

Missouri Viral Hepatitis Epidemiological Profile

2017 to 2021

May 2023

Acknowledgments

Bureau of Health Care Analysis and Data Dissemination
Bureau of HIV, STD, & Hepatitis
Bureau of Immunizations

The Missouri Department of Health and Senior Services, Office of Epidemiology, produces this epidemiologic profile. Funding is provided through a grant from the CDC titled *Integrated Viral Hepatitis Surveillance and Prevention Funding for Health Departments*.

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Introductory Material

Background

This five-year hepatitis epidemiological profile will establish the framework necessary to track future hepatitis trends across Missouri. The Missouri Department of Health and Senior Services (DHSS), Bureau of HIV, STD, and Hepatitis (BHS), Viral Hepatitis Prevention Program (VHPP) focus on educating and collaborating with providers, local public health agencies (LPHAs), substance use disorder treatment centers, and community-based organizations to implement effective prevention and treatment measures for people who are most at risk for viral hepatitis.

The Missouri DHSS Office of Epidemiology's (OOE) goal is to create a robust surveillance system that allows data to drive awareness, education, testing, and linkage to care. Funding for hepatitis prevention and mitigation is provided through a grant from the Center for Disease Control and Prevention (CDC) titled *Integrated Viral Hepatitis Surveillance and Prevention Funding for Health Departments*.

Abbreviations

AIDS	Acquired Immunodeficiency Syndrome
BHCADD	Bureau of Health Care Analysis and Data Dissemination
BHS	Bureau of HIV, STD, and Hepatitis
CDC	Centers for Disease Control and Prevention
CSR	Code of State Regulations
DHSS	Missouri Department of Health and Senior Services
HBV	Hepatitis B Virus
HCV	Hepatitis C Virus
HIV	Human Immunodeficiency Virus
LPHA	Local public health agency
MICA	Missouri Information for Community Assessment
MOPHIMS	Missouri Public Health Information Management System
OOE	Office of Epidemiology
PWID	Persons who inject drugs
STD	Sexually transmitted disease
STI	Sexually transmitted infection
VHPP	Viral Hepatitis Prevention Program
WebSurv	Missouri Health Surveillance Information System

Data Sources

Data was compiled from several sources to present the most complete epidemiological profile possible. Missouri's communicable disease reporting rule, 19 CSR 20-20.020¹, requires reporting acute and chronic HBV and HCV cases, perinatal HBV, and maternal HBV within three days to the local health authority or DHSS.

WebSurv (DHSS): The WebSurv application is a centralized and integrated database that allows the Department of Health and Senior Services and local public health agency staff the ability to enter and/or update case report information. The application includes electronic forms corresponding to the Disease Case Report (CD1) form and the various disease-specific forms used for reporting general communicable diseases to the Centers for Disease Control (CDC)².

Hepatitis Testing Sites Database (DHSS): Utilizing a secure web application for building and managing online surveys and databases that is compliant with 21 CFR Part 11, FISMA, HIPAA, and GDPR³, data is collected from testing and prevention organizations that perform rapid Anti-HCV tests.

MICA (DHSS): The Missouri Information for Community Assessment (MICA) is an interactive system that was developed to make health data accessible at the local level through an easy-to-use format. It allows users to summarize data, calculate rates, and prepare information in a graphic format. Data MICA users can access statistics on various health conditions and associated topics. Users can choose among the many conditions, generate data tables by year of occurrence, age, gender, race, and county or zip code of residence, and obtain age-adjusted rates⁴.

Missouri Bureau of Epidemiology & Vital Statistics: Vital statistics data have long been Missouri's primary source of health information. This long history of collection and recording makes vital statistics the most complete and probably the most accurate of all the sources for Missouri health data. Health and medical information from birth and death records is transformed into data to calculate population growth, identify health risk factors, measure health outcomes, plan and evaluate health programs, and conduct research⁵.

¹ [Missouri Secretary of State: Code of State Regulations \(mo.gov\)](https://www.sos.mo.gov/CodeofStateRegulations)

² <https://health.mo.gov/living/healthcondiseases/communicable/hepatitisc/pdf/elimination-plan.pdf>

³ <https://www.project-redcap.org>

⁴ <https://healthapps.dhss.mo.gov/MoPhims/MICAHome>

⁵ [Vital Statistics | Health & Senior Services \(mo.gov\)](https://www.dhs.gov/vital-statistics)

Data Definitions

Age: Incidence rates for Missouri are based on population data extracted from MICA for the period reported. The age groups used within this profile are: Less than <13 years, 13-18 years, 19-24 years, 25-44 years, 45-64 years, and 65 years old and older.

Case Definitions: The following surveillance case definitions are directly linked to the CDC National Notifiable Diseases Surveillance System.

Hepatitis B: Vaccine-preventable liver infection caused by the hepatitis B virus (HBV).

[HBV \(Acute\) Surveillance Case Definition](#)

[HBV \(Chronic\) Surveillance Case Definition](#)

Hepatitis C: Liver infection caused by the hepatitis C virus (HCV).

[HCV \(Acute\) Surveillance Case Definition](#)

[HCV \(Chronic\) Surveillance Case Definition](#)

Correctional Facilities Data: Data for persons diagnosed in Missouri Department of Corrections facilities are not included in the data presented. The county of residence cannot be validated and, therefore, would falsely elevate values for the county where the facility is located.

Data Limitations: Data release limitations ensure that information cannot be used to identify an individual inadvertently. It is difficult to draw meaningful conclusions concerning trends in areas with low numbers of cases. Therefore, please interpret rates with a numerator of less than 20 with caution because of the low reliability of rates based on a small number of cases.

Date of Diagnosis: This represents the date an individual was first diagnosed with the hepatitis virus, regardless of the stage of disease progression. However, in many instances, the initial diagnosis of infection does not occur until several years after the initial infection, so at best, the trends in diagnosed cases can only approximate actual trends in new infections.

Place of Residence: Data are presented based on an individual's residence at the time of most recent diagnosis of hepatitis. State and county of diagnosis do not change even if a person moves to a different county or out of state.

Race/Ethnicity: In the text of this document, whenever cases are being discussed, the term "white" represents persons of any ethnicity who report a race of white only. The term "black/African American" represents persons of any ethnicity who only report a race of black/African American. Unknown race, other race, and missing comprise 32.5% of the total data pulled.

Rates: Rates have been calculated per 100,000 persons. Unless otherwise noted, the denominator for calculating rates is based on the population data extracted from MICA for the period reported. The

numerator is the number of cases reported during the period. This number is divided by the population estimate and multiplied by 100,000.

Risk Factors: Data referring to risks include multiple risks selected by individuals who tested positive through the rapid HCV testing program. Of all individuals who tested positive through the rapid HCV testing program, 61% reported multiple risks, 29% reported one risk, and 10% had no risks marked.

Data Interpretations

The data presented in this report are current as publication. However, the data may differ from previous reports as new information is received. Limitations to data collection do exist, such as incomplete race, ethnicity, and risk information and underreporting. Missouri currently does not have the capacity to conduct investigations on viral hepatitis conditions which impacts the collection of risk factors and associated data.

To increase testing availability, the Hepatitis C Rapid Testing program was initiated in November of 2017, and the complete annual data is available starting with 2018.

In April 2020, the CDC updated its HCV testing recommendations to include one-time testing of all adults (18 years and older) and all pregnant persons during each pregnancy. CDC continued recommending that people with risk factors, including those who inject drugs, be tested regularly⁶.

In 2020, the COVID-19 pandemic impacted access to testing, care-related services, and case surveillance activities. DHSS does not receive negative reports; therefore, the true impact of the COVID-19 pandemic on testing is unknown. Thus, data from 2020 and 2021 should be interpreted with caution.

