

2021
King County
Sexually Transmitted Infection
Epidemiology Report



Public Health
Seattle & King County



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The 2021 Sexually Transmitted Infections (STI) Epidemiology report describes recent trends in syphilis, gonorrhea, and chlamydial infection King County residents and additional STIs, clinical services, and Pre-Exposure Prophylaxis (PrEP) use among Public Health – Seattle & King County (PHSKC) Sexual Health Clinic (SHC, formerly the STD Clinic) patients. Left untreated, these infections may cause serious long-term health consequences including infertility and vision loss. The information contained in this report will be useful to providers, policy-makers, researchers and others interested in reducing the transmission of sexually transmitted infections in King County.

The 2020-2021 STI data should be interpreted with caution. We do not know how much reported STI rates were affected by changes in the population's sexual behavior result from COVID-19 social distancing mandates versus changes in access to medical care (e.g., screening and diagnostic testing)¹. In addition to these unknowns, PHSKC had to curtail some surveillance activities in order to reassign staff to the COVID-19 response, potentially affecting some numbers presented in this report.

Key 2021 STI epidemiology findings in King County include:

- **Syphilis (all stages) rates among cisgender women increased 108% between 2020 and 2021 and 612% between 2012 and 2021.** The overall incidence of syphilis among cisgender women has increased substantially over the last decade. This trend was particularly pronounced when looking at early syphilis, which increased 104% between 2020 and 2021 and by 1616% between 2012 and 2021. Medical providers diagnosed 216 King County cisgender women with syphilis in 2021, including 119 cases of early syphilis. In 2021, 11 cases of congenital syphilis occurred in King County. Increases in congenital syphilis are occurring in Washington state and nationally.

Recommendations for medical providers:

- Review the 2022 PHSKC and Washington Department of Health (WA DOH) Updated Syphilis Screening Guidelines: <https://kingcounty.gov/depts/health/communicable-diseases/hiv-std/~media/depts/health/communicable-diseases/documents/hivstd/congenital-syphilis-letter-providers.ashx>
- Treat all patients with signs or symptoms consistent with primary or secondary syphilis and all persons evaluated because of sexual contact to a person with syphilis when they present for care. Do not wait to receive diagnostic test results.
- Test all pregnant women for syphilis at their first prenatal visit and again with routine 3rd trimester labs, typically at 24-28 weeks gestation.
- Pregnant women who present late for prenatal care or have fragmented care should be screened for syphilis (along with HIV, HBsAg and STI testing), whenever they present for care (e.g. emergency departments, jail, urgent care and labor and delivery).

¹Pinto CN, Niles JK, Kaufman HW, Marlowe EM, Alagia DP, Chi G, Van Der Pol B. Impact of the COVID-19 Pandemic on Chlamydia and Gonorrhea Screening in the U.S. *Am J Prev Med.* 2021 Sep;61(3):386-393.

- Medical providers should test sexually active persons experiencing homelessness, persons who exchange money or drugs for sex, and persons who use methamphetamine, heroin, or cocaine for syphilis when they present for care, including in emergency rooms.
- **Syphilis (all stages) rates among cisgender men who have sex with women only (MSW) increased 161% between 2020 and 2021 and have increased 1247% since 2012.** In 2021, the incidence of early syphilis among cisgender increased 268% compared to 2020 and 1571% compared to 2012. Overall, 229 syphilis cases were diagnosed among cisgender MSW in 2021, of which 159 were early syphilis.
- **Following declines in observed in 2020, gonorrhea and syphilis rates among cisgender men who have sex with men (MSM) increased in 2021, however not to the highs observed in 2019.** In 2021, early syphilis rates increased 128% compared to 2020 and gonorrhea rates increased 14%. MSM remain an important target population for continued efforts to promote condom use and increased STI screening, particularly for syphilis and extragenital gonorrhea and chlamydial infection.

Recommendations:

- PHSKC urges medical providers to perform at least annual STI and HIV screening on all sexually active cisgender men and transgender or non-binary persons who have sex with men.
 - MSM should promptly seek medical evaluation for sores on the penis, mouth or anus or for body rash, and specifically ask to be tested for syphilis.
 - HIV medical providers should test their sexually active MSM patients for syphilis each time they draw blood. (Men with a single, mutually monogamous partner do not require STI testing.)
 - Cisgender MSM and transgender or non-binary persons who have sex with men with any of the following risks in the prior year should test for STIs (and HIV if not living with HIV) every three months:
 - diagnosis of syphilis, gonorrhea or chlamydia,
 - methamphetamine use,
 - condomless anal sex with a partner living with HIV who is virally unsuppressed and a partner with unknown HIV status, or
 - ≥ 10 sex partners.
 - Persons taking HIV pre-exposure prophylaxis (PrEP).
 - Additional information on local MSM STI screening and PrEP guidelines are available at: <https://kingcounty.gov/depts/health/communicable-diseases/hiv-std/patients/pre-exposure-prophylaxis.aspx>
-

- **Gonorrhea rates among cisgender heterosexuals decline in 2021 compared to 2020, with rates among cisgender MSW and women decreasing 23% and 8% respectively.** Despite these declines gonorrhea rates remain high compared to 2012, with rates among cisgender MSW increasing 200% and rates among cisgender women increasing 195% in the last decade. The increase gonorrhea among heterosexuals was first observed in Washington State and other western U.S. states in 2012 and is now being observed nationally.

Recommendations for medical providers:

- Routinely test all sexually active women under the age of 25 annually for gonorrhea and chlamydial infection.
 - Rescreen all persons treated for gonorrhea 3 months after their initial infection.
 - Ensure that all potentially exposed sex partners of persons with gonorrhea or chlamydial infection receive treatment.
- **An estimated 15% of gonorrhea in King County has reduced susceptibility to azithromycin.** In 2021, PHSKC participated in two Centers for Disease Control and Prevention (CDC) antimicrobial-resistant *Neisseria gonorrhoeae* surveillance activities: Gonococcal Isolate Surveillance Project (GISP) and Strengthening the U.S. Response to Resistant Gonorrhea (SURRG). PHSKC tested 9% of all reported gonorrhea cases for antimicrobial resistance in 2021. Of the 387 unique gonorrhea cases with susceptibility results, 15% had decreased susceptibility to azithromycin and none had decreased susceptibility to cefixime or ceftriaxone.

In the 2020 STD Update to the Gonorrhea Treatment Guidelines², the CDC recommended a single 500 mg intramuscular dose of ceftriaxone for uncomplicated gonorrhea. Treatment for coinfection with *Chlamydia trachomatis* with oral doxycycline (100 mg twice daily for 7 days) should be administered when chlamydial infection has not been excluded. This represents a change from the dual therapy of 250 mg ceftriaxone intramuscular in a single dose in addition to azithromycin 1g orally in a single dose recommended in the 2015 guidelines.

- **Chlamydia rates among cisgender women and cisgender men decreased in 2021.** Although incidence decreased in all these populations, chlamydia infection remained the most commonly reported STI in King County. Young cisgender women continue to experience high incidence of chlamydial infection.
- **Rates of all STIs continue to show marked racial and ethnic disparities.** The burden of STI continues to disproportionately affect racial and ethnic minority residents of King County. Rates of gonorrhea and syphilis are consistently higher in Black, American Indian/Alaska Native, Hispanic/Latinx, and Native Hawaiian and Other

²<https://www.cdc.gov/std/treatment-guidelines/default.htm>

Pacific Islander cisgender women, with the highest burden of infection occurring in American Indian/Alaska Native and Black cisgender women. Among MSM, American Indian/Alaska Native, Black, Hispanic/Latinx and Native Hawaiian and Other Pacific Islander men experienced the highest incidences of gonorrhea infection.

- **The PHSKC Sexual Health Clinic remains a vital resource, diagnosing a substantial proportion of all reportable STIs reported in King County.** In 2021, the clinic diagnosed 14% of early syphilis cases in the county, 13% of all cases of gonorrhea, 5% of all cases of HIV, and an estimated 8% of all cases of chlamydial infection. The Sexual Health Clinic also provides EPT, partner services, long-acting reversible contraception, and PrEP services to eligible patients. Cisgender MSM patients continue to account for the majority of the SHC patients.
 - **Family planning clinics play a critical role in the control of STIs in King County.** Family planning clinics diagnosed 5% of all reported gonorrhea cases and 4% of all reported early syphilis cases.
-

King County morbidity data:

This report describes case numbers and rates of infection for three sexually transmitted infections in King County.

These three infections (chlamydia, gonorrhea, and syphilis) are notifiable diseases in Washington State.

Medical providers and laboratories are required by law to report all laboratory confirmed cases of these infections to the PHSKC HIV/STD Program who forwards these reports to the WA DOH. For this report, yearly infection totals are based on year of diagnosis. The numbers contained in the chlamydia, gonorrhea, and syphilis sections of this report are for cases diagnosed from 2002-2021 and reported through March 31, 2022. Data prior to 2002 are available in previous versions of the annual report or upon request. Throughout this report, Hispanic/Latinx ethnicity is treated as a separate racial group, and all other racial groups (White, Black, American Indian/Alaska Natives, Asian, and Native Hawaiian/Pacific Islander) are non-Hispanic. Cases are reported by gender identity.

Population data:

Incidence rates were calculated using population estimates provided by the Washington State Office of Financial Management for intercensal years and U.S. census annual population estimates for 2020. The 2021 rates were calculated using the population estimate for 2020 as newer estimates were not available. Incidence is a measure describing the number of new diagnoses of infection in a specific population over a period of time. In King County, incidence of STIs is calculated by dividing the number of reported cases of an infection over the total

King County population and is usually expressed as a number of cases per 100,000 population per year.

For years 2013 and earlier, STI estimates in MSM assume that 5.7% of men ages 15 and older in King County were MSM; this percentage comes from King County specific Behavioral Risk Factor Surveillance System (BRFSS) data collected in 2013 and 2014. BRFSS is a national telephone survey conducted annually by the CDC (<https://www.cdc.gov/brfss/index.html>). Some data suggest that the percentage of men in King County who are MSM is increasing. To address this, from 2014 onward this report bases the estimate of the MSM population size on the two-year average of the percentage of men who report being gay or bisexual in BRFSS using data from the two years prior to the year for which STI incidence is estimated (e.g. the 2020 estimate uses data from 2018 and 2019). The percentage of men ages 15 and older estimated to be MSM are as follows:

- 2014 – 6.2%
- 2015 – 6.3%
- 2016 – 6.4%
- 2017 – 6.6%
- 2018 – 6.7%
- 2019 – 6.5%
- 2020 – 6.4%
- 2020 – 6.5%

Population estimates for HIV-positive and negative MSM were provided by the PHSKC HIV/AIDS Epidemiology Unit from National HIV Surveillance System data.

