

HEPATITIS C EPIDEMIOLOGY REPORT



2023 SEATTLE & KING COUNTY

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Acknowledgements

This first Hepatitis C Epidemiology Report includes viral hepatitis laboratory results data collected by Public Health – Seattle & King County from January 1, 1989 to December 31, 2022. We thank the medical providers caring for people with hepatitis C and the clinics and patients participating in epidemiologic projects. We appreciate their cooperation with reporting hepatitis C laboratory test results included in this report – which are used for treatment, prevention, and planning efforts. We also wish to acknowledge the outstanding assistance of our program staff and thank the Hep C Program's two Disease Research & Intervention Specialists, Gardenia Vivas-Jimenez and Zenyth Sheppard, for their care and dedication to patients and their support in data collection and quality. Also a huge thank you to Kristen Wilson-Weiberg, RN who provides hep C treatment to patients at the Robert Clewis Center—Needle Exchange Program. Special thanks to Meaghan Fagalde and Atar Baer, whose initial work has been foundational in building this program.

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Photo Credit

Leilani Schwarcz, Mount Rainier from
the top of Crystal Mountain

Hepatitis C Reporting Requirements

Detailed requirements for reporting of hepatitis C are described in the Washington Administrative Code (WAC), section 246-101 (<https://doh.wa.gov/public-health-provider-resources/notifiable-conditions/hepatitis-c>).

In Washington state, health care providers, health care facilities, laboratories, food service establishments, child day care facilities, and schools are [legally required](#) to notify public health authorities at their local health jurisdiction of suspected or confirmed cases of selected diseases or conditions. These are referred to as **notifiable conditions**.

Laboratories are required to report any positive hep C test result, all hep C RNA tests (detectable or not), hep C genotype, and all hepatocellular enzyme levels, pregnancy status, negative result for IgM anti-HAV, and negative result for IgM anti-HBc associated with a specimen with a positive test result.

Laboratories, health care providers, and health care facilities shall report the patient's race, ethnicity, and preferred language as outlined in [WAC Chapter 246-101](#).

For further information about hep C reporting requirements, please contact your local health department or the Hepatitis C Surveillance Program Washington State Department of Health at Hepatitis@doh.wa.gov. In King County, call 206-263-2000.

Suggested Citation

HIV/STI/HCV Program, Public Health – Seattle & King County. Hepatitis C Epidemiology Report 2023, Volume 1.

Alternate Formats

- Online publications can be found here: www.kingcounty.gov/hivepi
- Alternate formats provided upon request.
- To be included on the mailing list or for address corrections, please call 206-263-2000

Technical Note

Past data estimates may change. Hep C surveillance data are dynamic with databases often being updated with new data, including data on characteristics of people living with hep C and causes of death. Health departments may also change their definitions for key outcomes, including new hep C diagnoses. These changes can affect current calculations of estimates from prior years. Thus, differences between Epi Reports for estimates for a given year are expected.

Definitions & Technical Notes

Birth Cohorts: A group of people born within a specified timeframe. The birth year cohort period designations used in this report are from Pew Research Center¹ and are listed below. Due to the emphasis on diagnosing hep C in the baby boomer birth cohort, this report examines birth cohort trends, as well as age.

Generation Alpha: Born 2013 and later

Generation Z: Born between 1997-2012

Millennials: Born between 1981-1996

Generation X: Born 1965-1980

Baby Boomers: Born 1946-1964

Greatest & Silent: Born before 1946

PHSKC: Public Health – Seattle & King County, the public health department that serves the residents of Seattle and King County, Washington.

Public Health Surveillance: Ongoing, systematic collection, analysis, and interpretation of health-related data essential to planning, implementation, and evaluation of public health practice.

Race/Ethnicity Category: Most race and ethnicity data are reported through electronic lab reporting (>90% since 2020). Race and ethnicity are captured in 2 separate variables, one for race and one for ethnicity. In this report, American Indian/Alaska Native, Asian, Black, Native Hawaiian/Pacific Islander, White, or Another race exclude Hispanic or Latinx ethnicity. Individuals who report Hispanic or Latinx ethnicity are grouped in the Hispanic or Latinx race/ethnicity category, regardless of their reported racial category. Latinx in this context refers to people of Latin American origin or descent (used as a gender-neutral or nonbinary alternative to Latino or Latina).

Sex: Sex as reported on lab-based reporting forms, which represents sex assigned at birth. No information on gender identity is available at this time.

WA DOH: Washington State Department of Health, the public health department that serves the residents of Washington state.

Hepatitis C Specific Terms

Hepatitis C: An infection caused by the hepatitis C virus that affects the liver. This report uses the shorten version “hep C”, but it is also routinely shortened as “HCV.” Hep C is not vaccine preventable.

Acute, chronic, and perinatal case definitions can be found on the CDC website (links below). The definition of confirmed hep C infection used in this report is presented in Figure 5.

Acute hepatitis C: <https://ndc.services.cdc.gov/case-definitions/hepatitis-c-acute-2020/>

Chronic hepatitis C: <https://ndc.services.cdc.gov/case-definitions/hepatitis-c-chronic-2020/>

Perinatal hepatitis C: <https://ndc.services.cdc.gov/conditions/hepatitis-c-perinatal-infection/>

Antibody Testing: A blood test that looks for antibodies in a person’s blood. Antibodies are proteins that the immune system makes to fight infections. Once a person has been exposed to hep C, they will continue to test positive for hep C antibodies even if they have spontaneously cleared the virus or been cured via treatment.

RNA (ribonucleic acid) Testing: A type of blood test that can detect genetic material of viruses and bacteria, such as for HIV or hep C. Hep C RNA tests will only be positive when a person has a current infection.

Sustained Virologic Response (SVR): People are considered cured of hep C when the virus remains undetectable in their blood after a period of time since they completed treatment, this is known as *sustained virologic response*. A number after SVR indicates the minimum number of weeks since they completed treatment (e.g., SVR12 means sustained virologic response at least 12 weeks after completing treatment).

Ever Diagnosed with Hep C: Refers to people who have ever had laboratory evidence of hep C viral infection.

Living with Untreated Confirmed Hep C: Refers to person with confirmed detectable hep C virus and no reported laboratory evidence of viral clearance, including a person classified as having hep C reinfection.

Presumed Cured: Refers to people with laboratory evidence of viral clearance, i.e., an RNA positive result followed by an RNA negative test result.

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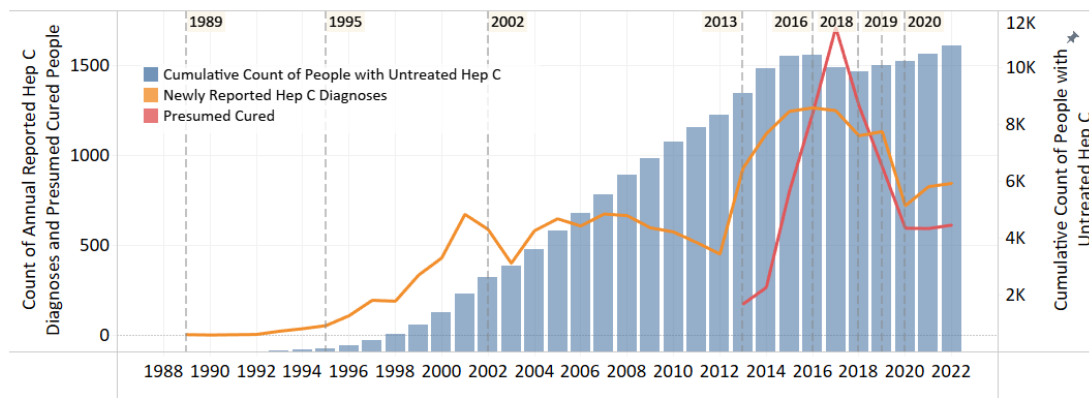
April 2025 Revision

Report Correction:

Since the release of PHSKC's first annual Hepatitis C Epidemiology report (2023), we have identified and corrected an error in classifying an individuals' cure date, which in turn impacts annual cure counts. In the original report, when an individual with confirmed HCV infection achieved cure/viral clearance, their cure date was incorrectly classified as the individual's last reported negative/undetectable RNA test result instead of the individual's first reported negative/undetectable HCV RNA test result (following confirmatory HCV infection). We have corrected this error, and the 2024 report will reflect these changes. No other changes have been made in the 2023 report.

Why does this matter?

This correction has altered some of the absolute numbers in the report and conclusions. This error did not impact KC's overall cure rate, but depicted longitudinal cures being achieved in more recent years when they were actually achieved in earlier years. This led us to conclude that our annual count of cures was outpacing the annual count of new HCV diagnoses. However, in the corrected analysis, we see that the pace of current cures is actually lower than we originally concluded. While the cure date correction does not impact aggregate numbers of cures, it does highlight the decreasing trend in annual cures since 2017.



Milestones

- 1989 – Hepatitis C virus discovered
- 1995 – Injectable interferon with ribavirin
- 2002 – Pegylated interferon
- 2013 – Well-tolerated DAA (direct-acting antivirals) era begins
- 2016 – HCA (Health Care Authority) lifts restrictions on DAA prescribing
- 2018 – HEP C Free WA signed by Governor
- 2019 – Statewide modified subscription model contract begins, lifting all prior approvals on glecaprevir /pibrentasvir
- 2020 – CDC expands to universal hep C screening and for all pregnant people for each pregnancy

Cumulative Count of People with Untreated Hep C: Rolling count of people with untreated hep C by year, subtracting out the corresponding cures that year. Untreated people include individuals with a detectable HCV RNA test result.

Newly Reported Hep C Diagnoses: Annual count of new hep C diagnoses (acute or chronic infections).

Presumed Cured: Annual count of presumed cured individuals based on reported laboratory test results.

Note: Counts exclude deceased patients. Individuals with reinfection are represented in the cumulative count of people with untreated hep C.