Suggested Citation

Missouri Department of Health and Senior Services. *Missouri Viral Hepatitis Epidemiological Profile 2017 – 2021*. Division of Community & Public Health, Office of Epidemiology. 2023. Available at: <https://health.mo.gov/data/hivstdaids/data.php>

Publication Date

May 2023

⁶ <https://www.cdc.gov/hepatitis/hcv/guidelinesc.htm>

Missouri State Demographics

Missouri Population Demographics, MICA, 2020

Sex	
Male	3,017,723
Female	3,133,825
Race	
White	5,167,248
Black/ African-American	776,774
American Indian and Alaska Native	46,265
Asian/Native Hawaiian and Other Pacific Islander	161,261
Age	
<2	142,909
2-12	835,507
13-18	467,543
19-24	483,476
25-44	1,586,731
45-64	1,545,668
65+	1,089,714

Figure 1. Missouri's population counts for sex, race, and age.

Source: DHSS - MOPHIMS - Population MICA

Missouri's population was estimated at 6,151,548 in 2020.

- Females represented 50.94% of Missouri's population.
- Whites comprised 84% of Missouri's population.
- Blacks/African Americans represented Missouri's second-largest race category at 12.63%.
- Over 50% of Missouri's population fell into one of two age groups:
 - 25.79% were 25-44 years old
 - 25.13% were 45-64 years old

Hepatitis Rates by County in 2020

Top 10 Chronic Hepatitis B and Chronic C Rates per 100,000 by County in 2020

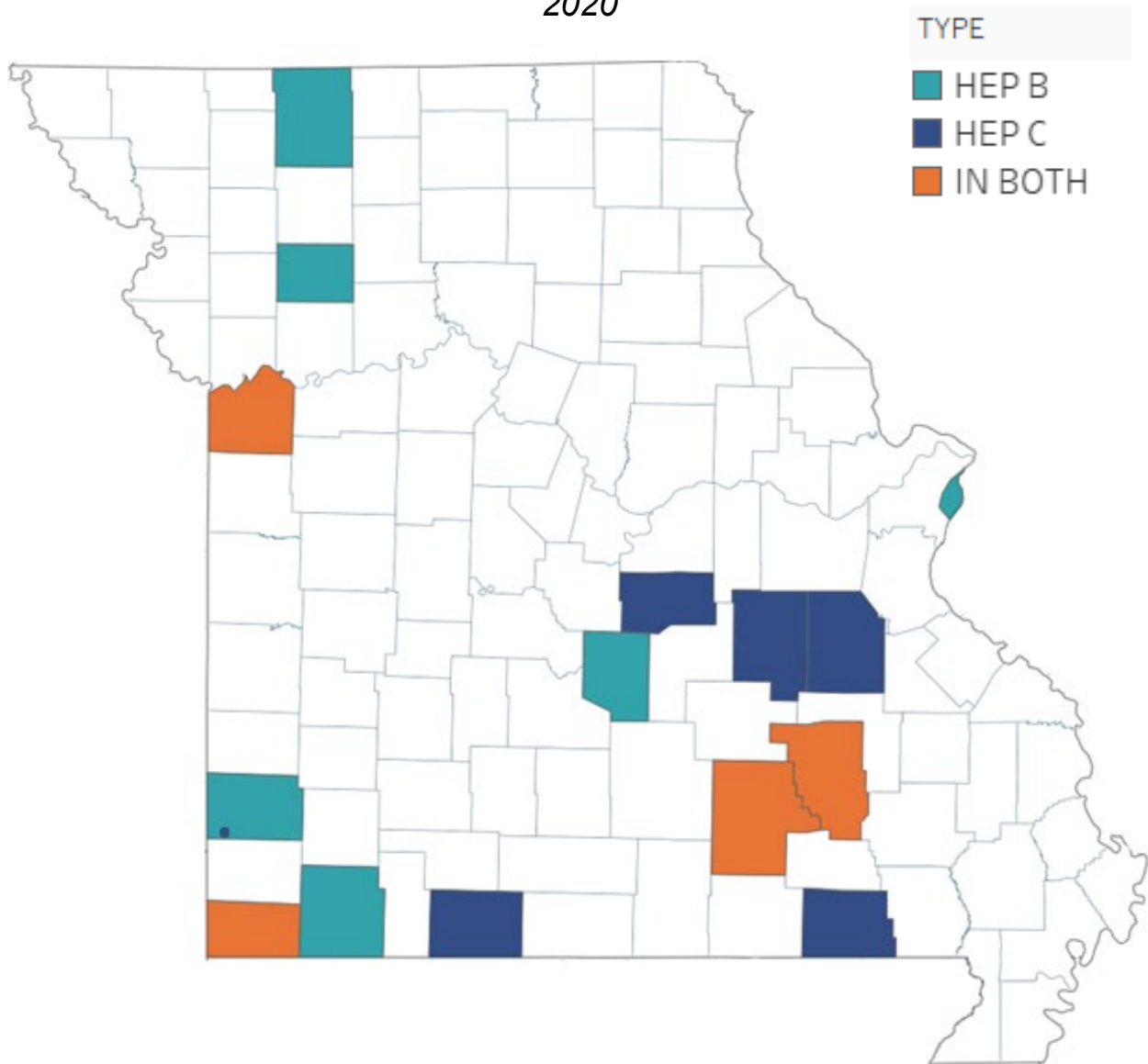


Figure 2. Shows the top 10 chronic HBV and chronic HCV rates by county on a map of Missouri.

Of the counties ranked in the top 10 for chronic HBV and/or chronic HCV in 2020, seven were in the state's southeastern/central area. Three counties in the state's southern region were in the top 10 for both chronic HBV and chronic HCV: McDonald County, Reynolds County, and Shannon County.

In the top 10 for chronic HBV, there is a 34.04% difference between the highest county (Barry County) and the lowest county (Caldwell County). The difference between the highest county (Shannon County) and lowest county (Maries County) in the top 10 for chronic HCV is 30.05%.

Top 10 Chronic Hepatitis B Rates per 100,000 by County in 2020

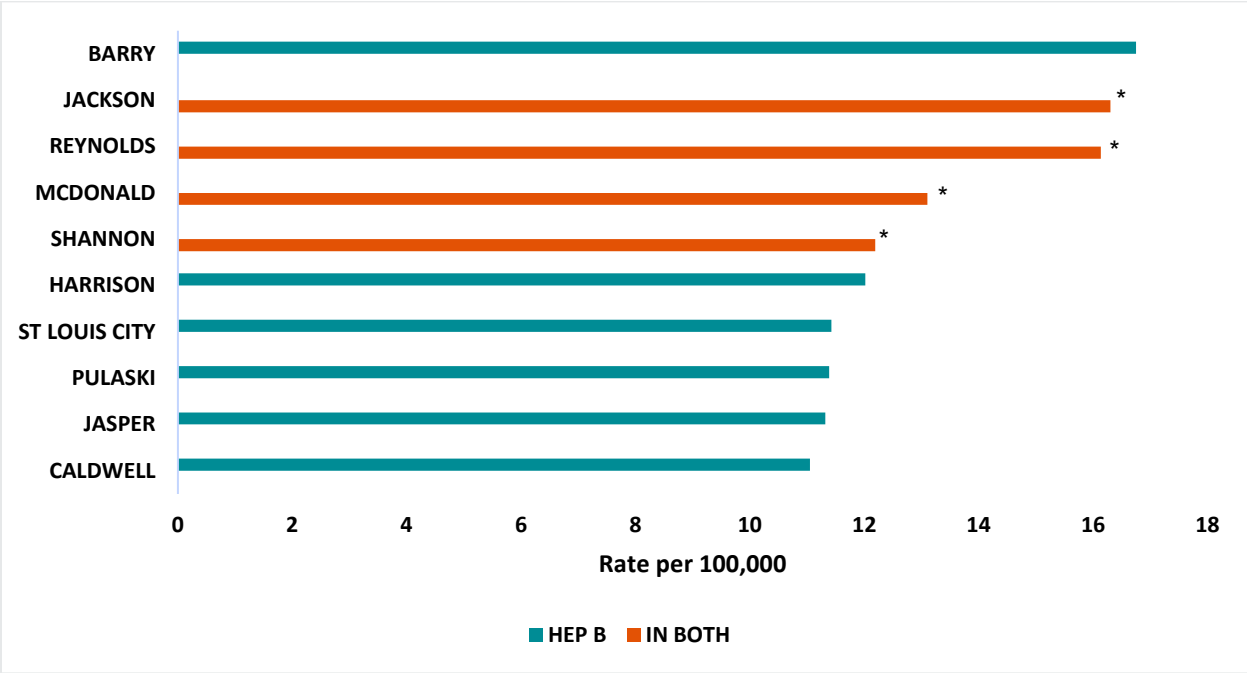


Figure 3. Compares the top 10 rates of HBV per county in 2020
 Counties in orange with an * indicate that those counties are on both lists

