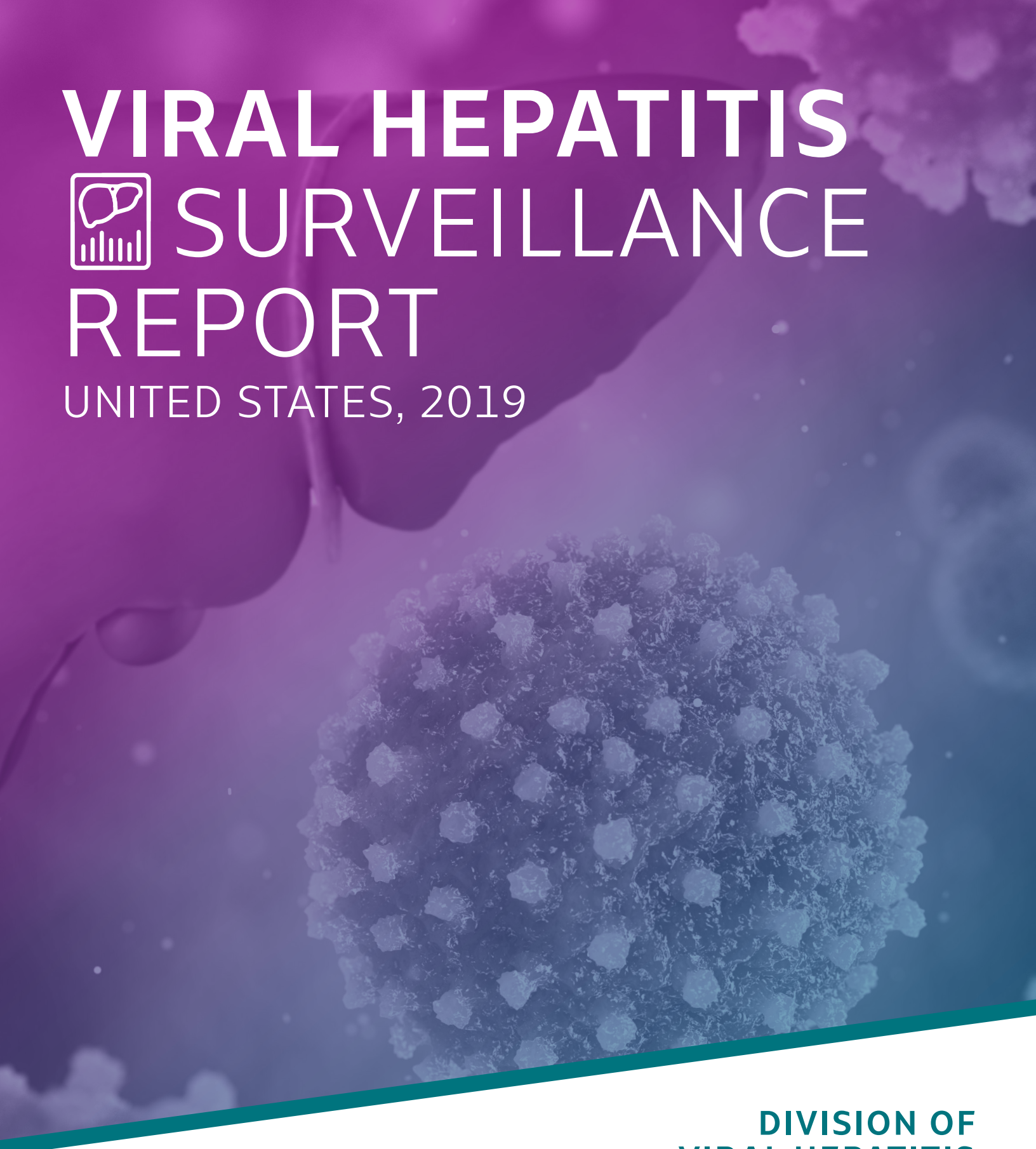
VIRAL HEPATITIS SURVEILLANCE REPORT

UNITED STATES, 2019



DIVISION OF VIRAL HEPATITIS

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

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UNITED STATES, 2019

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BACKGROUND

Hepatitis A is a vaccine-preventable liver disease caused by the hepatitis A virus (HAV). HAV is usually transmitted person-to-person through the fecal–oral route or through consumption of contaminated food or water. The majority of adults and older children with hepatitis A have symptoms that usually resolve ≤2 months after infection; children aged <6 years usually do not have symptoms, or they have an unrecognized infection. Signs and symptoms associated with hepatitis A can include ≥1 of the following: fever, fatigue, nausea, vomiting, loss of appetite, abdominal pain, dark urine, and clay-colored stools. Hepatitis A is a self-limited disease that does not result in chronic infection. Treatment for HAV infection might include rest, adequate nutrition, and fluids. Hospitalization might be required for more severe cases. The best way to prevent hepatitis A is by being vaccinated[1].

Hepatitis B is a vaccine-preventable liver disease caused by the hepatitis B virus (HBV). HBV is transmitted when blood, semen, or another body fluid from a person infected with the virus enters the body of someone who is uninfected. This can happen through sexual contact; sharing needles, syringes, or other drug-injection equipment; or from mother to baby at birth. For some persons, hepatitis B is an acute, or short-term, illness; for others, it can become a long-term, chronic infection. Chronic hepatitis B can lead to serious health problems, including cirrhosis, liver cancer, and death. Treatments are available, but no cure exists for hepatitis B. The best way to prevent hepatitis B is by being vaccinated[2,3].

Hepatitis C is a liver disease caused by the hepatitis C virus (HCV). HCV is a bloodborne virus. Today in the United States, the majority of persons become infected with HCV by sharing needles or other equipment used in injecting drugs[4]. For certain persons, hepatitis C is a short-term illness, but for >50% of persons who become infected with the HCV, it becomes a long-term, chronic infection[5]. Like chronic hepatitis B, chronic hepatitis C is a serious disease that can result in cirrhosis, liver cancer, and death. Persons might not be aware of their infection because they are not clinically ill. However, since 2013, a highly effective, well-tolerated curative treatment has been available for hepatitis C, but no vaccine for preventing hepatitis C is yet available[6]. The best way to prevent hepatitis C is by avoiding behaviors that can spread the disease, especially injecting drugs.

Key facts about hepatitis A, hepatitis B, and hepatitis C

Characteristic	Hepatitis A	Hepatitis B	Hepatitis C
Main route(s) of transmission	Fecal-oral	Blood, sexual	Blood
Incubation Period	15–50 days (average: 28 days)	60–150 days (average: 90 days)	14–182 days (average range: 14–84 days)
Symptoms of Acute Infection	Symptoms are similar and can include ≥1 of the following: jaundice, fever, fatigue, loss of appetite, nausea, vomiting, abdominal pain, joint pain, dark urine, clay-colored stools, diarrhea (hepatitis A only)		
Perinatal transmission	No	Yes	Yes
Vaccine available	Yes	Yes	No
Treatment	Supportive care	Yes, not curative	Yes, curative

NATIONAL PROFILE OF VIRAL HEPATITIS, 2019

The Centers for Disease Control and Prevention (CDC) collects, analyzes, and disseminates viral hepatitis surveillance data. Each week, staff at health departments submit case reports of viral hepatitis to CDC through the National Notifiable Diseases Surveillance System (NNDSS). The annual surveillance report, published by the CDC, summarizes information about reported cases of hepatitis A, hepatitis B, and hepatitis C and deaths with any of these hepatitides listed as a cause of death in CDC's National Vital Statistics System (NVSS). These surveillance data are used by public health partners to help focus prevention efforts, plan services, allocate resources, develop policy, and detect and respond to clusters of viral hepatitis infection. These actions support the goal of CDC's Division of Viral Hepatitis 2020 - 2025 Strategic Plan[7] for establishing comprehensive national viral hepatitis surveillance for public health action.

The *2019 Viral Hepatitis Surveillance Report* contains 21 tables and 25 figures, and there are some notable additions to the *2018 Viral Hepatitis Surveillance Report*[8]. For the first time, the Surveillance Report describes demographic characteristics of persons with chronic hepatitis B and chronic hepatitis C by age group, sex, race/ethnicity, and US Department of Health and Human Services regions. Additionally, the number and rates of viral hepatitis cases by urbanicity status is included for hepatitis A, acute and chronic hepatitis B, and acute and chronic hepatitis C infections. Finally, outcome data from CDC's Perinatal Hepatitis B Prevention Program for infants born during 2018 to persons with HBV infection are reported from 64 jurisdictions.

A Hepatitis A

During 2019, a total of 18,846 hepatitis A cases were reported to CDC, corresponding to 37,700 estimated infections (95% confidence interval [CI]: 26,400–41,500) after adjusting for case underascertainment and underreporting (see Technical Notes)[9]. The reported case count corresponds to a rate of 5.7 cases per 100,000 population, a 1,325% increase from the reported rate of 0.4 cases per 100,000 population during 2015. This increase was primarily driven by widespread person-to-person outbreaks of hepatitis A that have been unprecedented since introduction of the hepatitis A vaccine. These outbreaks are primarily occurring among persons who use drugs and those experiencing homelessness, resulting in prolonged community outbreaks in multiple states[10] that have been difficult to control. Approximately 75% of hepatitis A cases reported to CDC during 2019 occurred among persons aged 20–49 years, and 73% occurred among non-Hispanic White persons. Among the 10,991 (58%) reported cases that included risk information for injection drug use, 5,017 (46%) reported injection drug use. A total of 9,380 patients were hospitalized (64% hospitalization rate among the 14,619 cases with hospitalization information available).

Data from death certificates filed in the vital records offices of the 50 states and the District of Columbia revealed that the age-adjusted death rate associated with hepatitis A during 2019 among US residents was 0.04 deaths per 100,000 population, which is 4 times the rate of 0.01 deaths per 100,000 population during 2015.

B Hepatitis B

Reported cases of acute hepatitis B virus infection decreased after routine vaccination of children was recommended in 1991, and the number of cases became relatively stable during 2010–2019. During 2019, a total of 3,192 acute hepatitis B cases were reported to CDC, resulting in 20,700 estimated infections (95% CI: 11,800–50,800) after adjusting for case underascertainment and underreporting (see Technical Notes)[9]. The reported case count

corresponded to a rate of 1.0 per 100,000 population. Approximately 80% of acute hepatitis B cases reported to CDC during 2019 occurred among persons aged 30–59 years. The rate of acute hepatitis B was highest among non-Hispanic White persons (1.0 case per 100,000 population), compared with other racial/ethnicity groups. Among the 1,780 (56%) reported cases that included risk information for injection drug use, 631 (35%) reported injection drug use. A total of 1,427 patients with acute hepatitis B were hospitalized (64% hospitalization rate among 2,234 cases with hospitalization information available).

A total of 13,859 new cases of chronic hepatitis B were reported to CDC during 2019, corresponding to a rate of 5.9 cases per 100,000 population; 47% occurred among persons aged 30–49 years. The rate of new chronic hepatitis B was highest among Asian/Pacific Islander persons (18.9 cases per 100,000 population), which was >10 times the rate among non-Hispanic White persons (1.8 cases per 100,000 population).

A total of 17 perinatal hepatitis B cases were reported through NNDSS to CDC during 2019. Among the 9,950 infants born during 2018 and managed by 64 jurisdictions in the Perinatal Hepatitis B Prevention Program (see Supplement), 97% had received recommended prophylaxis at birth; 87% had completed 3 doses of vaccine by age 12 months; and 69% had received recommended post-vaccination serologic testing. Among those with post-vaccination testing (6,828), 23 (0.3%) were cases of perinatal hepatitis B transmission.

Data from death certificates filed in the vital records offices of the 50 states and the District of Columbia demonstrated that the age-adjusted death rate associated with hepatitis B during 2019 among US residents was 0.42 deaths per 100,000 population, approximately the same as the rate of 0.43 deaths per 100,000 population during 2018.

Hepatitis C

During 2019, a total of 4,136 acute hepatitis C cases were reported to CDC, corresponding to 57,500 estimated infections (95% CI: 45,500–196,000) after adjusting for case underascertainment and underreporting (see Technical Notes)[9]. The reported acute hepatitis C case count corresponds to a rate of 1.3 cases per 100,000 population, a 63% increase from the reported rate of 0.8 cases per 100,000 population during 2015. Approximately 63% of acute hepatitis C cases reported to CDC during 2019 were among persons aged 20–39 years. The rate of acute hepatitis C was highest among American Indian/Alaska Native persons (3.6 cases per 100,000 population), compared with other racial/ethnicity groups. Among the 1,952 (47%) reported acute cases that included risk information for injection drug use, 1,302 (67%) reported injection drug use. A total of 1,041 patients with acute hepatitis C were hospitalized (48% hospitalization rate among 2,156 cases with hospitalization information available).

A total of 123,312 new cases of chronic hepatitis C were reported to CDC during 2019, corresponding to a rate of 56.7 cases per 100,000 population. The rate of newly reported chronic hepatitis C was highest among persons aged 30–39 years (109.1 cases per 100,000 population), followed by persons aged 50–59 years (79.6 cases per 100,000 population), compared with other age categories. These rates are consistent with the previously reported bimodal distribution of newly reported chronic hepatitis C affecting multiple generations[11]. The rate of newly reported chronic hepatitis C cases was highest among American Indian/Alaska Native persons (86.7 cases per 100,000 population), compared with other racial/ethnicity categories.

A total of 217 perinatal hepatitis C cases were reported to CDC during 2019, the second year that standardized surveillance for perinatal hepatitis C was conducted by states and case notifications submitted to CDC. Data from death certificates filed in the vital records offices of the 50 states and the District of Columbia indicated that the age-adjusted death rate for hepatitis C during 2019 was 3.33 deaths per 100,000 population, representing a 32% decrease from the mortality rate during 2015 (4.91 deaths per 100,000 population).

TECHNICAL NOTES

Case Ascertainment and Case Reporting

For health department staff to report cases of viral hepatitis to CDC, systems and processes must be in place that ensure each case is detected. Because of varying state laws, resources, and infrastructure, not all health departments report all cases of acute or chronic viral hepatitis to CDC. Additionally, diagnosing every acute case is impossible, because symptoms might be either so mild that the person does not seek care or too vague to prompt a health care provider to suspect and test for viral hepatitis.

Case reporting begins when a local or state health department receives a positive laboratory report, indicating a person has a viral hepatitis infection. Because initial reporting provides limited information and clinical symptoms are frequently needed for classifying cases as acute, reported cases might require extensive follow-up to obtain full information for establishing case status and case classification.

Health departments prioritize cases for follow-up by using their own protocols and might submit cases to CDC with incomplete or missing information. Additionally, the volume of laboratory reports for chronic viral hepatitis infections might be so large that not all health departments are able to consistently detect and report all chronic cases to CDC; for example, during 2019, only 14 states (Florida, Georgia, Indiana, Kentucky, Louisiana, Massachusetts, New Jersey, North Carolina, Oklahoma, Ohio, Tennessee, Utah, Washington, and West Virginia) received federal funding for supporting viral hepatitis surveillance. Also, because case notifications for the 2019 reporting year were open for submission through December 10, 2020, the COVID-19 pandemic possibly affected a health department's ability to investigate and report cases in its jurisdiction. Data regarding chronic hepatitis B and hepatitis C infections are included in this report where available; however, these are newly identified chronic viral hepatitis cases and do not measure prevalence.

All viral hepatitis conditions with no reported cases or characterized as Not Reportable or Data Unavailable for 2019 in a jurisdiction's final signed report to CDC's National Center for Surveillance, Epidemiology, and Laboratory Services (CSELS) were reported according to the following notation used by CSELS[12]:

— : **No reported cases.** The reporting jurisdiction did not submit any cases to CDC.

N : **Not reportable.** The disease or condition was not reportable by law, statute, or regulation in the reporting jurisdiction.

U : **Unavailable.** The data are unavailable.

For 2019, CSELS additionally reported "The following 23 jurisdictions may have incomplete data, due to the coronavirus disease 2019 (COVID-19) pandemic: Alaska, California, Connecticut, District of Columbia, Florida, Idaho, Indiana, Kansas, Massachusetts, Minnesota, Missouri, Montana, Nebraska, New Hampshire, New York (excluding New York City), New York City, North Dakota, Ohio, Oklahoma, South Carolina, Tennessee, Texas, and West Virginia."[12]

Urbanicity: Urban and rural categorization was made according to CDC's 2013 National Center for Health Statistics urban-rural classification scheme for counties and county-equivalent entities. Large central metropolitan, large fringe metropolitan, medium metropolitan, and small metropolitan counties were grouped as urban. Micropolitan and noncore counties were grouped as rural.

US Department of Health and Human Services regions provide a standardized structure for grouping jurisdictions into larger geographic areas. Ten regional offices directly serve state and local organizations.

Region	Regional Office	State/Jurisdiction
1	Boston	Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont
2*	New York	New Jersey, New York, Puerto Rico, Virgin Islands
3	Philadelphia	Delaware, District of Columbia, Maryland, Pennsylvania, Virginia, West Virginia
4	Atlanta	Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee
5	Chicago	Illinois, Indiana, Michigan, Minnesota, Ohio, Wisconsin
6	Dallas	Arkansas, Louisiana, New Mexico, Oklahoma, Texas
7	Kansas City	Iowa, Kansas, Missouri, Nebraska
8	Denver	Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming
9*	San Francisco	Arizona, California, Hawaii, Nevada, American Samoa, Commonwealth of the Northern Mariana Islands, Federated States of Micronesia, Guam, Marshall Islands, Republic of Palau
10	Seattle	Alaska, Idaho, Oregon, Washington

*US territories are not included in this report.

Case Definitions

To ensure consistent reporting across states, the Council for State and Territorial Epidemiologists, in collaboration with CDC, developed case definitions for viral hepatitis A, hepatitis B, and hepatitis C. The case definitions facilitate standardized reporting by using uniform criteria and differentiating between acute, chronic, and perinatal cases. When new technologies are developed for laboratory testing or better clinical data become available, the case definitions are updated. Changes in case definitions should be considered when examining temporal trends. For more information regarding 2019 case definitions, visit the National Notifiable Diseases Surveillance System's website. No changes to case definitions were implemented for acute or chronic viral hepatitis during 2019.

Estimating Incidence of Acute Viral Hepatitis

To account for underascertainment and underreporting, a probabilistic model for estimating the true incidence of acute hepatitis A, hepatitis B, and hepatitis C from reported cases has been published previously[9]. The model includes the probabilities of symptoms, referral to care and treatment, and rates of reporting to local and state health departments. The published multipliers have since been corrected by CDC to indicate that each reported case of acute hepatitis A represents 2.0 estimated infections (95% bootstrap CI: 1.4–2.2); each reported case of acute hepatitis B represents 6.5 estimated infections (95% bootstrap CI: 3.7–15.9); and each reported case of acute hepatitis C represents 13.9 estimated infections (95% bootstrap CI: 11.0–47.4).

Mortality Surveillance

The NVSS provides information regarding deaths that occur in the United States. NVSS data in this report are from the 2015–2019 Multiple Cause of Death files in the CDC WONDER online database[13]. These data are based on information from all death certificates filed in the vital records offices of the 50 states and the District of Columbia through the Vital Statistics Cooperative Program. Deaths of nonresidents (e.g., nonresident aliens, nationals living abroad, or residents of US territories) and fetal deaths are excluded.

Perinatal Hepatitis B Prevention Program Surveillance

Outcome data regarding infants born to mothers with HBV infection are reported by the CDC Perinatal Hepatitis B Prevention Program. This program funds 64 jurisdictions to identify pregnant women infected with HBV and to case-manage their infants to improve receipt of postexposure prophylaxis, hepatitis B vaccine series completion, and post-vaccination serologic testing. Data in this report are from the reporting period for

the 2018 birth cohort, followed from January 1, 2018, through December 31, 2019, and only includes infants managed by the program. Infants have variable lengths of follow-up time, depending on their date of birth. More information is available at the Perinatal Hepatitis B Prevention Program website.

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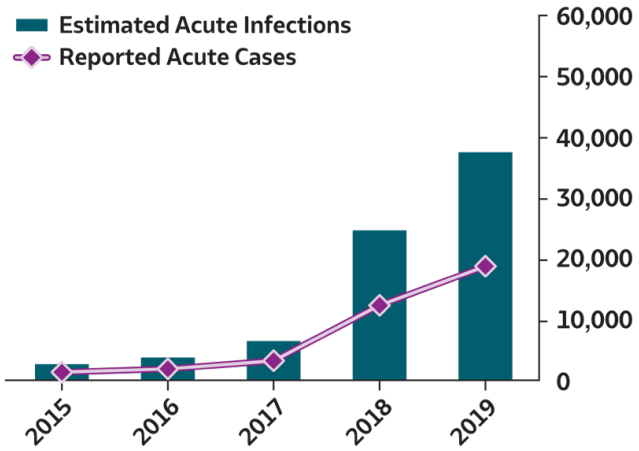
SUMMARY 2019
Viral Hepatitis Acute Infections

A Hepatitis A

18,846 Acute Cases Reported in 2019

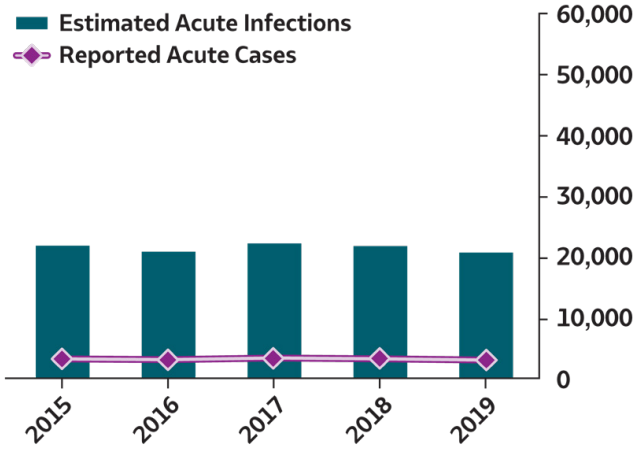
37,700 Acute Infections Estimated in 2019
(26,400 – 41,500)*



B Hepatitis B

3,192 Acute Cases Reported in 2019

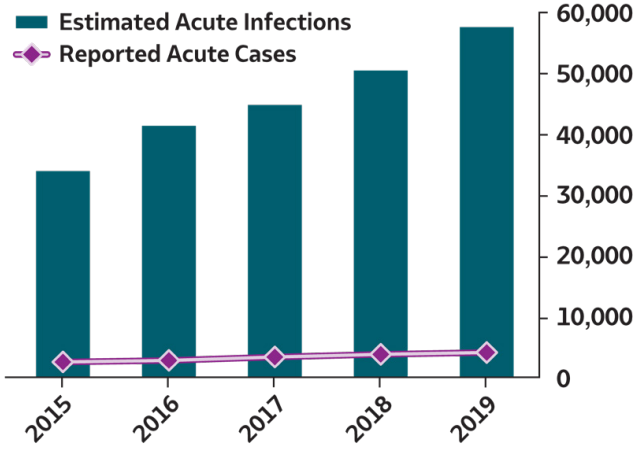
20,700 Acute Infections Estimated in 2019
(11,800 – 50,800)*



C Hepatitis C

4,136 Acute Cases Reported in 2019

57,500 Acute Infections Estimated in 2019
(45,500 – 196,000)*



*95% Bootstrap Confidence Interval

HEPATITIS A, 2019

18,846 Acute cases reported

5.7 Reported cases per 100,000 population

37,700* Acute infections estimated

AT A GLANCE
HEPATITIS A in 2019

Hepatitis A incidence increased **1,325%** from 2015 through 2019. The increase in 2019 was because of unprecedented person-to-person outbreaks in **31** states primarily among people who use drugs and people experiencing homelessness.

GROUPS MOST AFFECTED
BY HEPATITIS A IN 2019

By Age†

20–29 years: 7.9 cases per 100,000 people

30–39 years: 14.5 cases per 100,000 people

40–49 years: 10.4 cases per 100,000 people

By Sex†

Males: 7.3 cases per 100,000 people

By Race/Ethnicity†

White, Non-Hispanic: 6.8 cases per 100,000 people

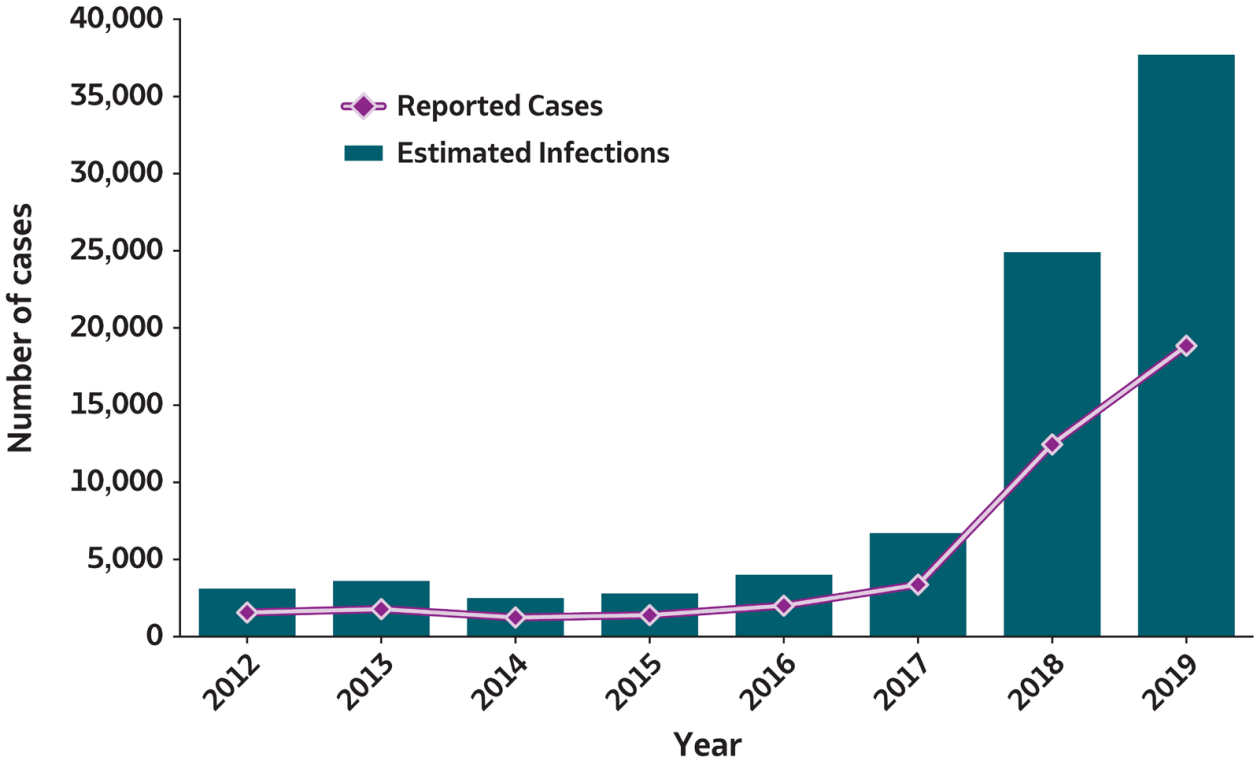
By Risk

Injection Drug Use (IDU):
Among the 10,991 reported cases with IDU information available, **5,017 (46%) reported IDU**

* 95% Bootstrap Confidence Interval: (26,400–41,500)

† Indicates groups at or above the US rate in 2019

Figure 1.1. Number of reported hepatitis A virus infection cases and estimated infections* — United States, 2012–2019



Hepatitis A	2012	2013	2014	2015	2016	2017	2018	2019
Reported cases	1,562	1,781	1,239	1,390	2,007	3,366	12,474	18,846
Estimated infections	3,100	3,600	2,500	2,800	4,000	6,700	24,900	37,700

Source: CDC, National Notifiable Diseases Surveillance System.

* The number of estimated viral hepatitis infections was determined by multiplying the number of reported cases that met the classification criteria for a confirmed case by a factor that adjusted for underascertainment and underreporting. The 95% bootstrap confidence intervals for the estimated number of infections are displayed in the Appendix.

During 2012–2015, the number of reported cases of hepatitis A ranged from approximately 1,200 to 1,800 cases yearly. The number of reported cases of hepatitis A began to increase during 2016, when 2 foodborne outbreaks were reported, and person-to-person outbreaks of hepatitis A, primarily among persons who use drugs and those experiencing homelessness, were first reported. Since then, person-to-person outbreaks have been reported in multiple states, resulting in substantial increases in hepatitis A. During 2019, the number of reported cases was 18,846, which corresponds to 37,700 estimated infections after adjusting for case underascertainment and underreporting. The number of reported cases during 2019 corresponds to a 51% increase from 2018 and is >13 times the number reported during 2015, before the person-to-person outbreaks were first reported.