Data limitations:

Notifiable disease data have several limitations. In some cases, considerable differences in numbers and rates of infection between subgroups are attributable in large part to screening and testing practices. For example, the rate of chlamydial infection in King County is substantially higher among cisgender women than men, reflecting national recommendations that women <25 years of age be screened for chlamydia annually, and the absence of corresponding recommendations for young heterosexual men.

While chlamydial infection, gonorrhea, and syphilis are all notifiable diseases in Washington State, these data are subject to under-reporting by physicians and laboratories. Additionally, because undiagnosed infections cannot be reported, infections that are frequently experienced with no symptoms, such as chlamydia, may exist at higher levels in the population than notifiable disease data indicate. PHSKC does not monitor the number of chlamydial or gonorrhea tests performed in the population. Therefore, we cannot estimate the extent to which changes in the number of cases reported reflect true changes in incidence vs. increased case detection or ascertainment due to changes in the number of tests performed, changes in the sensitivity of the tests employed, or more complete reporting of diagnosed cases.

Due to lack of funding for staff to enter chlamydia cases into the STI surveillance system, only cases reported by providers were entered and those reported only by

electronic laboratory report (ELR) were no longer entered into the STI surveillance starting in September 2019. The estimated number of chlamydial infections in King County from September 2019 to December 2021 was obtained by combining the entered case reports and the ELRs.

However, ELR cases have limited patient data, including patient gender and age. This means data for anatomic site of infection, provider type, race/ethnicity, patient gender, and gender of sex partners are not available for chlamydial infection in this report.

The Epidemiology Report includes case numbers in transgender women and transgender men, but not case rates since the U.S. Census does not provide a population size estimate for the number of King County residents who are transgender, non-binary, or genderqueer, and we are unable to calculate incidence rates in this population. Collection of gender identity has changed and improved over time and our ability to identify transgender and non-binary individuals in older years of data is limited. We are thus unable to identify transgender and non-binary patients who are misclassified in our analyses and the direction of this misclassification is also unknown.

Cisgender men are stratified by gender of sex partners into MSM and MSW. Male cases were classified as MSM if they met any of the following criteria: 1) medical provider indicated the case had male sex partners on the case report, 2) the case reported sex with men in the last year during a partner services interview, or 3) the case had rectal gonorrhea or chlamydial infection. Cisgender men

without rectal infections who are missing gender of sex partners data are classified as MSW, which may result in misclassification of these men and underestimation of incidences among MSM. In 2021, 9% of gonorrhea cases among cisgender men and 9% of early syphilis cases were missing this information.

Lastly, STI surveillance data are dynamic with databases often being updated with new data, including changes to

data collected such as gender identity, sex at birth, gender of sex partners, and symptoms. These changes can affect current calculations of estimates from prior years. Thus, differences between Epi Reports for estimates for a given year are expected. These changes are reflected in the availability of data for this report, where available data are reported for the last 20 years (2002-2021) and other analyses are limited to data from the current STI surveillance system (2007-2021).

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Table 1-1: Early Syphilis (primary, secondary, and early non-primary non-secondary) – Number of reported cases and incidence by gender* King County, WA, 2002-2021

Year	Cisgender Women		Cisgender Men		Transgender Women	Transgender Men	Non-binary/ Genderqueer	Total	
	Cases	Incidence per 100,000 population	Cases	Incidence per 100,000 population	Cases	Cases	Cases	Cases	Incidence per 100,000 population
2002	0	0.0	64	7.2				64	3.6
2003	2	0.2	80	9.0				82	4.6
2004	7	0.8	159	17.7				166	9.2
2005	7	0.8	186	20.6				193	10.6
2006	2	0.2	183	19.9				185	10.0
2007	1	0.1	199	21.3	0	0		200	10.7
2008	4	0.4	198	21.0	1	0		203	10.7
2009	6	0.6	150	15.7	0	0		156	8.2
2010	4	0.4	285	29.6	0	0		289	15.0
2011	5	0.5	340	35.1	1	0		346	17.8
2012	6	0.6	321	32.9	0	0		327	16.7
2013	10	1.0	312	31.6	0	0		322	16.2
2014	12	1.2	277	27.5	1	0		290	14.4
2015	7	0.7	432	42.2	0	0		439	21.4
2016	17	1.6	486	46.2	0	0		503	23.9
2017	8	0.7	646	60.0	0	0	2	656	30.5
2018	31	2.8	691	63.1	5	0	0	728	33.2
2019	32	2.9	707	63.5	7	1	0	747	33.6
2020	58	5.1	585	51.7	13	0	7	663	29.3
2021	119	10.5	854	74.1	20	1	6	1002	43.8

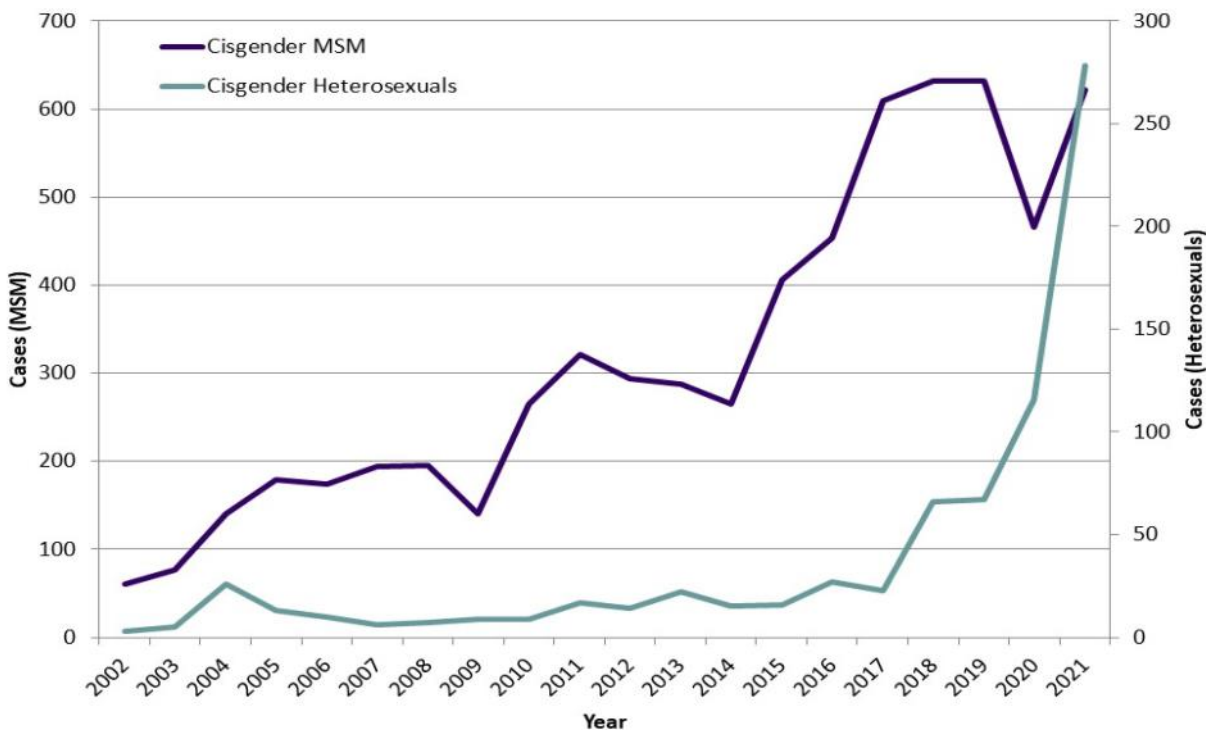
*Data for transgender cases are available starting in 2007 and for non-binary/genderqueer cases starting in 2017. Rates for transgender and non-binary/genderqueer populations cannot be calculated due to no available population estimate. Cases with sex at birth but unknown gender identity are assumed to be cisgender. Cases with unknown sex are included in the total cases.

Overview

A total of 1,002 early syphilis (primary, secondary, and early non-primary non-secondary [previously early latent]) cases were reported in King County residents in 2021 for an overall incidence of 43.8 cases per 100,000 persons (Table 1-1). This incidence represents a 49% increase compared to 2020. Syphilis cases increased among both cisgender MSM and heterosexuals in 2021 compared to 2020, though trends in the two populations differed. Among heterosexuals, the number of cases increased by 140%, continuing a trend of rapidly increasing syphilis that has been ongoing since 2017. In contrast, among cisgender MSM, cases increased by 33%, but this change followed a significant

