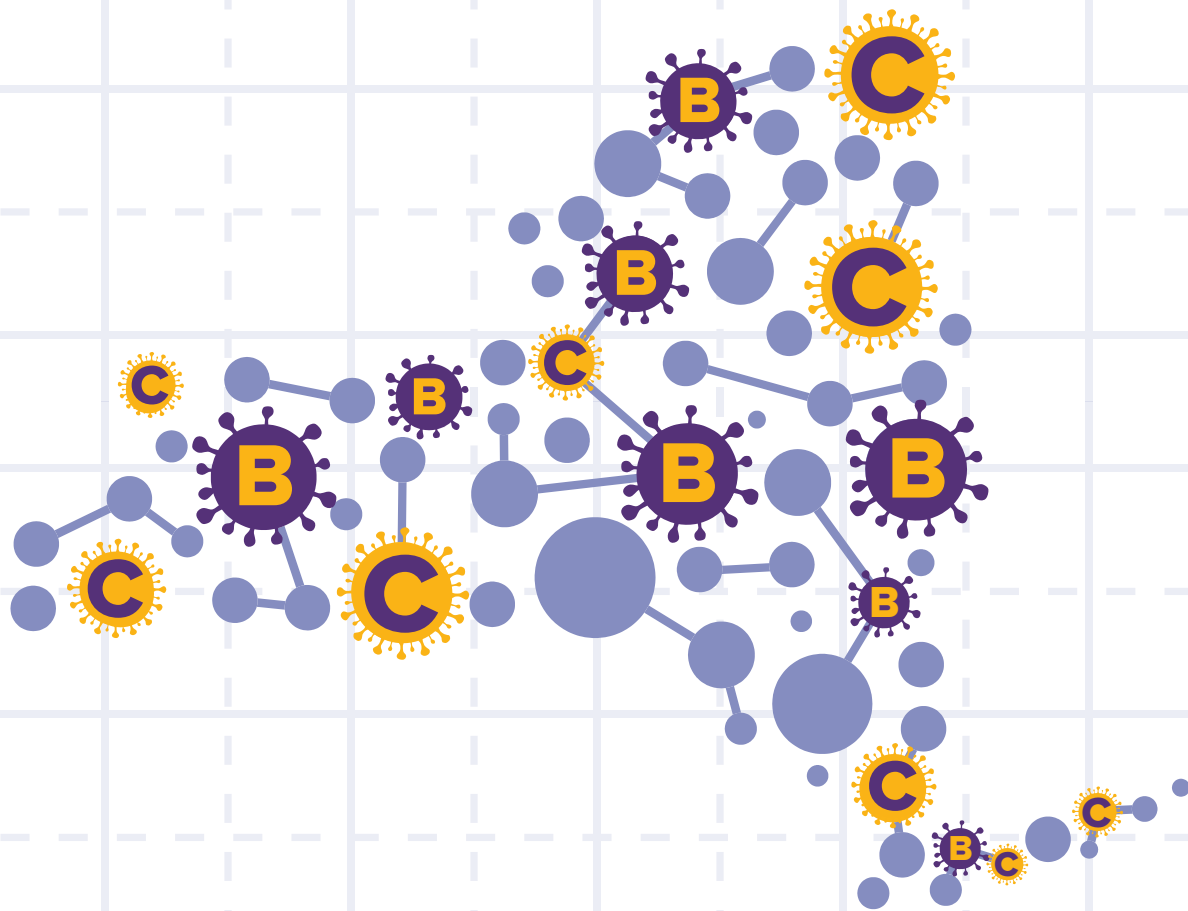


New York State Department of Health

Hepatitis B and C Annual Report 2018



Surveillance, Prevention, Programs and Special Projects

Table of Contents

Report Highlights	4
Background	6
Technical Notes	7
Viral Hepatitis Case Surveillance Data (for New York State, excluding New York City)	11
Hepatitis B	11
Table 1.1 Hepatitis B Cases Newly Reported in 2018	11
Figure 1.1 Hepatitis B Number and Rate per 100,000 Population by Year of Report	12
Figure 1.2 Hepatitis B Rate per 100,000 by Year of Report and Region	12
Figure 1.3a County Map, Rates of Newly Reported Hepatitis B Cases Reported in 2018 per 100,000 pop	13
Figure 1.3b County Map, Newly Reported Hepatitis B Cases Reported in 2018 per 100,000 pop	13
Figure 1.4 Hepatitis B Median Age at Diagnosis by Sex and Year of Report	14
Figure 1.5a Hepatitis B Cases by Race Reported in 2018, Including those with Unknown Race ..	14
Figure 1.5b Hepatitis B Cases by Race Reported in 2018 Excluding those with Unknown Race ..	15
Figure 1.5c Hepatitis B Cases by Ethnicity Reported in 2018, Including those with Unknown Ethnicity.....	15
Figure 1.5d Hepatitis B Cases by Ethnicity Reported in 2018, Excluding those with Unknown Ethnicity.....	16
Table 1.6 Risk Factors in Chronic Hepatitis B Cases Newly Reported in 2018	17
Figure 1.6 Risk Factors for Chronic Hepatitis B Newly Reported in 2018	17
Perinatal Hepatitis B Prevention Program (PHBPP)	18
Figure 1.7 PHBPP rates 2017 Birth Cohort.....	19
Figure 1.8 Birth Dose Vaccination Rates by Region 2018.....	19
Hepatitis C	20
Table 2.1 Hepatitis C Cases Newly Reported in 2018	21
Figure 2.1 Hepatitis C Number and Rate per 100,000 Population by Year of Report.....	22
Figure 2.2 Hepatitis C Rate per 100,000 Population by Year of Report and Region	23
Figure 2.3a County Map, Rates of Newly Reported Hepatitis C Cases in 2018 per 100,000 pop..	24
Figure 2.3b County Map, Newly Reported Cases Hepatitis C in 2018 per 100,000 pop.....	24
Figure 2.4a-c Hepatitis C by Year of Birth by Sex – in 2008, 2012 and 2018	25

Figure 2.4d Hepatitis C Median Age at Diagnosis by Sex and Year.....	26
Figure 2.4e Hepatitis C Cases among Females of Childbearing Age (15 -44), 2013 - 2018.....	26
Figure 2.5a Hepatitis C Cases by Race Reported in 2018, Including those with Unknown Race ..	27
Figure 2.5b Hepatitis C Cases by Race Reported in 2018, Excluding those with Unknown Race .	27
Figure 2.5c Hepatitis C Cases by Ethnicity Reported in 2018, Including those with Unknown Ethnicity.....	28
Figure 2.5d Hepatitis C Cases by Ethnicity Reported in 2018, Excluding those with Unknown Ethnicity.....	28
Table 2.6a Risk Factors in Acute Hepatitis C Cases Newly Reported in 2018	29
Figure 2.6a Risk Factors for Acute Hepatitis C Newly Reported in 2018.....	29
Table 2.6b Risk Factors in Chronic Hepatitis C Cases Newly Reported in 2018	30
Figure 2.6b Risk Factors for Chronic Hepatitis C Newly Reported in 2018.....	30
AIDS Institute Hepatitis C Programs, Initiatives and Special Studies.....	31
Hepatitis C Rapid Testing Program	31
Table 3.1 NYS Hepatitis C Rapid Testing Program.....	32
Hepatitis C Care and Treatment Initiative	34
Figure 4.1 Hepatitis C Care Cascade In 15 Primary Care Sites	34
Hepatitis C Continuity Program	35
Table 5.1 Demographics of Enrolled Releasees 2016-2018	35
Table 5.2 Referral Appointments Kept by Location of Releasee 2016-2018	35
National HIV Behavioral Surveillance System (NHBSS).....	36
Table 6.1 Hepatitis C Screening, Diagnosis and Treatment in Injection Drug Users	36
Figure 6.1 Hepatitis C Diagnosis History	37
Figure 6.2 Time Since Hepatitis C Diagnosis.....	37
Figure 6.3 Ever Treated for Hepatitis C	38
HIV and HCV Serosurvey Among Inmates Entering the NYS Department of Corrections and Community Supervision (DOCCS) System	39
Table 7.1 Hepatitis C Antibody Seroprevalence Among Inmates Entering the DOCCS System 2000-2017	40

Figure 7.1 Hepatitis C Antibody Seroprevalence by Sex by Year 2000-2017..... 41

Figure 7.2 HIV and HCV Co-infection by Sex 2000-2017 41

Additional Data 42

 Deaths Due to Hepatitis B, Hepatitis C and Liver Cancer – National Center for Health Statistics 43

 Table 8.1 Deaths Due to Hepatitis B and C 2012-2017..... 43

Relevant Links 44

List of Acronyms 45

Hepatitis B Surveillance

- During 2018, 1,862 cases of hepatitis B were newly reported to the New York State Department of Health (NYSDOH), including 32 acute cases and 1,830 chronic cases.
- Case rates (cases per 100,000 persons) were highest in males and in persons 30-39 years of age. Asian/Pacific Islanders account for nearly one-quarter of cases.
- The number of newly reported cases has increased over the last six years.
- The median age at the time of case report is gradually increasing for males, but not for females where it has remained relatively stable. Females are, on average, younger than males at the time of report.
- The most commonly reported risk factor for cases of chronic hepatitis B was close contact (i.e., sexual, injection drug use, or household) with a person who has hepatitis B. A large majority of cases were in persons who had never been vaccinated against hepatitis B.

Perinatal Hepatitis B Prevention Program

- The program enrolled 275 infants born with Hepatitis B in 2017. Nearly all infants (96%) received timely post-exposure prophylaxis; 92% also completed the hepatitis B vaccine series by 12 months of age, and 83% had completed post-vaccination serologic testing by the end of 2018.
- Under this program, perinatal infection was extremely rare (1 case during 2017 0.4% of infants)
- Eighty-five percent of infants born at NYS birthing hospitals received a dose of hepatitis B vaccine within three days of birth.

Hepatitis C Surveillance

- During 2018, 7148 cases of hepatitis C were reported to the NYSDOH, including 9 perinatal cases, 235 acute cases and 6904 newly reported chronic cases. The number of chronic cases newly reported decreased by 14% compared to 2017. However, in 2018 the number of acute cases, indication of a more recent infection, increased by 15% compared to the previous year.
- Case rates were highest in males and persons 30-39 years of age. Case rates were higher in young adults than in “baby boomers” (persons born during 1945-1965).
- Where race was reported, 91% of acute hepatitis cases and 79% of chronic hepatitis cases were among white persons.
- Recent case trends are difficult to discern for at least two reasons. Beginning in 2016, the surveillance case definition changed dramatically relative to the previous definition making case counts difficult to compare. Also, implementation of the NYS Hepatitis C Testing Law beginning in 2014 resulted in reporting of more cases that year, particularly in persons born during 1945-1965.
- The median age at the time of report has decreased by 10 years since 2012 and during 2017 was 37 for females and 41 for males. Females are, on average, younger than males at the time of report.
- The two most commonly reported risk factors for chronic hepatitis C cases were injection drug use and non-injection drug use. Other common risk factors included close contact (i.e., sexual, injection drug use, or household) with a person who has hepatitis C, and incarceration.

Hepatitis C Programs and Initiatives

- In 2017, the NYSDOH Rapid Testing Program enrolled 52 programs across the state. These programs tested 7,105 high-risk clients and identified 832 with reactive HCV antibody tests who either received or were referred for follow-up HCV RNA testing. The antibody reactivity rate was 11.7%.
- Starting in April 2015, the NYS Hepatitis C Care and Treatment Initiative funded 15 primary care sites across the state to integrate linkage to care activities and hepatitis C care, treatment and supportive services into their primary care structure. As of March 31, 2018, a total of 5,014 patients had been enrolled in the program since its inception. Eighty-five percent of patients diagnosed with hepatitis C were linked to care. Seventy-two percent of those linked to care initiated treatment, and 98% of those who completed treatment and returned to be assessed for a sustained virologic response were found to be cured
- The Hepatitis C Continuity Program promoted completion of treatment for hepatitis C among persons who had been incarcerated by the Department of Corrections and Community Supervision (DOCCS) and were being released. Of the 51 releasees enrolled in 2018, 47% kept their appointment with the community-based health care provider. After 2018, the program was integrated into the Hepatitis C Criminal Justice Initiative.

Viral hepatitis refers to a viral infection that affects the liver. There are at least five different types of viral hepatitis (A-E). The most common types of viral hepatitis in the United States are hepatitis A, hepatitis B, and hepatitis C. These viruses can cause a short-term (acute) illness characterized by fever, nausea, abdominal pain, malaise, and jaundice; however, sometimes these acute infections are mild or don't cause any symptoms. Hepatitis A virus is usually spread when a person ingests fecal matter - even in microscopic amounts - from contact with objects, food, or drinks contaminated by feces or stool from an infected person. Hepatitis A infections do not become long-term (chronic). In contrast, [hepatitis B](#) and [hepatitis C](#) can cause lifelong, chronic infections without symptoms. Many people with chronic hepatitis B or hepatitis C do not know that they are infected. Eventually, chronic hepatitis B or hepatitis C infection can cause cirrhosis (scarring) of the liver, liver cancer, liver failure, and death. Hepatitis B and hepatitis C are the leading causes of liver cancer and the most common reason for liver transplantation in the United States. Hepatitis B and C viruses are both blood-borne pathogens.

Hepatitis B virus (HBV) is transmitted through contact with blood or body fluids from an infected person, most often through sexual contact; sharing drug injection equipment such as needles, syringes or other works; sharing razors or medical equipment such as glucometers; or from an infected mother to her newborn during birth (perinatal transmission). Transmission can also occur through close contact with an infected person (e.g., household contact) or when health care infection control is inadequate. The risk for a hepatitis B infection becoming chronic becomes lower with age: approximately 90% of infants infected at birth, 25-50% of children infected at age 1-5, and 5% of persons infected as adults will become chronically infected. Infants born to infected mothers can be given prophylactic treatment at birth to prevent infection, and the Centers for Disease Control and Prevention (CDC) recommends vaccination of all infants at birth and anyone else at risk who had not already been vaccinated. Most adults are infected through sex with an infected person. People with chronic hepatitis B can be treated with medications that cause viral suppression and reduce liver damage, but typically need to take medication for life.

Hepatitis C virus (HCV) is transmitted most often through contact with blood from an infected person, such as through sharing injection drug use equipment or equipment used to snort drugs; needlestick injuries involving blood; receiving blood transfusions or blood products prior to the availability of blood supply screening in 1992; and inadequate infection control in health care settings. Less often, HCV can be transmitted through sexual contact or from an infected woman to her newborn. The best way to prevent infection is to avoid behaviors that can spread the disease such as sharing injection drug use works. About 75-85% of newly infected people do not spontaneously clear HCV from their body and develop chronic infection. People with hepatitis C can be treated with medications that can cure >90% of people after 8-12 weeks of therapy.

Case Reporting

Reporting of communicable diseases is mandated under the New York State Sanitary Code (10NYCRR 2.10). The NYSDOH requires health care providers, laboratories, and others to report suspected or confirmed cases of communicable disease, including viral hepatitis, to the local health department (LHD) where the patient resides. The LHDs conduct investigations and, for the 57 counties located outside of NYC, report case data to the NYSDOH via the Communicable Disease Electronic Surveillance System (CDESS). A large majority of investigations are triggered by receipt of clinical laboratory reports, which are electronically transmitted from laboratories to the NYSDOH through the Electronic Clinical Laboratory Reporting System (ECLRS). Laboratories report all positive markers of viral hepatitis infection to ECLRS. Since 2016, negative tests for hepatitis C RNA are also reportable. Laboratories are also asked to report other negative hepatitis results or the results of liver enzyme assays (e.g., alanine aminotransferase, ALT). In addition to patient name and date of birth, laboratories often, report additional demographic information such as sex or race.

Case investigation involves case ascertainment, case classification, and attempts to collect demographic, clinical, and exposure or risk factor information.

Case Definitions, Ascertainment, and Classification

Case ascertainment and classification are made according to the current CDC/Council of State and Territorial Epidemiologists (CSTE) case definitions using available laboratory testing results and clinical symptoms. Cases of acute hepatitis B, chronic hepatitis B, perinatal hepatitis B, acute hepatitis C, chronic hepatitis C, and perinatal hepatitis C, are recorded in CDESS. Cases that meet the definition for a confirmed or probable case are summarized in this report.

Case definitions change from time to time. The case definitions in effect during 2018 are:

Acute hepatitis B	https://wwwn.cdc.gov/nndss/conditions/hepatitis-b-acute/case-definition/2012
Chronic hepatitis B	https://wwwn.cdc.gov/nndss/conditions/hepatitis-b-chronic/case-definition/2012
Acute hepatitis C	https://wwwn.cdc.gov/nndss/conditions/hepatitis-c-acute/case-definition/2016
Chronic hepatitis C	https://wwwn.cdc.gov/nndss/conditions/hepatitis-c-chronic/case-definition/2016
Perinatal hepatitis C	https://wwwn.cdc.gov/nndss/conditions/hepatitis-c-perinatal-infection/case-definition/2018/

Under case definitions utilized in 2018, ascertainment of acute cases of hepatitis B and C depend on the presence of either 1) symptoms consistent with viral hepatitis along with either jaundice or an elevated ALT value, or 2) the documented conversion of a viral hepatitis test from negative to positive within a specified time frame. Chronic cases include any case that does not meet the definition for an acute case or for which symptoms or prior test results are unavailable.

Note that changes in standardized case definitions result in counting cases differently and can profoundly impact the number of cases reported in each year. The new 2016 case definitions for acute and chronic hepatitis C were substantially different from the previous case definition. Consequently,

comparing counts or rates of hepatitis C cases reported during 2016-2017 to those reported during 2015 and earlier years should be done with caution.¹

Variable Definitions

Case Year: Cases are recorded in the year during which the case was first reported; typically the year during which the first positive laboratory test for the patient was electronically reported to NYSDOH.

Sex at birth: Sex at birth is defined as male, female, or unknown/missing. Gender information is not collected. Sex is usually obtained from the laboratory report and is known for >99% of cases.

