Liver Cancer & Viral Hepatitis in Oregon

Background

Hepatocellular carcinoma (HCC) is the most common form of liver cancer and is primarily caused by viral hepatitis infection or cirrhosis of the liver. Other contributing factors, such as alcohol use, diabetes, and non-alcoholic fatty liver disease, have also been linked to HCC risk[1].

Liver cancer rates in the United States have more than tripled since 1980. In 2025, there will be an estimated 42,240 cases of liver and intrahepatic bile duct cancers and 30,000 related deaths[2]. Liver and intrahepatic bile duct cancers have risen to the 6th most common cause of cancer deaths in the U.S. (the 7th leading cause for women and 5th leading cause for men)[3]. While not in the top 10 causes of new cancer cases in the U.S., liver cancer is a leading cause of cancer deaths worldwide and is particularly prominent in less developed countries.

Given the rise of hepatitis cases in the U.S. since 2008 and Oregon's high incidence of both liver cancer and viral hepatitis, it is necessary to understand common outcomes and the populations most affected by this link to limit morbidity and mortality due to liver cancer.

From 2017-2021, the CDC estimated that Oregon experienced 9.1 annual cases of liver cancer per 100,000 population (age-adjusted)[4]. Liver cancer was the 6th leading cause of cancer death in Oregon in 2022, with 6.7 deaths per 100,000 population. Overall, liver cancer has a high mortality rate, with a 5-year survival rate in the U.S. of approximately 22%[5].

Between 1996 and 2021, 3,102 cases of liver cancer attributed to viral hepatitis were reported to the Oregon State Cancer Registry (OSCaR) (41.5% of all liver cancer cases). Of those, 409 (13%) were associated with Hepatitis B virus (HBV) infection, and 2693 (87%) were associated with Hepatitis C virus (HCV) infection. Cases of liver cancer attributed to viral hepatitis increased from 2005, when HCV first became reportable in Oregon, until approximately 2015, mostly attributable to HCV infection (Figure 1). There has been an overall decline since 2015, when liver cancer rates associated with viral hepatitis peaked, with a slight increase from 2020 to 2021.

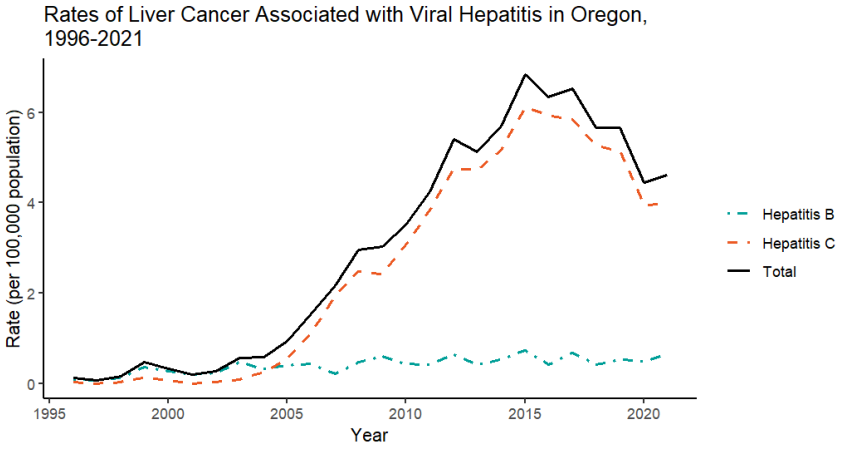


Figure 1: *Annual rates of viral hepatitis-associated liver cancer in Oregon, overall and by virus type (based on year of cancer diagnosis).*

