8.7 deaths per 100,000 persons, compared to the national mortality rate of 4.8 deaths per 100,000.

In contrast, mortality from HBV has declined, with an average of 32 deaths per year in the last five years (2009–2013). Numbers of deaths related to HBV are too small to analyze. However, HCV-related deaths from 2009–2013 are similar to national trends: The majority of deaths occurred in men (71%) and in persons aged 45–64 (80%). By race, the highest mortality rates occurred in AI/ANs (17.4 deaths/100,000) and

Facts at a glance

- Between 2009 and 2013, the highest mortality rates from HCV occurred in two groups: AI/ANs and blacks and African Americans. Both were roughly twice the rate of whites.
- The mortality rate in Oregon from HCV was nearly twice the national average in 2011.

Age-adjusted mortality rates for HIV and HCV, Oregon and U.S., 1999–2013

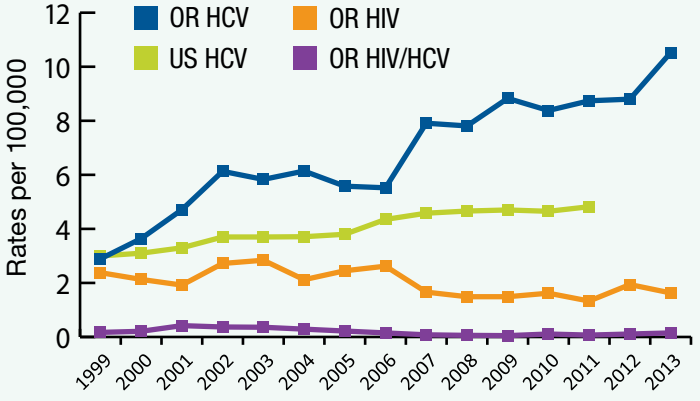


Figure 8 (See Table 56 in the Appendix section for details.)

blacks and African Americans (16.1 deaths/100,000) during this time period and both were roughly twice the rate in whites (8.9 deaths/100,000).

Public health implications

The long-term consequences of chronic HBV or HCV diagnosis are substantial morbidity and mortality. These findings highlight the need to promote HBV and HCV screening programs and HAV and HBV vaccination programs within communities and populations at high risk for viral hepatitis. Improved linkage to care and treatment for persons diagnosed with chronic HBV and HCV will also be critical in efforts to improve health outcomes and decrease cost.

Secondly, significant health disparities exist in Oregon for hepatitis B and C. There is clearly a need to:

- Educate providers and communities at risk about viral hepatitis prevention and screening; and
- Support access to culturally competent care and treatment for disproportionately affected populations including AI/ANs, Asians and PIs, blacks and African Americans, persons who inject drugs and incarcerated populations.

Special populations

HBV in Asians and Pacific Islanders

Background in the United States

Although Asian and Pacific Islanders (PIs) currently comprise about 5% of the U.S. population, they represent more than 50% of persons chronically infected with HBV.[43] Nearly 70% of Asians and PIs living in the United States were born or have parents who were born in countries where HBV is endemic. They were infected as infants or young children. The highest rates of chronic HBV infection in the world are found in Africa and Eastern and Southeastern Asia.[32] In contrast, rates of acute hepatitis A, B and C and chronic HCV are generally no higher in Asians and PIs living in the United States than in the general U.S. population.[6]

Risk of morbidity and mortality from HBV is also more common in Asians and PIs. During 2001–2006, the incidence of hepatocellular carcinoma (HCC) was higher among Asians and PIs than any other racial or ethnic group in the United States.[41] HBV-related mortality rates were 10 times higher in Asians and PIs than whites in the United States in 2010.[6]

HBV in Asians and PIs in Oregon

Data from Oregon match the national trends. Of the 2,130 laboratory reports consistent with chronic HBV reported in Oregon during 2009–2013, race is known for 1,815 (85%); 59% of cases occurred in Asians and PIs. Among the 1,024

Facts at a glance

- The majority of Oregon HBV chronic cases occur in persons born outside of the United States and were likely acquired at birth or in childhood.
- In 2009–2013, 59% of Oregon's chronic HBV cases occurred in Asians and PIs.
- Chronic HBV is more common in Asian and PI women than in women of other races.
- Nearly two-thirds (63%) of Oregon's liver cancer cases associated with HBV infection were among Asians and PIs.
- Asians and PIs accounted for a quarter of deaths from HBV infection between 2008 and 2012.

Birth countries of chronic hepatitis B cases, Oregon, 2009–2013

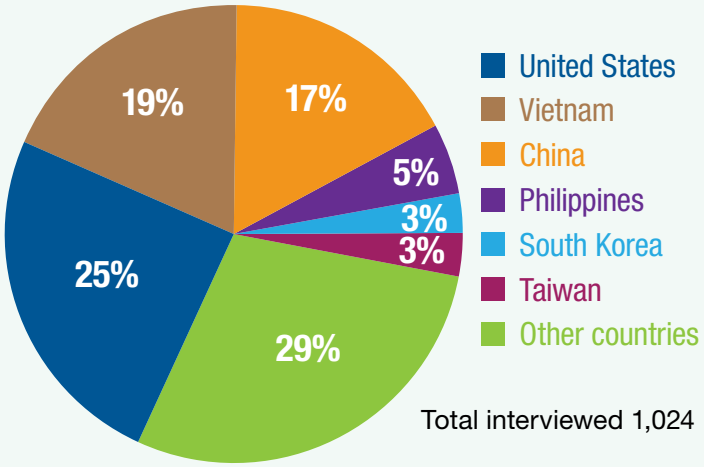


Figure 9 (See Table 40 in the Appendix section for details.)

interviewed cases whose birthplace was known, 770 (75%) reported being born outside of the United States. Five countries accounted for 47% of the cases: Vietnam (19%), China (17%), Philippines (5%), South Korea (3%) and Taiwan (3%). The rate of chronic HBV infection among Asians and PIs (131.4 and 139.8 cases per 100,000, respectively) are 41 and 44 times higher than rates in whites (3.2/100,000). Compared to persons of other races, Asians and PIs were more likely to be diagnosed at a younger age: In 2009–2013, 52% of chronic HBV laboratory reports for Asians and PIs were in persons less than 40 years of age, compared to only 30% of whites. Chronic HBV is also more common in Asian and PI women than in women of other races. More than half (52%) of chronic HBV laboratory reports in Asians and PIs occurred in females, while only 32% of cases in all other races combined occurred in females during this time period.

Of the 93 cases of persons with hepatocellular carcinoma (HCC) related to chronic HBV identified in Oregon between 2008 and 2012, 56 (60%) occurred in Asians and PIs. The risk of HBV-associated HCC in Oregon is 32 times higher in Asians and PIs compared to white persons. Oregon mortality data show that Asians disproportionately die from chronic HBV; of 159 deaths from HBV occurring in 2009–2013, 23% were in Asians and PIs.

Public health implications

Foreign-born Asians and PIs in Oregon carry a high risk of chronic HBV infection and the resulting sequelae of chronic liver disease, liver cancer and death. Lack of knowledge and awareness likely contribute to low testing rates in this population. Additionally, many immigrants may fear the stigma associated with HBV infection, and persons with limited English ability may avoid or delay visits to health care providers.

Partnerships with community-based agencies are necessary to provide ongoing prevention education, screening and vaccination services to the diverse Asian and PI communities affected by HBV. Providers also need training in culturally proficient care and treatment for persons living with chronic HBV.

Incidence of chronic hepatitis B by sex and race/ethnicity, Oregon, 2009–2013

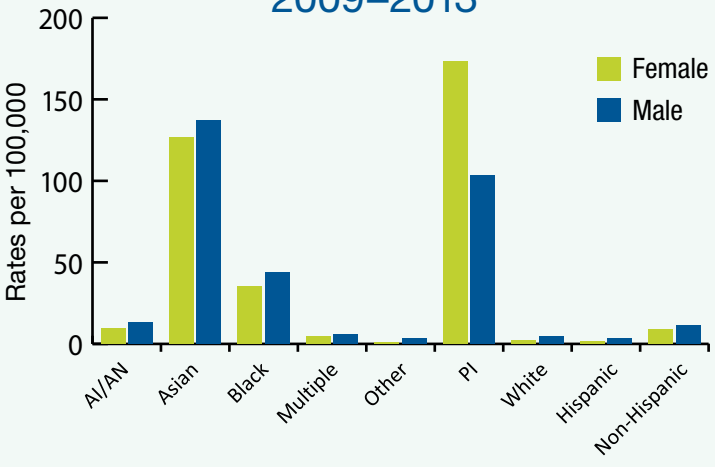


Figure 10 (See Table 30 in the Appendix section for details.)

Incidence of liver cancer associated with chronic hepatitis B, by race/ethnicity, Oregon, 2008–2012

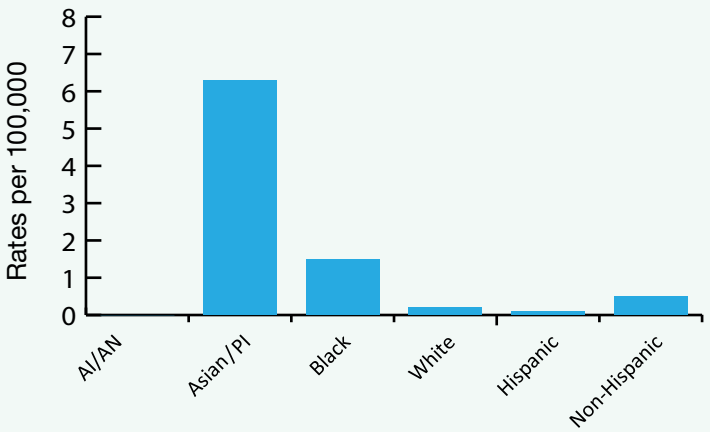


Figure 11 (See Table 52 in the Appendix section for details.)

Chronic viral hepatitis in blacks and African Americans

HBV in the United States in blacks and African Americans

Blacks and African Americans are disproportionately affected by chronic viral hepatitis. According to data reported to CDC's National Notifiable Diseases Surveillance System (NNDS), blacks and African Americans had higher rates of acute HBV than any other racial or ethnic group in 2011. Although reported cases of chronic infection due to HBV were most common in Asians and Pacific Islanders (PIs), more cases were reported in blacks and African Americans than in whites.[6] A national study from 1999 to 2006 found a high prevalence of past infection (12.2%) among non-Hispanic blacks and African Americans, and the prevalence of chronic HBV infection (0.89%) was nearly 10-fold higher than the prevalence in whites living in the United States (0.09%).[30] Lastly, deaths from HBV in 2010 were three times higher in blacks and African Americans than in whites.[6]

Facts at a glance

- Rates of acute HBV among blacks and African Americans in Oregon from 2009–2013 did not differ from other racial or ethnic groups. However, chronic HBV was more than 20 times higher in blacks and African Americans than in whites.
- The majority of cases of chronic HBV among blacks and African Americans in Oregon are among persons born in Africa (78%).
- Cases of chronic HBV and liver cancer associated with HBV are more common in blacks and African Americans than in whites in Oregon.
- Chronic HCV infection is more common in blacks and African Americans than in whites in Oregon.
- Among blacks and African Americans, 64% of chronic HCV cases occur in men and 67% in persons aged 40–59.
- Liver cancer and deaths from HCV are nearly twice as common in blacks and African Americans compared to whites.

Although the national rates of acute HCV are no higher in blacks and African Americans than in other racial or ethnic groups, chronic infection with HCV is more common in blacks and African Americans. The most recent national prevalence estimates found that blacks and African Americans have the highest risk of any racial group in the United States.[2] Rates of liver cancer and liver cancer deaths, which could be due to either HBV or HCV, are also consistently higher in blacks and African Americans compared to whites. Between 2006 and 2010, rates of deaths from HCV among blacks and African Americans averaged 79% higher than HCV deaths among whites.[6,40]

There are some well-recognized differences in the natural course of infection with HCV in blacks and African Americans. Although they have a lower prevalence of cirrhosis than whites, blacks and African Americans do not respond to treatment with antiviral medications as well as whites and have been underrepresented in clinical trials.[44] Blacks and African Americans are most commonly infected with HCV genotype 1, which is difficult to treat but does not explain the difference in response to treatment. Compared to whites with genotype 1, blacks and African Americans are still 50% less likely to clear the virus. One contributing factor is that blacks and African Americans are less likely to carry a variant of the IL-28B gene. This gene typically correlates with a better response to treatment. However, this genetic factor still does not fully explain treatment response differences between whites and blacks.

HBV in Oregon

Rates of acute HBV in blacks and African Americans in Oregon during 2009–2013 were not different from other racial or ethnic groups. Nevertheless, chronic HBV reports during this time were more than 12 times higher among blacks and African Americans than among whites in Oregon (39.9 cases per 100,000 vs. 3.2 cases per 100,000). However, HBV reports for blacks and African Americans were lower than in Asians and PIs. The majority of chronic HBV cases among blacks and African Americans occurred in men (59%). Chronic HBV cases were also more commonly found in persons under the age of 40 (64%, in contrast to only 30% of cases in whites occurring in persons under the age of 40). As with Asians and PIs, the main risk factor is foreign birth, which accounted for 78% of cases in blacks and African Americans during 2009–2013.

Similar to the trend seen in chronic HBV infections in Oregon, rates of liver cancer due to HBV were more than seven times higher in blacks and African Americans than in whites (1.5 cases per 100,000 vs. 0.2 cases per 100,000). The incidence of liver cancer due to HBV in blacks and African Americans was the second highest among any racial group in Oregon after Asians and PIs.

HCV in Oregon

Rates of acute infection in Oregon and nationally during the period 2009–2013 are the same in blacks and African Americans and in whites (0.6 cases per 100,000). In contrast, rates of positive HCV laboratory reports are 2.1 times higher in blacks and African Americans than in whites (124.4 cases per 100,000 vs. 57.5 cases per 100,000, respectively). Blacks and African Americans have the second highest incidence of HCV among racial groups in Oregon, with American Indians/Alaska Natives (AI/AN) having the highest rates. The age and sex of chronic HCV infection cases in blacks and African Americans are similar to other racial groups in Oregon, with 65% of cases occurring in men and 67% of cases in persons aged 40–59. Almost half (46%) were in persons aged 50–59. Like other racial and ethnic groups in Oregon, the most common route of transmission was injection drug use (76%).

The rate of liver cancer associated with HCV is 1.6 times higher in blacks and African Americans than in whites. Blacks and African Americans' incidence rate is 5.1 cases per 100,000. Mortality from HCV is also higher in blacks and African Americans than in whites and comparable to the rates in AI/ANs (blacks and African Americans, 16.1/100,000; whites, 8.9/100,000; AI/ANs, 17.4/100,000). All but one of the deaths in blacks and African Americans occurred in persons over age 45, with 20% in persons 45–54 years of age, 48% in 55–64 year-olds, and 25% in 65–74 year-olds.

Public health implications

Significant health disparities exist in Oregon for black communities in HBV and HCV infection, chronic liver disease, liver cancer and death. Providers and the group at risk may be unaware of the need to:

- Screen African Americans and foreign-born blacks for chronic HBV infection;
- Increase awareness of the existence of viral hepatitis health disparities; and
- Implement culturally appropriate prevention programs.

Birth cohort and risk-based HCV screenings for blacks and African Americans are also critical. More research into the differences in natural history and response to treatment in blacks and African Americans is needed, and efforts must be made to include blacks and African Americans in clinical trials of new antiviral medications.

Table 2. Disparities in incidence rate of viral hepatitis, liver cancer associated with viral hepatitis, and mortality from HCV between blacks and African Americans and whites in Oregon

Condition	Incidence rate in whites per 100,000	Incidence rate in blacks and African Americans per 100,000
Chronic HBV infection, 2009–2013	2.2	39.9
Chronic HCV infection, 2009–2013	57.5	124.4
HBV-associated liver cancer, 2008–2012	0.2	1.5
HCV-associated liver cancer, 2008–2012	3.1	5.1
Mortality from HCV, 2009–2013	8.9	16.1

HCV in American Indians and Alaska Natives

Background on HCV in American Indians and Alaska Natives

In 2010, chronic liver disease (CLD) was the fifth leading cause of death among American Indians and Alaska Natives (AI/ANs). In contrast, CLD was not in the top 10 causes of death in the United States overall and ranked 11th among whites.[45] Two studies evaluated the etiology of CLD among AI/AN populations. One study was in two regions of the southwestern United States and the second was in Alaska. Both found a high prevalence of alcoholic liver disease, HCV and non-alcoholic fatty liver disease in persons diagnosed with CLD.[46,47] The prevalence of HCV as an etiology of CLD was 6% and 24% in two medical centers in Arizona and California, respectively; it was 26% in the Alaskan study. AI/ANs also have elevated rates of liver cancer and mortality from liver cancer compared to other racial and ethnic groups in the United States. Their rates are second only to Asians and Pacific Islanders (PIs).[40]

Recent trends in national surveillance data reported to CDC's National Notifiable Diseases Surveillance System suggest that AI/ANs are not at higher risk of acute HAV, acute HBV or chronic HBV than other racial or ethnic groups. However, the highest U.S. rates of acute HCV between 2002 and 2011 occurred in AI/ANs.[6] In 2010, AI/ANs had the highest mortality rate of any race or ethnicity from HCV at 9.9 deaths per 100,000; this is more than twice the rate in whites (4.0 deaths /100,000).

One study that reviewed hospital discharge data from the Indian Health Service National Patient Information Reporting System found a three-fold increase in HCV-related hospitalizations between 1995 and 2007.[48] The hospitalization rate was highest among people aged 45–64, males, and those in the Alaska region. Another study of an Alaskan cohort found the highest prevalence in persons 40–59 years of age, males and urban residents.[49] A majority of infections with HCV were in people injecting drugs (61%) in this cohort, followed by those who received a transfusion (14%).

Facts at a glance

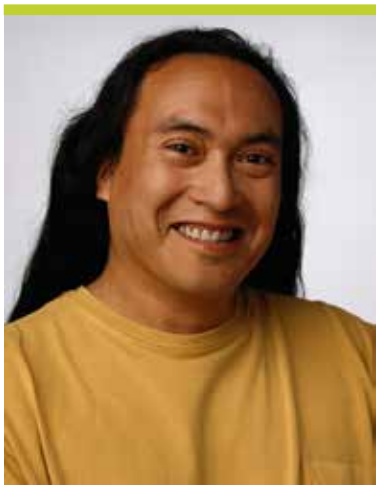
- Rates of acute HCV in Oregon are more than three times higher in AI/ANs than any other racial group.
- The highest rates of chronic HCV in Oregon are seen in AI/ANs and blacks and African Americans.
- Hospital discharge data from the Indian Health Service (IHS) found a three-fold increase in HCV-related hospitalizations between 1995 and 2007.
- In Oregon, AI/ANs are twice as likely to die from HCV as whites.

