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Slide set for 2018 Integrated Report

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LIST OF COMMONLY USED ACRONYMS

AI/AN  American Indian/Alaska Native
AIDS  Acquired Immunodeficiency Syndrome
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
DOE  Department of Education
HAV  Hepatitis A Virus
HBV  Hepatitis B Virus
HCV  Hepatitis C Virus
HIV  Human Immunodeficiency Virus
HTSX  Heterosexual Sex
IDU  Injection Drug Use
MDPH  Massachusetts Department of Public Health
MSM  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
PWID  Persons who Inject Drugs
STD  Sexually Transmitted Disease
STI  Sexually Transmitted Infection
The 2018 Integrated HIV/AIDS, 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
- Hepatitis A, B and C
- HIV/AIDS
- Syphilis

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 2018**

**Chlamydia, gonorrhea, and syphilis:**

- Chlamydia continues to be the most commonly reported infectious disease, with over 30,000 cases reported in 2018.

- The average age of confirmed chlamydia cases in Massachusetts increased from 23.5 years in 2009 to 25.0 years in 2018. This marks the first time that the average age has exceeded the Centers for Disease Control and Prevention (CDC) recommended female screening age range of 14 to 24 years.

- After a sharp 58% increase from 2016 (N=4,617) to 2017 (N=7,307), gonorrhea incidence increased 5% (N=7,617) in 2018, making it the second most commonly reported infectious disease that year.

- The number of gonorrhea cases reported among males has been more than double the number reported among females since 2014. In 2018, there were 5,334 gonorrhea cases reported among males, compared to 2,272 among females.

- The number of infectious syphilis cases (primary, secondary, and early non-primary non-secondary syphilis) increased to a ten-year high of 1,162 in 2018. Although cases among females are rising, syphilis continues to disproportionally affect males, reflecting an ongoing epidemic among men who have sex with men.

**HIV/AIDS:**

- The number of persons living with HIV infection (PLWH) in Massachusetts increased 2%-3% per year over the past ten years. This increase is due to improvements in health and longevity for PLWH coupled with ongoing transmission of HIV infection. From 2008 to 2017, the number of new HIV diagnoses decreased by 19% (from 755 to 608) and deaths among persons reported with HIV infection decreased by 6% (from 278 to 261).

*Due to the extensive follow-up required to verify date of diagnosis, all HIV/AIDS data reflect HIV infection diagnosed through 2017.*
There are large disparities in age-adjusted HIV diagnosis rates for 2015 to 2017 by race/ethnicity: the rates among black (non-Hispanic) individuals (34.7 per 100,000) and Hispanic/Latino individuals (21.1 per 100,000) were seven and four times that of white (non-Hispanic) individuals (4.9 per 100,000), respectively. Disparities were most notable among females, with the average annual age-adjusted HIV diagnosis rates for 2015 to 2017 among black (non-Hispanic) and Hispanic/Latina females being 15 and five times that of white (non-Hispanic) females, respectively.

Male-to-male sex (MSM) remained the predominant exposure mode among individuals diagnosed with HIV infection from 2008 to 2017. Those with no identified risk reported (NIR) comprised the second largest exposure mode group, consisting predominantly of black (non-Hispanic) and Hispanic/Latino males.

After declining by 62% from 2008 (N=78) to 2014 (N=30), the number of reported cases with injection drug use as the exposure mode increased to 105 in 2017. This increase is largely due to an HIV infection outbreak among injection drug users in the northeastern cities of Lawrence and Lowell that began in 2015.

Hepatitis A, B, and C:

Since April 2018, the MDPH and local health departments have been investigating an outbreak of hepatitis A. The populations most affected by the outbreak are those with recent experiences of homelessness or unstable housing, and/or substance use disorder. As of December 13, 2019, the outbreak involved 548 reported cases.

An average of 1,858 (range: 1,607 [2013] – 2,022 [2018]) confirmed and probable chronic hepatitis B virus (HBV) infection cases were reported each year from 2009 to 2018.

The total number of confirmed and suspect acute HBV cases reported increased from 110 in 2009 to 191 in 2018.

Hepatitis C (HCV) was the third most commonly reported infectious disease, with 7,013 confirmed and probable hepatitis C cases reported in 2018.* 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 hepatitis C cases reported among adolescents (age 15–19 years) and young adults (age 20–29 years), reflecting ongoing transmission among young people injecting drugs.

* Please note, in 2016, revised case definitions for acute and chronic HCV infection were implemented that contain significant changes from the case definitions for 2009 to 2015. For further information see https://wwwn.cdc.gov/nndss/conditions/
Chlamydia is the most commonly reported infectious disease in Massachusetts and nationally. Chlamydia is a bacterial sexually transmitted infection (STI) that can infect both males and females. It can be spread through vaginal, anal, or oral sexual contact with an infected partner and from mother to child during birth. Chlamydia infection is easily treated, but repeated infections are common. Females 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 gender, Massachusetts 2009-2018

- 30,311 cases of chlamydia were reported in Massachusetts in 2018, making it the most frequently reported infection in the Commonwealth.
- The total number of reported chlamydia cases increased by 61% from 18,796 in 2009 to 30,311 in 2018.
- In 2018, nearly twice as many chlamydia cases were reported among females (N=19,019) as among males (N=11,210).

Note: Cases with no reported gender or transgender are not presented in this analysis due to small numbers.
Figure 2. Number of laboratory confirmed chlamydia cases reported by age group (years), Massachusetts 2009-2018

- Each year from 2009 to 2018, the largest number of chlamydia cases was reported among 20–24 year-olds, followed by 15–19 year-olds.
- From 2009 to 2018, the largest increase in the number of reported chlamydia cases was among individuals aged 50 years and above (more than tripled from 204 to 674).

Note: Cases with no age reported are not presented in this analysis due to small numbers.
The United States Preventive Services Task Force and the Centers for Disease Control and Prevention recommend screening for chlamydia in sexually active women age 24 years and younger, and older women at increased risk for infection.* Routine screening of men is currently recommended only in higher prevalence clinical settings such as adolescent clinics, correctional facilities, and STD clinics, and among men who report sex with men.

The average age of laboratory-confirmed chlamydia cases in Massachusetts increased from 23.0 years in 2009 to 25.0 years in 2018.

The overall increase in average age appeared to be driven mostly by male chlamydia cases. From 2009 to 2018, the proportion of chlamydia cases among males increased from 28% to 37%. Additionally, the increase in average age of chlamydia cases reported among males was greater than the increase among females. From 2009 to 2018, the average age of chlamydia cases reported among males increased by 2.6 years compared to an increase of 1.4 years among females.

In 2018, the statewide chlamydia incidence rate of 462.9 per 100,000 population was lower than the national rate of 539.9 per 100,000.

- Massachusetts ranked the twelfth lowest in chlamydia incidence rate among the 50 states.*

- Chlamydia cases continue to be reported diffusely in Massachusetts, with additional concentration in urban areas.

- The five cities with the highest chlamydia incidence rates were Plainfield (4,166.7 per 100,000), Plainville (1,476.3 per 100,000),† Lawrence (1,328.9 per 100,000), Brockton (1,221.6 per 100,000), and Springfield (1,080.0 per 100,000).