- [Link to PHSKC Hepatitis C data dashboards with most current data](#)

Executive Summary

To achieve the goal of viral hepatitis elimination, it is essential that public health agencies accurately measure the burden of hepatitis C (hep C) and share those data with the public. Public Health – Seattle & King County (PHSKC) has historically tracked the number of new acute and chronic hep C infections reported among King County residents each year, publishing the number of new cases on its website.² Given shifts in the hep C epidemic resulting from the opioid crisis and the introduction of a highly effective curative treatment, PHSKC has modified both its public health strategy and its approach to reporting. The *2023 Hepatitis C Epidemiology Report* is a part of PHSKC's updated effort to address hep C. The report includes estimates of the prevalence, distribution, and cure rates for hep C in King

County, including an estimate of the number of people with untreated confirmed hep C. In addition, we present a King County-specific hep C care continuum, including an adjusted estimate of the number and proportion of people who have cleared the infection, either naturally or through treatment.

The goals of this report are:

- to establish a baseline understanding of the scope of hep C epidemic and progress towards elimination among residents of King County;
- to identify data gaps, which will inform prioritization of enhancements to the reporting system; and
- to share PHSKC's current approach to hep C elimination.

Baseline	Definition/Interpretation	What's next
Identification		
23,997 people ever confirmed to have hep C (18,058 still alive at the end of 2022)	The number of people who had confirmed hep C reported between 1989 and 2022; includes people with reported positive viral test (hep C	Work with community medical providers to increase treatment.
887 new hep C diagnoses in 2022	Newly reported individuals with positive RNA in 2022, including 50 presumed reinfections, an average of 2 diagnoses per day.	Monitor the proportion of people newly diagnosed that are treated.
Treatment		
7,189 (40%) presumed cured	Number and percentage of living people with confirmed hep C infection between 1989 and 2022 that are presumed cured based on an undetectable RNA test after a positive RNA	Increase cure rate to 58% by the end of 2025 in alignment with HHS Viral Hepatitis Elimination goals.
1,134 presumed cured in 2022	Number of people with confirmed hep C infection that are presumed cured based on an undetectable RNA test in 2022 after a previous	Evaluate the time interval from hep C diagnosis to cure date for newly diagnosed individuals.
Currently Living with Hep C		
10,869 people with untreated hep C	Cases based on patient-level longitudinal laboratory data.	Collaborate with healthcare organizations to determine true infection status among persons defined as being untreated based on surveillance data and link people living
4,456 people with untreated hep C	Estimate based on laboratory data and modified based on an investigation of randomly selected cases.	Collaborate with healthcare providers and review other available data sources to refine the estimate and understand who remains to be treated.

Executive Summary cont.

From 2013 to 2019, prior to the start of the COVID-19 pandemic, the number of new people reported with confirmed hep C increased by an average of 7% each year, except for 2018, which had a 22% reduction in new diagnoses. Between 2019 and 2020, the number of new hep C diagnoses declined by 37%, concurrent with the COVID-19 pandemic, likely reflecting decreased hep C testing related to disruptions in the healthcare system. In the last two years (2021-2022), the number of new diagnoses has increased from the low counts during the COVID-19 pandemic, but hasn't rebounded to the pre-pandemic magnitude, with 887 people newly reported with hep C in 2022. Based on an analysis of hep C laboratory test results reported from 1989-2022, an estimated 10,869 individuals are living with untreated confirmed hep C infection. After adjusting for outmigration, death, and unreported cures, we estimate that there are likely closer to 4,456 individuals living with untreated hep C infection in King County.

Since 2013, 7,189 (40%) King County residents were treated and cured of hep C. The number of people cured increased dramatically after 2013 as direct acting antiviral (DAA) therapy for hep C became widely available. Cures declined between 2019 and 2020, but have since increased with an estimated 1,134 people cured in 2022. This number likely underestimates the actual number of cures since mandatory reporting of negative hep C RNA test results was not in effect until January 1, 2023.

This report builds on the formative work conducted by PHSKC Communicable Disease Program³ and is an important step in understanding the continuum of care for hep C in King County. Over time, PHSKC anticipates refining the estimates provided in this report as additional data become available, including more complete estimates of cure, outmigration, and care disparities.

Background

According to the Centers for Disease Control and Prevention (CDC), there are an estimated 2.2 million adults living with hepatitis C (hep C) in the United States, with a 129% increase in acute infections since 2014.⁴ Due to screening, reporting, and data limitations, the exact burden of hep C infection in Washington state is difficult to estimate. In 2018, a report conducted by the Center for Disease Analysis Foundation estimated that there were 59,100 people living with chronic hep C in Washington state.⁵ According to the Washington State Department of Health (WA DOH), there was a 60% increase in reported acute infections from 2017 to 2021, with an average of 6,341 newly diagnosed chronic infections reported annually during this period.⁵ This parallels a national trend of increasing acute hep C infections resulting from a combination of rising levels of

transmission and improved detection of acute cases by providers.⁶

HEPATITIS C REPORTING IN WASHINGTON STATE

Hep C is a notifiable condition in Washington state and nationally.⁷ Acute hep C has been notifiable since 1981 and chronic hep C has been notifiable since 2000 in Washington state.⁸ Despite its long history as a notifiable condition, standardized surveillance data on hep C across the United States are limited, presenting challenges in estimating the prevalence of infection and monitoring progress towards treating individuals diagnosed with hep C.

Under Washington Administrative Code (WAC 246-101-201), laboratories are required to report both positive

Background

and negative laboratory results for hep C nucleic acid amplification tests (NAAT) to WA DOH, including qualitative and quantitative hep C RNA tests and hep C genotype tests.⁹ Prior to 2023, laboratories were not required to report negative hep C RNA results, although some laboratories were routinely doing so. Collection of negative hep C RNA results allow PHSKC to identify people with cleared or cured infections as well as people with acute infections (prior negative hep C RNA tests) and those with reinfection.

GUIDING HEPATITIS C ELIMINATION STRATEGIES

In September of 2018, Governor Jay Inslee issued a directive to eliminate hep C in Washington by 2030.¹⁰ A statewide hep C elimination coordinating committee subsequently developed a [Plan to Eliminate Hepatitis C in Washington State by 2030](#), and the state implemented a comprehensive procurement strategy for the purchase of hep C medications to ensure timely access to curative treatment for low-income Washingtonians.

In July 2019, after a competitive procurement, the drug manufacturer that produces the hep C medication glecaprevir/pibrentasvir was selected as a partner for the modified subscription model for hep C treatment for Apple Health (Medicaid).¹¹ Under this model, Apple Health pays a fixed annual amount for an unrestricted supply of drug. This has made glecaprevir/pibrentasvir available without prior authorization to all Apple Health patients in Washington state.

The Hep C Free Washington Elimination Strategic Plan aligns with Viral Hepatitis National Strategic Plan.¹² The national plan includes a framework to control viral hepatitis epidemics and eliminate viral hepatitis as a public health threat in the United States by 2030 through integrating prevention, screening, and linkage to care. The Viral Hepatitis National Strategic Plan suggests core indicators, one of which is to increase the proportion of people who have been cured of hep C to 58% by 2025 and to 80% by 2030.¹² While King County does not have its own elimination plan, PHSKC endorses and is an active participant in the Washington state elimination plan.

PUBLIC HEALTH—SEATTLE & KING COUNTY'S APPROACH TO HEP C

In 2022, PHSKC moved the hep C surveillance and prevention program from the Communicable Disease Program to the HIV/STD Program, which was renamed the HIV/STI/Hepatitis C Program. This shift was designed, in part, to integrate hep C related work with harm reduction related activities conducted through PHSKC's Syringe Services Program (SSP), which was already managed through the HIV/STD program. In addition, the advent of highly effective hep C treatment and the state's plan to eliminate hep C required a public health approach which emphasizes case-finding and treatment, similar to the approach implemented to address HIV. Using the lessons learned from HIV, PHSKC seeks to promote a test and treat approach to hep C.

While PHSKC's hep C control strategy is evolving, key aspects of the current strategy include:

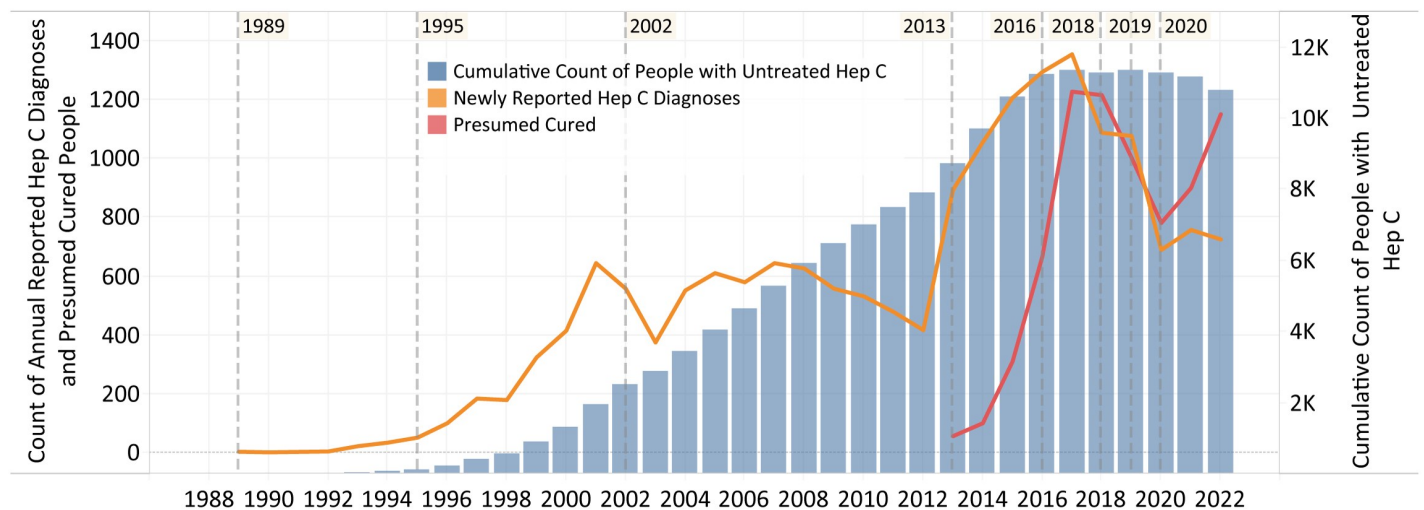
- Prevention through the provision of new sterile syringes and other supplies.
- Population-level monitoring of new diagnoses, cures, and the number of people with diagnosed, untreated infections, including efforts to evaluate the disparate impact of hep C across different populations in King County.
- Collaboration with large healthcare organizations to promote hep C testing and treatment, including the use of lab-based reporting data to help healthcare organizations identify patients with untreated hep C.
- Collaboration with WA DOH, the Hepatitis Education Project (HEP), and People's Harm Reduction Alliance (PRHA) on a jurisdictional approach to outreach-based hep C testing and clinical navigation services for people who use drugs, linking them with hep C prevention and treatment services.
- Provision of walk-in, low-barrier hep C treatment through the PHSKC's SSP and Sexual Health Clinic. This effort is designed to provide hep C treatment to people who might otherwise be unable to access it.