Top 10 Chronic Hepatitis C Rates per 100,000 by County in 2020

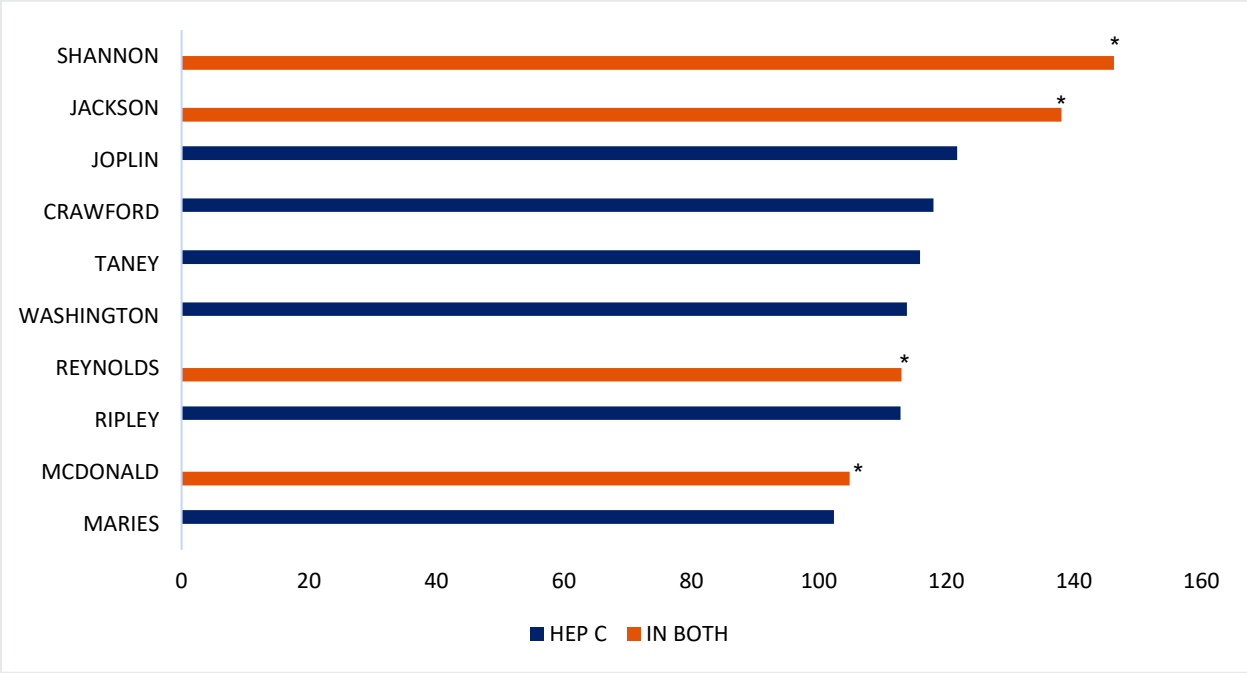


Figure 4. Compares the top 10 rates per 100,000 of HCV per county in 2020.
 Counties in orange with an * indicate that those counties are on both lists.

Hepatitis B

Total Number of Hepatitis B Cases, 2017-2021

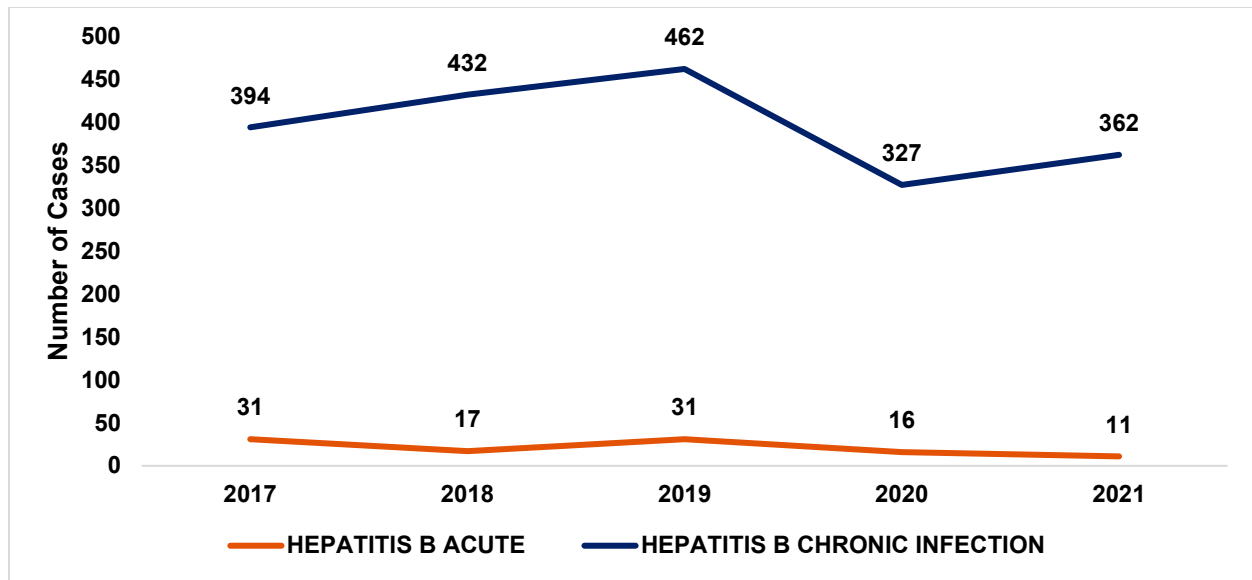


Figure 5. Compares the total number of viral HBV cases for the years 2017-2021.

Chronic HBV cases trended up from 2017 to 2019 but decreased in 2020, likely due to the COVID-19 pandemic. Numbers are slowly increasing toward pre-pandemic levels as of 2021.

Due to small numbers, it is best to interpret the acute HBV case data with caution. The trend line continues to indicate a decline in cases, although, in 2019, the number of cases almost reverted to 2017 levels. Acute HBV cases reached their lowest number in 2021.

Acute Hepatitis B

Acute Hepatitis B Counts by Sex, Race, and Age for 2017-2021

	2017	2018	2019	2020	2021
Total Acute Cases	31	17	31	16	11
Sex					
Female	10	6	19	9	7
Male	21	11	12	7	4
Race					
Black/African American	2	1	4	2	1
White	17	14	25	10	7
Other	12	2	2	4	3
Age					
13-18	0	0	1	0	0
19-24	1	1	3	2	1
25-44	10	11	14	8	2
45-64	19	5	10	5	8
65+	1	0	3	1	0

Figure 6. HBV acute case counts including totals, by sex, by race, and age between 2017 through 2021.

Missouri did not report any acute HBV cases for persons under the age of 13 during this reporting period; only 9 cases were reported for those between the ages of 13 – 24. This is likely due to the CDC’s recommendation for routine childhood vaccination against HBV in 1991.

