Working Toward a

Hep Free NYC

Hepatitis A, B and C in New York City: 2019 Annual Report

New York City Department of Health and Mental Hygiene

About This Report: This report was developed by the New York City Department of Health and Mental Hygiene and provides surveillance data and summaries of viral hepatitis program activities from January 1, 2019, through December 30, 2019. This report is required pursuant to Local Law 43 of 2015. For additional details about the use of denominators and definitions in this report, please see Appendix 1. For more information, email hep@health.nyc.gov.

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Achieving a Hep Free NYC

In 2016, the World Health Organization (WHO) created targets for the global elimination of viral hepatitis by 2030. The New York City (NYC) Department of Health and Mental Hygiene (the Health Department) works to eliminate viral hepatitis through the following activities:

Prevention, Screening and Vaccinations | Reporting and Surveillance | Outbreak Response | Linkage to Care | Health Care Capacity Building | Community Engagement | Public Education | Research and Publication

Using a Data-to-Care Approach to Hepatitis Elimination
Data-to-care is a public health strategy that uses surveillance data to drive interventions. Since 2016, the Health Department has used patterns of reportable hepatitis B and C test results to assess patient engagement in care and cure for hepatitis C. The Health Department is able to identify and link out-of-care patients to hepatitis medical care (see Page 30), as well as identify and provide training and technical assistance to health organizations with the highest number of people with hepatitis C (see Page 39).

Working Toward Health Equity Through Hepatitis Elimination
Health equity is when everyone has the opportunity to be as healthy as possible. Yet, many people with hepatitis B and C face barriers to accessing health care, such as limited health insurance or health care services that are unresponsive to cultural or linguistic needs. They may also face stigma and discrimination in the clinical setting, particularly people who use drugs, people of color, people living with HIV and people who have been incarcerated. In NYC, there are wide racial disparities in mortality from hepatitis B and hepatitis C, with Asian and Pacific Islander New Yorkers having more than seven times the rate of death from hepatitis B as compared to White New Yorkers, and Latino and Black New Yorkers having 2.9 and 2.6 times the rate of death from hepatitis C, respectively, compared to White New Yorkers. Social determinants of health — such as lack of affordable housing and criminalization of drug use — drive new viral hepatitis infections.[1]

The Health Department works toward health equity using an asset-driven approach:
- Promoting hepatitis care that uses a harm reduction and human rights approach[2]
- Recruiting peer and patient navigators from affected communities who are uniquely able to build trust and address patients' holistic needs
- Building capacity of health care providers to provide culturally responsive hepatitis care
- Informing policies that increase access to care, such as removal of treatment restrictions due to drug or alcohol use
- Developing a viral hepatitis elimination plan with a health equity framework

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[1] Edlin BR, Winkelstein ER. Can hepatitis C be eradicated in the United States?. *Antiviral Research*. 2014 Oct 1;110:79-93.

[2] UNAIDS. Health, rights and drugs: harm reduction, decriminalization and zero discrimination for people who use drugs. 2019.

# Hepatitis B in NYC: Opportunities for Elimination

241,000 Estimated number of people with hepatitis B in NYC*

28% Percentage of people ages 18 to 34 vaccinated against hepatitis B**

*For information about how the hepatitis B prevalence estimate is calculated, see Appendix 1.
**Reported through hepatitis C enhanced surveillance

Elimination of hepatitis B is possible with the vaccine, yet many adults are unvaccinated. Hepatitis B disproportionately affects people who are foreign-born and live in high-poverty neighborhoods.

Rate of hepatitis B infection per 100,000 people by neighborhood poverty level

Very high poverty	100.0
High poverty	76.0
Medium poverty	62.1
Low poverty	38.1
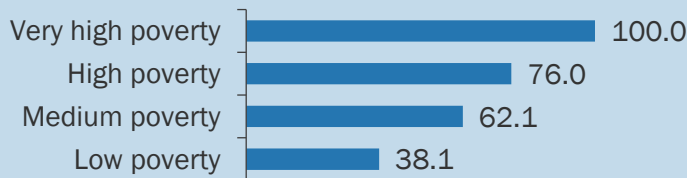
The rate of hepatitis B infection in very high-poverty neighborhoods is 2.5 times the rate in low-poverty neighborhoods.

The majority of pregnant people reported with a hepatitis B infection were born outside of the United States (U.S.).

U.S.-born, 3.2%

Born outside the U.S., 96.8%
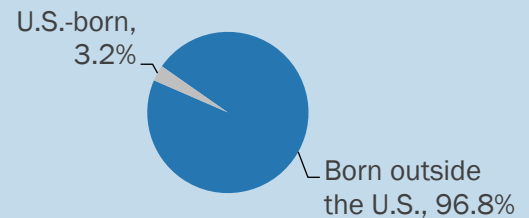
Hepatitis B can be treated to reduce the risk of liver disease, liver cancer and premature death, yet almost half of NYC residents with hepatitis B remain undiagnosed.

46% Almost half of NYC residents with hepatitis B are estimated to be undiagnosed.[3]

Percentage of people who died prematurely

Hepatitis B infection	45.5
Citywide (including hepatitis B)	27.4
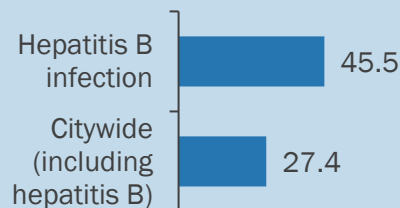
The percentage of people with hepatitis B who die prematurely is 1.5 times higher than all premature deaths in NYC.

Health Department Response
The Health Department has worked to eliminate hepatitis B by:
- Contacting more than 1,000 parents each year to ensure newborns receive hepatitis B prophylaxis and complete vaccination to protect them from infection
- Monitoring NYC hospitals to assess coverage of hepatitis B vaccination of newborns
- Expanding hepatitis B patient navigation services in neighborhoods with high rates of hepatitis B, reaching more than 1,500 people with hepatitis B testing, linkage to care and care coordination services
- Training more than 1,000 health care providers to screen and treat hepatitis B

Hepatitis C in NYC: Opportunities for Elimination

91,000 Estimated number of people with current hepatitis C infection in NYC*

40% Estimated percentage of NYC residents with chronic hepatitis C who are undiagnosed

*For information about how the hepatitis C prevalence estimate is calculated, see Appendix 1.

Hepatitis C can be cured, making elimination of the disease a reality. But two in five NYC residents with hepatitis C remain undiagnosed.

Rate of hepatitis C infection per 100,000 people by neighborhood poverty level

Very high poverty	71.5
High poverty	53.6
Medium poverty	47.0
Low poverty	32.1

The rate of hepatitis C infection in high-poverty neighborhoods is twice the rate in low-poverty neighborhoods.

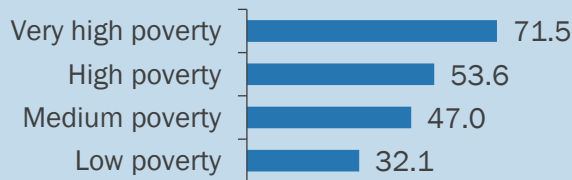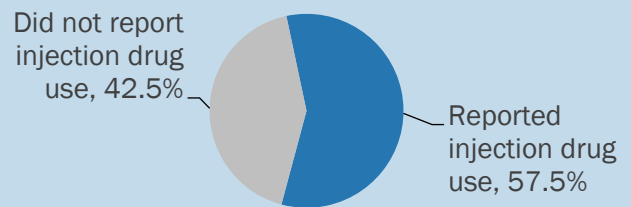More than half of people ages 18 to 34 with current hepatitis C infection* reported injection drug use.

Did not report injection drug use, 42.5%

Reported injection drug use, 57.5%

*Reported through enhanced surveillance

Hepatitis C can be cured, yet more than one-third of NYC residents diagnosed with hepatitis C remain untreated.

38% Estimated percentage of people diagnosed with chronic hepatitis C who have not initiated treatment

Percentage of people who died prematurely

Untreated hepatitis C infection	57.9
Citywide (including hepatitis C)	27.4
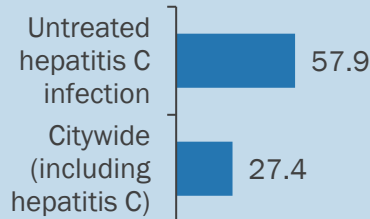
The percentage of people with hepatitis C who die prematurely is two times higher than all premature deaths in NYC.

Health Department Response

The Health Department has worked to eliminate hepatitis C by:

- Expanding hepatitis C patient and peer navigation services in neighborhoods with high rates of hepatitis C, reaching more than 13,000 people since 2014 with prevention, testing, linkage to care and care coordination services. Care coordination is shown to significantly increase rates of treatment initiation and cure.[3]
- Building capacity of health care facilities to promote hepatitis C treatment in 4,200 patients with hepatitis C and HIV coinfection during 2017–2019
- Training more than 1,000 health care providers to screen, treat and cure hepatitis C
- Funding dissemination of sterile drug-use equipment to 18,000 people who use drugs annually

[3] Deming R, Ford MM, Moore MS, et al. Evaluation of a hepatitis C clinical care coordination programme's effect on treatment initiation and cure: A surveillance-based propensity score matching approach. *J Viral Hepat*. 2018 Nov;25(11):1236-43.

WHO Hepatitis Elimination Indicators: Where NYC Stands

In 2016, the WHO created global targets to eliminate viral hepatitis by 2030.[4] In NYC, new case reports of hepatitis B and C continue to decline. However, the percentage of premature (preventable) deaths from hepatitis B and C and number of people treated for hepatitis C are below target.

Impact Targets

WHO indicator	WHO 2030 target	Proposed NYC indicator	NYC baseline data	Latest available NYC data	Percentage change from baseline
New cases of chronic hepatitis B infections	90% reduction	Newly reported cases of chronic hepatitis B[5]	8,344 (2016)	5,964 (2019)	28.5% reduction
New cases of chronic hepatitis C infections		Newly reported cases of chronic hepatitis C[5]	6,438 (2016)	4,427 (2019)	31.2% reduction
Hepatitis B deaths	65% reduction	Percentage of people with hepatitis B who died prematurely[5]	53% (2016)	46% (2017)	13.2% reduction
Hepatitis C deaths		Percentage of people with hepatitis C who died prematurely[5]	53% (2016)	48% (2017)	9.4% reduction

[4] World Health Organization. Global Health Sector Strategy on Viral Hepatitis, 2016-2021: Towards Ending Viral Hepatitis. 2016.
[5] NYC Health Department data

WHO Hepatitis Elimination Indicators: Where NYC Stands (continued)

Service Coverage Targets

WHO indicator	WHO 2030 target	Proposed NYC indicator	NYC baseline data	Latest available NYC data
Hepatitis B childhood third dose vaccination coverage	90%	*Hepatitis B vaccination has been required for elementary school in NYC since 1998; therefore, almost all children complete the hepatitis B vaccine series.*		
Hepatitis B virus birth-dose vaccination coverage	90%	Percentage of newborns receiving the birth dose within the first three days of life[6]	72% (2017)	77% (2019)
Blood safety and safe injections	90%	*NYC has essentially eliminated hepatitis B and C transmission in health care due to national blood safety and infection control policies.*		
Harm reduction: number of sterile syringes provided per person who injects drugs per year[6]	300 syringes	Number of sterile syringes distributed per syringe service program participant	247 (2017)	238 (2019)
Hepatitis B diagnosis	90% diagnosed	Proportion of people infected with hepatitis B who are diagnosed (as estimated from surveys)	54% (2016)[7]	To be determined
Hepatitis C diagnosis		Proportion of people infected with hepatitis C who are diagnosed (as estimated from surveys)	60% (2015)[8]	To be determined
Hepatitis B treatment	80% eligible for treatment are treated	Hepatitis B treatment rate (estimated using surveillance data)	Not available	Not available
Hepatitis C treatment		Hepatitis C treatment rate (estimated using surveillance data)	42% (2016)	62% (2019)[9]

[6] NYC Health Department data

[7] Moore MS, Bocour A, Winters A. Surveillance-based estimate of the prevalence of chronic hepatitis B virus infection, New York City, 2016. *Public Health Rep*. 2019;134(6):695-702.

[8] Bocour A, Greene SK, Laraque F, Winters A. Estimating the prevalence of chronic hepatitis C virus infection in New York City, 2015. *Epidemiol Infect*. 2018;146(12):1537-1542.

[9] See Page 26 for the hepatitis C care cascade.

Surveillance

Each year, the Health Department monitors the number of people with newly reported hepatitis A, B and C infections in NYC. The Health Department uses these data to describe trends over time and across groups, prevent new infections, and promote linkage to care and treatment. Read the surveillance technical notes in Appendix 1.

Hepatitis A

100	Number of people reported with hepatitis A in 2019	**+64%** Percentage change from 2018	**1.2** Rate per 100,000 people in 2019

From 2009 through 2012, with the availability of hepatitis A vaccine and universal childhood vaccine recommendations, the number of reported hepatitis A infections declined in NYC. Increases in infections since 2013 were related to food handlers (2013), local clusters associated with restaurants and social networks (2015), or outbreaks among men who have sex with men (MSM) (2017,[10] 2019).

Figure 1. Number of people reported with hepatitis A* in NYC, 2009–2019
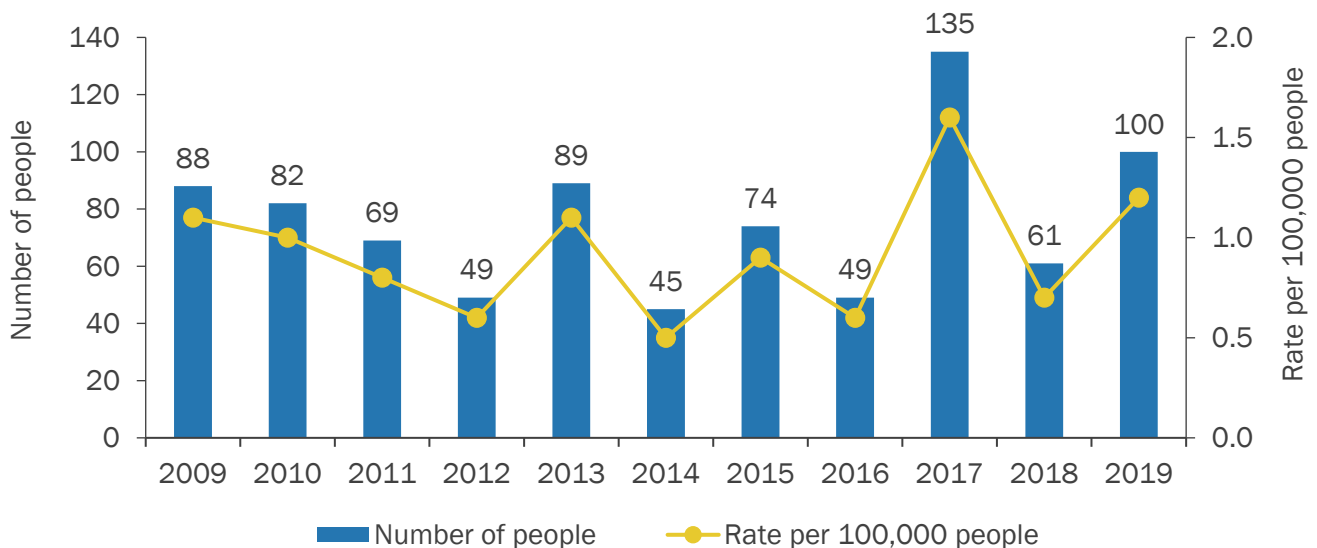
*Case definition for acute hepatitis A: discrete onset of symptoms consistent with hepatitis A infection, positive anti-hepatitis A virus IgM or hepatitis A RNA nucleic acid amplification test, either jaundice or elevated total bilirubin levels or elevated serum alanine aminotransferase levels, and the absence of a more likely diagnosis.

›› For information about how providers can report hepatitis A cases, see Appendix 2.

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[10] For more information, read the Centers for Disease Control and Prevention (CDC) Morbidity and Mortality Weekly Report: Latash J, Dorsinville M, Del Rosso P, et al. Notes from the Field: Increase in Reported Hepatitis A Infections Among Men Who Have Sex with Men — New York City, January-August 2017. *MMWR Morb Mortal Wkly Rep* 2017;66:999-1000. DOI: https://dx.doi.org/10.15585/mmwr.mm6637a7.

Figure 2: Percentage of people reported with hepatitis A in NYC by reported risk factors,[11] 2019

Risk factor	%
MSM	39.0
International travel	29.0
Drug use	21.0
Contact with a person with hepatitis A	7.0
Homelessness	5.0
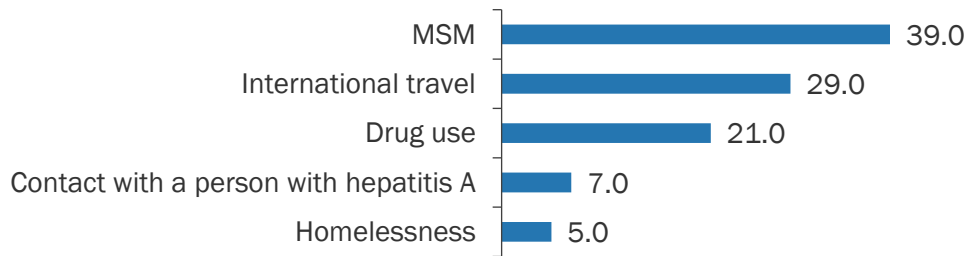
Figure 3: Percentage of people reported with hepatitis A in NYC by sex, age, race and ethnicity, and borough, 2019

Sex

Sex	%
Male	75.0
Female	25.0

Age

Age	%
0–9	9.0
10–19	3.0
20–29	21.0
30–39	38.0
40–49	16.0
50–59	8.0
≥ 60*	5.0

*Greater than or equal to 60

Borough

Borough	%
Manhattan	31.0
Queens	30.0
Brooklyn	20.0
Bronx	15.0
Staten Island	4.0

Race and ethnicity

Race and ethnicity	%
White, non-Latino/a	29.0
Black, non-Latino/a	25.0
Latino/a	19.0
Asian, non-Latino/a	15.0
Other	6.0
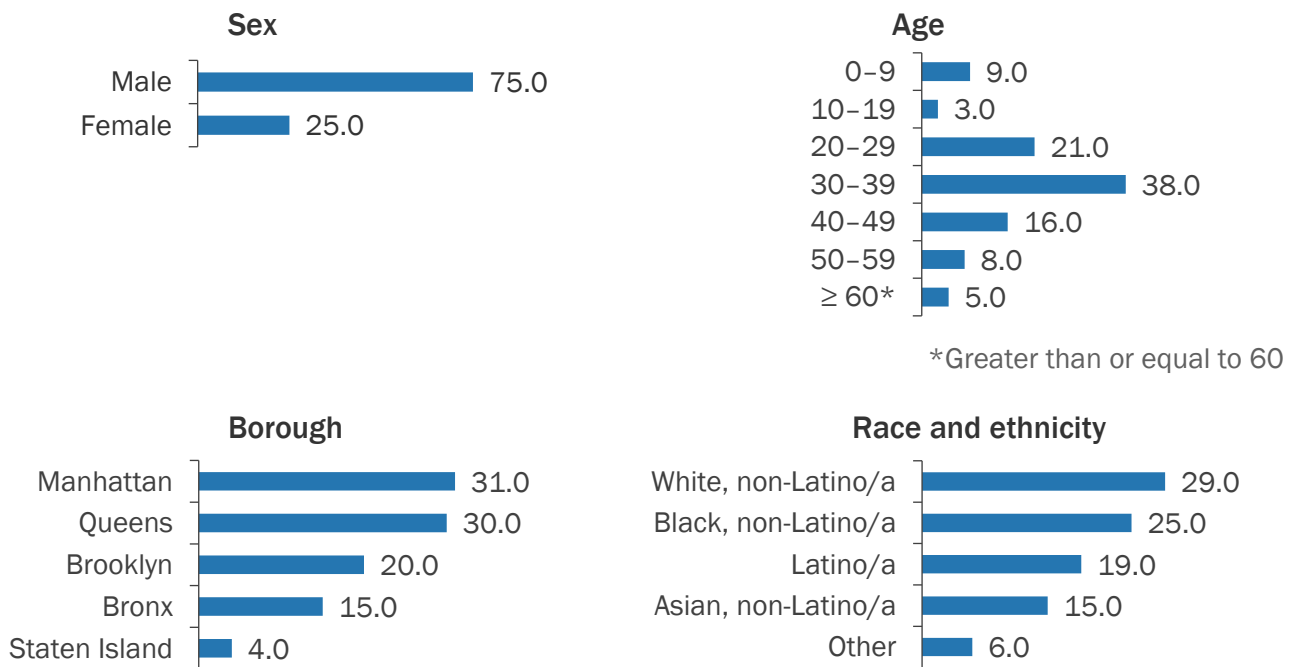
›› For full data, see Appendix 3.

Health Department Recommendation

Clinicians should administer two doses of hepatitis A vaccine at least six months apart to children beginning at age 1 year, as well as to the following groups:

- MSM
- Travelers to countries with high rates of hepatitis A, including countries in the Caribbean, Central and South America, Africa, Eastern Europe, and parts of Asia
- People with chronic liver disease, including hepatitis B and C
- People who use drugs (injection and non-injection)
- People experiencing homelessness, including those who live on the street, live in a shelter or otherwise do not have a permanent address

Read the full recommendations at cdc.gov/hepatitis/hav/havfaq.htm#vaccine. People with no or limited health insurance can receive low- or no-cost hepatitis A vaccines at the Health Department's Immunization Clinics (www1.nyc.gov/site/doh/services/immunization-clinics.page).

[11] Not mutually exclusive

Acute Hepatitis B

36 Number of people reported with acute hepatitis B in 2019

0.4 Rate per 100,000 people in 2019

Monitoring acute hepatitis B infections helps the Health Department determine where new infections occur, who is infected and how to implement effective prevention activities.

›› For information about how providers can report acute hepatitis B cases, see Appendix 2.

Figure 4. Number and percentage of people reported with acute hepatitis B in NYC by age, 2019
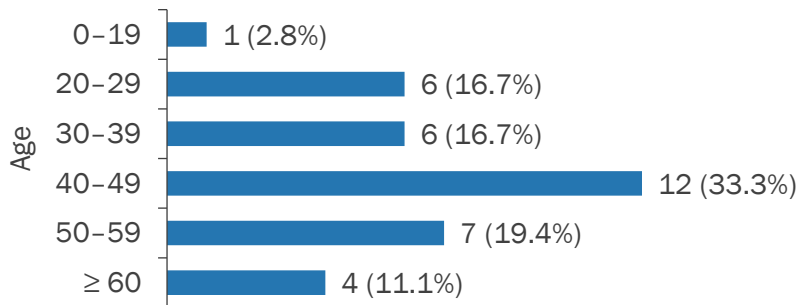
Sexual transmission was the most common reported risk factor for acute hepatitis B infection.