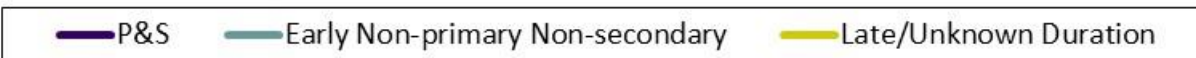
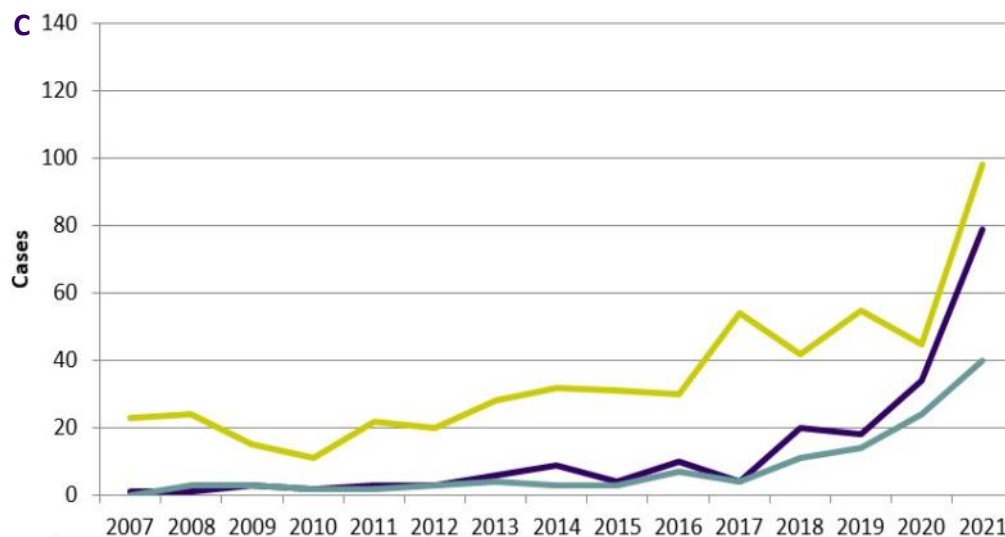
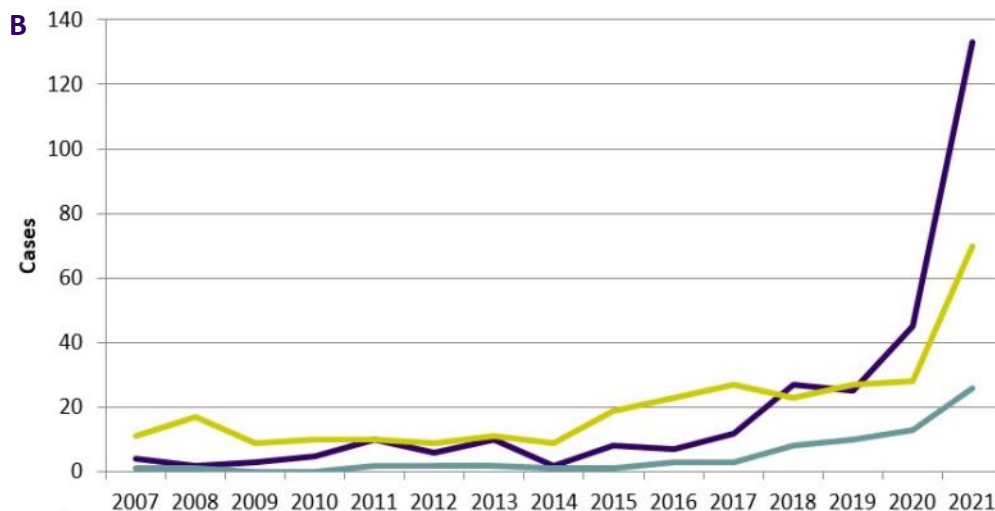
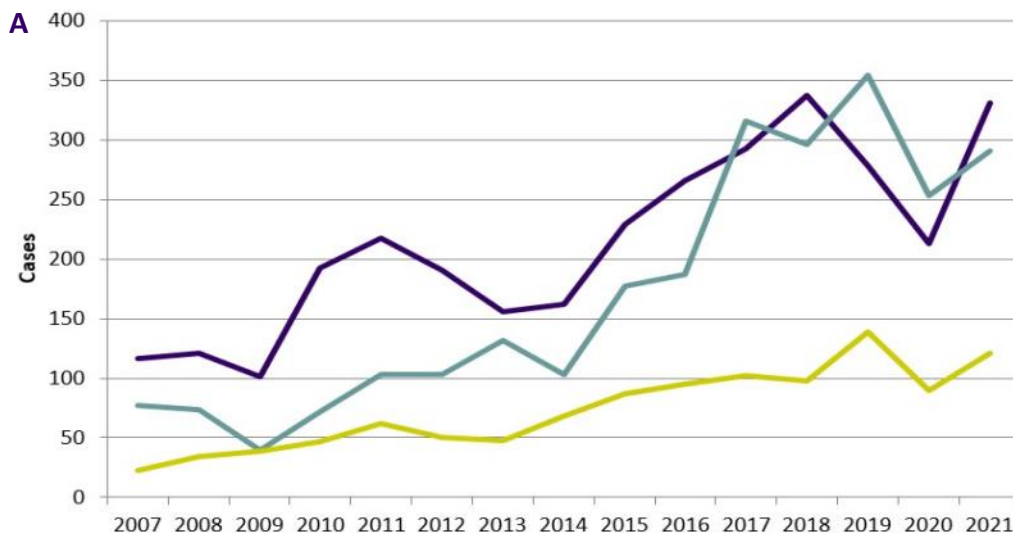
decrease between 2019 and 2020; the rate of early syphilis among MSM in 2021 was similar to that observed in 2019, prior to the COVID-19 epidemic (Figure 1-1). Early syphilis cases among MSM increased from 466 reported in 2020 to 622 in 2021, with a somewhat larger increase in primary and secondary (P&S) cases compared to early non-primary non-secondary or late/unknown duration cases (Figure 1-2A). Among cisgender heterosexuals, all stages of syphilis increased compared to 2020, with the largest increase occurring in P&S cases (Figures 1-2B&C). P&S cases increased 196% between 2020 and 2021 among cisgender MSW (45 to 133 cases) and 132% among cisgender women (34 to 79 cases).

Figure 1-1: Early Syphilis – Reported cases among cisgender men who have sex with men (MSM)* and cisgender heterosexuals King County, WA, 2002-2021



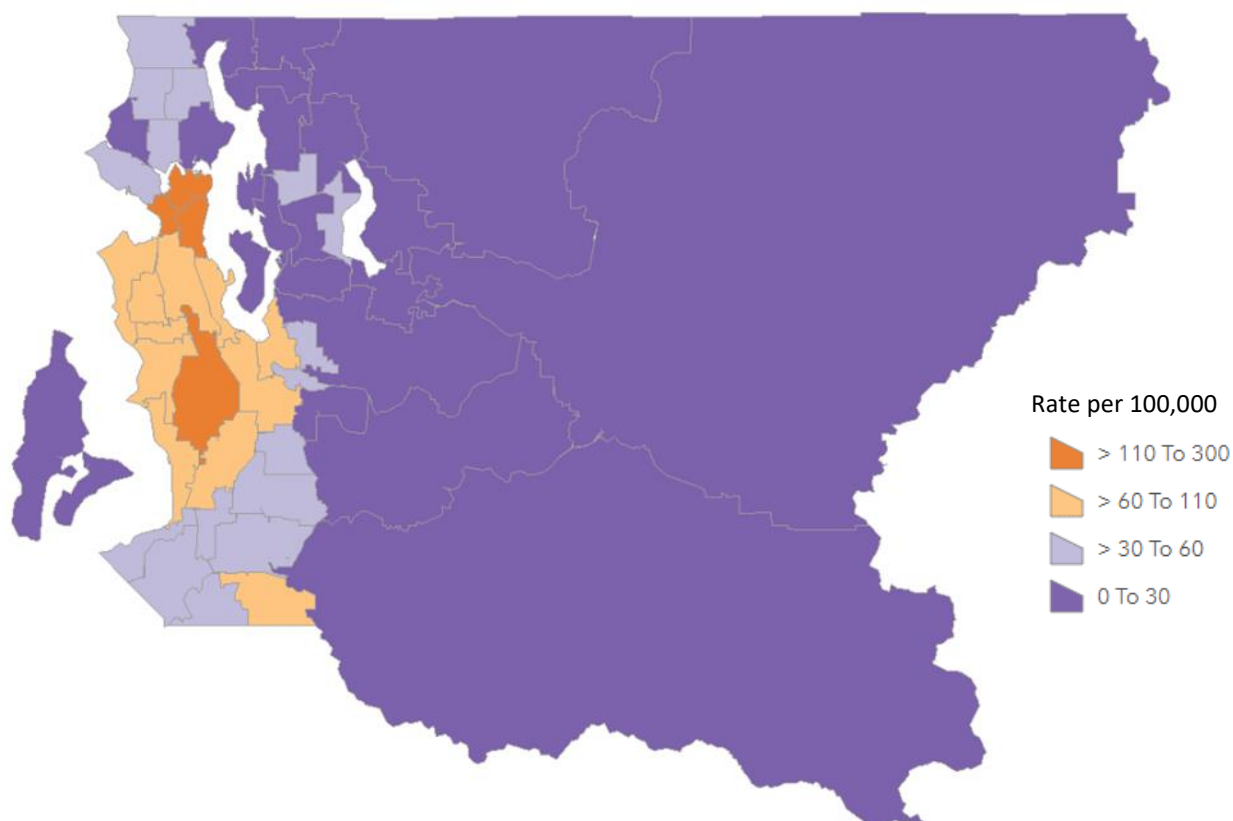
*Men were missing gender of sex partners data in the following years (numbers missing are included in parentheses: 2002 (1), 2005 (1), 2006(1), 2009(6), 2010(15), 2011(7), 2012(19), 2013(12), 2014(9), 2015(17), 2016(23), 2017(22), 2018(23), 2019(40), 2020(62), 2021(73).

Figure 1-2: Early Syphilis – Reported cases of primary and secondary (P&S), early non-primary non-secondary, and late or unknown duration syphilis among cisgender men who have sex with men (A), cisgender men who have sex with women (B), and cisgender women (C) King County, WA, 2007-2021