Snapshot of Hepatitis C in King County

As shown in Figure 1, new reports of hep C infection increased steadily from the early 1990's to 2001, followed by years of fluctuation between 2002 to 2012. A new era in the hep C epidemic began when new diagnoses rose sharply in 2012 following release of the United States Preventive Services Task Force recommendation for one-time hep C screening for baby boomers¹³ and the start of the second wave of the opioid crisis. This second wave followed 2010 changes in prescribing practices, which decreased access to

prescription opioids and prompted some people to obtain opioids outside of the health system.¹⁴ The number of new diagnoses declined from 2019-2020 concurrent with the COVID-19 pandemic, and increased in 2021 and 2022 as the pandemic waned.

FIGURE 1. TRENDS IN NEW HEP C DIAGNOSES, CURES, AND CUMULATIVE NUMBER OF INDIVIDUALS WITH UNTREATED HEP C IN KING COUNTY, 1989-2022



Milestones

- 1989 – Hepatitis C virus discovered
- 1995 – Injectible interferon with ribavirin
- 2002 – Pegylated interferon
- 2013 – Well-tolerated DAA (direct-acting antivirals) era begins
- 2016 – HCA (Health Care Authority) lifts restrictions on DAA prescribing
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- 2020 – CDC expands to universal hep C screening and for all pregnant people for each pregnancy

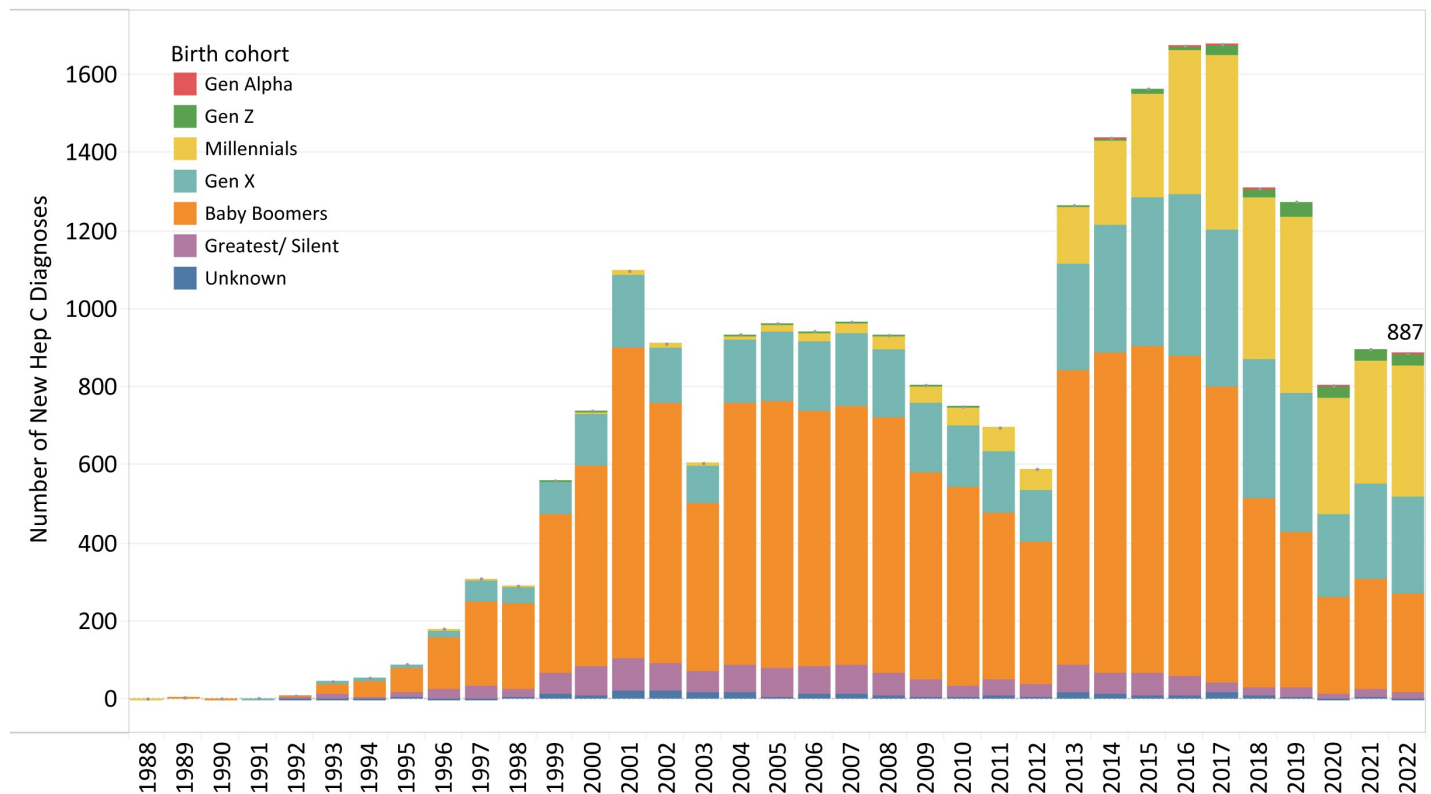
Cumulative Count of People with Untreated Hep C: Rolling count of people with untreated hep C by year, subtracting out the corresponding cures that year. Untreated people include individuals with a detectable HCV RNA test result.

Newly Reported Hep C Diagnoses: Annual count of new hep C diagnoses (acute or chronic infections).

Presumed Cured: Annual count of presumed cured individuals based on reported laboratory test results.

Note: Counts exclude deceased patients. Individuals with reinfection are represented in the cumulative count of people with untreated hep C.

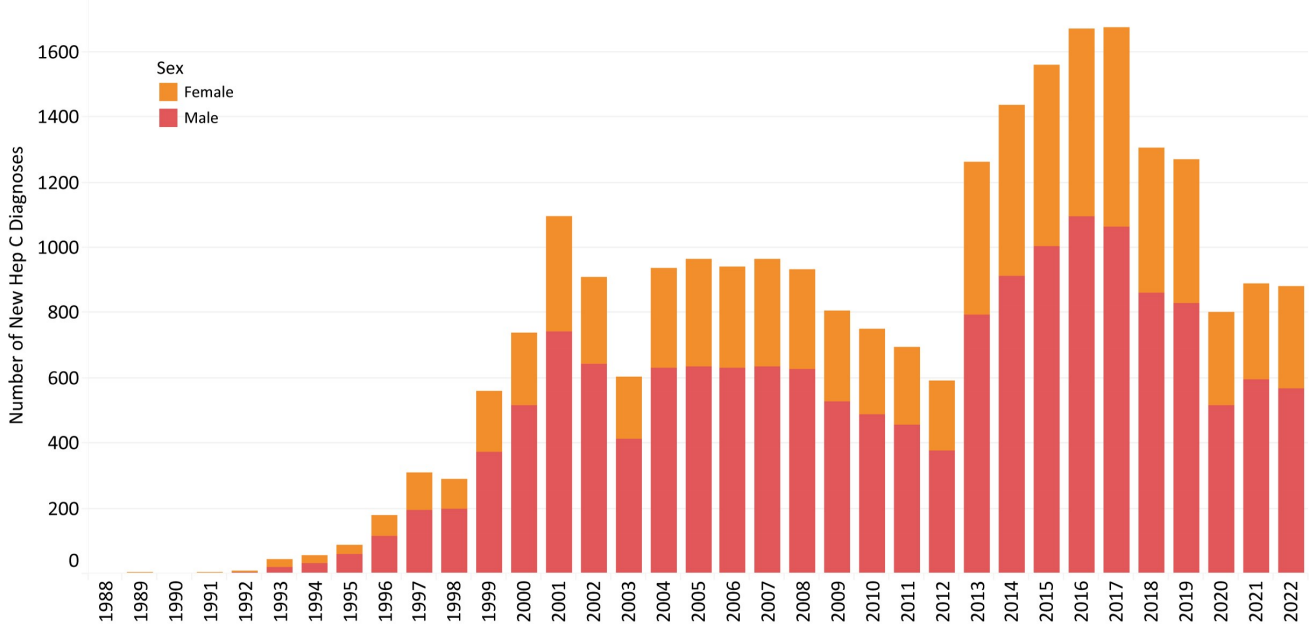
FIGURE 2. HEP C DIAGNOSES BY BIRTH COHORT, KING COUNTY, 1989-2022*



*Year represented is year of diagnosis in King County. Counts include deaths and reinfection events.

