

**NEW YORK STATE DEPARTMENT OF HEALTH
2017 HEPATITIS B AND C ANNUAL REPORT**

Viral Hepatitis
Surveillance, Prevention, and Programs

Table of Contents

Report Highlights.....3

Background and Technical Notes.....5

Viral Hepatitis Case Surveillance Data (for New York State, excluding New York City)9

 Hepatitis B9

 Table 1.1 Hepatitis B Cases Newly Reported in 20179

 Figure 1.1 Hepatitis B Cases and Rate per 100,000 Population by Year of Report10

 Figure 1.2 Hepatitis B Rate per 100,000 by Year of Report by Region10

 Figure 1.3 County Map, Rates of Newly Reported Hepatitis B Cases Reported in 2017 per 100,000 pop...11

 Figure 1.4 Hepatitis B Median Age at Diagnosis by Sex and Year of Report11

 Figure 1.5a Hepatitis B Cases by Race Reported in 2017, Including those with Unknown Race12

 Figure 1.5b Hepatitis B Cases by Race Reported in 2017, Excluding those with Unknown Race.....12

 Figure 1.5c Hepatitis B Cases by Ethnicity Reported in 2017, Including those with Unknown Ethnicity....13

 Figure 1.5d Hepatitis B Cases by Ethnicity Reported in 2017, Excluding those with Unknown Ethnicity ..13

 Table 1.6 Risk Factors in Chronic Hepatitis B Cases Newly Reported in 201714

 Figure 1.6 Risk Factors for Chronic Hepatitis B Newly Reported in 201714

 Perinatal Hepatitis B Prevention Program (PHBPP).....15

 Figure 1.7 PHBPP rates 2016 Birth Cohort.....15

 Figure 1.8 Birth Dose Vaccination Rates by Region 201716

 Hepatitis C.....17

 Table 2.1 Hepatitis C Cases Newly Reported in 201718

 Figure 2.1 Hepatitis C Cases and Rate per 100,000 Population by Year19

 Figure 2.2 Hepatitis C Rate per 100,000 Population by Year of Report by Region20

 Figure 2.3 County Map, Rates of Newly Reported Hepatitis C Cases in 2017 per 100,000 pop.21

 Figure 2.4a-c Hepatitis C by Year of Birth by Sex – in 2008, 2012 and 201722

 Figure 2.4d Hepatitis C Median Age at Diagnosis by Sex.....23

 Figure 2.5a Hepatitis C Cases by Race Reported in 2017, Including those with Unknown Race24

 Figure 2.5b Hepatitis C Cases by Race Reported in 2017, Excluding those with Unknown Race.....24

 Figure 2.5c Hepatitis C Cases by Ethnicity Reported in 2017, Including those with Unknown Ethnicity....25

 Figure 2.5d Hepatitis C Cases by Ethnicity Reported in 2017, Excluding those with Unknown Ethnicity ..25

 Table 2.6a Risk Factors in Acute Hepatitis C Cases Newly Reported in 201726

 Figure 2.6a-1 Risk Factors for Acute Hepatitis C Newly Reported in 201726

 Table 2.6b Risk Factors in Chronic Hepatitis C Cases Newly Reported in 201727

 Figure 2.6b-1 Risk Factors for Chronic Hepatitis C Newly Reported in 201727

AIDS Institute Hepatitis C Programs, Initiatives and Special Studies28

 Hepatitis C Rapid Testing Program28

 Table 3.1 NYS Hepatitis C Rapid Testing Program.....29

 Hepatitis C Care and Treatment Initiative30

 Figure 4.1 Hepatitis C Care Cascade In 15 Primary Care Sites30

 Hepatitis C Continuity Program31

 Table 5.1 Demographics of Enrolled Releasees 2016-201731

 Table 5.2 Referral Appointments Kept by Location of Releasee 2016-201731

 Figure 5.1 Outcomes 201632

 National HIV Behavioral Surveillance System (NHBSS)33

 Table 6.1 Hepatitis C Screening, Diagnosis and Treatment in Injection Drug Users34

 HIV and HCV Serosurvey Among Inmates Entering the NYS Department of Corrections and Community Supervision (DOCCS) System35

 Table 7.1 Hepatitis C Antibody Seroprevalence Among Inmates Entering the DOCCS System 2000-201536

 Figure 7.1 Hepatitis C Antibody Seroprevalence by Sex by Year 2000-2015.....36

 Figure 7.2 HIV and HCV Co-infection by Sex 2000-201537

 Behavioral Risk Factor Surveillance System (BRFSS)38

 Table 8.1 Hepatitis C Knowledge and Testing by Age, 2013-201638

Other Data39

 Deaths Due to Hepatitis B, Hepatitis C and Liver Cancer – National Center for Health Statistics39

 Table 9.1 Deaths Due to Hepatitis B and C 2012-201640

 Figure 9.1 Age Adjusted Death Rates Due to Hepatitis B and C, Liver Cancer, and HIV 1999-201641

References and Links42

List of Acronyms43

Report Highlights

Hepatitis B Surveillance

- During 2017, 1,993 cases of hepatitis B were newly reported to the New York State Department of Health (NYSDOH), including 37 acute cases and 1,956 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. 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 281 infants born during 2016 to mothers with hepatitis B. Nearly all (98%) infants received timely post-exposure prophylaxis; 94% also completed the hepatitis B vaccine series by 12 months of age, and 79% had completed post-vaccination serologic testing by the end of 2017.
- Under this program, perinatal infection was extremely rare (1 case during 2017, 0.4% of infants).
- Eighty-four percent of infants born at NYS birthing hospitals received a dose of hepatitis B vaccine within three days of birth.

Hepatitis C Surveillance

- During 2017, 8,280 cases of hepatitis C were reported to the NYSDOH, including 201 acute cases and 8,079 newly reported chronic cases. The number of cases newly reported during 2017 was similar to the number of cases reported during 2016.
- Case rates were highest in males and persons 20-29 years of age. Case rates were higher in young adults than in “baby boomers” (persons born during 1945-1965).
- Where race was reported, 79% of 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 2016, the NYSDOH Rapid Testing Program enrolled 48 programs across the state. These programs tested 5,841 high-risk clients and identified 616 with reactive HCV antibody tests who either received or were referred for follow-up HCV RNA testing. The antibody reactivity rate was 10.5%.
- In 2016, 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. A total of 1,790 patients were enrolled in the program. Ninety-two percent of patients diagnosed with hepatitis C were linked to care. Fifty-four percent of those linked to care initiated treatment, and 97% 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 Department of Corrections and Community Supervision (DOCCS) inmates. Among releasees enrolled in 2016, 80% completed treatment with a negative HCV RNA test, suggesting it is likely they were cured of their hepatitis C. In 2017, the program grew by 180%, enrolling 56 releasees in the program.

Background and Technical Notes

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://hepfree.nyc/hepatitis-a-b-and-c-in-new-york-city-2017-annual-report>.

Background

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.

Technical Notes

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, but don't always, 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, and chronic 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 2017 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>

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

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.

Variable Definitions and Notes

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

Sex: Sexes are male, female, or unknown/missing. Gender information is not collected. Sex is usually obtained from the laboratory report, and sex 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, other race (includes American Indian/Alaska Native and 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. Thus, 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. Thus, cases among DOCCS inmates are excluded from county- and region-level data to avoid overrepresenting cases in these counties and regions. Inmates of county jails are included in these geographic summaries.

Region: Different 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. County assignments are

Communicable Disease Surveillance Region	Central NY	Metropolitan Region		Capital District	Western Region	
Ryan White Region	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

Case Rates: Population estimates as of 2016 derived from US Census data are used as the denominator for overall case rates per 100,000 and rates by geographic area, age, sex.

Risk Factor Information

Risk factor information is collected by LHDs during investigation when available. Methods of data collection are varied and include 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. Resulting data are subject to varying investigative methods, 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.

This Report

The surveillance data summarize confirmed and probable cases of acute hepatitis B, chronic hepatitis B, perinatal hepatitis B, acute hepatitis C, and chronic hepatitis C in NYS (excluding NYC) reported during 2017. Trend data are also presented for cases reported during 2012 through 2017. Surveillance data are current as of August 2, 2018. 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.

For questions about this report, email NYSDOH at HepatitisAnnualReport@health.ny.gov.

Viral Hepatitis Case Surveillance Data (for New York State excluding New York City)

Hepatitis B

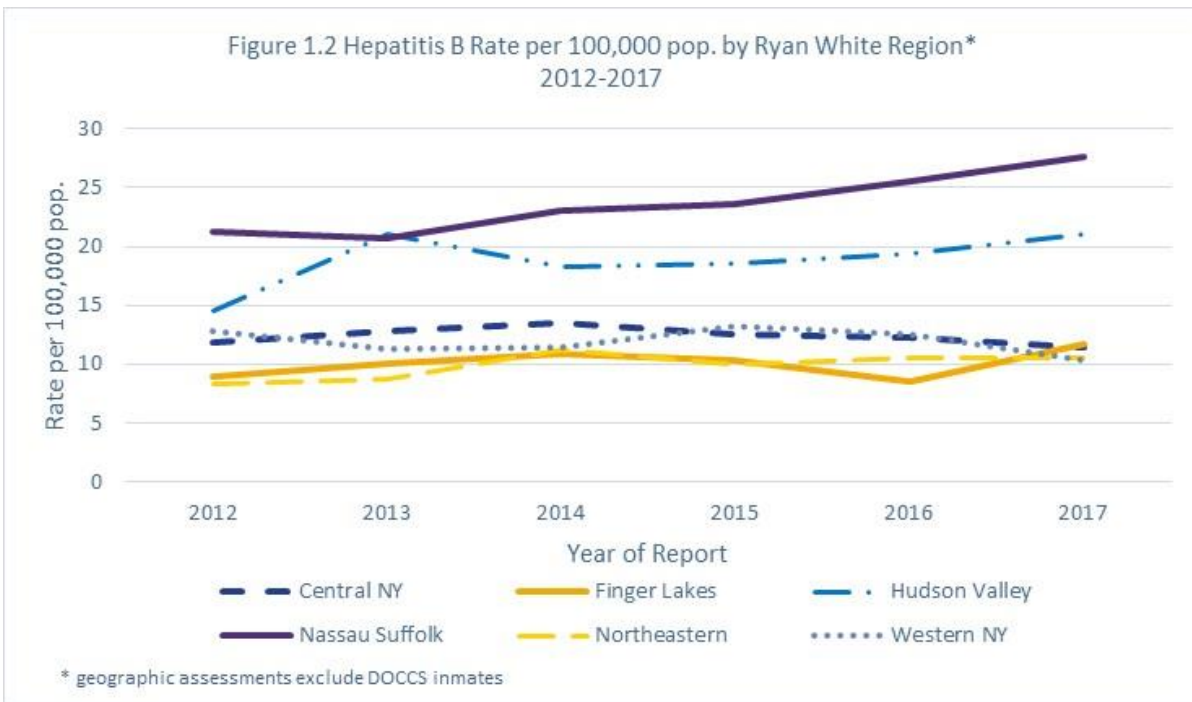
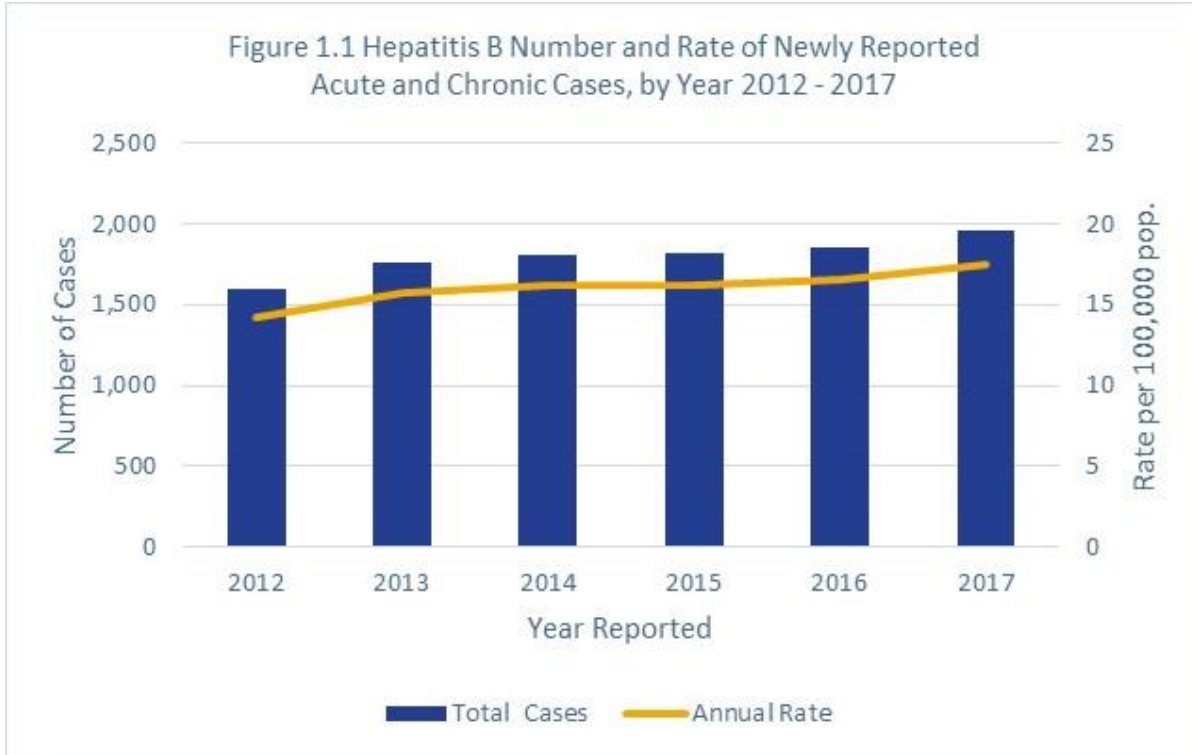
During 2017, 1,993 cases of hepatitis B were newly reported to NYSDOH; 98% of cases were classified as chronic. Demographic characteristics of hepatitis B cases are in Table 1.1. The majority of cases (57%) were in males, and 76% of the acute cases were in males. For both sexes, case rates were highest in persons aged 30-39 years, and in those with a reported race, Asian/Pacific Islanders account for 40% of cases. Case rates in the Metropolitan Region were more than double than those observed in the rest of the regions. (Table 1.1).

