

2021 Massachusetts Integrated HIV, STD, and Viral Hepatitis Surveillance Report



Massachusetts Department of Public Health
Bureau of Infectious Disease and
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Requests for additional data

<https://www.mass.gov/lists/infectious-disease-data-reports-and-requests>

Slide set for 2020 Integrated Report

<https://www.mass.gov/lists/std-data-and-reports>

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ⁱ Providers may use this number to report individuals newly diagnosed with a notifiable sexually transmitted infection, including HIV, or request partner services. Partner services is a free and confidential service for individuals recently diagnosed with a priority infection. The client-centered program offers counseling, linkage to other health and social services, anonymous notification of partners who were exposed and assistance with getting testing and treatment. For more information, see: <https://www.mass.gov/service-details/partner-services-program-information-for-healthcare-providers>

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LIST OF COMMONLY USED ACRONYMS

AFAB	Assigned Female at Birth
AI/AN	American Indian/Alaska Native
AIDS	Acquired Immunodeficiency Syndrome
AMAB	Assigned Male at Birth
API	Asian/Pacific Islander
BIDLS	Bureau of Infectious Disease and Laboratory Sciences
BRFSS	Behavioral Risk Factor Surveillance System
CDC	Centers for Disease Control and Prevention
CI	Confidence Interval
COVID-19	Coronavirus Disease 2019
DOE	Department of Education
HAV	Hepatitis A Virus
HBV	Hepatitis B Virus
HCV	Hepatitis C Virus
HIV	Human Immunodeficiency Virus
HSR	Health Service Region
HTSX	Heterosexual Sex
IDU	Injection Drug Use
MDPH	Massachusetts Department of Public Health
MSM	Male-to-Male Sex or Men Who Have Sex with Men
N	Number
NH	Non-Hispanic
NIR	No Identified Risk
PLWH	Persons Living with HIV Infection
Pres. HTSX	Presumed Heterosexual Sex
PR/USD	Puerto Rico/United States Dependency
PWID	Persons Who Inject Drugs
STD	Sexually Transmitted Disease
STI	Sexually Transmitted Infection

KEY HIGHLIGHTS

The 2021 Integrated HIV, STD, and Viral Hepatitis Surveillance Report provides data on infections reported to the Massachusetts Department of Public Health (MDPH), Bureau of Infectious Disease and Laboratory Sciences by healthcare providers and laboratories per regulation (105 CMR 300.000). This report focuses on a subset of these diseases:

- Chlamydia
- Gonorrhea
- Syphilis
- HIV
- Hepatitis A, B and C

The intended audience for this annual surveillance report includes the clinicians and laboratory professionals who report cases, community organizations, local public health departments, advocates, policymakers, and researchers who are interested in the health of Massachusetts residents.

Key highlights in 2021

The coronavirus disease 2019 (COVID-19) pandemic has had a large impact on the screening, treatment, and surveillance of other infectious diseases in 2020 and 2021. Nationally, the Centers for Disease Control and Prevention (CDC) observed a sharp decline in reported STD cases from March-April 2020, compared to March-April 2019.¹ Three factors were cited as likely contributing to the initial decrease in reported cases:

- Reduced screening – many health care clinics limited in-person visits to symptomatic cases or closed down
- Limited resources – many state and local health department STD staff were redirected from routine STD responsibilities to COVID-19 activities, which affected STD tracking capacity and reporting
- Social distancing measures – intended to reduce COVID-19 spread, may have influenced sexual behaviors and reduced STD transmission.

After the initial decrease in 2020, an increase across STDs was observed nationally² and in the Commonwealth in 2021. Possible factors contributing to an increase in reported cases could include:

- Increased service utilization after health care clinics re-opened
- Continued targeting of services to patients most likely to be infected, increasing the number of cases identified
- Higher disease transmission - For example, due to reduced access to care, those with an STD may have had their infections longer, providing more opportunities to transmit infection to their sexual partners. Additionally, following the initial shelter-in-place orders, sexual behaviors may have changed, including frequency of new sexual partners, leading to spread in sexual networks.³

At time of publication, the COVID-19 pandemic continues; its full effect on case detection and reporting and efforts to control the spread of infectious disease in the Commonwealth has yet to be determined. As such, please interpret 2020 and 2021 infectious disease data with caution.

¹ Source: CDC Press Release, July 16, 2021: Trends in STD case reports during the U.S. COVID-19 pandemic, January-December 2020 available at:

<https://www.cdc.gov/nchstp/newsroom/2021/2020-std-trend-report.html>

² CDC. Preliminary 2021 STD Surveillance Data.

<https://www.cdc.gov/std/statistics/2021/default.htm#:~:text=Preliminary%20data%20show%202.5%20million,%2C%20syphilis%2C%20and%20congenital%20syphilis>

³ CDC. Impact of COVID-19 on STDs. <https://www.cdc.gov/std/statistics/2020/impact.htm>

KEY HIGHLIGHTS

Chlamydia, gonorrhea, and syphilis:

- Chlamydia continues to be the most frequently reported STI, with over 26,000 cases reported in 2021.¹
- The total number of reported chlamydia cases increased by 32% from 23,930 in 2012 to 31,642 in 2019, decreased to 24,838 in 2020, and then increased to 26,957 in 2021.
- The overall average age of laboratory-confirmed chlamydia cases in Massachusetts increased from 23.3 years in 2012 to 26.0 years in 2021. This marks the third year that the average age has exceeded the CDC recommended screening age range of under 25 years for sexually active women.
- After a sharp 58% increase from 2016 (N=4,617) to 2017 (N=7,307), gonorrhea incidence remained relatively stable through 2020, and then increased 10% in 2021 (N=8,133).
- The number of confirmed gonorrhea cases reported among males far exceeds cases reported among females. In 2021, 5,386 gonorrhea cases were reported among males, compared to 2,704 among females, and 39 among individuals of transgender experience.²
- The number of infectious syphilis cases (primary, secondary, and early non-primary non-secondary syphilis) increased to a ten-year high of 1,243 in 2019, decreased slightly to 1,159 in 2020, and then increased to a new high of 1,352 in 2021. Although cases among females have risen over the past decade, infectious syphilis continues to disproportionately affect males, reflecting an ongoing epidemic among men who have sex with men (MSM).
- Among the 50 states in 2020, Massachusetts ranked tenth lowest in chlamydia incidence rate, ninth lowest in gonorrhea incidence rate.
- Massachusetts ranked 28th in primary and secondary syphilis incidence rate in 2020.³

HIV:

- The number of persons living with HIV infection (PLWH) in Massachusetts increased by 13% from 20,741 at the end of 2012 to 23,470 at the end of 2021.⁴
- Because of effective HIV treatment, people diagnosed with HIV infection are living longer, healthier lives. Survival of individuals diagnosed with HIV infection has increased over time. In the earliest cohort of HIV infection diagnoses (1987–1991), estimated survival at five years after HIV infection diagnosis was 48%, compared to 96% in the two most recent cohorts (2017–2021 and 2012–2016).
- After remaining relatively stable at approximately 700 diagnoses per year from 2012 to 2013 (two-year average = 701), then approximately 640 diagnoses per year from 2014 to 2018 (five-year average = 639), the number of new HIV infection diagnoses declined to 537 in 2019. The number of new HIV infection diagnoses further declined to 437 in 2020 and then remained relatively stable at 443 in 2021. However, caution should be used in the interpretation of this decline due to the impact of COVID-19 on access to HIV testing and care services, and case surveillance activities.
- Male-to-male sex (MSM) remained the predominant exposure mode among individuals diagnosed with HIV infection from 2012 to 2021. Those reported with no identified risk (NIR) comprised the second largest exposure mode group, accounting for 25% of recent HIV infection diagnoses and

¹ Please consider the impact of the COVID-19 pandemic on infectious disease screening, treatment, and surveillance in the interpretation of 2020 and 2021 data.

² Reported numbers among individuals of transgender experience are likely to be underestimates. Please note there may be underreporting or misreporting of gender due to the absence of appropriate collection of gender options (e.g., individuals who are nonbinary, and women and men of transgender experience, etc.).

³ Centers for Disease Control and Prevention. Sexually Transmitted Disease Surveillance 2020. Atlanta: U.S. Department of Health and Human Services; 2022. Please note, 2020 state rankings are presented because 2021 rankings were not yet available at the time of this publication.

⁴ HIV prevalence data are preliminary and subject to change.

KEY HIGHLIGHTS

consisting predominantly of individuals AMAB (65%), individuals born outside the US (63%), and individuals of black (non-Hispanic) (53%) and Hispanic/Latino (20%) ethnicity.

- The number of deaths due to any cause among individuals reported with HIV remained relatively stable from 2012 to 2021, with an average of 297 deaths per year (with a low of 276 in 2013 and a high of 323 in 2015).
- There were large disparities in age-adjusted HIV diagnosis rates by race/ethnicity: the average annual age-adjusted HIV diagnosis rates for 2019 to 2021 among black (non-Hispanic) individuals (30.2 per 100,000) and Hispanic/Latino individuals (13.8 per 100,000) were eight and four times that of white (non-Hispanic) individuals (3.7 per 100,000), respectively.
- After declining by 37% from 2012 (N=49) to 2014 (N=31), the number of reported cases with injection drug use (IDU) as the primary exposure mode peaked at 116 in 2017, then decreased to 58 in 2019. The increase was primarily associated with an outbreak among persons who inject drugs (PWID) in the northeast part of the state between 2016 and 2018.¹ Following an intensive and targeted public health response, the number of HIV infection diagnoses attributed to IDU in the northeast has decreased. However, in early 2019, a new cluster of HIV infection was identified in Boston among PWID who were experiencing or had experienced recent homelessness, and the total statewide number of reported cases with IDU as the primary exposure increased to 78 in 2021.² As of December 31, 2021, a total of 164 cases diagnosed since November 2018 have been investigated and identified as part of the Boston cluster. As it is an active cluster of concern, additional cases will continue to be investigated and added. Emerging trends among those newly diagnosed in the Boston cluster (N=65 cases diagnosed in 2021) include an increase in polysubstance and methamphetamine use.³

Hepatitis A, B, and C:

- Between 2018 and 2020, MDPH and local health departments investigated an outbreak of hepatitis A. The populations most affected by the outbreak were those with recent homelessness or unstable housing, and/or substance use disorder. Since spring of 2020, case counts have decreased to a pre-outbreak baseline, and very few cases have been reported among the populations most affected by the outbreak.
- From 2012 to 2021, an average of 1,755 cases of confirmed and probable chronic hepatitis B virus (HBV) infection were reported each year (with a low of 1,193 in 2020 and a high of 1,994 in 2017). Changes in testing behaviors and travel due to the COVID-19 pandemic likely influenced the number of reported cases and may contribute to the decrease in 2020, followed by the rebound in 2021.
- The total number of confirmed acute HBV cases reported has decreased between 2017 (52 cases) and 2021 (14 cases).
- In 2021, 4,297 confirmed and probable cases of Hepatitis C (HCV) were reported. Most reported cases are chronically infected and MDPH currently estimates that there are over 250,000 persons living with HCV infection in Massachusetts.
- There continued to be an increase of HCV cases reported among adolescents (age 15–19 years) and young adults (age 20–29 years), reflecting ongoing transmission among young people who inject drugs.

¹ For more information, see: Charles Alpren et al. "Opioid Use Fueling HIV Transmission in an Urban Setting: An Outbreak of HIV Infection Among People Who Inject Drugs—Massachusetts, 2015–2018", *American Journal of Public Health* 110, no. 1 (January 1, 2020): pp. 37-44. <https://doi.org/10.2105/AJPH.2019.305366>

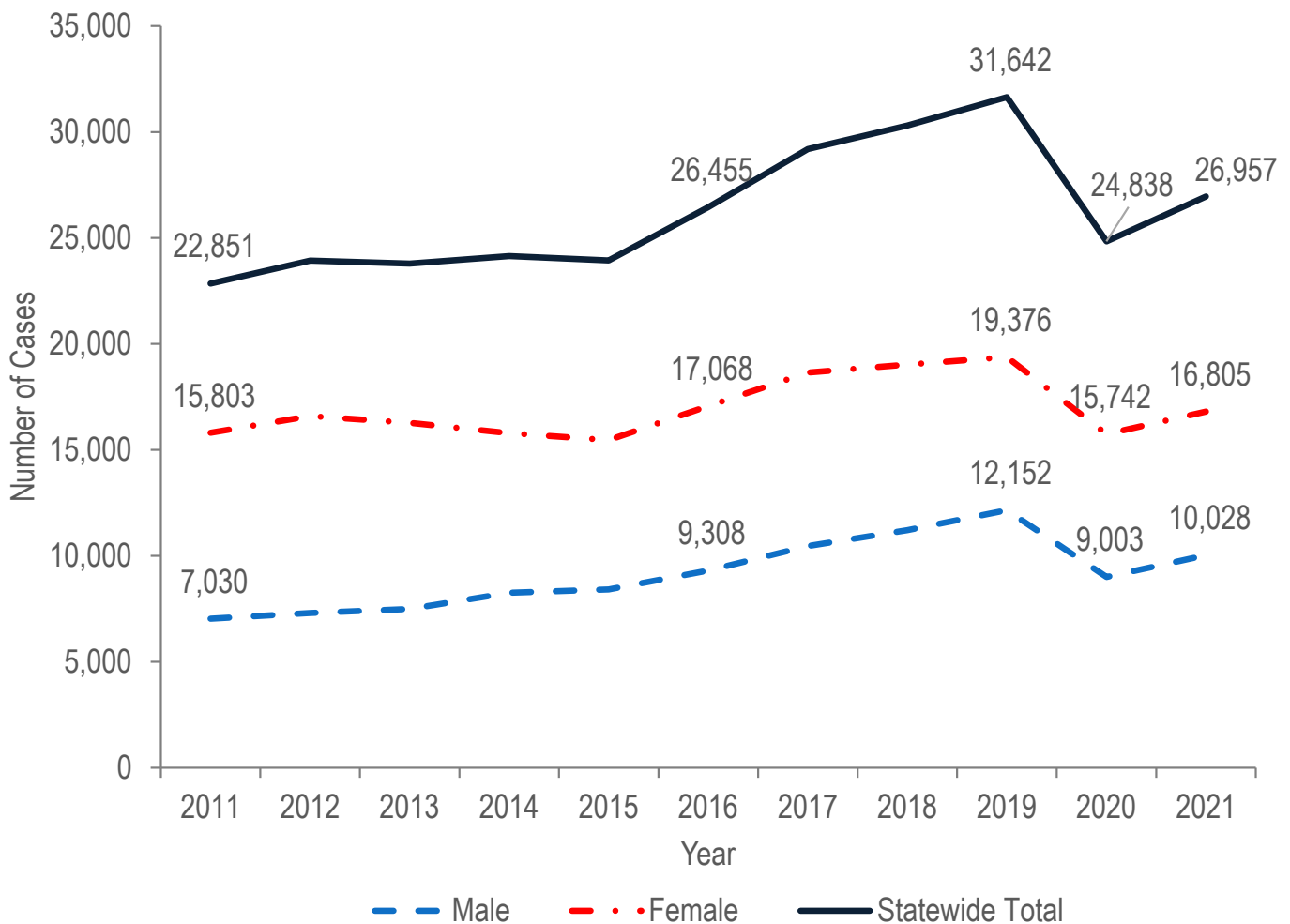
² Please consider the impact of the COVID-19 pandemic on infectious disease screening, treatment, and surveillance in the interpretation of 2020 and 2021 data.

³ For more information, see: Joint MDPH and BPHC Clinical Advisory: Increase in newly diagnosed HIV infections among persons who inject drugs in Boston, March 15, 2021, available at: <https://www.mass.gov/doc/joint-mdph-and-bphc-clinical-advisory-hiv-transmission-through-injection-drug-use-in-boston-march-15-2021/download>

CHLAMYDIA BY GENDER

Chlamydia is the most commonly reported infectious disease in Massachusetts and nationally. Chlamydia is a bacterial sexually transmitted infection (STI) that can infect all gender identities and sexual orientations. It can be spread through vaginal, anal, or oral sexual contact with an infected partner and from pregnant person to child during birth. While most people with chlamydia usually have no signs or symptoms, some may experience dysuria; vaginal, penile, or anal discharge; or irregular bleeding. Chlamydia infection is easily treated, but repeated infections are common. Women are at great risk of complications of repeated infections. For more information, see <https://www.cdc.gov/std/chlamydia/stdfact-chlamydia-detailed.htm>.

Figure 1. Number of laboratory-confirmed chlamydia cases reported by female and male gender, Massachusetts 2012–2021



Note: Cases reported as transgender or missing gender (2012–2021: N=804) are included in the statewide total but are not depicted in Figure 1 separately due to small numbers.

Data Source: Bureau of Infectious Disease and Laboratory Sciences, data are current as of 7/13/2022 and subject to change.

CHLAMYDIA BY GENDER

- The total number of reported chlamydia cases increased by 32% from 23,930 in 2012 to 31,642 in 2019, decreased to 24,838 in 2020, and then increased to 26,957 in 2021.¹ A decrease in reported chlamydia cases in 2020, followed by a rebound in 2021 was also observed nationally.² Case reporting could have been affected by a state of emergency that was declared in Massachusetts from March 10, 2020 until June 15, 2021 during which MDPH directed all hospitals and ambulatory surgical centers to postpone or cancel any nonessential elective procedures.³
- Each year from 2012 to 2021, approximately twice as many chlamydia cases were reported among females as among males. In 2021, the ratio of female-to-male chlamydia cases was 1.7 (1.7 = 16,805/10,028).
- In 2021, 49 chlamydia cases were reported among individuals of transgender experience. Please note reported numbers among individuals of transgender experience are likely to be underestimates as there may be underreporting or misreporting of gender due to the absence of appropriate collection of gender options (e.g., individuals who are nonbinary, and women and men of transgender experience, etc.)

¹ Please consider the impact of the COVID-19 pandemic on infectious disease screening, treatment, and surveillance in the interpretation of 2020 and 2021 data.

² CDC, Trends in Reported Cases and Rates of Reported Cases for Nationally Notifiable STDs, United States, 2017-2021*, available at

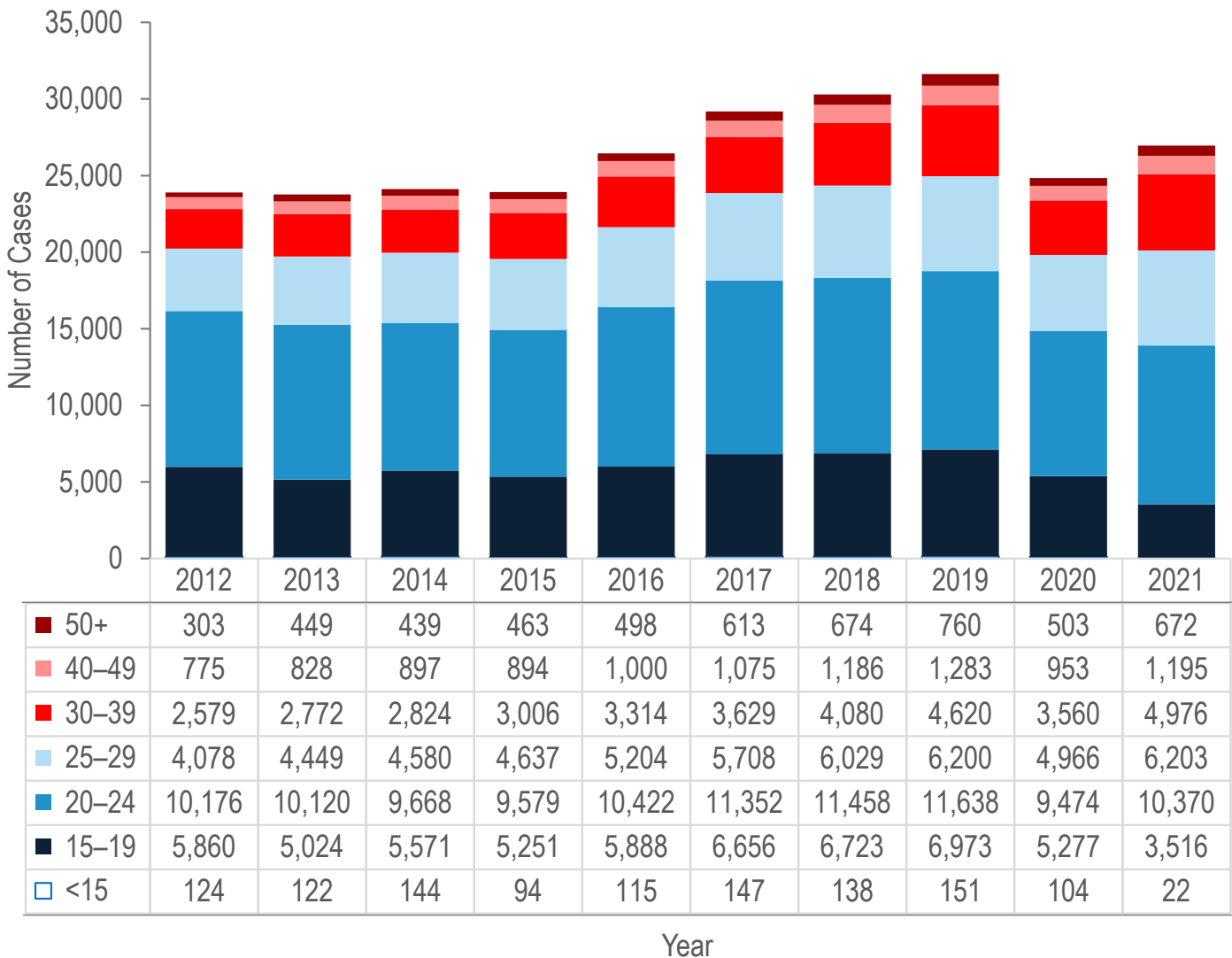
<https://www.cdc.gov/std/statistics/2021/default.htm>

Pagaoa, Melissa MPH; Grey, Jeremy PhD; Torrone, Elizabeth PhD; Kreisel, Kristen PhD; Stenger, Mark MA; Weinstock, Hillard MD Trends in Nationally Notifiable Sexually Transmitted Disease Case Reports During the US COVID-19 Pandemic, January to December 2020, Sexually Transmitted Diseases: October 2021 - Volume 48 - Issue 10 - p 798-804

³ For more information, see COVID-19 State of Emergency [https://www.mass.gov/info-details/covid-19-state-of-emergency#health-care-delivery-\(archive\)-](https://www.mass.gov/info-details/covid-19-state-of-emergency#health-care-delivery-(archive)-)

CHLAMYDIA BY AGE

Figure 2. Number of laboratory-confirmed chlamydia cases reported by age group (years), Massachusetts 2012–2021



Note: Cases with no age reported (2012–2021: N=170) are not included in this figure
 Data Source: Bureau of Infectious Disease and Laboratory Sciences, data are current as of 7/13/2022 and subject to change.

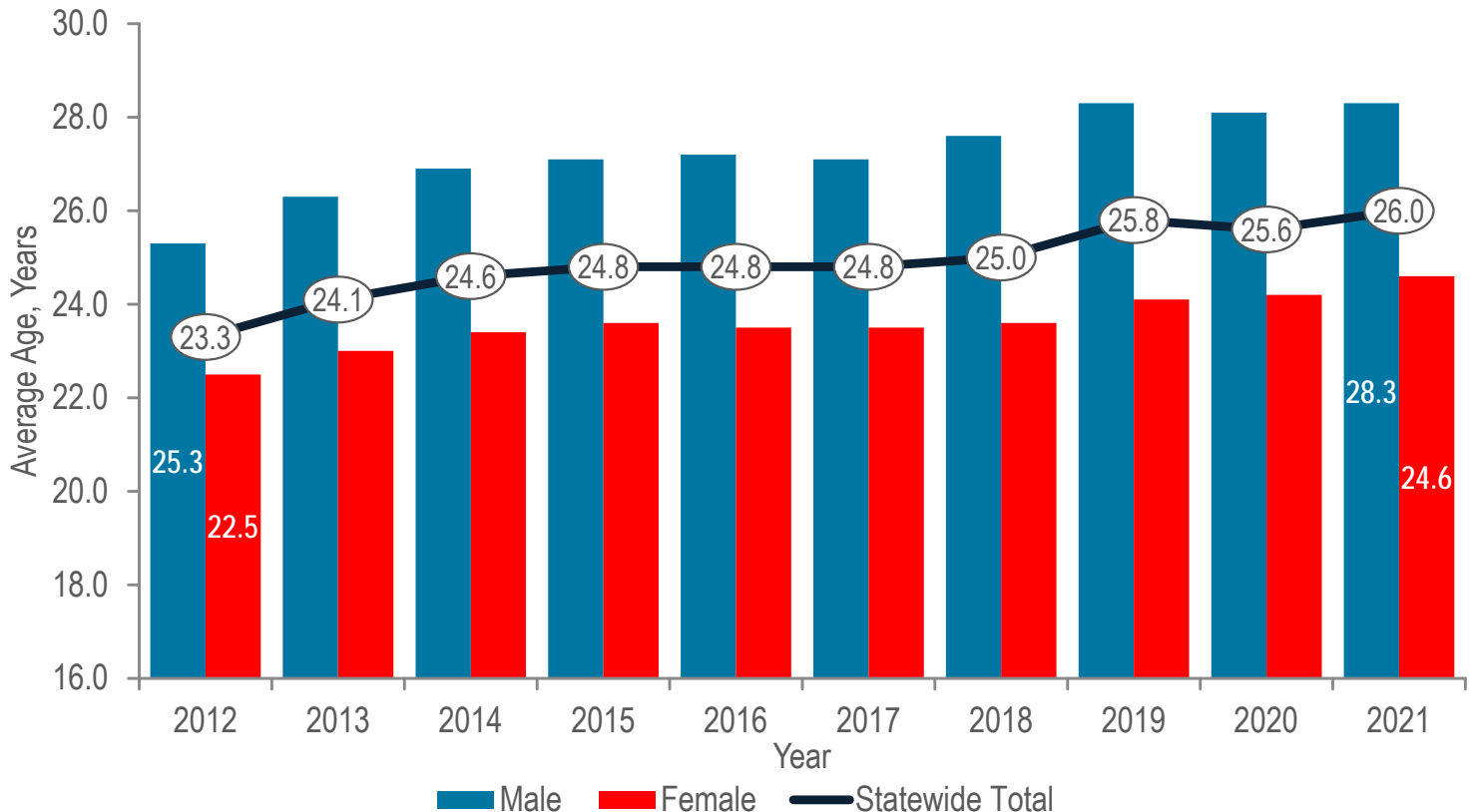
- Each year from 2012 to 2020, the greatest number of chlamydia cases was reported among 20–24 year-olds, followed by 15–19 year-olds. In 2021, the greatest number of chlamydia cases was still reported among 20–24 year-olds (N=10,370), but it was followed by 25–29 year-olds (N=6,203).¹
- The number of chlamydia cases reported among 15–19 year-olds decreased by 33% from 2020 to 2021. Because a similar decrease was not seen in older age groups, this decrease should be interpreted with caution due to the decrease in routine care and STD screening experienced during the COVID-19 pandemic. In April of 2020, CDC made recommendations to defer routine screening visits until after the emergency response was over in order to minimize reductions in STD care and treatment.²

¹ Please consider the impact of the COVID-19 pandemic on infectious disease screening, treatment, and surveillance in the interpretation of 2020 and 2021 data.
² For more information, see STD Treatment Options | 2020 | Dear Colleague Letters | NCHHSTP | CDC. Published April 6, 2020. Accessed November 11, 2022.
https://www.cdc.gov/nchhstp/dear_colleague/2020/dcl-040620-std-treatment-options.html

CHLAMYDIA BY AVERAGE AGE AND GENDER

In 2021, the United States Preventive Services Task Force and the CDC recommended screening for chlamydia in sexually active women aged 24 years and younger, and in older women at increased risk for infection.¹ Screening of sexually active young men is also recommended in higher prevalence clinical settings such as adolescent clinics, correctional facilities, and STD clinics, and among men who have sex with men.²

Figure 3. Average age of laboratory-confirmed chlamydia cases reported by female and male gender, Massachusetts 2012–2021



Note: Cases with no age reported (2012–2021: N=170) are not included in this analysis and cases reported as transgender or missing gender (2012–2021: N=804) are included in the statewide total but not presented separately due to small numbers.

Data Source: Bureau of Infectious Disease and Laboratory Sciences, data are current as of 7/13/2022 and subject to change

- The overall average age of laboratory-confirmed chlamydia cases in Massachusetts increased from 23.3 years in 2012 to 26.0 years in 2021.³
- The overall increase in average age appeared to be driven mostly by male chlamydia cases. From 2012 to 2021, the proportion of chlamydia cases among males increased from 31% to 37% (See Figure 1, page 4). Additionally, the increase in average age of chlamydia cases reported among males was greater than the increase among females. From 2012 to 2021, the average age of chlamydia cases reported among males increased by 3.0 years compared to an increase of 2.1 years among females.

¹ Source: *Final Recommendation Statement: Chlamydia and Gonorrhea: Screening*. U.S. Preventive Services Task Force. September 2021.

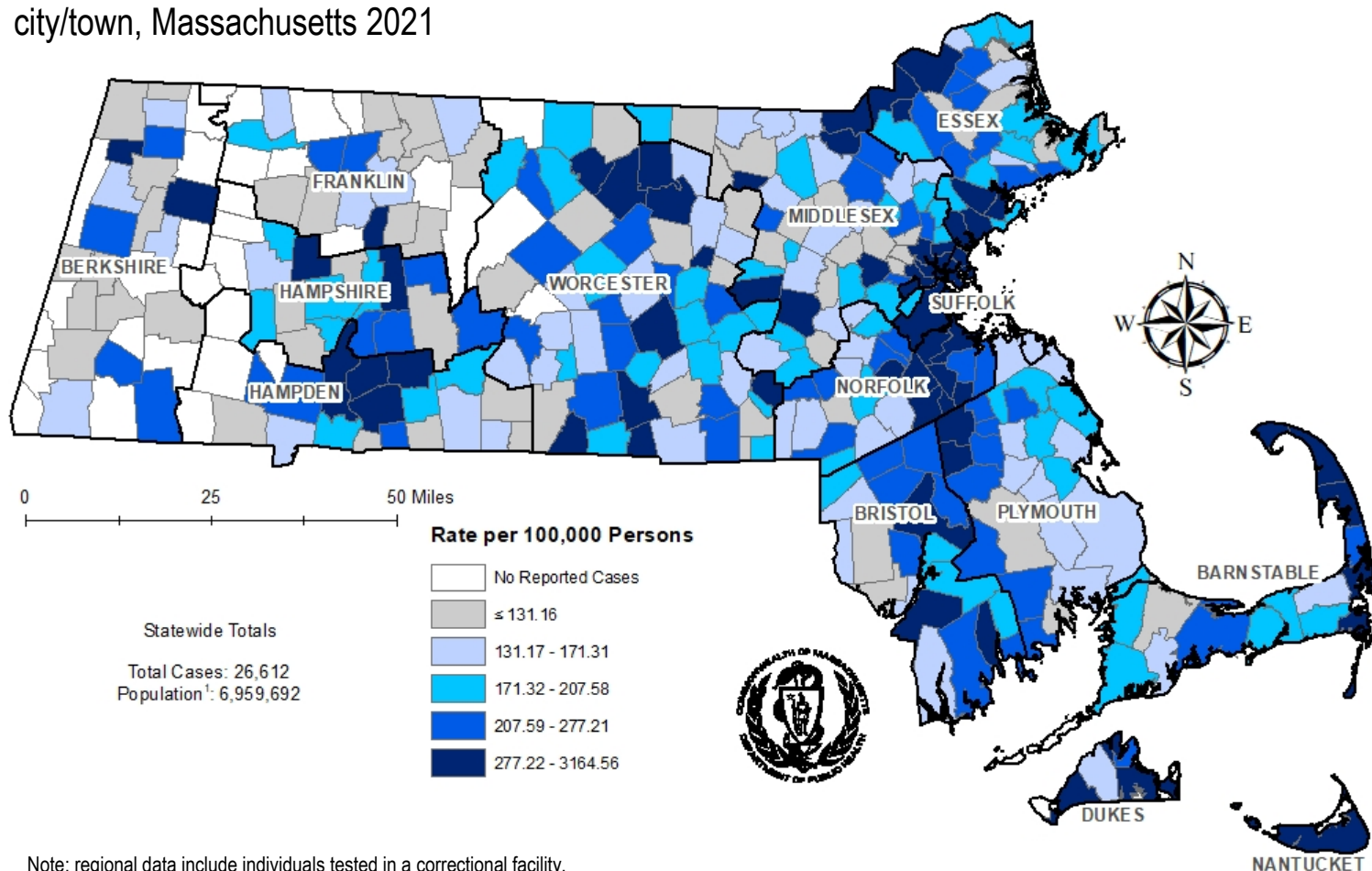
<https://www.uspreventiveservicestaskforce.org/uspstf/recommendation/chlamydia-and-gonorrhea-screening#fullrecommendationstart>

² For more information, see MDPH Chlamydia Screening Advisory (2022) <https://www.mass.gov/doc/chlamydia-screening-advisory-2022/download>

³ Please consider the impact of the COVID-19 pandemic on infectious disease screening, treatment, and surveillance in the interpretation of 2020 and 2021 data.

CHLAMYDIA BY CITY/TOWN

Figure 4. Incidence rate of confirmed chlamydia cases per 100,000 population¹ reported by city/town, Massachusetts 2021



Note: regional data include individuals tested in a correctional facility.

Data Source: Bureau of Infectious Disease and Laboratory Sciences, data are current as of 7/13/2022 and subject to change

- In 2021,² the statewide chlamydia incidence rate of 383.5 per 100,000 population was lower than the preliminary national rate of 490.6 per 100,000.³
 - Massachusetts ranked the tenth lowest in chlamydia incidence rate among the 50 states in 2020.⁴
- Chlamydia cases continue to be reported throughout Massachusetts, with concentrations in the most populated cities.
- The five cities⁵ with the highest chlamydia incidence rates in 2021 were Provincetown (2,210.7 per 100,000),⁶ Brockton (1,081.9 per 100,000), Lawrence (1,080.3 per 100,000), Springfield (942.1 per 100,000), and Chelsea (921.9 per 100,000).

¹ As of 1/1/2020, BIDLS calculates rates per 100,000 population using denominators estimated by the University of Massachusetts Donahue Institute: UMDI Interim 2020 Population Estimates by Age, Sex, Race, and Municipality, UMass Donahue Institute Population Estimates Program, March 1, 2022; Note that rates and trends calculated using previous methods cannot be compared to these. All rates are age-adjusted using the 2000 US standard population.

² Please consider the impact of the COVID-19 pandemic on infectious disease screening, treatment, and surveillance in the interpretation of 2020 and 2021 data.

³ Centers for Disease Control and Prevention, Trends in Reported Cases and Rates of Reported Cases for Nationally Notifiable STDs, United States, 2017-2021*, available at <https://www.cdc.gov/std/statistics/2021/default.htm>

⁴ Centers for Disease Control and Prevention. *Sexually Transmitted Disease Surveillance 2020* Atlanta: U.S. Department of Health and Human Services; 2022. Please note, 2020 state rankings are presented because 2021 rankings were not yet available at the time of this publication.

