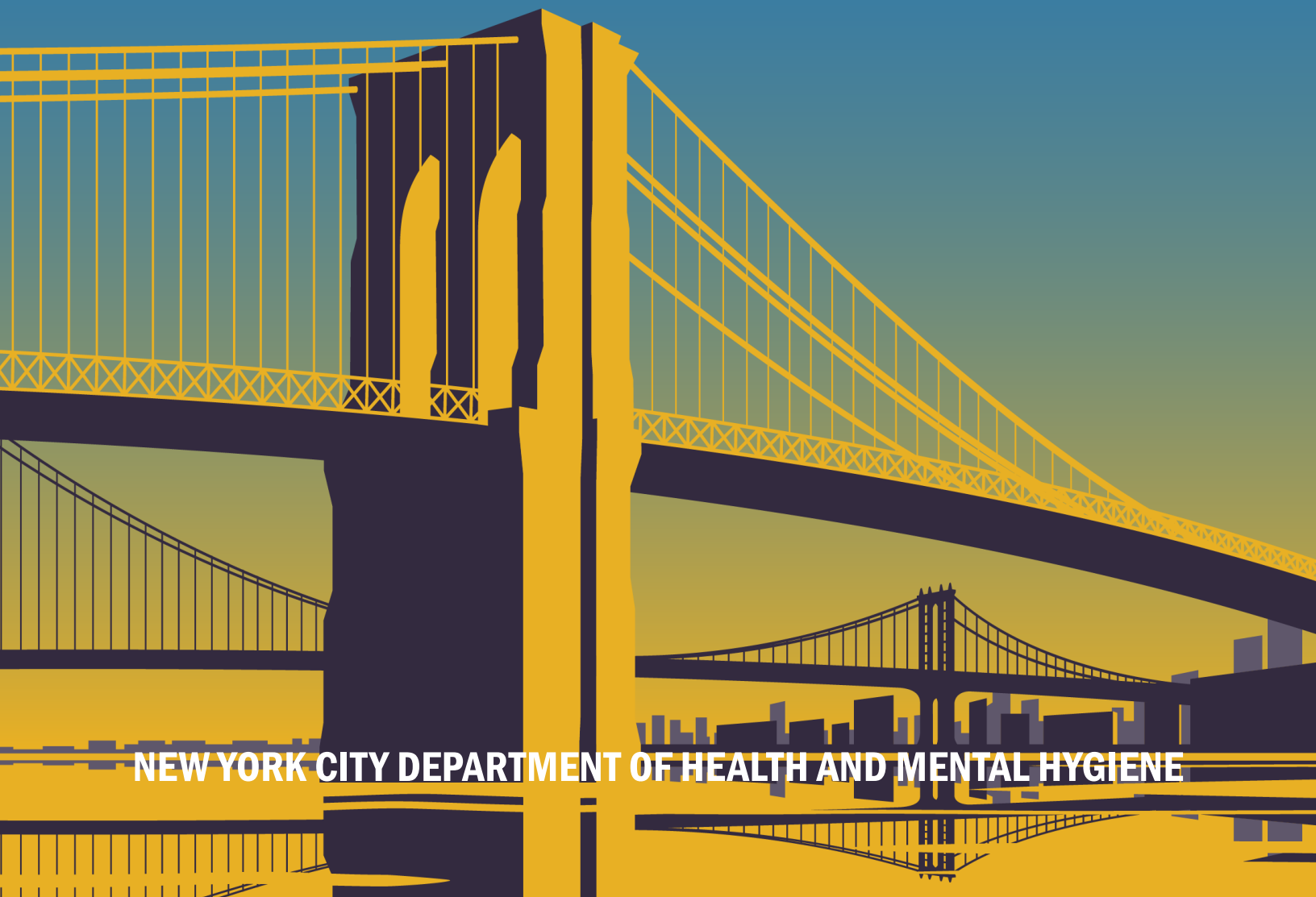
WORKING TOWARD A

HEP FREE NYC

HEPATITIS A, B AND C IN NEW YORK CITY: 2018 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, 2018, through December 30, 2018. This report is required pursuant to Local Law 43 of 2015. The data reflect the most complete information available for data through December 31, 2018. 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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TABLE OF CONTENTS

1. SUMMARY 4

2. STRATEGIC PLAN 5

2. SURVEILLANCE

Hepatitis A 6
Acute Hepatitis B 8
Chronic Hepatitis B 9
Chronic Hepatitis C 12
Hepatitis C and HIV Coinfection 22

3. PREVENTION AND SCREENING

Hepatitis A Vaccinations 23
Hepatitis B Vaccinations 23
Perinatal Hepatitis B Prevention and Screening 23
Syringe Exchange Programs and Medications for Addiction Treatment 25
Viral Hepatitis in Correctional Facilities 25

4. LINKAGE TO CARE

Hepatitis B Linkage to Care 26
Hepatitis C Linkage to Care 26

5. COMMUNITY HEPATITIS NAVIGATION PROGRAMS

Training and Workforce Development 27
Check Hep B Patient Navigation Program 28
Check Hep C Patient Navigation Program 29
Hep C Peer Navigation in Syringe Service Programs 30

6. CAPACITY BUILDING

Project SUCCEED 31
Hepatitis C Clinical Exchange Network 32
Training 33
Hep Free NYC 33
Public Education 34

7. POLICY 35

8. PUBLICATIONS AND PRESENTATIONS 36

9. REFERENCES AND RESOURCES 38

10. APPENDICES 39

SUMMARY

The New York City Department of Health and Mental Hygiene is a committed partner in global, national and statewide efforts to eliminate viral hepatitis by 2030. All New Yorkers living with viral hepatitis should know their diagnosis and should receive care to manage or cure their disease.

POPULATION ESTIMATES[1]

230,000 people estimated to have chronic hepatitis B (diagnosed and undiagnosed) (2016 data)

116,000 people estimated to have chronic hepatitis C (diagnosed and undiagnosed) (2015 data)

PREVENTION AND SCREENING

99% of the 1,289 infants who were born in 2017 to women with chronic hepatitis B received post-exposure prophylaxis

18,274 people used syringe exchange services

17,680 doses of hepatitis A, B or A/B combined vaccines were administered at Health Department clinics

PATIENT NAVIGATION

13,630 people at risk for or living with chronic hepatitis B or C were served by community hepatitis navigation programs

866 people living with chronic hepatitis B and C received Health Department linkage to care services

CLINICAL CAPACITY BUILDING

1,570 clinical and non-clinical providers were trained in hepatitis B and C screening, care and treatment

217 community health organizations were members of the Hep Free NYC network

SURVEILLANCE

In 2018:

61 people were newly reported with hepatitis A

6,075 people were newly reported with chronic hepatitis B

4,682 people were newly reported with chronic hepatitis C

QUALITY IMPROVEMENT

40 NYC hospitals participated in the Hepatitis C Clinical Exchange Network (HepCX Network)

30 HepCX hospitals perform hepatitis C antibody testing with reflex RNA testing

82% of newly reported people with hepatitis C RNA testing had reflex testing

[1] These data are the latest prevalence estimates that have been published or accepted for publication.

STRATEGIC PLAN

In 2018, the Health Department developed a strategic plan to define priorities and goals to address viral hepatitis and to guide activities for the next five years.

GOAL 1: Identify and share information about trends in viral hepatitis infections to promote citywide improvements in health care access and treatment

Objectives:

- Establish citywide baseline screening and treatment initiation rates for hepatitis C and update annually
- Establish citywide baseline hepatitis B linkage to care rate and update annually
- Identify facilities with the highest number of patients with hepatitis B and C in NYC

GOAL 2: Support health care organizations in eliminating hepatitis C and managing hepatitis B

Objectives:

- Partner with hospitals, health centers, substance use treatment programs and community organizations serving the highest number of people at risk for, or living with, hepatitis B and C
- Share diagnosis and treatment dashboards with facilities to support improvements in screening, linkage to care and treatment
- Develop and provide training and educational materials for health care providers
- Develop and manage hepatitis B and C community-based patient navigation programs
- Organize the Hep Free NYC community coalition and build the capacity of stakeholders to prevent, manage and treat hepatitis B and C by supporting networking and providing information and resources

GOAL 3: Substantially reduce new viral hepatitis infections in NYC

Objectives:

- Characterize new hepatitis C infections (including method of transmission, patient demographics, location of diagnosis and treatment) among people under age 35
- Partner with organizations that serve young people who use drugs to develop and implement hepatitis C primary prevention and treatment strategies for youth
- Identify priority populations at highest risk for ongoing transmission of hepatitis B and C, and develop population-specific interventions to reduce new infections

SURVEILLANCE

Each year, the Health Department monitors the number of people with newly reported hepatitis A, B and C infections in New York City (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.

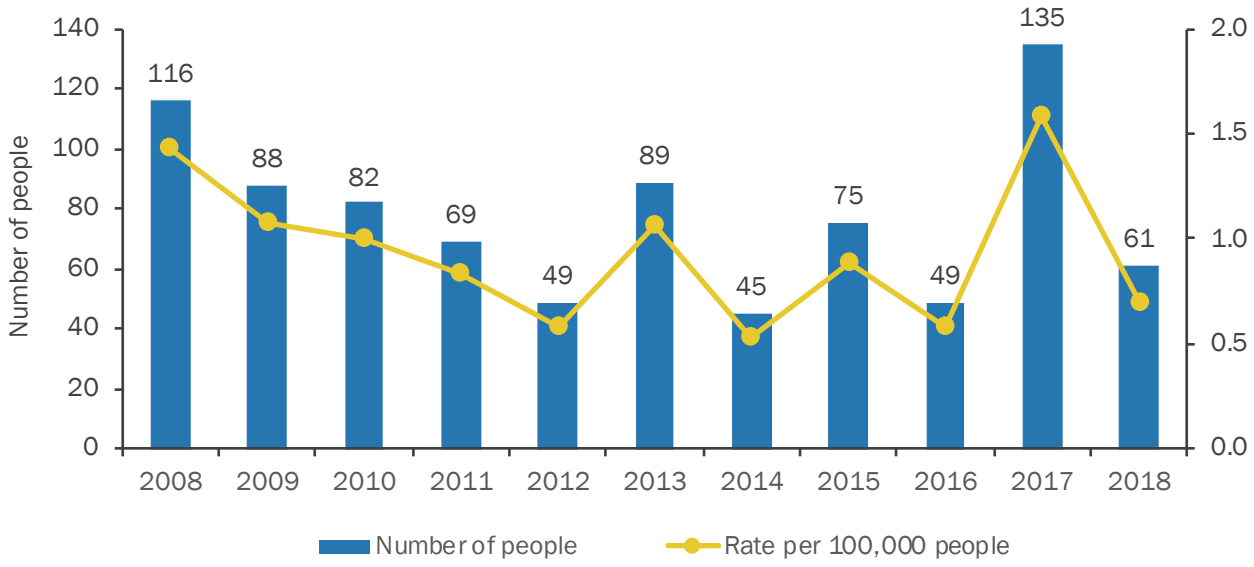
›› Read surveillance technical notes in Appendix 1.

HEPATITIS A

61	-55%	0.7
Number of people reported with hepatitis A in 2018	Percentage change from 2017	Rate per 100,000 people in 2018

From 2008 through 2012, with the availability of hepatitis A vaccine and universal childhood vaccine recommendations, the number of 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 an outbreak among men who have sex with men (MSM) (2017).[2]

FIGURE 1. Number of people reported with hepatitis A* in New York City, 2008–2018



* Case definition for acute hepatitis A: discrete onset of symptoms consistent with hepatitis A infection, positive anti-hepatitis A virus IgM, and either jaundice or elevated serum alanine aminotransferase levels

›› For information about how providers can report hepatitis A cases, see Appendix 3.

[2] For more information, read the Centers for Disease Control and Prevention's Morbidity and Mortality Weekly Report: September 22, 2017, at dx.doi.org/10.15585/mmwr.mm6637a7.

FIGURE 2. Percentage of people reported with hepatitis A in New York City by reported risk factors,[3] 2018

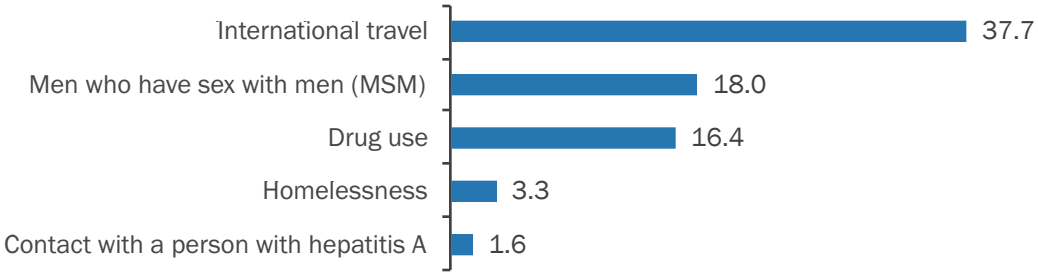
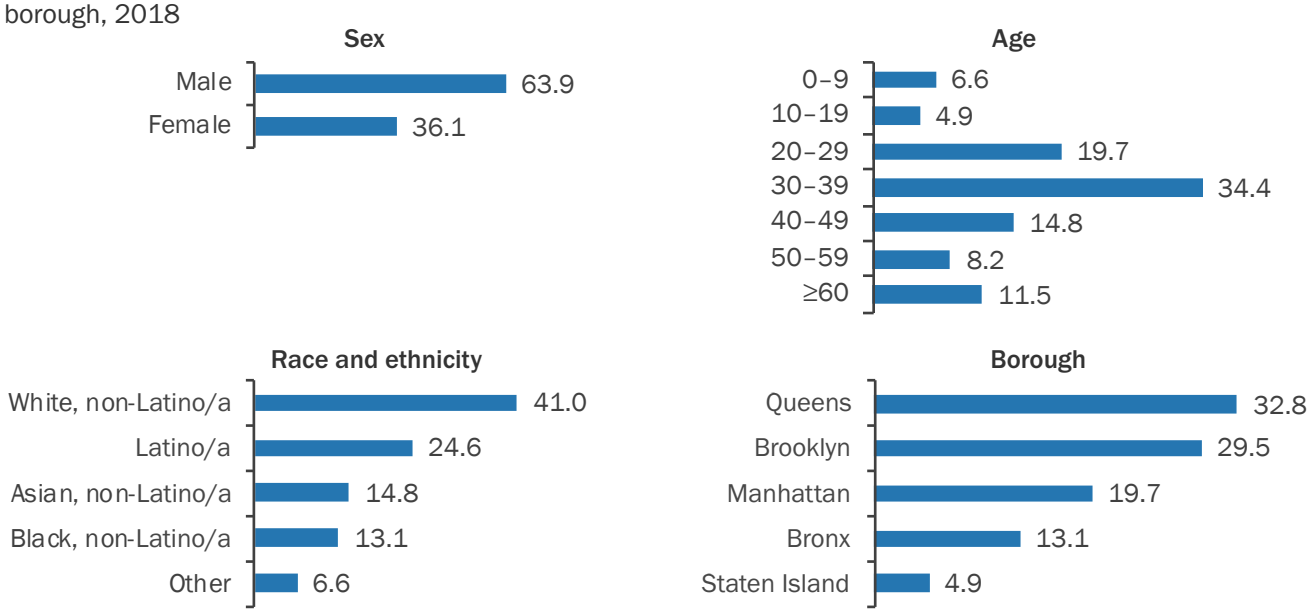


FIGURE 3. Percentage of people reported with hepatitis A in New York City by sex, age, race and ethnicity, and borough, 2018



›› For full data, see Appendix 2.

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:

- Men who have sex with men (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, in a shelter or otherwise do not have a permanent address[4]
- People with clotting-factor disorders
- People who work with hepatitis A virus in a laboratory

[3] Not mutually exclusive.

[4] Since 2017, there have been multiple large-scale hepatitis A outbreaks across the United States among people experiencing homelessness or using drugs. These outbreaks are unprecedented in size and severity. Although an outbreak is not currently occurring in these populations in NYC, homelessness is now considered an independent risk factor for hepatitis A infection. For more information, visit cdc.gov/mmwr/volumes/68/wr/mm6818a2.htm

ACUTE HEPATITIS B

21 Number of people reported with acute hepatitis B in 2018

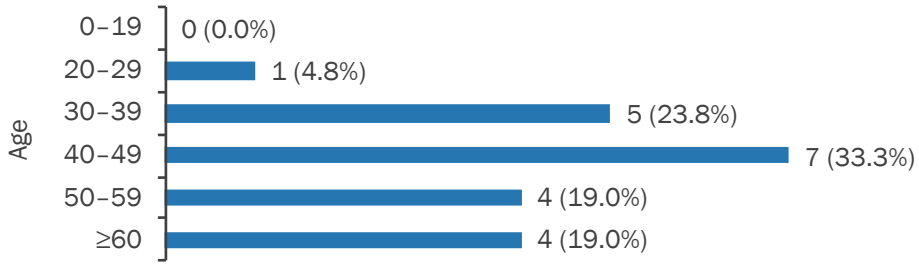
0.2 Rate per 100,000 people in 2018

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 3.

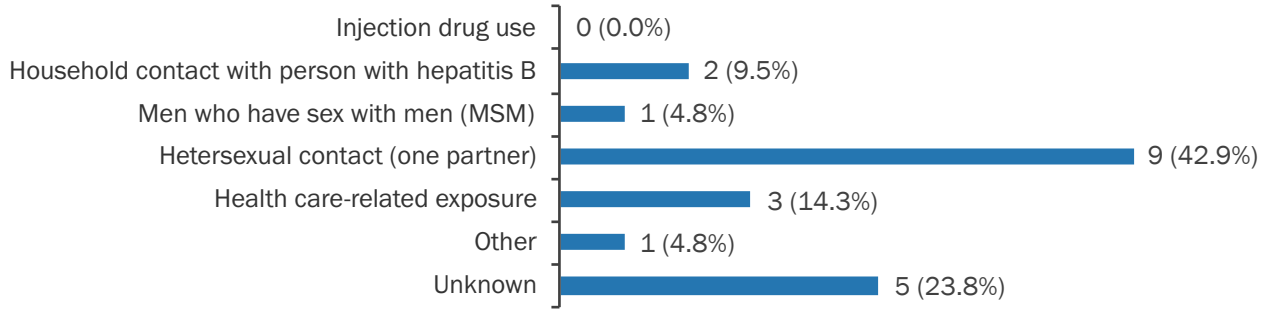
In 2018, no children younger than 20 years of age were reported with acute hepatitis B infection because of effective vaccination and perinatal prevention policies and programs.

FIGURE 4. Number and percentage of people reported with acute hepatitis B in New York City by age, 2018



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 New York City, by reported risk factors,[5] 2018



›› For full data, see Appendix 4.

HEALTH DEPARTMENT RECOMMENDATION

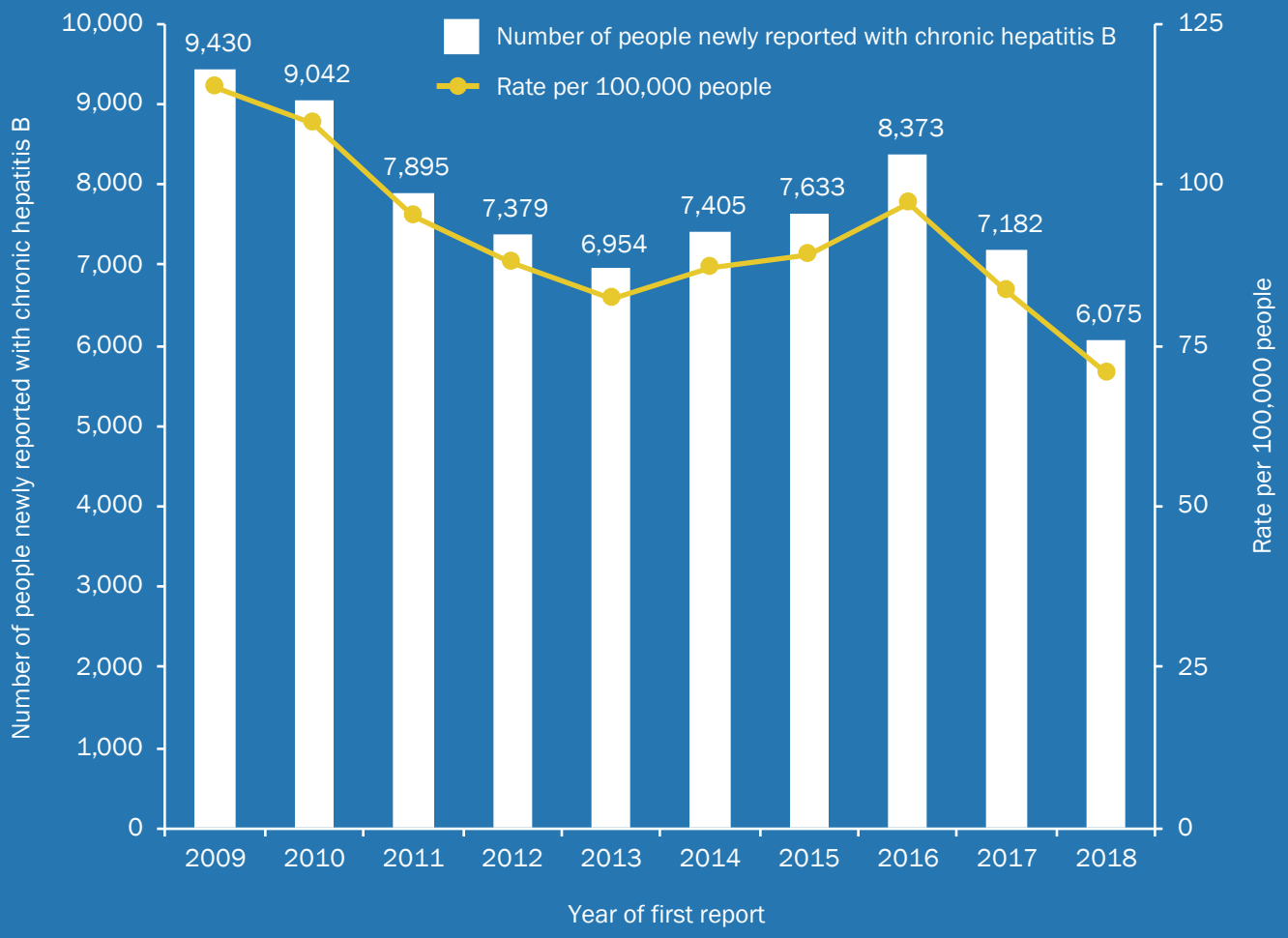
Clinicians should offer the hepatitis B vaccine to people at high risk (for example, sexual partners of people with hepatitis B, MSM, people with multiple sex partners), as recommended by the Advisory Committee on Immunization Practices. For more information, visit cdc.gov/hepatitis/hbv/vaccadults.htm.