Source: Klevens RM, Liu, S, Roberts H, et al. Estimating acute viral hepatitis infections from nationally reported cases. Am J Public Health 2014;104:482. PMC3953761. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3953761/pdf/AJPH.2013.301601.pdf

Table 1.1. Number and rates* of reported cases† of hepatitis A virus infection, by state or jurisdiction — United States, 2015–2019

State or Jurisdiction	2015		2016		2017		2018		2019	
	No.	Rate*	No.	Rate*	No.	Rate*	No.	Rate*	No.	Rate*
Alabama	23	0.5	19	0.4	23	0.5	38	0.8	242	4.9
Alaska	4	0.5	2	0.3	—	—	1	0.1	2	0.3
Arizona	54	0.8	32	0.5	59	0.8	77	1.1	584	8
Arkansas	10	0.3	13	0.4	7	0.2	254	8.4	203	6.7
California	179	0.5	229	0.6	947	2.4	189	0.5	256	0.6
Colorado	25	0.5	22	0.4	65	1.2	31	0.5	333	5.8
Connecticut	9	0.3	16	0.4	17	0.5	15	0.4	17	0.5
Delaware	2	0.2	1	0.1	6	0.6	7	0.7	36	3.7
District of Columbia	U	U	4	0.6	3	0.4	11	1.6	15	2.1
Florida	108	0.5	115	0.6	261	1.2	548	2.6	3,392	15.8
Georgia	30	0.3	44	0.4	24	0.2	84	0.8	844	7.9
Hawaii	6	0.4	285	20	8	0.6	4	0.3	1	0.1
Idaho	9	0.5	7	0.4	4	0.2	5	0.3	75	4.2
Illinois	57	0.4	71	0.6	73	0.6	93	0.7	185	1.5
Indiana	19	0.3	18	0.3	21	0.3	964	14.4	1,398	20.8
Iowa	16	0.5	16	0.5	9	0.3	10	0.3	9	0.3
Kansas	7	0.2	5	0.2	6	0.2	14	0.5	10	0.3
Kentucky	16	0.4	9	0.2	71	1.6	3,560	79.7	1,318	29.5
Louisiana	5	0.1	12	0.3	8	0.2	37	0.8	687	14.8
Maine	8	0.6	8	0.6	7	0.5	9	0.7	45	3.3
Maryland	19	0.3	37	0.6	29	0.5	52	0.9	88	1.5
Massachusetts	34	0.5	64	0.9	52	0.8	364	5.3	204	3
Michigan	51	0.5	112	1.1	670	6.7	299	3	70	0.7
Minnesota	21	0.4	15	0.3	30	0.5	16	0.3	76	1.3
Mississippi	2	0.1	2	0.1	3	0.1	13	0.4	128	4.3
Missouri	9	0.1	16	0.3	27	0.4	243	4	359	5.8
Montana	2	0.2	3	0.3	3	0.3	—	—	15	1.4
Nebraska	6	0.3	21	1.1	4	0.2	6	0.3	15	0.8
Nevada	11	0.4	14	0.5	19	0.6	41	1.4	102	3.3
New Hampshire	2	0.2	8	0.6	7	0.5	12	0.9	309	22.7
New Jersey	59	0.7	74	0.8	71	0.8	70	0.8	610	6.9
New Mexico	6	0.3	4	0.2	4	0.2	23	1.1	104	5
New York	123	0.6	99	0.5	218	1.1	165	0.8	391	2
North Carolina	45	0.4	52	0.5	29	0.3	103	1	154	1.5
North Dakota	5	0.7	2	0.3	—	—	—	—	4	0.5
Ohio	36	0.3	36	0.3	45	0.4	1,687	14.4	1,802	15.4
Oklahoma	11	0.3	11	0.3	9	0.2	5	0.1	13	0.3
Oregon	28	0.7	15	0.4	20	0.5	23	0.5	27	0.6
Pennsylvania	43	0.3	62	0.5	69	0.5	99	0.8	696	5.4
Rhode Island	4	0.4	4	0.4	6	0.6	7	0.7	6	0.6
South Carolina	16	0.3	21	0.4	21	0.4	30	0.6	662	12.9
South Dakota	2	0.2	1	0.1	1	0.1	1	0.1	8	0.9
Tennessee	14	0.2	7	0.1	6	0.1	654	9.7	2,160	31.6
Texas	147	0.5	139	0.5	129	0.5	88	0.3	159	0.5
Utah	8	0.3	12	0.4	159	5.1	135	4.3	20	0.6
Vermont	3	0.5	5	0.8	2	0.3	3	0.5	12	1.9
Virginia	50	0.6	190	2.3	46	0.5	82	1	309	3.6
Washington	26	0.4	31	0.4	28	0.4	35	0.5	181	2.4
West Virginia	8	0.4	15	0.8	6	0.3	2,247	124.4	467	26.1
Wisconsin	9	0.2	7	0.1	16	0.3	15	0.3	31	0.5
Wyoming	3	0.5	—	—	18	3.1	5	0.9	12	2.1
Total	**1,390**	**0.4**	**2,007**	**0.6**	**3,366**	**1**	**12,474**	**3.8**	**18,846**	**5.7**

Source: CDC, National Notifiable Diseases Surveillance System.

* Rates per 100,000 population.

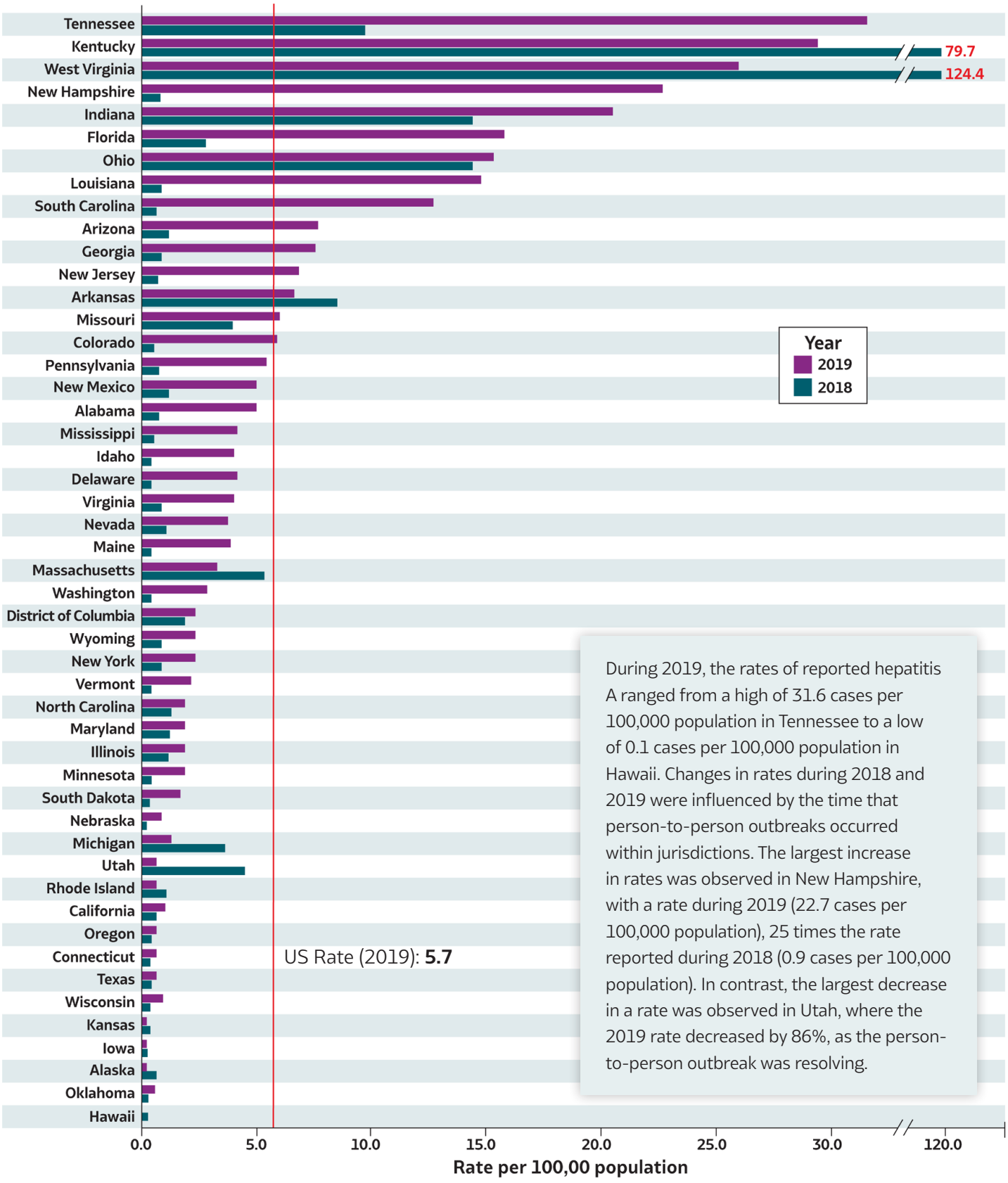
† Reported cases that met the classification criteria for a confirmed case. For the case definition, see https://ndc.services.cdc.gov/conditions/hepatitis-a-acute/.

—: No reported cases. The reporting jurisdiction did not submit any cases to CDC.

U: Unavailable. The data were unavailable.

The rate of reported hepatitis A in the United States was 5.7 per 100,000 population during 2019, approximately 1.5 times the rate reported during 2018 and >14 times the rate reported during 2015, before the widespread person-to-person outbreaks were first reported. The 5 states with the highest number of reported cases during 2019 (Florida, Tennessee, Ohio, Indiana, and Kentucky) account for >10,000 reported cases of hepatitis A, approximately half the national burden during 2019. These states were heavily affected by the person-to-person hepatitis A outbreaks during that year.

Figure 1.2. Rates* of reported hepatitis A† virus infection, by state or jurisdiction — United States, 2018–2019



During 2019, the rates of reported hepatitis A ranged from a high of 31.6 cases per 100,000 population in Tennessee to a low of 0.1 cases per 100,000 population in Hawaii. Changes in rates during 2018 and 2019 were influenced by the time that person-to-person outbreaks occurred within jurisdictions. The largest increase in rates was observed in New Hampshire, with a rate during 2019 (22.7 cases per 100,000 population), 25 times the rate reported during 2018 (0.9 cases per 100,000 population). In contrast, the largest decrease in a rate was observed in Utah, where the 2019 rate decreased by 86%, as the person-to-person outbreak was resolving.

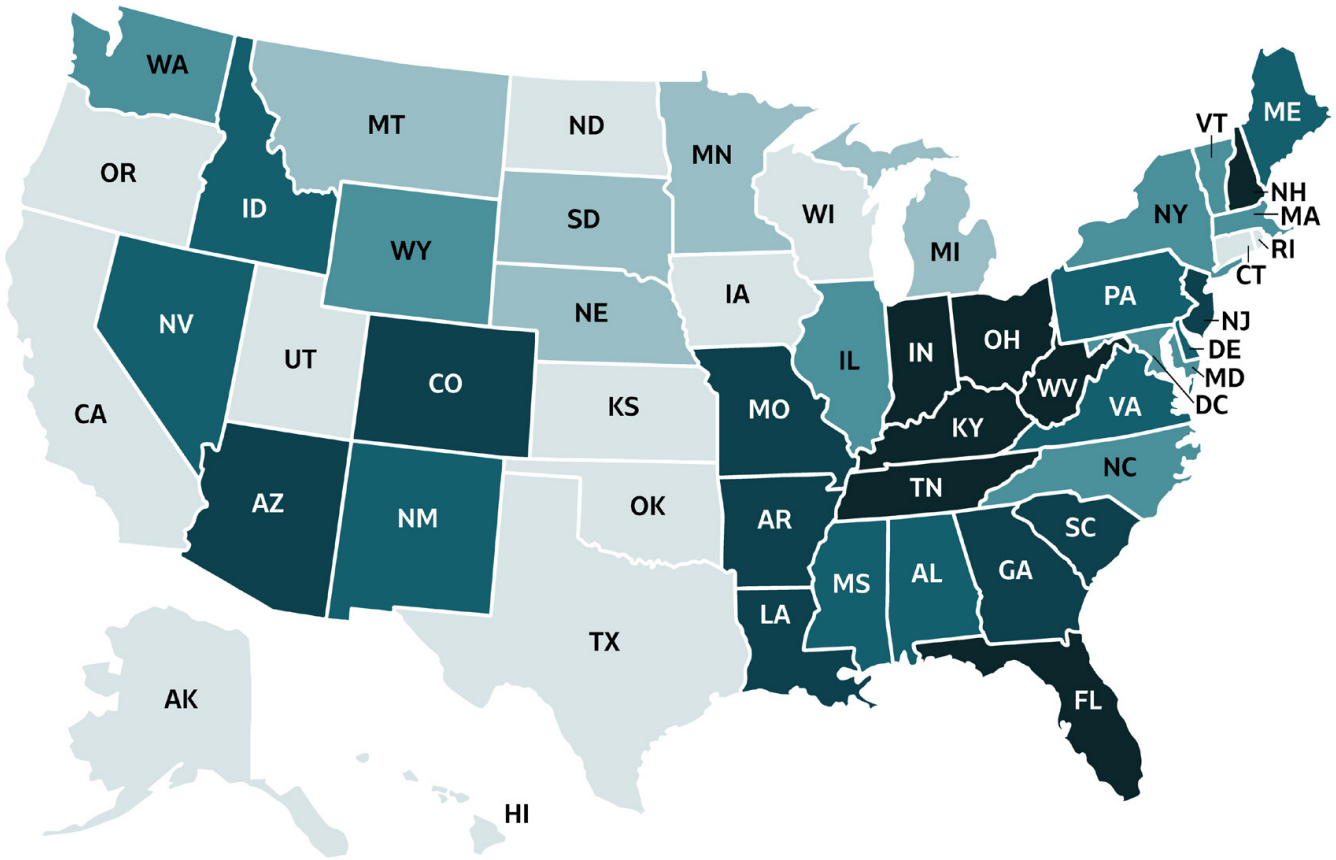
Source: CDC, National Notifiable Diseases Surveillance System.

* Rates per 100,000 population.

† Reported cases that met the classification criteria for a confirmed case. For the case definition, see https://ndc.services.cdc.gov/conditions/hepatitis-a-acute/.

Only states with rates for 2018 and 2019 are shown. No hepatitis A cases were reported from Montana and North Dakota in 2018.

Figure 1.3. Rates of reported hepatitis A virus infection, by state or jurisdiction — United States, 2019

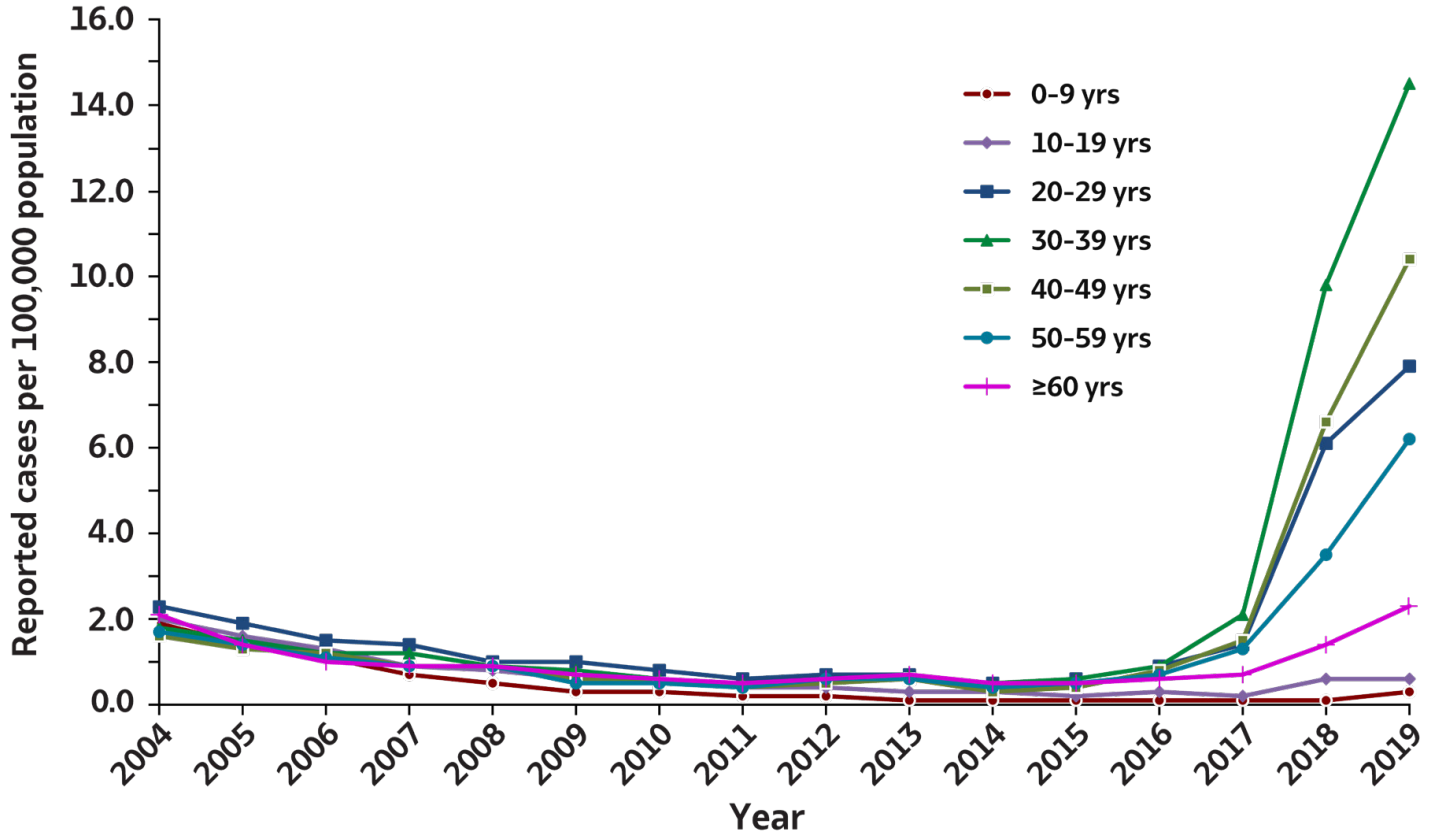


Color Key	Cases per 100,000 Population	State or Jurisdiction
	0.0-0.6	AK, CA, CT, HI, IA, KS, ND, OK, OR, RI, TX, UT, WI
	0.7-1.4	MI, MN, MT, NE, SD
	1.5-3.0	DC, IL, MA, MD, NC, NY, VT, WA, WY
	3.1-5.5	AL, DE, ID, ME, MS, NM, NV, PA, VA
	5.6-14.8	AR, AZ, CO, GA, LA, MO, NJ, SC
	14.9-31.6	FL, IN, KY, NH, OH, TN, WV

Source: CDC, National Notifiable Diseases Surveillance System.

The state-specific rates of hepatitis A varied throughout the country, ranging from a high of 31.6 cases per 100,000 population in Tennessee to a low of 0.1 cases per 100,000 population in Hawaii. Seven states heavily affected by person-to-person outbreaks were in the highest category and included Florida, Indiana, Kentucky, New Hampshire, Ohio, Tennessee, and West Virginia; 5 of these states are located in or near the Appalachian region. Lower incidence rates were observed in the central US and the West Coast.

Figure 1.4. Rates of reported hepatitis A virus infection, by age group — United States, 2004–2019

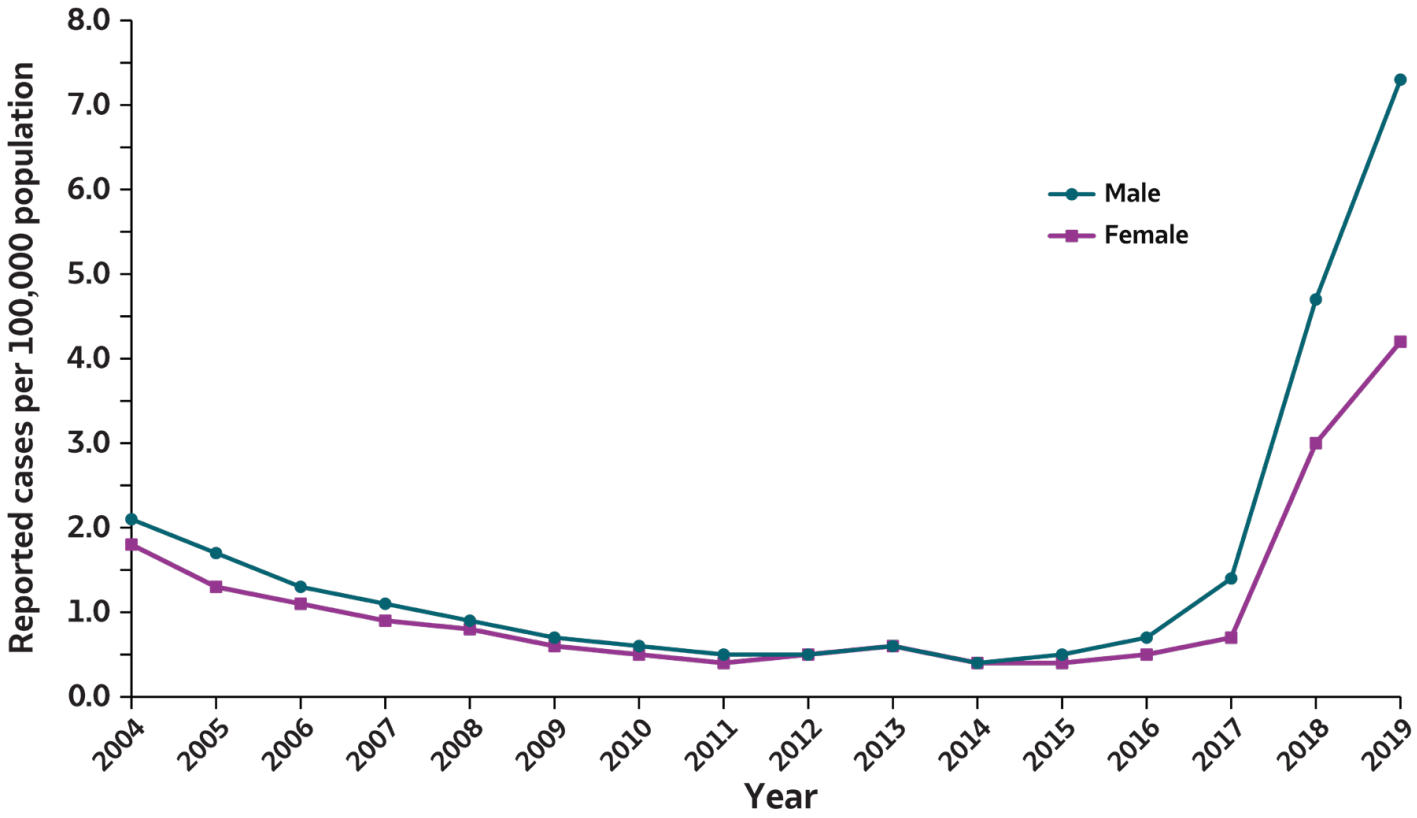


Age (years)	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
0-9	1.9	1.4	1.1	0.7	0.5	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.3
10-19	2.0	1.6	1.3	0.9	0.8	0.6	0.5	0.4	0.4	0.3	0.3	0.2	0.3	0.2	0.6	0.6
20-29	2.3	1.9	1.5	1.4	1.0	1.0	0.8	0.6	0.7	0.7	0.5	0.6	0.9	1.4	6.1	7.9
30-39	1.8	1.5	1.2	1.2	0.9	0.8	0.6	0.5	0.5	0.7	0.5	0.6	0.9	2.1	9.8	14.5
40-49	1.6	1.3	1.2	0.9	0.9	0.6	0.5	0.4	0.5	0.6	0.3	0.4	0.8	1.5	6.6	10.4
50-59	1.7	1.4	1.1	0.9	0.9	0.5	0.5	0.4	0.6	0.6	0.4	0.5	0.7	1.3	3.5	6.2
≥60	2.1	1.4	1	0.9	0.9	0.7	0.6	0.5	0.6	0.7	0.5	0.5	0.6	0.7	1.4	2.3

Source: CDC, National Notifiable Diseases Surveillance System.

The rates of hepatitis A decreased in approximately all age groups during 2004–2009 and remained constant until outbreaks of hepatitis A began to be reported during 2016. The substantial increase in the rates of hepatitis A observed in recent years has been apparent in almost all age groups, except persons aged <20 years, which is consistent with the introduction of the hepatitis A vaccine in 1996 and the gradual expansion to universal childhood vaccination recommendations in 2006. During 2019, the highest rates were observed among persons aged 20–49 years, largely influenced by widespread hepatitis A outbreaks occurring among persons who use drugs and those experiencing homelessness.

Figure 1.5. Rates of reported hepatitis A virus infection, by sex — United States, 2004–2019

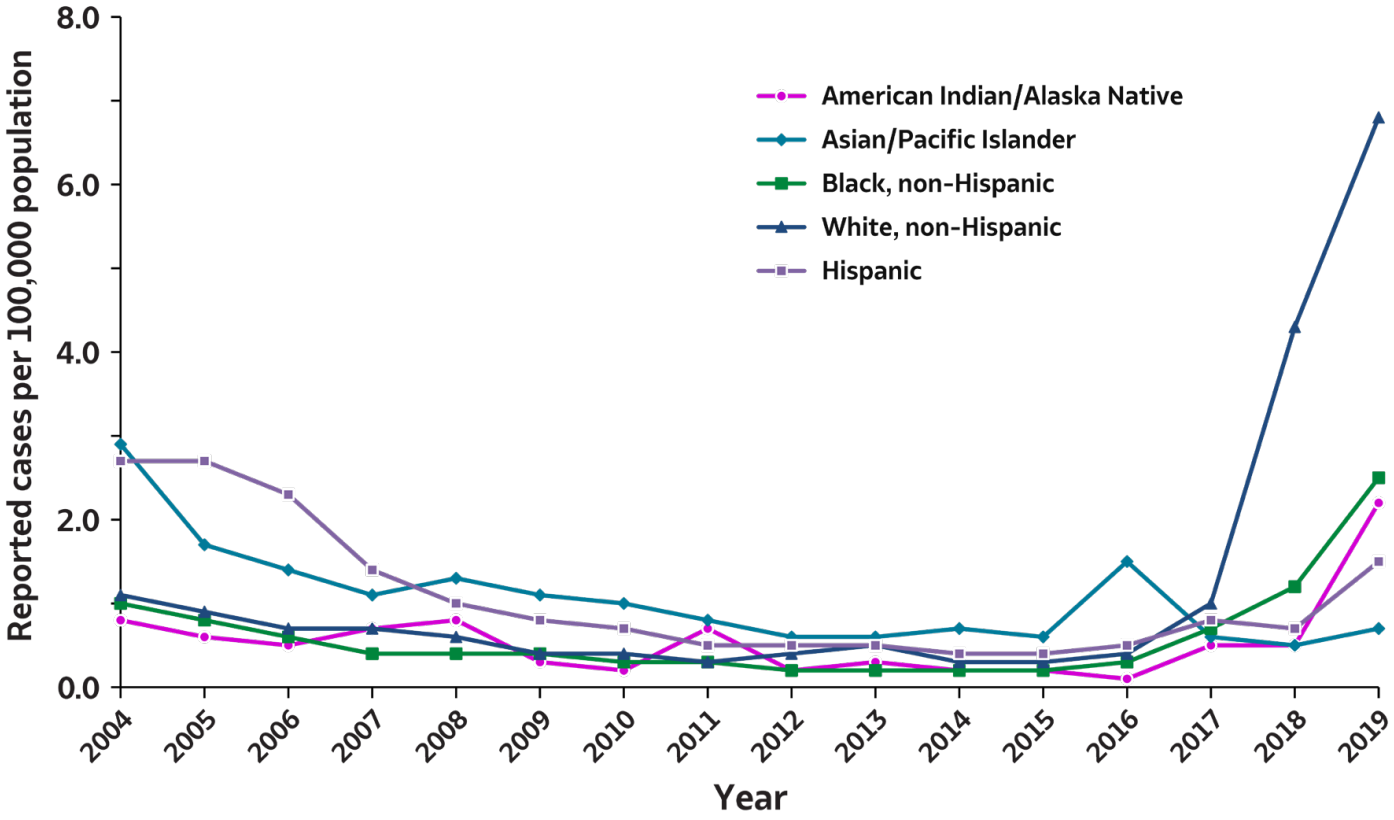


Sex	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Male	2.1	1.7	1.3	1.1	0.9	0.7	0.6	0.5	0.5	0.6	0.4	0.5	0.7	1.4	4.7	7.3
Female	1.8	1.3	1.1	0.9	0.8	0.6	0.5	0.4	0.5	0.6	0.4	0.4	0.5	0.7	3.0	4.2

Source: CDC, National Notifiable Diseases Surveillance System.

An increase in the reported rates of hepatitis A since person-to-person outbreaks were first reported during 2016 has been observed among both males and females. During 2019, the rate of reported hepatitis A virus infection was 7.3 cases per 100,000 population for males (>14 times the corresponding rate during 2015) and 4.2 cases per 100,000 population among females (>10 times the corresponding rate during 2015).

Figure 1.6. Rates of reported hepatitis A virus infection, by race/ethnicity — United States, 2004–2019



Race/ Ethnicity	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
American Indian/ Alaska Native	0.8	0.6	0.5	0.7	0.8	0.3	0.2	0.7	0.2	0.3	0.2	0.2	0.1	0.5	0.5	2.2
Asian/ Pacific Islander	2.9	1.7	1.4	1.1	1.3	1.1	1.0	0.8	0.6	0.6	0.7	0.6	1.5	0.6	0.5	0.7
Black, non-Hispanic	1.0	0.8	0.6	0.4	0.4	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.7	1.2	2.5
White, non-Hispanic	1.1	0.9	0.7	0.7	0.6	0.4	0.4	0.3	0.4	0.5	0.3	0.3	0.4	1.0	4.3	6.8
Hispanic	2.7	2.7	2.3	1.4	1.0	0.8	0.7	0.5	0.5	0.5	0.4	0.4	0.5	0.8	0.7	1.5

Source: CDC, National Notifiable Diseases Surveillance System.

During 2019, rates of hepatitis A ranged from a low of 0.7 cases per 100,000 population among Asian/Pacific Islander persons to a high of 6.8 cases per 100,000 population among non-Hispanic White persons. Rates increased among all racial/ethnicity categories during 2018–2019. The largest increase occurred among American Indian/Alaska Native persons, among whom the 2019 rate was >4 times the rate during 2018. However, the relatively smaller number of cases reported among American Indian/Alaska Native persons can result in wider fluctuations in annual rates. Compared with the preoutbreak period of 2015, the rates for reported hepatitis A increased most dramatically among non-Hispanic White persons, with a rate in 2019 that was >22 times the corresponding rate during 2015.

Table 1.2. Number and rates* of reported cases† of hepatitis A virus infection, by demographic characteristics — United States 2015–2019

Characteristic	2015		2016		2017		2018		2019	
	No.	Rate*	No.	Rate*	No.	Rate*	No.	Rate*	No.	Rate*
Total§	**1,390**	**0.4**	**2,007**	**0.6**	**3,366**	**1.0**	**12,474**	**3.8**	**18,846**	**5.7**
Age (years)										
0–9	48	0.1	47	0.1	40	0.1	54	0.1	127	0.3
10–19	97	0.2	131	0.3	86	0.2	231	0.6	231	0.6
20–29	287	0.6	392	0.9	659	1.4	2,763	6.1	3,582	7.9
30–39	233	0.6	391	0.9	893	2.1	4,268	9.8	6,400	14.5
40–49	164	0.4	333	0.8	621	1.5	2,658	6.6	4,177	10.4
50–59	205	0.5	297	0.7	554	1.3	1,509	3.5	2,635	6.2
≥60	353	0.5	409	0.6	509	0.7	987	1.4	1,691	2.3
Sex										
Male	726	0.5	1,107	0.7	2,209	1.4	7,497	4.7	11,824	7.3
Female	662	0.4	897	0.5	1,149	0.7	4,952	3.0	6,997	4.2
Race/ethnicity										
American Indian/ Alaska Native	5.0	0.2	3.0	0.1	13	0.5	15	0.5	60	2.2
Asian/Pacific Islander	114	0.6	299	1.5	124	0.6	104	0.5	139	0.7
Black, non-Hispanic	71	0.2	137	0.3	303	0.7	508	1.2	1,072	2.5
White, non-Hispanic	701	0.3	865	0.4	1,979	1.0	8,670	4.3	13,709	6.8
Hispanic	219	0.4	293	0.5	471	0.8	413	0.7	916	1.5
Urbanicity¶										
Urban	1,198	0.4	1,769	0.6	3,055	1.1	7,657	2.7	14,637	5.2
Rural	181	0.4	182	0.4	180	0.4	3,153	6.8	3,372	7.3
HHS Region: Regional Office#										
1: Boston	60	0.4	105	0.7	91	0.6	410	2.8	593	4.0
2: New York	182	0.6	173	0.6	289	1.0	235	0.8	1,001	3.5
3: Philadelphia	122	0.4	309	1.0	159	0.5	2,498	8.1	1,611	5.2
4: Atlanta	254	0.4	269	0.4	438	0.7	5,030	7.6	8,900	13.3
5: Chicago	193	0.4	259	0.5	855	1.6	3,074	5.9	3,562	6.8
6: Dallas	179	0.4	179	0.4	157	0.4	407	1.0	1,166	2.7
7: Kansas City	38	0.3	58	0.4	46	0.3	273	1.9	393	2.8
8: Denver	45	0.4	40	0.3	246	2.1	172	1.4	392	3.2
9: San Francisco	250	0.5	560	1.1	1,033	2.0	311	0.6	943	1.8
10: Seattle	67	0.5	55	0.4	52	0.4	64	0.5	285	2.0

Source: CDC, National Notifiable Diseases Surveillance System.