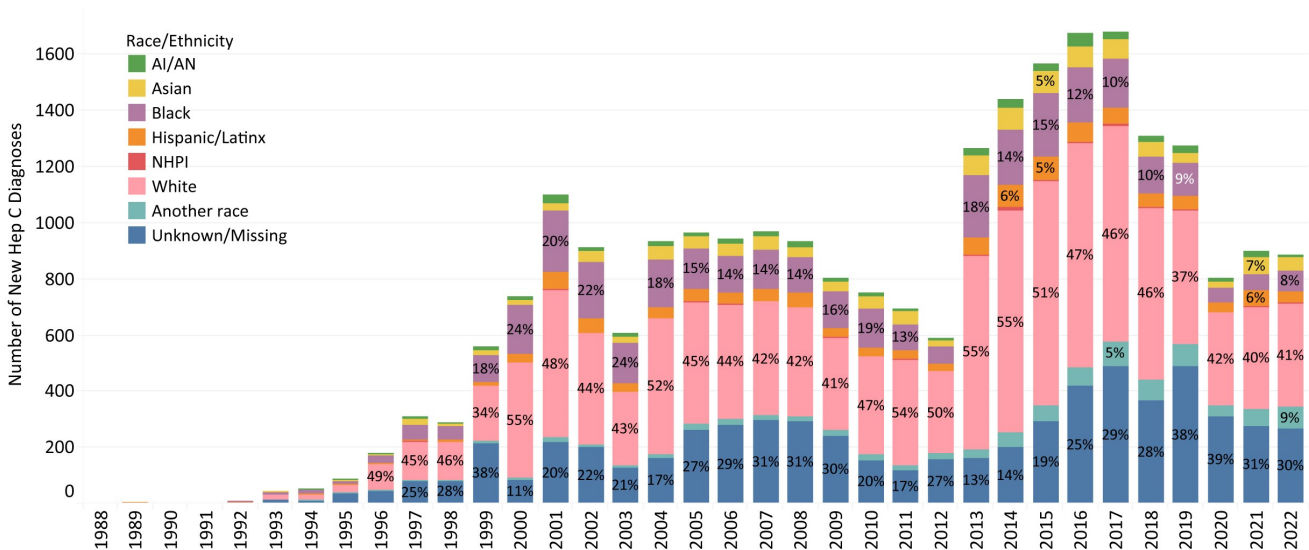
Note: Birth cohorts defined on page IV.

Figure 2 presents data on trends in hep C diagnoses in different birth cohorts. Prior to 2016, more than 50% of all newly reported hep C diagnoses occurred in baby boomers. In more recent years, baby boomers comprised approximately 30% of newly reported hep C diagnoses despite the large number of diagnoses that had already occurred in that generation and the shrinking share of baby boomers among US adults. In 2022, there was an increase in the proportion of hep C diagnoses in Generation X and millennials, with 28% and 38% of new diagnoses in those generations, respectively. The number and proportion of newly diagnosed people with hep C occurring in the millennial birth cohort have been increasing in King County, going from 855 people, or approximately 18% of cases in 2014-2016 to 955 people, about 37% of cases in 2020-2022. This shift occurs as millennials have begun to comprise a larger part of the adult population and the population of people who inject drugs.¹⁴

FIGURE 3. HEPATITIS C DIAGNOSES BY REPORTED SEX, 1989-2022*

*Year represented is year of diagnosis in King County. Counts include deaths and reinfection events.

Similar to national trends¹⁵, males are disproportionately impacted, comprising nearly two-thirds of newly reported hep C diagnoses each year. Of note, the preponderance of males among new hep C diagnoses has not changed substantially over time even as the number of new diagnoses has increased. This likely reflects the fact that injection drug use, the primary mode of hep C transmission, is more common among males than females and males typically start injecting at an earlier age than females, leading to a longer period of potential hep C acquisition.

FIGURE 4. NUMBER OF PEOPLE NEWLY DIAGNOSED WITH HEPATITIS C BY RACE/ETHNICITY IN KING COUNTY, 1989-2022*

Abbreviations: AI/AN = American Indian/ Alaska Native; NHPI = Native Hawaiian or Pacific Islander.

*Year represented is year of diagnosis in King County. Counts include deaths and reinfection events.

Hep C disproportionately affects Black and American Indian/Alaska Native (AI/AN) populations. Among individuals for whom race/ethnicity data are available, 19% of people ever diagnosed were Black and 3% AI/AN; only 7% of King County residents are Black and 1% are AI/AN ([US Census for King County](#)). However, among people newly diagnosed with hep C, data on race and ethnicity were missing for 30% of individuals, with little change in completeness over time. PHSKC is working to improve the completeness of these data to better characterize the burden of hep C across populations and inform efforts to reduce ethnic and racial disparities in hep C testing and treatment.

Hepatitis C Care Continuum

FIGURE 5. MODIFIED CDC LABORATORY RESULT-BASED HEPATITIS C CARE CONTINUUM DEFINITIONS FOR KING COUNTY RESIDENTS ALIVE AS OF 12/31/2022

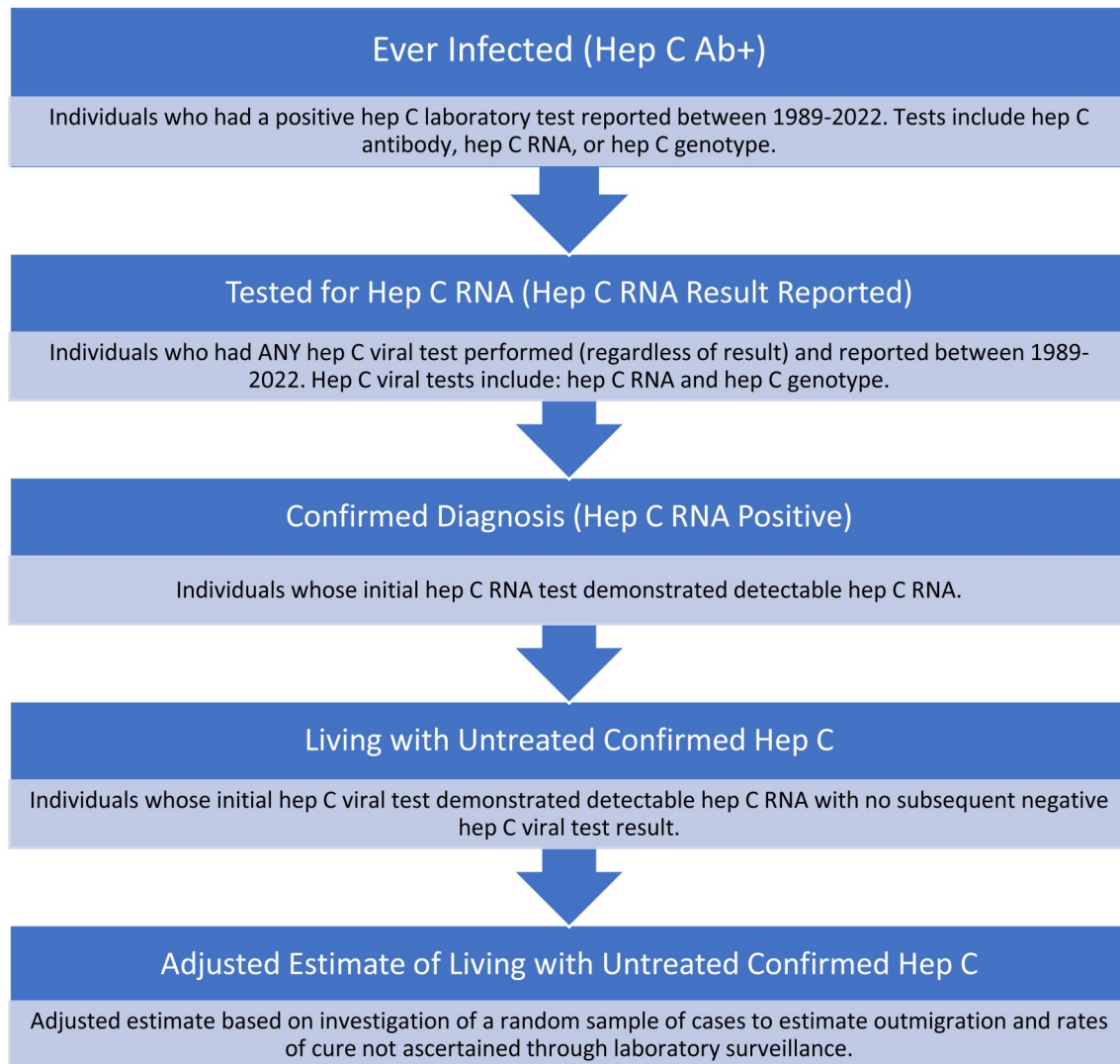


Figure 5 presents hepatitis C care continuum definitions modeled after the approach developed by CDC; the King County hep C care continuum is presented in Figure 6.¹⁷ The continuum includes individuals thought to be alive at the end of 2022 who had a positive hep C antibody test reported to PHSKC between 1989 and 2022. The figure also includes an adjusted estimate of the number of infected, untreated individuals accounting for outmigration and people whose treatment and cure were not identified via laboratory-based reporting (the approach to generating this estimate is described in detail on the next page).