Race and Ethnicity: For surveillance data, race and ethnicity are recorded separately. For this report, races are white, black, Asian/Pacific Islander, American Indian/Alaska Native, and other race, including more than one race, or unknown/missing. Ethnicities are Hispanic, non-Hispanic, and unknown/missing. Race and ethnicity are not required variables for laboratory reporting, and health care provider reporting of race and ethnicity is incomplete. A large percentage of cases, particularly chronic cases, are missing this information, and caution should be used when evaluating race and ethnicity patterns.

Case county: The case county is typically the county in which the patient resided at the time the case was first reported. Cases identified among inmates upon intake screening to NYS Department of Corrections and Community Supervision (DOCCS) prisons are assigned to the county where the intake facility is located rather than the county where the patient resided prior to incarceration. To avoid overrepresenting cases in counties and regions with DOCCS intake facilities, cases among DOCCS inmates are excluded from county and region-level data. However, inmates of county jails are included in these geographic summaries.

¹ In 2019, the Council of Territorial and State Epidemiologist (CSTE), in collaboration with the Centers for Disease Prevention and Control (CDC) revised hepatitis C case definitions for both acute and chronic cases. The revised 2020 case definition for hepatitis C is in effect January 1, 2020

Region: Program areas within NYSDOH define regions of the state differently. The regions presented here are grouped by county/LHD based on Communicable Disease Surveillance Regions and Ryan White HIV/AIDS Program service areas. There are four Communicable Disease Surveillance Regions: Western, Central, Capital, and Metropolitan. Ryan White regions further subdivide the Western region into Western and Finger Lakes regions, and the Metropolitan region into Hudson Valley and Nassau/Suffolk regions.

Communicable Disease surveillance	Central NY	Metropolitan Region		Capital District	Western Region	
Ryan White Program	Central NY	Hudson Valley	Nassau/Suffolk	Northeastern	Western NY	Finger Lakes
County	Broome Cayuga Chenango Cortland Herkimer Jefferson Lewis Madison Oneida Onondaga Oswego St. Lawrence Tioga Tompkins	Dutchess Orange Putnam Rockland Sullivan Ulster Westchester	Nassau Suffolk	Albany Clinton Columbia Delaware Essex Franklin Fulton Greene Hamilton Montgomery Otsego Rensselaer Saratoga Schenectady Schoharie Warren Washington	Allegany Cattaraugus Chautauqua Erie Genesee Niagara Orleans Wyoming	Chemung Livingston Monroe Ontario Schuyler Seneca Steuben Wayne Yates

Crude Case Rates: Population estimates for each year (2013 -2018) are used as denominator for overall case rates per 100,000 and rates by geographic area, age, sex. Estimates for the resident population by county are US Census Bureau, Population Division, are annual estimates of the resident population for selected age groups by sex for the United States, states, counties and Puerto Rico Commonwealth. April 1, 2010 to July 1, 2018. Release date: June 2019

Risk Factor Information

Risk factor information is collected by LHDs during investigation when available. Methods of data collection vary including a standard one-page survey of the patient's health care provider, phone interview with the health care provider, medical record review, review of records in the New York State Immunization Information System (NYSIIS), patient interview, or proxy interview. Additionally, surveillance data is affected by, for example, a provider's incomplete knowledge of the patient's risks, transposition errors, misinterpretation of the question, intentionally misleading answers, recall bias, uncertain timelines, and other forms of inaccuracies.

Risk factor data are often incomplete, particularly for chronic cases. Depending on disease and risk factor, the proportion of cases with unknown or missing information can be >80%. For these reasons, caution should be taken when interpreting risk information.

For acute cases, except where noted, risk factors and exposures are determined for the 6-month period before illness onset or test conversion. For chronic cases, lifetime risk is assessed.

Data on this Report

This report contains information about hepatitis B and hepatitis C gathered by the New York State Department of Health (NYSDOH). Information about residents of New York City (NYC) are excluded except where noted. New York City data are available from the New York City Department of Health and Mental Hygiene at: <https://www1.nyc.gov/assets/doh/downloads/pdf/cd/hepatitis-abc-annual-report-2018.pdf>

The surveillance data summarize confirmed and probable cases of acute hepatitis B, chronic hepatitis B, perinatal hepatitis B, acute hepatitis C, chronic hepatitis C, and perinatal hepatitis C in NYS (excluding NYC) reported during 2018. Trend data are also presented for cases reported during 2013 through 2018. Surveillance data for hepatitis C are current as of September 30, 2019. For hepatitis B, data are current as of November 27, 2019. All surveillance data should be considered preliminary and subject to change. Case data reflect only newly reported cases and are not intended to represent disease incidence (all new infections) nor prevalence (all persons currently infected). Data from sources other than surveillance are described in the sections in which they are presented.

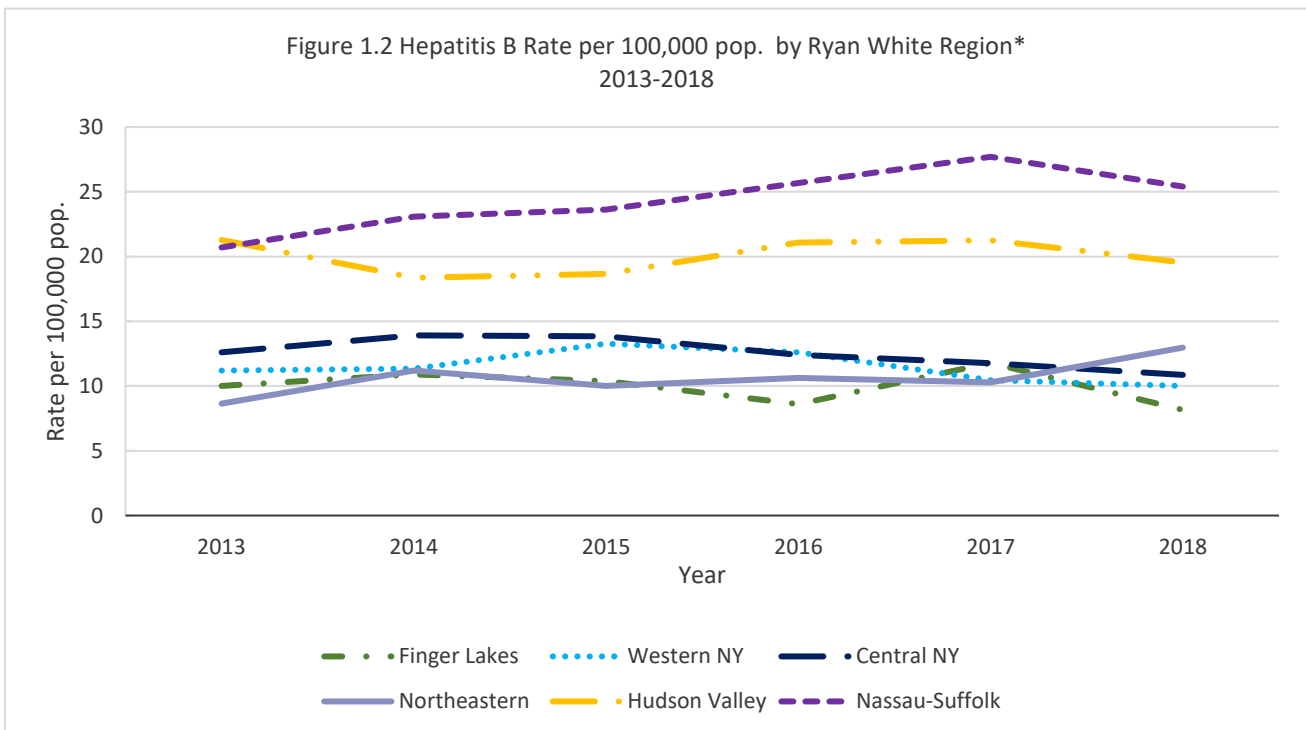
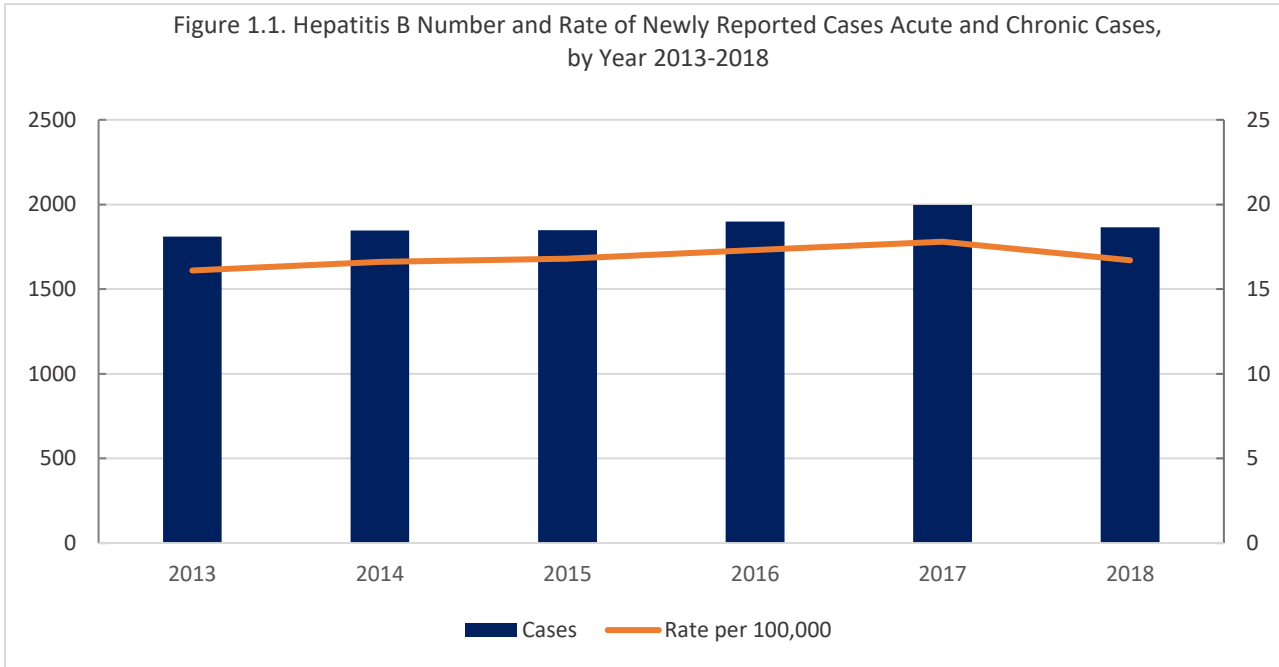
This report was developed by the NYS DOH Division of Epidemiology and the NYS DOH Aids Institute, Bureau of Hepatitis Healthcare. For questions about this report, email NYSDOH at HepBC.Surveillance@health.ny.gov

During 2018, 1,862 cases of hepatitis B were newly reported to NYSDOH; 98% of cases were classified as chronic. Demographic characteristics of hepatitis B cases are in Table 1.1. The majority of cases (58%) were in males, and 63% of the acute cases were in males. The case rates were highest in males aged 40-49 years, and in highest in females age 30-39. Case rates in the Metropolitan Region were almost double those observed in the rest of the regions. (Table 1.1).

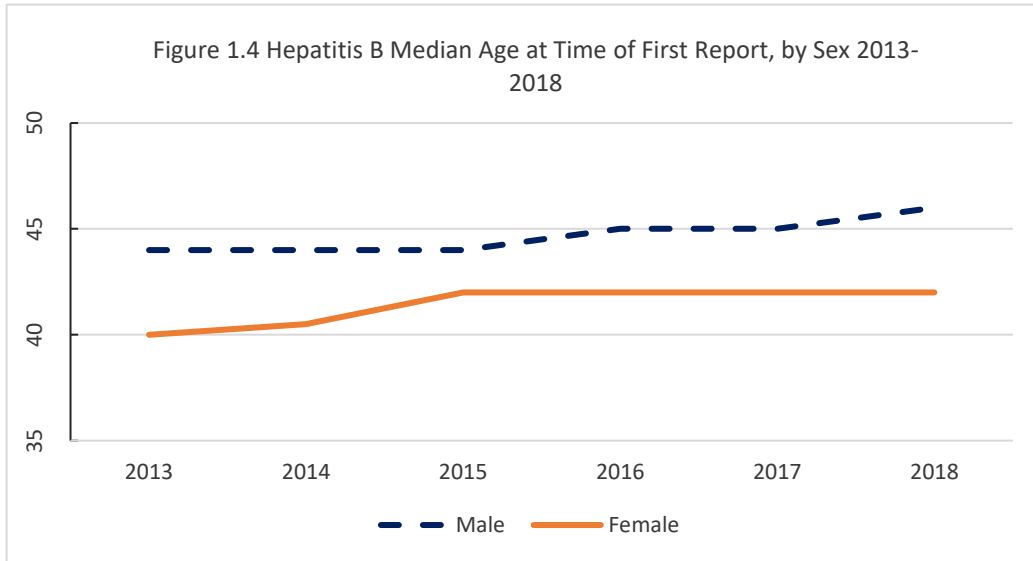
	Female		Male		Total	
	Numbers of Cases	Rate per 100,000	Numbers of Cases	Rate per 100,000	Numbers of Cases	Rate per 100,000
Total	764	13.49	1098	20	1862	16.7
acute	12	0.2	20	0.36	32	0.28
chronic	752	13.28	1078	19.66	1830	16.42
Age group (years) *						
0-19	20	1.54	22	1.62	42	1.58
20-29	129	18	91	12	220	14.9
30-39	198	30	245	36.5	443	33.3
40-49	137	20.3	264	39.8	401	29.9
50-59	121	14.5	218	27.5	339	20.87
60-69	106	14.8	162	24.3	268	19.4
70+	51	6.6	95	16.6	146	10.85
Region of Residence**						
Western Region	100	7	151	11.1	251	9
Finger Lakes	43	6.6	59	9.5	102	8
Western NY	57	7.3	92	12.38	149	9.8
Central NY	78	9	107	12.6	185	10.8
Northeastern	83	11	110	14.7	193	12.9
Metropolitan Region	498	18.9	669	26.4	1167	22.6
Hudson Valley	181	15.3	269	23.5	450	19.3
Nassau-Suffolk	317	21.8	400	28.7	717	25.2
	Number of Cases	Percent of Cases	Number of Cases	Percent of Cases	Number of Cases	Percent of Cases
Race***						
White	116	15.2	218	19.8	334	17.93
Black	94	12.3	145	13.2	239	12.8
Asian	209	27.3	230	20.9	439	23.6
American Indian/Alaskan	0	0	2	0.2	2	0.1
Other	44	5.75	70	6.4	114	6.1
Unknown	301	39.4	433	39.4	734	39.4
Ethnicity						
Hispanic	36	4.7	70	6.4	106	5.7
Non -Hispanic	271	35.5	369	33.6	640	34.4
Unknown	456	59.7	659	60	1115	59.8

*Excludes 3 cases with unknown data of birth at time of case report **Geographic assessments exclude DOCCS inmates **Rates per 100,000 population are not calculated due to the large number of missing values

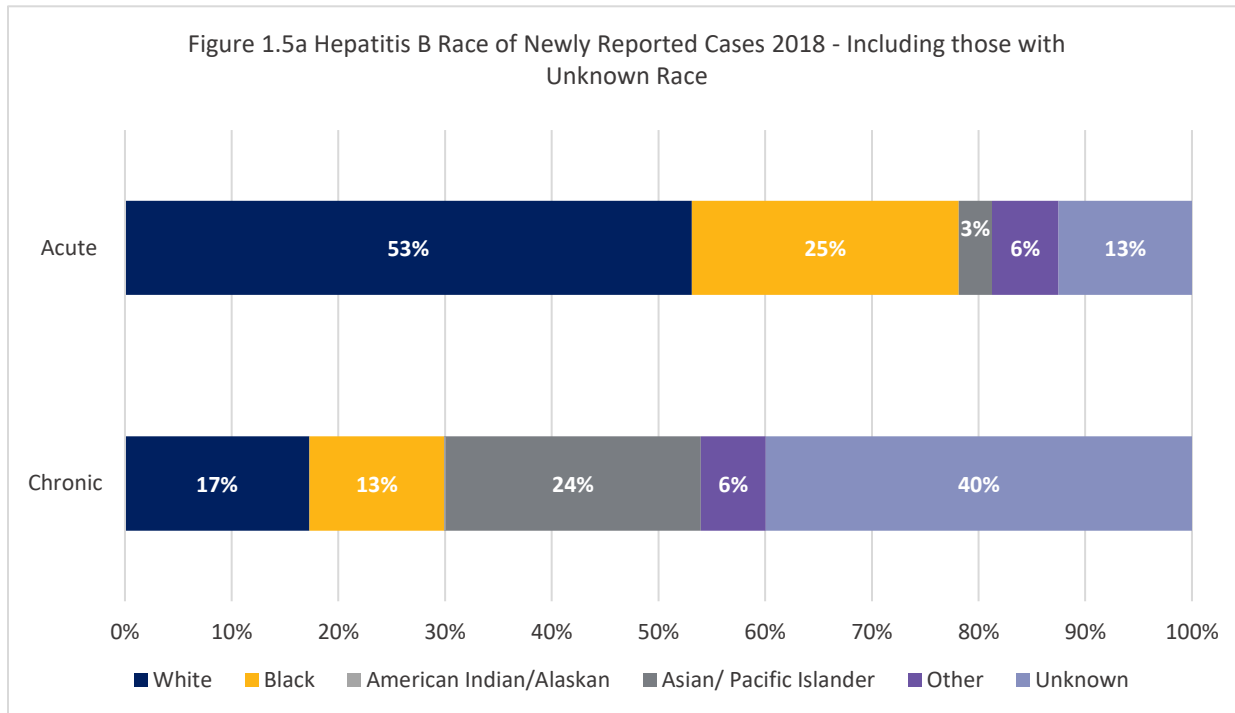
The number and rates per 100,000 population, of newly reported hepatitis B cases between 2013 and 2018 has remained relatively stable (Fig. 1.1), particularly in the Nassau/Suffolk and Hudson Valley Ryan White (Metropolitan) regions (Fig. 1.2). During 2018, case rates were highest in the Metropolitan region (22.6 per 100,000 population). In Ryan White regions, the Nassau/Suffolk region had the highest rate (25.2 per 100,000 population).