Figure 5. Number and percentage of people reported with acute hepatitis B infection in NYC, by reported risk factors,[12] 2019
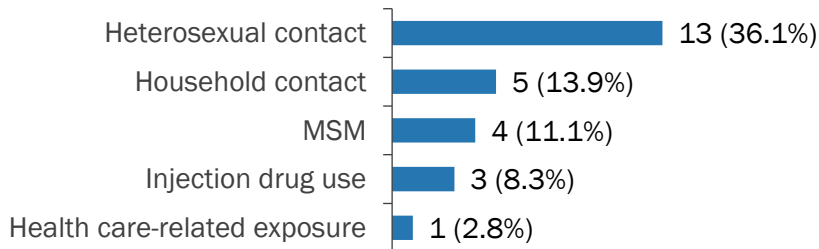
›› For full data, see Appendix 4.

Health Department Recommendation
- Clinicians should offer postexposure prophylaxis (PEP) to people exposed to hepatitis B (for example, through sex, sharing drug use equipment or blood exposure) to prevent infection. For more information, visit cdc.gov/hepatitis/hbv/pep.htm.
- Clinicians should offer the hepatitis B vaccine to people at high risk (for example, sexual partners and household contacts of people with hepatitis B, MSM and people who use drugs), as recommended by the Advisory Committee on Immunization Practices. For more information, visit cdc.gov/hepatitis/hbv/vaccadults.htm.

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[12] Mutually exclusive. Each patient is represented by the risk factor that poses the highest risk of hepatitis B infection. For example, a person who injected drugs and had a health care-related exposure is represented only once in injection drug use.

Chronic Hepatitis B

New reports of chronic hepatitis B declined from 2010 to 2013 and have continued to decline since 2016. However, NYC has one of the highest number of cases in the U.S.

FIGURE 6. Number and rate of people newly reported with chronic hepatitis B in NYC by year of first report, 2010–2019
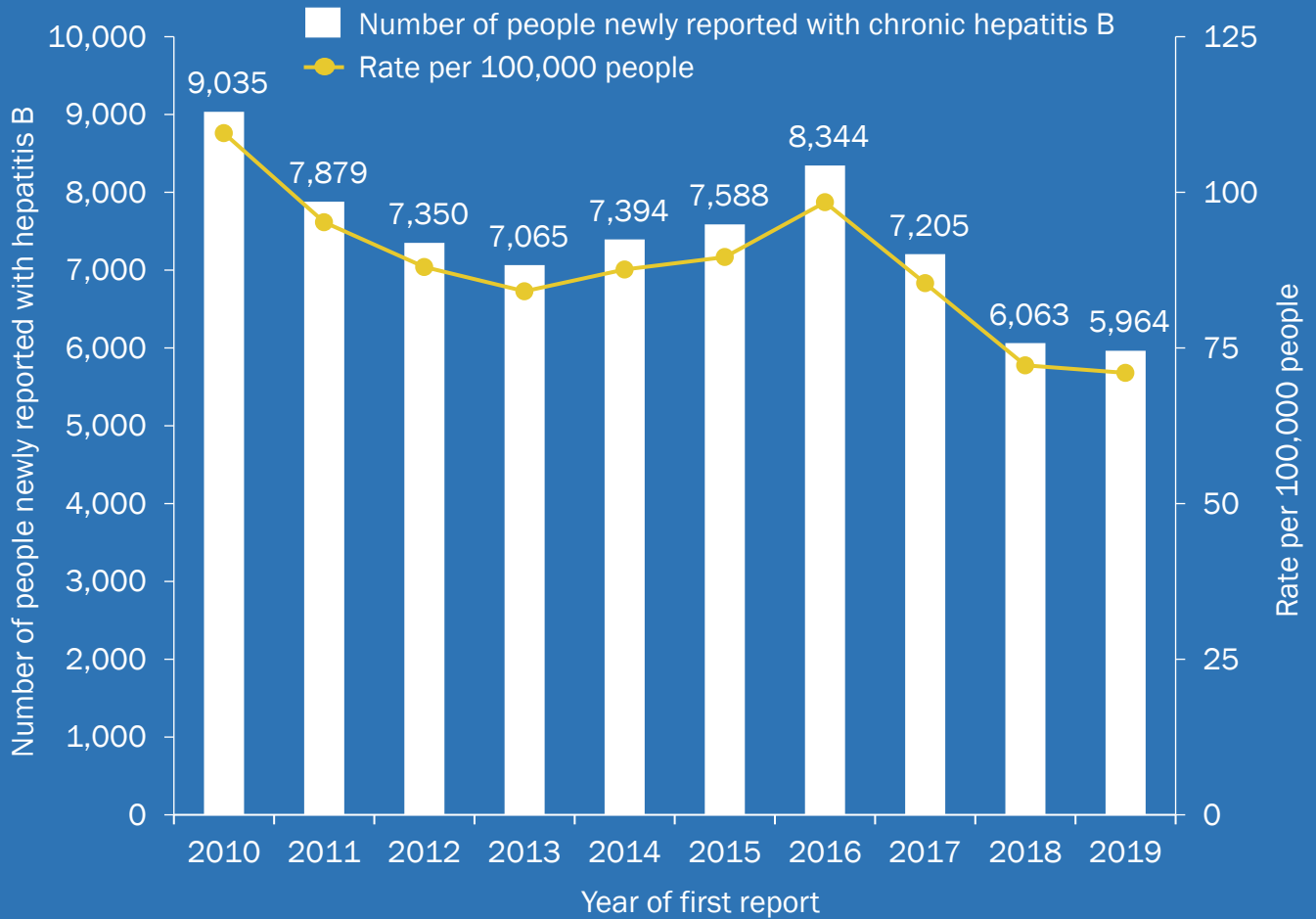
›› In NYC, there are many programs that provide supportive services and no- or low-cost hepatitis B care and treatment. For more information, visit nyc.gov/health and search for "hepatitis B."

Chronic Hepatitis B

5,964 Number of people newly reported with chronic hepatitis B in 2019

71.0 Rate of newly reported chronic hepatitis B per 100,000 people in 2019

HEPATITIS B PREVALENCE ESTIMATE

In 2019, the Health Department updated the prevalence of chronic hepatitis B in NYC.

241,000 Estimated number of people with chronic hepatitis B in NYC

The prevalence of chronic hepatitis B in NYC in 2017 was 2.9%, approximately 241,000 people.[13]

Characteristics of People Newly Reported With Chronic Hepatitis B

Figure 7. Percentage of people newly reported with chronic hepatitis B in NYC by sex, age, borough and neighborhood poverty level, 2019

Sex

Male	56.4
Female	43.2

Age

0–19	2.4
20–29	13.9
30–39	24.8
40–49	21.4
50–59	17.9
60–69	12.2
≥ 70	7.3

Borough

Brooklyn	32.9
Queens	28.5
Bronx	17.1
Manhattan	13.1
Staten Island	3.2

Neighborhood poverty level

Very high	23.4
High	25.8
Medium	35.0
Low	10.5
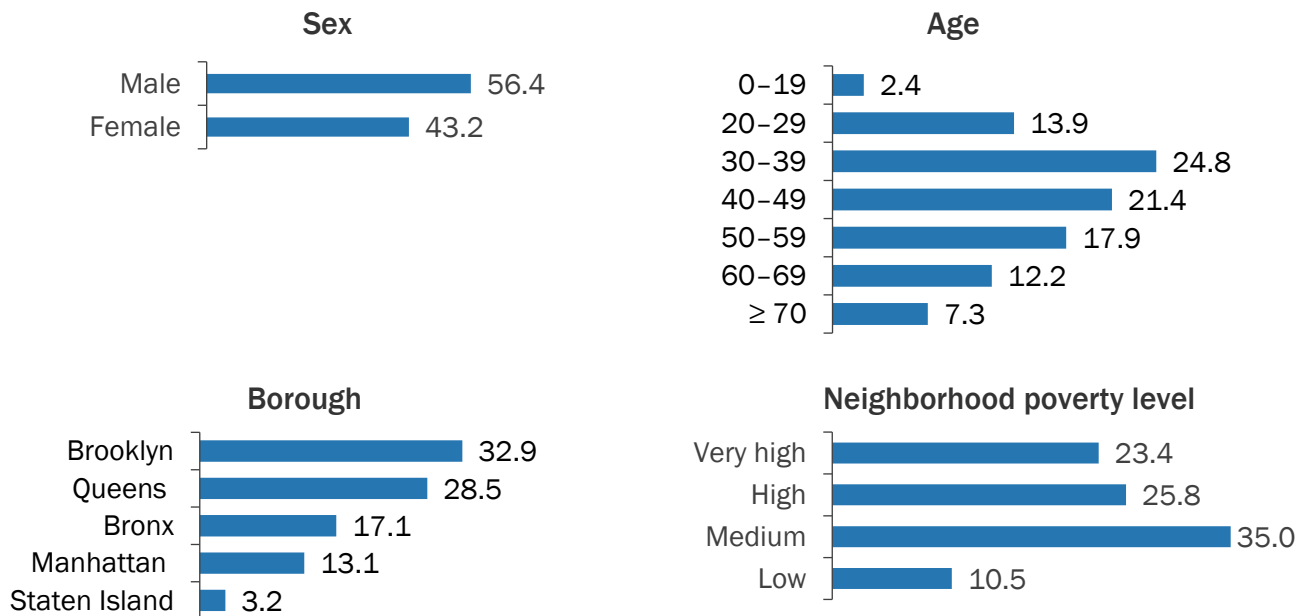
›› For full data, see Appendix 5.

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[13] Learn about the methods the Health Department uses to calculate the hepatitis B prevalence estimate at journals.sagepub.com/doi/full/10.1177/0033354919882962.

Chronic Hepatitis B: Geographic Distribution

Figure 8. Rate of people newly reported with chronic hepatitis B in NYC by neighborhood tabulation area (NTA), 2019[14]

Neighborhoods with the highest rates of people newly reported with chronic hepatitis B (per 100,000 people):
1. Sunset Park East, Brooklyn (476.7)
2. Flushing, Queens (400.6)
3. Queensboro Hill, Queens (275.4)
4. East Flushing, Queens (220.0)
5. Dyker Heights, Brooklyn (218.0)
6. Bensonhurst West, Brooklyn (195.0)
7. Chinatown, Manhattan (194.1)
8. Bensonhurst East, Brooklyn (156.9)
9. Elmhurst-Maspeth, Queens (156.7)
10. Elmhurst, Queens (145.1)

NYC rate: 71.0

Annual rate per 100,000 people
- 4.2–42.3
- 42.4–77.8
- 77.9–145.1
- 145.2–275.4
- 275.5–476.7
- 52.1 (correctional facilities)
- Non-residential areas
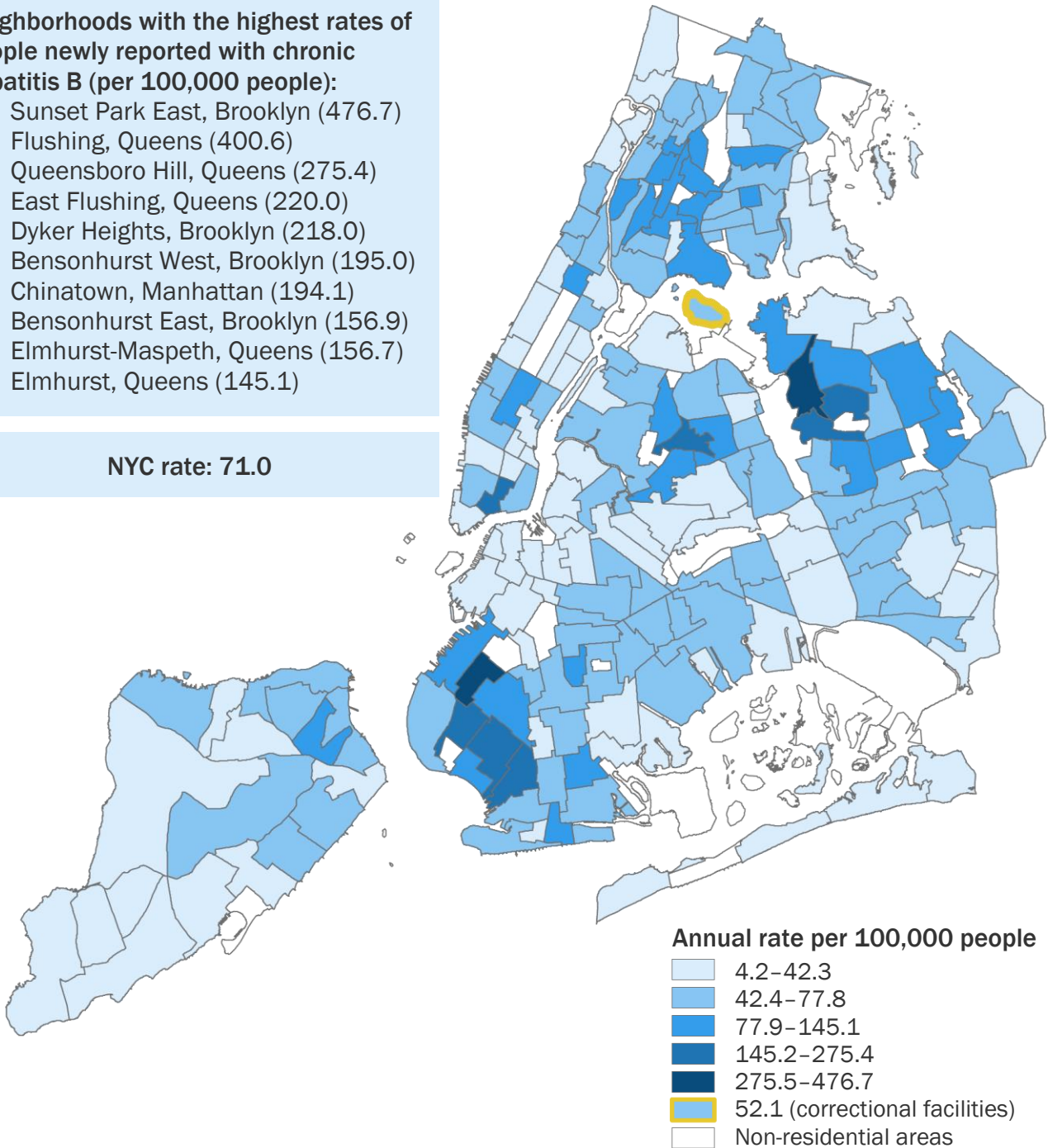
›› For full data and map of NTAs, see Appendices 6 and 7.

[14] NTAs could not be determined for 460 people (7.7%) with chronic hepatitis B based on their address at first report.

Perinatal Hepatitis B

Pregnant People With Chronic Hepatitis B Who Delivered a Live Birth in 2019

Hepatitis B can be transmitted from pregnant person to child during and after pregnancy. The Health Department tracks and provides case management services to pregnant people with hepatitis B to prevent perinatal transmission.

1,057 Number of pregnant people with hepatitis B

96.8% Percentage of pregnant people with hepatitis B born outside of the U.S.

›› For full data, see Appendix 8.

Hepatitis B Vaccination, Prophylaxis and Testing at Birth for Infants Born in 2018

Hepatitis B infection can be prevented in infants born to a pregnant person with hepatitis B by administering hepatitis B immune globulin and complete vaccination. In 2018, 1,083 infants were born to a pregnant person with hepatitis B.

Figure 9. Percentage of infants born to pregnant people with hepatitis B who received hepatitis B post-exposure prophylaxis (PEP), vaccination and testing, 2018

Given PEP	99.4
Completed vaccine series	90.6
Given PEP and vaccinated	90.2
Tested	84.5
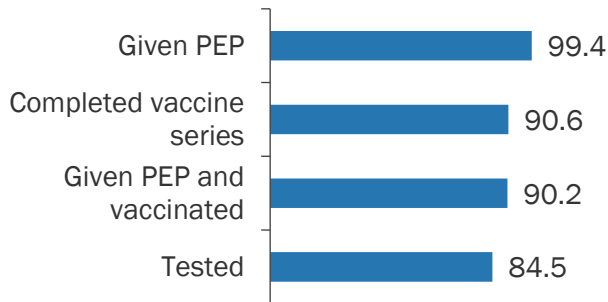
Figure 10. Test results of infants born to pregnant people with hepatitis B in NYC, 2018

Susceptible, 1.7%
Indeterminate, 0.9%
Infected, 0.3%
Immune, 97.0%
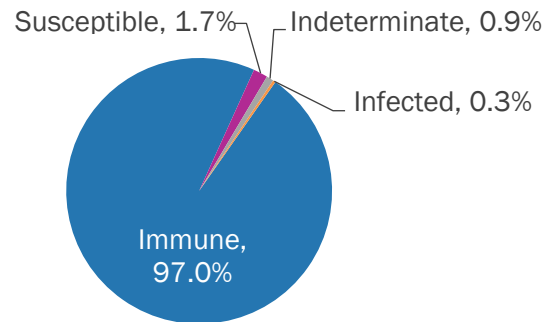
Health Department Recommendation

- Hospitals should give PEP (hepatitis B immune globulin and a dose of hepatitis B vaccine) to all infants born to pregnant people with chronic hepatitis B within 12 hours of birth.
- Providers should ensure that children complete the full hepatitis B vaccine series and all household and sexual contacts of parents with chronic hepatitis B are screened for and immunized against hepatitis B.

›› For more information, visit cdc.gov/hepatitis/hbv/perinatalxmtn.htm.

›› For full data, see Appendix 9.

Hepatitis B Vaccination at Birth

69% Percentage of 110,295 children born in 2019 who received the birth dose within one day of life

77% Percentage of 110,295 children born in 2019 who received the birth dose within three days of life

Health Department Recommendation

The Health Department recommends a universal dose of hepatitis B vaccine to all newborns within 24 hours of birth (in other words, birth dose), followed by completion of the vaccine series over approximately one year.[15]

›› For more information, go to nyc.gov/health and search "perinatal hepatitis B."

Hepatitis B: Deaths

People with hepatitis B are more likely to die prematurely than people with no hepatitis B infection.

Figure 11. Percentage of deaths among NYC residents that are premature (occurring before age 65), 2017

Hepatitis B infection	45.5
Citywide (including hepatitis B)	27.4
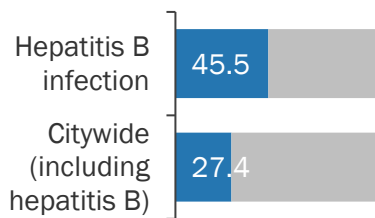
›› For full data, see Appendix 10A.

80 Number of deaths reported as caused by hepatitis B in 2018

0.8 Rate per 100,000 people in 2018

Figure 12. Age-adjusted death rate per 100,000 people among NYC residents where hepatitis B is listed as the cause of death in 2018, by sex and race and ethnicity

Sex

Male	1.4
Female	0.4

Race and ethnicity

Asian or Pacific Islander, non-Latino/a	2.5
Latino/a	1.4
Black, non-Latino/a	0.4
White, non-Latino/a	0.2
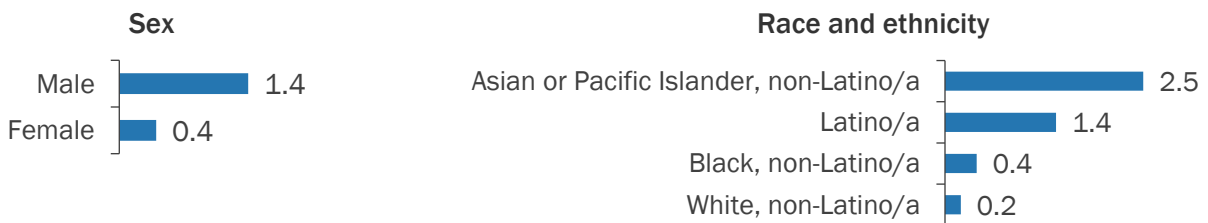
›› For full data, see Appendix 10B.

[15] The updated hepatitis B birth dose recommendation is the universal hepatitis B vaccination within 24 hours of birth for medically stable infants weighing ≥ 2,000 grams.

Acute Hepatitis C

Monitoring acute hepatitis C infections helps the Health Department determine where new infections occur, who is infected and how to implement effective prevention activities. (Acute infection means initial infection or the six-month time period following exposure to the virus.) The Health Department identifies acute infections from provider reports and during enhanced surveillance. In 2019, enhanced surveillance investigations were conducted for newly reported people ages 18 to 34.

Figure 13. Number of people reported with acute hepatitis C in NYC, 2015–2019
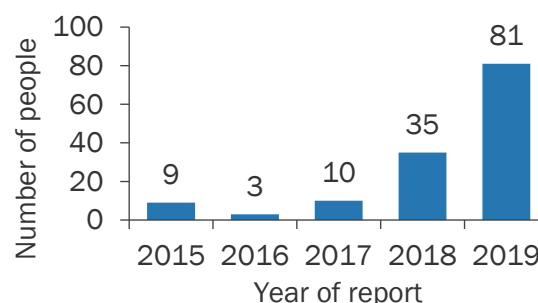
Outbreak Investigation: Health Care-Associated Infection

In March 2019, a hospital reported a cluster of three acute cases of hepatitis C infection associated with a private outpatient facility in Brooklyn. At a site visit, the Health Department identified multiple infection control lapses. A legal order was given to the physician to stop all invasive procedures. Patients seen at the facility were contacted to inform them of potential exposure to and promote testing for viral hepatitis and HIV. Molecular sequencing of specimens was performed by New York State (NYS) Wadsworth Laboratory. Five additional cases were linked to this site for a total of eight outbreak-associated cases.

Health Department Recommendation

All health care providers should: have an infection control policy, conduct annual bloodborne pathogen training, and prepare and administer parenteral medications with sterile technique. Providers should never: use single-dose vials for multiple patients, enter a medication vial, bag, or bottle with a used syringe or needle, or use expired medications.

Cluster Investigation: MSM Living With HIV

In March 2019, a Manhattan provider reported acute hepatitis C infection in eight people who were MSM living with HIV. Six of the men reported snorting, smoking or injecting crystal meth. Two people were re-infected; they had been previously treated and cured for hepatitis C. The Health Department released a Health Alert to health care providers promoting hepatitis C testing for high risk patients. See the Health Department's health alert at www1.nyc.gov/site/doh/providers/resources/health-alert-network.page. In addition, the Health Department facilitated molecular sequencing of specimens at NYS Wadsworth Laboratory to identify linkages between cases.

Health Department Recommendation

- People who use drugs and people living with HIV should be tested for hepatitis C at intake into care and at least annually.
- People with clinical manifestations of hepatitis or newly elevated alanine transaminase (ALT) should also be tested.
- Since early hepatitis C infection may result in a negative hepatitis C antibody test, RNA testing should be ordered at the same time as the antibody test in suspected cases of acute infection.
- Providers should report all acute cases of hepatitis C to the Health Department.

  ›› For more information about how providers can report acute hepatitis C cases, see Appendix 2.

Chronic Hepatitis C

Since 2009, newly reported cases of chronic hepatitis C have declined in NYC. Although the number of newly reported cases of hepatitis C continues to decline, more than 4,000 cases have been newly reported each year since 2009.