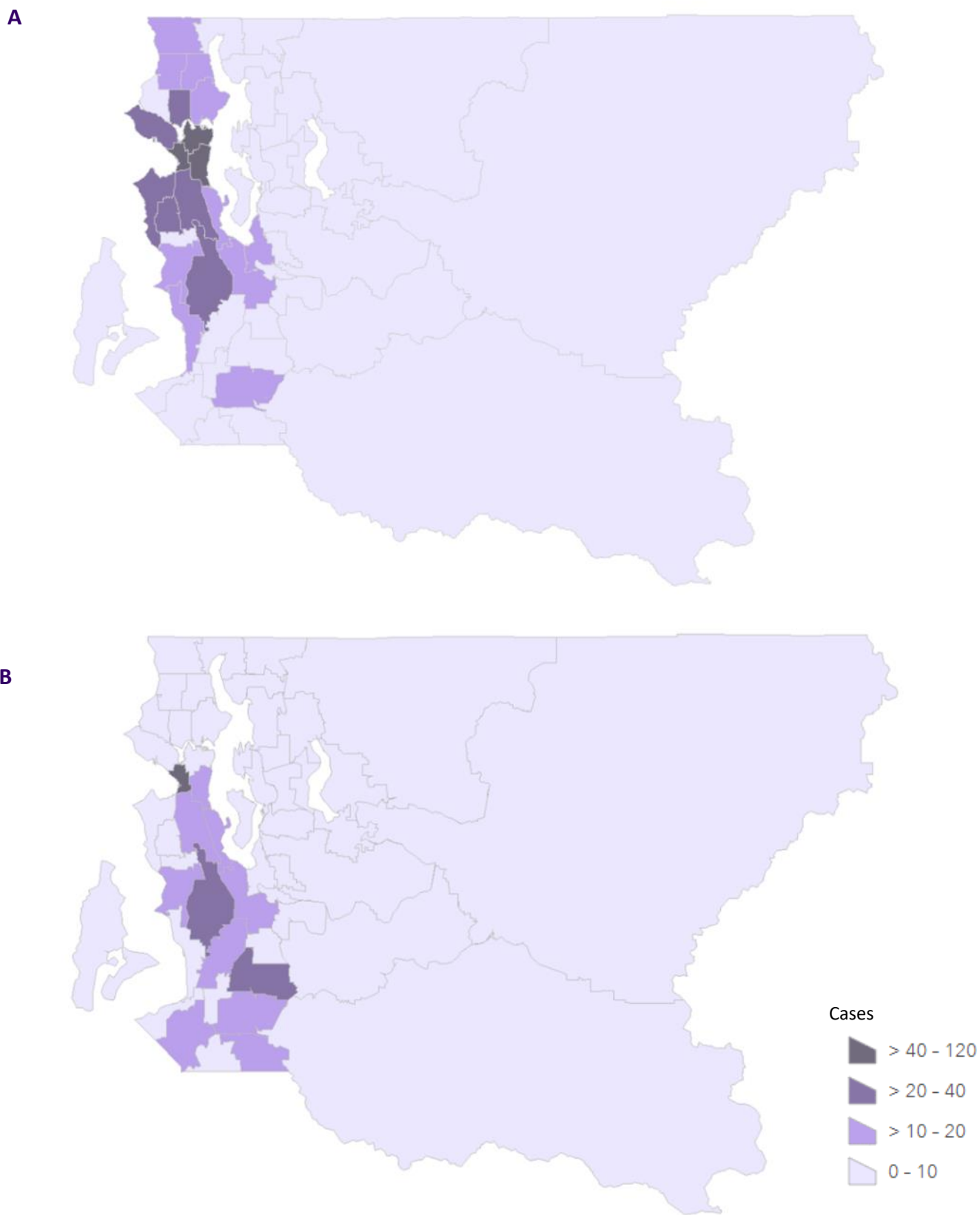
Syphilis case counts and incidence vary by Health Reporting Area³, with higher case counts and incidence observed in Seattle and south King County in 2021 (Figures 1-3A&B and 1-4A&B).

Figure 1-3: Syphilis (all stages) – Incidence by Health Reporting Area King County, WA, 2021



³<https://kingcounty.gov/depts/health/data/community-health-indicators/definitions.aspx>

Figure 1-4: Syphilis (all stages) – Cases among cisgender men who have sex with men (A) and cisgender heterosexuals (B) by Health Reporting Area King County, WA, 2021



Cisgender MSM

Sixty-two percent (n=622) of all early syphilis cases in 2021 occurred in cisgender MSM. The incidence of early syphilis among cisgender MSM (1,000 per 100,000) in 2021 was 56 times the rate among cisgender MSW (17.8 per 100,000) (Table 1-2). From

2014 to 2019, syphilis rates in MSM rose dramatically. Diagnoses dipped in 2020 concurrent with the COVID-19 epidemic; the extent to which this change reflects a true decline in syphilis incidence versus a decrease related to decreased testing is uncertain.

Table 1-2: Early Syphilis – Number of reported cases and incidence among cisgender men who have sex with men (MSM) and cisgender men who have sex with women (MSW), King County, WA, 2002-2021*

Year	Cisgender MSM		Cisgender MSW	
	Cases	Incidence per 100,000 population	Cases	Incidence per 100,000 population
2002	60	147	3	0.4
2003	77	187	3	0.4
2004	140	337	19	2.8
2005	179	426	6	0.9
2006	174	407	8	1.1
2007	194	447	5	0.7
2008	195	444	3	0.4
2009	141	318	3	0.4
2010	265	592	5	0.7
2011	321	711	12	1.6
2012	294	647	8	1.1
2013	288	625	12	1.6
2014	265	518	3	0.4
2015	406	767	9	1.1
2016	453	820	10	1.2
2017	609	1,044	15	1.8
2018	632	1,048	35	4.2
2019	632	1,060	35	4.1
2020	466	779	58	6.6
2021	622	1,000	159	17.8

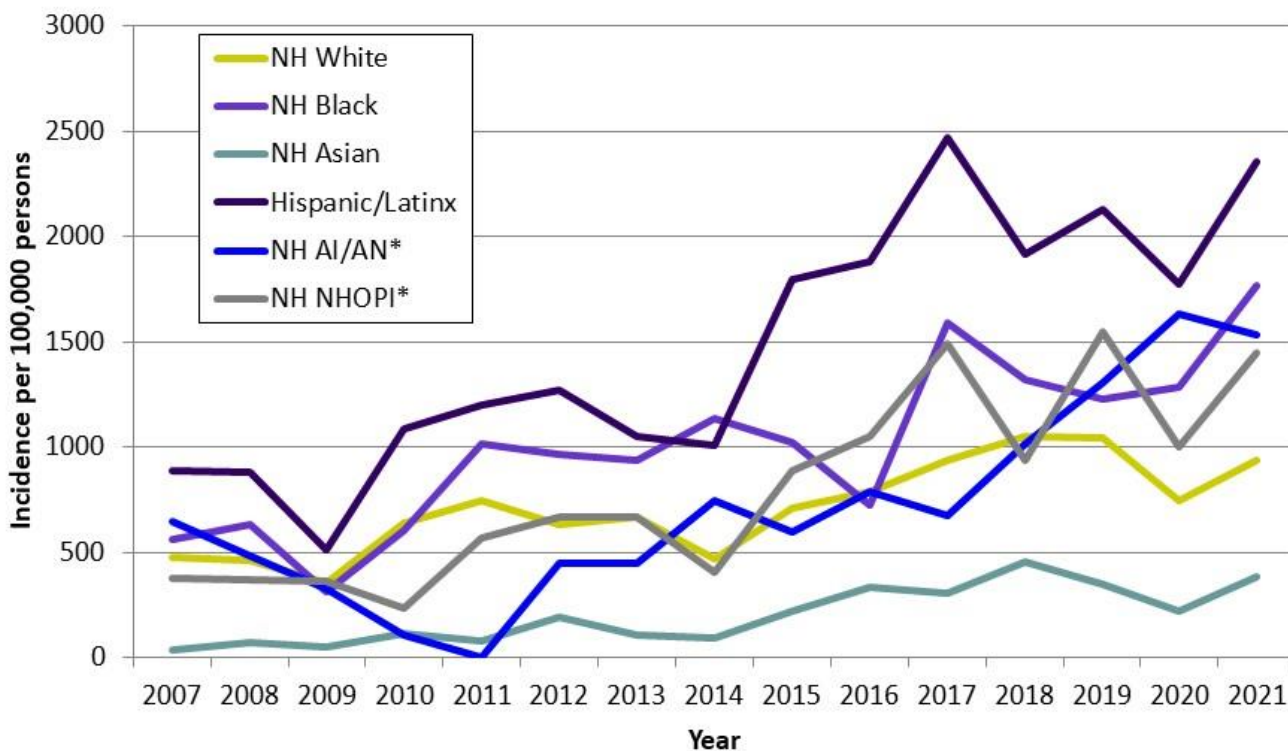
Men were missing sexual orientation data in the following years (numbers missing are included in parentheses: 2002 (1), 2005 (1), 2006(1), 2009(6), 2010(15), 2011(7), 2012(19), 2013(12), 2014(9), 2015(17), 2016(23), 2017(22), 2018(23), 2019(40), 2020(60), 2021(73)

Incidence of syphilis among cisgender MSM differs by racial and ethnic group (Figure 1-5). In 2021, Latinx MSM had the highest rate of early syphilis among MSM (2,354 per 100,000). Native Hawaiian/Pacific Islander MSM (1,770 per 100,000) had the second highest rate followed closely by Black MSM (1,764 per 100,000). All racial and ethnic groups experienced higher incidence in 2021 compared to 2020. The incidence of early syphilis among MSM also varies by age. In 2021, the incidence was highest among MSM 30 to 34 years (1,722 per 100,000), followed by 35 to 44 years (1,378 per 100,000) and 25-29 years (1,376 per 100,000). MSM ages 55 years and older experienced a slight

decrease in incidence compared to 2020 while all other age groups experience an increase in incidence between 2020 and 2021 (Figure 1-6).

Throughout the ongoing syphilis epidemic, syphilis has disproportionately affected MSM living with HIV (Figure 1-7). In 2021, the estimated incidence of early syphilis among MSM living with HIV was nearly 9 times higher than in HIV-negative MSM (5,111 vs. 591 per 100,000). However, since 2015, early syphilis has increasingly affected the larger population of HIV-negative MSM, and in 2021, 54% of early syphilis cases occurred in HIV-uninfected MSM (Figure 1-8).

Figure 1-5: Early Syphilis: Incidence among cisgender men who have sex with men (MSM) by race and ethnicity*, King County, WA, 2007-2021



NH = Non-Hispanic, AI/AN = American Indian/Alaska Native, NHOPI = Native Hawaiian/Pacific Islander
 *Cases with unknown race and ethnicity were distributed according to annual race and ethnicity distributions among cases with known race and ethnicity and included in race/ethnicity-specific incidences. Rates for Native Hawaiian/Pacific Islander and American Indian/Alaska Native MSM Rates are presented as three-year rolling averages to minimize random changes.