The median age for females newly reported with hepatitis B during 2018 was 42, and the median age for males was 45. These ages are slightly older than among cases newly reported during 2013-14 (Fig. 1.4). Because women are routinely screened for hepatitis B with each pregnancy, chronic cases might be identified at a younger age (i.e., earlier) among females.

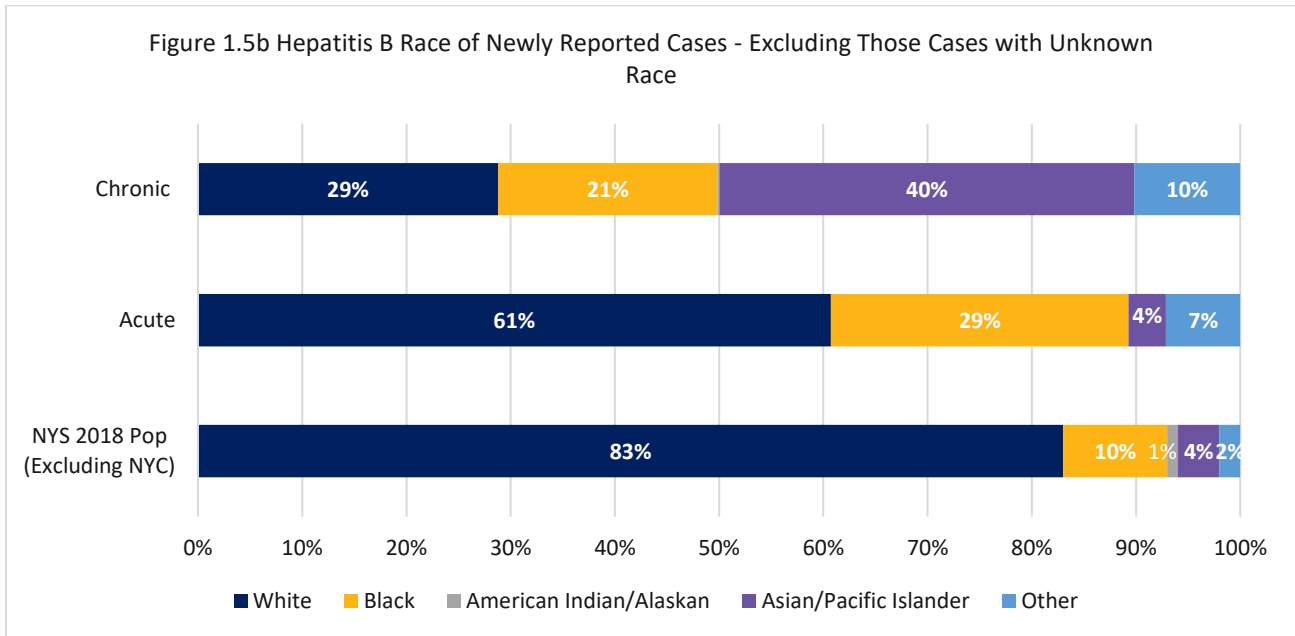


The distribution of race varied with whether the case was classified as acute or chronic hepatitis B. Figure 1.5a shows the distribution among all cases of hepatitis B reported during 2018. Note that race data were missing or unknown for 13% of acute and 40% of chronic hepatitis B cases.



Note. The percentage of cases of acute and chronic hepatitis B among American Indian/Alaskan is less than 1%

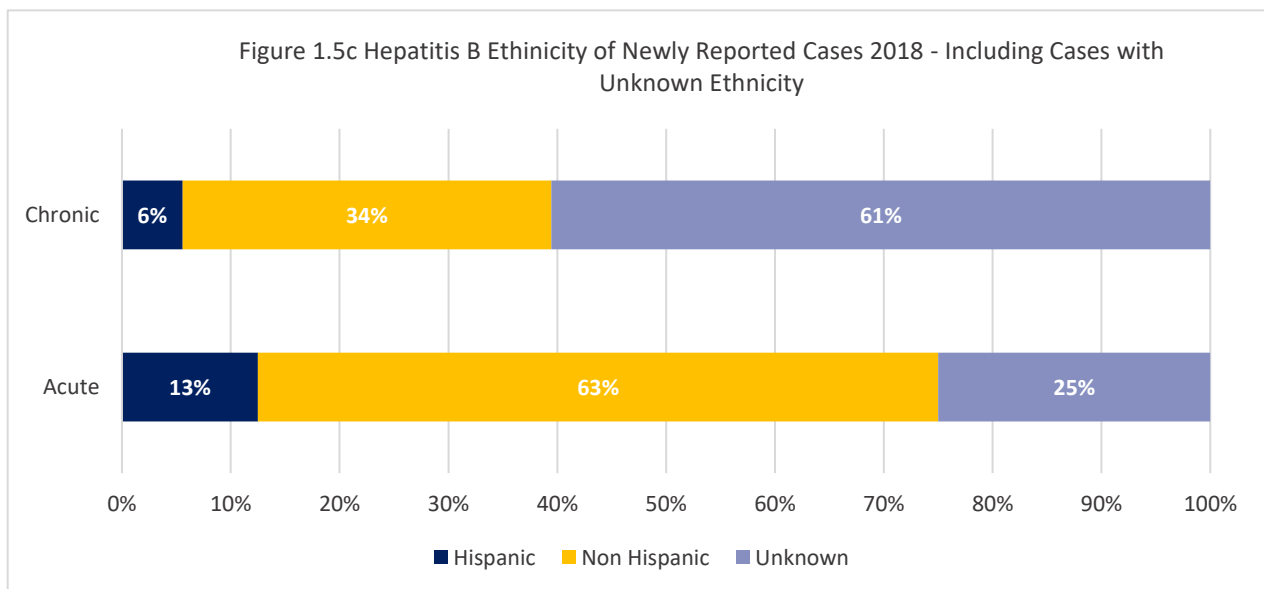
Figure 1.5b provides information on race for acute and chronic hepatitis B cases where race is reported (i.e., not missing or unknown). Among acute cases where race was reported, race was predominately white, followed by black, and then Asian/Pacific Islander.



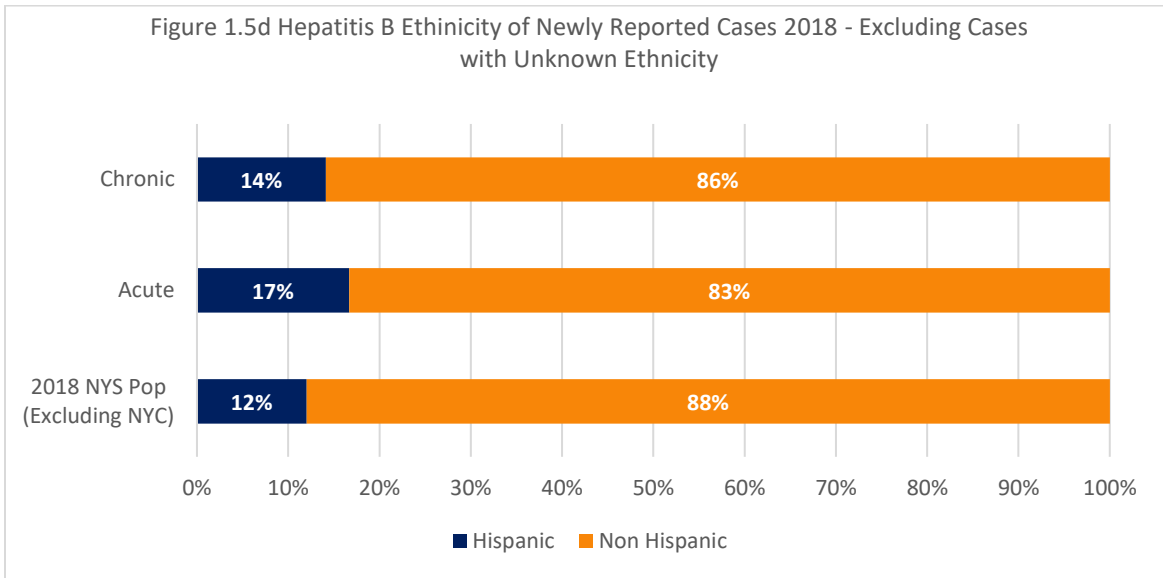
Note. The percentage of cases of acute and chronic hepatitis B among American Indian/Alaskan is less than 1%

Among chronic hepatitis B cases where race was reported, race was predominately Asian/Pacific Islander, followed by white, and then black. Prevalence of hepatitis B is >2% in most countries in Asia and Africa; perinatal transmission resulting in chronic infection is more common in these areas.

Figure 1.5c shows the distribution of Hispanic ethnicity among all hepatitis B cases reported during 2018. Note that ethnicity data were missing for a large proportion of acute (25%) and chronic (61%) hepatitis B cases.



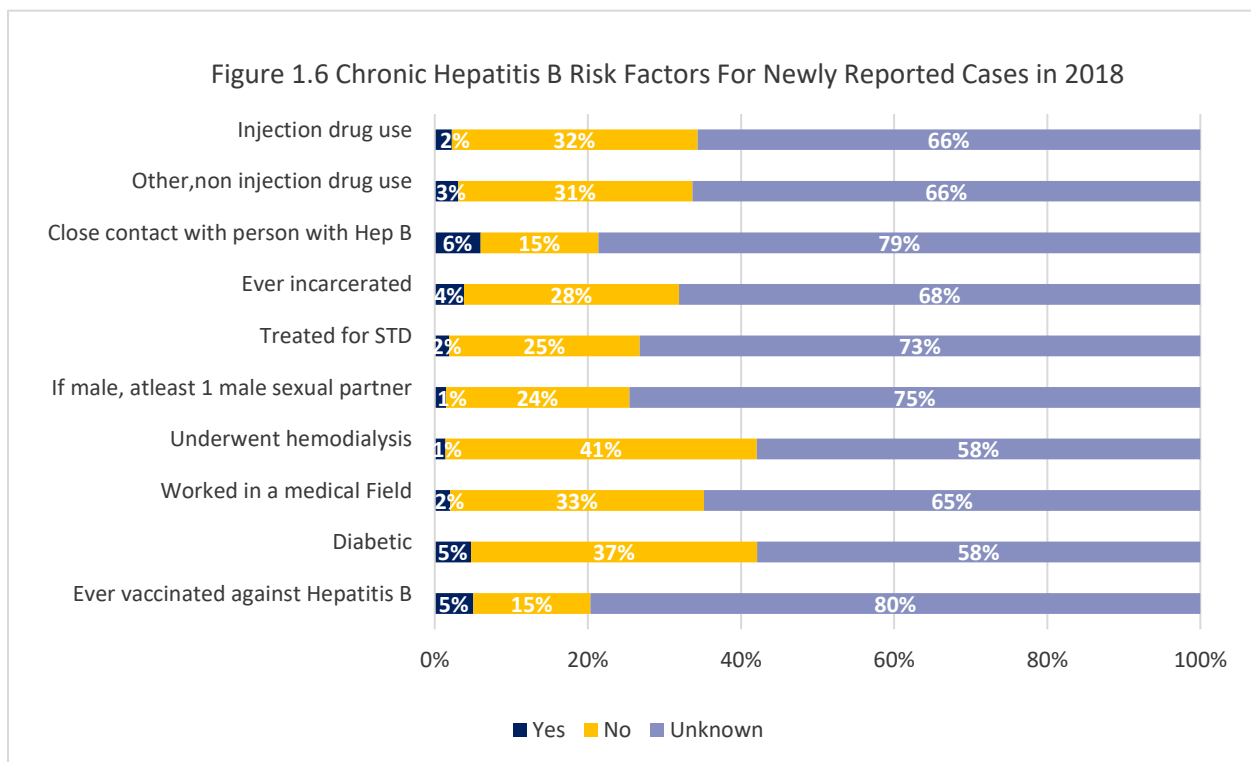
Where ethnicity was reported (i.e., not missing or unknown), ethnicity was recorded as non-Hispanic for 86% of chronic hepatitis B cases, and 83% of acute hepatitis B cases (Fig. 1.5d). The data may be subject to recording error and biases related to the ability of laboratories to report race and ethnicity.



Risk factor and exposure information for acute hepatitis B cases are not presented in this report given the small number of cases (N=32) and large percentage of cases with unknown or missing information. For chronic cases, risk factors and exposures are determined over the patient’s lifetime. Selected risk factor information for chronic hepatitis B cases are summarized in Table 1.6.

Table 1.6 Risk factors in Chronic Hepatitis B Newly Reported Cases in 2018				
	Yes	No	Unknown	Total
Injection drug use	41	588	1204	1833
Other, non-injection drug use	56	561	1216	1833
Close contact with person with Hep B	110	282	1441	1833
ever incarcerated	70	515	1248	1833
Treated for STD	35	456	1342	1833
If male, at least 1 male sexual partner	16	258	804	1078
Underwent hemodialysis	26	745	1062	1833
Worked in a medical Field	37	608	1188	1833
Diabetic	87	685	1061	1833
Ever vaccinated against Hepatitis B	92	281	1460	1833

Depending on risk factor, the percent of cases with unknown or missing information ranges from 58-80% (Fig. 1.6). Given the large percentage of cases with unknown or missing information, available risk factor information should be interpreted with caution.



In the 57 counties outside NYC, NYSDOH implements a Perinatal Hepatitis B Prevention Program (PHBPP) consistent with CDC guidance and NYSDOH laws and regulations.

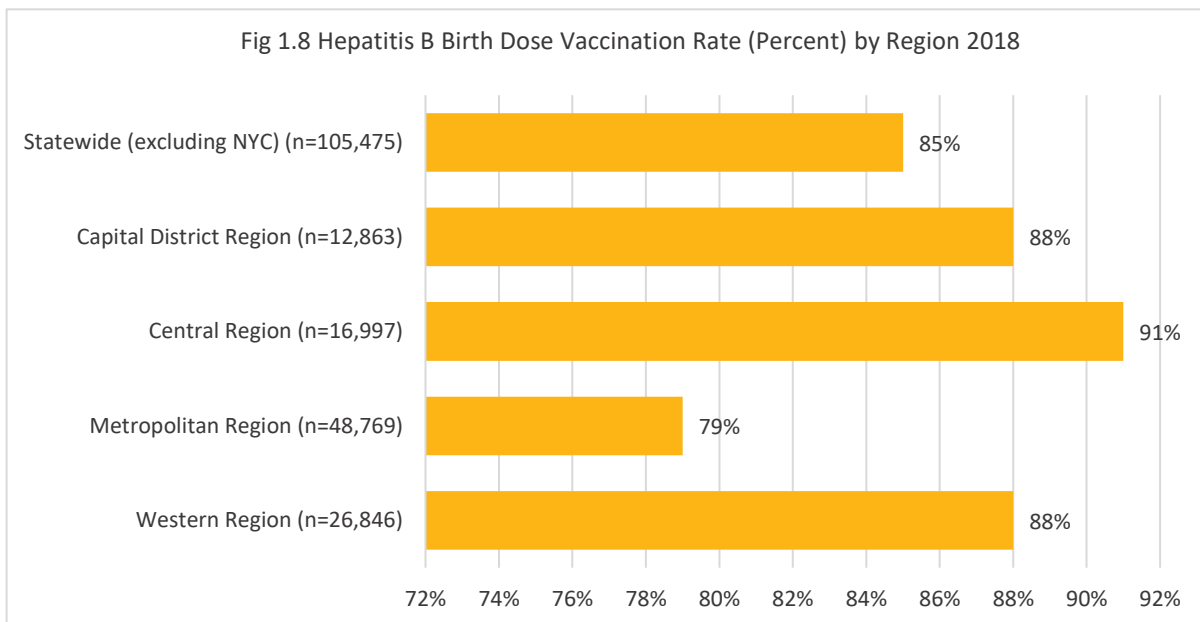
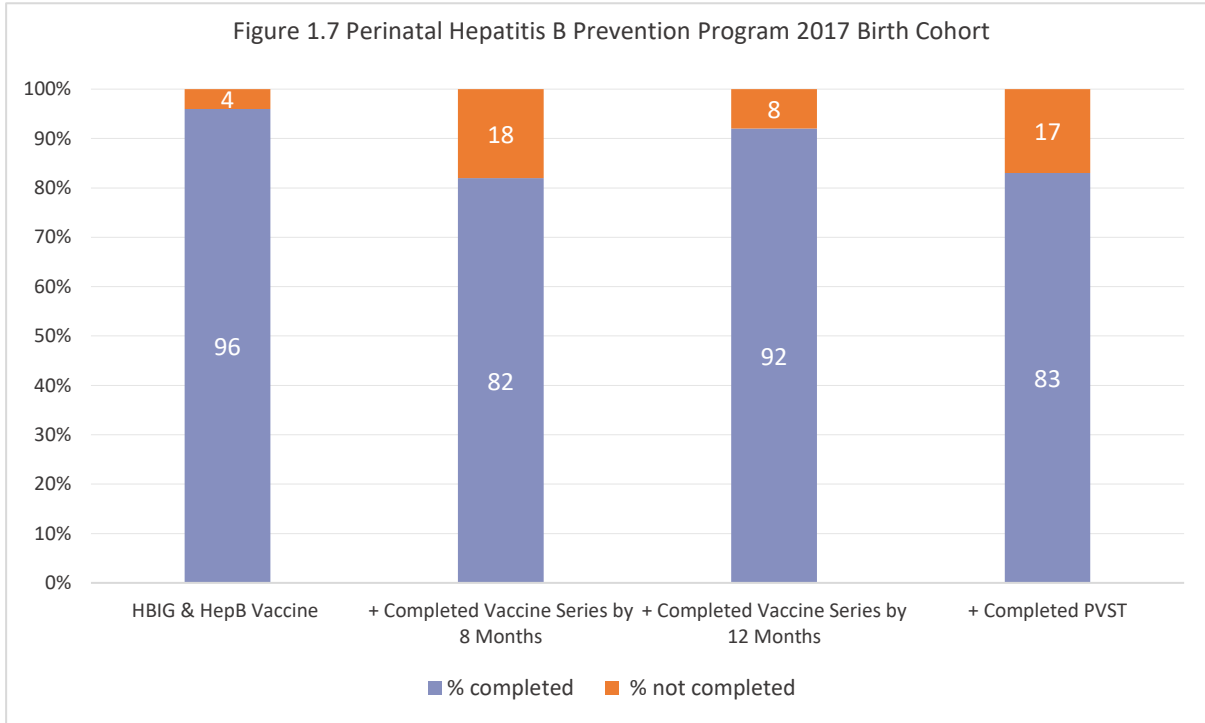
Program Goals are:

1. Screen every woman during every pregnancy for the presence of hepatitis B surface antigen (HBsAg), an indicator of active infection, and record the test result prominently in the pregnant woman's and infant's hospital medical record.
2. Case management of all pregnant women who have markers of active hepatitis B (positive HBsAg, positive hepatitis B e antigen [HBeAg], and/or detectable hepatitis B virus DNA), and pregnant women with unknown infection status, and their infants, to ensure that the infants receive timely post exposure prophylaxis (hepatitis B immune globulin [HBIG] and hepatitis B vaccine), complete the hepatitis B vaccine series, and undergo post-vaccination serologic testing (PVST).
3. Adoption of the universal hepatitis B vaccine birth dose by all birthing hospitals, which provides a "safety net" to prevent hepatitis B infection in infants born to HBV-infected mothers who were not identified prenatally and facilitates completion of the hepatitis B vaccine series.