* Rates per 100,000 population.

† For the case definition, see https://ndc.services.cdc.gov/conditions/hepatitis-a-acute/.

§ Numbers reported in each category might not add up to the total number of reported cases in a year because of cases with missing data or, in the case of race/ethnicity, cases categorized as "Other."

¶ Urbanicity was categorized according to the 2013 National Center for Health Statistics (NCHS) urban-rural classification scheme for counties and county-equivalent entities (https://www.cdc.gov/nchs/data_access/urban_rural.htm). Large central metropolitan, large fringe metropolitan, medium metropolitan, and small metropolitan counties were grouped as urban. Micropolitan and noncore counties were grouped as rural.

US Department of Health and Human Services (HHS) regions were categorized according to the grouping of states and US territories assigned under each of the 10 HHS regional offices (https://www.hhs.gov/about/agencies/iea/regional-offices/index.html). For the purposes of this report, regions with US territories (Regions 2 and 9) contain data from states only.

This table summarizes the epidemiology of hepatitis A in the United States during recent years, highlighting the populations most affected by outbreaks of hepatitis A occurring among persons who use drugs and persons experiencing homelessness. During 2019, rates of reported hepatitis A were highest among persons aged 20–49 years, males, non-Hispanic White persons, and in the US Department of Health and Human Services Region 4 (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, and Tennessee). Using urbanicity categories defined by the National Center for Health Statistics, compared with the preoutbreak period of 2015, the rates of hepatitis A in 2019 increased 13 times in urban settings and 18 times in rural settings. Among all hepatitis A cases reported during 2019, 75% occurred among persons aged 20–49 years; 73% occurred among non-Hispanic White persons; 78% occurred in urban areas; and 47% occurred in Health and Human Services Region 4.

HEPATITIS A RISK BEHAVIORS AND EXPOSURES

Figure 1.7. Availability of information regarding risk behaviors or exposures*† associated with reported cases of hepatitis A virus infection — United States, 2019

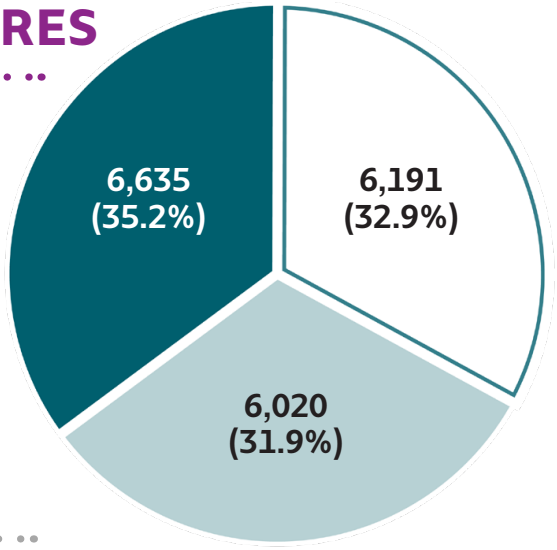


Table 1.3. Reported risk behaviors or exposures†# among reported cases of hepatitis A virus infection — United States, 2019

Risk behaviors/exposures	Risk identified*	No risk identified	Risk data missing
Injection drug use	5,017	5,974	7,855
Sexual contact §	693	6,928	11,225
Household contact (non-sexual) §	563	7,058	11,225
Other contact §	773	6,848	11,225
Men who have sex with men ¶	201	2,479	9,144
International travel	159	9,836	8,851

Source: CDC, Nationally Notifiable Diseases Surveillance System.

* Case reports with at least one of the following risk behaviors/exposures reported 2–6 weeks prior to symptom onset or documented seroconversion if asymptomatic: 1) injection drug use; 2) sexual, household, or other contact; 3) men who have sex with men; 4) travel to hepatitis A-endemic region.

† Reported cases may include more than one risk behavior/exposure.

Risk behaviors/exposures data from one state was classified as 'missing' because of errors in reporting.

§ Cases with more than one type of contact reported were categorized according to a hierarchy: 1) sexual contact; 2) household contact (nonsexual); and 3) other contact with hepatitis A case.

¶ A total of 11,824 hepatitis A cases were reported among males in 2019.

Health departments might conduct investigations of newly reported hepatitis A cases to ascertain risk behaviors and exposures associated with infection. However, investigations might not be possible for all cases if patients are lost to follow-up or if health departments lack adequate resources for investigating all cases reported in their jurisdiction. Among the 18,846 case reports of hepatitis A received by CDC for 2019, data regarding risk behaviors or exposures were missing for 6,191 (32.9%) cases. At least one risk behavior or exposure was reported for 6,635 (32.5%) cases during the 2–6 weeks before illness onset.

Among risk behaviors or exposures identified, injection drug use was most commonly reported (46% of the 10,991 cases for which injection drug use information was available). Because of limitations on variables included in the surveillance system during 2019, multiple risk behaviors or exposures associated with hepatitis A could not be well-characterized, including homelessness, incarceration, noninjection drug use, and high-risk sexual practices that increase the risk for fecal–oral exposure to hepatitis A virus.

Table 1.4. Number and rates* of deaths with hepatitis A virus infection listed as a cause of death† among residents, by demographic characteristics — United States, 2015–2019

Characteristic	2015		2016		2017		2018		2019	
	No.	Rate* (95% CI)	No.	Rate* (95% CI)	No.	Rate* (95% CI)	No.	Rate* (95% CI)	No.	Rate* (95% CI)
Total	**67**	**0.01 (0.01–0.02)**	**70**	**0.01 (0.00–0.01)**	**91**	**0.02 (0.02-0.03)**	**171**	**0.05 (0.04-0.06)**	**225**	**0.04 (0.03–0.05**
Age (years)										
0–44	5	UR§	6	UR§	9	UR§	33	0.02 (0.01-0.02)	24	0.01 (0.01-0.02)
45–64	25	0.03 (0.02-0.04)	33	0.04 (0.03-0.06)	35	0.04 (0.03-0.06)	72	0.09 (0.07-0.11)	118	0.14 (0.12-0.17)
≥65	37	0.08 (0.05-0.11)	31	0.06 (0.04-0.09)	47	0.09 (0.07-0.12)	66	0.13 (0.10-0.16)	83	0.15 (0.12-0.19)
Sex										
Male	38	0.02 (0.01-0.03)	38	0.01 (0.01-0.02)	63	0.03 (0.02-0.03)	115	0.07 (0.06-0.08)	159	0.09 (0.07-0.10)
Female	29	0.01 (0.00-0.01)	32	0.01 (0.01-0.02)	28	0.00 (0.00-0.00)	56	0.02 (0.02-0.03)	66	0.04 (0.03-0.05)
Race/ethnicity										
White, non-Hispanic	45	0.01 (0.00-0.01)	50	0.02 (0.01-0.02)	69	0.02 (0.02-0.03)	150	0.06 (0.05-0.07)	194	0.09 (0.07-0.10)
Other or not stated	22	S¶	20	S¶	22	S¶	21	S¶	31	S¶

Source: CDC, National Center for Health Statistics, Multiple Cause of Death 1999–2019 on CDC WONDER online database. Data are from the 2015–2019 Multiple Cause of Death files and are based on information from all death certificates filed in the vital records offices of the 50 states and the District of Columbia through the Vital Statistics Cooperative Program. Deaths of nonresidents (e.g., nonresident aliens, nationals living abroad, residents of Puerto Rico, Guam, the Virgin Islands, and other US territories) and fetal deaths are excluded. Numbers are slightly lower than previously reported for 2015–2016 because of NCHS standards that restrict displayed data to US residents. Accessed at http://wonder.cdc.gov/mcd-icd10.html on January 8, 2021. CDC WONDER data set documentation and technical methods can be accessed at https://wonder.cdc.gov/wonder/help/mcd.html#.

* Rates for race/ethnicity, sex, and the overall total are age-adjusted per 100,000 US standard population during 2000 by using the following age group distribution (in years): <1, 1–4, 5–14, 15–24, 25–34, 35–44, 45–54, 55–64, 65–74, 75–84, and ≥85. For age-adjusted death rates, the age-specific death rate is rounded to 1 decimal place before proceeding to the next step in the calculation of age-adjusted death rates for NCHS Multiple Cause of Death on CDC WONDER. This rounding step might affect the precision of rates calculated for small numbers of deaths. Missing data are not included.

† Cause of death is defined as 1 of the multiple causes of death and is based on the International Classification of Diseases, 10th Rev. (ICD-10) codes B15 (hepatitis A).

§UR Unreliable rate: Rates where death counts were <20 were not displayed because of the instability associated with those rates.

S¶ Suppressed: CDC WONDER did not have the functionality to calculate rates for the "Other or not stated" race/ethnicity group.

Hepatitis A is a self-limited disease that does not result in chronic infection and rarely results in death. In 2019, a total of 225 deaths with hepatitis-A virus infection listed were reported among US residents in the US Multiple Cause of Death data from the National Center for Health Statistics, resulting in an age-adjusted death rate of 0.04 per 100,000 population. The 2019 hepatitis A-associated mortality rate was highest among persons aged ≥45 years, compared with 0–44 years, and the mortality rate among males was >2 times the rate among females. Because of the low number of reported deaths, further stratification by age, race/ethnicity categories, state, and Health and Human Services region was impossible because of the instability associated with the rates.

B ACUTE HEPATITIS B, 2019

3,192 Acute cases reported

1.0 Reported cases per 100,000 population

20,700* Acute infections estimated

AT A GLANCE
ACUTE HEPATITIS B in 2019

Rates of acute hepatitis B remained low in children and adolescents, likely because of childhood vaccinations. However, **more than half** of acute hepatitis B cases reported to CDC in 2019 were among persons aged **30–49 years**.

GROUPS MOST AFFECTED
BY ACUTE HEPATITIS B IN 2019

By Age†

30–39 years: 1.8 cases per 100,000 people

40–49 years: 2.7 cases per 100,000 people

50–59 years: 1.6 cases per 100,000 people

By Sex†

Males: 1.3 cases per 100,000 people

By Race/Ethnicity†

White, non-Hispanic: 1.0 cases per 100,000 people

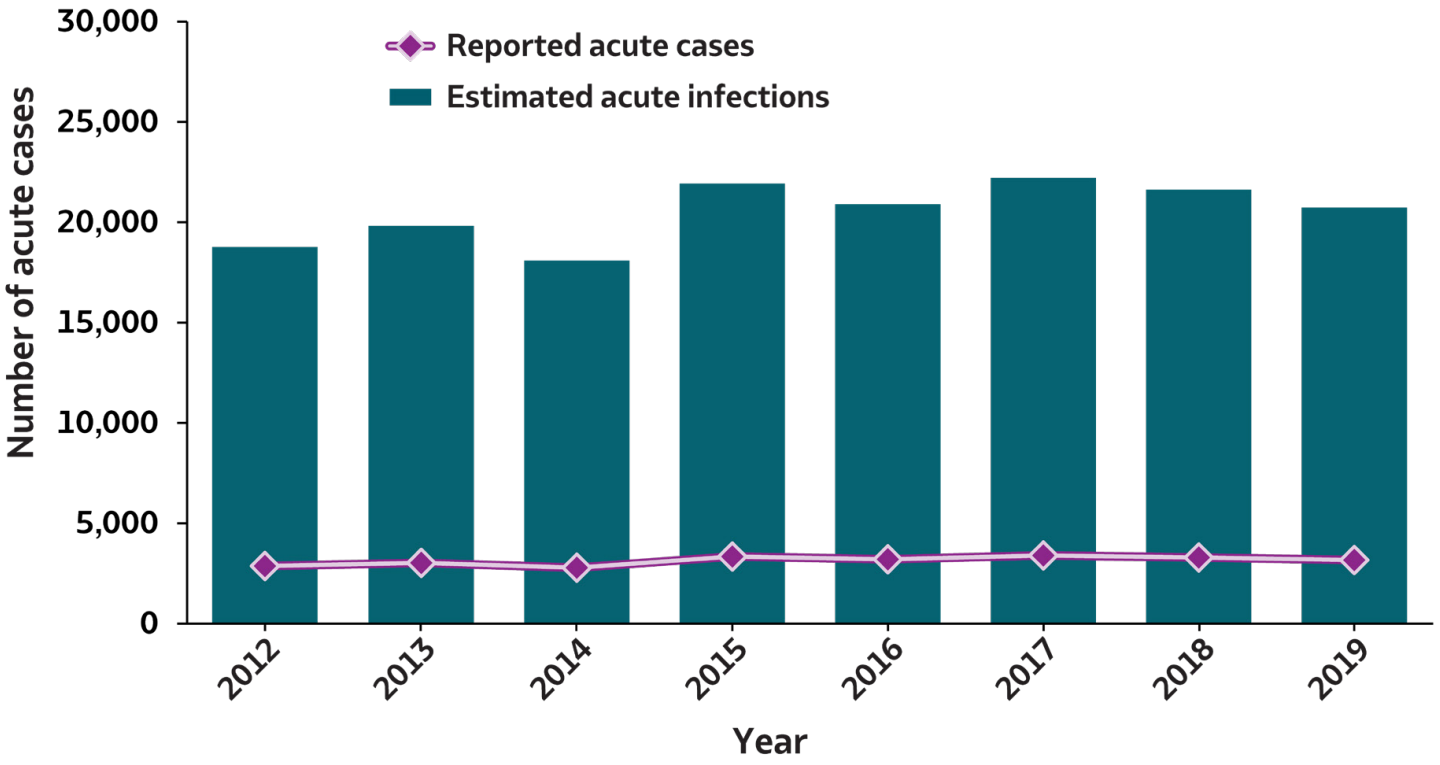
By Risk

Injection Drug Use (IDU):
Among the 1,780 reported cases with IDU information available, **631 (35%) reported IDU**

* 95% Bootstrap Confidence Interval: (11,800–50,800)

† Indicates groups at or above the US rate in 2019

Figure 2.1. Number of reported acute hepatitis B virus infection cases and estimated infections* — United States, 2012–2019



Acute Hepatitis B	2012	2013	2014	2015	2016	2017	2018	2019
Reported acute cases	2,895	3,050	2,791	3,370	3,218	3,409	3,322	3,192
Estimated acute infections	18,800	19,800	18,100	21,900	20,900	22,200	21,600	20,700

Source: CDC, National Notifiable Diseases Surveillance System.

* The number of estimated viral hepatitis infections was determined by multiplying the number of reported cases that met the classification criteria for a confirmed case by a factor that adjusted for underascertainment and underreporting. The 95% bootstrap confidence intervals for the estimated number of infections are displayed in the Appendix.

The number of acute hepatitis B cases reported each year in the United States has remained relatively stable during 2012–2019, with a low of 2,791 reported during 2014 and a high of 3,409 cases reported during 2017. During 2019, the number of reported cases was 3,192, which corresponds to 20,700 estimated infections after adjusting for case underascertainment and underreporting.

Source: Klevens RM, Liu, S, Roberts H, et al. Estimating acute viral hepatitis infections from nationally reported cases. Am J Public Health 2014;104:482. PMC3953761. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3953761/pdf/AJPH.2013.301601.pdf

Table 2.1. Number and rates* of reported cases† of acute hepatitis B virus infection, by state or jurisdiction — United States, 2015–2019

State or Jurisdiction	2015		2016		2017		2018		2019	
	No.	Rate*	No.	Rate*	No.	Rate*	No.	Rate*	No.	Rate*
Alabama	101	2.1	59	1.2	82	1.7	48	1.0	75	1.5
Alaska	3	0.4	6	0.8	9	1.2	7	0.9	6	0.8
Arizona	25	0.4	14	0.2	26	0.4	23	0.3	28	0.4
Arkansas	36	1.2	49	1.6	46	1.5	47	1.6	39	1.3
California	160	0.4	115	0.3	126	0.3	105	0.3	111	0.3
Colorado	28	0.5	28	0.5	32	0.6	21	0.4	17	0.3
Connecticut	6	0.2	7	0.2	10	0.3	10	0.3	3	0.1
Delaware	8	0.8	3	0.3	9	0.9	7	0.7	12	1.2
District of Columbia	U	U	U	U	U	U	U	U	U	U
Florida	432	2.1	558	2.7	588	2.8	617	2.9	595	2.8
Georgia	119	1.2	100	1.0	106	1.0	179	1.7	114	1.1
Hawaii	14	1.0	—	—	—	—	3	0.2	1	0.1
Idaho	8	0.5	6	0.4	6	0.3	6	0.3	7	0.4
Illinois	55	0.4	37	0.3	27	0.2	25	0.2	43	0.3
Indiana	133	2.0	146	2.2	170	2.5	169	2.5	170	2.5
Iowa	16	0.5	10	0.3	12	0.4	14	0.4	24	0.8
Kansas	19	0.7	21	0.7	24	0.8	16	0.5	11	0.4
Kentucky	162	3.7	222	5.0	236	5.3	260	5.8	188	4.2
Louisiana	87	1.9	48	1.0	73	1.6	57	1.2	73	1.6
Maine	9	0.7	53	4.0	77	5.8	52	3.9	58	4.3
Maryland	40	0.7	27	0.4	34	0.6	53	0.9	41	0.7
Massachusetts	25	0.4	31	0.5	51	0.7	46	0.7	37	0.5
Michigan	56	0.6	45	0.5	61	0.6	77	0.8	64	0.6
Minnesota	19	0.3	21	0.4	23	0.4	16	0.3	16	0.3
Mississippi	50	1.7	31	1.0	44	1.5	40	1.3	49	1.6
Missouri	35	0.6	40	0.7	31	0.5	18	0.3	33	0.5
Montana	4	0.4	1	0.1	3	0.3	1	0.1	1	0.1
Nebraska	3	0.2	8	0.4	10	0.5	3	0.2	—	—
Nevada	25	0.9	22	0.7	30	1.0	23	0.8	23	0.7
New Hampshire	—	—	—	—	—	—	4	0.3	5	0.4
New Jersey	85	0.9	59	0.7	57	0.6	64	0.7	78	0.9
New Mexico	2	0.1	1	0.0	1	0.0	2	0.1	4	0.2
New York	80	0.4	103	0.5	81	0.4	56	0.3	85	0.4
North Carolina	165	1.6	170	1.7	190	1.8	220	2.1	187	1.8
North Dakota	2	0.3	2	0.3	—	—	2	0.3	—	—
Ohio	409	3.5	299	2.6	285	2.4	310	2.7	311	2.7
Oklahoma	37	0.9	32	0.8	41	1.0	6	0.2	17	0.4
Oregon	24	0.6	20	0.5	23	0.6	18	0.4	17	0.4
Pennsylvania	61	0.5	43	0.3	69	0.5	61	0.5	91	0.7
Rhode Island	U	U	U	U	U	U	U	U	U	U
South Carolina	30	0.6	34	0.7	40	0.8	45	0.9	42	0.8
South Dakota	2	0.2	2	0.2	2	0.2	1	0.1	5	0.6
Tennessee	243	3.7	204	3.1	215	3.2	192	2.8	208	3.0
Texas	159	0.6	156	0.6	106	0.4	102	0.4	69	0.2
Utah	10	0.3	5	0.2	18	0.6	36	1.1	29	0.9
Vermont	3	0.5	2	0.3	1	0.2	3	0.5	9	1.4
Virginia	69	0.8	56	0.7	61	0.7	58	0.7	57	0.7
Washington	34	0.5	45	0.6	45	0.6	51	0.7	52	0.7
West Virginia	272	14.7	268	14.6	212	11.7	132	7.3	76	4.2
Wisconsin	5	0.1	9	0.2	14	0.2	14	0.2	8	0.1
Wyoming	U	U	U	U	2	0.3	2	0.3	3	0.5
Total	**3,370**	**1.1**	**3,218**	**1.0**	**3,409**	**1.1**	**3,322**	**1.0**	**3,192**	**1.0**

Source: CDC, National Notifiable Diseases Surveillance System.

* Rates per 100,000 population.

† Reported cases that met the classification criteria for a confirmed case. For the case definition, see https://ndc.services.cdc.gov/conditions/hepatitis-b-acute/.

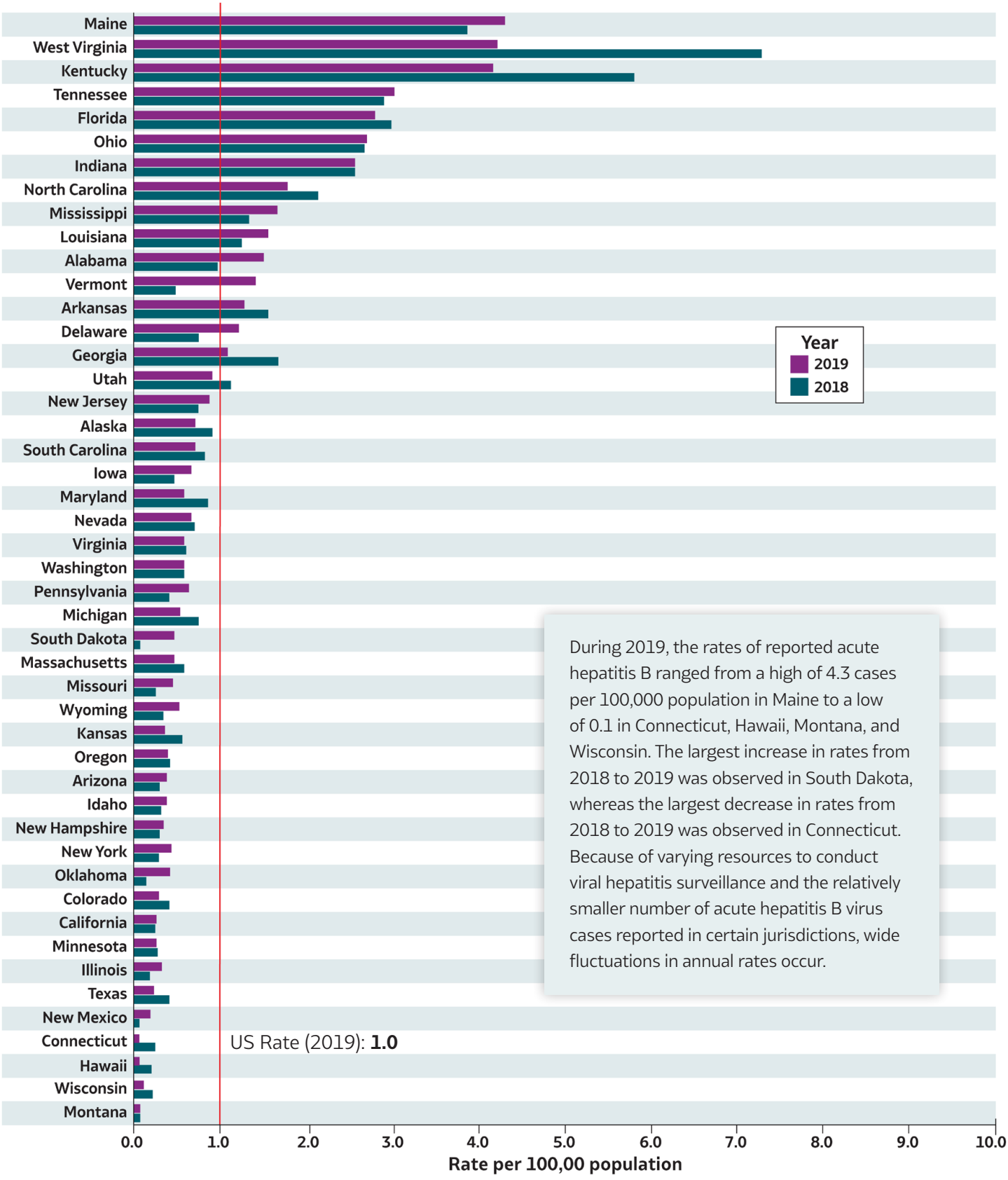
—: No reported cases. The reporting jurisdiction did not submit any cases to CDC.

N: Not reportable. The disease or condition was not reportable by law, statute, or regulation in the reporting jurisdiction.

U: Unavailable. The data were unavailable.

The capacity for notifying CDC of acute hepatitis B virus infection cases varies considerably on the basis of laws, resources, and infrastructure for conducting viral hepatitis surveillance in each jurisdiction. The national rate of acute hepatitis B was 1.0 reported cases per 100,000 population during 2019. Maine had the highest reported rate of acute hepatitis B during 2019 (4.3 cases per 100,000 population). Five states with the highest number of reported acute cases (Florida, Ohio, Tennessee, Kentucky, and North Carolina) accounted for approximately half of the national burden of acute hepatitis B cases reported during 2019.

Figure 2.2. Rates* of reported acute hepatitis B† virus infection, by state — United States, 2018–2019



During 2019, the rates of reported acute hepatitis B ranged from a high of 4.3 cases per 100,000 population in Maine to a low of 0.1 in Connecticut, Hawaii, Montana, and Wisconsin. The largest increase in rates from 2018 to 2019 was observed in South Dakota, whereas the largest decrease in rates from 2018 to 2019 was observed in Connecticut. Because of varying resources to conduct viral hepatitis surveillance and the relatively smaller number of acute hepatitis B virus cases reported in certain jurisdictions, wide fluctuations in annual rates occur.

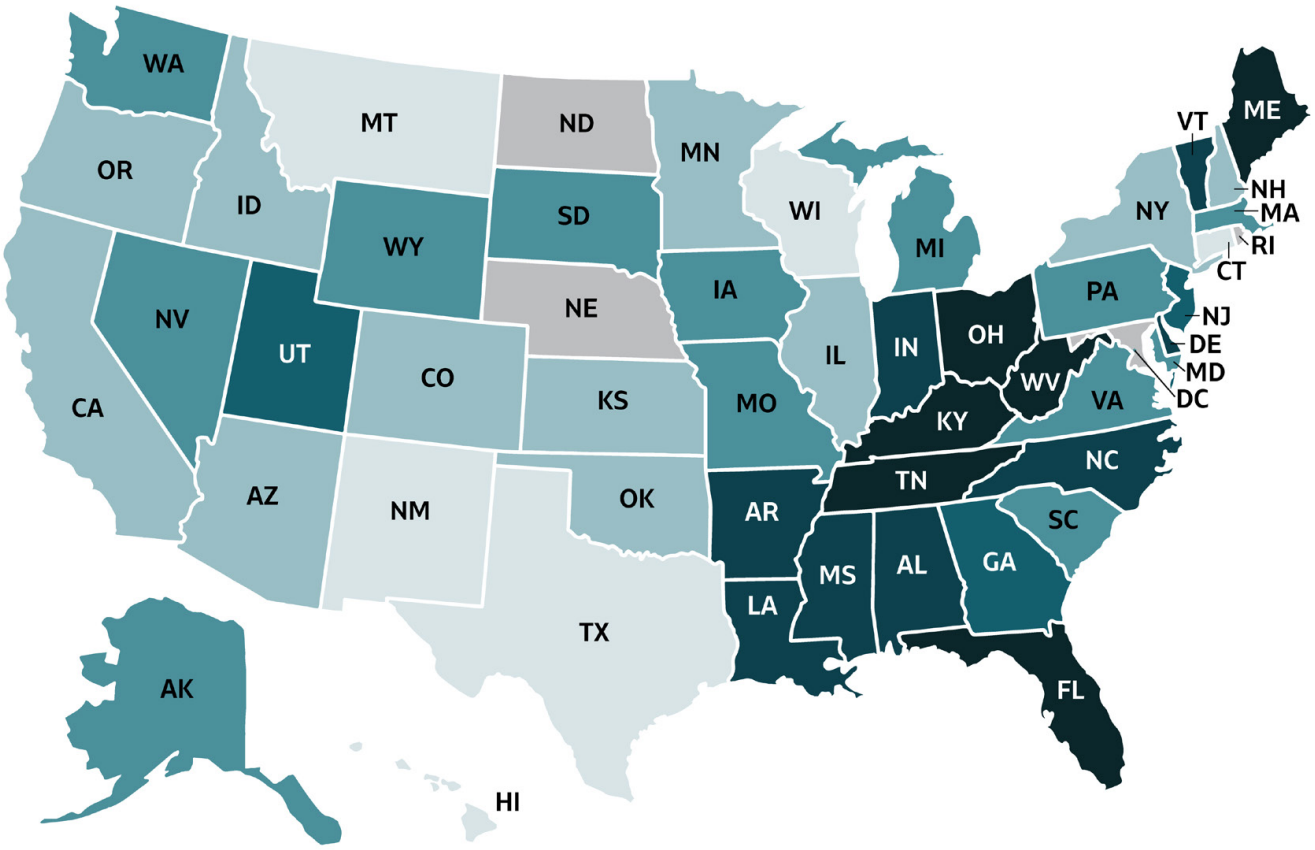
Source: CDC, National Notifiable Diseases Surveillance System.

* Rates per 100,000 population.

† Reported cases that met the classification criteria for a confirmed case. For the case definition, see https://ndc.services.cdc.gov/conditions/hepatitis-b-acute/.

Only states with rates for 2018 and 2019 are shown. State/jurisdiction and year for no reported cases: Nebraska (2019), North Dakota (2019); for unavailable data: District of Columbia (2018, 2019), Rhode Island (2018, 2019).