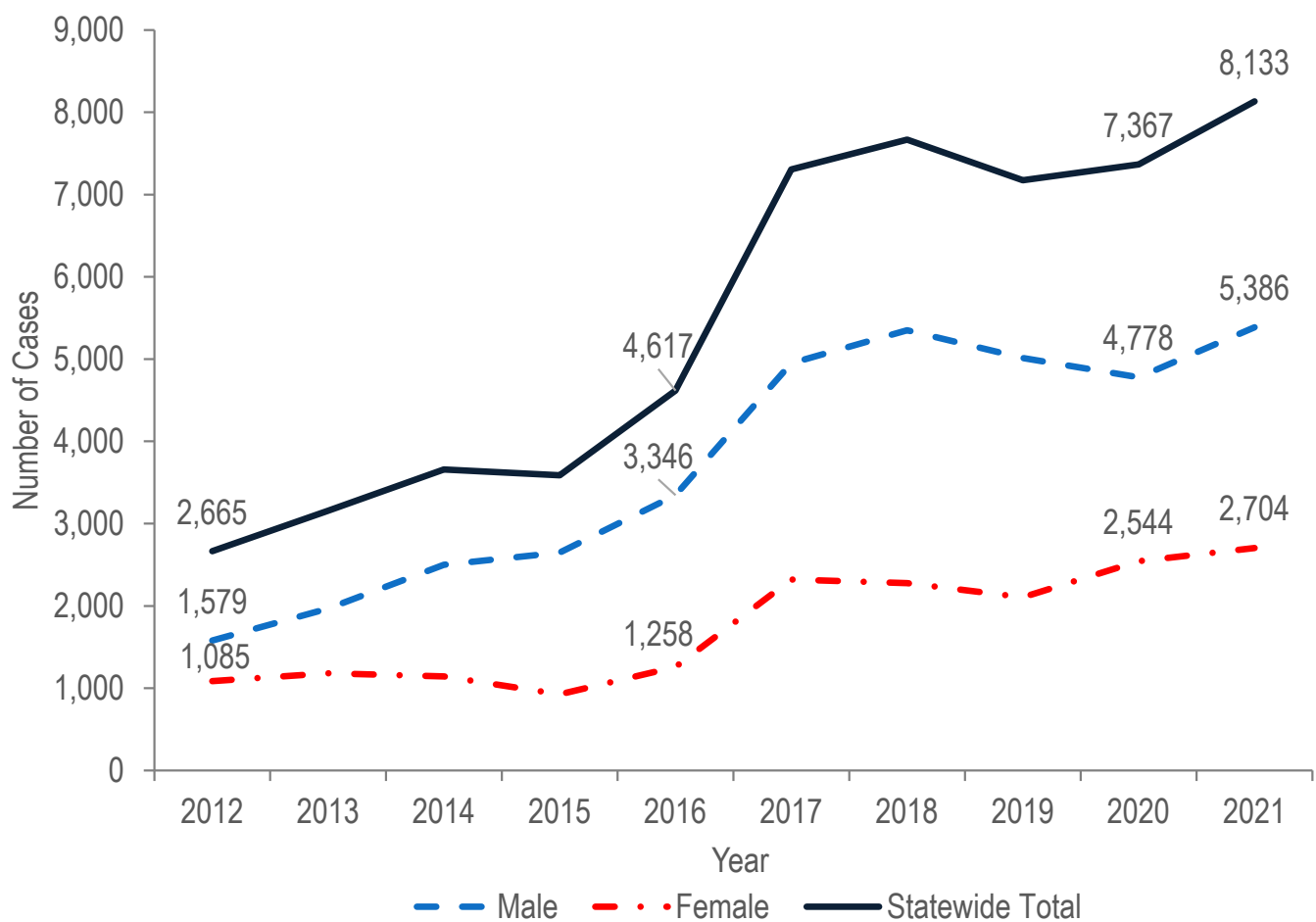
⁵ Among cities that reported at least 12 confirmed chlamydia cases in 2021.

⁶ The chlamydia incidence rate for Provincetown is high because of small population size (2,583), as opposed to the number of cases (81).

GONORRHEA BY GENDER

Gonorrhea is a common bacterial STI. It can be spread through vaginal, anal, or oral sexual contact with an infected partner or to an infant during birth. Symptoms of gonococcal infection can vary depending on the site of infection and may include dysuria; vaginal, penile, or anal discharge; irregular bleeding; abdominal or anal pain; and sore throat. Still, many infected individuals do not present with any symptoms of infection. Although gonorrhea infection is treatable, treatment has become more complex with increased antimicrobial resistance. At the time of publication, ceftriaxone-resistant gonorrhea has not been reported in Massachusetts. For more information, see <https://www.cdc.gov/std/gonorrhea/stdfact-gonorrhea-detailed.htm>

Figure 5. Number of laboratory-confirmed gonorrhea cases reported by female and male gender, Massachusetts 2012–2021



Note: Cases reported as transgender or missing gender (2012–2021: N=262) are included in the statewide total but are not depicted in Figure 5 separately due to small numbers.

Data Source: Bureau of Infectious Disease and Laboratory Sciences, data are current as of 7/13/2022 and subject to change

- After a sharp 58% increase from 2016 (N=4,617) to 2017 (N=7,307), gonorrhea incidence remained relatively stable through 2020, and then increased 10% in 2021 (N=8,133).¹

¹ Please consider the impact of the COVID-19 pandemic on infectious disease screening, treatment, and surveillance in the interpretation of 2020 and 2021 data.

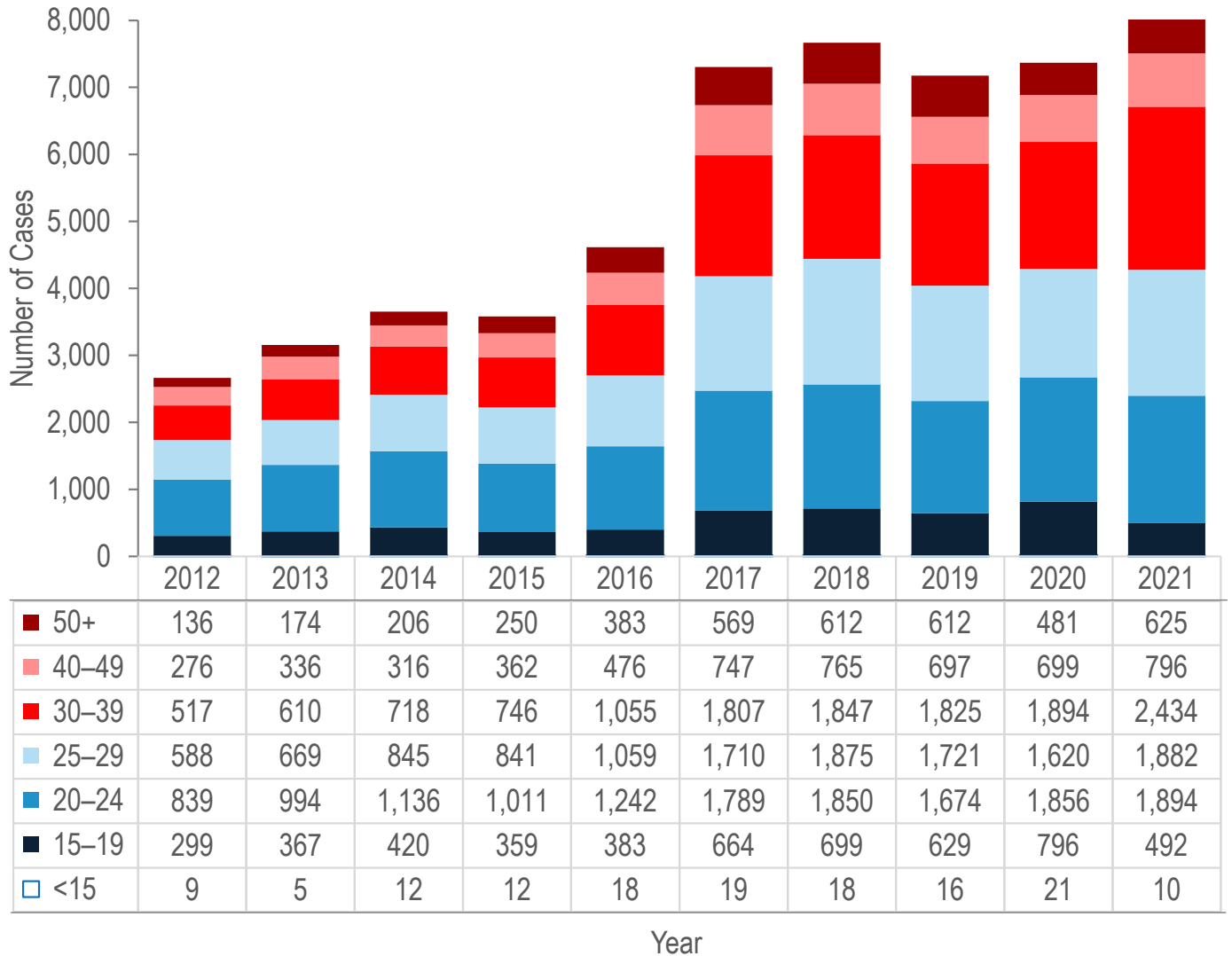
GONORRHEA BY GENDER

- Between 2012 and 2021,¹ the number of gonorrhea cases reported among males increased by 3.4 times (from 1,579 to 5,386, respectively). The number of gonorrhea cases among males in 2021 was nearly double the number among females (2,704).
- The number of gonorrhea cases reported among females increased by 2.5 times from 1,085 in 2012 to 2,704 in 2021.
- In 2021, 39 gonorrhea cases were reported among individuals of transgender experience. Please note reported numbers among individuals of transgender experience are likely to be underestimates as there may be underreporting or misreporting of gender due to the absence of appropriate collection of gender options (e.g., individuals who are nonbinary, and women and men of transgender experience, etc.)

¹ Please consider the impact of the COVID-19 pandemic on infectious disease screening, treatment, and surveillance in the interpretation of 2020 and 2021 data.

GONORRHEA BY AGE

Figure 6. Number of laboratory-confirmed gonorrhea cases reported by age group (years), Massachusetts 2012–2021



Note: Cases missing age (2012–2021: N=17) are not included in this figure

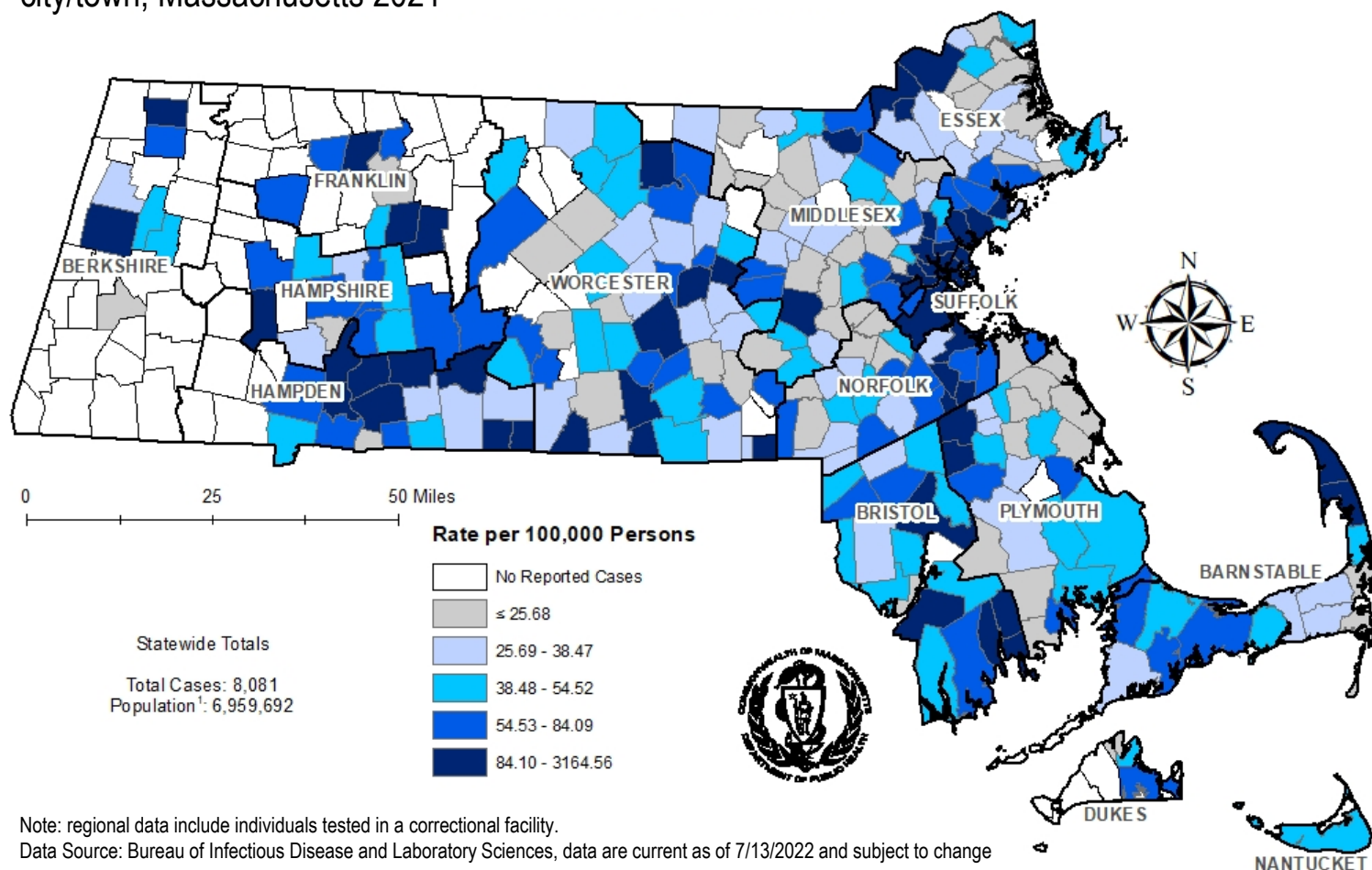
Data Source: Bureau of Infectious Disease and Laboratory Sciences, data are current as of 7/13/2022 and subject to change

- Each year from 2012 to 2021,¹ about half of gonorrhea cases were reported among individuals aged 20–24 or 25–29 years.
- From 2012 to 2021, the largest increases in the number of reported gonorrhea cases were among individuals aged 30–39 years (more than quadrupled from 517 to 2,434), and individuals aged 50 years and above (more than quadrupled from 136 to 625).

¹ Please consider the impact of the COVID-19 pandemic on infectious disease screening, treatment, and surveillance in the interpretation of 2020 and 2021 data.

GONORRHEA BY CITY/TOWN

Figure 7. Incidence rate of confirmed gonorrhea cases per 100,000 population¹ reported by city/town, Massachusetts 2021



Note: regional data include individuals tested in a correctional facility.

Data Source: Bureau of Infectious Disease and Laboratory Sciences, data are current as of 7/13/2022 and subject to change

- In 2021,² the statewide gonorrhea incidence rate of 115.7 per 100,000 population was lower than the preliminary national rate of 209.9 per 100,000.³
 - Massachusetts ranked the ninth lowest in gonorrhea incidence rate among the 50 states in 2020.⁴
- Gonorrhea cases continued to be clustered in the most populated cities in Massachusetts in 2021.
- The five cities⁵ with the highest gonorrhea incidence rates in 2021 were Provincetown (2,210.7 per 100,000),⁶ Springfield (402.7 per 100,000), Holyoke (340.0 per 100,000), Brockton (311.4 per 100,000), and Boston (305.9 per 100,000).

¹ As of 1/1/2020, BIDLS calculates rates per 100,000 population using denominators estimated by the University of Massachusetts Donahue Institute: UMDI Interim 2020 Population Estimates by Age, Sex, Race, and Municipality, UMass Donahue Institute Population Estimates Program, March 1, 2022; Note that rates and trends calculated using previous methods cannot be compared to these. All rates are age-adjusted using the 2000 US standard population.

² Please consider the impact of the COVID-19 pandemic on infectious disease screening, treatment, and surveillance in the interpretation of 2020 and 2021 data.

³ Centers for Disease Control and Prevention, Trends in Reported Cases and Rates of Reported Cases for Nationally Notifiable STDs, United States, 2017-2021*, available at <https://www.cdc.gov/std/statistics/2021/default.htm>

⁴ Centers for Disease Control and Prevention. *Sexually Transmitted Disease Surveillance 2020*. Atlanta: U.S. Department of Health and Human Services; 2022. Please note, 2020 state rankings are presented because 2021 rankings were not yet available at the time of this publication.

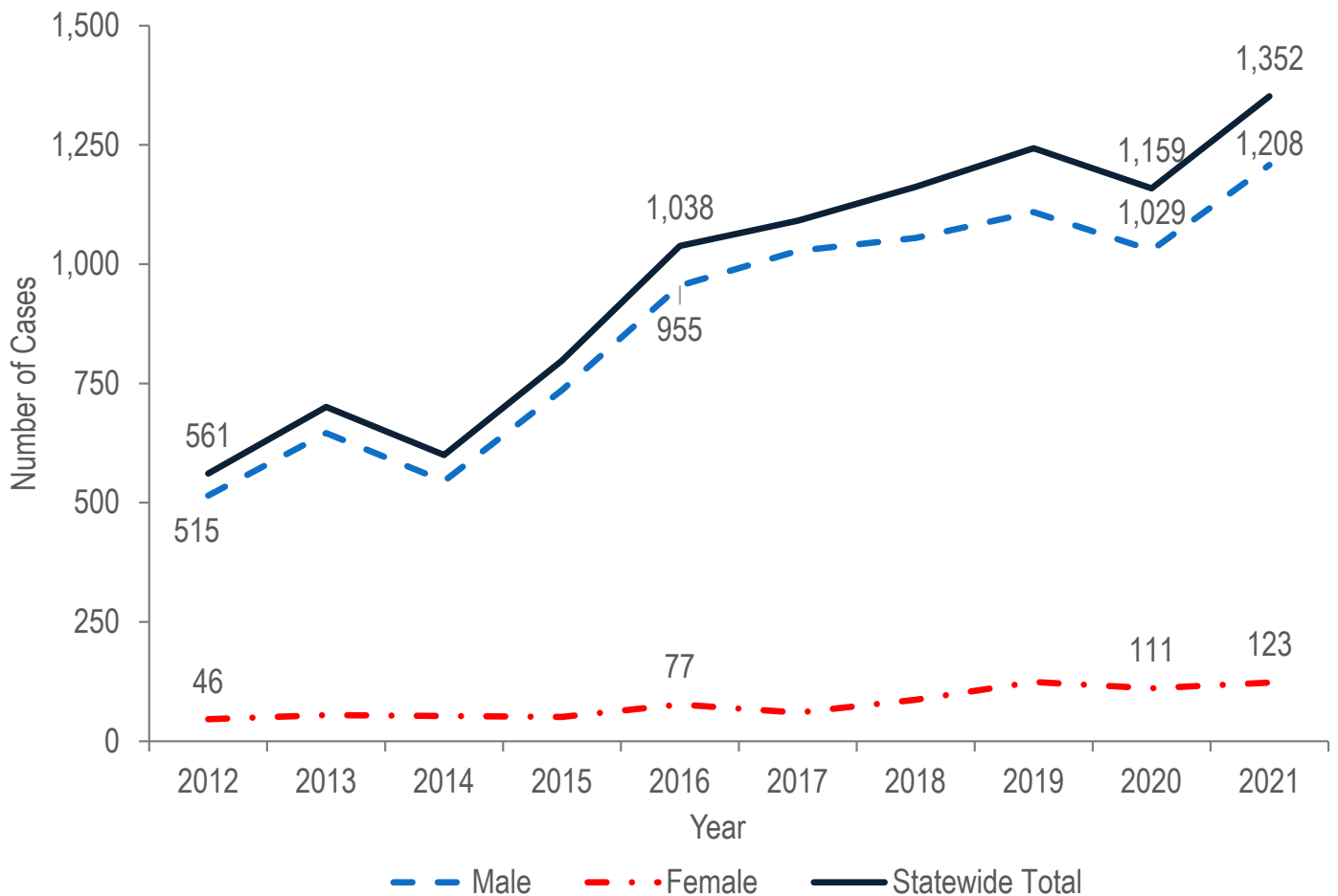
⁵ Among cities that reported at least 12 confirmed gonorrhea cases in 2021.

⁶ The gonorrhea incidence rate for Provincetown is high because of small population size (2583), as opposed to the number of cases (81).

SYPHILIS BY GENDER

Syphilis is a sexually transmitted infection that can be spread through sexual contact with an infected person. The first symptom of syphilis infection is a sore or chancre at the site of inoculation that is usually firm, round, and painless. The most recognized symptom of the second stage of infection is a body rash which can be present on the palms of hands and soles of feet. As with primary syphilis symptoms, secondary symptoms also resolve with or without treatment. After the secondary stage of syphilis, untreated infected individuals enter a time of latent syphilis that can last for years. Individuals with syphilis are thought to be most infectious for the first year after acquisition. Syphilis infection can also be transmitted to an infant during pregnancy and birth. Syphilis transmission to an unborn baby is a serious complication of syphilis infection among pregnant individuals. In 2019, 2020, and 2021 the annual number of probable cases of congenital syphilis diagnosed in Massachusetts reached nine, ten, and nine, respectively, after remaining between zero and four from 2011 to 2018. Syphilis is treatable and it is possible to be re-infected with repeated exposure. For more information see <https://www.cdc.gov/std/syphilis/stdfact-syphilis-detailed.htm>

Figure 8. Number of confirmed and probable infectious syphilis cases reported by female and male gender, Massachusetts 2012–2021



Note: Cases reported as transgender or missing gender (2012–2021: N=92) are included in the statewide total but are not depicted in Figure 8 separately due to small numbers. Data Source: Bureau of Infectious Disease and Laboratory Sciences, data are current as of 7/13/2022 and subject to change

SYPHILIS BY GENDER

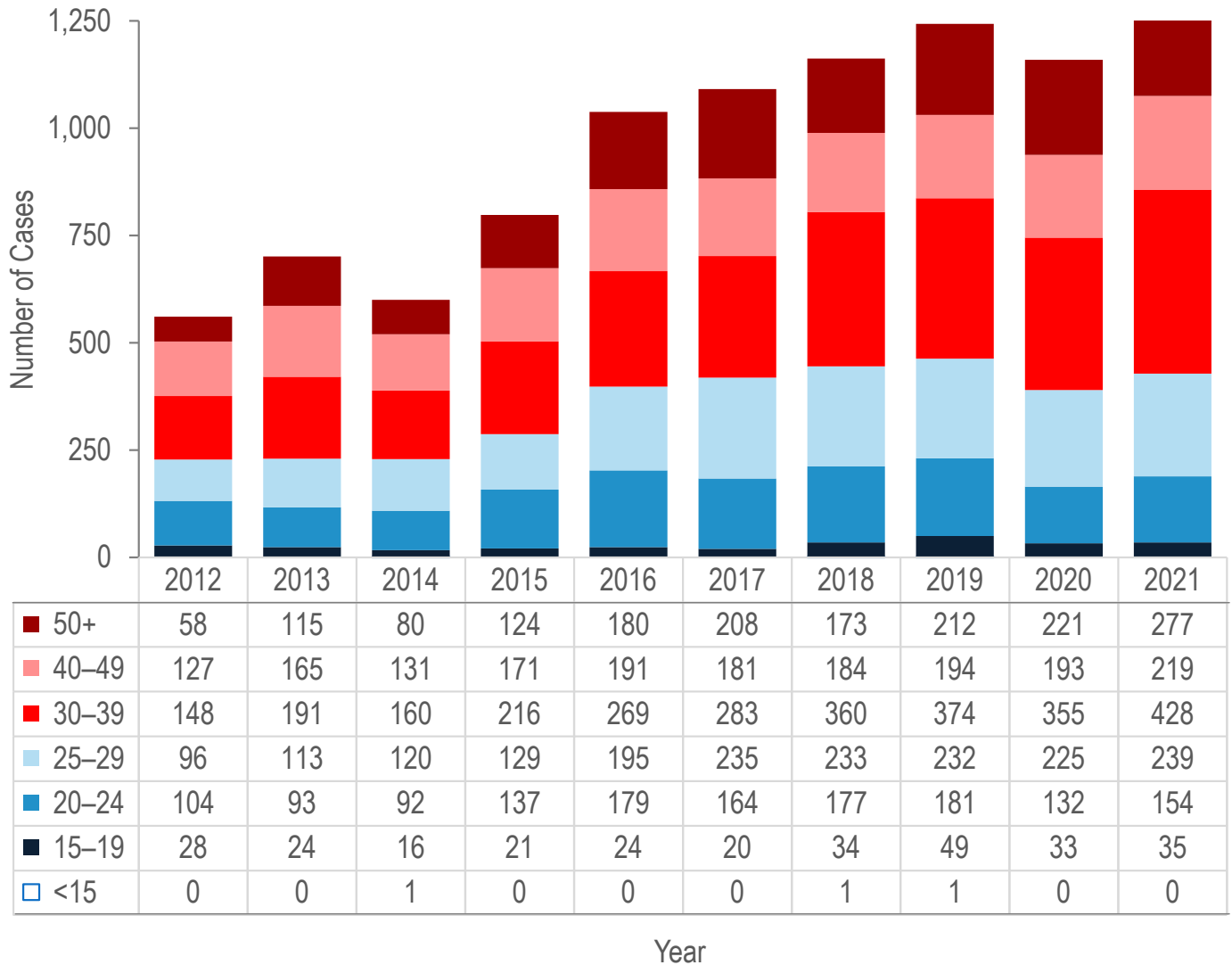
- The total number of infectious syphilis cases¹ increased to a ten-year high of 1,243 in 2019, decreased slightly to 1,159 in 2020, and then increased to a new high of 1,352 in 2021.² In 2021, the new ten-year high was observed among males (N=1,208). However, among females the number of cases in 2021 (N=123) was one fewer than the ten-year high reached in 2019 (N=124).
- The total number of reported confirmed and probable infectious syphilis cases increased by 2.4 times from 2012 (N=561) to 2021 (N=1,352). In the most recent five years from 2017 to 2021 the number of cases increased by 24% (from 1,091 to 1,352).
- Between 2012 and 2021, the proportion of syphilis cases among males remained between 89% and 94% each year. In 2021, there were nearly ten times as many syphilis cases reported among males (N=1,208) as among females (N=123).
- In 2021, 21 syphilis cases were reported among individuals of transgender experience. Please note reported numbers among individuals of transgender experience are likely to be underestimates as there may be underreporting or misreporting of gender due to the absence of appropriate collection of gender options (e.g., individuals who are nonbinary, and women and men of transgender experience, etc.).

¹ Infectious syphilis includes diagnoses made in the primary, secondary, and early non-primary non-secondary stages of infection (latent asymptomatic syphilis where infection occurred in the past 12 months).

² Please consider the impact of the COVID-19 pandemic on infectious disease screening, treatment, and surveillance in the interpretation of 2020 and 2021 data.

SYPHILIS BY AGE

Figure 9. Number of confirmed and probable infectious syphilis¹ cases reported by age group (years), Massachusetts 2012–2021



Note: All syphilis cases from 2012 to 2021 were reported with age, none were excluded from this figure

Data Source: Bureau of Infectious Disease and Laboratory Sciences, data are current as of 7/13/2022 and subject to change

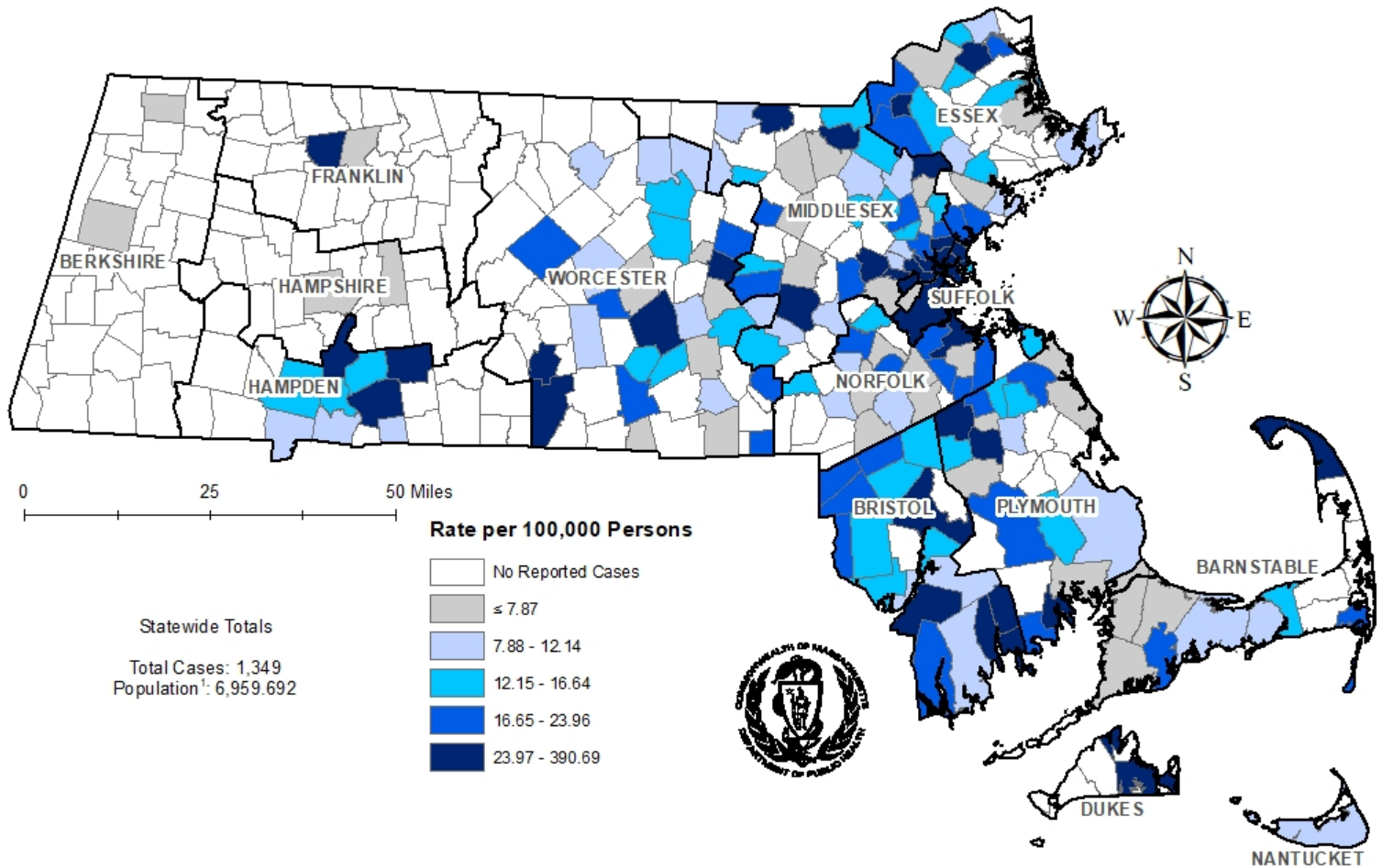
- From 2012 to 2021,² the largest increase in the number of reported confirmed and probable infectious syphilis cases was among individuals aged 50 years and above (more than quadrupled from 58 to 277).
- The largest number of reported confirmed and probable infectious syphilis cases was among 30–39 year-olds for the past decade.

¹ Infectious syphilis includes diagnoses made in the primary, secondary, and early non-primary non-secondary stages of infection (latent asymptomatic syphilis where infection occurred in the past 12 months).

² Please consider the impact of the COVID-19 pandemic on infectious disease screening, treatment, and surveillance in the interpretation of 2020 and 2021 data.

SYPHILIS BY CITY/TOWN

Figure 10. Incidence rate of confirmed and probable infectious syphilis¹ cases per 100,000 population² reported by city/town, Massachusetts, 2021



Note: regional data include individuals tested in a correctional facility.

Data Source: Bureau of Infectious Disease and Laboratory Sciences, data are current as of 7/13/2022 and subject to change

- The statewide infectious syphilis incidence rate increased over the past ten years to 17.7 per 100,000 in 2019, decreased to 16.6 per 100,000 in 2020, and then increased to a ten-year high of 19.2 in 2021.³
 - Massachusetts ranked 28th in primary and secondary syphilis incidence rate among the 50 states in 2020.⁴
- The five cities⁵ with the highest infectious syphilis incidence rates were Boston (51.5 per 100,000), Watertown (45.3 per 100,000), Malden (45.3 per 100,000), Everett (42.8 per 100,000), and Chelsea (41.7 per 100,000).

¹ Infectious syphilis includes diagnoses made in the primary, secondary, and early non-primary non-secondary stages of infection (latent asymptomatic syphilis where infection occurred in the past 12 months).

² As of 1/1/2020, BIDLs calculates rates per 100,000 population using denominators estimated by the University of Massachusetts Donahue Institute: UMDI Interim 2020 Population Estimates by Age, Sex, Race, and Municipality, UMass Donahue Institute Population Estimates Program, March 1, 2022; Note that rates and trends calculated using previous methods cannot be compared to these. All rates are age-adjusted using the 2000 US standard population.

³ Please consider the impact of the COVID-19 pandemic on infectious disease screening, treatment, and surveillance in the interpretation of 2020 and 2021 data.

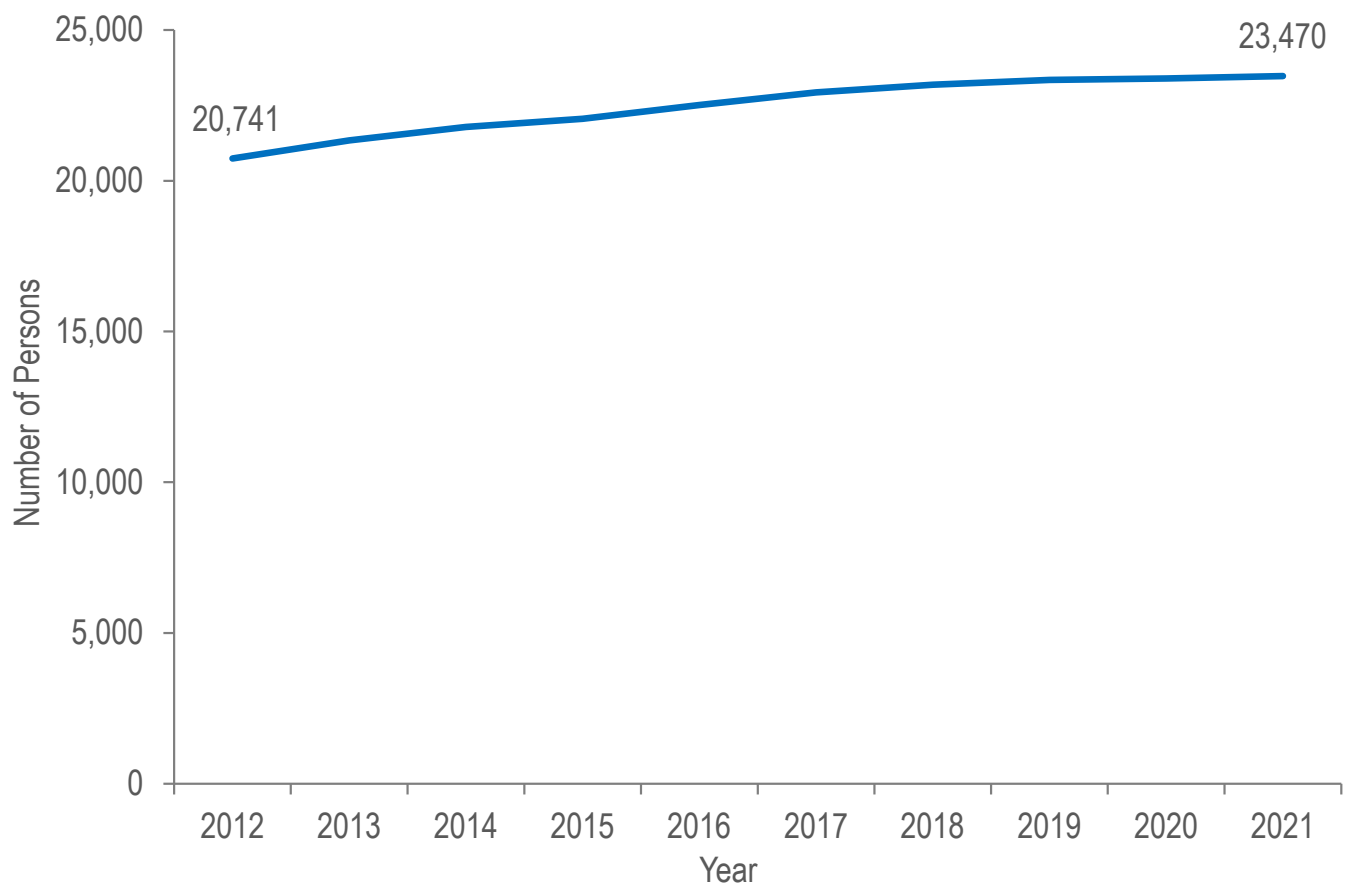
⁴ Centers for Disease Control and Prevention. Sexually Transmitted Disease Surveillance 2020. Atlanta: U.S. Department of Health and Human Services; 2022. Please note, 2020 state rankings are presented because 2021 rankings were not yet available at the time of this publication.

⁵ Among cities that reported at least 12 confirmed syphilis cases in 2021.