[5] 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. The risk factors are organized by highest to lowest risk from top to bottom.

CHRONIC HEPATITIS B

New reports of chronic hepatitis B declined from 2009 to 2013. Although there was a 15.4% decrease in reported cases in 2018, there have been more than 6,000 people newly reported with the infection each year since 2009.

FIGURE 6. Number and rate of people newly reported with chronic hepatitis B in New York City by year of first report, 2009–2018



›› In NYC, there are many programs that provide supportive services and free or low-cost hepatitis B care and treatment. For more information, visit nyc.gov/health and search for "hepatitis B."

CHRONIC HEPATITIS B

6,075 Number of people newly reported with chronic hepatitis B in 2018

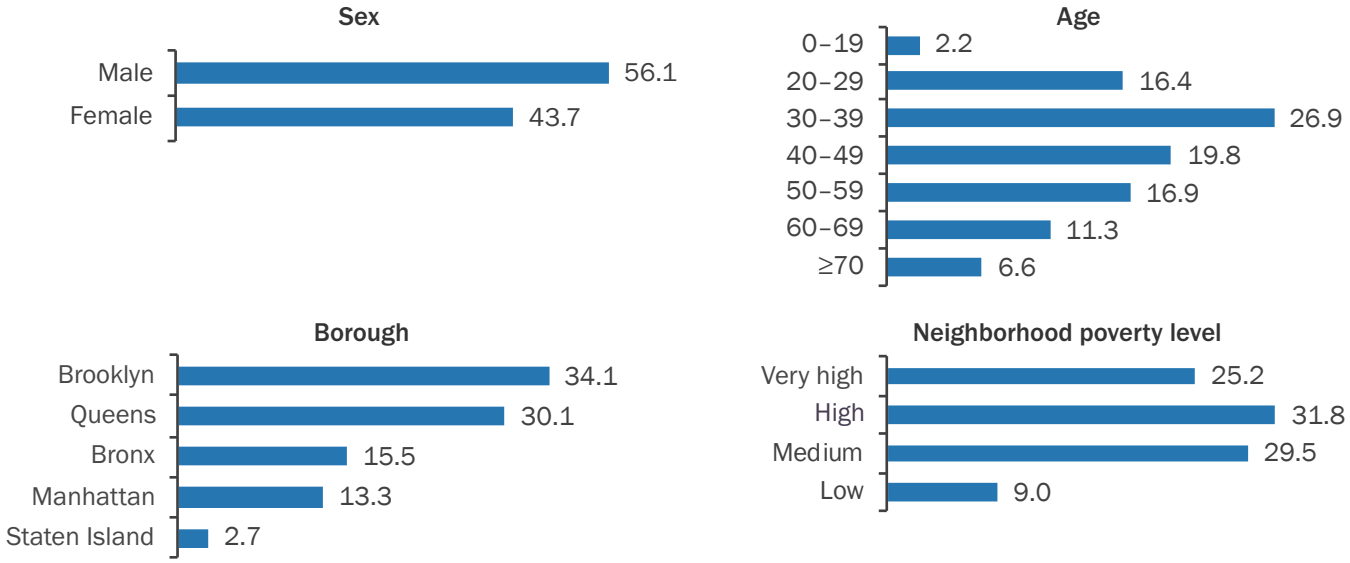
93,605 Number of people reported with chronic hepatitis B during 2015–2018*

70.5 Rate of newly reported chronic hepatitis B per 100,000 people in 2018

*The number of people reported with a hepatitis B test during 2015–2018, regardless of year of first report, can serve as a proxy for all people currently living and diagnosed with chronic hepatitis B in New York City.

Characteristics of People Newly Reported With Chronic Hepatitis B

FIGURE 7. Percentage of people newly reported with chronic hepatitis B in New York City by sex, age, borough and neighborhood poverty level, 2018



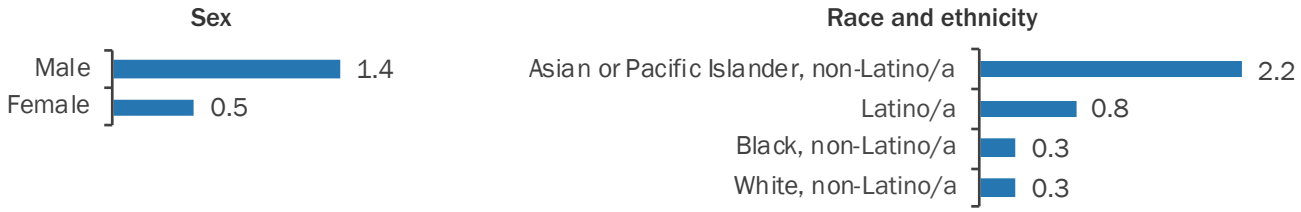
» For full data, see Appendix 5.

HEPATITIS B: DEATHS

83 Number of deaths in 2017

-16.2% Percentage change from 2016

FIGURE 8. Age-adjusted death rate per 100,000 people among New York City residents where hepatitis B is listed as the cause of death in 2017, by sex and race and ethnicity



Asian or Pacific Islander New Yorkers had a higher death rate than non-Asian or Pacific Islander New Yorkers where hepatitis B is listed as the cause of death in 2017.

» For full data, see Appendix 6.

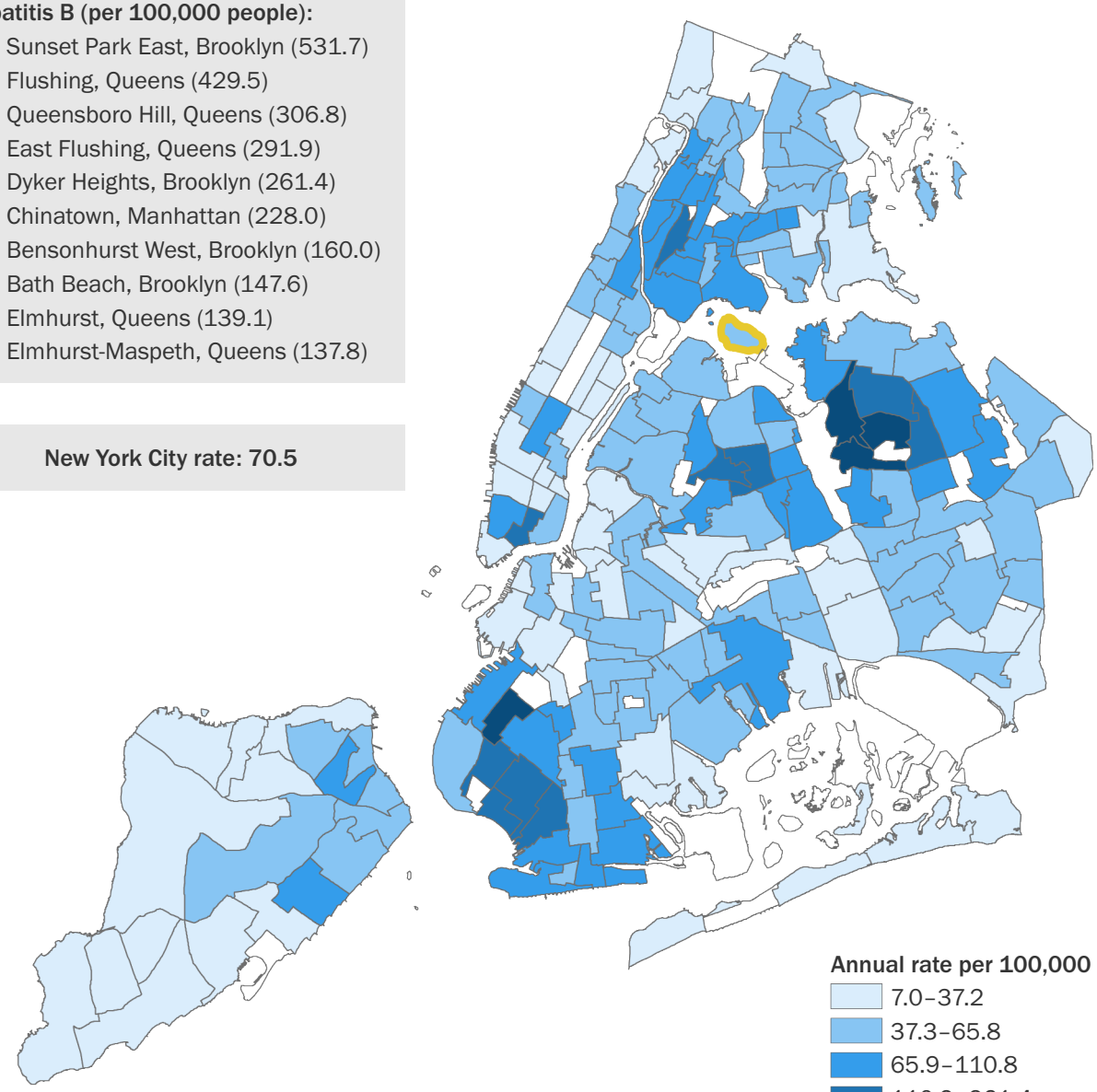
CHRONIC HEPATITIS B: GEOGRAPHIC DISTRIBUTION

FIGURE 9. Rate of people newly reported with chronic hepatitis B in New York City by neighborhood tabulation area, 2018[6]

Neighborhoods with the highest rates of people newly reported with chronic hepatitis B (per 100,000 people):

1. Sunset Park East, Brooklyn (531.7)
2. Flushing, Queens (429.5)
3. Queensboro Hill, Queens (306.8)
4. East Flushing, Queens (291.9)
5. Dyker Heights, Brooklyn (261.4)
6. Chinatown, Manhattan (228.0)
7. Bensonhurst West, Brooklyn (160.0)
8. Bath Beach, Brooklyn (147.6)
9. Elmhurst, Queens (139.1)
10. Elmhurst-Maspeth, Queens (137.8)

New York City rate: 70.5



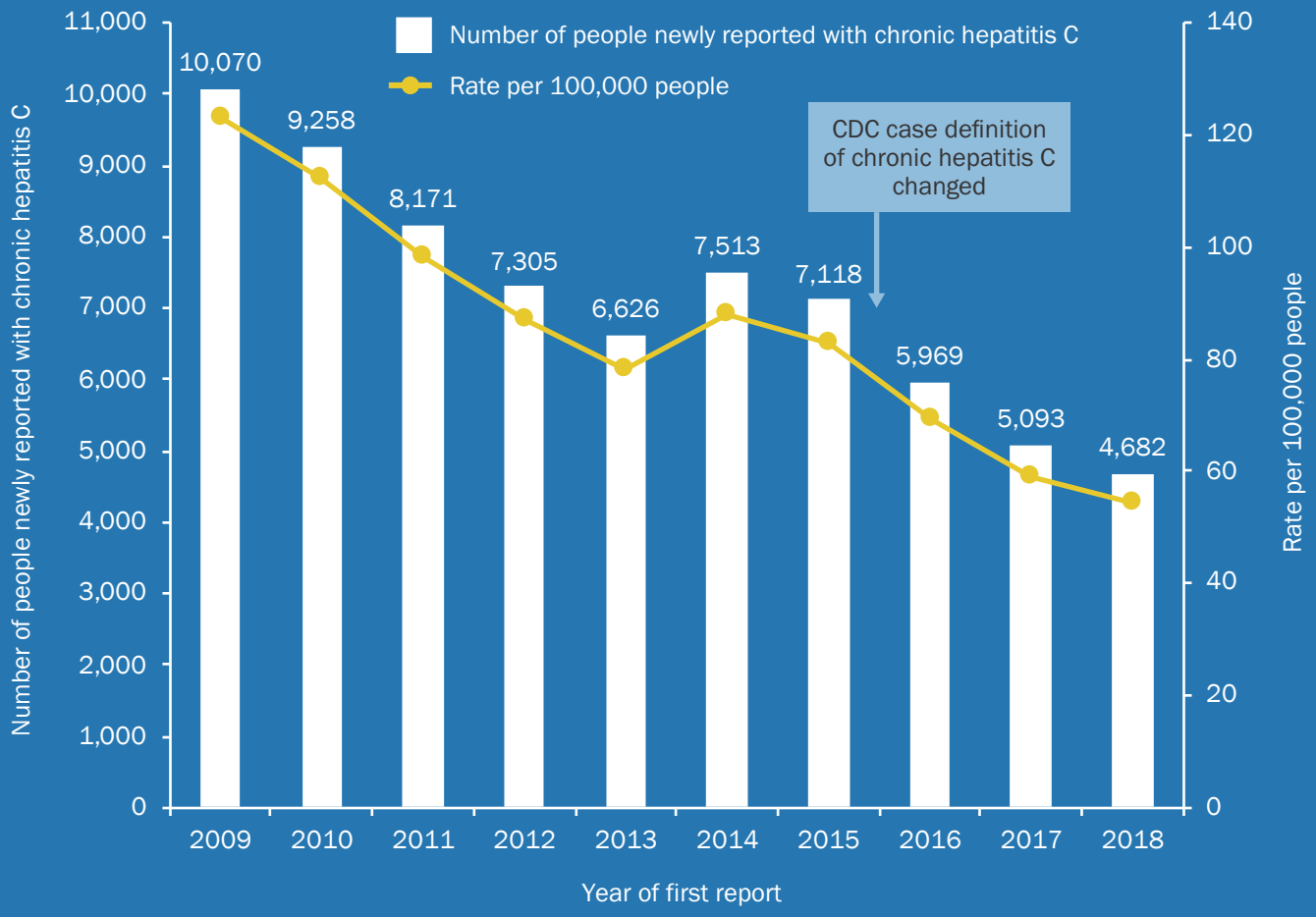
›› For full data and map of neighborhood tabulation areas, see Appendices 7 and 8.

[6] Neighborhood tabulation area could not be determined for 440 people (7.2%) with chronic hepatitis B based on their address at first report.

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 10. Number and rate of people newly reported with chronic hepatitis C in New York City by year of first report, 2009–2018



Data notes:

- In 2016, the Centers for Disease Control and Prevention (CDC) implemented a new case definition for chronic hepatitis C. In response, the Health Department began requiring laboratories to report all positive hepatitis C antibody tests, regardless of signal-to-cutoff ratio, for NYC residents. The CDC's 2016 case definition of chronic hepatitis C can be found at cdc.gov/nndss/conditions/hepatitis-c-chronic/case-definition/2016. The CDC 2016 case definition is used for people first reported with chronic hepatitis C in NYC 2016 and subsequent years. Prior years use the previous case definition for past or present hepatitis C infection. Visit cdc.gov/nndss/conditions/hepatitis-c-chronic/case-definition/2012/ for the previous case definition.
- In 2018, the CDC introduced a perinatal hepatitis C case definition, which can be found at cdc.gov/nndss/conditions/hepatitis-c-perinatal-infection/case-definition/2018. In 2018, people first reported with hepatitis C between ages 2 and 36 months were classified using this definition and were excluded from case counts. Perinatal hepatitis C case counts can be found on Page 18.

CHRONIC HEPATITIS C

4,682 Number of people newly reported with chronic hepatitis C in 2018

56.5 Rate of newly reported chronic hepatitis C per 100,000 people in 2018

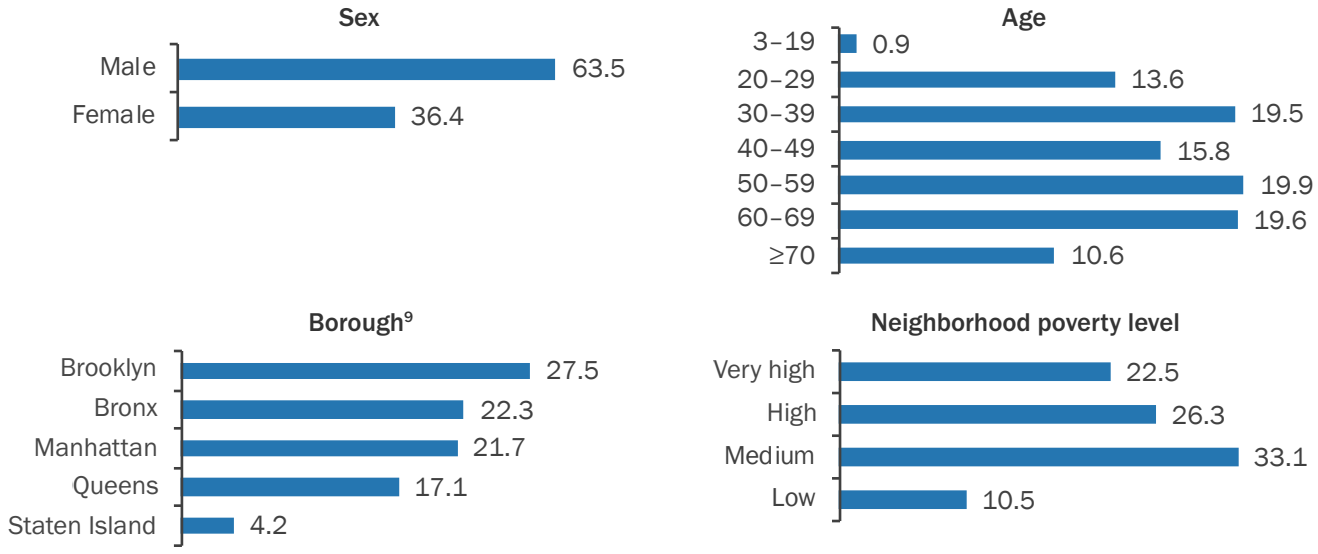
98,313 Number of people reported with chronic hepatitis C during 2015–2018*

In 2018, there were 4,682 people newly reported with a positive hepatitis C antibody result (RNA positive or RNA unknown), more than twice the number of new HIV diagnoses.[7] An additional 6,128 cases (57.0%) were antibody positive, RNA negative and therefore not currently infected.[8]

*The number of people reported with a hepatitis C test during 2015–2018, regardless of year of first report, can serve as a proxy for all people currently living and diagnosed with chronic hepatitis C in New York City.

Characteristics of People Newly Reported With Chronic Hepatitis C

FIGURE 11. Percentage of people newly reported with chronic hepatitis C in New York City by sex, age, borough and neighborhood poverty level, 2018



›› For full data, see Appendix 9.

HEALTH DEPARTMENT RECOMMENDATION

Providers should report acute hepatitis C cases to the Health Department. In 2018, the Health Department received few provider reports of acute hepatitis C, but estimates the actual number to be higher. Reporting of acute hepatitis C cases can help the Health Department identify outbreaks and inform effective prevention programs.

›› Providers can find more information about how to report acute hepatitis C cases in Appendix 3.

[7] HIV Surveillance Annual Report, 2017. New York City Department of Health and Mental Hygiene: nyc.gov/assets/doh/downloads/pdf/dires/hiv-surveillance-annualreport-2017.pdf.
[8] An antibody positive/RNA negative test combination suggests that a person either naturally cleared the infection or was previously cured, or that the antibody result was a false positive.
[9] The Bronx includes people in Rikers Island jail facilities. In 2018, 175 people were newly reported with chronic hepatitis C from Rikers Island.