For infants born during 2017 (Fig. 1.7):

- 275 infants and their mothers, who had markers of active hepatitis B, were enrolled in the PHBPP.
- 264 infants (96%) received hepatitis B vaccine and HBIG within one calendar day of birth.
- 8 infants received hepatitis B vaccine only; 3 infants did not receive hepatitis B vaccine and HBIG within one calendar day of birth.
- 226 infants (82%) received hepatitis B vaccine and HBIG within one calendar day of birth and completed the hepatitis B vaccine series by eight months of age.
- 253 infants (92%) received hepatitis B vaccine and HBIG within one calendar day of birth and completed the hepatitis B vaccine series by 12 months of age.
- 228 infants (83%) completed PVST by the end of the reporting period (December 31, 2018).
- 1 infant (0.4%) tested HBsAg-positive and was reported as a perinatal hepatitis B case during 2017.

The proportion of infants born at hospitals during 2018, in each region, who received a dose of hepatitis B vaccine within three days of birth are in Fig. 1.8. Overall, 85% of infants received the hepatitis B vaccine birth dose. Rates were highest in the Central Region (91%) and lowest in the Metropolitan Region (79%).



During 2018, 7,148 cases of hepatitis C were reported to the NYSDOH, including 9 perinatal cases (<1%), 235 acute cases (3%) and 6,904 newly reported chronic cases (96%). While this represents an overall 14% decrease since 2017, there was actually a 15% increase in acute cases, which are likely due to recent transmission, unlike chronic hepatitis C, which may have been transmitted decades earlier. Demographic characteristics of hepatitis C cases are in Table 2.1. Sixty-one percent of cases were among males. For both sexes, the largest number of cases, and the highest case rates, were in persons aged 30–39 years of age. Although persons born during 1945-1965 (“baby boomers”; age 53-73 years) have historically been considered to have the highest rates of hepatitis C infection, during 2018, rates of newly reported cases among baby boomers was 71.9/100,000 persons, compared with 131.4/100,000 persons among those aged 30-39 years.

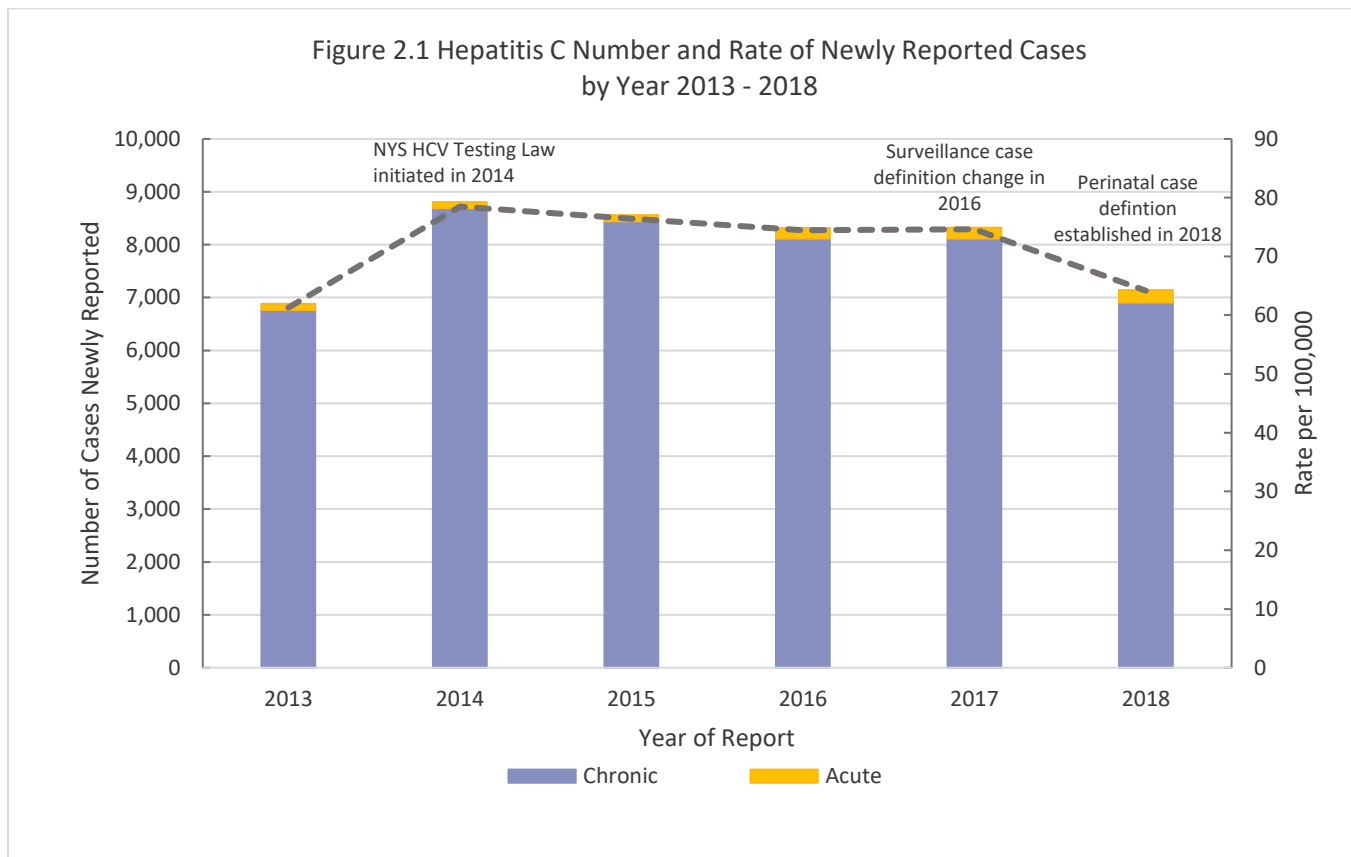
Race was unknown or missing for 31% of cases. Where race was reported, 80% of cases were among white persons. Ethnicity was unknown or missing for 59% of cases. Where ethnicity was known, 86% of cases were among non-Hispanic persons.

Three hundred and seventy-three hepatitis C cases were newly reported among persons incarcerated in DOCCS facilities (5.2% of all cases) and were typically identified upon intake screening. Fifty-eight cases were identified as female, and 315 as males. Cases among persons incarcerated in DOCCS facilities are excluded from the geographic analyses in this report, i.e., analyses presenting counts by NYS region and/or county.

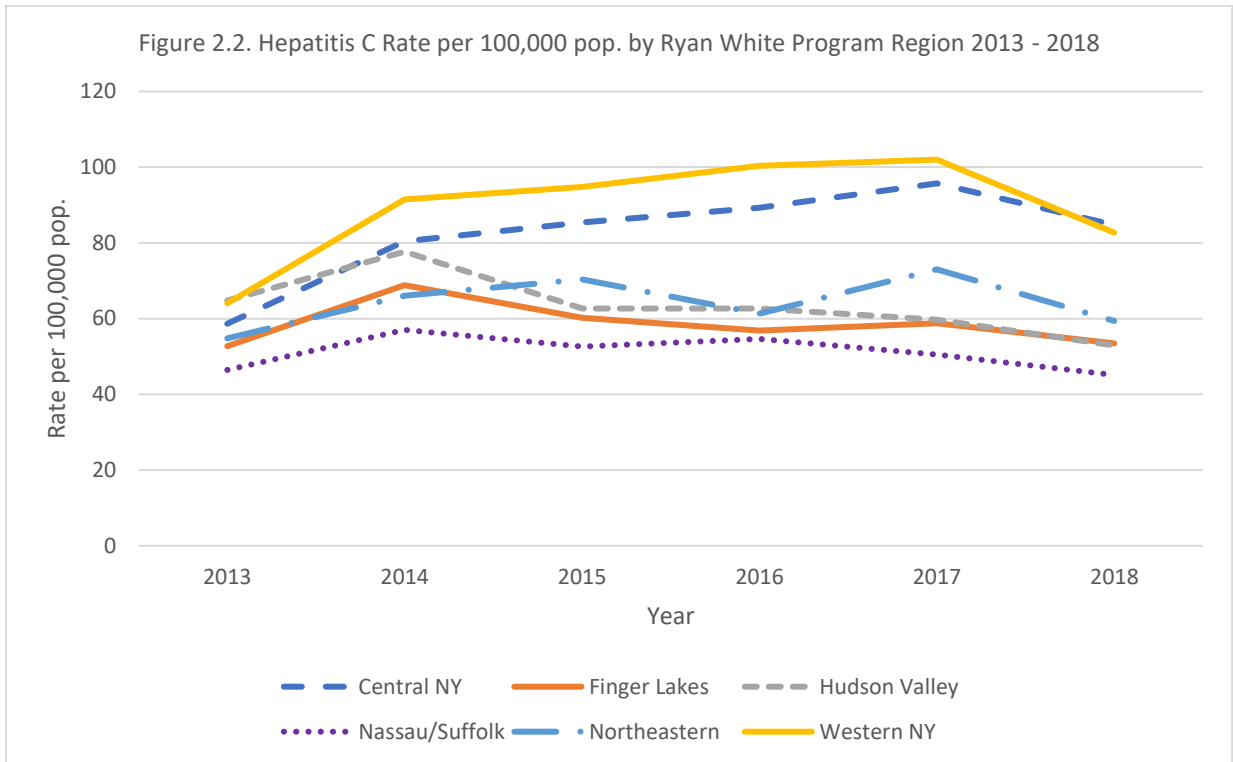
Table 2.1 Hepatitis C Cases Newly Reported in 2018						
	Female		Male		Total	
	Number of Cases	Rate per 100,000 pop.	Number of Cases	Rate per 100,000 pop.	Number of Cases	Rate per 100,000 pop.
Total	2769	48.9	4,374	79.8	7,148	64.1
Perinatal	5	2.9	4	2.2	9	2.5
Acute	103	1.9	132	2.4	235	2.2
Chronic	2,661	48.5	4,238	80.0	6,904	64.0
Age Group (years)						
< 3 years (perinatal)	5	2.9	4	2.2	9	2.5
3-9	0	NA	4	0.9	4	0.5
10-19	61	8.9	46	6.4	107	7.6
20-29	797	111.3	950	124.8	1,751	118.5
30-39	671	101.9	1,074	160.2	1,746	131.4
40-49	312	46.3	602	90.9	914	68.4
50-59	394	47.5	707	89.1	1,101	67.8
60-69	343	48.0	772	115.8	1,115	80.7
70+	178	23.0	211	36.9	388	28.9
Unknown	8	N/A	4	N/A	13	N/A
Region*						
Western Region	782	55.0	1148	84.4	1,932	69.4
Finger Lakes	267	41.4	408	66.1	675	53.5
Western NY	515	66.3	740	99.6	1,257	82.7
Central NY	593	69.0	848	100.4	1,443	84.7
Northeastern	368	48.9	521	70.0	889	59.4
Metropolitan Region	967	36.8	1542	60.9	2,510	48.6
Hudson Valley	453	38.4	775	67.8	1,229	52.9
Nassau-Suffolk	514	35.5	767	55.2	1,281	45.1
	Number of Cases	Percent of Cases	Number of Cases	Percent of Cases	Number of Cases	Percent of Cases
Race**						
White	1,542	55.7%	2,365	54.1%	3,908	54.7%
Black	205	7.4%	352	8.0%	557	7.8%
American Indian	21	0.8%	31	0.7%	52	0.7%
Asian/Pacific Islander	28	1.0%	45	1.0%	73	1.0%
Other	109	3.9%	216	4.9%	325	4.5%
Unknown	864	31.2%	1,365	31.2%	2,233	31.2%
Ethnicity**						
Hispanic	109	3.9%	288	6.6%	397	5.6%
Non-Hispanic	995	35.9%	1518	34.7%	2,513	35.2%
Unknown	1,665	60.1%	2568	58.7%	4,238	59.2%

Notes. + Totals include 5 cases where sex is unknown * Geographic assessments exclude persons incarcerated in DOCCS facilities ** Rates per 100,000 population are not calculated due to the large number of cases with missing values

Figure 2.1 displays the number and annual rate of newly reported hepatitis C cases during 2018 and the previous five years. Recent hepatitis C case trends are difficult to discern for at least two reasons. First, since January 2014, a state law (the “Hepatitis C Testing Law”) requires a one-time offer of an HCV screening test to all persons born during 1945-1965 who are receiving services as an inpatient of a hospital or in a primary care setting. An increase in the number of newly reported hepatitis C cases starting in 2014, in all regions, is attributable in part to changes in testing practices resulting from the law. Second, starting in 2016, a new case definition for hepatitis C has been in effect and has resulted in major changes to the way hepatitis C cases are counted based on laboratory results. Because the case definitions vary substantially, we recommend exercising caution when comparing numbers of cases of hepatitis C reported during 2016-2018 to cases reported during 2013-2015. There is a 14% decrease in the number of cases reported in 2018 (7,148) compared to the ones reported during 2017 (N=8,280). However, in 2018 there is a 15% increase in the number of newly reported cases, which is an indication of more recent infection.



Case rates varied widely by region during 2018. The largest number of cases was in the Central New York (N=1,443) and Nassau/Suffolk (N=1,281) regions. The highest case rates were reported in the Central (84.7/100,000 persons) and in Western New York (82.7/100,000 persons; Table 2.1 and Fig 2.2).



However, case rates also varied by county and were not evenly distributed within a region (Fig. 2.3). The counties with the highest rates were Broome, Chautauqua, Chenango, Franklin, Seneca, and Sullivan.

Figure 2.3a Hepatitis C Rate per 100,000 pop. by County New York State, Including Chronic, Acute, and Perinatal cases, Excluding Cases in Persons Incarcerated in DOCCS facilities, 2018 Newly Diagnosed Cases

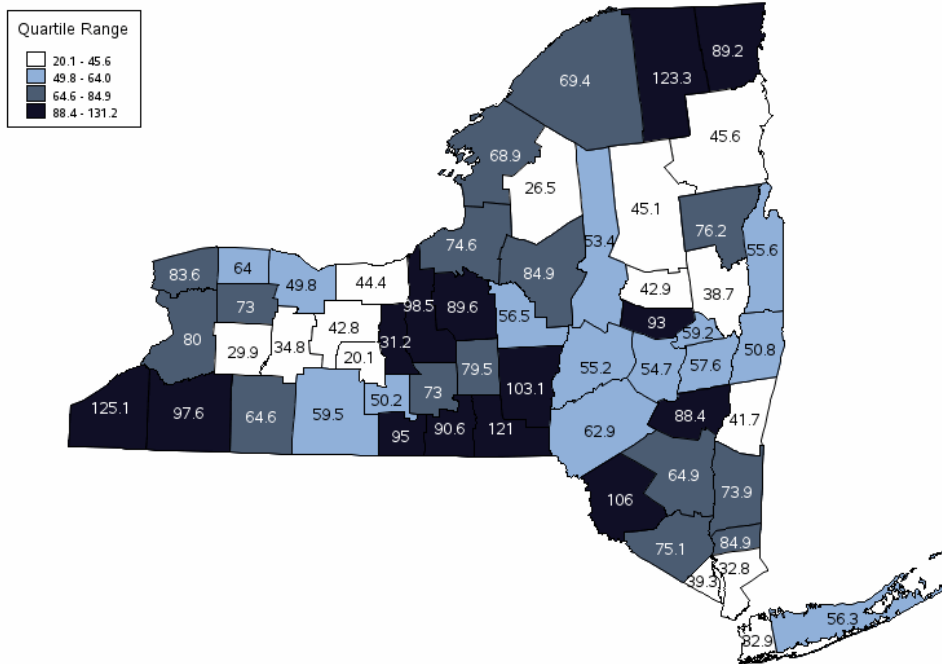
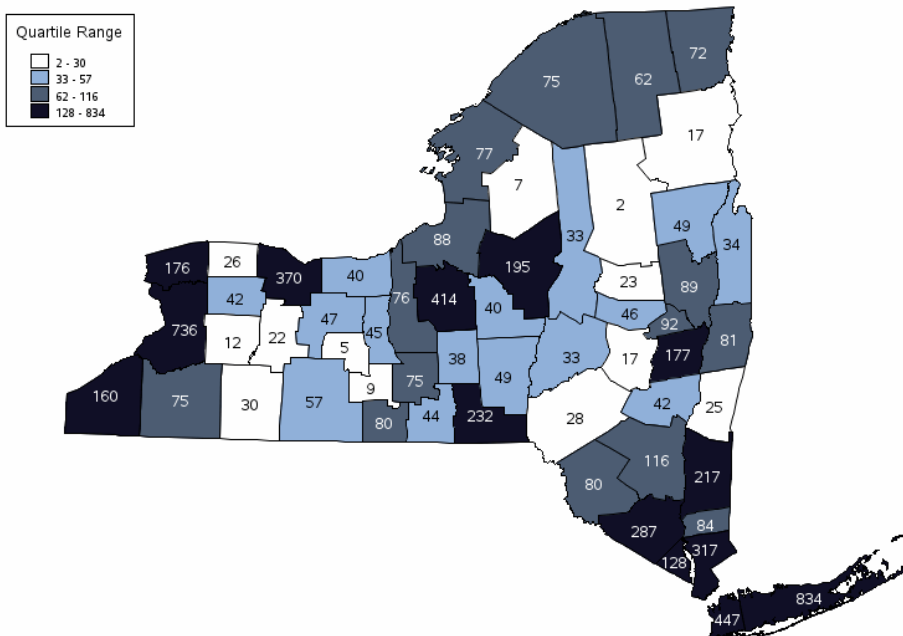


Figure 2.3b Hepatitis C Newly Reported Cases by County New York State, Including Chronic, Acute, and Perinatal Cases, Excluding Cases in Persons Incarcerated in DOCCS, 2018



Figures 2.4a-c display the number of hepatitis C cases newly reported during 2008, 2012, and 2018 by sex and birth year. A similar trend can be observed for both males and females. During 2008, 67% of reported cases were in baby boomers (persons born 1945-1965), and 15% were in persons aged 15-35 years. During 2012, 53% of cases were in baby boomers, and 28% were in persons aged 15-35. By 2018, more cases were reported in the younger ages than in the baby boomers. In 2018, 30% of reported cases were among baby boomers while the proportion of cases in persons aged 15-35 years of age had increased to approximately 42%.