Table 3. Disparities in incidence rates of viral hepatitis, liver cancer associated with viral hepatitis, and mortality from HCV in American Indians and Alaska Natives in Oregon

Condition	Incidence rates in AI/ANs per 100,000	Incidence rates in whites per 100,000
Chronic HCV infection, 2009–2013	127.7	57.5
HCV-associated liver cancer, 2008–2012	4.1	3.1
Mortality from HCV, 2009–2013	17.4	8.9

HCV in AI/ANs in Oregon

AI/ANs are more likely to acquire acute HCV than any other racial or ethnic group in Oregon, with a rate of 2.1/100,000 persons in 2009–2013. This is nearly four times higher than the rate in whites and in blacks and African Americans (0.6 cases/100,000). For chronic HCV, the rate of laboratory-reported cases of HCV in AI/ANs during the same time was 127.7 cases /100,000. The AI/AN rate is similar to the rate in blacks and African Americans (124.4 cases/100,000) and more than twice the rate in whites (57.5 cases/100,000). AI/AN cases were predominantly male (58%), and 65% occurred in persons aged 40–59, which is similar to other racial groups in Oregon. Expanded surveillance in Lane, Marion and Multnomah counties from 2011 to 2012 identified injection drug use as the predominant risk factor in all racial groups; 76% of those for whom race and risk factor data were available reported injection drug use. These numbers did not vary by race: 80% of AI/AN respondents reported injection drug use.



AI/ANs also had the second highest rate after blacks and African Americans of hepatocellular carcinoma (HCC, the type of liver cancer commonly due to viral hepatitis) due to HCV in Oregon in 2008–2012. AI/ANs' rate of 4.1 cases/100,000 compares to 5.1 cases/100,000 in blacks and African Americans and 3.1 cases/100,000 in whites. AI/ANs and blacks and African Americans also had the highest mortality rates from HCV in Oregon during 2009–2013 (17.4 and 16.1 cases per 100,000, respectively). Misclassification of race and ethnicity (in which AI/ANs are misclassified as either white, Asian or Hispanic) has been documented in several public health datasets, suggesting that these disparities may be even bigger than described here.[50-52]

Public health implications

AI/ANs experience some of the highest rates of HCV infection, liver cancer and death in Oregon. Studies of this population in other parts of the United States suggest that their course of HCV is often complicated by a high prevalence of other conditions that can damage the liver, such as alcoholism and fatty liver disease. Culturally appropriate efforts to raise awareness, support prevention efforts and promote birth cohort and risk-based HCV screenings are critical in this population. It is especially important to monitor screening efforts, linkage to care and access to treatment in this population because of the high risk of HCV progression to ESLD in persons with other co-morbidities affecting the liver.

Persons who inject drugs and viral hepatitis

Hepatitis A

HAV is an acute infection transmitted by the fecal-oral route. The infection may come from contaminated food or beverages or from sexual activity with an infected person. HAV transmission among persons who inject drugs (PWIDs) has been reported in the United States, including Oregon, where injection drug use fueled a large outbreak in Portland in the mid-1980s.[53] PWIDs who are homeless may be at increased risk of HAV infection because of their restricted access to sanitary bathroom and hand-washing facilities.[54] Although it has not been a common risk factor in Oregon in the last five years, in 2006 Multnomah County reported a cluster of six HAV cases among homeless PWIDs 20–49 years of age.

Facts at a glance

- Injection drug use accounts for 12% of new infections with acute HBV and 64% of new infections with acute HCV in Oregon.
- Prevalence of HCV in persons who inject ranges from 8% in persons under 20 years old to 58% in persons aged 50–54.
- Interviews with young persons being screened for HCV who inject drugs found that 50% reported sharing needles with someone with HCV.
- National trends suggest the pathway to injection drug use starts with misuse of prescription opioids. Oregon had the highest rate of use in the nation of non-medical prescription pain relievers in 2012.

Because persons with chronic liver disease are at higher risk for developing severe illness with HAV, the CDC recommends HAV vaccine for persons chronically infected with HBV or HCV, a group that often includes PWIDs.[55,56]

Hepatitis B and C among PWIDs in the United States

HBV is easily transmitted through infected blood and body fluids. In a study of the seroprevalence of HBV infection among young PWIDs in Seattle from 1994–2004, 27% had serologic evidence of past HBV infection. Seroprevalence of HBV ranged from 43% in 1994 to 15% in 2004. The decline in prevalence may have been due to increasing rates of HBV vaccination.[57] Review of U.S. cases of acute HBV reported to the CDC in 2011 reveal that sexual risk factors were the most common route of transmission, with 19% of cases occurring in men who have sex with men (MSM) and 7% reporting having sex with someone with HBV in the previous six months. Eighteen percent also reported injection drug use.[58]

In contrast, HCV is transmitted primarily through infected blood. Sexual transmission plays a much smaller role. Injection drug use accounted for most acute HCV infections (60%) reported in the United States in 2011. Thirteen percent of cases reported having sex with someone with HCV in the previous six months. Four percent were MSM. In the most recent national prevalence study, 51% of persons with chronic HCV aged 20–59 reported prior injection drug use.[2]

Syringe sharing has declined among PWIDs since the emergence of HIV. However, sharing and reusing drug preparation equipment are still often reported in the United States. The 2009 National HIV Behavioral Surveillance System conducts

surveys of PWIDs in urban areas. It reports a high proportion of participants sharing previously used syringes (35%). This holds true for receptive sharing of other injection equipment, such as cookers, cotton or water (58%) as well as syringes to divide drugs (35%).[59,60] The percentage of receptive sharing of syringes and equipment to inject drugs was highest among participants aged 18–29 and those who had been arrested during the past year. This is of particular concern because the level of HCV infection risk by sharing drug preparation equipment is just as high as the HCV transmission risk from sharing syringes.[61]

Recent national reports have described an increase in HCV infection among PWIDs in multiple states. The cases have commonly been under the age of 30, white and residents of suburban or rural areas.[14,62] Studies of young persons who inject drugs report misuse of prescription opiates as a common pathway to injecting drugs. They often obtain prescriptions themselves for opiates or get them from their friends or family members.[13,63]

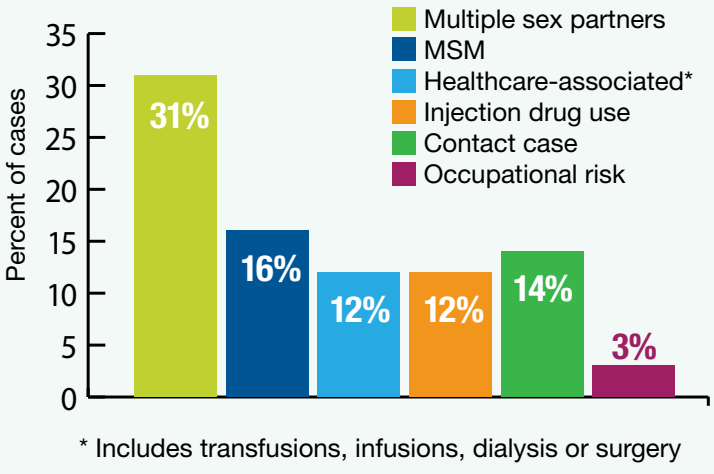
HBV in PWIDs in Oregon

In Oregon from 2009 to 2013, sexual risk factors were common among persons reported with acute HBV (31% reported multiple sex partners and 16% occurred in MSM.) However, 12% of acute HBV cases reported injection drug use (IDU). Among the 18 persons who reported IDU, 11 (61%) were male, and 44% (8/18) were aged 30–39. Only three (17%) were under age 30. Most of the HBV cases reported in Oregon with chronic HBV infection from 2009 to 2013 were persons born in endemic countries who likely acquired their infection at birth or in early childhood (75%); only 7% reported IDU.

HCV in PWIDs in Oregon

IDU is the predominant route of transmission of HCV in Oregon and nationally. Of the 81 acute HCV cases interviewed in Oregon from 2009 to 2013, 64% reported IDU. Among Oregon's acute HCV cases who reported IDU risk, 56% were male and, in marked contrast to acute HBV cases in Oregon, 55% were under age 30. Rates

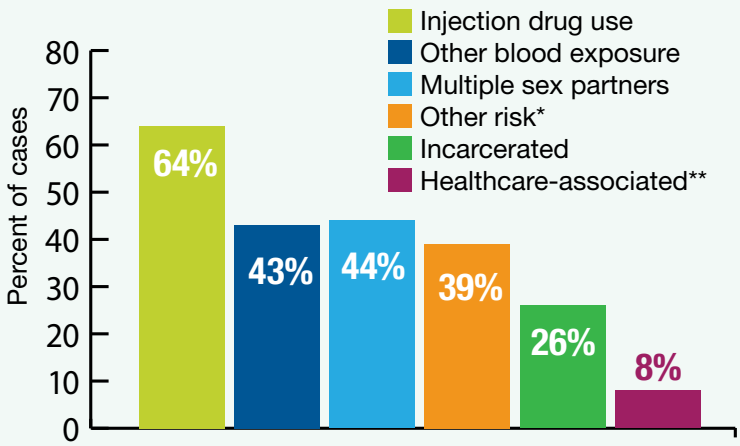
Risk factors among acute cases of HBV, 2009–2013, Oregon



* Includes transfusions, infusions, dialysis or surgery

Figure 12 (See Table 37 in the Appendix section for details.)

Risk factors among acute cases of HCV, 2009–2013, Oregon



* Includes needlesticks, tattoos and piercings
** Includes transfusions, infusions, dialysis or surgery

Figure 13 (See Table 41 in the Appendix section for details.)

of persons newly reported with chronic HCV infection have declined in Oregon since 2008. However, rates in persons under age 30 have increased steadily in the past two years, and have increased 27% since 2006.

Most local health departments do not have resources to investigate reported cases of chronic HCV infection. However, Lane, Marion and Multnomah counties participated in an expanded surveillance project in 2011–2012. Of the 1,778 chronic HCV cases from those three counties with IDU risk data available (representing 38% of the cases reported in that time), 77% reported IDU. Among chronic HCV cases reporting IDU in Lane, Marion and Multnomah counties, 64% were male, and 58% were in the 40–59 year-old age group. There were 1,519 chronic cases of HCV from the three counties in 2011–2012 for whom race and injection drug risks were known. Of these, 80% of AI/ANs, 76% of blacks and African Americans and 78% of whites reported IDU. This suggests little variation by race in the route of transmission.

Prevalence of HCV in current injection drug users by age, Oregon Adult High Risk Screening Project, 2007–2013

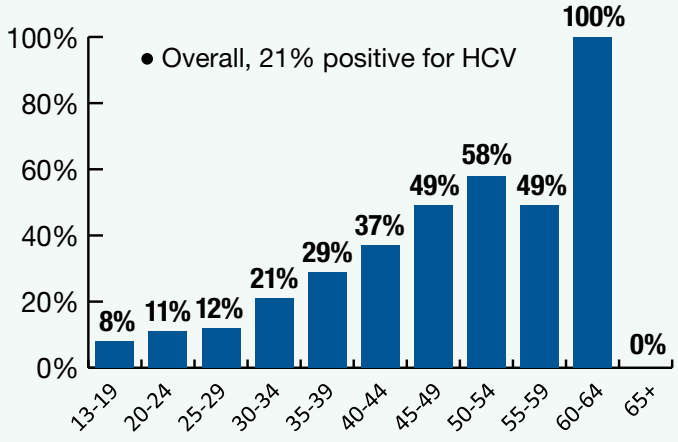


Figure 14 (See Table 65 in the Appendix section for details.)

High-risk behaviors in PWIDs in Oregon

Oregon has collected information about HCV behavior risk among persons tested for HCV through the state's High Risk Adult HCV Screening Project. Between 2007 and 2013, the screening project performed 4,027 HCV tests among persons who reported risk factors for HCV. Twenty local health departments and four syringe exchange programs participated in the screening.

Overall, 16% of the persons screened and 21% of persons who reported IDU were positive for HCV. The prevalence of HCV increased with age, ranging from 6% in persons less than 20 years of age to 39% in persons aged 50–54. The prevalence of HCV did not vary by sex or by race in this population.

Since the screening program targets persons at highest risk for HCV, the majority tested (72%) reported IDU at some point in their lives. Those with injection drug use risk reported methamphetamine and heroin as the primary drug injected (74% and 21% respectively). HCV prevalence between users of these two drugs did not vary. Of the 2,467 who reported IDU and responded to a question about their most recent drug use, 85% said they had injected within the past three years. This sub-group of recent injectors was young: 52% were under age 30. Half reported sharing needles with someone who had HCV, 54% lived with someone with HCV, and 46% reported having sex with someone with HCV. The prevalence of HCV antibodies in this group of recent injectors under the age of 30 was only 11%. This suggests that intervention in this age group could be effective in preventing further transmission.

More detailed data on injection practices came from a 2013 Lane County study of a fungal bloodstream infection outbreak in PWIDs using heroin. ACDP staff conducted in-depth interviews with 32 heroin users living in Lane County and found that 34% shared syringes, 63% shared cottons and 84% reported shared preparation surfaces.[64]

Data from a report published by the Injury and Prevention Section of the Oregon Health Authority on drug overdose deaths and hospitalizations in Oregon suggests that Oregon's rates of prescription opioid misuse and heroin abuse are very high.[65] The rate of unintentional and undetermined overdose deaths associated with prescription opioids has declined in Oregon since peaking in 2006. However, the rate of deaths (4.2/100,000) in 2012 was still higher than it was in 2000. Oregon also had the highest rate of non-medical use of prescription pain relievers in the nation in 2012.[66] Meanwhile, heroin overdose deaths in Oregon have increased three-fold since 2000. Hospitalizations due to unintentional and undetermined overdoses related to prescription opioids have increased five-fold between 2000 and 2012. Hospitalizations due to heroin poisoning have doubled during that same time. The biggest increases in heroin-associated hospitalizations have been in males 15–24 years of age, followed by 25–34 year-old males.

Public health implications

Viral hepatitis is a significant public health issue among PWIDs in Oregon and nationally. Most persons diagnosed with chronic HCV infection are over the age of 40 and likely acquired their infection decades earlier. However, Oregon has growing numbers of cases in young PWIDs. This is likely fueled by high rates of prescription opioid misuse and injection drug use.

Persons with injection drug use risk often have additional complex health and social issues. They experience marginalization, stigma and barriers to accessing social, behavioral and health care services.[67] These challenges contribute to PWIDs' continued viral hepatitis transmission and significant morbidity and mortality from viral hepatitis-related liver disease.

System level collaborations are needed among OHA's Public Health Division (PHD), Addictions and Mental Health Division (AMH) and the Medical Assistance Programs (MAP). Collaborations with state and local partners serving PWIDs — such as the Oregon Department of Corrections, coordinating care organizations, local health departments and community-based organizations (CBOs) — are also important. These partnerships can increase community and provider awareness, train providers across disciplines, and support screening and HAV/HBV vaccination efforts. Successfully reducing transmission of viral hepatitis between PWIDs requires combined interventions involving opiate substitution therapy programs, high coverage syringe exchange programs, pharmacy syringe access, and access to care and treatment.[68,69]

Viral hepatitis in incarcerated populations

Background

The criminal justice system includes jails, prisons, probation, parole and other forms of community supervision. An estimated one in six people in the United States passes through the criminal justice system each year.[70] Nationally, 13%–47% of incarcerated persons have past or current HBV infection. Chronic HBV infection affects from 1% to 3.7% of incarcerated persons.[71] The prevalence of HCV is higher, with evidence of past or current HCV infection reported in 16%–41% of incarcerated populations. Confirmed chronic HCV infection ranges from 12% to 35%.[71] These estimates compare to 0.27% for chronic HBV, and 1.0% for chronic HCV among civilian non-institutionalized persons.[2,30] In Oregon, 26% of cases of acute HCV between 2009 and 2013 reported a history of incarceration (either jail or prison) in the six months prior to their onset of hepatitis symptoms.

Studies have demonstrated that inmates rarely acquire these infections while incarcerated. The chronic infection is usually present at the time of entrance.[71,72] Several factors such as substance abuse, dependency, addiction and mental health issues contribute to the higher prevalence of HBV and HCV among persons formerly or currently incarcerated.[73,74]

Given this high prevalence of viral hepatitis, the CDC recommends that correctional facilities ask about risk factors for HBV and HCV infections during prison admission medical evaluations.[71] The facilities should offer HBV and HCV antibody screening tests to persons reporting risk factors. Persons who screen positive for HBV or HCV should be further evaluated for a chronic infection. If an infection is present, the extent of liver disease should also be evaluated.

Facts at a glance

- In Oregon, 30% of persons incarcerated in state prisons are thought to have chronic hepatitis C infection.[1]
- Between 2009 and 2013, one-quarter of acute HCV cases in Oregon reported a history of incarceration in the previous six months.
- Although the majority of persons jailed in Oregon are repeat offenders, only half have ever been offered HCV screening while in jail.
- Although screening programs in jails are limited, one study suggests that 11% of jail detainees in Oregon were infected with HCV at the time of entrance.

Number of new inmates tested for HCV and proportion positive as part of voluntary screening, Oregon Department of Corrections, 2009–2012

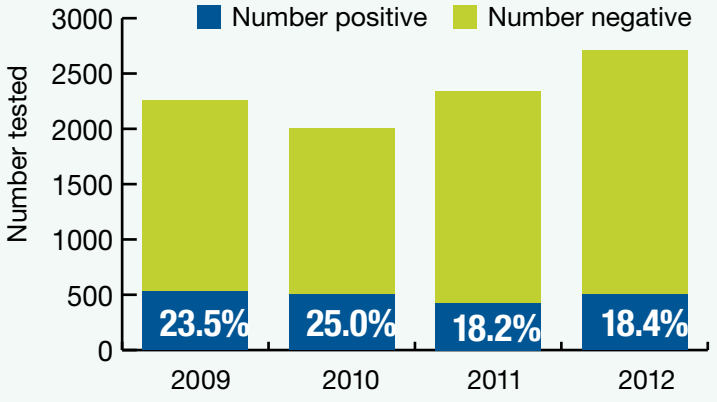


Figure 15 (See Table 66 in the Appendix section for details.)