Figure 2.3. Rates of reported acute hepatitis B virus infection, by state or jurisdiction — United States, 2019

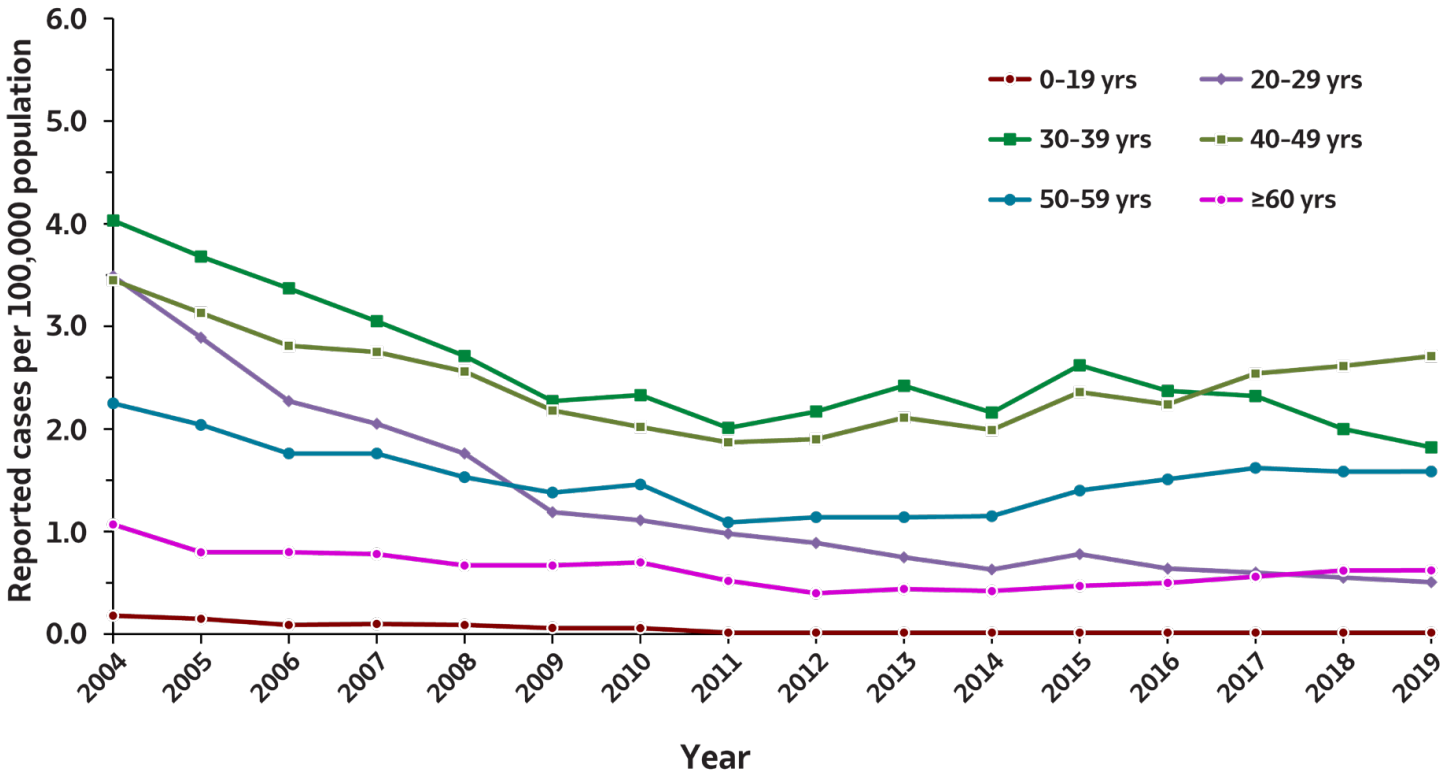


Color Key	Cases per 100,000 Population	State or Jurisdiction
	0.0-0.2	CT, HI, MT, NM, TX, WI
	0.3-0.4	AZ, CA, CO, ID, IL, KS, MN, NH, NY, OK, OR
	0.5-0.8	AK, IA, MA, MD, MI, MO, NV, PA, SC, SD, VA, WA, WY
	0.9-1.1	GA, NJ, UT
	1.2-2.5	AL, AR, DE, IN, LA, MS, NC, VT
	2.6-4.3	FL, KY, ME, OH, TN, WV
	Data not available	DC, ND, NE, RI

Source: CDC, National Notifiable Diseases Surveillance System.

The state-specific rates of reported acute hepatitis B varied throughout the country during 2019. The states in the highest rate category (2.6 to 4.3 cases per 100,000 population) include Florida, Kentucky, Maine, Ohio, Tennessee, and West Virginia. States with rates of acute hepatitis B higher than the national rate (1.0 cases per 100,000 population) were located in the eastern part of the country, particularly in or near the Appalachian region.

Figure 2.4. Rates of reported acute hepatitis B virus infection, by age group — United States, 2004–2019



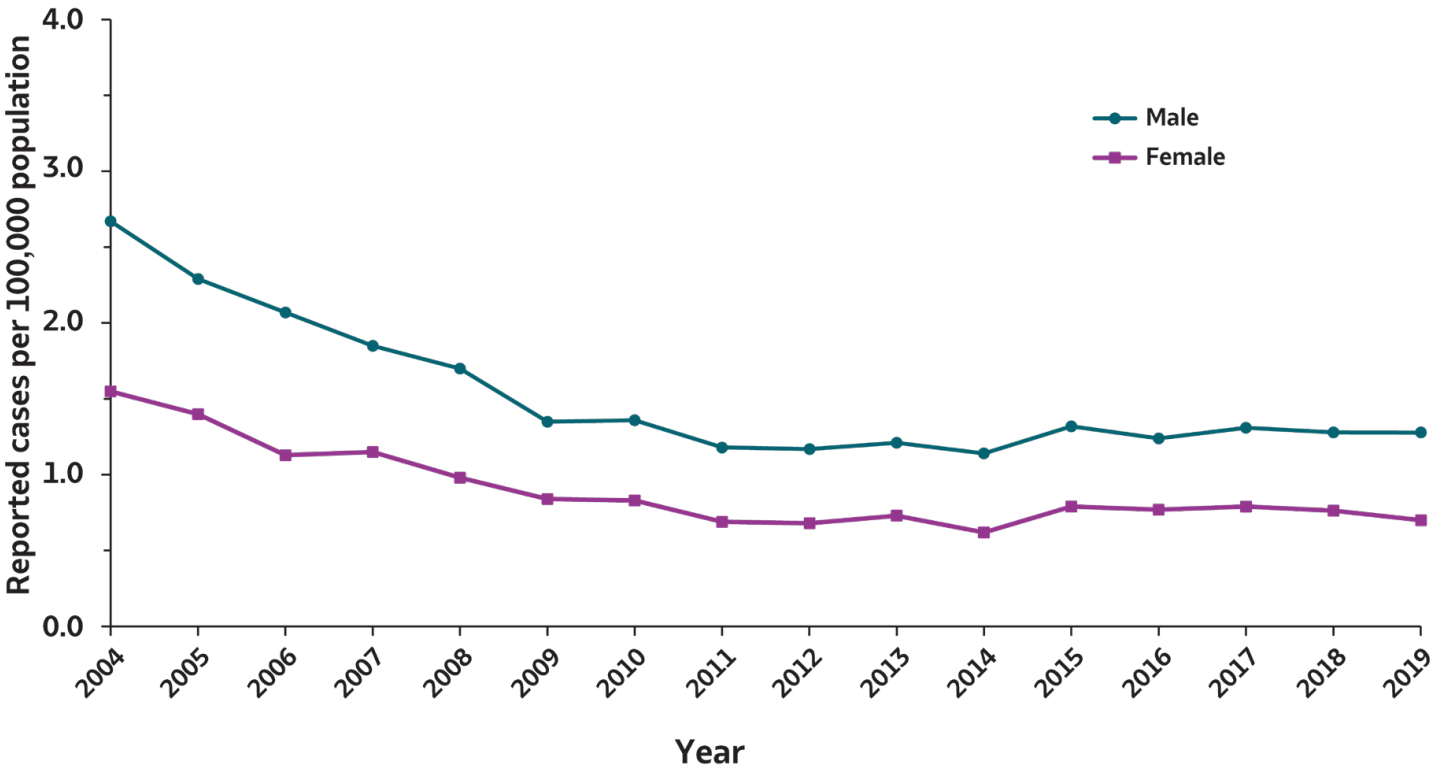
Age (years)	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
0–19	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0	0	0	0	0	0	0	0	0
20–29	3.5	2.9	2.3	2.0	1.8	1.2	1.1	1.0	0.9	0.8	0.6	0.8	0.6	0.6	0.6	0.5
30–39	4.0	3.7	3.4	3.0	2.7	2.3	2.3	2.0	2.2	2.4	2.2	2.6	2.4	2.3	2.0	1.8
40–49	3.4	3.1	2.8	2.7	2.6	2.2	2.0	1.9	1.9	2.1	2.0	2.4	2.2	2.5	2.6	2.7
50–59	2.3	2.0	1.8	1.8	1.5	1.4	1.5	1.1	1.1	1.1	1.2	1.4	1.5	1.6	1.6	1.6
≥60	1.1	0.8	0.8	0.8	0.7	0.7	0.7	0.5	0.4	0.4	0.4	0.5	0.5	0.6	0.6	0.6

Source: CDC, National Notifiable Diseases Surveillance System.

During 2011–2019, rates of reported acute hepatitis B steadily increased among persons aged 40–49 and 50–59 years. In contrast, rates continued to remain low among children and adolescents aged 0–19 years. During 2015–2019, rates of reported acute hepatitis B have decreased by 86% among persons aged 20–29 years, likely explained, in part, because of the implementation of childhood hepatitis B vaccine recommendations in 1991. As the cohort of persons aged 20–29 years has grown older, rates of acute hepatitis B among persons aged 30–39 years began to consistently decrease beginning in 2015.

Source: Schillie S, Vellozzi C, Reingold A, et al. Prevention of hepatitis B virus infection in the United States: recommendations of the Advisory Committee on Immunization Practices. MMWR Recomm Rep 2018;67(No. RR-1):1–31.

Figure 2.5. Rates of reported acute hepatitis B virus infection, by sex — United States, 2004–2019

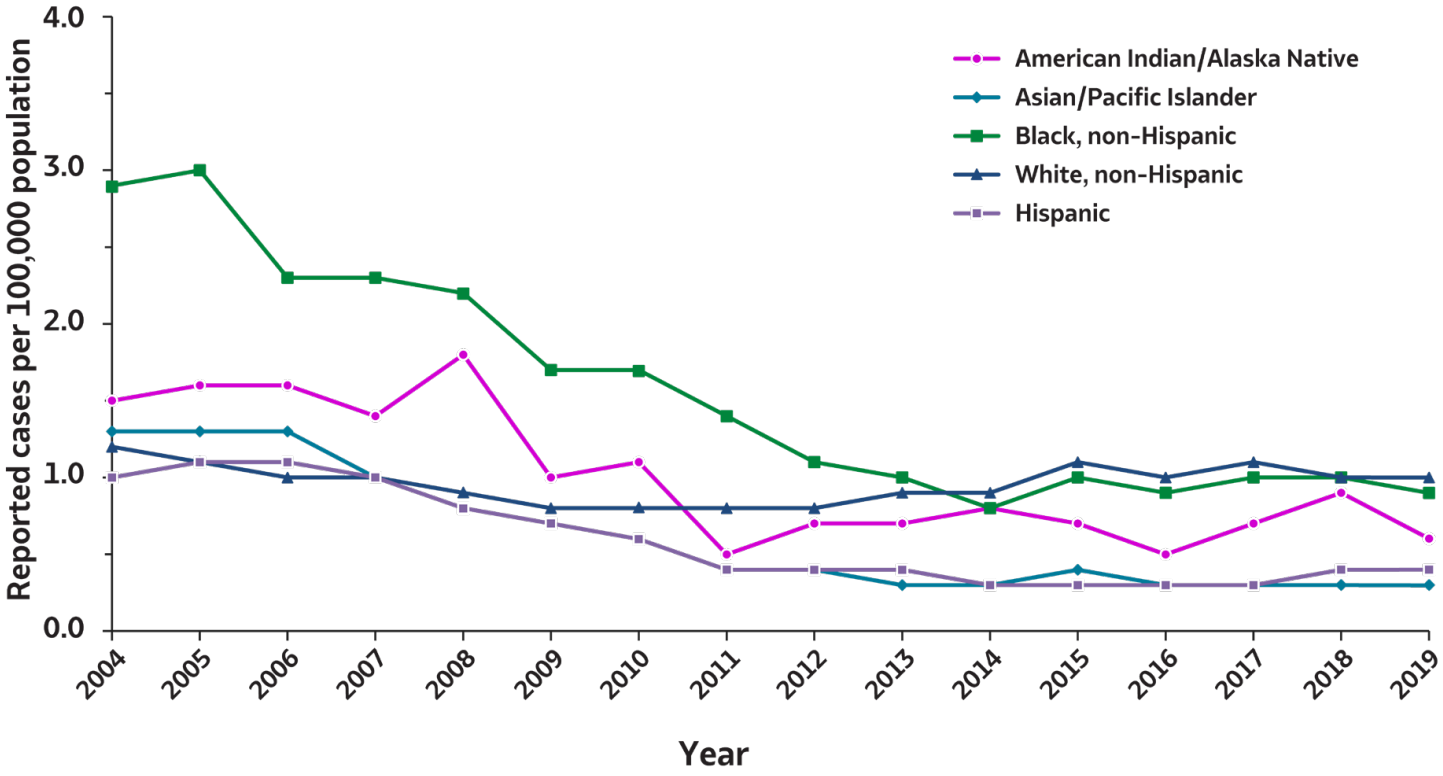


Sex	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Male	2.7	2.3	2.1	1.9	1.7	1.4	1.4	1.2	1.2	1.2	1.1	1.3	1.2	1.3	1.3	1.3
Female	1.5	1.4	1.1	1.1	1.0	0.8	0.8	0.7	0.7	0.7	0.6	0.8	0.8	0.8	0.8	0.7

Source: CDC, National Notifiable Diseases Surveillance System.

The rates of reported acute hepatitis B are higher among males than among females. Since 2011, rates have remained relatively stable, ranging from 1.1 to 1.3 cases per 100,000 among males and from 0.6 to 0.8 cases per 100,000 among females. This represents a decade of stable rates after a decrease from 2004 rates of 2.7 cases per 100,000 among males and 1.5 cases per 100,000 among females.

Figure 2.6. Rates of reported acute hepatitis B virus infections, by race/ethnicity — United States, 2004–2019



Race/Ethnicity	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
American Indian/ Alaska Native	1.5	1.6	1.5	1.4	1.8	1.0	1.1	0.5	0.7	0.7	0.8	0.7	0.5	0.7	0.9	0.6
Asian/Pacific Islander	1.3	1.3	1.2	0.9	0.8	0.7	0.6	0.4	0.4	0.3	0.3	0.4	0.3	0.3	0.3	0.3
Black, non-Hispanic	2.9	3.0	2.3	2.3	2.2	1.7	1.7	1.4	1.1	0.9	0.8	1.0	0.9	1.0	1.0	0.9
White, non-Hispanic	1.2	1.1	1.0	1.0	0.9	0.8	0.8	0.8	0.8	0.9	0.9	1.1	1.0	1.1	1.0	1.0
Hispanic	1.0	1.1	1.1	1.0	0.8	0.7	0.6	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.4	0.4

Source: CDC, National Notifiable Diseases Surveillance System.

Rates of reported acute hepatitis B decreased among all racial/ethnicity groups during 2004–2014 but have remained largely unchanged in recent years. During 2019, rates of reported acute hepatitis B ranged from a low of 0.3 cases per 100,000 among Asian/Pacific Islander persons to a high of 1.0 case per 100,000 among non-Hispanic White persons. Of note, the relatively small number of cases reported among certain racial/ethnicity categories can result in wider fluctuations in annual rates.

Table 2.2. Number and rates* of reported cases† of acute hepatitis B virus infection, by demographic characteristics — United States 2015–2019

Characteristic	2015		2016		2017		2018		2019	
	No.	Rate*	No.	Rate*	No.	Rate*	No.	Rate*	No.	Rate*
Total§	**3,370**	**1.1**	**3,218**	**1.0**	**3,409**	**1.1**	**3,322**	**1.0**	**3,192**	**1.0**
Age (years)										
0–19	19	0.0	18	0.0	16	0.0	27	0.0	13	0.0
20–29	348	0.8	286	0.6	271	0.6	249	0.6	218	0.5
30–39	1,094	2.6	1,000	2.4	998	2.3	868	2.0	801	1.8
40–49	961	2.4	906	2.2	1,028	2.5	1,052	2.6	1,067	2.7
50–59	615	1.4	655	1.5	700	1.6	675	1.6	675	1.6
≥60	312	0.5	342	0.5	395	0.6	450	0.6	418	0.6
Sex										
Male	2,080	1.3	1,957	1.2	2,095	1.3	2,050	1.3	2,021	1.3
Female	1,280	0.8	1,252	0.8	1,301	0.8	1,260	0.8	1,169	0.7
Race/ethnicity										
American Indian/ Alaska Native	18	0.7	14	0.5	19	0.7	25	0.9	15	0.6
Asian/Pacific Islander	67	0.4	56	0.3	64	0.3	55	0.3	63	0.3
Black, non-Hispanic	398	1.0	386	0.9	411	1.0	405	1.0	382	0.9
White, non-Hispanic	2,150	1.1	2,059	1.0	2,197	1.1	2,084	1.0	2,045	1.0
Hispanic	175	0.3	194	0.3	196	0.3	222	0.4	215	0.4
Urbanicity¶										
Urban	2,607	1.0	2,329	0.8	2,333	0.8	2,519	0.9	2,504	0.9
Rural	631	1.4	495	1.1	490	1.1	589	1.3	519	1.2
HHS Region: Regional Office#										
1: Boston	43	0.3	93	0.7	139	1.0	115	0.8	112	0.8
2: New York	165	0.6	162	0.6	138	0.5	120	0.4	163	0.6
3: Philadelphia	450	1.5	397	1.3	385	1.3	311	1.0	277	0.9
4: Atlanta	1,302	2.0	1,378	2.1	1,501	2.3	1,601	2.4	1,458	2.2
5: Chicago	677	1.3	557	1.1	580	1.1	611	1.2	612	1.2
6: Dallas	321	0.8	286	0.7	267	0.6	214	0.5	202	0.5
7: Kansas City	73	0.5	79	0.6	77	0.5	51	0.4	68	0.6
8: Denver	46	0.4	38	0.3	57	0.5	63	0.5	55	0.5
9: San Francisco	224	0.4	151	0.3	182	0.4	154	0.3	163	0.3
10: Seattle	69	0.5	77	0.6	83	0.6	82	0.6	82	0.6

Source: CDC, National Notifiable Diseases Surveillance System.

* Rates per 100,000 population.

† Reported cases that met the classification criteria for a confirmed case. For the case definition, see https://ndc.services.cdc.gov/conditions/hepatitis-b-acute/.

§ Numbers reported in each category might not add up to the total number of reported cases in a year because of cases with missing data or, in the case of race/ethnicity, cases categorized as "Other."

¶ Urbanicity was categorized according to the 2013 National Center for Health Statistics (NCHS) urban-rural classification scheme for counties and county-equivalent entities (https://www.cdc.gov/nchs/data_access/urban_rural.htm). Large central metropolitan, large fringe metropolitan, medium metropolitan, and small metropolitan counties were grouped as urban. Micropolitan and noncore counties were grouped as rural.

US Department of Health and Human Services (HHS) regions were categorized according to the grouping of states and US territories assigned under each of the 10 HHS regional offices (https://www.hhs.gov/about/agencies/iea/regional-offices/index.html). For the purposes of this report, regions with US territories (Region 2 and Region 9) contain data from states only.

This table summarizes the epidemiology of acute hepatitis B in the United States in recent years. During 2019, rates of acute hepatitis B were highest among persons aged 30–59 years, males, non-Hispanic White persons, and in US Department of Health and Human Services Region 4 (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, and Tennessee). Using urbanicity categories defined by the National Center for Health Statistics, the rates of reported acute hepatitis B remained higher in rural settings, compared with urban settings during 2015–2019. Among all acute hepatitis B cases reported during 2019, 80% occurred among persons aged 30–59 years; 64% occurred among non-Hispanic White persons; 78% occurred in urban areas; and 46% occurred in Health and Human Services Region 4.

HEPATITIS B RISK BEHAVIORS AND EXPOSURES

Figure 2.7. Availability of information regarding risk behaviors or exposures*† associated with reported cases of acute hepatitis B virus infection — United States, 2019

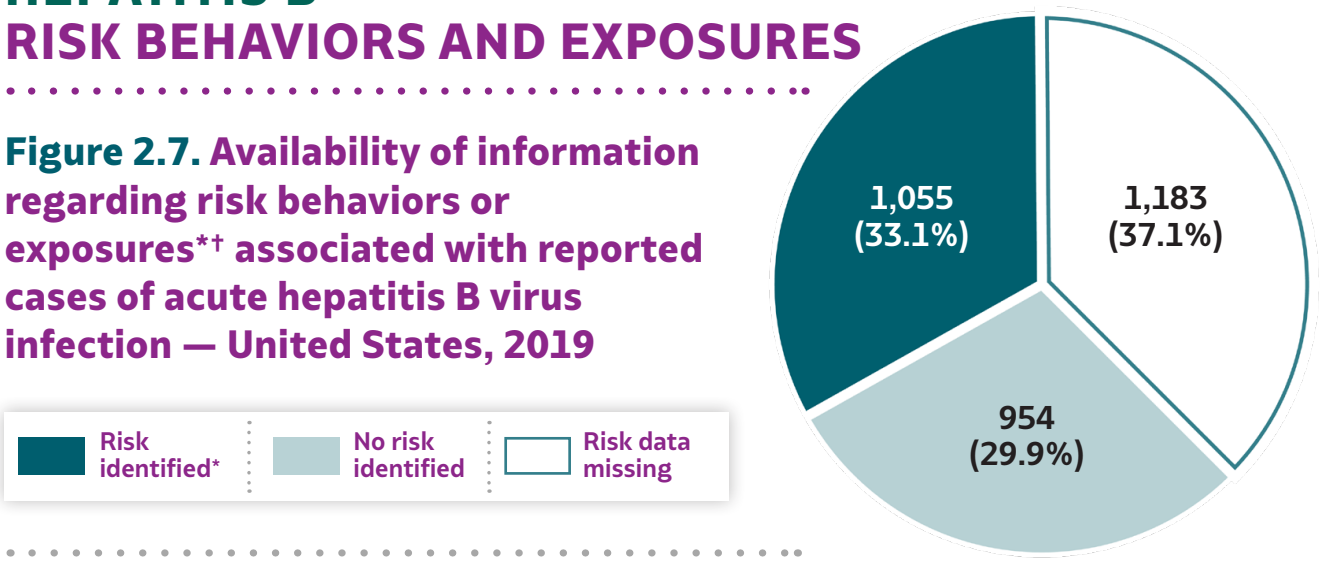


Table 2.3. Reported risk behaviors or exposures*† among reported cases of acute hepatitis B virus infection — United States, 2019

Risk behaviors/exposures	Risk identified*	No risk identified	Risk data missing
Injection drug use	631	1,149	1,412
Multiple sexual partners	241	801	2,150
Surgery	120	1,139	1,933
Sexual contact §	92	807	2,293
Needlestick	73	1,121	1,998
Men who have sex with men ¶	79	374	1,568
Household contact (non-sexual) §	17	882	2,293
Dialysis patient	34	1,258	1,900
Occupational	2	1,536	1,654
Transfusion	4	1,269	1,919

Source: CDC, Nationally Notifiable Diseases Surveillance System.

* Case reports with at least one of the following risk behaviors/exposures reported 6 weeks to 6 months prior to symptom onset or documented seroconversion if asymptomatic: 1) injection drug use; 2) multiple sexual partners; 3) underwent surgery; 4) men who have sex with men; 5) sexual contact with suspected/confirmed hepatitis B case; 6) sustained a percutaneous injury; 7) household contact with suspected/confirmed hepatitis B case; 8) occupational exposure to blood; 9) dialysis; and 10) transfusion. Reported cases may include more than one risk behavior/exposure.

† Risk behaviors/exposures data from one state was classified as 'missing' because of errors in reporting.

§ Cases with more than one type of contact reported were categorized according to a hierarchy: (1) sexual contact; (2) household contact (nonsexual).

¶ A total of 2,021 acute hepatitis B cases were reported among males in 2019.

Health departments might conduct investigations of newly reported acute hepatitis B cases to ascertain risk behaviors and exposures associated with infection. However, investigations might not be possible for all cases if patients are lost to follow-up or if health departments lack adequate resources for investigating all cases reported in their jurisdiction. Among the 3,192 case reports of acute hepatitis B received by CDC for 2019, data regarding risk behaviors and exposures were missing for 1,183 (37.1%) cases. At least one risk behavior or exposure was reported for 1,055 (33.1%) cases during the 6 weeks to 6 months before illness onset. More than one risk can be reported for each case.

Among risk behaviors and exposures identified, injection drug use was most commonly reported (35% of the 1,780 cases for which injection drug use information was available), followed by multiple sexual partners (23% of the 1,042 cases for which information regarding multiple sexual partners was available).

Hepatitis B transmission associated with surgery, dialysis, or transfusion is extremely rare in the United States; thus, the reporting of these exposures might represent recent exposure to these health care procedures.

Table 2.4. Number of newly reported cases* of perinatal hepatitis B virus infection, by state or jurisdiction — United States, 2019

State or Jurisdiction	Perinatal Hepatitis B
Alabama	2
Alaska	—
Arizona	—
Arkansas	—
California	4
Colorado	—
Connecticut	—
Delaware	—
District of Columbia	U
Florida	1
Georgia	—
Hawaii	—
Idaho	—
Illinois	—
Indiana	—
Iowa	—
Kansas	—
Kentucky	—
Louisiana	—
Maine	1
Maryland	—
Massachusetts	—
Michigan	—
Minnesota	—
Mississippi	1
Missouri	—
Montana	—
Nebraska	—
Nevada	—
New Hampshire	—
New Jersey	—
New Mexico	—
New York	2
North Carolina	1
North Dakota	—
Ohio	—
Oklahoma	—
Oregon	—
Pennsylvania	2
Rhode Island	U
South Carolina	—
South Dakota	—
Tennessee	1
Texas	—
Utah	—
Vermont	—
Virginia	2
Washington	—
West Virginia	—
Wisconsin	—
Wyoming	—
Total	**17**

During 2019, a total of 10 states reported 17 cases of perinatal hepatitis B that met the classification criteria for a confirmed case. California had the highest number of newly reported cases of perinatal hepatitis B (n = 4) during 2019. Of note, not all perinatal cases reported to National Notifiable Diseases Surveillance System are case managed by the Perinatal Hepatitis B Prevention Program.

Source: CDC, National Notifiable Diseases Surveillance System.

* Reported cases that met the classification criteria for a confirmed case. For case definition, see https://ndc.services.cdc.gov/conditions/hepatitis-b-perinatal-virus-infection/.

—: No reported cases. The reporting jurisdiction did not submit any cases to CDC.

U: Unavailable. The data were unavailable.

Table 2.5. Number and rates* of newly reported cases† of chronic hepatitis B virus infection, by state or jurisdiction — United States, 2019

State or Jurisdiction	No.	Rate*
Alabama	—	—
Alaska	22	3.0
Arizona	98	1.3
Arkansas	N	—
California	—	—
Colorado	203	3.5
Connecticut	N	—
Delaware	95	9.8
District of Columbia	U	—
Florida	2,283	10.6
Georgia	1,271	12.0
Hawaii	U	—
Idaho	60	3.4
Illinois	543	4.3
Indiana	275	4.1
Iowa	47	1.5
Kansas	25	0.9
Kentucky	N	—
Louisiana	305	6.6
Maine	57	4.2
Maryland	623	10.3
Massachusetts	244	3.5
Michigan	280	2.8
Minnesota	274	4.9
Mississippi	N	—
Missouri	467	7.6
Montana	21	2.0
Nebraska	65	3.4
Nevada	U	—
New Hampshire	U	—
New Jersey	332	3.7
New Mexico	31	1.5
New York	1,355	7.0
North Carolina	522	5.0
North Dakota	44	5.8
Ohio	777	6.6
Oklahoma	191	4.8
Oregon	93	2.2
Pennsylvania	926	7.2
Rhode Island	U	—
South Carolina	173	3.4
South Dakota	15	1.7
Tennessee	735	10.8
Texas	N	—
Utah	79	2.5
Vermont	21	3.4
Virginia	548	6.4
Washington	482	6.3
West Virginia	200	11.2
Wisconsin	54	0.9
Wyoming	23	4.0
Total	**13,859**	**5.9**

In the United States, chronic hepatitis B is one of the leading causes of cirrhosis, which is a major cause of liver cancer. This table displays the number and rates of newly identified chronic hepatitis B cases during 2019, by state or jurisdiction. Of note, cases of newly reported chronic hepatitis B do not represent all prevalent hepatitis B infections, which cannot be captured in the National Notifiable Diseases Surveillance System.

Of the 13,859 cases of chronic hepatitis B reported during 2019, approximately half of the cases were from 6 states (Florida, New York, Georgia, Pennsylvania, Ohio, and Tennessee). The highest rate of newly reported chronic hepatitis B was in Georgia (12.0 cases per 100,000 population), whereas the lowest rates were in Kansas and Wisconsin (0.9 cases per 100,000 population).

Source: CDC, National Notifiable Diseases Surveillance System.

* Rates per 100,000 population.

†For case definition, see https://ndc.services.cdc.gov/conditions/hepatitis-b-chronic/.

—: No reported cases. The reporting jurisdiction did not submit any cases to CDC.

N: Not reportable. The disease or condition was not reportable by law, statute, or regulation in the reporting jurisdiction.

U: Unavailable. The data were unavailable.

Table 2.6. Number and rates* of newly reported cases† of chronic hepatitis B virus infection, by demographic characteristics — United States, 2019

Characteristic	2019	
	No.	Rate
Total§	**13,859**	**5.9**
Age (years)		
0–19	265	0.5
20–29	1,703	5.4
30–39	3,490	11.3
40–49	3,020	10.7
50–59	2,562	8.4
≥60	2,809	5.1
Sex		
Male	7,985	7.0
Female	5,853	4.9
Race/ethnicity		
American Indian/Alaska Native	24	1.0
Asian/Pacific Islander	2,119	18.9
Black, non-Hispanic	2,198	6.7
White, non-Hispanic	2,807	1.8
Hispanic	444	1.4
Urbanicity¶		
Urban	12,372	6.3
Rural	1,249	3.5
HHS Region: Regional Office#		
1: Boston	322	3.6
2: New York	1,687	6.0
3: Philadelphia	2,392	7.9
4: Atlanta	4,984	9.1
5: Chicago	2,203	4.2
6: Dallas	527	4.9
7: Kansas City	604	4.3
8: Denver	385	3.1
9: San Francisco	98	1.3
10: Seattle	657	4.6

Source: CDC, National Notifiable Diseases Surveillance System.

* Rates per 100,000 population.

† Reported cases that met the classification criteria for a confirmed case. For the case definition, see https://ndc.services.cdc.gov/conditions/hepatitis-b-chronic/.

§ Numbers reported in each category might not add up to the total number of reported cases in a year because of cases with missing data or, in the case of race/ethnicity, cases categorized as "Other."

¶ Urban-rural region was categorized according to the 2013 National Center for Health Statistics (NCHS) urban-rural classification scheme for counties and county-equivalent entities (https://www.cdc.gov/nchs/data_access/urban_rural.htm). Large central metropolitan, large fringe metropolitan, medium metropolitan, and small metropolitan counties were grouped as urban. Micropolitan and noncore counties were grouped as rural.