Table 1.1 Hepatitis B Cases Newly Reported in 2017

	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	848	14.9	1,145	20.8	1,993	17.8
Acute	9	0.2	28	0.5	37	0.3
Chronic	839	14.7	1,117	20.3	1,956	17.5
Age Group (years)						
0-19	23	1.7	33	2.4	56	2.1
20-29	133	18.3	136	17.6	269	17.9
30-39	231	35.6	260	39.6	491	37.6
40-49	147	20.8	265	38.3	412	29.4
50-59	134	15.6	237	28.7	371	22.0
60-69	105	15.0	137	21.1	242	18.0
70+	75	10.3	77	14.6	152	12.1
Region of Residence*						
Western Region	131	9.2	177	12.9	308	11.0
Finger Lakes	64	9.8	85	13.7	149	11.7
Western NY	67	8.6	92	12.3	159	10.4
Central NY	79	9.1	120	14.0	199	11.5
Northeastern	53	7.0	106	14.2	159	10.6
Metropolitan Region	580	22.0	699	27.5	1,279	24.7
Hudson Valley	218	18.4	272	23.7	490	21.0
Nassau-Suffolk	362	24.8	427	30.6	789	27.6
	Number of Cases	Percent of Cases	Number of Cases	Percent of Cases	Number of Cases	Percent of Cases
Race**						
White	125	14.7	224	19.6	349	17.5
Black	101	11.9	163	14.2	264	13.2
Asian/Pacific Islander	219	25.8	277	24.2	496	24.9
Other	57	6.7	66	5.8	123	6.2
Unknown	346	40.8	415	36.2	761	38.2
Ethnicity**						
Hispanic	32	3.8	51	4.5	83	4.2
Non-Hispanic	254	30.0	378	33.0	632	31.7
Unknown	562	66.3	716	62.5	1,278	64.1

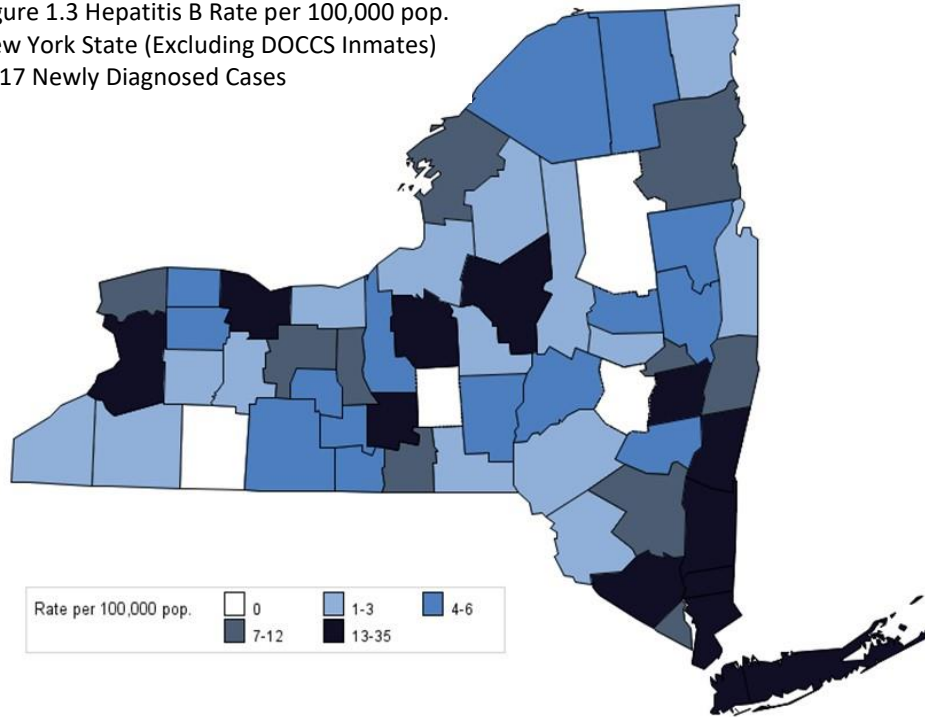
* Geographic assessments exclude DOCCS inmates
 ** Rates per 100,000 population are not calculated due to the large number of cases with missing values

The number of newly reported hepatitis B cases has been increasing since 2012 (Fig. 1.1), particularly in the Nassau/Suffolk and Hudson Valley Ryan White (Metropolitan) regions (Fig. 1.2). During 2017, case rates were highest in the Metropolitan region (24.7 per 100,000 population). In Ryan White regions, the Nassau/Suffolk region had the highest rate (27.6/100,000).

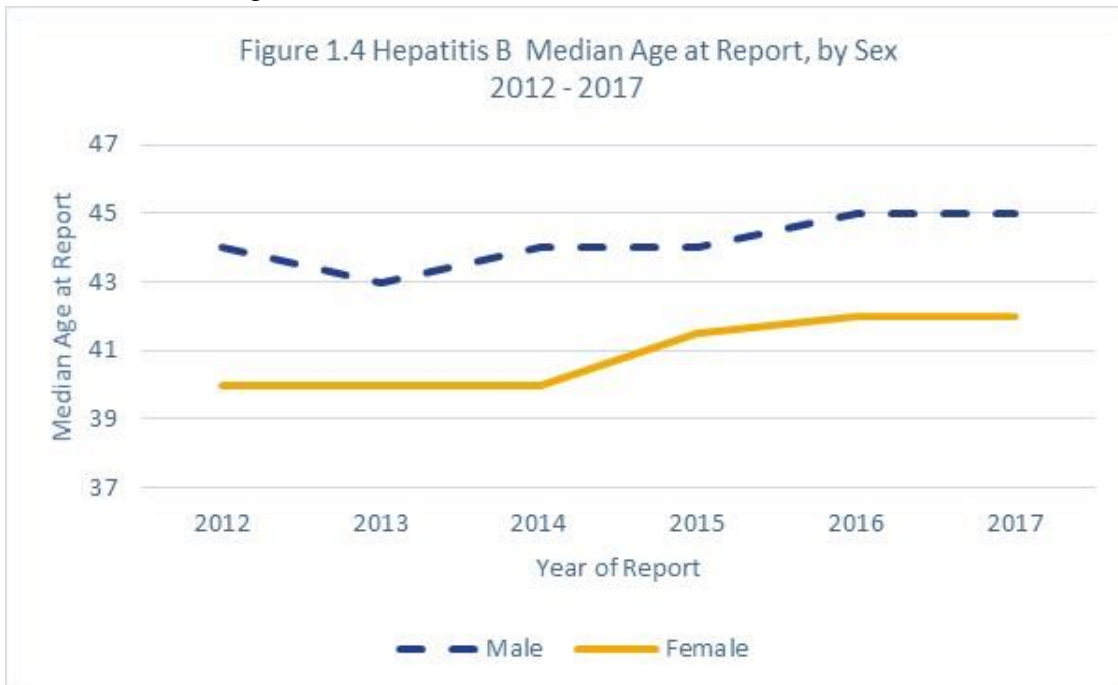


Outside of the Metropolitan region, case rates >13/100,000 population were also reported in Albany, Columbia, Erie, Monroe, Oneida, Onondaga, and Tompkins Counties. No new cases were reported in Allegany, Cortland, Hamilton, or Schoharie Counties (Fig. 1.3).

Figure 1.3 Hepatitis B Rate per 100,000 pop.
New York State (Excluding DOCCS Inmates)
2017 Newly Diagnosed Cases



The median age for females newly reported with hepatitis B during 2017 was 42, and the median age for males was 45. These ages are slightly older than among cases newly reported during 2012-14 (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 2017. Note that race data were missing or unknown for 13% of acute and 39% of chronic hepatitis B cases.

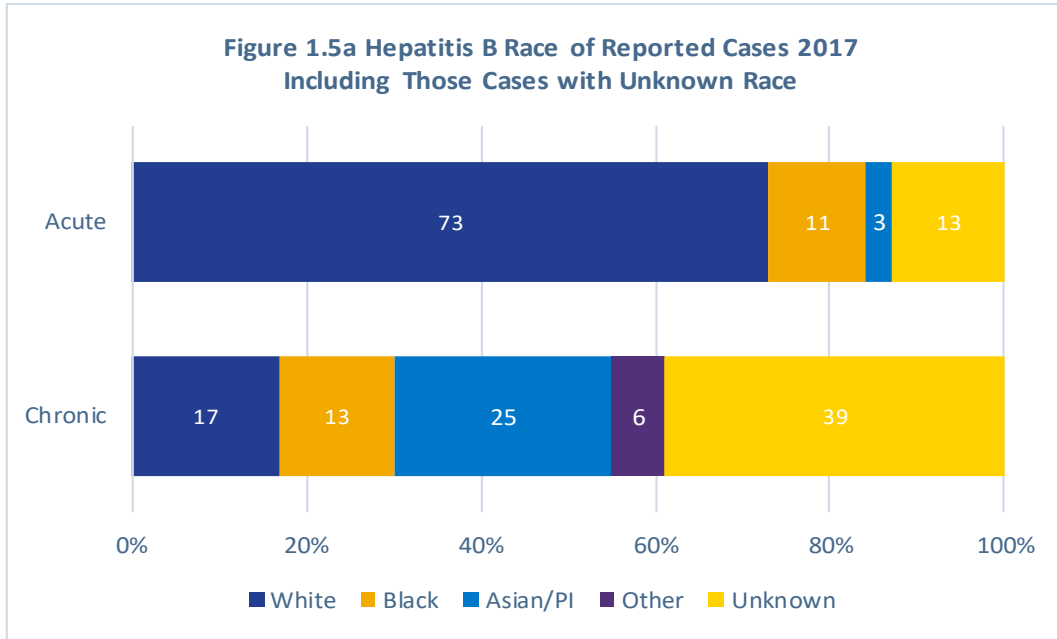


Figure 1.5b provides information on race for acute and chronic hepatitis B cases where race is reported (i.e., not missing or unknown). Among acute cases where race was reported, race was predominately white, followed by black, and then Asian/Pacific Islander. The racial distribution for new, acute infections closely aligns with the racial distribution of the NYS, excluding NYC, population.

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.

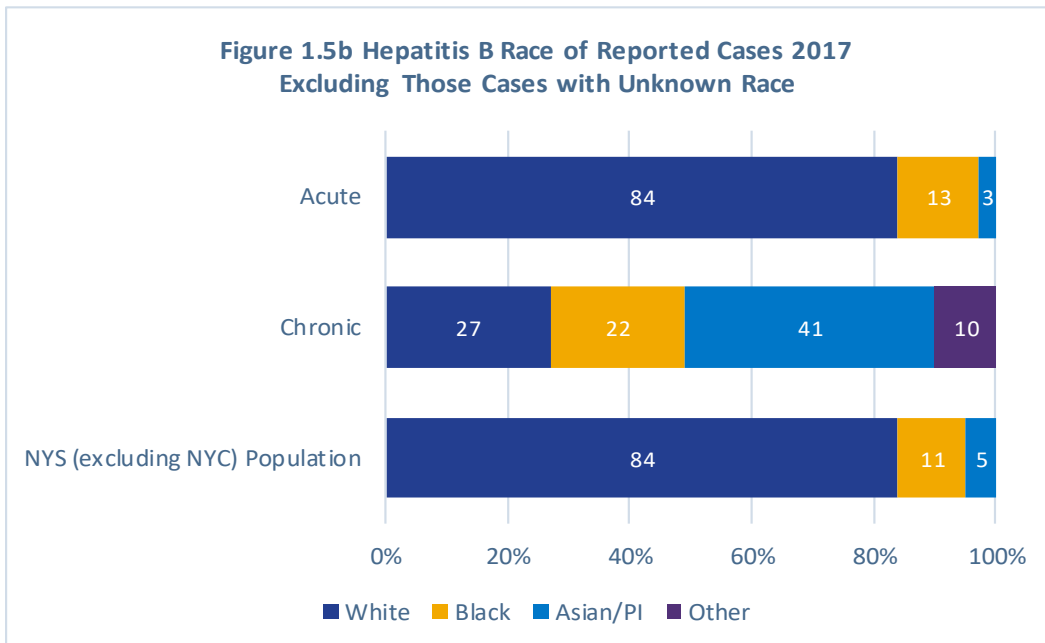
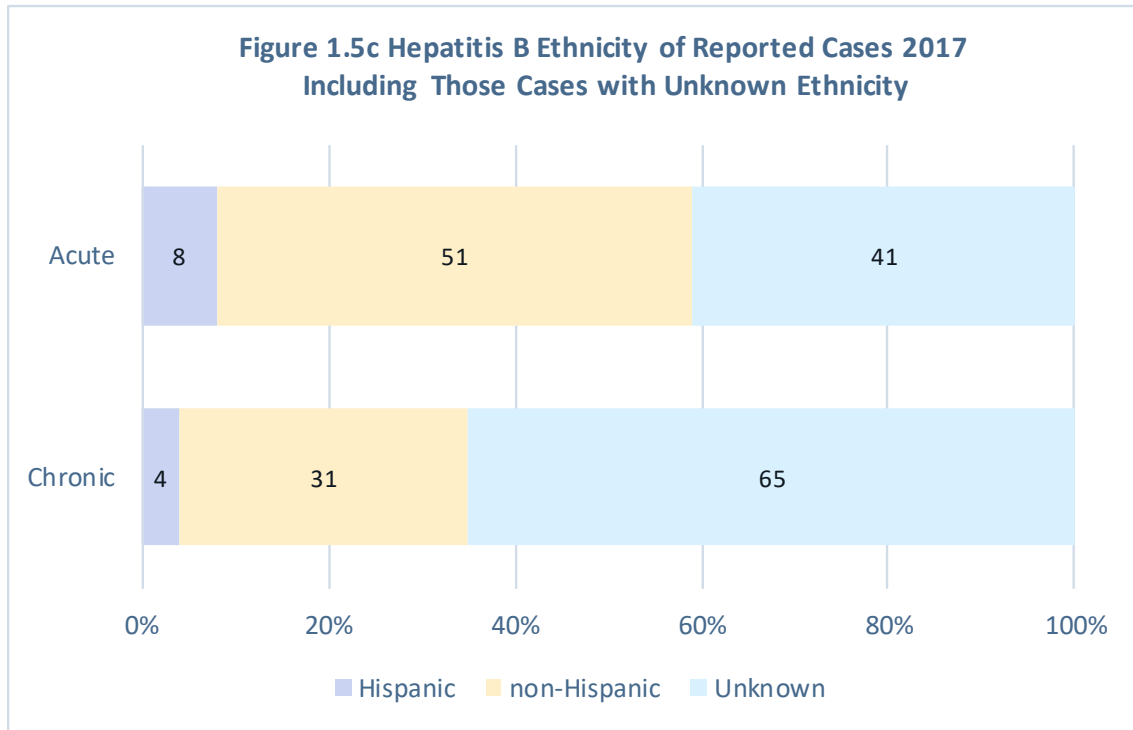
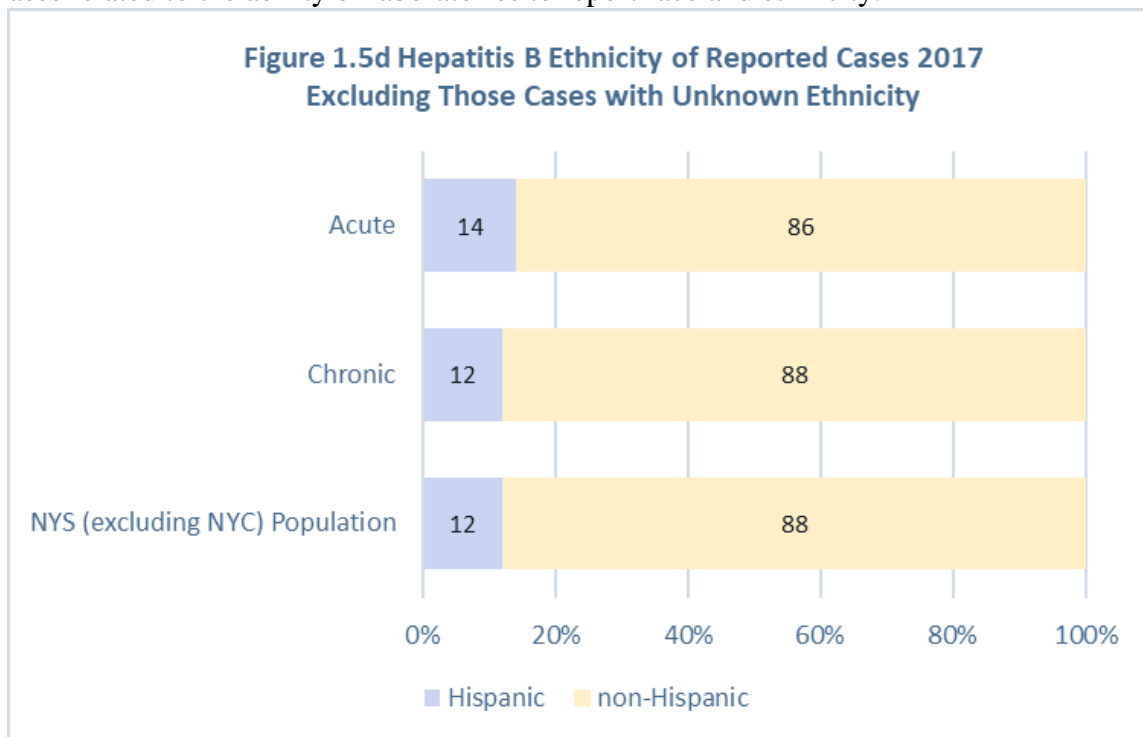