HIV PREVALENCE

Human immunodeficiency virus (HIV) is transmitted through exposure to blood, semen, vaginal secretions, or breast milk, most commonly through unprotected sex or through sharing injection drug equipment. HIV attacks the body's immune system, specifically the CD4 cells. Without treatment, HIV can destroy so many of these cells that the body can't fight off infections and can lead to acquired immunodeficiency syndrome (AIDS). But with proper medical care, HIV can be controlled. People with HIV who get effective HIV treatment can live long, healthy lives and protect their partners by reducing the risk for HIV transmission.¹

Figure 11. Number of persons living with HIV infection, Massachusetts 2012–2021



Data Source: Bureau of Infectious Disease and Laboratory Sciences, data are current as of 7/1/2022 and subject to change

- The number of persons living with HIV infection (PLWH) in Massachusetts increased by 13% from 20,741 at the end of 2012 to 23,470 at the end of 2021.^{2,3}

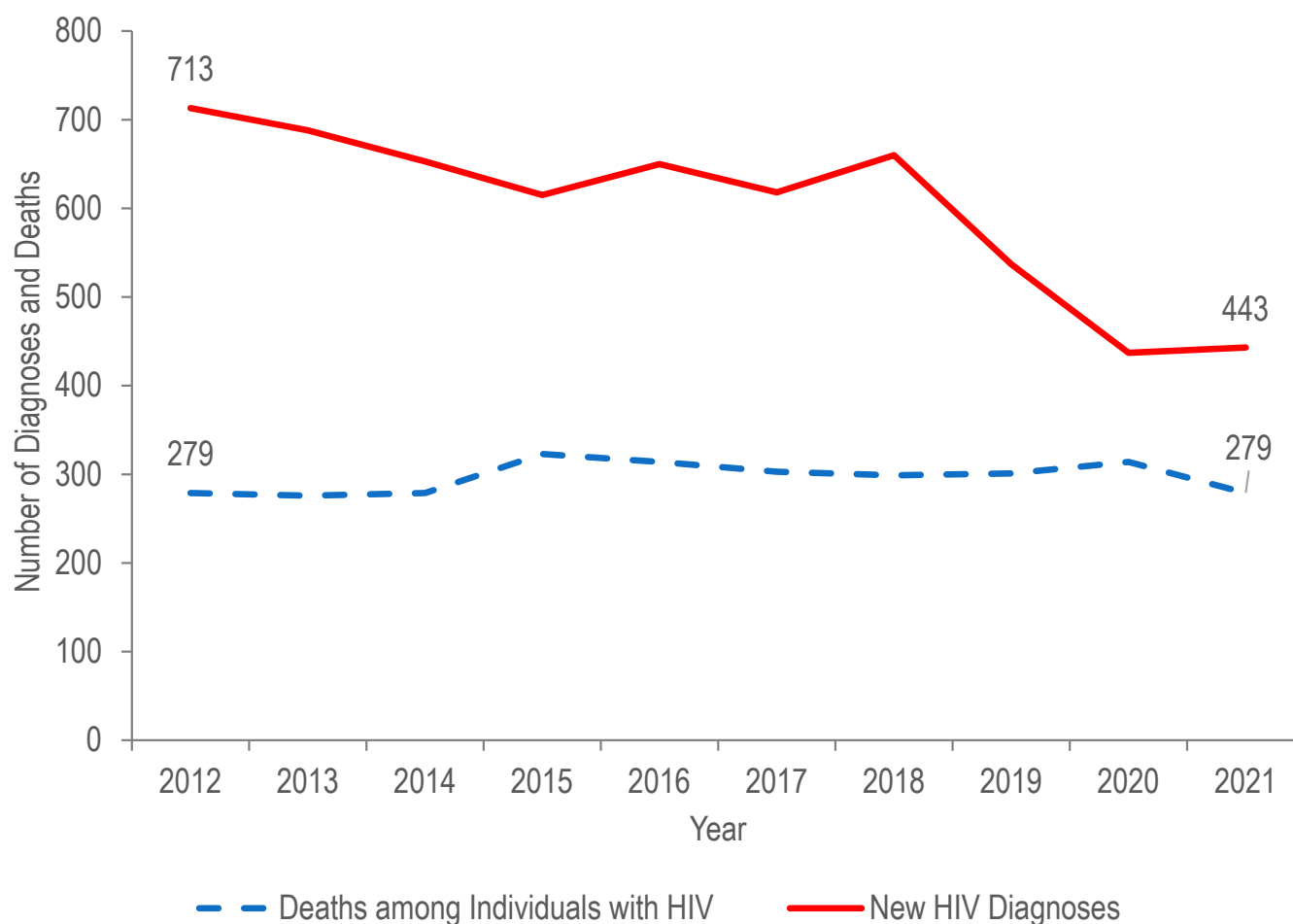
¹ For more information, see Centers for Disease Control and Prevention. *Diagnose and Treat to Save Lives: Decreasing Deaths Among People with HIV*. Atlanta: U.S. Department of Health and Human Services; 2020, available at: <https://www.cdc.gov/hiv/statistics/deaths/index.html>

² Please consider the impact of the COVID-19 pandemic on infectious disease screening, treatment, and surveillance in the interpretation of 2020 and 2021 data.

³ 2021 HIV prevalence data are preliminary and subject to change.

DIAGNOSES AND DEATHS FROM ANY CAUSE AMONG PERSONS REPORTED WITH HIV

Figure 12. Number of HIV infection diagnoses and deaths from any cause among persons with HIV, Massachusetts 2012–2021



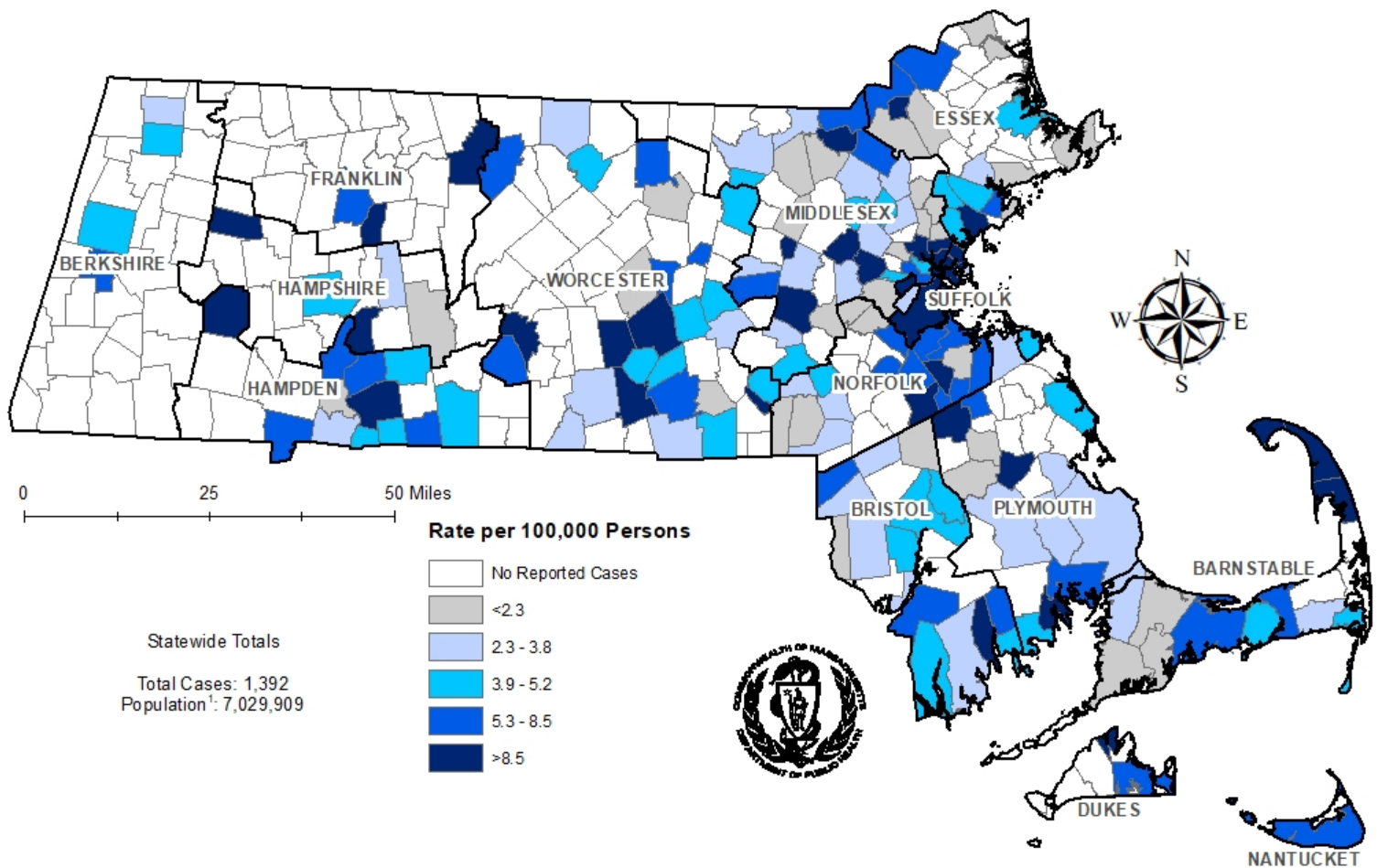
Data Source: Bureau of Infectious Disease and Laboratory Sciences, data are current as of 7/1/2022 and subject to change

- After remaining relatively stable at approximately 700 diagnoses per year from 2012 to 2013 (two-year average = 701), then approximately 640 diagnoses per year from 2014 to 2018 (five-year average = 639), the number of new HIV infection diagnoses declined to 537 in 2019. The number of new HIV infection diagnoses further declined to 437 in 2020 and then remained relatively stable at 443 in 2021.¹ However, caution should be used in the interpretation of this decline due to the impact of COVID-19 on access to HIV testing and care services, and case surveillance activities.
- The number of deaths due to any cause among individuals reported with HIV remained relatively stable from 2012 to 2021, with an average of 297 deaths per year (with a low of 276 in 2013 and a high of 323 in 2015).

¹Please consider the impact of the COVID-19 pandemic on infectious disease screening, treatment, and surveillance in the interpretation of 2020 and 2021 data.

HIV BY CITY/TOWN

Figure 13. Average annual rate of HIV diagnosis per 100,000 population¹ by city/town, Massachusetts 2019–2021



Note: regional HIV data exclude individuals diagnosed in a correctional facility.

Data Source: Bureau of Infectious Disease and Laboratory Sciences, data are current as of 7/1/2022 and subject to change

- The cities and towns² with the highest average annual rate of HIV infection diagnosis during 2019 to 2021³ included Everett (20.4 per 100,000), Brockton (18.3), Boston (17.1), Lawrence (15.3), and Malden (14.6).
- Boston had the highest number of new HIV infection diagnoses from 2019–2021 (N=347), followed by Worcester (N=83).

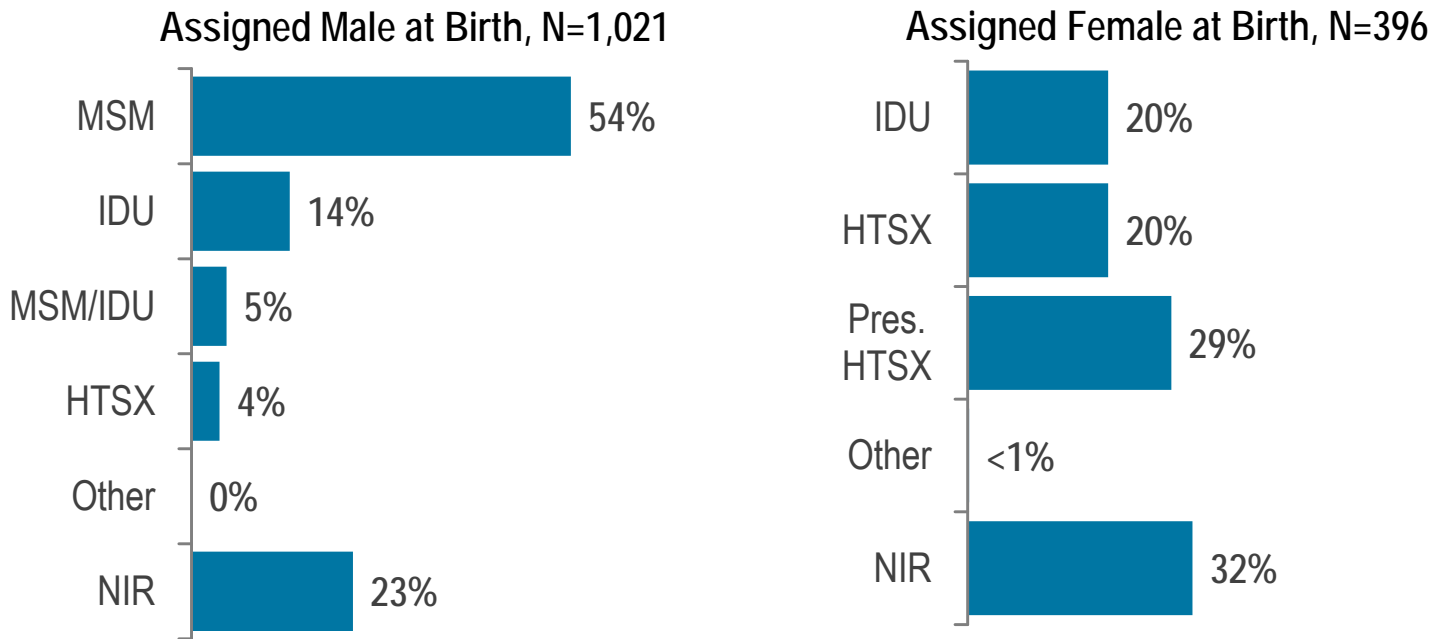
¹ As of 1/1/2020, BIDLS calculates rates per 100,000 population using denominators estimated by the University of Massachusetts Donahue Institute using a modified Hamilton-Perry model. Note that rates and trends calculated using previous methods cannot be compared to these. All rates are age-adjusted using the 2000 US standard population.

² Among cities that reported at least 12 HIV infections during 2019–2021. City/town is based on residence at HIV infection diagnosis and excludes individuals diagnosed in a correctional facility.

³ Please consider the impact of the COVID-19 pandemic on infectious disease screening, treatment, and surveillance in the interpretation of 2020 and 2021 data.

HIV BY EXPOSURE MODE AND SEX ASSIGNED AT BIRTH¹

Figure 14. Percentage of HIV infection diagnoses by sex assigned at birth and exposure mode, Massachusetts 2019–2021



Data Source: Bureau of Infectious Disease and Laboratory Sciences, data are current as of 7/1/2022 and subject to change

- From 2019 to 2021,² of the 1,417 HIV infections newly diagnosed in Massachusetts, 1,021 (72%) were among individuals assigned male at birth (AMAB) and 396 (28%) were among individuals assigned female at birth (AFAB). Among the 1,417 HIV infections, 14 (1%) were among individuals of transgender experience,³ and 1,403 (99%) were among cisgender individuals.⁴
- From 2019 to 2021, the most frequently reported known exposure mode among individuals AMAB was male-to-male sex (54%) and among individuals AFAB was presumed heterosexual sex (29%). A substantial proportion of diagnoses among both individuals AMAB and AFAB were reported with no identified risk (23% and 32%, respectively).
- Among individuals AMAB, the proportion of HIV infection diagnoses with injection drug use (IDU) exposure mode increased from a ten-year low of 4% (N=19/488) in 2014 to 17% (N=76/457) in 2017, decreased to 9% (N=34/396) in 2019, and then increased to 17% in 2021 (N=52/309).
- Among individuals AFAB, the proportion of HIV infection diagnoses with IDU exposure mode increased from a ten-year low of 7% (N=12/165) in 2014 to 25% (N=40/161) in 2017, decreased to 17% (N=24/141) in 2019, increased to 23% in 2020 (N=28/121), and then decreased to 19% (N=26/134) in 2021.

¹ Data reflect sex assigned at birth and therefore not gender identity or gender expression of transgender individuals.

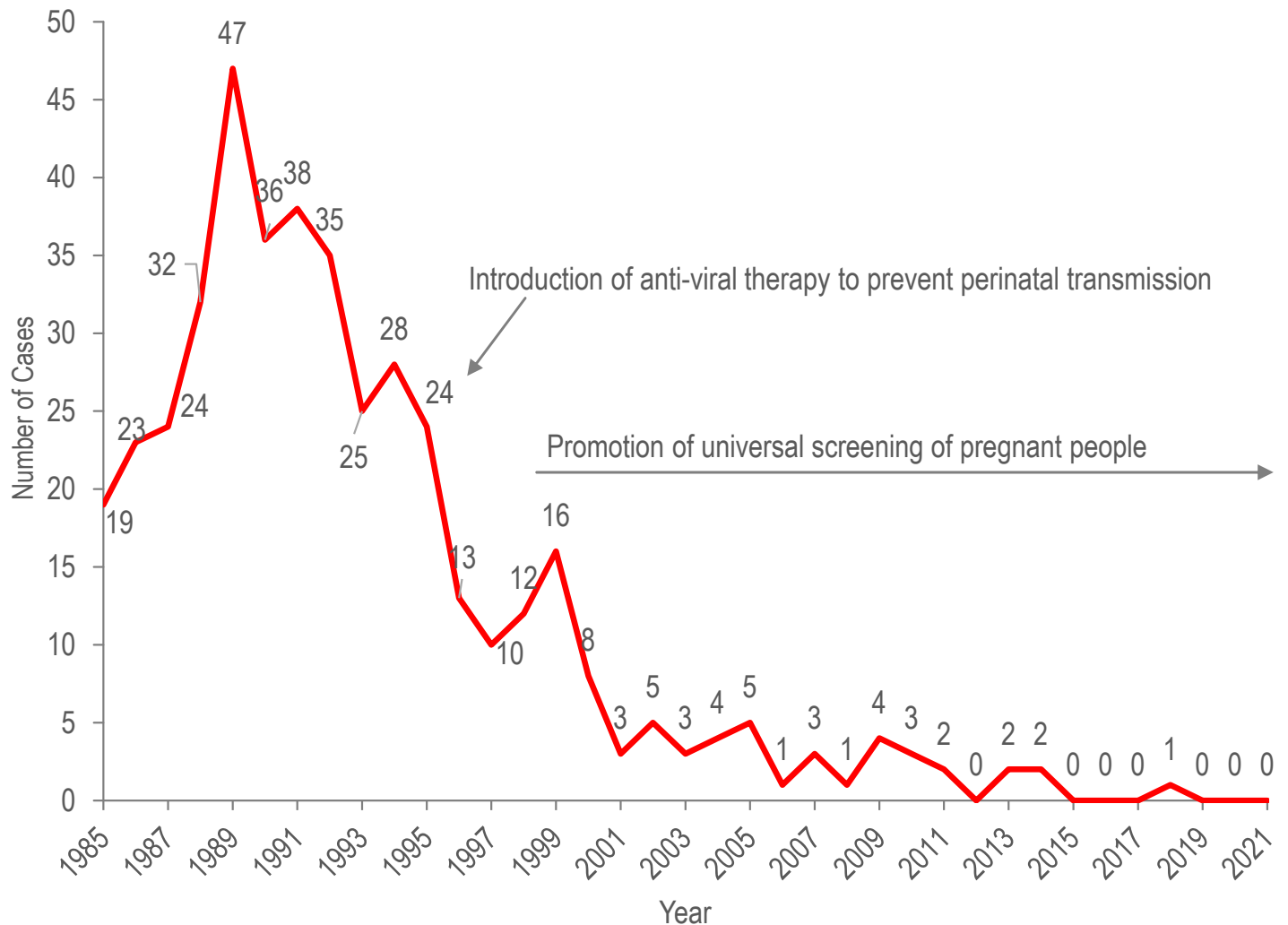
² Please consider the impact of the COVID-19 pandemic on infectious disease screening, treatment, and surveillance in the interpretation of 2020 and 2021 data.

³ Please note reported numbers among individuals of transgender experience are likely to be underestimates as there may be underreporting or misreporting of gender due to the absence of appropriate collection of gender options (e.g., individuals who are nonbinary, and women and men of transgender experience, etc.)

⁴ Persons whose current gender identity corresponds with their sex assigned at birth.

PERINATAL TRANSMISSION OF HIV

Figure 15. Number of reported cases of perinatal transmission of HIV infection, by year of birth, Massachusetts 1985–2021



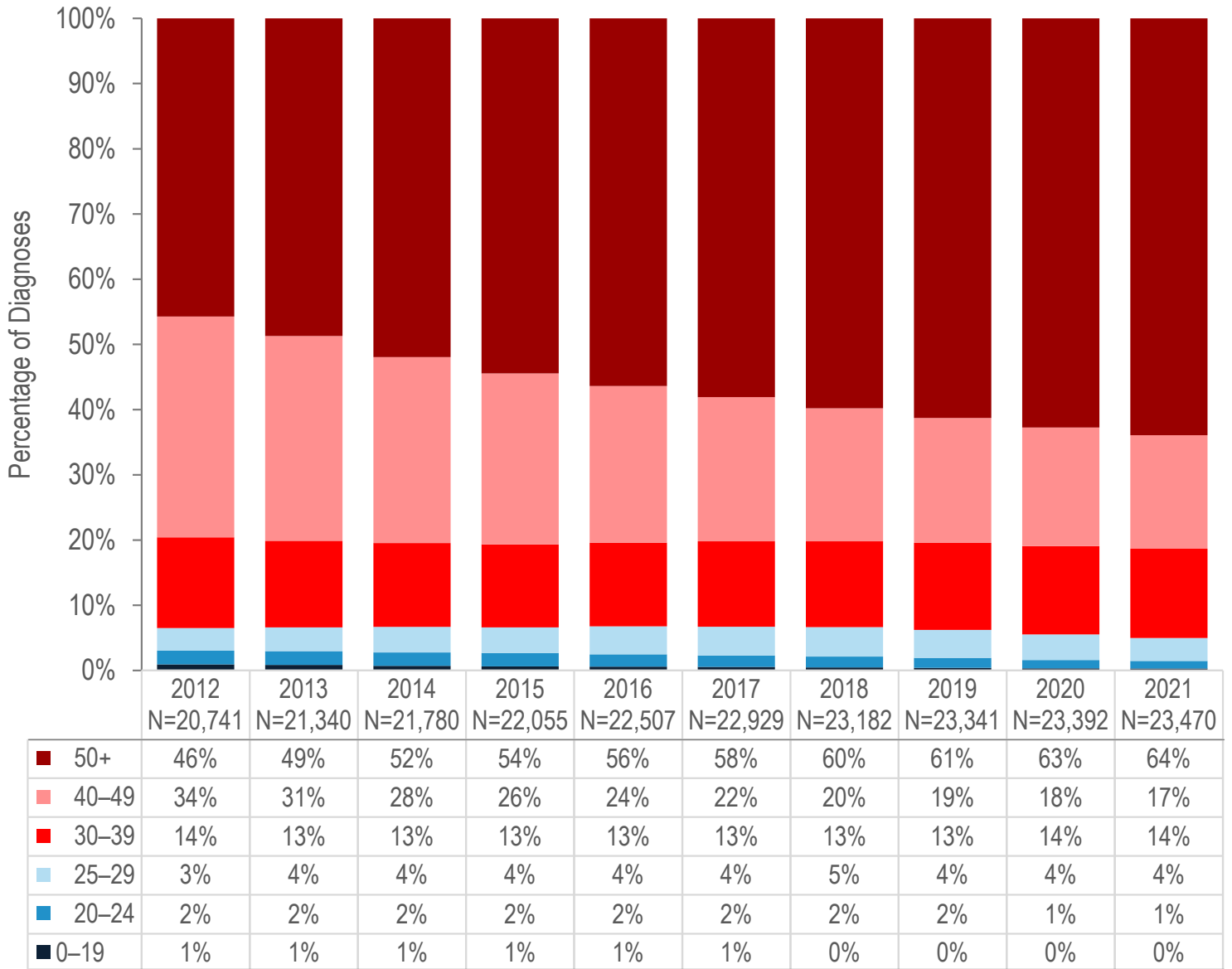
Data Source: Bureau of Infectious Disease and Laboratory Sciences, data are current as of 7/1/2022 and subject to change

- Since the mid-1990's, there has been a dramatic reduction in perinatal transmission of HIV infection related to high rates of antiretroviral treatment of HIV positive people and promotion of HIV screening during pregnancy.
- There was only one case identified in the past seven years (in 2018).¹

¹ Please consider the impact of the COVID-19 pandemic on infectious disease screening, treatment, and surveillance in the interpretation of 2020 and 2021 data.

AGE AMONG PERSONS LIVING WITH HIV INFECTION

Figure 16. Percentage distribution of individuals living with HIV infection by age on December 31, Massachusetts 2012–2021



Data Source: Bureau of Infectious Disease and Laboratory Sciences, data are current as of 7/1/2022 and subject to change

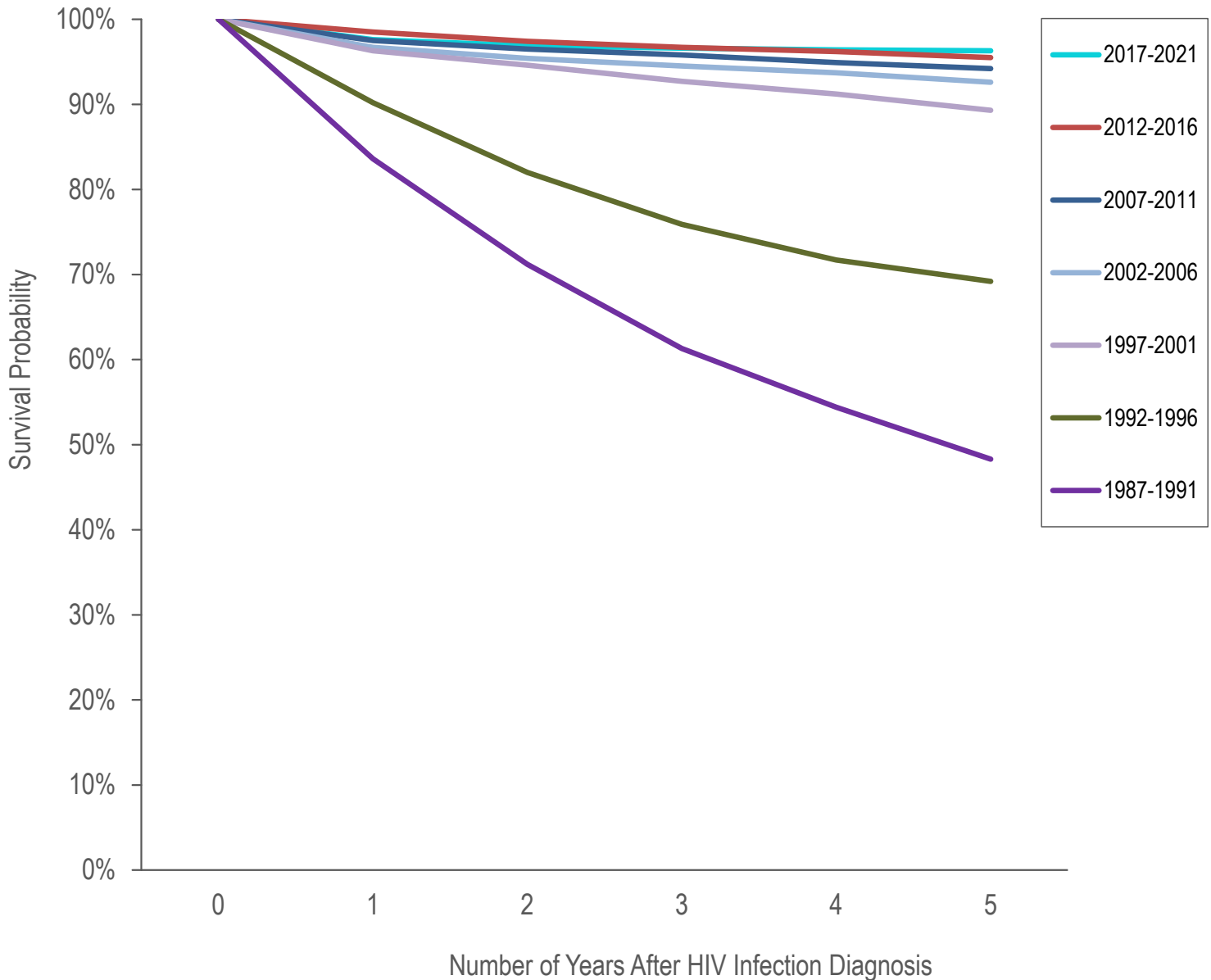
- Because of effective HIV treatment, people diagnosed with HIV infection are living longer, healthier lives. The proportion of people living with HIV infection who were aged 50 years or older increased from 46% on December 31, 2012 to 64% on December 31, 2021.^{1,2}

¹ Please consider the impact of the COVID-19 pandemic on infectious disease screening, treatment, and surveillance in the interpretation of 2020 and 2021 data.

² 2021 HIV prevalence data are preliminary and subject to change.

SURVIVAL AMONG INDIVIDUALS DIAGNOSED WITH HIV

Figure 17. Five-year survival among with individuals with HIV infection by year of diagnosis, Massachusetts 1987–2021 (Total number of HIV diagnoses from 1987–2021, N=35,888)



Data Source: Bureau of Infectious Disease and Laboratory Sciences, data are current as of 7/1/2022 and subject to change

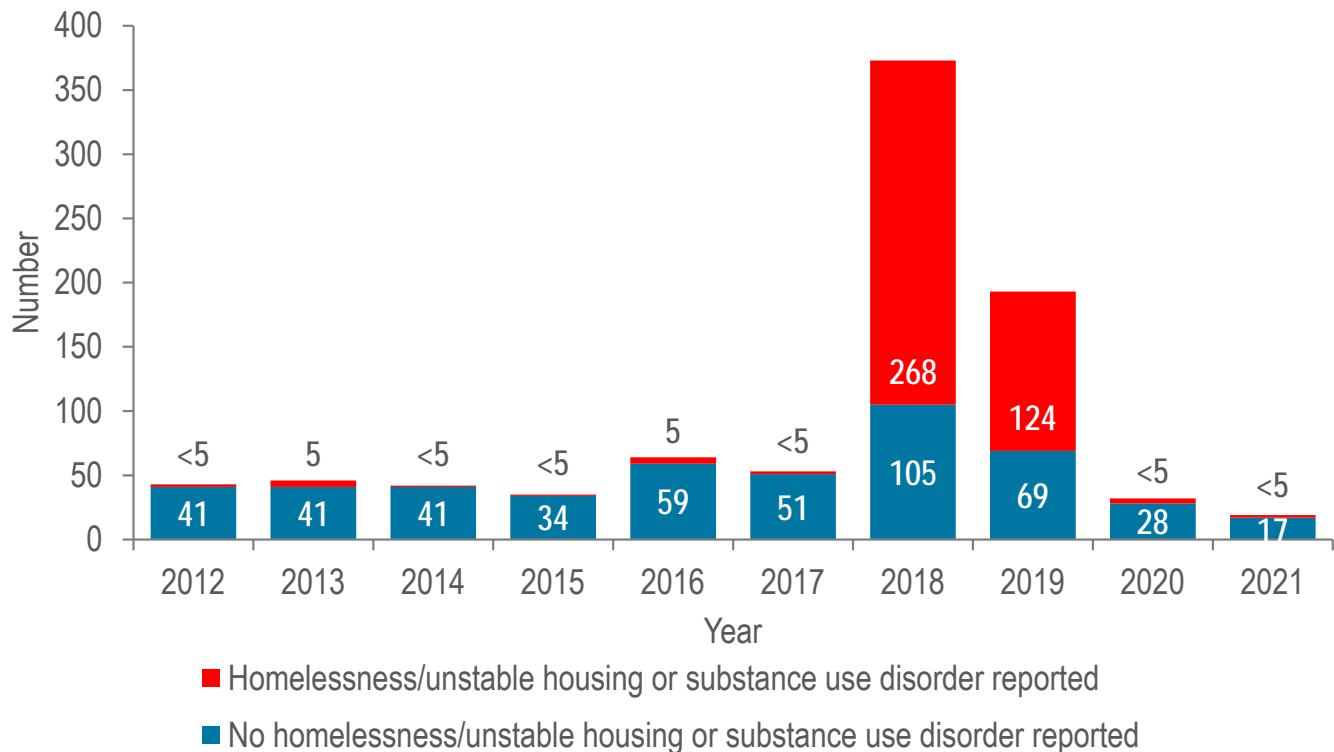
- Survival of individuals diagnosed with HIV infection has increased over time. In the earliest cohort of HIV infection diagnoses (1987–1991), estimated survival at five years after HIV infection diagnosis was 48%, compared to 96% in the two most recent cohorts (2017–2021 and 2012–2016).¹

¹ Please consider the impact of the COVID-19 pandemic on infectious disease screening, treatment, and surveillance in the interpretation of 2020 and 2021 data.

VIRAL HEPATITIS - HEPATITIS A

Hepatitis A is a vaccine-preventable, viral liver disease that can cause mild to severe illness. It is usually transmitted person-to-person through the fecal-oral route or through consumption of contaminated food or water. Hepatitis A is a self-limited disease that does not result in chronic infection.

Figure 18. Number of hepatitis A cases reported by year, housing status, and presence of substance use disorder, Massachusetts 2012–2021



Data Source: Bureau of Infectious Disease and Laboratory Sciences, data are current as of 7/20/2022 and subject to change

- Between 2018 and 2020, the Massachusetts Department of Public Health (MDPH) and local health departments investigated an outbreak of hepatitis A. The populations most affected by the outbreak were those with recent homelessness or unstable housing, and/or substance use disorder, accounting for 72% (N=268/373) and 64% (N=124/193) of reported cases in 2018 and 2019, respectively. MDPH partnered with clinical and community-based providers to implement a hepatitis A (HAV) vaccination response by deploying mobile vaccination providers to shelters, correctional facilities, harm reduction programs, and outreach venues. Since spring of 2020, case counts have decreased to a pre-outbreak baseline, and very few cases have been reported among the populations most affected by the outbreak. Less than five cases were reported among individuals with homelessness/unstable housing or substance use disorder in 2020 or 2021.¹ MDPH encourages continued vaccination of vulnerable populations in accordance with recommendations from the Advisory Committee on Immunization Practices.²

¹ Please consider the impact of the COVID-19 pandemic on infectious disease screening, treatment, and surveillance in the interpretation of 2020 and 2021 data.

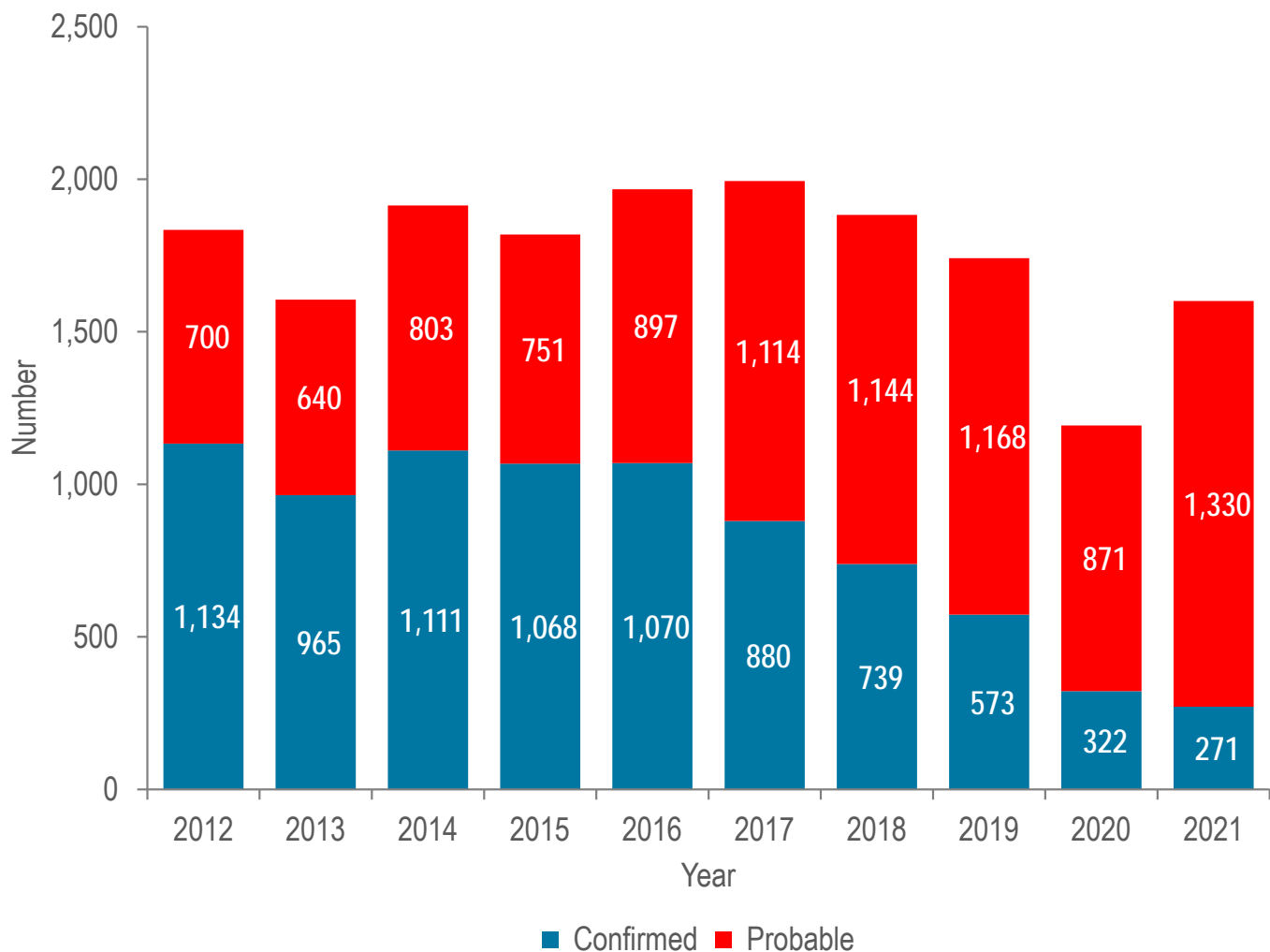
² Nelson NP, Weng MK, Hofmeister MG, et al. Prevention of Hepatitis A Virus Infection in the United States: Recommendations of the Advisory Committee on Immunization Practices, 2020. MMWR Recomm Rep 2020;69(No. RR-5):1–38. DOI: <http://dx.doi.org/10.15585/mmwr.r6905a1>

VIRAL HEPATITIS - HEPATITIS B

Hepatitis B is a liver infection caused by the hepatitis B virus. Transmission occurs via contact with blood or other body fluids, including from mother to infant at birth, via sexual contact, and through sharing of drug injection equipment. Most people who get the disease recover from it and cannot be re-infected. However, about 10% of adults who get hepatitis B will go on to have chronic (long-term) infection and can pass it on to others. When it is chronic, it can be a serious disease that can lead to cirrhosis (scarring of the liver) and/or liver cancer. The younger a person is when infected, the more likely he or she is to go on to have chronic infection and to develop serious liver disease. There is a vaccine to prevent hepatitis B infection.