Figure 14. Number and rate of people newly reported with chronic hepatitis C in NYC by year of first report, 2010–2019
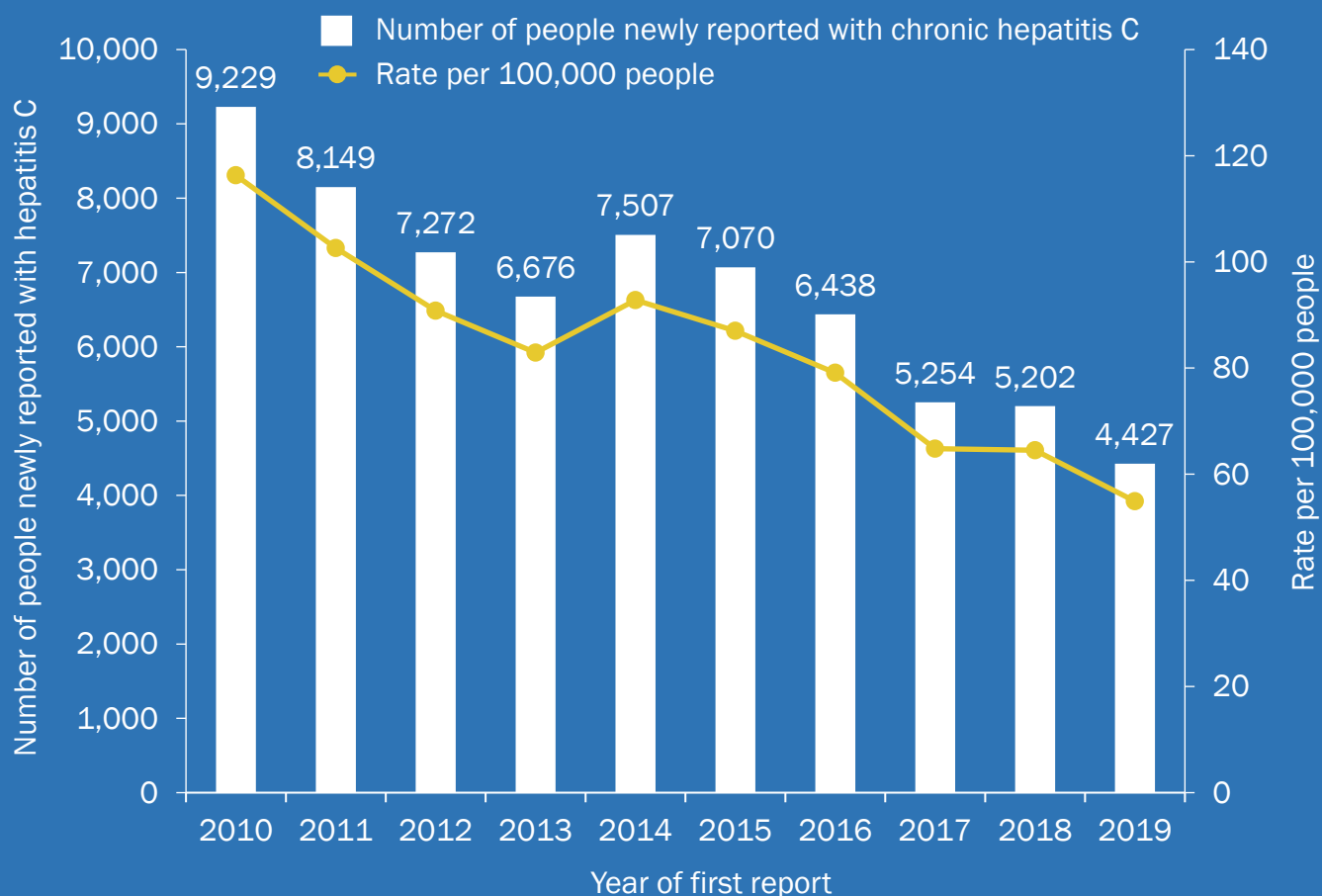
Data notes: In 2016 and 2018, the Council of State and Territorial Epidemiologists (CSTE) implemented new case definitions for chronic hepatitis C. Since 2018, people first reported with hepatitis C between ages 2 and 36 months were classified using the CSTE's perinatal hepatitis C case definition and were excluded from total case counts. Perinatal hepatitis C case counts can be found on Page 25.

Chronic Hepatitis C

4,427 Number of people newly reported with chronic hepatitis C in 2019

54.9 Rate of newly reported chronic hepatitis C per 100,000 people in 2019

In 2019, there were 4,427 people newly reported with a positive hepatitis C antibody result (RNA positive or RNA unknown), more than twice the number of new HIV diagnoses.[16]

Characteristics of People Newly Reported With Chronic Hepatitis C

Figure 15. Percentage of people newly reported with chronic hepatitis C in NYC by sex and borough, 2019

Sex

Male	62.3
Female	37.4

Borough[17]

Brooklyn	25.5
Bronx	23.6
Manhattan	22.1
Queens	19.3
Staten Island	4.0

›› For full data, see Appendix 11.

Chronic Hepatitis C: Age Distribution

In 2009, the age distribution of hepatitis C cases was concentrated among baby boomers (people born between 1945 and 1965). Ten years later, there was a second peak of hepatitis C cases among younger people. Younger people are likely to have been infected from recent drug use.

Figure 16. Age distribution of people reported with chronic hepatitis C in NYC, 2009 and 2019
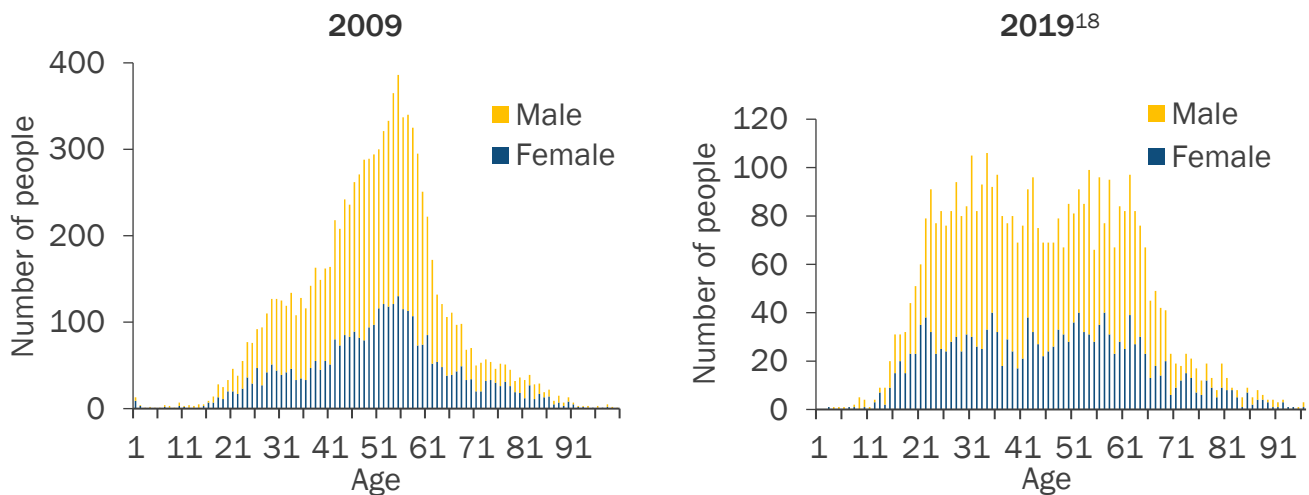
[16] HIV Surveillance Annual Report, 2018. New York City Department of Health and Mental Hygiene: https://www1.nyc.gov/assets/doh/downloads/pdf/dires/hiv-surveillance-annualreport-2018.pdf.
[17] The Bronx includes people in Rikers Island jail facilities.
[18] Starting 2018, children ages 0 to 36 months reported with hepatitis C are reported as perinatal infections.

Chronic Hepatitis C: Geographic Distribution

Figure 17. Rate of people newly reported with chronic hepatitis C in NYC by NTA,[19] 2019

Neighborhoods with the highest rates of people newly reported with chronic hepatitis C (per 100,000 people):
1. Rikers Island, Bronx (364.9)
2. Hudson Yards-Chelsea-Flatiron-Union Square,[20] Manhattan (179.4)
3. University Heights-Morris Heights, Bronx (119.7)
4. Midtown-Midtown South, Manhattan (116.4)
5. Central Harlem North-Polo Grounds (116.1)
6. Brighton Beach, Brooklyn (111.5)
7. East Harlem North. Manhattan (108.1)
8. Fordham South, Bronx (103.4)
9. Morrisania-Melrose, Bronx (100.5)
10. West Brighton, Brooklyn (99.2)

NYC rate: 54.9

Annual rate per 100,000 people
- 9.3–27.4
- 27.5–46.3
- 46.4–66.1
- 66.2–94.6
- 94.7–179.4
- 364.9 (correctional facilities)
- Non-residential areas

›› For full data and map of NTAs, see Appendices 6 and 12.

[19] NTA could not be determined for 388 people (8.8%) with chronic hepatitis C based on their address at first report.
[20] Many of the people reporting an address in this neighborhood use Manhattan's main post office address, which is often used by people without a permanent residence to receive mail.

Hepatitis C: People Ages 3 to 29

The Health Department monitors trends and clusters of hepatitis C in people ages 3 to 29 years because new cases among young people are more likely to be recent infections.[21] In 2019, 90.6% of people ages 3 to 29 years newly reported with chronic hepatitis C were ages 20 to 29 years.

639 Number of people ages 3 to 29 years newly reported with chronic hepatitis C in 2019

22.1 Rate of newly reported chronic hepatitis C per 100,000 people ages 3 to 29 years in 2019

FIGURE 18. Number of people ages 3 to 29 years reported with chronic hepatitis C in NYC by year of first report, 2010–2019
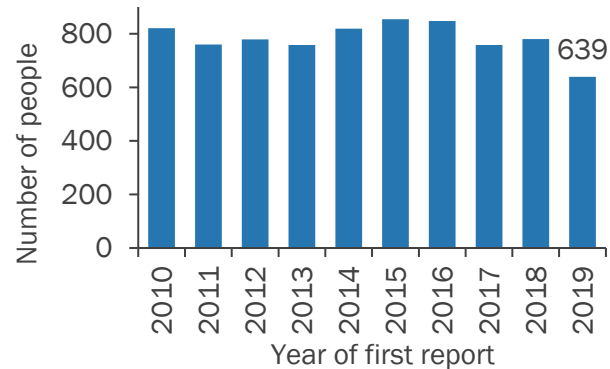
Geographic Distribution

Figure 19. Rate of people ages 3 to 29 years newly reported with chronic hepatitis C in NYC by NTA,[22] 2019

Neighborhoods with the highest rates of people ages 3 to 29 years newly reported with chronic hepatitis C (per 100,000 people):
1. Rikers Island, Bronx (252.6)
2. Hudson Yards-Chelsea-Flat Iron-Union Square, Manhattan (104.0)
3. Queensbridge-Ravenswood-Long Island City, Queens (83.4)
4. Old Town-Dongan Hills-South Beach, Staten Island (62.7)
5. New Dorp-Midland Beach, Staten Island (59.8)

Annual rate per 100,000 people
- 0.0
- 3.3–13.8
- 13.9–22.9
- 23.0–36.6
- 36.7–62.6
- 62.7–104.0
- 252.6 (correctional facilities)
- Non-residential area

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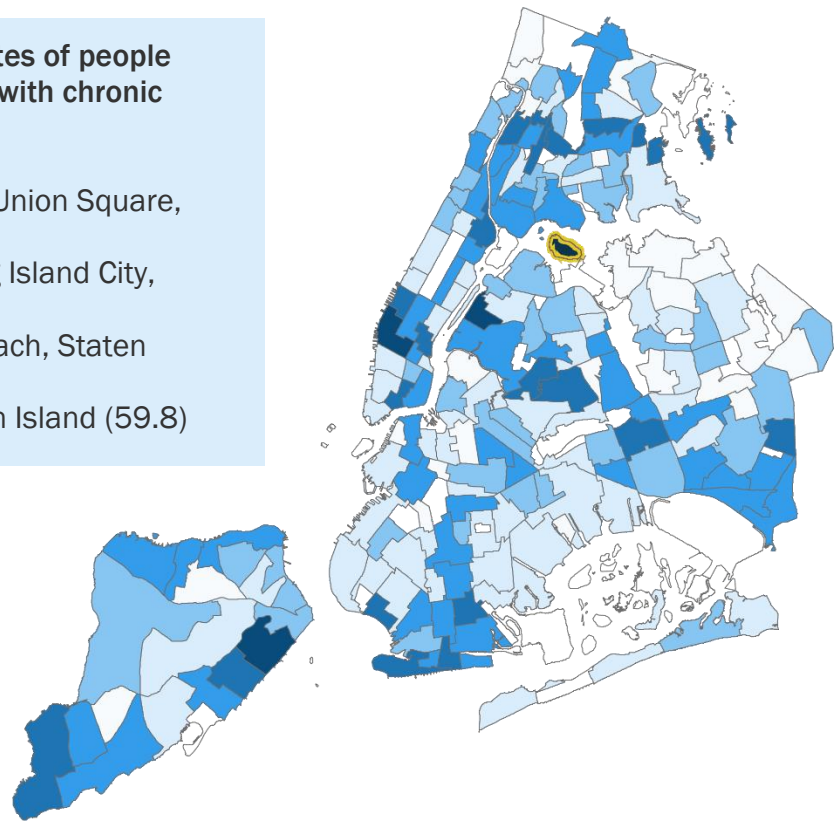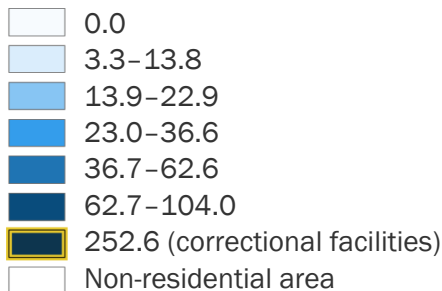
[21] Starting 2018, children ages 0 to 36 months reported with hepatitis C are reported as perinatal infections.
[22] NTA could not be determined for 35 people based on their address at first report.

Enhanced Chronic Hepatitis C Surveillance of People Ages 18 to 34

In 2019, the Health Department investigated 496 out of 567 (88%) people ages 18 to 34 years in NYC newly reported with chronic hepatitis C and their health care providers.

Patient Demographics

Figure 20. Characteristics of people newly reported in 2019 ages 18 to 34 years with chronic hepatitis C interviewed through enhanced surveillance (n=496)

Gender identity

Men	73.5%
Women	32.1%
Transgender	1.3%

Place of birth

U.S.-born	34.3%
Non-U.S.-born	21.1%
U.S. territory	0.2%
Unknown	51.3%

Race or ethnicity

White, non-Latino/a	34.1%
Latino/a	23.3%
Black, non-Latino/a	19.8%
Asian, non-Latino/a	6.5%
Native American*	0.2%
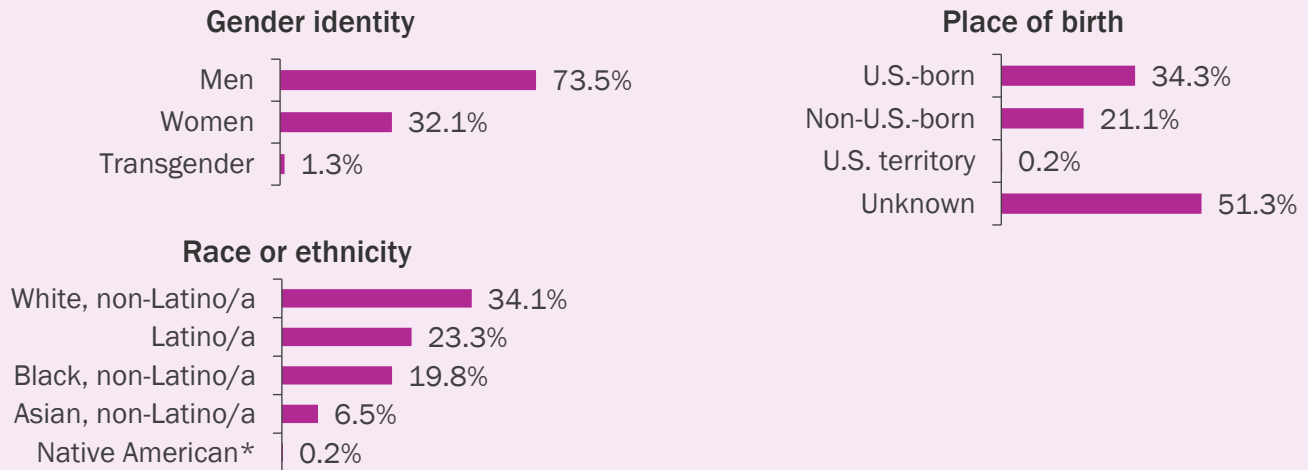
*Or Alaska Native, non-Latino/a

Hepatitis C Risk Factors

People with a history of injection or intranasal drug use make up more than half of people ages 18 to 34 years newly reported with chronic hepatitis C in NYC.

Figure 21. Risk factors for hepatitis C infection of people ages 18 to 34 years newly reported with chronic hepatitis C in NYC in 2019, interviewed through enhanced surveillance (n=496)[23]

Injection drug use	57.5%
Intranasal drug use	40.1%
History of homelessness	37.7%
MSM	27.9%
HIV	16.6%
Household contact	11.9%
History of incarceration	10.1%
Non-professional tattoo or body piercing	7.3%
Other*	4.1%
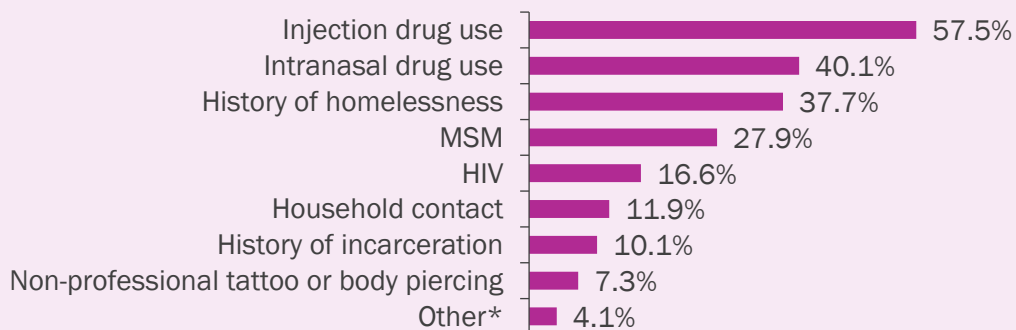
*Other includes: transfusion or transplant before 1992 or outside of the U.S.; employed in the medical or dental field; and received dialysis

Health Department Recommendation

Hepatitis C prevention interventions for people with a history of drug use — syringe services programs and medication-assisted treatment — should be prioritized to prevent new hepatitis C infections in NYC. Providers can find services at nycwell.cityofnewyork.us/en/find-services.

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[23] Not mutually exclusive

Hepatitis C Screening

Figure 22. Reason for hepatitis C screening among people ages 18 to 34 years newly reported with chronic hepatitis C in 2019 in NYC, interviewed through enhanced surveillance (n=496)[24]

Hepatitis C risk factors	28.4%
Routine hepatitis C screening	24.6%
Drug or alcohol treatment	23.5%
Elevated liver enzymes	16.6%
History of incarceration	10.1%
Previously tested for hepatitis C	4.3%
Symptoms or signs	4.1%
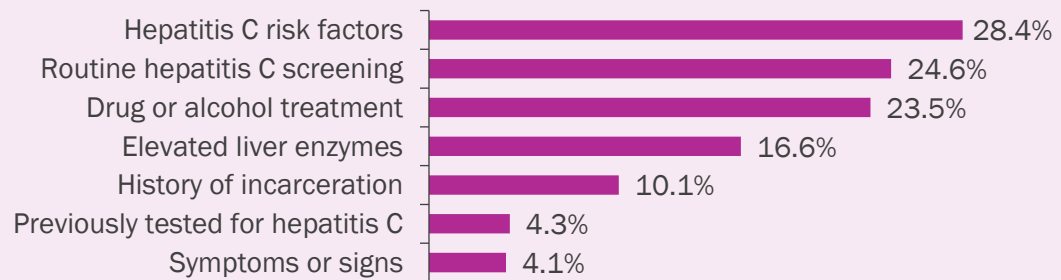
Access to Hepatitis C Health Care

88% Percentage of people ages 18 to 34 years with health insurance

81% Percentage of insured people ages 18 to 34 years enrolled in Medicaid

Clinical Assessment and Care

Figure 23. Providers' clinical assessment and care of people ages 18 to 34 years newly reported with chronic hepatitis C in 2019 in NYC, interviewed through enhanced surveillance (n=464)

Vaccinated for hepatitis A and/or B, 28.9%

Not vaccinated for hepatitis A and/or B, 71.1%

Assessed for fibrosis or cirrhosis, 26.7%

Not assessed for fibrosis or cirrhosis, 73.3%
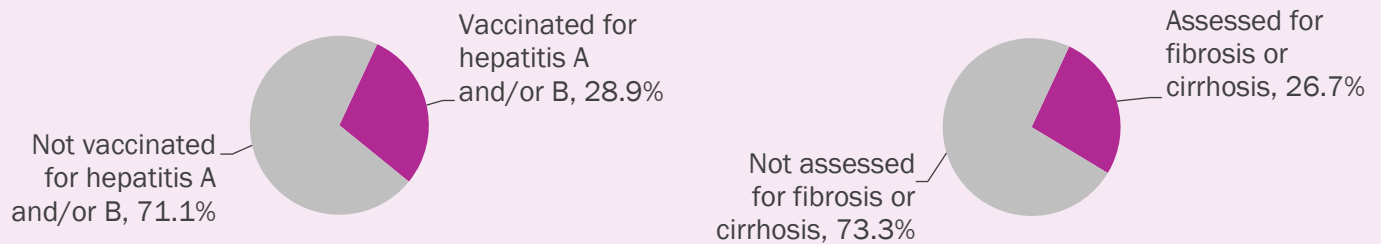
Hepatitis C Treatment Status

21% Percentage of people ages 18 to 34 years currently being treated for hepatitis C

11% Percentage of people ages 18 to 34 years treated who achieved cure

›› For full hepatitis C enhanced surveillance data, see Appendix 13.

Health Department Recommendation

All people with chronic hepatitis C should receive:
- Vaccination for hepatitis A and B
- Assessment for fibrosis or cirrhosis
- Screening for liver cancer if cirrhotic
- Treatment to cure infection

Read the City Health Information for clinical guidance on care of people diagnosed with hepatitis C at www1.nyc.gov/assets/doh/downloads/pdf/chi/chi-37-2.pdf.