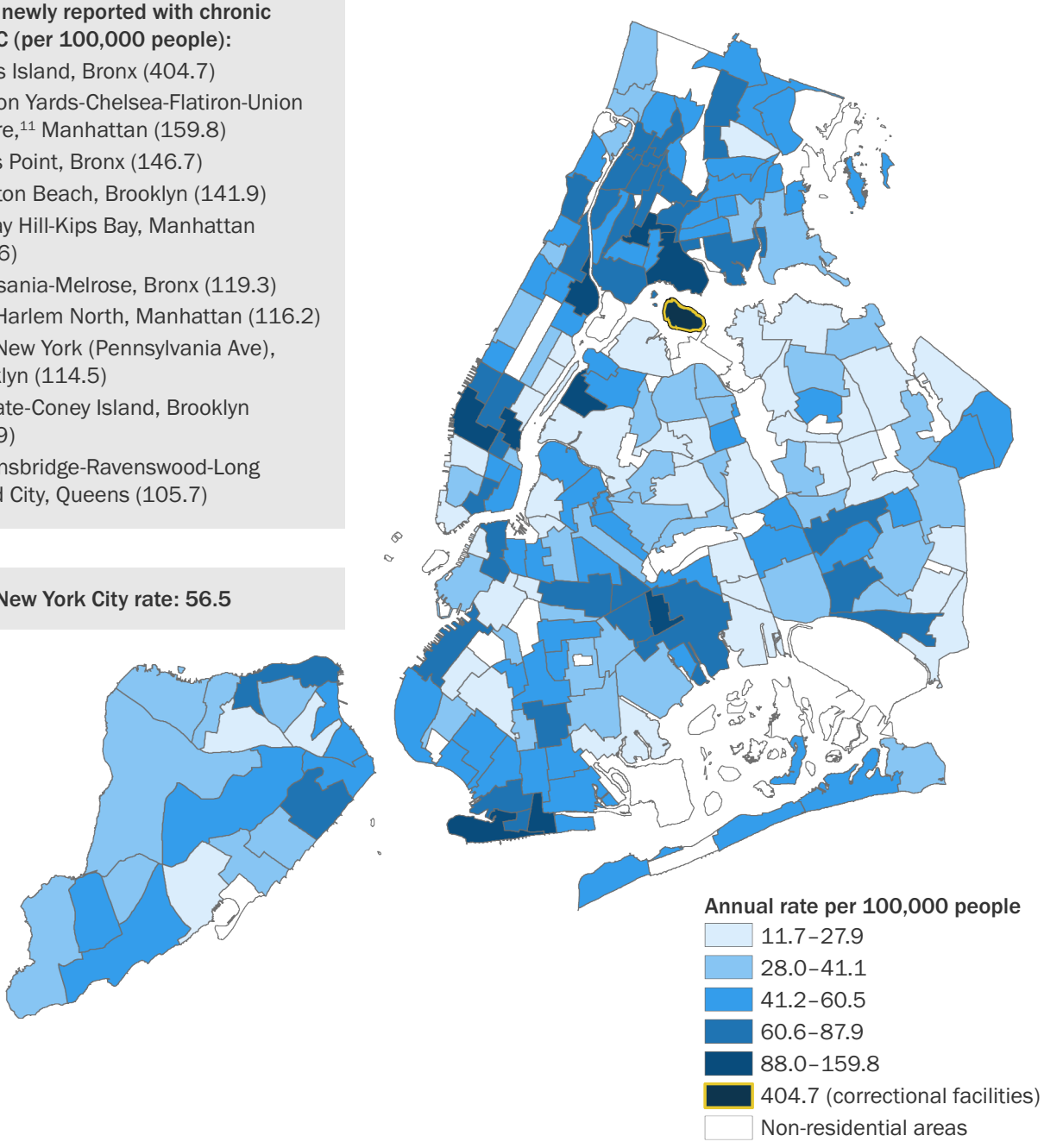
CHRONIC HEPATITIS C: GEOGRAPHIC DISTRIBUTION

FIGURE 12. Rate of people newly reported with chronic hepatitis C in New York City by neighborhood tabulation area,[10] 2018

Neighborhoods with the highest rates of people newly reported with chronic hepatitis C (per 100,000 people):

1. Rikers Island, Bronx (404.7)
2. Hudson Yards-Chelsea-Flatiron-Union Square,[11] Manhattan (159.8)
3. Hunts Point, Bronx (146.7)
4. Brighton Beach, Brooklyn (141.9)
5. Murray Hill-Kips Bay, Manhattan (119.6)
6. Morrisania-Melrose, Bronx (119.3)
7. East Harlem North, Manhattan (116.2)
8. East New York (Pennsylvania Ave), Brooklyn (114.5)
9. Seagate-Coney Island, Brooklyn (107.9)
10. Queensbridge-Ravenswood-Long Island City, Queens (105.7)

New York City rate: 56.5



›› For full data and map of neighborhood tabulation areas, see Appendices 8 and 10.

[10] Neighborhood tabulation area could not be determined for 505 people (10.8%) with chronic hepatitis C based on their address at first report.

[11] 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.

CHRONIC HEPATITIS C: ENHANCED SURVEILLANCE INTERVIEWS

In 2018, the Health Department interviewed a random sample of people newly reported with chronic hepatitis C and their health care providers. Of 570 people sampled, 513 were eligible[12] for interviews and 419 patients or their providers were interviewed. The median age of the people interviewed was 49 (range: 19–88 years).

FIGURE 13. Characteristics of people newly reported with chronic hepatitis C from November 1, 2017, to December 31, 2018, interviewed through enhanced surveillance (n=419)

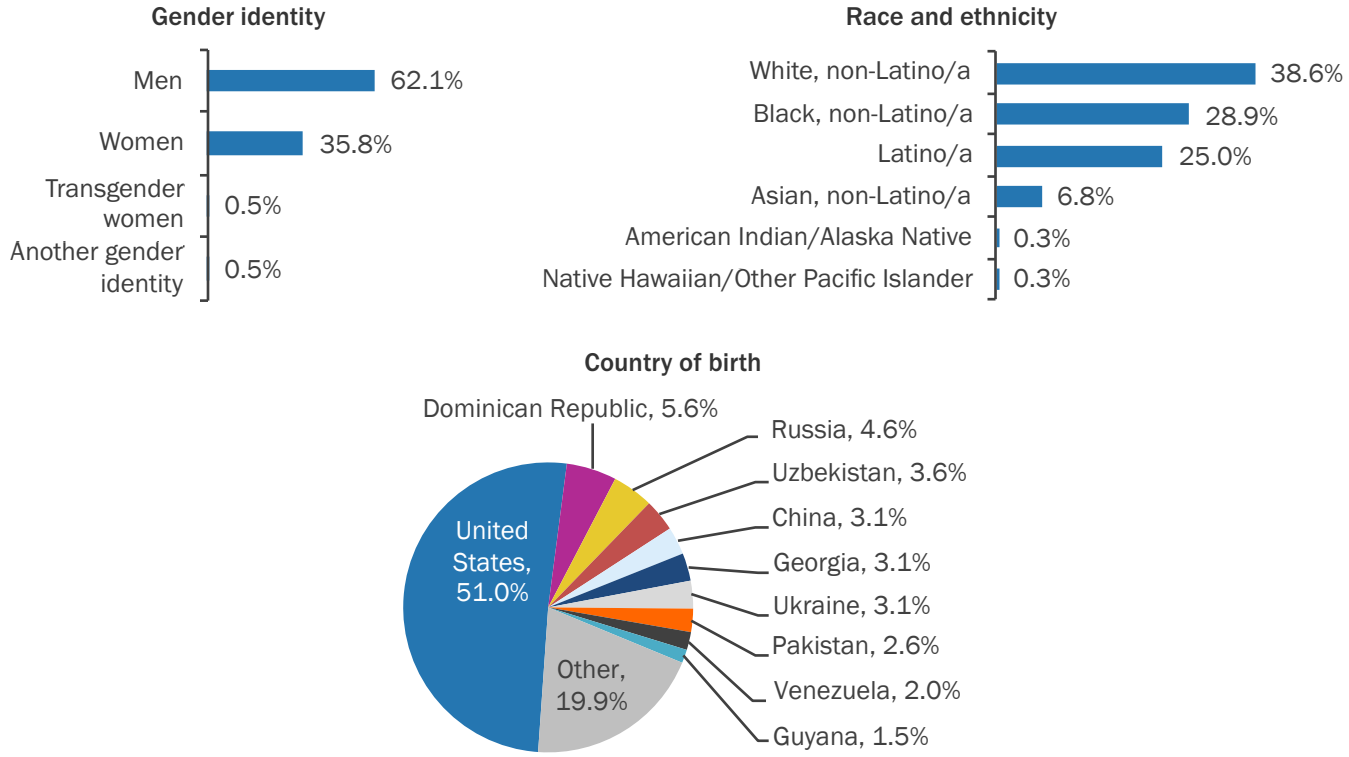
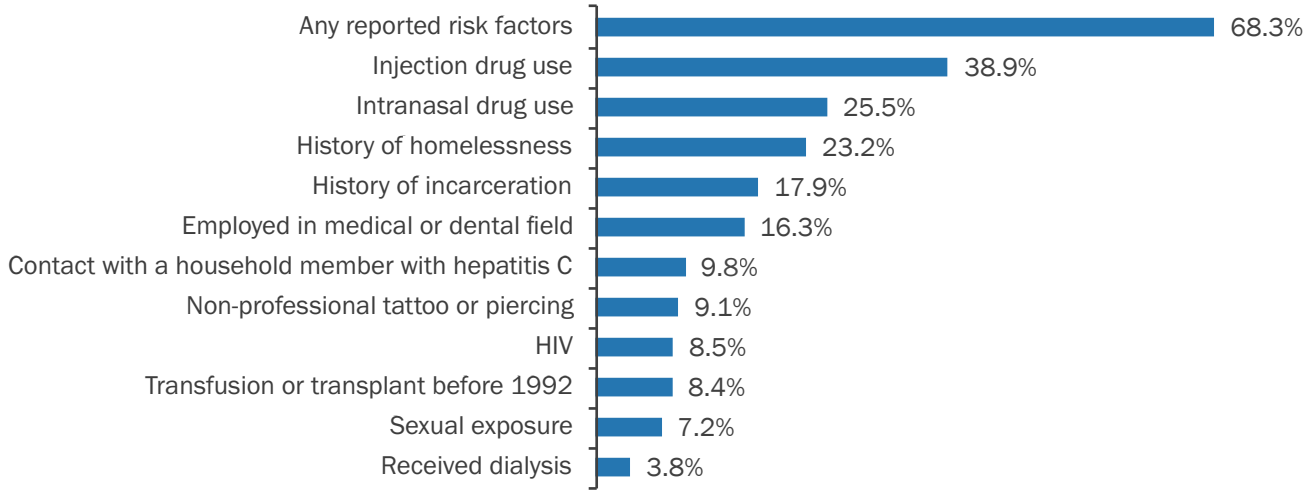


FIGURE 14. Risk factors for hepatitis C infection of people newly reported with chronic hepatitis C from November 1, 2017, to December 31, 2018, interviewed through enhanced surveillance (n=419)[13]



[12] Patients were excluded if, upon investigation, it was determined that they lived outside of NYC, were deceased or were not infected with hepatitis C.
[13] Not mutually exclusive.

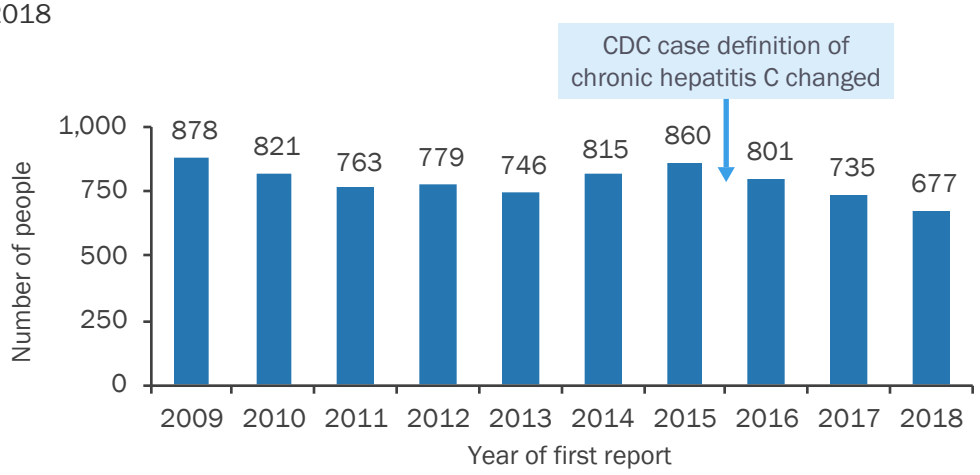
HEPATITIS C: PEOPLE AGES 3 TO 29

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.[14] In 2018, 93.9% of people ages 3 to 29 newly reported with chronic hepatitis C were ages 20 to 29 years.

677 Number of people ages 3 to 29 years newly reported with chronic hepatitis C in 2018

22.4 Rate of newly reported chronic hepatitis C per 100,000 people ages 3 to 29 years in 2018

FIGURE 15. Number of people ages 3 to 29 years reported with chronic hepatitis C in New York City by year of first report, 2009–2018



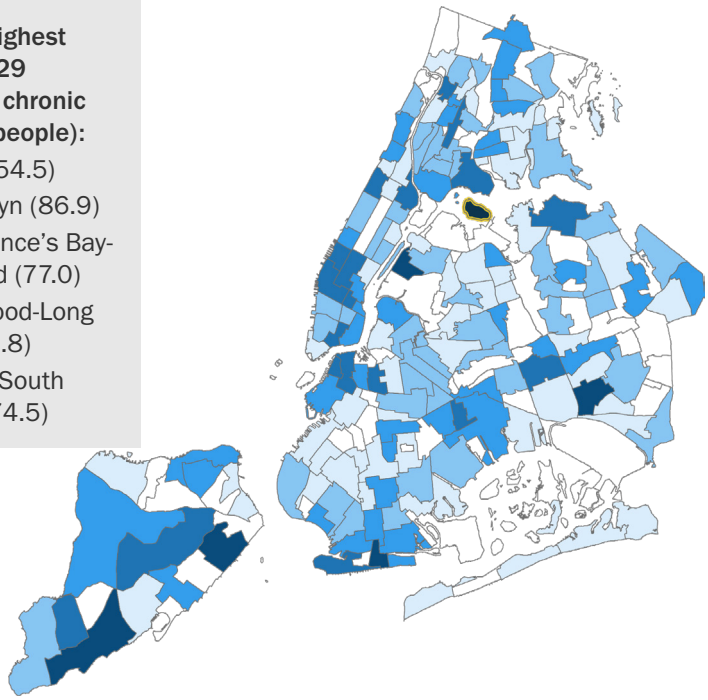
Geographic Distribution

FIGURE 16. Rate of people ages 3 to 29 years newly reported with chronic hepatitis C in New York City by neighborhood tabulation area,[15] 2018

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 (254.5)
2. Brighton Beach, Brooklyn (86.9)
3. Annadale-Huguenot-Prince's Bay-Eltingville, Staten Island (77.0)
4. Queensbridge-Ravenwood-Long Island City, Queens (75.8)
5. Old Town-Dongan Hills-South Beach, Staten Island (74.5)

New York City rate: 22.4



[14] Starting 2018, children ages 0 to 36 months reported with hepatitis C are reported as perinatal hepatitis C infections.
[15] Neighborhood tabulation area could not be determined for 45 people (6.6%) ages 3 to 29 years with chronic hepatitis C based on their address at first report.

PERINATAL HEPATITIS C

Perinatal transmission is the leading cause of childhood hepatitis C, occurring in 5.8% of infants born to women with hepatitis C.[16] The Health Department monitors newly reported hepatitis C in women of childbearing age (ages 15 to 44) and in children ages 0 to 36 months to identify perinatal transmission and prevention opportunities.

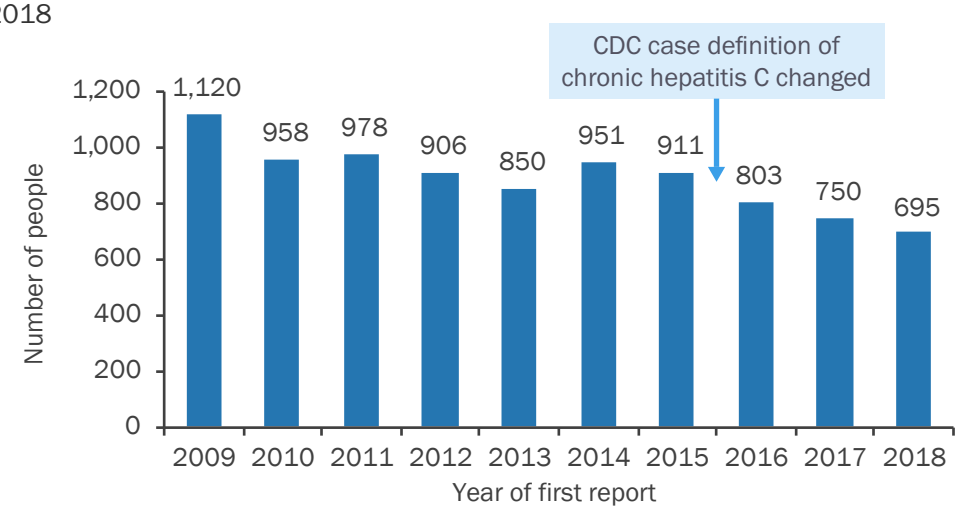
Hepatitis C: Women of Childbearing Age

Nationally, an increasing number of women of childbearing age are becoming infected with hepatitis C. In NYC, the number of women of childbearing age newly reported with chronic hepatitis C has been slightly declining since 2014.

695 Number of women of childbearing age newly reported with chronic hepatitis C in 2018

36.1 Rate of newly reported chronic hepatitis C per 100,000 women of childbearing age in 2018

FIGURE 17. Number of women of childbearing age reported with chronic hepatitis C in New York City by year of first report, 2009–2018



›› PERINATAL HEPATITIS C TRANSMISSION IN NEW YORK CITY, 2013–2015

Maternal hepatitis C infections in the United States (U.S.) nearly doubled from 2009 to 2014. However, many children born to women with hepatitis C are not screened. In 2018, the Health Department analyzed hepatitis C surveillance data and 2013–2015 birth records to determine if perinatally exposed children were being screened and to characterize women with hepatitis C giving birth in NYC.

472 Number of women who gave birth from 2013–2015 reported with confirmed chronic hepatitis C

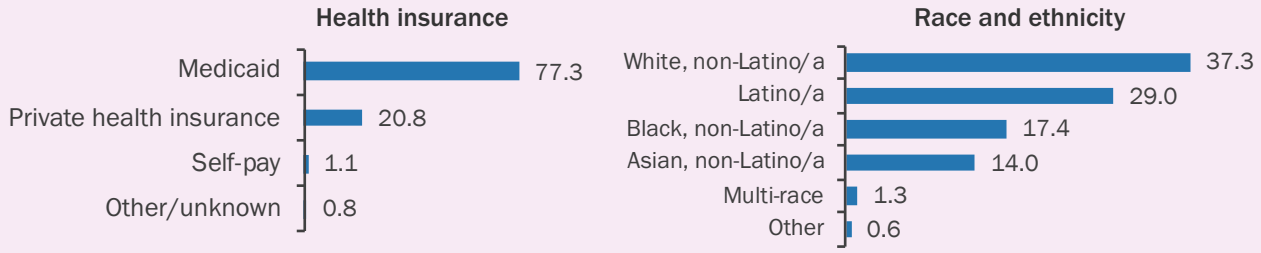
5 Number of children identified with confirmed hepatitis C

Only 5 of 472 children born to women with chronic hepatitis C were reported with a positive hepatitis C test. This is lower than the expected 27 positive reports (given a transmission rate of 5.8%), suggesting low hepatitis C screening rates among perinatally exposed children.

[16] 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

PERINATAL HEPATITIS C TRANSMISSION IN NEW YORK CITY, 2013–2015 (cont.)

FIGURE 18. Percentage of women with confirmed chronic hepatitis C prior to delivery in New York City (n=472) by health insurance and race and ethnicity, 2013–2015

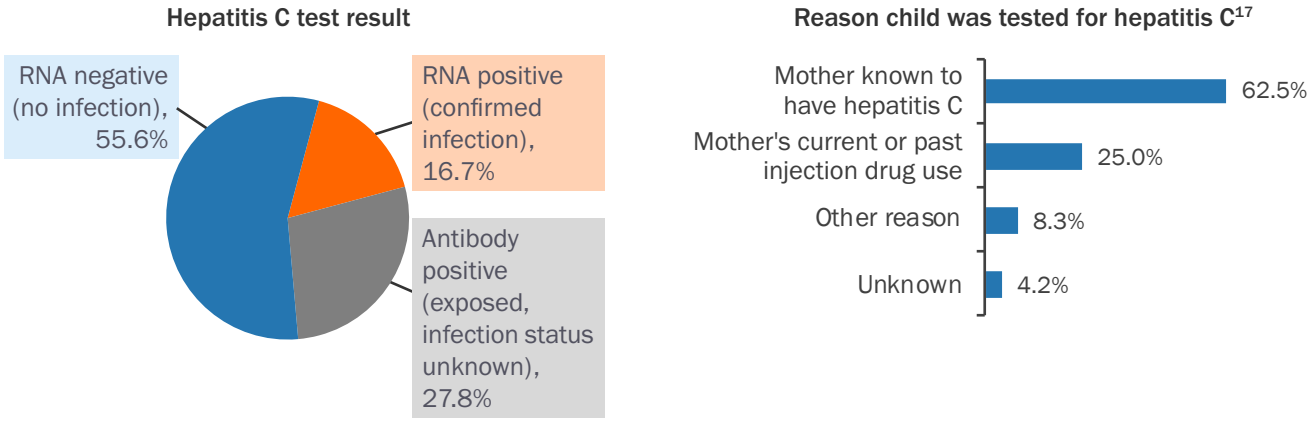


See full data in Appendix 11.