US Department of Health and Human Services Regions (HHS) were categorized according to the grouping of states and US territories assigned under each of the 10 HHS regional offices (https://www.hhs.gov/about/agencies/iea/regional-offices/index.html). For the purposes of this report, regions with US territories (Regions 2 and 9) contain data from states only.

During 2019, the rate of newly reported chronic hepatitis B was highest among persons aged 30–49 years and accounted for 47% of all chronic hepatitis B cases reported during 2019. Approximately 89% of all newly reported chronic hepatitis B cases occurred in urban areas, as defined by the National Center for Health Statistics, and approximately one-third were reported from US Department of Health and Human Services Region 4 (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, and Tennessee).

Although the rate of reported acute hepatitis B among Asian/Pacific Islander persons (Figure 2.6) was the lowest among all racial/ethnicity groups, the rate of newly reported chronic hepatitis B was highest among Asian/Pacific Islander persons (18.9 reported cases per 100,000 population), >10 times the rate among non-Hispanic White persons. Because the majority of prevalent chronic hepatitis B virus infections in the United States are among persons who are non-US-born, differences in the rates of newly reported chronic hepatitis B by race/ethnicity are likely influenced by country of birth. However, country of birth is not routinely collected in National Notifiable Diseases Surveillance System.

Source: Patel EU, Thio CL, Boon D, et al. Prevalence of hepatitis B and hepatitis D virus infections in the United States, 2011–2016. Clin Infect Dis 2019;69:709–12. doi: https://doi.org/10.1093/cid/ciz001

Table 2.7. Number and rates* of deaths with hepatitis B virus infection listed as a cause of death† among residents, by state or jurisdiction — United States, 2015–2019

State or Jurisdiction	2015		2016		2017		2018		2019	
	No.	Rate*	No.	Rate*	No.	Rate*	No.	Rate*	No.	Rate*
Alabama	15	UR§	19	UR§	19	UR§	19	UR§	12	UR§
Alaska	S¶	UR§	S¶	UR§	S¶	UR§	S¶	UR§	S¶	UR§
Arizona	30	0.36	29	0.34	19	UR§	31	0.34	30	0.34
Arkansas	12	UR§	10	UR§	22	0.60	17	UR§	16	UR§
California	355	0.82	337	0.78	346	0.80	304	0.67	327	0.70
Colorado	23	0.40	23	0.39	32	0.51	26	0.39	35	0.49
Connecticut	17	UR§	S¶	UR§	S¶	UR§	13	UR§	S¶	UR§
Delaware	S¶	UR§	S¶	UR§	S¶	UR§	S¶	UR§	S¶	UR§
District of Columbia	S¶	UR§	11	UR§	12	UR§	S¶	UR§	S¶	UR§
Florida	108	0.40	98	0.36	129	0.45	109	0.41	111	0.40
Georgia	43	0.37	35	0.30	34	0.28	40	0.35	44	0.35
Hawaii	13	UR§	26	1.50	15	UR§	14	UR§	21	1.17
Idaho	S¶	UR§	S¶	UR§	S¶	UR§	S¶	UR§	S¶	UR§
Illinois	30	0.21	40	0.28	30	0.19	31	0.20	25	0.17
Indiana	21	0.27	26	0.32	29	0.34	16	UR§	21	0.26
Iowa	S¶	UR§	16	UR§	15	UR§	19	UR§	11	UR§
Kansas	S¶	UR§	15	UR§	11	UR§	12	UR§	13	UR§
Kentucky	26	0.54	36	0.72	35	0.75	47	0.98	37	0.77
Louisiana	36	0.63	26	0.49	30	0.53	36	0.60	31	0.55
Maine	S¶	UR§	S¶	UR§	S¶	UR§	S¶	UR§	S¶	UR§
Maryland	25	0.38	31	0.43	31	0.43	37	0.52	39	0.53
Massachusetts	46	0.54	32	0.37	36	0.47	28	0.36	22	0.24
Michigan	35	0.29	27	0.18	28	0.22	33	0.25	23	0.17
Minnesota	31	0.45	25	0.42	21	0.30	33	0.51	48	0.70
Mississippi	20	0.61	22	0.64	23	0.67	20	0.61	25	0.72
Missouri	20	0.25	13	UR§	19	UR§	24	0.31	19	UR§
Montana	S¶	UR§	S¶	UR§	S¶	UR§	S¶	UR¶	S¶	UR§
Nebraska	S¶	UR§	S¶	UR§	S¶	UR§	10	UR§	S¶	UR§
Nevada	18	UR§	23	0.66	13	UR§	20	0.51	16	UR§
New Hampshire	S¶	UR§	S¶	UR§	S¶	UR§	S¶	UR¶	S¶	UR§
New Jersey	48	0.45	39	0.34	43	0.43	41	0.39	34	0.29
New Mexico	S¶	UR§	S¶	UR§	S¶	UR§	S¶	UR¶	S¶	UR§
New York	115	0.50	138	0.60	123	0.50	115	0.47	113	0.48
North Carolina	40	0.34	42	0.37	36	0.29	35	0.27	39	0.29
North Dakota	S¶	UR§	S¶	UR§	S¶	UR§	S¶	UR§	S¶	UR§
Ohio	58	0.44	44	0.34	55	0.42	42	0.32	49	0.36
Oklahoma	34	0.77	43	0.95	40	0.95	54	1.16	45	0.98
Oregon	35	0.67	27	0.54	29	0.52	23	0.45	42	0.78
Pennsylvania	44	0.27	41	0.25	35	0.20	34	0.22	37	0.25
Rhode Island	S¶	UR§	S¶	UR§	S¶	UR§	11	UR§	S¶	UR§
South Carolina	22	0.35	38	0.60	26	0.39	26	0.42	17	UR§
South Dakota	S¶	UR§	S¶	UR§	S¶	UR§	S¶	UR§	S¶	UR§
Tennessee	54	0.70	55	0.71	63	0.83	50	0.61	63	0.87
Texas	130	0.43	149	0.51	150	0.51	119	0.40	135	0.43
Utah	10	UR§	S¶	UR§	11	UR§	S¶	UR§	S¶	UR§
Vermont	S¶	UR§	S¶	UR§	S¶	UR§	S¶	UR§	S¶	UR§
Virginia	25	0.26	23	0.24	29	0.30	28	0.28	20	0.18
Washington	48	0.53	47	0.55	47	0.56	53	0.57	50	0.54
West Virginia	21	0.89	11	UR§	14	UR§	23	1.26	18	UR§
Wisconsin	18	UR§	19	UR§	21	0.31	19	UR§	S¶	UR§
Wyoming	S¶	UR§	S¶	UR§	S¶	UR§	S¶	UR§	S¶	UR§
Total	**1,707**	**0.46**	**1,690**	**0.45**	**1,727**	**0.46**	**1,649**	**0.43**	**1,662**	**0.42**

Source: CDC, National Center for Health Statistics, Multiple Cause of Death 1999–2019 on CDC WONDER Online Database. Data are from the 2015–2019 Multiple Cause of Death files and are based on information from all death certificates filed in the vital records offices of the 50 states and the District of Columbia through the Vital Statistics Cooperative Program. Deaths of nonresidents (e.g., nonresident aliens, nationals living abroad, residents of Puerto Rico, Guam, the Virgin Islands, and other US territories) and fetal deaths are excluded. Numbers are slightly lower than previously reported for 2015–2016 because of NCHS standards that restrict displayed data to US residents. Accessed at http://wonder.cdc.gov/mcd-icd10.html on January 11, 2021. CDC WONDER data set documentation and technical methods can be accessed at https://wonder.cdc.gov/wonder/help/mcd.html#.

* Rates are age-adjusted per 100,000 US standard population during 2000 by using the following age group distribution (in years): <1, 1–4, 5–14, 15–24, 25–34, 35–44, 45–54, 55–64, 65–74, 75–84, and ≥85. For age-adjusted death rates, the age-specific death rate is rounded to 1 decimal place before proceeding to the next step in the calculation of age-adjusted death rates for NCHS Multiple Cause of Death on CDC WONDER. This rounding step might affect the precision of rates calculated for small numbers of deaths. Missing data are not included.

† Cause of death is defined as 1 of the multiple causes of death and is based on the International Classification of Diseases, 10th Rev. (ICD-10) codes B16, B17.0, B18.0, B18.1 (hepatitis B).

§UR Unreliable rate: Rates where death counts were <20 were not displayed because of the instability associated with those rates.

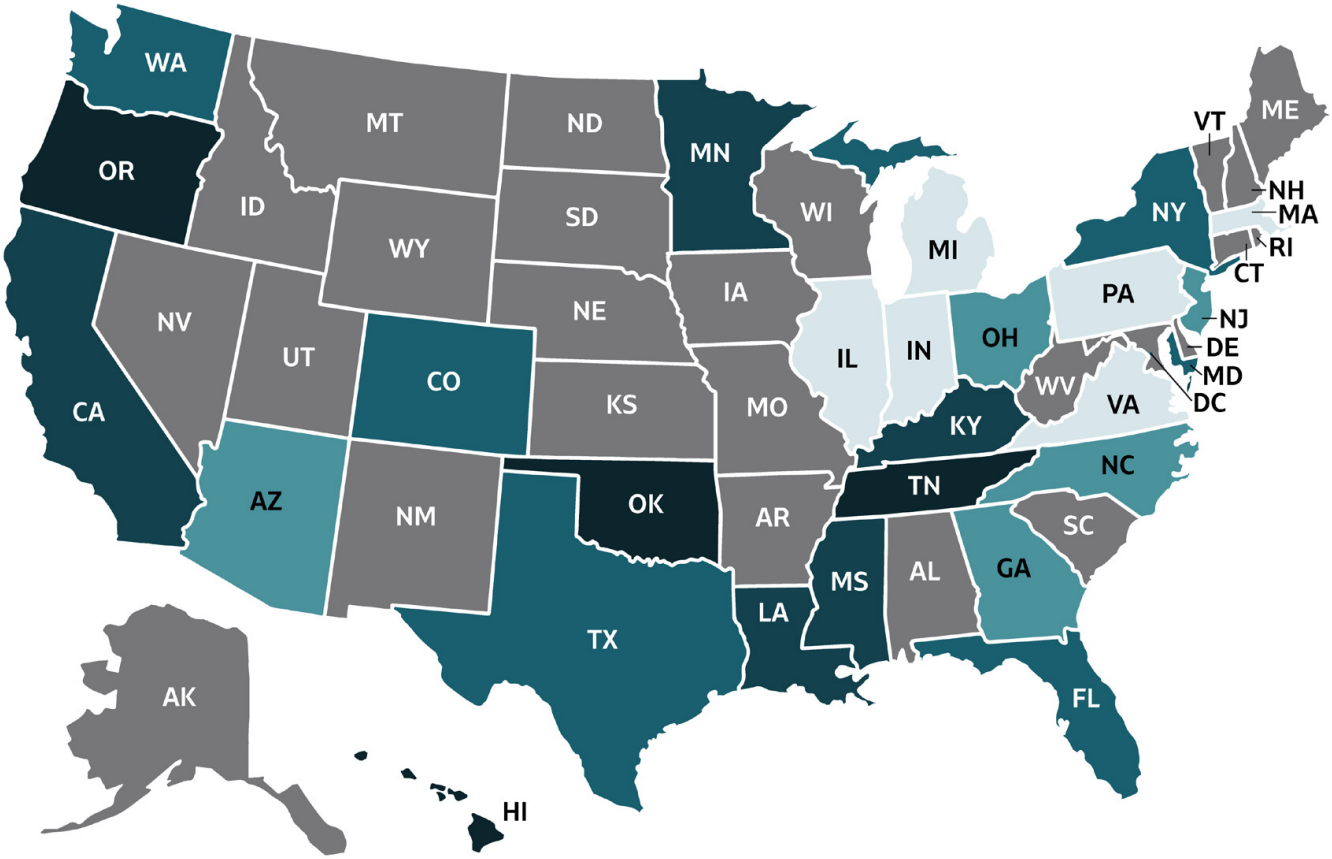
¶ S Suppressed: Subnational data representing <10 deaths (0–9) are suppressed or CDC WONDER did not have the functionality to calculate rates.

Hepatitis B is associated with premature death, elevated rates of death from all causes, and elevated rates of death from liver-related causes, including hepatocellular carcinoma. Although death certificate data can help characterize deaths in the United States associated with hepatitis B, underreporting of hepatitis B as the underlying or contributing cause of death is known to occur. During 2019, the reported number of deaths was suppressed in 17 jurisdictions with <10 deaths, and rates were suppressed for another 8 states with <20 deaths.

Among jurisdictions with death rates available, the highest hepatitis B-associated death rate was observed in Hawaii (1.17 cases per 100,000 population), and the lowest rate was observed in Illinois and Michigan (0.17 cases per 100,000 population). In total, 14 states had hepatitis B-associated death rates higher than the national average. Four states with the highest number of deaths reported (California, Texas, New York, and Florida) accounted for more than 40% of all hepatitis B-associated deaths reported during 2019.

Source: Bixler D, Zhong Y, Ly KN, et al; CHeCS Investigators. Mortality among patients with chronic hepatitis B infection: the chronic hepatitis cohort study (CHeCS). Clin Infect Dis 2019;68:956–63. doi: 10.1093/cid/ciy598. PMID: 30060032. https://pubmed.ncbi.nlm.nih.gov/30060032/

Figure 2.8. Rates* of deaths with hepatitis B virus infection listed as a cause of death† among residents, by jurisdiction — United States, 2019



Color Key	Deaths per 100,000 Population	State or Jurisdiction
	0.00-0.29	IL, IN, MA, MI, PA, VA
	0.30-0.40	AZ, GA, NC, NJ, OH
	0.41-0.54	CO, FL, MD, NY, TX, WA
	0.55-0.77	CA, KY, LA, MN, MS
	0.78-1.17	HI, OK, OR, TN
	UR	AK, AL, AR, CT, DC, DE, IA, ID, KS, ME, MO, MT, ND, NE, NH, NM, NV, RI, SC, SD, UT, VT, WI, WV, WY

During 2019, the reported number of hepatitis B-associated deaths was suppressed in 17 jurisdictions with <10 deaths, and rates were suppressed for another 8 states with <20 deaths. Among states with death rates available, the states in the lowest category (≤0.29 deaths per 100,000 population) include Illinois, Indiana, Massachusetts, Michigan, Pennsylvania, and Virginia. The states in the highest category (0.78 to 1.17 deaths per 100,000 population) include Hawaii, Oklahoma, Oregon, and Tennessee.

Source: CDC, National Center for Health Statistics, Multiple Cause of Death 1999–2019 on CDC WONDER Online Database. Data are from the 2015–2019 Multiple Cause of Death files and are based on information from all death certificates filed in the vital records offices of the fifty states and the District of Columbia through the Vital Statistics Cooperative Program. Deaths of nonresidents (e.g., nonresident aliens, nationals living abroad, residents of Puerto Rico, Guam, the Virgin Islands, and other U.S. territories) and fetal deaths are excluded. Numbers are slightly lower than previously reported for 2015–2016 due to NCHS standards which restrict displayed data to U.S. residents. Accessed at http://wonder.cdc.gov/mcd-icd10.html on January 11, 2021. CDC WONDER dataset documentation and technical methods can be accessed at https://wonder.cdc.gov/wonder/help/mcd.html.

* Rates are age-adjusted per 100,000 US standard population in 2000 using the following age group distribution (in years): <1, 1–4, 5–14, 15–24, 25–34, 35–44, 45–54, 55–64, 65–74, 75–84, and ≥85. For age-adjusted death rates, the age-specific death rate is rounded to one decimal place before proceeding to the next step in the calculation of age-adjusted death rates for NCHS Multiple Cause of Death on CDC WONDER. This rounding step may affect the precision of rates calculated for small numbers of deaths. Missing data are not included.

† Cause of death is defined as one of the multiple causes of death and is based on the International Classification of Diseases, 10th Revision (ICD-10) codes B16, B17.0, B18.0, B18.1 (hepatitis B).

UR: Unreliable rates. Death counts that were less than 20 were not displayed due to the instability associated with those rates.

Table 2.8. Number and rates* of deaths with hepatitis B virus infections listed as a cause of death† among residents, by demographic characteristics — United States, 2015–2019

Characteristic	2015		2016		2017		2018		2019	
	No.	Rate* (95% CI)	No.	Rate* (95% CI)	No.	Rate* (95% CI)	No.	Rate* (95% CI)	No.	Rate* (95% CI)
Total	**1,707**	**0.46 (0.44–0.49)**	**1,690**	**0.45 (0.43–0.48)**	**1,727**	**0.46 (0.44–0.49)**	**1,649**	**0.43 (0.41–0.45)**	**1,662**	**0.42 (0.40–0.44)**
Age (years)										
0–34	30	0.02 (0.01- 0.03)	39	0.03 (0.02-0.04)	29	0.02 (0.01-0.03)	32	0.02 (0.01-0.03)	45	0.03 (0.02–0.04)
35–44	118	0.29 (0.24-0.34)	116	0.29 (0.23-0.34)	106	0.26 (0.21-0.31)	122	0.3 (0.24-0.35)	110	0.26 (0.21–0.31)
45–54	330	0.76 (0.68-0.85)	324	0.76 (0.67-0.84)	323	0.76 (0.68-0.85)	283	0.68 (0.60-0.76)	255	0.62 (0.55–0.70)
55–64	610	1.49 (1.37-1.61)	576	1.39 (1.28-1.50)	548	1.3 (1.20-1.41)	520	1.23 (1.12-1.34)	502	1.18 (1.08–1.29)
65–74	382	1.39 (1.25-1.53)	383	1.34 (1.20-1.47)	417	1.4 (1.27-1.54)	422	1.38 (1.25-1.52)	484	1.54 (1.40–1.67)
≥75	236	1.17 (1.02-1.32)	252	1.22 (1.07-1.37)	303	1.43 (1.27-1.59)	270	1.23 (1.08-1.38)	266	1.18 (1.04–1.32)
Sex										
Male	1,270	0.7 (0.66-0.74)	1,231	0.67 (0.64-0.71)	1,275	0.7 (0.66-0.74)	1,191	0.65 (0.61-0.69)	1,248	0.66 (0.62–0.70
Female	437	0.21 (0.19-0.23)	459	0.22 (0.20-0.24)	452	0.23 (0.20-0.25)	458	0.22 (0.20-0.24)	414	0.21 (0.19–0.24)
Race/ethnicity										
White, non-Hispanic	805	0.28 (0.26-0.30)	767	0.29 (0.27-0.31)	776	0.28 (0.26-0.30)	760	0.27 (0.25-0.29)	761	0.28 (0.26–0.30)
Black, non-Hispanic	318	0.75 (0.67-0.84)	315	0.73 (0.65-0.81)	320	0.74 (0.66-0.83)	304	0.7 (0.62-0.79)	291	0.64 (0.56–0.71)
Hispanic	136	0.32 (0.27-0.38)	128	0.3 (0.25-0.36)	109	0.26 (0.21-0.32)	122	0.28 (0.23-0.33)	117	0.27 (0.21–0.32)
Asian/Pacific Islander	419	2.23 (2.01-2.45)	454	2.38 (2.16-2.60)	492	2.45 (2.23-2.67)	439	2.1 (1.90-2.30)	463	2.10 (1.90–2.29)
American Indian/ Alaska Native	13	UR§	16	UR§	17	UR§	6	UR§	20	0.76 (0.46–1.18)
HHS Region: Regional Office¶										
1: Boston	81	0.43 (0.34-0.54)	56	0.28 (0.21-0.37)	60	0.35 (0.27-0.46)	64	0.34 (0.26-0.45)	43	0.22 (0.16–0.30)
2: New York	163	0.48 (0.41-0.56)	177	0.51 (0.43-0.59)	166	0.47 (0.39-0.54)	156	0.44 (0.36-0.51)	147	0.42 (0.35–0.49)
3: Philadelphia	126	0.35 (0.28-0.41)	118	0.32 (0.26-0.38)	128	0.32 (0.27-0.38)	130	0.35 (0.29-0.41)	126	0.32 (0.26–0.38)
4: Atlanta	328	0.43 (0.38-0.48)	345	0.44 (0.39-0.49)	365	0.45 (0.41-0.50)	346	0.45 (0.40-0.50)	348	0.42 (0.38–0.47)
5: Chicago	193	0.32 (0.27-0.36)	181	0.29 (0.25-0.33)	184	0.29 (0.24-0.33)	174	0.28 (0.24-0.33)	173	0.27 (0.23–0.31)
6: Dallas	220	0.5 (0.43-0.56)	230	0.51 (0.44-0.57)	247	0.55 (0.48-0.62)	230	0.47 (0.41-0.53)	230	0.48 (0.42–0.55)
7: Kansas City	44	0.26 (0.19-0.36)	52	0.33 (0.24-0.44)	50	0.29 (0.22-0.39)	65	0.38 (0.29-0.48)	51	0.30 (0.22–0.40)
8: Denver	42	0.35 (0.25-0.47)	35	0.27 (0.19-0.38)	48	0.37 (0.27-0.49)	34	0.25 (0.17-0.35)	47	0.32 (0.23–0.43)
9: San Francisco	416	0.72 (0.65-0.79)	415	0.73 (0.66-0.80)	393	0.69 (0.62-0.76)	369	0.62 (0.56-0.69)	394	0.64 (0.57–0.70)
10: Seattle	94	0.56 (0.45-0.69)	81	0.51 (0.40-0.63)	86	0.52 (0.41-0.64)	81	0.47 (0.37-0.59)	103	0.58 (0.47–0.70)

Source: CDC, National Center for Health Statistics, Multiple Cause of Death 1999–2019 on CDC WONDER Online Database. Data are from the 2015–2019 Multiple Cause of Death files and are based on information from all death certificates filed in the vital records offices of the 50 states and the District of Columbia through the Vital Statistics Cooperative Program. Deaths of nonresidents (e.g., nonresident aliens, nationals living abroad, residents of Puerto Rico, Guam, the Virgin Islands, and other US territories) and fetal deaths are excluded. Numbers are slightly lower than previously reported for 2015–2016 because of NCHS standards that restrict displayed data to US residents. Accessed at http://wonder.cdc.gov/mcd-icd10.html on January 8, 2021. CDC WONDER data set documentation and technical methods can be accessed at https://wonder.cdc.gov/wonder/help/mcd.html#.

* Rates for race/ethnicity, sex, HHS region, and the overall total are age-adjusted per 100,000 US standard population during 2000 by using the following age group distribution (in years): <1, 1–4, 5–14, 15–24, 25–34, 35–44, 45–54, 55–64, 65–74, 75–84, and ≥85. For age-adjusted death rates, the age-specific death rate is rounded to 1 decimal place before proceeding to the next step in the calculation of age-adjusted death rates for NCHS Multiple Cause of Death on CDC WONDER. This rounding step might affect the precision of rates calculated for small numbers of deaths. Missing data are not included.

† Cause of death is defined as 1 of the multiple causes of death and is based on the International Classification of Diseases, 10th Rev (ICD-10) codes B16, B17.0, B18.0, B18.1 (hepatitis B).

§ Unreliable rate: Rates where death counts were <20 were not displayed because of the instability associated with those rates.

¶ US Department of Health and Human Services (HHS) regions were categorized according to the grouping of states and US territories assigned under each of the 10 HHS regional offices (https://www.hhs.gov/about/agencies/iea/regional-offices/index.html). For the purposes of this report, regions with US territories (Regions 2 and 9) contain data from states only.

This table summarizes the characteristics of hepatitis B-associated deaths among residents in the United States. During 2019, a total of 1,662 hepatitis B-associated deaths among US residents were reported in the US Multiple Cause of Death data from the National Center for Health Statistics, which corresponds to an age-adjusted death rate of 0.42 cases per 100,000 population. The US age-adjusted death rates have been relatively consistent during 2015–2019. The mortality rate was highest among Asian/Pacific Islander persons (2.10 deaths per 100,000 population), approximately 7.5 times the rate among non-Hispanic White persons. The hepatitis B-associated mortality rates were also higher than the national rate among adults aged ≥45 years, males, and in Health and Human Services Regions 9 (Arizona, California, Hawaii, and Nevada) and 10 (Alaska, Idaho, Oregon, and Washington).

ACUTE HEPATITIS C, 2019

4,136 Acute cases reported

1.3 Reported cases per 100,000 population

57,500* Acute infections estimated

AT A GLANCE
ACUTE HEPATITIS C in 2019

Rates of acute hepatitis C **increased** again in 2019. The highest rates occurred in persons **20–39 years**, consistent with age groups most impacted by the nation's opioid crisis.

GROUPS MOST AFFECTED
BY ACUTE HEPATITIS C IN 2019

By Age†

20–29 years: 2.9 cases per 100,000 people

30–39 years: 3.2 cases per 100,000 people

40–49 years: 1.7 cases per 100,000 people

By Sex†

Males: 1.6 cases per 100,000 people

By Race/Ethnicity†

American Indian/Alaska Native: 3.6 cases per 100,000 people

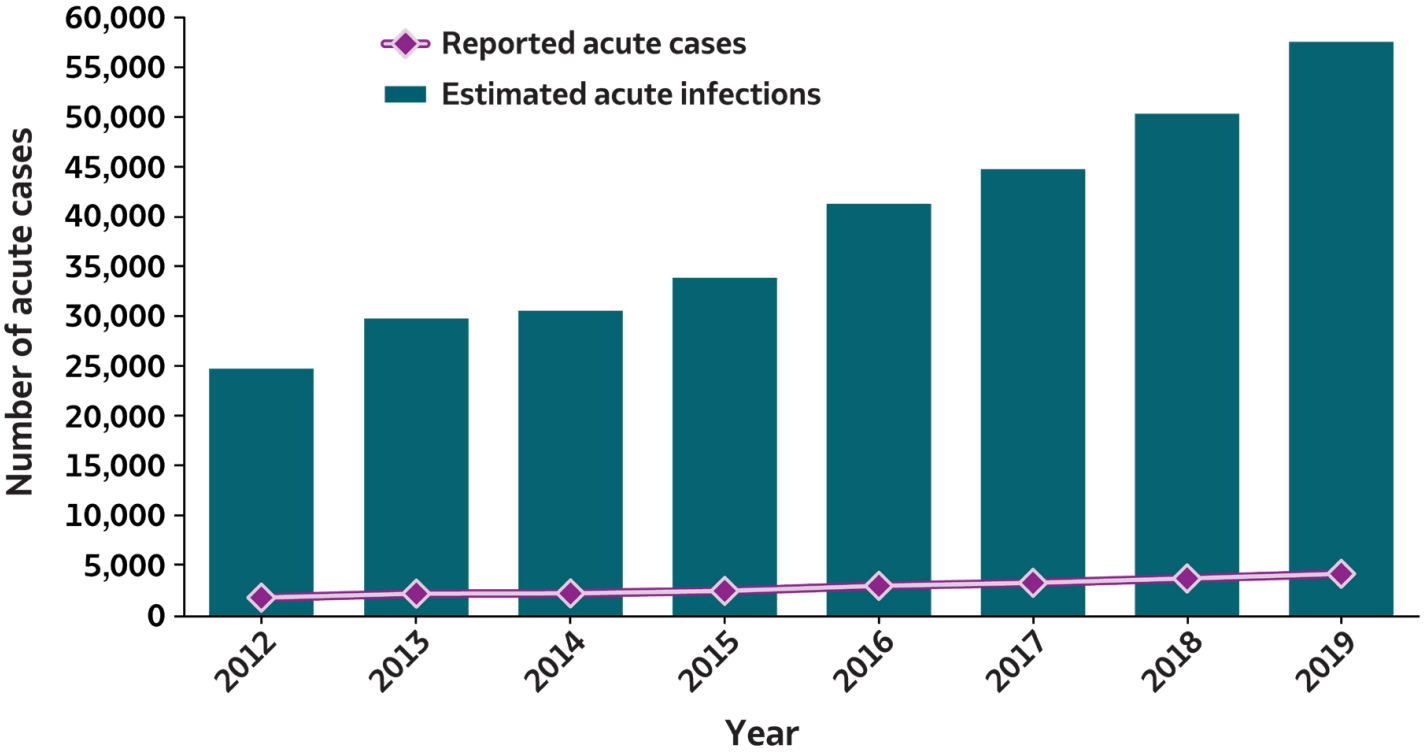
By Risk

Injection Drug Use (IDU):
Among the 1,952 reported cases with IDU information available, **1,302 (67%) reported IDU**

* 95% Bootstrap Confidence Interval: (45,500–196,000)

† Indicates groups at or above the US rate in 2019

Figure 3.1. Number of reported acute hepatitis C virus infection cases and estimated infections* — United States, 2012–2019



Acute Hepatitis C	2012	2013	2014	2015	2016	2017	2018	2019
Reported acute cases	1,778	2,138	2,194	2,436	2,967	3,216	3,621	4,136
Estimated acute infections	24,700	29,700	30,500	33,900	41,200	44,700	50,300	57,500

Source: CDC, National Notifiable Diseases Surveillance System.

*The number of estimated viral hepatitis infections was determined by multiplying the number of reported cases that met the classification criteria for a confirmed case by a factor that adjusted for underascertainment and underreporting. The 95% bootstrap confidence intervals for the estimated number of infections are displayed in the Appendix.

The number of acute hepatitis C cases reported in the United States increased every year during 2012–2019. During 2019, a total of 4,136 acute cases were reported, corresponding to 57,500 estimated infections after adjusting for case underascertainment and underreporting. The number of cases reported during 2019 corresponded to a 14% increase from the 3,621 cases reported during 2018, and a 133% increase from the 1,778 cases reported during 2012.