As described in Data Interpretation, the decrease in total acute HBV observed in 2020 and 2021 was likely due to the COVID-19 impact on testing.

Chronic Hepatitis B

Chronic Hepatitis B Rates per 100,000 by Sex, 2017-2021

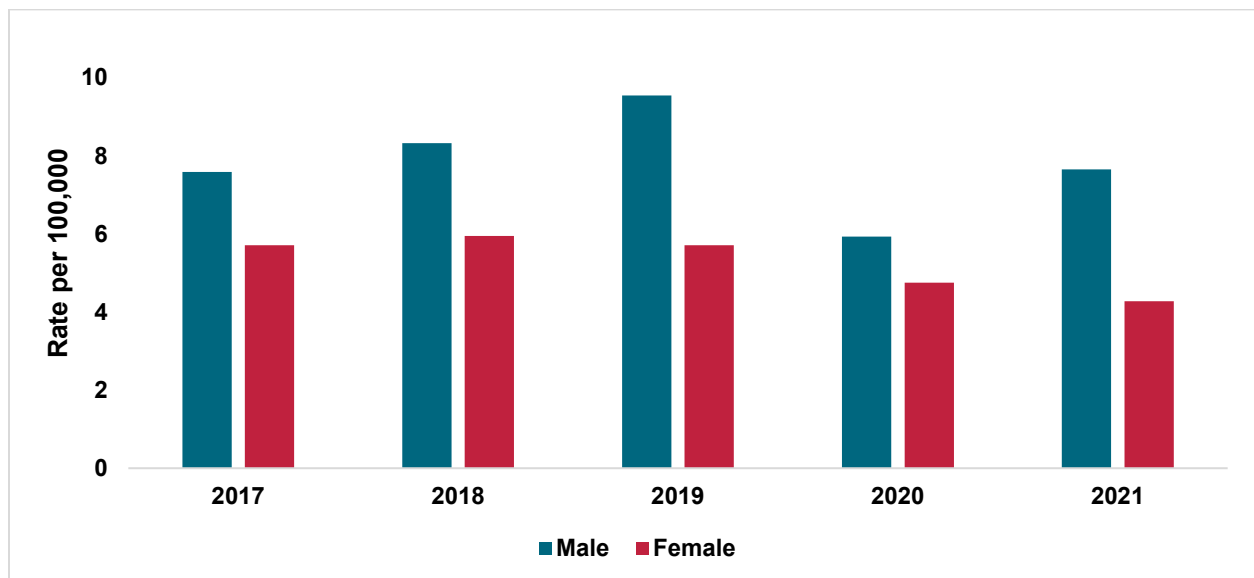


Figure 7. Compares the rate of chronic HBV cases amongst males and females from 2017 through 2021 per 100,000 population.

In 2019 and 2021, the rate gap between males and females diagnosed with chronic HBV averaged .68 times higher for males than females.

Chronic Hepatitis B Rates per 100,000 by Race, 2017-2021

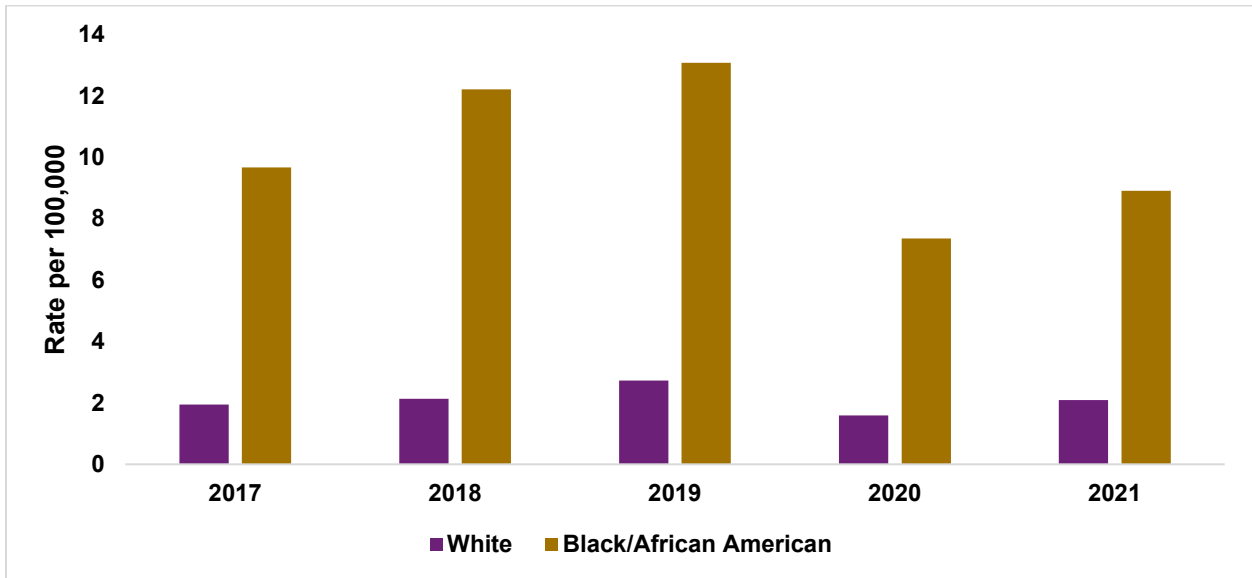


Figure 8. Compares the rate of chronic HBV cases amongst Black/African Americans and Whites for the years 2017 through 2021 per 100,000 population.

The average rate for Black/African Americans with a chronic HBV diagnosis was 3.9 times higher than whites during the five-year period.

Chronic Hepatitis B Cases Rates per 100,000 by Age

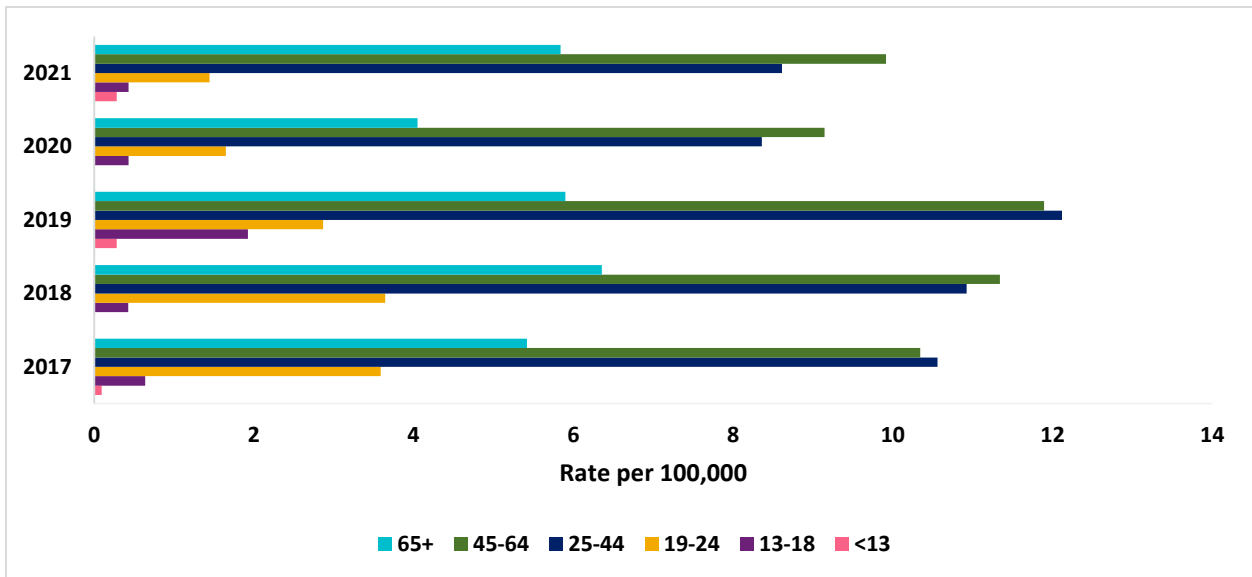


Figure 9. Compares the total number of chronic HBV cases in 2021 amongst six age groups per 100,000 population.