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 CDC perinatal hepatitis C case definition. To read the definition, visit cdc.gov/nndss/conditions/hepatitis-c-perinatal-infection/case-definition/2018.

FIGURE 19. Characteristics of children ages 0 to 36 months newly reported with hepatitis C in New York City (n=18), 2018



For full data, see Appendix 12.

HEALTH DEPARTMENT RECOMMENDATION

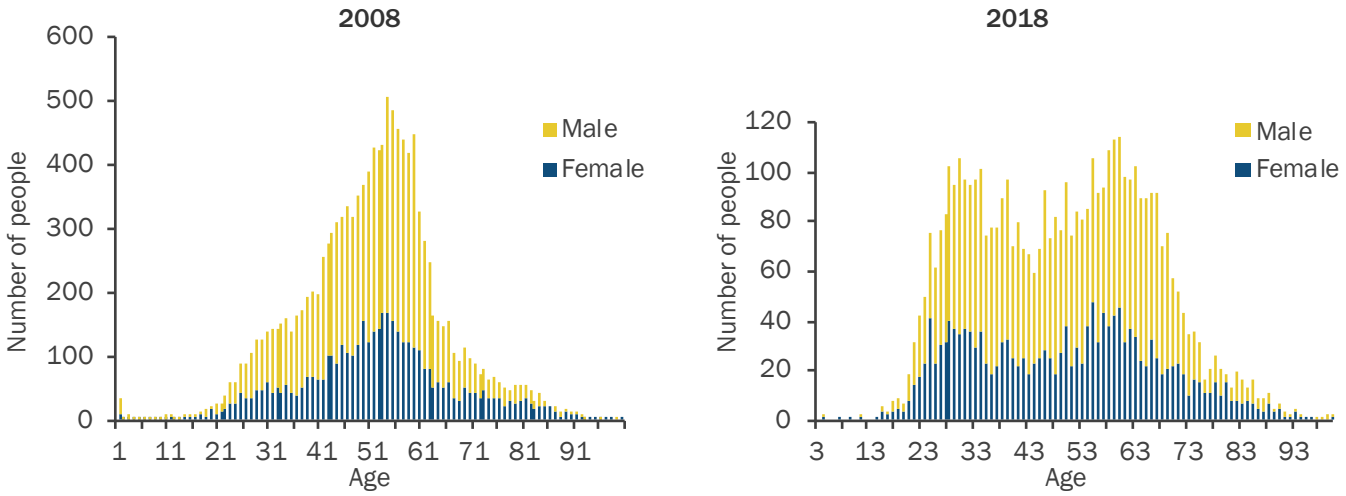
All children born to women with hepatitis C should be tested for hepatitis C at age 18 months or older. For more information, visit hcvguidelines.org/unique-populations/children. All people diagnosed with hepatitis C should be connected to care.

[17] Not mutually exclusive

CHRONIC HEPATITIS C: AGE DISTRIBUTION

In 2008, 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 as a result of recent injection drug use.

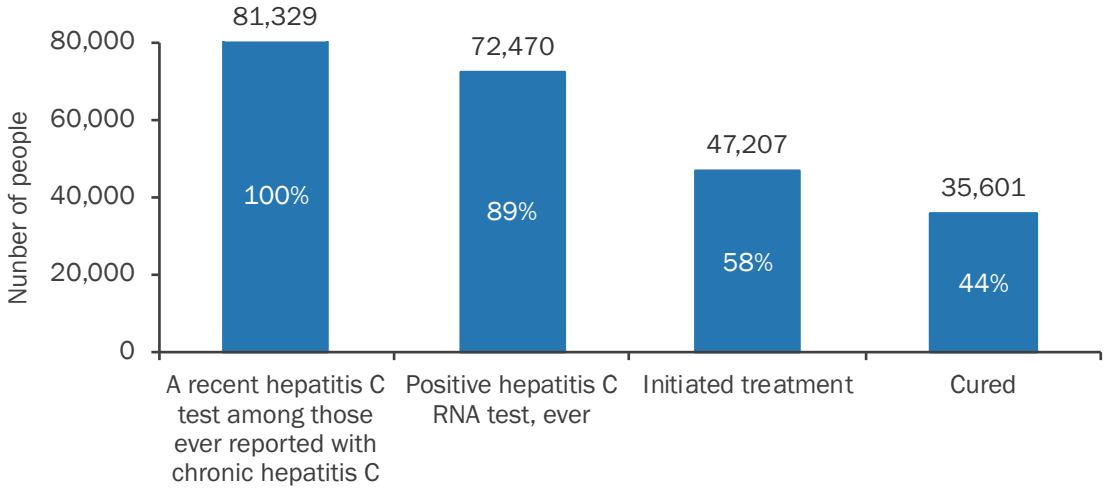
FIGURE 20. Age distribution of people reported with chronic hepatitis C in New York City, 2008 and 2018



CHRONIC HEPATITIS C CARE CASCADE

The Health Department estimates that 116,000 people (1.4% of NYC residents) are living with chronic hepatitis C.[18] 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.[19]

FIGURE 21. Care cascade for people in New York City with chronic hepatitis C recently reported (from July 1, 2014, to June 30, 2018) with a positive hepatitis C test, regardless of year of first report



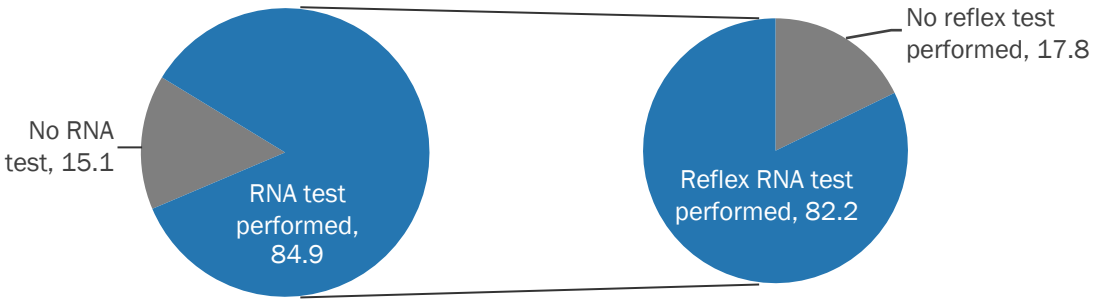
›› Read the definitions for each category in Appendix 13.

[18] To read how the hepatitis C prevalence estimate was calculated, visit dx.doi.org/10.1017/S095026881800170X.
[19] To read how the validated algorithm was developed, read Moore MS, Bocour A, Jordan L, et al. Development and validation of surveillance-based algorithms to estimate hepatitis C treatment and cure in New York City. *J Public Health Manag Pract*. 2018;24(6):526-532 at ncbi.nlm.nih.gov/pubmed/29227418.

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 and uses confirmatory RNA test results 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.[20]

FIGURE 22. Percentage of people newly reported with hepatitis C (n=10,810) who received RNA testing and reflex RNA testing, 2018



›› See full data in Appendix 14.

In 2018, 84.9 percent of people newly reported with hepatitis C received RNA testing. Of the group which received RNA testing, 82.2 percent had a reflex test.

POLICY

- Since 2017, Section §13.03(b)(3) of the NYC Health Code requires laboratories to perform confirmatory hepatitis C RNA reflex testing when there is a positive hepatitis C antibody test result.
- The Health Department evaluates compliance with Health Code mandates and provides technical assistance to health care facilities and laboratories to support implementation of reflex testing.

Hepatitis C Genotype

Hepatitis C genotype testing may be used to determine which direct acting antiviral (DAA) treatment is appropriate, though pangenotypic options are available. Genotype 1 is the most common genotype in the U.S..

FIGURE 23. Percentage of people newly reported with hepatitis C who received genotype testing, 2018

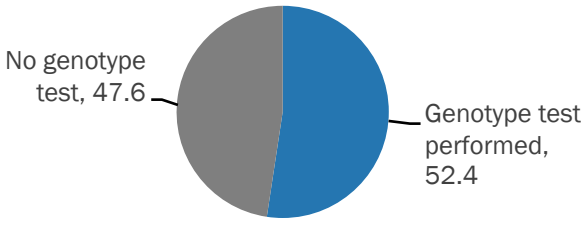
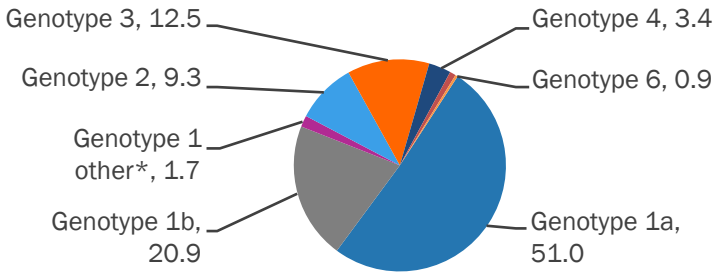


FIGURE 24. Percentage of people with each hepatitis C genotype among people newly reported with hepatitis C, 2018



*1 unspecified, other, or 1a/1b

›› See full data in Appendix 14.

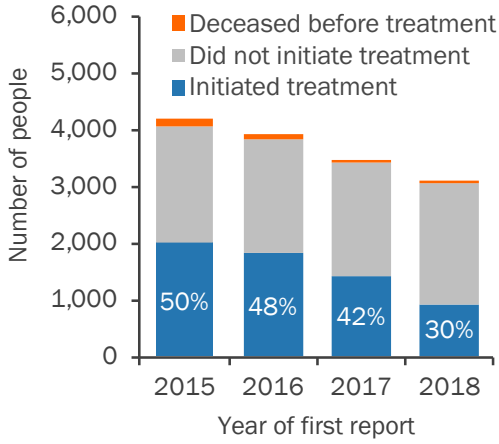
[20] Reflex testing is performed on the initial specimen or a second specimen collected at the same time as the initial specimen.

Hepatitis C Treatment Initiation

50% Percentage of people reported with chronic hepatitis C in 2015 who had not started treatment by the end of 2018

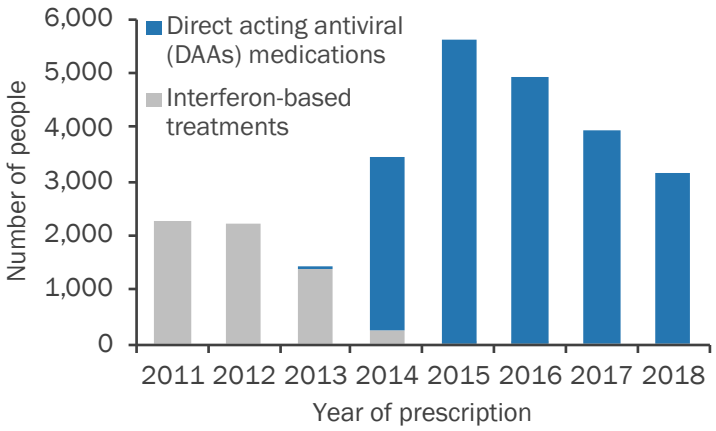
The majority of people in NYC with chronic hepatitis C have not been treated. Treatment can prevent the development of liver fibrosis, cirrhosis, hepatocellular carcinoma and premature death.

FIGURE 25. Treatment initiation among people newly reported with a positive hepatitis C RNA test, by year of first report*



Data source: NYC hepatitis C surveillance registry
*As of April 15, 2019. Matching to 2018 Vital Statistics deaths incomplete.

FIGURE 26. Hepatitis C medication prescriptions for people covered by Medicaid, 2011–2018



Data source: Salient NYS Medicaid Enterprise System

Treatment with all-oral DAAs has declined since 2015 for people with hepatitis C who are enrolled in Medicaid. From 2017 to 2018, there was a 20% decrease in the number of people prescribed DAAs. People who remain untreated might require more intensive efforts to connect them to medical care.

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 free or low-cost hepatitis C care and treatment. For more information, visit nyc.gov/health/hepc.

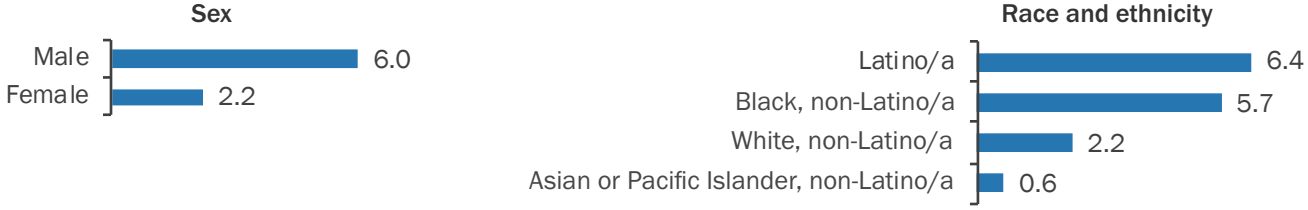
HEPATITIS C: DEATHS

376 Number of deaths in 2017

-17.2% Percentage change from 2016

3.9 Rate per 100,000 people in 2017

FIGURE 27. Age-adjusted death rate per 100,000 people among New York City residents where hepatitis C is listed as the cause of death in 2017, by sex and race and ethnicity



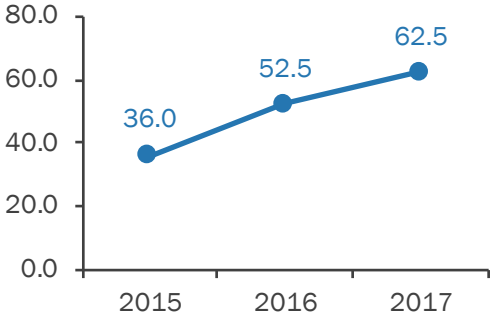
›› For full data, see Appendix 15.

HEPATITIS C AND HIV COINFECTION

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

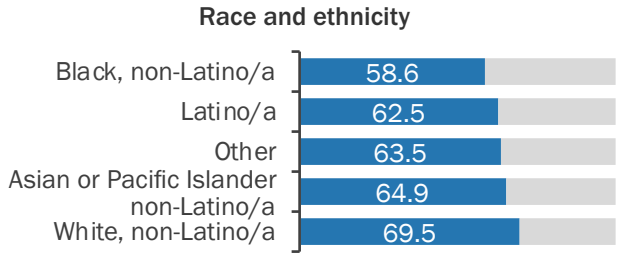
FIGURE 28. Percentage of people living with confirmed chronic hepatitis C and HIV coinfection in New York City who initiated hepatitis C treatment by year, 2015–2017[21]



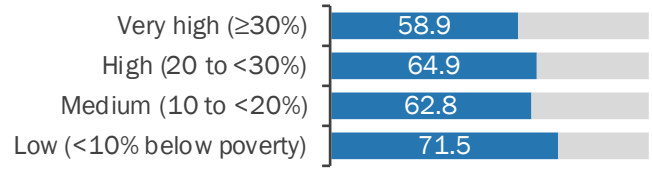
By the end of 2017, 62.5% of people living with HIV who ever tested positive for hepatitis C RNA were treated, but 3,372 (more than one-third) remained untreated.

Data source: NYC HIV and hepatitis C surveillance registries

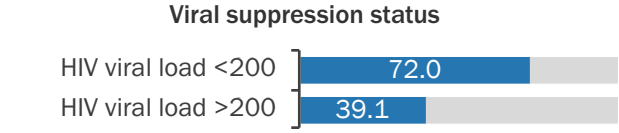
FIGURE 29. Percentage of people with hepatitis C and HIV coinfection who initiated hepatitis C treatment, by race and ethnicity, poverty level, viral suppression status and history of incarceration, 2017



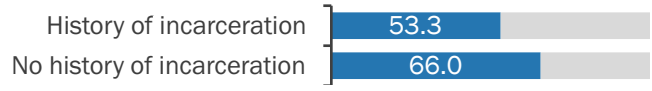
Black New Yorkers were less likely than non-Black New Yorkers to have initiated treatment.



People living in very high poverty neighborhoods were less likely than those living in lower poverty neighborhoods to have initiated treatment.



People with HIV viral load >200 copies/ml were less likely to have initiated treatment than those with a viral load <200 copies/ml.



People with a history of incarceration were less likely to have initiated treatment than those without a history of incarceration.

HEALTH DEPARTMENT RECOMMENDATION

Health care providers should prioritize hepatitis C treatment in all patients with HIV, including people of color, people living in poverty or people with a history of incarceration. For more information, visit hcvguidelines.org/unique-populations/hiv-hcv.

›› For full data, see Appendix 16.
For more information about Health Department services for people who are coinfected, see Page 31.

[21] Data only available through 2017

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, men who have sex with men, 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 and excluded from resources or uninsured.

HEPATITIS A VACCINATIONS

5,671 Number of hepatitis A vaccine doses provided at Health Department clinics in 2018

130,786 Number of people who completed the hepatitis A vaccine series in New York City in 2018*

HEPATITIS B VACCINATIONS

12,009 Number of hepatitis B vaccine doses provided at Health Department clinics in 2018

107,487 Number of children ages 4 to 18 years who completed the hepatitis B series in New York City in 2018*

*as reported to the Citywide Immunization Registry

›› For full data, see Appendices 17 and 18.

Hepatitis B Vaccination Birth Dose

The Health Department recommends a universal dose of hepatitis B vaccine to all newborns within 24 hours of birth (i.e., birth dose), followed by completion of the vaccine series over approximately one year.[22]

75.6% Percentage of 115,773 children born in 2018 who received the birth dose within the first three days of life

62.3% Percentage of 115,773 children born in 2018 who received the birth dose within one day of life

PERINATAL HEPATITIS B PREVENTION AND SCREENING

Characteristics of Women With Chronic Hepatitis B Who Delivered a Live Birth in 2018

Hepatitis B can be transmitted from mother to child during and after pregnancy. In 2018, 1,094 infants were born to women with chronic hepatitis B; 96.4% of these women were born outside of the U.S.

FIGURE 30. Percentage of women with hepatitis B who delivered a live birth in New York City by race and ethnicity and country of birth, 2018

›› For full data, see Appendix 19.

[22] 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. For more information, visit ncbi.nlm.nih.gov/pubmed/29939980.

PERINATAL HEPATITIS B PREVENTION AND SCREENING

Hepatitis B Vaccination, Prophylaxis and Testing at Birth for Infants Born in 2017

The Health Department tracks and provides case management for post-exposure prophylaxis (PEP) with hepatitis B immune globulin, vaccination and hepatitis B testing of infants born to women with chronic hepatitis B who live in NYC. In 2017, 1,289 infants were born to women with hepatitis B.[23]

FIGURE 31. Percentage of infants born to women with hepatitis B who received hepatitis B post-exposure prophylaxis (PEP), vaccination and testing, 2017

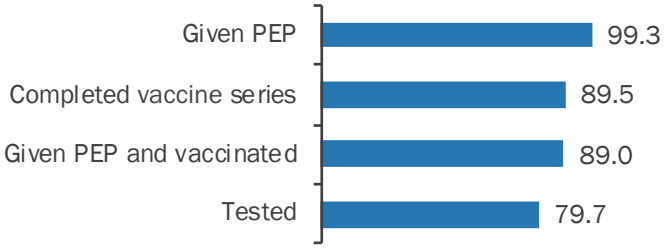
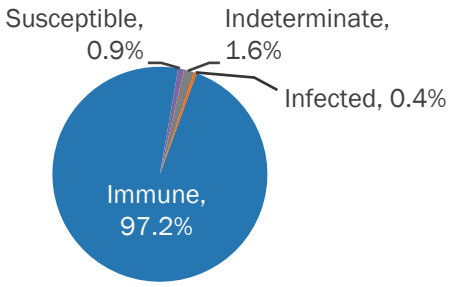


FIGURE 32. Test results of infants born to women with hepatitis B in New York City, 2017



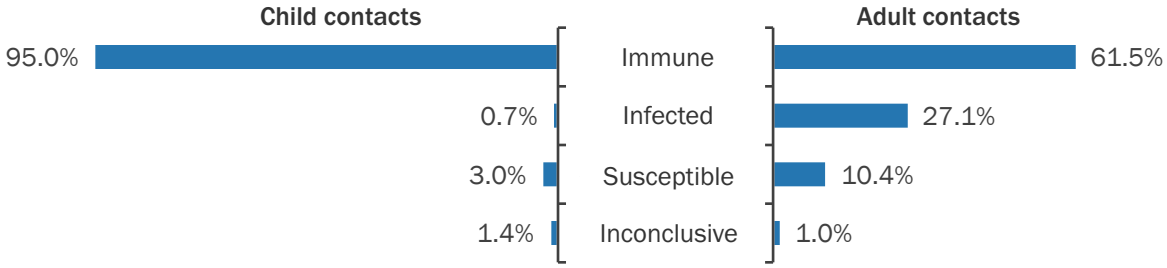
Hepatitis B Immunization and Testing of Sexual and Household Contacts

The Health Department identifies the household and sexual contacts of pregnant women with chronic hepatitis B and refers them for testing and vaccination.