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[24] Not mutually exclusive

Research Highlight: Impact of Case Definition Changes on Hepatitis C Surveillance

Hepatitis C cases are classified based on the results of the hepatitis C antibody and/or RNA tests:[25]

Hepatitis C antibody test result	Hepatitis C RNA test result	Hepatitis C case classification
Positive (Ab+)	Negative (RNA−)	Not a case
Positive (Ab+)	Not available	Probable[26]
Positive (Ab+)	Positive (RNA+)	Confirmed

In 2016, CSTE implemented a new case definition for chronic hepatitis C. This definition expanded the case definition to include "low" antibody test results in addition to "high" antibody test results. This change led to a marked increase in the number of people reported with positive antibody test results. The Health Department analyzed its surveillance data and found a 69% increase in reporting of Ab+/RNA− test combinations during 2016–2017 compared with 2009–2015.
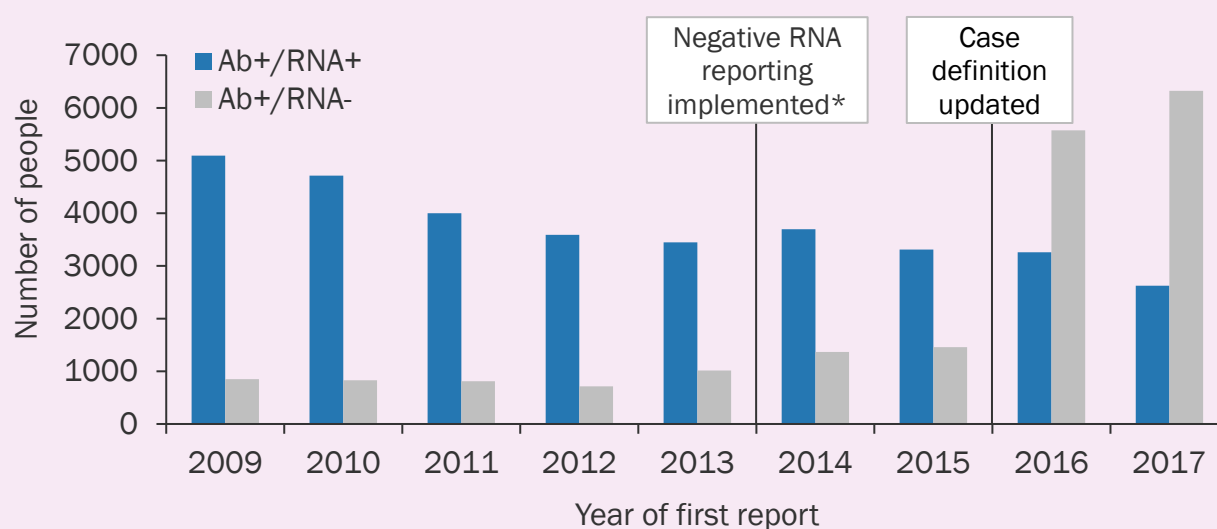
*Negative RNA tests became reportable in 2014; year of first report based on the first reported positive Ab test

For states that do not have negative RNA test reporting, the reporting of "low" positive antibody tests may result in an increase in probable cases, even though many of those cases may be RNA negative. Being aware of this issue can help public health stakeholders interpret changes in probable case reports beginning in 2016.

[25] "Hepatitis C, Chronic." National Notifiable Diseases Surveillance System (NNDSS), CDC Division of Health Informatics and Surveillance. Available at cdc.gov/nndss/conditions/hepatitis-c-chronic/case-definition/ 2016. Accessed June 13, 2018.

[26] Council of State and Territorial Epidemiologists. Revision of the Case Definition of Hepatitis C for National Notification. Position Statement 15-ID-03. Available at cdn.ymaws.com/www.cste.org/resource/resmgr/ 2015PS/2015PSFinal/15-ID-03.pdf. Accessed June 13, 2018.

Perinatal Hepatitis C

Perinatal transmission is the leading cause of childhood hepatitis C, occurring in 5.8% of infants born to a pregnant person with hepatitis C.[27] The Health Department monitors newly reported hepatitis C in people who can become pregnant (ages 15 to 44 years) as well as in children ages 0 to 36 months to identify perinatal transmission and prevention opportunities.

Hepatitis C: People Who Can Become Pregnant (Ages 15 to 44 Years)

Nationally, an increasing number of people who can become pregnant are becoming infected with hepatitis C. In NYC, the number of people who can become pregnant newly reported with chronic hepatitis C has been slightly declining since 2014.

681 Number of people who can become pregnant newly reported with chronic hepatitis C in 2019

36.7 Rate of newly reported chronic hepatitis C per 100,000 people who can become pregnant in 2019

Figure 24. Number of people who can become pregnant reported with chronic hepatitis C in NYC by year of first report, 2010–2019
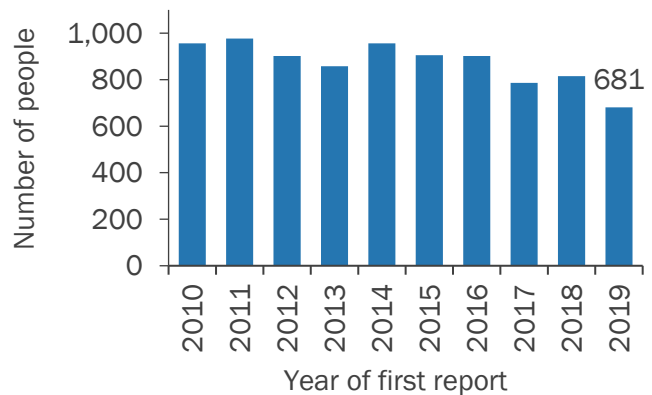
Health Department Recommendation
All pregnant people should be screened for hepatitis C during each pregnancy according to 2020 CDC guidelines (cdc.gov/mmwr/volumes/69/rr/rr6902a1.htm).

Characteristics of Children Newly Reported With Hepatitis C

In 2018, the Health Department began classifying children ages 0 to 36 months newly reported with hepatitis C virus in NYC using the 2018 CSTE perinatal hepatitis C case definition. To read the definition, visit cdc.gov/nndss/conditions/hepatitis-c-perinatal-infection/case-definition/2018.

14 Number of children ages 0 to 36 months newly reported with hepatitis C in 2019

43% Percentage of children tested because their mother was known to have hepatitis C

›› For full data, see Appendix 14.

Health Department Recommendation
All children born to people with hepatitis C should be tested for hepatitis C at age 18 months or older. For more information, visit hcvguidelines.org/unique-populations/children. All people diagnosed with hepatitis C should be connected to care.

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[27] Benova L, Mohamoud YA, Calvert C, et al. Vertical transmission of hepatitis C virus: systematic review and meta-analysis. *Clin Infect Dis*. 2014;59(6):765-773.

Chronic Hepatitis C Care Cascade

In 2016, the Health Department developed a validated algorithm to determine the number of people treated for and cured of chronic hepatitis C using surveillance data. To read how the validated algorithm was developed, visit ncbi.nlm.nih.gov/pubmed/29227418.

Figure 25. Care cascade for people in NYC with chronic hepatitis C recently reported (from July 1, 2014, to June 30, 2019) with a positive hepatitis C test, regardless of year of first report
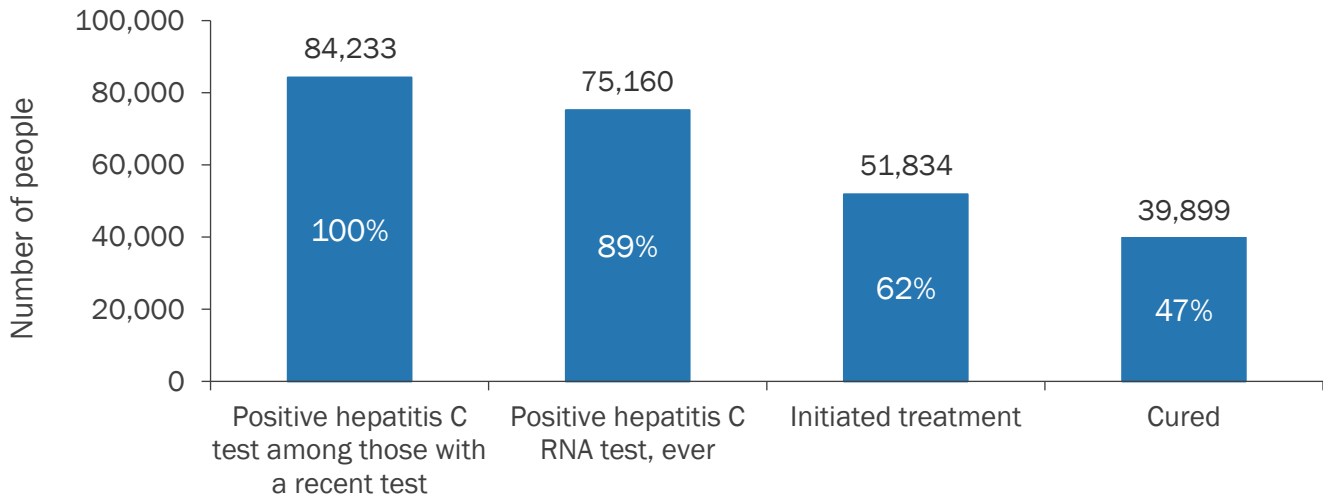
›› Read the definitions for each category in Appendix 16.

Hepatitis C Treatment Initiation

Figure 26. Treatment initiation among people newly reported with a positive hepatitis C RNA test, by year of first report[28]
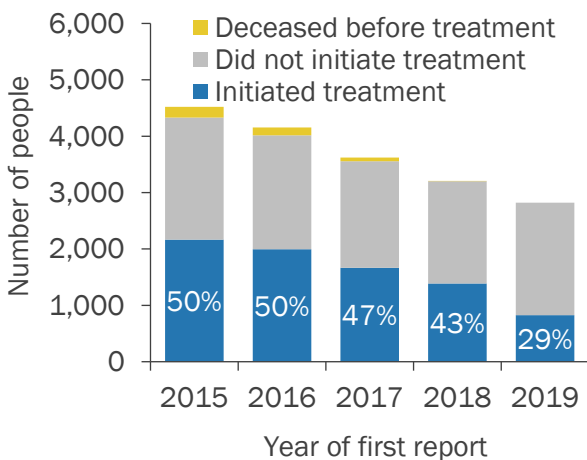
Data source: NYC hepatitis C surveillance registry

Only half of people first reported in 2015 and 2016 have been treated for hepatitis C.

Figure 27. Hepatitis C medication prescriptions for people covered by Medicaid, 2011–2019
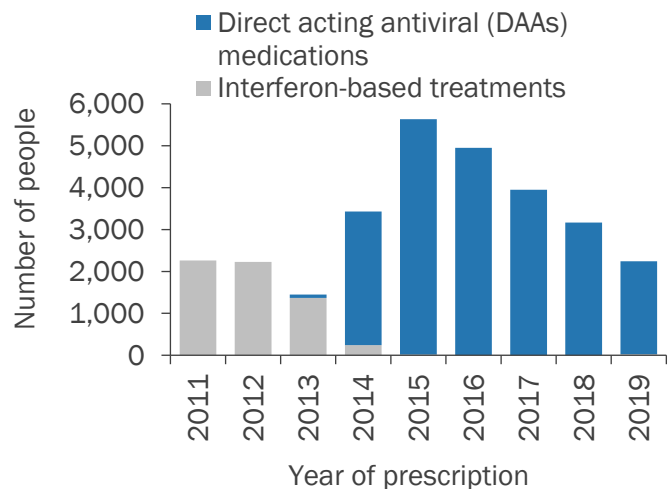
Data source: Salient NYS Medicaid Enterprise System

Treatment with all-oral DAAs has declined since 2015 for people with hepatitis C enrolled in Medicaid. More intensive efforts may be needed to connect people who are untreated to care.

[28] As of April 15, 2020. Matching to 2018 and 2019 Vital Statistics deaths incomplete.

Health Department Recommendation

All people with chronic hepatitis C can be treated and cured, including people who use drugs and alcohol. In NYC, there are many programs that provide supportive services and no- or low-cost hepatitis C care and treatment. For more information, visit nyc.gov/health/hepc.

Confirmatory Testing for Hepatitis C Infection

Confirmatory RNA testing is an essential step in hepatitis C diagnosis and is the standard of care. The Health Department monitors the number of people who receive RNA testing after a positive hepatitis C antibody test to determine how many people are living with hepatitis C. Reflex testing is automatic confirmatory RNA testing when the hepatitis C antibody test result is positive.[29]

›› For data on the RNA and genotype test results of people newly reported with hepatitis C in NYC in 2019, see Appendix 17.

Research Highlight: Hepatitis C Reflex Testing Requirement

FIGURE 28. Percentage of positive hepatitis C antibody tests that were reflexed to RNA tests for NYC residents, May 2017 to December 2019
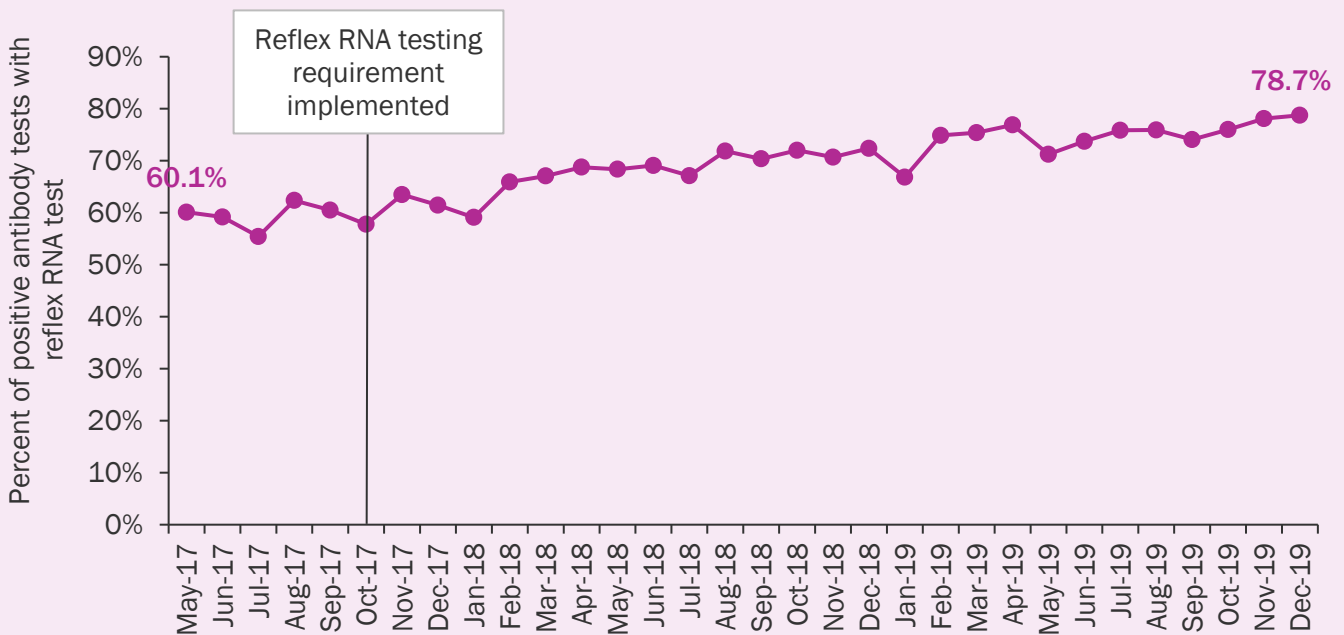
In October 2017, the NYC Health Code was amended to require laboratories to routinely perform a confirmatory RNA hepatitis C test when there is a positive hepatitis C antibody test result. Overall, the rate of reflex RNA testing has increased since May 2017. The Health Department identifies labs with low rates of reflex RNA testing, investigates barriers to implementation and supports lab directors in increasing reflex testing rates and track compliance quarterly.

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[29] Reflex testing is performed on the initial specimen or a second specimen collected at the same time as the initial specimen.

Hepatitis C: Deaths

People with hepatitis C are more likely to die prematurely than people with no hepatitis C infection.

Figure 29. Percentage of deaths among NYC residents that are premature (occurring before age 65), 2017

Untreated hepatitis C infection	57.9
Citywide (including hepatitis C)	27.4
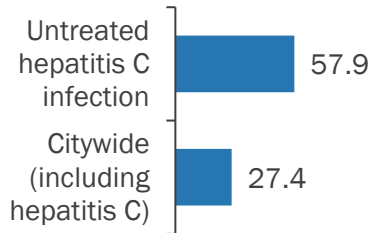
›› For full data, see Appendix 18A.

311 Number of deaths reported as caused by hepatitis C in 2018

3.3 Rate per 100,000 people in 2018

Figure 30. Age-adjusted death rate per 100,000 people among NYC residents where hepatitis C is listed as the cause of death in 2018, by sex and race and ethnicity

Sex

Male	4.5
Female	2.3

Race and ethnicity

Black, non-Latino/a	5.0
Latino/a	4.5
White, non-Latino/a	2.0
Asian or Pacific Islander, non-Latino/a	0.7
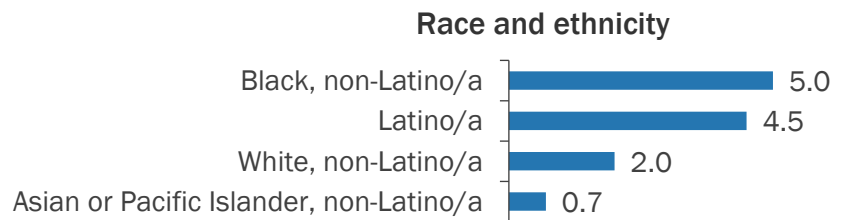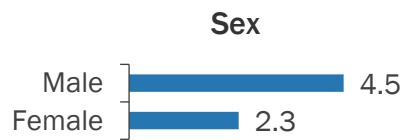
›› For full data, see Appendix 18B.

Hepatitis C and HIV Coinfection

People coinfected with hepatitis C and HIV are at high risk for serious liver disease, liver cancer and premature death.[30] The Health Department matches hepatitis C and HIV surveillance data to characterize NYC's coinfected population and identify opportunities to improve access to hepatitis C treatment.

Hepatitis C Treatment Initiation Among People Living With HIV

Figure 31. Percentage of people with hepatitis C and HIV coinfection who initiated hepatitis C treatment, by gender identity, birth cohort, years since HIV diagnoses and HIV viral load, 2018

Gender identity

Woman	70.4
Man	69.2
Transgender*	62.1
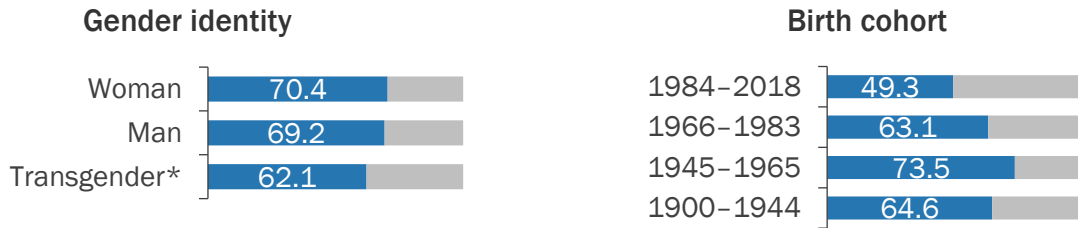
*Transgender man or women

A greater percentage of cisgender New Yorkers initiated treatment compared with transgender New Yorkers.

Birth cohort

1984–2018	49.3
1966–1983	63.1
1945–1965	73.5
1900–1944	64.6

A greater percentage of people in the birth cohort (1945–1965) initiated treatment compared with people born in 1984–2018.

History of incarceration

History of incarceration	56.2
No history of incarceration	71.1
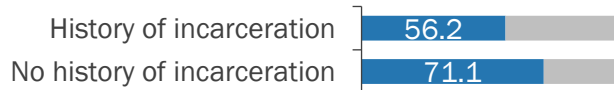
A greater percentage of people who did not have a history of incarceration initiated treatment compared with people with a history of incarceration.

HIV viral suppression status

Less than (<) 200	77.0
Greater than (>) 200	48.1
Unknown	44.8
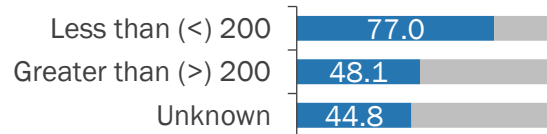
A greater percentage of people with a viral load < 200 copies per millimeter (IU/mL) initiated treatment compared with people with a viral load > 200 IU/mL.

›› For full data, see Appendix 15.

Project SUCCEED: Hepatitis C Elimination in People Living With HIV

In 2017–2019, the Health Department implemented Project SUCCEED (Scaling up Co-Infection Care and Eliminating Ethnic Disparities), a two-year micro-elimination project that aimed to accelerate efforts to cure hepatitis C infection in all people living with HIV in NYC. Using a data-to-care model, the Health Department matched and analyzed hepatitis C and HIV surveillance registry data to identify people currently coinfected with hepatitis C and HIV. Based on these data, the Health Department provided training and technical assistance to health care facilities with the highest number of people with hepatitis C and HIV coinfection and conducted telephone outreach to people not currently in medical care. (Continued on page 30.)

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[30] Pinchoff J, Drobnik A, Bornschlegel, K, et al. Deaths among people with hepatitis C in New York City, 2000–2011. *Clin Infect Dis*. 2014 Apr;58(8):1047-54.

Project SUCCEED: Hepatitis C Elimination In People Living With HIV (continued)

Project Interventions

Provider education and training	Clinical practice facilitation
• Coinfected patient dashboards for HIV care facilities • Symposia on hepatitis C micro-elimination best practices • Guidelines emailed to 30,000 NYC clinical providers • Provider trainings and preceptorships on hepatitis C screening, care and medication coverage	• Coinfected patient lists for case finding by HIV care facilities • Hepatitis C screening electronic health records query technical assistance • Clinical quality improvement projects

Training and Technical Assistance Outcomes, 2017–2019

632 Number of clinical and non-clinical providers trained in hepatitis C screening and treatment

9 Number of facilities engaged in hepatitis C screening and treatment quality improvement

Patient Navigation Outcomes, 2017–2019

220 Number of people with hepatitis C and HIV coinfection provided hepatitis C patient tele-navigation

73% Percentage of 220 people enrolled and linked to hepatitis C medical care

Figure 32. Percentage of people living with confirmed chronic hepatitis C and HIV coinfection in NYC who initiated hepatitis C treatment by year, 2015–2018
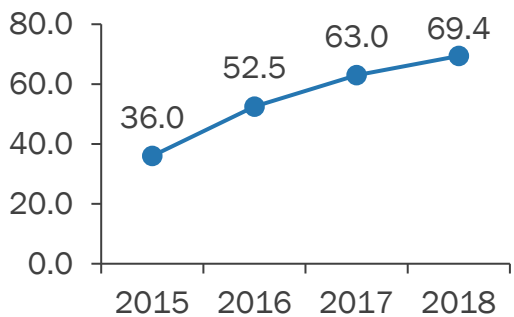
By the end of 2018, 69.4% of people living with HIV who ever tested positive for hepatitis C RNA were treated, but 2,772 (over one-quarter) remained untreated.

Data source: NYC HIV and hepatitis C surveillance registries

Health Department Recommendation
Health care providers should prioritize hepatitis C screening and treatment in all patients with HIV. For more information, visit hcvguidelines.org/unique-populations/hiv-hcv.