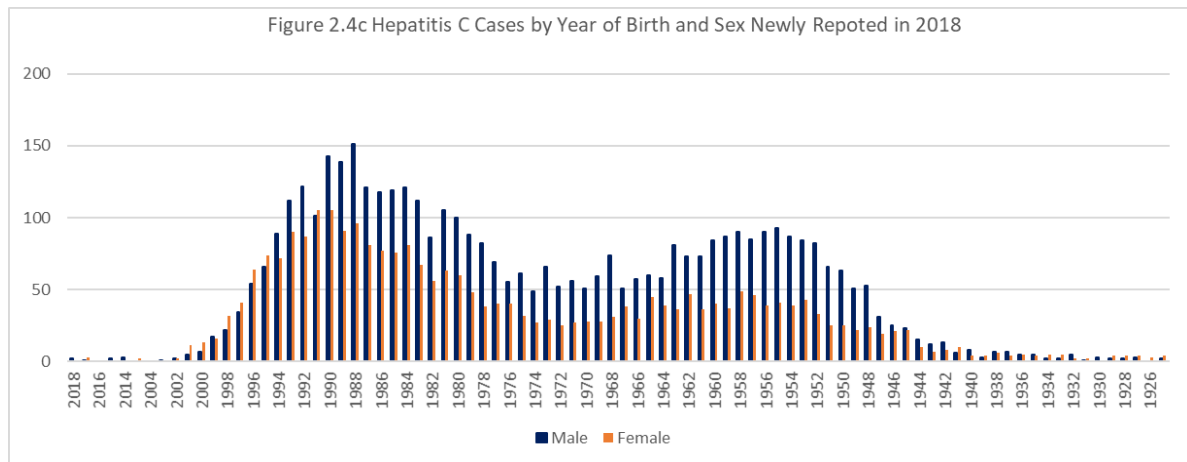
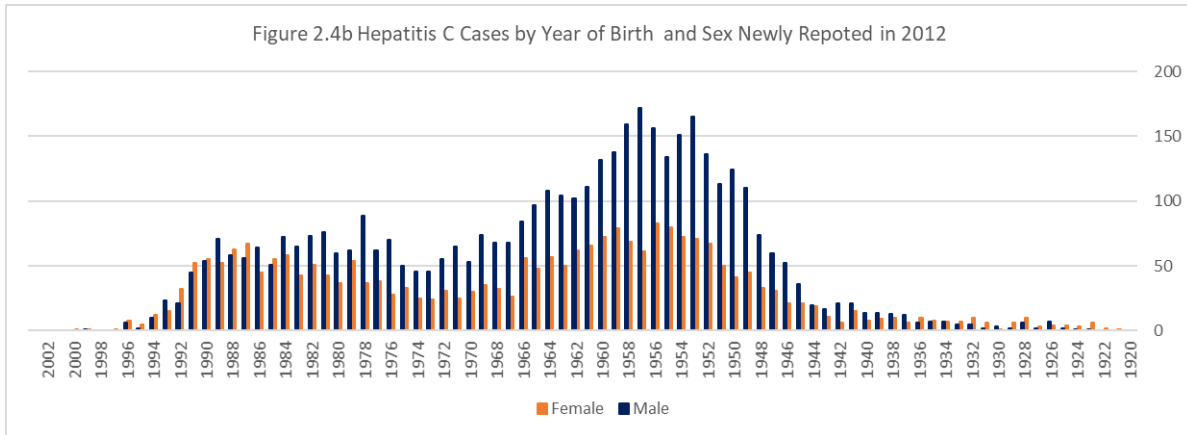
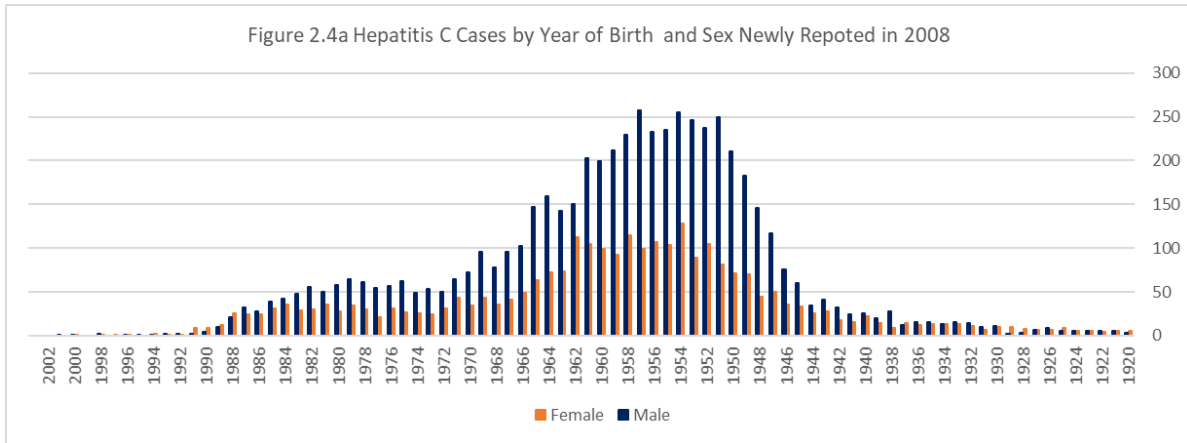


Figure 2.4d shows the steady decline in the median age of cases at time of report during 2013-2018. The median age for females is a few years younger than for males during each year. The increase in median age during 2014 compared with 2013 is likely a result of the initiation of the Hepatitis C Testing Law, which targeted baby boomers. For both sexes, the median age at the time of report has declined by about 10 years between 2013-2018.

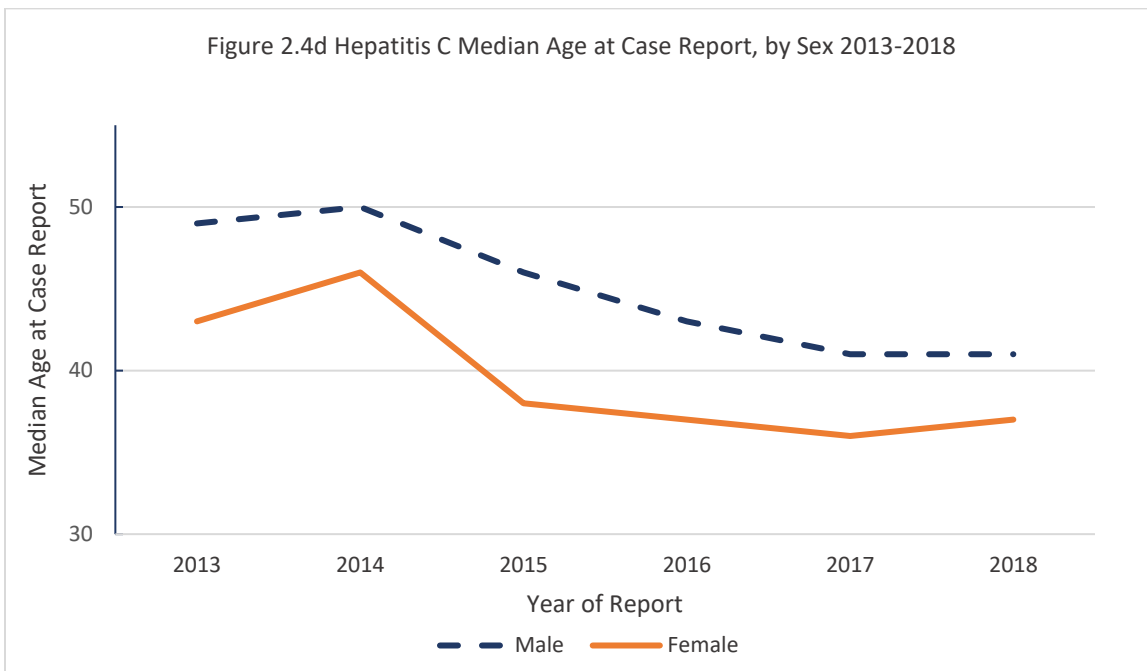
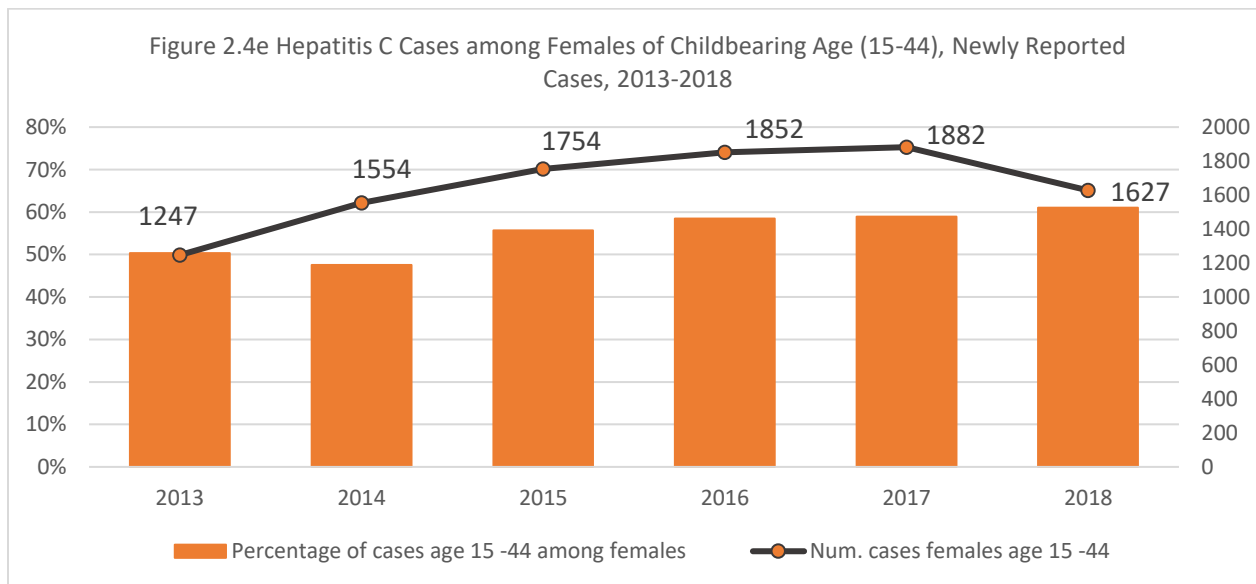
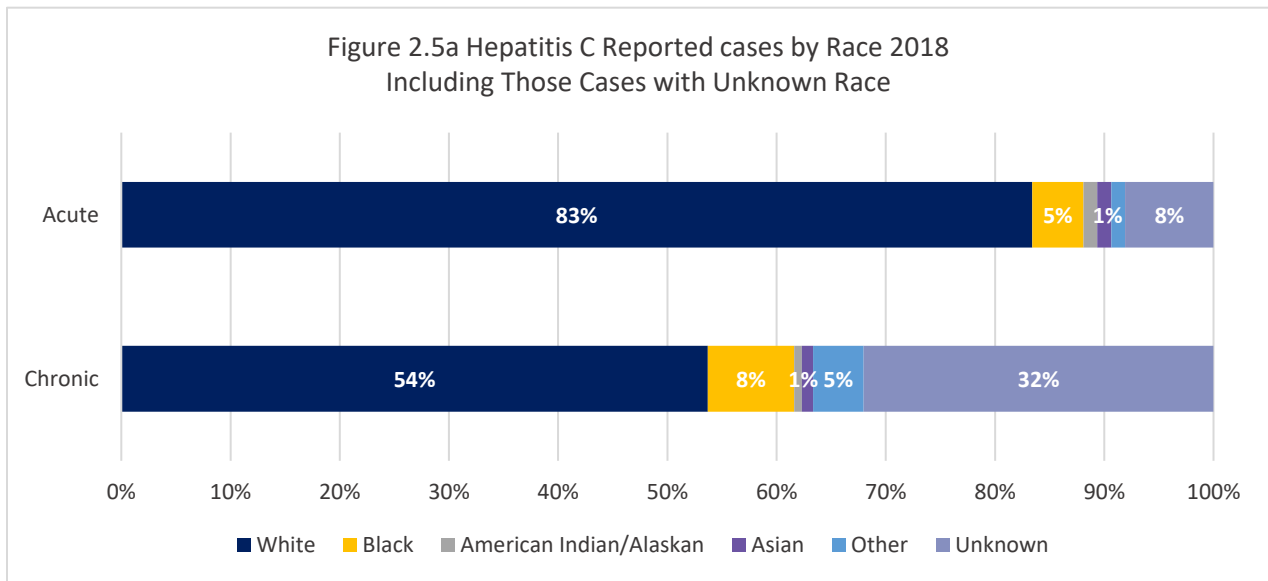


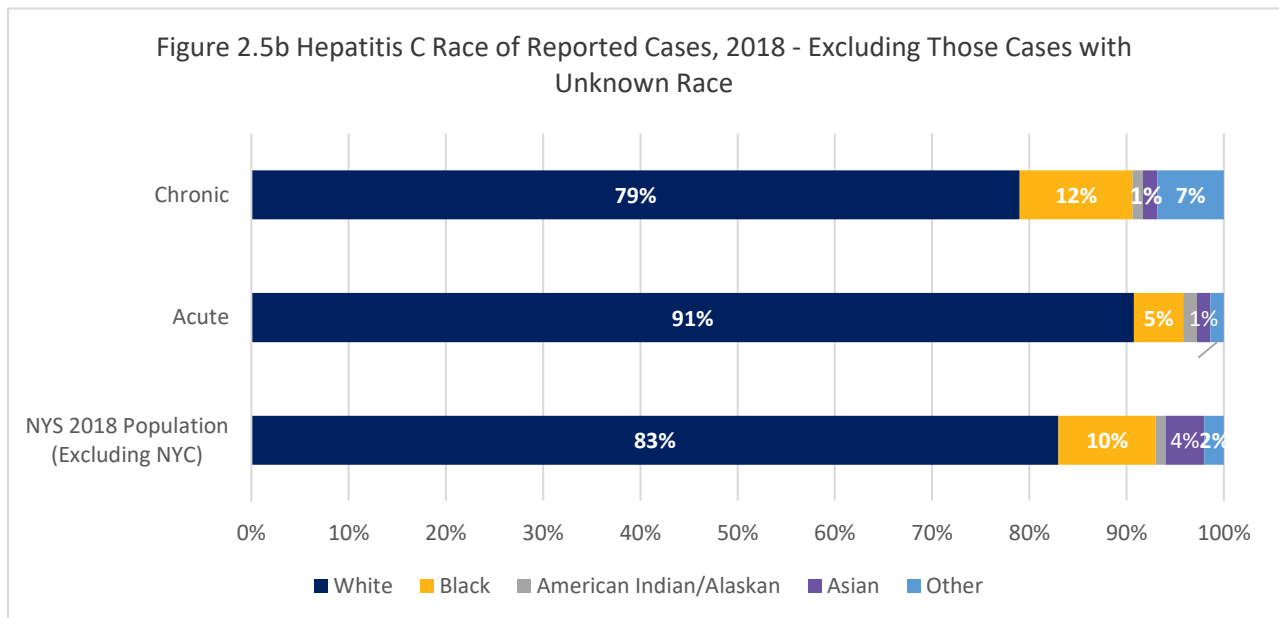
Figure 2.4e presents the trend in newly reported cases among females. Almost 40% of all cases are among females, of those 61% are among females of childbearing age



The distribution of race varied with whether the case was classified as acute or chronic hepatitis C. Figure 2.5a shows the distribution of race among all cases of hepatitis C reported during 2018. Note that race data were missing for 8% of acute and 32% of chronic hepatitis C cases.