758 Child contacts identified | **84%** Percentage of child contacts tested

435 Adult contacts identified | **22%** Percentage of adult contacts tested

FIGURE 33. Hepatitis B test results of child and adult contacts of pregnant women with hepatitis B, 2018



›› For full data, see Appendices 20 and 22.

Only 96 (22%) adult contacts were tested for hepatitis B. Of those, 27% had hepatitis B.

HEALTH DEPARTMENT RECOMMENDATION

- Hospitals should give PEP (hepatitis B immune globulin and a dose of hepatitis B vaccine) to all infants born to women 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 women with chronic hepatitis B are screened for and immunized against hepatitis B.

[23] The Health Department's Perinatal Hepatitis B Prevention Program reports on PEP after follow-up is completed, which occurs more than nine months after birth. Therefore, data are available only through 2017.

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.

18,274 | Number of syringe service program participants in 2018

4,500,926 | Number of syringes distributed in 2018

The Health Department works to expand access to methadone and buprenorphine, 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.

27,762 | Number of people in methadone treatment in 2018*

15,174 | Number of people filling a buprenorphine prescription in 2018*

2,358 | Number of providers who issued buprenorphine prescriptions to New York City residents in 2018*

*As of January 12, 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.

HEALTH DEPARTMENT RECOMMENDATION

- Providers should assess all patients for injection drug use and provide overdose and infection prevention services to patients who inject drugs.
- Providers should administer the hepatitis A and B vaccines to patients who report current injection drug use, or have hepatitis C.
- People who have had a nonfatal overdose should be screened for hepatitis B and C.

VIRAL HEPATITIS IN CORRECTIONAL FACILITIES

Since 2013, NYC Health + Hospitals/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.

15,593 | Number of hepatitis C antibody tests performed in 2018

5% | Percentage of hepatitis C screening tests that were positive in 2018

216 | Number of people treated for hepatitis C in New York City jails in 2018

509 | Number of people in New York City jails vaccinated against hepatitis B in 2018

LINKAGE TO CARE

The Health Department uses surveillance data to identify people reported with hepatitis B or C and provides patient navigation and linkage to care services. The Health Department prioritizes people who are out of care and are at risk for poor health outcomes. Health Department staff contact patients by telephone, assess barriers to care, and support linkage to hepatitis medical care and supportive services. In 2018, the Health Department enhanced its hepatitis surveillance database to track and evaluate patient navigation activities.

Hepatitis B Linkage to Care

As few as one-fifth of women who test positive for hepatitis B during pregnancy receive recommended follow-up care for hepatitis B after childbirth.[24] Since 2017, the Health Department has contacted women who gave birth and who were reported to the Health Department with chronic hepatitis B. Of 316 women enrolled, nearly half could not speak or read English, and many needed hepatitis B health education, referrals for supportive services and help scheduling appointments.

316 Number of women enrolled in 2017–2018

81% Percentage of women enrolled who were linked to hepatitis B medical care after childbirth in 2017–2018

Hepatitis C Linkage to Care

In 2018, the Health Department expanded its telephone-based patient navigation services to people living with hepatitis C. Among people with hepatitis C, the Health Department prioritized people who were coinfected with HIV, tested positive in NYC jails or who recently gave birth.

442 Number of people with hepatitis C called in 2018

156 Number of people contacted and offered services in 2018

111 Number of people linked to hepatitis C medical care in 2018

39 Number of people treated* in 2018

*Defined by negative hepatitis C RNA test reported on a date after the intervention was given

[24] Chang MS, Tuomala R, Rutherford AE, et al. Postpartum care for mothers diagnosed with hepatitis B during pregnancy. *Am J Obstet Gynecol*. 2015;212(3):365-e1.

COMMUNITY HEPATITIS NAVIGATION PROGRAMS

The Health Department promotes patient navigation for people at risk for and living with hepatitis B and C in NYC. Many people living with hepatitis B and C who are out of care face unique barriers to accessing health care such as low income, homelessness and limited or no health insurance. The Health Department supports programs that help patients overcome barriers to hepatitis B and C testing, care and treatment. In 2014, the Health Department established the Viral Hepatitis Initiative with funding from the NYC Council and private funders. Since then, the initiative has helped 33 community health organizations hire and train hepatitis B and C patient and peer navigators.

Peers and patient navigators are trained by the Health Department to provide:

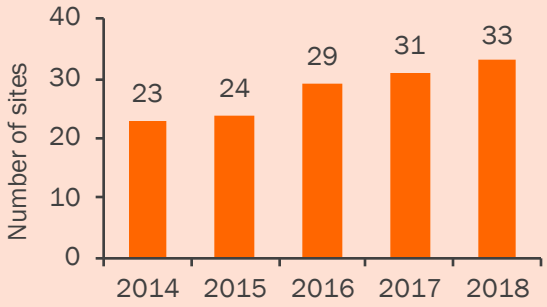
- Outreach and prevention services to people at risk (i.e., harm reduction and hepatitis B vaccine)
- Health promotion and help accessing supportive services
- Navigation through complete hepatitis C testing (antibody and confirmatory)
- Linkage to and retention in hepatitis B and C care and treatment

13,630 Number of people at risk for or living with hepatitis B or C who received hepatitis patient navigation services through the Viral Hepatitis Initiative*

5,983 Number of people who received hepatitis B or C medical care and treatment through the Viral Hepatitis Initiative*

*From July 1, 2014, through December 31, 2018

FIGURE 34. Number of Viral Hepatitis Initiative community health organizations, 2014–2018



TRAINING AND WORKFORCE DEVELOPMENT

Since 2014, the Viral Hepatitis Initiative has collaborated with the Empire Liver Foundation and the Harm Reduction Coalition to train health care providers and peer and patient navigators in effective hepatitis B and C prevention, testing, linkage to care, medical evaluation and treatment.

56 Number of patient navigators who were trained and employed at health centers, hospitals and community organizations

27 Number of hospitals that received hepatitis B or C grand rounds, reaching 1,547 clinical providers

79 Number of syringe services program participants who were trained and employed as peer navigators

234 Number of clinical providers who were trained to provide hepatitis B or C care and treatment

Helping People Who Use Drugs Join the Workforce

The Viral Hepatitis Initiative funds syringe service programs to train and employ program participants as hepatitis C peer navigators. This program supports peers in their own recovery and professional development.

CHECK HEP B PATIENT NAVIGATION PROGRAM

Since 2014, the Health Department has offered training and technical assistance to community organizations and health facilities that provide patient navigation to people living with chronic hepatitis B.

1,302 Number of people with hepatitis B enrolled in Check Hep B*

94% Percentage of enrollees who completed a hepatitis B medical evaluation*

93% Percentage of treatment candidates who started hepatitis B treatment*

*From July 1, 2014, through December 31, 2018

Check Hep B Patient Navigation Program Patient Characteristics

85% Percentage of participants born outside of the U.S.

58 Number of countries of birth

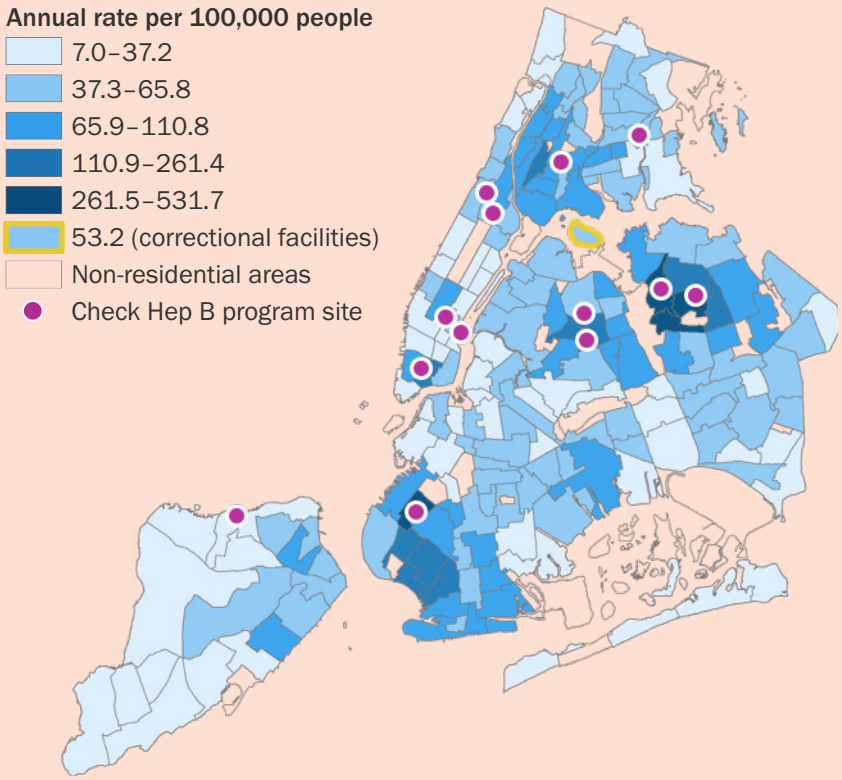
26% Percentage of participants who are uninsured

32 Number of languages spoken other than English

2018 Program Outcomes

In 2018, the Check Hep B Patient Navigation Program served 954 people living with chronic hepatitis B.

FIGURE 35. Rate of people newly reported with chronic hepatitis B in New York City by neighborhood tabulation area and Check Hep B Patient Navigation Program locations



Health Centers and Hospitals

1. APICHA Community Health Center
2. BronxCare Health System
3. Charles B. Wang Community Health Center
4. Health + Hospitals Bellevue Hospital
5. Health + Hospitals 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 Health Department has offered training and technical assistance to community organizations and health facilities that provide patient navigation to people with chronic hepatitis C. In health centers and hospitals, Check Hep C patient navigators coordinate patients' care to help them complete hepatitis C treatment. In syringe service programs, Check Hep C patient navigators conduct outreach, link patients to care and support retention in care to help patients complete hepatitis C treatment.

Patient navigation service	Health centers and hospitals	Syringe service programs
Number of people with chronic hepatitis C:		
Enrolled in 2018	1,450	798
Enrolled in 2014–2018*	3,193	893
Number of people with chronic hepatitis C:		
Linked to care*	90%	30%
Treated*	60%	19%

*From July 1, 2014, through December 31, 2018; most syringe service programs began implementation in July 2017

FIGURE 36. Check Hep C Patient Navigation Program participant characteristics

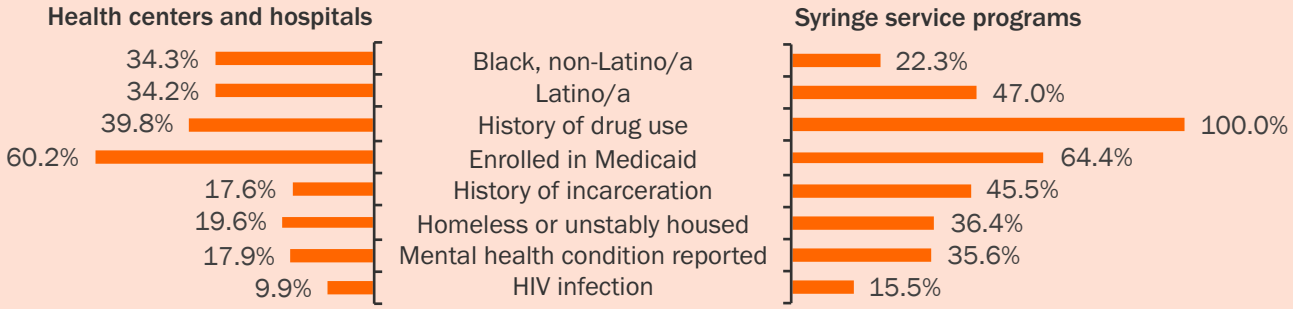
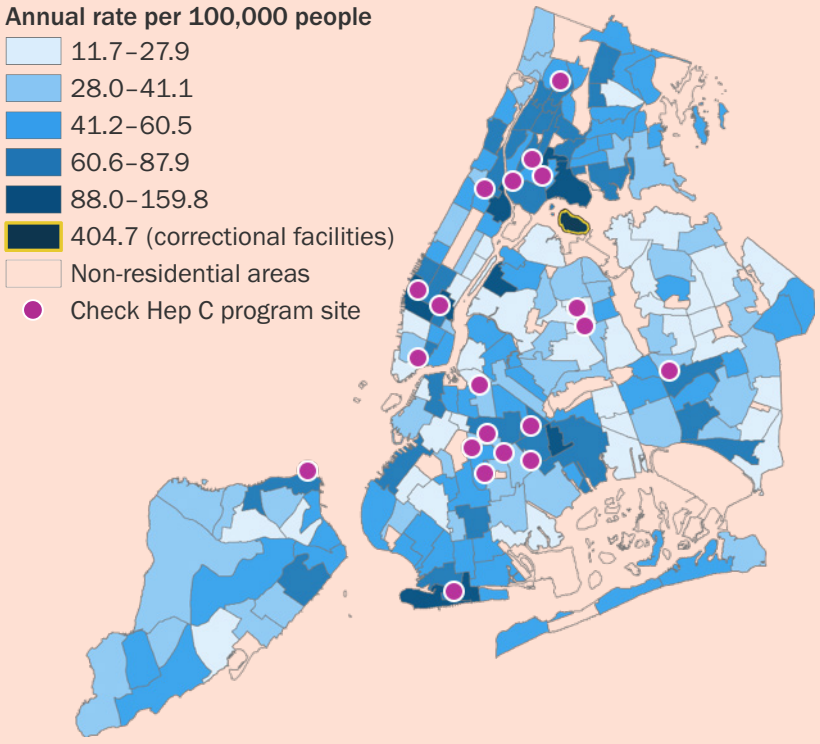


FIGURE 37. Rate of people newly reported with chronic hepatitis C in New York City by neighborhood tabulation area and Check Hep C Patient Navigation Program locations



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. Health + Hospitals Bellevue Hospital
7. Health + Hospitals Coney Island Hospital
8. Health + Hospitals Elmhurst Hospital
9. Health + Hospitals Kings County Hospital
10. Kingsbrook Jewish Medical Center
11. Montefiore Comprehensive Health Care Center

Syringe Service Programs

1. After Hours Project
2. Alliance for Positive Change
3. BOOM!Health
4. Community Health Action of Staten Island
5. Family Services Network of New York
6. Praxis Housing Initiatives

HEP C PEER NAVIGATION IN SYRINGE SERVICE PROGRAMS

Since 2014, the Health Department has provided training and technical assistance to 15 syringe service and harm reduction programs that provide peer navigation to people at risk for or living with hepatitis C. Peer navigators conduct outreach, promote prevention, link patients to care and support retention in care to promote complete hepatitis C treatment.

8,242 Number of people enrolled who received education and prevention services*

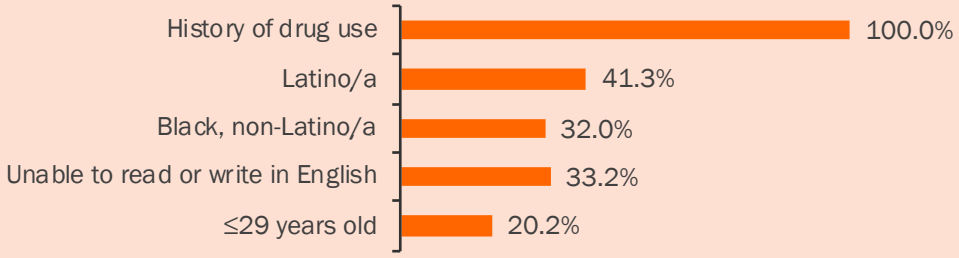
2,532 Number of people enrolled who tested positive for hepatitis C*

1,565 Number of people with hepatitis C who were linked to care*

358 Number people with hepatitis C who were treated*

*From July 1, 2014, through December 31, 2018

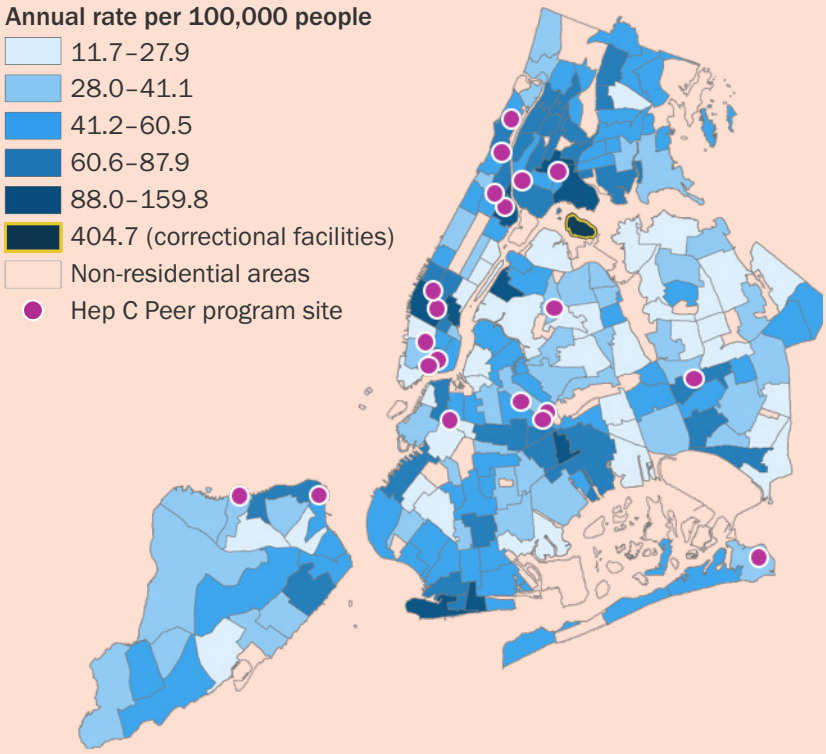
FIGURE 38. NYC Hep C Peer Navigation Program participant characteristics



2018 Program Outcomes

In 2018, the Hep C Peer Navigation Program at syringe service programs served 2,350 people at risk for or living with hepatitis C.

FIGURE 39. Rate of people newly reported with chronic hepatitis C in New York City by neighborhood tabulation area and Check Hep C Patient Navigation Program locations



Syringe Service Programs

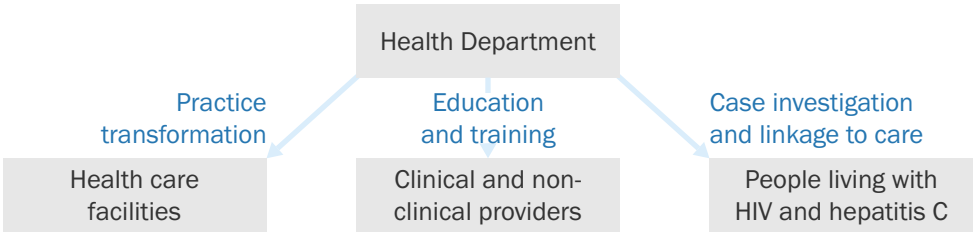
1. Alliance for Positive Change
2. After Hours Project
3. AIDS Center of Queens County
4. BOOM!Health
5. Community Health Action of Staten Island
6. Family Services Network of New York
7. Harlem United FROST'D
8. Housing Works Crosby Street
9. New York Harm Reduction Educators
10. Positive Health Project
11. Praxis Housing Initiatives
12. Safe Horizon Street works
13. St. Ann's Corner of Harm Reduction
14. VOCAL-NY
15. Washington Heights CORNER Project

CAPACITY BUILDING

The Health Department works to increase the capacity of community health and clinical providers to provide high-quality viral hepatitis care.

PROJECT SUCCEED: HEPATITIS C ELIMINATION IN PEOPLE LIVING WITH HIV

In 2016, the Health Department launched Project SUCCEED, a three-year intervention to increase screening and linkage to care among people coinfected with hepatitis C and HIV in NYC. Project SUCCEED is a multipronged initiative intervening at different levels of the health care system to improve health outcomes and reduce ethnic and racial disparities among people with coinfection.



Practice Transformation

Project SUCCEED offered technical assistance to health care facilities with the highest number of patients with hepatitis C and HIV coinfection. The project developed dashboards to identify the percentage of patients who had not received treatment for hepatitis C at 47 facilities, and provided 29 facilities a list of their coinfected patients to promote return to care and treatment. For nine health care facilities, Project SUCCEED provided mini-grants to improve hepatitis C screening and treatment practices.