Figure 1-6: Early Syphilis—Incidence among cisgender men who have sex with men (MSM) by age, King County, WA, 2007-2021

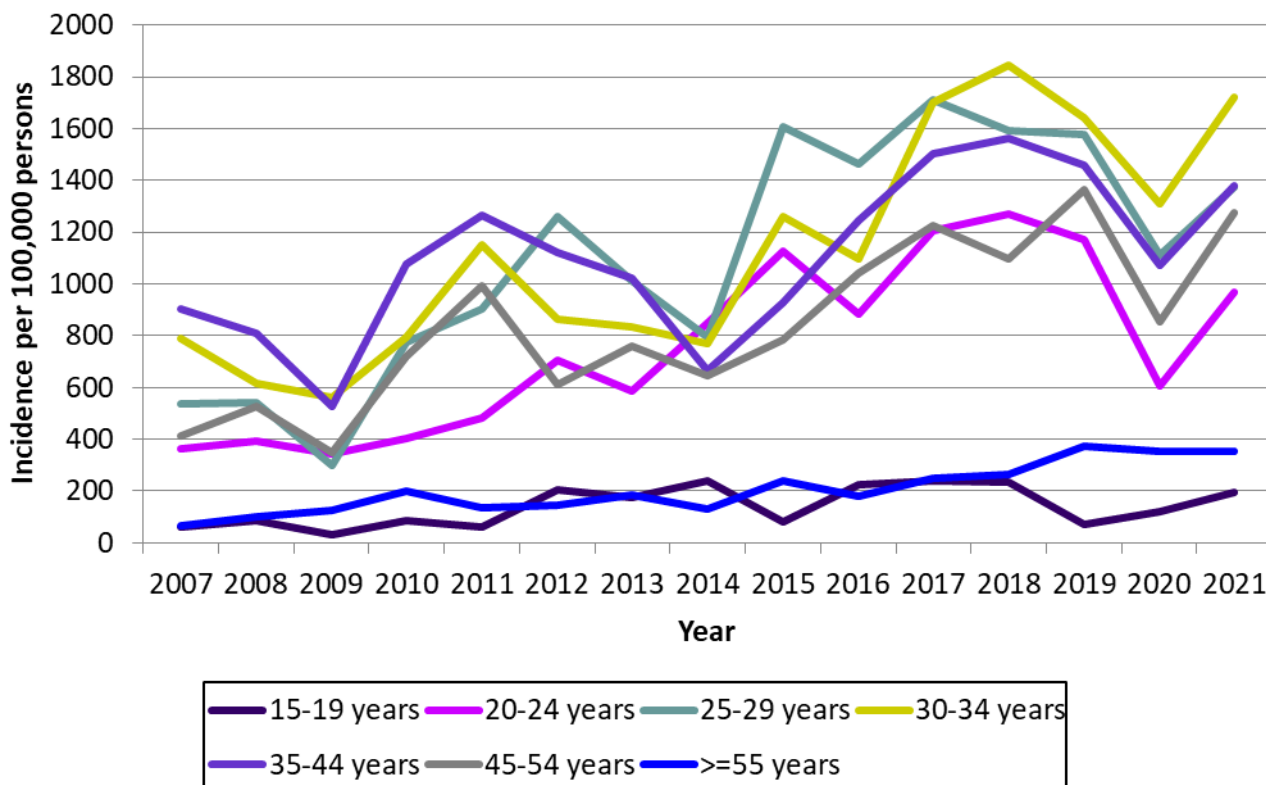
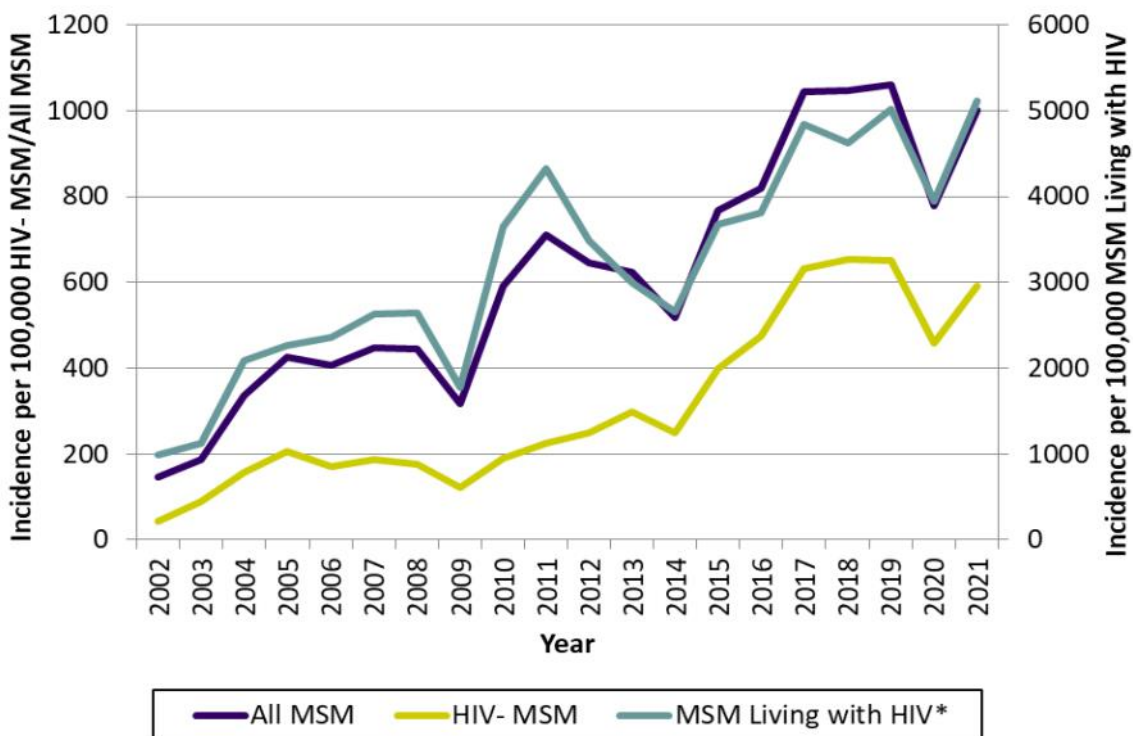
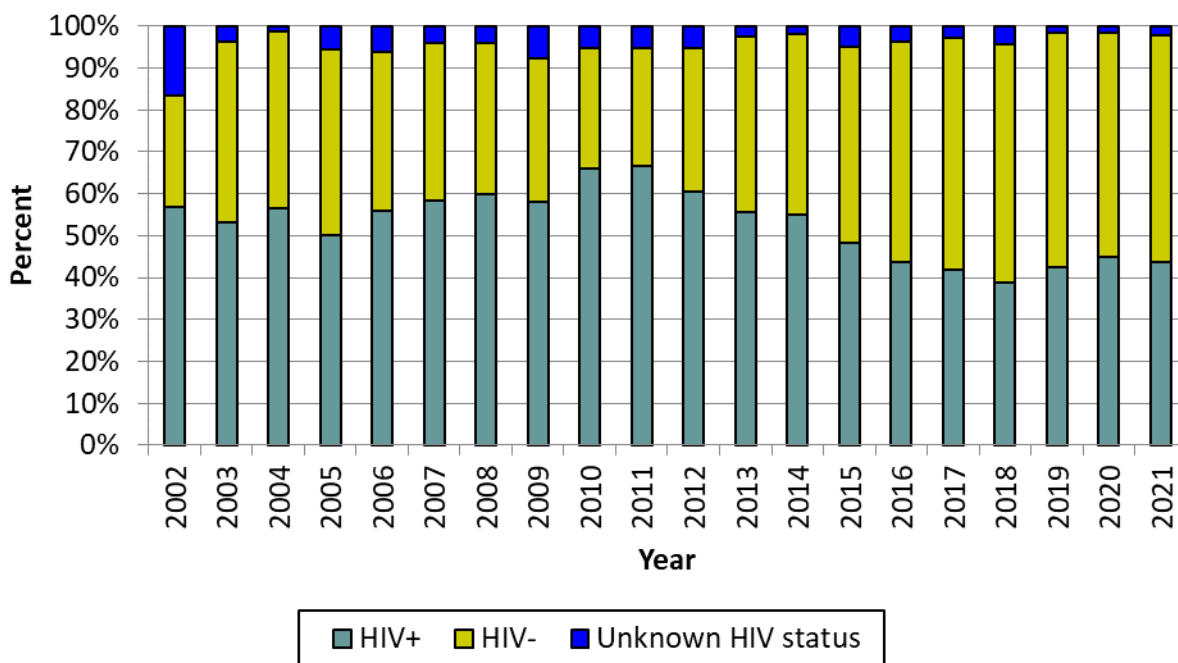


Figure 1-7: Early Syphilis – Incidence among cisgender men who have sex with men (MSM) by HIV Status King County, WA, 2002-2021



*Right side Y-axis

Figure 1-8: Early Syphilis – Percent of reported cases among cisgender men who have sex with men (MSM) by HIV status King County, WA, 2002-2021



Cisgender Heterosexuals and congenital syphilis

Although early syphilis incidence among cisgender heterosexuals remained a fraction of the incidence in cisgender MSM in 2021, (Tables 1-1 and 1-2) cases among cisgender heterosexuals (n=278) continued to increase dramatically. The increase in early syphilis cases among cisgender heterosexuals represents a 1109% increase since 2017 (n=23 cases) and an 140% increase since 2020 (n=116 cases). Nine (3%) of the early syphilis cases reported among cisgender women and MSW in 2021 were known to be living with HIV.

The incidence of total syphilis (early and late/unknown

duration stages) among cisgender women increased 731% from 2012 and 110% since 2020 (Table 1-3). Until 2018, most of this trend reflected an increase in the number of diagnoses of late latent syphilis and syphilis of unknown duration among cisgender women. However, starting in 2018 early syphilis among cisgender women began rising dramatically. This change in the pattern of infection suggests that there is likely a growing reservoir of undiagnosed syphilis among King County heterosexuals, and that the cases being diagnosed – the growing proportion of which are symptomatic – are a fraction of the true epidemic.⁴

Table 1-3: Syphilis (all stages) – Number of reported cases and incidence among cisgender women and cisgender men who have sex with women (MSW) 15 years and older, King County, WA, 2007-2021