Figure 1.5c shows the distribution of Hispanic ethnicity among all hepatitis B cases reported during 2017. Note that ethnicity data were missing for a large proportion of acute (41%) and chronic (65%) hepatitis B cases.



Where ethnicity was reported (i.e., not missing or unknown), ethnicity was recorded as non-Hispanic for 86% of acute hepatitis B cases, and 88% of chronic 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.

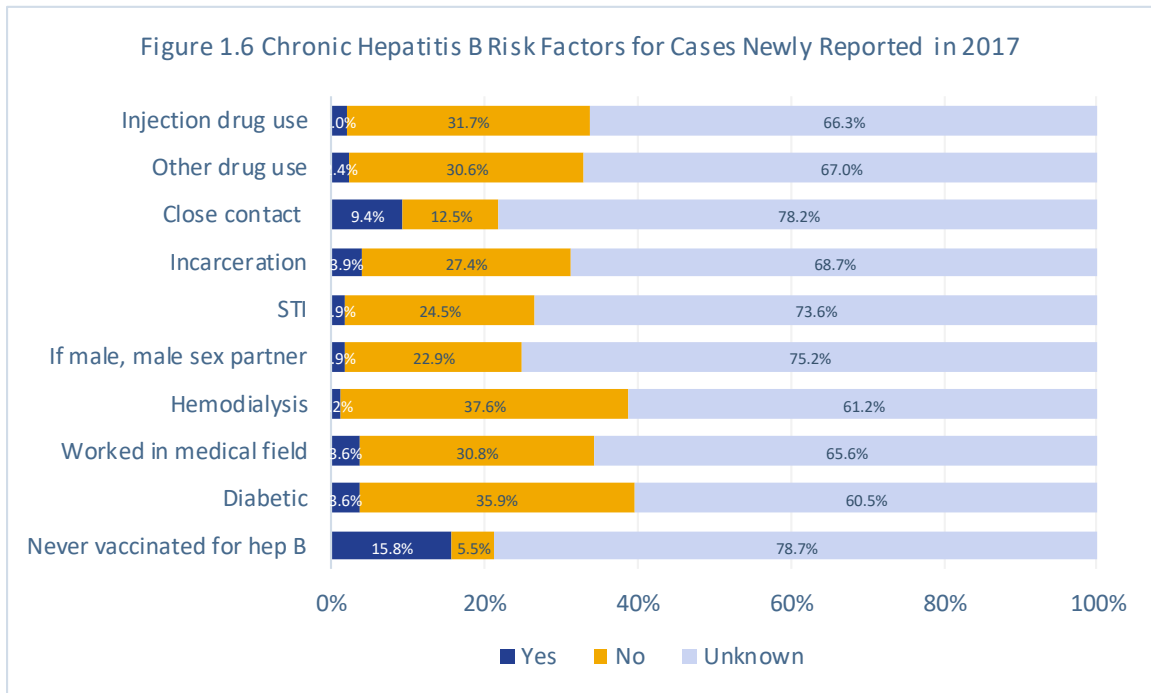


Risk factor and exposure information for acute hepatitis B cases are not presented in this report given the small number of cases (N=37) and large percentage of cases with unknown or missing information. A majority of patients reported with acute hepatitis B, where vaccination history was known, had not been vaccinated against hepatitis B.

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.

	Number			Total
	Yes	No	Unknown	
Injection drug use	39	620	1,297	1,956
Other, non-injection drug use	46	599	1,311	1,956
Close contact with person who has hepatitis B	183	244	1,529	1,956
Ever incarcerated	76	536	1,344	1,956
Treated for sexually transmitted infection	37	479	1,440	1,956
If male, at least 1 male sex partner	21	256	840	1,117
Underwent hemodialysis	24	735	1,197	1,956
Worked in medical field	71	602	1,283	1,956
Diabetic	70	702	1,184	1,956
Never vaccinated against Hepatitis B	310	107	1,539	1,956

Depending on risk factor, the percent of cases with unknown or missing information ranges from 61-79% (Fig. 1.6). Given the large percentage of cases with unknown or missing information, available risk factor information should be interpreted with caution.



Perinatal Hepatitis B Prevention Program

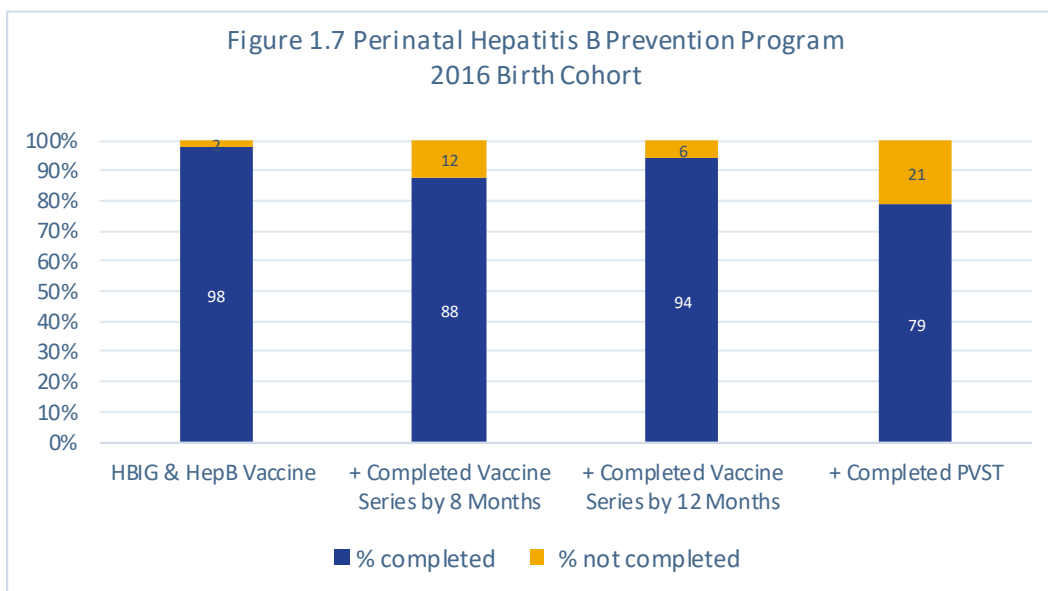
In the 57 counties outside NYC, NYSDOH implements a Perinatal Hepatitis B Prevention Program (PHBPP) consistent with CDC guidance and NYSDOH laws and regulations.

Program Goals are

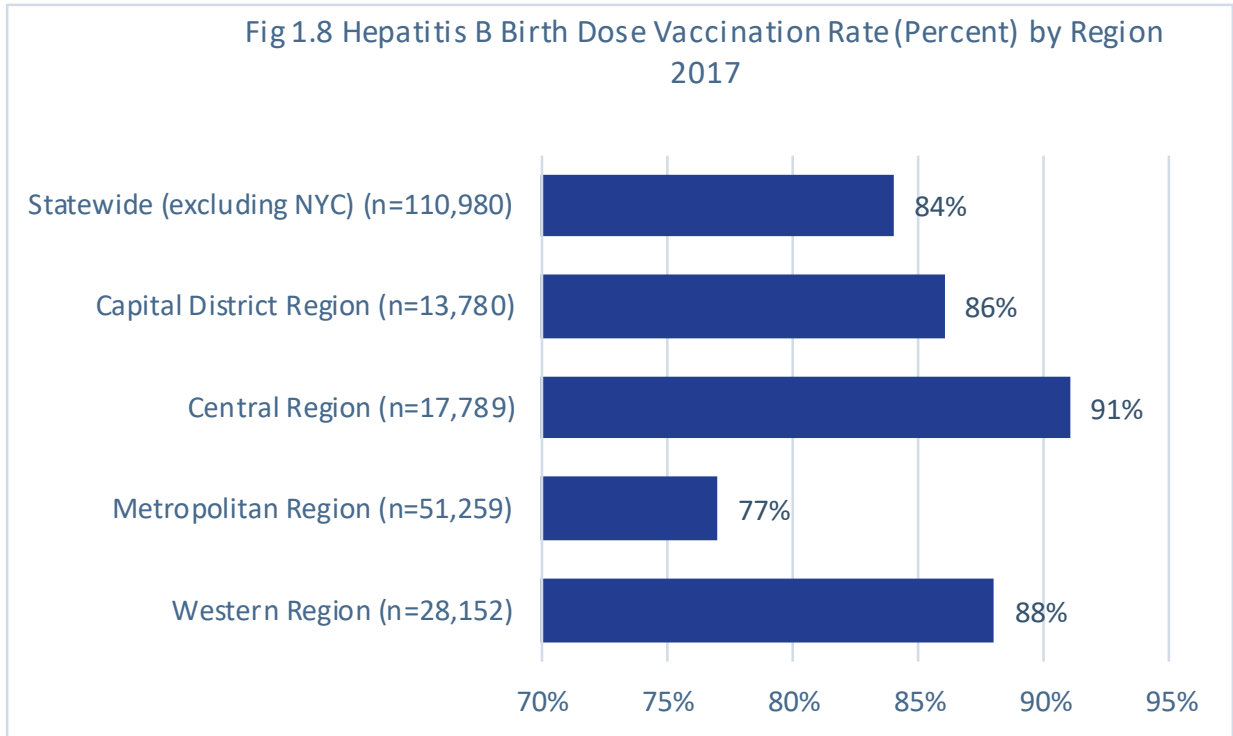
1. Screen every woman during every pregnancy for the presence of hepatitis B surface antigen (HBsAg), an indicator of active infection, and record the test result prominently in the pregnant woman's and infant's hospital medical record.
2. Case management of all pregnant women who have markers of active 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 2016 (Fig. 1.7):

- 281 infants and their mothers, who had markers of active hepatitis B, were enrolled in the PHBPP (0-56 infants/county)
- 275 infants (98%) received hepatitis B vaccine and HBIG within one calendar day of birth
 - 1 infant received HBIG only
 - 5 infants received hepatitis B vaccine only
- 248 infants (88%) received hepatitis B vaccine and HBIG within one calendar day of birth and completed the hepatitis B vaccine series by eight months of age
- 263 infants (94%) received hepatitis B vaccine and HBIG within one calendar day of birth and completed the hepatitis B vaccine series by 12 months of age
- 222 infants (79%) completed PVST by the end of the reporting period (December 31, 2017)
- 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 2017, in each region, who received a dose of hepatitis B vaccine within three days of birth are in Fig. 1.8. Overall, 84% of infants received the hepatitis B vaccine birth dose. Rates were highest in the Central Region (91%) and lowest in the Metropolitan Region (77%).



Hepatitis C

During 2017, 8,280 cases of hepatitis C were reported to the NYSDOH, including 201 acute cases (2%) and 8,079 newly reported chronic cases (98%). 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 20–39 years of age. Although persons born during 1945-1965 (“baby boomers”; age 52-72 years) have historically been considered to have the highest rates of hepatitis C infection, during 2017, rates of newly reported cases among baby boomers was 88.6/100,000 persons, compared with 147.1/100,000 persons among those aged 20-29 years.