The burden of chronic hepatitis B in the US is greater among people born in regions of the world with high or moderate prevalence of chronic hepatitis B, including much of Asia and the Pacific Islands.

Figure 19. Number of confirmed and probable chronic hepatitis B cases reported by year, Massachusetts 2012–2021



Data Source: Bureau of Infectious Disease and Laboratory Sciences, data are current as of 8/19/2022 and subject to change

VIRAL HEPATITIS - HEPATITIS B

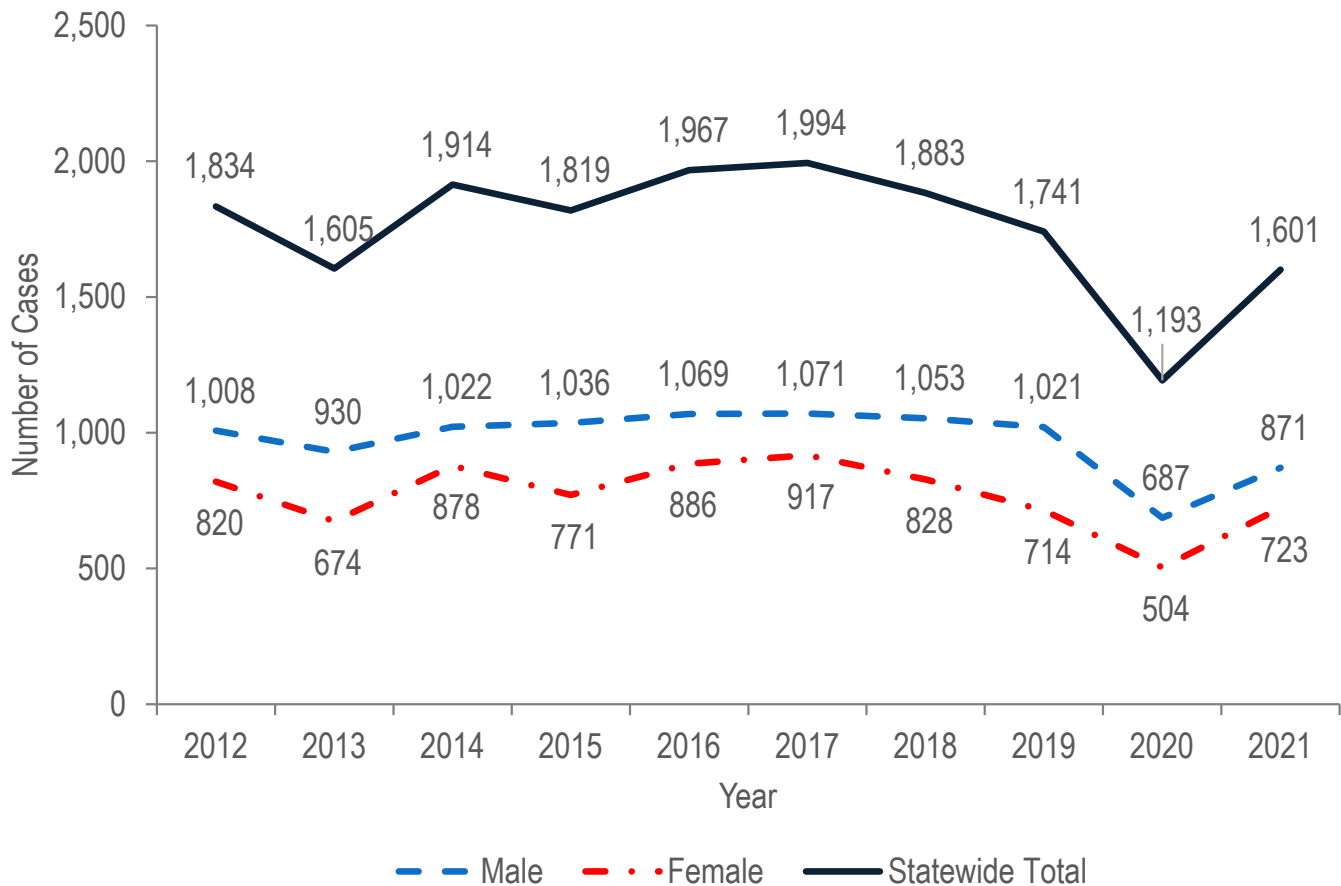
- From 2012 to 2021,¹ an average of 1,755 cases of confirmed and probable chronic hepatitis B virus (HBV) infection were reported each year (with a low of 1,193 in 2020 and a high of 1,994 in 2017). Changes in testing behaviors and travel due to the COVID-19 pandemic likely influenced the number of reported cases and may contribute to the decrease in 2020, followed by the rebound in 2021.
- The surveillance case definition for chronic HBV requires two positive tests; for certain test types, these two tests must be taken at least six months apart. Reported cases are classified as "probable" following the initial test result and are re-classified as "confirmed" if additional test results are received. During the most recent year of data, 2021, some cases currently reported as probable may be eventually confirmed in future reports as additional information is obtained.²

¹Please consider the impact of the COVID-19 pandemic on infectious disease screening, treatment, and surveillance in the interpretation of 2020 and 2021 data.

²For more information, see HIV, STD, and Viral Hepatitis Case Classifications beginning on [page 62](#).

HEPATITIS B BY GENDER

Figure 20. Number of confirmed and probable chronic hepatitis B cases reported by female and male gender, Massachusetts 2012–2021



Note: Cases reported as transgender or missing gender (2012–2021: N=68) are included in the statewide total but are not depicted in Figure 20 separately due to small numbers.

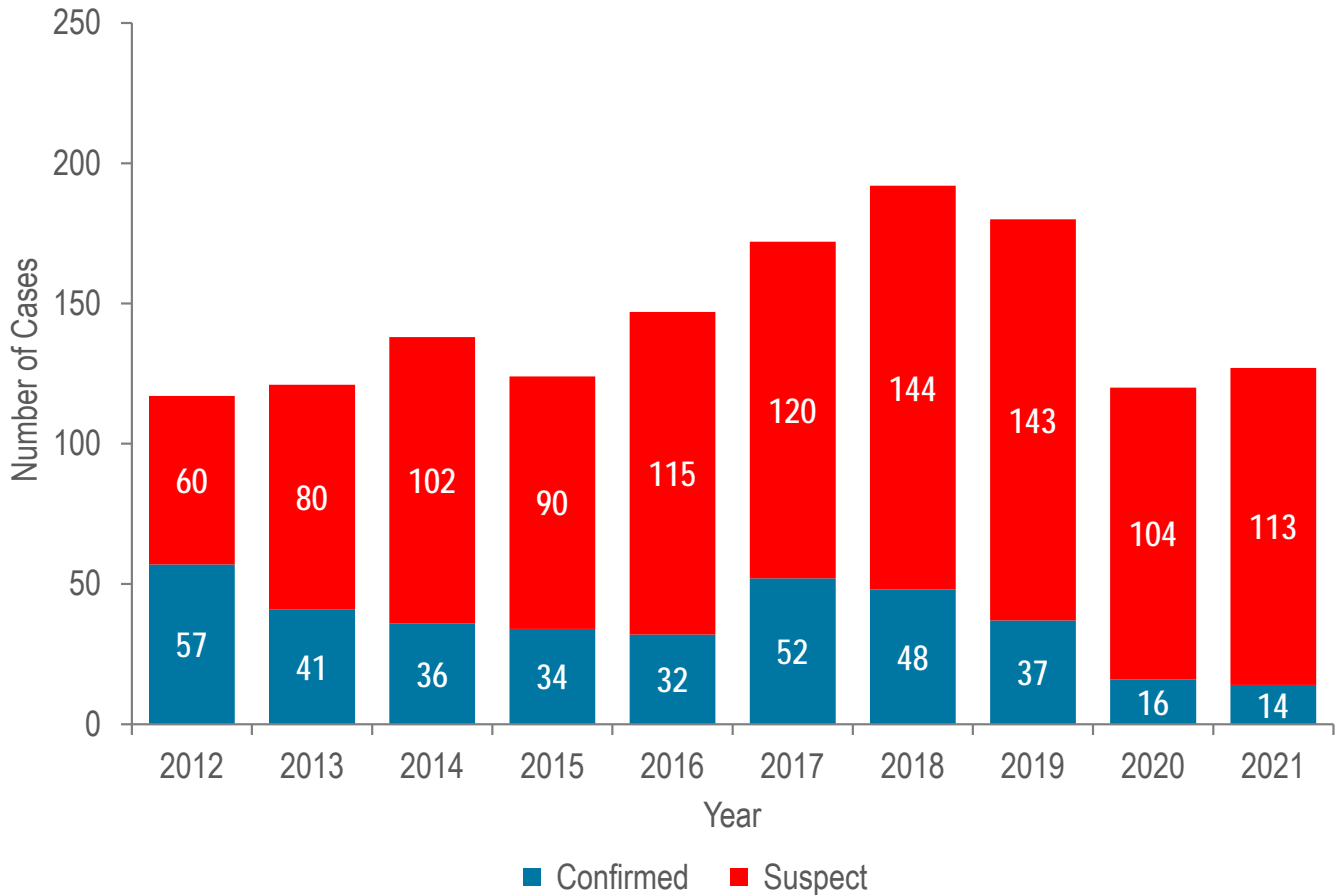
Data Source: Bureau of Infectious Disease and Laboratory Sciences, data are current as of 8/19//2022 and subject to change

- In 2021,¹ 871 (54%) cases of confirmed and probable chronic HBV infection were newly reported among males, 723 (45%) were reported among females, and less than five were reported among individuals of transgender experience. Please note reported numbers among individuals of transgender experience are likely to be underestimates as there may be underreporting or misreporting of gender due to the absence of appropriate collection of gender options (e.g., individuals who are nonbinary, and women and men of transgender experience, etc.). Changes in testing behaviors due to the COVID-19 pandemic likely affected the numbers of reported cases in 2020 and 2021.
- Hepatitis B in people of childbearing age is of particular concern due to the risk of transmission from pregnant person to infant at birth. Perinatal HBV transmission can be prevented by identifying HBV positive pregnant people and providing post-exposure prophylaxis (PEP) to their infants within 12 hours of birth. The MDPH Perinatal Hepatitis B Prevention Program provides case management to pregnant people who are HBV positive and their infants to ensure appropriate PEP, vaccination, and post-vaccination serologic testing.

¹ Please consider the impact of the COVID-19 pandemic on infectious disease screening, treatment, and surveillance in the interpretation of 2020 and 2021 data.

ACUTE HEPATITIS B

Figure 21. Number of confirmed and suspect acute hepatitis B cases reported by year, Massachusetts 2012–2021



Data Source: Bureau of Infectious Disease and Laboratory Sciences, data are current as of 8/19/2022 and subject to change

- In 2021,¹ there were 14 confirmed acute and 113 suspect acute HBV cases for a total of 127 acute cases.²
- The total number of confirmed acute HBV cases reported has decreased between 2017 (52 cases) and 2021 (14 cases).
- Injection drug use (IDU) is a significant, and increasingly important, risk factor for acquisition of acute HBV infection.

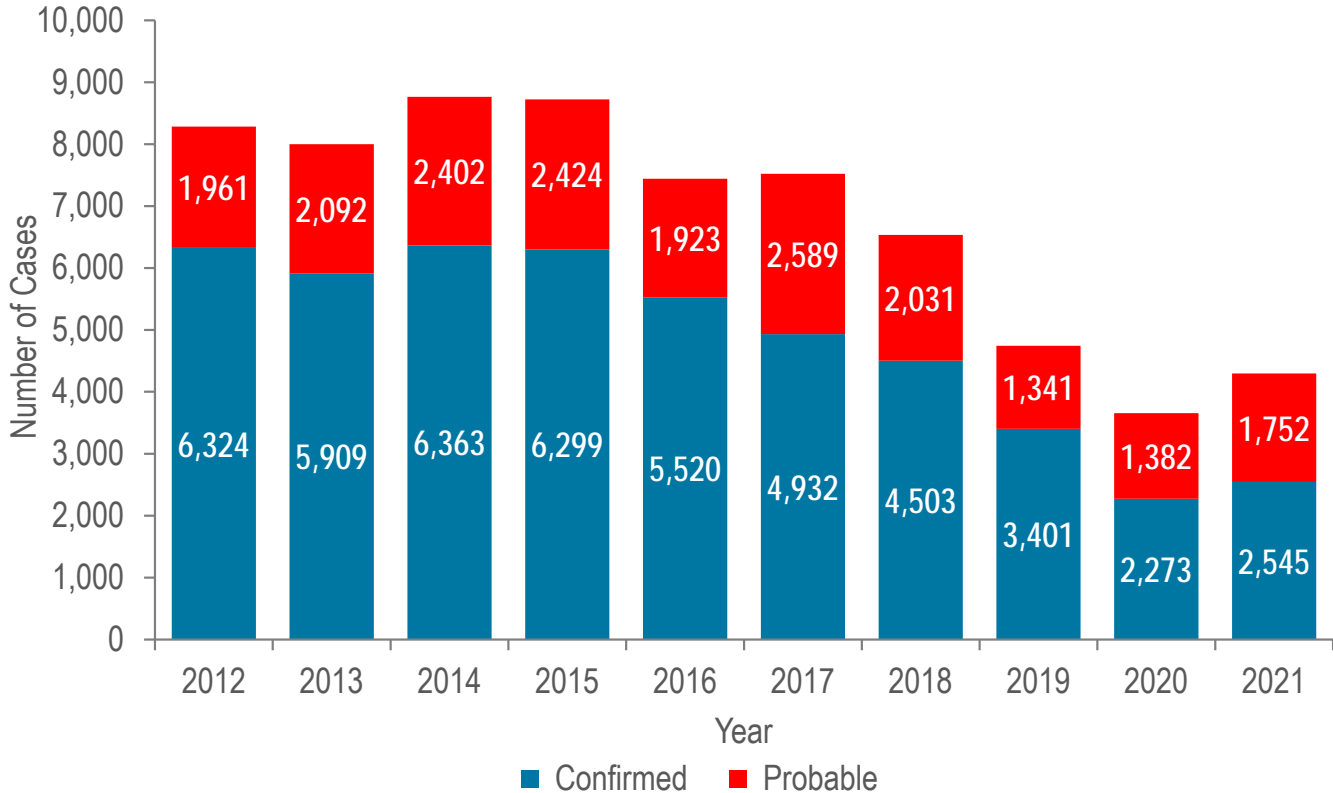
¹ Please consider the impact of the COVID-19 pandemic on infectious disease screening, treatment, and surveillance in the interpretation of 2020 and 2021 data.

² For more information, see HIV, STD, and Viral Hepatitis Case Classifications beginning on [page 62](#).

VIRAL HEPATITIS - HEPATITIS C

Hepatitis C is a liver infection caused by the hepatitis C virus. The majority of infected individuals are asymptomatic, but symptoms can include fatigue, loss of appetite, nausea, vomiting, abdominal pain, and jaundice. Over time, liver damage can result, and complications can include cirrhosis and liver cancer. Hepatitis C infection is spread by direct contact with the blood of an infected person. Transmission mechanisms can include: sharing equipment used to inject drugs, blood transfusions and organ transplants (primarily prior to 1992 when widespread screening of the blood supply began), from gestational parent to child at birth, sharing personal items such as toothbrushes or razors, tattoos and piercings in non-sterile environments, infection control breaches in healthcare settings, and, rarely, through sexual contact (more likely with HIV co-infection). Most people who get the infection will go on to have chronic infection. With the advent of direct-acting antivirals, hepatitis C infection is curable with a weeks-long course of treatment.

Figure 22. Number of confirmed and probable hepatitis C cases reported by year, Massachusetts 2012–2021



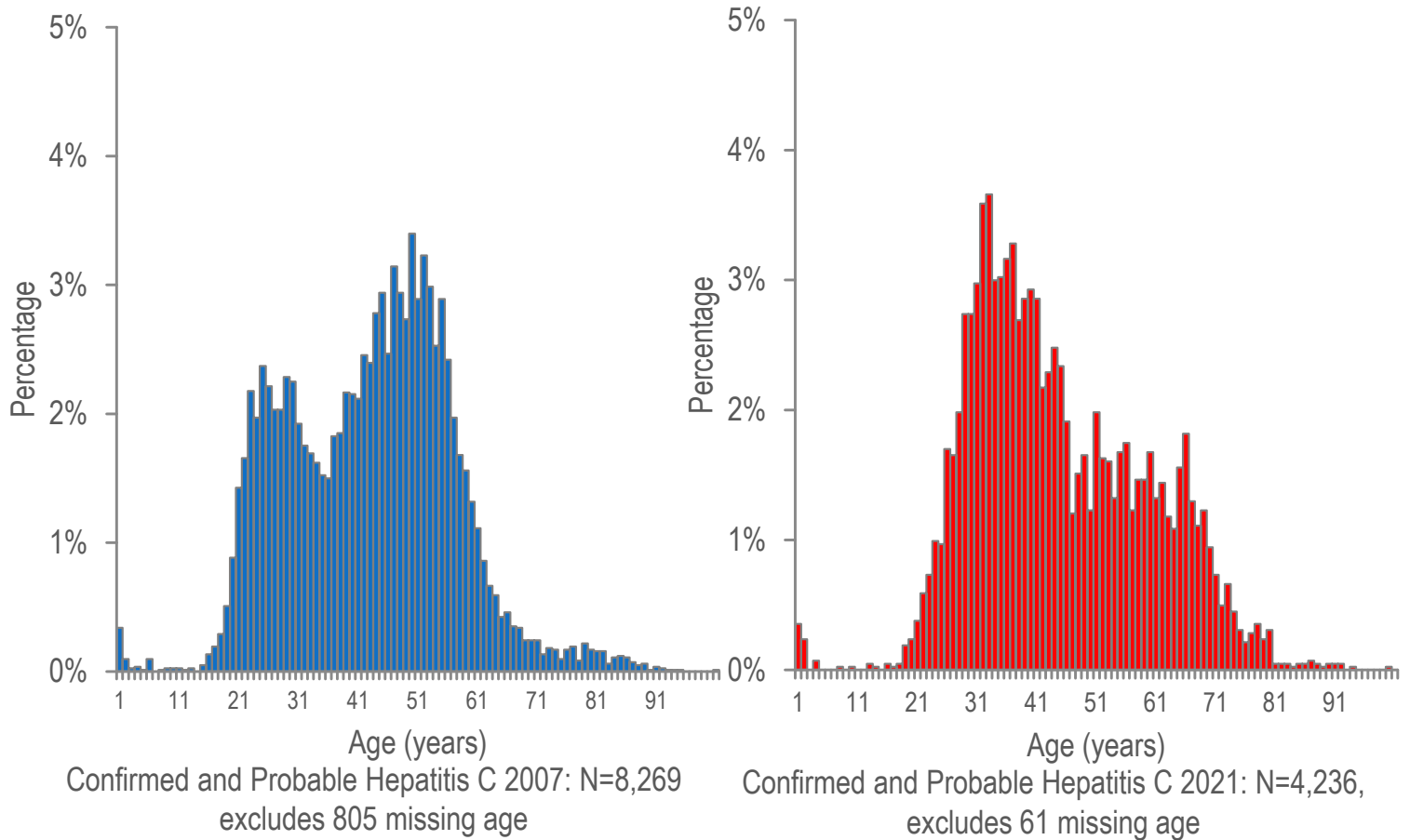
Data Source: Bureau of Infectious Disease and Laboratory Sciences, data are current as of 6/3/2022 and subject to change

- The total number of reported confirmed and probable hepatitis C cases decreased from 8,285 in 2012 to 4,297 in 2021.¹
 - Most reported cases are chronically infected and MDPH currently estimates that there are over 250,000 people living with HCV infection in Massachusetts.

¹ Please consider the impact of the COVID-19 pandemic on infectious disease screening, treatment, and surveillance in the interpretation of 2020 and 2021 data. Please note, in 2016, revised case definitions for acute and chronic HCV infection were implemented that contain significant changes from the case definitions for 2012 to 2015. For further information see <https://www.cdc.gov/nndss/conditions/>

HEPATITIS C BY AGE

Figure 23. Distribution of confirmed and probable hepatitis C cases by age: 2007 versus 2021



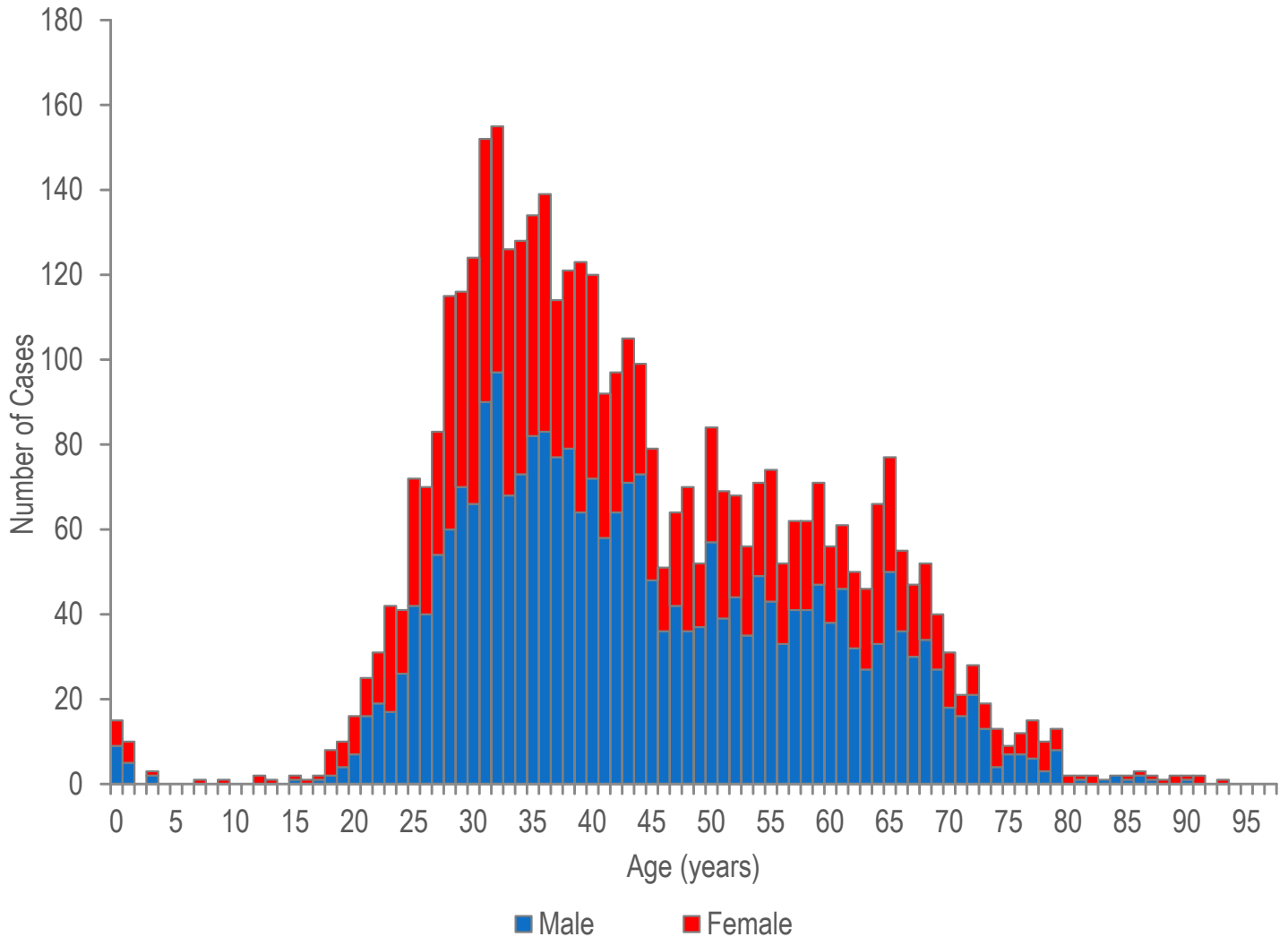
Data Source: Bureau of Infectious Disease and Laboratory Sciences, data are current as of 6/3/2022 and subject to change

- In 2007, reported cases of hepatitis C were distributed in a curve with two age peaks, with the lower peak at age 24 years and the higher peak at age 49 years.
- In 2021,¹ the reported cases were again distributed in a bi-modal curve, but with the higher peak at age 32 years, reflecting a continuing shift in the age profile of newly reported cases.

¹ Please consider the impact of the COVID-19 pandemic on infectious disease screening, treatment, and surveillance in the interpretation of 2020 and 2021 data.

HEPATITIS C BY AGE AND GENDER

Figure 24. Number of confirmed and probable hepatitis C cases reported by age, and female and male gender, Massachusetts 2021



Note: Confirmed and Probable Hepatitis C 2021: N=4,227, excludes 61 missing age and/or gender. Cases reported as transgender (N=9) are not depicted in Figure 24 separately due to small numbers. Data Source: Bureau of Infectious Disease and Laboratory Sciences, data are current as of 6/3/2022 and subject to change

- In 2021,¹ 2,585 (61%) confirmed and probable hepatitis C infection cases were reported among males, 1,642 (39%) were reported among females, and nine were reported among individuals of transgender experience. Please note reported numbers among individuals of transgender experience are likely to be underestimates as there may be underreporting or misreporting of gender due to the absence of appropriate collection of gender options (e.g., individuals who are nonbinary, and women and men of transgender experience, etc.).

¹ Please consider the impact of the COVID-19 pandemic on infectious disease screening, treatment, and surveillance in the interpretation of 2020 and 2021 data.

HEPATITIS C BY AGE AND GENDER

- Fifty-six percent (N=375/669) of confirmed and probable hepatitis C infection cases in those less than 30 years of age were reported among males, 44% (N=292/669) were reported among females, and less than 1% were reported among individuals of transgender experience. ¹
 - For newly reported hepatitis C infections among persons less than 30 years of age with a known risk history, injection drug use was the most commonly reported risk factor for infection.
- Sixty-two percent (N=2,210/3,567) of confirmed and probable hepatitis C infection cases in those 30 years of age and older were reported among males, 38% (N=1,350/3,567) were reported among females, and less than 1% were reported among individuals of transgender experience.

¹ Please consider the impact of the COVID-19 pandemic on infectious disease screening, treatment, and surveillance in the interpretation of 2020 and 2021 data.

Table 1. Percentage of 2021 confirmed and probable infectious syphilis¹ cases ever co-infected with HIV by gender, race/ethnicity, and age

	Syphilis Cases (N=1,352)	HIV/Syphilis Co-infections (N=419) ²	% of Syphilis Cases Co- infected with HIV
Gender:			
Male	1,208	407	34%
Female	123	2	2%
Transgender	21	10	48%
Race/Ethnicity:			
White NH	552	182	33%
Black NH	198	71	36%
Hispanic/Latino	358	114	32%
Other NH	147	36	24%
Unreported	97	16	16%
Age:			
<15 years	0	0	0%
15–19 years	35	1	3%
20–24 years	154	13	8%
25–29 years	239	47	20%
30–39 years	428	130	30%
40–49 years	219	91	42%
50+ years	277	137	49%

Data Source: Bureau of Infectious Disease and Laboratory Sciences, data are current as of 7/13/2022 and subject to change

- In 2021,³ among 1,352 reported cases of infectious syphilis, 31% (N=419/1,352) were co-infected with HIV.
- Among infectious syphilis cases reported in 2021, higher rates of HIV co-infection were observed in individuals of transgender experience, males, and individuals aged 40 years and above. Co-infection rates were similar across categories of race/ethnicity.
- Sixty-six percent (N=887/1,352) of infectious syphilis cases among males reported same sex contact. Of those who reported male-to-male sex, 38% (N=335/887) were co-infected with HIV, compared to 22% (N=72/321) of males with unknown risk.

¹ Infectious syphilis includes diagnoses made in the primary, secondary, and early non-primary non-secondary stages of infection (latent asymptomatic syphilis where infection occurred in the past 12 months).

² HIV/syphilis co-infections include all infectious syphilis cases reported in 2021 that were ever diagnosed with HIV infection.

³ Please consider the impact of the COVID-19 pandemic on infectious disease screening, treatment, and surveillance in the interpretation of 2020 and 2021 data.

CO-INFECTIONS - HIV/GONORRHEA

Table 2. Percentage of 2021 laboratory-confirmed gonorrhea cases ever co-infected with HIV by gender, race/ethnicity, and age

	Gonorrhea Cases (N=8,133)	HIV/Gonorrhea Co-infections (N=618) ¹	% of Gonorrhea Cases Co-infected with HIV
Gender:			
Male	5,386	601	11%
Female	2,704	11	<1%
Transgender	39	6	15%
Unreported	4	0	0%
Race/Ethnicity:			
White NH	1,772	165	9%
Black NH	1,333	95	7%
Hispanic/Latino	1,307	113	9%
Other NH	670	51	8%
Unreported	3,051	194	6%
Age:			
<15 years	10	0	0%
15–19 years	492	2	<1%
20–24 years	1,894	41	2%
25–29 years	1,882	81	4%
30–39 years	2,434	257	11%
40–49 years	796	94	12%
50+ years	625	143	23%

Data Source: Bureau of Infectious Disease and Laboratory Sciences, data are current as of 7/13/2022 and subject to change

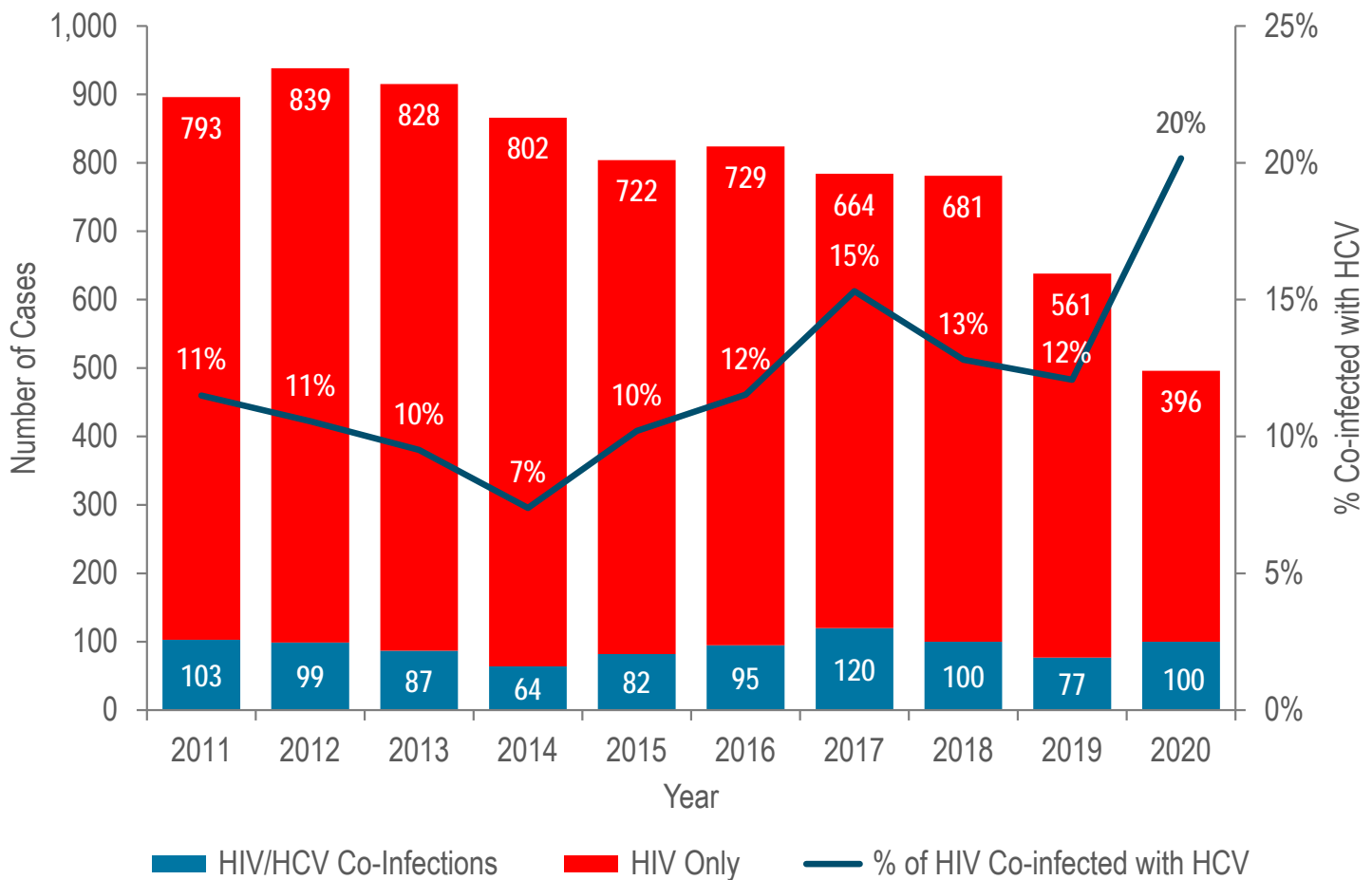
- In 2021,² among 8,133 reported cases of gonorrhea, 8% (N=618/8,133) were ever co-infected with HIV.
- Among laboratory-confirmed gonorrhea cases reported in 2021, higher rates of HIV co-infection were observed in individuals of transgender experience, males, and individuals aged 50 years or older. Co-infection rates were similar across categories of race/ethnicity for individuals with a race/ethnicity reported. However, caution should be used in interpretation as a large percentage of cases had unreported race/ethnicity (38%).

¹ HIV/gonorrhea co-infections include all laboratory-confirmed gonorrhea cases reported in 2021 that were ever diagnosed with HIV infection.

² Please consider the impact of the COVID-19 pandemic on infectious disease screening, treatment, and surveillance in the interpretation of 2020 and 2021 data.

CO-INFECTIONS - HIV/HEPATITIS C

Figure 25. Number of individuals diagnosed with HIV infection only, and ever co-infected with hepatitis C (HCV) by year of HIV infection diagnosis, Massachusetts 2011–2020



Data Source: Bureau of Infectious Disease and Laboratory Sciences, data are current as of 7/1/2022 and subject to change

- The percentage of individuals diagnosed with HIV infection who were co-infected with hepatitis C decreased from 11% (N=103/896) in 2011 to 7% (N=64/866) in 2014, increased to 15% (N=120/784) in 2017, decreased to 12% in 2019 (N=77/638), and then increased again to a ten-year high of 20% (N=100/496) in 2020.^{1,2} This trend mirrors that among HIV infection diagnoses with a primary exposure mode of injection drug use and is likely related to two outbreaks of HIV infection among persons who inject drugs. The first outbreak occurred from 2016 to 2018 in the northeastern part of the state and the second was identified in 2019 in the Boston area and is still ongoing (see page 50 for more information).

¹ Total number of annual HIV diagnoses presented here is larger than totals presented elsewhere in the report because all HIV diagnoses, including those first made in another state, were included in the co-infection analysis.

² Please consider the impact of the COVID-19 pandemic on infectious disease screening, treatment, and surveillance in the interpretation of 2020 and 2021 data.

HIV/HEPATITIS C CO-INFECTIONS BY DEMOGRAPHICS

Table 3. Individuals diagnosed with HIV infection ever co-infected with hepatitis C virus (HCV) by year of HIV infection diagnosis and selected demographics, 2016–2020

	2016		2017		2018		2019		2020	
	N	%	N	%	N	%	N	%	N	%
Sex at Birth:										
Male	61	64%	80	67%	62	62%	51	66%	69	69%
Female	34	36%	40	33%	38	38%	26	34%	31	31%
Race/Ethnicity:										
White NH	60	63%	73	61%	63	63%	45	58%	72	72%
Black NH	13	14%	7	6%	9	9%	12	16%	12	12%
Hispanic/Latino	22	23%	40	33%	28	28%	15	19%	16	16%
Asian/Pacific Islander NH	0	0%	0	0%	0	0%	2	3%	0	0%
Other NH/Unknown	0	0%	0	0%	0	0%	3	4%	0	0%
Age:										
13–19 years	0	0%	1	1%	1	1%	0	0%	0	0%
20–29 years	24	25%	43	36%	24	24%	21	27%	18	18%
30–39 years	36	38%	44	37%	36	36%	33	43%	53	53%
40–49 years	13	14%	20	17%	23	23%	15	19%	17	17%
50+ years	22	23%	12	10%	16	16%	8	10%	12	12%
HIV Exposure Mode:										
MSM	7	7%	5	4%	4	4%	5	6%	8	8%
IDU	66	69%	99	83%	78	78%	51	66%	75	75%
MSM/IDU	7	7%	12	10%	6	6%	9	12%	11	11%
HTSX	2	2%	3	3%	6	6%	3	4%	0	0%
Pres. HTSX	3	3%	0	0%	1	1%	0	0%	2	2%
NIR	10	11%	1	1%	5	5%	9	12%	4	4%
Total:	95	100%	120	100%	100	100%	77	100%	100	100%

MSM=Male-to-Male Sex, IDU=Injection Drug Use, HTSX=Heterosexual Sex, Pres.=Presumed, NIR=No Identified Risk. For more information, see HIV primary exposure mode definitions in Interpreting HIV, STD, and Viral Hepatitis Data, on page 60.