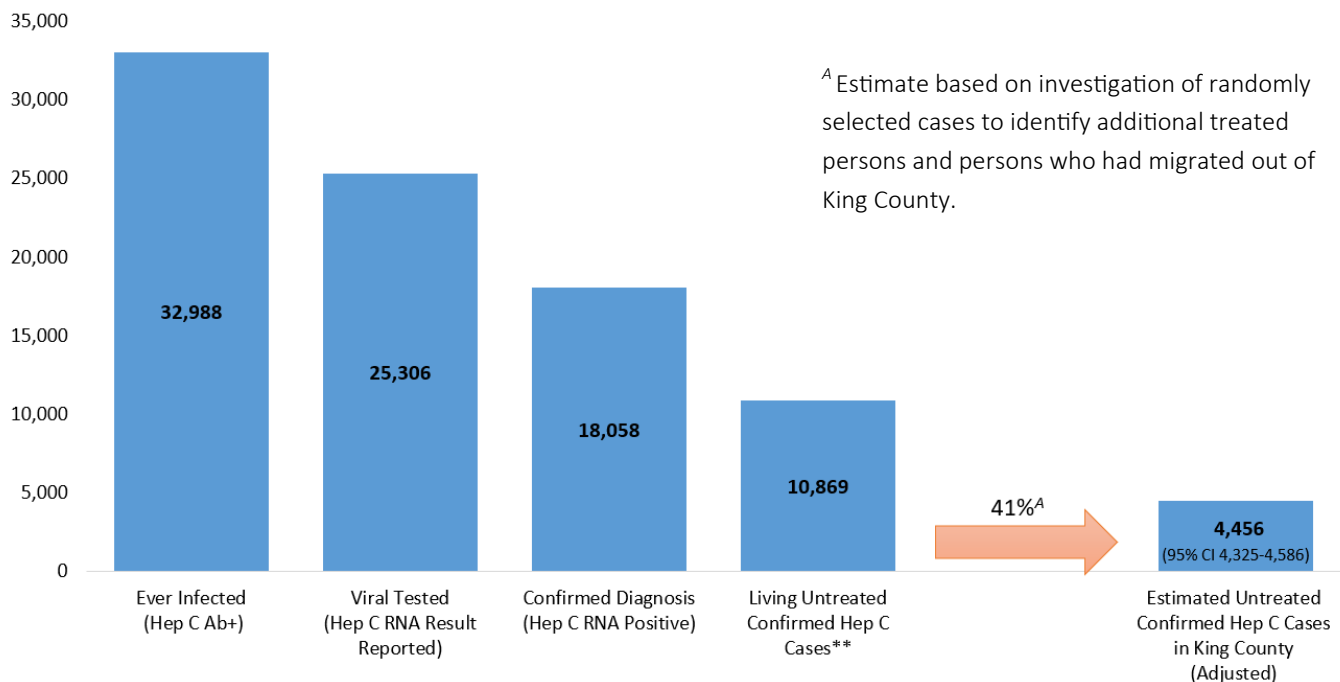
Between 1989 and 2022, a total of 43,091 individuals had a positive or detectable hep C test (antibody, RNA, genotype or antigen tests) reported to PHSKC. Of these individuals, 10,103 were known to have died of any cause as of the end of 2022, leaving **32,988** individuals known to be alive ('Ever Infected' of Figure 6). Among individuals with positive antibody tests, **25,306** (77%) had a hep C RNA test performed with results reported to PHSKC, and 7,682 (23%) never had confirmatory hep C RNA testing or had an unreported hep C RNA negative test. Negative RNA testing was not routinely reported until 2015 and mandated reporting began in January 2023. Among the 25,306 individuals known to have

confirmatory hep C RNA testing performed, **18,058** (71%) were hep C RNA positive and 7,248 (29%) were hep C RNA negative. Individuals with negative hep C RNA test results are presumed to have cleared hep C, were treated out-of-jurisdiction previously, or had false positive antibody tests. These findings are consistent with research that estimates 20 to 40% of people spontaneously clear hep C without treatment.¹⁸ A total of 7,189 (40%) of the 18,058 people with confirmed hep C had a subsequent negative hep C RNA test and were presumed to have had curative treatment. Three percent (n=231) of people with a negative hep C RNA test had a subsequent positive RNA test and were presumed to have been reinfected. Based on laboratory data reported to PHSKC, there were an estimated **10,869** people with confirmed, untreated hep C in King County, WA.

To better understand the limitations of surveillance data and refine our estimate of the number of people with untreated, confirmed hep C in King County, PHSKC investigated a random sample of patients diagnosed with hep C and reported through seven healthcare systems between 2014 and 2022 (Figure 7). These healthcare

systems reported 48% of all confirmed cases in King County who appeared to be untreated. Of the 290 investigated cases, 120 (41%) had left King County, 17 (6%) had died, and 153 (53%) had evidence in their medical records that they were still living in King County; 36 (22%) of the 153 individuals who were still in King County had completed treatment for hep C but had not had a negative hep C RNA test reported to PHSKC (Figure 7). These data suggest that a significant number of people classified as untreated based on laboratory data reported to PHSKC no longer reside in King County, have been treated, or have died, and the true number of people with confirmed, untreated hep C in King County is substantially less than 10,869. Assuming that findings from the random sample of investigations applies to the larger population of people defined as diagnosed and untreated based on laboratory data alone, we estimate that there are approximately **4,456** people with untreated confirmed hep C in King County. In the coming years, PHSKC will refine these estimates to better define the prevalence of the hep C in King County and address disparities specific to this epidemic.

FIGURE 6. HEPATITIS C CARE CONTINUUM, KING COUNTY, 1989-2022*

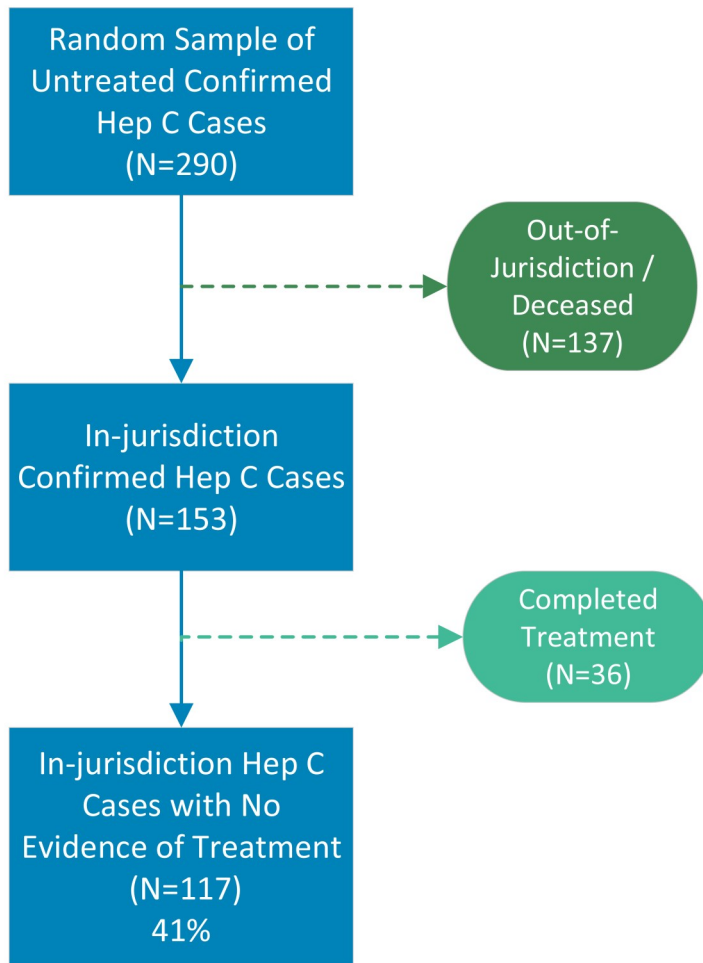


*The date range refers to the report date for an individual's first positive hep C lab test. Counts exclude deceased individuals. People with untreated confirmed hep C are individuals whose last hep C viral test is detectable with no subsequent undetectable hep C viral test result.

**There were 231 reinfections among the 10,869 untreated confirmed hep C cases.

Note: The continuum includes all individuals thought to be living in-jurisdiction and excludes any deceased individuals as of 12/31/2022. From 1989-2022, 5,939 people with confirmed hep C infection died.

FIGURE 7. RANDOM SAMPLE OF UNTREATED CONFIRMED HEP C CASES IN KING COUNTY, 2014-2022



Characteristics of Individuals Diagnosed with Hepatitis C

Since 1989, 43,091 people have had positive antibody tests reported to PHSKC and 23,997 people residing in King County were reported to PHSKC with confirmed hep C (ever diagnosed). Table 1 presents data on the characteristics of this population, including information characterizing persons with cured infections, people living with untreated hep C, and people who have died since being diagnosed. Overall, two-thirds of diagnoses were among males and 59% of diagnoses were among individuals in the baby boomer birth cohort (born 1946-1964, henceforth referred to as baby boomers).

TABLE 1. DEMOGRAPHIC CHARACTERISTICS OF KING COUNTY RESIDENTS WITH CONFIRMED HEP C, 1989-2022

	Ever Diagnosed with Hep C ^A		Among People Ever Diagnosed with Hep C					
			Presumed Cured of Hep C ^B		Living with Hep C ^C		Deaths ^D	
	N	%	n	%	n	%	n	%
Total	23,997	100%	7,189	100%	10,869	100%	5,939	100%
Sex								
Female	8,190	34%	2,786	39%	3,757	35%	1,647	28%
Male	15,758	66%	4,398	61%	7,072	65%	4,288	72%
Missing/Unknown	49	<1%	5	<1%	40	<1%	4	<1%
Age at hep C diagnosis (years)								
0-17	132	1%	31	<1%	95	1%	6	<1%
18-29	2,333	10%	622	9%	1,507	14%	204	3%
30-39	4,080	17%	1,081	15%	2,434	22%	565	10%
40-49	6,225	26%	1,806	25%	2,758	25%	1,661	28%
50-59	6,940	29%	2,202	31%	2,597	24%	2,141	36%
60-69	3,508	15%	1,277	18%	1,199	11%	1,032	17%
70+	771	3%	170	2%	271	3%	330	6%
Missing	8	<1%	0	0%	8	<1%	0	0%
Birth Cohort								
Gen Alpha	9	<1%	0	0%	9	<1%	0	0%
Gen Z	201	1%	29	0%	166	2%	6	<1%
Millennials	3,396	14%	873	12%	2,330	21%	193	3%
Gen X	4,632	19%	1,354	19%	2,648	24%	630	11%
Baby Boomers	14,253	59%	4,646	65%	5,282	49%	4,325	73%
Greatest/Silent	1,503	6%	287	4%	434	4%	785	13%
Race/Ethnicity								
AI/AN	454	2%	15	<1%	195	2%	156	3%
Asian	1,013	4%	490	7%	322	3%	201	3%
Black	3,422	14%	1,131	16%	1,235	11%	1,056	18%
Hispanic or Latinx (all races)	1,068	5%	342	5%	493	5%	233	4%
NHPI	45	<1%	15	<1%	18	<1%	12	<1%
White	11,054	46%	3,732	52%	4,398	41%	2,924	49%
Another race	614	3%	262	4%	295	3%	57	1%
Missing/Unknown	6,327	26%	1,114	16%	3,913	36%	1,300	22%
Race/Ethnicity (excluding people with missing information)								
Subtotal	17,670	100%	6,075	100%	6,956	100%	4,639	100%
AI/AN	454	3%	15	2%	195	3%	156	3%
Asian	1,013	6%	490	8%	322	5%	201	4%
Black	3,422	19%	1,131	19%	1,235	18%	1,056	23%
Hispanic or Latinx (all races)	1,068	6%	342	6%	493	7%	233	5%
NHPI	45	<1%	15	<1%	18	<1%	12	<1%
White	11,054	63%	3,732	61%	4,398	63%	2,924	63%
Another race	614	3%	262	4%	295	4%	57	1%

Technical Notes for Table 1

- ^A 'Ever diagnosed' refers to persons who have ever had laboratory evidence of hep C viral infection in PHSKC reporting system.
- ^B 'Presumed cured' refers to living persons with laboratory evidence of viral clearance with an RNA positive, followed by a subsequent RNA negative test result.
- ^C 'Living with hep C' refers to persons with confirmed detectable hep C virus and no reported laboratory evidence of viral clearance, and include cases classified as reinfections.