† The chlamydia incidence rates for Plainfield and Plainville are high because of small population sizes (648 and 8,264, respectively), as opposed to the number of cases (27 and 122, respectively).
GONORRHEA BY GENDER

Gonorrhea is a common bacterial STI that infects both males and females. It can be spread through vaginal, anal, or oral sexual contact with an infected partner and from mother to child 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. Untreated gonorrhea can cause serious complications. Although gonorrhea infection is treatable, treatment has become more complex with increased antimicrobial resistance. Currently, there are no known ceftriaxone-resistant gonorrhea cases in Massachusetts. The CDC STD Treatment Guidelines are available for treatment and rescreening recommendations. For more information see https://www.cdc.gov/std/gonorrhea/stdfact-gonorrhea-detailed.htm

Figure 5. Number of laboratory confirmed gonorrhea cases reported by gender, Massachusetts 2009-2018

- After a sharp 58% increase from 2016 (N=4,617) to 2017 (N=7,307), gonorrhea incidence increased 5% (N=7,617) in 2018, making it the second most commonly reported infectious disease that year.
- Between 2009 and 2018, the number of gonorrhea cases reported among males increased by more than five times (from 981 to 5,334). The number of gonorrhea cases among males is now more than double the number among females (2,272).
- The number of gonorrhea cases reported among females more than doubled from 934 in 2009 to 2,272 in 2018.
**GONORRHEA BY AGE**

**Figure 6.** Number of laboratory confirmed gonorrhea cases reported by age group (years), Massachusetts 2009-2018

<table>
<thead>
<tr>
<th>Year</th>
<th>50+</th>
<th>40–49</th>
<th>30–39</th>
<th>25–29</th>
<th>20–24</th>
<th>15–19</th>
<th>&lt;15</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>69</td>
<td>160</td>
<td>318</td>
<td>347</td>
<td>618</td>
<td>383</td>
<td>13</td>
</tr>
<tr>
<td>2010</td>
<td>149</td>
<td>324</td>
<td>459</td>
<td>473</td>
<td>718</td>
<td>355</td>
<td>8</td>
</tr>
<tr>
<td>2011</td>
<td>124</td>
<td>256</td>
<td>438</td>
<td>469</td>
<td>734</td>
<td>308</td>
<td>12</td>
</tr>
<tr>
<td>2012</td>
<td>136</td>
<td>276</td>
<td>517</td>
<td>588</td>
<td>839</td>
<td>299</td>
<td>9</td>
</tr>
<tr>
<td>2013</td>
<td>174</td>
<td>336</td>
<td>610</td>
<td>669</td>
<td>994</td>
<td>367</td>
<td>5</td>
</tr>
<tr>
<td>2014</td>
<td>206</td>
<td>316</td>
<td>718</td>
<td>845</td>
<td>1,136</td>
<td>420</td>
<td>12</td>
</tr>
<tr>
<td>2015</td>
<td>250</td>
<td>362</td>
<td>746</td>
<td>841</td>
<td>1,011</td>
<td>359</td>
<td>12</td>
</tr>
<tr>
<td>2016</td>
<td>383</td>
<td>476</td>
<td>1,055</td>
<td>1,059</td>
<td>1,242</td>
<td>383</td>
<td>18</td>
</tr>
<tr>
<td>2017</td>
<td>569</td>
<td>474</td>
<td>1,807</td>
<td>1,710</td>
<td>1,789</td>
<td>664</td>
<td>19</td>
</tr>
<tr>
<td>2018</td>
<td>610</td>
<td>764</td>
<td>1,843</td>
<td>1,878</td>
<td>1,841</td>
<td>694</td>
<td>18</td>
</tr>
</tbody>
</table>

Note: Cases with no age reported are not presented in this analysis due to small numbers.

- From 2009 to 2018, the proportion of gonorrhea cases reported among individuals aged 15-19 years decreased from 20% to 9%, and among individuals aged 20-24 years from 32% to 24%. During the same time period the proportion of cases reported among individuals aged 25-29 years increased from 18% to 25%, and among individuals aged 30-39 years from 17% to 24%.

- From 2009 to 2018, the largest increase in the number of reported gonorrhea cases was among individuals aged 50 years and above (nearly nine times, from 69 to 610).
In 2018, the statewide gonorrhea incidence rate of 116.8 per 100,000 was lower than the national rate of 179.1 per 100,000.

- Massachusetts ranked the 11th lowest in gonorrhea incidence rate among the 50 states.*

- Gonorrhea cases continued to be clustered in urban areas in Massachusetts in 2018.

- The five cities with the highest gonorrhea incidence rates were Provincetown (1,291.6 per 100,000), Springfield (390.0 per 100,000), Boston (344.2 per 100,000), Brockton (288.6 per 100,000), and Fitchburg (270.4 per 100,000).†

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† The gonorrhea incidence rate for Provincetown is high because of small population size (2,942), as opposed to the number of cases (38).
Syphilis is a sexually transmitted infection that can be spread through sexual contact with an infected person in the primary or secondary stages of syphilis infection. The first symptoms of syphilis infection appear at the site of inoculation 10 to 90 days after exposure. 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 latent syphilis are thought to be infectious for the first year after infection. During both early and late syphilis infection some individuals experience infection of the nervous system. This can lead to a range of neurologic, otic, and ocular symptoms that can be severe and life altering. Syphilis infection can also be transmitted from mother to child during pregnancy and birth. Syphilis transmission to an unborn baby is a serious complication of syphilis infection among pregnant individuals. Syphilis is treatable and it is possible to be re-infected with repeated exposure. The CDC STD Treatment Guidelines are available for treatment and rescreening recommendations. 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 gender, Massachusetts 2009-2018

Note: Cases with no reported gender or transgender are not presented in this analysis due to small numbers

- The total number of reported confirmed and probable infectious syphilis cases tripled from 2009 (N=379) to 2018 (N=1,162).
- Between 2009 and 2018, the proportion of syphilis cases among males remained above 90% each year. In 2018, there were 12 times as many syphilis cases reported among males (N=1,055) as among females (N=87).
Figure 9. Number of confirmed and probable infectious syphilis cases reported by age group (years), Massachusetts 2009-2018

Note: Cases with no age reported are not presented in this analysis due to small numbers

- From 2009 to 2018, the largest increase in the number of reported confirmed and probable infectious syphilis cases was among individuals aged 25-29 years (nearly five times, from 52 to 233).
The statewide infectious syphilis incidence rate increased over the past ten years to a high of 17.7 per 100,000 in 2018.

- Massachusetts ranked the 24th highest in primary and secondary syphilis incidence rate among the 50 states. *
- The five cities with the highest infectious syphilis incidence rates were Provincetown (339.9 per 100,000), Winthrop (62.9 per 100,000), Boston (51.3 per 100,000), Springfield (50.3 per 100,000), and Framingham (48.3 per 100,000).

HIV, or human immunodeficiency virus, 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). HIV is transmitted through exposure to blood, semen, vaginal secretions, or breast milk, most commonly through unprotected sex or through sharing injecting drug equipment.

**Figure 11.** Number of persons living with HIV infection, Massachusetts, 2008–2017

- Ongoing transmission of HIV infection, coupled with improvements in health and longevity, have resulted in an increase in the number of individuals living with HIV infection in Massachusetts of 2%-3% per year over the past ten years.
From 2008 to 2017, the number of new HIV infection diagnoses decreased by 19% (from 755 to 608), and deaths among individuals reported with HIV/AIDS decreased by 6% (from 278 to 261).
The cities and towns with the highest average annual rate of HIV infection diagnosis during 2015 to 2017 included Provincetown (191.5 per 100,000), Lawrence (32.4 per 100,000), Brockton (28.1 per 100,000), Lowell (25.1 per 100,000), and Boston (21.1 per 100,000).†

†Among cities that reported at least 15 HIV infections during 2015-2017.
From 2015 to 2017, of the 1,855 HIV infections newly diagnosed in Massachusetts, 1,368 (74%) were among individuals who were assigned male sex at birth and 487 (26%) were among individuals who were assigned female sex at birth. Among the 1,855 HIV infections, 24 (1%) were transgender,† and 1,831 (99%) were cisgender.‡

From 2015 to 2017, the most frequently reported exposure mode among males was male-to-male sex (56%) and among females was presumed heterosexual sex (35%). A substantial proportion of diagnoses among both males and females were reported with No Identified Risk (25% and 31%, respectively).