Data Source: Bureau of Infectious Disease and Laboratory Sciences, data are current as of 7/1/2022 and subject to change

- From 2016 to 2020,^{1,2} the proportion of individuals co-infected with HIV/HCV who were white (non-Hispanic) increased from 63% to 72%, while the proportion of Hispanic/Latino individuals decreased from 23% to 16%. During the same time period, the proportion of 30-39 year-olds increased from 38% to 53%, while the proportion of individuals age 50 years and above decreased from 23% to 12%, and the proportion of 20-29 year-olds decreased from 25% to 18%. The proportion of individuals co-infected with HIV/HCV with IDU exposure mode likely reflected two separate HIV outbreaks among persons who inject drugs (PWID), increasing from 69% in 2016 to 83% in 2017, decreasing to 66% in 2019 and then increasing again to 75% in 2020.
- The distribution of individuals co-infected with HIV/HCV infection by sex assigned at birth remained relatively stable from 2016 to 2020.

¹ HIV/HCV co-infections include all HIV infection diagnoses reported in 2020 that were ever diagnosed with HCV infection. Total number of annual HIV diagnoses presented here is larger than totals presented elsewhere in the report because all HIV diagnoses, including those first made in another state, were included in the co-infection analysis.

² Please consider the impact of the COVID-19 pandemic on infectious disease screening, treatment, and surveillance in the interpretation of 2020 and 2021 data.

HIV/HEPATITIS C - PERCENTAGE CO-INFECTED

Table 4. Percentage of 2020 HIV infection diagnoses ever co-infected with HCV by gender, race/ethnicity, age, and HIV exposure mode

	HIV Diagnoses (N=496)	HIV/HCV Co-infections (N=100) ¹	% of HIV Diagnoses Co-infected with HCV
Assigned Sex at Birth:			
Male	363	69	19%
Female	133	31	23%
Race/Ethnicity:			
White NH	192	72	38%
Black NH	150	12	8%
Hispanic/Latino	132	16	12%
Asian/Pacific Islander NH	8	0	0%
Other NH/Unknown	14	0	0%
Age:			
13–19 years	12	0	0%
20–29 years	137	18	13%
30–39 years	173	53	31%
40–49 years	67	17	25%
50+ years	107	12	11%
HIV Exposure Mode:			
MSM	197	8	4%
IDU	84	75	89%
MSM/IDU	25	11	44%
HTSX	56	0	0%
Pres. HTSX	31	2	6%
NIR	103	4	4%
Total:	496	100	20%

MSM=Male-to-Male Sex and Men Who Have Sex with Men, IDU=Injection Drug Use, HTSX=Heterosexual Sex, Pres.=Presumed, NIR=No Identified Risk
Data Source: Bureau of Infectious Disease and Laboratory Sciences, data are current as of 7/1/2022 and subject to change

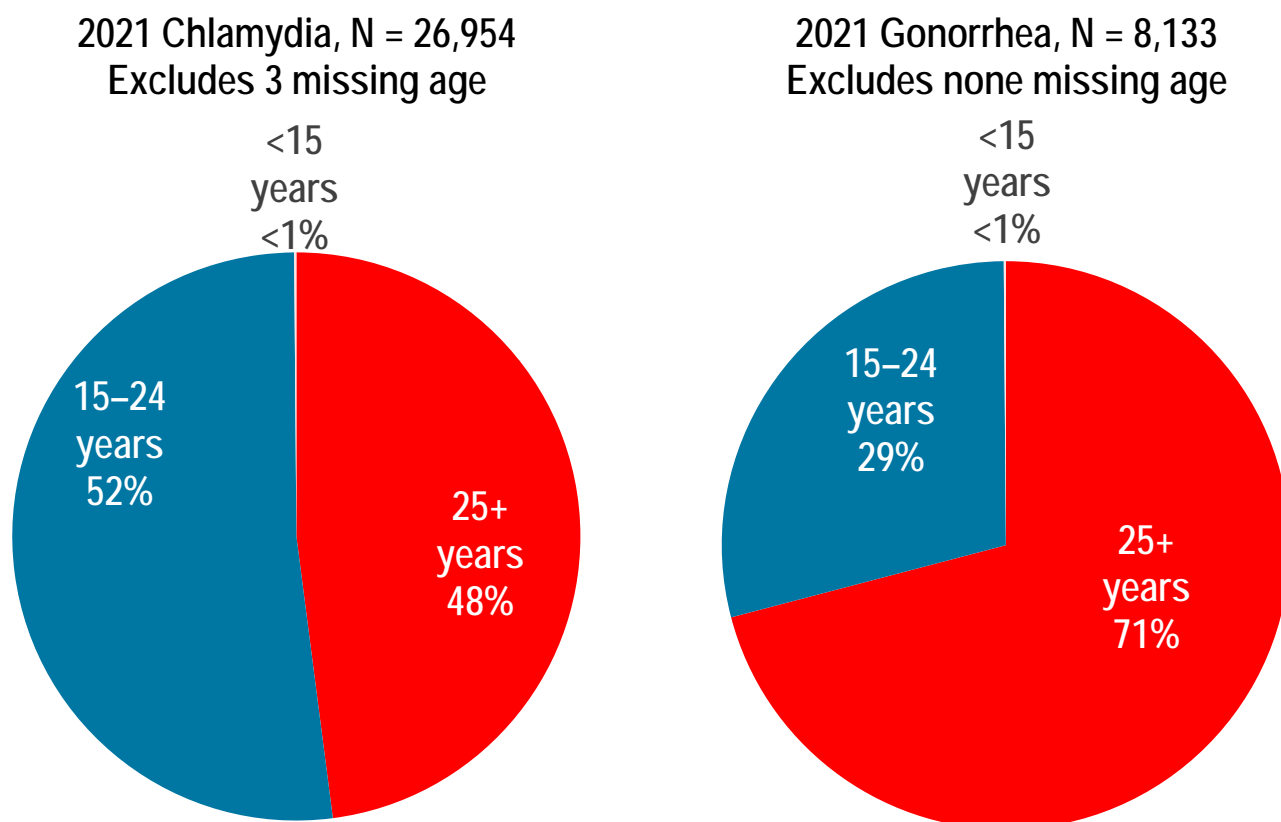
- In 2020,² among 496 individuals diagnosed with HIV infection, 20% (N=100/496) were ever co-infected with HCV.
- Among individuals diagnosed with HIV infection in 2020, higher rates of HCV co-infection were observed in white (non-Hispanic) individuals (38%), individuals aged 30–39 years (31%) or 40–49 years (25%), and individuals with IDU exposure mode (89%), or MSM/IDU exposure mode (44%). Co-infection rates were similar for individuals assigned male at birth and individuals assigned female at birth.

¹ HIV/HCV co-infections include all HIV infection diagnoses reported in 2020 that were ever diagnosed with HCV infection. Total number of annual HIV diagnoses presented here is larger than totals presented elsewhere in the report because all HIV diagnoses, including those first made in another state, were included in the co-infection analysis.

² Please consider the impact of the COVID-19 pandemic on infectious disease screening, treatment, and surveillance in the interpretation of 2020 and 2021 data.

SPECIFIC POPULATIONS - ADOLESCENTS AND YOUNG ADULTS, STD DIAGNOSES BY AGE

Figure 26. Distribution of confirmed chlamydia and gonorrhea cases reported by age group (years), Massachusetts 2021



Data Source: Bureau of Infectious Disease and Laboratory Sciences, data are current as of 7/13/2022 and subject to change

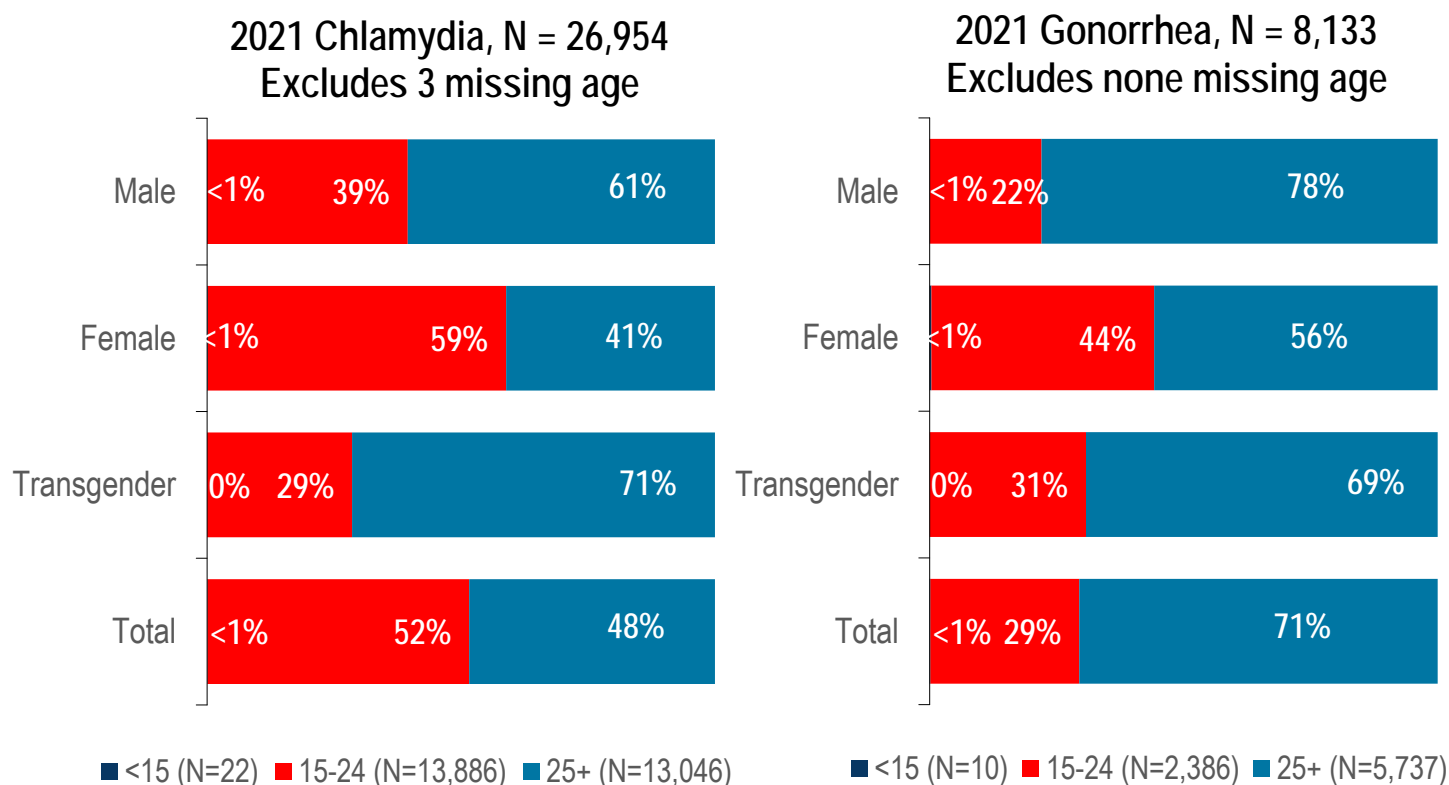
- In 2021,¹ in Massachusetts, 52% of chlamydia cases and 29% of gonorrhea cases were reported among adolescents and young adults aged 15–24 years.
 - Nationally, 61% of chlamydia cases and 42% of gonorrhea cases were reported among adolescents and young adults aged 15–24 years in 2020.²

¹ Please consider the impact of the COVID-19 pandemic on infectious disease screening, treatment, and surveillance in the interpretation of 2020 and 2021 data.

² Centers for Disease Control and Prevention. *Sexually Transmitted Disease Surveillance 2020*. Atlanta: U.S. Department of Health and Human Services; 2022. National percentages among 15-24 year-olds also exclude cases of unknown age for comparability with Massachusetts percentages. Please note, 2020 percentages are presented because 2021 percentages by age were not yet available at the time of this publication.

STD DIAGNOSES BY AGE AND GENDER

Figure 27. Distribution of confirmed chlamydia and gonorrhea cases reported by age group (years) and gender, Massachusetts 2021



Data Source: Bureau of Infectious Disease and Laboratory Sciences, data are current as of 7/13/2022 and subject to change

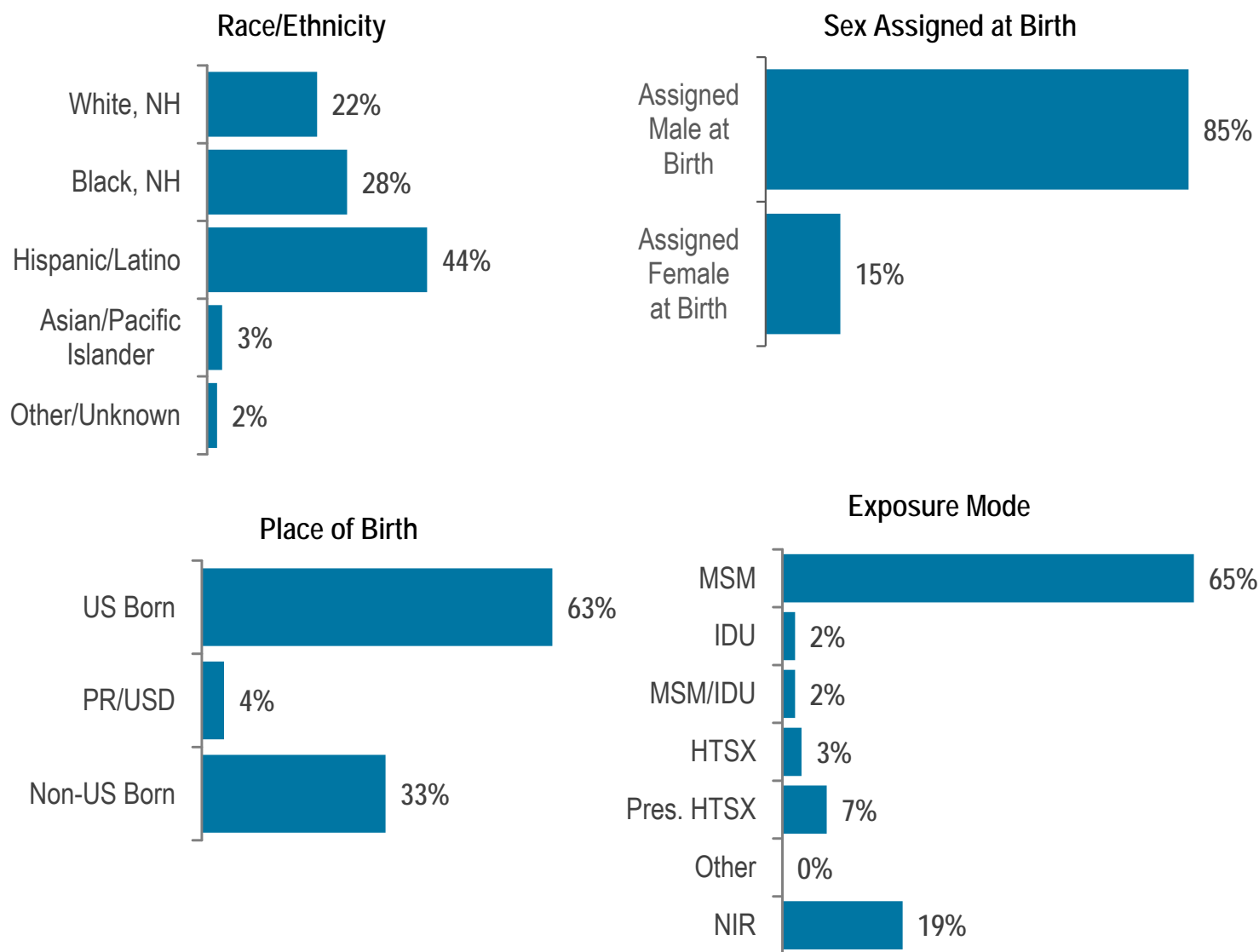
- In 2021,¹ in Massachusetts, 39% of chlamydia cases reported among males, 59% among females, 29% among individuals of transgender experience, and 52% of total cases were reported among adolescents and young adults aged 15–24 years.
 - Nationally in 2020, 49% of chlamydia cases reported among males, 67% among females, and 61% of total cases were reported among adolescents and young adults aged 15–24 years.²
- In 2021, in Massachusetts, 22% of gonorrhea cases reported among males, 44% among females, 31% among individuals of transgender experience, and 29% of total cases were reported among adolescents and young adults aged 15–24 years.
 - Nationally in 2020, 34% of gonorrhea cases reported among males, 53% among females, and 42% of total cases were reported among adolescents and young adults aged 15–24 years.²

¹ Please consider the impact of the COVID-19 pandemic on infectious disease screening, treatment, and surveillance in the interpretation of 2020 and 2021 data.

² Centers for Disease Control and Prevention. Sexually Transmitted Disease Surveillance 2020. Atlanta: U.S. Department of Health and Human Services; 2022. National percentages among 15-24 year-olds also exclude cases of unknown age for comparability with Massachusetts percentages. Please note, 2020 national data are presented because 2021 data by age and gender were not yet available at the time of this publication.

HIV DIAGNOSES BY RACE/ETHNICITY AND EXPOSURE MODE

Figure 28. Distribution of HIV infection diagnoses in adolescents and young adults (aged 15–24 years) by race/ethnicity, exposure mode, place of birth, and sex assigned at birth, Massachusetts 2019–2021, N=162



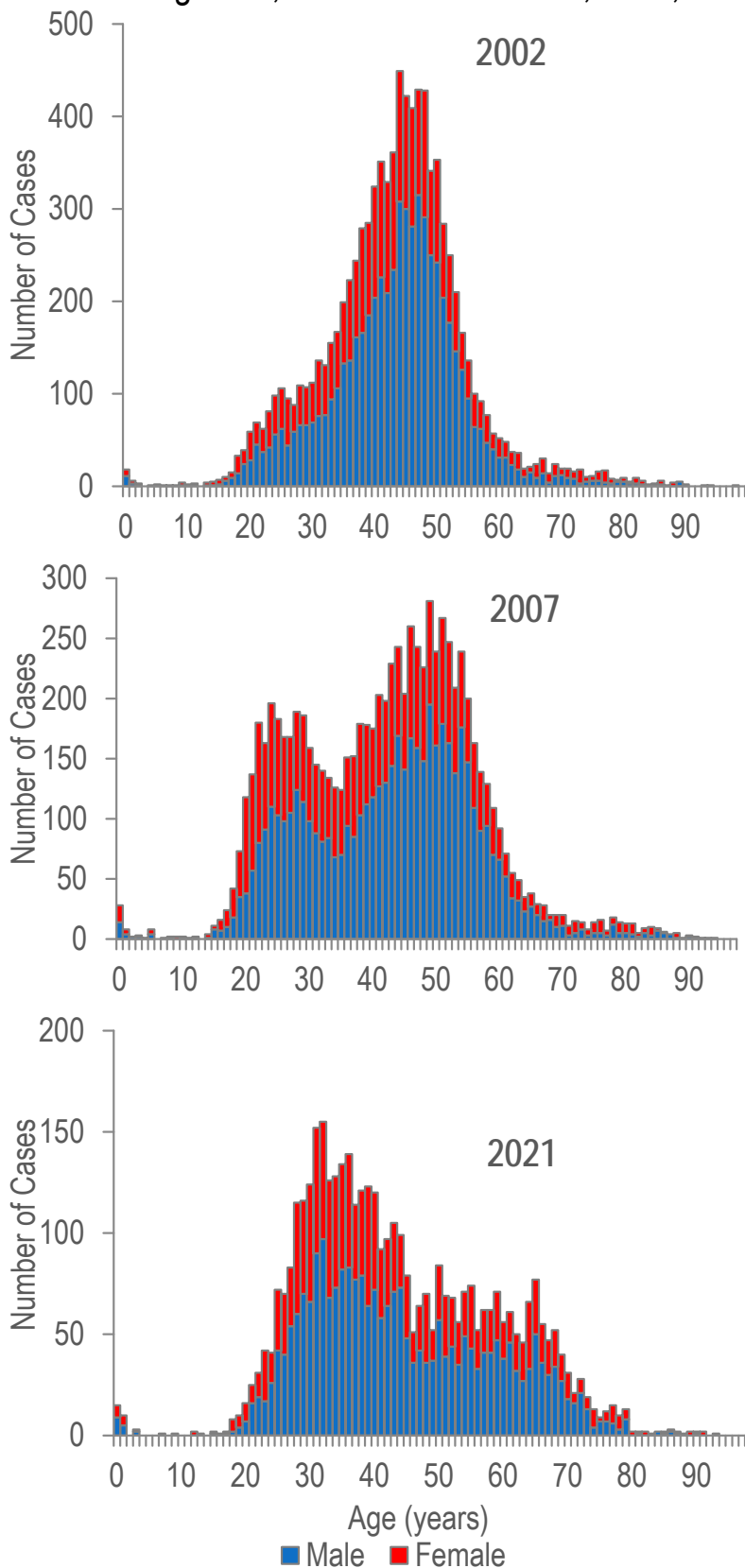
Data Source: Bureau of Infectious Disease and Laboratory Sciences, data are current as of 7/1/2022 and subject to change

- During 2019 to 2021,¹ 11% (N=162/1,417) of HIV infection diagnoses were reported among adolescents and young adults aged 15–24 years.
- Adolescent and young adults aged 15–24 years newly diagnosed with HIV infection in Massachusetts during 2019 to 2021 were predominantly Hispanic/Latino (44%) or black (non-Hispanic) (28%), assigned male at birth (85%), and US born (63%), with an exposure mode of male-to-male sex (65%).

¹ Please consider the impact of the COVID-19 pandemic on infectious disease screening, treatment, and surveillance in the interpretation of 2020-2021 data.

HEPATITIS C BY AGE AND GENDER

Figure 29. Number of confirmed and probable hepatitis C cases reported by age and female and male gender, Massachusetts 2002, 2007, 2021*



- The age distribution of hepatitis C virus (HCV) cases reported in Massachusetts changed between 2002 and 2021¹ with a significant increase in cases among young persons who inject drugs.
- In 2002, reported HCV cases were distributed in a curve with one age peak at 44 years.
- In 2007, reported cases of hepatitis C were distributed in a curve with two age peaks, with the lower peak at age 24 years and the higher peak at age 49 years.
- In 2021, HCV cases among young adults who inject drugs outnumbered newly reported cases among the older (“baby boomer”) age cohort.
- The proportion of cases among young adults (aged 15–29 years) was higher in 2021 (15%, N=636/3,567) and 2007 (22%, N=1,854/8,269) compared to 2002 (11%, N=978/9,031).
- The primary risk for hepatitis C infection in younger adults is injection drug use. While the primary exposure mode for HIV infection in younger adults is male-to-male sex, recent increases in the number of HIV infections attributed to injection drug use have been observed, particularly among young adults (aged 13–29 years).

¹ Please consider the impact of the COVID-19 pandemic on infectious disease screening, treatment, and surveillance in the interpretation of 2020-2021 data.

*Probable and Confirmed Hepatitis C 2002, N=9,031 (excludes 164 with missing age and/or gender, 2007 N=8,269 (excludes 805 with missing age and/or gender), 2021 N=4,236 (excludes 61 with missing age and/or gender). Cases reported as transgender (2002 [N<5], 2007 [N<5], and 2021 [N=9]) are not depicted in Figure 29 separately due to small numbers. Data Source: Bureau of Infectious Disease and Laboratory Sciences, data are current as of 6/3/2022 and subject to change

Table 5. Reported sexual behaviors among Massachusetts high school students, 2011–2019

	Percentage who reported:				
	2011	2013	2015	2017	2019
	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)
	n ¹	n	n	n	n
Ever having sexual intercourse	42.0% (37.5–46.6) 2,513	38.1% (34.3–42.0) 2,516	36.4% (32.4–40.6) 2,779	35.3% (31.8–39.1) 2,889	36.9% (32.8–41.3) 1,946
Having sexual intercourse before age 13	4.2% (3.1–5.5) 2,512	3.0% (2.4–3.8) 2,506	2.9% (2.2–3.8) 2,793	2.4% (1.6–3.4) 2,886	2.5% (1.7–3.4) 1,951
Having had sexual intercourse with 4+ partners during their life	11.4% (9.1–14.2) 2,510	9.3% (8.0–10.8) 2,508	7.9% (6.2–10.0) 2,781	6.7% (5.4–8.2) 2,886	7.8% (6.3–9.5) 1,938
Using a condom at last sexual intercourse ²	57.7% (52.8–62.5) 761	57.6% (52.9–62.2) 667	62.5% (58.9–65.9) 766	57.8% (53.1–62.3) 719	51.4% (45.3–57.4) 427
Drinking alcohol or using drugs before last sexual intercourse ²	22.7% (19.5–26.4) 770	23.5% (19.9–27.5) 679	21.8% (18.1–26.0) 782	18.2% (15.8–21.0) 631	23.4% (19.5–27.9) 434
Ever tested for HIV	10.9% (8.7–13.7) 2,652	11.0% (9.0–13.4) 2,659	9.9% (8.0–12.2) 3,010	10.5% (9.0–12.1) 3,125	12.6% (10.4–15.3) 2,085

¹ The number of respondents (unweighted) varied for each question because participants may not answer all questions.

² Among youth reporting sexual intercourse in the past three months

Centers for Disease Control and Prevention (CDC). 2019 High School Youth Risk Behavior Survey Data. Available at <http://nccd.cdc.gov/youthonline/>. Accessed on [9/2/2020] CDC, Accessed at Youth Online, <https://nccd.cdc.gov/Youthonline/App/Default.aspx>

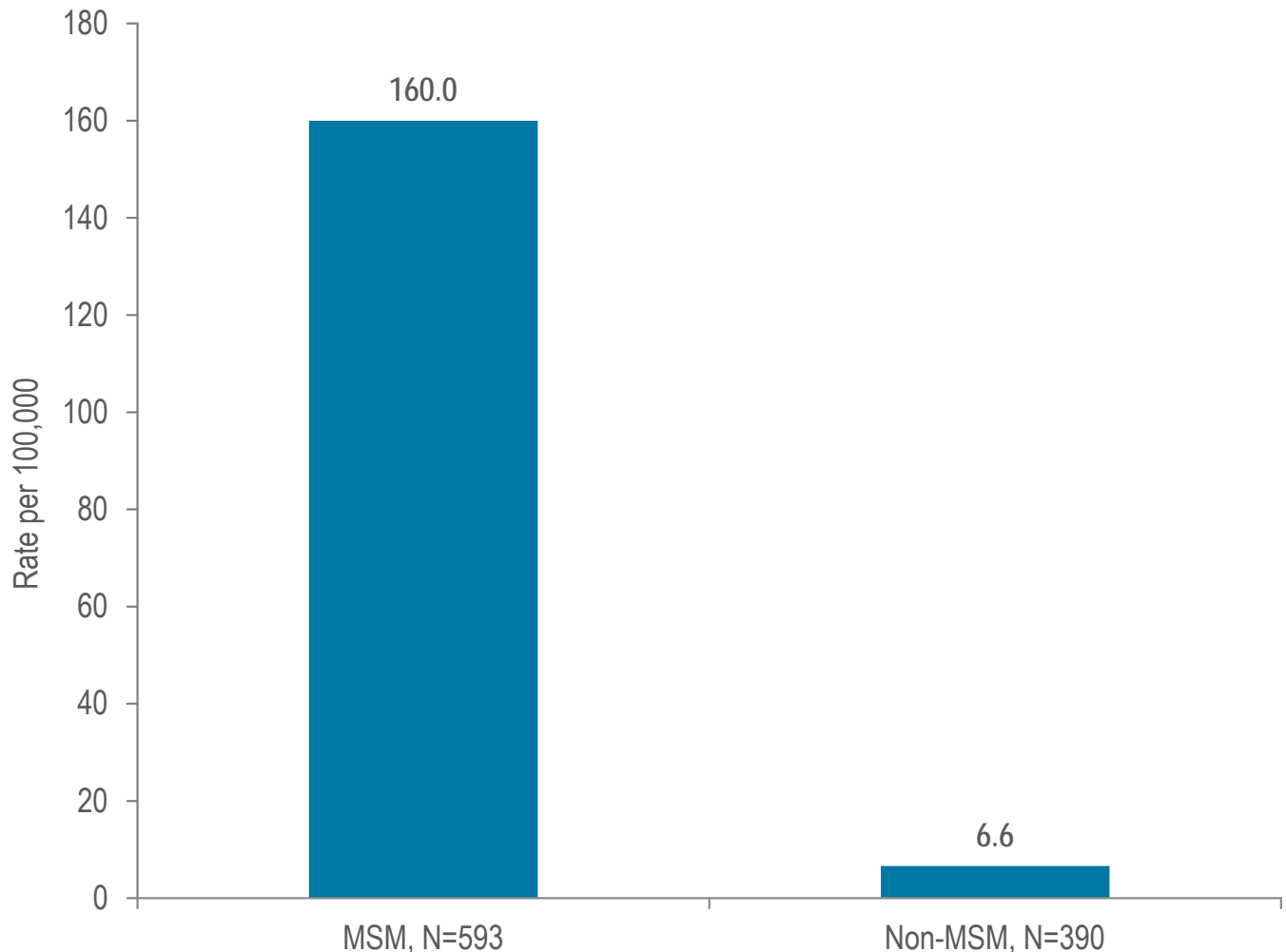
- The Massachusetts Youth Risk Behavior Survey (MYRBS) is performed biennially among a sample of ninth to twelfth grade students.
- From 2011 to 2019,³ there were no significant changes in sexual behaviors reported by respondents to the Massachusetts YRBS.

³ 2019 data are presented because 2021 data were not yet available at the time of publication.

SPECIFIC POPULATIONS - MEN WHO HAVE SEX WITH MEN

HIV DIAGNOSIS RATE PER 100,000

Figure 30. Estimated¹ average annual HIV diagnosis rate per 100,000 population: MSM (men who have sex with men) compared to non-MSM (males) ages 18–64 years: Massachusetts 2019–2021



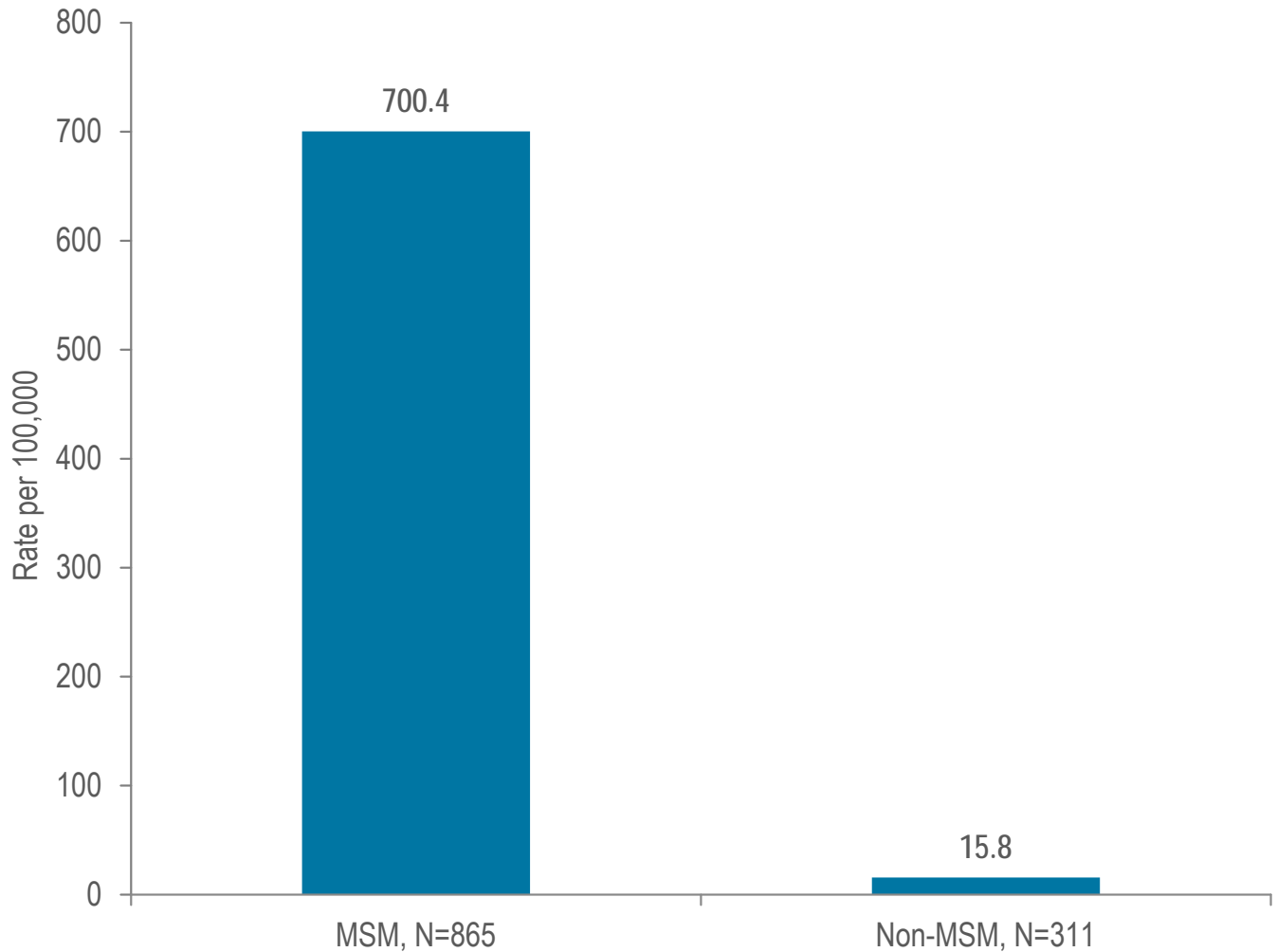
- At 160.0 per 100,000 population (95% confidence interval [CI]: 134.9–200.9 per 100,000), the estimated average rate of HIV diagnosis from 2019 to 2021² among MSM (ages 18–64 years) was 24 times the rate of infection in men who did not report sex with men (6.6 per 100,000 [95% CI: 6.5–6.7 per 100,000]).

¹ Multiple source estimation method for MSM rate (2019–2021 BRFSS, UMDI Interim 2020 Population Estimates by Age, Sex, Race, and Municipality, UMass Donahue Institute Population Estimates Program, March 1, 2022; and MDPH Bureau of Infectious Disease and Laboratory Sciences, data as of 7/1/2022)

² Please consider the impact of the COVID-19 pandemic on infectious disease screening, treatment, and surveillance in the interpretation of 2020 and 2021 data.

MSM - SYPHILIS RATE PER 100,000

Figure 31. Estimated¹ infectious syphilis² rate per 100,000 population: MSM compared to non-MSM (males) ages 18–64 years: Massachusetts 2021



- At 700.4 per 100,000 population (95% confidence interval [CI]: 590.3–879.2 per 100,000), the estimated infectious syphilis rate in 2020³ among MSM (ages 18-64) was 44 times the rate of infection in men who did not report sex with men (15.8 per 100,000 [95% CI: 15.6–16.0 per 100,000]).