Viral hepatitis in Oregon's prisons

The Oregon Department of Corrections (ODOC) reports a high prevalence of substance abuse and mental health issues among persons incarcerated in the state prison system. In 2013, close to 80% of persons incarcerated in Oregon state prisons reported substance abuse, dependence or addiction issues. Half of the state's incarcerated population had existing mental health treatment needs; 23% had severe or high need.[75] Like prisons in other parts of the country, ODOC reports a high prevalence of HBV and HCV in its facilities. It offers voluntary HBV and HCV screening at the time of entrance. Between 2009 and 2012, approximately half of persons who requested HBV screening were found to be immune to HBV, either through vaccination or past infection; 1.5% were chronically infected with HBV. During the same time, the prevalence of HCV among the 2,300 persons screened annually ranged from 18% to 25%. Additionally, persons are diagnosed during the course of medical care while incarcerated and persons aware of their viral hepatitis status may report this to ODOC health services staff at intake or any time during incarceration. The ODOC experienced a 29% increase in identified HCV cases between 2006 and 2012 (from 1,402 to 1,804 HCV cases, respectively).[76] The ODOC used these two sources of data (voluntary screening, identification of infected individuals as part of their medical care) and a 2006 unpublished seroprevalence study to estimate in June 2014 that 140 persons were infected with chronic HBV and between 3,600 and 4,400 incarcerated persons were infected with chronic HCV.[1] These estimates of 1% for HBV and 30% for HCV are consistent with the published national prison population estimates of HBV and HCV infection.[71,72]

Viral hepatitis in Oregon's jails

Nationally and in Oregon, health screening and behavioral risk factor data for jail populations is limited.[70] Oregon jails do not report the number of persons with HBV and HCV diagnoses detained within Oregon's county jail facilities each year. The limited data that exist about jail populations in Oregon come from the Oregon High Risk Adult HCV Screening Project, conducted by local health departments and syringe exchange programs. Jail settings were added as a test setting to the screening risk questionnaire in 2012 in five counties, and 11% of the 255 rapid HCV antibody screening tests in jail settings from 2012 to 2013 were positive in Oregon.

In the Deschutes County Jail, the HIV/HCV Health Education and Screening Program collected additional data on incarceration history and risk behavior of persons who participated

Jails vs. prisons

Most people do not distinguish between jails and prisons, but the two systems differ.

Jails are locally operated and hold persons awaiting trial or sentencing. They also hold convicted persons sentenced to a term of one year or less. Jails have high bed turnover, with stays usually lasting less than 48 hours. Jails have a higher prevalence of persons with acute intoxication and uncontrolled mental illness.

Prisons are state or federally operated and hold convicted persons with sentences of one year or longer. Persons arrive at prison relatively stable and the intake process may take several weeks.

Effective interventions in jails must be limited in scope and occur within a very narrow time frame.[48]

in an HIV/HCV education class in 2011–2012. Of the 111 respondents who provided complete responses, 92% had been jailed at least once before the current episode; 60% had been jailed more than six times. Forty-eight percent reported receiving testing at least once for HCV. The probability of being tested increased with the number of times the individual had been jailed, but it was not statistically significant (42% of those jailed between two and five times compared to 54% of those jailed six or more times). Those with a history of incarceration in a state prison were more than twice as likely to have been tested previously.

Public health perspective

Incarcerated settings have concentrated numbers of persons at risk of or living with chronic HBV and HCV. These settings present opportunities for public health partnerships and efforts, such as the vaccination campaign described below in state correctional facilities.[79] Early detection, liver health education and treatment can slow disease progression and reduce morbidity and mortality.

Almost half of the state prison population is scheduled for release within 24 months; addressing the health needs of persons in Oregon's prisons and linking people to care after release benefits communities. Most of the cost savings of prevention, detection and treatment will occur after incarceration.[80]

Table 4. Screening for HCV in Deschutes County Jail, 2010–2011 (n=111)

Opportunity for screening for HCV	Number screened	Percent screened
Number of times detained in a county jail		
First time	2/8	25
Two to five times	15/36	42
Six or more times	36/67	54
Overall	53/111	48
Ever incarcerated in state prison		
Yes	31/45	69
No	21/65	32

Example of successful collaboration between Public Health and Department of Corrections: Hepatitis B vaccination of adults during incarceration in Oregon

The Advisory Committee on Immunization Practices (ACIP) recommends HBV vaccination for adults in correctional settings because of their increased risk for infection;[77] vaccination of persons incarcerated in state prison systems has been found feasible and cost saving.[77,78]

ODOC collaborated with the Oregon Health Authority to implement the ACIP recommendations. ODOC offers the three-dose (zero, one-month and six-month) hepatitis B vaccination series to inmates. The ODOC health clinic staff document the vaccinations in the state's electronic vaccination registry so that individuals returning to the community have record of HBV vaccination. In 2013, the program provided 2,593 doses to 1,569 persons, with 83% of persons who received a first dose in 2013 reported as also receiving a second dose. Sixty percent of persons who received a second dose in 2003 also reported a third dose. Thirty-four percent of persons who initiated the HBV series in ODOC during 2013 completed the three dose series within the same year.

Appendix: Supporting data tables

Table 1. Incidence of acute hepatitis A, Oregon, 1993–2013

Source: Orpheus hepatitis A surveillance and American Community Survey, June 2014

Year	Oregon population	Cases	Incidence rate per 100,000
1993	3,059,110	559	18.27
1994	3,119,940	1,328	42.56
1995	3,182,690	2,943	92.47
1996	3,245,100	918	28.29
1997	3,302,140	399	12.08
1998	3,350,080	422	12.60
1999	3,393,410	254	7.49
2000	3,431,085	170	4.95
2001	3,470,385	106	3.05
2002	3,502,588	64	1.83
2003	3,538,591	60	1.70
2004	3,578,895	70	1.96
2005	3,626,938	41	1.13
2006	3,685,206	50	1.36
2007	3,739,359	35	0.94
2008	3,784,182	28	0.74
2009	3,815,775	19	0.50
2010	3,837,300	17	0.44
2011	3,857,625	13	0.34
2012	3,883,735	8	0.21
2013	3,930,065	31	0.79

Table 2. Incidence of acute hepatitis B, Oregon, 1993–2013

Source: Orpheus hepatitis B surveillance and American Community Survey, June 2014

Year	Oregon population	Cases	Incidence rate per 100,000
1993	3,059,110	286	9.35
1994	3,119,940	223	7.15
1995	3,182,690	187	5.88
1996	3,245,100	162	4.99
1997	3,302,140	133	4.03
1998	3,350,080	171	5.10
1999	3,393,410	120	3.54
2000	3,431,085	122	3.56
2001	3,470,385	170	4.90
2002	3,502,588	128	3.65
2003	3,538,591	115	3.25
2004	3,578,895	122	3.41
2005	3,626,938	107	2.95
2006	3,685,206	79	2.14
2007	3,739,359	61	1.63
2008	3,784,182	48	1.27
2009	3,815,775	51	1.34
2010	3,837,300	43	1.12
2011	3,857,625	33	0.86
2012	3,883,735	30	0.77
2013	3,930,065	38	0.97

Table 3. Incidence of acute hepatitis C, Oregon, 1993–2013

Source: Orpheus hepatitis C surveillance and American Community Survey, June 2014

Year	Oregon population	Cases	Incidence rate per 100,000
1993	3,059,110	0	0.00
1994	3,119,940	1	0.03
1995	3,182,690	6	0.19
1996	3,245,100	25	0.77
1997	3,302,140	11	0.33
1998	3,350,080	7	0.21
1999	3,393,410	24	0.71
2000	3,431,085	22	0.64
2001	3,470,385	15	0.43
2002	3,502,588	12	0.34
2003	3,538,591	17	0.48
2004	3,578,895	15	0.42
2005	3,626,938	18	0.50
2006	3,685,206	27	0.73
2007	3,739,359	24	0.64
2008	3,784,182	30	0.79
2009	3,815,775	23	0.60
2010	3,837,300	24	0.63
2011	3,857,625	23	0.60
2012	3,883,735	39	1.00
2013	3,930,065	15	0.38

Table 4. Incidence of chronic hepatitis B, Oregon, 1993–2013

Source: Orpheus hepatitis B surveillance and American Community Survey, June 2014

Year	Oregon population	Cases	Incidence rate per 100,000
1993	3,059,110	366	11.96
1994	3,119,940	537	17.21
1995	3,182,690	503	15.80
1996	3,245,100	452	13.93
1997	3,302,140	434	13.14
1998	3,350,080	415	12.39
1999	3,393,410	473	13.94
2000	3,431,085	475	13.84
2001	3,470,385	547	15.76
2002	3,502,588	503	14.36
2003	3,538,591	432	12.21
2004	3,578,895	502	14.03
2005	3,626,938	433	11.94
2006	3,685,206	410	11.13
2007	3,739,359	466	12.46
2008	3,784,182	494	13.05
2009	3,815,775	435	11.40
2010	3,837,300	444	11.57
2011	3,857,625	446	11.56
2012	3,883,735	431	11.10
2013	3,930,065	444	11.30

Table 5. Incidence of chronic hepatitis C, Oregon, 1993–2013*

Source: Orpheus hepatitis C surveillance and American Community Survey, June 2014

Year	Oregon population	Cases	Incidence rate per 100,000
1993	3,059,110	6	0.20
1994	3,119,940	5	0.16
1995	3,182,690	6	0.19
1996	3,245,100	8	0.25
1997	3,302,140	5	0.15
1998	3,350,080	9	0.27
1999	3,393,410	14	0.41
2000	3,431,085	28	0.82
2001	3,470,385	18	0.52
2002	3,502,588	37	1.06
2003	3,538,591	110	3.11
2004	3,578,895	164	4.58
2005	3,631,440	2,318	63.83
2006	3,690,505	6,155	166.78
2007	3,745,455	6,898	184.17
2008	3,791,075	6,424	169.45
2009	3,815,775	5,723	149.98
2010	3,837,300	5,567	145.08
2011	3,857,625	5,495	142.45
2012	3,883,735	4,649	119.70
2013	3,919,020	4,003	102.14

*First made reportable in 2005

Table 6. Incidence of acute hepatitis A by county, Oregon, 2009–2013

Source: Orpheus hepatitis A surveillance and American Community Survey, June 2014
Hepatitis A counts and rates per 100,000 residents

	2009		2010		2011		2012		2013		2009–2013	
County	Count	Rate	Count	Rate	Count	Rate	Count	Rate	Count	Rate	Count	Rate
Baker	0	0	0	0	0	0	0	0	2	12	2	2.46
Benton	1	1	0	0	0	0	0	0	1	1	2	0.46
Clackamas	0	0	3	1	1	0	2	1	2	1	8	0.42
Clatsop	0	0	0	0	0	0	0	0	0	0	0	0.00
Columbia	0	0	0	0	0	0	0	0	0	0	0	0.00
Coos	0	0	0	0	0	0	0	0	1	2	1	0.32
Crook	0	0	0	0	0	0	0	0	0	0	0	0.00
Curry	0	0	0	0	0	0	0	0	0	0	0	0.00
Deschutes	2	1	2	1	1	1	0	0	0	0	5	0.63
Douglas	0	0	1	1	0	0	0	0	0	0	1	0.19
Gilliam	0	0	0	0	0	0	0	0	0	0	0	0.00
Grant	0	0	0	0	0	0	0	0	0	0	0	0.00
Harney	0	0	0	0	0	0	0	0	0	0	0	0.00
Hood River	0	0	0	0	2	9	0	0	0	0	2	1.77
Jackson	2	1	1	0	0	0	1	0	2	1	6	0.59
Jefferson	0	0	0	0	0	0	0	0	0	0	0	0.00
Josephine	0	0	0	0	0	0	0	0	0	0	0	0.00
Klamath	1	2	0	0	1	2	1	1	0	0	3	0.90
Lake	0	0	0	0	0	0	0	0	0	0	0	0.00
Lane	3	1	3	1	0	0	0	0	4	1	10	0.57
Lincoln	0	0	0	0	0	0	0	0	1	2	1	0.43
Linn	0	0	0	0	0	0	0	0	0	0	0	0.00
Malheur	0	0	0	0	1	3	0	0	0	0	1	0.64
Marion	1	0	1	0	0	0	1	0	2	1	5	0.31
Morrow	0	0	0	0	0	0	1	9	0	0	1	1.77
Multnomah	4	1	2	0	4	1	0	0	4	1	14	0.38
Polk	0	0	1	1	0	0	0	0	0	0	1	0.26
Sherman	0	0	0	0	0	0	0	0	0	0	0	0.00
Tillamook	0	0	0	0	0	0	0	0	0	0	0	0.00
Umatilla	0	0	0	0	0	0	1	1	0	0	1	0.26
Union	0	0	0	0	0	0	0	0	3	11	3	2.28
Wallowa	0	0	0	0	0	0	0	0	0	0	0	0.00
Wasco	0	0	0	0	0	0	0	0	0	0	0	0.00
Washington	5	1	3	1	2	0	2	0	8	1	20	0.74
Wheeler	0	0	0	0	0	0	0	0	0	0	0	0.00
Yamhill	0	0	0	0	0	0	0	0	0	0	0	0.00

Table 7. Incidence of acute hepatitis B by county, Oregon, 2009–2013

Source: Orpheus hepatitis B surveillance and American Community Survey, June 2014
Acute hepatitis B counts and rates per 100,000 residents

	2009		2010		2011		2012		2013		2009–2013	
County	Count	Rate	Count	Rate	Count	Rate	Count	Rate	Count	Rate	Count	Rate
Baker	0	0	0	0	0	0	0	0	0	0	0	0.00
Benton	1	1	0	0	0	0	0	0	1	1	2	0.46
Clackamas	4	1	6	2	5	1	1	0	1	0	17	0.90
Clatsop	1	3	0	0	1	3	0	0	1	3	3	1.61
Columbia	0	0	0	0	0	0	1	2	4	8	5	2.01
Coos	0	0	1	2	0	0	1	2	0	0	2	0.64
Crook	0	0	1	5	0	0	0	0	0	0	1	0.95
Curry	0	0	0	0	0	0	0	0		0	0	0.00
Deschutes	4	3	3	2	1	1	0	0	0	0	8	1.01
Douglas	2	2	1	1	0	0	2	2	0	0	5	0.93
Gilliam	0	0	0	0	0	0	0	0	0	0	0	0.00
Grant	0	0	0	0	0	0	0	0	0	0	0	0.00
Harney	0	0	0	0	0	0	0	0	0	0	0	0.00
Hood River	0	0	0	0	0	0	0	0	0	0	0	0.00
Jackson	3	1	1	0	1	0	0	0	3	1	8	0.78
Jefferson	0	0	0	0	0	0	0	0	0	0	0	0.00
Josephine	0	0	0	0	0	0	0	0	2	2	2	0.48
Klamath	1	2	0	0	0	0	0	0	0	0	1	0.30
Lake	0	0	0	0	0	0	0	0	0	0	0	0.00
Lane	4	1	4	1	3	1	5	1	1	0	17	0.96
Lincoln	0	0	0	0	0	0	1	2	0	0	1	0.43
Linn	0	0	3	3	1	1	2	2	0	0	6	1.02
Malheur	1	3	0	0	1	3	0	0	0	0	2	1.28
Marion	4	1	4	1	2	1	1	0	3	1	14	0.88
Morrow	0	0	0	0	0	0	0	0	0	0	0	0.00
Multnomah	14	2	8	1	9	1	5	1	13	2	49	1.32
Polk	0	0	2	3	1	1	0	0	0	0	3	0.79
Sherman	0	0	0	0	0	0	0	0	0	0	0	0.00
Tillamook	0	0	1	4	0	0	0	0	0	0	1	0.79
Umatilla	0	0	0	0	0	0	1	1	0	0	1	0.26
Union	0	0	0	0	1	4	1	4	0	0	2	1.53
Wallowa	0	0	0	0	0	0	0	0	0	0	0	0.00
Wasco	0	0	3	12	2	8	0	0	1	4	6	4.73
Washington	11	2	5	1	5	1	6	1	5	1	32	1.20
Wheeler	0	0	0	0	0	0	0	0	0	0	0	0.00
Yamhill	0	0	1	1	0	0	1	1	2	2	4	0.79

Table 8. Incidence of chronic hepatitis B by county, Oregon, 2009–2013

Source: Orpheus hepatitis B surveillance and American Community Survey, June 2014
Chronic hepatitis B counts and rates per 100,000 residents

	2009		2010		2011		2012		2013		2009–2013	
County	Count	Rate	Count	Rate	Count	Rate	Count	Rate	Count	Rate	Count	Rate
Baker	1	6	0	0	0	0	0	0	0	0	1	1.24
Benton	4	5	5	6	5	6	10	12	8	9	32	7.39
Clackamas	39	10	30	8	38	10	31	8	42	11	180	9.48
Clatsop	2	5	1	3	1	3	3	8	6	16	13	6.99
Columbia	2	4	4	8	2	4	0	0	5	10	13	5.24
Coos	2	3	2	3	4	6	2	3	4	6	14	4.45
Crook	1	5	0	0	0	0	0	0	1	5	2	1.91
Curry	2	9	0	0	1	4	1	4	0	0	4	3.57
Deschutes	6	4	5	3	9	6	6	4	5	3	32	3.89
Douglas	7	6	8	7	6	6	4	4	5	5	30	5.56
Gilliam	0	0	0	0	1	53	1	53	0	0	2	21.16
Grant	0	0	0	0	0	0	0	0	0	0	0	0.00
Harney	0	0	1	13	1	14	0	0	0	0	2	5.40
Hood River	1	4	0	0	0	0	1	4	3	13	5	4.35
Jackson	8	4	12	6	11	5	5	2	8	4	44	4.31
Jefferson	0	0	1	5	1	5	1	5	3	14	6	5.47
Josephine	3	4	3	4	2	2	4	5	4	5	16	3.87
Klamath	1	2	8	12	4	6	1	1	3	4	17	5.11
Lake	0	0	0	0	1	13	0	0	1	13	2	5.06
Lane	18	5	14	4	21	6	17	5	30	8	100	5.66
Lincoln	4	9	4	9	4	9	2	4	1	2	15	6.50
Linn	7	6	7	6	5	4	5	4	3	3	27	4.61
Malheur	3	10	1	3	2	6	4	13	2	6	12	7.65
Marion	23	7	30	9	27	8	27	8	28	9	135	8.48
Morrow	2	18	1	9	0	0	2	18	1	9	6	10.66
Multnomah	182	25	181	25	198	27	168	22	199	26	928	24.98
Polk	2	3	6	8	0	0	4	5	5	6	17	4.47
Sherman	0	0	0	0	0	0	0	0	0	0	0	0.00
Tillamook	0	0	1	4	1	4	2	8	2	8	6	4.74
Umatilla	4	5	4	5	4	5	3	4	4	5	19	4.96
Union	1	4	1	4	2	8	4	15	0	0	8	6.15
Wallowa	0	0	1	14	0	0	0	0	0	0	1	2.86
Wasco	2	8	2	8	0	0	2	8	3	12	9	7.07
Washington	83	16	86	16	68	13	88	16	87	16	412	15.33
Wheeler	0	0	0	0	0	0	0	0	0	0	0	0.00
Yamhill	4	4	2	2	7	7	3	3	4	4	20	4.00