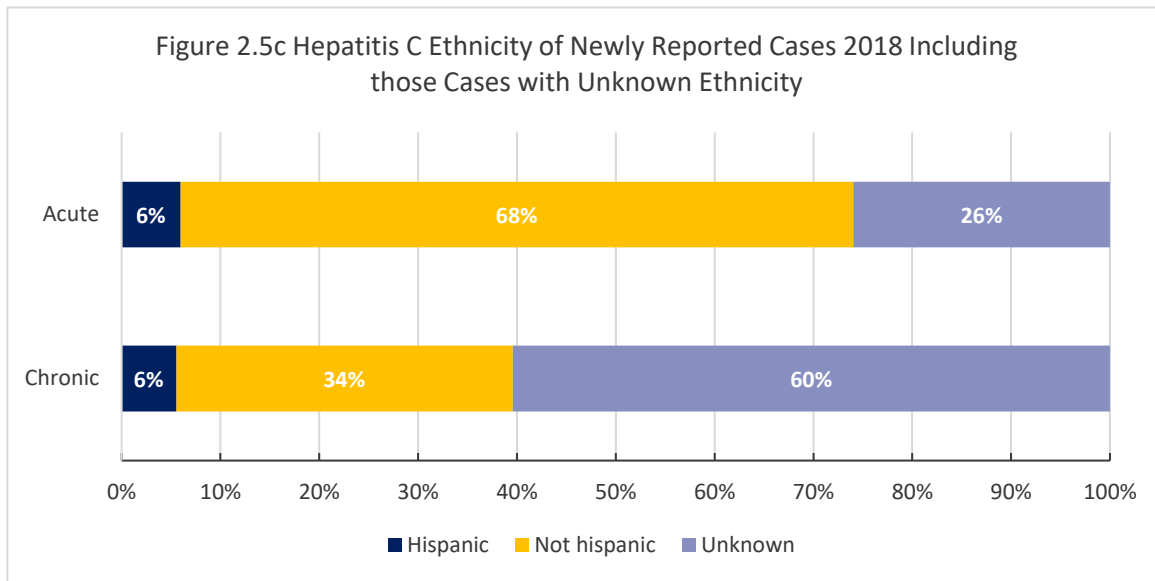


Note. The percentage of acute hepatitis C cases among American Indian/Alaskan, Asian, and Other Race is 1%. The percentage of chronic hepatitis C cases among American Indian/Alaskan and Asian is 1%

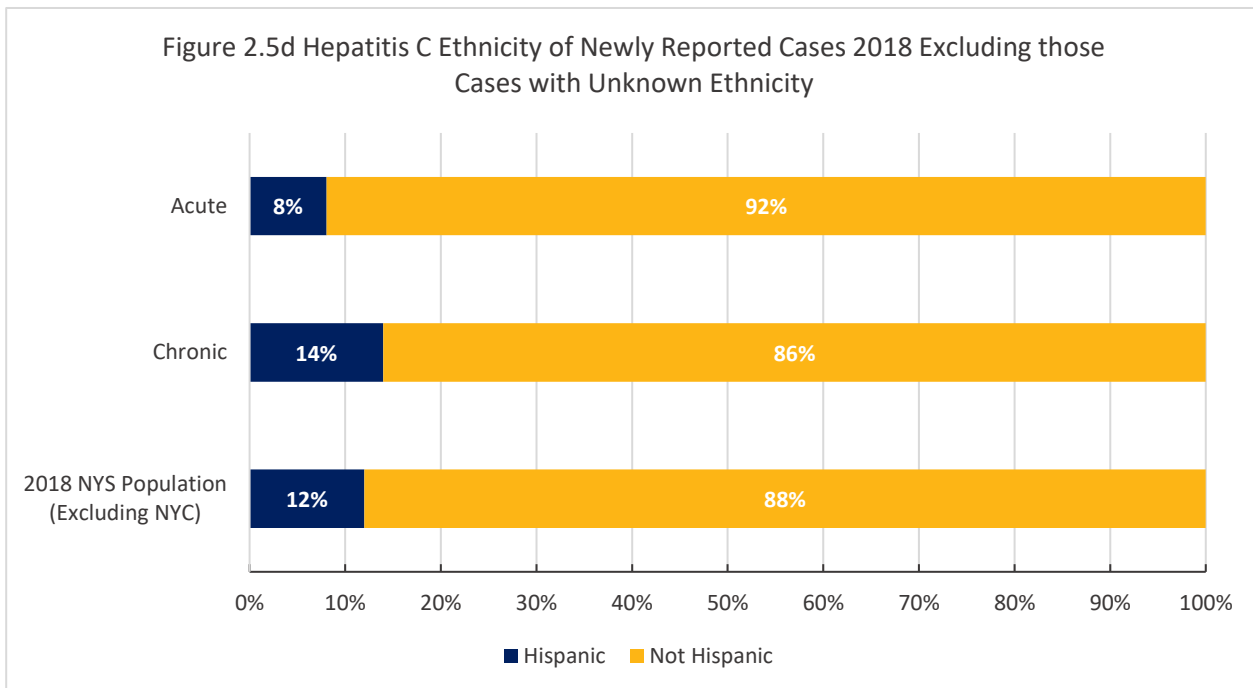


Note. The percentage of acute hepatitis C cases among American Indian/Alaskan, Asian, and Other Race is 1%. The percentage of chronic hepatitis C cases among American Indian/Alaskan and Asian is 1%

Figure 2.5c shows the distribution of Hispanic ethnicity among all hepatitis C cases reported during 2018. Note that ethnicity data were missing for 26% of acute hepatitis C and 60% of chronic hepatitis C cases.

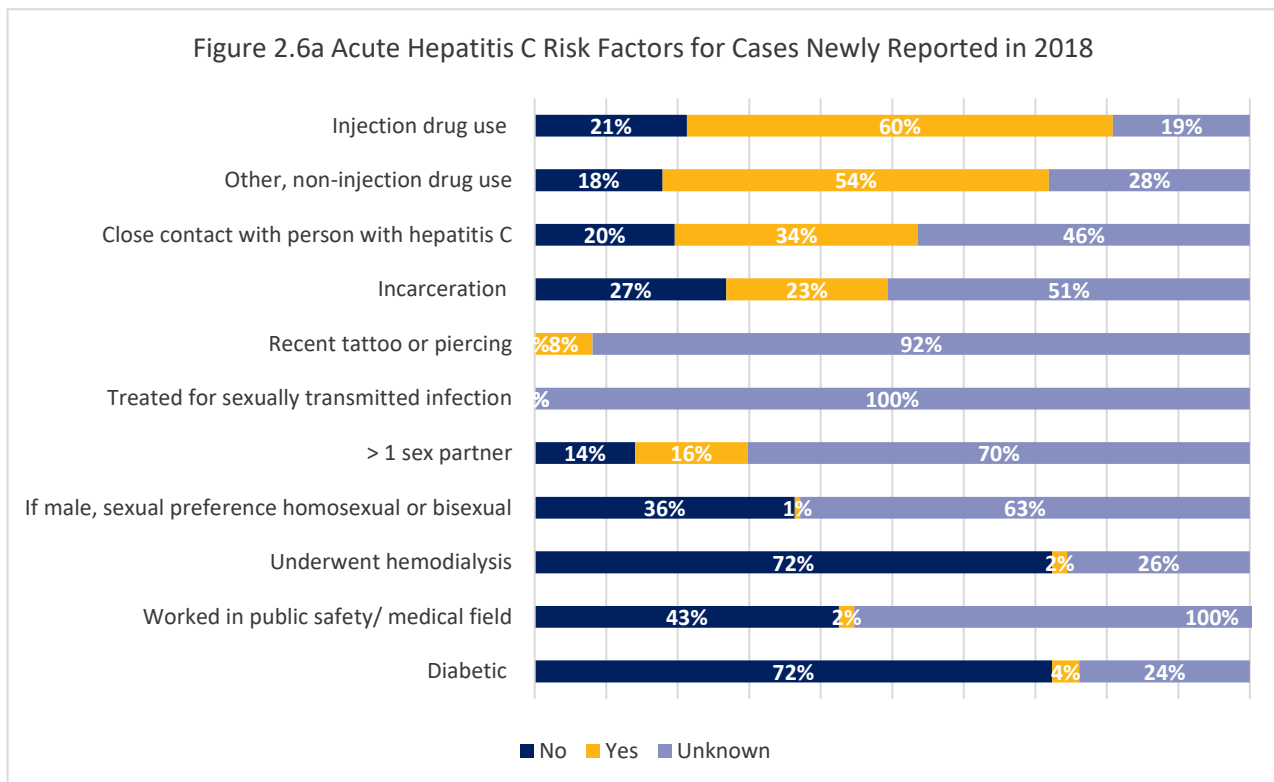


Where ethnicity was reported (i.e., not missing or unknown), ethnicity was non-Hispanic for 92% of acute hepatitis C cases and 86% of chronic hepatitis C cases (Fig 2.5d). Data may be subject to recording error and biases related to the ability of laboratories to report race and ethnicity.



For acute cases, except where noted, risk factors and exposures are determined for the six-month period before illness onset or test conversion. Selected risk factor information for acute hepatitis C cases are summarized in Table 2.6a. Depending on risk factor, the percent of cases with unknown or missing information ranged from 19-100% (Fig. 2.6a).

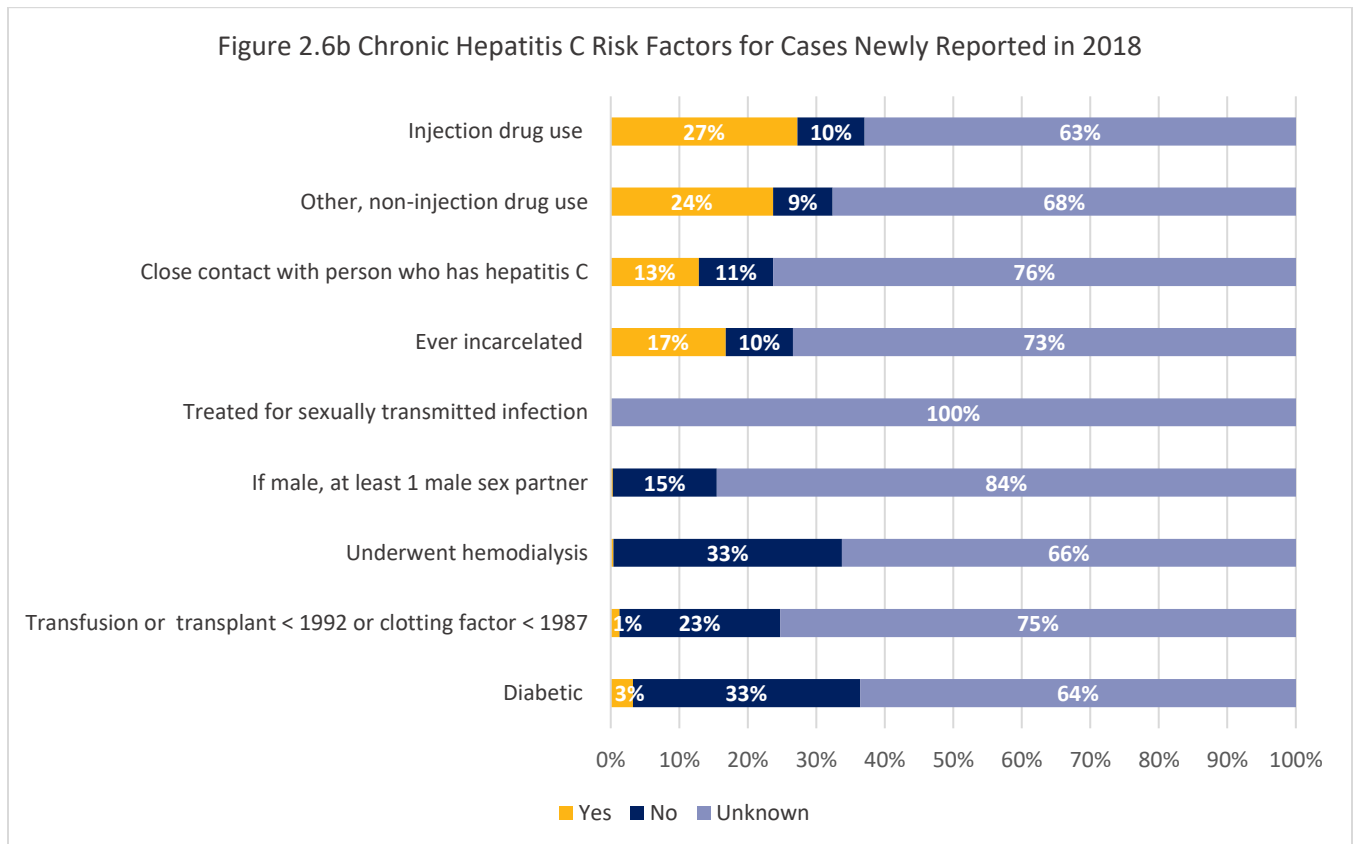
	Number of cases			Total
	Yes	No	Unknown	
Injection drug use	140	50	45	235
Other, non-injection drug use	127	42	66	235
Close contact with person who has hepatitis C	80	46	109	235
Incarceration	53	63	119	235
Recent tattoo or piercing	19	0	216	235
Treated for sexually transmitted infection	0	0	0	235
> 1 sex partner	37	33	165	235
If male, sexual preference homosexual or bisexual	1	48	83	132
Underwent hemodialysis	5	170	60	235
Worked in public safety, medical field, or dialysis center	0	0	235	235
Diabetic	9	170	56	235



For chronic cases, risk factors and exposures are determined over the patient's lifetime. Selected risk factor information for chronic hepatitis C cases are summarized in Table 2.6b.

Table 2.6b Risk Factors in Chronic Hepatitis C Cases Newly Reported in 2018				
	Number of cases			Total
	Yes	No	Unknown	
Injection drug use	1880	678	4346	6904
Other, non-injection drug use	1635	602	4667	6904
Close contact with person who has hepatitis C	887	750	5267	6904
Ever incarcerated	1158	678	5068	6904
Treated for sexually transmitted infection	0	0	6904	6904
If male, at least 1 male sex partner	13	644	3581	4238
Underwent hemodialysis	26	2304	4574	6904
Blood transfusion or organ transplant < 1992 or clotting factor < 1987	0	0	6904	6904
Diabetic	223	2289	4392	6904

Depending on risk factor, the percent of cases with unknown or missing information ranges from 63-100% (Fig. 2.6b)



Hepatitis C Rapid Testing Program

The NYSDOH AIDS Institute Hepatitis C Rapid Testing Program (HCV RTP) provides free HCV rapid antibody test kits and controls to programs serving underinsured individuals at highest risk for HCV infection. This program is designed to identify and screen persons at risk -- specifically those high-risk persons not engaged in routine health care -- to provide risk and result-specific counseling messages, and to link persons with reactive HCV antibody (positive) results to diagnostic testing (HCV RNA test), care, and treatment. In 2017, 52 programs were enrolled across the state, with at least one program in each region (including New York City). Programs enrolled in the HCV RTP must, at minimum, refer those with reactive HCV antibody tests to a health care provider for an HCV RNA test.

The HCV RTP program includes LHDs, syringe exchange programs, community-based organizations, community health clinics and local county jails. These programs must meet specific enrollment requirements and be able to outreach to those at highest risk for HCV infection. The largest number of enrolled programs in 2017 were LHDs (16) and syringe exchange programs (15).

In 2017, of 7,105 clients screened for HCV as part of the HCV RTP, 832 (11.7%) were found to have a reactive HCV antibody test. There was variation in reactivity rates by gender, race, ethnicity and age.

- Reactivity rates were higher for males (13.3%) than females (9.6%) and were lowest for those identified as transgender (5.6%).
- Reactivity rates were highest among clients reporting multiple races (21.5%) and white race (15.4%), but lower among blacks (5.8%).
- Hispanics had higher reactivity rates (16.4%) than non-Hispanics (10.0%).
- Reactivity rates were lowest in the youngest age groups (1.6% in those 19 years or younger), and highest among clients in their 30s (14.9%).

Additional testing results are provided in Table 3.1.

**Table 3.1 Client Characteristics and HCV Rapid Testing Reactivity of all Clients Screened for HCV Antibodies (Ab)
 NYSDOH HCV Rapid Testing Program: 2017 (Data as of Aug. 22, 2017)**

		# Screened	% of All Patients Tested	# Ab+	% of All Ab+ Patients	Reactivity Rate
Overall	Total	7,105	100.0%	832	100.0%	11.7
Gender	Male	4,175	58.8%	556	66.8%	13.3
	Female	2,820	39.7%	270	32.5%	9.6
	Transgender	107	1.5%	6	0.7%	5.6
	Unknown	3	0.0%	0	0.0%	0.0
Race	White	3,728	52.6%	575	69.1%	15.4
	Black	2,534	35.8%	147	17.7%	5.8
	Other Race	404	5.7%	45	5.4%	11.1
	Multiple Races	247	3.5%	53	6.4%	21.5
	Asian	80	1.1%	0	0.0%	0.0
	Native American/Alaskan Native	76	1.1%	8	1.0%	10.5
	Hawaiian	24	0.3%	2	0.2%	8.3
	Refused	9	0.1%	2	0.2%	22.2
	Unknown	3	0.0%	0	0.0%	0.0
Ethnicity	Hispanic	1,922	27.1%	315	37.9%	16.4
	Non-Hispanic	5,172	72.8%	517	62.1%	10.0
	Unknown	11	0.2%	0	0.0%	0.0
Age	≤19 years	186	2.6%	3	0.4%	1.6
	20-29 years	1,754	24.7%	191	23.0%	10.9
	30-39 years	1,586	22.3%	237	28.5%	14.9
	40-49 years	1,234	17.4%	159	19.1%	12.9
	50+ years	2,342	33.0%	242	29.1%	10.3
	Unknown	3	0.0%	0	0.0%	0.0

Prior to being screened, all clients must undergo a thorough risk assessment which includes evaluation of Primary and Additional Risk Factors for HCV. Primary Risk Factors include behaviors most likely to result in the transmission of HCV (e.g., injection drug use), and at least one should be present when offering an HCV rapid test. Risk factors are not mutually exclusive as clients may report multiple risks. (Table 3.2)

- Among all screened clients, injection drug use (IDU) and snorting drugs were the most commonly reported Primary Risk Factors (29.0%).
- Other commonly reported Primary Risk Factors included being born between 1945 and 1965 (27.4%) and tattoos (26.3%).
- Clients reporting a history of IDU had reactivity rates three times higher (34.5%) than the overall reactivity rate of 11.7%.