In 2021, people aged 45-64 were the largest demographic group for chronic HBV cases making up 37% of the diagnosis. The following two largest groups were 25-44 year-olds with 32% and individuals 65+ with 22%.

Maternal Hepatitis B

Total Number of Maternal Hepatitis B Cases, 2017-2021

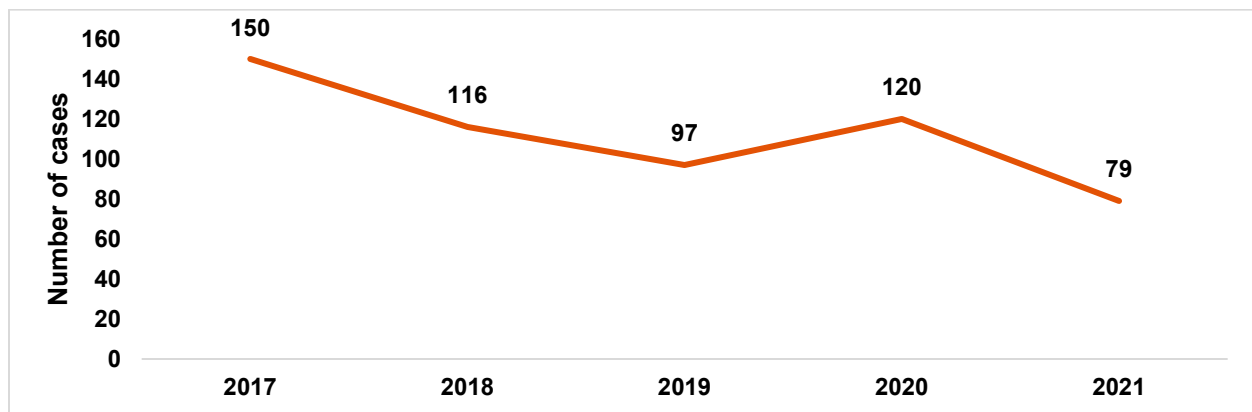


Figure 10. Provides data for the total number of maternal HBV cases from 2017 through 2021.

Maternal HBV cases have continued to decline over the past five years. Though an increase of 23.7% in new cases occurred in 2020, new cases for 2021 were down to the lowest they have been in the past five years. There were no perinatal HBV cases reported during the same period.

Hepatitis B Vaccines

There is no cure for hepatitis B. However, the best way to prevent HBV is with the vaccine. Missouri's School Immunization Requirements are compatible with the current recommendations of the Advisory Committee on Immunization Practices (ACIP) of the Centers for Disease Control and Prevention (CDC), the American Academy of Pediatrics, and the American Academy of Family Physicians. The current hepatitis B vaccine recommendation is to initiate the series at birth. Infants who did not receive a birth dose should receive 3 doses of a HepB-containing vaccine on a schedule of 0, 1 to 2 months, and 6 months starting as soon as feasible⁸.

Percent of Missouri Residents with Initiated Hepatitis B Vaccines after Birth, 2017-2021

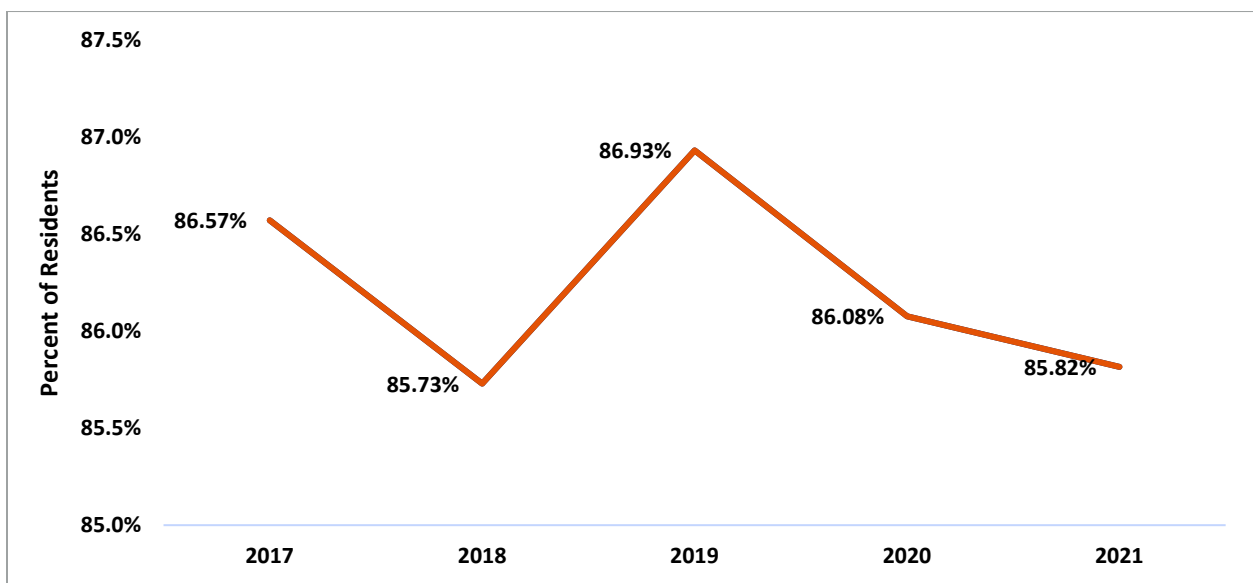


Figure 11. Shows the percentage of infants receiving the HBV vaccine after birth, according to Vital Records, between 2017 and 2021.

The percentage of the population that has initiated the hepatitis B vaccine series at birth decreased slightly (4.36%) from 2017 to 2021.

⁸ [MOSchoolImmunizationRequirements0-18YearsofAge.pdf](#)

Hepatitis C

Hepatitis C Cases, 2017-2021

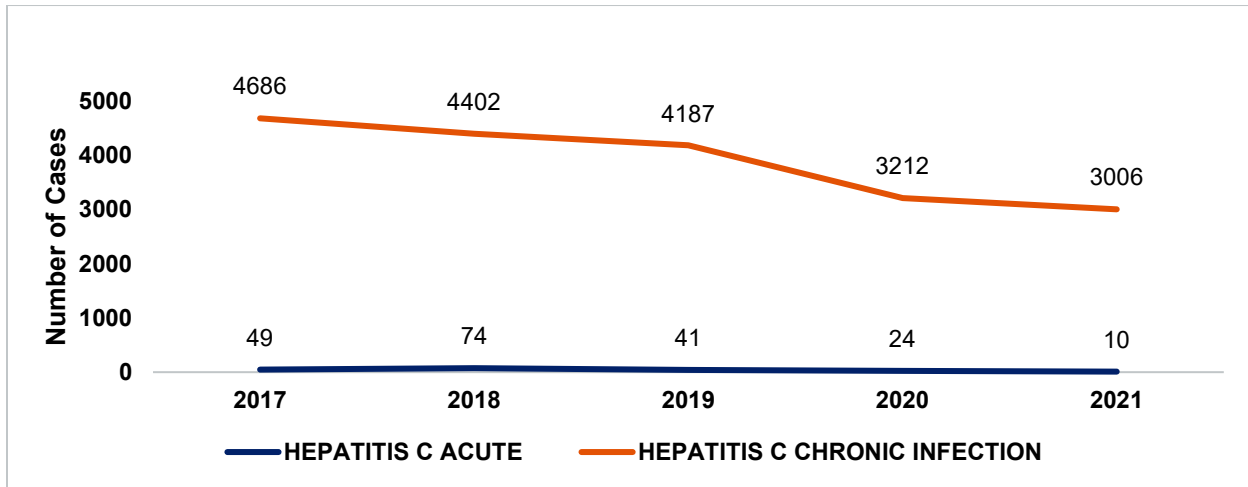


Figure 12. Provides data for the total number of acute HCV and chronic HCV cases for the years 2017 through 2021.