Table 9. Incidence of acute hepatitis C by county, Oregon, 2009–2013

Source: Orpheus hepatitis C surveillance and American Community Survey, June 2014
Acute hepatitis C counts and rates per 100,000 residents

	2009		2010		2011		2012		2013		2009–2013	
County	Count	Rate	Count	Rate	Count	Rate	Count	Rate	Count	Rate	Count	Rate
Baker	0	0		0		0		0		0	0	0
Benton	0	0	0	0	0	0	2	2	0	0	2	0
Clackamas	3	1	2	1	1	0	3	1	5	1	14	1
Clatsop	1	3	0	0	0	0	0	0	0	0	0	1
Columbia	0	0	0	0	0	0	0	0	1	2	1	0
Coos	0	0	0	0	0	0	0	0	0	0	0	0
Crook	0	0	0	0	0	0	0	0	0	0	0	0
Curry	0	0	0	0	0	0	0	0	0	0	0	0
Deschutes	0	0	1	1	1	1	2	1	1	1	5	1
Douglas	2	2	5	5	2	2	4	4	0	0	13	2
Gilliam	0	0	0	0	0	0	0	0	0	0	0	0
Grant	0	0	0	0	0	0	0	0	0	0	0	0
Harney	0	0	1	13	0	0	1	14	0	0	2	5
Hood River	0	0	2	9	0	0	0	0	0	0	2	2
Jackson	2	1	0	0	0	0	0	0	1	0	3	0
Jefferson	1	5	0	0	0	0	0	0	0	0	1	1
Josephine	1	1	0	0	0	0	1	1	0	0	2	0
Klamath	4	6	0	0	2	3	1	1	0	0	7	2
Lake	0	0	0	0	0	0	0	0	0	0	0	0
Lane	5	1	4	1	5	1	5	1	3	1	22	1
Lincoln	0	0	0	0	0	0	0	0	1	2	1	0
Linn	0	0	0	0	1	1	0	0	0	0	1	0
Malheur	0	0	0	0	0	0	0	0	0	0	0	0
Marion	1	0	3	1	3	1	6	2	1	0	14	1
Morrow	0	0	0	0	0	0	0	0	0	0	0	0
Multnomah	1	0	3	0	5	1	12	2	0	0	21	1
Polk	1	1	0	0	1	1	0	0	0	0	2	1
Sherman	0	0	0	0	0	0	0	0	0	0	0	0
Tillamook	0	0	0	0	0	0	0	0	0	0	0	0
Umatilla	2	3	1	1	1	1	1	1	0	0	5	1
Union	0	0	0	0	0	0	0	0	0	0	0	0
Wallowa	0	0	0	0	0	0	0	0	0	0	0	0
Wasco	0	0	0	0	0	0	0	0	0	0	0	0
Washington	0	0	0	0	1	0	1	0	1	0	3	0
Wheeler	0	0	0	0	0	0	0	0	0	0	0	0
Yamhill	0	0	0	0	0	0	0	0	0	0	0	0

Table 10. Incidence of chronic hepatitis C by county, Oregon, 2009–2013

Source: Orpheus hepatitis C surveillance and American Community Survey, June 2014
Chronic hepatitis C counts and rates per 100,000 residents

	2009		2010		2011		2012		2013		2009–2013	
County	Count	Rate	Count	Rate	Count	Rate	Count	Rate	Count	Rate	Count	Rate
Baker	29	180	16	99	15	93	20	123	22	135	102	126
Benton	74	87	57	66	57	66	38	44	38	43	264	61
Clackamas	348	93	283	75	315	83	281	74	327	85	1,554	82
Clatsop	61	165	61	165	63	170	55	148	36	97	276	149
Columbia	51	104	76	154	65	131	64	129	33	66	289	117
Coos	157	249	143	227	133	211	132	210	52	83	617	196
Crook	16	76	23	109	20	96	30	145	13	63	102	98
Curry	62	276	53	237	37	166	38	170	25	112	215	192
Deschutes	164	104	159	101	215	135	195	122	168	103	901	113
Douglas	192	178	202	188	239	222	160	148	134	123	927	172
Gilliam	2	107	3	160	3	160	1	53	2	103	11	116
Grant	6	80	4	54	7	94	0	0	5	67	22	59
Harney	5	67	8	107	10	136	8	109	8	110	39	106
Hood River	11	49	9	40	8	35	15	66	6	26	49	43
Jackson	346	171	281	138	331	162	239	117	224	109	1,418	139
Jefferson	48	222	48	221	51	233	57	260	72	327	276	252
Josephine	187	226	176	213	172	208	105	127	101	122	741	179
Klamath	142	214	119	179	104	156	70	105	71	106	506	152
Lake	14	177	15	190	12	152	13	164	15	189	69	174
Lane	632	180	590	168	550	156	470	133	419	118	2,661	151
Lincoln	62	135	69	150	101	219	88	190	79	170	399	173
Linn	229	197	224	192	188	160	149	126	142	120	932	159
Malheur	115	368	80	255	82	261	63	201	33	105	373	238
Marion	504	161	540	171	500	157	412	129	329	102	2,285	144
Morrow	0	0	2	18	10	89	8	71	2	18	22	39
Multnomah	1,360	186	1,469	199	1,430	193	1,266	169	938	124	6,463	174
Polk	80	107	71	94	72	95	46	60	59	77	328	86
Sherman	1	56	1	57	0	0	3	170	1	56	6	68
Tillamook	30	119	34	135	47	186	27	107	20	79	158	125
Umatilla	196	259	169	222	97	127	106	137	90	116	658	172
Union	39	152	19	74	41	158	13	50	14	53	126	97
Wallowa	2	28	7	100	6	86	1	14	7	99	23	66
Wasco	25	99	26	103	27	107	30	118	21	81	129	102
Washington	438	83	438	82	379	71	324	60	388	70	1,967	73
Wheeler	4	277	0	0	0	0	2	140	1	70	7	98
Yamhill	91	92	91	92	108	108	122	121	107	106	519	104

Table 11. Cases of hepatitis A by age group and sex, Oregon, 2009–2013

Source: Orpheus hepatitis A surveillance

	Female		Male		Total	
Age	Count	Percent	Count	Percent	Count	Percent
0–19 years	3	7%	3	7%	6	7%
20s	6	15%	8	17%	14	16%
30s	6	15%	6	13%	12	14%
40s	4	10%	8	17%	12	14%
50s	10	24%	9	20%	19	22%
60s	6	15%	5	11%	11	13%
70s	4	10%	5	11%	9	10%
80+	2	5%	2	4%	4	5%
Total	41	47%	46	53%	87	100%

Note: 87/87 (100%) data available.

Table 12. Cases of acute hepatitis B by age group and sex, Oregon, 2009–2013

Source: Orpheus hepatitis B surveillance

	Female		Male		Total	
Age	Count	Percent	Count	Percent	Count	Percent
0–19 years	2	3%	1	1%	3	2%
20s	6	10%	14	11%	20	10%
30s	16	27%	20	15%	36	19%
40s	18	30%	39	30%	57	30%
50s	10	17%	34	26%	44	23%
60s	6	10%	17	13%	23	12%
70s	1	2%	6	5%	7	4%
80+	1	2%	1	1%	2	1%
Total	60	31%	132	69%	192	100%

Note: 192/192 (100%) data available.

Table 13. Cases of chronic hepatitis B by age group and sex, Oregon, 2009–2013

Source: Orpheus hepatitis B surveillance

	Unknowns excluded					
	Female		Male		Total	
Age	Count	Percent	Count	Percent	Count	Percent
0–19 years	59	6%	33	3%	92	4%
20s	206	22%	151	13%	357	17%
30s	241	26%	261	22%	502	24%
40s	157	17%	307	25%	464	22%
50s	130	14%	269	22%	399	19%
60s	84	9%	132	11%	216	10%
70s	29	3%	42	3%	71	3%
80+	12	1%	12	1%	24	1%
Total	918	43%	1,207	57%	2,125	100%

Note: 2,125/2,130 (99.8%) data available.

Table 14. Cases of acute hepatitis C by age group and sex, Oregon, 2009–2013

Source: Orpheus hepatitis C surveillance

	Female		Male		Total	
Age	**Count**	**Percent**	**Count**	**Percent**	**Count**	**Percent**
0–19 years	6	11%	8	12%	14	11%
20s	20	37%	21	31%	41	34%
30s	10	19%	18	26%	28	23%
40s	12	22%	11	16%	23	19%
50s	5	9%	9	13%	14	11%
60s	1	2%	0	0%	1	1%
70s	0	0%	1	1%	1	1%
Total	54	44%	68	56%	122	100%

Note: 122/122 (100%) data available.

Table 15. Cases of chronic hepatitis C by age group and sex, Oregon, 2009–2013

Source: Orpheus hepatitis C surveillance

	Unknowns excluded					
	Female		Male		Total	
Age	**Count**	**Percent**	**Count**	**Percent**	**Count**	**Percent**
0–19 years	166	2%	117	1%	283	1%
20s	1,012	10%	976	6%	1,990	8%
30s	1,342	14%	1,738	11%	3,100	12%
40s	2,473	25%	3,825	25%	6,323	25%
50s	3,365	35%	6,107	39%	9,513	37%
60s	1,124	12%	2,437	16%	3,572	14%
70s	188	2%	278	2%	468	2%
80+	64	1%	66	0%	131	1%
Total	9,734	38%	15,544	61%	25,380	100%

Note: 25,380/25,437 (99.8%) data available.

Table 16. Incidence of acute hepatitis A by sex and age, Oregon, 2009–2013

Source: Orpheus hepatitis A surveillance and the American Community Survey, June 2014

Average incidence rates per 100,000 Oregon residents, 2009–2013			
Age	**Female**	**Male**	**Total**
0–19	0.13	0.12	0.12
20s	0.46	0.60	0.53
30s	0.47	0.46	0.47
40s	0.31	0.62	0.47
50s	0.71	0.68	0.69
60s	0.52	0.49	0.51
70s	0.67	0.99	0.82
80+	0.41	0.69	0.52
Total	**0.42**	**0.48**	**0.45**

Table 17. Incidence of acute hepatitis B by sex and age, Oregon, 2009–2013

Source: Orpheus hepatitis B surveillance and the American Community Survey, June 2014

Average incidence rates per 100,000 Oregon residents, 2009–2013			
Age	**Female**	**Male**	**Total**
0-19	0.09	0.04	0.06
20s	0.36	0.94	0.76
30s	1.26	1.52	1.41
40s	1.41	3.03	2.22
50s	0.75	2.60	1.61
60s	0.53	1.51	1.09
70s	0.09	1.05	0.62
80+	0.22	0.19	0.26
Total	**0.62**	**1.38**	**0.99**

Table 18. Incidence of chronic hepatitis B by sex and age, Oregon, 2009–2013

Source: Orpheus hepatitis B surveillance and the American Community Survey, June 2014

Average incidence rates per 100,000 Oregon residents, 2009–2013			
Age	**Female**	**Male**	**Total**
0-19	2.52	1.32	1.90
20s	15.75	11.38	13.55
30s	19.09	19.99	19.54
40s	12.26	23.81	18.16
50s	9.24	20.19	14.56
60s	7.58	12.78	10.17
70s	4.81	8.21	6.38
80+	2.51	4.07	3.10
Total	**9.40**	**12.58**	**11.00**

Table 19. Incidence of acute hepatitis C by sex and age, Oregon, 2009–2013

Source: Orpheus hepatitis C surveillance and the American Community Survey, June 2014

Average incidence rates per 100,000 Oregon residents, 2009–2013			
Age	**Female**	**Male**	**Total**
0-19	0.25	0.32	0.29
20s	1.53	1.59	1.56
30s	0.79	1.37	1.09
40s	0.94	0.85	0.90
50s	0.36	0.67	0.51
60s	0.09	0.00	0.04
70s	0.00	0.18	0.09
80+	0.00	0.00	0.00
Total	**0.55**	**0.71**	**0.63**

Table 20. Incidence of chronic hepatitis C by sex and age, Oregon, 2009–2013

Source: Orpheus hepatitis C surveillance and the American Community Survey, June 2014

Average incidence rates per 100,000 Oregon residents, 2009–2013			
Age	**Female**	**Male**	**Total**
0-19	7.08	4.69	5.84
20s	77.36	73.54	75.50
30s	106.29	133.37	120.81
40s	192.72	296.49	245.72
50s	239.04	458.97	347.39
60s	102.64	234.62	167.46
70s	31.96	54.49	42.58
80+	13.39	22.53	17.02
Total	**99.89**	**162.62**	**131.5234012**

Table 21. Hepatitis A cases by sex and race/ethnicity, Oregon, 2009–2013

Source: Orpheus hepatitis A surveillance
Unknowns excluded

	Hepatitis A cases by race, 2009–2013					
	Female		Male		Total	
Race	Count	Percent	Count	Percent	Count	Percent
AI/AN	0	0%	1	2%	1	1%
Asian/PI	1	3%	3	7%	4	5%
Black	1	3%	1	2%	2	2%
Other	0	0%	2	4%	2	2%
White	38	95%	37	82%	75	88%
Multiple	0	0%	1	2%	1	1%
Total	40	47%	45	53%	85	100%

*85/87 (98%) data available

	Hepatitis A cases by ethnicity, 2009–2013					
	Female		Male		Total	
Hispanic	Count	Percent	Count	Percent	Count	Percent
No	35	97%	35	83%	70	90%
Yes	1	2%	7	17%	8	10%
Total	36	46%	42	54%	78	100%

Note: 78/87 (90%) data available

Table 22. Acute hepatitis B cases by sex and race/ethnicity, Oregon, 2009–2013

Source: Orpheus hepatitis B surveillance

	Acute hepatitis B cases by race and sex, 2009–2013					
	Female		Male		Total	
Race	Count	Percent	Count	Percent	Count	Percent
AI/AN	0	0%	1	1%	1	1%
Asian	1	2%	4	3%	5	3%
Black	2	4%	1	1%	3	2%
Multiple	2	4%	3	2%	5	3%
Other	0	0%	2	2%	2	1%
PI	1	2%	0	0%	1	1%
White	49	89%	114	91%	163	91%
Total	55	31%	125	69%	180	100%

*180/192 (94%) data available

	Acute hepatitis B cases by ethnicity and sex, 2009–2013					
	Female		Male		Total	
Hispanic	Count	Percent	Count	Percent	Count	Percent
No	52	93%	111	90%	163	91%
Yes	4	7%	13	10%	17	9%
Total	56	31%	124	69%	180	100%

Note: 180/192 (94%) data available

Table 23. Chronic hepatitis B cases by sex and race/ethnicity, Oregon, 2009–2013

Source: Orpheus hepatitis B surveillance

	Chronic hepatitis B cases by race and sex, 2009–2013					
	Female		Male		Total	
Race	Count	Percent	Count	Percent	Count	Percent
AI/AN	11	1%	17	2%	28	2%
Asian	504	62%	456	46%	960	53%
Black	57	7%	82	8%	139	8%
Multiple	17	2%	20	2%	37	2%
Other	4	0%	13	1%	17	1%
PI	66	8%	37	4%	103	6%
White	155	19%	376	38%	531	29%
Total	814	45%	1001	55%	1,815	100%

*1,815/2,130 (85%) data available

	Chronic hepatitis B cases by ethnicity and sex, 2009–2013					
	Female		Male		Total	
Hispanic	Count	Percent	Count	Percent	Count	Percent
No	761	83%	948	79%	1709	97%
Yes	17	2%	44	4%	61	3%
Total	778	44%	992	56%	1,770	100%

Note: 1,770/2,130 (83%) data available

Table 24. Acute hepatitis C cases by sex and race/ethnicity, Oregon, 2009–2013

Source: Orpheus hepatitis C surveillance

	Acute hepatitis C cases by race and sex, 2009–2013					
	Female		Male		Total	
Race	Count	Percent	Count	Percent	Count	Percent
AI/AN	1	2%	4	7%	5	5%
Black	1	2%	1	2%	2	2%
Multiple	1	2%	0	0%	1	1%
Other	0	0%	1	2%	1	1%
White	46	94%	48	89%	94	91%
Total	49	48%	54	52%	103	100%

*103/122 (84%) data available

	Acute hepatitis C cases by ethnicity and sex, 2009–2013					
	Female		Male		Total	
Hispanic	Count	Percent	Count	Percent	Count	Percent
No	47	100%	51	91%	98	95%
Yes	0	0%	5	9%	5	5%
Total	47	46%	56	54%	103	100%

Note: 103/122 (84%) data available

Table 25. Chronic hepatitis C cases by sex and race/ethnicity, Oregon, 2009–2013

Source: Orpheus hepatitis C surveillance

	Chronic hepatitis C cases by race and sex, 2009–2013					
	Female		Male		Total	
Race	Count	Percent	Count	Percent	Count	Percent
AI/AN	131	3%	182	3%	313	3%
Asian	61	1%	105	2%	166	2%
Black	152	4%	282	4%	434	4%
Multiple	29	1%	49	1%	78	1%
Other	50	1%	86	1%	136	1%
PI	6	0%	18	0%	24	0%
White	3,885	90%	5,584	89%	9,469	89%
Total	4,314	41%	6,306	59%	10,620	100%

*10,620/25,437 (42%) data available

	Chronic hepatitis C cases by ethnicity and sex, 2009–2013					
	Female		Male		Total	
Hispanic	Count	Percent	Count	Percent	Count	Percent
No	3,951	97%	5,734	94%	9,685	95%
Yes	142	3%	337	6%	479	5%
Total	4,093	40%	6,071	60%	10,164	100%

Note: 10,164/25,437 (40%) data available

Table 26. Incidence of acute hepatitis A by sex and race/ethnicity, Oregon, 2009–2013