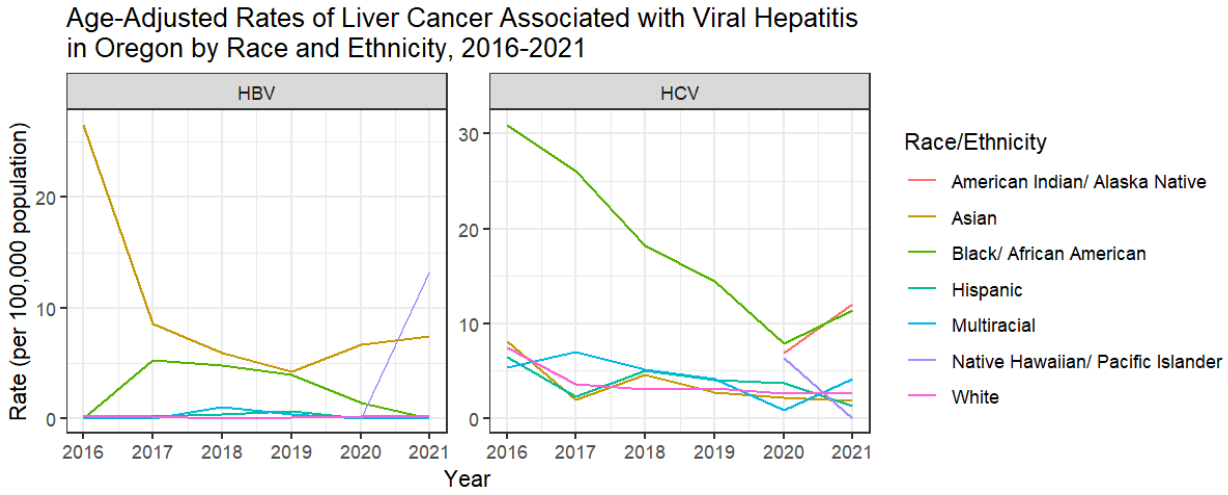
Key Demographics

Approximately 80% of viral hepatitis-associated liver cancer cases are in men, for both HBV and HCV. This matches broader trends of liver cancer, which occurs more frequently in men across populations[6]. Individuals with HBV infection and liver cancer were on average younger than those with HCV infection and liver cancer; only 56% of those with HBV infection compared to 89% of those with HCV infection were age 50 or older at hepatitis diagnosis.

Most individuals with viral hepatitis-associated liver cancer were identified as Non-Hispanic White, accounting for 76% of overall cases. However, Non-Hispanic Asian individuals accounted for 53% of HBV related cases, aligning with significantly higher rates of HBV in this population due primarily to immigration from regions with endemic HBV (such as East Asia and the Pacific Islands) and vertical HBV transmission (mother-to-child)[7]. This population also had the highest age-adjusted rates of HBV-associated liver cancer from 2016-2020, but was passed by the Hawaiian Native/Pacific Islander population in 2021 (Figure 2) (however, due to low case counts and subsequent increasing rate variability in some populations, these rates should be interpreted with caution). Non-Hispanic Black individuals also experienced elevated rates of HBV-associated liver cancer. Factors contributing to these disparities include reduced access to care, poverty and income disparities, housing, and immigration from countries with high rates of HBV (which includes many in Africa)[8]. Non-Hispanic Black populations also have historically lower rates of HBV vaccination than Non-Hispanic White populations, likely contributing to the elevated rate of hepatitis B-associated liver cancer in this population[9].

The Non-Hispanic Black population had the highest rate of HCV-related cases, peaking at 31 per 100,000 population in 2016 and decreasing until 2020 (Figure 2); on average, the rates in this population were approximately 5 times those in the Non-Hispanic White population for the same period. American Indian/Alaska Native populations also experienced similarly high rates in 2020 and 2021 (the only years for which population data was available in this group).

***Figure 2**: Graph of age-adjusted rate of hepatitis-associated liver cancer by race and ethnicity in Oregon from 2016-2021. Rates are adjusted to the 2000 U.S. reference population.[10]*