The proportion of HIV infection diagnoses with IDU exposure mode decreased from 10% (N=78/755) in 2008 to 5% (N=30/651) in 2014, then increased to 17% (N=105/608) in 2017.

* Data reflect sex at birth and therefore not gender identity or gender expression of transgender individuals.
† Reported numbers among transgender individuals are likely to be underestimates.
‡ Persons whose current gender identity corresponds with their sex assigned at birth.
MOTHER-TO-CHILD TRANSMISSION OF HIV

Figure 15. Number of reported cases of mother-to-child transmission of HIV infection, by year of birth, Massachusetts, 1985–2017

- Since the mid-1990’s, there has been a dramatic reduction in mother-to-child transmission of HIV infection related to high rates of antiretroviral treatment of HIV+ women and promotion of HIV screening during pregnancy.
- There were no cases identified in the past three years.
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 through consumption of contaminated food or water. Hepatitis A is a self-limited disease that does not result in chronic infection.

Since April 2018, MDPH and local health departments have been investigating an outbreak of hepatitis A. The populations most affected by the outbreak are those with recent experiences of homelessness or unstable housing, and/or substance use disorder. The cornerstone of hepatitis A outbreak response is vaccination of those at high risk for hepatitis A infection.

Table 1. Reported hepatitis A cases linked to person-to-person outbreak (April 1, 2018 – December 13, 2019) compared to pre-outbreak cases (2017), Massachusetts

<table>
<thead>
<tr>
<th></th>
<th>2017 cases</th>
<th>2018-2019 outbreak cases</th>
<th>2017 cases</th>
<th>2018-2019 outbreak cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of cases</td>
<td>53</td>
<td>548</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0 deaths)</td>
<td>(7 deaths)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Demographics</td>
<td></td>
<td></td>
<td>58% (31)</td>
<td>79% (433)</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td>0%</td>
<td>1% (7)</td>
</tr>
<tr>
<td>Age: median (range)</td>
<td></td>
<td></td>
<td>0%</td>
<td>36%</td>
</tr>
<tr>
<td>Risks</td>
<td></td>
<td></td>
<td>2%</td>
<td>56%</td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td></td>
<td>4%</td>
<td>69%</td>
</tr>
<tr>
<td>Affected counties</td>
<td></td>
<td></td>
<td>0%</td>
<td>2%</td>
</tr>
<tr>
<td>Asian</td>
<td></td>
<td></td>
<td>2%</td>
<td>3%</td>
</tr>
<tr>
<td>Black</td>
<td></td>
<td></td>
<td>4%</td>
<td>46%</td>
</tr>
<tr>
<td>NH/Pl‡</td>
<td></td>
<td></td>
<td>2%</td>
<td>56%</td>
</tr>
<tr>
<td>White</td>
<td></td>
<td></td>
<td>4%</td>
<td>69%</td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
<td>1%</td>
<td>13%</td>
</tr>
<tr>
<td>Unknown</td>
<td>64% male</td>
<td>4%</td>
<td>2%</td>
<td>69%</td>
</tr>
<tr>
<td>Race</td>
<td>36 (5-85)</td>
<td>35 (6-98)</td>
<td>4%</td>
<td>56%</td>
</tr>
<tr>
<td>Ethnicity</td>
<td>36 (5-85)</td>
<td>35 (6-98)</td>
<td>2%</td>
<td>56%</td>
</tr>
<tr>
<td>Hispanic</td>
<td>6%</td>
<td>1%</td>
<td>6%</td>
<td>1%</td>
</tr>
<tr>
<td>Non-Hispanic</td>
<td>4%</td>
<td>4%</td>
<td>2%</td>
<td>46%</td>
</tr>
<tr>
<td>Unknown</td>
<td>36%</td>
<td>14%</td>
<td>0%</td>
<td>36%</td>
</tr>
<tr>
<td>Co-infections</td>
<td>36%</td>
<td>14%</td>
<td>0%</td>
<td>36%</td>
</tr>
<tr>
<td>Hepatitis B*</td>
<td>2%</td>
<td>3%</td>
<td>2%</td>
<td>3%</td>
</tr>
<tr>
<td>Hepatitis C*</td>
<td>2%</td>
<td>46%</td>
<td>2%</td>
<td>7%</td>
</tr>
<tr>
<td>HIV</td>
<td></td>
<td></td>
<td>2%</td>
<td>7%</td>
</tr>
<tr>
<td>Complications</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hospitalizations</td>
<td>4%</td>
<td>7%</td>
<td>2%</td>
<td>13%</td>
</tr>
<tr>
<td>Deaths</td>
<td>0%</td>
<td>7%</td>
<td>2%</td>
<td>13%</td>
</tr>
<tr>
<td>Homelessness/unstable housing</td>
<td>5%</td>
<td>10%</td>
<td>2%</td>
<td>5%</td>
</tr>
<tr>
<td>Known injection drug use</td>
<td>2%</td>
<td>4%</td>
<td>2%</td>
<td>5%</td>
</tr>
<tr>
<td>Known any illicit drug use</td>
<td>4%</td>
<td>6%</td>
<td>4%</td>
<td>6%</td>
</tr>
<tr>
<td>Other</td>
<td>49%</td>
<td>73%</td>
<td>2%</td>
<td>0%</td>
</tr>
<tr>
<td>Unknown</td>
<td>1%</td>
<td>1%</td>
<td>0%</td>
<td>36%</td>
</tr>
<tr>
<td>Affected counties</td>
<td>2%</td>
<td>3%</td>
<td>4%</td>
<td>4%</td>
</tr>
<tr>
<td>Barnstable</td>
<td>4%</td>
<td>7%</td>
<td>0%</td>
<td>2%</td>
</tr>
<tr>
<td>Berkshire</td>
<td>2%</td>
<td>4%</td>
<td>0%</td>
<td>2%</td>
</tr>
<tr>
<td>Bristol</td>
<td>1%</td>
<td>5%</td>
<td>0%</td>
<td>2%</td>
</tr>
<tr>
<td>Dukes</td>
<td>0%</td>
<td>3%</td>
<td>0%</td>
<td>2%</td>
</tr>
<tr>
<td>Essex</td>
<td>1%</td>
<td>5%</td>
<td>0%</td>
<td>2%</td>
</tr>
<tr>
<td>Franklin</td>
<td>2%</td>
<td>4%</td>
<td>0%</td>
<td>2%</td>
</tr>
<tr>
<td>Hampden</td>
<td>4%</td>
<td>7%</td>
<td>0%</td>
<td>2%</td>
</tr>
<tr>
<td>Middlesex</td>
<td>2%</td>
<td>3%</td>
<td>0%</td>
<td>2%</td>
</tr>
<tr>
<td>Norfolk</td>
<td>8%</td>
<td>7%</td>
<td>0%</td>
<td>2%</td>
</tr>
<tr>
<td>Plymouth</td>
<td>9%</td>
<td>7%</td>
<td>0%</td>
<td>2%</td>
</tr>
<tr>
<td>Suffolk</td>
<td>19%</td>
<td>20%</td>
<td>0%</td>
<td>2%</td>
</tr>
<tr>
<td>Worcester</td>
<td>9%</td>
<td>20%</td>
<td>0%</td>
<td>2%</td>
</tr>
</tbody>
</table>

‡ Native Hawaiian/Pacific Islander
*Includes confirmed and probable cases.