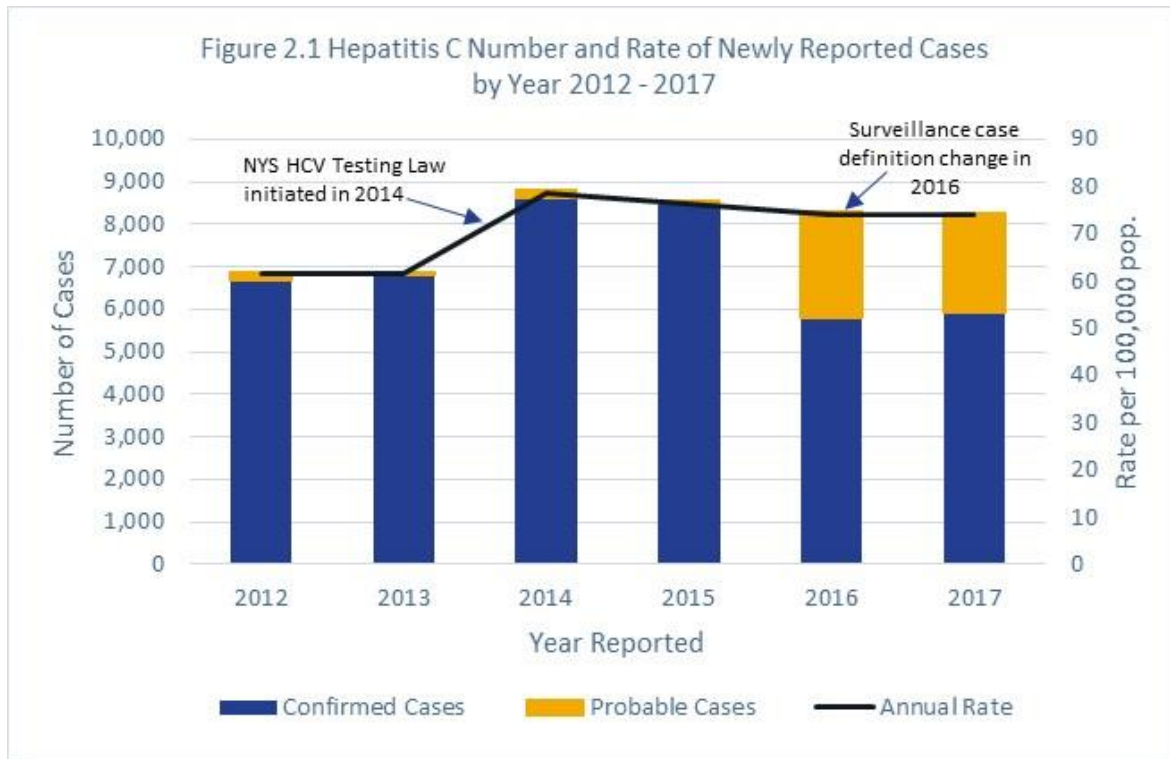
Race was unknown or missing for 31% of cases. Where race was reported, 79% of cases were among white persons. Ethnicity was unknown or missing for 55% of cases. Where ethnicity was known, 87% of cases were among non-Hispanic persons.

Five hundred hepatitis C cases were newly reported in DOCCS inmates (6% of all cases), and were typically identified upon intake screening. Sixty-three cases were identified in female inmates, and 437 in male inmates. Cases in DOCCS inmates are excluded from the following geographic analyses (region and county).

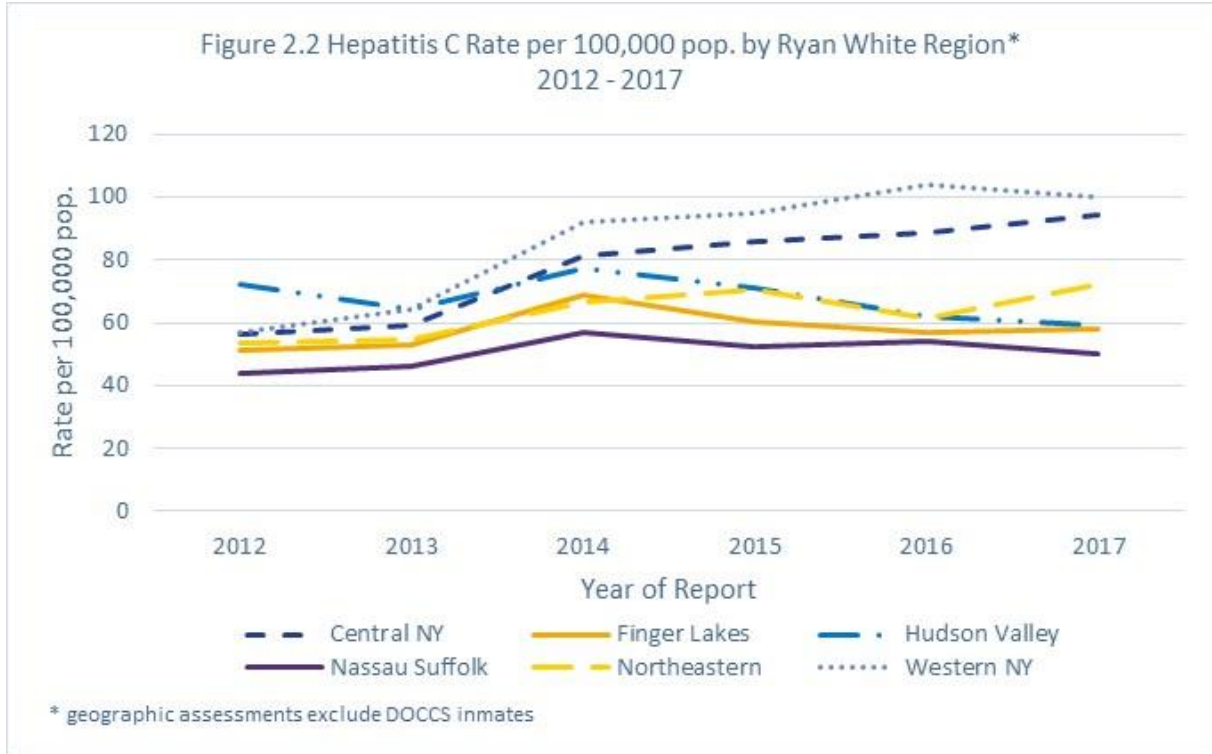
Table 2.1 Hepatitis C Cases Newly Reported in 2017

	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	3,231	56.7	5,039	91.4	8,280	73.9
Acute	96	1.7	105	1.9	201	1.8
Chronic	3,135	55.0	4,934	89.5	8,079	72.1
Age Group (years)						
0-19	92	7.0	62	4.5	154	5.7
20-29	961	132.0	1,245	160.7	2,210	147.1
30-39	708	109.2	1,110	169.0	1,820	139.4
40-49	343	48.4	635	91.7	979	69.9
50-59	476	55.4	851	103.2	1,328	78.8
60-69	453	64.9	890	137.0	1,344	99.7
70+	195	26.7	241	45.7	437	34.8
Unknown	3	NA	5	NA	8	NA
Region*						
Western Region	940	65.7	1,322	96.5	2,262	80.7
Finger Lakes	303	46.5	433	69.6	736	57.8
Western NY	637	81.7	889	118.8	1,526	99.9
Central NY	671	77.2	950	111.1	1,625	94.2
Northeastern	432	57.3	653	87.6	1,085	72.4
Metropolitan Region	1,125	42.6	1,677	66.0	2,808	54.2
Hudson Valley	552	46.7	824	71.9	1,379	59.2
Nassau-Suffolk	573	39.3	853	61.1	1,429	50.1
	Number of Cases	Percent of Cases	Number of Cases	Percent of Cases	Number of Cases	Percent of Cases
Race**						
White	1,809	56.0	2,721	54.0	4,531	54.7
Black	241	7.5	431	8.6	672	8.1
Asian/Pacific Islander	49	1.5	42	0.8	91	1.1
Other	108	3.3	311	6.2	419	5.1
Unknown	1,024	31.7	1,534	30.4	2,567	31.0
Ethnicity**						
Hispanic	129	4.0	354	7.0	483	5.8
Non-Hispanic	1,283	39.7	1,999	39.7	3,283	39.6
Unknown	1,819	56.3	2,686	53.3	4,514	54.5
+ Total includes 10 cases where sex is not known						
* Geographic assessments exclude DOCCS inmates						
** 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 2017 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 2016-2017 to cases reported during 2012-2015. The number of cases newly reported during 2016 (N=8,298) and 2017 (N=8,280) were similar.

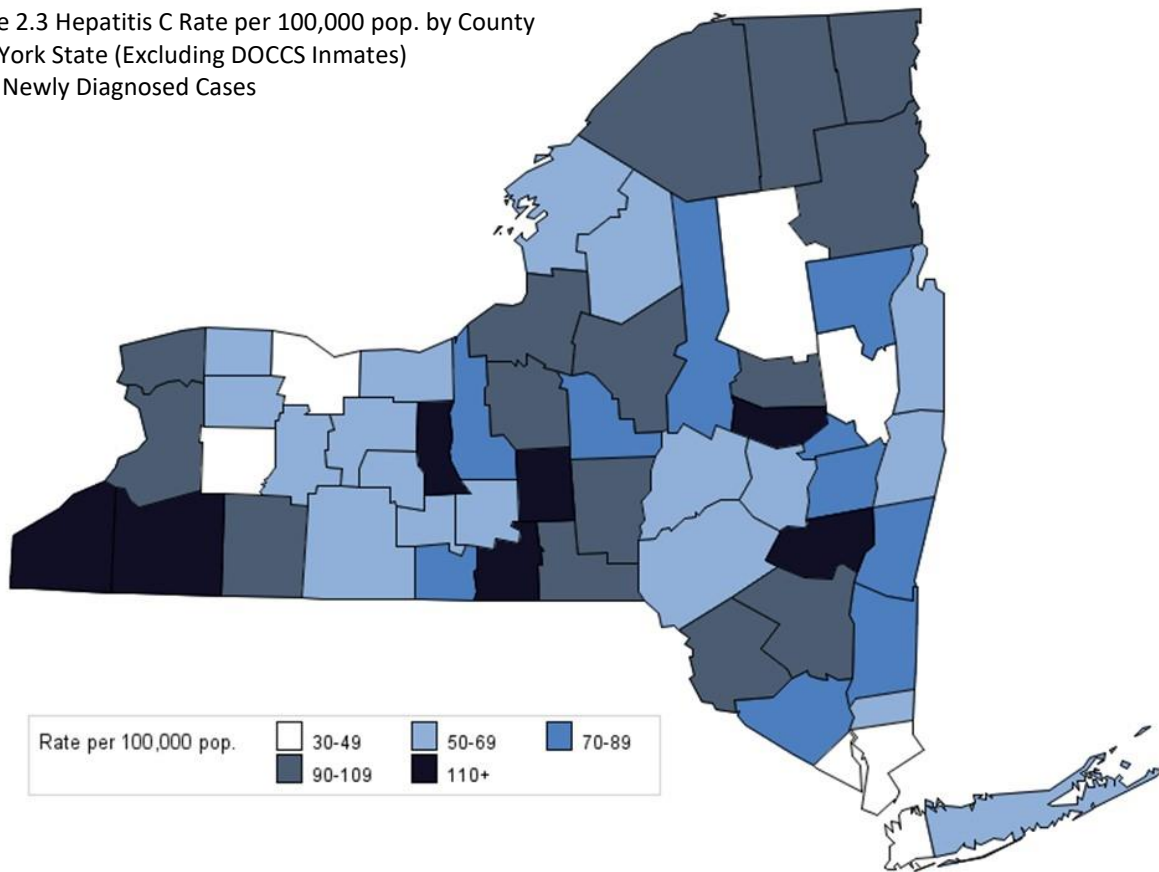


Case rates varied widely by region during 2017. The largest number of cases was in the Western (N=2,262) and Metropolitan (N=2,808) regions. The highest case rates were reported in the Central (94.2/100,000 persons) and Western (80.7/100,000 persons) regions, and particularly in the Western NY Ryan White region (99.9/100,000 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 Cattaraugus, Chautauqua, Chemung, Seneca, Montgomery, Schoharie, and Sullivan.

Figure 2.3 Hepatitis C Rate per 100,000 pop. by County
New York State (Excluding DOCCS Inmates)
2017 Newly Diagnosed Cases



Figures 2.4a-c display the number of hepatitis C cases newly reported during 2008, 2012, and 2017 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 2017, more cases were reported in the younger ages than in the baby boomers. Only 32% of reported cases were in baby boomers during 2017, while the proportion of cases in persons aged 15-35 years of age had increased to 43%.