Prevention and Screening

The Health Department promotes hepatitis A, B and C prevention and screening among people at high risk of acquiring these infections, including people who use drugs; people who have sexual partner(s) with hepatitis A, B or C; MSM; and children born to mothers with hepatitis B and C. The Health Department provides hepatitis A and B vaccinations at its clinics, including to people who are underinsured or uninsured.

Hepatitis A and B Vaccinations

	Number of vaccine doses provided at Health Department clinics in 2019	Number of people who completed the vaccine series in NYC in 2019*
Hepatitis A	6,563	126,012
Hepatitis B	11,423	62,682**

*As reported to the Citywide Immunization Registry (CIR); CIR data is less representative of adult vaccination
**Children ages 0 to 18 years

Figure 33. Percentage of people who completed the hepatitis A vaccines series in NYC in 2019 who are adults and children

Vaccines provided to adults ages 19 and older, 2.8

Vaccines provided to children ages 0 to 18 years, 97.2
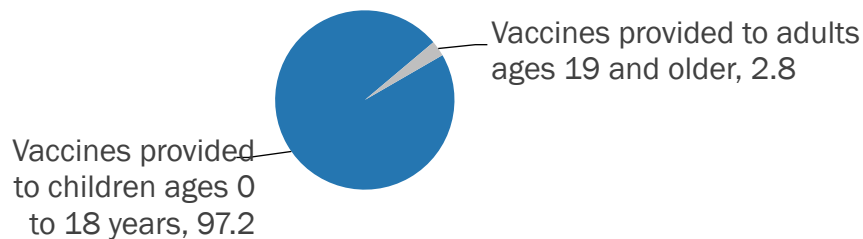
›› For full data, see Appendices 19 and 20.

Viral Hepatitis in Correctional Facilities
Since 2013, NYC Health + Hospitals (H+H)/Correctional Health Services has screened people in the City's jails for hepatitis C. In 2018, Correctional Health Services implemented universal hepatitis C screening. Correctional Health Services also provides vaccinations against hepatitis B.

25,070 Number of hepatitis C screening tests performed in 2019

8% Percentage of hepatitis C screening tests that were positive in 2019*

*Based on rapid test, antibody, or viral load test

232 Number of people treated for hepatitis C in NYC jails in 2019**

483 Number of people in NYC jails vaccinated against hepatitis B in 2019

**Includes those who completed or partially completed treatment

›› See guidance on providing primary care to patients with a history of criminal justice system involvement at www1.nyc.gov/assets/doh/downloads/pdf/chi/chi-38-2.pdf.

Syringe Service Programs and Medications for Addiction Treatment

The Health Department funds 14 syringe service programs to provide health care services to people who use drugs. Services include hepatitis B vaccination, hepatitis C testing and care coordination, overdose prevention and harm reduction education, distribution of sterile syringes and other drug use equipment to prevent the transmission of viral hepatitis and other blood-borne diseases, and access to buprenorphine treatment.

21,005 Number of syringe service program participants in 2019 **4,995,262** Number of syringes distributed in 2019

›› For more data on syringe service programs in NYC, see the Epi Data Brief at www1.nyc.gov/assets/doh/downloads/pdf/epi/databrief110.pdf.

The Health Department works to expand access to methadone and buprenorphine, which are medicines for addiction treatment for people with opioid use disorder. Treatment with methadone and buprenorphine has been shown to reduce a person's risk of getting hepatitis B and C and their risk of overdose.

27,833 Number of people in methadone treatment in 2019*

16,383 Number of people filling a buprenorphine prescription in 2019*

2,721 Number of providers who issued buprenorphine prescriptions to NYC residents in 2019*

*As of December 31, 2019

Provisional data show that in 2018, 1,444 people died from drug overdose in NYC. The Health Department estimates there are **more than 10,000** nonfatal overdoses each year. People with a history of nonfatal overdose are at risk for hepatitis B and C and should be tested and connected to care and treatment.

›› For more data on drug overdose in NYC, see the Epi Data Brief at www1.nyc.gov/assets/doh/downloads/pdf/epi/databrief116.pdf.

Health Department Recommendation
- Providers should assess all patients for drug use and provide overdose and infection prevention services to patients who use drugs.
- Providers should provide the hepatitis A and B vaccines for patients who report current injection or intranasal drug use, are at risk for sexual transmission or have hepatitis C.
- People who have had a nonfatal overdose should be screened for hepatitis B and C.

Health Department Tele-Navigation

The Health Department uses hepatitis B and C surveillance data to assess patient diagnosis and engagement in care status and perform outreach. In 2017–2019, the Health Department reached out to 2,082 people with hepatitis B or C by telephone to provide health care navigation services to support linkage to care and treatment.

1,096 Number of people with hepatitis B or C called to offer tele-navigation services in 2019

462 Number of people with hepatitis B or C reached and offered tele-navigation in 2019
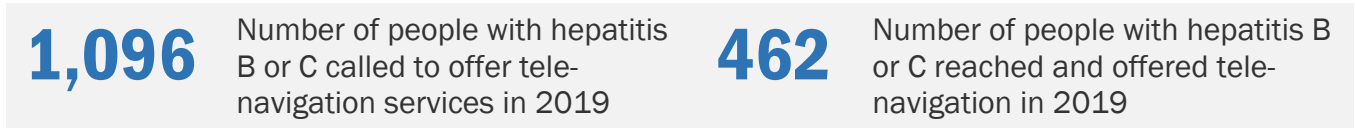
Hepatitis B Tele-Navigation Program Participants

In 2019, the Health Department enrolled 199 people with hepatitis B.

66% Percentage of enrollees linked to hepatitis B medical care in 2019

62% Percentage of people linked to hepatitis B medical care who were virally suppressed in 2019
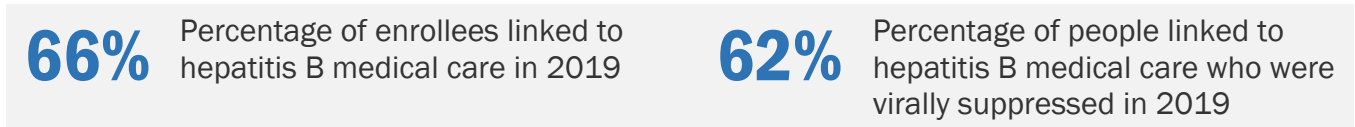
FIGURE 34. Characteristics of people enrolled in hepatitis B tele-navigation services, 2019

Characteristic	Percent
Born outside of the U.S.	98.5
Live in high or very high poverty neighborhood	65.8
Do not speak English	63.3
Uninsured or temporarily insured during pregnancy	21.6
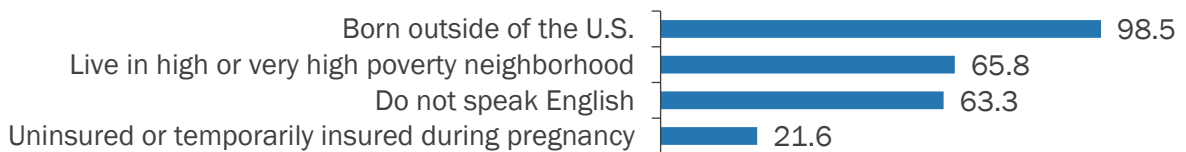
Hepatitis C Tele-Navigation Program Participants

In 2019, the Health Department enrolled 263 people with hepatitis C.

72% Percentage of enrollees linked to hepatitis C medical care in 2018–2019

36% Percentage of people linked to hepatitis C medical care who initiated treatment in 2018–2019
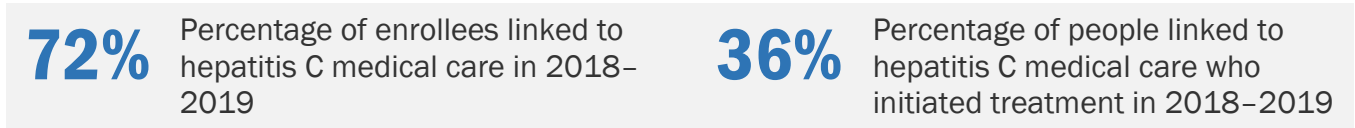
Of the enrollees living with hepatitis C, the Health Department prioritized outreach to people who were coinfected with HIV, tested positive in NYC jails,[31] were under the age of 30, who recently gave birth or had advanced liver disease. Of enrollees, 42% had a history of substance use.[32]

Figure 35. Characteristics of people enrolled in hepatitis C tele-navigation services, 2018–2019

Characteristic	Percent
Live in high or very high poverty neighborhood	62.4
Live with HIV	55.5
Have a history of substance use	41.8
Have a history of incarceration	40.3
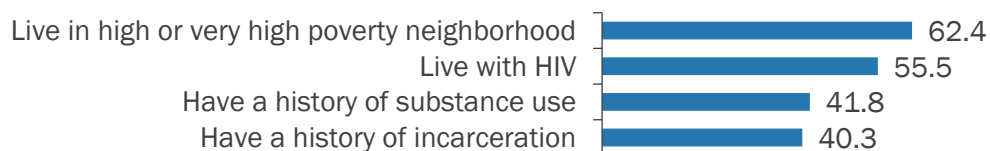
[31] History of incarceration is defined as any hepatitis C laboratory report ever from an NYC correctional facility.
[32] History of substance use is defined as any hepatitis C laboratory report ever from a free-standing NYC substance use treatment center.

Community Hepatitis Navigation Programs

The New York City Council Viral Hepatitis Initiative provides funding to community organizations to help patients overcome barriers to hepatitis B and C testing, care and treatment. Since 2014, the initiative has enabled 33 community health organizations to hire and train hepatitis B and C patient and peer navigators. The initiative also funds three community organizations to train health care providers in hepatitis B and C screening, care, treatment and health care navigation, as well as educate people at risk to promote prevention and care.

Navigation Description
Peers and patient navigators are trained and employed to provide:
- Outreach and prevention services to people at risk (harm reduction and hepatitis A and B vaccine)
- Health promotion and help accessing supportive services
- Navigation through complete hepatitis B and C testing
- Linkage to and retention in hepatitis B and C care and treatment

Training Description
Training programs aim to:
- Increase clinical capacity to treat hepatitis B and hepatitis C in NYC
- Build capacity of navigators and other service providers to support hepatitis patients through care and treatment
- Educate people at risk

Fiscal Year 2015 (FY15) to FY19 Program Outcomes

15,003 Number of people at risk for or living with hepatitis B or C who received hepatitis education and navigation services

6,413 Number of people who were linked to hepatitis B or C medical care

3,187 Number of people who were treated for hepatitis B or C

Check Hep B Patient Navigation Program

Since 2014, the Viral Hepatitis Initiative has supported hospitals, health centers and community organizations to provide patient navigation to people chronic hepatitis B. Check Hep B patient navigators coordinate patient care to help them complete hepatitis B testing, medical evaluation and treatment. In FY19 (July 1, 2018, through June 30, 2019), the Program served 1,102 people living with chronic hepatitis B, including people served in previous years who need ongoing care coordination.

FY15 to FY19 Program Outcomes

From July 1, 2014, through June 30, 2019:

1,532 Number of enrollees

96% Percentage of enrollees linked to care who completed a hepatitis B medical evaluation

95% Percentage of treatment candidates who started hepatitis B treatment

Patient Characteristics

62% of participants were born outside of the U.S.

29% of participants were uninsured

66 countries of birth

35 languages other than English were spoken
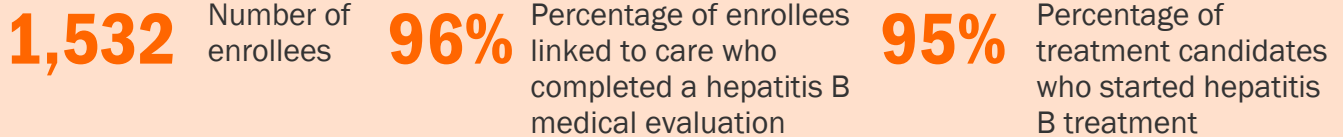
Check Hep B Organizations

The map below shows the rate of people newly reported with chronic hepatitis B in NYC in 2019 by NTA and Check Hep B Patient Navigation Program locations.

Annual hepatitis B rate per 100,000 people

- 4.2–42.3
- 42.4–77.8
- 77.9–145.1
- 110.9–261.4
- 261.5–531.7
- 52.1 (correctional facilities)
- Non-residential area
- ● Check Hep B Program
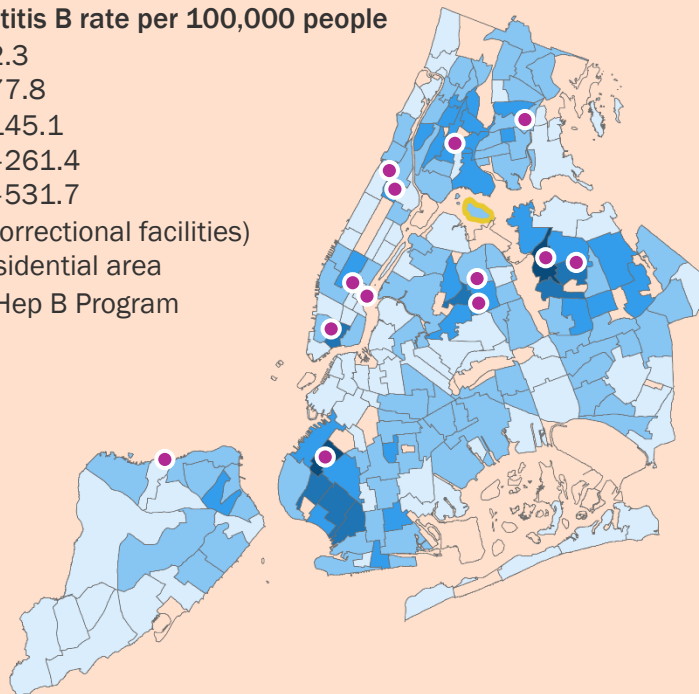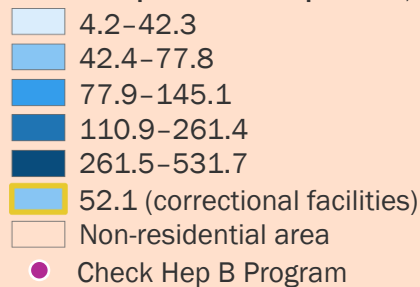
Health Centers and Hospitals
1. APICHA Community Health Center
2. BronxCare Health System
3. Charles B. Wang Community Health Center
4. H+H/Bellevue Hospital
5. H+H/Elmhurst Hospital
6. Montefiore Medical Center
7. NYU Seventh Avenue Family Health Center

Community Organizations
1. African Services Committee
2. Community Health Action of Staten Island
3. Korean Community Services

Check Hep C Patient Navigation Program

Since 2014, the Viral Hepatitis Initiative has supported health centers and hospitals to provide patient navigation to people living with chronic hepatitis C. Check Hep C patient navigators coordinate patient care to help them complete hepatitis C testing, medical evaluation and treatment. In FY19 (July 1, 2018, through June 30, 2019), the Program served 1,253 people living with chronic hepatitis C.

FY15 to FY19 Program Outcomes

From July 1, 2014, through June 30, 2019:

3,667 Number of enrollees

91% Percentage of enrollees linked to care

59% Percentage of enrollees linked to care who were treated

Patient Characteristics

Characteristic	Percentage
Black, non-Latino/a	34.7%
Latino/a	33.9%
History of drug use	28.9%
Enrolled in Medicaid	59.0%
History of incarceration	16.7%
Homeless or unstably housed	19.0%
Mental health condition reported	24.0%
HIV infection	9.4%
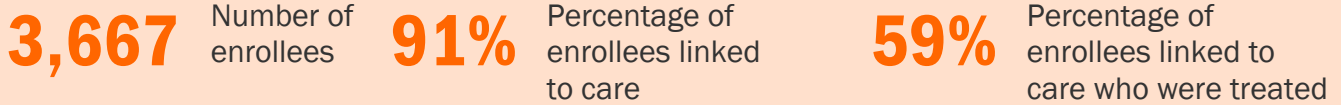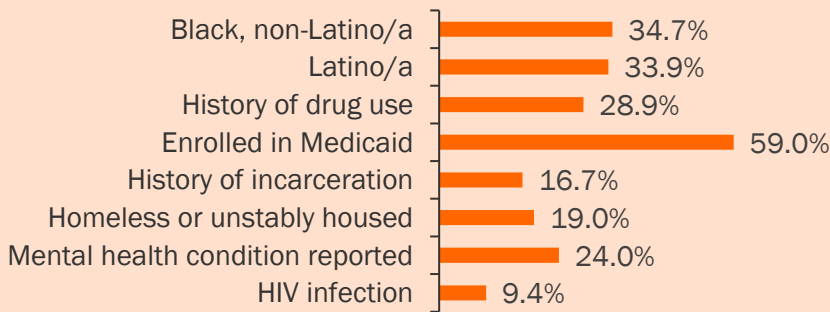
Check Hep C Health Centers and Hospitals

The map below shows the rate of people newly reported with chronic hepatitis C in NYC in 2019 by NTA and Check Hep C Patient Navigation Program health center and hospital locations.

Annual hepatitis C rate per 100,000 people

- 9.3–27.4
- 27.5–46.3
- 46.4–66.1
- 66.2–94.6
- 94.7–179.4
- 364.9 (correctional facilities)
- Non-residential area
- Check Hep C Program
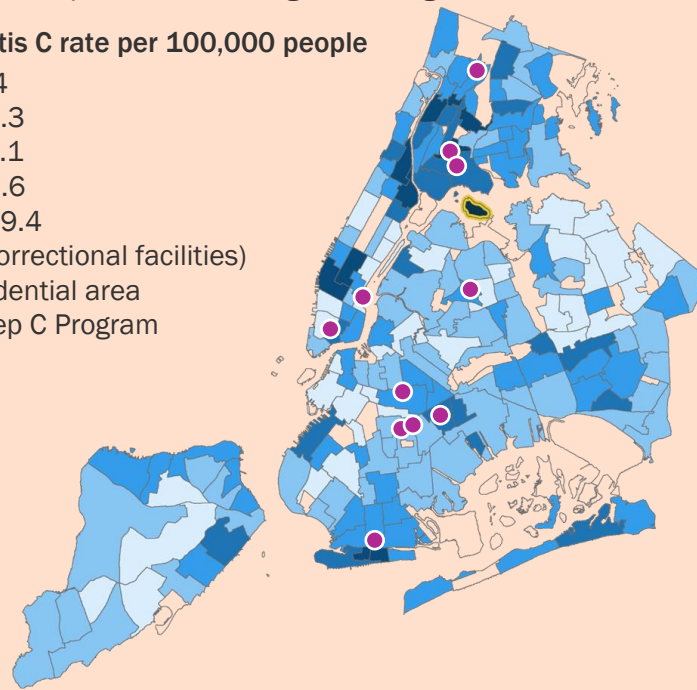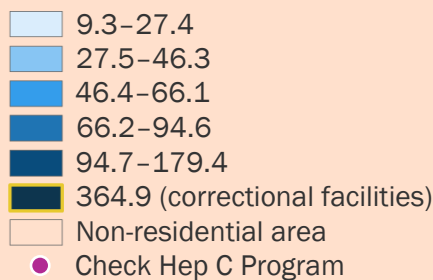
Health Centers and Hospitals

1. APICHA Community Health Center
2. Bedford-Stuyvesant Family Health Center
3. BronxCare Health System
4. Brownsville Multiservice Family Health Center
5. Community Healthcare Network
6. H+H/Bellevue Hospital
7. H+H/Coney Island Hospital
8. H+H/Elmhurst Hospital
9. H+H/Kings County Hospital
10. Kingsbrook Jewish Medical Center
11. Montefiore Comprehensive Health Care Center

Hep C Navigation in Syringe Service Programs

Since 2014, the Viral Hepatitis Initiative has supported NYC syringe service programs to provide peer navigation services to people at risk for hepatitis C. Six of these programs were also funded to provide patient navigation services to people living with hepatitis C. Peers utilize their lived experience expertise to conduct outreach, prevention and linkage to care, while patient navigators coordinate care and support retention in care to complete hepatitis C treatment. In FY19 (July 1, 2018, through June 30, 2019), 2,023 people at risk for hepatitis C were enrolled.

FY15 to FY19 Program Outcomes

From July 1, 2014, through June 30, 2019:

9,401 Number of people at risk for hepatitis C who received education and prevention services

968 Number of people who tested positive for hepatitis C

700 Number of people with hepatitis C linked to care

450 Number of people with hepatitis C treated

Patient Characteristics*

Characteristic	Percentage	Characteristic	Percentage
Black, non-Latino/a	23.8%	History of incarceration	44.6%
Latino/a	45.1%	Homeless or unstably housed	35.4%
Enrolled in Medicaid	62.2%	Mental health condition reported	34.5%
History of drug use	60.7%	HIV infection	15.3%

*Characteristics of 1,086 participants enrolled for whom data are available

Program Organizations

The map below shows the rate of people newly reported with chronic hepatitis C in NYC in 2019 by NTA and syringe service program locations.

Annual hepatitis C rate per 100,000 people

- 9.3–27.4
- 27.5–46.3
- 46.4–66.1
- 66.2–94.6
- 94.7–179.4
- 364.9 (correctional facilities)
- Non-residential area
- Hep C Peer Program
- Integrated Peer and Check Hep C Patient Navigation Program

Hep C Peer Program
1. AIDS Center of Queens County
2. Harlem United FROST'D*
3. Housing Works
4. NY Harm Reduction Educators
5. Positive Health Project
6. Safe Horizon Street works
7. St. Ann's Corner of Harm Reduction
8. VOCAL-NY

Integrated Hep C Peer and Check Hep C Patient Navigation Program
1. Alliance for Positive Change
2. After Hours Project
3. BOOM!Health
4. Community Health Action of Staten Island
5. Family Services Network of NY
6. Praxis Housing Initiatives
7. Washington Heights CORNER Project

*Discontinued 2019

Health Care Provider Training and Workforce Development

Since 2014, the Viral Hepatitis Initiative has supported the Harm Reduction Coalition, Empire Liver Foundation and, in 2018, the Hep C Mentor and Support Group to train peer and patient navigators and clinical providers in hepatitis B and C prevention, testing, linkage to care, medical evaluation and treatment.

FY15 to FY19 Harm Reduction Coalition Navigation Training Program Outcomes
From July 1, 2014, through June 30, 2019:

58 Number of patient navigators trained and employed at health centers, hospitals and community organizations

111 Number of syringe services program participants trained and employed as peer navigators

"This program affirmed how I am uniquely equipped because of my lived experience and continued training…. I help others help themselves to be cured and living Hep C-free!"

– Hep C peer navigator

FY15 to FY19 Empire Liver Foundation Clinical Training Program Outcomes
From July 1, 2014, through June 30, 2019:

Clinical training event	Number of clinical provider participants
Clinical hepatitis B and C grand rounds at health care facilities across NYC	1,384
Hepatitis C clinical training series	456
Hepatitis B clinical training series	150
Clinical preceptorship in liver clinic	13

"In the clinical preceptorship, I was able to ask questions one-on-one; this was tremendously helpful. It was also helpful to observe how liver disease is described to patients, and I hope to emulate that."