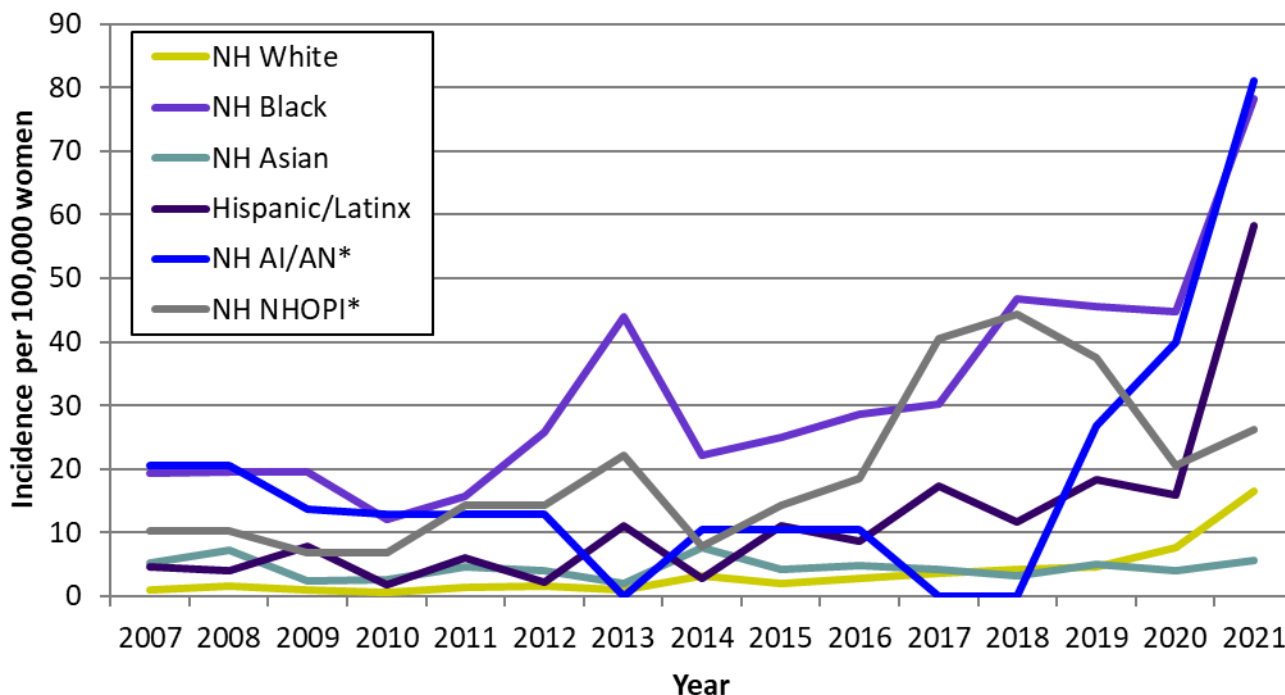
Year	Cisgender Women		Cisgender MSW	
	Cases	Incidence per 100,000 population	Cases	Incidence per 100,000 population
2007	24	3.1	16	2.2
2008	28	3.6	20	2.8
2009	21	2.7	12	1.6
2010	15	1.9	15	2.0
2011	27	3.3	22	2.9
2012	26	3.2	17	2.3
2013	38	4.6	23	3.0
2014	44	5.3	12	1.6
2015	38	4.5	28	3.6
2016	47	5.4	33	4.1
2017	62	6.9	42	5.1
2018	73	8.0	58	6.9
2019	87	9.4	62	7.2
2020	103	10.9	86	9.8
2021	216	22.8	229	25.6

⁴Berzkalns A, Ramchandani MS, Cannon CA, Kerani RP, Dombrowski JC, Golden MR. The Syphilis Epidemic Among Heterosexuals Is Accelerating: Evidence From King County, Washington. *Open Forum Infect Dis*. 2023;10(10):ofad481. Published 2023 Sep 23. doi:10.1093/ofid/ofad481

Rates of syphilis among cisgender women varied by racial and ethnic group (Figure 1-9). American Indian/ Alaska Native women had the highest rate (123.5 cases per 100,000) of syphilis in 2021, followed by Black women (78.3 cases per 100,000), and Hispanic/Latinx women (58.3 cases per 100,000). These rates represent health disparities as the rates among American Indian/

Alaska Native women (7.5 times higher), Black women (4.7 times higher), and Hispanic/Latinx women (3.5 times higher) were all higher than the rate among White women (16.6 cases per 100,000). MSW also experienced an increase in total syphilis incidence, from 9.8 cases per 100,000 in 2020 to 25.6 cases per 100,000 in 2021, a 161% percent increase (Table 1-3).

Figure 1-9: Syphilis - Incidence among cisgender women by race and ethnicity*, King County, WA 2007-2021

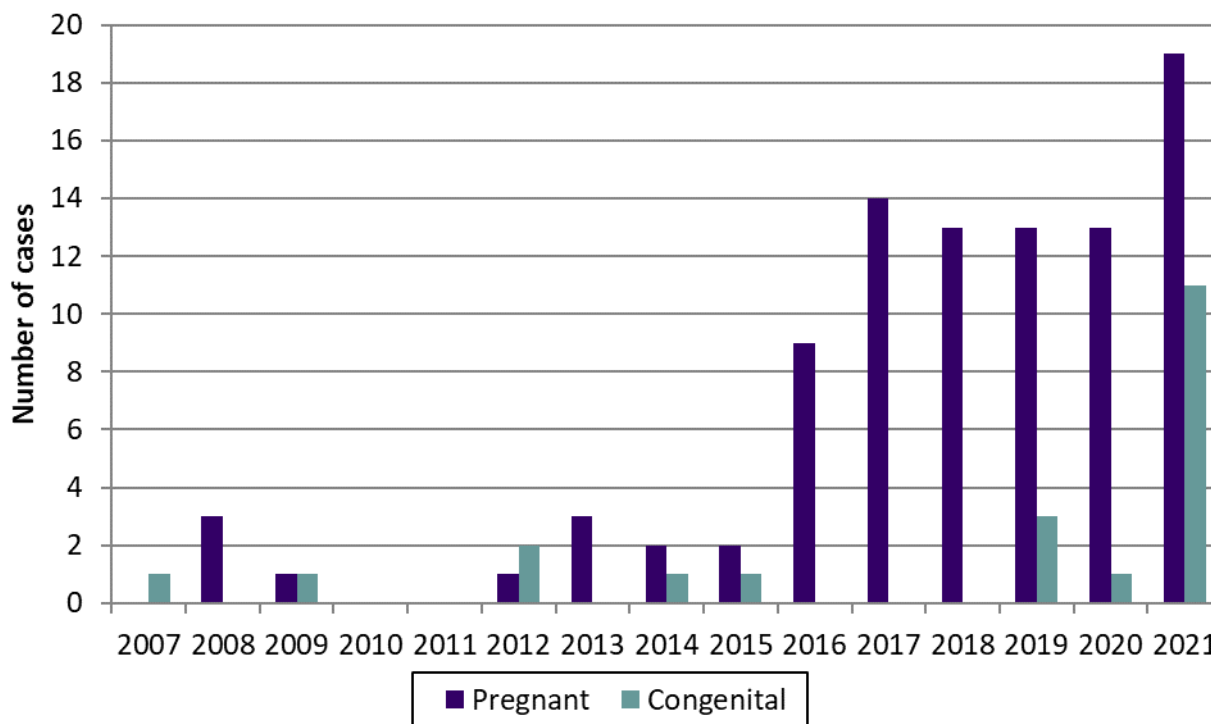


NH = Non-Hispanic, AI/AN = American Indian/Alaska Native, NHOPI = Native Hawaiian/Pacific Islander
 *Cases with unknown race and ethnicity were distributed according to annual race and ethnicity distributions among cases with known race and ethnicity and included in race/ethnicity-specific incidences. Rates for Native Hawaiian/Pacific Islander and

Similar to national trends, congenital syphilis is increasing in Washington State and in King County.⁵ In 2021, a record high 53 congenital cases were diagnosed in Washington State and 11 of these cases were diagnosed among King County residents (Figure 1-10). Trends in congenital syphilis usually mirror the trends in primary and secondary syphilis among reproductive age women, and the increase in syphilis among this population suggests that some pregnant women in King County are at risk for syphilis during pregnancy and for transmitting the infection to their unborn children. Medical providers caring for pregnant women should routinely test women when they establish prenatal care and in the third trimester

of pregnancy (24-28 weeks gestation). PHSKC prioritizes pregnant women for outreach and partner services to ensure that these cases receive adequate and appropriate treatment. In 2021, 19 syphilis cases in King County were pregnant at the time of diagnosis (Figure 1-10). Of the pregnant cases, 17 (89%) received treatment for syphilis, which may represent additional cases of congenital syphilis averted due to clinical and public health interventions. However, only 11 (58%) pregnant completed stage appropriate syphilis treatment. Of note, preliminary 2022 data indicate that there were 12 cases of congenital syphilis in King County in 2022 and 54 cases in WA State.

Figure 1-10: Syphilis – Pregnant and congenital cases King County, WA 2007-2021*



*Pregnancy status was added to the STD case report form in October 2014.

⁵Centers for Disease Control and Prevention. Sexually Transmitted Disease Surveillance 2021. Atlanta: U.S. Department of Health and Human Services; 2023.

Syphilis cases interviewed for partner services are asked questions to capture potential risk factors for syphilis infection. (For additional information about partner services see the Partner Services section.) In 2021, 239 (54%) of the syphilis cases among cisgender heterosexuals were interviewed by King County public health staff (Table 1-4). A high proportion of both cisgender MSW (25%) and women (33%) reported experiencing homelessness in the prior three months. A higher proportion of

interviewed cisgender women reported injection drug use, methamphetamine, or heroin use in the past year than interviewed cisgender MSW. Six percent of cisgender women and 10% of cisgender MSW reported receiving or giving money or drugs in exchange for sex in the past year. Many cases did not report a risk factor for an increased risk of syphilis infection, a sign the current syphilis epidemic may increasingly be affecting a larger population of heterosexuals.

Table 1-4: Syphilis (all stages) – Risk factors among cisgender women and cisgender men who have sex with women (MSW) interviewed for partner services, King County, WA, 2021

Risk Factors	Cisgender MSW		Cisgender Women	
	Cases	Percent	Cases	Percent
<i>Total Interviewed</i>	126	100%	113	100%
Experienced homelessness (past 3 months)	31	25%	37	33%
Injection drug use (past year)	7	6%	12	11%
Methamphetamine (past year)	29	23%	33	29%
Heroin (past year)	11	9%	16	14%
Receive or give money or drugs in exchange for sex (past year)	12	10%	7	6%
Any of the above risks reported	53	42%	46	41%

Stage of infection and reason for testing

In 2021, 53% of all early syphilis cases in cisgender MSM were staged as primary or secondary and 47% sought medical care because of symptoms, 38% were diagnosed through asymptomatic screening and 12% because of a sex partner's syphilis diagnosis (Table 1-5, Figure 1-11). Over time, the proportion of early