Source: Orpheus hepatitis A surveillance and the American Community Survey, June 2014

Average incidence rate per 100,000 Oregon residents, 2009–2013			
Race	Female	Male	Total
AI/AN	0.00	0.83	0.42
Asian	0.27	0.89	0.55
Black	0.61	0.53	0.57
Multiple	0.00	0.30	0.15
Other	0.00	0.47	0.26
PI	0.00	0.00	0.00
White	0.45	0.45	0.48

Note: 85/87(98%) data available

Ethnicity	Female	Male	Total
Hispanic	0.10	0.59	0.36
Non-Hispanic	0.40	0.42	0.41
Black	0.61	0.53	0.57

Note: 78/87 (90%) data available

Table 27. Incidence of acute hepatitis B by sex and race/ethnicity, Oregon, 2009–2013

Source: Orpheus hepatitis B surveillance and the American Community Survey, June 2014

Average incidence rate per 100,000 Oregon residents, 2009–2013			
Race	Female	Male	Total
AI/AN	0.00	0.83	0.42
Asian	0.27	1.17	0.68
Black	1.23	0.54	0.86
Multiple	0.56	0.79	0.68
Other	0.00	0.49	0.26
PI	2.25	0.00	1.21
White	0.59	1.40	0.85

Note: 180/192 (94%) data available

Ethnicity	Female	Male	Total
Hispanic	0.38	1.08	0.75
Non-Hispanic	0.60	1.33	0.96
Black	0.61	0.53	0.57

Note: 180/192 (94%) data available

Table 28. Incidence of acute hepatitis C by sex and race/ethnicity, Oregon, 2009–2013

Source: Orpheus hepatitis C surveillance and the American Community Survey, June 2014

Average 2009–2013 incidence rate per 100,000			
Race	**Female**	**Male**	**Total**
AI/AN	0.86	3.18	2.07
Asian	0.00	0.00	0.00
Black	0.62	0.53	0.57
Multiple	0.30	0.00	0.15
Other	0.00	0.26	0.14
PI	0.00	0.00	0.00
White	0.55	0.59	0.57

Note: 103/122 (84%) data available

Ethnicity	**Female**	**Male**	**Total**
Hispanic	0.00	0.41	0.21
Non-Hispanic	0.54	0.61	0.57
Black	0.61	0.53	0.57

Note: 103/122 (84%) data available

Table 29. Incidence of chronic hepatitis C by sex and race/ethnicity, Oregon, 2009–2013

Source: Orpheus hepatitis C surveillance and the American Community Survey, June 2014

Average 2009–2013 incidence rate per 100,000			
Race	**Female**	**Male**	**Total**
AI/AN	112.82	143.56	127.72
Asian	15.10	31.31	22.62
Black	93.43	151.02	124.39
Multiple	8.22	13.71	11.13
Other	14.21	20.84	17.80
PI	15.13	47.70	31.36
White	46.55	68.70	57.53

Note: 10,620/25,437 (42%) data available

Ethnicity	**Female**	**Male**	**Total**
Hispanic	13.11	27.73	20.84
Non-Hispanic	45.50	68.47	56.93
Black	0.61	0.53	0.57

Note: 10,164/25,437 (40%) data available

Table 30. Incidence of chronic hepatitis B by sex and race/ethnicity, Oregon, 2009–2013

Source: Orpheus hepatitis B surveillance and the American Community Survey, June 2014

Average incidence rate per 100,000 Oregon residents, 2009–2013

Race	**Female**	**Male**	**Total**
AI/AN	9.45	13.11	11.40
Asian	126.38	136.82	131.41
Black	35.19	44.11	39.89
Multiple	4.86	5.53	5.20
Other	1.18	3.26	2.33
PI	173.30	103.55	139.78
White	1.86	4.62	3.23

Note: 1,815/2,130 (85%) data available

Ethnicity	**Female**	**Male**	**Total**
Hispanic	1.56	3.65	2.66
Non-Hispanic	8.76	11.31	10.03

Note: Ethnicity known for 1,770/2,130 (83%)

Table 31. Acute hepatitis A by age and race/ethnicity, Oregon, 2009–2013

Source: Orpheus hepatitis A surveillance

	0–19 years		20s		30s		40s		50s		60s		70s		80+		Total	
Race	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**
AI/AN	0	0%	0	0%	0	0%	1	100%	0	0%	0	0%	0	0%	0	0%	1	1%
Asian/PI	0	0%	2	50%	1	25%	0	0%	0	0%	1	25%	0	0%	0	0%	4	5%
Black	1	50%	0	0%	1	50%	0	0%	0	0%	0	0%	0	0%	0	0%	2	2%
Multiple	0	0%	0	0%	1	100%	0	0%	0	0%	0	0%	0	0%	0	0%	1	1%
Other	0	0%	2	100%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	2	2%
White	5	7%	10	13%	9	12%	10	13%	19	25%	10	13%	8	11%	4	5%	75	88%
Total	6	7%	14	16%	12	14%	11	13%	19	22%	11	13%	8	9%	4	5%	85	100%

Note: 85/87 (98%)data available

	0–19 years		20s		30s		40s		50s		60s		70s		80+		Total	
Hispanic	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**
No	4	6%	11	16%	8	11%	9	13%	16	23%	10	14%	8	11%	4	6%	70	90%
Yes	2	25%	3	38%	2	25%	0	0%	1	13%	0	0%	0	0%	0	0%	8	10%
Total	6	8%	14	18%	10	13%	9	12%	17	22%	10	13%	8	10%	4	5%	78	100%

Note: 78/87 (90%) data available

Table 32. Acute hepatitis B by age and race/ethnicity, Oregon 2009–2013

Source: Orpheus hepatitis B surveillance

	0–19 years		20s		30s		40s		50s		60s		70s		80+		Total	
Race	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**
AI/AN	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	1	100%	0	0%	1	1%
Asian	0	0%	2	40%	0	0%	2	40%	0	0%	1	20%	0	0%	0	0%	5	3%
Black	1	33%	0	0%	0	0%	1	33%	1	33%	0	0%	0	0%	0	0%	3	2%
Multiple	1	20%	0	0%	1	20%	1	20%	2	40%	0	0%	0	0%	0	0%	5	3%
Other	0	0%	0	0%	0	0%	1	50%	0	0%	0	0%	1	50%	0	0%	2	1%
PI	0	0%	0	0%	0	0%	1	100%	0	0%	0	0%	0	0%	0	0%	1	1%
White	1	1%	18	11%	31	19%	48	29%	38	23%	21	13%	5	3%	1	1%	163	91%
Total	3	2%	20	11%	32	18%	54	30%	41	23%	22	12%	7	4%	1	1%	180	

Note: 180/192 (94%) data available

	0–19 years		20s		30s		40s		50s		60s		70s		80+		Total	
Hispanic	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**
No	3	2%	18	11%	27	17%	49	30%	38	23%	22	13%	5	3%	1	1%	163	91%
Yes	0	0%	2	12%	5	29%	5	29%	3	18%	0	0%	1	6%	1	6%	17	9%
Total	3	2%	20	11%	32	18%	54	30%	41	23%	22	12%	6	3%	2	1%	180	

Note: 180/192 (94%) data available

Table 33. Chronic hepatitis B by age and race/ethnicity, Oregon 2009–2013

Source: Orpheus hepatitis B surveillance

	0–19 years		20s		30s		40s		50s		60s		70s		80+		Total	
Race	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**
AI/AN	1	4%	9	32%	5	18%	7	25%	2	7%	2	7%	1	4%	1	4%	28	2%
Asian	49	5%	165	17%	267	28%	206	21%	151	16%	88	9%	30	3%	6	1%	962	53%
Black	12	9%	42	30%	35	25%	24	17%	14	10%	9	6%	3	2%	0	0%	139	8%
Multiple	1	3%	3	8%	12	32%	13	35%	5	14%	2	5%	0	0%	1	3%	37	2%
Other	0	0%	6	35%	5	29%	1	6%	3	18%	1	6%	1	6%	0	0%	17	1%
PI	6	6%	31	30%	30	29%	18	17%	15	15%	1	1%	2	2%	0	0%	103	6%
White	15	3%	60	11%	82	15%	119	22%	139	26%	81	15%	25	5%	10	2%	531	29%
Total	84	5%	316	17%	436	24%	388	21%	329	18%	184	10%	62	3%	18	1%	1,817	100%

Note: 1,817/2,130 (85%) data available

	0–19 years		20s		30s		40s		50s		60s		70s		80+		Total	
Hispanic	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**
No	77	4%	296	17%	405	24%	370	22%	311	18%	172	10%	62	4%	19	1%	1,712	97%
Yes	3	5%	9	15%	14	23%	19	31%	11	18%	4	7%	1	2%	0	0%	61	3%
Total	80	5%	305	17%	419	24%	389	22%	322	18%	176	10%	63	4%	19	1%	1,773	100%

Note: 1,773/2,130 (83%) data available

Table 34. Acute hepatitis C by age and race/ethnicity, Oregon, 2009–2013

Source: Orpheus hepatitis C surveillance

	0–19 years		20s		30s		40s		50s		60s		70s		Total	
Race	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**
AI/AN	0	0%	1	20%	3	60%	0	0%	1	20%	0	0%	0	0%	5	4%
Black	0	0%	2	100%	0	0%	0	0%	0	0%	0	0%	0	0%	2	2%
Multiple	0	0%	1	100%	0	0%	0	0%	0	0%	0	0%	0	0%	1	1%
Other	0	0%	0	0%	1	100%	0	0%	0	0%	0	0%	0	0%	1	1%
White	11	12%	32	34%	21	22%	17	18%	12	13%	0	0%	1	1%	94	77%
Total	11	11%	36	35%	25	24%	17	17%	13	13%	0	0%	1	1%	103	

Note: 103/122 (84%) data available

	0–19 years		20s		30s		40s		50s		60s		70s		Total	
Hispanic	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**
No	10	10%	33	34%	25	26%	16	16%	13	13%	0	0%	1	1%	98	95%
Yes	2	40%	2	40%	1	20%	0	0%	0	0%	0	0%	0	0%	5	5%
Total	12	12%	35	34%	26	25%	16	16%	13	13%	0	0%	1	1%	103	

Note: 103/122 (84%) data available

Table 35. Chronic hepatitis C by age and race/ethnicity, Oregon 2009–2013

Source: Orpheus hepatitis C surveillance

	0–19 years		20s		30s		40s		50s		60s		70s		80+		Total	
Race	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**
AI/AN	5	2%	27	9%	49	16%	105	34%	99	32%	27	9%	1	0%	0	0%	313	3%
Asian	7	4%	9	5%	15	9%	37	22%	51	31%	29	17%	11	7%	7	4%	167	2%
Black	7	2%	17	4%	22	5%	90	21%	201	46%	83	19%	10	2%	4	1%	434	4%
Multiple	3	4%	7	9%	9	11%	24	30%	28	35%	8	10%	0	0%	0	0%	79	1%
Other	1	1%	9	7%	17	13%	35	26%	48	35%	23	17%	1	1%	2	1%	136	1%
PI	0	0%	7	29%	4	17%	2	8%	6	25%	4	17%	0	0%	1	4%	24	0%
White	133	1%	971	10%	1,281	14%	2,295	24%	3,376	36%	1,218	13%	153	2%	42	0%	9,477	89%
Total	156	1%	1,047	10%	1,397	13%	2,588	24%	3,809	36%	1,392	13%	176	2%	56	1%	10,630	100%

Note: 10,630/25,437 (42%) data available

	0–19 years		20s		30s		40s		50s		60s		70s		80+		Total	
Hispanic	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**
No	137	1%	988	10%	1,282	13%	2,343	24%	3,465	36%	1,268	13%	166	2%	56	1%	9,711	95%
Yes	14	3%	42	9%	86	18%	159	33%	126	26%	44	9%	6	1%	2	0%	480	5%
Total	151	1%	1,030	10%	1,368	13%	2,502	25%	3,591	35%	1,312	13%	172	2%	58	1%	10,191	100%

Note: 10,191/25,437 (40%) data available

Table 36. Hepatitis A risk factors, 2009–2013

Source: Orpheus hepatitis A surveillance
Unknown responses excluded from denominator

Hepatitis A risk factor, 2009–2013	Yes		No		Unknown	
Risks (non-mutually exclusive)	**Count**	**Percent of known cases for risk**	**Count**	**Percent of known cases for risk**	**Count**	**Percent of total investigated cases**
Travel	36	44%	46	56%	0	0%
HH travel	15	19%	63	81%	4	5%
Contact of a case	7	10%	66	90%	9	11%
Outbreak	7	25%	21	75%	54	66%
Street drugs	6	8%	74	93%	2	2%
Child care	3	4%	77	96%	2	2%
HH member works at daycare	2	3%	77	97%	3	4%
Injection drug use	1	1%	79	99%	2	2%
Total interviewed cases	**82**	Note: 82/87 (94.3%) interviewed				
Total cases	**87**					

Table 37. Acute hepatitis B risk factors, Oregon 2009–2013

Source: Orpheus hepatitis B surveillance
Unknown responses excluded from denominator

Acute hepatitis B risk factors, Oregon, 2009–2013	Yes		No		Unknown	
Risks (non-mutually exclusive)	**Count**	**Percent of known cases for risk**	**Count**	**Percent of known cases for risk**	**Count**	**Percent of total investigated cases**
Other risk*	60	65%	32	35%	66	42%
Multiple sex partners	49	31%	107	69%	2	1%
Dental care	39	26%	109	74%	10	6%
MSM	26	16%	132	84%	0	0%
Healthcare-associated**	18	12%	132	88%	8	5%
Injection drug use	18	12%	133	88%	7	4%
Contact of case	13	14%	78	86%	67	42%
Occupational risk	4	3%	151	97%	3	2%
Total interviewed cases	**158**	* Street drugs, needlestick, tattoo, piercing, other blood exposure				
Total cases	**192**	** Transfusion, infusions, dialysis, surgery Note: 158/192(82.3%) interviewed				

Table 38. Chronic hepatitis B risk factors, 2009–2013

Source: Orpheus hepatitis B surveillance
Unknown responses excluded from denominator

Chronic hepatitis B risk factors, 2009–2013	Yes		No		Unknown	
Risks (non-mutually exclusive)	**Count**	**Percent of known cases for risk**	**Count**	**Percent of known cases for risk**	**Count**	**Percent of total investigated cases**
Foreign born	770	75%	258	25%	224	18%
Contact of a case	271	35%	503	65%	278	22%
Multiple sex partners	135	43%	179	57%	938	75%
Ever STD	103	11%	822	89%	327	26%
Occupational exposure	73	16%	394	84%	785	63%
Injection drug use	71	7%	1,006	93%	175	14%
MSM	50	9%	493	91%	709	57%
Dialysis	9	1%	1,107	99%	136	11%
Total Interviewed cases	**1,252**	Note: 1,252/2,130 (58.8%) data available				
Total cases	**2,130**					

Table 39. Chronic hepatitis B race by birthplace, Oregon, 2009–2013

Source: Orpheus hepatitis B surveillance

	AI/AN		Asian		Black		Multiple		Other		PI		White		Unknown		Total	
	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%
Foreign born	0	0%	529	94%	71	78%	4	25%	5	71%	67	93%	67	29%	27	75%	770	75%
United States	9	100%	36	6%	20	22%	12	75%	2	29%	5	7%	165	71%	9	25%	258	25%
Total	9	1%	565	55%	91	9%	16	2%	7	1%	72	7%	232	23%	36	4%	1,028	

Note: 1028/1252 (82.1%) foreign born data available

Table 40. Birth countries of chronic hepatitis B cases, Oregon 2009–2013

United States	258	25%
Vietnam	192	19%
China	173	17%
Philippines	48	5%
South Korea	29	3%
Taiwan	27	3%
Other countries	297	29%
Total interviewed	**1,024**	**100%**
Total cases	**2,130**	

Note: 1,024/2,130 (48.1%) country of birth data available

Table 41. Acute hepatitis C risk factors, Oregon, 2009–2013

Source: Orpheus hepatitis C surveillance/unknown responses excluded from denominator

Acute hepatitis C risk factors,Oregon, 2009–2013	Yes		No		Unknown	
Risks (non-mutually exclusive)	**Count**	**Percent of known cases for risk**	**Count**	**Percent of known cases for risk**	**Count**	**Percent of total investigated cases**
Injection drug use	52	64%	29	36%	1	1%
Street drug	39	60%	26	40%	17	21%
Other blood exposure	27	43%	36	57%	19	23%
Multiple sex partners	25	44%	32	56%	25	30%
Other risk*	24	39%	39	63%	19	23%
Incarcerated	19	26%	53	74%	10	12%
Healthcare-associated**	5	8%	61	92%	16	20%
Total interviewed cases	**82**					
Total cases	**122**					

* Needlestick, tattoo, piercing, other blood exposure
** Transfusion, infusions, dialysis, surgery
Note: 82/122 (67.2%) interviewed

Table 42. Chronic hepatitis C risk factors, Lane, Marion and Multnomah counties, Oregon, 2011–2012

Source: Orpheus hepatitis C surveillance/unknown responses excluded from denominator

Chronic hepatitis C risk factors, Lane, Marion, Multnomah counties, Oregon, 2011–2012	Yes		No		Unknown	
Risks (non-mutually exclusive)	**Count**	**Percent of known cases for risk**	**Count**	**Percent of known cases for risk**	**Count**	**Percent of total investigated cases**
Injection drug use	1,376	77%	402	23%	849	32%
Contact with case of HCV	577	74%	202	26%	1,848	70%
Ever incarcerated	553	59%	384	41%	1,690	64%
Ever have STD	257	35%	468	65%	1,902	72%
Transfusion	128	13%	895	87%	1,604	61%
Occupational exposure	85	7%	1,075	93%	1,467	56%
MSM	78	14%	483	86%	2,066	79%
Total investigated cases	**2,627**					
Total cases	**4,633**					

Note: 2,627/4,633 (56.7%) interviewed

Table 43. Race of persons with chronic HCV who reported injection drug use, Lane, Marion and Multnomah counties, Oregon, 2011–2012

	Race															
	AI/AN		**Asian**		**Black**		**Multiple**		**Other**		**PI**		**White**		**Total**	
IDU	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%
Yes	37	80%	4	12%	67	76%	15	83%	5	83%	3	43%	1,027	78%	1,158	76%
No	9	20%	29	88%	21	24%	3	17%	1	17%	4	57%	294	22%	361	24%
Total	46	3%	33	2%	88	6%	18	1%	6	0%	7	0%	1,321	87%	1,519	