47 Number of New York City hospitals that were provided hepatitis C patient data dashboards

134 Number of clinical and non-clinical health professionals trained in hepatitis C patient navigation, care and treatment

Education and Training

Project SUCCEED provided in-person and online hepatitis C training to 64 clinical and 170 non-clinical HIV providers. The project held three citywide provider meetings to promote dissemination of best practices.

Case Investigation and Linkage to Care

Project SUCCEED matched hepatitis C and HIV surveillance registries to identify people with hepatitis C and HIV coinfection in NYC. Using these data, Health Department patient navigators called 394 people with coinfection and provided hepatitis C education and linkage to hepatitis C treatment.

HEPATITIS C CLINICAL EXCHANGE NETWORK (HepCX)

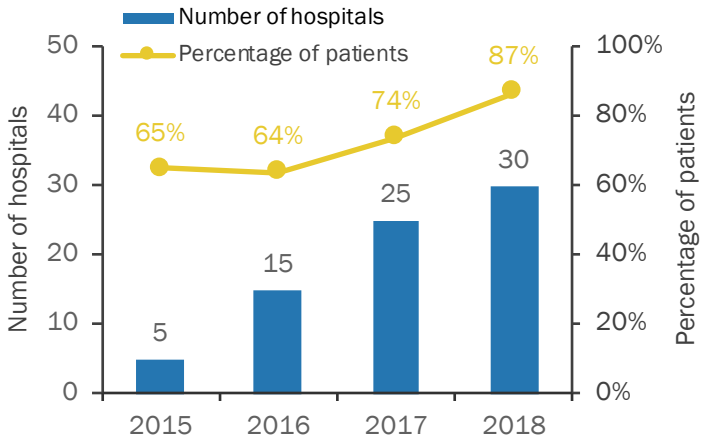
Since 2014, the Health Department has facilitated HepCX, a learning collaborative that aims to improve hepatitis C screening and treatment practices in NYC's hospitals. In 2018, the Health Department:

- Analyzed surveillance data to create dashboards (reports) displaying hepatitis C RNA confirmatory testing and treatment initiation rates for 30 hospitals
- Supported quality improvement initiatives at 40 hospitals in the HepCX network to increase rates of hepatitis C reflex RNA testing and treatment initiation, including providing mini-grants to six hospitals

Hepatitis C Reflex to RNA Testing

In 2018, HepCX aimed to increase the percentage of patients receiving a hepatitis C RNA test within three months of a positive antibody test to 85%.

FIGURE 40. Number of HepCX hospitals implementing reflex RNA testing and percentage of patients receiving a hepatitis C RNA test within three months of a positive antibody test, 2015–2018



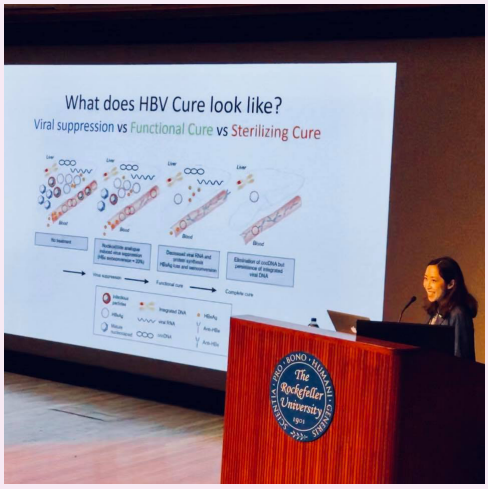
Hepatitis C Treatment Initiation

At HepCX network hospitals, 43% of patients with a positive RNA test in 2017 initiated treatment by the end of 2018.

›› 2018 NEW YORK CITY VIRAL HEPATITIS RESEARCH SYMPOSIUM

In May 2018, the Health Department convened more than 200 health care providers and researchers at the New York City Viral Hepatitis Research Symposium. The symposium focused on promoting equity in hepatitis B and C prevention and treatment. Workshops and posters presented at the symposium focused on the following:

- Overcoming barriers to improve hepatitis C screening, linkage to care and treatment
- Epidemiology and treatment of hepatitis B among pregnant women
- Hepatitis C among people who inject drugs, experience homelessness and are justice-involved
- Epidemiology and treatment of hepatitis B and C among immigrants and people of color



TRAINING

In 2018, the Health Department trained clinical providers, navigators, testers and other health professionals to strengthen hepatitis B and hepatitis C screening and linkage to care practices. Trainings included "Introduction to Viral Hepatitis," "Hep C Point of Care Testing," "Hep C Patient Navigation" and "Hep C Basics for Communities at Risk."

850 Number of health professionals trained in 2018

54 Number of trainings in 2018

99 Number of organizations represented at trainings in 2018

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

Since 2016, the Health Department has collaborated with the Empire Liver Foundation — an association of New York State (NYS) liver specialists — to deliver the Hepatitis Clinical Training Program. This program aims to increase the number of NYC physicians who screen, diagnose, manage and treat hepatitis B and C according to national guidelines.

720 Number of clinical providers trained in 2018

138 Number of organizations represented at trainings in 2018

HEP FREE NYC

Since 2004, the Health Department has organized a citywide network of community health organizations to work together to prevent, manage and treat hepatitis B and C in NYC. The Hep Free NYC network — which includes the NYC Hep B Coalition and the NYC Hep C Task Force — brings together various stakeholders including health care providers, public health professionals and advocates at semimonthly meetings.

217 Number of Hep Free NYC participating organizations in 2018

478 Number of meeting attendees in 2018

3,835 Number of Hep Free NYC email subscribers in 2018

At Hep Free NYC meetings, attendees review the latest surveillance, programmatic, policy and advocacy and research data, and discuss opportunities for strengthening patient referrals.

›› For more information about Hep Free NYC, contact hep@health.nyc.gov.

›› ORGANIZING FOR HEPATITIS AWARENESS

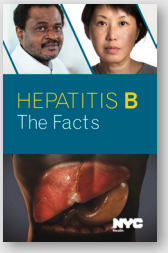
In 2018, Hep Free NYC activities included:

- The Sixth Annual Hepatitis Awareness Day event on the steps of City Hall with 140 advocates, health care leaders and NYC Council members
- National African HIV and Hepatitis Awareness Day collaboration among Hep Free NYC members
- Hep Free NYC's Twitter account (@HepFreeNYC) participated in the CDC's national Twitter #LiverChat with 15,100 impressions

PUBLIC EDUCATION

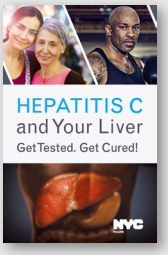
The Health Department produces and distributes free educational materials to community-based organizations and health care facilities to promote up-to-date hepatitis B and C health promotion, care and treatment and referrals to NYC resources.

Public Education Materials



The “Hepatitis B: The Facts” booklet offers basic hepatitis B information, as well as guidance on testing, treatment, prevention and self-care.

The "Hepatitis B Vaccine" palm card allows people to track their hepatitis B vaccinations.



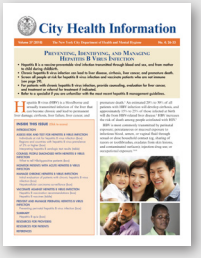
The “Hepatitis C and Your Liver” booklet offers basic hepatitis C information, as well as guidance on testing, treatment, prevention and self-care.

The “Hepatitis C: Get Checked, Get Cured” palm card provides key prevention and care messages for people at risk of or living with hepatitis C.

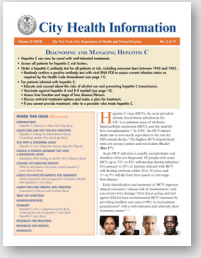
The “Get Hepatitis C Checked” poster promotes hepatitis C testing and treatment and explains the effectiveness of new treatments.

The “Reduce your Risk of Overdose, Hep C and HIV” palm card for people who use drugs has information about preventing overdose, hepatitis C and HIV.

Provider Education Materials



The “Diagnosing and Managing Hepatitis B” City Health Information (CHI) clinical bulletin gives guidance updated in 2018 on preventing, identifying and managing hepatitis B virus infection. See page 36 for more information.



The “Diagnosing and Managing Hepatitis C” CHI clinical bulletin gives guidance updated in 2018 on diagnosing and managing hepatitis C virus infection. See page 36 for more information.

›› For a full list of hepatitis B and C educational materials, call 311 or email hep@health.nyc.gov.

POLICY

The Health Department supports the development of State and City policies to improve viral hepatitis surveillance, monitoring and access to hepatitis care and treatment.

HEALTH CODE AMENDMENTS

The Health Department updated the NYC Health Code to ensure the effective monitoring of infections and prevention of hepatitis transmission.

- **Lowering Age of Exclusion for Children With Enteric Infections (Hepatitis A)**
  In 2014, the Health Code was amended to lower the age of exclusion for children with enteric infections, including hepatitis A, in school, day care or other congregate care settings. The age criterion was lowered from age 6 to age 5, so that control efforts are focused on ages with the highest risk for transmission.
- **Hepatitis B Test Reporting for Children**
  In 2014, the Health Code was amended to require laboratories to report all hepatitis B virus results for hepatitis B surface antigen (HBsAg) and hepatitis B surface antibody (anti-HBs) tests for children ages 0 to 5. This amendment allowed for more efficient and complete surveillance and case management of perinatal hepatitis B cases.
- **Negative Hepatitis C RNA/NAT and Negative Hepatitis B DNA Test Reporting**
  In 2014, the Health Code was amended to require laboratories to report all hepatitis C virus RNA or NAT test results, including negative results. In 2018, another amendment required laboratories to report all hepatitis B virus DNA test results. Previously, only positive test results were reported. These data will enable the Health Department to assess whether patients with hepatitis B and C are in care and to identify care and treatment gaps.
- **Removal of Reporting Requirement of Hepatitis D and E**
  In 2017, the Health Code was amended to remove the reporting requirement of hepatitis D and E. Surveillance since 2005 had revealed very few cases.
- **Hepatitis C Antibody to Reflex Testing Mandate**
  In October 2017, the New York City Health Code was amended to require laboratories to perform a confirmatory hepatitis C RNA test after obtaining a positive hepatitis C antibody test result. This requirement aims to improve hepatitis C diagnosis.

NEW YORK STATE'S HEPATITIS C ELIMINATION PLAN

Since 2016, the New York City Health Department has been a member of the New York State (NYS) Hepatitis C Elimination Initiative (for more information, visit endhepcny.org). In 2018, New York State established the Hepatitis C Elimination Task Force to carry out the Initiative's plan to eliminate hepatitis C statewide. The New York City Health Department is a member of this task force.

Changes to New York State's Medicaid Requirements for Hepatitis C Treatment Prescribers

As of August 2018, NYS Medicaid no longer requires providers prescribing hepatitis C treatment to meet its clinical experience and training requirements. Any NYS Medicaid provider may now prescribe hepatitis C treatment. Learn more at health.ny.gov/health_care/medicaid/program/update/2018/2018-06.htm.

PUBLICATIONS AND PRESENTATIONS

In 2018, the Health Department shared surveillance, research and direct service program data and findings in peer-reviewed journals and at local, regional and national conferences.

PUBLICATIONS

- 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.
- Bosh KA, Coyle JR, Hansen V, et al. HIV and viral hepatitis coinfection analysis using surveillance data from 15 US states and two cities. *Epidemiol Infect*. 2018;146(7):920-930.
- Teixeira PA, Bresnahan MP, Laraque F, et al. Telementoring of primary care providers delivering hepatitis C treatment in New York City: Results from Project INSPIRE. *Learn Health Sys*. 2018;2:e10056.
- Deming R, Ford MM, Moore MS, et al. Evaluation of a hepatitis C clinical care coordination program's effect on treatment initiation and cure: a surveillance-based propensity score matching approach. *J Viral Hepat*. 2018;25(11):1236-1243.
- Ford MM, Jorden AE, Johnson N, et al. Check Hep C: a community-based approach to hepatitis C diagnosis and linkage to care in high-risk populations. *J Public Health Manag Pract*. 2018;24(1):41-48.
- Moore MS, Bocour A, Winters A. Dialysis facility screening and testing practices in the era of improved hepatitis C treatment. *J Viral Hepat*. 2018;25(9):1099-1101.
- Moore MS, Bocour A, Laraque F, Winters A. A surveillance-based hepatitis C care cascade, New York City, 2017. *Public Health Rep*. 2018;133(4):497-501.
- Moore MS, Bocour A, Tran OC, et al. Effect of hepatocellular carcinoma on mortality among individuals with hepatitis B or hepatitis C infection in New York City, 2001–2012. *Open Forum Infect Dis*. 2018;5(7):ofy144.
- Torian LV, Felsen UR, Xia Q, et al. Undiagnosed HIV and HCV infection in a New York City Emergency Department, 2015. *Am J Public Health*. 2018;108(5):652-658

PRESENTATIONS

- Belfon K, Brenes A, Kgama M, Octave N. Project SUCCEED: HIV undetectable, hep C cured! Presented at 13th Annual Women as the Face of AIDS Summit, May 2018; New York, NY.
- Bocour A and Winters A. Using surveillance data to implement mandatory hepatitis C RNA reflex confirmatory testing in New York City. Presented at Council of State and Territorial Epidemiologists Annual Conference, June 2018; West Palm Beach, FL.
- Bresnahan MP. Project INSPIRE: Expanding care and providing support. Presented at NYC Viral Hepatitis Research Symposium, May 2018; New York, NY.
- Davidson C, Stalsburg BL, Bresnahan MP, Deming R. A qualitative approach to understanding perspectives from patients and the clinical team of Project INSPIRE, a comprehensive hepatitis C care coordination program. Presented at NYC Viral Hepatitis Research Symposium, May 2018; New York, NY.
- Diaz Muñoz D, Johnson N. Career pathways for hepatitis C peer navigators in New York City. Presented at 12th National Harm Reduction Conference, October 2018; New Orleans, LA.
- Flanigan C, Davidson A, Perumalswami P, Weiss J, Schwartz J. A survey of the hepatitis C infrastructure and technical assistance needs of New York State community health centers. The AASLD Liver Meeting, November 2018; San Francisco, CA.
- Johnson N, Diaz Muñoz D, Schwartz J, Khatun U, Winters A. Hepatitis C screening and linkage to care at four New York City syringe exchange programs. Presented at International Symposium on Hepatitis Care in Substance Users, September 2018; Cascais, Portugal.

- Johnson N, Casey A. Project SUCCEED: using a data to care approach to eliminate hepatitis C in people living with HIV in New York City. Presented at United States Conference on AIDS; September 2018; Orlando, FL.
- Kela-Murphy N, Harrison E, Duerme R, Bresnahan MP, Winters A. Quality improvement initiatives for hepatitis C management in hospital-based practices in New York City. Presented at Institute for Healthcare Improvement Summit on Improving Patient Care, April 2018; San Diego, CA.
- Kgama M. Project SUCCEED: scaling up coinfection care and eliminating ethnic disparities. Presented at Coalition on Positive Health Empowerment Hep C University Conference, July 2018; New York, NY.
- Khosa P, Bocour A, Duerme D, Kela-Murphy N, Peterson E, Winters A. Using surveillance data to understand hepatitis C testing practices at New York City hospitals. Presented at NYC Viral Hepatitis Research Symposium, May 2018; New York, NY.
- Moore MS, Bocour A, Winters A. Evaluating hepatitis C RNA negative to positive test conversions as possible acute infections. Presented at Northeast Epidemiology Conference, November 2018; Manchester, VT.
- Penrose K, Moore M, Casey A, Johnson N, Schwartz J, Bocour A. Persons without durable HIV viral suppression are less likely to initiate treatment for hepatitis C. Presented at NYC Viral Hepatitis Research Symposium, May 2018; New York, NY.
- Schwartz J. Patient navigation to promote hep B linkage to care among perinatal hepatitis B program patients. Presented at the NASTAD National HIV and Hepatitis Technical Assistance Meeting, October 2018; Baltimore, MD.
- Tang L. Hep B Moms Project: a postpartum patient navigation program for women living with hepatitis B. Presented at Hep B United Summit, July 2018; Washington, DC.
- Winters A, Khosa P, Bocour A. Understanding perinatal hepatitis C exposure in New York City using surveillance and birth certificate data. Presented at The AASLD Liver Meeting, November 2018; San Francisco, CA.
- Whitney A. Hep C basics and New York City Health Department Hep C Peer and Patient Navigation Programs. Presented at Tackling Youth Substance Abuse Opioid Workgroup meeting, December 2018; Staten Island, NY.

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). a816-healthpsi.nyc.gov/epiquery.
- New York City Department of Health and Mental Hygiene Hepatitis A, B and C Reports: www1.nyc.gov/site/doh/data/data-sets/hepatitis-abc-surveillance-data.page.
- 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.
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- Prussing C, Chan C, Pinchoff J, et al. HIV and viral hepatitis coinfection in New York City, 2000-2010: prevalence and case characteristics. *Epidemiol and Infect*. 2015;143(7):1408-1416.

National and state guidelines on hepatitis prevention, care and treatment:

- National Academies of Sciences, Engineering and Medicine, "A National Strategy for the Elimination of Hepatitis B and C: Phase Two Report": nap.edu/24731.
- New York State Health Department, "Viral Hepatitis Strategic Plan 2016-2020": health.ny.gov/publications/1806.pdf.
- U.S. Preventive Services Task Force, "Guide to Clinical Preventive Services 2014": ahrq.gov/professionals/clinicians-providers/guidelines-recommendations/guide/index.html

Clinical guidance on hepatitis screening, care and treatment:

- American Association for the Study of Liver Diseases Practice Guidelines: aasld.org/publications/practice-guidelines-0.
- New York City Department of Health and Mental Hygiene, 2018. "Diagnosing and Managing Hepatitis C": 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": www1.nyc.gov/assets/doh/downloads/pdf/chi/chi-37-4.pdf.

For interpreting Health Department surveillance data:

- Centers for Disease Control and Prevention Case Definitions: cdc.gov/nndss/case-definitions.html.
- Neighborhood Tabulation Areas (NTAs): 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 CDC'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 2012 to 2016. Neighborhood poverty categories are defined as follows:
  - Low (less than 10 percent below FPL)
  - Medium (10 to less than 20 percent below FPL)
  - High (20 to less than 30 percent below FPL)
  - Very high (greater than or equal to 30 percent 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-healthpsi.nyc.gov/epiquery/CDSS/index.html.

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 2016, 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 Neighborhood Tabulation Areas (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.

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: Characteristics of people reported with confirmed hepatitis A infection in New York City, 2018

Characteristics	Number	Percentage of each group	Rate per 100,000 people
Overall	61	100.0	0.7
Sex			
Female	22	36.1	0.5
Male	39	63.9	0.9
Age at time of first report			
0–9	4	6.6	0.4
10–19	3	4.9	0.3
20–29	12	19.7	0.9
30–39	21	34.4	1.5
40–49	9	14.8	0.8
50–59	5	8.2	0.5
≥60	7	11.5	0.4
Race and ethnicity			
Latino/a	15	24.6	0.6
White, non-Latino/a	25	41.0	0.9
Black, non-Latino/a	8	13.1	0.4
Asian, non-Latino/a	9	14.8	0.7
Other	4	6.6	2.3
Unknown	0	0.0	N/A
Borough of residence			
Bronx	8	13.1	0.5
Brooklyn	18	29.5	0.7
Manhattan	12	19.7	0.7
Queens	20	32.8	0.8
Staten Island	3	4.9	0.6
Neighborhood poverty level by ZIP code			
Low (<10% below poverty)	12	19.7	0.8
Medium (10 to <20%)	25	41.0	0.8
High (20 to <30%)	15	24.6	0.6
Very high (≥30%)	9	14.8	0.6
Risk factors (not mutually exclusive)			
Men who have sex with men	11	18.0	N/A
International travel	23	37.7	N/A
Drug use	10	16.4	N/A
Contact with a person with hepatitis A	1	1.6	N/A
Homelessness	2	3.3	N/A
Unknown	23	37.7	N/A

APPENDIX 3: Hepatitis A, B and C reporting in New York City

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, for example, 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).