Source: Klevens RM, Liu, S, Roberts H, et al. Estimating acute viral hepatitis infections from nationally reported cases. Am J Public Health 2014;104:482. PMC3953761. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3953761/pdf/AJPH.2013.301601.pdf

Table 3.1. Number and rates* of reported cases† of acute hepatitis C, by state or jurisdiction — United States, 2015–2019

State or Jurisdiction	2015		2016		2017		2018		2019	
	No.	Rate*	No.	Rate*	No.	Rate*	No.	Rate*	No.	Rate*
Alabama	70	1.4	32	0.7	17	0.3	52	1.1	87	1.8
Alaska	N	N	N	N	N	N	N	N	N	N
Arizona	U	U	U	U	U	U	U	U	U	U
Arkansas	2	0.1	—	—	1	0	10	0.3	58	1.9
California	59	0.2	60	0.2	103	0.3	114	0.3	200	0.5
Colorado	40	0.7	35	0.6	42	0.7	46	0.8	45	0.8
Connecticut	—	—	17	0.5	9	0.3	10	0.3	7	0.2
Delaware	4	0.4	25	2.6	4	0.4	U	U	U	U
District of Columbia	U	U	U	U	U	U	U	U	U	U
Florida	126	0.6	236	1.1	357	1.7	435	2.0	616	2.9
Georgia	84	0.8	93	0.9	100	1.0	84	0.8	61	0.6
Hawaii	—	—	—	—	—	—	—	—	7	0.5
Idaho	4	0.2	7	0.4	8	0.5	4	0.2	17	1.0
Illinois	31	0.2	21	0.2	39	0.3	93	0.7	156	1.2
Indiana	138	2.1	146	2.2	191	2.9	266	4.0	325	4.8
Iowa	U	U	U	U	U	U	U	U	10	0.3
Kansas	22	0.8	15	0.5	19	0.7	13	0.4	19	0.7
Kentucky	119	2.7	103	2.3	83	1.9	164	3.7	128	2.9
Louisiana	24	0.5	5	0.1	7	0.1	8	0.2	8	0.2
Maine	30	2.3	25	1.9	21	1.6	23	1.7	43	3.2
Maryland	38	0.6	35	0.6	32	0.5	38	0.6	33	0.5
Massachusetts	249	3.7	424	6.2	327	4.8	110	1.6	161	2.3
Michigan	83	0.8	107	1.1	152	1.5	142	1.4	117	1.2
Minnesota	37	0.7	51	0.9	57	1.0	60	1.1	62	1.1
Mississippi	U	U	U	U	U	U	U	U	U	U
Missouri	8	0.1	24	0.4	49	0.8	74	1.2	41	0.7
Montana	15	1.5	20	1.9	14	1.3	8	0.8	17	1.6
Nebraska	8	0.4	2	0.1	2	0.1	2	0.1	4	0.2
Nevada	12	0.4	16	0.5	35	1.2	19	0.6	15	0.5
New Hampshire	N	N	N	N	25	1.9	25	1.8	20	1.5
New Jersey	130	1.5	122	1.4	125	1.4	96	1.1	99	1.1
New Mexico	40	1.9	18	0.9	16	0.8	22	1.0	10	0.5
New York	121	0.6	179	0.9	188	0.9	236	1.2	306	1.6
North Carolina	144	1.4	82	0.8	114	1.1	149	1.4	150	1.4
North Dakota	—	—	1	0.1	1	0.1	10	1.3	—	—
Ohio	122	1.1	187	1.6	159	1.4	282	2.4	281	2.4
Oklahoma	35	0.9	32	0.8	46	1.2	28	0.7	23	0.6
Oregon	13	0.3	19	0.5	35	0.8	14	0.3	23	0.5
Pennsylvania	129	1.0	225	1.8	224	1.7	249	1.9	210	1.6
Rhode Island	U	U	U	U	U	U	U	U	U	U
South Carolina	5	0.1	10	0.2	13	0.3	15	0.3	9	0.2
South Dakota	—	—	20	2.3	19	2.2	19	2.2	28	3.2
Tennessee	173	2.6	150	2.3	142	2.1	157	2.3	202	3.0
Texas	48	0.2	40	0.1	35	0.1	46	0.2	58	0.2
Utah	30	1.0	76	2.5	81	2.6	120	3.8	127	4.0
Vermont	1	0.2	5	0.8	9	1.4	4	0.6	6	1.0
Virginia	52	0.6	43	0.5	62	0.7	47	0.6	70	0.8
Washington	63	0.9	62	0.9	52	0.7	101	1.3	81	1.1
West Virginia	63	3.4	94	5.1	102	5.6	70	3.9	79	4.4
Wisconsin	64	1.1	103	1.8	94	1.6	134	2.3	112	1.9
Wyoming	U	U	U	U	5	0.9	22	3.8	5	0.9
Total	**2,436**	**0.8**	**2,967**	**1.0**	**3,216**	**1.0**	**3,621**	**1.2**	**4,136**	**1.3**

Source: CDC, National Notifiable Diseases Surveillance System.

Klevens RM, Liu, S, Roberts H, et al. Estimating acute viral hepatitis infections from nationally reported cases. Am J Public Health 2014;104:482. PMC3953761. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3953761/pdf/AJPH.2013.301601.pdf

* Rates per 100,000 population.

† Reported cases that met the classification criteria for a confirmed case. For the case definition, see https://ndc.services.cdc.gov/conditions/hepatitis-c-acute/.

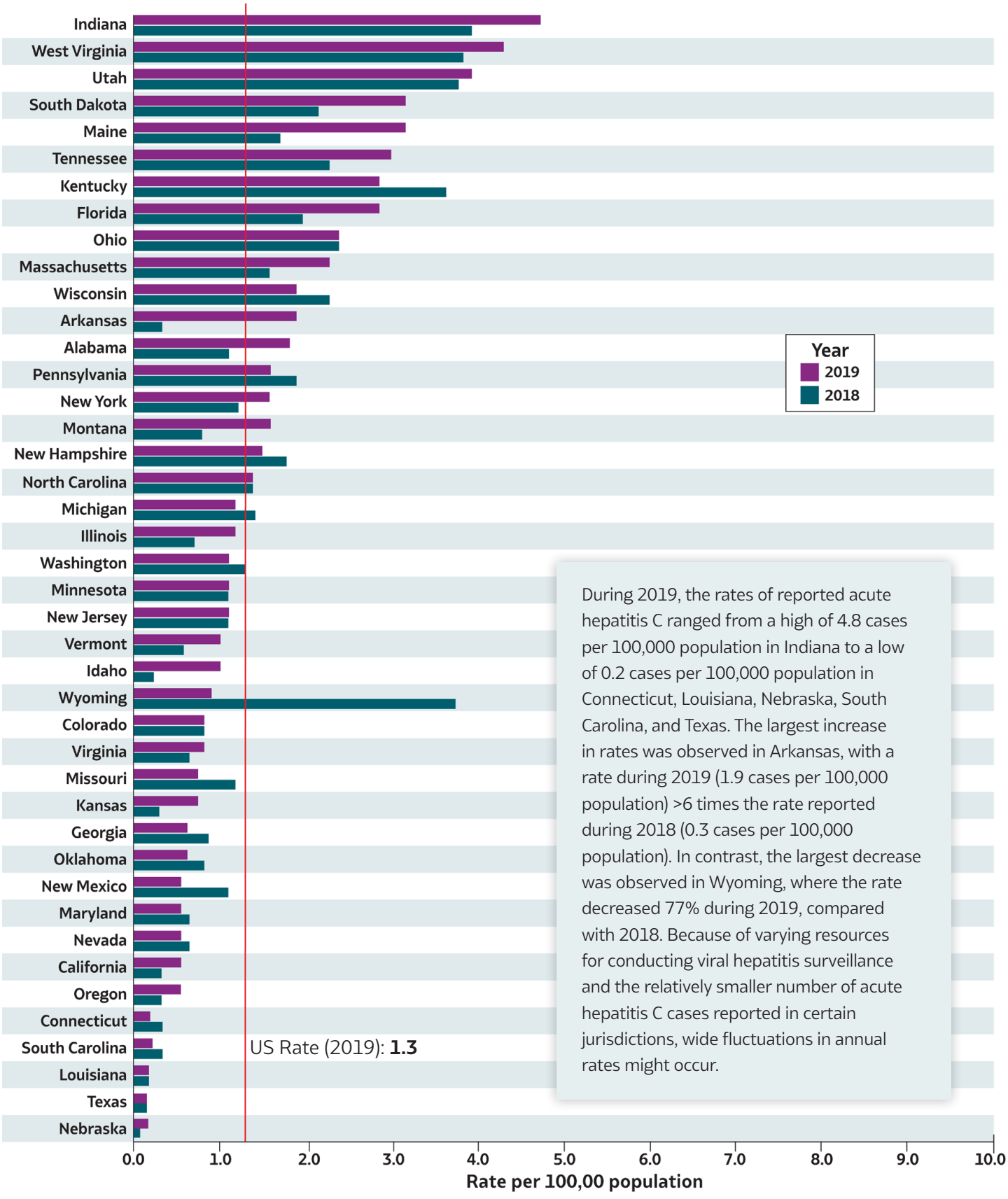
—: No reported cases. The reporting jurisdiction did not submit any cases to CDC.

N: Not reportable. The disease or condition was not reportable by law, statute, or regulation in the reporting jurisdiction.

U: Unavailable. The data were unavailable.

The capacity of each jurisdiction for notifying CDC of acute hepatitis C cases varies considerably on the basis of laws, resources, and infrastructure for conducting viral hepatitis surveillance. During 2019, a total of 7 jurisdictions did not submit acute hepatitis C case notifications to CDC. The national rate of acute hepatitis C was 1.3 reported cases per 100,000 population during 2019, a >60% increase from the rate reported during 2015. Indiana had the highest reported rate of acute hepatitis C (4.8 cases per 100,000 population), whereas Florida reported the largest number of cases (*n* = 616). Seven states with the highest number of reported acute cases (Florida, Indiana, New York, Ohio, Pennsylvania, Tennessee, and California) accounted for >50% of the national burden of acute hepatitis C during 2019.

Figure 3.2. Rates* of reported acute hepatitis C† virus infections, by state — United States, 2018–2019



During 2019, the rates of reported acute hepatitis C ranged from a high of 4.8 cases per 100,000 population in Indiana to a low of 0.2 cases per 100,000 population in Connecticut, Louisiana, Nebraska, South Carolina, and Texas. The largest increase in rates was observed in Arkansas, with a rate during 2019 (1.9 cases per 100,000 population) >6 times the rate reported during 2018 (0.3 cases per 100,000 population). In contrast, the largest decrease was observed in Wyoming, where the rate decreased 77% during 2019, compared with 2018. Because of varying resources for conducting viral hepatitis surveillance and the relatively smaller number of acute hepatitis C cases reported in certain jurisdictions, wide fluctuations in annual rates might occur.

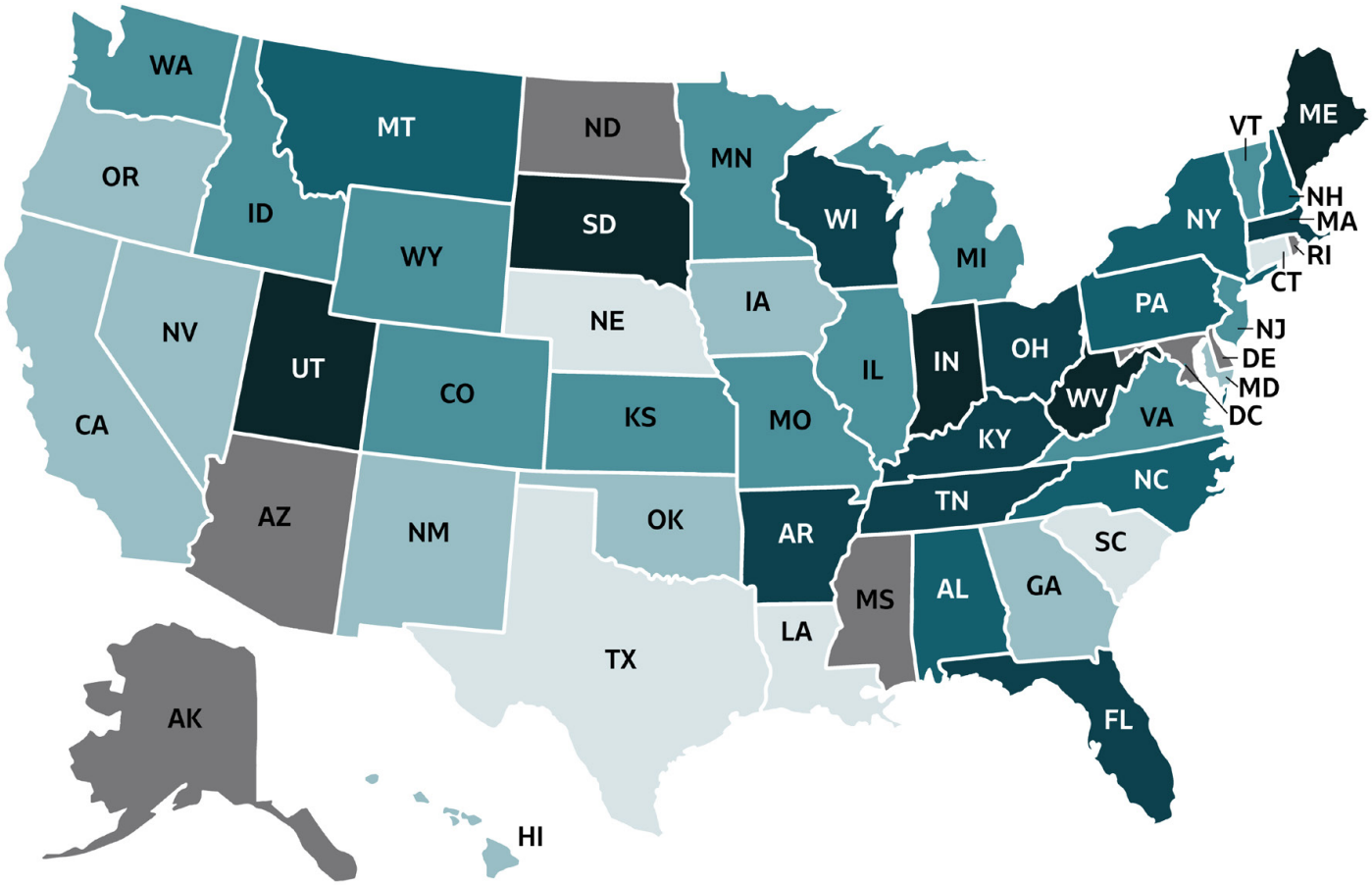
Source: CDC, National Notifiable Diseases Surveillance System.

* Rates per 100,000 population.

† Reported cases that met the classification criteria for a confirmed case. For the case definition, see https://ndc.services.cdc.gov/conditions/hepatitis-c-acute/.

Only states with rates for 2018 and 2019 are shown. State/jurisdiction and year for no reported cases: North Dakota (2019), Hawaii (2018); for not reportable condition; Alaska (2018, 2019); for unavailable data: Arizona (2018, 2019), Delaware (2018, 2019), District of Columbia (2018, 2019), Iowa (2018, 2019), Mississippi (2018, 2019), Rhode Island (2018, 2019).

Figure 3.3. Rates of reported acute hepatitis C virus infection, by state or jurisdiction — United States, 2019

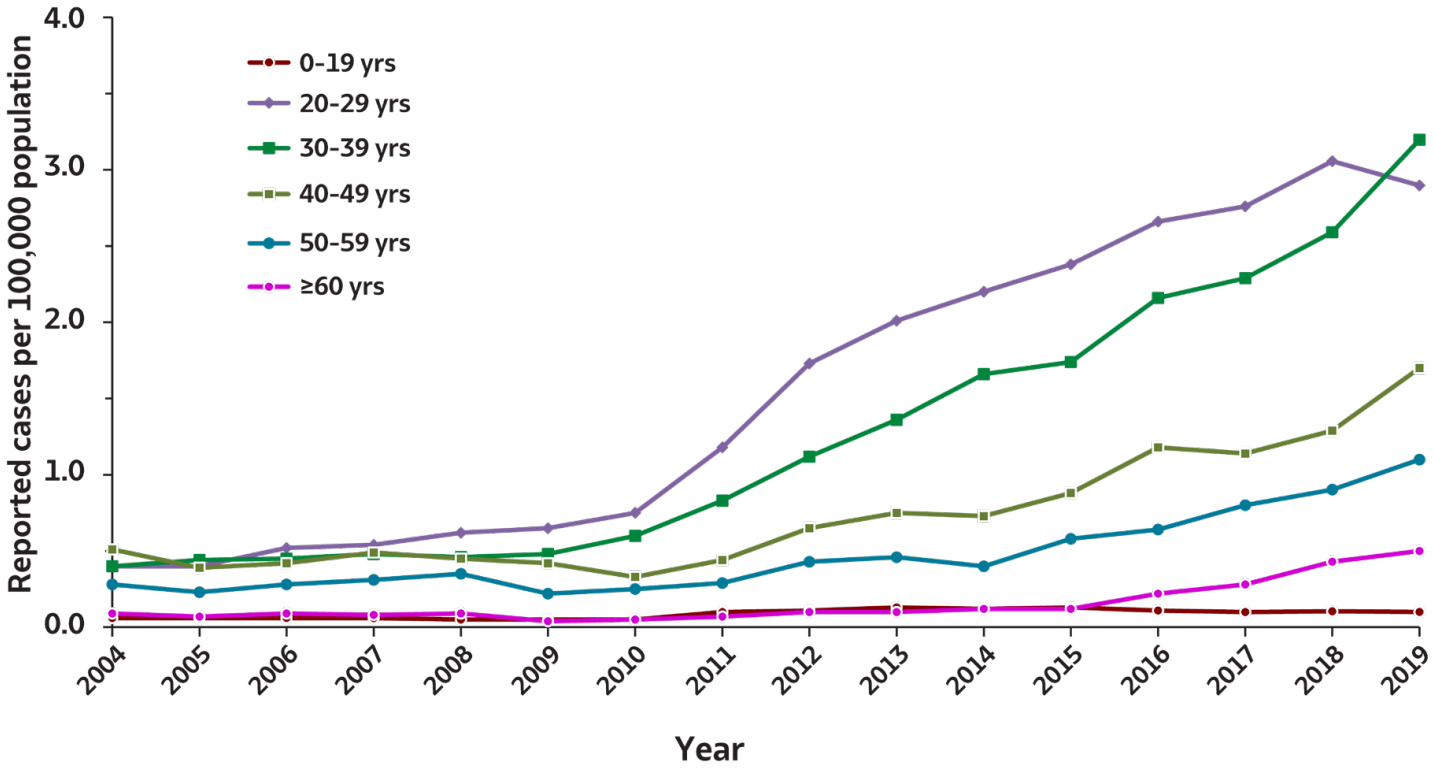


Color Key	Cases per 100,000 Population	State or Jurisdiction
	0.0-0.2	CT, LA, NE, SC, TX
	0.3-0.6	CA, GA, HI, IA, MD, NM, NV, OK, OR
	0.7-1.2	CO, ID, IL, KS, MI, MN, MO, NJ, VA, VT, WA, WY
	1.3-1.8	AL, MT, NC, NH, NY, PA
	1.9-3.0	AR, FL, KY, MA, OH, TN, WI
	3.1-4.8	IN, ME, SD, UT, WV
	Data not available	AK, AZ, DC, DE, MS, ND, RI

Source: CDC, National Notifiable Diseases Surveillance System.

The state-specific rates of reported acute hepatitis C varied throughout the country during 2019. Aside from Utah (4.0 cases per 100,000 population) and South Dakota (3.2 cases per 100,000 population), the states with the highest rates of acute hepatitis C are located in the eastern part of the country, particularly in or near the Appalachian region.

Figure 3.4. Rates of reported acute hepatitis C virus infection, by age group — United States, 2004–2019



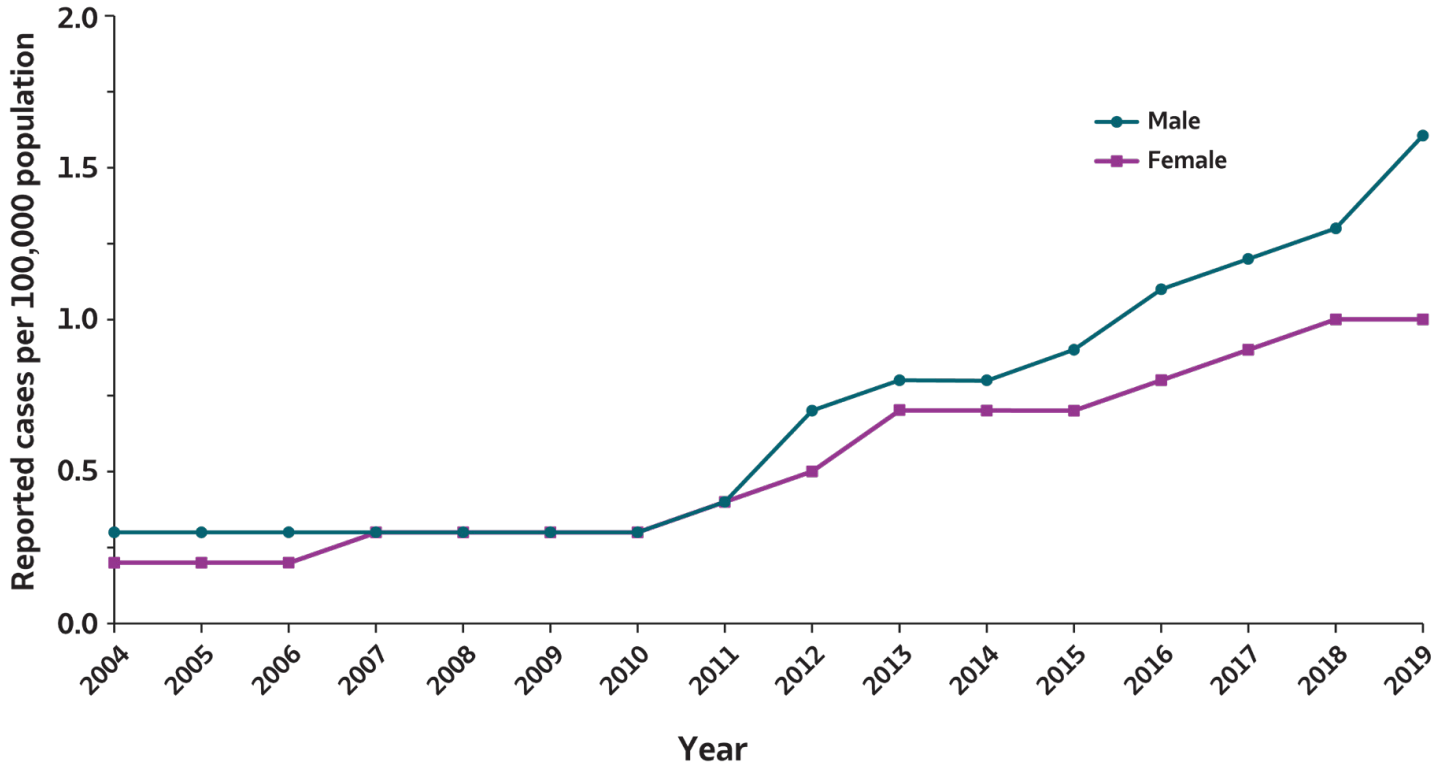
Age (years)	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
0–19	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
20–29	0.4	0.4	0.5	0.5	0.7	0.7	0.7	1.2	1.7	2.0	2.2	2.4	2.7	2.7	3.0	2.9
30–39	0.4	0.4	0.4	0.5	0.5	0.5	0.6	0.8	1.1	1.4	1.7	1.7	2.2	2.3	2.6	3.2
40–49	0.5	0.4	0.4	0.5	0.5	0.4	0.3	0.4	0.6	0.7	0.7	0.9	1.2	1.1	1.3	1.7
50–59	0.3	0.2	0.3	0.3	0.4	0.2	0.3	0.3	0.4	0.5	0.4	0.6	0.6	0.8	0.9	1.1
≥60	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.4	0.5

Source: CDC, National Notifiable Diseases Surveillance System.

Since 2010, rates of reported acute hepatitis C increased among almost all age groups of ≥20 years. The rate of acute hepatitis C has remained the highest among persons aged 20–39 years, similar to age groups at highest risk for fatal overdose in the United States and age at initiation of injection drug use among certain US populations. Compared with 2018, the greatest increase in the rates of acute hepatitis C were observed among those aged 40–49 years (31% increase), followed by those aged 30–39 years (23% increase). For the first time in more than a decade, the rate of acute hepatitis C decreased slightly among those aged 20–29 years. Rates have consistently been lowest among those aged <20 years or ≥60 years; however, rates have been increasing among those aged ≥60 years since 2015.

Source: Jalal H, Buchanich JM, Sinclair DR, et al. Age and generational patterns of overdose death risk from opioids and other drugs. Nat Med 2020;26:699–704. doi: 10.1038/s41591-020-0855-y

Figure 3.5. Rates of reported acute hepatitis C virus infection, by sex — United States, 2004–2019

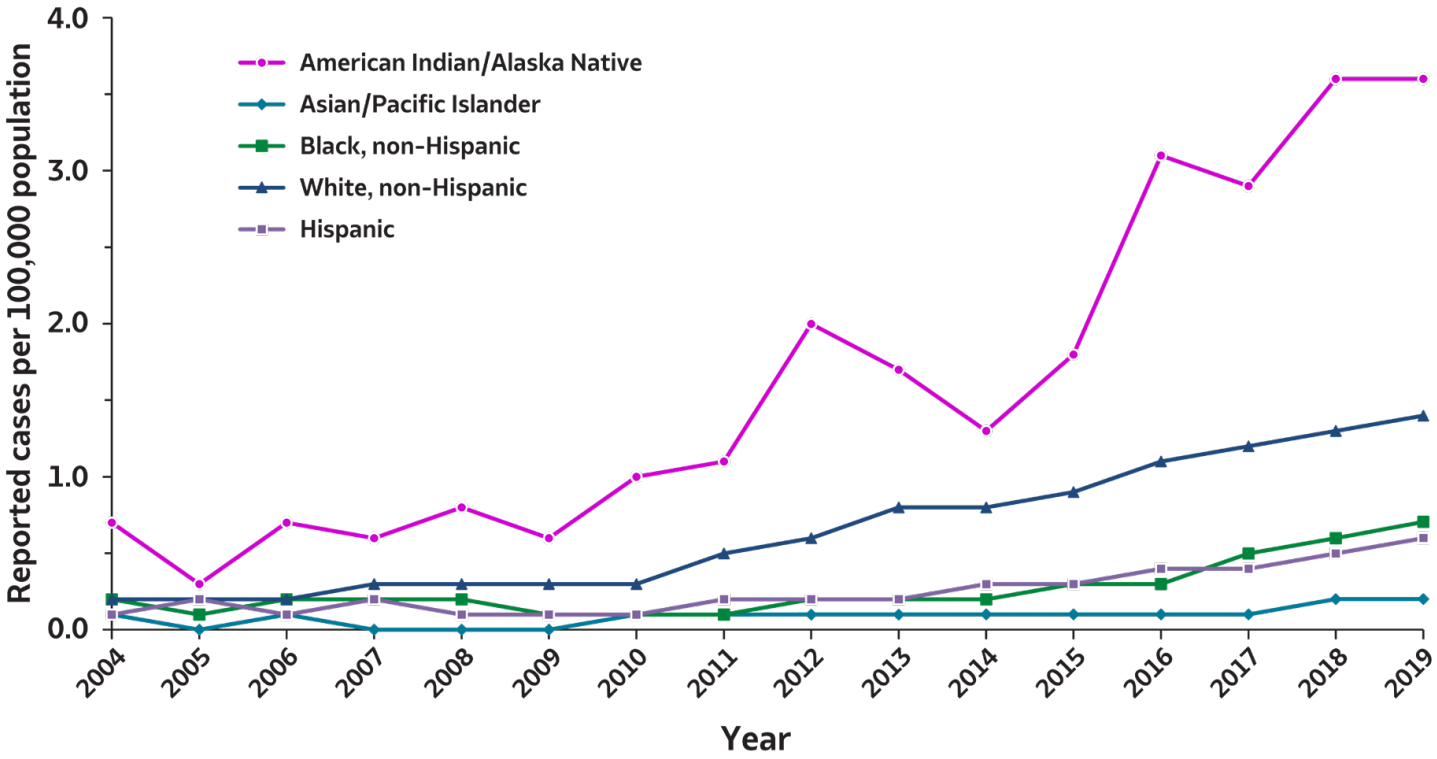


Sex	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Male	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.7	0.8	0.8	0.9	1.1	1.2	1.3	1.6
Female	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.5	0.7	0.7	0.7	0.8	0.9	1.0	1.0

Source: CDC, National Notifiable Diseases Surveillance System.

The increase in reported rates of acute hepatitis C since 2010 has been observed among both males and females. During 2019, the rate of acute hepatitis C was 1.6 cases per 100,000 population among males (>5.3 times the corresponding rate during 2010) and 1.0 cases per 100,000 population among females (>3.3 times the corresponding rate during 2010).

Figure 3.6. Rates of reported acute hepatitis C virus infection, by race/ethnicity — United States, 2004–2019



Race/Ethnicity	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
American Indian/ Alaska Native	0.7	0.3	0.7	0.6	0.8	0.6	1.0	1.1	2.0	1.7	1.3	1.8	3.1	2.9	3.6	3.6
Asian/ Pacific Islander	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
Black, non-Hispanic	0.2	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.5	0.6	0.7
White, non-Hispanic	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.5	0.6	0.8	0.8	0.9	1.1	1.2	1.3	1.4
Hispanic	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.5	0.6

Source: CDC, National Notifiable Diseases Surveillance System.

During 2019, rates of acute hepatitis C ranged from a low of 0.2 cases per 100,000 population among Asian/Pacific Islander persons to a high of 3.6 cases per 100,000 population among American Indian/Alaska Native persons. However, the relatively smaller number of cases reported among these race/ethnicity categories can result in wider fluctuations in annual rates. Compared with 2010, in 2019 rates were substantially higher among all racial/ethnicity categories; the most notable relative increases occurred among non-Hispanic Black persons and Hispanic persons.

Table 3.2. Number and rates* of reported cases† of acute hepatitis C, by demographic characteristics — United States 2015–2019

Characteristic	2015		2016		2017		2018		2019	
	No.	Rate*	No.	Rate*	No.	Rate*	No.	Rate*	No.	Rate*
Total§	**2,436**	**0.8**	**2,967**	**1.0**	**3,216**	**1.0**	**3,621**	**1.2**	**4,136**	**1.3**
Age (years)										
0–19	99	0.1	86	0.1	103	0.1	81	0.1	63	0.1
20–29	999	2.4	1,135	2.7	1,189	2.7	1,310	3.0	1,262	2.9
30–39	682	1.7	868	2.2	937	2.3	1,070	2.6	1,347	3.2
40–49	337	0.9	452	1.2	441	1.1	494	1.3	664	1.7
50–59	240	0.6	264	0.6	332	0.8	366	0.9	442	1.1
≥60	77	0.1	141	0.2	185	0.3	295	0.4	358	0.5
Sex										
Male	1,334	0.9	1,627	1.1	1,775	1.2	2,012	1.3	2,471	1.6
Female	1,093	0.7	1,310	0.8	1,431	0.9	1,605	1.0	1,653	1.0
Race/ethnicity										
American Indian/ Alaska Native	39	1.8	70	3.1	67	2.9	83	3.6	83	3.6
Asian/Pacific Islander	16	0.1	25	0.1	23	0.1	29	0.1	36	0.2
Black, non-Hispanic	112	0.3	130	0.3	202	0.5	231	0.6	267	0.7
White, non-Hispanic	1,724	0.9	2,109	1.1	2,227	1.2	2,405	1.3	2,683	1.4
Hispanic	148	0.3	191	0.3	234	0.4	280	0.5	350	0.6
Urbanicity¶										
Urban	1,812	0.7	2,227	0.8	2,397	0.9	2,782	1.0	3,275	1.2
Rural	545	1.3	501	1.2	485	1.1	676	1.6	720	1.7
HHS Region: Regional Office#										
1: Boston	280	3.2	471	3.8	391	2.8	172	1.2	237	1.7
2: New York	251	0.9	301	1.0	313	1.1	332	1.2	405	1.4
3: Philadelphia	286	1.0	422	1.4	424	1.4	404	1.4	392	1.3
4: Atlanta	721	1.2	706	1.1	826	1.3	1,056	1.7	1,253	2.0
5: Chicago	475	0.9	615	1.2	692	1.3	977	1.9	1,053	2.0
6: Dallas	149	0.4	95	0.2	105	0.2	114	0.3	157	0.4
7: Kansas City	38	0.3	41	0.4	70	0.6	89	0.8	74	0.5
8: Denver	85	0.8	152	1.4	162	1.4	225	1.9	222	1.9
9: San Francisco	71	0.2	76	0.2	138	0.3	133	0.3	222	0.5
10: Seattle	80	0.6	88	0.7	95	0.7	119	0.9	121	0.9

Source: CDC, National Notifiable Diseases Surveillance System.