Notes: 1,778/2,627 (67.6%) IDU data available; 2,130/2,627 (81.1%) race data available

Table 44. Age and sex of persons with chronic HCV who reported injection drug use, Lane, Marion and Multnomah counties, Oregon, 2011–2012

	Sex					
	Female		Male		Total	
Age	Count	Percent	Count	Percent	Count	Percent
0–19	10	2%	10	1%	20	1%
20s	86	17%	117	13%	203	15%
30s	79	16%	120	14%	199	14%
40s	127	26%	219	25%	346	25%
50s	157	32%	300	34%	457	33%
60s	32	6%	107	12%	139	10%
70s	2	0%	9	1%	11	1%
Unknown	0	0%	1	0%	1	0%
Total	493	36%	883	64%	1,376	100%

Notes: 1,375/1,376 (99.9%) age data available; 1,376/1,376 (100%) sex data available

Table 45. Hospital discharges related to HCV by category of liver disease and year of discharge, Oregon, 2008–2012

	Cirrhosis*		Decompensated cirrhosis**		Other chronic liver disease***		Liver transplants#		Liver cancer##		Total
Year	Count	Percent	Count	Percent	Count	Percent	Count	Percent	Count	Percent	
2008	592	77%	590	77%	166	22%	22	3%	93	12%	764
2009	565	75%	555	73%	173	23%	26	3%	123	16%	756
2010	559	74%	575	76%	173	23%	19	3%	106	14%	758
2011	624	74%	645	77%	169	20%	15	2%	144	17%	838
2012	579	72%	604	75%	168	21%	21	3%	131	16%	801
2008–2012	**2,919**	**75%**	**2,969**	**76%**	**849**	**22%**	**103**	**3%**	**597**	**15%**	**3,917**

* Defined by the following ICD9 codes: 571.2, alcoholic cirrhosis of liver; 571.5, cirrhosis of liver without alcohol; 571.6, biliary cirrhosis

** Defined by the following ICD9 codes: 348.3x, encephalopathy not classified elsewhere; 456.0x, 456.1x, esophageal varices with/without bleeding; 456.20, 456.21, esophageal varices in diseases classified elsewhere with/without bleeding; 572.2, hepatic encephalopathy; 572.3, portal hypertension; 572.4, hepatorenal syndrome; 789.5x, ascites elsewhere with/without bleeding

*** Defined by the following ICD9 codes: 571.0 alcoholic fatty liver; 571.1 acute alcoholic hepatitis; 571.3 alcoholic liver damage unspecified; 571.40 chronic hepatitis unspecified; 571.41 chronic persistent hepatitis; 571.42 autoimmune hepatitis; 571.49 other chronic hepatitis; 571.8 other chronic nonalcoholic liver disease; 571.9 unspecified chronic liver disease without alcohol; 572.0 abscess of liver; 572.1 portal pyemia; 572.8 other sequelae of chronic liver disease; chronic passive congestion of liver; 573.1 hepatitis in viral diseases classified elsewhere; 573.2 hepatitis in other infectious diseases classified elsewhere; 573.3 hepatitis unspecified; 573.4 hepatic infarction; 573.8 other specified disorders of liver; 573.9 unspecified disorder of liver

\# Defined by the following ICD9 codes: 996.8, V42.7

Defined by the following ICD9 codes: 155.x, 197.7, and V10.07

Table 46. Hospital discharges related to HCV by categories of liver disease, Oregon, 2008–2012

		Morbidity by disease group											
		Cirrhosis		Decompensated cirrhosis		Other chronic liver disease		Liver transplants		Liver cancer		Total	
		Count	Percent	Count	Percent	Count	Percent	Count	Percent	Count	Percent	Count	Percent
Sex	Female	944	32%	978	33%	303	36%	34	33%	121	20%	1,294	33%
	Male	1,975	68%	1,991	67%	546	64%	69	67%	476	80%	2,623	67%
	Unknown	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
Age group	0–12	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
	13–19	10	0%	11	0%	3	0%	0	0%	0	0%	11	0%
	20–24	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
	25–29	0	0%	1	0%	4	0%	2	2%	0	0%	6	0%
	30–34	12	0%	14	0%	13	2%	0	0%	1	0%	24	1%
	35–39	53	2%	54	2%	27	3%	0	0%	5	1%	76	2%
	40–44	157	5%	166	6%	54	6%	4	4%	11	2%	212	5%
	45–49	380	13%	406	14%	146	17%	15	15%	31	5%	519	13%
	50–54	760	26%	750	25%	210	25%	25	24%	104	17%	955	24%
	55–59	851	29%	861	29%	214	25%	28	27%	204	34%	1,136	29%
	60–64	482	17%	478	16%	128	15%	19	18%	152	25%	655	17%
	65+	214	7%	228	8%	50	6%	10	10%	89	15%	323	8%
Race	AI/AN	167	6%	166	6%	57	7%	1	1%	18	3%	218	6%
	Asian	31	1%	31	1%	9	1%	9	9%	15	3%	49	1%
	Black	60	2%	62	2%	12	1%	3	3%	12	2%	82	2%
	Native Hawaiian/PI	5	0%	4	0%	3	0%	0	0%	3	1%	8	0%
	White	2,116	72%	2,142	72%	617	73%	80	78%	440	74%	2,849	73%
	Refused	19	1%	19	1%	7	1%	0	0%	6	1%	24	1%
	Unknown	276	9%	307	10%	83	10%	5	5%	46	8%	373	10%
	Other	245	8%	238	8%	61	7%	5	5%	57	10%	314	8%
Ethnicity	Hispanic	157	5%	147	5%	51	6%	5	5%	25	4%	201	5%
	Non-Hispanic	2,369	81%	2,404	81%	682	80%	90	87%	501	84%	3,194	82%
	Refused	20	1%	20	1%	8	1%	0	0%	6	1%	26	1%
	Unknown	373	13%	398	13%	108	13%	8	8%	65	11%	496	13%
Race/ethnicity	Hispanic	157	5%	147	5%	51	6%	5	5%	25	4%	201	5%
	AI/AN	157	5%	156	5%	52	6%	1	1%	18	3%	205	5%
	Asian/PI	36	1%	35	1%	12	1%	9	9%	18	3%	57	1%
	Black	60	2%	62	2%	12	1%	3	3%	12	2%	82	2%
	White	2,026	69%	2,061	69%	590	69%	75	73%	425	71%	2,733	70%
	Refused	19	1%	19	1%	7	1%	0	0%	6	1%	24	1%
	Unknown	269	9%	302	10%	81	10%	5	5%	45	8%	366	9%
	Other	195	7%	187	6%	44	5%	5	5%	48	8%	249	6%

Table 46 continued on next page

Table 46, continued

		Morbidity by disease group											
		Cirrhosis		Decompensated cirrhosis		Other chronic liver disease		Liver transplants		Liver cancer		Total	
		Count	Percent	Count	Percent	Count	Percent	Count	Percent	Count	Percent	Count	Percent
Primary payer	Medicare (managed care)	244	8%	270	9%	66	8%	14	14%	73	12%	362	9%
	Medicare (fee-for-service)	583	20%	593	20%	165	19%	35	34%	130	22%	811	21%
	Medicaid (managed care)	655	22%	657	22%	177	21%	3	3%	83	14%	848	22%
	Medicaid (fee-for-service)	258	9%	241	8%	79	9%	7	7%	55	9%	330	8%
	Medicaid – out of state	56	2%	60	2%	7	1%	0	0%	6	1%	67	2%
	Department of Defense	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
	Department of Veterans Affairs	100	3%	102	3%	32	4%	2	2%	16	3%	131	3%
	Indian Health Service or tribe	13	0%	16	1%	5	1%	0	0%	1	0%	17	0%
	HRSA program	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
	State government	24	1%	26	1%	7	1%	0	0%	5	1%	29	1%
	Local government	7	0%	6	0%	2	0%	0	0%	1	0%	8	0%
	HMO/managed care	163	6%	152	5%	39	5%	13	13%	60	10%	225	6%
	Private health insurance – indemnity	14	0%	15	1%	2	0%	0	0%	1	0%	19	0%
	Regence Blue Cross managed care	127	4%	124	4%	33	4%	16	16%	57	10%	182	5%
	Regence Blue Cross indemnity	72	2%	84	3%	23	3%	3	3%	15	3%	101	3%
	Self-pay	327	11%	338	11%	131	15%	1	1%	28	5%	423	11%
	No charge	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
	Refused to pay/ bad debt	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
	Hill Burton free care	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
	Workers Compensation	3	0%	3	0%	1	0%	0	0%	0	0%	3	0%
	Other payer	29	1%	26	1%	7	1%	0	0%	6	1%	37	1%
	Tricare (Champus)	11	0%	12	0%	4	0%	0	0%	1	0%	13	0%
	Kaiser Permanente	61	2%	55	2%	14	2%	6	6%	26	4%	85	2%
	Commercial indemnity	130	4%	146	5%	36	4%	3	3%	29	5%	174	4%
	Self-insured	1	0%	1	0%	0	0%	0	0%	0	0%	1	0%
	Charity	41	1%	42	1%	19	2%	0	0%	4	1%	51	1%

Table 46 continued on next page

Table 46, continued

		Morbidity by disease group											
		Cirrhosis		Decompensated cirrhosis		Other chronic liver disease		Liver transplants		Liver cancer		Total	
		Count	Percent	Count	Percent	Count	Percent	Count	Percent	Count	Percent	Count	Percent
Admission type	Home health	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
	ER	2,043	70%	2,114	71%	640	75%	35	34%	304	51%	2,706	69%
	Urgent	692	24%	714	24%	175	21%	59	57%	160	27%	949	24%
	Elective	179	6%	136	5%	33	4%	9	9%	131	22%	255	7%
	Newborn	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
	Trauma center	3	0%	3	0%	0	0%	0	0%	2	0%	5	0%
	Other	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
	N/A	2	0%	2	0%	1	0%	0	0%	0	0%	2	0%
Total		**2,919**		**2,969**		**849**		**103**		**597**		**3,917**	

Table 47. Rates of hospital discharges related to HCV by sex, age and race, Oregon 2008–2012

		HCV discharges		
		Count	Percent	Average annual rate per 100,000 population
Sex	Female	1,294	33%	13.5
	Male	2,623	67%	27.2
Age group	0-12	0	0%	0.0
	13-19	11	0%	0.6
	20-24	0	0%	0.0
	25-29	6	0%	0.5
	30-34	24	1%	1.9
	35-39	76	2%	6.0
	40-44	212	5%	16.9
	45-49	519	13%	39.5
	50-54	955	24%	69.0
	55-59	1,136	29%	83.1
	60-64	655	17%	54.5
	65+	323	8%	11.9
Race	AI/AN	218	6%	57.7
	Black	82	2%	17.4
	Asian/PI	57	1%	6.4
	White	2,849	73%	16.3
	Refused/unknown/other	711	18%	0.0
Ethnicity	Hispanic	201	5%	9.0
	Non-Hispanic	3,194	82%	18.8
	Refused/unknown/other	522	13%	0.0
Race/ethnicity	Hispanic	201	5%	9.0
	AI/AN	205	5%	77.7
	Asian/PI	57	1%	6.7
	Black	82	2%	19.5
	White	2,733	70%	17.7
	Refused/unknown/other	639	16%	0.0
Total		**3,917**	**100%**	**20.4**

Table 48. Lengths of stay and total charges related HCV hospital discharges, by category of liver disease, Oregon 2008–2012, n = 3,917

		Cirrhosis			Decompensated cirrhosis		
	Year	Mean*	Median	Sum	Mean	Median	Sum
Length of stay	2008	4.6	4.0	2,736	4.9	4.0	2,892
	2009	4.5	3.0	2,565	5.0	4.0	2,762
	2010	4.4	3.0	2,435	4.9	3.0	2,824
	2011	4.1	3.0	2,577	4.8	3.0	3,121
	2012	4.1	3.0	2,375	4.8	3.0	2,906
	5-year average	**4.4**			**4.9**		
Charges	2008	$21,416	$14,846	$12,678,326	$22,808	$15,651	$13,456,429
	2009	$23,782	$15,983	$13,436,843	$25,645	$16,764	$14,233,139
	2010	$25,189	$17,362	$14,080,645	$28,878	$18,764	$16,604,969
	2011	$25,103	$16,903	$15,664,406	$28,391	$18,560	$18,312,265
	2012	$24,217	$16,917	$14,021,791	$30,449	$19,465	$18,391,008
	5-year average	**$23,942**			**$27,234**		

		Other chronic liver disease			Transplants		
	Year	Mean	Median	Sum	Mean	Median	Sum
Length of stay	2008	4.7	4.0	774	5.7	6.0	126
	2009	5.0	3.0	857	11.7	6.5	305
	2010	4.1	3.0	703	7.1	5.0	134
	2011	4.4	3.0	738	4.9	4.0	73
	2012	4.1	3.0	684	5.1	3.0	108
	5-year average	**4.4**			**6.9**		
Charges	2008	$18,990	$13,043	$3,152,397	$40,407	$20,879	$888,951
	2009	$24,949	$15,140	$4,316,245	$72,900	$29,280	$1,895,390
	2010	$21,288	$15,863	$3,682,802	$63,627	$27,040	$1,208,912
	2011	$22,970	$14,243	$3,881,974	$31,883	$26,936	$478,243
	2012	$22,951	$15,565	$3,855,770	$52,911	$21,965	$1,111,135
	5-year average	**$22,230**			**$52,345**		

		Liver cancer			Total		
	Year	Mean	Median	Sum	Mean	Median	Sum
Length of stay	2008	5.3	5.0	497	4.9	4.0	3,734
	2009	5.5	4.0	679	5.0	3.5	3,777
	2010	4.6	4.0	489	4.7	3.0	3,564
	2011	4.1	3.0	583	4.6	3.0	3,882
	2012	5.7	4.0	751	4.6	3.0	3,688
	5-year average	**5.1**			**$26,961**		**$21,149,111**
Charges	2008	$30,373	$22,974	$2,824,652	$22,800	$15,379	$17,419,210
	2009	$36,164	$22,081	$4,448,217	$27,230	$16,503	$20,585,543
	2010	$29,191	$20,126	$3,094,251	$27,723	$18,076	$21,013,741
	2011	$30,000	$21,156	$4,320,012	$27,768	$17,982	$23,269,572
	2012	$45,677	$21,635	$5,983,698	$29,285	$18,248	$23,457,487
	5-year average	**$34,281**		**Total**	**$134,805**	**Total**	**$105,745,554**

* Mean or median length of stay (days) or total charge per discharge per year (in U.S. dollars)

Table 49. Cases of liver cancer by year, with and without chronic viral hepatitis, 1996–2012 (n=3,395)

Sources: Oregon State Cancer Registry (1996–2012) and Orpheus Surveillance Database (1988–2012)

Year	No known history of viral hepatitis	Percent	HBV (n=196)	Percent	HCV (n=763)	Percent	Total cases of liver cancer
1996	80	95.2%	3	3.6%	1	1.2%	84
1997	83	97.6%	2	2.4%	0	0.0%	85
1998	102	95.3%	4	3.7%	1	0.9%	107
1999	120	90.9%	10	7.6%	2	1.5%	132
2000	115	93.5%	7	5.7%	1	0.8%	123
2001	108	94.7%	6	5.3%	0	0.0%	114
2002	135	92.5%	9	6.2%	2	1.4%	146
2003	153	89.0%	16	9.3%	3	1.7%	172
2004	179	90.4%	12	6.1%	7	3.5%	198
2005	169	85.8%	11	5.6%	17	8.6%	197
2006	154	73.0%	15	7.1%	42	19.9%	211
2007	175	69.4%	6	2.4%	71	28.2%	252
2008	170	60.3%	17	6.0%	95	33.7%	282
2009	190	60.9%	21	6.7%	101	32.4%	312
2010	191	59.0%	18	5.6%	115	35.5%	324
2011	165	50.5%	13	4.0%	149	45.6%	327
2012	147	44.7%	26	7.9%	156	47.4%	329
						Total	**3,395**

Table 50. Cases of liver cancer associated with HBV, by age and sex, Oregon, 2008–2012

Sources: Orpheus Hepatitis Surveillance Database (2008–2012)

	Sex								
	Female			Male			Total		
Age	Count	Percent	Rates	Count	Percent	Rates	Count	Percent	Rates
0–19	0	0.0%	0.0	0	0.0%	0.0	0	0.0%	0.0
20s	0	0.0%	0.0	0	0.0%	0.0	0	0.0%	0.0
30s	0	0.0%	0.0	7	9.0%	0.5	7	7.5%	0.5
40s	2	13.3%	0.2	17	21.8%	1.3	19	20.4%	1.5
50s	3	20.0%	0.2	22	28.2%	1.7	25	26.9%	1.9
60s	10	66.7%	1.0	19	24.2%	2.0	29	31.2%	3.0
70s	0	0.0%	0.0	13	16.7%	1.7	13	14.0%	1.7
Total	15	16.1%	0.8	78	83.9%	4.1	93	100%	4.9

Table 51. Cases of liver cancer associated with HCV, by age and sex, Oregon, 2008–2012

Sources: Orpheus Hepatitis Surveillance Database (2008–2012)

	Sex								
	Female			Male			Total		
Age	Count	Percent	Rates	Count	Percent	Rates	Count	Percent	Rates
0–19	0	0.0%	0.0	1	0.2%	0.0	1	0.2%	0.0
20s	0	0.0%	0.0	1	0.2%	0.1	1	0.2%	0.1
30s	0	0.0%	0.0	0	0.0%	0.0	0	0.0%	0.0
40s	12	8.8%	0.9	30	6.3%	2.3	42	6.9%	3.2
50s	67	49.3%	4.9	254	53.5%	19.1	321	52.5%	24.0
60s	41	30.1%	4.1	160	33.7%	16.7	201	32.9%	20.7
70s	16	11.8%	1.6	29	6.1%	3.7	45	7.4%	5.3
Total	136	22.3%	7.0	475	77.7%	24.9	611	100.0%	31.9

Table 52. Numbers of cases and incidence of liver cancer associated with chronic HBV, by race and ethnicity, 2008–2012

Sources: Orpheus Hepatitis Surveillance Database (2008–2012)

Race	Count	Percent	Rate/100,000
AI/AN	0	0%	0.0
Asian/PI	56	60%	6.3
Black	7	8%	1.5
White	30	32%	0.2
Total	**93**	**100%**	

Race known for 93/95=98%

Ethnicity	Count	Percent	Rate/100,000
Hispanic	3	3%	0.1
Non-Hispanic	91	97%	0.5
Total	**94**		