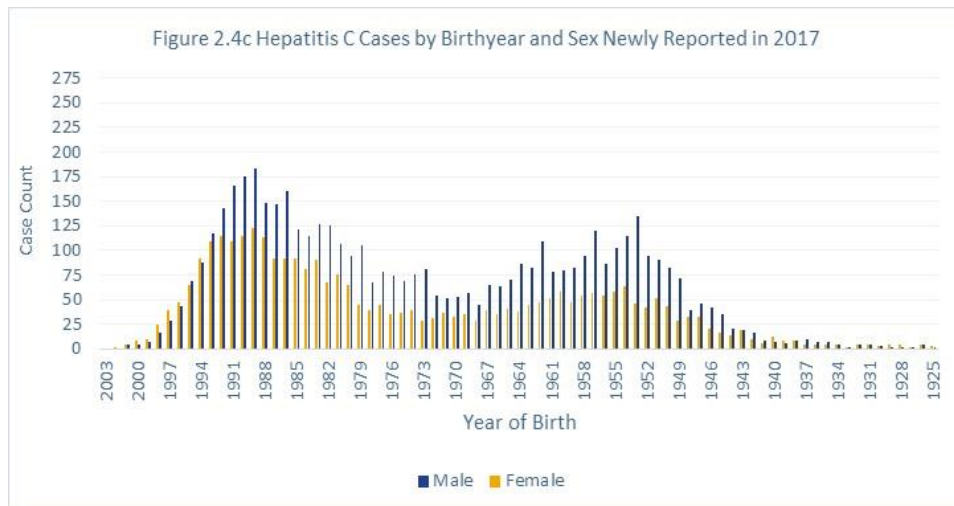
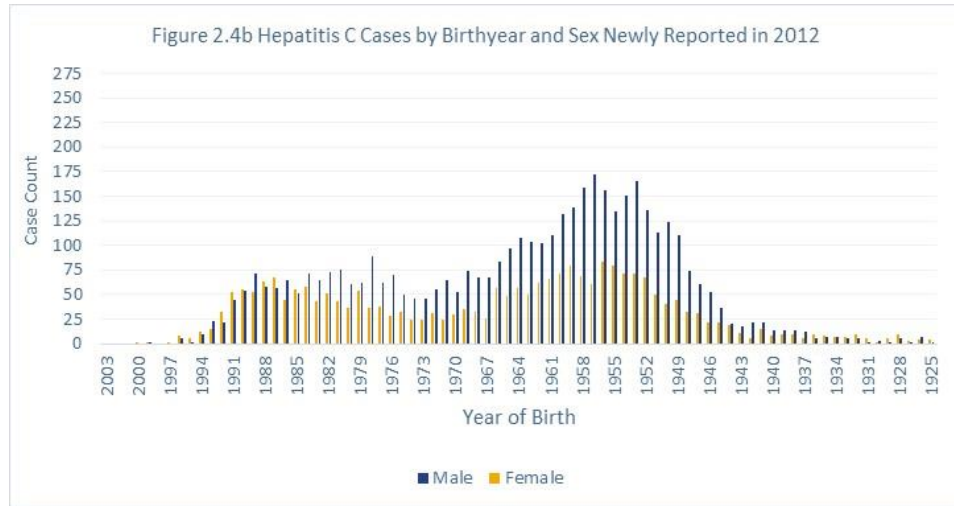
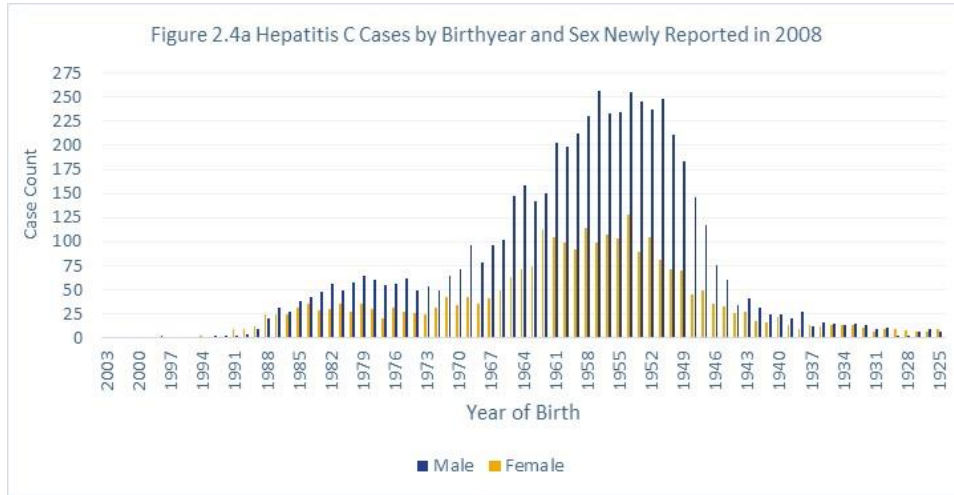
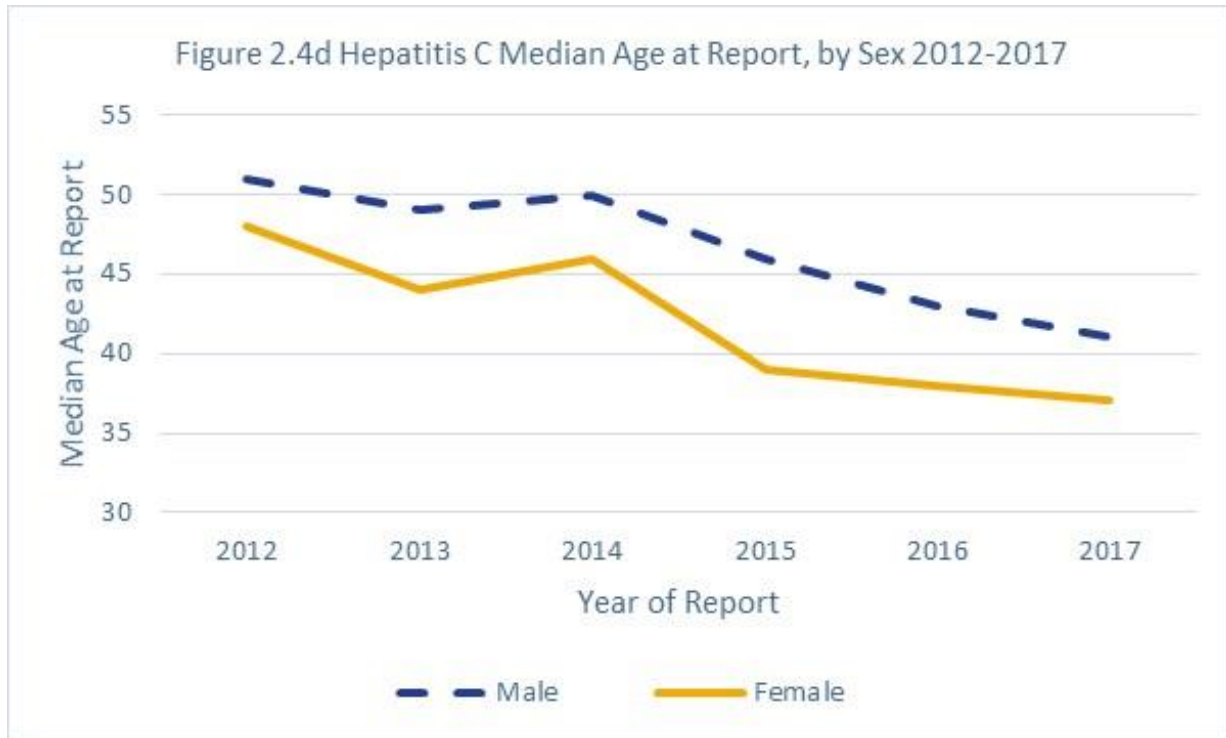
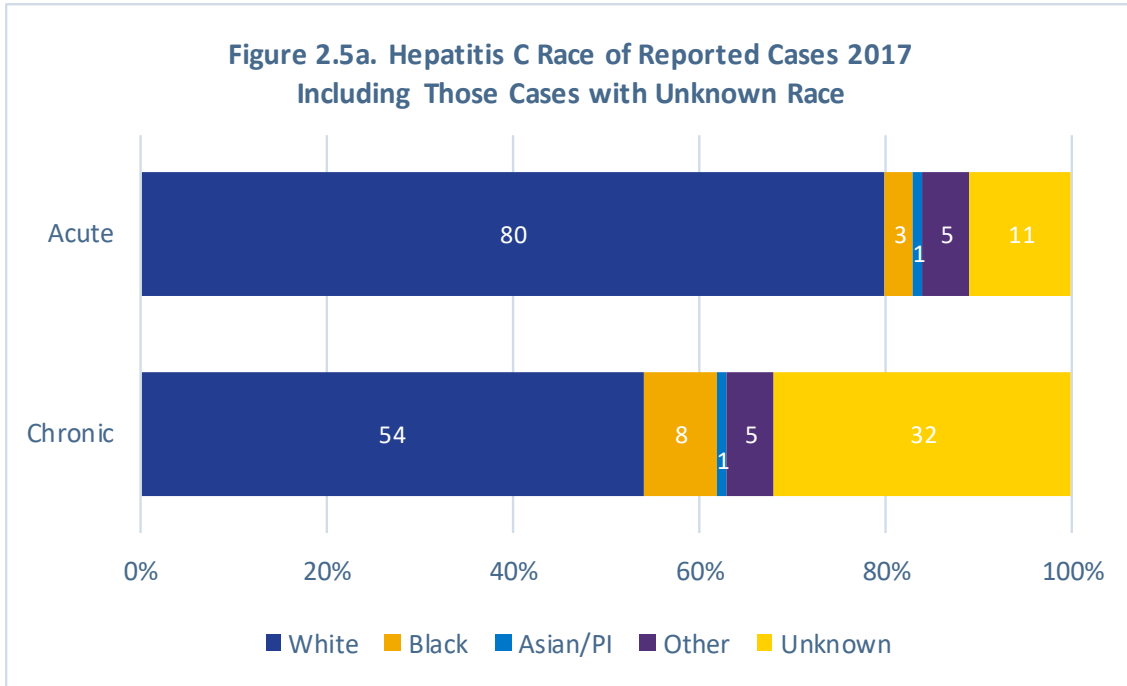


Figure 2.4d shows the steady decline in the median age of cases at time of report during 2012-2017. The median age for females is a few years younger than for males during each year. The increase in median age during 2014 compared with 2013 is likely a result of the initiation of the Hepatitis C Testing Law, which targeted baby boomers during that year. For both sexes, the median age at the time of report has declined by about 10 years during 2012-2017.



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 2017. Note that race data were missing for 11% of acute and 32% of chronic hepatitis C cases.



Among acute hepatitis C cases where race was reported (i.e., not missing or unknown), race was predominately white. Among chronic hepatitis C cases where race was reported, race again was predominately white, followed by black (Fig 2.5b).

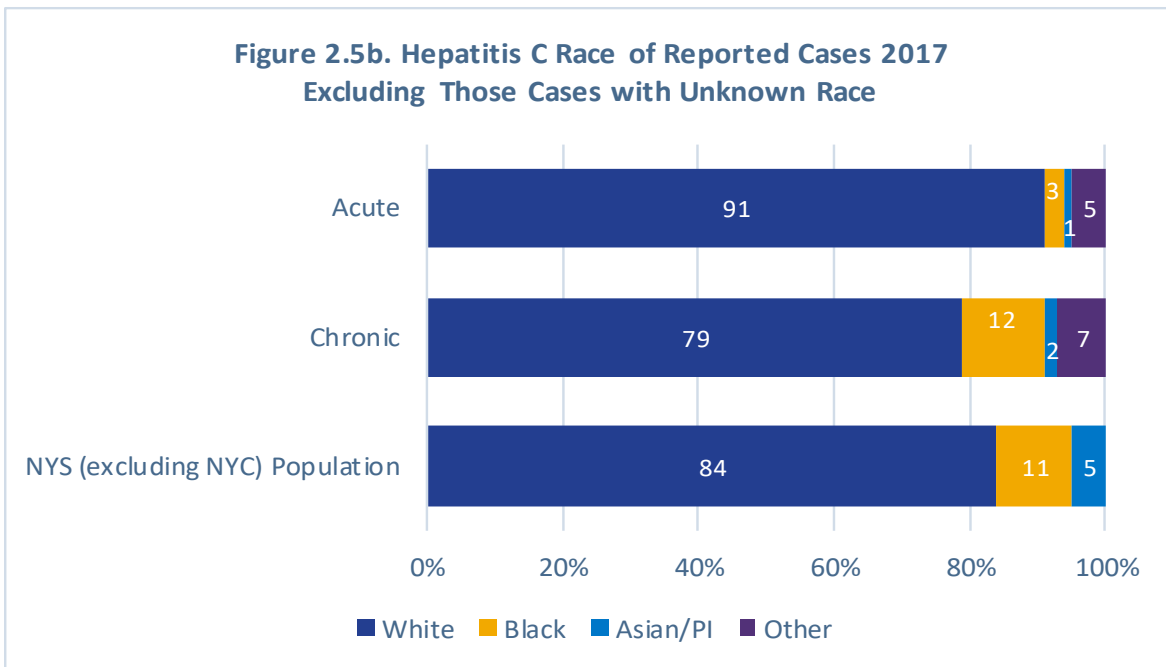
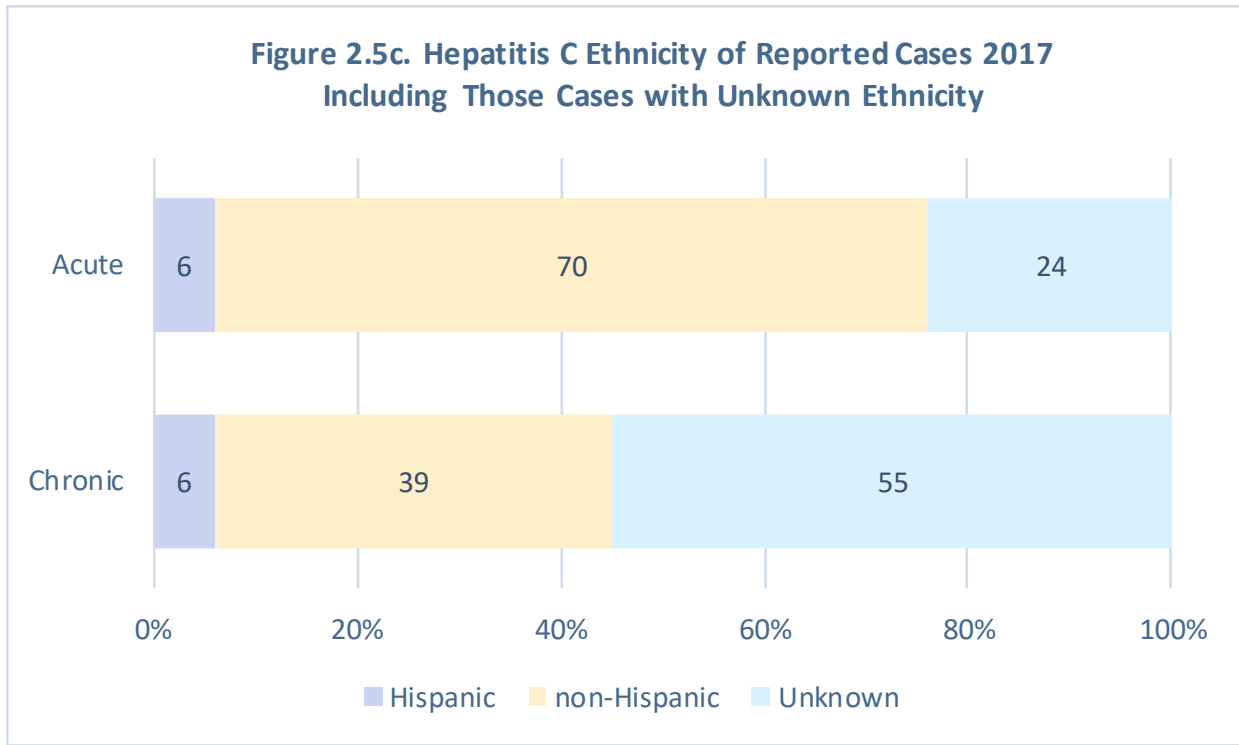
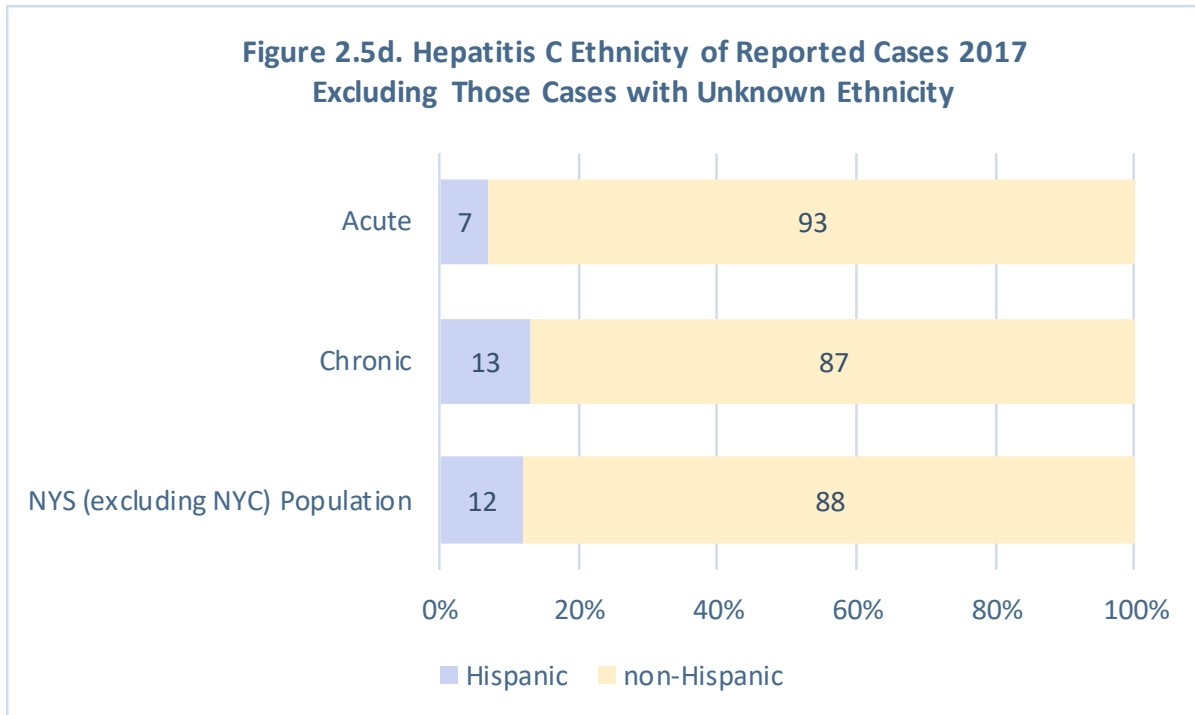