Hepatitis A cases should also be reported immediately to the PAL at (866) 692-3641 if the case meets any of this risk group criteria:

- Food handler in a commercial establishment
- Staff member or child (aged <5) in a school, daycare facility, camp or other congregate setting
- Resident or staff member in a correctional facility, homeless facility, or other congregate residence
- Healthcare practitioner that provides oral care or feeds patients

APPENDIX 4: Characteristics of people reported with acute hepatitis B in New York City, 2018

Characteristics	Number	Percentage of each group	Rate per 100,000 people
Overall	21	100.0	0.2
Sex			
Female	4	19.0	0.1
Male	17	81.0	0.4
Age at time of first report			
0–19	0	0.0	0.0
20–29	1	4.8	0.1
30–39	5	23.8	0.4
40–49	7	33.3	0.6
50–59	4	19.0	0.4
≥60	4	19.0	0.2
Race and ethnicity			
Latino/a	1	4.8	0.0
White, non-Latino/a	3	14.3	0.1
Black, non-Latino/a	6	28.6	0.3
Asian, non-Latino/a	2	9.5	0.2
Multi-race	1	4.8	0.7
Unknown	8	38.1	N/A
Borough of residence			
Bronx	3	14.3	0.2
Brooklyn	5	23.8	0.2
Manhattan	3	14.3	0.2
Queens	8	38.1	0.3
Staten Island	2	9.5	0.4
Neighborhood poverty level by ZIP code			
Low (<10% below poverty)	3	14.3	0.2
Medium (10 to <20%)	6	28.6	0.2
High (20 to <30%)	8	38.1	0.3
Very high (≥30%)	4	19.0	0.3
Risk factors (mutually exclusive[1])			
Injection drug use	0	0.0	N/A
Household contact with a person with hepatitis B	2	9.5	N/A
Men who have sex with men	1	4.8	N/A
Heterosexual contact (multiple partners)	0	0.0	N/A
Heterosexual contact (one partner)	9	42.9	N/A
Health care-related exposure	3	14.3	N/A
Other	1	4.8	N/A
Unknown	5	23.8	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 New York City, 2018

Characteristics	People newly reported in 2018			All people reported 2015–2018, regardless of year of first report	
	Number	Percentage of each group	Rate per 100,000 people	Number	Percentage of each group
Overall	6,075	100.0	70.5	93,605	100.0
Sex[1]					
Female	2,656	43.7	58.9	41,891	44.8
Male	3,407	56.1	82.8	51,596	55.1
Unknown	12	0.2	N/A	116	0.1
Age at time of first report[2]					
0–19	133	2.2	6.7	4,774	5.1
20–29	994	16.4	71.7	21,888	23.4
30–39	1,632	26.9	119.1	25,318	27.0
40–49	1,200	19.8	109.1	19,551	20.9
50–59	1,025	16.9	94.9	13,177	14.1
60–69	688	11.3	78.6	6,522	7.0
≥70	401	6.6	47.9	2,371	2.5
Borough of residence					
Bronx[3]	944	15.5	64.2	9,627	10.3
Brooklyn	2,071	34.1	78.2	34,006	36.3
Manhattan	809	13.3	48.6	18,656	19.9
Queens	1,829	30.1	77.5	27,983	29.9
Staten Island	167	2.7	34.8	1,879	2.0
Unknown	255	4.2	N/A	1,454	1.6
Neighborhood poverty level by ZIP code[4]					
Low (<10% below poverty)	545	9.0	35.9	9,001	9.6
Medium (10 to <20%)	1,786	29.5	55.0	26,066	27.9
High (20 to <30%)	1,927	31.8	83.4	32,918	35.2
Very high (≥30%)	1,527	25.2	98.7	23,387	25.0
Unknown	267	4.4	N/A	2,019	2.2

[1] People reported as transgender are excluded. Gender identity is not consistently reported by all laboratories and is therefore underreported. From 2015–2018, there were two people reported with transgender identity.
[2] Four people reported during 2015–2018 are missing age at first report.
[3] The Bronx includes people in Rikers Island facilities. In 2018, 10 people were reported from Rikers Island.
[4] Neighborhood poverty level data excludes people incarcerated at the time of first report. In 2018, there were 23 newly reported people incarcerated at the time of first report. From 2015–2018, there were 214 incarcerated at time of their most recent report.

APPENDIX 6: Characteristics of decedents where hepatitis B is listed as the underlying cause or contributing cause of death, New York City, 2017

Characteristics	Number	Percentage of each group	Age-adjusted rate per 100,000 people[1]
Overall	83	N/A	0.9
Sex			
Female	25	30.1	0.5
Male	58	69.9	1.4
Age			
0–24	0	0.0	0.0
25–44	2	2.4	0.1
45–64	41	49.4	1.9
65–84	35	42.2	3.3
≥85	5	6.0	2.8
Race and ethnicity			
Black, non-Latino/a	21	25.3	0.9
White, non-Latino/a	11	13.3	0.3
Asian/Pacific Islander, non-Latino/a	31	37.3	2.2
Latino/a	18	21.7	0.8
Other	2	2.4	N/A
Unknown	0	0.0	N/A

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

APPENDIX 7: Number and rate of people newly reported with chronic hepatitis B by neighborhood tabulation area (NTA) in New York City, 2018[1]

NTA name (code)	Number of cases	Rate per 100,000 people
Allerton-Pelham Gardens (BX31)	13	39.0
Annadale-Huguenot-Prince's Bay-Eltingville (SI01)	2	7.0
Arden Heights (SI48)	6	22.7
Astoria (QN70)	31	40.0
Auburndale (QN48)	26	122.6
Baisley Park (QN76)	20	51.0
Bath Beach (BK27)	51	147.6
Battery Park City-Lower Manhattan (MN25)	8	16.7
Bay Ridge (BK31)	37	45.4
Bayside-Bayside Hills (QN46)	43	93.4
Bedford (BK75)	26	34.5
Bedford Park-Fordham North (BX05)	33	57.6
Bellerose (QN43)	12	43.6
Belmont (BX06)	19	64.9
Bensonhurst East (BK29)	89	132.5
Bensonhurst West (BK28)	153	160.0
Borough Park (BK88)	99	91.4
Breezy Point-Belle Harbor-Rockaway Park-Broad Channel (QN10)	2	7.1
Briarwood-Jamaica Hills (QN35)	21	48.4
Brighton Beach (BK19)	31	88.7
Bronxdale (BX07)	21	52.1
Brooklyn Heights-Cobble Hill (BK09)	2	8.0
Brownsville (BK81)	29	49.5
Bushwick North (BK77)	21	34.8
Bushwick South (BK78)	30	40.4
Cambria Heights (QN33)	11	54.4
Canarsie (BK50)	52	60.1
Carroll Gardens-Columbia Street-Red Hook (BK33)	8	18.2
Central Harlem North-Polo Grounds (MN03)	58	68.7
Central Harlem South (MN11)	32	65.0
Charleston-Richmond Valley-Tottenville (SI11)	2	8.3
Chinatown (MN27)	109	228.0
Claremont-Bathgate (BX01)	32	91.0
Clinton (MN15)	27	51.4
Clinton Hill (BK69)	16	40.6
Co-op City (BX13)	13	25.7
College Point (QN23)	25	94.8
Corona (QN25)	49	82.2
Crotona Park East (BX75)	16	68.2
Crown Heights North (BK61)	58	54.5
Crown Heights South (BK63)	24	57.0
Cypress Hills-City Line (BK83)	24	49.3
Douglas Manor-Douglaston-Little Neck (QN45)	12	45.6
DUMBO-Vinegar Hill-Downtown Brooklyn-Boerum Hill (BK38)	18	38.0
Dyker Heights (BK30)	125	261.4
East Concourse-Concourse Village (BX14)	82	123.6
East Elmhurst (QN27)	19	86.5
East Flatbush-Farragut (BK91)	29	54.0
East Flushing (QN52)	81	291.9
East Harlem North (MN34)	37	60.9
East Harlem South (MN33)	34	56.8
East New York (BK82)	66	71.3
East New York (Pennsylvania Ave) (BK85)	13	45.5
East Tremont (BX17)	27	59.5
East Village (MN22)	3	7.2
East Williamsburg (BK90)	16	43.1
Eastchester-Edenwald-Baychester (BX03)	18	50.4
Elmhurst (QN29)	121	139.1
Elmhurst-Maspeth (QN50)	38	137.8
Erasmus (BK95)	19	65.8
Far Rockaway-Bayswater (QN15)	14	25.6
Flatbush (BK42)	70	64.1
Flatlands (BK58)	18	24.9
Flushing (QN22)	326	429.5
Fordham South (BX40)	16	55.4
Forest Hills (QN17)	66	74.5

[1] 440 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 neighborhood tabulation area (NTA) in New York City, 2018 (cont.)

NTA name (code)	Number of cases	Rate per 100,000 people
Fort Greene (BK68)	11	33.5
Fresh Meadows-Utopia (QN41)	17	88.4
Ft. Totten-Bay Terrace-Clearview (QN47)	10	44.5
Georgetown-Marine Park-Bergen Beach-Mill Basin (BK45)	15	30.7
Glen Oaks-Floral Park-New Hyde Park (QN44)	6	25.1
Glendale (QN19)	7	20.6
Gramercy (MN21)	5	18.2
Grasmere-Arrochar-Ft. Wadsworth (SI14)	9	55.3
Gravesend (BK26)	22	70.6
Great Kills (SI54)	9	20.7
Greenpoint (BK76)	5	14.6
Grymes Hill-Clifton-Fox Hills (SI08)	20	89.9
Hamilton Heights (MN04)	26	50.0
Hammels-Arverne-Edgemere (QN12)	13	33.4
Highbridge (BX26)	29	72.7
Hollis (QN07)	4	18.4
Homecrest (BK25)	28	61.9
Hudson Yards-Chelsea-Flatiron-Union Square (MN13)	28	34.1
Hunters Point-Sunnyside-West Maspeth (QN31)	44	59.5
Hunts Point (BX27)	20	73.4
Jackson Heights (QN28)	63	58.8
Jamaica (QN61)	36	63.3
Jamaica Estates-Holliswood (QN06)	17	61.5
Kensington-Ocean Parkway (BK41)	34	87.8
Kew Gardens (QN60)	7	29.1
Kew Gardens Hills (QN37)	36	92.8
Kingsbridge Heights (BX30)	28	86.3
Laurelton (QN66)	9	32.7
Lenox Hill-Roosevelt Island (MN31)	29	34.9
Lincoln Square (MN14)	15	24.2
Lindenwood-Howard Beach (QN57)	4	14.1
Longwood (BX33)	14	47.0
Lower East Side (MN28)	46	61.2
Madison (BK44)	30	72.6
Manhattanville (MN06)	12	51.2
Marble Hill-Inwood (MN01)	17	32.1
Mariner's Harbor-Arlington-Port Ivory-Graniteville (SI12)	10	32.5
Maspeth (QN30)	22	75.7
Melrose South-Mott Haven North (BX34)	31	70.4
Middle Village (QN21)	18	47.4
Midtown-Midtown South (MN17)	31	100.1
Midwood (BK43)	44	81.0
Morningside Heights (MN09)	31	59.0
Morrisania-Melrose (BX35)	40	98.6
Mott Haven-Port Morris (BX39)	40	70.8
Mount Hope (BX41)	52	96.0
Murray Hill (QN51)	75	135.4
Murray Hill-Kips Bay (MN20)	21	44.6
New Brighton-Silver Lake (SI35)	9	49.0
New Dorp-Midland Beach (SI45)	17	79.3
New Springville-Bloomfield-Travis (SI05)	14	33.3
North Corona (QN26)	23	42.4
North Riverdale-Fieldston-Riverdale (BX22)	4	14.6
North Side-South Side (BK73)	14	24.0
Norwood (BX43)	18	40.9
Oakland Gardens (QN42)	22	75.2
Oakwood-Oakwood Beach (SI25)	3	14.5
Ocean Hill (BK79)	11	33.1
Ocean Parkway South (BK46)	9	41.9
Old Astoria (QN71)	13	46.0
Old Town-Dongan Hills-South Beach (SI36)	14	55.4
Ozone Park (QN56)	12	51.2
Park Slope-Gowanus (BK37)	10	13.0

APPENDIX 7: Number and rate of people newly reported with chronic hepatitis B by neighborhood tabulation area (NTA) in New York City, 2018 (cont.)

NTA name (code)	Number of cases	Rate per 100,000 people
park-cemetery-etc-Bronx (BX99)	0	--
park-cemetery-etc-Manhattan (MN99)	0	--
Parkchester (BX46)	22	68.4
Pelham Bay-Country Club-City Island (BX10)	15	56.6
Pelham Parkway (BX49)	19	61.9
Pomonok-Flushing Heights-Hillcrest (QN38)	15	40.7
Port Richmond (SI28)	6	30.7
Prospect Heights (BK64)	10	44.7
Prospect Lefferts Gardens-Wingate (BK60)	32	45.7
Queens Village (QN34)	22	39.6
Queensboro Hill (QN62)	69	306.8
Queensbridge-Ravenswood-Long Island City (QN68)	12	58.0
Rego Park (QN18)	28	96.7
Richmond Hill (QN54)	23	33.3
Ridgewood (QN20)	23	31.7
Rikers Island (BX98)	23	53.2
Rosedale (QN05)	7	25.5
Rossville-Woodrow (SI32)	4	18.9
Rugby-Remsen Village (BK96)	21	37.7
Schuylerville-Throgs Neck-Edgewater Park (BX52)	14	29.3
Seagate-Coney Island (BK21)	28	94.0
Sheepshead Bay-Gerritsen Beach-Manhattan Beach (BK17)	54	79.5
SoHo-TriBeCa-Civic Center-Little Italy (MN24)	34	79.2
Soundview-Bruckner (BX55)	25	64.0
Soundview-Castle Hill-Clason Point-Harding Park (BX09)	27	46.3
South Jamaica (QN01)	26	62.2
South Ozone Park (QN55)	23	26.7
Springfield Gardens North (QN02)	9	31.7
Springfield Gardens South-Brookville (QN03)	11	50.0
Spuyten Duyvil-Kingsbridge (BX29)	7	21.7
St. Albans (QN08)	22	39.7
Stapleton-Rosebank (SI37)	15	55.4
Starrett City (BK93)	6	47.6
Steinway (QN72)	19	39.5
Stuyvesant Heights (BK35)	32	48.0
Stuyvesant Town-Cooper Village (MN50)	6	25.5
Sunset Park East (BK34)	400	531.7
Sunset Park West (BK32)	41	70.4
Todt Hill-Emerson Hill-Heartland Village-Lighthouse Hill (SI24)	13	39.0
Turtle Bay-East Midtown (MN19)	19	36.8
University Heights-Morris Heights (BX36)	47	82.9
Upper East Side-Carnegie Hill (MN40)	11	18.0
Upper West Side (MN12)	26	19.0
Van Cortlandt Village (BX28)	30	56.9
Van Nest-Morris Park-Westchester Square (BX37)	15	50.0
Washington Heights North (MN35)	22	29.7
Washington Heights South (MN36)	43	46.2
West Brighton (BK23)	10	61.9
West Concourse (BX63)	31	81.1
West Farms-Bronx River (BX08)	27	73.3
West New Brighton-New Brighton-St. George (SI22)	5	14.6
West Village (MN23)	11	16.5
Westchester-Unionport (BX59)	11	37.2
Westerleigh (SI07)	8	32.8
Whitestone (QN49)	18	57.0
Williamsbridge-Olinville (BX44)	35	53.0
Williamsburg (BK72)	3	8.8
Windsor Terrace (BK40)	8	34.9
Woodhaven (QN53)	24	37.8
Woodlawn-Wakefield (BX62)	14	31.3
Woodside (QN63)	52	110.8
Yorkville (MN32)	20	24.5

APPENDIX 8: New York City neighborhood tabulation areas (NTA)

APPENDIX 9: Characteristics of people reported with chronic hepatitis C in New York City, 2018

Characteristics	People newly reported in 2018			All people reported 2015–2018, regardless of year of first report	
	Number	Percentage of each group	Rate per 100,000 people	Number	Percentage of each group
Overall	4,682	100.0	56.5	98,313	100.0
Sex[1]					
Female	1,702	36.4	39.2	36,822	37.5
Male	2,973	63.5	75.5	61,335	62.4
Unknown	7	0.1	N/A	152	0.2
Age at time of first report					
0–2[2]	N/A	N/A	N/A	63	0.1
3–19	41	0.9	2.5	856	0.9
20–29	636	13.6	45.9	7,466	7.6
30–39	912	19.5	66.6	15,870	16.1
40–49	742	15.8	67.4	27,677	28.2
50–59	934	19.9	86.5	29,063	29.6
60–69	919	19.6	105.0	12,823	13.0
≥70	498	10.6	59.5	4,495	4.6
Birth cohort					
1900–1944	331	7.1	55.7	8,595	8.7
1945–1965	1,805	38.6	97.0	61,429	62.5
1966–1983	1,422	30.4	68.8	21,663	22.0
1984–2015	1,124	24.0	29.9	6,626	6.7
Borough of residence					
Bronx[3]	1,046	22.3	74.4	25,890	26.3
Brooklyn	1,288	27.5	50.9	28,241	28.7
Manhattan	1,018	21.7	63.1	21,923	22.3
Queens	801	17.1	35.3	16,747	17.0
Staten Island	195	4.2	42.1	4,163	4.2
Unknown	334	7.1	N/A	1,349	1.4
Neighborhood poverty level by ZIP code[4]					
Low (<10% below poverty)	468	10.5	31.9	10,302	10.8
Medium (10 to <20%)	1,472	33.1	47.0	29,590	31.0
High (20 to <30%)	1,175	26.3	53.1	26,729	28.0
Very high (≥30%)	1,004	22.5	68.2	26,847	28.2
Unknown	339	7.6	N/A	1,918	2.0

[1] People reported as transgender are excluded. Gender identity is not consistently reported by all laboratories and is therefore underreported. From 2015–2018, there were four people reported with transgender identity.
[2] People newly reported in 2018 ages 0-2 years are classified using the 2018 CDC perinatal hepatitis C case definition and are reported in Appendix 12.
[3] The Bronx includes people in Rikers Island facilities. In 2018, 175 people were reported from Rikers Island.
[4] Neighborhood poverty level data excludes people incarcerated at the time of first report. In 2018, there were 224 newly reported people incarcerated at the time of first report. From 2015–2018, there were 2,927 people incarcerated at time of their most recent report.

APPENDIX 10: Number and rate of people newly reported with chronic hepatitis C by neighborhood tabulation area (NTA) in New York City, 2018[1]

NTA name (code)	Number of cases	Rate per 100,000 people
Allerton-Pelham Gardens (BX31)	9	27.9
Annadale-Huguenot-Prince's Bay-Eltingville (SI01)	15	54.2
Arden Heights (SI48)	10	39.1
Astoria (QN70)	34	45.2
Auburndale (QN48)	3	14.6
Baisley Park (QN76)	29	77.0
Bath Beach (BK27)	19	57.3
Battery Park City-Lower Manhattan (MN25)	12	26.0
Bay Ridge (BK31)	36	45.9
Bayside-Bayside Hills (QN46)	11	24.7
Bedford (BK75)	24	34.0
Bedford Park-Fordham North (BX05)	34	62.4
Bellerose (QN43)	16	60.2
Belmont (BX06)	14	50.1
Bensonhurst East (BK29)	35	54.1
Bensonhurst West (BK28)	46	49.9
Borough Park (BK88)	23	23.3
Breezy Point-Belle Harbor-Rockaway Park-Broad Channel (QN10)	13	47.9
Briarwood-Jamaica Hills (QN35)	12	28.8
Brighton Beach (BK19)	48	141.9
Bronxdale (BX07)	26	67.3
Brooklyn Heights-Cobble Hill (BK09)	5	20.8
Brownsville (BK81)	42	75.3
Bushwick North (BK77)	31	53.8
Bushwick South (BK78)	29	40.6
Cambria Heights (QN33)	5	25.5
Canarsie (BK50)	32	38.4
Carroll Gardens-Columbia Street-Red Hook (BK33)	15	35.9
Central Harlem North-Polo Grounds (MN03)	59	72.7
Central Harlem South (MN11)	24	50.7
Charleston-Richmond Valley-Tottenville (SI11)	8	34.1
Chinatown (MN27)	36	77.1
Claremont-Bathgate (BX01)	29	87.0
Clinton (MN15)	36	69.9
Clinton Hill (BK69)	19	50.3
Co-op City (BX13)	22	44.6
College Point (QN23)	7	27.7
Corona (QN25)	25	44.0
Crotona Park East (BX75)	17	76.0
Crown Heights North (BK61)	77	75.5
Crown Heights South (BK63)	13	32.5
Cypress Hills-City Line (BK83)	23	49.6
Douglas Manor-Douglaston-Little Neck (QN45)	3	11.7
DUMBO-Vinegar Hill-Downtown Brooklyn-Boerum Hill (BK38)	34	75.3
Dyker Heights (BK30)	17	37.0
East Concourse-Concourse Village (BX14)	44	69.7
East Elmhurst (QN27)	6	28.5
East Flatbush-Farragut (BK91)	17	32.8
East Flushing (QN52)	12	44.8
East Harlem North (MN34)	68	116.2
East Harlem South (MN33)	32	55.4
East New York (BK82)	58	65.7
East New York (Pennsylvania Ave) (BK85)	31	114.5
East Tremont (BX17)	34	78.8
East Village (MN22)	21	51.0
East Williamsburg (BK90)	16	44.2
Eastchester-Edenwald-Baychester (BX03)	15	43.6
Elmhurst (QN29)	21	25.1
Elmhurst-Maspeth (QN50)	7	26.3
Erasmus (BK95)	12	43.4
Far Rockaway-Bayswater (QN15)	18	34.9
Flatbush (BK42)	44	42.2
Flatlands (BK58)	24	34.4
Flushing (QN22)	20	27.1
Fordham South (BX40)	24	87.9
Forest Hills (QN17)	22	25.8

[1] 505 people could not be assigned to an NTA based on their address at first report.