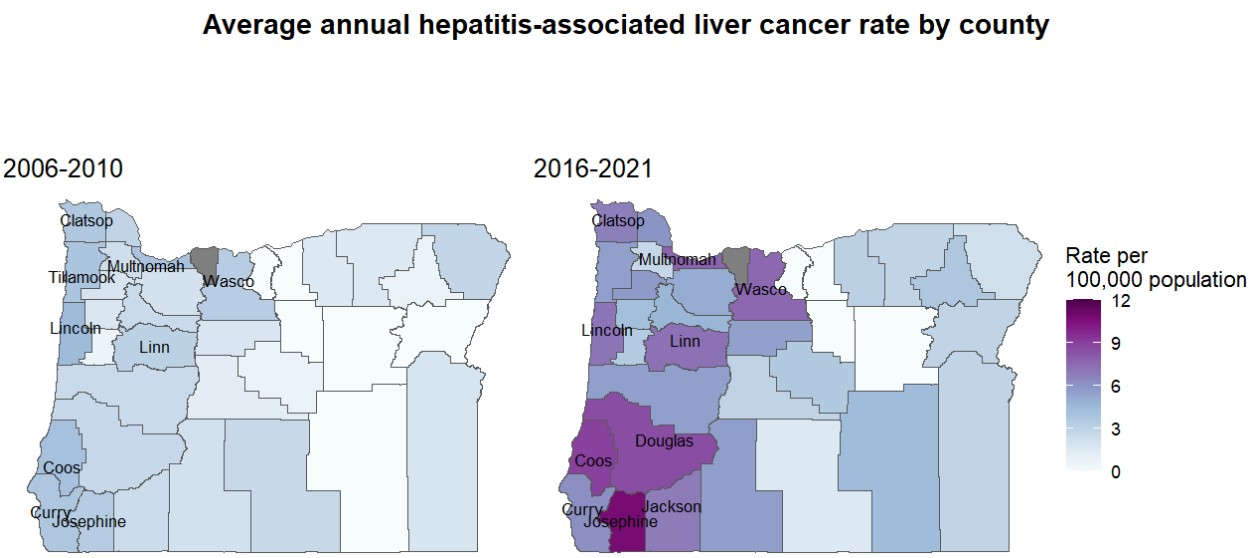
Due to low case counts increasing rate variability in some populations, caution should be used when interpreting rate calculations.

Geographic Distribution

At the county level, average annual hepatitis-associated liver cancer rates from 2016-2021 ranged from 0 to 10.8 cases per 100,000 population. This is a significant increase from 2006-2010, where the maximum county level rate was 4.5 cases per 100,000 population per year. The counties with the highest rates are primarily located in western Oregon, with especially high rates in the southwestern corner of the state.

Figure 3 shows the rates for all 36 counties, with the top 10 counties with the highest rates of hepatitis-associated liver cancer labeled for each period. Many of the same counties had the highest rates in both periods.

Figure 3: *Map of county-level average hepatitis-associated liver cancer rates per 10,000 population. Labelled counties had the highest average rates for each period.*



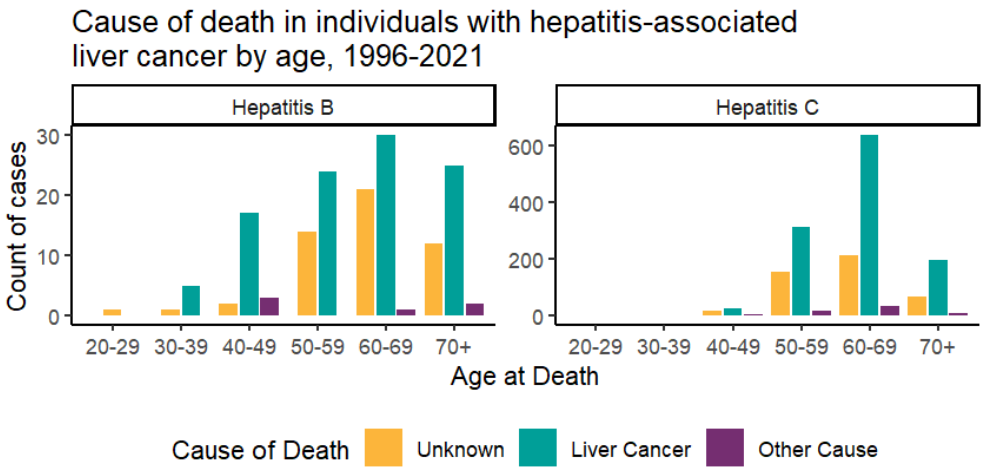
Timing of Diagnosis

Though liver cancer on average takes 20-30 years to develop from a hepatitis infection[11], the median time from diagnosis with viral hepatitis to diagnosis with liver cancer was 3.3 years (IQR: 0.26, 7.5). This did not significantly vary by race or ethnicity. A total of 2519 (82%) individuals received a diagnosis of viral hepatitis prior to being diagnosed with liver cancer. However, only 71% of those with HBV infection were diagnosed with hepatitis before being diagnosed with liver cancer. Additionally, 27% of cases (816 total) received the two diagnoses in the same year – this represented only 5% of HBV-related cases and 30% of HCV-related cases.