Note: Ethnicity known for 94/95=99%

Table 53. Numbers of cases and incidence of liver cancer associated with chronic HCV, by race and ethnicity, 2008–2012

Sources: Orpheus Hepatitis Surveillance Database (2008–2012)

Race	Count	Percent	Rate/100,000
AI/AN	16	3%	4.1
Asian/PI	24	4%	2.7
Black	24	4%	5.1
White	543	89%	3.1
Total	**607**		

Race known for 607/616=99%

Ethnicity	Count	Percent	Rate/100,000
Hispanic	40	7%	1.8
Non-Hispanic	570	93%	3.4
Total	**610**		

Note: Race known for 610/616=99%

Table 54. Liver transplants performed at OHSU, by HBV and HCV status, 2009–2013

Clinical Transplant Services, Oregon Health & Science University

	2009		2010		2011		2012		2013		Totals	
	Count	Percent	Count	Percent	Count	Percent	Count	Percent	Count	Percent	Count	Percent
HBV	1	3.1%	2	7.1%	2	4.8%	1	2.9%	0	0.0%	6	3.6%
HCV	16	50.0%	19	67.9%	18	42.9%	21	60.0%	17	53.1%	91	53.8%
Other	15	46.9%	7	25.0%	22	52.4%	13	37.1%	15	46.9%	72	42.6%
Total	**32**		**28**		**42**		**35**		**32**		**169**	

Table 55. Age-adjusted mortality rates for viral hepatitis and HIV, Oregon, 1993–2013

Source: Oregon Vital Statistics Mortality data; NCHS population estimate bridged 6/26/2014

	Age-adjusted death rate					Number of deaths				
Year	HBV	HCV	HIV	HIV/HBV	HIV/HCV	HBV	HCV	HIV	HIV/HBV	HIV/HCV
1993	0.78	0.10	9.80	0.06	0.00	25	3	306	2	0
1994	0.99	0.09	10.38	0.00	0.00	31	3	331	0	0
1995	1.12	0.06	10.15	0.22	0.00	36	2	330	7	0
1996	0.90	0.06	7.20	0.12	0.00	29	2	239	4	0
1997	0.59	0.23	2.97	0.09	0.00	20	8	100	3	0
1998	0.76	0.12	2.40	0.03	0.00	26	4	81	1	0
1999	0.55	2.89	2.38	0.09	0.17	19	101	82	3	6
2000	0.90	3.64	2.13	0.12	0.21	32	130	72	4	7
2001	1.06	4.71	1.92	0.20	0.42	38	173	67	7	15
2002	0.63	6.13	2.72	0.08	0.37	24	231	97	3	14
2003	0.83	5.83	2.84	0.02	0.36	32	223	103	1	13
2004	0.85	6.14	2.12	0.13	0.29	32	240	76	4	10
2005	0.79	5.58	2.45	0.15	0.22	30	228	89	5	8
2006	0.51	5.52	2.62	0.08	0.15	21	233	98	3	6
2007	0.52	7.91	1.66	0.00	0.08	22	348	63	0	3
2008	0.96	7.81	1.49	0.00	0.06	42	357	60	0	2
2009	0.80	8.83	1.49	0.06	0.05	35	405	62	2	2
2010	0.86	8.38	1.62	0.03	0.11	37	400	66	1	5
2011	0.59	8.74	1.33	0.03	0.07	26	425	58	2	3
2012	0.75	8.80	1.94	0.03	0.11	35	434	81	1	4
2013	0.57	10.52	1.63	0.02	0.15	26	543	70	1	6

Table 56. Age adjusted mortality rates for HIV and HCV, Oregon and U.S., 1999–2013

Year	OR HCV	US HCV	OR HIV/HCV	OR HIV
1999	2.89	3.00	0.17	2.38
2000	3.64	3.10	0.21	2.13
2001	4.71	3.30	0.42	1.92
2002	6.13	3.70	0.37	2.72
2003	5.83	3.70	0.36	2.84
2004	6.14	3.71	0.29	2.12
2005	5.58	3.80	0.22	2.45
2006	5.52	4.35	0.15	2.62
2007	7.91	4.58	0.08	1.66
2008	7.81	4.66	0.06	1.49
2009	8.83	4.70	0.05	1.49
2010	8.38	4.65	0.11	1.62
2011	8.74	4.82	0.07	1.33
2012	8.80		0.11	1.94
2013	10.52		0.15	1.63

Sources

Ly, KN, et al.[8];

Centers for Disease Control and Prevention (CDC). Number and rate of deaths with hepatitis C listed as a cause of death, U.S., 2007–2011. Retrieved May 1, 2015, from www.cdc.gov/hepatitis/Statistics/2012Surveillance/Table4.4.htm;

CDC. Number and rate of deaths with hepatitis C listed as a cause of death, U.S., 2009–2013. Retrieved May 1, 2015, from www.cdc.gov/hepatitis/Statistics/2013Surveillance/Table4.5.htm.

Mortality rates were calculated by taking the number of contributing causes of deaths for the specific disease or combination of diseases (HBV, HCV or HIV) and dividing by the Oregon population for the same time period (2009–2013), and then multiplying 100,000 to get the crude rate. The crude rate for each age group was then multiplied by a population weight in order to adjust the distribution of deaths to that of the standard U.S. population in 2000 (Direct Method).

Table 57. HBV Deaths by age, sex, race and ethnicity, 2009–2013

		Deaths		
		Count	Percent	Rate per 100,000
Sex	Female	31	19%	0.3
	Male	128	81%	1.1
Age group*	<1	0	0%	0.0
	1–4	0	0%	0.0
	5–14	0	0%	0.0
	15–24	0	0%	0.0
	25–34	3	2%	0.1
	35–44	18	11%	0.7
	45–54	45	28%	1.7
	55–64	58	36%	2.2
	65–74	22	14%	1.4
	75–84	11	7%	1.3
	85+	2	1%	0.5
Hispanic	Not Hispanic	149	94%	0.7
	Hispanic	10	6%	0.8
Race	White	107	70%	0.5
	Black	7	5%	1.8
	American Indian/Alaska Native	4	3%	1.5
	Asian/PI	35	23%	4.5
Total		**159**	**100%**	**0.7**

Table 58. HCV deaths by age, sex, race and ethnicity, 2009–2013

		Deaths		
		Count	Percent	Rate per 100,000
Sex	Female	639	29%	5.5
	Male	1,568	71%	12.6
Age group*	<1	0	0%	0.0
	1–4	0	0%	0.0
	5–14	0	0%	0.0
	15–24	1	0%	0.0
	25–34	14	1%	0.5
	35–44	86	4%	3.4
	45–54	585	27%	22.1
	55–64	1,165	53%	44.7
	65–74	264	12%	16.9
	75–84	74	3%	8.8
	85+	18	1%	4.5
Hispanic	Not Hispanic	2,115	96%	9.2
	Hispanic	92	4%	7.8
Race	White	2,018	93%	8.9
	Black	56	3%	16.1
	American Indian/Alaska Native	64	3%	17.4
	Asian/PI	38	2%	5.9
Total		**2,207**	**100%**	**9.1**

Source: Oregon Vital Statistics (exported June 2, 2014), NCHS intercensal population estimates (June 26, 2014).
Rates for sex, race and ethnicity are age-adjusted; age groups are crude rates.

Table 59. Mortality from HBV by county, Oregon, 2009–2013

	NCHS population estimates					HBV counts				
County	2009	2010	2011	2012	2013	2009	2010	2011	2012	2013
Baker	16,097	16,093	16,040	15,909	16,018	1	0	0	0	0
Benton	82,806	85,531	86,006	86,430	86,591	0	1	0	0	0
Clackamas	384,852	377,001	379,984	383,857	388,263	1	1	3	2	0
Clatsop	37,170	37,073	37,171	37,301	37,244	1	0	0	0	0
Columbia	49,557	49,339	49,357	49,286	49,344	0	0	0	0	0
Coos	62,683	63,053	62,795	62,534	62,282	0	2	0	2	0
Crook	22,623	20,896	20,662	20,729	20,815	0	1	1	0	0
Curry	21,165	22,364	22,462	22,248	22,339	0	0	0	0	0
Deschutes	158,532	157,895	160,083	162,277	165,954	0	1	1	0	1
Douglas	103,065	107,696	107,400	107,164	106,940	1	0	1	0	3
Gilliam	1,637	1,871	1,953	1,953	1,947	0	0	0	0	0
Grant	6,817	7,452	7,410	7,317	7,283	0	0	0	0	0
Harney	6,691	7,409	7,368	7,212	7,146	0	0	0	0	0
Hood River	21,916	22,435	22,414	22,584	22,675	0	1	0	0	0
Jackson	201,248	203,474	204,718	206,412	208,545	1	1	0	2	2
Jefferson	19,996	21,680	21,686	21,749	21,145	1	1	0	0	0
Josephine	80,982	82,865	82,680	82,930	83,306	0	1	0	0	0
Klamath	66,227	66,349	66,296	65,912	65,910	1	1	0	0	0
Lake	7,043	7,875	7,920	7,771	7,820	0	0	0	0	0
Lane	350,209	351,921	353,481	354,542	356,212	5	6	2	4	1
Lincoln	46,227	46,022	45,885	46,151	46,350	1	1	1	1	2
Linn	116,392	116,894	118,135	118,360	118,765	3	0	1	2	0
Malheur	30,721	31,322	30,757	30,630	30,479	0	1	0	0	0
Marion	317,192	316,025	317,826	319,985	323,614	2	3	2	3	4
Morrow	11,480	11,202	11,181	11,244	11,336	0	0	0	1	0
Multnomah	727,990	737,492	748,091	759,256	766,135	14	8	10	11	6
Polk	77,846	75,612	75,996	76,353	76,794	1	2	0	2	1
Sherman	1,709	1,770	1,734	1,732	1,731	0	0	0	0	1
Tillamook	24,899	25,265	25,389	25,287	25,317	0	0	0	0	0
Umatilla	73,525	76,054	76,668	76,820	76,720	0	0	1	1	0
Union	25,285	25,761	25,775	25,759	25,652	0	0	0	0	0
Wallowa	6,848	7,025	6,995	6,821	6,814	0	0	0	0	0
Wasco	24,098	25,254	25,228	25,487	25,477	0	0	0	0	1
Washington	536,920	531,440	539,464	547,672	554,996	2	4	3	4	4
Wheeler	1,375	1,447	1,419	1,424	1,381	0	0	0	0	0
Yamhill	99,235	99,355	99,800	100,255	100,725	0	1	0	0	0

Table 59 continued on next page

Table 59, continued

	HBV rates/100,000 population					NCHS	County	HBV Rate/100,000
County	2009	2010	2011	2012	2013	5-year average	5-year average	5-year average
Baker	6.21	0.00	0.00	0.00	0.00	16,031	0.2	1.25
Benton	0.00	1.17	0.00	0.00	0.00	85,473	0.2	0.23
Clackamas	0.26	0.27	0.79	0.52	0.00	382,791	1.4	0.37
Clatsop	2.69	0.00	0.00	0.00	0.00	37,192	0.2	0.54
Columbia	0.00	0.00	0.00	0.00	0.00	49,377	0.0	0.00
Coos	0.00	3.17	0.00	3.20	0.00	62,669	0.8	1.28
Crook	0.00	4.79	4.84	0.00	0.00	21,145	0.4	1.89
Curry	0.00	0.00	0.00	0.00	0.00	22,116	0.0	0.00
Deschutes	0.00	0.63	0.62	0.00	0.60	160,948	0.6	0.37
Douglas	0.97	0.00	0.93	0.00	2.81	106,453	1.0	0.94
Gilliam	0.00	0.00	0.00	0.00	0.00	1,872	0.0	0.00
Grant	0.00	0.00	0.00	0.00	0.00	7,256	0.0	0.00
Harney	0.00	0.00	0.00	0.00	0.00	7,165	0.0	0.00
Hood River	0.00	4.46	0.00	0.00	0.00	22,405	0.2	0.89
Jackson	0.50	0.49	0.00	0.97	0.96	204,879	1.2	0.59
Jefferson	5.00	4.61	0.00	0.00	0.00	21,251	0.4	1.88
Josephine	0.00	1.21	0.00	0.00	0.00	82,553	0.2	0.24
Klamath	1.51	1.51	0.00	0.00	0.00	66,139	0.4	0.60
Lake	0.00	0.00	0.00	0.00	0.00	7,686	0.0	0.00
Lane	1.43	1.70	0.57	1.13	0.28	353,273	3.6	1.02
Lincoln	2.16	2.17	2.18	2.17	4.31	46,127	1.2	2.60
Linn	2.58	0.00	0.85	1.69	0.00	117,709	1.2	1.02
Malheur	0.00	3.19	0.00	0.00	0.00	30,782	0.2	0.65
Marion	0.63	0.95	0.63	0.94	1.24	318,928	2.8	0.88
Morrow	0.00	0.00	0.00	8.89	0.00	11,289	0.2	1.77
Multnomah	1.92	1.08	1.34	1.45	0.78	747,793	9.8	1.31
Polk	1.28	2.65	0.00	2.62	1.30	76,520	1.2	1.57
Sherman	0.00	0.00	0.00	0.00	57.77	1,735	0.2	11.53
Tillamook	0.00	0.00	0.00	0.00	0.00	25,231	0.0	0.00
Umatilla	0.00	0.00	1.30	1.30	0.00	75,957	0.4	0.53
Union	0.00	0.00	0.00	0.00	0.00	25,646	0.0	0.00
Wallowa	0.00	0.00	0.00	0.00	0.00	6,901	0.0	0.00
Wasco	0.00	0.00	0.00	0.00	3.93	25,109	0.2	0.80
Washington	0.37	0.75	0.56	0.73	0.72	542,098	3.4	0.63
Wheeler	0.00	0.00	0.00	0.00	0.00	1,409	0.0	0.00
Yamhill	0.00	1.01	0.00	0.00	0.00	99,874	0.2	0.20

Table 60. Mortality from HCV by county, Oregon, 2009–2013

	NCHS population estimates					HCV counts				
County	2009	2010	2011	2012	2013	2009	2010	2011	2012	2013
Baker	16,097	16,093	16,040	15,909	16,018	2	1	0	1	3
Benton	82,806	85,531	86,006	86,430	86,591	9	7	5	3	1
Clackamas	384,852	377,001	379,984	383,857	388,263	27	30	26	33	41
Clatsop	37,170	37,073	37,171	37,301	37,244	5	7	4	7	9
Columbia	49,557	49,339	49,357	49,286	49,344	7	6	5	2	7
Coos	62,683	63,053	62,795	62,534	62,282	9	5	15	16	16
Crook	22,623	20,896	20,662	20,729	20,815	1	3	2	2	4
Curry	21,165	22,364	22,462	22,248	22,339	2	5	3	2	6
Deschutes	158,532	157,895	160,083	162,277	165,954	9	9	12	9	26
Douglas	103,065	107,696	107,400	107,164	106,940	22	25	28	25	26
Gilliam	1,637	1,871	1,953	1,953	1,947	0	0	1	0	0
Grant	6,817	7,452	7,410	7,317	7,283	1	0	0	2	2
Harney	6,691	7,409	7,368	7,212	7,146	1	0	1	0	0
Hood River	21,916	22,435	22,414	22,584	22,675	1	1	0	0	2
Jackson	201,248	203,474	204,718	206,412	208,545	23	25	22	27	45
Jefferson	19,996	21,680	21,686	21,749	21,145	4	3	2	1	3
Josephine	80,982	82,865	82,680	82,930	83,306	24	9	23	15	23
Klamath	66,227	66,349	66,296	65,912	65,910	9	9	7	8	8
Lake	7,043	7,875	7,920	7,771	7,820	2	1	0	1	1
Lane	350,209	351,921	353,481	354,542	356,212	40	43	53	57	72
Lincoln	46,227	46,022	45,885	46,151	46,350	8	6	12	7	17
Linn	116,392	116,894	118,135	118,360	118,765	16	16	13	20	11
Malheur	30,721	31,322	30,757	30,630	30,479	2	4	5	3	0
Marion	317,192	316,025	317,826	319,985	323,614	38	36	38	44	37
Morrow	11,480	11,202	11,181	11,244	11,336	0	0	2	1	1
Multnomah	727,990	737,492	748,091	759,256	766,135	91	94	95	92	115
Polk	77,846	75,612	75,996	76,353	76,794	5	6	8	3	9
Sherman	1,709	1,770	1,734	1,732	1,731	0	1	0	0	2
Tillamook	24,899	25,265	25,389	25,287	25,317	5	0	3	1	5
Umatilla	73,525	76,054	76,668	76,820	76,720	6	6	8	6	8
Union	25,285	25,761	25,775	25,759	25,652	2	1	3	3	4
Wallowa	6,848	7,025	6,995	6,821	6,814	0	2	1	0	0
Wasco	24,098	25,254	25,228	25,487	25,477	4	2	6	9	3
Washington	536,920	531,440	539,464	547,672	554,996	21	29	15	26	31
Wheeler	1,375	1,447	1,419	1,424	1,381	0	0	0	1	0
Yamhill	99,235	99,355	99,800	100,255	100,725	9	8	7	7	5