Abbreviations: AI/AN = American Indian/ Alaska Native, NHPI = Native Hawaiian or Pacific Islander

Note: Race/ethnicity is single category only, which limits multiracial individuals to one category. Race and ethnicity are captured in two separate variables. AIAN, Asian, Black, NHPI, White, or Another race exclude Hispanic or Latinx. Individuals with Hispanic or Latinx ethnicity are grouped in the Hispanic or Latinx race/ethnicity category, regardless of their reported race category.

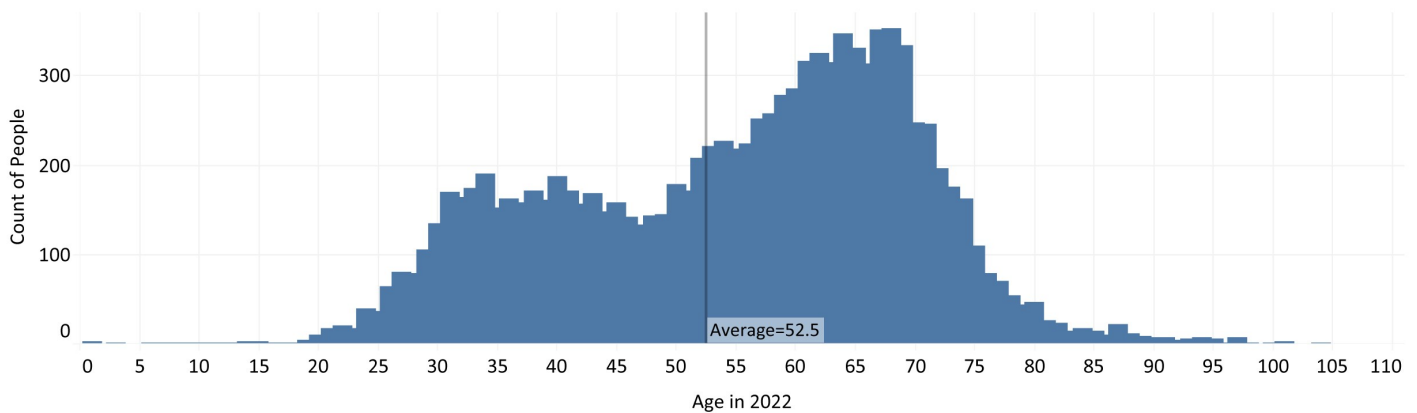
People Living with Hepatitis C

This section summarizes demographic characteristics of people with diagnosed, untreated hep C who were alive at the end of 2022. As indicated above, PHSKC estimates that there are approximately 4,456 people living with confirmed, untreated hep C in King County; however, we are not able to generate patient-level demographic data

for this population-level estimate. Therefore, we present data on the 10,869 individuals with confirmed hep C identified through laboratory data.

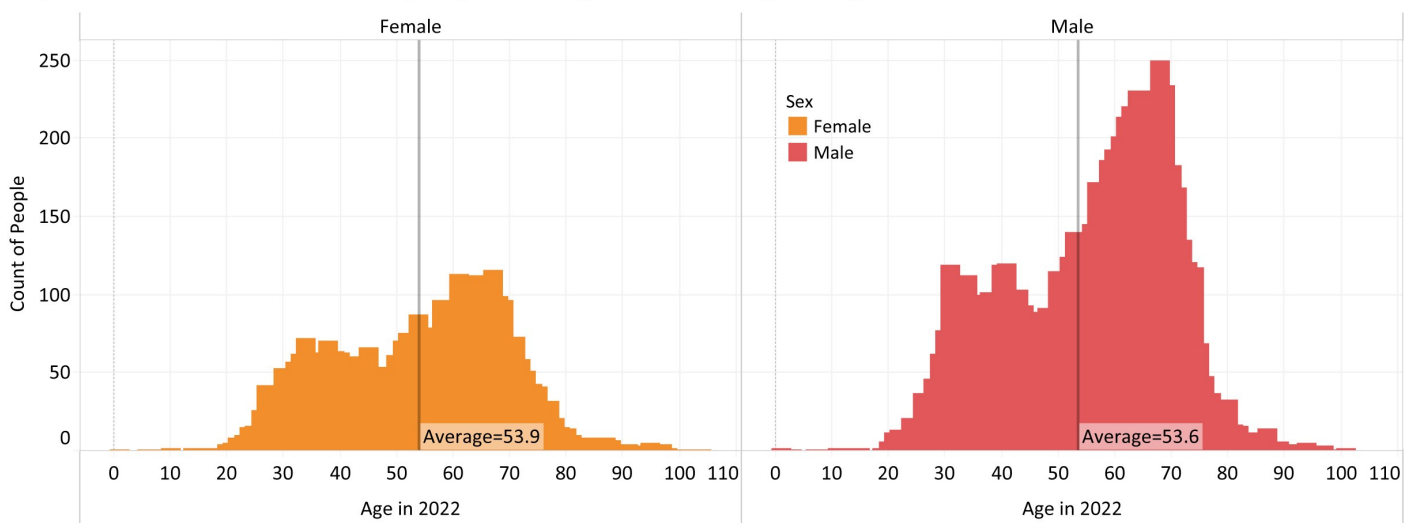
FIGURE 8. UNTREATED CONFIRMED HEPATITIS C IN KING COUNTY BY CURRENT AGE AND REPORTED SEX, 1989-2022

People with Untreated Confirmed Hep C by Current Age* in King County, 1989-2022



*Age is calculated as the difference from 12/31/2022 and the patient's reported date of birth.

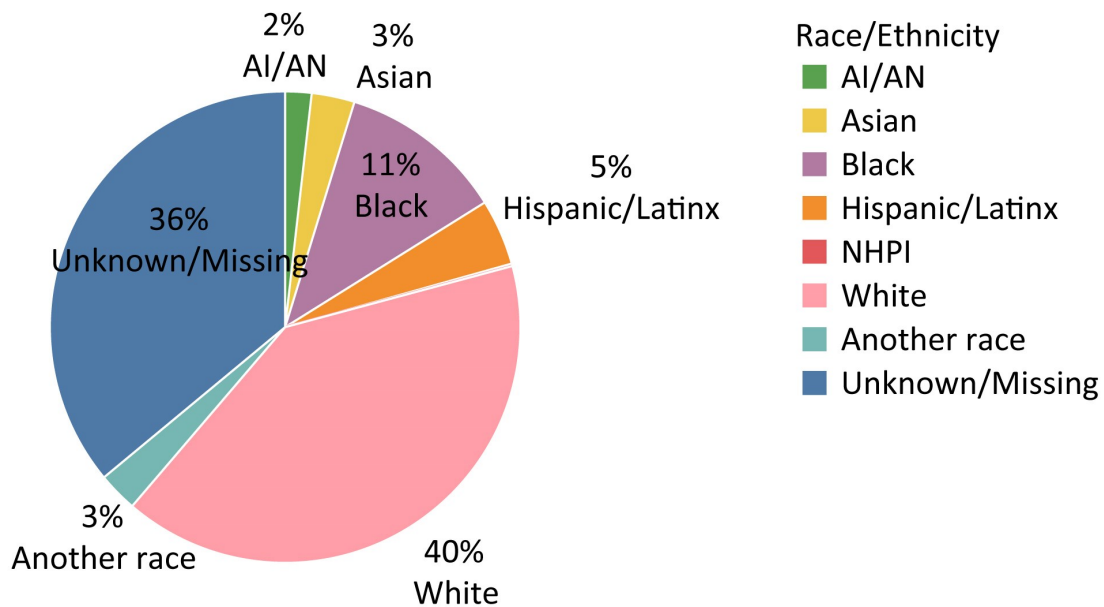
People with Untreated Confirmed Hep C by Current Age and Sex in King County, 1989-2022



Among all living individuals with untreated confirmed hep C in King County from 1989-2022, the average current age as of 12/31/2022 is 52.5 years (median 58) (Figure 8). Age distribution by sex shows a bimodal curve with two age peaks across sexes, at 34 years and 67 years among females and at 31 and 41 years and 68

years among males, with a more pronounced bimodal distribution among males. Among all people with untreated confirmed hep C, baby boomers comprise the largest group (49% of cases), followed by Generation X (24%) and millennials (21%).