- The chart above, which is updated bi-weekly and available at [https://www.mass.gov/info-details/current-hepatitis-a-outbreak](https://www.mass.gov/info-details/current-hepatitis-a-outbreak), summarizes outbreak-associated cases and compares them to 2017 cases (pre-outbreak). Outbreak cases have higher rates of co-infections, hospitalizations, and deaths than 2017 cases, and were more frequently associated with drug use.
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 can not 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 16.** Number of confirmed and probable chronic hepatitis B cases reported by year, Massachusetts, 2009–2018

- An average of 1,858 (range: 1,607 [2013] – 2,022 [2018]) confirmed and probable chronic hepatitis B virus (HBV) infection cases were reported each year from 2009 to 2018.

- The surveillance case definition for chronic HBV requires two positive tests; for certain test types, these two tests must be conducted 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, 2018, some cases currently reported as probable may be converted to confirmed in future reports as additional information is obtained.

*Case definitions and classifications can be found in the Technical Notes beginning on page 51.*
In 2018, 1,106 (55%) newly reported confirmed and probable chronic HBV infection cases were reported among males, and 912 (45%) were reported among females.

Hepatitis B in women of childbearing age is of particular concern due to the risk of transmission from mother to infant at birth. Perinatal HBV transmission can be prevented by identifying HBV positive pregnant women 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 women who are HBV positive and their infants to ensure appropriate PEP, vaccination, and post-vaccination serologic testing.

Figure 17. Number of confirmed and probable chronic hepatitis B cases reported by gender, Massachusetts 2009-2018

Note: Cases with no reported gender or transgender are not presented in this analysis due to small numbers
In 2018, there were 48 confirmed acute and 143 suspect acute HBV cases for a total of 191 acute cases.

The total number of confirmed and suspect acute HBV cases reported increased from 110 in 2009 to 191 in 2018.

Injection drug use (IDU) is a significant, and increasingly important, risk factor for acquisition of acute HBV infection.

*Case definitions and classifications can be found in the Technical Notes beginning on page 51.*
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 mother 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 19. Number of confirmed and probable hepatitis C cases reported by year, Massachusetts, 2009–2018

- hepatitis C (HCV) was the third most commonly reported infectious disease, with 7,013 confirmed and probable hepatitis C cases reported in 2018.*
- Most reported cases are chronically infected and MDPH currently estimates that there are over 250,000 people living with HCV infection in Massachusetts.

* Please note, in 2016, revised case definitions for acute and chronic HCV infection were implemented that contain significant changes from the case definitions for 2009 to 2015. For further information see https://wwwn.cdc.gov/nndss/conditions/.
In 2007, reported cases of hepatitis C were distributed in a curve with two age peaks, with the lower peak at age 25 years and the higher peak at age 50 years.

In 2018, the reported cases were again distributed in a bi-modal curve, but with the higher peak at age 31 years and the lower peak at age 55 years.
Fifty-five percent (N=791/1,449) of confirmed and probable hepatitis C infection cases in those less than 30 years of age were male, and 45% (N=658/1,449) were female.

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-three percent (N=3,432/5,449) of confirmed and probable hepatitis C infection cases in those 30 years of age and older were male, and 37% (N=2,017/5,449) were female.
In 2018, among 1,166 reported cases of infectious syphilis, 32% (N=369/1,166) were ever infected with HIV.

Among infectious syphilis cases reported in 2018, higher rates of HIV co-infection were observed in males, transgender individuals, individuals aged 30 years and above, and black (non-Hispanic) individuals.

Seventy-three percent (N=776/1,064) of infectious syphilis cases among males reported same sex contact (MSM). Of those who reported MSM, 37% (N=289/776) were co-infected with HIV, compared to 25% (N=73/288) of males with unknown risk.
Table 3. Percentage of 2018 laboratory confirmed gonorrhea cases ever co-infected with HIV, by gender, race/ethnicity, and age

<table>
<thead>
<tr>
<th>Gender:</th>
<th>All Gonorrhea Cases (N=7,641)*</th>
<th>HIV/Gonorrhea Co-infections (N=700)</th>
<th>% of Gonorrhea Cases Co-infected with HIV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>5,335</td>
<td>669</td>
<td>13%</td>
</tr>
<tr>
<td>Female</td>
<td>2,268</td>
<td>29</td>
<td>1%</td>
</tr>
<tr>
<td>Transgender</td>
<td>38</td>
<td>2</td>
<td>5%</td>
</tr>
<tr>
<td>Race/Ethnicity:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White NH</td>
<td>2,262</td>
<td>250</td>
<td>11%</td>
</tr>
<tr>
<td>Black NH</td>
<td>1,342</td>
<td>128</td>
<td>10%</td>
</tr>
<tr>
<td>Hispanic/Latino</td>
<td>932</td>
<td>92</td>
<td>10%</td>
</tr>
<tr>
<td>Other</td>
<td>765</td>
<td>68</td>
<td>9%</td>
</tr>
<tr>
<td>Unreported</td>
<td>2,340</td>
<td>162</td>
<td>7%</td>
</tr>
<tr>
<td>Age:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-19</td>
<td>716</td>
<td>9</td>
<td>1%</td>
</tr>
<tr>
<td>20-29</td>
<td>3,710</td>
<td>210</td>
<td>6%</td>
</tr>
<tr>
<td>30-39</td>
<td>1,843</td>
<td>214</td>
<td>12%</td>
</tr>
<tr>
<td>40-49</td>
<td>763</td>
<td>125</td>
<td>16%</td>
</tr>
<tr>
<td>50-59</td>
<td>477</td>
<td>113</td>
<td>24%</td>
</tr>
<tr>
<td>60+</td>
<td>132</td>
<td>29</td>
<td>22%</td>
</tr>
</tbody>
</table>

* Total number of laboratory confirmed gonorrhea cases is slightly larger than the total presented elsewhere in the report because a more recent file date was used for the co-infection analysis (data as of 12/13/19)

- In 2018, among 7,641 reported cases of gonorrhea, 9% (N=700/7,641) were ever infected with HIV.
- Among laboratory confirmed gonorrhea cases reported in 2018, higher rates of HIV co-infection were observed in males, and individuals aged 50 years and above. Co-infection rates were similar across categories of race/ethnicity.
The percentage of individuals diagnosed with HIV infection who were co-diagnosed with hepatitis C decreased from 16% (N=157/981) in 2008 to 8% (N=61/811) in 2014, and then increased to 17% (N=119/698) in 2017.*

* Total number of annual HIV diagnoses 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.
From 2013 to 2017, the proportion of individuals co-infected with HIV/HCV who were white (non-Hispanic) increased from 45% to 61%, while the proportion of black (non-Hispanic) individuals decreased from 17% to 6%. During the same time period, the proportion of 20-29 year-olds increased from 13% to 37% and the proportion of 30-39 year-olds increased from 25% to 39%, while the proportion of 40-49 year-olds decreased by 35% to 16%, and the proportion of individuals age 50 years and above decreased from 27% to 8%. There was also a shift in the distribution of exposure mode: the proportion of individuals co-infected with HIV/HCV and IDU exposure mode increased from 43% to 84%, while the proportion with MSM exposure mode decreased from 19% to 3%.

The distribution of individuals co-diagnosed with HIV/HCV infection by sex at birth remained relatively stable from 2013 to 2017.