* Rates per 100,000 population.

† Reported cases that met the classification criteria for a confirmed case. For the case definition, see https://ndc.services.cdc.gov/conditions/hepatitis-c-acute/.

§ Numbers reported in each category might not add up to the total number of reported cases in a year because of cases with missing data or, in the case of race/ethnicity, cases categorized as "Other."

¶ Urbanicity was categorized according to the 2013 National Center for Health Statistics (NCHS) urban-rural classification scheme for counties and county-equivalent entities (https://www.cdc.gov/nchs/data_access/urban_rural.htm). Large central metropolitan, large fringe metropolitan, medium metropolitan, and small metropolitan counties were grouped as urban. Micropolitan and noncore counties were grouped as rural.

US Department of Health and Human Services (HHS) regions were categorized according to the grouping of states and US territories assigned under each of the 10 HHS regional offices (https://www.hhs.gov/about/agencies/iea/regional-offices/index.html). For the purposes of this report, regions with US territories (Regions 2 and 9) contain data from states only.

This table summarizes the epidemiology of acute hepatitis C in the United States. During 2019, rates of acute hepatitis C were highest among persons aged 20–49 years, males, American Indian/Alaska Native persons, and those living in the US Department of Health and Human Services Regions 4 (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, and Tennessee) and 5 (Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin). The geographic distribution of hepatitis C is similar to the geographic distribution of fatal overdose. By using urbanicity categories defined by the National Center for Health Statistics, CDC determined that the rates of acute hepatitis C remained higher in rural settings, compared with urban settings during 2015–2019, continuing a trend of increasing rates of hepatitis C disproportionately affecting White persons aged ≤30 years in nonurban areas of the United States. Among all acute hepatitis C cases reported during 2019, 79% occurred among persons aged 20–49 years; 65% occurred among non-Hispanic White persons; 79% occurred in urban areas; and 56% occurred in Health and Human Services Regions 4 and 5.

Source:

Jalal H, Buchanich JM, Sinclair DR, et al. Age and generational patterns of overdose death risk from opioids and other drugs. Nat Med 2020;26:699–704. doi: 10.1038/s41591-020-0855-y

Suryaprasad, AG, White JZ, Xu F, et al. Emerging epidemic of hepatitis C virus infections among young nonurban persons who inject drugs in the United States, 2006–2012. Clin Infect Dis 2014;59:1411–9. doi: 10.1093/cid/ciu643

HEPATITIS C
RISK BEHAVIORS AND EXPOSURES

Figure 3.7. Availability of information regarding risk behaviors or exposures*† associated with reported cases of acute hepatitis C virus infection — United States, 2019

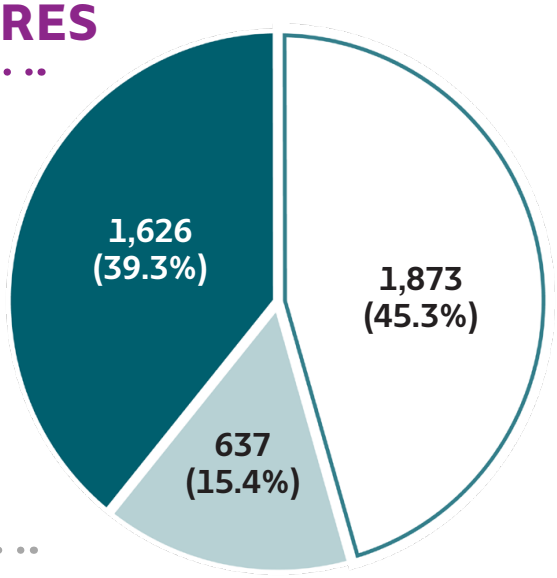


Table 3.3. Reported risk behaviors or exposures*† among reported cases of acute hepatitis C virus infection — United States, 2019

Risk behaviors/exposures	Risk identified*	No risk identified	Risk data missing
Injection drug use	1,302	650	2,184
Multiple sexual partners	223	594	3,319
Surgery	179	888	3,069
Sexual contact §	142	334	3,660
Needlestick	91	886	3,159
Men who have sex with men ¶	42	315	2,114
Household contact (non-sexual) §	36	440	3,660
Dialysis patient	61	1,249	2,826
Occupational	7	1,278	2,851
Transfusion	3	1,105	3,028

Source: CDC, Nationally Notifiable Diseases Surveillance System.

* Case reports with at least one of the following risk behaviors/exposures reported 6 weeks to 6 months prior to symptom onset or documented seroconversion if asymptomatic: 1) injection drug use; 2) multiple sexual partners; 3) underwent surgery; 4) men who have sex with men; 5) sexual contact with suspected/confirmed hepatitis C case; 6) sustained a percutaneous injury; 7) household contact with suspected/confirmed hepatitis C case; 8) occupational exposure to blood; 9) dialysis; and 10) transfusion. Reported cases may include more than one risk behavior/exposure.

† Risk behaviors/exposures data from one state was classified as 'missing' because of errors in reporting.

§ Cases with more than one type of contact reported were categorized according to a hierarchy: (1) sexual contact; (2) household contact (nonsexual).

¶ A total of 2,471 acute hepatitis C cases were reported among males in 2019.

Health departments might conduct investigations of newly reported acute hepatitis C cases to ascertain risk behaviors and exposures associated with infection. However, investigations might not be possible for all cases if patients are lost to follow-up or if health departments lack adequate resources for investigating all cases reported in their jurisdiction. Among the 4,136 case reports of acute hepatitis C received by CDC for 2019, data regarding risk behaviors or exposures were missing for 1,873 (45.3%) cases. At least one risk behavior or exposure was reported for 1,626 (39.3%) cases during the 6 weeks to 6 months before illness onset. More than one risk can be reported for each case.

Among risk behaviors and exposures identified, injection drug use was most commonly reported (67% of the 1,952 cases for which injection drug use information was available). Hepatitis C virus transmission associated with surgery, dialysis, or transfusion is extremely rare in the United States; thus, the reporting of these exposures might represent a history of recent exposure to these health care procedures.

Table 3.4. Number of newly reported cases* of perinatal hepatitis C virus infection, by state or jurisdiction — United States, 2019

State or Jurisdiction	Perinatal Hepatitis C
Alabama	—
Alaska	2
Arizona	—
Arkansas	3
California	15
Colorado	1
Connecticut	—
Delaware	U
District of Columbia	—
Florida	20
Georgia	5
Hawaii	—
Idaho	—
Illinois	10
Indiana	14
Iowa	—
Kansas	2
Kentucky	—
Louisiana	—
Maine	4
Maryland	—
Massachusetts	14
Michigan	11
Minnesota	5
Mississippi	—
Missouri	—
Montana	—
Nebraska	—
Nevada	1
New Hampshire	—
New Jersey	11
New Mexico	—
New York	1
North Carolina	—
North Dakota	—
Ohio	41
Oklahoma	—
Oregon	—
Pennsylvania	20
Rhode Island	U
South Carolina	2
South Dakota	2
Tennessee	16
Texas	N
Utah	2
Vermont	—
Virginia	12
Washington	3
West Virginia	—
Wisconsin	—
Wyoming	—
Total	**217**

Standardized perinatal hepatitis C case notifications to CDC began during 2018, with implementation of the National Notifiable Diseases Surveillance System case definition. The capacity of health departments for conducting perinatal hepatitis C surveillance varies on the basis of different factors, including local testing and laboratory reporting practices and resources for case management and follow-up. As capacity for viral hepatitis surveillance improves, CDC anticipates that the number of perinatal hepatitis C cases identified and reported to CDC will increase with time.

During 2019, a total of 24 states reported 217 cases of perinatal hepatitis C. The states with the highest reported number of perinatal hepatitis C cases include Ohio (*n* = 41), Florida (*n* = 20), and Pennsylvania (*n* = 20).

Source: CDC, National Notifiable Diseases Surveillance System.

* Reported cases that met the classification criteria for a confirmed case. For case definition, see https://ndc.services.cdc.gov/conditions/hepatitis-c-perinatal-infection/.

—: No reported cases. The reporting jurisdiction did not submit any cases to CDC.

N: Not reportable. The disease or condition was not reportable by law, statute, or regulation in the reporting jurisdiction.

U: Unavailable. The data were unavailable.

Table 3.5. Number and rates* of newly reported cases† of chronic hepatitis C virus infection, by state or jurisdiction — United States, 2019

State or Jurisdiction	No.	Rate*
Alabama	1,818	37.1
Alaska	957	130.8
Arizona	U	U
Arkansas	N	N
California	—	—
Colorado	2,554	44.4
Connecticut	1,322	37.1
Delaware	U	U
District of Columbia	U	U
Florida	14,328	66.7
Georgia	4,900	46.2
Hawaii	U	U
Idaho	779	43.6
Illinois	4,224	33.3
Indiana	N	N
Iowa	1,173	37.2
Kansas	1,195	41.0
Kentucky	N	N
Louisiana	3,840	82.6
Maine	936	69.6
Maryland	3,163	52.3
Massachusetts	3,092	44.9
Michigan	3,887	38.9
Minnesota	1,021	18.1
Mississippi	—	—
Missouri	4,755	77.5
Montana	900	84.2
Nebraska	615	31.8
Nevada	U	U
New Hampshire	135	9.9
New Jersey	3,358	37.8
New Mexico	2,287	109.1
New York	6,914	35.5
North Carolina	N	N
North Dakota	501	65.7
Ohio	9,511	81.4
Oklahoma	1,942	49.1
Oregon	2,569	60.9
Pennsylvania	10,848	84.7
Rhode Island	U	U
South Carolina	3,817	74.1
South Dakota	455	51.4
Tennessee	8,660	126.8
Texas	N	N
Utah	929	29.0
Vermont	378	60.6
Virginia	5,329	62.4
Washington	4,321	56.7
West Virginia	3,603	201.0
Wisconsin	1,963	33.7
Wyoming	333	57.5
Total	**123,312**	**56.7**

Source: CDC, National Notifiable Diseases Surveillance System.

* Rates per 100,000 population.

† Reported cases that met the classification criteria for a confirmed case. For case definition, see https://ndc.services.cdc.gov/conditions/hepatitis-c-chronic/.

—: No reported cases. The reporting jurisdiction did not submit any cases to CDC.

N: Not reportable. The disease or condition was not reportable by law, statute, or regulation in the reporting jurisdiction.

U: Unavailable. The data were unavailable.

In the United States, chronic hepatitis C is one of the leading causes of cirrhosis, a major cause of liver cancer. This table displays the number and rates of newly reported chronic hepatitis C cases during 2019, by state or jurisdiction. Because health departments might not have adequate resources for investigating all cases reported in their jurisdiction, certain cases of acute hepatitis C might be misclassified as chronic hepatitis C if health departments are not able to identify symptoms or laboratory abnormalities necessary for classifying a case as acute. Of note, cases of newly reported chronic hepatitis C do not represent all prevalent hepatitis C infections, which cannot be captured in the National Notifiable Diseases Surveillance System.

Of the 123,312 newly reported cases of chronic hepatitis C during 2019, approximately one-third were from 4 states (Florida, Pennsylvania, Ohio, and Tennessee). The highest rate of newly reported cases of chronic hepatitis C was in West Virginia (201.0 cases per 100,000 population) followed by Alaska, Tennessee, and New Mexico where rates were >100 cases per 100,000 population.

Table 3.6. Number and rates* of newly reported cases† of chronic hepatitis C virus infection, by demographic characteristics — United States, 2019

Characteristic	2019	
	No.	Rate
Total§	**123,312**	**56.7**
Age (years)		
0–19	951	1.8
20–29	21,263	72.3
30–39	31,383	109.1
40–49	19,035	72.1
50–59	22,748	79.6
≥60	26,142	50.8
Sex		
Male	79,012	73.9
Female	43,966	39.7
Race/ethnicity		
American Indian/Alaska Native	1,657	86.7
Asian/Pacific Islander	755	7.1
Black, non-Hispanic	9,566	31.0
White, non-Hispanic	49,814	34.0
Hispanic	3,913	14.1
Urbanicity¶		
Urban	96,039	52.1
Rural	23,022	67.7
HHS Region: Regional Office#		
1: Boston	5,863	42.5
2: New York	10,272	36.3
3: Philadelphia	22,943	78.6
4: Atlanta	33,523	68.4
5: Chicago	20,606	45.0
6: Dallas	8,069	75.4
7: Kansas City	7,738	54.7
8: Denver	5,672	46.3
9: San Francisco	U	U
10: Seattle	8,626	60.1

During 2019, the rates of newly reported chronic hepatitis C were highest among persons aged 30–39 years, males, American Indian/Alaska Native persons, those living in rural areas, and persons in US Department of Health and Human Services Region 3 (Delaware, District of Columbia, Maryland, Pennsylvania, Virginia, and West Virginia). Chronic hepatitis C data was unavailable from all states in Health and Human Services Region 9. Among all 123,312 cases of chronic hepatitis C newly reported during 2019, 25% occurred among persons aged 30–39 years; 64% occurred among males; and 78% occurred in urban areas. Race/ethnicity information was only available for 65,705 (53%) cases of newly reported chronic hepatitis C; after excluding cases with missing race/ethnicity information, 76% of cases occurred among non-Hispanic White persons.

Source: CDC, National Notifiable Diseases Surveillance System.

* Rates per 100,000 population.

† Reported cases that met the classification criteria for a confirmed case. For the case definition, see https://ndc.services.cdc.gov/conditions/hepatitis-c-chronic/.

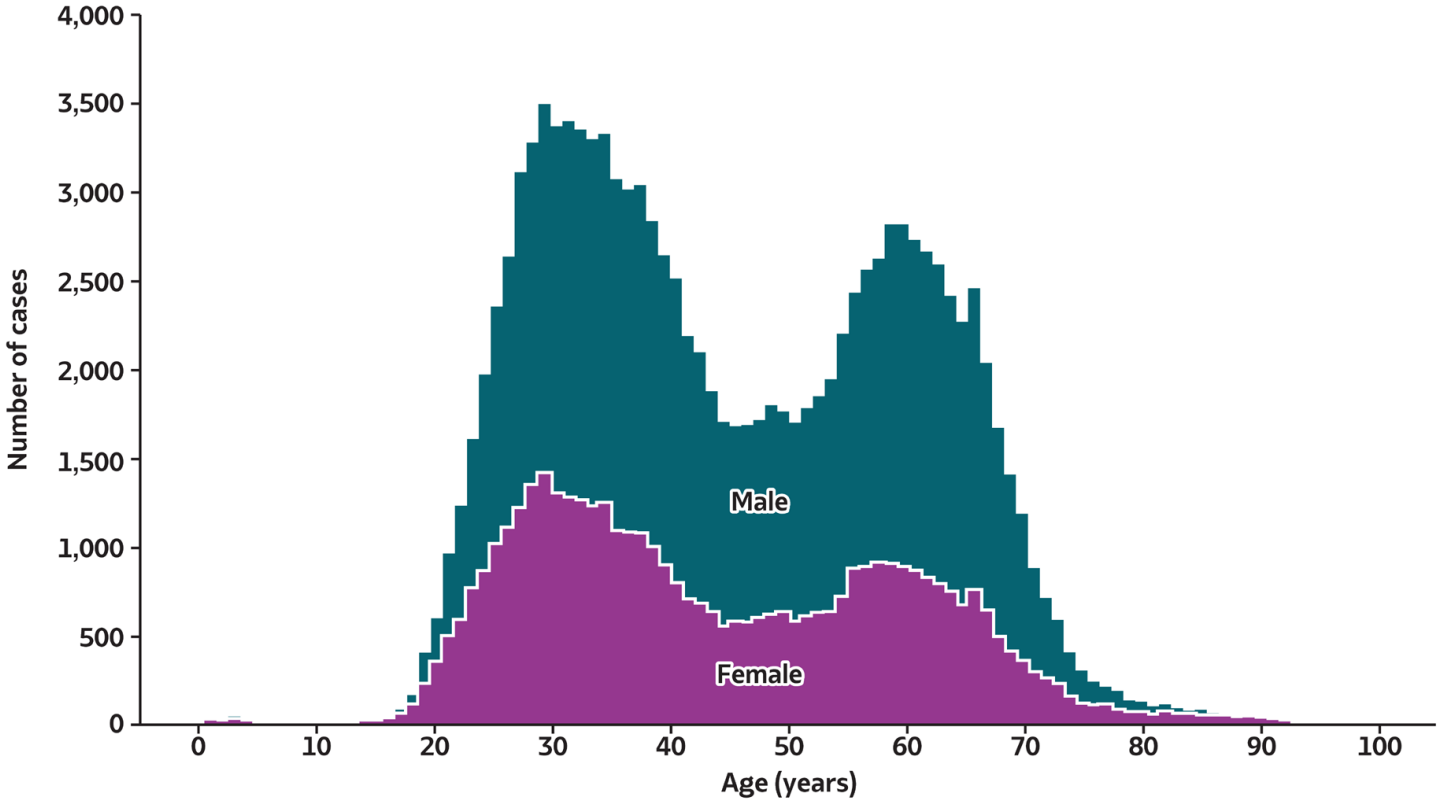
§ Numbers reported in each category might not add up to the total number of reported cases in a year because of cases with missing data or, in the case of race/ethnicity, cases categorized as "Other."

¶ Urbanicity was categorized according to the 2013 National Center for Health Statistics (NCHS) urban-rural classification scheme for counties and county-equivalent entities (https://www.cdc.gov/nchs/data_access/urban_rural.htm). Large central metropolitan, large fringe metropolitan, medium metropolitan, and small metropolitan counties were grouped as urban. Micropolitan and noncore counties were grouped as rural.

US Department of Health and Human Services (HHS) regions were categorized according to the grouping of states and US territories assigned under each of the 10 HHS regional offices (https://www.hhs.gov/about/agencies/iea/regional-offices/index.html). For the purposes of this report, regions with US territories (Regions 2 and 9) contain data from states only.

U: data were unavailable.

Figure 3.8. Number of newly reported* chronic hepatitis C virus infection cases†, by sex and age — United States, 2019



Source: CDC, National Notifiable Diseases Surveillance System.

* During 2019, cases of chronic hepatitis C were either not reportable by law, statute, or regulation; not reported; or otherwise unavailable to CDC from Arizona, Arkansas, California, Delaware, District of Columbia, Hawaii, Indiana, Kentucky, Mississippi, Nevada, North Carolina, Rhode Island, and Texas.

† Only confirmed, newly reported, chronic hepatitis C cases are included. For the complete case definition, see https://ndc.services.cdc.gov/conditions/hepatitis-c-chronic/.

A total of 123,312 new chronic hepatitis C cases were reported during 2019. A higher number of newly reported cases of chronic hepatitis C was observed among males, compared with females across all age groups. Among both males and females, a bimodal age distribution was observed with infections highest among persons aged 20–39 years (peak: 29 years) and a second apex around 55–70 years (peak: 59 years).

Table 3.7. Number and rates* of deaths with hepatitis C listed as a cause of death† among residents, by state or jurisdiction — United States, 2015–2019

State or Jurisdiction	2015		2016		2017		2018		2019	
	No.	Rate*	No.	Rate*	No.	Rate*	No.	Rate*	No.	Rate*
Alabama	187	3.08	166	2.63	188	2.97	167	2.54	134	2.06
Alaska	41	4.95	50	5.38	38	4.38	40	5.00	41	4.66
Arizona	567	6.90	500	5.81	480	5.45	348	3.84	277	3.01
Arkansas	183	5.01	184	4.91	169	4.43	150	3.86	134	3.45
California	3,245	7.19	2,917	6.33	2,630	5.58	2,391	4.98	2,114	4.36
Colorado	362	5.51	385	5.74	386	5.62	387	5.48	376	5.24
Connecticut	153	3.20	123	2.52	130	2.61	89	1.72	102	2.03
Delaware	45	3.41	47	3.63	49	3.80	34	2.33	26	2.12
District of Columbia	101	13.93	95	13.37	83	11.42	70	9.40	75	10.08
Florida	1,270	4.62	1,222	4.26	1,222	4.16	1,005	3.34	1,025	3.31
Georgia	396	3.26	368	2.98	344	2.66	326	2.46	313	2.33
Hawaii	68	3.70	70	3.75	67	3.48	49	2.42	45	2.38
Idaho	99	4.79	115	5.40	84	3.82	108	4.87	93	4.07
Illinois	399	2.56	354	2.18	288	1.72	279	1.67	221	1.31
Indiana	270	3.26	295	3.60	269	3.16	259	2.98	241	2.76
Iowa	125	3.19	109	2.67	122	3.01	98	2.40	116	2.82
Kansas	141	4.11	148	4.20	141	3.83	130	3.48	116	3.12
Kentucky	270	5.09	269	5.05	306	5.58	319	5.77	267	5.08
Louisiana	396	7.15	383	6.60	382	6.49	352	5.92	347	5.70
Maine	57	3.05	40	1.87	32	1.60	34	1.69	23	1.31
Maryland	366	4.84	327	4.32	340	4.41	352	4.44	282	3.48
Massachusetts	317	3.71	261	2.98	267	3.00	211	2.33	192	2.09
Michigan	512	3.77	415	3.06	368	2.61	384	2.72	359	2.50
Minnesota	234	3.40	240	3.28	235	3.19	209	2.81	199	2.65
Mississippi	162	4.57	183	5.08	159	4.38	141	3.70	144	3.85
Missouri	275	3.50	258	3.23	247	3.06	244	3.09	205	2.47
Montana	77	5.76	75	5.71	68	4.89	76	5.36	54	4.02
Nebraska	82	3.60	78	3.25	79	3.29	72	3.26	59	2.41
Nevada	173	4.80	181	4.97	153	4.00	140	3.59	128	3.19
New Hampshire	65	3.28	68	3.57	57	2.90	64	3.36	44	2.28
New Jersey	400	3.52	378	3.24	342	2.90	309	2.64	224	1.89
New Mexico	195	8.05	203	8.12	175	6.70	163	6.30	165	6.33
New York	979	3.89	789	3.06	701	2.71	615	2.40	556	2.12
North Carolina	532	4.19	511	3.92	460	3.44	426	3.11	402	2.82
North Dakota	32	3.55	20	2.25	23	2.88	23	2.52	30	3.42
Ohio	559	3.70	546	3.58	541	3.48	480	3.16	450	2.90
Oklahoma	510	11.02	538	11.46	555	11.84	534	11.00	533	10.75
Oregon	514	9.68	491	8.90	518	9.24	466	8.03	425	7.26
Pennsylvania	726	4.18	564	3.28	563	3.15	417	2.37	445	2.48
Rhode Island	97	7.26	89	6.57	76	5.15	91	6.37	57	3.79
South Carolina	294	4.67	299	4.51	302	4.51	259	3.70	220	3.09
South Dakota	35	3.33	37	3.46	29	2.56	30	2.80	29	2.61
Tennessee	592	7.27	482	5.89	469	5.57	517	6.01	491	5.77
Texas	1,996	6.72	1,886	6.12	1,888	6.03	1,708	5.30	1,383	4.20
Utah	98	3.47	85	2.98	68	2.29	78	2.59	69	2.17
Vermont	43	4.87	35	3.72	40	4.44	30	3.32	30	2.95
Virginia	330	3.15	327	3.03	290	2.68	272	2.48	249	2.29
Washington	651	7.06	517	5.53	528	5.46	466	4.76	441	4.43
West Virginia	107	4.65	118	4.85	116	4.94	108	4.90	108	4.92
Wisconsin	208	2.78	214	2.70	145	1.82	151	1.90	141	1.72
Wyoming	30	3.95	38	4.89	41	5.50	42	5.84	42	5.33
Total	**19,566**	**4.91**	**18,093**	**4.42**	**17,253**	**4.13**	**15,713**	**3.72**	**14,242**	**3.33**

Source: CDC, National Center for Health Statistics, Multiple Cause of Death 1999–2019 on CDC WONDER Online Database. Data are from the 2015–2019 Multiple Cause of Death files and are based on information from all death certificates filed in the vital records offices of the 50 states and the District of Columbia through the Vital Statistics Cooperative Program. Deaths of nonresidents (e.g., nonresident aliens, nationals living abroad, residents of Puerto Rico, Guam, the Virgin Islands, and other US territories) and fetal deaths are excluded. Numbers are slightly lower than previously reported for 2015–2016 because of NCHS standards that restrict displayed data to US residents. Accessed at http://wonder.cdc.gov/mcd-icd10.html on January 11, 2021. CDC WONDER data set documentation and technical methods can be accessed at https://wonder.cdc.gov/wonder/help/mcd.html#.

* Rates are age-adjusted per 100,000 US standard population during 2000 by using the following age group distribution (in years): <1, 1–4, 5–14, 15–24, 25–34, 35–44, 45–54, 55–64, 65–74, 75–84, and ≥85. For age-adjusted death rates, the age-specific death rate is rounded to 1 decimal place before proceeding to the next step in the calculation of age-adjusted death rates for NCHS Multiple Cause of Death on CDC WONDER. This rounding step might affect the precision of rates calculated for small numbers of deaths. Missing data are not included.

† Cause of death is defined as 1 of the multiple causes of death and is based on the International Classification of Diseases, 10th Rev. (ICD-10) codes B17.1, and B18.2 (hepatitis C).

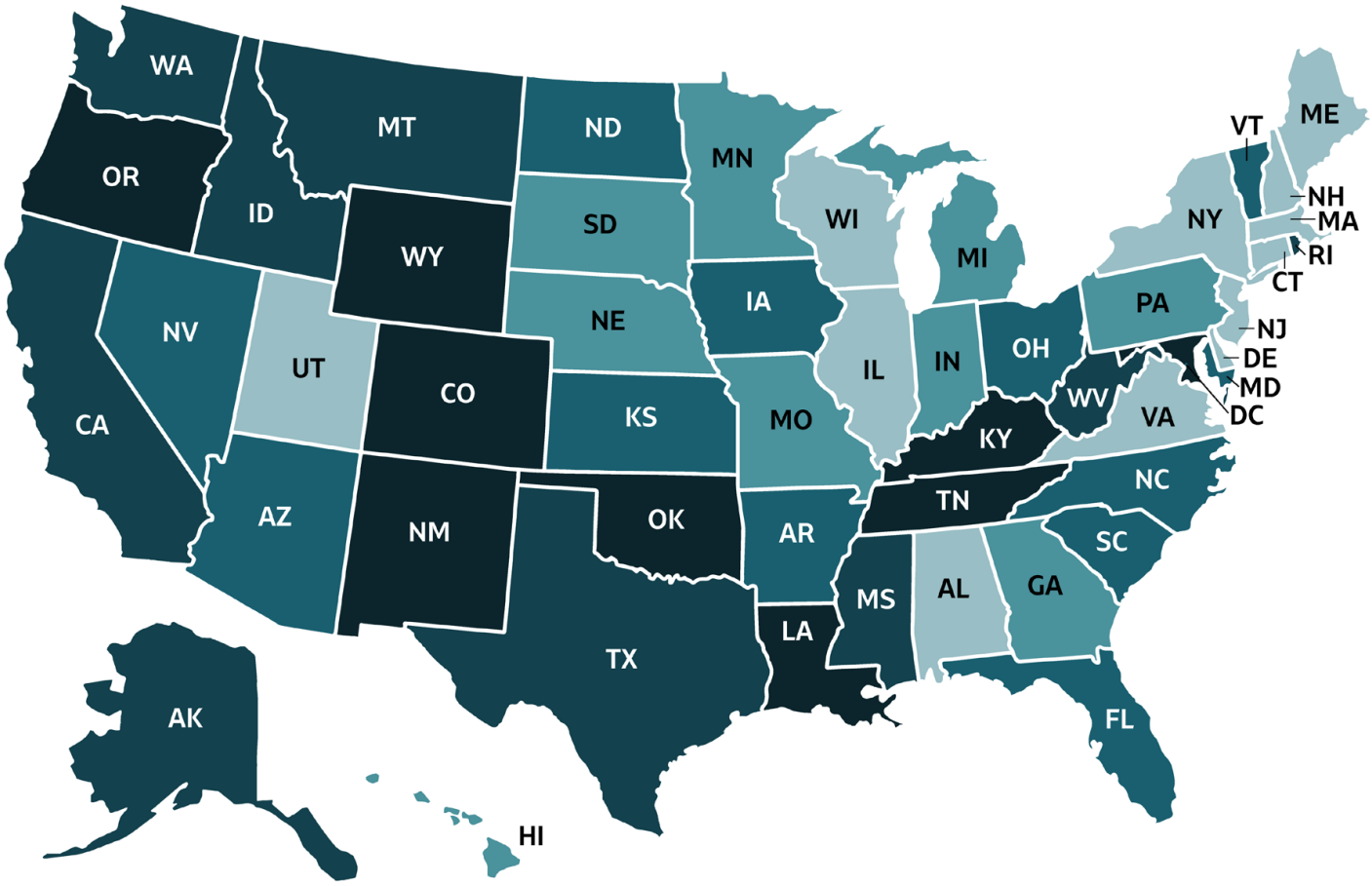
During 2019, a total of 14,242 hepatitis C-associated deaths were reported in the US Multiple Cause of Death data from the National Center for Health Statistics. Although death certificate data can help characterize deaths in the United States associated with hepatitis C, underreporting of hepatitis C as a primary or underlying cause of death does occur. Treatment of hepatitis C with direct-acting antiviral agents and sustained viral response is associated with reductions in mortality among persons with chronic hepatitis C. During 2019, the age-adjusted mortality rate was 3.33 deaths per 100,000 population, an approximate 32% decrease from the corresponding rate during 2015. The highest mortality rates were observed in Oklahoma and the District of Columbia (10.75 and 10.08 deaths per 100,000 population, respectively), whereas the lowest rates were observed in Illinois and Maine (both 1.31 deaths per 100,000 population). Three states (California, Texas, and Florida) had the highest number of hepatitis C-associated deaths reported, accounting for >30% of all the deaths reported nationally during 2019.