Figure 2.5c shows the distribution of Hispanic ethnicity among all hepatitis C cases reported during 2017. Note that ethnicity data were missing for 24% of acute hepatitis C and 55% of chronic hepatitis C cases.

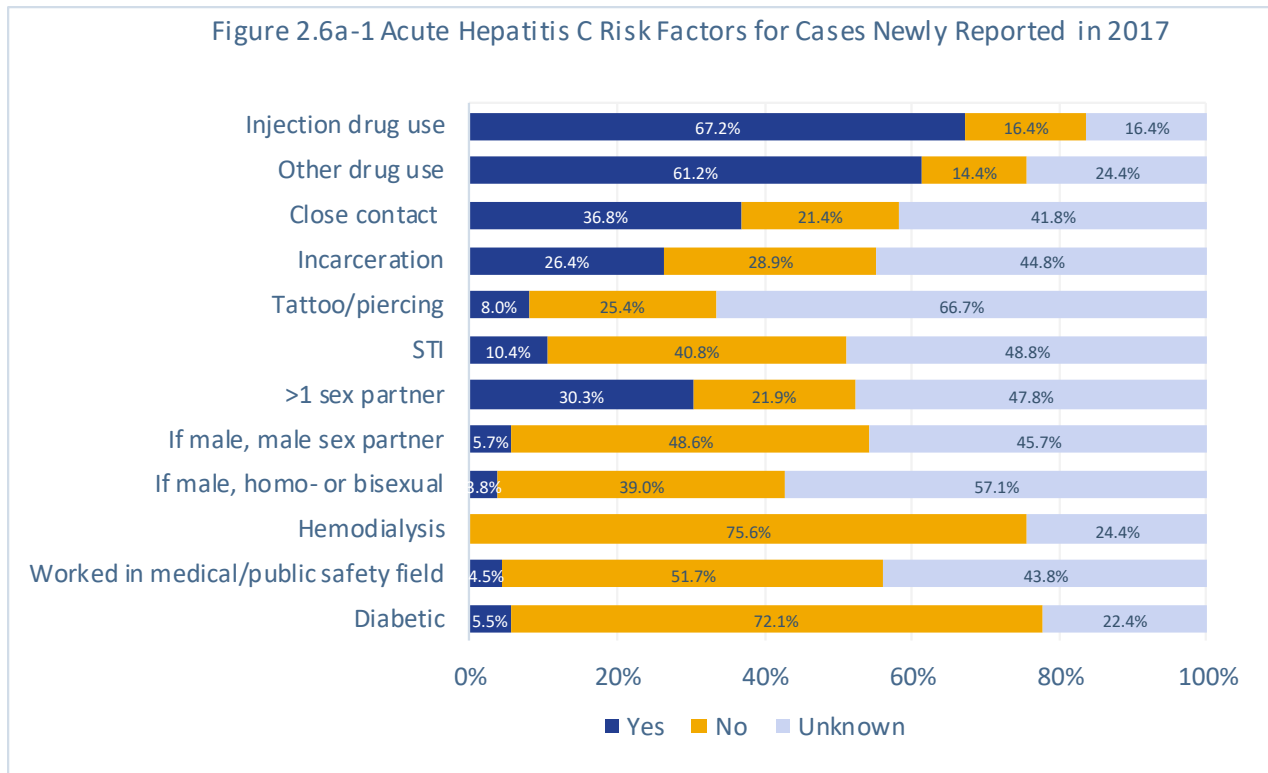


Where ethnicity was reported (i.e., not missing or unknown), ethnicity was non-Hispanic for 93% of acute hepatitis C cases and 87% of chronic hepatitis C cases (Fig 2.5d). Data may be subject to recording error and biases related to the ability of laboratories to report race and ethnicity.



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 16-67% (Fig. 2.6a-1).

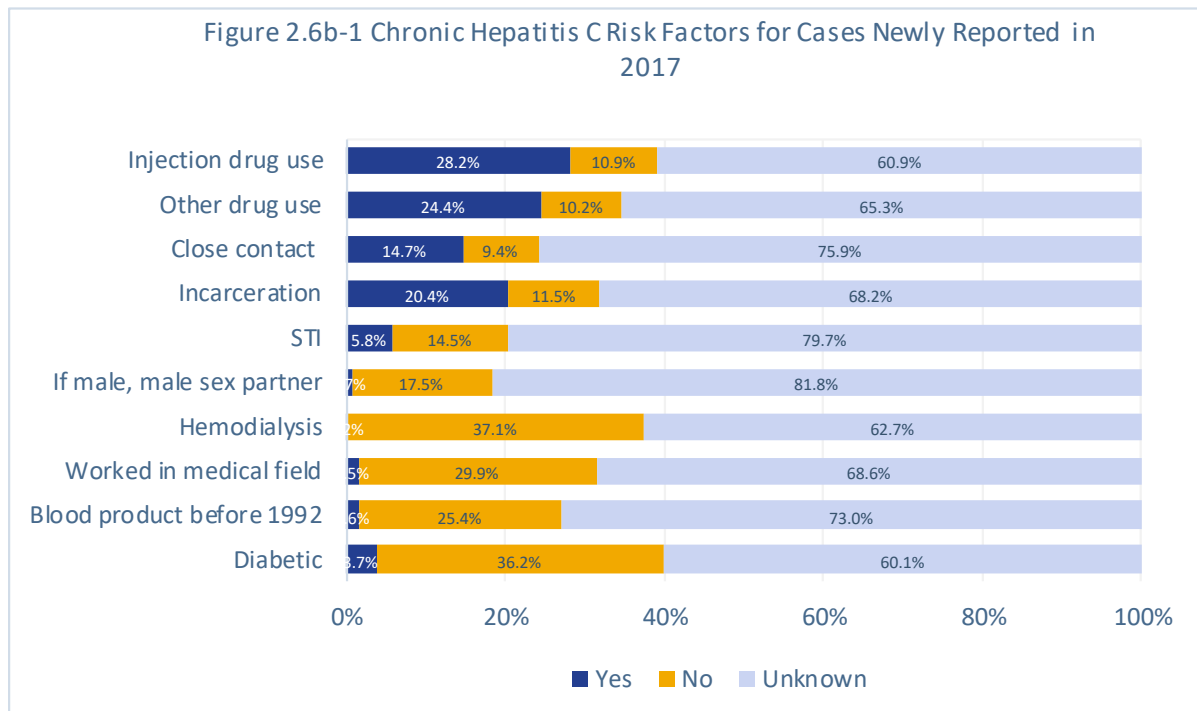
	Number			Total
	Yes	No	Unknown	
Injection drug use	135	33	33	201
Other, non-injection drug use	123	29	49	201
Close contact with person who has hepatitis C	74	43	84	201
Incarceration	53	58	90	201
Recent tattoo or piercing	16	51	134	201
Treated for sexually transmitted infection	21	82	98	201
>1 sex partner	61	44	96	201
If male, at least 1 male sex partner	6	51	48	105
If male, sexual preference homosexual or bisexual	4	41	60	105
Underwent hemodialysis	0	152	49	201
Worked in public safety, medical field, or dialysis center	9	104	88	201
Diabetic	11	145	45	201



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.

	Number			Total
	Yes	No	Unknown	
Injection drug use	2,275	881	4,923	8,079
Other, non-injection drug use	1,973	828	5,278	8,079
Close contact with person who has hepatitis C	1,184	760	6,135	8,079
Ever incarcerated	1,645	928	5,506	8,079
Treated for sexually transmitted infection	466	1,175	6,438	8,079
If male, at least 1 male sex partner	37	861	4,036	4,934
Underwent hemodialysis	14	3,001	5,064	8,079
Worked in medical field	122	2,414	5,543	8,079
Blood transfusion or organ transplant <1992 or clotting factor <1987	132	2,052	5,895	8,079
Diabetic	301	2,925	4,853	8,079

Depending on risk factor, the percent of cases with unknown or missing information ranges from 61-79% (Fig. 2.6b-1).



NYS AIDS Institute Hepatitis C Programs, Initiatives and Special Studies

Hepatitis C Rapid Testing Program

The NYSDOH AIDS Institute Hepatitis C Rapid Testing Program (HCV RTP) provides free hepatitis C 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 2016, 48 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. Sixteen of the 48 programs offered free, immediate access to HCV RNA testing through a contract with Quest Diagnostics.

The HCV RTP programs include 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 2016 were LHDs (15) and syringe exchange programs (14). Enrolled programs that are not able to reach those at highest risk are disenrolled from the NYSDOH HCV RTP.* In 2016, four programs were disenrolled.

While most (32) programs offered only rapid screening testing with referral for follow-up RNA testing to other offsite providers, 16 programs offered at least some onsite follow-up HCV RNA testing. Programs offering onsite RNA testing also provided referrals for medical follow-up for clients with detectable RNA results.

* The HCV RTP has a rolling enrollment process and a program capacity of approximately 50 agencies. Staff routinely monitor enrolled agencies to assess targeted risk-based screening, linkage to care outcomes, resource allocation, timely data reporting and oversight of Limited Service Laboratory (LSL) standards. Written corrective action plans and technical assistance are provided to programs that are not meeting prescribed expectations outlined during the enrollment process and included in the comprehensive HCV RTP Implementation Guide. Technical assistance (emails, conference calls, site visits, etc.) continues for no less than six months to address problems and assist with implementing recommendations outlined in the corrective action plan. Disenrollment conference calls are held with programs that are unable to correct negative findings or adequately address recommendations. Programs are informed that they can request a reenrollment conference at any time should circumstances change.

In 2016, of 5,841 clients screened for HCV as part of the Hepatitis C Rapid Testing Program, 616 (10.5%) were found to have a reactive HCV antibody test. While reactivity rates were similar for all genders, there was variation by race, ethnicity and age.

- Reactivity rates were highest among clients reporting multiple races (19.6%) and white race (12.2%), but lower among Blacks (7.3%).
- Hispanics had higher reactivity rates (15.5%) than non-Hispanics (9.0%).
- Reactivity rates were lowest in the youngest age groups (2.8% in those 19 years or younger, 8.4% among clients in their 20s), and equally high among clients in their 30s and 40s (12.7%).

Additional testing results are provided in Table 3.1.