Table 4. Individuals diagnosed with HIV infection and co-infected with hepatitis C virus (HCV) by selected demographics, 2013–2017

<table>
<thead>
<tr>
<th></th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
<td>N</td>
</tr>
<tr>
<td>Sex:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>55</td>
<td>63%</td>
<td>47</td>
<td>77%</td>
<td>60</td>
</tr>
<tr>
<td>Female</td>
<td>33</td>
<td>38%</td>
<td>14</td>
<td>23%</td>
<td>24</td>
</tr>
<tr>
<td>Race/Ethnicity:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White NH</td>
<td>40</td>
<td>45%</td>
<td>31</td>
<td>51%</td>
<td>44</td>
</tr>
<tr>
<td>Black NH</td>
<td>15</td>
<td>17%</td>
<td>12</td>
<td>20%</td>
<td>15</td>
</tr>
<tr>
<td>Hispanic/Latino</td>
<td>31</td>
<td>35%</td>
<td>16</td>
<td>26%</td>
<td>24</td>
</tr>
<tr>
<td>Asian/Pacific Islander</td>
<td>2</td>
<td>2%</td>
<td>1</td>
<td>2%</td>
<td>1</td>
</tr>
<tr>
<td>Other/Unknown</td>
<td>0</td>
<td>0%</td>
<td>1</td>
<td>2%</td>
<td>0</td>
</tr>
<tr>
<td>Age:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13-19</td>
<td>0</td>
<td>0%</td>
<td>0</td>
<td>0%</td>
<td>0</td>
</tr>
<tr>
<td>20-29</td>
<td>11</td>
<td>13%</td>
<td>9</td>
<td>15%</td>
<td>16</td>
</tr>
<tr>
<td>30-39</td>
<td>22</td>
<td>25%</td>
<td>21</td>
<td>34%</td>
<td>16</td>
</tr>
<tr>
<td>40-49</td>
<td>31</td>
<td>35%</td>
<td>12</td>
<td>20%</td>
<td>28</td>
</tr>
<tr>
<td>50+</td>
<td>24</td>
<td>27%</td>
<td>19</td>
<td>31%</td>
<td>24</td>
</tr>
<tr>
<td>Exposure Mode:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MSM</td>
<td>17</td>
<td>19%</td>
<td>20</td>
<td>33%</td>
<td>10</td>
</tr>
<tr>
<td>IDU</td>
<td>38</td>
<td>43%</td>
<td>21</td>
<td>34%</td>
<td>56</td>
</tr>
<tr>
<td>MSM/IDU</td>
<td>5</td>
<td>6%</td>
<td>8</td>
<td>13%</td>
<td>8</td>
</tr>
<tr>
<td>HTSX</td>
<td>8</td>
<td>9%</td>
<td>1</td>
<td>2%</td>
<td>3</td>
</tr>
<tr>
<td>Pres. HTSX</td>
<td>6</td>
<td>7%</td>
<td>3</td>
<td>5%</td>
<td>0</td>
</tr>
<tr>
<td>NIR</td>
<td>14</td>
<td>16%</td>
<td>8</td>
<td>13%</td>
<td>7</td>
</tr>
<tr>
<td>Total:</td>
<td>88</td>
<td>100%</td>
<td>61</td>
<td>100%</td>
<td>84</td>
</tr>
</tbody>
</table>

MSM=Male-to-Male Sex, IDU=Injection Drug Use, HTSX=Heterosexual Sex, Pres.=Presumed, NIR=No Identified Risk
In 2018, in Massachusetts, 60% of chlamydia cases and 33% of gonorrhea cases were reported among adolescents and young adults aged 15–24 years.

Nationally in 2018, 62% of chlamydia cases and 43% of gonorrhea cases were reported among adolescents and young adults aged 15–24 years.*

During 2015 to 2017, 15% (N=271/1,855) of HIV infection diagnoses were reported among adolescents and young adults aged 15–24 years.

The largest proportions of adolescents and young adults aged 15–24 years diagnosed with HIV infection were Hispanic/Latino (36%) and black (non-Hispanic) (30%).

During 2015 to 2017, the primary exposure mode for HIV infection among adolescents and young adults was male-to-male sex (58%), followed by injection drug use (8%), presumed heterosexual sex (6%), heterosexual sex (6%), and male-to-male sex/injection drug use (3%). Eighteen percent of adolescents and young adults were reported with no identified risk (NIR).
The age distribution of hepatitis C virus (HCV) cases reported in Massachusetts changed between 2002 and 2018 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 45 years.
- In 2007, reported cases of hepatitis C were distributed in a curve with two age peaks, with the lower peak at age 25 years and the higher peak at age 50 years.
- In 2018, HCV cases among young adults who inject drugs outnumbered newly reported cases among the older age (“baby boomer”) cohort.
- The proportion of cases among young adults (aged 15–29 years) was higher in 2018 (21%, N=1,449/6,898) and 2007 (22%, N=1,748/8,101) compared to 2002 (10%, N=999/10,460).
- 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).

*Probable and Confirmed Hepatitis C 2002, N=10,460 (excludes 187 with missing age and/or gender), 2007 N=8,101 (excludes 853 with missing age and/or gender, 2018 N=6,898 (excludes 115 with missing age and/or gender).
The Massachusetts Youth Risk Behavior Survey (MYRBS) is performed biennially among a sample of ninth to twelfth grade students.*

Three indicators of high-risk youth sexual behavior (ever having sexual intercourse, having sexual intercourse before age 13 years, having had sexual intercourse with four or more partners during their life) reached their lowest levels in 2017 (35.3%, 2.4%, and 6.7%, respectively).

Lifetime injection drug use remained at a low of 1% in 2017.

From 2009 to 2017, there were no significant changes in condom use, alcohol use, or drug use before last sexual intercourse.

---

**Table 5. Reported sexual behaviors among Massachusetts high school students, 2009–2017**

<table>
<thead>
<tr>
<th></th>
<th>2009</th>
<th>2011</th>
<th>2013</th>
<th>2015</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
</tr>
<tr>
<td></td>
<td>(95% CI)</td>
<td>(95% CI)</td>
<td>(95% CI)</td>
<td>(95% CI)</td>
<td>(95% CI)</td>
</tr>
<tr>
<td>Ever having sexual intercourse</td>
<td>46.4% (42.6–50.2)</td>
<td>42.0% (37.5–46.6)</td>
<td>38.1% (34.3–42.0)</td>
<td>36.4% (32.4–40.6)</td>
<td>35.3% (31.8–39.1)</td>
</tr>
<tr>
<td>Having sexual intercourse before age 13</td>
<td>5.4% (4.3–6.8)</td>
<td>4.2% (3.1–5.5)</td>
<td>3.0% (2.4–3.8)</td>
<td>2.9% (2.2–3.8)</td>
<td>2.4% (1.6–3.4)</td>
</tr>
<tr>
<td>Having had sexual intercourse with 4+ partners during their life</td>
<td>12.9% (10.9–15.1)</td>
<td>11.4% (9.1–14.2)</td>
<td>9.3% (8.0–10.8)</td>
<td>7.9% (6.2–10.0)</td>
<td>6.7% (5.4–8.2)</td>
</tr>
<tr>
<td>Using a condom at last sexual intercourse¹</td>
<td>57.5% (54.1–60.8)</td>
<td>57.7% (52.8–62.5)</td>
<td>57.6% (52.9–62.2)</td>
<td>62.5% (58.9–65.9)</td>
<td>57.8% (53.1–62.3)</td>
</tr>
<tr>
<td>Drinking alcohol or using drugs before last sexual intercourse²</td>
<td>23.5% (20.0–27.3)</td>
<td>22.7% (19.5–26.4)</td>
<td>23.5% (19.9–27.5)</td>
<td>21.8% (18.1–26.0)</td>
<td>18.2% (15.8–21.0)</td>
</tr>
<tr>
<td>Ever injecting any illegal drug²</td>
<td>1.9% (1.0–2.6)</td>
<td>1.8% (1.2–2.5)</td>
<td>1.0% (0.5–1.4)</td>
<td>1.1% (0.7–1.6)</td>
<td>1.0% (0.5 – 1.5)</td>
</tr>
<tr>
<td>n³</td>
<td>2,698</td>
<td>2,726</td>
<td>2,711</td>
<td>3,114</td>
<td>3,275</td>
</tr>
</tbody>
</table>

¹ Among youth reporting sexual intercourse in the past three months
² Data Source for ever injecting any illegal drug into your body for 2009–2013 is the Massachusetts Youth Risk Behavior Survey, for 2015–2017 the data source is the Massachusetts Youth Health Survey (Nationally the question was removed from the YRBS after 2013, after which Massachusetts added it to the Youth Health Survey)
³ The number of respondents (unweighted) varied for each question because participants may not answer all questions.