Table 60 continued on next page

Table 60, continued

	HCV rates/100,000 population					NCHS	County	HCV rate/100,000
County	2009	2010	2011	2012	2013	5-year average	5-year average	5-year average
Baker	12.42	6.21	0.00	6.29	18.73	16,031	1.4	8.73
Benton	10.87	8.18	5.81	3.47	1.15	85,473	5.0	5.85
Clackamas	7.02	7.96	6.84	8.60	10.56	382,791	31.4	8.20
Clatsop	13.45	18.88	10.76	18.77	24.16	37,192	6.4	17.21
Columbia	14.13	12.16	10.13	4.06	14.19	49,377	5.4	10.94
Coos	14.36	7.93	23.89	25.59	25.69	62,669	12.2	19.47
Crook	4.42	14.36	9.68	9.65	19.22	21,145	2.4	11.35
Curry	9.45	22.36	13.36	8.99	26.86	22,116	3.6	16.28
Deschutes	5.68	5.70	7.50	5.55	15.67	160,948	13.0	8.08
Douglas	21.35	23.21	26.07	23.33	24.31	106,453	25.2	23.67
Gilliam	0.00	0.00	51.20	0.00	0.00	1,872	0.2	10.68
Grant	14.67	0.00	0.00	27.33	27.46	7,256	1.0	13.78
Harney	14.95	0.00	13.57	0.00	0.00	7,165	0.4	5.58
Hood River	4.56	4.46	0.00	0.00	8.82	22,405	0.8	3.57
Jackson	11.43	12.29	10.75	13.08	21.58	204,879	28.4	13.86
Jefferson	20.00	13.84	9.22	4.60	14.19	21,251	2.6	12.23
Josephine	29.64	10.86	27.82	18.09	27.61	82,553	18.8	22.77
Klamath	13.59	13.56	10.56	12.14	12.14	66,139	8.2	12.40
Lake	28.40	12.70	0.00	12.87	12.79	7,686	1.0	13.01
Lane	11.42	12.22	14.99	16.08	20.21	353,273	53.0	15.00
Lincoln	17.31	13.04	26.15	15.17	36.68	46,127	10.0	21.68
Linn	13.75	13.69	11.00	16.90	9.26	117,709	15.2	12.91
Malheur	6.51	12.77	16.26	9.79	0.00	30,782	2.8	9.10
Marion	11.98	11.39	11.96	13.75	11.43	318,928	38.6	12.10
Morrow	0.00	0.00	17.89	8.89	8.82	11,289	0.8	7.09
Multnomah	12.50	12.75	12.70	12.12	15.01	747,793	97.4	13.02
Polk	6.42	7.94	10.53	3.93	11.72	76,520	6.2	8.10
Sherman	0.00	56.50	0.00	0.00	115.54	1,735	0.6	34.58
Tillamook	20.08	0.00	11.82	3.95	19.75	25,231	2.8	11.10
Umatilla	8.16	7.89	10.43	7.81	10.43	75,957	6.8	8.95
Union	7.91	3.88	11.64	11.65	15.59	25,646	2.6	10.14
Wallowa	0.00	28.47	14.30	0.00	0.00	6,901	0.6	8.69
Wasco	16.60	7.92	23.78	35.31	11.78	25,109	4.8	19.12
Washington	3.91	5.46	2.78	4.75	5.59	542,098	24.4	4.50
Wheeler	0.00	0.00	0.00	70.22	0.00	1,409	0.2	14.19
Yamhill	9.07	8.05	7.01	6.98	4.96	99,874	7.2	7.21

Table 61. Leading underlying causes of death among deaths with HBV as multiple cause of death, Oregon 2009–2013

ICD10	Count	Percent	Name
C220	36	22.6%	Liver cell carcinoma
B169	27	17.0%	Acute hepatitis B without delta agent and without hepatic coma
B181	12	7.5%	Chronic viral hepatitis B without delta agent
C229	5	3.1%	Malignant neoplasm of liver, not specified as primary or secondary
C349	4	2.5%	Malignant neoplasm of unspecified part of bronchus or lung
F102	4	2.5%	Alcohol dependence
K703	4	2.5%	Alcoholic cirrhosis of liver
K709	4	2.5%	Alcoholic liver disease, unspecified
X42	4	2.5%	Accidental poisoning by and exposure to narcotics and psychodysleptics
B182	3	1.9%	Chronic viral hepatitis C
J449	3	1.9%	Chronic obstructive pulmonary disease, unspecified
K746	3	1.9%	Other and unspecified cirrhosis of liver
X44	3	1.9%	Accidental poisoning by and exposure to other and unspecified drugs, medicaments and biological substances
Other	47	29.6%	Misc.
Total	**159**	**100.0%**	

Table 62. Leading underlying causes of death among deaths with HCV as multiple cause of death, Oregon 2009–2013

ICD10	Count	Percent	Name
B182	885	40.1%	Chronic viral hepatitis C
C220	293	13.3%	Liver cell carcinoma
K703	140	6.3%	Alcoholic cirrhosis of liver
C229	96	4.3%	Malignant neoplasm of liver, not specified as primary or secondary
J449	40	1.8%	Chronic obstructive pulmonary disease unspecified
X42	39	1.8%	Accidental poisoning by and exposure to narcotics and psychodysleptics [hallucinogens], not elsewhere classified
K746	34	1.5%	Other and unspecified cirrhosis of liver
K709	33	1.5%	Alcoholic liver disease, unspecified
K704	32	1.4%	Alcoholic hepatic failure
C349	31	1.4%	Malignant neoplasm of unspecified part of bronchus or lung
I251	29	1.3%	Atherosclerotic cardiovascular disease
C80	20	0.9%	Malignant neoplasm without specification of site
Other	535	24.2%	Misc.
Total	**2,207**	**100.0%**	

Table 63. High Risk Adult Screening Project, 2007–2013

Source: Oregon High Risk Adult Screening Project, July 2014

HCV screening results by age, Oregon High Risk Adult Screening Project, 2007–2013					
	HCV test result				
Age group	**Negative**	**Positive**	**Total**	**Total (%)**	**Positive (%)**
0–12	2	0	2	0%	0%
13–19	202	12	214	5%	6%
20–24	753	67	820	21%	8%
25–29	754	69	823	21%	8%
30–34	547	94	641	16%	15%
35–39	376	100	476	12%	21%
40–44	267	102	369	9%	28%
45–49	218	88	306	8%	29%
50–54	109	70	179	4%	39%
55–59	68	36	104	3%	35%
60–64	34	5	39	1%	13%
65+	18	1	19	0%	5%
Total	**3,348**	**644**	**3,992**	**100%**	**16%**

Note: 3,992/4,027 (99.1%) data available

HCV screening results by sex, Oregon High Risk Adult Screening Project, 2007–2013					
	HCV test result				
Sex	**Negative**	**Positive**	**Total**	**Total (%)**	**Positive (%)**
Female	1,415	279	1,694	42%	16%
Male	1,965	368	2,333	58%	16%
Total	**3,380**	**647**	**4,027**	**100%**	**16%**

Note: 4,027/4,027 (100%) data available

HCV screening results by race, Oregon High Risk Adult Screening Project, 2007–2013					
	HCV test result				
Race	**Negative**	**Positive**	**Total**	**Total (%)**	**Positive (%)**
AI/AN	91	18	109	3%	17%
Asian	18	3	21	1%	14%
Black	46	10	56	1%	18%
Mixed	37	6	43	1%	14%
NH/PI	20	3	23	1%	13%
Other	40	7	47	1%	15%
Refused	6	0	6	0%	0%
White	2,985	570	3,555	92%	16%
Multiracial	1	1	2	0%	50%
Total	**3,244**	**618**	**3,862**	**100%**	**16%**

Note: 3,862/4,027 (95.9%) data available

Table 63 continued on next page

Table 63, continued

HCV screening results by ethnicity, Oregon High Risk Adult Screening Project, 2007–2013					
HCV Test Result					
Hispanic	**Negative**	**Positive**	**Total**	**Total (%)**	**Positive (%)**
Yes	254	43	297	8%	14%
No	2,820	542	3,362	92%	16%
Total	**3,074**	**585**	**3,659**	**100%**	**16%**

Note: 3,659/4,027 (90.9%) data available

Table 64. High Risk Adult Screening Project, 2007–2013

Source: Oregon High Risk Adult Screening Project, July 2014/missing and unknown values removed

		HCV test result				
Risk questions		**Negative**	**Positive**	**Total**	**Total (%)**	**Positive (%)**
Transfusion	No	3,135	581	3,716	97%	16%
	Yes	87	34	121	3%	28%
	Subtotal	**3,222**	**615**	**3,837**	**100%**	**16%**
	Note: 3,837/4,027 (95.3%) data available					
Inject drugs not prescribed (ever)	No	1,068	34	1,102	28%	3%
	Yes	2,263	610	2,873	72%	21%
	Subtotal	**3,331**	**644**	**3,975**	**100%**	**16%**
	Note: 3,975/4,027 (98.7%) data available					
	If yes, primary drug injected					
	Miscellaneous	1	0	1	0%	0%
	Cocaine	38	24	62	2%	39%
	Heroin	454	129	583	21%	22%
	Methamphetamine/speed	1,631	430	2,061	74%	21%
	Other	58	13	71	3%	18%
	Prefer to not disclose	1	0	1	0%	0%
	Speedball	15	4	19	1%	21%
	Subtotal	**2,198**	**600**	**2,798**	**100%**	**21%**
	Note: 2,798/2,873 (97.4%) data available					
Incarcerated	No	1,110	87	1,197	32%	7%
	Yes	2,070	532	2,602	68%	20%
	Subtotal	**3,180**	**619**	**3,799**	**100%**	**16%**
	Note: 3,799/4,027 (94.3%) data available					
Medical employment	No	2,749	547	3,296	90%	17%
	Yes	331	49	380	10%	13%
	Subtotal	**3,080**	**596**	**3,676**	**100%**	**16%**

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Table 64, continued

Risk questions		HCV test result				
		Negative	Positive	Total	Total (%)	Positive (%)
	Note: 3,676/4,027 (91.3%) data available					
Ever an STD	No	2,056	381	2,437	66%	16%
	Yes	1,051	217	1,268	34%	17%
	Subtotal	**3,107**	**598**	**3,705**	**100%**	**16%**
	Note: 3,705/4,027 (76.5%) data available					
Current IDU	Current IDU (injected ≤ 3 yrs)	1,662	438	2,100	85%	21%
	Previous IDU (injected > 3 yrs)	275	92	367	15%	25%
	Subtotal	**1,937**	**530**	**2,467**	**100%**	**21%**
	Note: 3,551/4,027 (88.2%) data available; "Not IDU" was not shown n= 1,084					
Sex contact with hepatitis	No	580	125	705	43%	18%
	Yes	720	230	950	57%	24%
	Subtotal	**1,300**	**355**	**1,655**	**100%**	**21%**
	Note: 1,655/2,195 (75.4%) data available					
Household contact with hepatitis	No	436	129	565	33%	23%
	Yes	931	215	1,146	67%	19%
	Subtotal	**1,367**	**344**	**1,711**	**100%**	**20%**
	Note: 1,711/2,195 (77.9%) data available					
Needle contact with hepatitis	No	524	80	604	50%	13%
	Yes	424	175	599	50%	29%
	Subtotal	**948**	**255**	**1,203**	**100%**	**21%**
	Note: 1,203/2,195 (54.8%) data available					
Tested in jail (asked 2012–2013 only)	No	950	127	1,077	81%	12%
	Yes	227	28	255	19%	11%
	Subtotal	**1,177**	**155**	**1,332**	**100%**	**12%**

Table 65. Current injection drug users in the High Risk Adult Screening Project, 2007–2013

Source: Oregon High Risk Adult Screening Project, July 2014; current use is defined as having injected in the three years prior to the HCV test.

Not IDU, previous IDU and other (internally inconsistent or missing/unknown values) were excluded below; n = 2,100

Age	Negative	Positive	Total	Total (%)	HCV positive (%)
0–12	1	0	1	0%	0%
13–19	116	10	126	6%	8%
20–24	440	54	494	24%	11%
25–29	406	54	460	22%	12%
30–34	293	76	369	18%	21%
35–39	188	77	265	13%	29%
40–44	112	66	178	9%	37%
45–49	49	47	96	5%	49%
50–54	24	33	57	3%	58%
55–59	18	17	35	2%	49%
60–64	0	3	3	0%	100%
65+	0	0	0	0%	0%
Total	**1,647**	**437**	**2,084**	**100%**	**21%**

Note: 2,084/2,100 (99.2%) data available

Birth cohort (born 1945–1965)	Negative	Positive	Total	Total (%)	HCV positive (%)
Birth cohort	94	107	201	10%	53%
Before/after birth cohort	1,553	330	1,883	90%	18%
Total	**1,647**	**437**	**2,084**	**100%**	**21%**

*2,084/2,100 (99.2%) data available

Sex	Negative	Positive	Total	Total (%)	HCV positive (%)
Female	727	197	924	44%	21%
Male	935	241	1,176	56%	20%
Total	**1,662**	**438**	**2,100**	**100%**	**21%**

Note: 2,100/2,100 (100%) data available

Race	Negative	Positive	Total	Total (%)	HCV positive (%)
AI/AN	41	11	52	2%	21%
Asian	4	3	7	0%	43%
Black	15	6	21	1%	29%
NH/PI	9	3	12	1%	25%
White	1,500	383	1,883	90%	20%
Other	37	11	48	2%	23%
Total	**1,662**	**438**	**2,100**	**100%**	**21%**

Note: 2,100/2,100 (100%) data available

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Table 65, continued

Hispanic	Negative	Positive	Total	Total (%)	HCV positive (%)
No	1,415	374	1,789	94%	21%
Yes	93	27	120	6%	23%
Total	**1,508**	**401**	**1,909**	**100%**	**21%**

Note: 1,909/2,100 (90.9%) data available

Testing setting (2012–2013)	Negative	Positive	Total	Total (%)	HCV positive (%)
Health department or other setting	290	47	337	61%	14%
Jail	114	20	134	24%	15%
Needle exchange site	64	13	77	14%	17%
Total	**468**	**80**	**548**	**100%**	**15%**

Note: 548/662 (82.8%) data available

Drug of choice	Negative	Positive	Total	Total (%)	HCV positive (%)
Cocaine	15	6	21	1%	29%
Heroin	357	104	461	22%	23%
Methamphetamine/ speed	1,212	317	1,529	74%	21%
Speedball	12	3	15	1%	20%
Other	35	4	39	2%	10%
Total	**1,631**	**434**	**2,065**	**100%**	**21%**

Note: 2,065/2,100 (98.3%) data available

County	Negative	Positive	Total	Total (%)	HCV positive (%)
Baker	6	2	8	0%	25%
Benton	59	17	76	4%	22%
Clackamas	4	0	4	0%	0%
Clatsop	16	4	20	1%	20%
Coos	7	3	10	0%	30%
Crook	1	1	2	0%	50%
Deschutes	288	55	343	16%	16%
Douglas	172	51	223	11%	23%
Hood River	1	0	1	0%	0%
Jackson	181	38	219	10%	17%
Josephine	5	1	6	0%	17%
Klamath	49	9	58	3%	16%
Lake	0	1	1	0%	100%
Lane	325	145	470	22%	31%

Table 65 continued on next page

Table 65, continued

County	Negative	Positive	Total	Total (%)	HCV positive (%)
Lincoln	10	3	13	1%	23%
Linn	129	27	156	7%	17%
Malheur	1	0	1	0%	0%
Marion	300	59	359	17%	16%
Multnomah	1	0	1	0%	0%
Tillamook	2	0	2	0%	0%
Umatilla	72	17	89	4%	19%
Wasco	31	5	36	2%	14%
Total	**1,660**	**438**	**2,098**	**100%**	**21%**

Note: 2,098/2,100 (99.9%) data available

Sex contact	Negative	Positive	Total	Total (%)	HCV positive (%)
No	533	119	652	54%	18%
Yes	393	166	559	46%	30%
Total	**926**	**285**	**1,211**	**100%**	**24%**

Note: 1,211/2,100 (57.7%) data available

Household contact	Negative	Positive	Total	Total (%)	HCV positive (%)
No	474	109	583	46%	19%
Yes	498	174	672	54%	26%
Total	**972**	**283**	**1,255**	**100%**	**23%**

Note: 1,255/2,100 (59.8%) data available

Needle contact	Negative	Positive	Total	Total (%)	HCV positive (%)
No	428	70	498	50%	14%
Yes	348	142	490	50%	29%
Total	**776**	**212**	**988**	**100%**	**21%**

Note: 988/2,100 (47.0%) data available

Table 66. Oregon Department of Corrections screening data, 2009–2012

	2009				2010			
Test	**Total tests**	**Negatives**	**Positives**	**% positive**	**Total tests**	**Negatives**	**Positives**	**% positive**
HBsAg *	2,244	2,209	35	1.6%	1,967	1,937	30	1.5%
HBsAb **	2,211	982	1,229	55.6%	1,940	906	1,034	53.3%
Anti-HCV	2,260	1,730	530	23.5%	2,001	1,501	500	25.0%

	2011				2012			
Test	**Total tests**	**Negatives**	**Positives**	**% positive**	**Total tests**	**Negatives**	**Positives**	**% positive**
HBsAg *	2,085	2,052	33	1.6%	2,523	2,490	33	1.3%
HBsAb **	2,055	1,029	1,026	49.9%	2,673	1,273	1,400	52.4%
Anti-HCV	2,335	1,909	426	18.2%	2,706	2,207	499	18.4%

* Presence of hepatitis B surface antigen indicates presence of chronic infection with HBV

** Presence of hepatitis B surface antibody indicates either past history of infection or immunization with HBV vaccine

Table 67. Deschutes County Jail Screening Program, 2011–2012

Ever Screened for HCV — yes			
Number of times detained	**Count**	**Percent**	**Total count**
1st time	2	25	8
2–5 times	15	42	36
6 or more times	36	54	67
Total	**53**	**48**	**111**

Note: 111/137=81% data available

Ever Screened for HCV — yes			
Ever incerated at ODOC facility	**Count**	**Percent**	**Total count**
Yes	31	69	45
No	21	32	65
Total	**52**	**47**	**110**

Note: 110/137=81% data available

Ever Screened for HCV — yes			
Age group	**Count**	**Percent**	**Total count**
<20	1	50	2
20–29	24	39	61
30–39	21	75	28
40–49	6	33	18
50–59	2	40	5
60 plus	1	50	2
Total	**55**	**47**	**116**

Note: 116/137=85% data available

Glossary

ACDP: Acute and Communicable Disease Prevention

ACIP: Advisory Committee on Immunization Practices

AI/AN: American Indians and Alaska Natives

ALT: Alanine aminotransferase levels

AMH: Addictions and Mental Health Division

CBOs: Community-based organizations

CDC: Centers for Disease Control and Prevention

DAAs: Direct-acting antivirals

DCC: Decompensated cirrhosis

ESLD: End-stage liver disease

HAV: Hepatitis A virus

HBV: Hepatitis B virus

HCV: Hepatitis C virus

HCC: Hepatocellular carcinoma

HIV: Human immunodeficiency virus

IDU: Injection drug use

MAP: Medical Assistance Programs

MSM: Men who have sex with men

NNDS: National Notifiable Diseases Surveillance System

ODOC: Oregon Department of Corrections

OHA: Oregon Health Authority

OHSU: Oregon Health & Science University

PIs: Pacific Islanders

PIFN: Pegylated interferon

PWIDs: Persons who inject drugs

QALY: Quality-adjusted life year

RNA: Ribonucleic acid

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Viral Hepatitis in Oregon

MAY 2015

Oregon Health Authority
PUBLIC HEALTH DIVISION
Acute and Communicable Disease Program

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OHA 8598 (06/2015)