– Clinical preceptorship participant

Hepatitis C Education for People At Risk

In 2018–2019, the Hepatitis C Mentor and Support Group reached 290 people at risk for or with hepatitis C through educational programs and support groups at 20 community-based organizations, substance use treatment and harm reduction programs.

Capacity Building

The Health Department engages with organizations throughout NYC to build capacity to prevent, screen and treat hepatitis B and C. The Health Department contracts with organizations to support patient navigation services, trains clinical and non-clinical providers, conducts data-to-care quality improvement projects and convenes coalition meetings.

Hep Free NYC Community Coalitions

Since 2004, the Health Department has collaborated with community health organizations to support Hep Free NYC, a citywide network of health care providers, patients and public health professionals working together to prevent, manage and treat hepatitis B and C in NYC.

108 Number of Hep Free NYC participating organizations in 2019

571 Number of meeting attendees in 2019

FIGURE 36. Organizational makeup of Hep Free NYC meeting attendees by percentage, 2019

Hospitals, 21%
Community health center, 10%
Community-based organizations, 26%
Pharmacy, 8%
Education, 7%
Government agencies, 5%
Other,* 23%
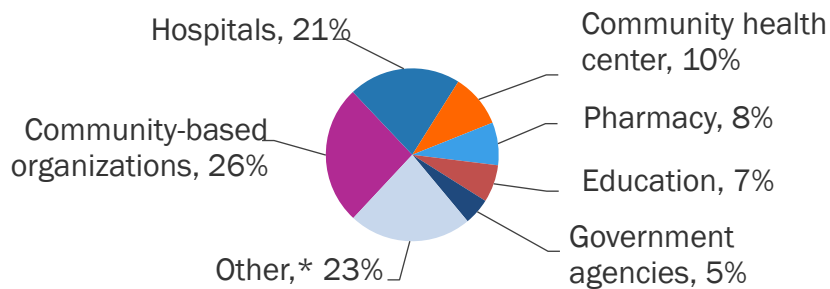
*"Other" includes health businesses, foundations or associations, and academic or research centers.

At Hep Free NYC meetings, attendees review the latest viral hepatitis data, share best practices in screening, linkage to care and treatment, collaborate on special projects to meet community needs, and develop new patient referral relationships.

4,275 Number of Hep Free NYC newsletter subscribers in 2019

3,562 Number of Hep Free NYC social media followers

›› To sign up for Hep Free NYC meeting invites and the newsletter, contact hep@health.nyc.gov.

›› **Hep Free NYC Highlights**
In 2019:
- The HepFree.nyc website won the BestOf.nyc Best of Brooklyn award — a local contest that celebrates .nyc businesses and organizations — with more than 4,600 votes.
- Hep Free NYC's Twitter account (@HepFreeNYC) generated 255,177 impressions in the CDC's national Twitter #HepChat and #LiverChat.
- Active Hep Free NYC committees included the Communications, Advocacy and Coalition against Hepatitis in People of African Origin (CHIPO) NYC committees.

Health Department Training

In 2019, the Health Department delivered 22 trainings on "Introduction to Viral Hepatitis," "Hep C Point of Care Testing," "Hep C Patient Navigation" and "Hep C Basics for Communities at Risk."

›› See the Health Department training catalog at nychealthtraining.org/training.

	Number of trainings	Number of participants	Number of organizations represented
Introduction to Viral Hepatitis	5	41	21
Hepatitis C Basics for Communities At Risk	6	94	3
Hepatitis C Point of Care Testing	5	37	16
Hepatitis C Patient Navigation	8	66	38

Public Education

The Health Department produces and distributes free educational materials to community-based organizations and health care facilities to promote up-to-date hepatitis B and C health prevention, care and treatment, and referrals to NYC resources. In 2019, the Health Department created new materials on buprenorphine — medicine for addiction treatment for people with opioid use disorder — as well as new translations of its hepatitis B and hepatitis C educational resources.

Provider Education Materials

"**Preventing, Identifying and Managing Hepatitis B**" (English): Clinical recommendations for hepatitis B prevention, diagnosis and management

"**Diagnosing and Managing Hepatitis C**" (English): Clinical recommendations for hepatitis C prevention, diagnosis and management
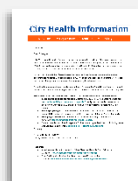
"**Dear Colleague Letter: Hepatitis B and C Screening, Care and Treatment Recommendations, 2020**"(English)
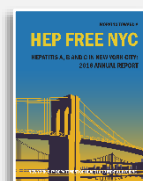
"**Hepatitis A, B and C in NYC: 2018 Annual Report**" (English): Annual report of viral hepatitis surveillance data and programmatic activities

"**Treat Addiction. Save Lives.**" (English): Pamphlet with provider information on buprenorphine prescription and opportunities for training and preceptorship
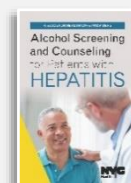
"**Alcohol Screening and Counseling for Patients with Hepatitis**" (English): Alcohol counseling guidance for patients with hepatitis C, accompanies "Alcohol and Hepatitis" palm card

Public Education Materials

"Hepatitis B: The Facts" (English, Spanish, Chinese, French, Korean, Russian, Bengali, Albanian and Uzbek): Booklet with basic hepatitis B information, testing, treatment, prevention and self-care

Hepatitis B Vaccine Palm Card (English, Spanish, Chinese and French): Palm card to track hepatitis B vaccine doses

"Hepatitis C and Your Liver" (English, Spanish, Arabic, Russian, Urdu, Bengali and Hindi): Booklet with basic Hep C information, testing, treatment, prevention and care

"Hepatitis C: Get Checked, Get Cured" (English, Spanish and Russian): Palm card with basic Hep C information promoting testing, care, treatment and prevention

"Your Liver Keeps You Healthy: Protect It" (English, Spanish and Chinese): Booklet with information on Hep A, B and C testing, treatment, prevention and care

"Alcohol and Hepatitis" (English and Spanish): Palm card with alcohol reduction tips and action plan template

"Take Charge, Take Care" (English, Spanish and Russian) Booklet providing information about safer drug use, including preventing hepatitis C infection

"Buprenorphine" (English, Spanish, Russian, Traditional Chinese and Arabic): Pamphlet with information on buprenorphine safety, side effects and insurance coverage

"Reduce Your Risk of Overdose, Hep C & HIV" (English, Spanish and Russian): Palm card listing tips for preventing overdose, Hep C and HIV among people who inject drugs

"Your Guide to Syringe Service Programs" (English, Spanish and Russian): Palm card listing syringe service programs in NYC

"Fentanyl" (English, Spanish, Russian, Simplified Chinese and Traditional Chinese): Postcard with information on preventing opioid overdose

"Hepatitis C: Get Tested, Get Cured" (English and Spanish): Poster promoting hepatitis C testing and treatment among baby boomers

"Hepatitis C Treatment: Before & Now" (English and Spanish): Poster providing information about new hepatitis C treatments

"Get Hepatitis C Checked" (English and Spanish): Posters promoting hepatitis C testing

"Get Hepatitis C Cured" (English and Spanish): Posters promoting hepatitis C treatment

›› For more information or to order materials, call 311.

Publications and Presentations

Publications

- Behrends CN, Eggman AA, Gutkind S, et al. A cost reimbursement model for hepatitis C treatment care coordination. *J Public Health Manag Pract*. May/Jun 2019;25(3):253-261.
- Fluegge K, Bresnahan MP, Laraque F, et al. Evaluating reimbursement of integrated support services using chronic care management (CCM) codes for treatment of hepatitis C among Medicare beneficiaries. *J Healthc Risk Manag*. Oct 2019;39(2):31-40.
- Gabai CM, Moore MS, Penrose K, et al. Hepatitis C infection among men who have sex with men living with HIV in New York City, 2000-2015. *Sex Transm Infect*. 2019.
- Guerra K, Deming R, Bocour A, Winters A. Validation of a surveillance-based definition for hepatitis B treatment eligibility. *Online J Public Health Inform*. 2019 May 30;11(1).
- Moore MS, Bocour A, Winters A. Surveillance-based estimate of the prevalence of chronic hepatitis B virus infection, New York City, 2016. *Public Health Rep*. 2019;134(6):695-702.
- Moore MS, Greene SK, Bocour A, et al. Comprehensive nationwide chronic hepatitis C surveillance is necessary for accurate state-level prevalence estimates. *J Viral Hepat*. 2019;26(9):1124-1126.

Presentations

- Casey AC, Johnson N. Project SUCCEED: A health department intervention to eliminate HCV in PLWH in NYC. HRSA Final Project Meeting, Arlington, VA, 2019.
- Diaz Muñoz D, Heau N. Hepatitis C patient navigation training. Presented at New York State Department of Health Hepatitis C Patient Navigation Program Provider Meeting, February 2019; Albany, NY.
- Diaz Muñoz D, Johnson N, Winters A. Hep Free NYC curing HCV through partnerships. Presented at National Latinx Conference on HIV, HCV and Substance Use Disorder, May 2019; San Antonio, TX.
- Diaz Muñoz D, Johnson N, Winters A. NYC Health Department hepatitis C community navigation program. Presented at Centers for Medicaid and Medicare Services Innovation Day, May 2019; New York, NY.
- Diaz Muñoz D, Johnson N, Winters A, Flanigan C. The road towards the elimination of hepatitis: Update and call to action. Presented at Reunion Latina Training Institute, March 2019; Albany, NY.
- Diaz Muñoz D, Kahl C, Martinez J. Hepatitis C Peers Keeping It Real. Presented at Mount Sinai HepCure webinar series, June 2019; New York, NY.
- Johnson N, Khatun U. Hepatitis B and C community navigation model. Presented at NASTAD Technical Assistance Meeting, December 2019; Washington, D.C.
- Johnson N, Khatun U, Schwartz J, Winters A. NYC Health Department Check Hep B Patient Navigation Program. Presented at 2019 Hep B United Summit, July 2019; Washington, D.C.
- Johnson N. Hepatitis B and C elimination in New York City. Presented at Sexual Health of Immigrant Gay & Latino Men in NYC Summit, October 2019; New York, NY.
- Johnson N. SUCCEED Toolkit: A health department intervention to eliminate HCV in PLWH. HRSA National Webinar, 2020.
- Johnson N, Penrose K, Belfon K, et al. Data to care model for eliminating hepatitis C among PLWH, New York City, 2016-2019. Fast Track Cities Conference, London, U.K, 2019

- Johnson, N, Penrose K, Octave N, et al. Project SUCCEED Toolkit: Strengthening the capacity of HIV providers to eliminate hepatitis C in people living with HIV in NYC. Poster. HRSA Final Project Meeting, Arlington, VA, 2019.
- Kela-Murphy N, Moore M, Harrison E, Malhotra Verma C, Bresnahan M, Winters A. Using surveillance data to promote hepatitis C screening and linkage to care at New York City Hospitals, 2015-2018. Presented at AASLD Liver Meeting, November 2019; Boston, MA.
- Moore M, Kela-Murphy N. Data-to-care model using facility-specific hepatitis C dashboards. Webinar presentation for Hepatitis C Medicaid Affinity Group Monthly Call, October 16, 2019.
- Tang L, Pene F, Schwartz J, Johnson N, Winters A. Linkage to care of postpartum women in New York City. Presented at 2019 Hep B United Summit, July 2019; Washington, D.C.

References and Resources

Local and national hepatitis B and C epidemiological data:

- EpiQuery: Provides data on the health of New Yorkers from a variety of sources, including surveys, surveillance data and vital records (births and deaths). https://a816-health.nyc.gov/hdi/epiquery.
- New York City Department of Health and Mental Hygiene Hepatitis A, B and C Reports: https://www1.nyc.gov/site/doh/data/data-sets/hepatitis-abc-surveillance-data.page.
- Moore MS, Bocour A, Winters A. Surveillance-based estimate of chronic hepatitis B prevalence, New York City, 2016. *Public Health Reports.* 2019; 134(6):695-702.
- Bocour A, Greene SK, Laraque F, Winters A. Estimating the prevalence of chronic hepatitis C virus infection in New York City, 2015. *Epidemiol Infect*. 2018;146(12):1537-1542.

Viral hepatitis elimination planning:

- World Health Organization. Combating hepatitis B and C to reach elimination by 2030. Geneva, 2016. https://who.int/hepatitis/publications/hep-elimination-by-2030-brief/en.
- National Academies of Sciences, Engineering and Medicine, "A National Strategy for the Elimination of Hepatitis B and C: Phase Two Report": https://nap.edu/24731.
- New York State Health Department, "Viral Hepatitis Strategic Plan 2016-2020": https://health.ny.gov/publications/1806.pdf.

Clinical guidance on hepatitis screening, care and treatment:

- New York City Department of Health and Mental Hygiene, 2018. "Diagnosing and Managing Hepatitis C": https://www1.nyc.gov/assets/doh/downloads/pdf/chi/chi-37-2.pdf.
- New York City Department of Health and Mental Hygiene, 2018. "Diagnosing and Managing Hepatitis B": https://www1.nyc.gov/assets/doh/downloads/pdf/chi/chi-37-4.pdf.
- American Association for the Study of Liver Diseases Practice Guidelines: https://aasld.org/publications/practice-guidelines-0.
- Schillie S, Wester C, Osborne M, Wesolowski L, Ryerson AB. CDC recommendations for hepatitis C screening among adults—United States, 2020. *MMWR Recommendations and Reports*. 2020 Apr 3;69(2):1.
- Dieterich DT, Ahn J, Bacon B, et al. A simplified algorithm for the management of hepatitis C infection. *Gastroenterology & Hepatology*. 2019 May;15(5 Suppl 3):1.

For interpreting Health Department surveillance data:

- Council of State and Territorial Epidemiologists (CSTE) Case Definitions: https://cdc.gov/nndss/case-definitions.html.
- Neighborhood Tabulation Areas (NTAs): https://www1.nyc.gov/site/planning/data-maps/open-data/dwn-nynta.page.

Appendices

Appendix 1: Surveillance technical data notes

When interpreting NYC hepatitis B and C surveillance data, please note:
- This report includes surveillance data on people who meet the CSTE's current case definition for chronic hepatitis C confirmed or probable cases, which was implemented in 2016. Therefore, cases that are antibody positive with only negative RNA results are excluded from most analyses, unless otherwise specified. For more information, visit cdc.gov/nndss/conditions.
- Laboratories are required to report positive hepatitis B and C tests to the Health Department, as well as negative results for hepatitis C RNA tests and hepatitis B DNA tests. For more information about hepatitis labs reportable to the Health Department, visit wadsworth.org/sites/default/files/WebDoc/618150225/CDRG%202016%20Complete.pdf.
- The Health Department often receives more than one hepatitis B or C laboratory report per person and uses automatic deduplication methods to identify multiple reports for the same person based on name, date of birth and other information. Only the first report is counted in the counts of newly reported cases for the year in which the person was first reported.
- The Health Department does not investigate all chronic hepatitis B and C cases, so only minimal information — patient name, address, date of birth and sex — from laboratory reports is available. Gender identity (how one lives or sees themselves — for example: woman, transgender woman, man, transgender man, nonbinary person, gender nonconforming) is not consistently reported by all laboratories and is therefore underreported.
- The Health Department investigates all positive hepatitis B core IgM antibody reports and other positive hepatitis B reports that include significantly elevated liver function tests as potential cases of acute hepatitis B.
- Veterans Affairs (VA) health care facilities began reporting cases through routine surveillance at the end of 2016; therefore, people with viral hepatitis who receive health care at only VA facilities are not fully represented in this report.
- Differences in data between this report and previous reports may be related to factors such as delays in disease reporting, correction of errors and refinements in data processing (for example, the removal of duplicate reports).
- Many people with acute hepatitis B or C have no or mild symptoms. As a result, these infections might not be diagnosed at the time of infection. Therefore, surveillance data underestimate the true incidence of acute hepatitis B and C in NYC.
- Neighborhood poverty based on ZIP code was defined as the percentage of residents with incomes below 100% of the Federal Poverty Level (FPL), per American Community Survey data from 2013 to 2017. Neighborhood poverty categories are defined as follows:
  - Low (less than 10% below FPL)
  - Medium (10% to less than 20% below FPL)
  - High (20% to less than 30% below FPL)
  - Very high (greater than or equal to 30% below FPL)
  These categories are not applied to people whose first or most recently reported address is a NYC correctional facility.
- All people reported from a NYC correctional facility have been aggregated to Rikers Island in maps.
- Many patients with chronic hepatitis B or C are asymptomatic; as a result, many cases are not diagnosed or reported. Therefore, surveillance data underestimate the true level of chronic hepatitis B and C in NYC.
- Ten-year trends are shown for hepatitis A, chronic hepatitis B and C. Years prior to 2008 can be found on EpiQuery: a816-health.nyc.gov/hdi/epiquery.

Rates

- Rates presented include people newly reported to the Health Department. They are not prevalence rates or incidence rates.
- Age adjustment was performed using the following age categories: 0-24, 25-44, 45-64, 65-84 and ≥ 85 years, and weighted to the U.S. 2000 standard population.
- Rates stratified by age group are presented as age-specific rates (in other words, no age adjusting within a presented age stratum was performed).
- Denominators used throughout this report are intercensal estimates for 2018, except denominators for the Rikers Island population, which were provided by NYC Correctional Health Services.
- The jail at Rikers Island is part of the Bronx, although it has a Queens ZIP code (11370; note that ZIP code 11370 also includes parts of mainland Queens). Therefore, for numbers and rates presented by borough, Rikers Island cases are included with other Bronx cases.
- The Health Department is presenting maps using NYC NTAs, which are aggregations of census tracts that are subsets of NYC's 55 Public Use Microdata Areas. For details on NTAs, please see www1.nyc.gov/site/planning/data-maps/open-data/dwn-nynta.page.

Prevalence Estimates

- Hepatitis B and C prevalence estimates were updated for 2017 and used the methods described in Moore MS, et al. Surveillance-based estimate of chronic hepatitis B prevalence, New York City, 2016, and Bocour A, et al. Estimating the prevalence of chronic hepatitis C virus infection in New York City, 2015. Estimates will be updated annually.

Death Data

- Deaths occurring outside NYC or those of non-NYC residents are not included.
- Both underlying and contributing causes are included. Underlying cause of death is the disease or condition that set off the chain of events leading to death. Contributing causes of death are diseases, morbid conditions or injuries that either resulted in or contributed to death.
- Causes of death are coded using ICD-10 classifications. The codes used for hepatitis B are: B16, B170, B180 and B181; and for hepatitis C, B171, B182. Both acute and chronic hepatitis B and C are included as causes of death.
- Causes of death are not mutually exclusive.

Appendix 2: Hepatitis A, B and C reporting in NYC

Laboratories are required to electronically report chronic hepatitis B and C tests to the Health Department. Providers should report all hepatitis A (IgM positive), and acute B and acute C cases (based on clinical criteria, such as jaundice) to the Health Department. The Health Department uses demographic and risk information to determine the characteristics of those infected with acute hepatitis B and C and to prevent ongoing transmission.

Health care providers can report hepatitis A, B and C cases:

• Online: Visit nyc.gov/nycmed.

• By mail: Download the Universal Reporting Form at www1.nyc.gov/assets/doh/downloads/pdf/hcp/urf-0803.pdf.

• By phone: Call the Health Department's Provider Access Line (PAL) at 866-NYC-DOH1 (866-692-3641).

Appendix 3: Characteristics of people reported with confirmed hepatitis A infection in NYC, 2019

Characteristics	Number	Percentage of each group	Rate per 100,000 people
Overall	100	100.0	1.2
Sex			
Female	25	25.0	0.6
Male	75	75.0	1.9
Age at time of report			
0–9	9	9.0	0.9
10-19	3	3.0	0.3
20–29	21	21.0	1.6
30–39	38	38.0	2.8
40–49	16	16.0	1.5
50–59	8	8.0	0.8
≥ 60	5	5.0	0.3
Borough of residence			
Bronx	15	15.0	1.0
Brooklyn	20	20.0	0.8
Manhattan	31	31.0	1.9
Queens	30	30.0	1.3
Staten Island	4	4.0	0.8
Neighborhood poverty level by ZIP code			
Low (< 10% below poverty)	21	21.0	1.3
Medium (10 to < 20%)	35	35.0	1.0
High (20 to < 30%)	30	30.0	1.5
Very high (≥ 30%)	14	14.0	1.0
Race and ethnicity			
Asian, non-Latino/a	15	15.0	1.2
Black, non-Latino/a	25	25.0	1.4
Latino/a	19	19.0	0.8
White, non-Latino/a	29	29.0	1.1
Other	6	6.0	3.4
Unknown	6	6.0	N/A
Risk factors (not mutually exclusive)			
MSM	39	39.0	N/A
International travel	29	29.0	N/A
Drug use	21	21.0	N/A
Contact with a person with hepatitis A	7	7.0	N/A
Homelessness	5	5.0	N/A
Unknown	25	25.0	N/A

Appendix 4: Characteristics of people reported with acute hepatitis B in NYC, 2019

Characteristics	Number	Percentage of each group	Rate per 100,000 people
Overall	36	100.0	0.4
Sex			
Female	10	27.8	0.2
Male	26	72.2	0.6
Age at time of first report			
0–19	1	2.8	0.1
20–29	6	16.7	0.5
30–39	6	16.7	0.4
40–49	12	33.3	1.1
50–59	7	19.4	0.2
≥ 60	4	11.1	0.2
Borough of residence			
Bronx	10	27.8	0.7
Brooklyn	9	25.0	0.3
Manhattan	8	22.2	0.5
Queens	7	19.4	0.3
Staten Island	2	5.6	0.4
Neighborhood poverty level by ZIP code			
Low (< 10% below poverty)	5	13.9	0.3
Medium (10 to < 20%)	11	30.6	0.3
High (20 to < 30%)	9	25.0	0.4
Very high (≥ 30%)	11	30.6	0.8
Race and ethnicity			
Asian, non-Latino/a	2	5.6	0.2
Black, non-Latino/a	8	22.2	0.4
Latino/a	4	11.1	0.2
White, non-Latino/a	3	8.3	0.1
Multi-race	0	0.0	0.0
Unknown	19	52.8	N/A
Risk factors (mutually exclusive[1])			
Injection drug use	3	8.3	N/A
Household contact with a person with hepatitis B	5	13.9	N/A
MSM	4	11.1	N/A
Heterosexual contact (multiple partners)	1	2.8	N/A
Heterosexual contact (one partner)	12	33.3	N/A
Health care-related exposure	1	2.8	N/A
Other	2	5.6	N/A
Unknown	8	22.2	N/A

[1] "Mutually exclusive" means that each patient is represented by the risk factor that poses the highest risk of hepatitis B infection. For example, a person who injected drugs and had a health care-related exposure is represented only once, in the Injection drug use row. The table lists risk factors from highest to lowest risk.