Data Source: Massachusetts Department of Elementary and Secondary Education, Massachusetts Youth Risk Behavior Survey

*For more information see https://www.mass.gov/lists/massachusetts-youth-health-survey-myhs
Figure 26. Estimated\(^1\) average annual HIV diagnosis rate per 100,000 population: MSM compared to non-MSM (men only) ages 18–64 years: Massachusetts, 2015–2017

\[278.8 \text{ per 100,000 population}\]

\[8.4 \text{ per 100,000 population}\]

\(^1\) Multiple source estimation method for MSM rate (2015-2017 BRFSS, 2015-2017 US Census Population Estimates, and MDPH Bureau of Infectious Disease and Laboratory Sciences, data as of 1/1/19)

- At 278.8 per 100,000 population, the estimated average annual rate of HIV diagnosis from 2015 to 2017 among MSM (ages 18-64) was 33 times the rate of infection in men who do not report sex with men (8.4 per 100,000).
Figure 27. Estimated infectious syphilis rate per 100,000 population: MSM compared to non-MSM (men only) ages 18–64 years: Massachusetts, 2018

At 766.0 per 100,000 population, the estimated infectious syphilis rate in 2018 among MSM (ages 18–64) was 170 times the rate of infection in men who do not report sex with men (4.5 per 100,000).

\(^1\) Multiple source estimation method for MSM rate (2015-2017 BRFSS, 2017 US Census Population Estimates, and MDPH Bureau of Infectious Disease and Laboratory Sciences data as of 9/24/19)
• The incidence of syphilis in Massachusetts nearly doubled in the past five years; gay/bisexual men and other men who have sex with men (MSM) represent the overwhelming majority of cases (66% in 2018).

• In 2018, 38% (N=479/767) of infectious syphilis cases among men reporting sex with men also self-reported that they were co-infected with HIV.*

* 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 25 of this report.
**MSM - SYPHILIS BY COUNTY**

**Figure 29.** Total number of confirmed and probable infectious syphilis cases and number among MSM by county, 2018

- In 2018, the largest proportion of infectious syphilis cases in MSM was reported in Suffolk County (37%), followed by Middlesex County (26%).

* Barnstable, Dukes and Nantucket Counties are combined because of small numbers.
The greatest proportion of infectious syphilis cases reported among MSM in 2018 was white (non-Hispanic) (44%), followed by Hispanic/Latino (25%), and black (non-Hispanic) (16%). The racial/ethnic distribution of recent HIV infection diagnoses among MSM was very similar to that for syphilis: 46% white (non-Hispanic), 31% Hispanic/Latino, and 16% black (non-Hispanic).
• Among males, the proportion of HIV infection diagnoses with male-to-male sex as the reported mode of exposure remained between 52% and 65% from 2008 to 2017. During the same time period, the proportion reported with no identified risk remained between 20% and 27%.

• The proportion of cases among males attributed to injection drug use increased from 4% in 2014 to 16% in 2017. This was primarily due to an outbreak among persons who inject drugs in the northeast part of the state.*

SPECIFIC POPULATIONS - PERSONS WHO INJECT DRUGS

- An outbreak of HIV infection was identified in the northeastern cities of Lawrence and Lowell among persons who inject drugs (PWID), involving 129 individuals diagnosed with HIV infection during January 1, 2015–June 30, 2018. Ninety-four (73%) were diagnosed with HIV infection between 20 and 39 years, 55 (43%) were female, and 87 (67%) were white (non-Hispanic). Close to 90% of these individuals also had evidence of hepatitis C exposure at some point.

- By June 4, 2019, the outbreak, including diagnoses since June 2018, had increased to 166 cases. The outbreak-associated cases accounted for 52% of HIV infection diagnoses among PWID in 2016 to 2017, and for the increase in HIV infection diagnoses in PWID statewide.


**Figure 32.** Individuals diagnosed with HIV infection by exposure mode, Massachusetts 2008-2017

- After declining by 62% from 2008 (N=78) to 2014 (N=30), the number of reported cases with injection drug use as the exposure mode increased to 105 in 2017.
Individuals with IDU exposure mode newly diagnosed with HIV infection in Massachusetts during 2015–2017 were predominantly middle-aged (34% 30–39 year-olds and 19% 40–49 year-olds), white (non-Hispanic) (62%), and US born (84%).
The greatest proportion of deaths among individuals with HIV/AIDS was in those with an exposure mode of injection drug use (IDU). In 2017, 40% of deaths among individuals with HIV/AIDS were reported with a exposure mode of IDU and an additional 5% were reported with an exposure mode of MSM/IDU compared to 17% and 4%, respectively, of new HIV diagnoses.

In 2018, black (non-Hispanic) and Hispanic/Latino individuals represented 8% and 12% of the total Massachusetts population, and 18% and 29% of infectious syphilis cases (with known race/ethnicity), respectively.

During 2015 to 2017, black (non-Hispanic) and Hispanic/Latino individuals represented 29% and 28% of individuals diagnosed with HIV infection in Massachusetts, respectively.
From 2009 to 2018, the greatest increase in the number of infectious syphilis cases was reported among Hispanic/Latino individuals (more than quadrupled from 68 to 308), followed by black (non-Hispanic) (more than doubled from 79 to 196), and white (non-Hispanic) individuals (more than doubled from 196 to 471).
In 2015–2017, the average annual age-adjusted HIV diagnosis rate per 100,000 population for males was three times that for females.

There are large disparities in age-adjusted HIV diagnosis rates by race/ethnicity:

- The rates among black (non-Hispanic) individuals and Hispanic/Latino individuals were seven and four times that of white (non-Hispanic) individuals, respectively.
- The rates among black (non-Hispanic) and Hispanic/Latina females were 15 and five times that of white (non-Hispanic) females, respectively.
- The rates among black (non-Hispanic) and Hispanic/Latino males were five and four times that of white (non-Hispanic) males, respectively.
- These disparities exist in all regions of Massachusetts.

\[\text{Figure 37. Average annual age-adjusted HIV diagnosis rates per 100,000 population}^{\text{\textsuperscript{i}}}\text{ by sex at birth and race/ethnicity, Massachusetts 2015–2017 (N=1,855)}\]

\[\text{i The denominators for rate calculations are Vintage 2017 Bridged-Race Postcensal Estimates (release date: June 2018), produced by the U.S. Census Bureau, Population Estimates Program in collaboration with National Center for Health Statistics. All rates are age-adjusted using the 2000 US standard population.}\]
In 2018, 63% of reported chlamydia cases were among females (N=19,019), 37% were among males (N=11,210), and less than one percent (N=46) was among transgender individuals.