The trend in acute and chronic HCV cases indicates a decrease from 2017 to 2021. The percentage of the decline in chronic HCV cases was 61.2% as of 2021. In 2018, acute HCV cases increased by over 53.2% from 2017. However, acute HCV cases decreased by 80.9% from 2017 to 2021. Due to low numbers of acute HCV, please interpret the data with caution.

Acute Hepatitis C

Acute Hepatitis C Counts by Sex, Race, and Age for 2017-2021

	2017	2018	2019	2020	2021
Total Acute Cases	49	74	41	24	10
Sex					
Female	16	35	14	11	3
Male	33	39	27	13	7
Race					
Black/African American	6	18	9	6	0
White	25	32	22	12	6
Other	18	24	10	6	4
Age					
13-18	2	1	1	0	0
19-24	6	2	1	1	0
25-44	20	37	17	17	6
45-64	18	30	14	4	3
65+	3	4	8	2	1

Figure 13. HCV acute case counts including totals, by sex, by race, and age between 2017 through 2021.

Missouri did not report any acute HCV cases for persons under the age of 13 during this reporting period. As described in Data Interpretation, the decrease in total acute HBV observed in 2020 and 2021 was likely due to the COVID-19 impact on testing.

Chronic Hepatitis C

Chronic Hepatitis C Rate per 100,000 by Sex, 2017-2021

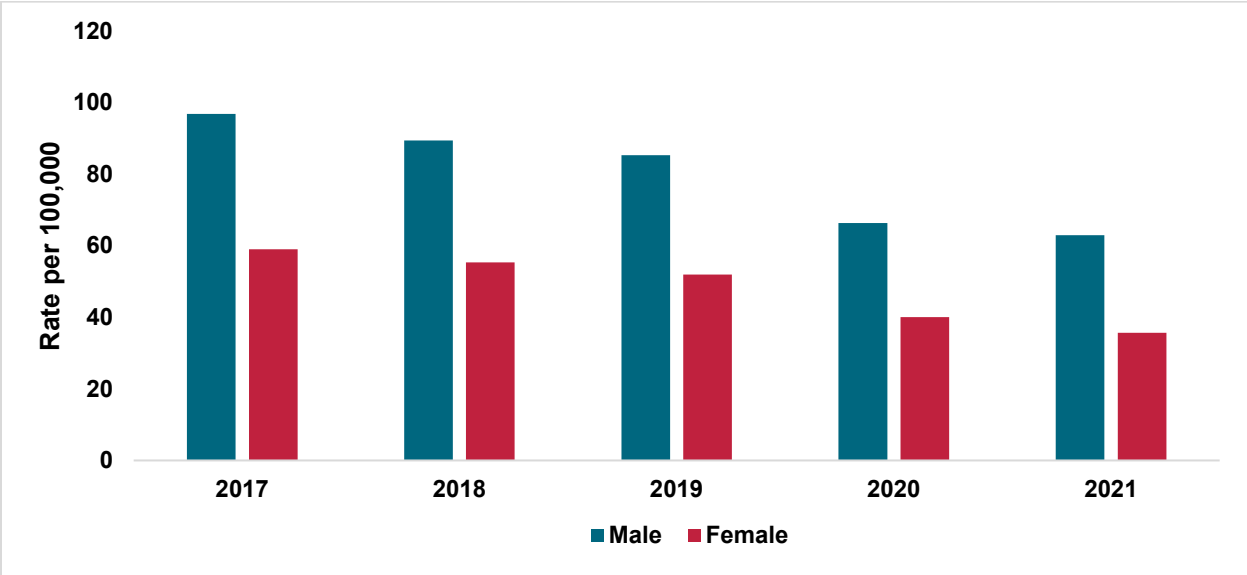


Figure 14. Compares the rate of chronic HCV cases amongst males and females from 2017 through 2021 per 100,000 population.

In 2021, males were 1.8 times more likely than females to receive a new diagnosis of chronic HCV. Rates for chronic HCV for males and females have consistently decreased over the 5 year period.

Chronic Hepatitis C Rate per 100,000 by Race, 2017-2021

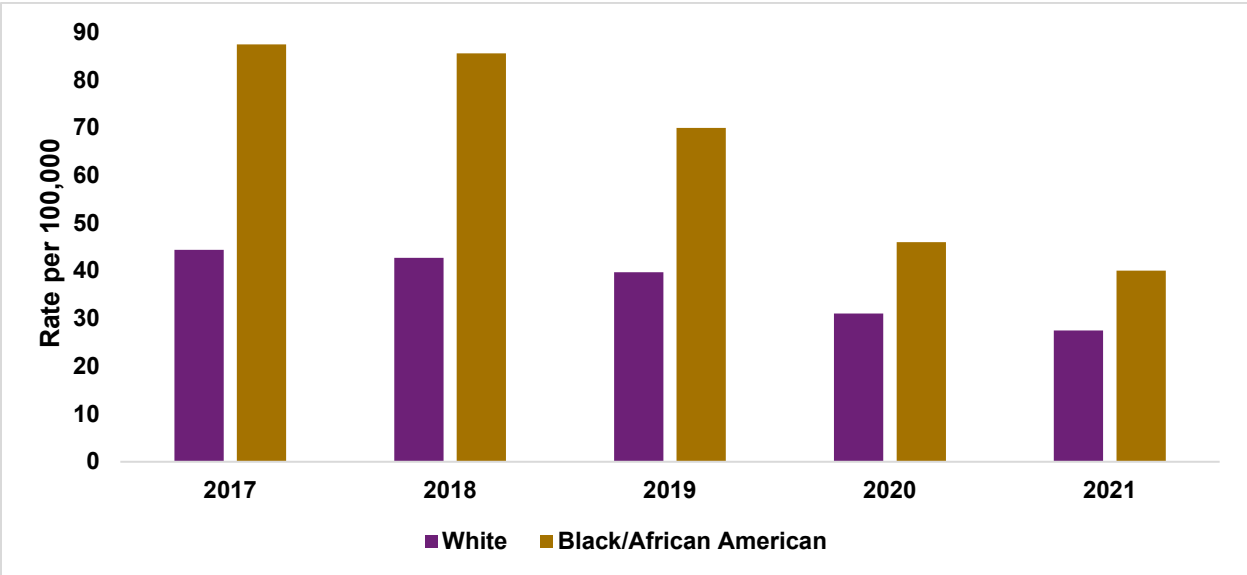


Figure 15. Compares the rate of chronic HCV cases amongst Black/African Americans and whites for the years 2017 through 2021 per 100,000 population.

The rate of Black/African Americans diagnosed with chronic HCV has decreased by 45.8%, while the rate of whites diagnosed has decreased by 61.9%.