Appendix 5: Characteristics of people reported with chronic hepatitis B in NYC, 2019

Characteristics	People newly reported in 2019			All people reported 2016–2019, regardless of year of first report	
	Number	Percentage of each group	Rate per 100,000 people	Number	Percentage of each group
Overall	5,964	100.0	71.0	95,617	100.0
Sex[1]					
Female	2,576	43.2	58.6	42,700	44.7
Male	3,361	56.4	83.9	52,816	55.2
Unknown	26	0.4	N/A	99	0.1
Age at time of first report[2]					
0–19	146	2.4	7.6	4,684	4.9
20–29	830	13.9	63.3	21,612	22.6
30–39	1,480	24.8	110.7	25,894	27.1
40–49	1,276	21.4	120.2	20,246	21.2
50–59	1,070	17.9	101.9	13,746	14.4
60–69	726	12.2	83.3	6,890	7.2
≥ 70	436	7.3	51.2	2,544	2.7
Borough of residence					
Bronx[3]	1,017	17.1	71.0	10,041	10.5
Brooklyn	1,962	32.9	76.0	34,662	36.3
Manhattan	784	13.1	48.1	18,551	19.4
Queens	1,697	28.5	74.5	28,581	29.9
Staten Island	190	3.2	39.9	1,997	2.1
Unknown	314	5.3	N/A	1,785	1.9
Neighborhood poverty level by ZIP code[4]					
Low (< 10% below poverty)	627	10.5	38.1	10,519	11.0
Medium (10 to < 20%)	2,080	35.0	62.1	32,089	33.6
High (20 to < 30%)	1,532	25.8	76.0	27,889	29.2
Very high (≥ 30%)	1,390	23.4	100.0	22,664	23.8
Unknown	317	5.3	N/A	2,266	2.4

[1] People reported as transgender are excluded. Gender identity is not consistently reported by all laboratories and is therefore underreported. In 2019, there was one person reported with a transgender identity. In 2016-2019, two people were reported with a transgender identity.

[2] In 2016–2019, one person is missing age at first report.

[3] The Bronx includes 11 people reported from people in Rikers Island facilities and 124 people in 2016-2019.

[4] Neighborhood poverty level data excludes people incarcerated at the time of first report. In 2019, there were 18 newly reported people incarcerated at the time of first report. In 2016–2019, there were 190 people who were incarcerated at the time of their most recent report.

Appendix 6: NYC NTAs

Appendix 7: Number and rate of people newly reported with chronic hepatitis B by NTA in NYC, 2019[1]

NTA name (code)	Number of cases	Rate per 100,000 people	NTA name (code)	Number of cases	Rate per 100,000 people
Allerton-Pelham Gardens (BX31)	15	47.0	Cambria Heights (QN33)	8	38.6
Annadale-Huguenot-Prince's Bay-Eltingville (SI01)	3	10.6	Canarsie (BK50)	45	53.4
Arden Heights (SI48)	5	19.0	Carroll Gardens-Columbia Street-Red Hook (BK33)	11	25.3
Astoria (QN70)	34	46.2	Central Harlem North-Polo Grounds (MN03)	45	54.1
Auburndale (QN48)	14	69.2	Central Harlem South (MN11)	40	81.1
Baisley Park (QN76)	17	43.8			
Bath Beach (BK27)	43	132.3	Charleston-Richmond Valley-Tottenville (SI11)	2	8.6
Battery Park City-Lower Manhattan (MN25)	16	36.3	Chinatown (MN27)	91	194.1
Bay Ridge (BK31)	44	55.9	Claremont-Bathgate (BX01)	33	95.2
Bayside-Bayside Hills (QN46)	40	91.1	Clinton (MN15)	37	72.2
Bedford (BK75)	20	27.0	Clinton Hill (BK69)	13	34.7
Bedford Park-Fordham North (BX05)	44	77.7	Co-op City (BX13)	23	94.6
			College Point (QN23)	27	55.4
Bellerose (QN43)	12	44.4	Corona (QN25)	38	65.8
Belmont (BX06)	24	83.7	Crotona Park East (BX75)	19	80.0
Bensonhurst East (BK29)	103	156.9	Crown Heights North (BK61)	51	48.4
Bensonhurst West (BK28)	180	195.0	Crown Heights South (BK63)	24	60.5
Borough Park (BK88)	92	88.8	Cypress Hills-City Line (BK83)	25	53.2
Breezy Point-Belle Harbor-Rockaway Park-Broad Channel (QN10)	7	26.4	Douglas Manor-Douglaston-Little Neck (QN45)	18	71.8
Briarwood-Jamaica Hills (QN35)	22	52.1	DUMBO-Vinegar Hill-Downtown Brooklyn-Boerum Hill (BK38)	21	41.2
Brighton Beach (BK19)	36	102.3			
Bronxdale (BX07)	12	31.2	Dyker Heights (BK30)	97	218.0
Brooklyn Heights-Cobble Hill (BK09)	3	12.4	East Concourse-Concourse Village (BX14)	73	113.0
Brownsville (BK81)	27	50.4			
Bushwick North (BK77)	21	37.1	East Elmhurst (QN27)	13	62.7
Bushwick South (BK78)	17	23.4	East Flatbush-Farragut (BK91)	26	50.6

[1] Four hundred forty people could not be assigned to an NTA based on their address at first report.

Appendix 7: Number and rate of people newly reported with chronic hepatitis B by NTA in NYC, 2019

NTA name (code)	Number of cases	Rate per 100,000 people
East Flushing (QN52)	57	220.0
East Harlem North (MN34)	25	41.3
East Harlem South (MN33)	31	52.4
East New York (BK82)	69	75.4
East New York (Pennsylvania Ave) (BK85)	16	58.0
East Tremont (BX17)	36	81.0
East Village (MN22)	10	24.7
East Williamsburg (BK90)	16	45.1
Eastchester-Edenwald-Baychester (BX03)	16	43.9
Elmhurst (QN29)	118	145.1
Elmhurst-Maspeth (QN50)	39	156.7
Erasmus (BK95)	23	82.2
Far Rockaway-Bayswater (QN15)	16	30.2
Flatbush (BK42)	74	69.9
Flatlands (BK58)	29	40.5
Flushing (QN22)	287	400.6
Fordham South (BX40)	32	115.8
Forest Hills (QN17)	60	69.8
Fort Greene (BK68)	10	27.6
Fresh Meadows-Utopia (QN41)	16	89.2
Ft. Totten-Bay Terrace-Clearview (QN47)	5	22.9
Georgetown-Marine Park-Bergen Beach-Mill Basin (BK45)	16	33.6
Glen Oaks-Floral Park-New Hyde Park (QN44)	6	25.3
Glendale (QN19)	12	35.8
Gramercy (MN21)	5	18.8
Grasmere-Arrochar-Ft. Wadsworth (SI14)	5	30.4
Gravesend (BK26)	21	69.3
Great Kills (SI54)	10	23.7

NTA name (code)	Number of cases	Rate per 100,000 people
Greenpoint (BK76)	7	18.3
Grymes Hill-Clifton-Fox Hills (SI08)	20	92.7
Hamilton Heights (MN04)	28	53.9
Hammels-Arverne-Edgemere (QN12)	10	25.8
Highbridge (BX26)	42	105.7
Hollis (QN07)	13	61.0
Homecrest (BK25)	25	56.7
Hudson Yards-Chelsea-Flatiron-Union Square (MN13)	33	43.8
Hunters Point-Sunnyside-West Maspeth (QN31)	38	47.2
Hunts Point (BX27)	28	106.0
Jackson Heights (QN28)	52	51.6
Jamaica (QN61)	40	73.0
Jamaica Estates-Holliswood (QN06)	18	68.2
Kensington-Ocean Parkway (BK41)	28	75.5
Kew Gardens (QN60)	6	25.7
Kew Gardens Hills (QN37)	23	61.7
Kingsbridge Heights (BX30)	23	70.0
Laurelton (QN66)	3	11.1
Lenox Hill-Roosevelt Island (MN31)	33	40.5
Lincoln Square (MN14)	18	29.3
Lindenwood-Howard Beach (QN57)	10	35.6
Longwood (BX33)	10	35.0
Lower East Side (MN28)	43	60.2
Madison (BK44)	39	95.7
Manhattanville (MN06)	14	61.0
Marble Hill-Inwood (MN01)	18	34.6

Appendix 7: Number and rate of people newly reported with chronic hepatitis B by NTA in NYC, 2019

NTA name (code)	Number of cases	Rate per 100,000 people
Mariner's Harbor-Arlington-Port Ivory-Graniteville (SI12)	23	72.9
Maspeth (QN30)	25	84.6
Melrose South-Mott Haven North (BX34)	32	75.8
Middle Village (QN21)	11	29.0
Midtown-Midtown South (MN17)	39	130.8
Midwood (BK43)	33	62.0
Morningside Heights (MN09)	21	41.5
Morrisania-Melrose (BX35)	39	98.1
Mott Haven-Port Morris (BX39)	34	63.4
Mount Hope (BX41)	48	89.8
Murray Hill (QN51)	71	137.0
Murray Hill-Kips Bay (MN20)	16	34.4
New Brighton-Silver Lake (SI35)	8	45.4
New Dorp-Midland Beach (SI45)	10	47.6
New Springville-Bloomfield-Travis (SI05)	13	30.1
North Corona (QN26)	14	27.1
North Riverdale-Fieldston-Riverdale (BX22)	6	22.2
North Side-South Side (BK73)	14	23.1
Norwood (BX43)	27	64.3
Oakland Gardens (QN42)	25	88.4
Oakwood-Oakwood Beach (SI25)	8	38.4
Ocean Hill (BK79)	22	67.0
Ocean Parkway South (BK46)	6	29.1
Old Astoria (QN71)	14	53.1

NTA name (code)	Number of cases	Rate per 100,000 people
Old Town-Dongan Hills-South Beach (SI36)	14	55.7
Ozone Park (QN56)	16	69.0
Park Slope-Gowanus (BK37)	13	17.4
Parkchester (BX46)	27	87.4
Pelham Bay-Country Club-City Island (BX10)	7	26.1
Pelham Parkway (BX49)	31	106.7
Pomonok-Flushing Heights-Hillcrest (QN38)	34	94.8
Port Richmond (SI28)	7	35.8
Prospect Heights (BK64)	3	14.0
Prospect Lefferts Gardens-Wingate (BK60)	34	50.5
Queens Village (QN34)	25	46.5
Queensboro Hill (QN62)	58	275.4
Queensbridge-Ravenswood-Long Island City (QN68)	9	40.3
Rego Park (QN18)	19	68.6
Richmond Hill (QN54)	24	37.4
Ridgewood (QN20)	27	38.0
Rikers Island (BX98)	18	52.1
Rosedale (QN05)	10	38.2
Rossville-Woodrow (SI32)	6	28
Rugby-Remsen Village (BK96)	25	46.4
Schuylerville-Throgs Neck-Edgewater Park (BX52)	17	37.7
Seagate-Coney Island (BK21)	23	76.6

Appendix 7: Number and rate of people newly reported with chronic hepatitis B by NTA in NYC, 2019

NTA name (code)	Number of cases	Rate per 100,000 people
Sheepshead Bay-Gerritsen Beach-Manhattan Beach (BK17)	48	72.1
SoHo-TriBeCa-Civic Center-Little Italy (MN24)	24	56.2
Soundview-Bruckner (BX55)	24	65.3
Soundview-Castle Hill-Clason Point-Harding Park (BX09)	31	54.4
South Jamaica (QN01)	21	50.6
South Ozone Park (QN55)	33	40.4
Springfield Gardens North (QN02)	15	55.4
Springfield Gardens South-Brookville (QN03)	10	45.6
Spuyten Duyvil-Kingsbridge (BX29)	8	25.6
St. Albans (QN08)	18	33.3
Stapleton-Rosebank (SI37)	17	62.7
Starrett City (BK93)	2	16.2
Steinway (QN72)	17	36.9
Stuyvesant Heights (BK35)	30	46.2
Stuyvesant Town-Cooper Village (MN50)	1	4.2
Sunset Park East (BK34)	330	476.7
Sunset Park West (BK32)	53	95.6
Todt Hill-Emerson Hill-Heartland Village-Lighthouse Hill (SI24)	14	42.3
Turtle Bay-East Midtown (MN19)	23	45.1
University Heights-Morris Heights (BX36)	42	75.0

NTA name (code)	Number of cases	Rate per 100,000 people
Upper East Side-Carnegie Hill (MN40)	11	18.2
Upper West Side (MN12)	29	21.6
Van Cortlandt Village (BX28)	24	46.9
Van Nest-Morris Park-Westchester Square (BX37)	22	75.5
Washington Heights North (MN35)	26	35.6
Washington Heights South (MN36)	42	46.6
West Brighton (BK23)	5	30.4
West Concourse (BX63)	26	68.7
West Farms-Bronx River (BX08)	20	56.3
West New Brighton-New Brighton-St. George (SI22)	20	60.1
West Village (MN23)	10	15.0
Westchester-Unionport (BX59)	17	58.2
Westerleigh (SI07)	4	16.5
Whitestone (QN49)	10	31.3
Williamsbridge-Olinville (BX44)	39	60.8
Williamsburg (BK72)	4	12.0
Windsor Terrace (BK40)	6	26.7
Woodhaven (QN53)	33	54.3
Woodlawn-Wakefield (BX62)	23	53.2
Woodside (QN63)	41	92.8
Yorkville (MN32)	12	14.7

Appendix 8: Demographic characteristics of pregnant people with hepatitis B in NYC who delivered a live birth in 2019[1]

Characteristics	Number	Percentage of each group
Overall	1,057	n/a
Borough of residence		
Bronx	159	15.0
Brooklyn	439	41.5
Manhattan	99	9.4
Queens	326	30.8
Staten Island	34	3.2
Race and ethnicity		
Asian/Pacific Islander, non-Latino/a	697	65.9
Black, non-Latino/a	176	16.7
Latino/a	25	2.4
White, non-Latino/a	90	8.5
Other	66	6.2
Unknown	3	0.3
Country of birth		
China	559	52.9
Ghana	47	4.5
Uzbekistan	39	3.7
USA	34	3.2
Bangladesh	26	2.5
Guinea	25	2.4
Dominican Republic	24	2.3
Albania	22	2.1
Haiti	21	1.9
Nigeria	19	1.8
Unknown	2	0.2
Other	239	22.6
Region of birth[1]		
China	559	52.9
Western Africa	180	17.0
Caribbean and Haiti	56	5.3
West and Central Asia	52	4.9
Europe	44	4.2
South Asia	42	4.0
U.S.	34	3.2
East Asia (excluding China)	27	2.6
Southeast Asia	26	2.5
Mexico, Central and South America	18	1.7
Middle East	9	0.9
Africa (excluding Western Africa)	7	0.7
Unknown	2	0.2
Australia and Oceania	1	0.1

[1] Includes countries counted as separate regions for comparison with larger regions. Excludes regions that were not reported as a region of birth for any reported person (Canada and Pacific Islands).

Appendix 9: Hepatitis B vaccination, post-exposure prophylaxis (PEP) and testing for infants born in 2018 to mothers with hepatitis B, NYC

Characteristics	Number	Percentage of each group
Overall	1,083	N/A
PEP[1] and vaccination status[2]		
PEP	1,077	99.4
Vaccine series completion[3]	981	90.6
PEP and vaccine series completion[3]	977	90.2
Testing status		
Tested	915	84.5
Not tested	168	15.5
Test results[4]		
Infected	3	0.3
Immune	888	97.0
Susceptible	16	1.7
Indeterminate	8	0.9

[1] Defined as administration of hepatitis B immune globulin and birth dose of hepatitis B vaccine series within one day of life

[2] Not mutually exclusive

[3] Defined as receiving three valid doses of hepatitis B vaccine including a dose given at age greater than or equal to 164 days

[4] Percentage calculated out of those tested (n=915)

Appendix 10A: Number of deaths and premature deaths in 2017 among people in NYC reported with hepatitis B and alive at the end of 2016 (n=200,510)

Characteristics	Number of and percentage of premature deaths			Age at death	
	Number of people who died in 2017	Number of premature deaths[1]	Percentage (row)	Age at death (median)	Premature age of death (median)
NYC, overall	54,319	14,876	27.4	N/A	N/A
Hepatitis B					
Alive at the end of 2016	704	320	45.5	66.0	64.0

[1] Defined as death before age 65 years

APPENDIX 10B: Characteristics of decedents where hepatitis B is listed as the underlying cause or contributing cause of death, NYC, 2018

Characteristics	Number	Percentage of each group	Age-adjusted rate per 100,000 people[1]
Overall	80	100.0	0.8
Sex			
Female	20	25.0	0.4
Male	60	75.0	1.4
Age			
0–24	0	0.0	0.0
25–44	7	8.8	0.3
45–64	39	48.8	1.9
65–84	29	36.3	2.7
≥ 85	5	6.3	2.9
Race and ethnicity			
Asian/Pacific Islander, non-Latino/a	35	43.8	2.5
Black, non-Latino/a	29	36.3	1.4
Latino/a	9	11.3	0.4
White, non-Latino/a	5	6.3	0.2
Other/Unknown	2	2.5	-

[1] Rates stratified by age group are presented as age-specific rates (in other words, no age adjusting within a presented age stratum was performed).

Appendix 11: Characteristics of people reported with chronic hepatitis C in NYC, 2019

Characteristics	People newly reported in 2019			All people reported 2016–2019, regardless of year of first report	
	Number	Percentage of each group	Rate per 100,000 people	Number	Percentage of each group
Overall	4,427	100.0	54.9	95,578	100.0
Sex[1]					
Female	1,653	37.4	39.1	35,987	37.7
Male	2,755	62.3	71.8	59,476	62.2
Unknown	17	0.4	N/A	113	0.1
Age at time of first report					
0–2[2]	N/A	N/A	N/A	46	0.1
3–19	60	1.4	3.8	868	0.9
20–29	579	13.1	44.2	7,570	7.9
30–39	898	20.3	67.2	15,892	16.6
40–49	812	18.3	76.5	26,926	28.2
50–59	795	18.0	75.7	27,472	28.7
60–69	828	18.7	95.0	12,416	13.0
≥ 70	455	10.3	53.4	4,388	4.6
Birth cohort					
1900–1944	267	6.0	48.8	7,812	8.2
1945–1965	1,558	35.2	86.6	58,511	61.2
1966–1983	1,493	33.7	75.8	21,930	22.9
1984–2015	1,109	25.1	29.6	7,325	7.6
Borough of residence					
Bronx[3]	1,043	23.6	76.1	25,110	26.3
Brooklyn	1,130	25.5	45.8	27,644	28.9
Manhattan	976	22.1	61.8	21,148	22.1
Queens	855	19.3	39.0	16,455	17.2
Staten Island	179	4.0	38.9	4,086	4.3
Unknown	244	5.5	N/A	1,135	1.2
Neighborhood poverty level by ZIP code[4]					
Low (< 10% below poverty)	511	12.0	32.1	11,152	12.0
Medium (10 to < 20%)	1,517	35.6	47.0	31,542	33.8
High (20 to < 30%)	1,035	24.3	53.6	23,628	25.3
Very high (≥ 30%)	944	22.2	71.5	24,689	26.5
Unknown	252	5.9	N/A	2,324	2.5

[1] People reported as transgender are excluded. Gender identity is not consistently reported by all laboratories and is therefore underreported. In 2019, there were two people reported with a transgender identity.

[2] People newly reported in 2019 ages 0 to 2 years are classified using the 2018 CDC perinatal hepatitis C case definition and are reported in Appendix 14.

[3] The Bronx includes 125 people reported from Rikers Island facilities.

[4] Neighborhood poverty level data excludes people incarcerated at the time of first report. In 2019, there were 168 newly reported people incarcerated at the time of first report. In 2016–2019, there were 2,243 people incarcerated at time of their most recent report.

Appendix 12: Number and rate of people newly reported with chronic hepatitis C by NTA in NYC, 2019[1]

NTA name (code)	Number of cases	Rate per 100,000 people	NTA name (code)	Number of cases	Rate per 100,000 people
Allerton-Pelham Gardens (BX31)	12	39.0	Cambria Heights (QN33)	7	34.8
Annadale-Huguenot-Prince's Bay-Eltingville (SI01)	8	29.2	Canarsie (BK50)	25	30.8
Arden Heights (SI48)	4	15.7	Carroll Gardens-Columbia Street-Red Hook (BK33)	5	12.1
Astoria (QN70)	18	25.2	Central Harlem North-Polo Grounds (MN03)	93	116.1
Auburndale (QN48)	3	15.3	Central Harlem South (MN11)	30	63.2
Baisley Park (QN76)	18	48.2	Charleston-Richmond Valley-Tottenville (SI11)	10	44.4
Bath Beach (BK27)	14	44.9	Chinatown (MN27)	40	87.3
Battery Park City-Lower Manhattan (MN25)	14	33.1	Claremont-Bathgate (BX01)	25	76.1
Bay Ridge (BK31)	26	34.3	Clinton (MN15)	33	65.7
Bayside-Bayside Hills (QN46)	10	23.5	Clinton Hill (BK69)	12	33.4
Bedford (BK75)	25	35.9	Co-op City (BX13)	9	38.6
Bedford Park-Fordham North (BX05)	34	63.2	College Point (QN23)	25	52.7
Bellerose (QN43)	13	49.7	Corona (QN25)	22	40.0
Belmont (BX06)	14	51.2	Crotona Park East (BX75)	10	44.1
Bensonhurst East (BK29)	34	53.8	Crown Heights North (BK61)	54	53.5
Bensonhurst West (BK28)	38	42.7	Crown Heights South (BK63)	10	26.5
Borough Park (BK88)	25	26.4	Cypress Hills-City Line (BK83)	17	37.9
Breezy Point-Belle Harbor-Rockaway Park-Broad Channel (QN10)	15	58.5	Douglas Manor-Douglaston-Little Neck (QN45)	4	16.4
Briarwood-Jamaica Hills (QN35)	7	17.3	DUMBO-Vinegar Hill-Downtown Brooklyn-Boerum Hill (BK38)	23	47.3
Brighton Beach (BK19)	38	111.5	Dyker Heights (BK30)	7	16.4
Bronxdale (BX07)	20	54.2	East Concourse-Concourse Village (BX14)	40	65.0
Brooklyn Heights-Cobble Hill (BK09)	3	13.0	East Elmhurst (QN27)	7	35.2
Brownsville (BK81)	45	88.1	East Flatbush-Farragut (BK91)	21	42.2
Bushwick North (BK77)	25	46.1			
Bushwick South (BK78)	30	42.9			

[1] Three hundred eighty-eight people could not be assigned to an NTA based on their address at first report.