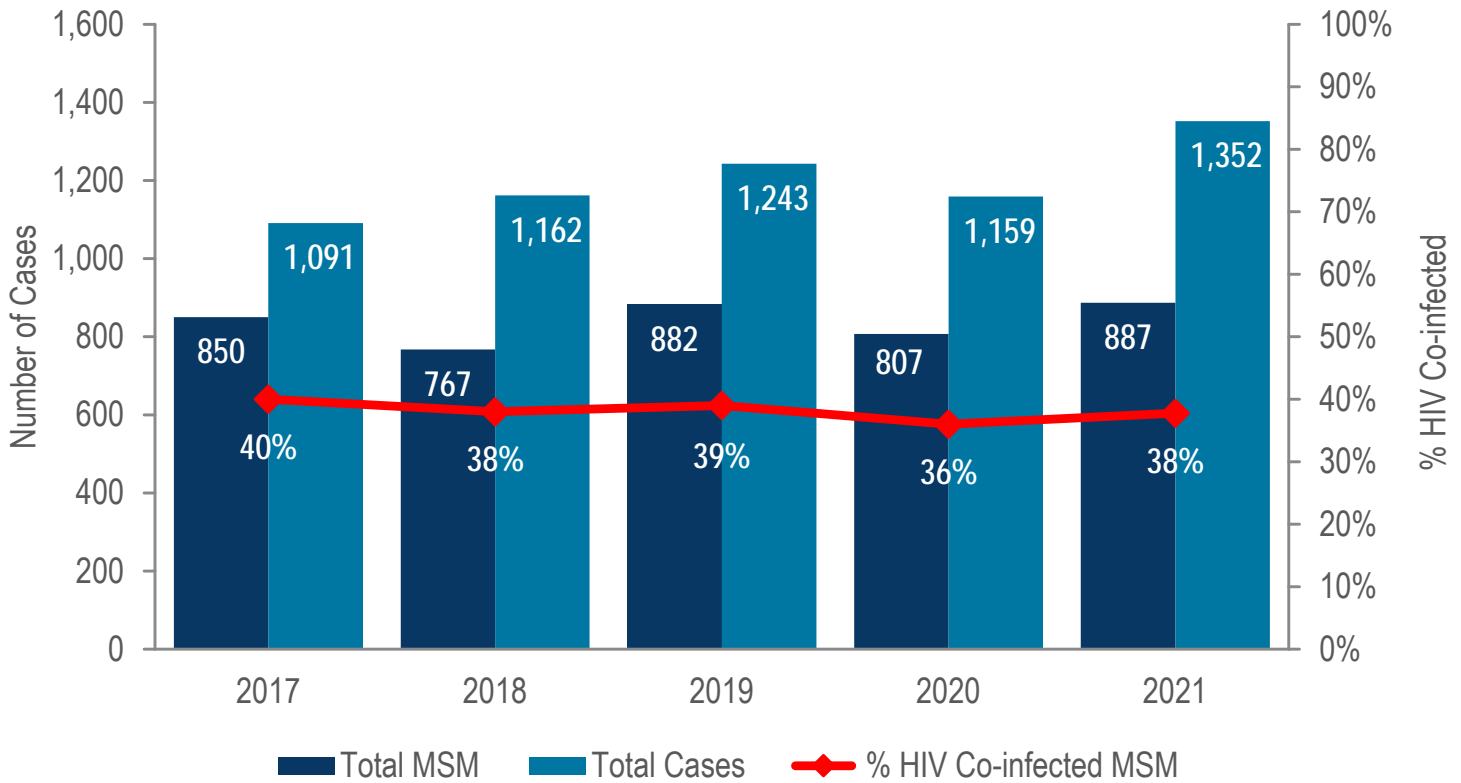
¹ Multiple source estimation method for MSM rate (2019-2021 BRFSS, UMDI Interim 2020 Population Estimates by Age, Sex, Race, and Municipality, UMass Donahue Institute Population Estimates Program, March 1, 2022, and MDPH Bureau of Infectious Disease and Laboratory Sciences, data as of 7/13/2022)

² Infectious syphilis includes diagnoses made in the primary, secondary, and early non-primary non-secondary stages of infection (latent asymptomatic syphilis where infection occurred in the past 12 months).

³ Please consider the impact of the COVID-19 pandemic on infectious disease screening, treatment, and surveillance in the interpretation of 2020 and 2021 data.

MSM - SYPHILIS/HIV CO-INFECTION

Figure 32. Number of confirmed and probable infectious syphilis¹ cases among MSM and the percent of cases among MSM known to ever be co-infected with HIV, Massachusetts 2017–2021



Data Source: Bureau of Infectious Disease and Laboratory Sciences, data are current as of 7/13/2022 and subject to change

- The incidence of syphilis in Massachusetts increased by 24% in the past five years; men who have sex with men represented the majority of cases (66% in 2021).
- In 2021,² 38% (N=335/887) of infectious syphilis cases among men reporting sex with men also self-reported co-infection with HIV.³

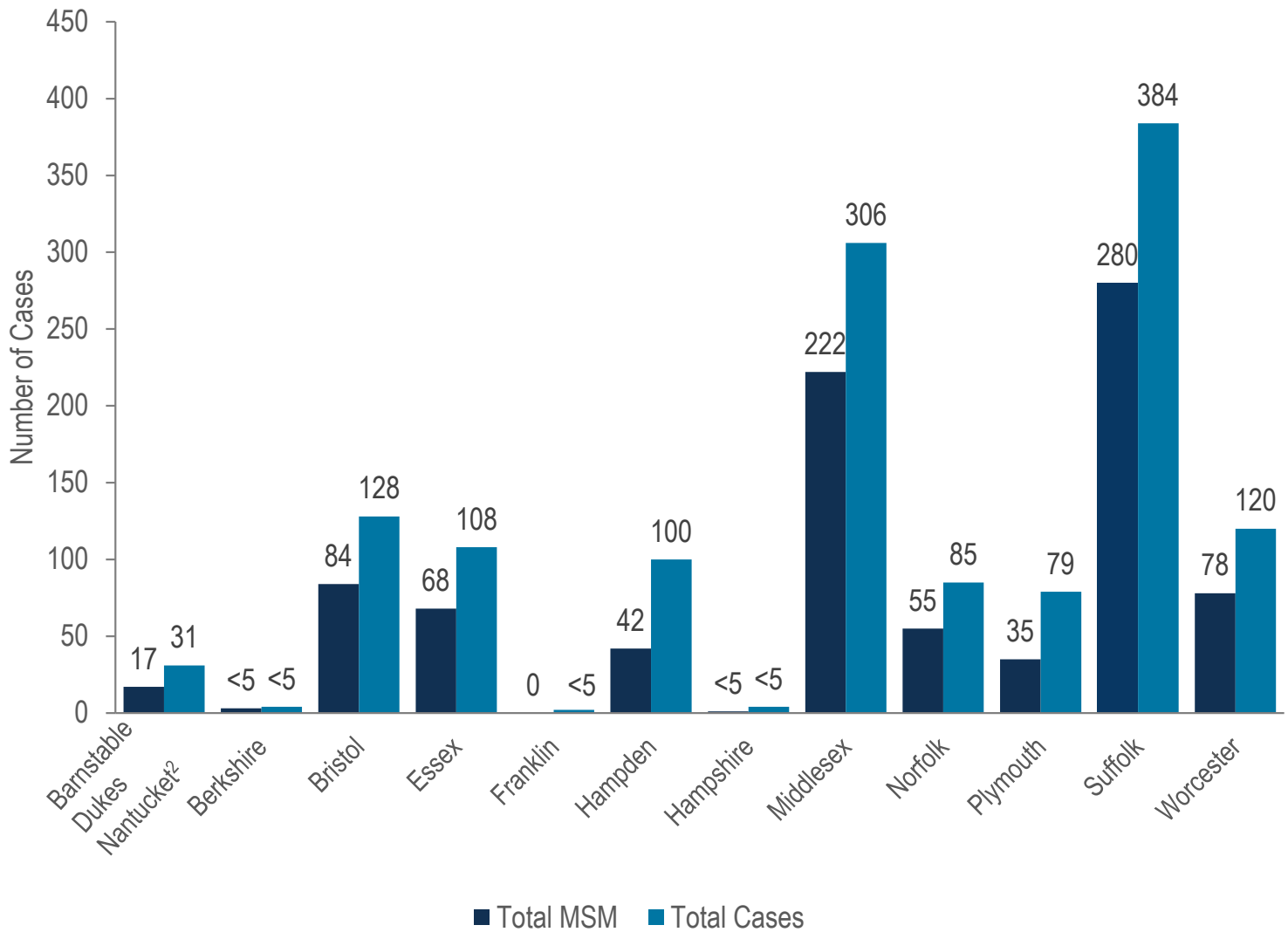
¹ Infectious syphilis includes diagnoses made in the primary, secondary, and early non-primary non-secondary stages of infection (latent asymptomatic syphilis where infection occurred in the past 12 months).

² Please consider the impact of the COVID-19 pandemic on infectious disease screening, treatment, and surveillance in the interpretation of 2020 and 2021 data.

³ Please note that the syphilis/HIV co-infection rate among MSM is based on self-report; not database matching analyses, which were used to calculate HIV/syphilis co-infection rates on page 31 of this report.

MSM - SYPHILIS BY COUNTY

Figure 33. Total number of confirmed and probable infectious syphilis¹ cases and number among MSM by county, Massachusetts 2021



Note: MSM N=885, Other risk N=261, missing risk information N=205, total cases N=1,351 and excludes one case with no reported county of residence. Data Source: Bureau of Infectious Disease and Laboratory Sciences, data are current as of 7/13/2022 and subject to change.

- In 2021,³ the largest proportion of MSM among infectious syphilis cases was reported in Middlesex (73%, N=222/306) and Suffolk counties (73%, N=280/384).

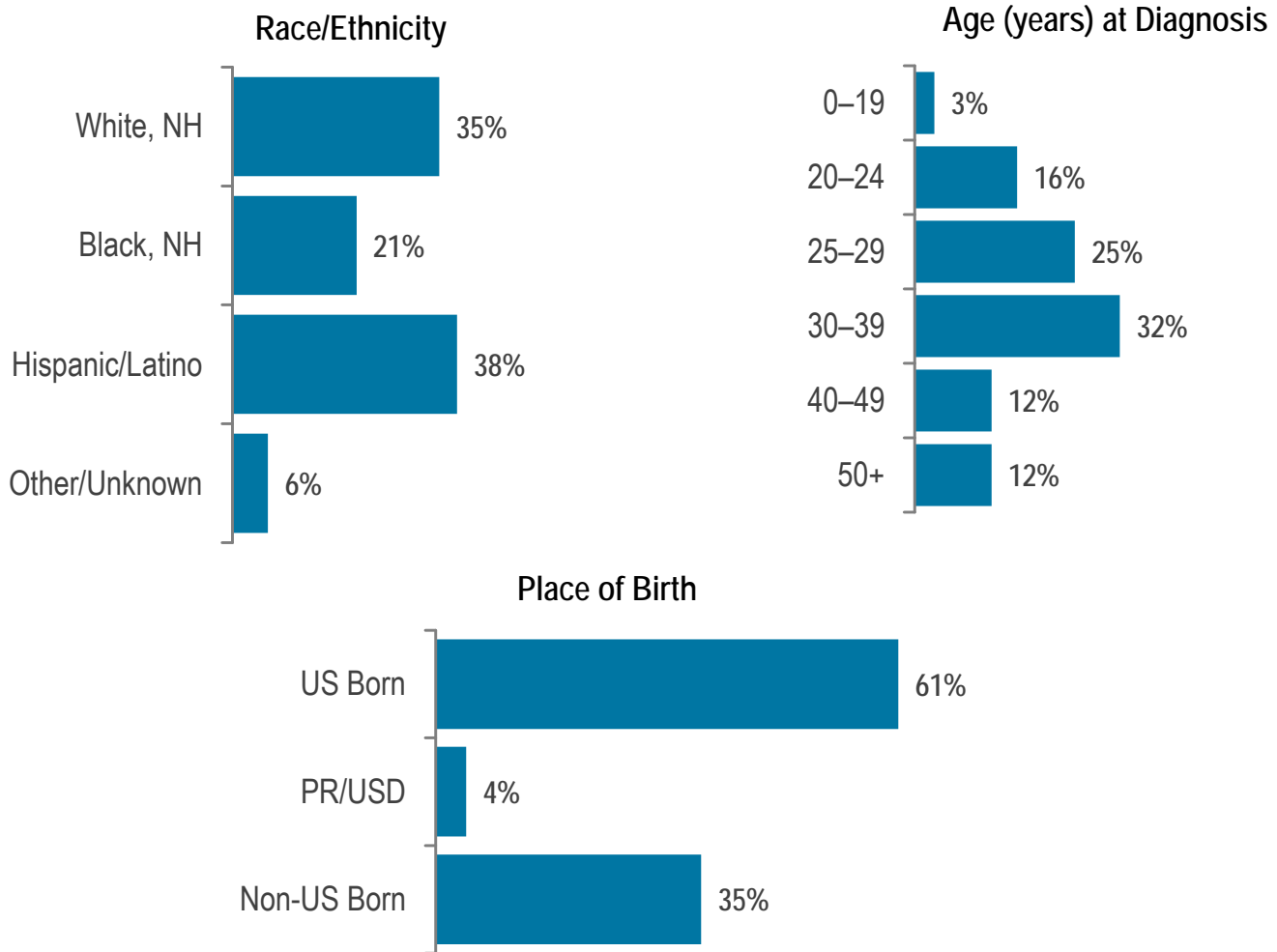
¹ Infectious syphilis includes diagnoses made in the primary, secondary, and early non-primary non-secondary stages of infection (latent asymptomatic syphilis where infection occurred in the past 12 months).

² Barnstable, Dukes and Nantucket Counties are combined because of small numbers.

³ Please consider the impact of the COVID-19 pandemic on infectious disease screening, treatment, and surveillance in the interpretation of 2020 and 2021 data.

MSM - RECENT HIV DIAGNOSES

Figure 34. HIV infection diagnoses among men reporting sex with men by race/ethnicity, age at diagnosis, and place of birth, Massachusetts 2019–2021 (N=555)

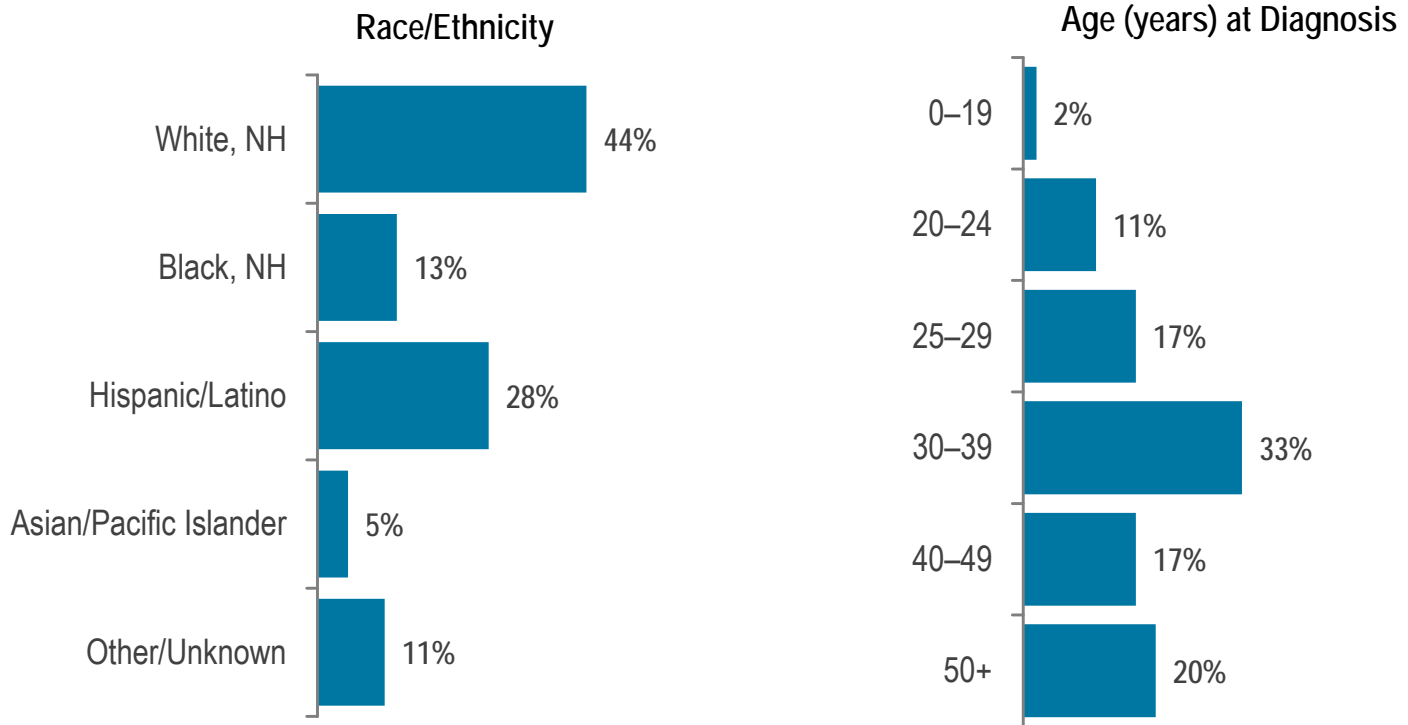


Data Source: Bureau of Infectious Disease and Laboratory Sciences, data are current as of 7/1/2022 and subject to change

- Black (non-Hispanic) and Hispanic/Latino individuals represented 7% and 13% of men in Massachusetts, compared to 21% and 38%, respectively, of men recently diagnosed with HIV infection with MSM exposure mode.
- Individuals with MSM exposure mode newly diagnosed with HIV infection in Massachusetts during 2019 to 2021¹ were predominantly in their twenties or thirties (41% 20–29 year-olds, 32% 30–39 year-olds), Hispanic/Latino (38%) or white (non-Hispanic) (35%), and US born (61%).

¹ Please consider the impact of the COVID-19 pandemic on infectious disease screening, treatment, and surveillance in the interpretation of 2020 and 2021 data.

Figure 35. Confirmed and probable infectious syphilis¹ cases among men reporting sex with men, by race/ethnicity and age, Massachusetts 2021 (N=887)



Data Source: Bureau of Infectious Disease and Laboratory Sciences, data are current as of 7/13/2022 and subject to change

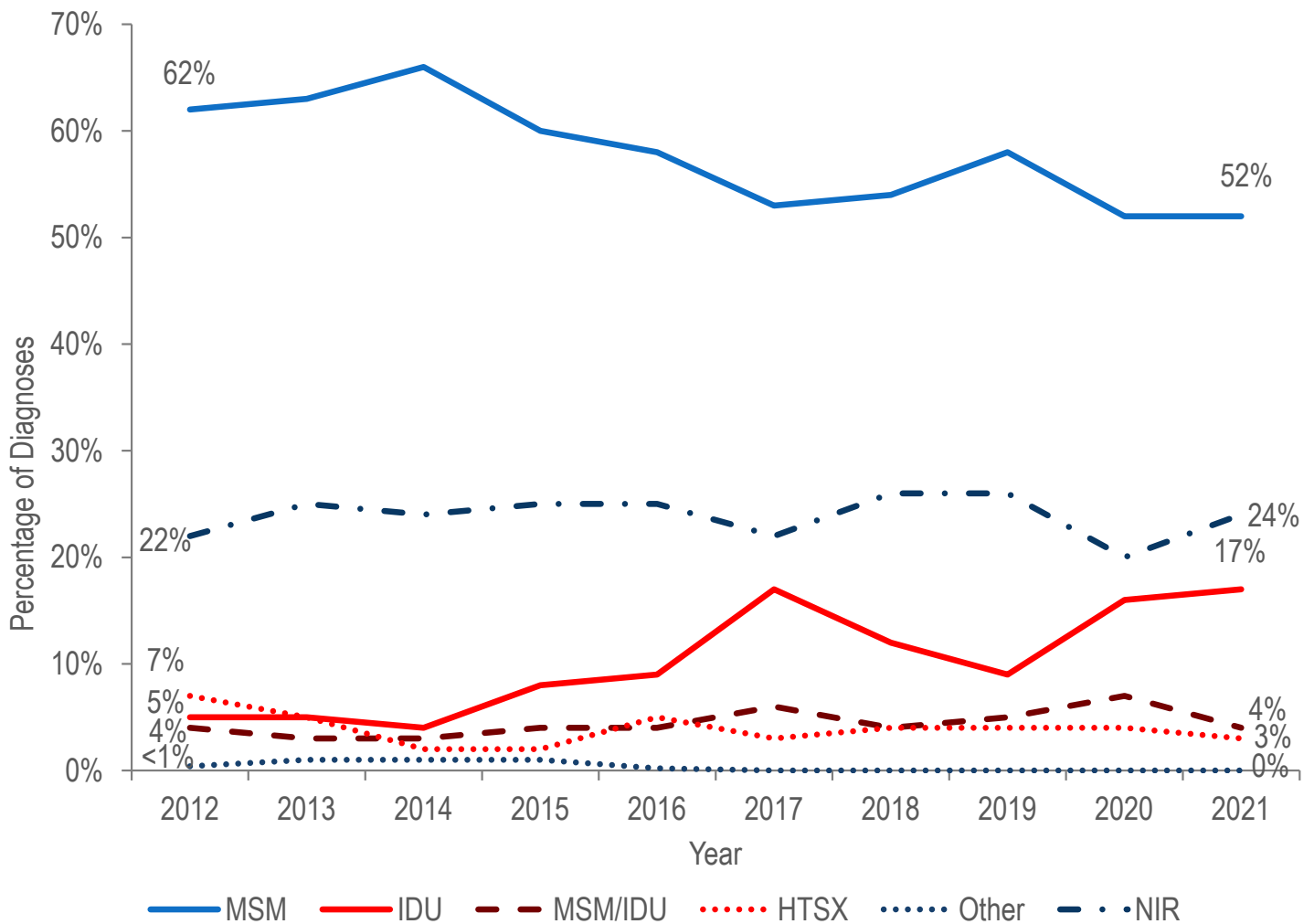
- Black (non-Hispanic) and Hispanic/Latino individuals represented 7% and 13% of men in Massachusetts, compared to 13% and 28%, respectively, of infectious syphilis cases among men reporting sex with men in 2021.
- In 2021,² infectious syphilis cases among men reporting sex with men were predominantly white (non-Hispanic) (44%), and age 30 years and above (70% 30+ year-olds).

¹ Infectious syphilis includes diagnoses made in the primary, secondary, and early non-primary non-secondary stages of infection (latent asymptomatic syphilis where infection occurred in the past 12 months).

² Please consider the impact of the COVID-19 pandemic on infectious disease screening, treatment, and surveillance in the interpretation of 2020 and 2021 data.

TRENDS IN HIV EXPOSURE MODE AMONG MALES

Figure 36. Percentage distribution of individuals assigned male at birth (AMAB) diagnosed with HIV infection by exposure mode, Massachusetts 2012–2021



Data Source: Bureau of Infectious Disease and Laboratory Sciences, data are current as of 7/1/2022 and subject to change

- Among individuals AMAB, the proportion of HIV infection diagnoses with male-to-male sex as the reported mode of exposure remained between 52% and 66% from 2012 to 2021.¹ During the same time period, the proportion reported with no identified risk remained between 20% and 26%.
- The proportion of cases among individuals AMAB attributed to injection drug use increased from 5% in 2015 to a peak of 17% in 2017 and then decreased to 9% in 2019. The increase was primarily due to an outbreak among persons who inject drugs in the northeast part of the state between 2016 and 2018.² Following an intensive and targeted public health response, the number of HIV infection diagnoses attributed to IDU in the northeast decreased. However, in early 2019, a new cluster of HIV infection was identified in Boston among PWID who were experiencing or had experienced recent homelessness, and the proportion of HIV infection diagnoses among AMAB with IDU as the primary exposure increased again to 17% in 2021.³

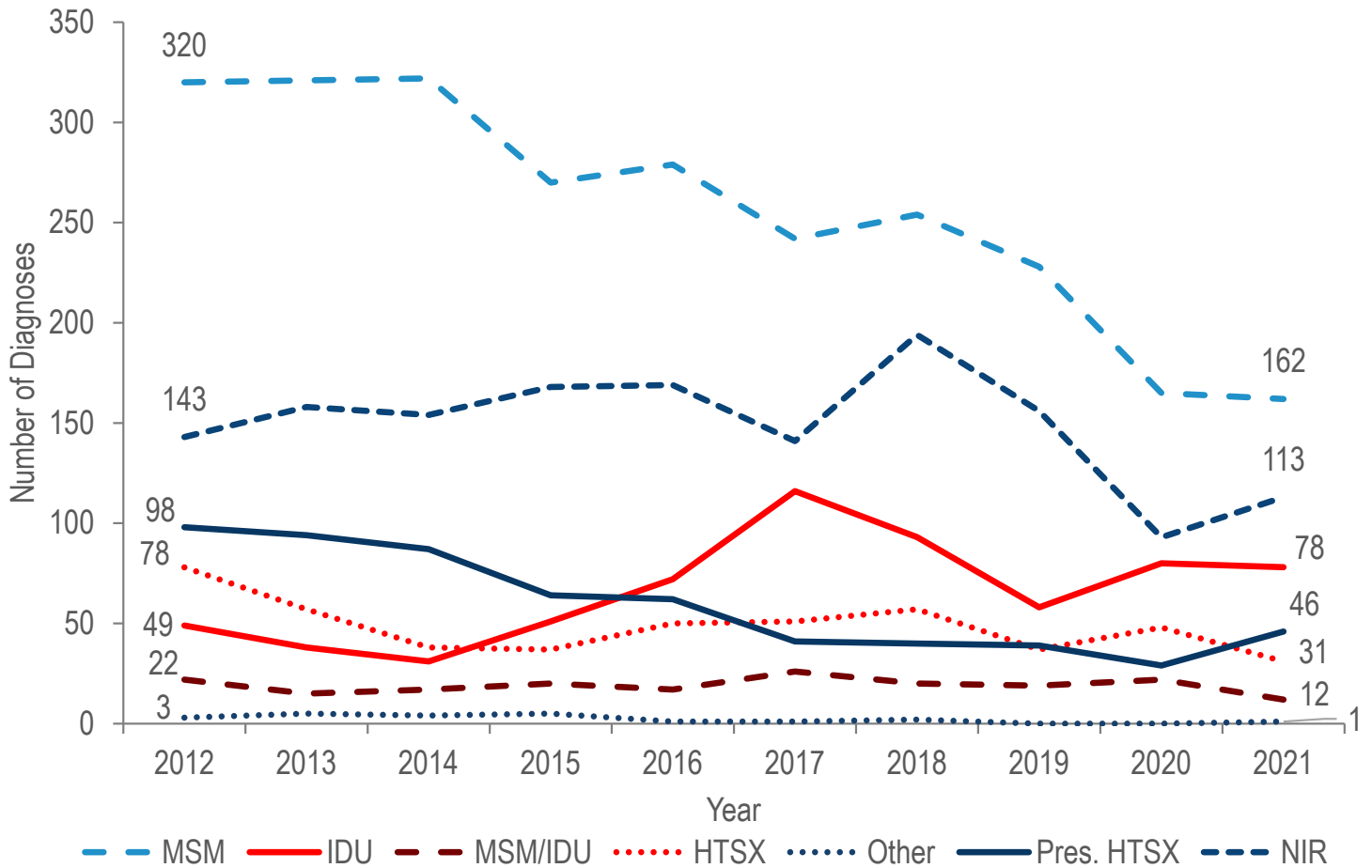
¹ Please consider the impact of the COVID-19 pandemic on infectious disease screening, treatment, and surveillance in the interpretation of 2020 and 2021 data.

² For more information see: Charles Alpren et al. "Opioid Use Fueling HIV Transmission in an Urban Setting: An Outbreak of HIV Infection Among People Who Inject Drugs—Massachusetts, 2015–2018", *American Journal of Public Health* 110, no. 1 (January 1, 2020): pp. 37–44. <https://doi.org/10.2105/AJPH.2019.305366>

³ For more information, see: Joint MDPH and BPHC Clinical Advisory: Increase in newly diagnosed HIV infections among persons who inject drugs in Boston, March 15, 2021, available at: <https://www.mass.gov/doc/joint-mdph-and-bphc-clinical-advisory-hiv-transmission-through-injection-drug-use-in-boston-march-15-2021/download>

SPECIFIC POPULATIONS - PERSONS WHO INJECT DRUGS

Figure 37. Individuals diagnosed with HIV infection by exposure mode, Massachusetts 2012–2021



Data Source: Bureau of Infectious Disease and Laboratory Sciences, data are current as of 7/1/2022 and subject to change

- After declining by 37% from 2012 (N=49) to 2014 (N=31), the number of reported cases with injection drug use (IDU) as the primary exposure mode peaked at 116 in 2017 then decreased to 58 in 2019. The increase was primarily due to an outbreak among persons who inject drugs (PWID) in the northeast part of the state between 2016 and 2018.¹ Following an intensive and targeted public health response, the number of HIV infection diagnoses attributed to IDU in the northeast has decreased.
- However, in early 2019, a new cluster of HIV infection was identified in Boston among PWID who were experiencing or had experienced recent homelessness, and the total statewide number of reported cases with IDU as the primary exposure increased to 78 in 2021.² As of December 31, 2021, a total of 164 cases diagnosed since November 2018 have been investigated and identified as part of the Boston cluster. As it is an active cluster of concern, additional cases will continue to be investigated and added. Emerging trends among those newly diagnosed in the Boston cluster (N=65 cases diagnosed in 2021) include an increase in polysubstance and methamphetamine use.³

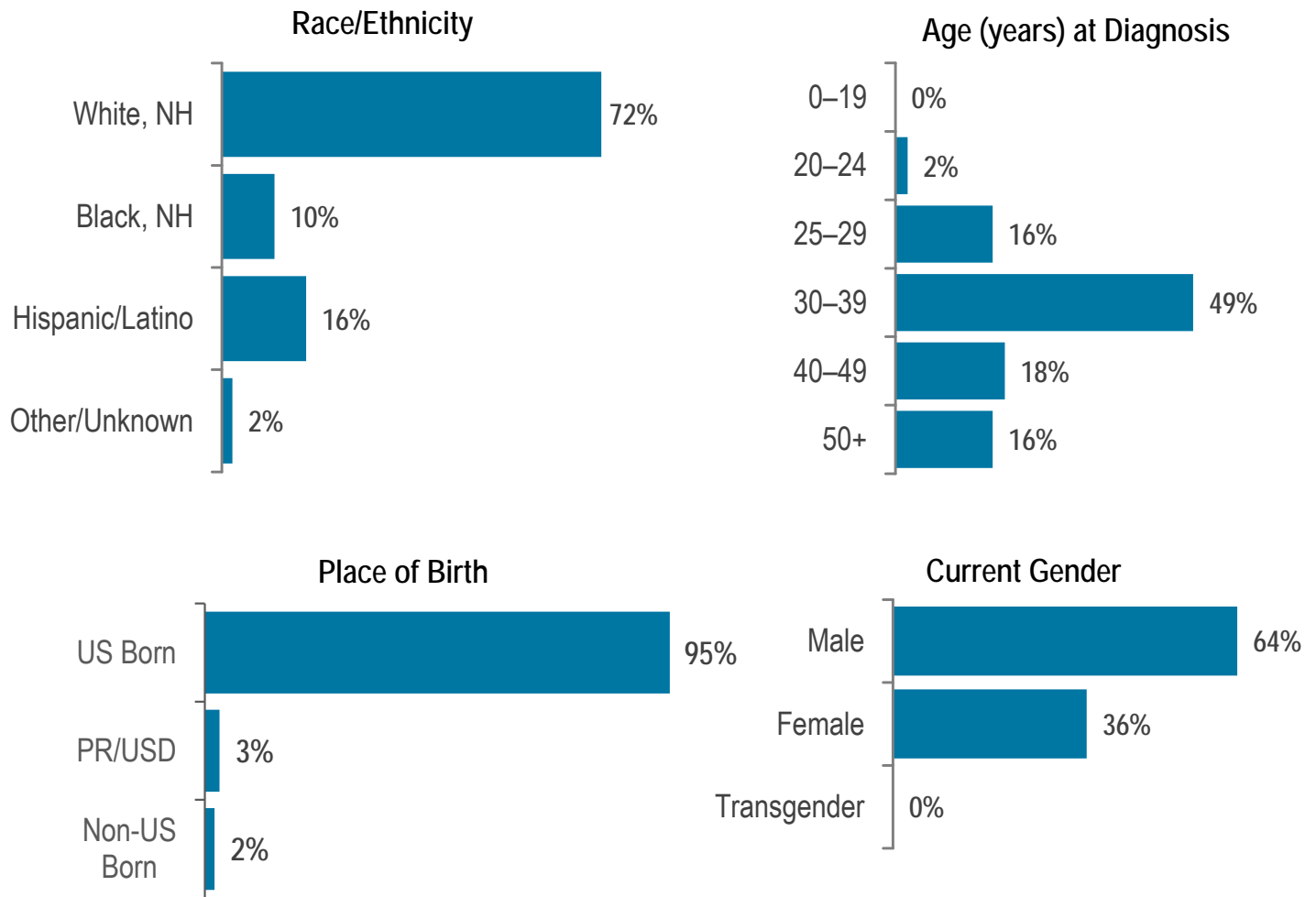
¹ For more information, see: Charles Alpren et al. "Opioid Use Fueling HIV Transmission in an Urban Setting: An Outbreak of HIV Infection Among People Who Inject Drugs—Massachusetts, 2015–2018", *American Journal of Public Health* 110, no. 1 (January 1, 2020): pp. 37-44. <https://doi.org/10.2105/AJPH.2019.305366>

² Please consider the impact of the COVID-19 pandemic on infectious disease screening, treatment, and surveillance in the interpretation of 2020 and 2021 data.

³ For more information, see: Joint MDPH and BPHC Clinical Advisory: Increase in newly diagnosed HIV infections among persons who inject drugs in Boston, March 15, 2021, available at: <https://www.mass.gov/doc/joint-mdph-and-bphc-clinical-advisory-hiv-transmission-through-injection-drug-use-in-boston-march-15-2021/download>

PERSONS WHO INJECT DRUGS - RECENT HIV DIAGNOSES

Figure 38. Percentage of individuals with IDU exposure mode diagnosed with HIV infection by race/ethnicity, age, place of birth and current gender, Massachusetts 2019–2021 (N=216)



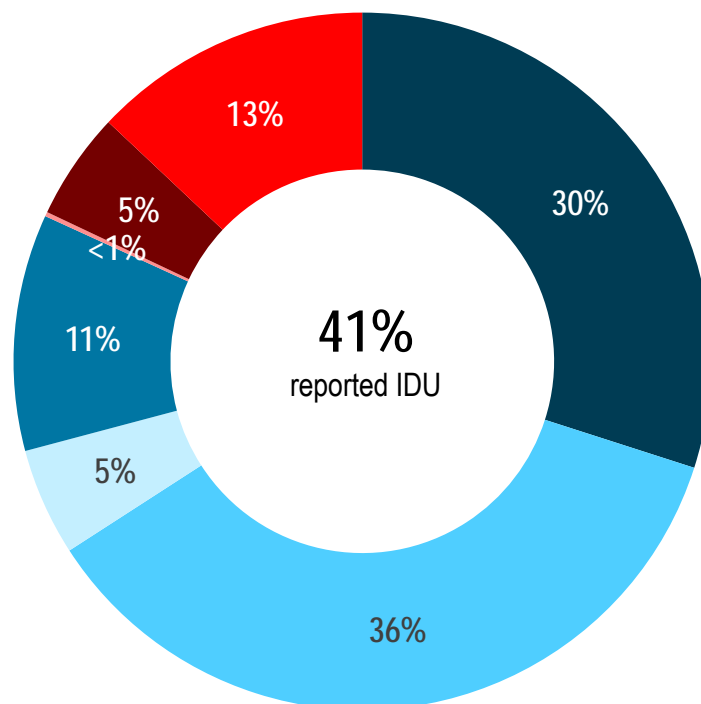
Data Source: Bureau of Infectious Disease and Laboratory Sciences, data are current as of 7/1/2022 and subject to change

- Individuals with IDU exposure mode newly diagnosed with HIV infection in Massachusetts during 2019 to 2021¹ were predominantly white (non-Hispanic) (72%), between 30 and 39 years of age (49%), US born (95%), and male (64%).

¹ Please consider the impact of the COVID-19 pandemic on infectious disease screening, treatment, and surveillance in the interpretation of 2020 and 2021 data.