Table 3.1 Client Characteristics and Rapid Testing Reactivity of all Clients Screened for HCV Antibodies					
NYSDOH HCV Rapid Testing Program: 2016*					
	Number Screened	Percent of All Patients Tested	Number Antibody Positive	Percent of All Antibody Positive Patients	Reactivity Rate
Total	5,841	100.0%	616	100.0%	10.5
Gender					
Female	2,200	37.7%	218	35.4%	9.9
Male	3,622	62.0%	397	64.4%	11.0
Transgender	10	0.2%	1	0.2%	10.0
Unknown	9	0.2%	0	0.0%	0.0
Race					
White	3,199	54.8%	391	63.5%	12.2
Black	1,945	33.3%	142	23.1%	7.3
Other Race	328	5.6%	35	5.7%	10.7
Multiple Races	219	3.7%	43	7.0%	19.6
Asian	91	1.6%	2	0.3%	2.2
Hawaiian	18	0.3%	2	0.3%	11.1
Native American/Alaskan Native	33	0.6%	1	0.2%	3.0
Refused	8	0.1%	0	0.0%	0.0
Unknown	0	0.0%	0	0.0%	0.0
Ethnicity					
Hispanic	1,409	24.1%	219	35.6%	15.5
Non-Hispanic	4,431	75.9%	397	64.4%	9.0
Unknown	1	0.0%	0	0.0%	0.0
Age Group					
≤19 years	211	3.6%	6	1.0%	2.8
20-29 years	1,700	29.1%	143	23.2%	8.4
30-39 years	1,284	22.0%	163	26.5%	12.7
40-49 years	1,027	17.6%	130	21.1%	12.7
50+ years	1,613	27.6%	174	28.2%	10.8
Unknown	6	0.1%	0	0.0%	0.0

* Source: AIDS Institute Reporting System (AIRS) Nov. 21, 2017

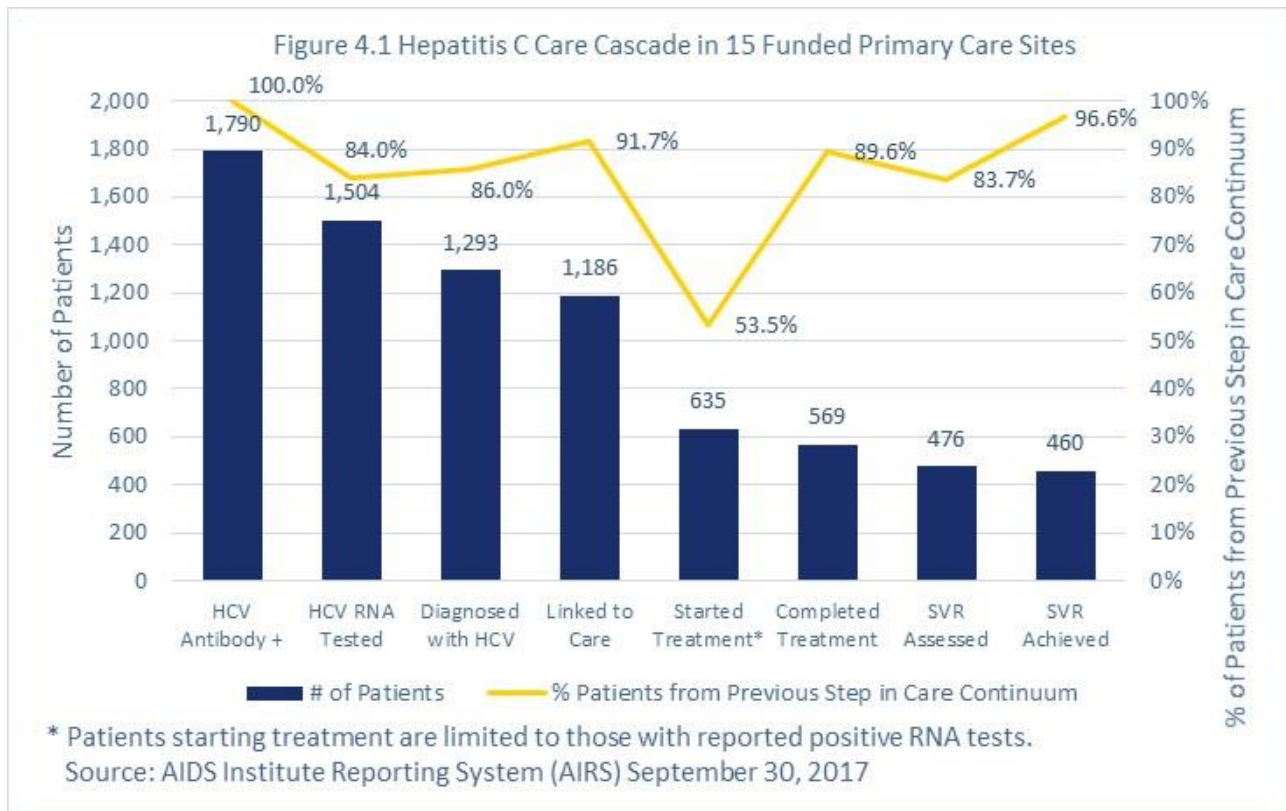
NYS Hepatitis C Care and Treatment Initiative

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.

Results from the initiative’s second year (April 1, 2016 through March 31, 2017) 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:

- 1,790 patients were enrolled in the program with a positive HCV antibody test.
- 54% of patients linked to care initiated treatment for hepatitis C.
- Among those who initiated treatment, 90% completed treatment.
- 97% of patients who initiated treatment and completed their final HCV RNA test were cured of hepatitis C.



Hepatitis C Continuity Program

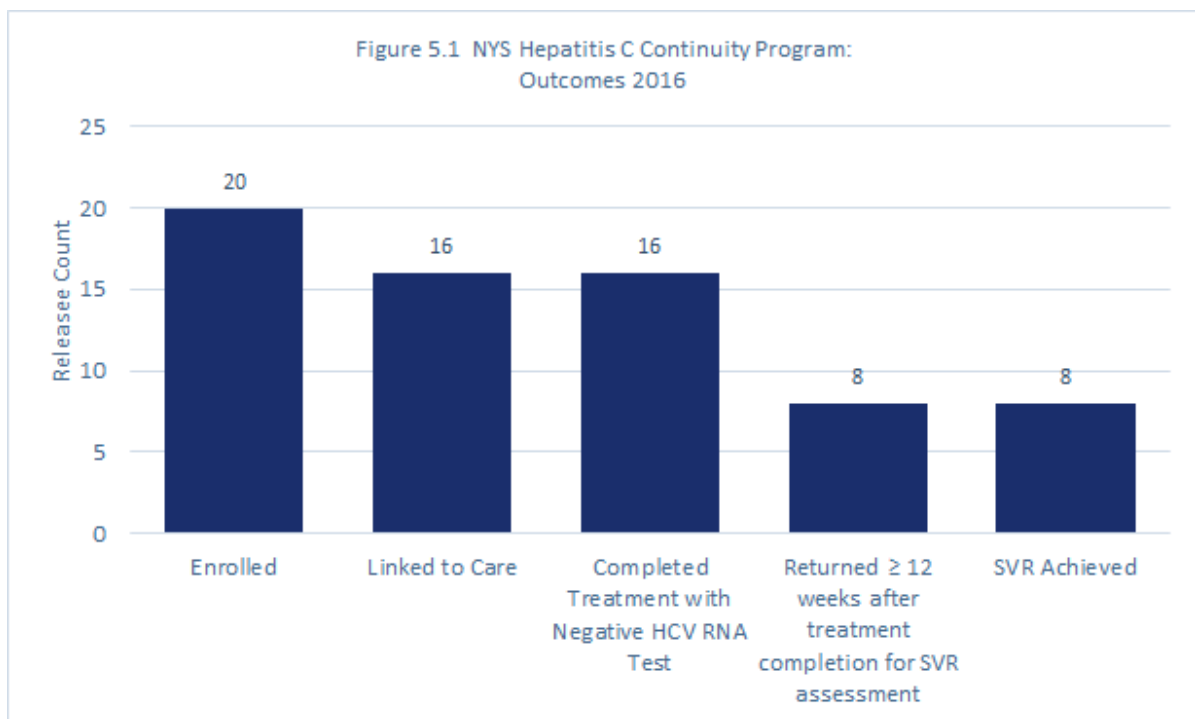
State prisons house a significant number of inmates with hepatitis C, presenting an opportunity to screen, diagnose, treat and cure these individuals and prevent further spread of the disease both during incarceration and upon release to the community. The Hepatitis C Continuity Program is a partnership among the NYSDOH, DOCCS, and community-based health care providers. The program promotes the completion of treatment for hepatitis C among DOCCS inmates upon and after release into the community. Inmates participate on a voluntary basis. DOCCS health services staff and facility parole officers work with inmates 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 inmate can be referred after release. The program was initiated in 2006. Data from 2016 and 2017 are presented in Table 5.1 and Table 5.2.

	2016		2017	
	Number	Percent	Number	Percent
Total	20	100.0	56	100.0
Gender				
Female	1	5.0	1	1.8
Male	19	95.0	55	98.2
Age				
20 - 29 years	0	0.0	7	12.5
30 - 39 years	2	10.0	11	19.6
40 - 49 years	5	25.0	15	26.8
50 - 59 years	10	50.0	16	28.6
60 - 69 years	3	15.0	7	12.5

- From 2016 to 2017, enrollment grew 180% from 20 to 56 releasees.
- In 2017, 32% of enrolled releasees were less than 40 years of age compared to 10% in 2016.
- The percent of releasees who kept their appointment with the community-based health care provider was 80% in 2016 and 50% in 2017.

	2016			2017		
	Number Releasees	Number Appointments Kept	Percent Appointments Kept	Number Releasees	Number Appointments Kept	Percent Appointments Kept
Total	20	16	80.0	56	28	50.0
Releasee Location						
Outside of NYC	12	10	83.3	47	25	53.2
In NYC	8	6	75.0	9	3	33.3

- Treatment outcome data are available for inmates released during 2016 and presented in Figure 5.1. Of the 20 releasees, 16 attended the initial medical appointment after release from prison (linked to care). All 16 completed treatment and had negative HCV RNA tests at the end of treatment. Of these, eight returned at least 12 weeks after completed treatment and were assessed for a sustained virologic response. All eight who returned at least 12 weeks after completing treatment to be assessed for a sustained virologic response (SVR) were found to have achieved SVR.
- The remaining eight patients were lost to follow-up prior to being assessed for SVR because of: reincarceration, change in housing status, detox for relapse of alcohol use, or difficulty keeping appointments. However, because they each had a negative HCV RNA test at the end of treatment, it is likely that all were cured of hepatitis C.



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). The health survey is implemented in annual rotating cycles among men who have sex with men, heterosexuals at increased risk for HIV, and persons who inject drugs (PWID). The survey collects timely, comprehensive information about sexual and drug use risk behaviors, HIV testing histories, exposure to and use of HIV prevention services, and hepatitis C. Respondents are screened with a rapid hepatitis C antibody test. During 2015, the most recent year for which data are available, the survey was conducted among PWID.

Hepatitis C Data highlights (Table 6.1) include:

- In the 2015 survey of PWID, 79% reported ever being tested for hepatitis C and 37% reported ever being diagnosed with hepatitis C.
- Of those ever diagnosed with hepatitis C, 52% were diagnosed at least five years ago, before highly effective, well tolerated, direct-acting antiviral treatment was available.
- Among those tested during the survey, 38% had reactive (positive) HCV antibody results. Of these, 26% did not self-report as HCV-positive, suggesting that they were previously unaware of their infection.

Table 6.1 Hepatitis C Screening, Diagnosis, and Treatment History Among People Who Inject Drugs (PWID) in the Nassau-Suffolk National HIV Behavioral Surveillance Study, 2015	
	Number (Percentage)
Total	213
Ever tested for hepatitis C	
No	39 (18%)
Yes	169 (79%)
Unknown	5 (2%)
Of those tested – Ever diagnosed with hepatitis C	
No	106 (63%)
Yes	62 (37%)
Unknown	1 (0%)
When diagnosed with hepatitis C	
≤6 months ago	6 (10%)
More than 6 months to <1 year ago	7 (11%)
1 year to <5 years ago	17 (27%)
5 years to <10 years ago	16 (26%)
10+ years ago	16 (26%)
Unknown	0
Ever taken medicine to treat hepatitis C	
No	46 (74%)
Yes	16 (26%)
Unknown	0
Rapid HCV antibody test result	
Non-reactive	121 (57%)
Reactive	82 (38%)
Not done	10 (5%)
Self-reported HCV status among those with reactive rapid HCV antibody test result	
Did not self-report as HCV positive	21 (26%)
Self-report as HCV positive	55 (67%)
Unknown	6 (7%)

HIV and HCV Serosurvey Among Inmates Entering the NYS Department of Corrections and Community Supervision (DOCCS) System

Since 1988, the NYSDOH has conducted twelve HIV serosurveys of incoming inmates in DOCCS. 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 serosurvey. Studies conducted in 2000, 2003, 2005, 2007, 2009, 2012 and 2015 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 inmates 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.
- Of 4,239 tests in the 2015 study cohort, 556 were HCV antibody positive, yielding a 13.1% seroprevalence (Table 7.1)
 - HCV antibody seroprevalence for females was 24.2%, up from 14.6% in 2012 (Figure 7.1)
 - HCV antibody seroprevalence for males was relatively stable over time (9.6% in 2012; 10.3% in 2015)
- Seroprevalence has been consistently highest among white inmates, followed by Hispanic inmates, across all years (Table 7.1).
- Seropositivity rates have trended downward among inmates in NYC, while the opposite trend has been observed among inmates from the rest of NYS. Rates among inmates from outside NYC were higher than those from NYC in the 2012 and 2015 serosurveys.
- Other demographic and risk trends can be seen in Table 7.1.