Appendix 12: Number and rate of people newly reported with chronic hepatitis C by NTA in NYC, 2019

NTA name (code)	Number of cases	Rate per 100,000 people
East Flushing (QN52)	8	31.9
East Harlem North (MN34)	63	108.1
East Harlem South (MN33)	45	78.8
East New York (BK82)	39	44.6
East New York (Pennsylvania Ave) (BK85)	22	84.2
East Tremont (BX17)	40	94.7
East Village (MN22)	23	57.6
East Williamsburg (BK90)	5	14.5
Eastchester-Edenwald-Baychester (BX03)	15	42.7
Elmhurst (QN29)	16	20.5
Elmhurst-Maspeth (QN50)	14	58.4
Erasmus (BK95)	10	37.3
Far Rockaway-Bayswater (QN15)	24	48.1
Flatbush (BK42)	39	38.6
Flatlands (BK58)	22	31.9
Flushing (QN22)	39	56.0
Fordham South (BX40)	27	103.4
Forest Hills (QN17)	24	29.1
Fort Greene (BK68)	14	40.3
Fresh Meadows-Utopia (QN41)	10	57.9
Ft. Totten-Bay Terrace-Clearview (QN47)	5	23.7
Georgetown-Marine Park-Bergen Beach-Mill Basin (BK45)	16	35.0
Glen Oaks-Floral Park-New Hyde Park (QN44)	10	43.3
Glendale (QN19)	14	43.5
Gramercy (MN21)	10	38.2
Grasmere-Arrochar-Ft. Wadsworth (SI14)	6	37.7
Gravesend (BK26)	16	54.9
Great Kills (SI54)	10	24.4

NTA name (code)	Number of cases	Rate per 100,000 people
Greenpoint (BK76)	12	32.3
Grymes Hill-Clifton-Fox Hills (SI08)	6	28.9
Hamilton Heights (MN04)	36	71.6
Hammels-Arverne-Edgemere (QN12)	26	70.5
Highbridge (BX26)	25	66.2
Hollis (QN07)	6	29.1
Homecrest (BK25)	25	59.7
Hudson Yards-Chelsea-Flatiron-Union Square (MN13)	132	179.4
Hunters Point-Sunnyside-West Maspeth (QN31)	24	31.0
Hunts Point (BX27)	23	91.5
Jackson Heights (QN28)	31	32.0
Jamaica (QN61)	36	68.8
Jamaica Estates-Holliswood (QN06)	5	19.6
Kensington-Ocean Parkway (BK41)	18	50.9
Kew Gardens (QN60)	16	71.5
Kew Gardens Hills (QN37)	8	22.8
Kingsbridge Heights (BX30)	20	63.9
Laurelton (QN66)	12	45.5
Lenox Hill-Roosevelt Island (MN31)	12	15.3
Lincoln Square (MN14)	20	33.8
Lindenwood-Howard Beach (QN57)	8	29.5
Longwood (BX33)	23	84.8
Lower East Side (MN28)	43	61.9
Madison (BK44)	19	48.4
Manhattanville (MN06)	13	58.7
Marble Hill-Inwood (MN01)	17	33.9

Appendix 12: Number and rate of people newly reported with chronic hepatitis C by NTA in NYC, 2019

NTA name (code)	Number of cases	Rate per 100,000 people
Mariner's Harbor-Arlington-Port Ivory-Graniteville (SI12)	14	46.4
Maspeth (QN30)	11	38.8
Melrose South-Mott Haven North (BX34)	28	69.7
Middle Village (QN21)	14	38.2
Midtown-Midtown South (MN17)	34	116.4
Midwood (BK43)	28	55.3
Morningside Heights (MN09)	21	42.4
Morrisania-Melrose (BX35)	38	100.5
Mott Haven-Port Morris (BX39)	38	74.3
Mount Hope (BX41)	42	82.6
Murray Hill (QN51)	13	25.9
Murray Hill-Kips Bay (MN20)	29	63.8
New Brighton-Silver Lake (SI35)	5	29.4
New Dorp-Midland Beach (SI45)	10	49.2
New Springville-Bloomfield-Travis (SI05)	14	33.5
North Corona (QN26)	7	14.4
North Riverdale-Fieldston-Riverdale (BX22)	15	57.6
North Side-South Side (BK73)	27	46.4
Norwood (BX43)	24	60.0
Oakland Gardens (QN42)	5	18.2
Oakwood-Oakwood Beach (SI25)	8	39.5
Ocean Hill (BK79)	20	64.0
Ocean Parkway South (BK46)	7	36.4
Old Astoria (QN71)	7	27.5

NTA name (code)	Number of cases	Rate per 100,000 people
Old Town-Dongan Hills-South Beach (SI36)	20	82.1
Ozone Park (QN56)	7	31.4
Park Slope-Gowanus (BK37)	14	19.6
Parkchester (BX46)	15	50.5
Pelham Bay-Country Club-City Island (BX10)	16	61.9
Pelham Parkway (BX49)	22	78.8
Pomonok-Flushing Heights-Hillcrest (QN38)	7	20.2
Port Richmond (SI28)	10	53.5
Prospect Heights (BK64)	5	24.6
Prospect Lefferts Gardens-Wingate (BK60)	28	43.3
Queens Village (QN34)	16	30.8
Queensboro Hill (QN62)	8	39.2
Queensbridge-Ravenswood-Long Island City (QN68)	16	74.5
Rego Park (QN18)	16	59.7
Richmond Hill (QN54)	38	61.8
Ridgewood (QN20)	16	23.6
Rikers Island (BX98)	126	364.9
Rosedale (QN05)	11	43.6
Rossville-Woodrow (SI32)	6	28.9
Rugby-Remsen Village (BK96)	16	30.8
Schuylerville-Throgs Neck-Edgewater Park (BX52)	20	45.9
Seagate-Coney Island (BK21)	25	86.4

Appendix 12: Number and rate of people newly reported with chronic hepatitis C by NTA in NYC, 2019

NTA name (code)	Number of cases	Rate per 100,000 people	NTA name (code)	Number of cases	Rate per 100,000 people
Sheepshead Bay-Gerritsen Beach-Manhattan Beach (BK17)	35	54.3	Upper East Side-Carnegie Hill (MN40)	17	29.0
SoHo-TriBeCa-Civic Center-Little Italy (MN24)	10	24.3	Upper West Side (MN12)	35	27.0
Soundview-Bruckner (BX55)	19	54.2	Van Cortlandt Village (BX28)	27	55.0
Soundview-Castle Hill-Clason Point-Harding Park (BX09)	34	61.9	Van Nest-Morris Park-Westchester Square (BX37)	17	60.9
South Jamaica (QN01)	19	47.7	Washington Heights North (MN35)	26	36.9
South Ozone Park (QN55)	28	35.7	Washington Heights South (MN36)	55	63.1
Springfield Gardens North (QN02)	20	76.5	West Brighton (BK23)	16	99.2
Springfield Gardens South-Brookville (QN03)	9	42.9	West Concourse (BX63)	22	61.1
			West Farms-Bronx River (BX08)	13	38.3
Spuyten Duyvil-Kingsbridge (BX29)	12	40.0	West New Brighton-New Brighton-St. George (SI22)	20	62.8
St. Albans (QN08)	32	61.4	West Village (MN23)	14	21.5
Stapleton-Rosebank (SI37)	14	53.7	Westchester-Unionport (BX59)	15	53.6
Starrett City (BK93)	9	74.9	Westerleigh (SI07)	4	17.0
Steinway (QN72)	14	31.4	Whitestone (QN49)	4	12.9
Stuyvesant Heights (BK35)	32	51.3	Williamsbridge-Olinville (BX44)	47	76.4
Stuyvesant Town-Cooper Village (MN50)	6	25.5	Williamsburg (BK72)	6	20.4
Sunset Park East (BK34)	32	48.8	Windsor Terrace (BK40)	2	9.3
Sunset Park West (BK32)	38	71.7	Woodhaven (QN53)	31	53.2
			Woodlawn-Wakefield (BX62)	13	31.2
Todt Hill-Emerson Hill-Heartland Village-Lighthouse Hill (SI24)	7	21.8	Woodside (QN63)	15	35.1
Turtle Bay-East Midtown (MN19)	12	24.1	Yorkville (MN32)	14	17.7
University Heights-Morris Heights (BX36)	64	119.7			

Appendix 13: Characteristics of people ages 18 to 34 newly reported with chronic hepatitis C in 2019 interviewed through enhanced surveillance (n=496)

Characteristics	Number	Percentage of each group
Interviewed		
Patient interview	169	36.4
Provider interview	464	93.5
Demographic information		
Gender identity		
Men	341	73.5
Women	149	32.1
Transgender men	0	0
Transgender women	6	1.3
Another gender identity	0	0
Borough of residence		
Bronx	137	29.5
Brooklyn	112	24.1
Manhattan	117	25.2
Queens	80	17.2
Staten Island	26	5.6
Outside of NYC	2	0.4
Missing	22	4.7
Race and ethnicity		
Asian, non-Latino/a	30	6.5
Black, non-Latino/a	92	19.8
Latino/a	108	23.3
Native American or Alaska Native, non-Latino/a	1	0.2
White, non-Latino/a	158	34.1
Other	21	4.2
Unknown	86	17.3
Place of birth		
U.S.	159	34.3
U.S. dependency	1	0.2
Outside of the U.S.	98	21.1
Unknown	238	48.0

Characteristics	Number	Percentage of each group
Country of birth		
Uzbekistan	11	12.1
India	9	9.9
Dominican Republic	7	7.7
China	6	6.6
Guyana	5	5.5
Pakistan	5	5.5
Russia	4	4.4
Ukraine	3	3.3
Albania	2	2.2
Haiti	2	2.2
Mexico	2	2.2
Turkmenistan	2	2.2
Venezuela	2	2.2
Other	20	22.0
Access to care		
Insurance status		
Insured	407	87.7
Not insured	16	3.4
Unknown	61	13.1
Missing	12	2.6
Type of insurance		
Medicaid	303	80.6
Employer-sponsored	29	7.7
Medicare	14	3.7
NYS Essential Plan	5	1.3
Health Exchange Plan	3	0.8
VA	0	0.0
Other	58	15.4
Unknown	14	3.8
Have a hepatitis C care provider		
Yes	137	81.1
No (referred to linkage to care specialist)	21	12.4

Appendix 13: Characteristics of people ages 18 to 34 newly reported with chronic hepatitis C in 2019 interviewed through enhanced surveillance (n=496) (continued)

Characteristics	Number	Percentage of each group
Hepatitis A and B vaccination (provider question)		
Hepatitis A	15	3.5
Hepatitis B	53	12.2
Hepatitis A and B	70	16.2
Not vaccinated against either	99	22.9
Patient has immunity	1	0.2
Missing	226	52.1
Clinical assessment		
Why patient tested for hepatitis C[1]		
Jaundice	8	1.7
Symptoms or signs	19	4.1
Elevated LFTs	77	16.6
Drug or alcohol treatment	109	23.5
Incarceration	47	10.1
Risk factors	132	28.4
Dialysis	1	0.2
Previously tested for hepatitis C	20	4.3
Routine screening	114	24.6
Other	112	24.1
Assessed for fibrosis or cirrhosis		
Yes	124	26.7
Degree of liver damage		
Normal liver	84	67.7
Stage 1	13	10.5
Stage 2	5	4.0
Stage 3	3	2.4
Stage 4	3	2.4
Normal/stage 1	1	0.8
Stages 1/2	1	0.8
Stages 2/3	1	0.8
F0/A2	1	0.8
Missing	12	9.7
Screened for liver cancer (if stage 3 or 4)		
Yes	2	28.6

Characteristics	Number	Percentage of each group
Currently being treated for hepatitis C		
Yes	99	21.3
No	265	57.1
Unknown	132	28.5
Did patient achieve cure?		
Yes	10	10.9
In progress	82	89.1
No	4	4.3
Unknown	3	3.3
Risk factors[1]		
Male sex assigned at birth	305	65.7
Injection drug use	267	57.5
Intranasal drug use	186	40.1
History of homelessness	175	37.7
MSM	85	27.9
HIV infection	77	16.6
Contact with a household member with hepatitis C	55	11.9
History of incarceration	47	10.1
Non-professional tattoo or body piercing	34	7.3
Transfusion or transplant before 1992, or outside of the U.S.	12	2.6
Employed in medical or dental field	9	1.9
Received dialysis	1	0.2
Injection drug use		
Patient self-reported IDU	63	37.3
Self-reported injection drug use		
Ever shared needles	28	48.3
Ever shared drug supplies	23	39.7

[1] Not mutually exclusive

Appendix 14: Characteristics of children ages 0 to 36 months newly reported with hepatitis C in NYC, 2019

Characteristics	Number	Percentage of each group
Overall	14	100.0
Hepatitis C test results		
Confirmed[1]	1	7.1
Exposed (infection status unknown)[2]	2	14.3
Not currently infected[3]	11	78.6
Reason child was tested for hepatitis C[4]		
Mother known to have hepatitis C	6	42.9
Mother's current or past injection drug use	2	14.3
Other reason	4	28.6
Unknown	4	28.6
Sex		
Female	8	57.1
Male	6	42.9
Race and ethnicity		
Asian, non-Latino/a	2	14.3
Black, non-Latino/a	0	0.0
Latino/a	2	14.3
Multi-race	0	0.0
White, non-Latino/a	6	42.9
Unknown	4	28.6
Borough of residence		
Bronx	3	21.4
Brooklyn	2	14.3
Manhattan	3	21.4
Queens	4	28.6
Staten Island	2	14.3
Other characteristics[4]		
Mother previously reported to Health Department with hepatitis C	12	85.7
Child lives with biological mother[5]	4	28.6

[1] RNA positive between ages 2 to 36 months
[2] Antibody positive between ages 0 to 36 months or RNA positive between ages 0 to 2 months
[3] RNA negative between ages 2 to 36 months or antibody negative between ages 18 to 36 months
[4] Not mutually exclusive
[5] Unknown for eight children

Appendix 15: Characteristics of people reported with hepatitis C and HIV coinfection in NYC by end of 2018

Characteristics	Total		Initiated treatment by end of 2018[3]		Had not initiated treatment by end of 2018	
	Number	Percentage (column)	Number	Percentage (row)	Number	Percentage (row)
Overall	9,057	100.0	6,285	69.4	2,772	30.6
Gender identity						
Man	6,720	74.2	4,653	69.2	2,067	30.8
Transgender man or woman	153	1.7	95	62.1	58	37.9
Woman	2,184	24.1	1,537	70.4	647	29.6
Age						
0–19	4	0.0	2	50.0	2	50.0
20–29	162	1.8	73	45.1	89	54.9
30–39	706	7.8	379	53.7	327	46.3
40–49	1,233	13.6	791	64.2	442	35.8
50–59	3,220	35.6	2,245	69.7	975	30.3
60–69	3,164	34.9	2,390	75.5	774	24.5
≥ 70	568	6.3	405	71.3	163	28.7
Current borough of residence						
Bronx	3,282	36.2	2,308	70.3	974	29.7
Brooklyn	2,227	24.6	1,587	71.3	640	28.7
Manhattan	2,170	24.0	1,480	68.2	690	31.8
Queens	1,123	12.4	734	65.4	389	34.6
Staten Island	255	2.8	176	69.0	79	31.0
Neighborhood poverty level by ZIP code[4]						
Low (< 10% below poverty)	600	6.6	451	75.2	149	24.8
Medium (10 to < 20%)	2,861	31.6	1,955	68.3	906	31.7
High (20 to < 30%)	2,304	25.4	1,619	70.3	685	29.7
Very high (≥ 30%)	3,269	36.1	2,246	68.7	1,023	31.3
Unknown	23	0.3	14	60.9	9	39.1
Race and ethnicity						
Asian/Pacific Islander, non-Latino/a	120	1.3	78	65.0	42	35.0
Black, non-Latino/a	3,625	40.0	2,419	66.7	1,206	33.3
Latino/a	3,859	42.6	2,711	70.3	1,148	29.7
White, non-Latino/a	1,410	15.6	1,048	74.3	362	25.7
Other	38	0.4	26	68.4	12	31.6
Unknown	5	0.1	3	60.0	2	40.0

Appendix 15: Characteristics of people reported with hepatitis C and HIV coinfection in NYC by end of 2018 (continued)

Characteristics	Total		Initiated treatment by end of 2018[3]		Had not initiated treatment by end of 2018	
	Number	Percentage (column)	Number	Percentage (row)	Number	Percentage (row)
Birth cohort						
1900–1944	195	2.2	126	64.6	69	35.4
1945–1965	6,027	66.5	4,432	73.5	1,595	26.5
1966–1983	2,389	26.4	1,507	63.1	882	36.9
1984–2018	446	4.9	220	49.3	226	50.7
Years since HIV diagnosis						
< 5	392	4.3	211	53.8	181	46.2
5–9	738	8.1	446	60.4	292	39.6
10–19	3,706	40.9	2,556	69.0	1,150	31.0
≥ 20	4,221	46.6	3,072	72.8	1,149	27.2
HIV viral load < 200 at most recent lab in 2018						
Yes	6,788	74.9	5,229	77.0	1,559	23.0
No	1,195	13.2	575	48.1	620	51.9
Unknown (no viral loads in 2018)	1,074	11.9	481	44.8	593	55.2
Ryan White Part A client in 2018						
Yes	1,999	22.1	1,345	67.3	654	32.7
No	7,058	77.9	4,940	70.0	2,118	30.0
HIV viral load ever reported by NYC correctional facility						
Yes	1,033	11.4	581	56.2	452	43.8
No	8,024	88.6	5,704	71.1	2,320	28.9

[1] Individuals were diagnosed with HIV and hepatitis C and living as of December 31, 2018, with at least one HIV or hepatitis C lab reported since January 1, 2014. Individuals with a residential address outside of NYC were excluded, as the Health Department only receives hepatitis C lab results for NYC residents. Individuals were considered to have a history of confirmed hepatitis C infection if they had at least one positive hepatitis C RNA test reported prior to the end of 2018.

[2] Demographic characteristics and HIV clinical characteristics were obtained from the NYC HIV surveillance registry. Ryan White Part A service data was obtained from eSHARE. Hepatitis C outcomes were obtained from the NYC hepatitis C surveillance registry.

[3] Individuals were considered to have initiated hepatitis C treatment if they had at least one negative hepatitis C RNA result reported after a positive RNA result prior to the end of 2018.

[4] Based on ZIP code at most recent report

Appendix 16: Definitions of hepatitis C care cascade categories

- **Ever reported with chronic hepatitis C:** Ever reported with a positive enzyme immunoassay (EIA), recombinant immunoblot assay (RIBA), ribonucleic acid (RNA) or genotype test
- **Recent hepatitis C test:** A hepatitis C EIA, RNA or genotype test of any result reported between July 1, 2014, and June 30, 2019
- **Positive hepatitis C RNA test:** Ever reported with a positive RNA test
- **Initiated treatment:** A reported negative test in 2014 or later preceded at any time by a positive RNA test with viral load ≥ 1000 IU/mL
- **Cured:** From the date of the first identified negative, indeterminate (positive, below the limit of detection), or low positive RNA (viral load < 1000 IU/mL) following the most recently reported high positive (viral load ≥ 1000 IU/mL) RNA:
  - At least one additional negative RNA result performed at least four months later
  - No subsequent high positive RNA results
  - Most recent RNA test result is negative

Pre-direct acting antiviral (DAA) medication treatment and cure rates are not included in the cascade. Estimates are based on people with any hepatitis test performed since July 1, 2014, when negative RNA reporting was implemented in NYC.

People reported as antibody positive, but with only negative RNA results, are excluded from the cascade.

For information about how the hepatitis C care cascade was developed, read Public Health Reports' "A Surveillance-Based Hepatitis C Care Cascade, New York City, 2017" by Miranda Moore, Angelica Bocour, Fabienne Laraque and Ann Winters.

Appendix 17: RNA and genotype test results of people newly reported with chronic hepatitis C in NYC, 2019

Characteristics	Number	Percentage of each group
All new reports of hepatitis C	10,899	100.0
Any RNA test performed[1]	9,255	84.9
Reflex RNA test performed[2]	7,716	83.4
Case definition		
Not currently infected: antibody positive, RNA negative only	6,472	59.4
Probable: antibody positive only	1,628	14.9
Confirmed: antibody positive, RNA positive or genotype tested[3]	2,799	25.7
Genotype test performed[4]		
Yes	1,581	56.5
No	1,218	43.5
Genotype[5]		
1a	795	50.3
1b	288	18.2
1 unspecified, 1 other, or 1a/1b	49	3.1
2	145	9.2
3	238	15.1
4	36	2.3
6	27	1.7
Mixed	3	0.2

[1] Based on the Health Department's hepatitis C surveillance data as of April 2020. Reporting of negative RNA test results to the Health Department was mandated on July 21, 2014.

[2] Reflex RNA is defined as an RNA test performed on the same day as or with the same accession number as a positive antibody test. Percentage with a reflex RNA test performed is calculated out of all people with a reported RNA test.

[3] Thirty-three people only had a genotype result and no RNA positive result.

[4] Genotype data are presented for patients who had a positive RNA or genotype test reported (n=2,799).

[5] Percentage calculated out of those with a genotype test (n=1,581).

Appendix 18A: Number of deaths and premature deaths in 2017 among people in NYC reported with hepatitis C and alive at the end of 2016 (n=151,719)

Characteristics	Number of and percentage of premature deaths			Age at death	
	Number of people who died in 2017	Number of premature deaths[1]	Percentage (row)	Age at death (median)	Premature age of death (median)
NYC, overall	54,319	14,876	27.4	N/A	N/A
Hepatitis C					
Alive at the end of 2016	2,779	1,345	48.4	65.0	59.0
Alive at the end of 2016 and had a positive hepatitis C RNA test in 2016	941	545	57.9	N/A	N/A

[1] Defined as death before age 65 years

Appendix 18B: Characteristics of decedents where hepatitis C is listed as the underlying cause or contributing cause of death, NYC, 2018

Characteristics	Number	Percentage of each group	Age-adjusted rate per 100,000 people[1]
Overall	311	100.0	3.3
Sex			
Female	123	39.5	2.3
Male	188	60.5	4.5
Age			
0–24	0	0.0	0.0
25–44	8	2.6	0.3
45–64	135	43.4	6.6
65–84	153	49.2	14.3
≥ 85	15	4.8	8.5
Race and ethnicity			
Asian/Pacific Islander, non-Latino/a	9	2.9	0.7
Black, non-Latino/a	110	35.4	5.0
Latino/a	106	34.1	4.5
White, non-Latino/a	70	22.5	2.0
Other/Unknown	16	5.1	-

[1] Rates stratified by age group are presented as age-specific rates (in other words, no age adjusting within a presented age stratum was performed).

Appendix 19: Number of hepatitis A and B vaccines provided by Health Department facilities, 2019

Vaccine	Total hepatitis vaccine doses	Completed hepatitis vaccine series
Immunization clinics		
Hepatitis A only, ages 4 to 18	5,108	1,457
Hepatitis A only, ages 19 and older	373	232
Hepatitis B only, ages 4 to 18	4,076	1,315
Hepatitis B only, ages 19 and older	5,309	1,158
Sexual health clinics		
Hepatitis A only	1,082	247
Hepatitis B only	2,038	279
Hepatitis A/B combination	3,120[1]	526[2]

[1] Total of hepatitis A and hepatitis B vaccine doses
[2] Total number of individuals who completed either hepatitis A or hepatitis B vaccine series in 2019

Appendix 20: Number of hepatitis A and B vaccines provided by NYC providers, 2019

Vaccine	Total hepatitis vaccine doses	Completed hepatitis vaccine series
Hepatitis A only, ages 0 to 18	256,264	122,449
Hepatitis A only, ages 19 and older	14,208	3,563
Hepatitis B only, ages 0 to 18	266,920	62,682
Hepatitis B only, ages 19 and older	65,495	9,078