Source:

Spradling PR, Zhong Y, Moorman AC, et al. The persistence of underreporting of hepatitis C as an underlying or contributing cause of death, 2011–2017. Clin Infect Dis 2021;ciab108. doi: 10.1093/cid/ciab108. Epub ahead of print.

Sahakyan, Y, Lee-Kim V, Bermner KE, et al. Impact of direct-acting antiviral regimens on mortality and morbidity outcomes in patients with chronic hepatitis C: systematic review and meta-analysis. J Viral Hepat 2021. doi: https://doi.org/10.1111/jvh.13482

Figure 3.9. Rates* of death† with hepatitis C virus infection listed as a cause of death among residents, by jurisdiction — United States, 2019



Color Key	Deaths per 100,000 Population	State or Jurisdiction
	0.00-2.30	AL, CT, DE, IL, MA, ME, NH, NJ, NY, UT, VA, WI
	2.31-2.80	GA, HI, IN, MI, MN, MO, NE, PA, SD
	2.81-3.50	AR, AZ, FL, IA, KS, MD, NC, ND, NV, OH, SC, VT
	3.51-5.00	AK, CA, ID, MS, MT, RI, TX, WA, WV
	5.01-10.75	CO, DC, KY, LA, NM, OK, OR, TN, WY

Source: CDC, National Center for Health Statistics, Multiple Cause of Death 1999–2019 on CDC WONDER Online Database. Data are from the 2015–2019 Multiple Cause of Death files and are based on information from all death certificates filed in the vital records offices of the fifty states and the District of Columbia through the Vital Statistics Cooperative Program. Deaths of nonresidents (e.g., nonresident aliens, nationals living abroad, residents of Puerto Rico, Guam, the Virgin Islands, and other U.S. territories) and fetal deaths are excluded. Numbers are slightly lower than previously reported for 2015–2016 due to NCHS standards which restrict displayed data to US residents. Accessed at http://wonder.cdc.gov/mcd-icd10.html on January 11, 2021. CDC WONDER dataset documentation and technical methods can be accessed at https://wonder.cdc.gov/wonder/help/mcd.html.

* Rates are age-adjusted per 100,000 US standard population in 2000 using the following age group distribution (in years): <1, 1–4, 5–14, 15–24, 25–34, 35–44, 45–54, 55–64, 65–74, 75–84, and ≥85. For age-adjusted death rates, the age-specific death rate is rounded to one decimal place before proceeding to the next step in the calculation of age-adjusted death rates for NCHS Multiple Cause of Death on CDC WONDER. This rounding step may affect the precision of rates calculated for small numbers of deaths. Missing data are not included.

† Cause of death is defined as one of the multiple causes of death and is based on the International Classification of Diseases, 10th Revision (ICD-10) codes B17.1, and B18.2 (hepatitis C).

The state-specific mortality rates varied throughout the country during 2019 but are highest in the Central, Western, and certain Appalachian states, which reflects a different epidemiologic picture from acute hepatitis C rates (Figure 3.3). The states in the highest mortality rate category (5.01 to 10.75 deaths per 100,000 population) include Colorado, District of Columbia, Kentucky, Louisiana, New Mexico, Oklahoma, Oregon, Tennessee, and Wyoming. The states in the lowest mortality rate category (≤2.30 deaths per 100,000 population) include Alabama, Connecticut, Delaware, Illinois, Maine, Massachusetts, New Hampshire, New Jersey, New York, Utah, Virginia, and Wisconsin.

Table 3.8. Number and rates* of deaths with hepatitis C virus infection listed as a cause of death† among residents, by demographic characteristics — United States, 2015–2019

Characteristic	2015		2016		2017		2018		2019	
	No.	Rate* (95% CI)	No.	Rate* (95% CI)	No.	Rate* (95% CI)	No.	Rate* (95% CI)	No.	Rate* (95% CI)
Total	**19,566**	**4.91 (4.84–4.98)**	**18,093**	**4.42 (4.36–4.49)**	**17,253**	**4.13 (4.07–4.20)**	**15,713**	**3.72 (3.66–3.78)**	**14,242**	**3.33 (3.28–3.39)**
Age (years)										
0–34	196	0.13 (0.11-0.15)	164	0.11 (0.09-0.13)	180	0.12 (0.10-0.14)	212	0.14 (0.12-0.16)	170	0.11 (0.10–0.13)
35–44	592	1.46 (1.34-1.58)	532	1.31 (1.20-1.43)	507	1.24 (1.13-1.35)	499	1.21 (1.10-1.31)	472	1.13 (1.03–1.24)
45–54	3,659	8.47 (8.20-8.75)	3,026	7.07 (6.82-7.32)	2,556	6.03 (5.80-6.27)	2,040	4.90 (4.69-5.11)	1,676	4.10 (3.90–4.30)
55–64	9,678	23.68 (23.20-24.15)	9,011	21.73 (21.28-22.18)	8,275	19.70 (19.28-20.13)	7,297	17.26 (16.87-17.66)	6,304	14.85 (14.48–15.22)
65–74	4,009	14.55 (14.10-15.00)	4,071	14.22 (13.78-14.66)	4,397	14.81 (14.38-15.25)	4,429	14.52 (14.10-14.95)	4,499	14.29 (13.87–14.71)
≥75	1,431	7.08 (6.71-7.45)	1,288	6.25 (5.91-6.59)	1,329	6.28 (5.94-6.61)	1,235	5.63 (5.32-5.94)	1,117	4.95 (4.66–5.24)
Sex										
Male	14,043	7.27 (7.15-7.40)	12,815	6.48 (6.36-6.59)	12,287	6.12 (6.01-6.23)	11,242	5.53 (5.42-5.63)	10,229	4.96 (4.86–5.05)
Female	5,523	2.71 (2.63-2.78)	5,278	2.54 (2.47-2.61)	4,966	2.32 (2.26-2.39)	4,471	2.09 (2.02-2.15)	4,013	1.83 (1.77–1.89
Race/ethnicity										
White, non-Hispanic	12,329	4.35 (4.27-4.43)	11,389	3.95 (3.88-4.03)	10,781	3.70 (3.63-3.78)	9,858	3.35 (3.28-3.42)	9,056	3.08 (3.01–3.14)
Black, non-Hispanic	3,602	8.13 (7.86-8.40)	3,360	7.42 (7.16-7.68)	3,262	7.03 (6.79-7.28)	2,978	6.31 (6.08-6.54)	2,646	5.44 (5.23–5.65)
Hispanic	2,737	6.48 (6.23-6.74)	2,510	5.76 (5.53-6.00)	2,399	5.29 (5.08-5.51)	2,190	4.64 (4.44-4.84)	1,865	3.84 (3.66–4.02)
Asian/Pacific Islander	415	2.32 (2.09-2.55)	384	2.03 (1.82-2.24)	368	1.86 (1.67-2.05)	300	1.43 (1.27-1.60)	308	1.43 (1.27–1.59)
American Indian/ Alaska Native	324	11.45 (10.18-12.73)	285	9.80 (8.63-10.97)	299	10.24 (9.04-11.44)	264	9.05 (7.93-10.17)	259	8.63 (7.55–9.72)
HHS Region: Regional Office¶										
1: Boston	732	3.78 (3.50-4.07)	616	3.10 (2.85-3.35)	602	2.97 (2.72-3.21)	519	2.56 (2.33-2.79)	448	2.15 (1.94–2.36)
2: New York	1,379	3.78 (3.58-3.98)	1,167	3.12 (2.94-3.30)	1,043	2.76 (2.59-2.93)	924	2.48 (2.31-2.64)	780	2.06 (1.91–2.21)
3: Philadelphia	1,675	4.17 (3.96-4.37)	1,478	3.68 (3.48-3.87)	1,441	3.53 (3.35-3.72)	1,253	3.04 (2.87-3.22)	1,185	2.85 (2.68–3.02)
4: Atlanta	3,703	4.53 (4.38-4.68)	3,500	4.18 (4.03-4.32)	3,450	4.03 (3.89-4.16)	3,160	3.60 (3.47-3.72)	2,996	3.36 (3.24–3.49)
5: Chicago	2,182	3.24 (3.11-3.38)	2,064	3.01 (2.88-3.15)	1,846	2.63 (2.51-2.75)	1,762	2.52 (2.40-2.64)	1,611	2.27 (2.15–2.38)
6: Dallas	3,280	7.08 (6.83-7.33)	3,194	6.69 (6.45-6.92)	3,169	6.54 (6.31-6.77)	2,907	5.85 (5.64-6.07)	2,562	5.06 (4.86–5.25)
7: Kansas City	623	3.58 (3.29-3.87)	593	3.31 (3.04-3.59)	589	3.24 (2.97-3.51)	544	3.04 (2.78-3.30)	496	2.67 (2.43–2.92)
8: Denver	634	4.67 (4.30-5.04)	640	4.69 (4.32-5.06)	615	4.38 (4.02-4.73)	636	4.45 (4.09-4.80)	600	4.10 (3.77–4.44)
9: San Francisco	4,053	6.84 (6.63-7.05)	3,668	6.08 (5.88-6.28)	3,330	5.37 (5.19-5.56)	2,928	4.63 (4.46-4.80)	2,564	4.00 (3.84–4.15)
10: Seattle	1,305	7.49 (7.08-7.91)	1,173	6.56 (6.17-6.94)	1,168	6.38 (6.01-6.76)	1,080	5.79 (5.43-6.14)	1,000	5.27 (4.94–5.61)

Source: CDC, National Center for Health Statistics, Multiple Cause of Death 1999–2019 on CDC WONDER Online Database. Data are from the 2015–2019 Multiple Cause of Death files and are based on information from all death certificates filed in the vital records offices of the 50 states and the District of Columbia through the Vital Statistics Cooperative Program. Deaths of nonresidents (e.g., nonresident aliens, nationals living abroad, residents of Puerto Rico, Guam, the Virgin Islands, and other US territories) and fetal deaths are excluded. Numbers are slightly lower than previously reported for 2015–2016 because of NCHS standards that restrict displayed data to US residents. Accessed at http://wonder.cdc.gov/mcd-icd10.html on January 11, 2021. CDC WONDER data set documentation and technical methods can be accessed at https://wonder.cdc.gov/wonder/help/mcd.html.

* Rates for race/ethnicity, sex, HHS region, and the overall total are age-adjusted per 100,000 US standard population during 2000 by using the following age group distribution (in years): <1, 1–4, 5–14, 15–24, 25–34, 35–44, 45–54, 55–64, 65–74, 75–84, and ≥85. Missing data are not included. For age-adjusted death rates, the age-specific death rate is rounded to 1 decimal place before proceeding to the next step in the calculation of age-adjusted death rates for NCHS Multiple Cause of Death on CDC WONDER. This rounding step might affect the precision of rates calculated for small numbers of deaths.

† Cause of death is defined as 1 of the multiple causes of death and is based on the International Classification of Diseases, 10th Rev. (ICD-10) codes B17.1, and B18.2 (hepatitis C).

¶§ US Department of Health and Human Services (HHS) regions were categorized according to the grouping of states and US territories assigned under each of the 10 HHS regional offices (https://www.hhs.gov/about/agencies/iea/regional-offices/index.html). For the purposes of this report, regions with US territories (Regions 2 and 9) contain data from states only.

This table summarizes the characteristics of hepatitis C-associated deaths among residents in the United States. During 2019, a total of 14,242 hepatitis C-associated deaths were reported among US residents in the US Multiple Cause of Death data from the National Center for Health Statistics, resulting in an age-adjusted mortality rate of 3.33 deaths per 100,000 population. Mortality rates were highest among persons aged 55–74 years, compared with other age categories, and deaths in this age group accounted for 76% of all hepatitis C-associated deaths reported during 2019. Non-Hispanic White persons accounted for 64% of all hepatitis C-associated deaths; however, the mortality rates among American Indian/Alaska Native persons and non-Hispanic Black persons were 2.8 times and 1.8 times, respectively, the mortality rate among non-Hispanic White persons. The highest hepatitis C-associated mortality rate was reported in Health and Human Services Region 10 (Alaska, Idaho, Oregon, and Washington), compared with other regions. Region-specific mortality rates have been consistently decreasing each year since 2015 for all regions except Health and Human Services Region 8 (Colorado, Montana, North Dakota, South Dakota, Utah, and Wyoming), which has had the lowest overall decrease in hepatitis C-associated mortality rate since 2015.

APPENDIX

Table A.1. Number of reported acute viral hepatitis infection cases and estimated infections with 95% bootstrap confidence intervals — United States, 2012–2019

Year	Hepatitis A		Acute Hepatitis B		Acute Hepatitis C	
	Reported	Estimated* (95% bootstrap confidence interval)	Reported	Estimated* (95% bootstrap confidence interval)	Reported	Estimated* (95% bootstrap confidence interval)
2012	1,562	3,100 (2,200–3,400)	2,895	18,800 (10,700–46,000)	1,778	24,700 (19,600–84,300)
2013	1,781	3,600 (2,500–3,900)	3,050	19,800 (11,300–48,500)	2,138	29,700 (23,500–101,300)
2014	1,239	2,500 (1,700–2,700)	2,791	18,100 (10,300–44,400)	2,194	30,500 (24,100–104,000)
2015	1,390	2,800 (1,900–3,100)	3,370	21,900 (12,500–53,600)	2,436	33,900 (26,800–115,500)
2016	2,007	4,000 (2,800–4,400)	3,218	20,900 (11,900–51,200)	2,967	41,200 (32,600–140,600)
2017	3,366	6,700 (4,700–7,400)	3,409	22,200 (12,600–54,200)	3,216	44,700 (35,400–152,400)
2018	12,474	24,900 (17,500–27,400)	3,322	21,600 (12,300–52,800)	3,621	50,300 (39,800–171,600)
2019	18,846	37,700 (26,400–41,500)	3,192	20,700 (11,800–50,800)	4,136	57,500 (45,500–196,000)

Source:

CDC, National Notifiable Diseases Surveillance System.

Klevens RM, Liu, S, Roberts H, et al. Estimating acute viral hepatitis infections from nationally reported cases. Am J Public Health 2014;104:482. PMC3953761. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3953761/pdf/AJPH.2013.301601.pdf

* To account for underestimation, a probabilistic model to estimate the true incidence (symptomatic and asymptomatic cases) of acute hepatitis A, B, and C virus infections from reported (symptomatic) cases has been published previously. The model includes the probabilities of symptoms, referral to care and treatment, and rates of reporting to local and state health departments. The published multipliers have since been corrected by CDC to indicate that each reported case of hepatitis A represents 2.0 estimated infections (95% bootstrap confidence interval [CI]: 1.4–2.2); each reported case of acute hepatitis B represents 6.5 estimated infections (95% CI: 3.7–15.9); and each reported case of hepatitis C represents 13.9 estimated infections (95% CI: 11.0–47.4).

SUPPLEMENTAL REPORT

Perinatal Hepatitis B Prevention Program Data

Technical Notes: Outcome data on infants born to persons with hepatitis B virus infection are reported by the CDC Perinatal Hepatitis B Prevention Program (PHBPP)[1], which funds 64 jurisdictions to identify pregnant persons infected with hepatitis B virus and to ensure that medical care is provided to their infants to improve receipt of post-exposure prophylaxis (hepatitis B vaccine birth dose and hepatitis B immune globulin), hepatitis B vaccine series completion, and post-vaccination serologic testing. Participating jurisdictions are the 50 US states, District of Columbia, 5 cities (Chicago, Houston, New York City, Philadelphia, and San Antonio), 5 territories (American Samoa, Guam, N. Mariana Islands, Puerto Rico, U.S. Virgin Islands), and 3 freely associated island nations (Federated States of Micronesia, Republic of the Marshall Islands, Republic of Palau). Data in this report are from the reporting period for the 2018 birth cohort, followed from January 1, 2018 through December 31, 2019 and only include infants managed by the program. Infants have variable lengths of follow-up time depending on their date of birth. Not all infants identified as HBsAg positive are reported to the CDC National Notifiable Diseases Surveillance System (NNDSS). (https://www.cdc.gov/vaccines/programs/perinatal-hepb/index.html)

[1] National Perinatal Hepatitis B Prevention Program: 2009–2017. Koneru A, Fenlon N, Schillie S, et al. Pediatrics March 2021, 147 (3) e20201823; DOI: https://doi.org/10.1542/peds.2020-1823.

Table S.1. Outcomes of infants born in 2018 to hepatitis B infected persons and managed by the CDC Perinatal Hepatitis B Prevention Program through the end of 2019, 64 US Jurisdictions

Grantee	All infants managed	Hepatitis B vaccine administration								Post-vaccination serologic testing					
		HBIG & vaccine at birth		Complete series by 12 months of age		Complete series after 12 months of age		Total with complete series		Received †		HBsAg positive		Immune §	
	No.	No.	%	No.	%	No.	%	No.	%	No.	%	No.	% ¶	No.	% ¶
All Jurisdictions	**9,950**	**9617**	**97%**	**8,609**	**87%**	**129**	**1%**	**8,738**	**88%**	**6,828**	**69%**	**23**	**0%**	**6,547**	**96%**
State															
Alabama	61	60	98%	58	95%	0	0%	58	95%	52	85%	1	2%	48	92%
Alaska	31	30	97%	23	74%	0	0%	23	74%	19	61%	1	5%	18	95%
Arizona	120	112	93%	103	86%	7	6%	110	92%	67	56%	0	0%	64	96%
Arkansas	61	60	98%	59	97%	0	0%	59	97%	53	87%	1	2%	50	94%
California	1,739	1,700	98%	1,316	76%	7	0%	1,323	76%	983	57%	3	0%	940	96%
Colorado	131	130	99%	128	98%	1	1%	129	98%	113	86%	0	0%	110	97%
Connecticut	85	84	99%	71	84%	2	2%	73	86%	22	26%	0	0%	21	95%
Delaware	46	46	100%	43	93%	2	4%	45	98%	41	89%	0	0%	39	95%
Florida	383	338	88%	308	80%	5	1%	313	82%	141	37%	2	1%	130	92%
Georgia	292	279	96%	260	89%	5	2%	265	91%	230	79%	0	0%	220	96%
Hawaii	152	152	100%	146	96%	3	2%	149	98%	134	88%	0	0%	132	99%
Idaho	20	20	100%	20	100%	0	0%	20	100%	13	65%	0	0%	13	100%
Illinois	168	161	96%	159	95%	1	1%	160	95%	133	79%	0	0%	128	96%
Indiana	130	130	100%	124	95%	0	0%	124	95%	109	84%	0	0%	109	100%

Grantee	All infants managed	Hepatitis B vaccine administration								Post-vaccination serologic testing					
		HBIG & vaccine at birth		Complete series by 12 months of age		Complete series after 12 months of age		Total with complete series		Received †		HBsAg positive		Immune §	
	No.	No.	%	No.	%	No.	%	No.	%	No.	%	No.	% ¶	No.	% ¶
Iowa	100	96	96%	96	96%	1	1%	97	97%	78	78%	0	0%	74	95%
Kansas	52	52	100%	48	92%	0	0%	48	92%	33	63%	0	0%	33	100%
Kentucky	78	60	77%	38	49%	8	10%	46	59%	46	59%	0	0%	46	100%
Louisiana	149	136	91%	128	86%	5	3%	133	89%	81	54%	0	0%	78	96%
Maine	11	9	82%	7	64%	0	0%	7	64%	6	55%	2	33%	4	67%
Maryland	253	243	96%	168	66%	1	0%	169	67%	163	64%	0	0%	161	99%
Massachusetts	305	304	100%	287	94%	1	0%	288	94%	255	84%	0	0%	251	98%
Michigan	154	153	99%	144	94%	1	1%	145	94%	118	77%	0	0%	117	99%
Minnesota	378	377	100%	361	96%	4	1%	365	97%	311	82%	0	0%	303	97%
Mississippi	53	50	94%	47	89%	6	11%	53	100%	26	49%	2	8%	18	69%
Missouri	93	87	94%	80	86%	0	0%	80	86%	56	60%	0	0%	51	91%
Montana	3	3	100%	3	100%	0	0%	3	100%	3	100%	0	0%	3	100%
Nebraska	60	56	93%	55	92%	0	0%	55	92%	49	82%	0	0%	47	96%
Nevada	73	67	92%	65	89%	0	0%	65	89%	52	71%	0	0%	49	94%
New Hampshire	13	13	100%	11	85%	0	0%	11	85%	11	85%	0	0%	11	100%
New Jersey	297	278	94%	263	89%	7	2%	270	91%	147	49%	0	0%	124	84%
New Mexico	11	11	100%	11	100%	0	0%	11	100%	7	64%	0	0%	7	100%
New York State	246	239	97%	232	94%	1	0%	233	95%	202	82%	0	0%	196	97%
North Carolina	202	199	99%	187	93%	3	1%	190	94%	143	71%	2	1%	134	94%
North Dakota	40	40	100%	35	88%	0	0%	35	88%	24	60%	0	0%	24	100%
Ohio	282	251	89%	266	94%	2	1%	268	95%	171	61%	1	1%	157	92%
Oklahoma	66	64	97%	59	89%	1	2%	60	91%	47	71%	1	2%	43	91%
Oregon	101	100	99%	93	92%	2	2%	95	94%	80	79%	0	0%	75	94%
Pennsylvania	157	157	100%	150	96%	1	1%	151	96%	126	80%	1	1%	125	99%
Rhode Island	40	40	100%	24	60%	12	30%	36	90%	36	90%	0	0%	36	100%
South Carolina	74	65	88%	69	93%	3	4%	72	97%	58	78%	0	0%	58	100%
South Dakota	25	25	100%	25	100%	0	0%	25	100%	18	72%	0	0%	17	94%
Tennessee	143	141	99%	131	92%	3	2%	134	94%	105	73%	1	1%	100	95%
Texas	647	624	96%	550	85%	5	1%	555	86%	438	68%	1	0%	428	98%
Utah	71	69	97%	70	99%	0	0%	70	99%	59	83%	0	0%	58	98%
Vermont	7	7	100%	6	86%	0	0%	6	86%	1	14%	0	0%	1	100%
Virginia	282	268	95%	254	90%	0	0%	254	90%	165	59%	1	1%	159	96%
Washington	303	291	96%	271	89%	2	1%	273	90%	234	77%	0	0%	204	87%
West Virginia	21	20	95%	21	100%	0	0%	21	100%	17	81%	0	0%	17	100%
Wisconsin	128	127	99%	113	88%	2	2%	115	90%	86	67%	0	0%	85	99%

Grantee	All infants managed	Hepatitis B vaccine administration								Post-vaccination serologic testing					
		HBIG & vaccine at birth		Complete series by 12 months of age		Complete series after 12 months of age		Total with complete series		Received †		HBsAg positive		Immune §	
	No.	No.	%	No.	%	No.	%	No.	%	No.	%	No.	% ¶	No.	% ¶
City															
Chicago	96	96	100%	95	99%	0	0%	95	99%	80	83%	0	0%	76	95%
District of Columbia	34	34	100%	32	94%	0	0%	32	94%	29	85%	0	0%	29	100%
Houston	139	129	93%	107	77%	1	1%	108	78%	96	69%	0	0%	95	99%
New York City	1,083	1,077	99%	973	90%	8	1%	981	91%	918	85%	3	0%	891	97%
Philadelphia	139	135	97%	124	89%	6	4%	130	94%	108	78%	0	0%	106	98%
San Antonio	34	34	100%	31	91%	0	0%	31	91%	26	76%	0	0%	25	96%
Territory															
American Samoa	7	7	100%	6	86%	0	0%	6	86%	0	0%	0	0%	0	0%
Guam	12	12	100%	3	25%	5	42%	8	67%	0	0%	0	0%	0	0%
N. Mariana Islands	9	9	100%	8	89%	1	11%	9	100%	7	78%	0	0%	7	100%
Puerto Rico	3	3	100%	1	33%	0	0%	1	33%	0	0%	0	0%	0	0%
Virgin Islands	3	3	100%	1	33%	1	33%	2	67%	0	0%	0	0%	0	0%
Freely Associated Island Nations															
Micronesia	35	35	100%	23	66%	3	9%	26	74%	0	0%	0	0%	0	0%
Republic of the Marshall Islands	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Palau	17	17	100%	17	100%	0	0%	17	100%	0	0%	0	0%	0	0%

HBIG=hepatitis B immune globulin; HBsAg=hepatitis B surface antigen; U=unavailable; anti-HBs=antibody to hepatitis B surface antigen; PVST=post-vaccination serologic testing.

* These data only include infants followed by the Perinatal Hepatitis B Prevention Program (PHBPP). National and jurisdictional level HepB vaccination coverage rates are available via annual MMWR publications of National Immunization Survey data (https://www.cdc.gov/vaccines/imz-managers/nis/index.html) and via VaxView (https://www.cdc.gov/vaccines/vaxview/index.html).

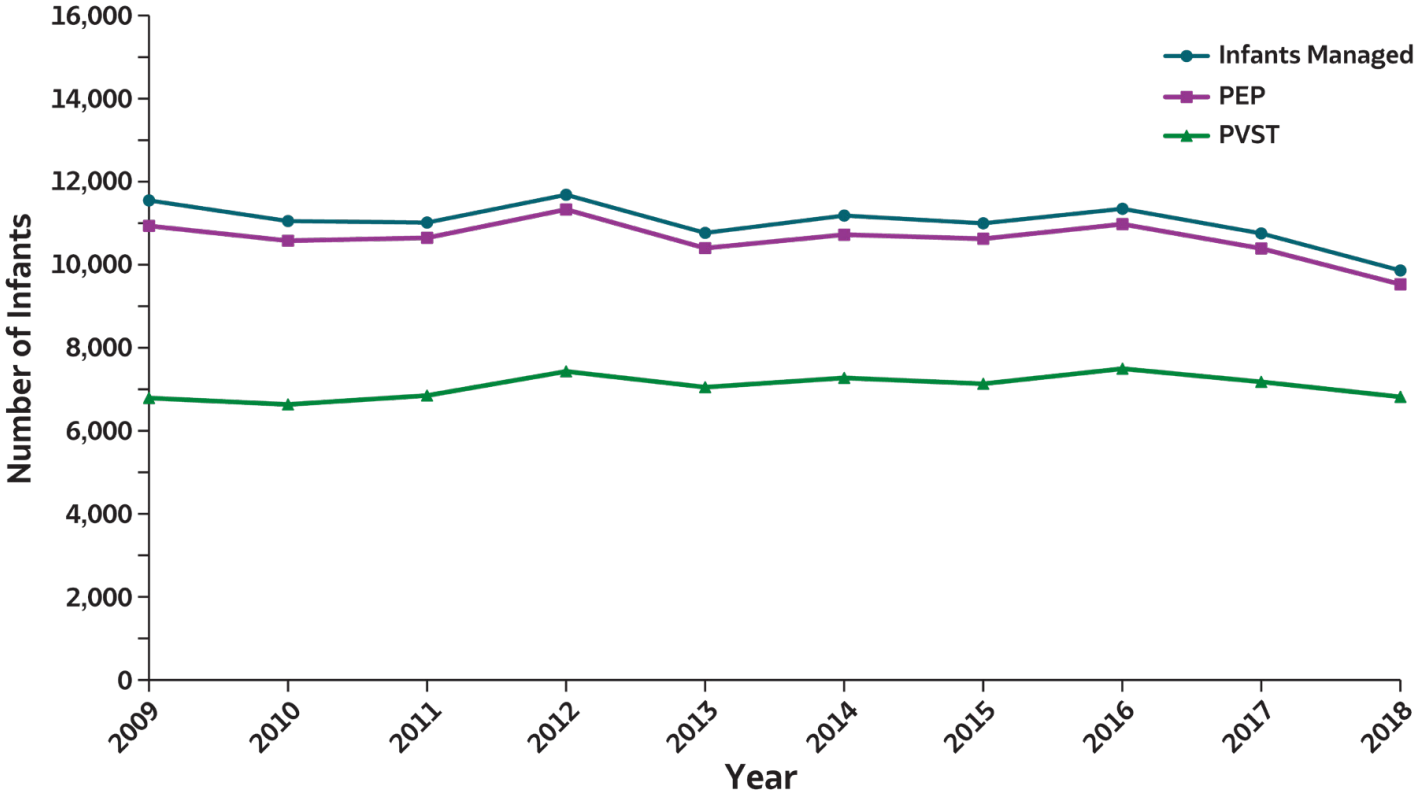
† Post-vaccination serologic testing includes a test for HBsAg, anti-HBs, or both.

§ Anti-HBs >10 mIU/mL.

¶ Percentage is among infants that completed the vaccine series and received PVST.

This table summarizes outcome data on infants born in 2018 to persons with hepatitis B virus infection from the CDC Perinatal Hepatitis B Prevention Program. The 2018 birth cohort includes infants born in 2018 and followed through December 31, 2019. Among the 9,950 infants managed by the Perinatal Hepatitis B Prevention Program, 97% received recommended prophylaxis at birth, 88% completed the vaccine series, and 69% received recommended post-vaccination serologic testing. Among infants with post-vaccination testing (6,828), there were 23 (0.3%) cases of perinatal hepatitis B transmission; the proportion of infants testing positive for hepatitis B was lower among those who received prophylaxis within 1 day of birth (21/6,697, 0.3%) compared to those who did not (2/131, 1.5%).

Figure S.1. Outcomes of infants born to hepatitis B infected persons and managed by the CDC Perinatal Hepatitis B Prevention Program, by birth cohort year — 56 US Jurisdictions*, 2009–2018



	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Infants managed	11,551	11,054	11,018	11,687	10,769	11,186	11,000	11,350	10,757	9,864
PEP	10,937	10,580	10,650	11,333	10,402	10,726	10,627	10,980	10,394	9,531
PSVT	6,792	6,637	6,852	7,433	7,053	7,276	7,135	7,499	7,181	6,820

Source: CDC, National Perinatal Hepatitis B Prevention Program.

Infants managed, number of infants case managed by the Perinatal Hepatitis B Prevention Program (PHBPP).

PEP (post-exposure prophylaxis), number of infants who received PEP (hepatitis B immune globulin and 1st dose of hepatitis B vaccine) for hepatitis B infection.

PVST (post-vaccination serological testing), number of infants who received PVST after hepatitis B vaccine series completion.

* Includes 50 states, District of Columbia, and 5 cities. Excludes territories and freely associated island nations.

The number of infants managed in the Perinatal Hepatitis B Prevention Program from 50 states, District of Columbia, and 5 cities was 11,551 in 2009 and 9,864 in 2018. During 2009 to 2018, the percentage of infants managed who received PEP has remained relatively stable between 95% to 97% each year. The percentage of infants managed who received PSVT has increased from 59% (6,792 of 11,551 infants managed) in 2009 to 69% (6,820 of 9,864 infants managed) in 2018.