Liver Cancer Mortality

A total of 80% of reported cases were deceased at the time of last patient contact (i.e. had a reported death certificate or otherwise noted in the surveillance system that they were deceased). Of those deaths, 64% were attributed to liver cancer (Figure 4). Only 5% had another cause of death listed, while 30% had an unknown cause of death (as reported in OSCaR). Having an unknown or other cause of death was more likely among those age 50 and older. Additionally, a significantly higher proportion of individuals with HBV-associated liver cancer had an unknown cause of death compared to those with HCV.

***Figure 4**: Cause of death in individuals with hepatitis-associated liver cancer, by virus type and age group*



KEY FACTS

- 41% of liver cancer cases in Oregon are associated with viral hepatitis infection; of those, 87% are associated with Hepatitis C and 13% with Hepatitis B.
- Rates of hepatitis-associated liver cancer have increased significantly since 2005, but have been declining since 2015.
- 80% of hepatitis-associated liver cancer cases occur in men.
- Racial disparities in hepatitis-associated liver cancer persist: rates of hepatitis-associated liver cancer were highest among non-Hispanic Black populations and were also higher in non-Hispanic Asian, Native Hawaiian/Pacific Islander, American Indian/Alaska Native, and Multiracial/Other race populations than the non-Hispanic White population.
- Viral hepatitis and liver cancer are often diagnosed close together, suggesting opportunities for earlier testing to detect hepatitis prior to liver cancer developing.
- Liver cancer mortality rates continue to be high, and deaths are primarily caused by liver cancer.

References

1. National Cancer Institute. (2024, May 15). *Liver cancer causes, risk factors, and prevention.* National Cancer Institute. https://www.cancer.gov/types/liver/what-is-liver-cancer/causes-risk-factors
2. American Cancer Society. (2025, Feb 11). *Key Statistics About Liver Cancer.* American Cancer Society. https://www.cancer.org/cancer/types/liver-cancer/about/what-is-key-statistics.html
3. American Cancer Society. (2025). *Cancer Statistics Center.* American Cancer Society. https://cancerstatisticscenter.cancer.org/
4. U.S. Cancer Statistics Working Group. (2024, June). *U.S. Cancer Statistics Data Visualizations Tool.* Centers for Disease Control & Prevention. https://gis.cdc.gov/Cancer/USCS/#/AtAGlance/
5. American Cancer Society. (2025, Feb 11). *Liver Cancer Survival Rates.* American Cancer Society. https://www.cancer.org/cancer/types/liver-cancer/detection-diagnosis-staging/survival-rates.html
6. Islami, F., Miller, K. D., Siegel, R. L., Fedewa, S. A., Ward, E. M., & Jemal, A. (2017). Disparities in liver cancer occurrence in the United States by race/ethnicity and state. *CA: a cancer journal for clinicians*, *67*(4), 273–289. https://doi.org/10.3322/caac.21402
7. Chen, M. S., Jr, & Dang, J. (2015). Hepatitis B among Asian Americans: Prevalence, progress, and prospects for control. *World journal of gastroenterology*, *21*(42), 11924–11930. https://doi.org/10.3748/wjg.v21.i42.11924
8. Kim, N. J., Cravero, A., VoPham, T., Vutien, P., Carr, R., Issaka, R. B., Johnston, J., McMahon, B., Mera, J., & Ioannou, G. N. (2023). Addressing racial and ethnic disparities in US liver cancer care. *Hepatology communications*, *7*(7), e00190. https://doi.org/10.1097/HC9.0000000000000190
9. Bhuiyan, A. R., Kabir, N., Mitra, A. K., Ogungbe, O., & Payton, M. (2020). Disparities in Hepatitis B Vaccine Coverage by Race/Ethnicity: The National Health and Nutrition Examination Survey (NHANES) 2015-2016. *Diseases (Basel, Switzerland), 8*(2), 10. https://doi.org/10.3390/diseases8020010
10. Klein, R. J., & Schoenborn, C. A. (2001). Age adjustment using the 2000 projected U.S. population. *Healthy People 2010 Statistical Notes*. https://doi.org/10.1037/e583772012-001
11. 11. Vescovo, T., Refolo, G., Vitagliano, G., Fimia, G. M., Piacentini, M. (2016). Molecular mechanisms of hepatitis C virus–induced hepatocellular carcinoma. *Clinical Microbiology and Infection, 22*(10), 853-861. https://doi.org/10.1016/j.cmi.2016.07.019