In 2018, 30% of reported gonorrhea cases were among females (N=2,272), 70% were among males (N=5,334), and one percent (N=42) was among transgender individuals.
In 2018, there was one probable case of congenital syphilis* reported in Massachusetts.

Massachusetts was one of only nine states that reported no congenital syphilis cases in 2018. Nationally, the congenital syphilis rate increased from 11.6 cases per 100,000 live births in 2014 to 33.1 cases per 100,000 live births in 2018.†

The few cases of congenital syphilis occurring in Massachusetts in recent years were born to women with little or no prenatal care, or women who were not known to be at high risk for syphilis infection, and therefore did not receive repeat syphilis screening in the third trimester or at delivery.


Females newly diagnosed with HIV infection in Massachusetts during 2015–2017 were predominantly middle-aged (30% 30–39 year-olds and 20% 40–49 year-olds), black (non-Hispanic) (47%), and born outside the US (48% non-US born), with an exposure mode of presumed heterosexual sex (35%). While presumed heterosexual sex was the leading exposure mode, a large percentage of new HIV diagnoses had no identified risk (31%).

Among females, the proportion of HIV infection diagnoses with IDU exposure mode decreased from 14% (N=29/204) in 2008 to 7% (N=11/160) in 2014, then increased to 22% (N=35/158) in 2017.

*Recent HIV diagnoses among women include 487 individuals assigned female sex at birth. Data included reflect sex at birth and therefore not gender identity or gender expression of transgender individuals (N=24 transgender individuals diagnosed with HIV infection from 2015 – 2017).
### Strengths and Limitations of Data

<table>
<thead>
<tr>
<th>Description</th>
<th>HIV/AIDS</th>
<th>STD</th>
<th>Viral Hepatitis</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Collected by</strong></td>
<td><strong>Reported statewide</strong></td>
<td><strong>Includes individuals first reported as living in MA.</strong></td>
<td><strong>Includes individuals first reported as living in MA.</strong></td>
</tr>
<tr>
<td><strong>MDPH Bureau of Infectious Disease and Laboratory Sciences</strong></td>
<td><strong>All laboratories and healthcare providers are required by state law to report</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>New HIV diagnoses include only individuals who were first diagnosed in Massachusetts.</strong></td>
<td></td>
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<tr>
<td><strong>HIV prevalence data include all individuals who were reported as residing in Massachusetts regardless of where they were first diagnosed.</strong></td>
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</table>

#### Strengths

- 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.

#### Limitations

- Due to follow up conducted to verify accurate date of diagnosis, annual incidence data are released a year after the close of the year. For example, 2018 HIV diagnoses through December 31, 2018 will be released on January 1, 2020.
- Race/ethnicity data are incomplete for gonorrhea (missing for 34% of 2018 cases) and chlamydia (missing for 59% of 2018 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.

### Massachusetts Youth Risk Behavior Survey

<table>
<thead>
<tr>
<th>Description</th>
<th>Strengths</th>
<th>Limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>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 (ESE) 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 <a href="https://www.mass.gov/lists/massachusetts-youth-health-survey-myhs">https://www.mass.gov/lists/ma...</a></strong></td>
<td><strong>A two-stage sampling method is used to produce representative samples of students in grades 9 – 12. Response rates are high.</strong></td>
<td><strong>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.</strong></td>
</tr>
</tbody>
</table>

| | **Race/ethnicity data are incomplete.** | **Race/ethnicity data are incomplete.** |
| | **Risk history data are not collected on chronic HBV cases.** | |
INTERPRETING HIV/AIDS, STD, AND VIRAL HEPATITIS DATA

Hepatitis B surveillance data are current as of June 19, 2019, hepatitis C data are as of June 16, 2019, HIV/AIDS data are as of January 1, 2019 and STD data are as of September 24, 2019, HIV/STD co-infection data are as of December 13, 2019. All data are subject to change.

I. HIV/AIDS Exposure Mode Definitions

The HIV exposure mode indicates the most probable risk behavior associated with HIV infection. Assignment of exposure mode is done in accordance with Centers for Disease Control and Prevention (CDC) guidelines when multiple exposure modes are reported. Although the reported 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 males who report sexual contact with other males, and males who report sexual contact with both males and females. Please note the acronym MSM is also used to refer to “men who have sex with men”.

• **IDU (Injection Drug Use):** Cases among persons who report injection drug use.

• **MSM/IDU:** Cases among males who report both injection drug use and sexual contact with other males.

• **Heterosexual Sex:** Cases among persons who report heterosexual sex with a person living with, or at increased risk for, HIV infection (e.g. a person who injects drugs). The sub-categories for this mode of transmission are listed below.
  • Heterosexual Sex w/ an person who injects drugs
  • Heterosexual Sex w/ a person 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 mother to child transmission through pregnancy, childbirth, or breastfeeding (perinatal transmission).

• **Presumed Heterosexual:** The presumed heterosexual risk category is used exclusively for females to identify HIV exposure mode when sex with males 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 male sexual partners were unknown. The rationale for the application of the presumed heterosexual risk category to females only has been addressed in the MDPH Office of HIV/AIDS 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 risk for those cases that are initially reported without a risk identified. Includes cases among males 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/AIDS data reflect HIV infections diagnosed through 2017. Newly diagnosed HIV infections/cases include all persons diagnosed with HIV from 2015 to 2017, 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/AIDS 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 reflect year of report. The source of denominators for calculating rate maps was the 2010 US Census. 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 47% of confirmed chlamydia cases and 32% of confirmed gonorrhea cases reported from 2009 to 2018. 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 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 person more likely to get infections or infection-related cancers. These opportunistic infections, or cancers take advantage of the weakened immune system and signal that the person has AIDS (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 (Venereal Disease Research Laboratory [VDRL], rapid plasma reagin [RPR], or equivalent serologic methods), **OR**
- A reactive treponemal serologic test (*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].

**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, popular, 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.
**Case classification**

**Probable:** a case that meets the clinical description of secondary syphilis with a nontreponemal (VDRL, RPR, or equivalent serologic methods) titer $\geq 4$ 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 (Venereal Disease Research Laboratory [VDRL], rapid plasma reagin [RPR], or equivalent serologic methods), AND

- A reactive treponemal serologic test (*T. pallidum* particle agglutination [TP-PA], enzyme immunoassay [EIA], chemiluminescence immunoassay [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.
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.
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),
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 *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
- Polymerase chain reaction (PCR) or other equivalent direct molecular methods of lesions, neonatal nasal discharge, placenta, umbilical cord, or autopsy material, OR
- Immunohistochemistry (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 (Venereal Disease Research Laboratory [VDRL], rapid plasma reagin [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 cerebrospinal fluid (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.