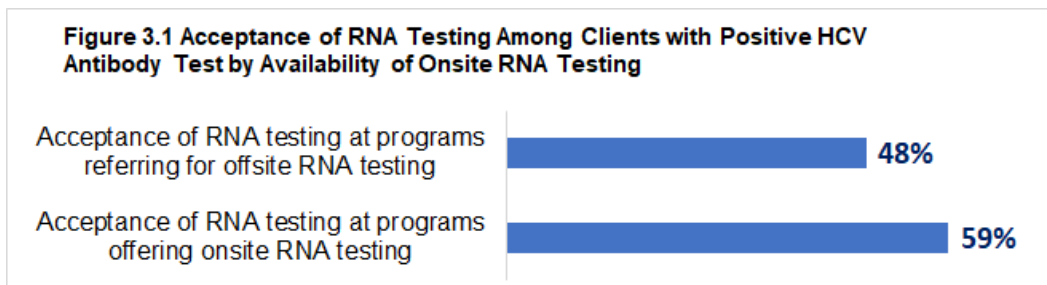
Table 3.2 Client Risk Factors* and HCV Rapid Testing Reactivity of all Clients Screened for HCV Antibody (Ab)
 NYSDOH HCV Rapid Testing Program: 2017 (Data as of Aug. 22, 2018)

		# Screened	% of All Patients Tested	# Ab+	% of All Ab+ Patients	Reactivity Rate
Overall	Total	7,105	100.0%	832	100.0%	11.7
Primary Risk Factors	Injection Drug Use	2,062	29.0%	712	85.6%	34.5
	Snorted Drugs	2,057	29.0%	379	45.6%	18.4
	1945-1965 Birth Cohort	1,946	27.4%	211	25.4%	10.8
	Tattoo	1,871	26.3%	293	35.2%	15.7
	Body Piercing	1,155	16.3%	143	17.2%	12.4
	Occupational Exposure	535	7.5%	45	5.4%	8.4
	Blood Transfusion/Transplant Before 1992	163	2.3%	17	2.0%	10.4
	HIV +	114	1.6%	20	2.4%	17.5
	Longterm Dialysis	26	0.4%	5	0.6%	19.2
	Clotting Factor Before 1987	23	0.3%	4	0.5%	17.4
Additional Risk Factors	Sex with Multiple Partners	2,983	42.0%	320	38.5%	10.7
	MSM	778	17.4%	26	3.1%	3.3
	Sex with HCV Infected Person	644	9.1%	175	21.0%	27.2
	Household Contact	534	7.5%	108	13.0%	20.2
Refused to Report	Refused	279	3.9%	6	0.7%	2.2

* Clients should report at least one primary risk factor, but multiple risks per client can be reported.

While most (30) programs offered HCV rapid screening testing with referral for follow-up RNA testing to other offsite providers, 22 programs offered free onsite HCV RNA testing. Programs offering onsite RNA testing also provided referrals for medical follow-up for clients with detectable RNA results.

- Acceptance of RNA testing was more common at programs offering onsite RNA testing (Figure 3.1).



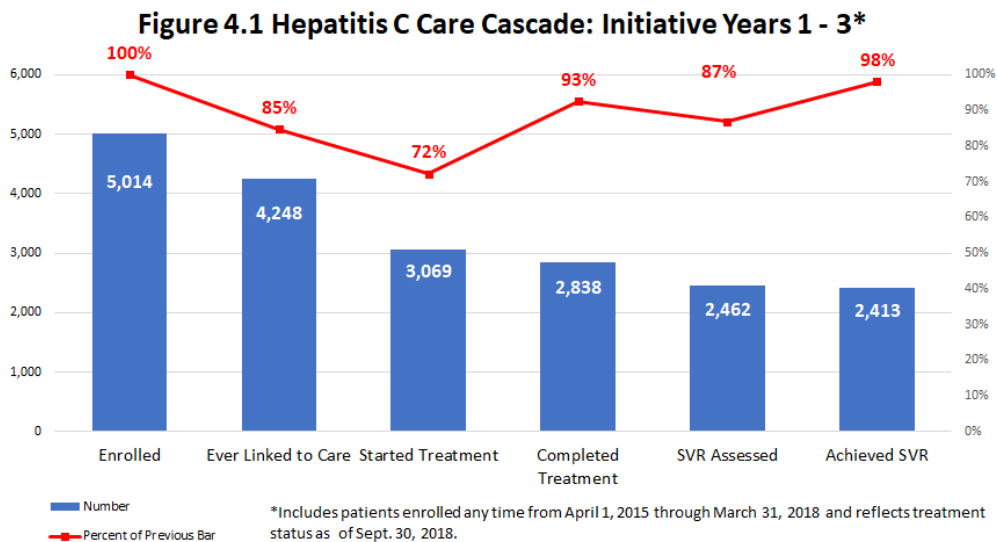
NYS Hepatitis C Care and Treatment Initiative

Since April 2015, the NYSDOH AIDS Institute (AI) has funded 15 primary care sites across NYS and NYC to integrate linkage to care activities and hepatitis C care, treatment, and supportive services into their existing primary care structure. The purpose of this five-year initiative is to create an innovative hepatitis C care and treatment model that will eliminate patient, provider and health care system barriers and increase the number of HCV-infected people who are linked to care, initiate and complete treatment, and are cured of their disease.

Funded sites include community health centers, hospital-based clinics and drug treatment programs, including a methadone maintenance treatment program.

Cumulative results from the initiative’s first three years (April 1, 2015 through March 31, 2018) can be seen in the hepatitis C care cascade presented in Figure 4.1. The bars represent the number of patients reaching each step in the care continuum and the line represents the percent of patients from the previous step in the care continuum to reach the subsequent step. The final step, achieving a sustained virologic response (SVR), is defined as the absence of circulating HCV RNA 12 weeks post treatment completion. Patients who achieve SVR are considered cured of hepatitis C. Highlights from Figure 4.1 include:

- 5,014 patients were enrolled in the program with a positive HCV antibody test.
- 72% of patients linked to care initiated treatment for hepatitis C.
- Among those who initiated treatment, 93% completed treatment.
- 98% of patients who initiated treatment and completed their final HCV RNA test were cured of hepatitis C.



Hepatitis C Continuity Program

State prisons house a significant number of incarcerated persons with hepatitis C, presenting an opportunity to screen, diagnose, treat and cure these individuals and prevent further spread of the disease both during incarceration and upon release to the community. The Hepatitis C Continuity Program is a partnership among the NYSDOH, DOCCS, and community-based health care providers. The program promotes the completion of treatment for hepatitis C among persons incarcerated in DOCCS facilities after release into the community. Participation in the program is voluntary. DOCCS health services staff and facility parole officers work with incarcerated persons prior to the initiation of treatment to arrange participation and secure the necessary Release of Information forms, initiate enrollment in Medicaid, and select a health care provider in the community to whom the individual can be referred after release. The program was initiated in 2006 and maintained through 2018. After 2018, the program was integrated into the Hepatitis C Criminal Justice Initiative. Data from 2018 are presented in Tables 5.1 and 5.2.

**Table 5.1 NYS Hepatitis C Continuity Program:
Demographics of Enrolled Releasees, 2018**

	Number	Percent
Total	51	100.0
Gender		
Female	13	25.4
Male	38	74.5
Age		
20 - 29 years	9	17.6
30 - 39 years	17	33.3
40 - 49 years	11	21.5
50 - 59 years	11	21.5
60 - 69 years	3	5.8

- In 2018, 51 releasees were enrolled.
- 13 (25%) of releasees were female, an increase from 2 (2.6%) in 2016-2017.
- The percent of releasees who kept their appointment with the community-based health care provider was 47%. Those released outside of NYC were more likely to keep their appointment (51%) than those released in NYC (25.0%).

**Table 5.2 NYS Hepatitis C Continuity Program:
Referral Appointments Kept By Location of Releasee, 2018**

	Number Releasees	Number Appointments Kept	Percent Appointments Kept
Total	51	24	47.1
Releasee Location			
Outside of NYC	43	22	51.2
In NYC	8	2	25.0

National HIV Behavioral Surveillance System (NHBS)

The National HIV Behavioral Surveillance (NHBS) system is a CDC-sponsored, cross-sectional study of people at high-risk for HIV infection in selected cities. The NYSDOH conducts the survey with a geographic focus in Nassau and Suffolk Counties (Long Island). This anonymous health survey is implemented in annual rotating cycles among men who have sex with men, people who engage in heterosexual behavior at increased risk for HIV, and persons who inject drugs (PWID). The survey collects timely, comprehensive information about sexual and drug use behaviors, HIV testing histories, exposure to and use of HIV prevention services, and hepatitis C. Respondents are screened with an HCV rapid antibody test. During 2018, the most recent year for which data are available, the survey was conducted among PWID.

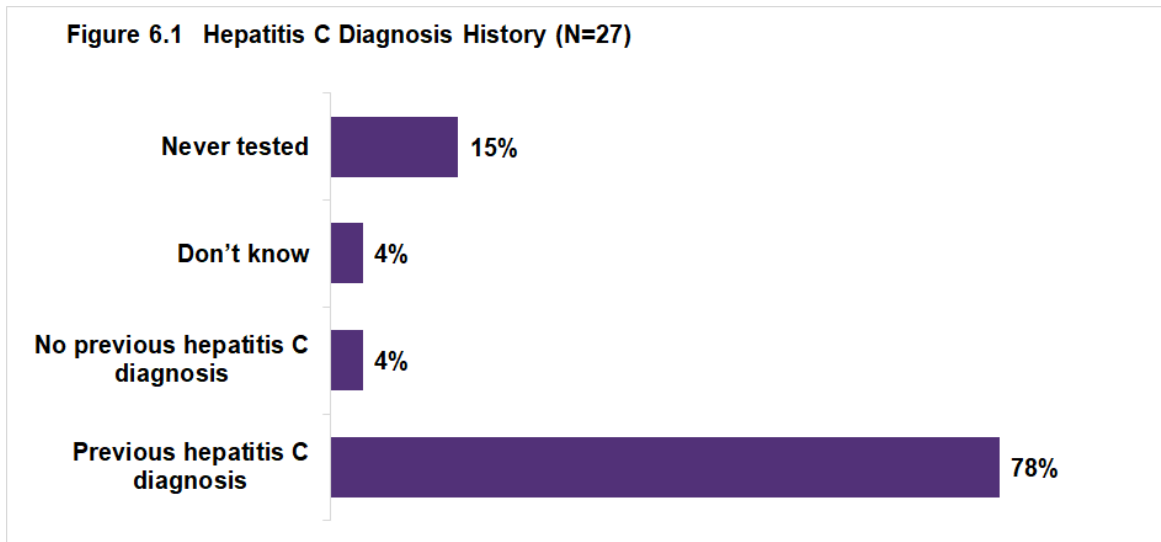
Hepatitis C Data highlights include:

In the 2018 survey of PWID, 148 (98%) of the 151 interviewed participants were screened for hepatitis C with an HCV rapid antibody test. The overall reactivity rate was 18%. Reactivity rates were higher among males, Hispanics and non-Hispanic whites, participants in their 40s and 60 years of age or older and those who reported injecting drugs for at least three years. (Table 6.1)

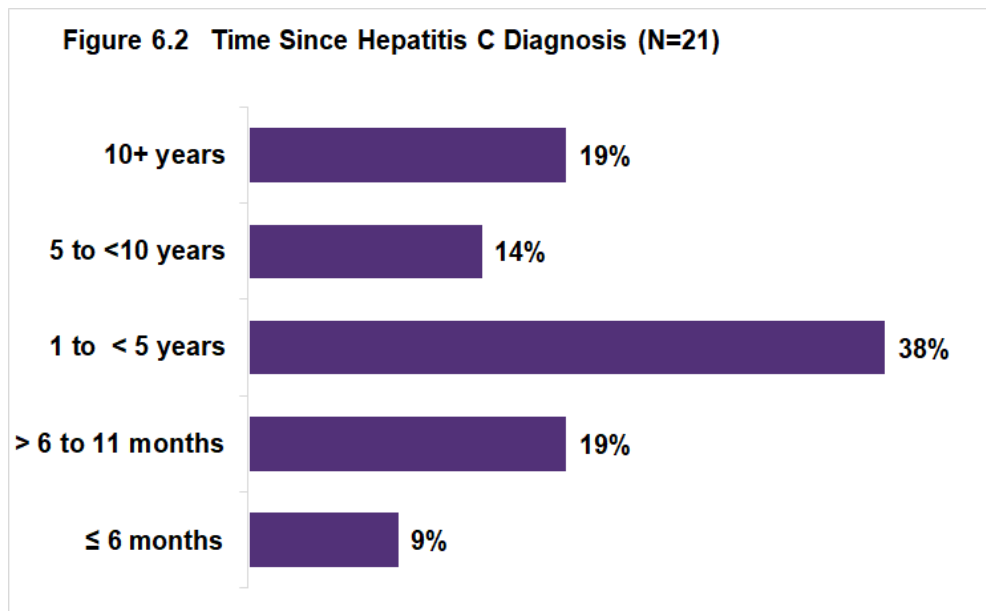
Table 6.1 Participant Characteristics and Hepatitis C Rapid Testing Results Among People Who Inject Drugs (PWID) in the Nassau-Suffolk (Long Island), New York National HIV Behavioral Surveillance Study, 2018

	Number Screened for HCV	% of all Participants Tested	Number Antibody Positive	Reactivity Rate
Total	148	100%	27	18%
Gender				
Male	95	64%	20	21%
Female	52	35%	7	13%
Transgender	1	1%	0	n/a
Race/ethnicity (mutually exclusive)				
Black	91	62%	13	14%
White	37	25%	9	24%
Hispanic	14	9%	4	28%
More than one race	5	3%	0	0%
Asian	1	1%	1	100%
Age Group				
≤29 years	15	10%	3	20%
30 – 39 years	27	18%	5	18%
40 – 49 years	23	15%	7	30%
50 - 59 years	59	40%	5	8%
≥60 years	24	16%	7	29%
Years Injecting				
≤3 years	15	10%	1	7%
>3 years	133	90%	26	19%
Ever previously tested for HCV				
Yes	97	65%	22	27%
No	45	30%	4	9%
Don't know	6	4%	1	17%

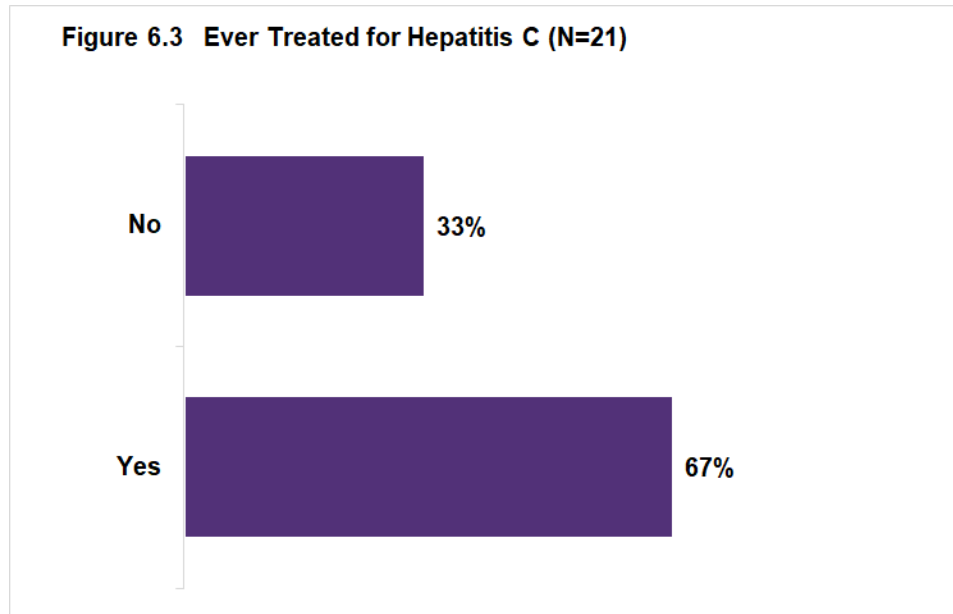
Among 27 participants with a positive HCV rapid antibody test, 78% (21) reported being diagnosed with hepatitis C in the past (Figure 6.1). Twenty-two percent (6) did not self-report as HCV-positive, suggesting that they were previously unaware of their infection.



Of those ever diagnosed with hepatitis C, 29% (6) were diagnosed within the past year and 19% (4) were diagnosed at least ten years ago, before highly effective, well tolerated, direct-acting antiviral treatment were available (Figure 6.2).



Among those ever diagnosed, 67% (7) reported taking medicine to treat hepatitis C (Figure 6.3).²



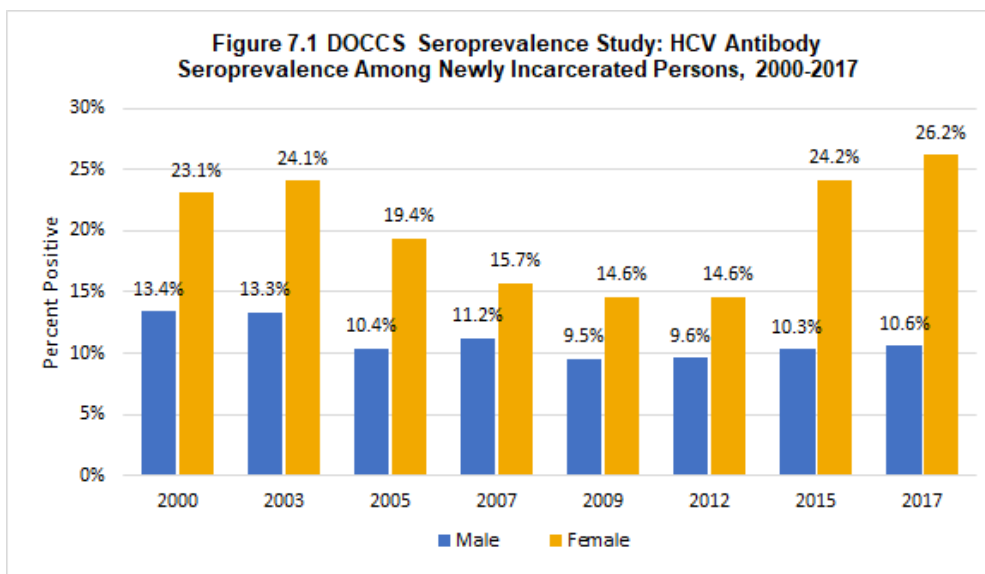
² This presentation was supported by the Cooperative Agreement Number PS16-1601.NU62 NATIONAL HIV BEHAVIORAL SURVEILLANCE (NHBS) from the Centers for Disease Control and Prevention. Its contents are solely the responsibility of the authors and do not necessarily represent the official views of the Centers for Disease Control and Prevention.