Chronic Hepatitis C Rate per 100,000 by Age, 2021

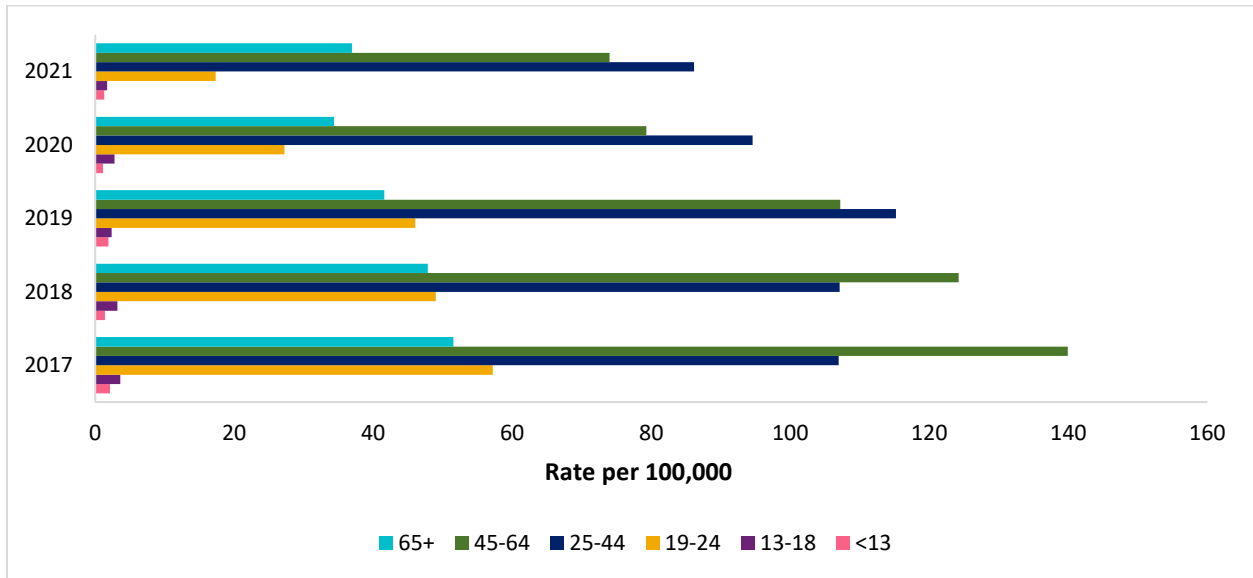


Figure 16. Compares the total number of chronic HCV cases in 2021 amongst six age groups per 100,000 population.

While the rate for newly diagnosed chronic HCV cases continues downward for those aged 25-44 and 45-64, they still comprise the largest groups at 40% and 34% respectively. Rates for those 65 and older have increased slightly to 17%.

Rapid Hepatitis C Tests

In November 2017, the Missouri Department of Health and Senior Services (MODHSS), the Bureau of HIV, STD, and Hepatitis (BHSB) began providing rapid hepatitis C tests to partner organizations to perform preliminary rapid tests. The data collected from these tests are reported to BHSB and analyzed below.

Rapid Hepatitis C Total Tests and Positives, 2018-2021

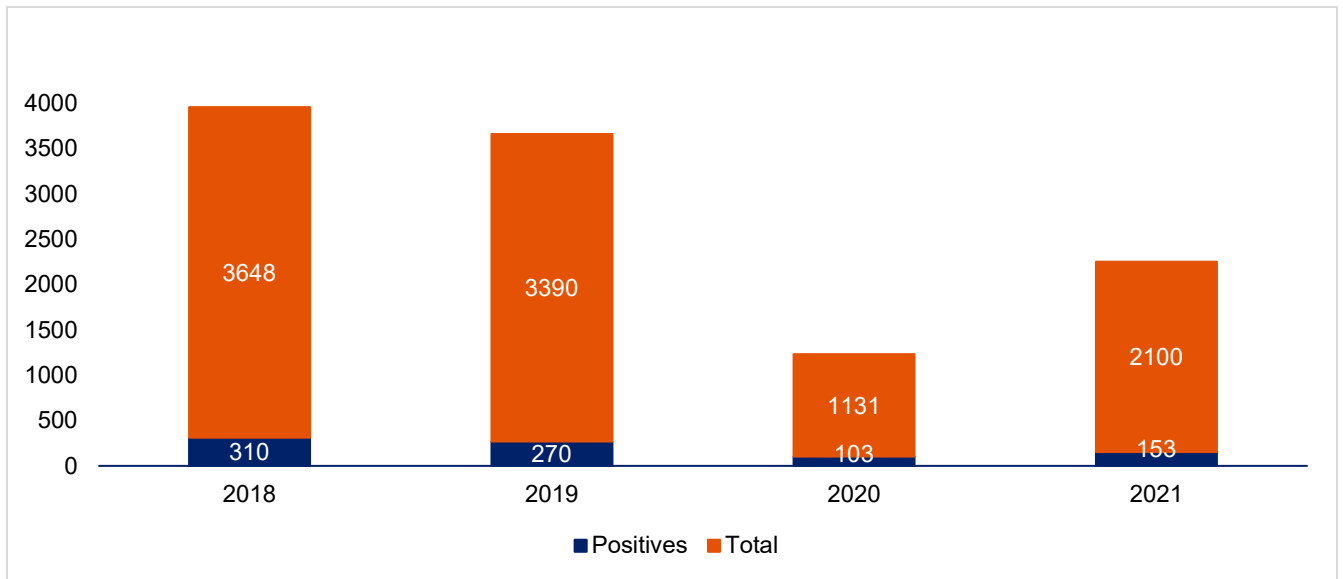


Figure 17. Provides data for the total number of rapid HCV tests performed versus the total number of positives from those tests from 2018 through 2021.

The average percent of positivity over the four-year period was 8.14%. The year with the highest positivity was 2020 at 9.11%. The lowest positivity rate was 7.29% in 2021.

Rapid Hepatitis C Tests by Sex, 2018-2021

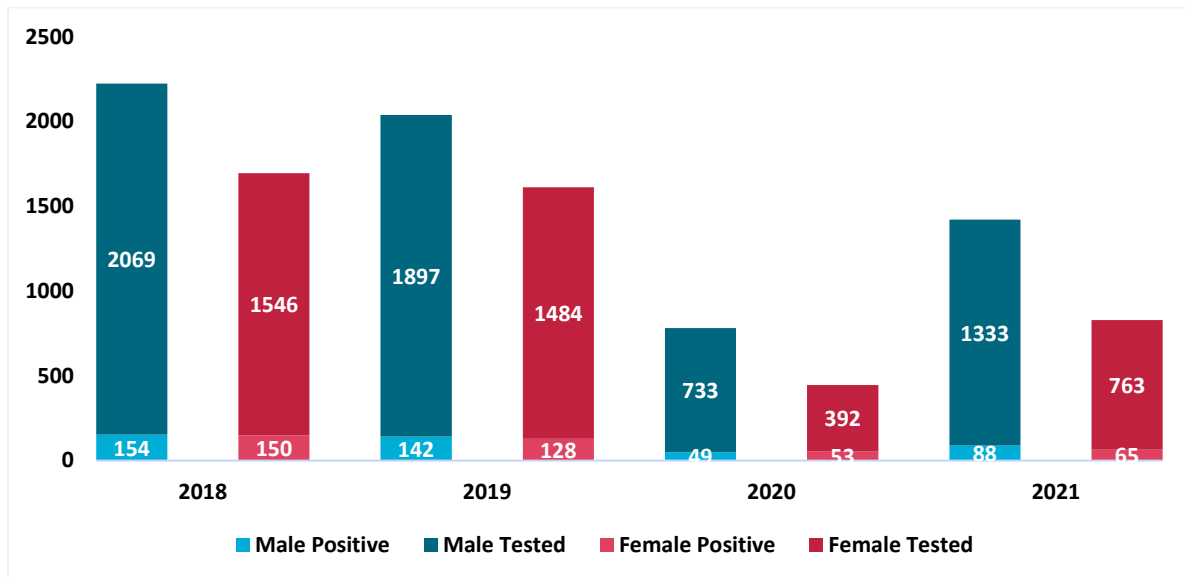


Figure 18. Compares the number of people who tested positive through the rapid HCV tests among males and females from 2017 through 2021.

On average, females tested positive 3% more than males. In 2020, females tested positive 2 times more than males.