Chronic HBV

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

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
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
- 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):
HIV/AIDS, STD, AND VIRAL HEPATITIS CASE CLASSIFICATIONS

- 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.
### HIV/AIDS, STD and Viral Hepatitis Program Staff Contact Information

<table>
<thead>
<tr>
<th>Topic</th>
<th>Contact</th>
<th>E-Mail</th>
<th>Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Division of STD Prevention &amp; HIV/AIDS Surveillance, and Ratelle STD/HIV Prevention Training Center</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Policy Development and Administration</td>
<td>Kathleen Roosevelt (Director, STD Prevention Division)</td>
<td><a href="mailto:Kathleen.Roosevelt@state.ma.us">Kathleen.Roosevelt@state.ma.us</a></td>
<td>617-983-6941</td>
</tr>
<tr>
<td></td>
<td>Sylvie Ratelle STD/HIV Prevention Training Center</td>
<td>Katherine Hsu (Medical Director)</td>
<td><a href="mailto:Katherine.Hsu@state.ma.us">Katherine.Hsu@state.ma.us</a></td>
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<tr>
<td></td>
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<td>Janine Dyer (Deputy Director)</td>
<td><a href="mailto:Janine.Dyer@state.ma.us">Janine.Dyer@state.ma.us</a></td>
</tr>
<tr>
<td>STD/HIV/AIDS Surveillance and Epidemiology</td>
<td>Betsey John (Director, HIV/AIDS and STD Surveillance)</td>
<td><a href="mailto:Betsey.John@state.ma.us">Betsey.John@state.ma.us</a></td>
<td>617-983-6570</td>
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<td>STD Clinical Services</td>
<td>Katherine Hsu (Medical Director)</td>
<td><a href="mailto:Katherine.Hsu@state.ma.us">Katherine.Hsu@state.ma.us</a></td>
<td>617-983-6948</td>
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<tr>
<td></td>
<td>Lila Coverstone (Public Health Nurse)</td>
<td><a href="mailto:Lila.Coverstone@state.ma.us">Lila.Coverstone@state.ma.us</a></td>
<td>617-983-6959</td>
</tr>
<tr>
<td>STD Disease Intervention Field Services and STD Partner Notification</td>
<td>David Goudreau (Field Operations Manager)</td>
<td><a href="mailto:David.Goudreau@state.ma.us">David.Goudreau@state.ma.us</a></td>
<td>617-983-6835</td>
</tr>
<tr>
<td></td>
<td>Christopher Borger (Field Operations Manager)</td>
<td><a href="mailto:Chris.Borger@state.ma.us">Chris.Borger@state.ma.us</a></td>
<td>617-983-6930</td>
</tr>
<tr>
<td></td>
<td>Brenda Hernandez (Field Operations Manager)</td>
<td><a href="mailto:Brenda.Hernandez@state.ma.us">Brenda.Hernandez@state.ma.us</a></td>
<td>617-983-6943</td>
</tr>
<tr>
<td></td>
<td>Courtney Breen (Field Operations Manager)</td>
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<td>617-983-6955</td>
</tr>
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<td>STD Health Education, Training, and Prevention</td>
<td>Victor Ramirez (Special Projects Coordinator)</td>
<td><a href="mailto:Victor.Ramirez@state.ma.us">Victor.Ramirez@state.ma.us</a></td>
<td>617-983-6567</td>
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<tr>
<td><strong>Office of HIV/AIDS</strong></td>
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<tr>
<td>HIV/AIDS Resource Allocation, Policy, and Programs</td>
<td>H. Dawn Fukuda (Director, Office of HIV/AIDS)</td>
<td><a href="mailto:Dawn.Fukuda@state.ma.us">Dawn.Fukuda@state.ma.us</a></td>
<td>617-624-5303</td>
</tr>
<tr>
<td>Health Promotion and Disease Prevention Services</td>
<td>Linda Goldman (Director of Health Promotion and Disease Prevention)</td>
<td><a href="mailto:Linda.Goldman@state.ma.us">Linda.Goldman@state.ma.us</a></td>
<td>617-624-5347</td>
</tr>
<tr>
<td>Behavioral Health and Community Engagement</td>
<td>Barry Callis (Director of Behavioral Health and Infectious Disease Prevention)</td>
<td><a href="mailto:Barry.Callis@state.ma.us">Barry.Callis@state.ma.us</a></td>
<td>617-624-5316</td>
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<tr>
<td><strong>Viral Hepatitis Program</strong></td>
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<tr>
<td>Viral Hepatitis Surveillance and Epidemiology</td>
<td>Lindsay Bouton (Programmatic epidemiologist for hepatitis A and B)</td>
<td><a href="mailto:Lindsay.Bouton@state.ma.us">Lindsay.Bouton@state.ma.us</a></td>
<td>617-983-6800</td>
</tr>
<tr>
<td></td>
<td>Molly Crockett (Surveillance epidemiologist for hepatitis A and B)</td>
<td><a href="mailto:Molly.Crockett@state.ma.us">Molly.Crockett@state.ma.us</a></td>
<td>617-983-6801</td>
</tr>
<tr>
<td></td>
<td>Anthony Osinski (Programmatic epidemiologist for hepatitis C)</td>
<td><a href="mailto:Anthony.Osinski@state.ma.us">Anthony.Osinski@state.ma.us</a></td>
<td>617-983-6800</td>
</tr>
<tr>
<td></td>
<td>Susan Soliva (Surveillance epidemiologist for hepatitis C)</td>
<td><a href="mailto:Susan.Soliva@state.ma.us">Susan.Soliva@state.ma.us</a></td>
<td>617-983-6801</td>
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</table>
Training

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

<table>
<thead>
<tr>
<th>Type of Training</th>
<th>Contact Information and Website</th>
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<tbody>
<tr>
<td>STD Education, STD Partner Notification, and STD Reporting</td>
<td>617-983-6940</td>
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<tr>
<td></td>
<td><a href="http://www.mass.gov/dph/cdc/std">www.mass.gov/dph/cdc/std</a></td>
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<tr>
<td>HIV/AIDS Reporting and Surveillance Projects</td>
<td>617-983-6560</td>
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<td><a href="http://www.mass.gov/dph/cdc/aids">www.mass.gov/dph/cdc/aids</a></td>
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<tr>
<td>HIV/AIDS Provider Trainings</td>
<td>617-624-5338</td>
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<td><a href="http://www.mass.gov/dph/aids">www.mass.gov/dph/aids</a></td>
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<tr>
<td>Viral Hepatitis Education</td>
<td>617-983-6800</td>
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<tr>
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<td><a href="https://www.mass.gov/lists/hepatitis-b-educational-materials-and-other-resources">https://www.mass.gov/lists/hepatitis-b-educational-materials-and-other-resources</a></td>
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<tr>
<td>STD Diagnosis, Treatment, and Management</td>
<td>617-983-6845</td>
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<td><a href="http://www.RatellePTC.org">www.RatellePTC.org</a></td>
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Material and Clinical Toolkits

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

<table>
<thead>
<tr>
<th>Type of Material</th>
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<tbody>
<tr>
<td>STD, HIV, Viral Hepatitis Fact Sheets</td>
<td>617-983-6940</td>
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<tr>
<td></td>
<td><a href="https://www.mass.gov/fact-sheets-on-infectious-diseases">https://www.mass.gov/fact-sheets-on-infectious-diseases</a></td>
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<tr>
<td>HIV/AIDS Reporting for Health Care Providers</td>
<td>617-983-6560</td>
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<tr>
<td></td>
<td><a href="https://www.mass.gov/infectious-disease-surveillance-reporting-and-control">https://www.mass.gov/infectious-disease-surveillance-reporting-and-control</a></td>
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<tr>
<td>STD, and HIV Posters and Brochures</td>
<td>617-983-6800</td>
</tr>
<tr>
<td></td>
<td><a href="https://massclearinghouse.ehs.state.ma.us/">https://massclearinghouse.ehs.state.ma.us/</a></td>
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<tr>
<td>STD Diagnosis, Treatment, and Management Toolkits</td>
<td>617-983-9645</td>
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<tr>
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<td><a href="http://www.RatellePTC.org">www.RatellePTC.org</a></td>
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</table>

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-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

Center for Disease Control and Prevention
- Division of STD Prevention www.cdc.gov/std
- Division of HIV/AIDS Prevention www.cdc.gov/hiv
- Division of Viral Hepatitis www.cdc.gov/hepatitis
- National Network of STD/HIV Prevention Training Centers www.nnptc.org