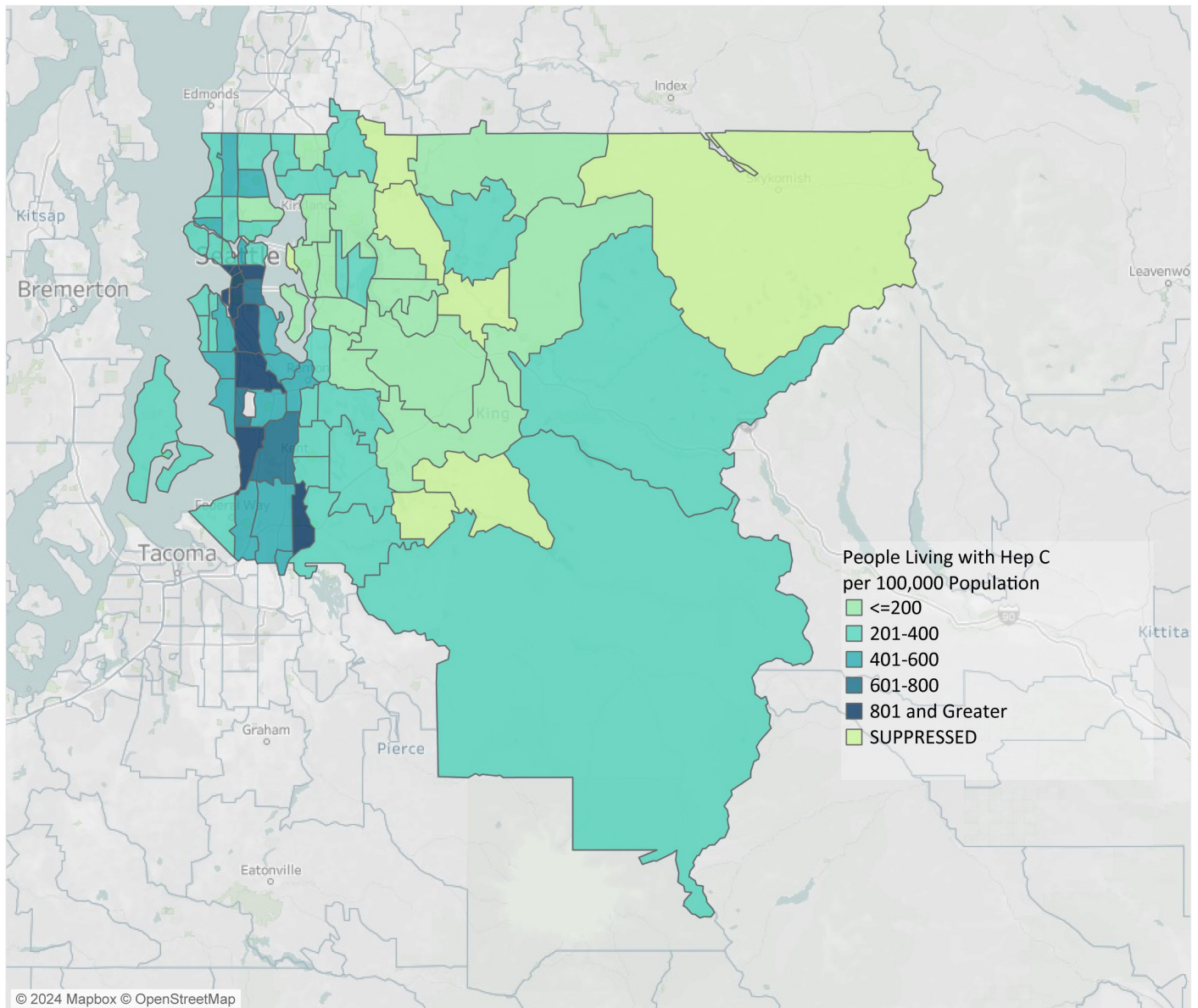
FIGURE 9. UNTREATED CONFIRMED HEPATITIS C IN KING COUNTY BY REPORTED RACE AND ETHNICITY, 1989-2022



Abbreviations: AI/AN = American Indian/ Alaska Native; NHPI = Native Hawaiian or Pacific Islander.

While more than 26% of race and ethnicity data are missing for all hep C diagnoses (Table 1), 36% of race and ethnicity data are missing for cases that have not been treated. It is likely that the missingness across racial and ethnic identities is not equally distributed.¹⁹ However, based on the available data, Black and AI/AN individuals appear to be disproportionately impacted. Among individuals living with untreated confirmed hep C, 11% are Black and 2% are AI/AN. White individuals comprise the greatest number of people living with untreated hep (n=4,398), which is consistent with the overall demographics of King County.²⁰

FIGURE 10. UNTREATED CONFIRMED HEPATITIS C RATE PER 100,000 POPULATION BY ZIP CODE IN KING COUNTY, 1989-2022



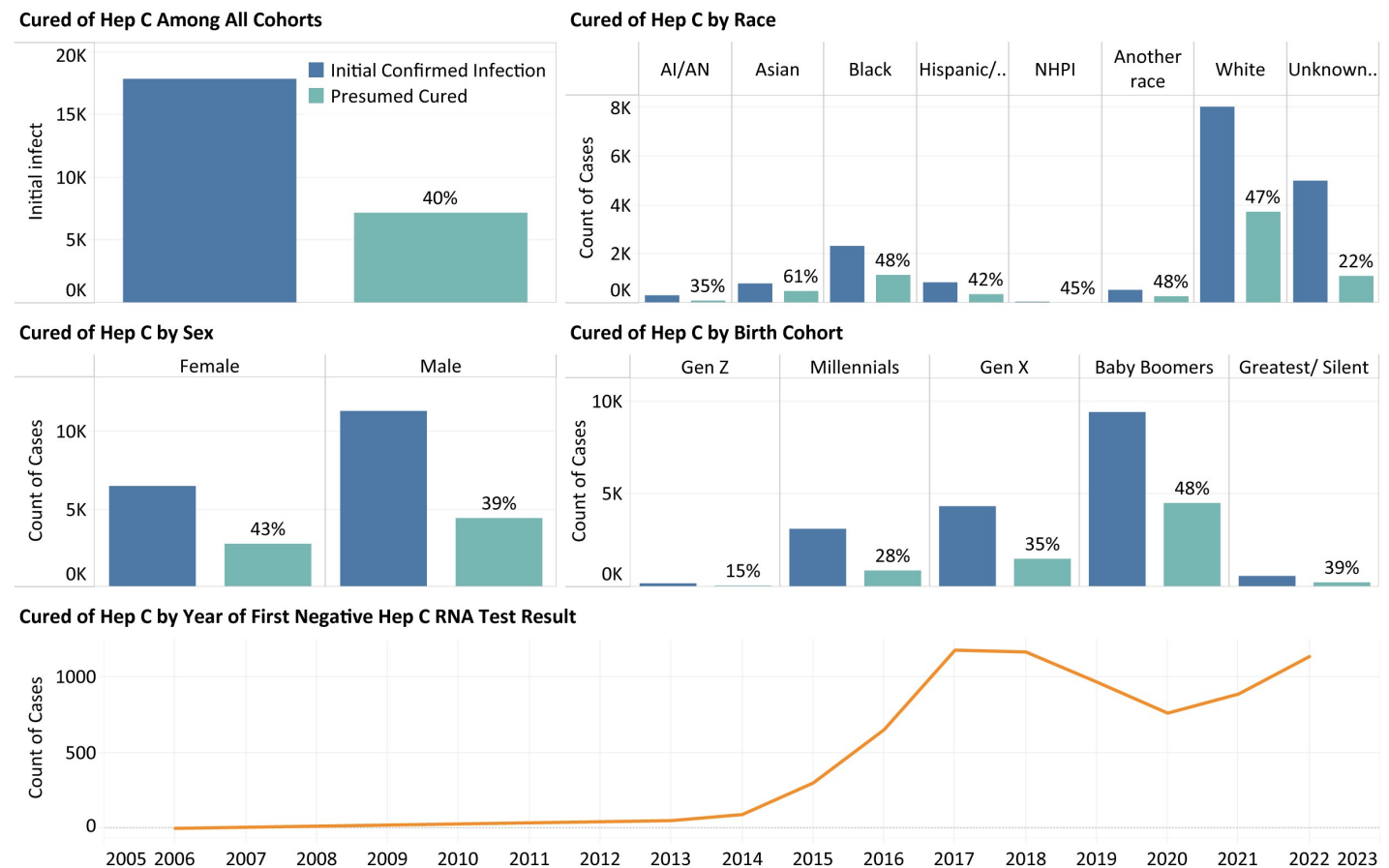
Note: The following zip codes have small populations: 98050, 98039, 98288, 98195, and 98224. A rate based on a very small number of hep C infections reported in the listed zip codes (<20) may make the rate statistically unstable and thus suppressed.

South King County and central Seattle have the highest rates of people living with hep C per 100,000 population across the county. Approximately 30% of people living with untreated confirmed hep C live in six zip codes (98104, 98101, 98198, 98168, 98122, 98002), and 50% live in the 14 zip codes of Seattle and South King County that follow the Interstate-5 corridor. Population demographics in these areas have higher proportions of people living below the poverty line than in King County overall.²¹ PHSKC is pursuing data enhancements, such as improved housing status and address data, to better understand the intersection of sociodemographic and spatial patterns.

Hepatitis C Treatment and Cure

This section presents data on cure rates, overall and stratified by select demographics characteristics, for the 7,189 people alive at the end of 2022 who were presumed cured of hep C. Cure is defined based on a reported negative or undetectable hep C RNA test result 180 or more days after a reported positive hep C RNA test result.

FIGURE 11. CHARACTERISTICS OF INDIVIDUALS CURED OF HEPATITIS C, KING COUNTY, 1989-2022



Note: Low counts of 'unknown/missing' demographic data are excluded. All charts exclude deceased individuals.
Abbreviations: AI/AN = American Indian/ Alaska Native; NHPI = Native Hawaiian or Pacific Islander

Overall, 40% of all individuals with confirmed hep C who were alive at the end of 2022 are presumed to have been cured. Cure rates are highest among baby boomers, the birth cohort for which screening has been recommended and promoted for the longest, although only 48% of individuals with reported hep C in this generation have evidence of being cured. Females have slightly higher cure rates than males (43% versus 39%).

individuals cured was similar in White and Black individuals (47% and 48%) but was lower in American Indian/Alaska Native individuals (35%). Cure rates were substantially lower among individuals with missing race and ethnicity data.