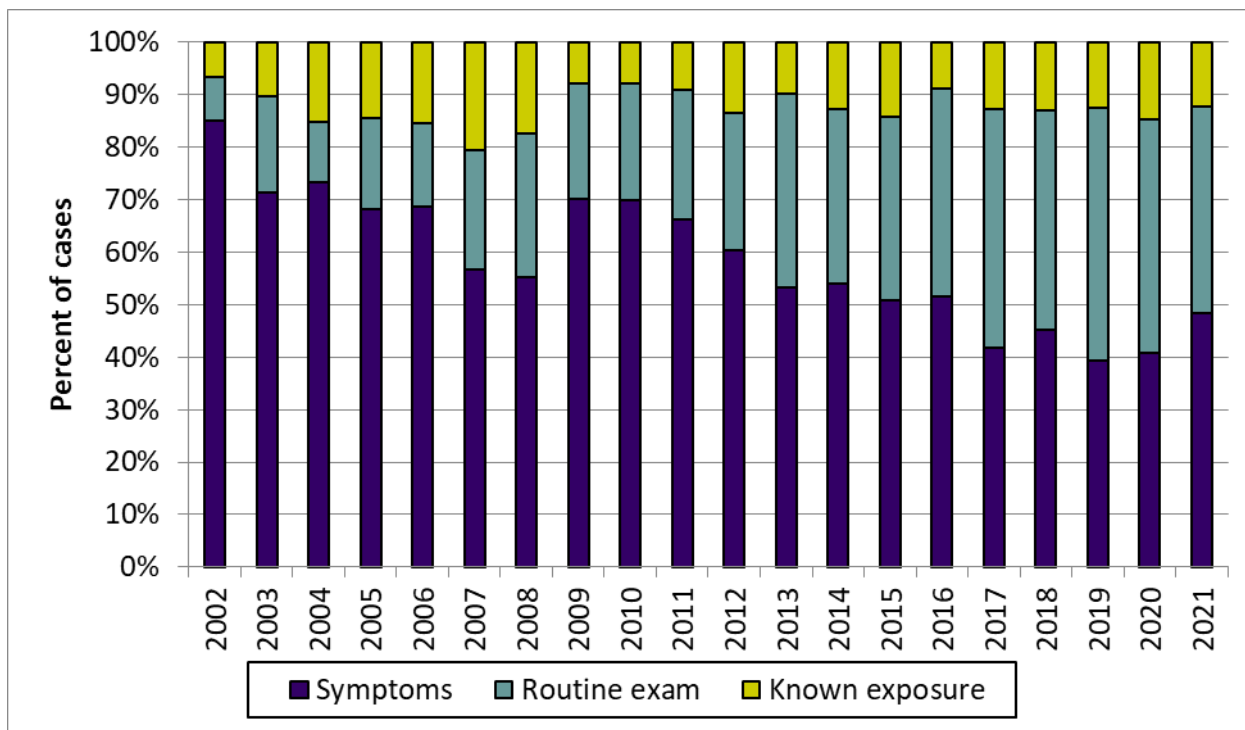
syphilis cases among MSM diagnosed through asymptomatic testing has increased. These data suggest that increased testing and ascertainment of asymptomatic infections may be an important factor contributing to the overall increase in the syphilis rate among cisgender MSM; the extent to which these cases reflect identification of cases prior to the

development of secondary syphilis vs. infections in persons who have already passed through the period of secondary infection is unknown. Additionally, some evidence suggests that the increase in asymptomatic infections may reflect a change in the natural history of syphilis as persons with a history of syphilis experience recurrent infections that may be less overtly symptomatic.⁶ PHSKC recommends that MSM at elevated risk for syphilis test for STIs, including syphilis, every three months and that medical providers test HIV-positive MSM for syphilis each time they draw their blood. (Such testing is not needed in men who have had not oral or anal sex or who are in long-term

mutually monogamous relationships.)

In contrast to cisgender MSM, 74% of cisgender heterosexual early syphilis cases tested due to symptoms. Although we are unable to determine if these symptoms were syphilis specific or related to another STI, this is a higher proportion than observed among MSM and may reflect the lack of routine syphilis testing among cisgender heterosexuals. A higher proportion of early syphilis cases among cisgender MSM were diagnosed as non-primary, non-secondary compared to cisgender heterosexuals (47% vs 24%).

Figure 1-11: Early Syphilis – Reason for visit among cisgender men who have sex with men (MSM)*, King County, WA, 2002-2021



*Excludes MSM who did not report a reason for visit.

⁶Kerani R, Lukehart S, Stenger M, et al. Is early latent syphilis more likely in patients with a prior syphilis infection? British Society for Sexual Health and HIV. Paper presented at: 18th International Society for STD Research, June 28–July 1, 2009; London, UK

Table 1-5: Syphilis – Stage of infection, race/ethnicity, HIV status, and reason for testing among cisgender men who have sex with men (MSM), cisgender men who have sex with women (MSW), and cisgender women, King County, WA, 2021*

	Early Syphilis				Late/Unknown Duration Syphilis			
	Cisgender MSM (N=622)		Cisgender MSW and Women (N=278)		Cisgender MSM (N=121)		Cisgender MSW and Women (N=168)	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Stage of Infection								
Primary	128	21%	126	45%				
Secondary	203	33%	86	31%				
Early latent (non-primary non-secondary)	291	47%	66	24%				
Late or unknown duration					121	100%	168	100%
Race/ethnicity								
American Indian/Alaska Native	5	1%	5	2%	0	0%	4	2%
Asian	35	6%	15	5%	8	7%	6	4%
Black	60	10%	72	26%	3	2%	38	23%
Hispanic/Latinx	116	19%	34	12%	31	26%	31	18%
Native Hawaiian/Pacific Islander	7	1%	2	1%	2	2%	2	1%
White	287	46%	82	29%	52	43%	47	28%
Multiple	13	2%	10	4%	2	2%	6	4%
Other	1	0%	3	1%	1	1%	1	1%
Unknown	98	16%	55	20%	22	18%	33	20%
HIV Status								
Positive	272	44%	9	3%	47	39%	5	3%
Negative	336	54%	228	82%	67	55%	152	90%
Unknown	14	2%	41	15%	7	6%	11	7%
Reason for Visit								
Routine exam	236	38%	38	14%	79	65%	93	55%
Symptoms [^]	290	47%	206	74%	28	23%	49	29%
Known exposure	74	12%	29	10%	9	7%	20	12%
None/other	22	5%	5	2%	5	4%	6	4%
Clinical Manifestations								
Neurologic	3	0%	0	0%	4	3%	0	0%
Ocular	7	1%	3	1%	6	5%	5	3%
Otic	1	0%	0	0%	1	1%	0	0%

*These exclude cases among cisgender men for whom gender of sex partners is unknown and transgender cases.

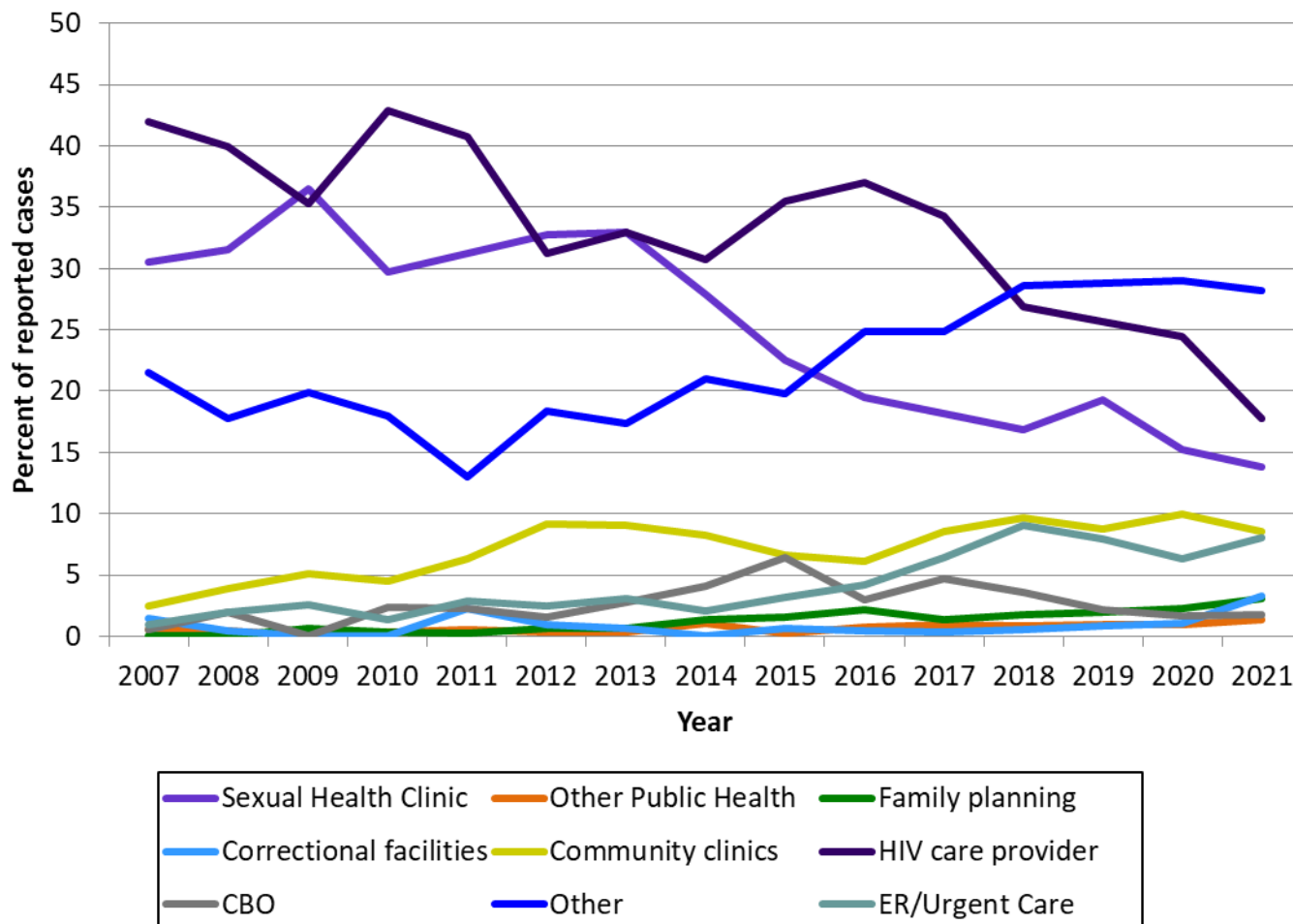
[^]Symptoms as a reason for visit at the time of syphilis diagnosis includes other sexually transmitted infection related symptoms and may not be specific to syphilis infection.

Providers Diagnosing Syphilis

Many types of providers in King County are diagnosing early syphilis cases (Figure 1-12). In 2021, the PHSKC Sexual Health Clinic continued to be the largest single source of diagnosis for persons with early syphilis, accounting for 14% of all diagnoses. As a group, HIV care providers reported 18% of the 2021 cases. Family care providers reported 18% of the 2021 cases. Family planning clinics, community clinics, county jails,

community-based organizations, and other public health clinics combined to account for 18% of cases. Emergency rooms and urgent care facilities accounted for 8% of the 2021 cases. Diagnoses from other providers (typically private practices and large healthcare organizations) accounted for 28% of the reported cases. For 14% of the cases the diagnosing provider was missing.