DEATHS FROM ANY CAUSE AMONG INDIVIDUALS REPORTED WITH HIV BY EXPOSURE MODE

Figure 39. Deaths from any cause among individuals reported with HIV by exposure mode, Massachusetts 2021 (N=279)



■ MSM ■ IDU ■ MSM/IDU ■ HTSX ■ Other ■ Pres. HTSX ■ NIR

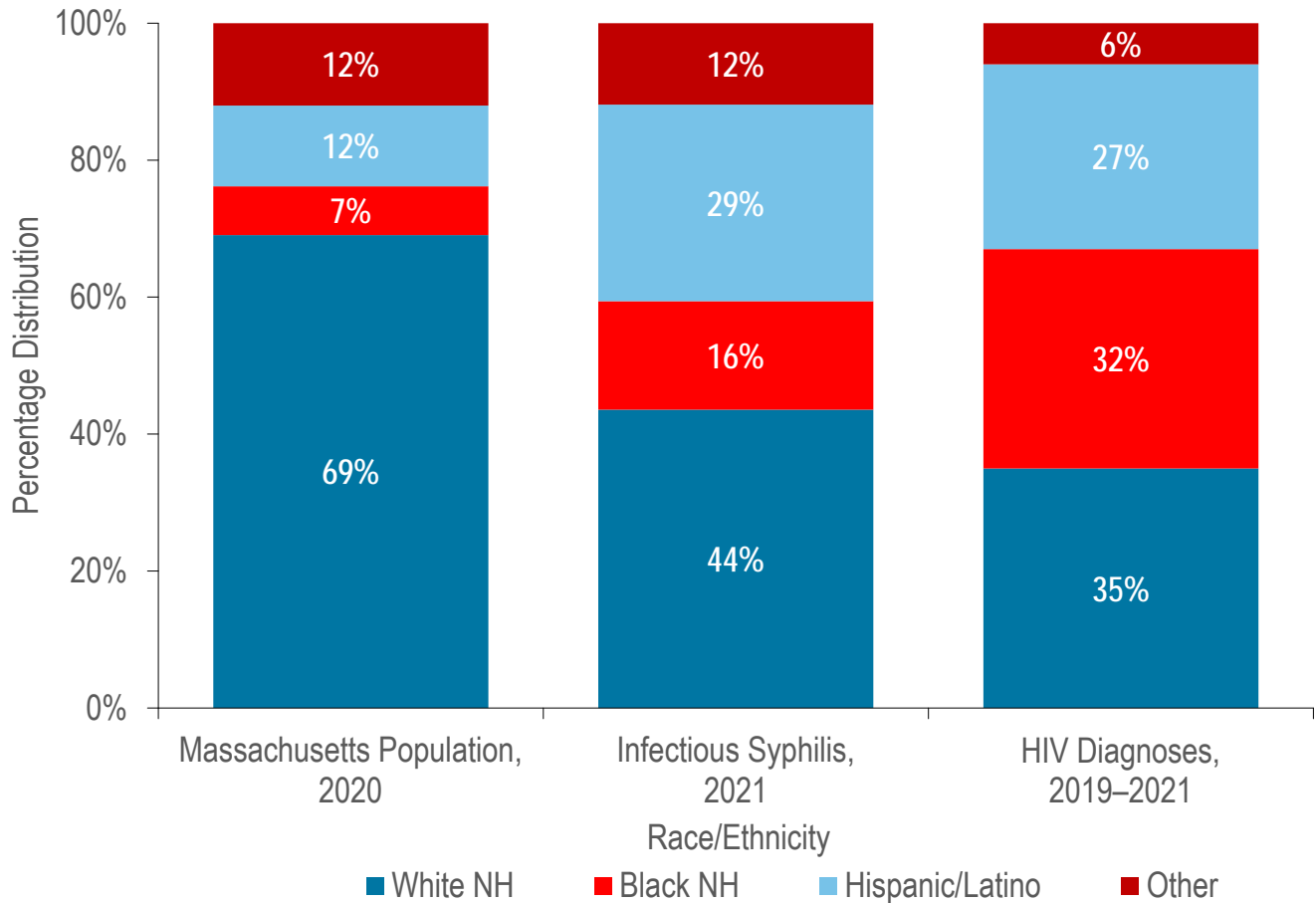
Data Source: Bureau of Infectious Disease and Laboratory Sciences, data are current as of 7/1/2022 and subject to change

- The proportion of deaths from any cause among individuals with HIV with IDU exposure mode decreased from 44% in 2012 to 36% in 2021.¹ At 36%, the proportion among IDU remained the largest among exposure modes in 2021, with an additional 5% reported with an exposure mode of MSM/IDU, compared to 18% and 3%, respectively, of new HIV diagnoses.

¹ Please consider the impact of the COVID-19 pandemic on infectious disease screening, treatment, and surveillance in the interpretation of 2020 and 2021 data.

SPECIFIC POPULATIONS - RACIAL/ETHNIC MINORITIES

Figure 40. Distribution of the general population¹ and of individuals diagnosed with confirmed and probable infectious syphilis² in 2021, and HIV infection during 2019–2021 by race/ethnicity, Massachusetts



Confirmed and Probable Infectious Syphilis 2020, N=1,255 and excludes 97 (7%) cases missing race/ethnicity; HIV Diagnoses 2019-2021, N=1,417
 Data Source: Bureau of Infectious Disease and Laboratory Sciences, HIV data are current as of 7/1/2022, STD data are current as of 7/13/2022 and subject to change

- In 2021,³ black (non-Hispanic) and Hispanic/Latino individuals represented 7% and 12% of the total Massachusetts population and 16% and 29% of infectious syphilis cases (with known race/ethnicity), respectively.
- During 2019 to 2021, black (non-Hispanic) and Hispanic/Latino individuals represented 32% and 27% of individuals diagnosed with HIV infection in Massachusetts, respectively.

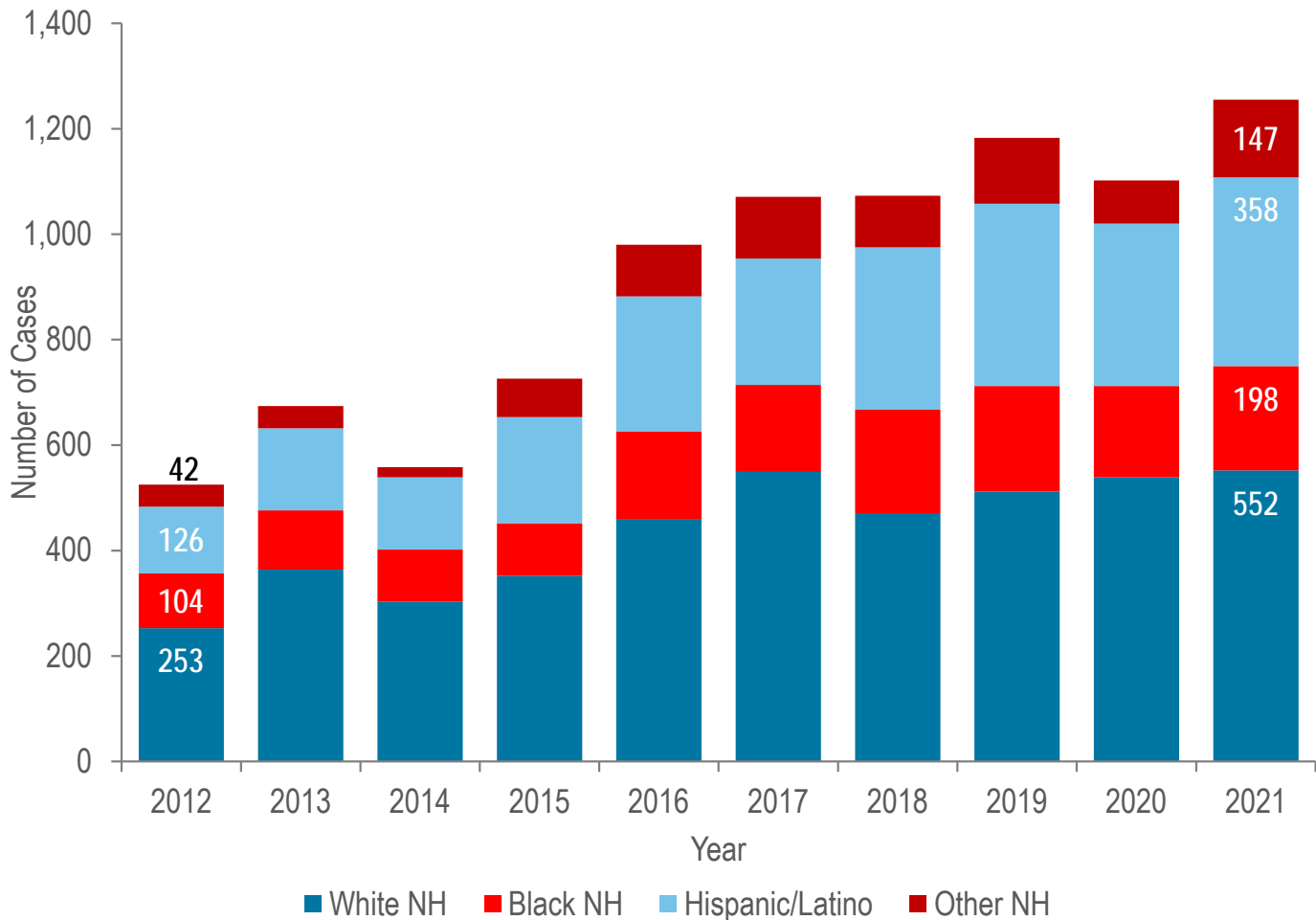
¹ Population Data Source: UMDI Interim 2020 Population Estimates by Age, Sex, Race, and Municipality, UMass Donahue Institute Population Estimates Program, March 1, 2022;

² Infectious syphilis includes diagnoses made in the primary, secondary, and early non-primary non-secondary stages of infection (latent asymptomatic syphilis where infection occurred in the past 12 months).

³ Please consider the impact of the COVID-19 pandemic on infectious disease screening, treatment, and surveillance in the interpretation of 2020 and 2021 data.

SYPHILIS BY RACE/ETHNICITY

Figure 41. Number of confirmed and probable infectious syphilis¹ cases reported by race/ethnicity, Massachusetts 2012–2021



Confirmed and Probable Syphilis 2012-2021 Total N=9,147; 558 (6%) cases missing race/ethnicity are not included in this figure
Data Source: Bureau of Infectious Disease and Laboratory Sciences, data are current as of 7/13/2022 and subject to change

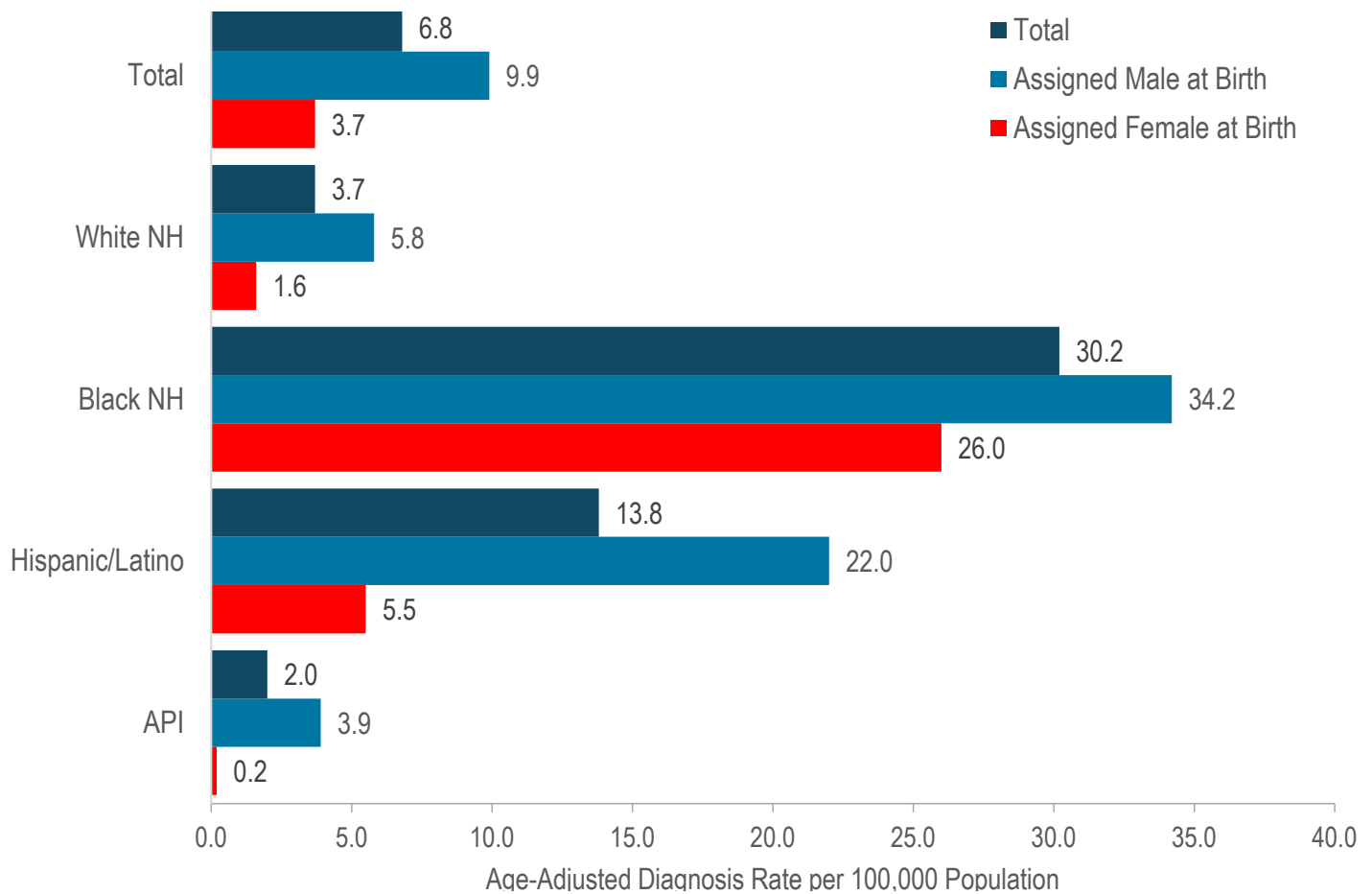
- The greatest number of infectious syphilis cases was among white (non-Hispanic) individuals each year from 2012 to 2021.²
- From 2012 to 2021, the greatest increase in the number of infectious syphilis cases was reported among Hispanic/Latino individuals (nearly tripled from 126 to 358), followed by white (non-Hispanic) (more than doubled from 253 to 552), and black (non-Hispanic) individuals (nearly doubled from 104 to 198).
- In 2021, the age-adjusted infectious syphilis incidence rate among black (non-Hispanic) individuals (35.7 per 100,000) and Hispanic/Latino individuals (38.7 per 100,000) were both three times that of white (non-Hispanic) individuals (11.4 per 100,000).

¹ Infectious syphilis includes diagnoses made in the primary, secondary, and early non-primary non-secondary stages of infection (latent asymptomatic syphilis where infection occurred in the past 12 months).

² Please consider the impact of the COVID-19 pandemic on infectious disease screening, treatment, and surveillance in the interpretation of 2020 and 2021 data.

HIV BY RACE/ETHNICITY

Figure 42. Average annual age-adjusted HIV diagnosis rate per 100,000 population¹ by sex assigned at birth and race/ethnicity, Massachusetts 2019–2021 (N=1,417)



Data Source: Bureau of Infectious Disease and Laboratory Sciences, data are current as of 7/1/2022 and subject to change

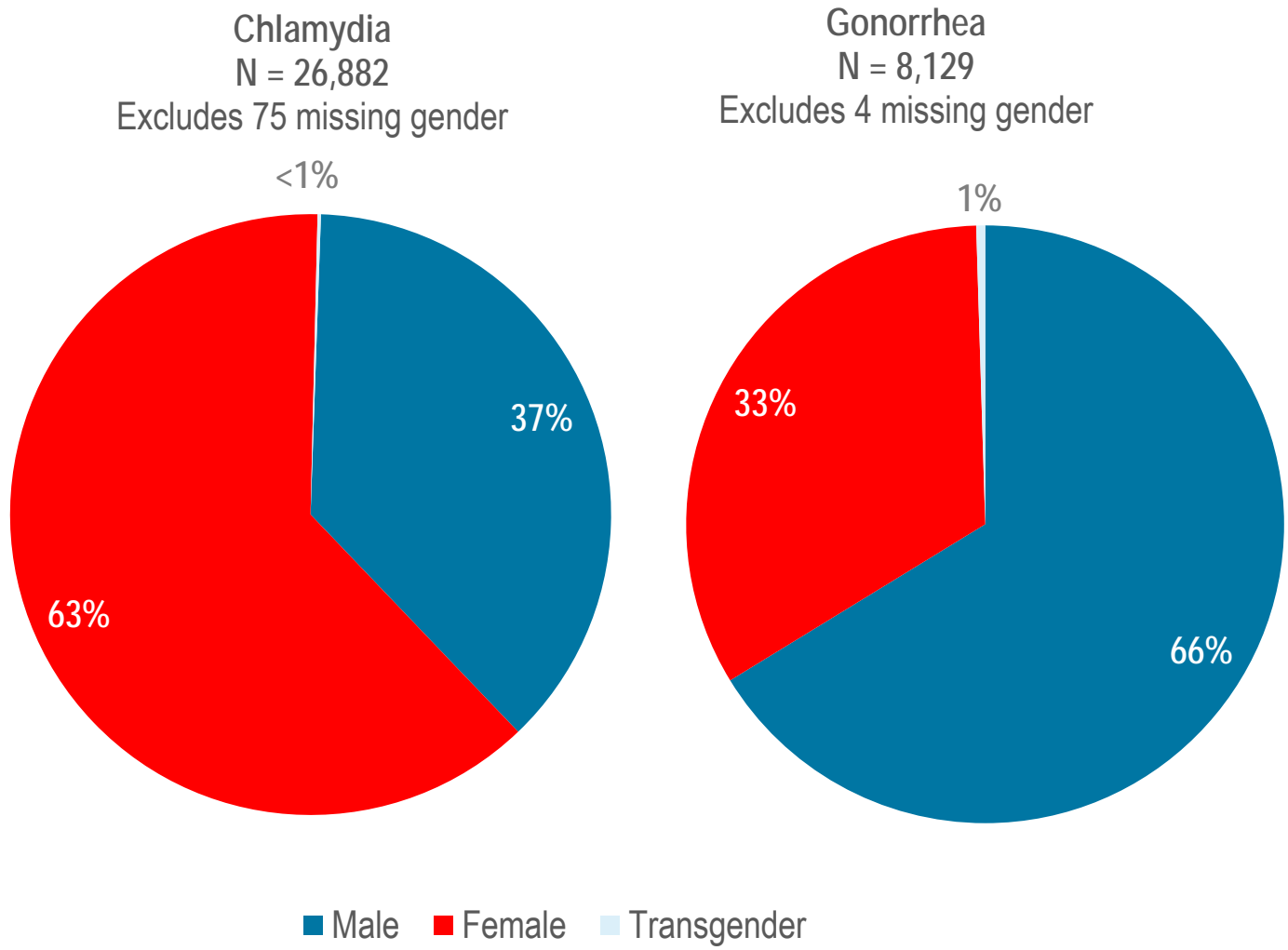
- In 2019–2021,² the average annual age-adjusted HIV diagnosis rate per 100,000 population of individuals assigned male at birth (AMAB) was three times that of individuals assigned female at birth (AFAB). There were large disparities in age-adjusted HIV diagnosis rates by race/ethnicity, the average annual age-adjusted HIV diagnosis rates among:
 - black (non-Hispanic) individuals was eight times that of white (non-Hispanic) individuals,
 - Hispanic/Latino individuals was four times that of white (non-Hispanic) individuals,
 - black (non-Hispanic) individuals AFAB was 16 times that of white (non-Hispanic) individuals AFAB,
 - Hispanic/Latina individuals AFAB was three times that of white (non-Hispanic) individuals AFAB,
 - black (non-Hispanic) individuals AMAB, was six times that of white (non-Hispanic) individuals AMAB, and
 - Hispanic/Latino individuals AMAB was four times that of white (non-Hispanic) individuals AMAB.

¹ As of 1/1/2020, BIDLS calculates rates per 100,000 population using denominators estimated by the University of Massachusetts Donahue Institute: UMDI Interim 2020 Population Estimates by Age, Sex, Race, and Municipality, UMass Donahue Institute Population Estimates Program, March 1, 2022; Note that rates and trends calculated using previous methods cannot be compared to these. All rates are age-adjusted using the 2000 US standard population.

² Please consider the impact of the COVID-19 pandemic on infectious disease screening, treatment, and surveillance in the interpretation of 2020 and 2021 data.

SPECIFIC POPULATIONS - WOMEN AND INFANTS

Figure 43. Distribution of confirmed chlamydia and gonorrhea cases reported by gender, Massachusetts 2021



Data Source: Bureau of Infectious Disease and Laboratory Sciences, data are current as of 7/13/2022 and subject to change

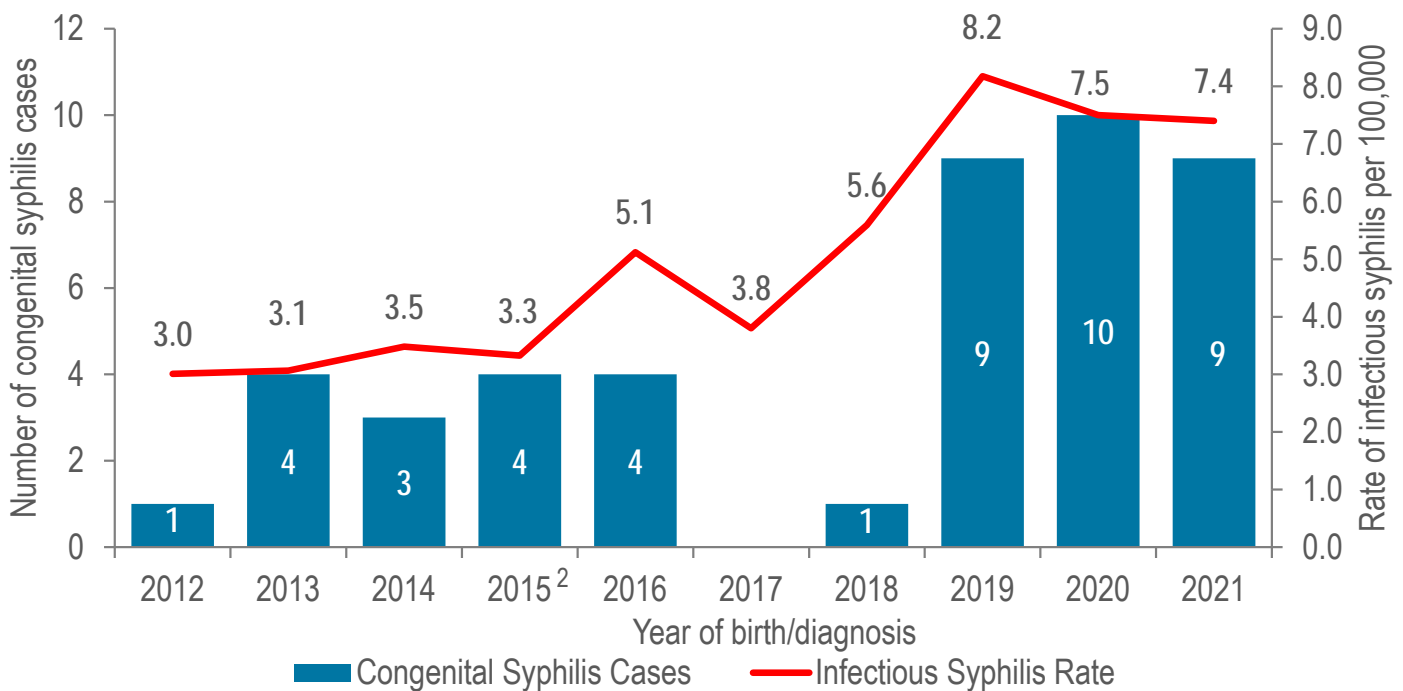
- In 2021,¹ 63% of reported chlamydia cases were among females (N=16,805), 37% were among males (N=10,028), and less than one percent (N=49) was among individuals of transgender experience.
- In 2021, 33% of reported gonorrhea cases were among females (N=2,704), 66% were among males (N=5,386), and one percent (N=39) was among individuals of transgender experience.

¹ Please consider the impact of the COVID-19 pandemic on infectious disease screening, treatment, and surveillance in the interpretation of 2020 and 2021 data.

WOMEN AND INFANTS - CONGENITAL SYPHILIS

Despite close follow-up of cases of syphilis in pregnant patients and their partners, breakthrough cases of congenital syphilis¹ have increased in Massachusetts. Two syphilitic stillbirths and a symptomatic congenital syphilis case were reported to MDPH as of June 30, 2020, with additional cases expected throughout the year. In 2020, MDPH released a recommendation for universal syphilis screening early in the 3rd trimester (around 27–28 weeks gestation), in addition to routine syphilis screening performed at the first prenatal visit. For more information see, Congenital Syphilis Clinical Alert, June 30, 2020, available at <https://www.mass.gov/doc/congenital-syphilis-clinical-alert-6-30-2020/download>

Figure 44. Number of confirmed and probable congenital syphilis cases reported by year of birth and rate of infectious syphilis per 100,000 among women of child-bearing age (15–44 years), Massachusetts 2012–2021



Data Source: Bureau of Infectious Disease and Laboratory Sciences, data are current as of 7/13/2022 and subject to change

- Trends in congenital syphilis typically mirror trends in infectious syphilis among females of child-bearing age. In Massachusetts, as the rate of infectious syphilis among females of child-bearing age remained relatively stable at 7.4 per 100,000 in 2021,³ so too did the number of probable cases of congenital syphilis (N=9).
- Nationally, the preliminary number of congenital syphilis cases reached 2,677 in 2021, with a rate of 74.1 cases per 100,000 live births, the highest rate reported since 1994.⁴

¹ A condition caused by infection in utero with *Treponema pallidum*. A wide spectrum of severity exists, from inapparent infection to severe cases that are clinically apparent at birth. For more information see <http://www.cdc.gov/std/stats/congenitalsyphilisdef-rev-jan-2015.pdf>

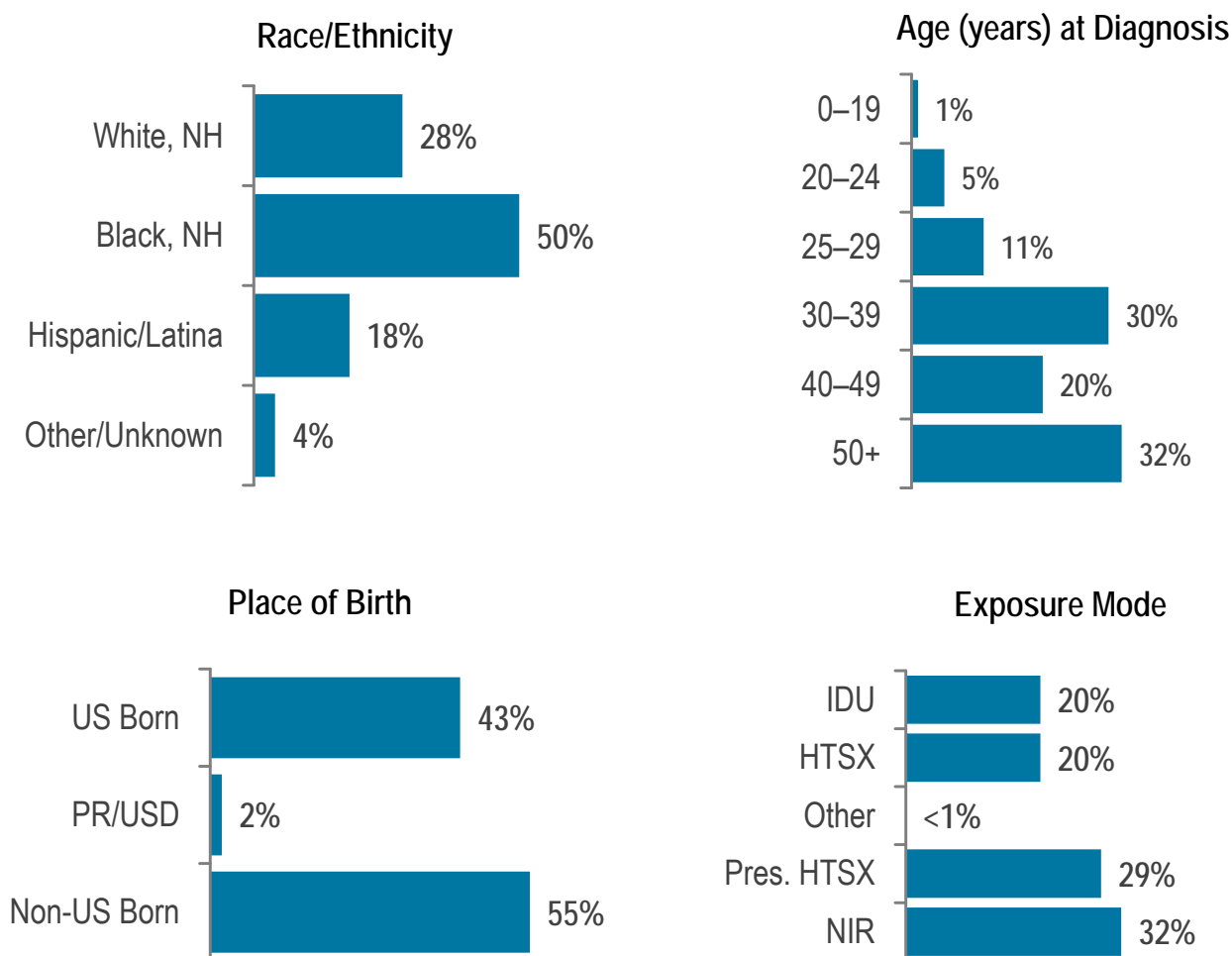
² On January 1, 2015, the congenital case definition was updated to better define treatment and laboratory parameters for classifying cases. From 2019 through 2021, one confirmed cases of congenital syphilis and 6 syphilitic stillbirths were reported. All other reportable cases from 2015 to 2021 met the case definition of probable congenital syphilis which uses the birthing person's treatment adequacy and timing as the primary criteria for this classification status.

³ Please consider the impact of the COVID-19 pandemic on infectious disease screening, treatment, and surveillance in the interpretation of 2020 and 2021 data.

⁴ Centers for Disease Control and Prevention. Trends in Reported Cases and Rates of Reported Cases for Nationally Notifiable STDs, United States, 2017–2021*, available at <https://www.cdc.gov/std/statistics/2021/default.htm>

WOMEN¹ - RECENT HIV DIAGNOSES

Figure 45. Percentage of individuals assigned female at birth and diagnosed with HIV infection by race/ethnicity, age, place of birth, and exposure mode, Massachusetts 2019–2021 (N=396)



Data Source: Bureau of Infectious Disease and Laboratory Sciences, data are current as of 7/1/2022 and subject to change

- Individuals assigned female at birth (AFAB) and newly diagnosed with HIV infection in Massachusetts during 2019–2021² were predominantly black (non-Hispanic) (50%), 30 years of age or older (30% 30–39 year-olds, 20% 40–49 year-olds, 32% 50+ year-olds), with an exposure mode of presumed heterosexual sex (29%). While presumed heterosexual sex was the leading reported exposure mode, a larger percentage of new HIV diagnoses were reported with no identified risk (NIR) (32%).
- Among individuals AFAB, the proportion of HIV infection diagnoses with IDU exposure mode increased from 7% (N=12/165) in 2014 to 25% (N=40/161) in 2017, and then remained between 17% (2019, N=24/141) and 23% (2020, N=28/121) from 2018 through 2021.

¹ Recent HIV diagnoses among women include 396 individuals assigned female sex at birth. Data included reflect sex assigned at birth and therefore not gender identity or gender expression of individuals of transgender experience (N=14 individuals of transgender experience diagnosed with HIV infection from 2019 – 2021).

² Please consider the impact of the COVID-19 pandemic on infectious disease screening, treatment, and surveillance in the interpretation of 2020 and 2021 data.

STRENGTHS AND LIMITATIONS OF DATA

	HIV	STD	Viral Hepatitis
Description	<ul style="list-style-type: none"> HIV, STD, and Viral Hepatitis data are: <ul style="list-style-type: none"> Collected by MDPH Bureau of Infectious Disease and Laboratory Sciences Reported statewide Required by state law to be reported by all laboratories and healthcare providers 		
	<ul style="list-style-type: none"> New HIV diagnoses include only individuals who were first diagnosed in Massachusetts. HIV prevalence data include all individuals who were reported as residing in Massachusetts regardless of where they were first diagnosed. 	<ul style="list-style-type: none"> Includes individuals first reported as living in MA. 	<ul style="list-style-type: none"> Includes individuals first reported as living in MA.
Strengths	<ul style="list-style-type: none"> Completeness of race/ethnicity data is high. All clinical laboratories in MA report electronically resulting in more complete and timely reporting of disease. Data are estimated to be 99% complete. 	<ul style="list-style-type: none"> All clinical laboratories in MA report electronically resulting in more complete and timely reporting of disease. Most infectious syphilis cases agree to interview, resulting in reasonably complete race/ethnicity and sex of sex partner data. 	<ul style="list-style-type: none"> All clinical laboratories in MA report electronically resulting in more complete and timely reporting of disease.
Limitations	<ul style="list-style-type: none"> 2021 HIV prevalence data as of 7/1/2022 are preliminary. 	<ul style="list-style-type: none"> Race/ethnicity data are incomplete for gonorrhea (missing for 38% of 2021 cases) and chlamydia (missing for 45% of 2021 cases). Sex of sex partner is not routinely collected for gonorrhea and chlamydia cases. Bias is introduced for some STDs, such as chlamydia infection, where screening of asymptomatic persons occurs more frequently among women than among men. 	<ul style="list-style-type: none"> Race/ethnicity data are incomplete. Risk history data are not collected on chronic HBV cases.

Massachusetts Youth Risk Behavior Survey

Description	The Massachusetts Youth Risk Behavior Survey (MYRBS) is conducted every two years through a collaborative effort between the Massachusetts Department of Elementary and Secondary Education (DESE) and Department of Public Health (DPH) to monitor health indicators, behaviors, and risk factors contributing to the leading causes of morbidity, mortality, and social and academic problems among adolescents. For more information, see https://www.mass.gov/lists/massachusetts-youth-health-survey-myhs
Strengths	A two-stage sampling method is used to produce representative samples of students in grades 9 – 12. Response rates are high.
Limitations	All data collected for the MYRBS and the MYHS are based on self-report from students. Self-reported data may be subject to error for several reasons, including inaccurate recall of events.

INTERPRETING HIV, STD, AND VIRAL HEPATITIS DATA

Hepatitis A outbreak surveillance data are current as of May 29, 2020, hepatitis B surveillance data are current as of October 14, 2021, hepatitis C data are as of November 19, 2021, HIV data are as of February 1, 2021, and STD data are as of November 4, 2021. All data are subject to change.

I. HIV Primary Exposure Mode Definitions

The HIV primary exposure mode indicates the most probable exposure associated with HIV infection.

Assignment of primary exposure mode is done in accordance with Centers for Disease Control and Prevention (CDC) guidelines when multiple exposure modes are reported. Although the reported primary exposure mode is the most likely mode of transmission, there is always the possibility that it is not the actual mode of transmission. Following is a description of the exposure mode categories:

- **MSM (Male-to-Male Sex):** Includes all individuals assigned male at birth who report any sexual contact with other individuals that identify as male. Please note that in accordance with CDC guidelines, this category is defined by an individual's assigned sex at birth and not an individual's current gender identity.
 - **Sex with Men:** This exposure mode category is used by the Bureau of Infectious Disease and Laboratory Sciences (BIDLS) to categorize sexual risk in transgender women reporting sex with men only. For the purposes of official reporting in the MA HIV Surveillance System and to CDC, exposure mode for transgender women is based on sex assigned at birth, and therefore would be reported as male-to-male sex.
- **IDU (Injection Drug Use):** Cases among persons who report injection drug use.
- **MSM/IDU:** Includes all individuals assigned male at birth who report both injection drug use and any sexual contact with other individuals that identify as male.
 - **Sex with Men/IDU:** This exposure mode category is used by BIDLS to categorize sexual risk in transgender women reporting both sex with men and injection drug use. For the purposes of official reporting in the MA HIV Surveillance System and to CDC, exposure mode for transgender women is based on sex assigned at birth, and therefore would be reported as MSM/IDU.
- **Heterosexual Sex:** Cases among persons who report heterosexual sex with a person diagnosed with, or at increased risk for, HIV infection (e.g., a PWID). The sub-categories for this mode of transmission are listed below.
 - Heterosexual Sex w/ a person who injects drugs
 - Heterosexual Sex w/ a person diagnosed w/ HIV infection or AIDS
 - Heterosexual Sex w/ a bisexual male
 - Other Heterosexual Sex: Includes all other sub-categories of heterosexual risk, such as heterosexual contact with a person infected through a blood transfusion.
- **Other:** Cases among persons with other known exposure modes, including receipt of clotting factor, receipt of transfusion or transplant, and person-to-child transmission through pregnancy, childbirth, or breastfeeding (perinatal transmission).

INTERPRETING HIV, STD, AND VIRAL HEPATITIS DATA

- **Presumed Heterosexual:** The presumed heterosexual risk category is used by BIDLS exclusively for individuals assigned female at birth to identify HIV exposure mode when sex with individuals that identify as male was the only reported risk factor, there was no evidence of current or past injection drug use (IDU), and behavioral risk and HIV status information about sexual partners that identify as male was unknown. The rationale for the application of the presumed heterosexual risk category to individuals assigned female at birth only has been addressed in the MDPH Office of HIV report “Intersecting Risks: HIV Infection among Heterosexual Women and Men in Massachusetts” (2010).
- **NIR (No Identified Risk):** Cases among persons with no reported history of exposure to HIV through any of the listed exposure categories. Follow-up is conducted to determine exposure for those cases that are initially reported without an exposure mode identified. Includes cases among individuals assigned male at birth who were previously categorized in Massachusetts as Presumed Heterosexual.

II. References to Newly Diagnosed HIV Infections

Due to the extensive follow up required to verify accurate date of diagnosis, all HIV data reflect HIV infections diagnosed through 2021. Newly diagnosed HIV infections/cases include all persons diagnosed with HIV from 2019 to 2021, including those who were concurrently or subsequently diagnosed with AIDS. All HIV data are presented by the year of diagnosis, not the year of report.

III. Race/Ethnicity of STD and HIV Cases

Race/ethnicity references to white residents and black residents represent persons who are white (non-Hispanic) and black (non-Hispanic), respectively. All references to Hispanic/Latino for race/ethnicity represent persons of Hispanic/Latino heritage regardless of race.