As highlighted previously, it is difficult to make inferences about race and ethnicity disparities due to the significant amount of missing demographic data. However, among individuals with known reported race, the percentage of

Perinatal Hepatitis C

An estimated 6%–7% of all perinatally exposed infants and children will develop hep C infection.²² Curative DAA therapy can be administered beginning at age 3 years; however, many perinatally exposed infants and children are not tested for hep C infection and are consequently not referred for hep C care and treatment. In response to a 20% increase of acute hep C infection among reproductive-aged people in the US from 2016-2020, the CDC updated screening recommendations in 2020 to recommend universal hep C screening for all adults, including screening pregnant people during each pregnancy.²³ In November of 2023, CDC updated testing recommendations for infants and children born to hep C-infected pregnant people.²²

Recognizing hep C during pregnancy is an important step in identifying hep C among exposed infants and may serve as a linkage pathway to curative treatment for the pregnant person post-partum as hep C treatment is not well-studied in pregnant people and thus, not currently recommended during pregnancy.²⁴ The testing necessary to diagnosis infants can be complex. For example, RNA testing prior to 2 months of age can result in false negative results and antibody testing can result in false

positive results as infants can carry the antibodies of their birth parent. The current recommendation is to test for hep C RNA at 2-6 months.²²

Table 2 presents the hep C status of perinatally exposed infants reported to PHSKC since 1993. The table is divided into two time periods, 1993-2013, which is before PHSKC routinely received negative RNA results, and 2014-2022, when more systematic reporting of negative hep C RNA results began, thus reducing the number of indeterminate results for infants. Since 1993, PHSKC received a total of 222 reports of infants perinatally exposed to hep C. Of those exposed infants, 16 (7%) were presumed to be infected (hep C RNA positive lab reports). An additional 31 infants had indeterminate status based on lab-reporting (only positive antibody testing reported), 20 of which occurred before PHSKC started consistently receiving negative RNA reports; many of those infants likely had negative RNA results that were not reported to PHSKC.

TABLE 2. HEP C STATUS OF PERINATALLY EXPOSED INFANTS

Report Period	Confirmed Hepatitis C - [*]	Confirmed Hepatitis C + ^α	Indeterminate ^β
1993-2013	36	10	20
2014-2022	139	6	11
Total	175	16	31

^{*}Confirmed Hepatitis C– includes infants who had an undetectable hep C RNA test result.
^αConfirmed Hepatitis C+ includes infants who had a detectable hep C RNA test result.
^β Indeterminate includes infants who received a reactive antibody hep C test, but never received a subsequent hep C RNA test.

PHSKC Program Highlight:

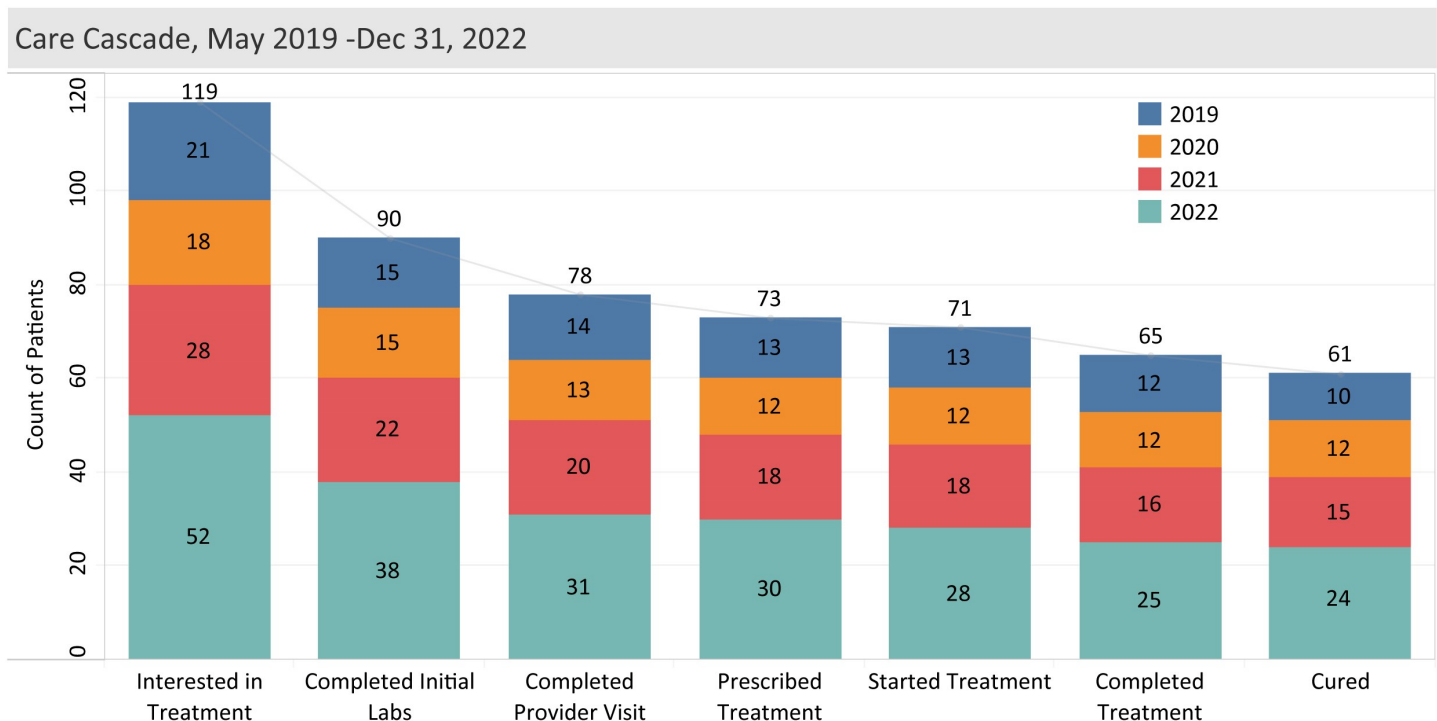
Hepatitis C Treatment at the Robert Clewis Center

Since 2019, the King County Syringe Services Program (SSP) at the Robert Clewis Center has offered hep C treatment to SSP clients in a low-stigma and non-judgmental setting. The King County SSP is operated by PHSKC and has locations in downtown Seattle, Capitol Hill, and South Seattle/South King County. The program serves people who use drugs, providing clients with clean syringes and works, social services, naloxone, safer smoking supplies, referrals for substance use treatment, and limited medical services. In addition to hep C treatment, medical services include wound care and HIV, viral hepatitis, and syphilis testing.²⁵ The program is co-located in the same building as *Bupe Pathways*, which offers low-threshold access to buprenorphine, a medication for opioid use disorder.

Hep C treatment is supported through a public health nurse who works directly with a physician to evaluate SSP

clients with hep C for an 8-week treatment regimen. The hep C treatment program is designed to provide clients with low-barrier access to treatment, including flexible coordination of medication pick-up and storage. The main contributions of this program are making services accessible to people who face multiple challenges to engaging in care. Many clients are transient and use different services at different times, requiring several touch points for optimum support throughout the treatment process. Since 2019, the program has initiated hep C treatment for 73 people, including 30 people in 2022 (Figure 12) and 65 clients have completed treatment. Since its inception, the program has cured 61 individuals of hep C infection (confirmed via SVR lab testing). Additionally, every year there has been an increase in people interested in treatment and those who complete treatment and achieve cure.

FIGURE 12. CARE CASCADE AMONG PEOPLE EVALUATED FOR HEPATITIS C AT THE KING COUNTY SYRINGE SERVICES PROGRAM, 2019-2022



Data Limitations and Considerations

The data presented in this report are subject to a number of limitations.

- **Status classification is only as good as our data.** An individual's hep C infection status is based solely on lab test results reported to WA DOH/PHSKC. Individuals who received treatment, but did not have post-treatment lab testing to assess sustained virologic response (SVR) are misclassified in public health surveillance as living with untreated hep C. Likewise, people who may have spontaneously cleared the virus but have not had follow up hep C RNA testing would be misclassified as living with untreated confirmed hep C.
- **It is challenging to estimate the true number of King County residents living with hepatitis C.** While hep C is a notifiable condition in Washington state, not everyone at risk is screened for the infection and people move in and out of the jurisdiction. To improve surveillance data, PHSKC linked hepatitis C reports and Washington state death certificate data to identify people with hep C who have died. However, this effort would not have identified individuals who died outside of Washington state, and such people would still be classified as living in King County.
- **Data gaps impact conclusions.** Many laboratories reporting hep C lab test results provide information on an individual's sex, but do not capture data on gender identity. In addition, data on race and/or ethnicity are often missing. This lack of information makes it difficult, and in the case of gender identity impossible, to estimate disparities or identify groups who are disproportionately impacted by hep C. Additionally, hep C treatment is not an event reportable to Public Health. As a result, it is not possible to estimate the number of individuals receiving treatment. With current data reporting requirements, it is not possible to definitively distinguish between people who spontaneously cleared hep c versus those that were cured through treatment.

Future Directions

This initial hep C surveillance report is an important starting place for monitoring progress towards the goal of hep C elimination. With approximately 4,500 people living with diagnosed and untreated hep C in King County, our community has many opportunities to improve linkage and access to care through collaborations that include PHSKC, community, and medical providers. Although baby boomers have received the most treatment, comprising 65% of those presumed to be cured, a large number remain untreated. Additionally, there is a growing number of diagnoses among younger adults (millennials and Gen Z) who use injection drugs. This population needs new approaches to care designed to accommodate the competing priorities that impact the population's ability to successfully receive medical care.

Over the last year, the PHSKC HIV/STI/Hepatitis C program has expanded our hep C related work to

emphasize testing and treatment. The program's limited capacity for epidemiologic investigations has shifted from a focus on investigating potential acute hep C infections to using case investigations to improve hep C surveillance and develop an effective system to link untreated persons to hep C care. This approach prioritizes the use of person-level longitudinal hep C lab test results to monitor population-level hep C treatment and identify individuals who require linkage to care.

In the coming year, PHSKC will convene a group of key stakeholders to better define a local hep C elimination strategy, collaborate with local healthcare organizations and community groups to promote testing and treatment, and work to improve our epidemiologic data quality and completeness to better focus disease intervention and monitor our progress towards hep C elimination.

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