Rapid Hepatitis C Tests Percent Positive by Race, 2018-2021

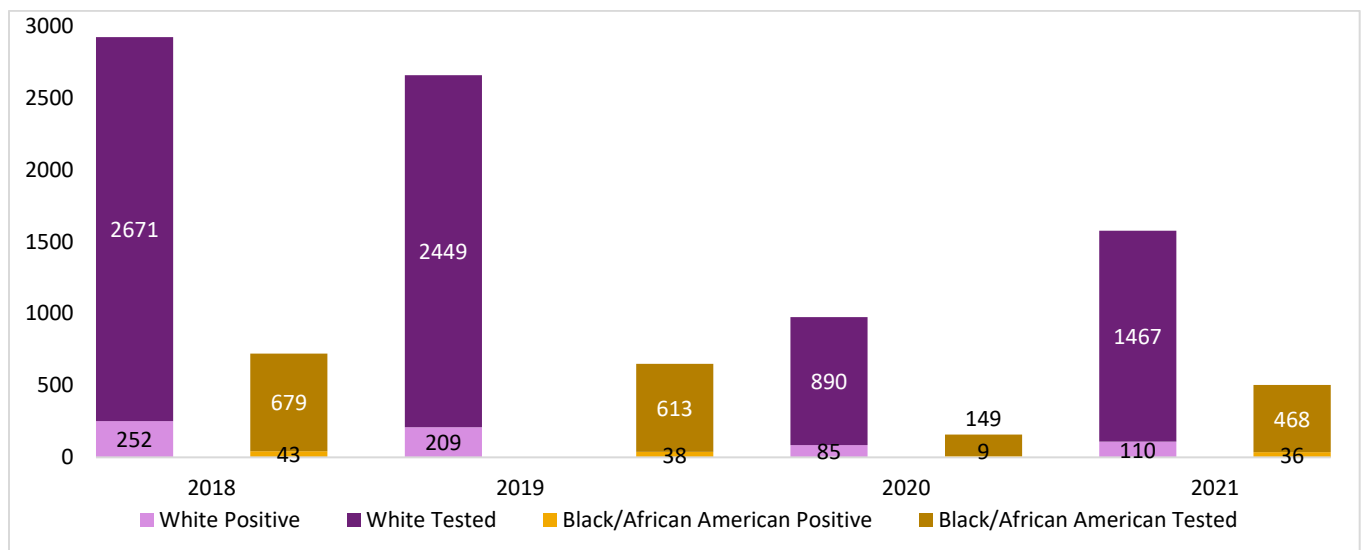


Figure 19. Compares the number of people by race who were tested through the rapid HCV tests and the percent of people who tested positive amongst Black/African Americans and whites from 2017 through 2021.

The average number of whites who were tested over the program’s four years was three times higher than Black/African Americans. The average percent positivity for whites over the four years of the rapid testing program was 2% higher than Black/African Americans.

Rapid Hepatitis C Positive Tests by Age, 2018-2021

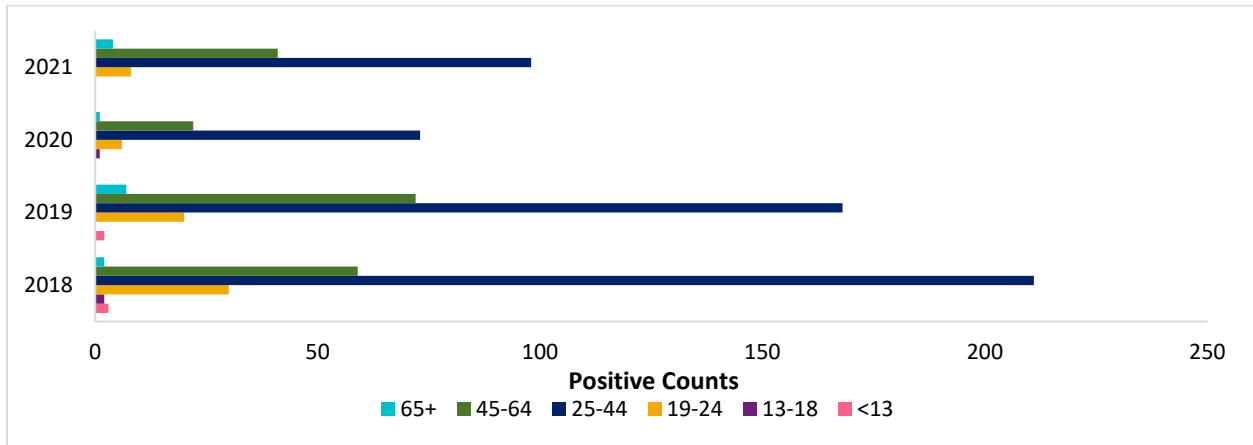


Figure 20. Compares the total number of people who tested positive through the rapid HCV program from 2018-2021 amongst six age groups.

In 2021, 65% of the people who tested positive for HCV through the rapid HCV test program were 25-44 year-olds. The next two largest groups were 45-64 (27%) and 19-24 year-olds (5%).

Rapid Hepatitis C Test Risk Factors for Positive Cases, 2018-2021

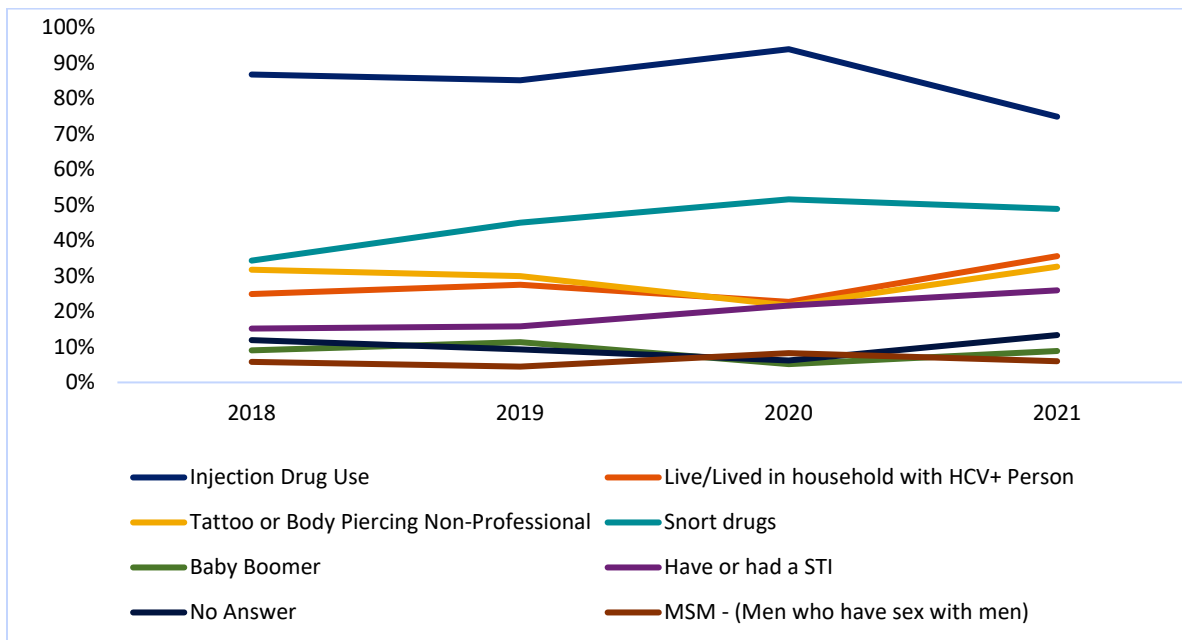


Figure 21. Displays the various risk factors trends for people who tested positive via the rapid HCV testing performed from 2018 through 2021.

Risks reported through the rapid HCV testing program are not mutually exclusive; therefore, risk totals will exceed 100%. Of all individuals who tested positive through the rapid HCV testing program, 61% reported multiple risks, 29% reported one risk, and 10% had no risks marked. Over the past four years, the top two risks of those who tested positive were injection drug use and snort drugs.