Table 7.1 DOCCS Serosurvey: HCV Antibody Seroprevalence Among Incoming Inmates by Basic Demographic and Risk Factor: 2000 - 2015

Demographics & Risk Factors	2000		2003		2005		2007		2009		2012		2015	
	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
Female	190	23.1	197	24.1	146	19.4	141	15.7	125	14.6	128	14.6	206	24.2
Age														
< 30	59	3.7	61	3.8	52	3.3	39	2.4	64	3.7	88	5.1	139	8.3
30 - 39	228	16.0	179	14.2	130	11.1	120	10.9	101	9.4	115	9.7	180	13.8
≥ 40	315	37.0	371	34.3	291	25.4	343	25.0	265	20.5	245	19.0	237	18.9
Race/Ethnicity														
White	165	18.5	158	18.4	152	15.2	155	15.5	166	14.8	224	17.1	334	24.4
Black	227	11.3	230	11.6	168	8.5	160	7.5	121	6.1	88	4.6	77	4.3
Hispanic	204	22.0	209	21.4	149	17.6	178	19.3	135	15.3	115	13.6	129	14.3
Other	7	9.7	10	10.4	3	5.0	8	11.0	6	8.3	19	13.1	14	7.9
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
NYC excluding NYC	242	13.2	257	13.6	226	10.7	211	9.9	212	9.7	272	11.3	385	15.2
Risks*														
IDU	235	78.9	281	78.1	184	45.1	206	72.8	204	62.6	225	53.4	368	56.2
MSM	6	21.4	11	16.7	21	11.1	7	14.9	2	3.1	10	17.2	7	14.3
SXIDU	106	56.1	133	53.0	109	36.2	103	52.3	81	50.6	152	48.3	260	53.9
CRACK	185	24.5	222	26.2	162	18.7	156	19.9	165	22.8	168	23.3	243	31.0
SXMDRG	82	31.4	110	33.2	89	22.4	71	25.5	42	23.7	46	26.6	62	36.0
DRUG EVER	517	19.2	537	19.0	413	14.3	451	14.5	389	12.9	402	13.7	520	16.1

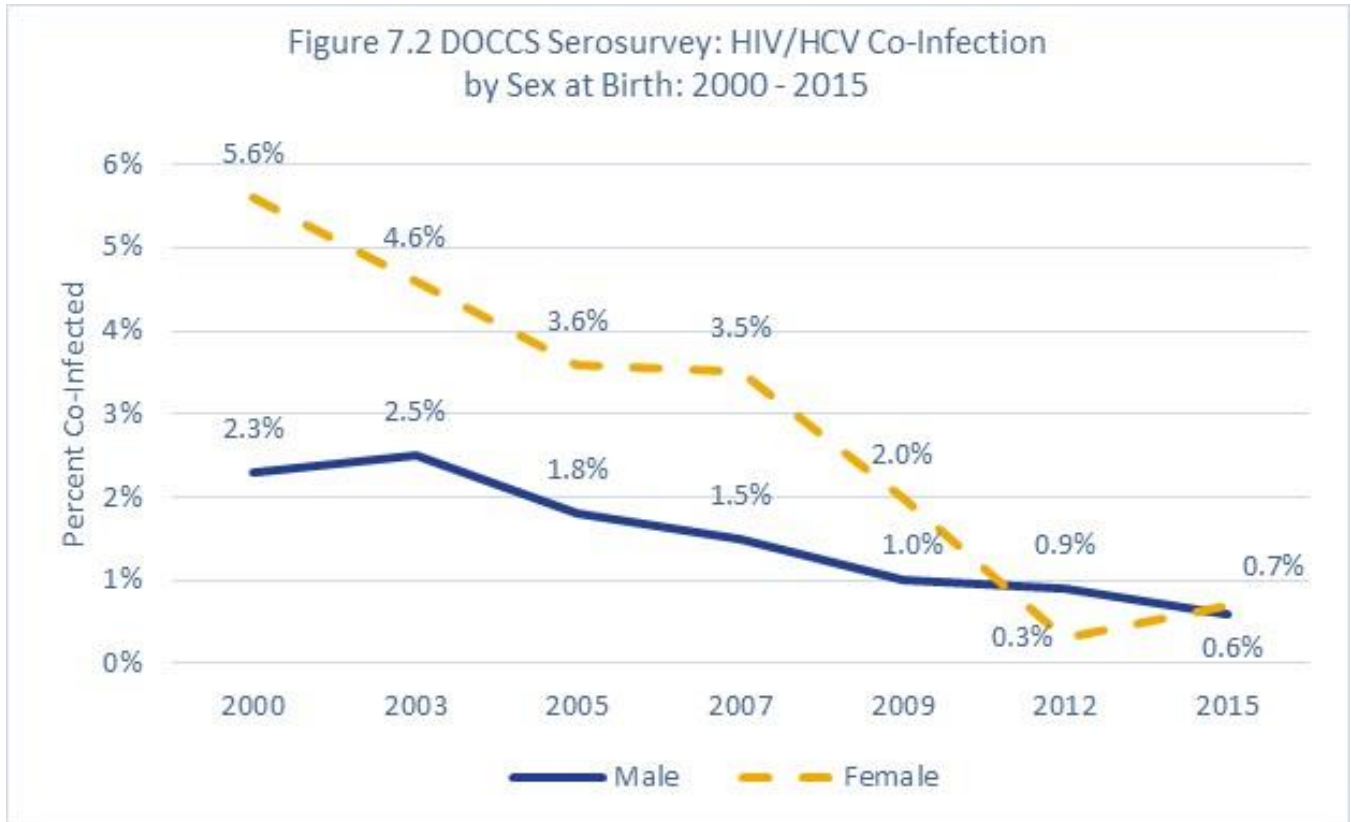
* IDU=Injection Drug Use; MSM=Men Having Sex with Men; SXIDU=Sexual Partner of Injection Drug User; SXMDRG=Sex for Drug and/or Money; DRUG EVER=any reported drug use

Figure 7.1 DOCCS Serosurvey: HCV Antibody Seroprevalence Among Inmates Entering NYS DOCCS, 2000-2015



HIV/HCV Co-Infection

- Just 0.6% (27) of tested inmates were seropositive for both HIV and HCV antibodies in 2015, an 80.0% decline from 3.0% in 2000.
- HIV/HCV co-infection rates decreased between 2000 and 2015 for both males (74% decrease) and females (88% decrease). Between 2012 and 2015 HIV/HCV coinfection increased 133% for female inmates (compared to a 33% decrease among males). (Figure 7.2)
- Of the 556 HCV antibody seropositive inmates, 5% were also HIV seropositive (down from 7% in 2012).
- Of the 88 HIV seropositive inmates, 31% were also HCV antibody seropositive.



Behavioral Risk Factor Surveillance System (BRFSS) in New York State Excluding NYC

The Behavioral Risk Factor Surveillance System (BRFSS) is an annual statewide telephone and cellular surveillance survey designed by CDC and administered by the NYSDOH. BRFSS collects and monitors self-reported information on behaviors, risk factors, and utilization of preventive services related to the leading causes of chronic and infectious diseases, disability, injury, and death among the noninstitutionalized, civilian population aged 18 years and older.

During 2013 - 2016, questions about hepatitis C knowledge and testing were included in the NYS BRFSS. This four-year span reflects the time period before and after the January 1, 2014 implementation of the NYS Hepatitis C Testing Law.

Presented here (Table 8.1) are the weighted percentages among the adult population NYS.

- More than 90% of all adults were aware of hepatitis C in 2013 through 2016 surveys, and awareness of hepatitis C increased among baby boomers from 92.3% in 2013 to 96.2% in the 2014-2016 surveys.
- Hepatitis C testing increased significantly among baby boomers, the focus of the testing law, from 23.7% reporting ever been tested for hepatitis C in 2013 to 28.0% in the 2014-2016 surveys.

In the 2014-2016 surveys, testing rates were significantly higher among younger adults (born 1966 or later) than baby boomers (35.3% vs. 28.0% ever been tested for hepatitis C and 32.9% vs. 24.4% tested in the past 12 months, among those ever tested), while awareness of hepatitis C was significantly lower among younger adults than baby boomers (92.2% vs. 96.2%).

Table 8.1 BRFSS Hepatitis C Knowledge and Testing by Age: New York (Excluding NYC), 2013-2016

	2013 (n=4,881)	2014 (n=3,879)	2015 (n=7,977)	2016 (n=29,776)	2014-2016 (n=49,513)
	Percent (95% C.I.)	Percent (95% C.I.)	Percent (95% C.I.)	Percent (95% C.I.)	Percent (95% C.I.)
Heard of Hepatitis C					
All Adults 18 Years and Older	91.6 (90.0, 93.0)	92.9 (91.1, 94.8)	94.5* (93.4, 95.5)	92.7 (91.3, 94.2)	93.4* (92.5, 94.2)
Younger Adults (Born 1966 or later)	91.8 (89.1, 94.4)	92.0 (88.7, 95.3)	93.9 (92.1, 95.7)	90.8 (88.2, 93.4)	92.2 (90.6, 93.7)
Baby Boomers (Born 1945-1965)	92.3 (90.0, 94.5)	94.9 (92.9, 96.9)	96.4* (95.3, 97.5)	97.1* (96.3, 97.8)	96.2* (95.4, 96.9)
Ever Tested for Hepatitis C					
All Adults 18 Years and Older	24.5 (21.9, 27.0)	29.6* (26.0, 33.2)	28.6* (26.3, 31.0)	30.4* (28.3, 32.6)	29.6* (28.0, 31.2)
Younger Adults (Born 1966 or later)	30.4 (25.8, 35.0)	36.5 (30.1, 42.9)	33.7 (29.6, 37.9)	35.7 (32.1, 39.2)	35.3 (32.6, 38.1)
Baby Boomers (Born 1945-1965)	23.7 (20.2, 27.3)	26.1 (21.8, 30.5)	29.4* (26.3, 32.6)	28.4 (25.3, 31.5)	28.0* (25.9, 30.0)
Tested for Hepatitis C in the Past 12 Months, Among Those Ever Tested for Hepatitis C					
All Adults 18 Years and Older	NA	26.9 (19.6, 34.1)	28.6 (24.3, 33.0)	31.4 (27.5, 35.4)	29.1 (26.0, 32.1)
Younger Adults (Born 1966 or later)	NA	32.3 (21.3, 43.3)	31.5 (24.8, 38.3)	34.6 (29.0, 40.2)	32.9 (28.3, 37.6)
Baby Boomers (Born 1945-1965)	NA	19.2 (11.7, 26.6)	24.8 (19.7, 29.9)	28.5 (22.3, 34.7)	24.4 (20.8, 28.1)
<i>n = unweighted frequency</i>					
<i>95% C.I. = 95% Confidence Interval</i>					
<i>*= Indicates statistically significant differences (at the .05 level) from year 2013.</i>					
<i>NA=Not available because date of HCV test was not collected in 2013.</i>					

Other Data

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 2016 and are provided in Figure 9.1 and Table 9.1.

Hepatitis B

- From 2012 to 2016 the overall rate of deaths from hepatitis B was 0.3/100,000 persons. There was little change from year to year.
- Rates are highest in the older age-groups, males, non-Hispanic blacks, and Asian/Pacific Islanders.

Hepatitis C

- Nationally, in 2013, hepatitis C-related mortality surpassed deaths from 60 other reportable infectious disease.¹ Yet, it is estimated that as few as one-fifth of hepatitis C patients who die have it listed as a cause of death.²
- From 2012 to 2016, the overall rate of deaths from hepatitis C was 3.6/100,000 persons. Rates have decreased 32.5% from 4.0 /100,000 persons during 2012 to 2.7/100,000 persons during 2016.
- Rates were highest in persons who are 55-64 and 65-74 years of age, males, and non-Hispanic blacks.
- Reported hepatitis C death rates have surpassed HIV death rates each year since 2006.

Liver Cancer

- Rates of liver cancer deaths have increased during 1999-2016.
- 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.³

Table 9.1 Deaths Due to Hepatitis B and C, 2012-2016: New York State (Excluding NYC)

	Hepatitis B		Hepatitis C	
	Number of Deaths	Rate Per 100,000 population	Number of Deaths	Rate Per 100,000 population
Total	190	0.3	2,000	3.6
Sex				
Female	45	0.2	547	1.9
Male	145	0.5	1,453	5.3
Race/Ethnicity				
Black, Non-Hispanic	43	0.8	364	7.1
White, Non-Hispanic	100	0.2	1,362	3.2
Asian or Pacific Islander	25	1.1	35	1.5
American Indian/Alaskan Native	NA	NA	15	6.8*
Hispanic	20	0.3	209	3.5
Age at Death				
< 25	NA	NA	NA	NA
25 - 34	NA	NA	12	0.2*
35 - 44	12	0.2*	38	0.6
45 - 54	42	0.5	347	4.2
55 - 64	64	0.8	992	13.0
65 - 74	41	0.8	410	8.3
75 - 84	24	0.9	126	4.7
85+	NA	NA	66	4.9

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

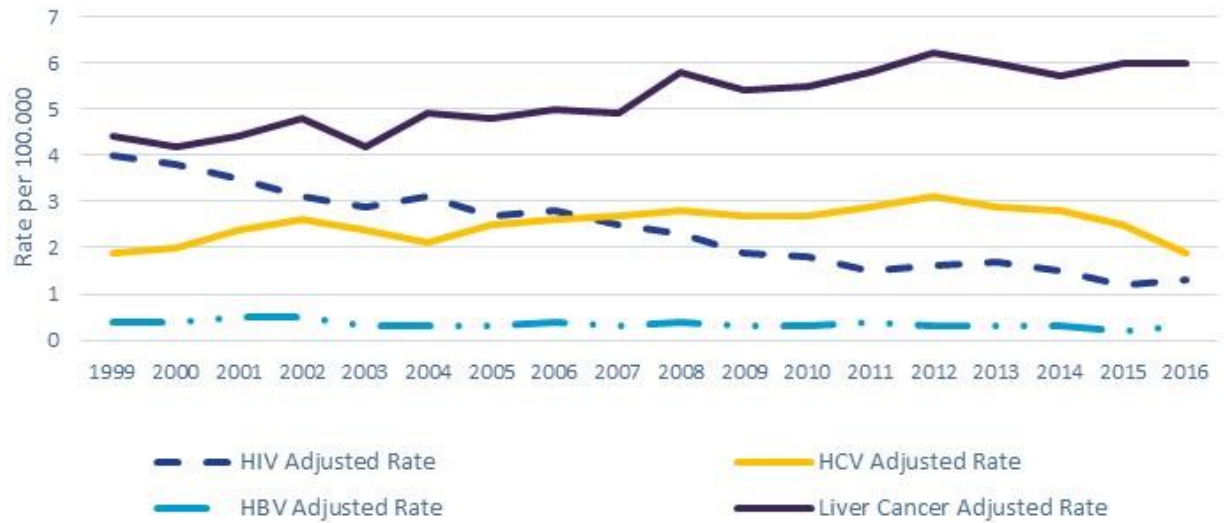
NA indicates cell sizes from 0-9.

*Rates are unreliable when death count is < 20.

ICD-10 Codes: Hep. B (B16.0-B16.2, B16.9, B17.0, B18.0, B18.1) Hep. C (B17.1, B18.2)

Source: CDC Wonder Multiple Cause of Death files (<http://wonder.cdc.gov/mcd-icd10.html>)

Figure 9.1 Age Adjusted Death Rates Due to Hepatitis B & C, Liver Cancer and HIV
New York State, excluding New York City, 1999 - 2016



Source: CDC Wonder Multiple Cause of Death Files
 ICD-10 Codes: Hep B (B16.0-B16.2, B16.9, B17.0, B18.0, B18.1)
 HepC (17.1, B18.2) Liver Cancer (C22) HIV (B20-B24, O98.7, R75)

References and Links

References

¹ 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>

² 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>

³ <https://www.cdc.gov/nchhstp/newsroom/docs/factsheets/viral-hep-liver-cancer.pdf>

Links

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

NYCDOHMH Hepatitis A, B and C in New York City: 2017 annual report:
<https://hepfree.nyc.gov/hepatitis-a-b-and-c-in-new-york-city-2017-annual-report/>

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