HIV and HCV Seroprevalence Study Among Incarcerated Persons Entering the NYS Department of Corrections and Community Supervision (DOCCS) System

Since 1988, the NYSDOH has conducted twelve HIV seroprevalence studies of persons entering DOCCS custody. A sample of inmates entering one of four DOCCS facilities (Bedford Hills, Ulster, Downstate and Elmira) had data and residual blood specimens from the routine intake process collected during each seroprevalence study. Studies conducted in 2000, 2003, 2005, 2007, 2009, 2012, 2015, and 2017 included HCV antibody testing. Hepatitis C RNA testing was not performed to confirm or rule out active infection. Below are some key findings and trends in HCV antibody positivity and HIV/HCV co-infection among incarcerated persons who enter the DOCCS system.

HCV Antibody Testing

- After delinking all identifiers, stored study blood specimens were tested to determine the presence of significant hepatitis C antibody levels (high signal-to-cutoff ratio), which indicated presumed infection. No confirmatory RNA testing was performed.
- For the 2017 study cohort, 13.8% (604/4,390) were HCV antibody positive (Table 7.1)
 - HCV antibody seroprevalence for females was 26.2%, up from 24.2% in 2015 (Figure 7.1)
 - HCV antibody seroprevalence for males has remained relatively stable over time (10.3% in 2015; 10.6% in 2017)



Since 2012, seroprevalence has been consistently highest among incoming non-Hispanic white incarcerated persons.

HCV seropositivity rates have trended downward among incarcerated persons originating from NYC, while the opposite trend has been observed among those originating from non-NYC counties of NYS. Since 2009, rates among incarcerated persons originating from outside NYC have continued to rise. Conversely, rates among incarcerated persons from NYC are the lowest observed since 2000 when HCV antibody testing was first included as part of the study. Other demographic and risk trends can be seen in Table 7.1.

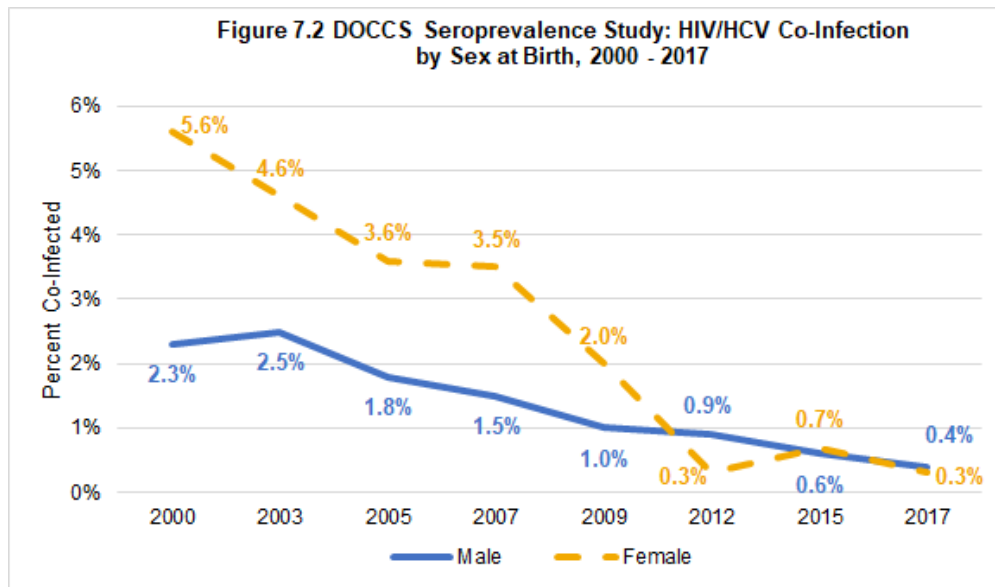
Table 7.1 DOCCS Seroprevalence Study
HCV Antibody Seroprevalence Among Newly Incarcerated Persons by Basic Demographic and Risk Factors: 2000 - 2017

Demographics & Risk Factors	2000		2003		2005		2007		2009		2012		2015		2017	
	Number Positive	Percent Positive	Number Positive	Percent Positive	Number Positive	Percent Positive	Number Positive	Percent Positive	Number Positive	Percent Positive	Number Positive	Percent Positive	Number Positive	Percent Positive	Number Positive	Percent Positive
Sex																
Male	413	13.4	414	13.3	327	10.4	361	11.2	305	9.5	320	9.6	350	10.3	371	10.6
Female	190	23.1	197	24.1	146	19.4	141	15.7	125	14.6	128	14.6	206	24.2	233	26.2
Age																
< 30	59	3.7	61	3.8	52	3.3	39	2.4	64	3.7	88	5.1	139	8.3	132	8.4
30 - 39	228	16.0	179	14.2	130	11.1	120	10.9	101	9.4	115	9.7	180	13.8	230	15.7
>= 40	315	37.0	371	34.3	291	25.4	343	25.0	265	20.5	245	19.0	237	18.9	242	17.9
Race/Ethnicity																
White	165	18.5	158	18.4	152	15.2	155	15.5	166	14.8	224	17.1	334	24.4	412	28.2
Black	227	11.3	230	11.6	168	8.5	160	7.5	121	6.1	88	4.6	77	4.3	80	4.3
Hispanic	204	22.0	209	21.4	149	17.6	178	19.3	135	15.3	115	13.6	129	14.3	93	10.3
Other	7	9.7	10	10.4	3	5.0	8	11.0	6	8.3	19	13.1	14	7.9	19	11.7
Region of Arrest/Commitment																
NYC	359	17.8	354	17.5	247	14.1	291	14.8	218	11.6	176	9.9	171	10.0	108	7.2
ROS	242	13.2	257	13.6	226	10.7	211	9.9	212	9.7	272	11.3	385	15.2	496	17.3
Risks*																
IDU	235	78.9	281	78.1	184	45.1	206	72.8	204	62.6	225	53.4	368	56.2	415	56.9
MSM	6	21.4	11	16.7	21	11.1	7	14.9	2	3.1	10	17.2	7	14.3	9	15.5
SXIDU	106	56.1	133	53.0	109	36.2	103	52.3	81	50.6	152	48.3	260	53.9	330	53.7
CRACK	185	24.5	222	26.2	162	18.7	156	19.9	165	22.8	168	23.3	243	31.0	309	34.3
SXMDRG	82	31.4	110	33.2	89	22.4	71	25.5	42	23.7	46	26.6	62	36.0	70	39.3
DRUG EVER	517	19.2	537	19.0	413	14.3	451	14.5	389	12.9	402	13.7	520	16.1	570	17.1

* IDU=Injection Drug Use; MSM=Men Having Sex with Men; SXIDU=Sexual Partner of Injection Drug User; SXMDRG=Sex for Drug and/or Money; DRUG EVER=any reported drug use

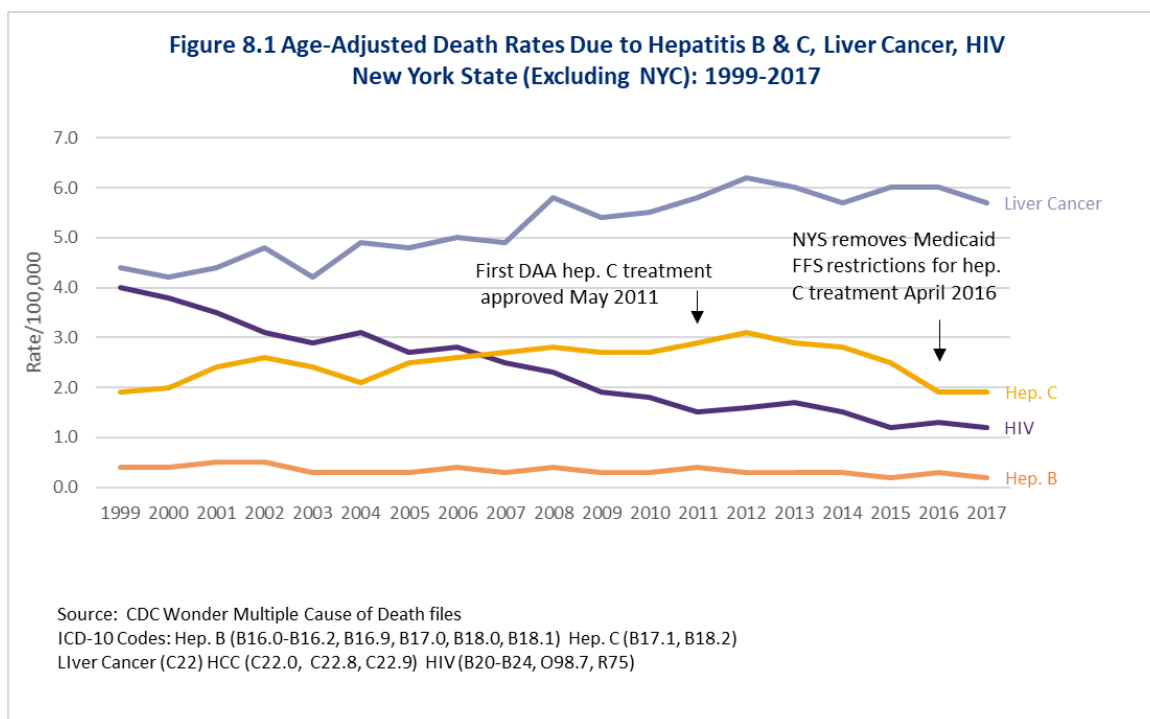
HIV/HCV Co-Infection

- In the 2017 study cohort, just 0.4% (16) of tested incarcerated persons had detectable HIV and HCV antibodies, an 86.7% decline from 3.0% in 2000.
- HIV/HCV co-infection rates decreased between 2000 and 2017 for both males (83% decrease) and females (95% decrease). Between 2015 and 2017, coinfection in males decreased 33% while decreasing 57% in females. (Figure 7.2)
- Of the 604 HCV antibody positive incarcerated persons, 2.7% were also HIV positive (down from 5% in 2015).
- Of the 82 HIV positive incarcerated persons, 20% were also HCV antibody positive (down from 31% in 2015).



Deaths from Hepatitis B, Hepatitis C and Liver Cancer – National Center for Health Statistics

Data on hepatitis deaths and liver cancer were obtained from the National Center for Health Statistics, multiple causes of death file, available at [Wonder.cdc.gov](http://wonder.cdc.gov). At the time of this report, data were available through 2017 and are provided in Figure 8.1 and Table 8.1



Hepatitis B

- In New York (excluding NYC), from 2011 to 2017 the overall age-adjusted rate of deaths from hepatitis B was 0.2 per 100,000 persons. Since 1999, there was little change from year to year.
- Rates are highest among, males, non-Hispanic blacks, Asian/Pacific Islanders, and Hispanics.

Hepatitis C

- Nationally, in 2013, hepatitis C-related mortality surpassed deaths from 60 other reportable infectious diseases.³ Yet, it is estimated that as few as one-fifth of hepatitis C patients who die have it listed as a cause of death.⁴
- In New York (excluding NYC), from 2011 to 2017, the overall age-adjusted rate of deaths from hepatitis C was 2.6 per 100,000 persons. Age-adjusted rates decreased 38.7% from 3.1 per

³ Kathleen N. Ly et al. Rising Mortality Associated with Hepatitis C Virus in the United States, 2003–2013. *Clinical Infectious Diseases*, 62(10), 1287-1288, <https://doi.org/10.1093/cid/ciw111>

⁴ Reena Mahajan et al. Mortality Among Persons in Care with Hepatitis C Virus Infection: The Chronic Hepatitis Cohort Study (CHeCS), 2006–2010. *Clinical Infectious Diseases*, 58(8), 1055–1061, <https://doi.org/10.1093/cid/ciu077>

100,000 in 2012, when rates were highest, to 1.9 per 100,000 persons in 2017, but have remained unchanged since 2016.

- Rates were highest in persons who are 45-64 and 65-84 years of age, males, non-Hispanic blacks, American Indian/Alaskan Natives, and Hispanics.
- Reported hepatitis C death rates have surpassed HIV death rates each year since 2006.

Liver Cancer

- Age-adjusted rates of liver cancer deaths peaked in 2012 at 6.2 per 100,000. By 2017, the age-adjusted rate dropped 8.1% to 5.7 per 100,000.
- The CDC estimates that approximately 65% of liver cancer cases are related to hepatitis B or C, with nearly 50% attributable to hepatitis C alone.⁵

Table 8.1 Deaths Due to Hepatitis B and C: New York State (Excluding NYC), 2011-2017

	Hepatitis B			Hepatitis C		
	Number of Deaths	% of All Hepatitis B Deaths	Age-Adjusted Rate Per 100,000 Population	Number of Deaths	% of All Hepatitis C Deaths	Age-Adjusted Rate Per 100,000 Population
Total	279	100.0%	0.3	2,718	100.0%	2.6
Sex						
Male	212	76.0%	0.4	1,974	72.6%	3.9
Female	67	24.0%	0.1	744	27.4%	1.4
Race/Ethnicity						
American Indian/Alaskan Native	NA	NA	NA	21	0.9%	5.4
Black, Non-Hispanic	59	21.1%	0.8	492	20.3%	6.7
Hispanic	32	11.5%	0.5	273	10.0%	4.5
White, Non-Hispanic	143	51.3%	0.2	1,860	76.9%	2.1
Asian or Pacific Islander	41	14.7%	1.4	47	1.9%	1.7
Age at Death**						
<25	NA	NA	NA	NA	NA	NA
25-44	18	6.5%	0.7*	75	2.8%	0.4
45-64	162	58.1%	0.7	1,797	66.1%	8.0
65-84	89	31.9%	0.8	746	27.4%	7.0
85+	NA	NA	NA	90	3.3%	4.7

* Rates are unreliable when death count is < 20.

** Age-specific rates are not age-adjusted.

Note: Due to small cell sizes and missing data, may not add to total.

NA indicates cell sizes from 0 - 9.

ICD-10 Codes: Hep. B (B16.0, 16.1, 16.2, 16.9, 17.0, 18.0, 18.1) Hep. C (B17.1, B18.2)

Source: CDC Wonder Multiple Cause of Death files (<https://wonder.cdc.gov/mcd.html>)

⁵ Centers for Disease Control and Prevention, Viral hepatitis and Liver Cancer Fact Sheet, March 2016 online <https://www.cdc.gov/nchhstp/newsroom/docs/factsheets/viral-hep-liver-cancer.pdf>

Additional Links

NYSDOH viral hepatitis information: <https://www.health.ny.gov/diseases/communicable/hepatitis/>

NYCDOHMH Hepatitis A, B and C in New York City: 2018 annual report:

<https://www1.nyc.gov/assets/doh/downloads/pdf/cd/hepatitis-abc-annual-report-2018.pdf>

NYS Hepatitis C Care and Treatment Initiative:

https://www.health.ny.gov/diseases/communicable/hepatitis/hepatitis_c/providers/programs.htm

NYS Hepatitis C Continuity Program Fact Sheet:

https://www.health.ny.gov/diseases/aids/providers/corrections/hcv_factsheet.htm

Health Data NY Hepatitis B Birth Dose Vaccination Rates:

<https://healthdata.ny.gov/en/browse?q=birth+dose>

Give birth to the end of Hep B: <http://www.immunize.org/protect-newborns/>

Rapid Testing Program:

https://www.health.ny.gov/diseases/communicable/hepatitis/hepatitis_c/implementation_guide/index.htm/

Surveillance Case definitions:

Acute hepatitis B

<https://wwwn.cdc.gov/nndss/conditions/hepatitis-b-acute/case-definition/2012>

Chronic hepatitis B

<https://wwwn.cdc.gov/nndss/conditions/hepatitis-b-chronic/case-definition/2012>

Acute hepatitis C

<https://wwwn.cdc.gov/nndss/conditions/hepatitis-c-acute/case-definition/2016>

Chronic hepatitis C

<https://wwwn.cdc.gov/nndss/conditions/hepatitis-c-chronic/case-definition/2016>

US Census Population Data: <https://factfinder.census.gov/>

CDC Bridged-Race Population Estimates: <https://wonder.cdc.gov/bridged-race-population.html>

List of Acronyms

AI – AIDS Institute

BRFSS - Behavioral Risk Factor Surveillance System

CDC – Centers for Disease Control and Prevention

CDESS - Communicable Disease Electronic Surveillance System

CSTE - Council of State and Territorial Epidemiologists

DNA – deoxyribonucleic acid

DOCCS - Department of Corrections and Community Supervision

ECLRS - Electronic Clinical Laboratory Reporting System

HBeAg - hepatitis B e antigen

HBIG - hepatitis B immune globulin

HBsAG - hepatitis B surface antigen

HBV – hepatitis B virus

HCV – hepatitis C virus

HCV RPT - Hepatitis C Rapid Testing Program

HIV - human immunodeficiency virus

LHD - local health department (LHD)

NHBS - National HIV Behavioral Surveillance

NYC – New York City

NYSDOH – New York State Department of Health

NYCDOHMH – New York City Department of Health and Mental Hygiene

PHBPP - Perinatal Hepatitis B Prevention Program

PVST - post vaccination serologic testing

PWID - persons who inject drugs

RNA - ribonucleic acid

SVR - sustained virologic response