APPENDIX 10: Number and rate of people newly reported with chronic hepatitis C by neighborhood tabulation area (NTA) in New York City, 2018 (cont.)

NTA name (code)	Number of cases	Rate per 100,000 people
Fort Greene (BK68)	18	57.0
Fresh Meadows-Utopia (QN41)	4	21.6
Ft. Totten-Bay Terrace-Clearview (QN47)	8	36.8
Georgetown-Marine Park-Bergen Beach-Mill Basin (BK45)	8	17.0
Glen Oaks-Floral Park-New Hyde Park (QN44)	10	42.9
Glendale (QN19)	10	30.6
Gramercy (MN21)	21	77.7
Grasmere-Arrochar-Ft. Wadsworth (SI14)	8	50.7
Gravesend (BK26)	19	63.4
Great Kills (SI54)	6	14.2
Greenpoint (BK76)	15	45.0
Grymes Hill-Clifton-Fox Hills (SI08)	5	23.4
Hamilton Heights (MN04)	26	51.7
Hammels-Arverne-Edgemere (QN12)	16	43.1
Highbridge (BX26)	29	76.5
Hollis (QN07)	9	42.8
Homecrest (BK25)	26	60.5
Hudson Yards-Chelsea-Flatiron-Union Square (MN13)	128	159.8
Hunters Point-Sunnyside-West Maspeth (QN31)	16	22.5
Hunts Point (BX27)	38	146.7
Jackson Heights (QN28)	30	29.1
Jamaica (QN61)	34	62.6
Jamaica Estates-Holliswood (QN06)	7	26.1
Kensington-Ocean Parkway (BK41)	19	51.5
Kew Gardens (QN60)	11	47.7
Kew Gardens Hills (QN37)	14	38.3
Kingsbridge Heights (BX30)	21	68.0
Laurelton (QN66)	5	18.7
Lenox Hill-Roosevelt Island (MN31)	18	22.5
Lincoln Square (MN14)	25	42.1
Lindenwood-Howard Beach (QN57)	7	25.6
Longwood (BX33)	16	56.7
Lower East Side (MN28)	43	58.9
Madison (BK44)	19	47.8
Manhattanville (MN06)	7	30.9
Marble Hill-Inwood (MN01)	16	31.4
Mariner's Harbor-Arlington-Port Ivory-Graniteville (SI12)	10	33.9
Maspeth (QN30)	11	39.4
Melrose South-Mott Haven North (BX34)	19	45.3
Middle Village (QN21)	8	21.8
Midtown-Midtown South (MN17)	21	69.3
Midwood (BK43)	35	67.6
Morningside Heights (MN09)	30	58.5
Morrisania-Melrose (BX35)	46	119.3
Mott Haven-Port Morris (BX39)	40	74.3
Mount Hope (BX41)	39	75.8
Murray Hill (QN51)	16	29.8
Murray Hill-Kips Bay (MN20)	55	119.6
New Brighton-Silver Lake (SI35)	7	39.6
New Dorp-Midland Beach (SI45)	8	38.6
New Springville-Bloomfield-Travis (SI05)	14	34.4
North Corona (QN26)	15	29.4
North Riverdale-Fieldston-Riverdale (BX22)	10	37.8
North Side-South Side (BK73)	14	25.0
Norwood (BX43)	18	43.0
Oakland Gardens (QN42)	10	35.2
Oakwood-Oakwood Beach (SI25)	7	34.8
Ocean Hill (BK79)	23	72.6
Ocean Parkway South (BK46)	7	34.9
Old Astoria (QN71)	13	47.6
Old Town-Dongan Hills-South Beach (SI36)	19	77.6
Ozone Park (QN56)	4	17.8
Park Slope-Gowanus (BK37)	18	24.6

APPENDIX 10: Number and rate of people newly reported with chronic hepatitis C by neighborhood tabulation area (NTA) in New York City, 2018 (cont.)

NTA name (code)	Number of cases	Rate per 100,000 people
park-cemetery-etc-Bronx (BX99)	1	0.0
park-cemetery-etc-Manhattan (MN99)	45	0.0
Parkchester (BX46)	13	42.1
Pelham Bay-Country Club-City Island (BX10)	13	50.8
Pelham Parkway (BX49)	17	57.6
Pomonok-Flushing Heights-Hillcrest (QN38)	6	16.8
Port Richmond (SI28)	6	32.1
Prospect Heights (BK64)	5	23.5
Prospect Lefferts Gardens-Wingate (BK60)	33	49.1
Queens Village (QN34)	18	33.5
Queensboro Hill (QN62)	6	27.5
Queensbridge-Ravenswood-Long Island City (QN68)	21	105.7
Rego Park (QN18)	9	32.2
Richmond Hill (QN54)	35	53.0
Ridgewood (QN20)	22	31.7
Rikers Island (BX98)	175	404.7
Rosedale (QN05)	6	22.6
Rossville-Woodrow (SI32)	11	53.9
Rugby-Remsen Village (BK96)	19	35.4
Schuylerville-Throgs Neck-Edgewater Park (BX52)	14	30.4
Seagate-Coney Island (BK21)	31	107.9
Sheepshead Bay-Gerritsen Beach-Manhattan Beach (BK17)	36	54.8
SoHo-TriBeCa-Civic Center-Little Italy (MN24)	17	41.1
Soundview-Bruckner (BX55)	16	43.0
Soundview-Castle Hill-Clason Point-Harding Park (BX09)	36	64.1
South Jamaica (QN01)	17	42.4
South Ozone Park (QN55)	24	28.9
Springfield Gardens North (QN02)	11	40.1
Springfield Gardens South-Brookville (QN03)	13	61.8
Spuyten Duyvil-Kingsbridge (BX29)	11	35.5
St. Albans (QN08)	17	31.7
Stapleton-Rosebank (SI37)	11	42.3
Starrett City (BK93)	7	57.1
Steinway (QN72)	13	27.9
Stuyvesant Heights (BK35)	35	54.7
Stuyvesant Town-Cooper Village (MN50)	7	30.5
Sunset Park East (BK34)	18	25.3
Sunset Park West (BK32)	40	71.8
Todt Hill-Emerson Hill-Heartland Village-Lighthouse Hill (SI24)	17	52.5
Turtle Bay-East Midtown (MN19)	13	25.8
University Heights-Morris Heights (BX36)	37	68.4
Upper East Side-Carnegie Hill (MN40)	18	30.3
Upper West Side (MN12)	44	33.3
Van Cortlandt Village (BX28)	22	43.5
Van Nest-Morris Park-Westchester Square (BX37)	15	52.2
Washington Heights North (MN35)	40	56.0
Washington Heights South (MN36)	58	64.5
West Brighton (BK23)	10	63.1
West Concourse (BX63)	20	55.0
West Farms-Bronx River (BX08)	17	48.4
West New Brighton-New Brighton-St. George (SI22)	26	79.5
West Village (MN23)	17	26.0
Westchester-Unionport (BX59)	10	35.3
Westerleigh (SI07)	6	25.4
Whitestone (QN49)	8	26.2
Williamsbridge-Olinville (BX44)	43	68.0
Williamsburg (BK72)	4	13.3
Windsor Terrace (BK40)	8	36.6
Woodhaven (QN53)	13	21.3
Woodlawn-Wakefield (BX62)	21	48.7
Woodside (QN63)	13	28.7
Yorkville (MN32)	10	12.6

APPENDIX 11: Characteristics of women with confirmed hepatitis C prior to or on delivery, who gave birth in New York City, 2013 to 2015

Group	Number	Percentage of each group
Overall	472	N/A
Race and ethnicity		
Latino/a	137	29.0
White, non-Latino/a	176	37.3
Black, non-Latino/a	82	17.4
Asian, non-Latino/a	66	14.0
Multi-race	6	1.3
Other	3	0.6
Unknown	2	0.4
Borough of residence		
Bronx	163	34.5
Brooklyn	113	23.9
Manhattan	82	17.4
Queens	80	16.9
Staten Island	34	7.2
Year hepatitis C infection was first reported		
Before 2001	12	2.5
2001–2005	79	16.7
2006–2010	180	38.1
2011–2015	201	42.6
Health insurance at delivery		
Medicaid	365	77.3
Private health insurance	98	20.8
Self-pay	5	1.1
Other/unknown	4	0.8

APPENDIX 12: Characteristics of children 0-36 months of age newly reported with hepatitis C virus in New York City, 2018

Characteristics	Number	Percentage of each group
Overall	18	N/A
Hepatitis C test results		
Confirmed[1]	3	16.7
Exposed (infection status unknown)[2]	5	27.8
Not currently infected[3]	10	55.6
Reason child was tested for hepatitis C[4]		
Mother known to have hepatitis C	15	83.3
Mother's current or past injection drug use	6	33.3
Other reason	2	11.1
Unknown	1	5.6
Sex		
Female	10	55.6
Male	8	44.4
Race and ethnicity		
Latino/a	1	5.6
White, non-Latino/a	2	11.1
Black, non-Latino/a	2	11.1
Asian, non-Latino/a	1	5.6
Multi-race	0	0.0
Unknown	12	66.7
Borough of residence		
Bronx	3	16.7
Brooklyn	8	44.4
Manhattan	4	22.2
Queens	0	0.0
Staten Island	3	16.7
Other characteristics[4]		
Mother previously reported to Health Department with hepatitis C	10	55.6
Child lives with biological mother	10	55.6

[1] RNA positive between ages 2-36 months
[2] Antibody positive between ages 0-36 months or RNA positive between ages 0-2 months
[3] RNA negative between ages 2-36 months or antibody negative between ages 18-36 months
[4] Not mutually exclusive

APPENDIX 13: 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, 2018
- **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 any 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 4 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.

To read how the hepatitis C care cascade was developed, read Moore MS, Bocour A, Laraque F, Winters A. A surveillance-based hepatitis C care cascade, New York City, 2017. Public Health Rep. 2018; 133(4):497-501 at ncbi.nlm.nih.gov/pmc/articles/PMC6055289.

APPENDIX 14: RNA and genotype test results of people newly reported with chronic hepatitis C in New York City, 2018

Characteristics	Number	Percentage of each group
All new reports of hepatitis C	10,810	100.0
Any RNA test performed[1]	9,177	84.9
Reflex RNA test performed[2]	7,545	82.2
Case definition		
Not currently infected: antibody positive, RNA negative only[3]	6,128	56.7
Probable: antibody positive only	1,588	14.7
Confirmed: antibody positive, RNA positive or genotype tested[4]	3,094	28.6
Genotype test performed[5]		
Yes	1,621	52.4
No	1,473	47.6
Genotype[6]		
1a	826	51.0
1b	338	20.9
1 unspecified, 1 other, or 1a/1b	28	1.7
2	150	9.3
3	203	12.5
4	55	3.4
6	15	0.9
Mixed	6	0.4

[1] Based on the Health Department's hepatitis C surveillance data as of April 2019. Reporting of negative RNA test results to the Health Department was mandated 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] 11 people were classified as not currently infected but did not have a RNA negative result.
[4] 34 people only had a genotype result and no RNA positive result.
[5] Genotype data are presented for patients who had a positive RNA or genotype test reported (n=3,094).
[6] Percentage calculated out of those with a genotype test (n=1,621).

APPENDIX 15: Characteristics of decedents where hepatitis C is listed as the underlying cause or contributing cause of death, New York City, 2017

Characteristics	Number	Percentage of each group	Age-adjusted rate per 100,000 people[1]
Overall	376	N/A	3.9
Sex			
Female	120	31.9	2.2
Male	256	68.1	6.0
Age			
0–24	0	0.0	0.0
25–44	12	3.2	0.4
45–64	180	47.9	8.5
65–84	167	44.4	15.8
≥85	17	4.5	9.7
Race and ethnicity			
Black, non-Latino/a	126	33.5	5.7
White, non-Latino/a	78	20.7	2.2
Asian/Pacific Islander, non-Latino/a	9	2.4	0.6
Latino/a	151	40.2	6.4
Other	1	0.3	N/A
Unknown	11	2.9	N/A

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

APPENDIX 16: Characteristics of people reported with hepatitis C and HIV coinfection in New York City by end of 2017[1,2]

Characteristics	Total		Initiated treatment by end of 2017[3]		Had not initiated treatment by end of 2017	
	Number	Percentage (column)	Number	Percentage (row)	Number	Percentage (row)
Overall	8,988	100.0	5,616	62.5	3,372	37.5
Race and ethnicity						
Black, non-Latino/a	3,658	40.7	2,145	58.6	1,513	41.4
Latino/a	3,791	42.2	2,409	63.5	1,382	36.5
White, non-Latino/a	1,388	15.4	965	69.5	423	30.5
Asian/Pacific Islander, non-Latino/a	114	1.3	74	64.9	40	35.1
Other	32	0.4	20	62.5	12	37.5
Unknown	5	0.1	3	60.0	2	40.0
Age						
0–19	3	0.0	1	33.3	2	66.7
20–29	159	1.8	67	42.1	92	57.9
30–39	669	7.4	320	47.8	349	52.2
40–49	1,294	14.4	755	58.3	539	41.7
50–59	3,401	37.8	2,136	62.8	1,265	37.2
60–69	3,013	33.5	2,050	68.0	963	32.0
≥70	449	5.0	287	63.9	162	36.1
Birth cohort						
1900–1944	204	2.3	117	57.4	87	42.6
1945–1965	6,152	68.4	4,060	66.0	2,092	34.0
1966–1983	2,283	25.4	1,286	56.3	997	43.7
1984–2017	349	3.9	153	43.8	196	56.2
Gender identity						
Man	6,666	74.2	4,176	62.6	2,490	37.4
Woman	2,219	24.7	1,390	62.6	829	37.4
Transgender man or woman	103	1.1	50	48.5	53	51.5
Current borough of residence						
Bronx	3,269	36.4	2,003	61.3	1,266	38.7
Brooklyn	2,252	25.1	1,430	63.5	822	36.5
Manhattan	2,108	23.5	1,353	64.2	755	35.8
Queens	1,116	12.4	667	59.8	449	40.2
Staten Island	243	2.7	163	67.1	80	32.9

[1] Individuals were diagnosed with HIV and hepatitis C and living as of December 31, 2017, 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 2017.

[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 2017.

APPENDIX 16: Characteristics of people reported with hepatitis C and HIV coinfection in New York City by end of 2017 (cont.)

Characteristics	Total		Initiated treatment by end of 2017		Had not initiated treatment by end of 2017	
	Number	Percentage (column)	Number	Percentage (row)	Number	Percentage (row)
Neighborhood poverty level by ZIP code[4]						
Low (<10% below poverty)	663	7.4	474	71.5	189	28.5
Medium (10 to <20%)	2,504	27.9	1,573	62.8	931	37.2
High (20 to <30%)	2,311	25.7	1,500	64.9	811	35.1
Very high (≥30%)	3,482	38.7	2,052	58.9	1,430	41.1
Unknown	28	0.3	17	60.7	11	39.3
Years since HIV diagnosis						
<5	390	4.3	201	51.5	189	48.5
5–9	819	9.1	445	54.3	374	45.7
10–19	3,801	42.3	2,352	61.9	1,449	38.1
≥20	3,978	44.3	2,618	65.8	1,360	34.2
HIV viral load <200 at most recent lab in 2017						
Yes	6,508	72.4	4,686	72.0	1,822	28.0
No	1,371	15.3	536	39.1	835	60.9
Unknown (no viral loads in 2017)	1,109	12.3	394	35.5	715	64.5
Ryan White Part A client in 2017						
Yes	2,097	23.3	1,246	59.4	851	40.6
No	6,891	76.7	4,370	63.4	2,521	36.6
HIV viral load ever reported by NYC correctional facility						
Yes	2,256	25.1	1,202	53.3	1,054	46.7
No	6,732	74.9	4,414	65.6	2,318	34.4

[4] Based on ZIP code at most recent report

APPENDIX 17: Number of hepatitis A and B vaccines provided by Health Department facilities, 2018

Characteristics	Total hepatitis vaccine doses	Completed hepatitis vaccine series
Immunization clinics		
Hepatitis A only, ages 4 to 18	4,314	1,211
Hepatitis A only, ages 19 and older	329	188
Hepatitis B only, ages 4 to 18	3,209	1,152
Hepatitis B only, ages 19 and older	5,291	1,168
Sexual health clinics		
Hepatitis A only	1,028	397
Hepatitis B only	2,432	591
Hepatitis A/B combination	1,077	212

APPENDIX 18: Number of hepatitis A and B vaccines provided by New York City providers, 2018

Characteristics	Total hepatitis vaccine doses	Completed hepatitis vaccine series
Hepatitis A only, ages 0 to 18	262,260	127,553
Hepatitis A only, ages 19 and older	15,908	3,233
Hepatitis B only, ages 0 to 18	385,380	107,487
Hepatitis B only, ages 19 and older	54,211	7,685

APPENDIX 19: Demographic characteristics of pregnant women with hepatitis B infection in New York City who delivered a live birth in 2018

Characteristics	Number	Percentage of each group
Overall	1,094	N/A
Borough of residence		
Bronx	172	15.7
Brooklyn	437	39.9
Manhattan	93	8.5
Queens	350	32.0
Staten Island	42	3.8
Race and ethnicity		
Latino/a	31	2.8
White, non-Latino/a	102	9.3
Black, non-Latino/a	113	10.3
Asian/Pacific Islander, non-Latino/a	709	64.8
Other	138	12.6
Unknown	1	0.1
Country of birth		
China	557	50.9
Uzbekistan	43	3.9
Guinea	41	3.7
Ghana	40	3.7
U.S.	40	3.7
Bangladesh	27	2.5
Senegal	25	2.3
Dominican Republic	23	2.1
Mali	23	2.1
Albania	19	1.7
Other	252	23.0
Unknown	4	0.4

APPENDIX 19: Demographic characteristics of pregnant women with hepatitis B infection in New York City who delivered a live birth in 2018 (cont.)

Characteristics	Number	Percentage of each group
Region of birth[1]		
China	557	50.9
Western Africa	207	18.9
South Asia	52	4.8
West and Central Asia	51	4.7
Europe	44	4.0
Caribbean and Haiti	40	3.7
U.S.	40	3.7
East Asia (excluding China)	36	3.3
Southeast Asia	25	2.3
Mexico, Central and South America	20	1.8
Middle East	10	0.9
Africa (excluding Western Africa)	6	0.5
Canada	1	0.1
Pacific Islands	1	0.1
Other and Unknown	4	0.4

[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 (Australia/Oceania).

APPENDIX 20: Hepatitis B vaccination, post-exposure prophylaxis (PEP) and testing for infants born in 2017 to mothers with hepatitis B infection, New York City

Characteristics	Number	Percentage of each group
Overall	1,289	N/A
PEP[1] and vaccination status[2]		
PEP	1,280	99.3
Vaccine series completion[3]	1,154	89.5
PEP and vaccine series completion[3]	1,147	89.0
Testing status		
Tested	1,027	79.7
Not tested	262	20.3
Test result[4]		
Infected	4	0.4
Immune	998	97.2
Susceptible	9	0.9
Indeterminate	16	1.6

[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 ≥164 days.
[4] Percentage calculated out of those tested (n=1,027).

APPENDIX 21: Hepatitis B vaccination and testing of child contacts of mothers with hepatitis B infection, identified in 2018, New York City

Characteristics	Number	Percentage of each group
Total children ages 18 or younger[1]	758	N/A
Vaccine series completion[2]	727	95.9
Did not complete series, but received at least one dose	16	2.1
Not vaccinated	15	2.0

[1] Excludes children born in 2018.
[2] Defined as receiving three valid doses of hepatitis B vaccine.

APPENDIX 22: Hepatitis B vaccination and testing of child and adult contacts of pregnant women with hepatitis B infection, identified in 2018, New York City

Characteristics	Total tested		Tested previously		Tested in 2018	
	Number	Percentage	Number	Percentage	Number	Percentage
Children (age 18 or younger)[1]						
Total identified	758	100.0	N/A	N/A	N/A	N/A
Tested[2]	640	84.4	522	81.6	118	18.4
Infected	4	0.6	3	0.5	1	0.8
Immune	608	95.0	501	96.0	107	90.7
Susceptible	19	3.0	10	1.9	9	7.6
Inconclusive	9	1.4	8	1.5	1	0.8
Adults (age 19 or older)						
Total identified	435	100.0	N/A	N/A	N/A	N/A
Tested[3]	96	22.1	60	62.5	36	37.5
Infected	26	27.1	19	31.7	7	19.4
Immune	59	61.5	34	56.7	25	69.4
Susceptible	10	10.4	6	10.0	4	11.1
Inconclusive	1	1.0	1	1.7	0	0.0

[1] Excludes children born in 2018.
[2] Determined based on reported laboratory test results only.
[3] Determined based on reported laboratory test results or verbally reported by adult contact.


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