IV. STD Case Reports and Analyses

All information on STD cases reflects year of report. As of 1/1/2020, BIDLS calculates rates per 100,000 population using denominators estimated by the University of Massachusetts Donahue Institute using a modified Hamilton-Perry model. 2019 population estimates were used for single-year rates; for pooled year rates (i.e., 2017-2019), the 2019 population estimates were multiplied by three. For more information, see: Strate S, et al. Small Area Population Estimates for 2011 through 2020, report published Oct 2016, and <http://www.donahue.umassp.edu/business-groups/economic-public-policy-research/massachusetts-population-estimates-program>. When the proportion of STD cases with unknown values is greater than or equal to 30%, incidence trends are not presented by that variable. For instance, race/ethnicity is unknown for 50% of confirmed chlamydia cases and 34% of confirmed gonorrhea cases reported from 2011 to 2020. Therefore, the number of confirmed chlamydia and gonorrhea cases by race/ethnicity are not presented in this report.

V. Cell suppression methodology:

Values less than five are suppressed for denominator populations less than 50,000 or for unknown values. Additional values may be suppressed to prevent back calculation. Values less than five are not suppressed for compound categories (categories containing two or more subcategories, such as other/undetermined) because the exact population value of each subcategory cannot be determined.

HIV, STD, AND VIRAL HEPATITIS CASE CLASSIFICATIONS

In the time period of the data in this report

HIV infection

Clinical description: HIV (human immunodeficiency virus) is a retrovirus with two serologically and geographically distinct species: HIV-1 and HIV-2. It is spread via person-to-person transmission through sexual contact, the use of HIV-contaminated needles and syringes, vertical transmission from mother to infant, or the transfusion of contaminated blood or its components. HIV attacks the body's immune system, making the individual more likely to acquire infections or develop infection-related cancers. These opportunistic infections or cancers take advantage of the "opportunity" of a weakened immune system and may be one signal that the person has an AIDS diagnosis (acquired immunodeficiency syndrome), the advanced stage of HIV infection.

Case Classification

Confirmed: Positive HIV-1, Positive HIV-2, or Positive (Undifferentiated) HIV result from a differentiating immunoassay, Western Blot, IFA, or culture; Positive/Detected Qualitative HIV NAT (DNA or RNA); Quantitative HIV NAT (detectable viral load assay) or physician verified diagnosis.

Sexually transmitted diseases (STD)

Chlamydia trachomatis Infection (Effective 1/10)

Clinical description

Infection with *Chlamydia trachomatis* may result in urethritis, epididymitis, cervicitis, acute salpingitis, or other syndromes when sexually transmitted; however, the infection is often asymptomatic in women. Perinatal infections may result in inclusion conjunctivitis and pneumonia in newborns. Other syndromes caused by *C. trachomatis* include lymphogranuloma venereum (see Lymphogranuloma Venereum) and trachoma.

Laboratory criteria for diagnosis

Isolation of *C. trachomatis* by culture or

Demonstration of *C. trachomatis* in a clinical specimen by detection of antigen or nucleic acid

Case classification

Confirmed: a case that is laboratory confirmed.

Gonorrhea (Effective 1/14)

Clinical description

A sexually transmitted infection commonly manifested by urethritis, cervicitis, proctitis, salpingitis, or pharyngitis. Infection may be asymptomatic.

Laboratory criteria for diagnosis

Observation of gram-negative intracellular diplococci in a urethral smear obtained from a male or an endocervical smear obtained from a female, or

Isolation of typical gram-negative, oxidase-positive diplococci by culture (presumptive *Neisseria gonorrhoeae*) from a clinical specimen, or

Demonstration of *N. gonorrhoeae* in a clinical specimen by detection of antigen or nucleic acid

Case classification

Probable: demonstration of gram-negative intracellular diplococci in a urethral smear obtained from a male or an endocervical smear obtained from a female.

Confirmed: a person with laboratory isolation of typical gram-negative, oxidase-positive diplococci by culture (presumptive *N. gonorrhoeae*) from a clinical specimen, or demonstration of *N. gonorrhoeae* in a clinical specimen by detection of antigen or detection of nucleic acid via nucleic acid amplification (e.g., polymerase chain reaction [PCR]) or hybridization with a nucleic acid probe.

Syphilis

Syphilis is a complex sexually transmitted disease that has a highly variable clinical course. Adherence to the following surveillance case definitions will facilitate understanding the epidemiology of this disease across the US.

Syphilis, primary (2014)

Clinical description

A stage of infection with *Treponema pallidum* characterized by one or more ulcerative lesions (e.g. chancre), which might differ considerably in clinical appearance.

Laboratory criteria for diagnosis

Demonstration of *T. pallidum* in clinical specimens by darkfield microscopy, or by PCR or equivalent direct molecular methods.

Case classification

Probable: a case that meets the clinical description of primary syphilis with a reactive serologic test (nontreponemal: Venereal Disease Research Laboratory [VDRL], rapid plasma reagin [RPR], or equivalent serologic methods; treponemal: fluorescent treponemal antibody absorbed [FTA-ABS], *T. pallidum* particle agglutination [TP-PA], enzyme immunoassay [EIA], chemiluminescence immunoassay [CIA], or equivalent serologic methods). These treponemal tests supersede older testing technologies, including microhemagglutination assay for antibody to *T. pallidum* [MHA-TP].

Confirmed: a case that meets the clinical description of primary syphilis that is laboratory confirmed.

Syphilis, primary (2018)

Clinical description

A stage of infection with *Treponema pallidum* characterized by one or more ulcerative lesions (e.g. chancre), which might differ considerably in clinical appearance.

Laboratory criteria for diagnosis

Confirmatory:

- Demonstration of *T. pallidum* by darkfield microscopy in a clinical specimen that was not obtained from the oropharynx and is not potentially contaminated by stool, OR
- Demonstration of *T. pallidum* by polymerase chain reaction (PCR) or equivalent direct molecular methods in any clinical specimen.

Supportive:

- A reactive nontreponemal serologic test (VDRL, RPR, or equivalent serologic methods), OR
- A reactive treponemal serologic test (TP-PA, EIA, CIA, or equivalent serologic methods).*

* These treponemal tests supersede older testing technologies, including MHA-TP.

Case classification

Probable: A case that meets the clinical description of primary syphilis and the supportive laboratory criteria.

Confirmed: A case that meets the clinical description of primary syphilis and the confirmatory laboratory criteria.

Syphilis, secondary (2014)

Clinical description

A stage of infection caused by *T. pallidum* characterized by localized or diffuse mucocutaneous lesions (e.g., rash – such as non-pruritic macular, maculopapular, papular, or pustular lesions), often with generalized lymphadenopathy. Other symptoms can include mucous patches, condyloma lata, and alopecia. The primary ulcerative lesion may still be present. Because of the wide array of symptoms possibly indicating secondary syphilis, serologic tests for syphilis and a thorough sexual history and physical examination are crucial to determining if a case should be classified as secondary syphilis.

Laboratory criteria for diagnosis

Demonstration of *T. pallidum* in clinical specimens by darkfield microscopy, or by PCR or equivalent direct molecular methods.

HIV, STD, AND VIRAL HEPATITIS CASE CLASSIFICATIONS

Case classification

Probable: a case that meets the clinical description of secondary syphilis with a nontreponemal (VDRL, RPR, or equivalent serologic methods) titer ≥ 4 and a reactive treponemal test (FTA-ABS, TP-PA, EIA, CIA, or equivalent serologic methods).

Confirmed: a case that meets the clinical description of secondary syphilis (with at least one sign or symptom) that is laboratory confirmed.

Syphilis, secondary (2018)

Clinical description

A stage of infection caused by *T. pallidum* characterized by localized or diffuse mucocutaneous lesions (e.g., rash – such as non-pruritic macular, maculopapular, papular, or pustular lesions), often with generalized lymphadenopathy. Other signs can include mucous patches, condyloma lata, and alopecia. The primary ulcerative lesion may still be present.*

*Because of the wide array of symptoms and signs possibly indicating secondary syphilis, serologic tests for syphilis and a physical examination are crucial to determining if a case should be classified as secondary syphilis.

Laboratory criteria for diagnosis

Confirmatory:

- Demonstration of *T. pallidum* by darkfield microscopy in a clinical specimen that was not obtained from the oropharynx and is not potentially contaminated by stool, OR
- Demonstration of *T. pallidum* by polymerase chain reaction (PCR) or equivalent direct molecular methods in any clinical specimen.

Supportive:

- A reactive nontreponemal serologic test (VDRL, RPR] or equivalent serologic methods), AND
- A reactive treponemal serologic test (TP-PA, EIA, CIA, or equivalent serologic methods).

Case classification

Probable: A case that meets the clinical description of secondary syphilis and the supportive laboratory criteria.

Confirmed: A case that meets the clinical description of secondary syphilis and the confirmatory laboratory criteria.

Syphilis, early latent (2014)

Clinical description

A subcategory of latent syphilis (a stage of infection caused by *T. pallidum* in which organisms persist in the body of the infected person without causing symptoms or signs) when initial infection has occurred within the previous 12 months.

Case classification

Probable: A person with no clinical signs or symptoms of syphilis who has one of the following:

- No past diagnosis of syphilis, and a reactive nontreponemal test (e.g., VDRL, RPR, or equivalent serologic methods), and a reactive treponemal test (e.g., FTA-ABS, TP-PA, EIA, CIA, or equivalent serologic methods), or
- A current nontreponemal test titer demonstrating fourfold or greater increase from the last nontreponemal test titer

AND evidence of having acquired the infection within the previous 12 months based on one or more of the following criteria:

- Documented seroconversion or fourfold or greater increase in titer of a nontreponemal test during the previous 12 months
- Documented seroconversion of a treponemal test during the previous 12 months
- A history of symptoms consistent with primary or secondary syphilis during the previous 12 months
- A history of sexual exposure to a partner within the previous 12 months who had primary, secondary, or early latent syphilis (documented independently as duration <12 months)
- Only sexual contact was within the last 12 months (sexual debut).

There is no confirmed case classification for early latent syphilis.

Syphilis, early non-primary non-secondary (2018)

Clinical description

A stage of infection caused by *T. pallidum* in which initial infection has occurred within the previous 12 months, but there are no signs or symptoms of primary or secondary syphilis.

Laboratory criteria for diagnosis

Supportive:

- A current nontreponemal test titer demonstrating fourfold or greater increase from the last nontreponemal test titer, unless there is evidence that this increase was not sustained for >2 weeks.

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Case classification

Probable

- A person with no clinical signs or symptoms of primary or secondary syphilis who has one of the following:
- No prior history of syphilis, AND a current reactive nontreponemal test (e.g., VDRL, RPR, or equivalent serologic methods), AND a current reactive treponemal test (e.g., TP-PA, EIA, CIA, or equivalent serologic methods), OR
- A prior history of syphilis and meets the supportive laboratory criteria.

AND evidence of having acquired the infection within the previous 12 months based on one or more of the following criteria:

- Documented seroconversion or fourfold or greater increase in titer of a nontreponemal test during the previous 12 months, unless there is evidence that this increase was not sustained for >2 weeks
- Documented seroconversion of a treponemal test during the previous 12 months
- A history of symptoms consistent with primary or secondary syphilis during the previous 12 months
- Meets epidemiologic criteria

Epidemiological Criteria:

- A history of sexual exposure to a partner within the previous 12 months who had primary, secondary, or early non-primary non-secondary syphilis (documented independently as duration <12 months).
- Only sexual contact (sexual debut) was within the previous 12 months.

Syphilis, late latent (2014)

Clinical description

A subcategory of latent syphilis (a stage of infection caused by *T. pallidum* in which organisms persist in the body of the infected person without causing symptoms or signs) when initial infection has occurred >12 months previously.

Case classification

Probable: a person with no clinical signs or symptoms of syphilis who has one of the following:

- No past diagnosis of syphilis, and a reactive nontreponemal test (e.g., VDRL, RPR, or equivalent serologic methods), and a reactive treponemal test (e.g., FTA-ABS, TP-PA, EIA, CIA, or equivalent serologic methods), or
- A past history of syphilis therapy and a current nontreponemal test titer demonstrating fourfold or greater increase from the last nontreponemal test titer.

AND who has no evidence of having acquired the disease within the preceding 12 months (see Syphilis, early latent).

There is no confirmed case classification for late latent syphilis.

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Syphilis, unknown duration or late (2018)

Clinical description

A stage of infection caused by *T. pallidum* in which initial infection has occurred >12 months previously or in which there is insufficient evidence to conclude that infection was acquired during the previous 12 months.

Case classification

Probable

A person with no clinical signs or symptoms of primary or secondary syphilis who meets one of the following sets of criteria:

- No prior history of syphilis, and a current reactive nontreponemal test (e.g., VDRL, RPR, or equivalent serologic methods), and a current reactive treponemal test (e.g., TP-PA, EIA, CIA, or equivalent serologic methods), OR
- A prior history of syphilis, and a current nontreponemal test titer demonstrating fourfold or greater increase from the last nontreponemal test titer, unless there is evidence that this increase was not sustained for >2 weeks, OR
- Clinical signs or symptoms and laboratory results that meet the likely or verified criteria for neurologic, ocular, otic, or late clinical manifestations syphilis (see below)

AND who has no evidence of having acquired the disease within the preceding 12 months (see Syphilis, early non-primary non-secondary)

Comments

Although cases of syphilis of unknown duration are grouped together with late syphilis for the purposes of surveillance, the conservative clinical and public health responses to these cases will differ when there is uncertainty about the duration of infection. When faced with uncertainty, clinicians should act conservatively and treat unknown duration syphilis as if it were late infection, with three doses of benzathine penicillin. In contrast, the most conservative approach for STD control programs would be to manage cases of syphilis of unknown duration as early non-primary non-secondary infections and search for partners who may have been recently infected. Because this would not be feasible for most STD control programs, programs should consider prioritizing cases of syphilis of unknown duration with higher nontreponemal titers (e.g., 1:32 or higher) for investigation and partner services. Although nontreponemal titers cannot reliably distinguish between early infection (<12 months duration) and late infection (>12 months duration), nontreponemal titers usually are higher early in the course of syphilis infection.

Syphilis, Congenital (2015)

Clinical description

A condition caused by infection in utero with *T. pallidum*. A wide spectrum of severity exists, from inapparent infection to severe cases that are clinically apparent at birth. An infant or child (aged less than 2 years) may have signs such as hepatosplenomegaly, rash, condyloma lata, snuffles, jaundice (nonviral hepatitis),

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pseudoparalysis, anemia, or edema (nephrotic syndrome and/or malnutrition). An older child may have stigmata (e.g., interstitial keratitis, nerve deafness, anterior bowing of shins, frontal bossing, mulberry molars, Hutchinson teeth, saddle nose, rhagades, or Clutton joints).

Laboratory criteria for diagnosis

- Demonstration of *T. pallidum* by darkfield microscopy of lesions, body fluids, or neonatal nasal discharge, or
- PCR or other equivalent direct molecular methods of lesions, placenta, umbilical cord, or autopsy material, or
- Immunohistochemistry (IHC), or special stains (e.g., silver staining) of specimens from lesions, neonatal nasal discharge, placenta, umbilical cord, or autopsy material.

Case classification

Probable: a condition affecting an infant whose mother had untreated or inadequately treated* syphilis at delivery, regardless of signs in the infant, or an infant or child who has a reactive non-treponemal test for syphilis (VDRL, RPR, or equivalent serologic methods) AND any one of the following:

- Any evidence of congenital syphilis on physical examination (see Clinical description)
- Any evidence of congenital syphilis on radiographs of long bones
- A reactive CSF VDRL test
- In a nontraumatic lumbar puncture, an elevated CSF leukocyte (white blood cell [WBC]) count or protein (without other cause):

* Adequate treatment is defined as completion of a penicillin-based regimen, in accordance with CDC treatment guidelines, appropriate for stage of infection, initiated 30 or more days before delivery.

Suggested parameters for abnormal CSF WBC and protein values:

- During the first 30 days of life, a CSF WBC count of >15 WBC/mm³ or a CSF protein >120 mg/dL.
- After the first 30 days of life, a CSF WBC count of >5 WBC mm³ or a CSF protein >40 mg/dL, regardless of CSF serology.
- The treating clinician should be consulted to interpret the CSF values for the specific patient.

Confirmed: a case that is laboratory confirmed.

Syphilis, Congenital (2018)

Clinical Description

A condition caused by infection in utero with *Treponema pallidum*. A wide spectrum of severity exists, from inapparent infection to severe cases that are clinically apparent at birth. An infant or child (aged less than 2 years) may have signs such as hepatosplenomegaly, rash, condyloma lata, snuffles, jaundice (nonviral hepatitis), pseudoparalysis, anemia, or edema (nephrotic syndrome and/or malnutrition). An older child may have stigmata (e.g., interstitial keratitis, nerve deafness, anterior bowing of shins, frontal bossing, mulberry molars, Hutchinson teeth, saddle nose, rhagades, or Clutton joints).

Laboratory Criteria for Diagnosis

Demonstration of *Treponema pallidum* by:

- Darkfield microscopy of lesions, body fluids, or neonatal nasal discharge, OR
- PCR or other equivalent direct molecular methods of lesions, neonatal nasal discharge, placenta, umbilical cord, or autopsy material, OR
- IHC, or special stains (e.g., silver staining) of specimens from lesions, placenta, umbilical cord, or autopsy material.

Case Classification

Probable

A condition affecting an infant whose mother had untreated or inadequately treated* syphilis at delivery, regardless of signs in the infant, OR an infant or child who has a reactive non-treponemal test for syphilis (VDRL, RPR, OR equivalent serologic methods) AND any one of the following:

- Any evidence of congenital syphilis on physical examination (see Clinical description)
- Any evidence of congenital syphilis on radiographs of long bones
- A reactive CSF venereal disease research laboratory test (VDRL) test
- In a non-traumatic lumbar puncture, an elevated CSF leukocyte (white blood cell, WBC) count or protein (without other cause):
 - Suggested parameters for abnormal CSF WBC and protein values:
 1. During the first 30 days of life, a CSF WBC count of >15 WBC/mm³ or a CSF protein >120 mg/dl is abnormal.
 2. After the first 30 days of life, a CSF WBC count of >5 WBC/mm³ or a CSF protein >40 mg/dl, regardless of CSF serology.

The treating clinician should be consulted to interpret the CSF values for the specific patient.

*Adequate treatment is defined as completion of a penicillin-based regimen, in accordance with CDC treatment guidelines, appropriate for stage of infection, initiated 30 or more days before delivery.

Confirmed

A case that is laboratory confirmed.

Comments

Congenital and acquired syphilis may be difficult to distinguish when a child is seropositive after infancy. Signs of congenital syphilis may not be obvious, and stigmata may not yet have developed. Abnormal values for CSF VDRL, WBC count, and protein may be found in either congenital or acquired syphilis. Findings on radiographs of long bones may help because radiographic changes in the metaphysis and epiphysis are considered classic signs of congenitally acquired syphilis. While maternal antibodies can complicate interpretation of serologic tests in an infant, reactive tests past 18 months of age are considered to reflect the status of the child. The decision may ultimately be based on maternal history and clinical judgment. In a young child, the possibility of sexual abuse should be considered as a cause of acquired rather than congenital syphilis, depending on the clinical picture. For reporting purposes, congenital syphilis includes cases of congenitally acquired syphilis among infants and children as well as syphilitic stillbirths.

Viral Hepatitis

Hepatitis is inflammation of the liver. It can impair vital liver functions such as processing nutrients, filtering the blood and fighting infection. Viral hepatitis is inflammation of the liver caused by infection with a virus. In Massachusetts, the most common types of viral hepatitis are hepatitis A, hepatitis B and hepatitis C. Non-viral hepatitis can also result from heavy alcohol use, toxins, some medications, and certain medical conditions.

Hepatitis A, Acute (2019)

Clinical Criteria - An acute illness with a discrete onset of any sign or symptom consistent with acute viral hepatitis (e.g., fever, headache, malaise, anorexia, nausea, vomiting, diarrhea, abdominal pain, or dark urine)

AND

- a) jaundice or elevated total bilirubin levels ≥ 3.0 mg/dL, OR
- b) elevated serum alanine aminotransferase (ALT) levels >200 IU/L,

AND

- c) the absence of a more likely diagnosis

Laboratory Criteria for Diagnosis

Confirmatory laboratory evidence:

- Immunoglobulin M (IgM) antibody to hepatitis A virus (anti-HAV) positive,

OR

- Nucleic acid amplification test (NAAT; such as Polymerase Chain Reaction [PCR] or genotyping) for hepatitis A virus RNA positive

Epidemiologic Linkage

Contact (e.g., household or sexual) with a laboratory-confirmed hepatitis A case 15-50 days prior to onset of symptoms.

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Criteria to Distinguish a New Case from an Existing Case

Hepatitis A is usually self-limiting and does not result in chronic infection. However, up to 10% of persons with hepatitis A may experience a relapse during the 6 months after acute illnesses. Cases of relapsing hepatitis A should not be enumerated as new cases. In addition, a case should not be counted as a hepatitis A case if there is an alternate, more likely diagnosis.

Case Classification

Confirmed:

- A case that meets the clinical criteria and is IgM anti-HAV positive §, OR
- A case that has hepatitis A virus RNA detected by NAAT (such as PCR or genotyping), OR
- A case that meets the clinical criteria and occurs in a person who had contact (e.g., household or sexual) with a laboratory-confirmed hepatitis A case 15-50 days prior to onset of symptoms.
§ And not otherwise ruled out by IgM anti-HAV or NAAT for hepatitis A virus testing performed in a public health laboratory.

Chronic HBV (2012)

Confirmed:

IgM antibodies to hepatitis B core antigen (IgM anti-HBc) negative

AND

A positive result on one of the following tests: hepatitis B surface antigen (HBsAg), hepatitis B e antigen (HBeAg), or nucleic acid test for hepatitis B virus DNA (including qualitative, quantitative and genotype testing),

OR

HBsAg positive or nucleic acid test for hepatitis B virus DNA (including qualitative, quantitative and genotype testing), or HBeAg positive two times at least 6 months apart (Any combination of these tests performed 6 months apart is acceptable.)

Probable:

A case with a single HBsAg positive or HBV DNA positive (including qualitative, quantitative and genotype testing), or HBeAg positive lab result when no IgM anti-HBc results are available

Acute HBV infection (2012)

Clinical Presentation: An acute illness with a discrete onset of symptoms consistent with acute viral hepatitis (e.g., fever, headache, malaise, anorexia, nausea, vomiting, diarrhea, and abdominal pain) and either a) jaundice or b) elevated serum alanine aminotransferase levels > 100 IU/L

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Confirmed:

Clinically compatible case* not known to have chronic hepatitis B and

HBsAg positive

AND

IgM antibody to hepatitis B core antigen (IgM anti- HBc) positive, if done *

A documented negative hepatitis B surface antigen (HBsAg) laboratory test result within 6 months prior to a positive test (either HBsAg, Hepatitis B “e” antigen (HBeAg), or hepatitis B virus nucleic acid testing (HBV NAT) including genotype) result does NOT require an acute clinical presentation to meet the surveillance case definition.

Suspect:

Positive IgM antibody to hepatitis B core antigen (IgM anti-HBc) that does not meet the clinical definition

Note that the year into which a case is categorized is based upon the case’s “Event Date”, which is assigned by the following case characteristics, in decreasing order of specificity, dependent on availability of information: symptom onset date, specimen collection date, diagnosis date, or case report date

Hepatitis C, Acute (2012)

Clinical description – An acute illness with a discrete onset of any sign or symptom consistent with acute viral hepatitis (e.g. fever, headache, malaise, anorexia, nausea, vomiting, diarrhea, and abdominal pain), and either a) jaundice, or b) elevated ALT levels >400 IU/L. A documented negative HCV antibody laboratory test result followed within 6 months by a positive test result does not require an acute clinical presentation to meet the surveillance case definition.

Laboratory criteria for diagnosis – One or more of the following three criteria (except in persons less than 18 months of age, for whom only the third criterion would meet the case classification criteria):

- Anti-HCV screening-test-positive with a signal to cut-off ratio predictive of a true positive as determined for the particular assay as defined by CDC, or
- HCV recombinant immunoblot assay positive, or
- Nucleic acid test (NAT) for HCV RNA positive (including qualitative, quantitative, or genotype testing) and, if done meets the following two criteria:
 - Absence of IgM antibody to hepatitis A virus
 - Absence of IgM antibody to hepatitis B core antigen

Confirmed – A case that meets the clinical case definition, is laboratory confirmed, and is not known to have chronic hepatitis C.

Hepatitis C, Past or Present (2012)

Laboratory criteria for diagnosis – One or more of the following three criteria (except in persons less than 18 months of age, for whom only the third criterion would meet the case classification criteria):

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- Anti-HCV screening-test-positive with a signal to cut-off ratio predictive of a true positive as determined for the particular assay as defined by CDC, or
- HCV recombinant immunoblot assay positive, or
- NAT for HCV RNA positive (including qualitative, quantitative, or genotype testing)

Probable – A case that does not meet the case definition for acute hepatitis C, is anti-HCV positive (repeat reactive) by EIA, and has ALT values above the upper limit of normal, but the anti-HCV EIA result has not been verified by an additional more specific assay or the signal to cut-off ratio is unknown.

Confirmed – A case that is laboratory confirmed and does not meet the case definition for acute hepatitis C.

Hepatitis C, Acute (2016)

Clinical criteria – An illness with discrete onset of any sign or symptom consistent with viral hepatitis (e.g. fever, headache, malaise, anorexia, nausea, vomiting, diarrhea, and abdominal pain) and a) jaundice or b) a peak elevated serum ALT level >200 IU/L during the period of acute illness.

Laboratory criteria for diagnosis

- A positive test for antibodies to HCV
- HCV detection test: NAT for HCV RNA positive, including qualitative, quantitative, or genotype testing
- A positive test indicating presence of HCV antigen when and if a test for HCV antigen is approved by FDA and available

Probable – A case that meets clinical criteria and has a positive anti-HCV antibody test, but has no reports of a positive HCV NAT or positive HCV antigen tests and does not have test seroconversion within 12 months or has no report of test conversion.

Confirmed – A case that meets clinical criteria and has a positive HCV NAT or HCV antigen, or a documented negative HCV antibody, HCV antigen or NAT laboratory test result followed within 12 months by a positive result of any of these tests (test conversion).

Hepatitis C, Chronic (2016)

Laboratory criteria for diagnosis

- A positive test for antibodies to HCV
- HCV detection test: NAT for HCV RNA positive, including qualitative, quantitative, or genotype testing
- A positive test indicating presence of HCV antigen when and if a test for HCV antigen is approved by FDA and available

Probable – A case that does not meet clinical criteria or has no report of clinical criteria, and does not have test conversion within 12 months or has no report of test conversion, and has a positive anti-HCV antibody test, but no report of a positive HCV NAT or positive HCV antigen test.

Confirmed – A case that does not meet clinical criteria or has no report of clinical criteria, and does not have test conversion within 12 months or has no report of test conversion, and has a positive HCV NAT or HCV antigen test.

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Hepatitis C, Acute (2020)

Clinical Criteria - All hepatitis C virus cases in each classification category should be > 36 months of age, unless known to have been exposed non-perinatally.

One or more of the following:

- Jaundice, OR
- Peak elevated total bilirubin levels ≥ 3.0 mg/dL, OR
- Peak elevated serum alanine aminotransferase (ALT) levels >200 IU/L,

AND

The absence of a more likely diagnosis (which may include evidence of acute liver disease due to other causes or advanced liver disease due to pre-existing chronic Hepatitis C virus (HCV) infection or other causes, such as alcohol exposure, other viral hepatitis, hemochromatosis, etc.)

Laboratory Criteria

Confirmatory laboratory evidence:

- Positive hepatitis C virus detection test: NAT for HCV RNA positive (including qualitative, quantitative, or genotype testing), OR
- A positive test indicating presence of hepatitis C viral antigen(s) (HCV antigen)

Presumptive laboratory evidence:

- A positive test for antibodies to hepatitis C virus (anti-HCV)

Epidemiologic Linkage

No epidemiologic linkage is required for case classification.

Criteria to Distinguish a New Case from an Existing Case

A new acute case is an incident case that is over the age of 36 months and has not previously been reported meeting case criteria for chronic hepatitis C or for whom there is laboratory evidence of re-infection. Cases under the age of 36 months should be classified under the Perinatal HCV Position Statement (17-ID-08) unless the exposure mode is not perinatal (e.g., healthcare acquired).

All jurisdictions are encouraged to track negative HCV viral detection tests to document both spontaneous clearance of infection or sustained viral response to HCV treatment. Cases that have evidence of having cleared the infection at time of initial report or are considered false positive should not be reported to CDC.

Acute cases determined via anti-HCV test conversion do not need to have a positive HCV viral detection test reported to be considered confirmed acute cases.

A new probable acute case may be reclassified as confirmed acute if a positive HCV viral detection test is reported in the same reporting year (e.g. prior to CDC closing reporting for the calendar year).

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Collection of risk history data is recommended for probable and confirmed acute HCV cases. Timing of risk history data to collect ranges from 2 weeks to 12 months prior to symptom onset or diagnosis. The time frame to employ depends on the method of classification (e.g. if a case meets clinical criteria and has a positive HCV detection test, a risk history time frame of 2 weeks to 6 months prior to onset should be used; for a case classified via anti-HCV test conversion or HCV RNA test conversion, 2 weeks to 12 months prior to onset should be considered).

If evidence indicating resolution of infection is received after a confirmed acute case has been reported to CDC, the case report does not need to be modified as it was a confirmed case at the time of initial report. However, negative HCV viral detection test results received on confirmed acute case, subsequent to an initial positive result, should be appended to case reports, as feasible, and considered for the purpose of data analysis by each jurisdiction.

For probable acute cases, the presence of a negative HCV viral detection test result, in the absence of criteria that would allow for confirmation, indicates that a case should not be classified as probable acute and should not be reported to CDC.

A confirmed acute case may be classified as a confirmed chronic case if a positive HCV viral detection test is reported one year or longer after acute case onset. A confirmed acute case may not be reported as a probable chronic case (i.e. HCV antibody positive, but with an unknown HCV viral detection test). For purposes of incidence and prevalence calculations, confirmed acute and chronic HCV cases should be counted.

Case Classification

Probable

- A case that meets clinical criteria and has presumptive laboratory evidence,
AND
- Does not have a hepatitis C virus detection test reported,
AND
- Has no documentation of anti-HCV or HCV RNA test conversion within 12 months,

Confirmed

- A case that meets clinical criteria and has confirmatory laboratory evidence,
OR
- A documented negative HCV antibody followed within 12 months by a positive HCV antibody test (anti-HCV test conversion) in the absence of a more likely diagnosis,
OR
- A documented negative HCV antibody OR negative hepatitis C virus detection test (in someone without a prior diagnosis of HCV infection) followed within 12 months by a positive hepatitis C virus detection test (HCV RNA test conversion) in the absence of a more likely diagnosis

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Hepatitis C, Chronic (2020)

Clinical Criteria - All hepatitis C virus cases in each classification category should be > 36 months of age, unless known to have been exposed non-perinatally.

One or more of the following:

- Jaundice, OR
- Peak elevated total bilirubin levels ≥ 3.0 mg/dL, OR
- Peak elevated serum alanine aminotransferase (ALT) levels >200 IU/L,

AND

The absence of a more likely diagnosis (which may include evidence of acute liver disease due to other causes or advanced liver disease due to pre-existing chronic Hepatitis C virus (HCV) infection or other causes, such as alcohol exposure, other viral hepatitis, hemochromatosis, etc.)

Laboratory Criteria

Confirmatory laboratory evidence:

- Positive hepatitis C virus detection test: NAT for HCV RNA positive (including qualitative, quantitative, or genotype testing), OR
- A positive test indicating presence of hepatitis C viral antigen(s) (HCV antigen)

Presumptive laboratory evidence:

- A positive test for antibodies to hepatitis C virus (anti-HCV)

Epidemiologic Linkage - No epidemiologic linkage is required for case classification.

Criteria to Distinguish a New Case from an Existing Case

All jurisdictions are encouraged to track negative HCV viral detection tests to document both spontaneous clearance of infection or sustained viral response to HCV treatment. Cases that have evidence of having cleared the infection at time of initial report or are considered false positive should not be reported to CDC.

If evidence indicating resolution of infection is received after a confirmed chronic case has been reported to CDC, the case report does not need to be modified as it was a confirmed case at the time of initial report. However, negative HCV viral detection test results received on confirmed chronic cases, subsequent to an initial positive result, should be appended to case reports, as feasible, and considered for the purpose of data analysis by each jurisdiction.

Evidence for re-infection may include a case of confirmed chronic HCV infection that has at least two sequential negative HCV viral detection tests reported, indicative of treatment initiation and sustained virologic response, followed by a positive HCV viral detection test. Under current treatment recommendations, those two negative tests should be at least three months apart, however, the timing may change as standard of care for HCV treatment evolves. Other evidence of reinfection should be considered, including a report of a new genotype on

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a case that has previously cleared a different genotype. Jurisdictions are encouraged to ensure that cases of HCV treatment failure are not classified as new cases of HCV infection to the extent that it can be determined. Jurisdictions tracking re-infection should also consider collecting data on prior treatment completion (when relevant and possible to document), treatment failure, change in reported genotype if that applies, and the known time frame for reinfection.

For probable chronic cases, the presence of a negative HCV viral detection test result, in the absence of criteria that would allow for confirmation, indicates that a case should not be classified as probable chronic and should not be reported to CDC.

A new chronic case is a newly reported case that does not have evidence of being an acute case of HCV infection. A confirmed acute case may be classified as a confirmed chronic case if a positive HCV viral detection test is reported one year or longer after acute case onset. A confirmed acute case may not be reported as a probable chronic case (i.e. HCV antibody positive, but with an unknown HCV viral detection test). For purposes of incidence and prevalence calculations, confirmed chronic HCV cases should be counted.

Jurisdictions are also encouraged to track and classify possible re-infection cases that may have been previously submitted to CDC as a confirmed or probable chronic HCV infection case. Jurisdictions tracking re-infection should also consider collecting data on prior treatment completion (when relevant and possible to document), treatment failure, change in reported genotype if that applies, and the known time frame for reinfection.

Case Classification

Suspect

NUL

Probable

- A case that does not meet OR has no report of clinical criteria,
AND
- Has presumptive laboratory evidence,
AND
- Has no documentation of anti-HCV or RNA test conversion within 12 months,
AND
- Does not have an HCV RNA detection test reported.

Confirmed

- A case that does not meet OR has no report of clinical criteria,
AND
- Has confirmatory laboratory evidence,
AND
- Has no documentation of anti-HCV or HCV RNA test conversion within 12 months.

HIV, STD, AND VIRAL HEPATITIS PROGRAM STAFF CONTACT INFORMATION

Topic	Contact	E-Mail	Phone
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HIV, STD, AND VIRAL HEPATITIS RESOURCES

Training

Professional training to community based organizations, local public health departments, and medical providers can be requested and is free of charge.

Type of Training	Contact Information and Website
STD Education, STD Partner Notification, and STD Reporting	617-983-6940 www.mass.gov/dph/cdc/std
HIV Reporting and Surveillance Projects	617-983-6560 www.mass.gov/dph/cdc/aids
HIV Provider Trainings	617-624-5338 www.mass.gov/dph/aids
Viral Hepatitis Education	617-983-6800 https://www.mass.gov/lists/hepatitis-b-educational-materials-and-other-resources https://www.mass.gov/lists/hepatitis-c-educational-materials-and-other-resources
STD Diagnosis, Treatment, and Management	617-983-6945 www.RatellePTC.org

Material and Clinical Toolkits

Health education materials and clinical toolkits can be requested free of charge.

Type of Material	Contact Information and Website
Massachusetts HIV Epidemiologic Profile	617-983-6560 https://www.mass.gov/lists/hivaids-epidemiologic-profiles
HIV Reporting for Health Care Providers	617-983-6560 https://www.mass.gov/infectious-disease-surveillance-reporting-and-control
STD, and HIV Posters and Brochures	617-983-6800 https://massclearinghouse.ehs.state.ma.us/
STD Diagnosis, Treatment, and Management Toolkits	617-983-9645 www.RatellePTC.org
Partner Services Program Information	617-983-6999 https://www.mass.gov/partner-services-program-ppp

MDPH and MDPH Funded Websites

Bureau of Infectious Disease and Laboratory Sciences

www.mass.gov/orgs/bureau-of-infectious-disease-and-laboratory-sciences

Office of HIV/AIDS

www.mass.gov/dph/aids

Viral Hepatitis Programs

www.mass.gov/hepatitis-a

www.mass.gov/hepatitis-b-hbv

www.mass.gov/hepatitis-c-hcv

Sylvie Ratelle STD/HIV Prevention Training Center

www.RatellePTC.org

Division of STD Prevention

www.mass.gov/dph/cdc/std

National Websites

Centers for Disease Control and Prevention

www.cdc.gov

Division of STD Prevention

www.cdc.gov/std

Division of HIV Prevention

www.cdc.gov/hiv

Division of Viral Hepatitis

www.cdc.gov/hepatitis

National Network of STD/HIV Prevention

www.nnptc.org

Training Centers