Figure 1-12: Early Syphilis – Reporting Providers King County, WA, 2007-2021*



CBO = Community based organization

*Figure excludes cases missing diagnosing provider. In 2021, 14% of cases were missing diagnosing provider.

Table 2-1: Gonorrhea — Number of reported cases and incidence by gender* King County, WA, 2002-2021

Year	Cisgender Women		Cisgender Men		Transgender Women	Transgender Men	Non-binary/ Genderqueer	Total	
	Cases	Incidence per 100,000 population	Cases	Incidence per 100,000 population	Cases	Cases	Cases	Cases	Incidence per 100,000 population
2002	584	65	1,197	135				1,781	100
2003	528	59	1,119	126				1,647	92
2004	556	62	1,021	114				1,577	88
2005	788	87	1,457	161				2,245	124
2006	962	104	1,506	164				2,468	134
2007	553	59	856	92	0	0		1,412	75
2008	489	52	813	86	0	0		1,302	69
2009	289	30	806	85	0	2		1,097	57
2010	412	43	1,165	121	1	2		1,580	82
2011	392	40	987	102	1	1		1,381	71
2012	327	33	1,200	123	2	1		1,530	78
2013	406	41	1,361	138	1	2		1,770	89
2014	585	58	1,635	162	8	2		2,230	111
2015	787	77	2,129	208	2	2		2,920	142
2016	789	75	2,540	242	9	8		3,346	159
2017	948	88	3,192	297	25	9	5	4,180	194
2018	955	87	3,441	314	22	7	8	4,435	202
2019	1,089	98	3,581	322	16	13	3	4,703	211
2020	1,167	103	3,052	270	24	11	11	4,276	189
2021	1,080	95	3,090	268	52	20	40	4,294	188

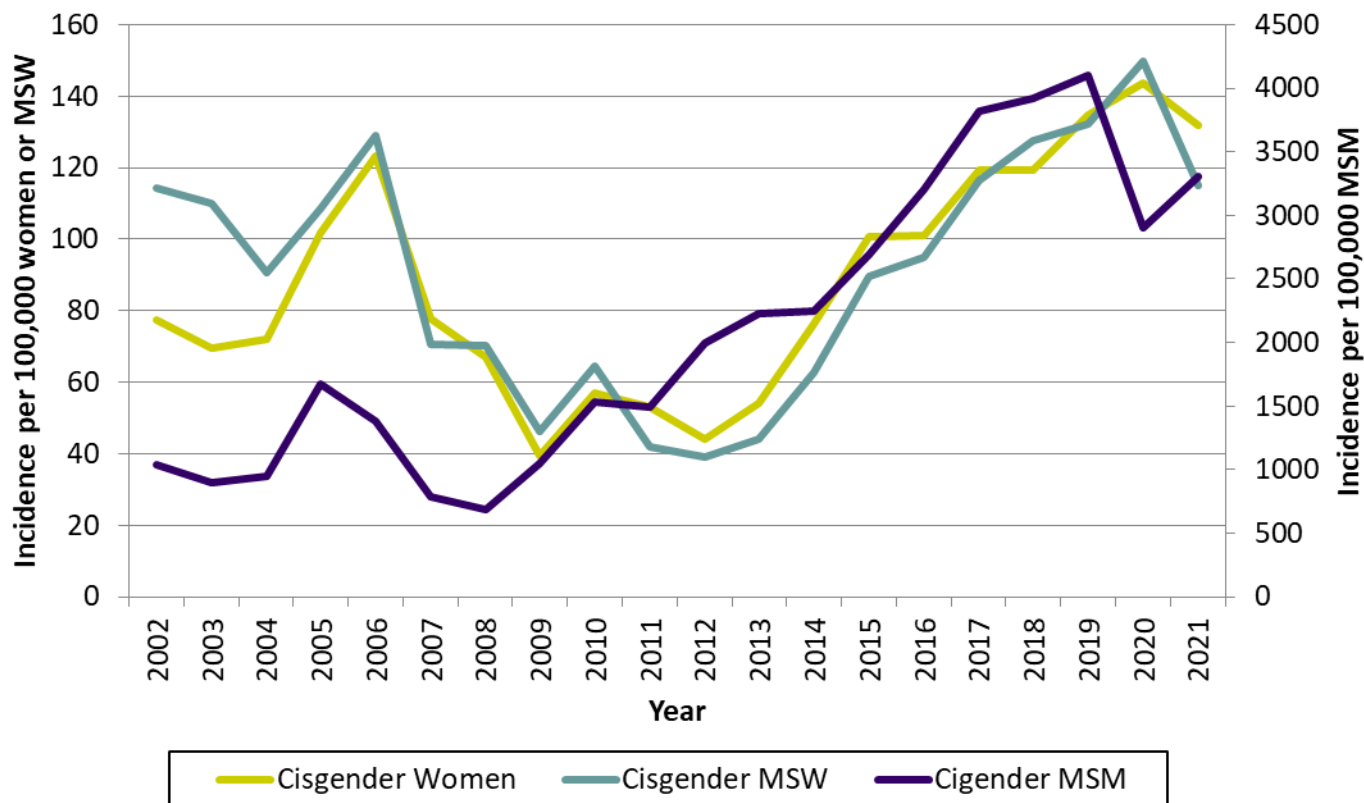
*Data for transgender cases are available starting in 2007 and for non-binary/genderqueer cases starting in 2017. Rates for transgender and non-binary/genderqueer populations cannot be calculated due to no available population estimate. Cases with sex at birth but unknown gender identity are assumed to be cisgender. Cases with unknown sex are included in the total cases.

Overview

The incidence of gonorrhea remained stable in 2021 (Table 2-1). However, trends in the rate of gonorrhea among King County MSM and heterosexuals diverged. Among MSM, the rate of gonorrhea increased 14% compared to 2020, though it remained below the rate seen in 2019; the rate in 2020 was likely impacted by decreased screening in the context of the COVID-19 epidemic. In contrast, following the historic peaks in

2020, the rate of gonorrhea among cisgender women and cisgender MSW decreased by 8% and 23% respectively, reversing an increasing trend that had been ongoing since 2012 (Figure 2-1). The rate of gonorrhea among cisgender MSM (3,308 per 100,000) remains higher than the incidence among cisgender women (132 per 100,000) and cisgender MSW (115 per 100,000).

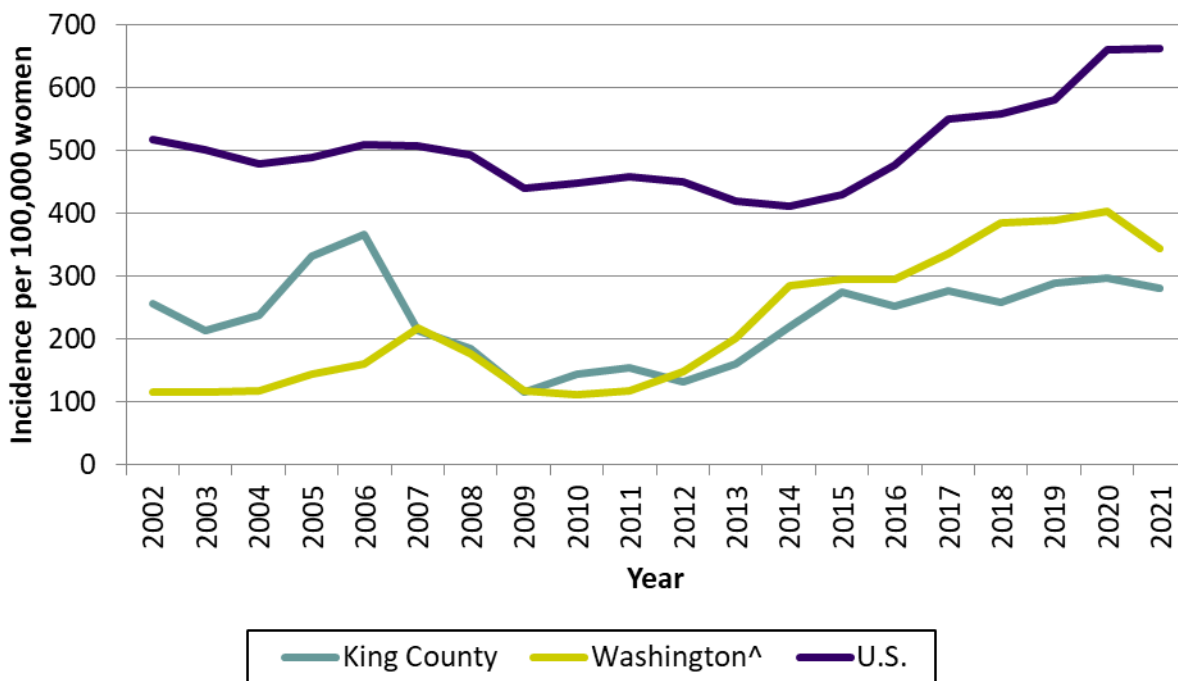
Figure 2-1: Gonorrhea –Incidence among cisgender women, cisgender heterosexual men (MSW), and cisgender men who have sex with men (MSM) ages 15 years and older, King County, WA, 2002-2021



Gonorrhea trends among cisgender women in King County were consistent with national gonorrhea trends, though the increase in gonorrhea among cisgender women in King County started several years before the increase in national data; this earlier increase was also seen elsewhere in the Western U.S. (Figure 2-2).⁷ However, in 2021, rates among women 15-29 ages 15-29 decreased in King

County and Washington state decreased compared to 2020 while the rate among U.S. women ages 15-29 continued to increase. Similar to syphilis, gonorrhea cases and incidence vary by Health Reporting Area with higher incidence and case counts observed in Seattle and south King County (Figures 2-3A and Figure 2-4A&B).

Figure 2-2: Gonorrhea – Incidence among Cisgender women Ages 15-29 King County, Washington State (excluding King County), and U.S., 2002-2021



*Cases with unknown age were distributed according to annual age distributions among cases with known age and included in age-specific incidences.
 ^ Washington State rates exclude King County.

⁷Centers for Disease Control and Prevention. Sexually Transmitted Disease Surveillance 2018. Atlanta: U.S. Department of Health and Human Services; 2019. DOI: 10.15620/cdc.79370

Figure 2-3: Gonorrhea – Incidence by Health Reporting Area, King County 2021

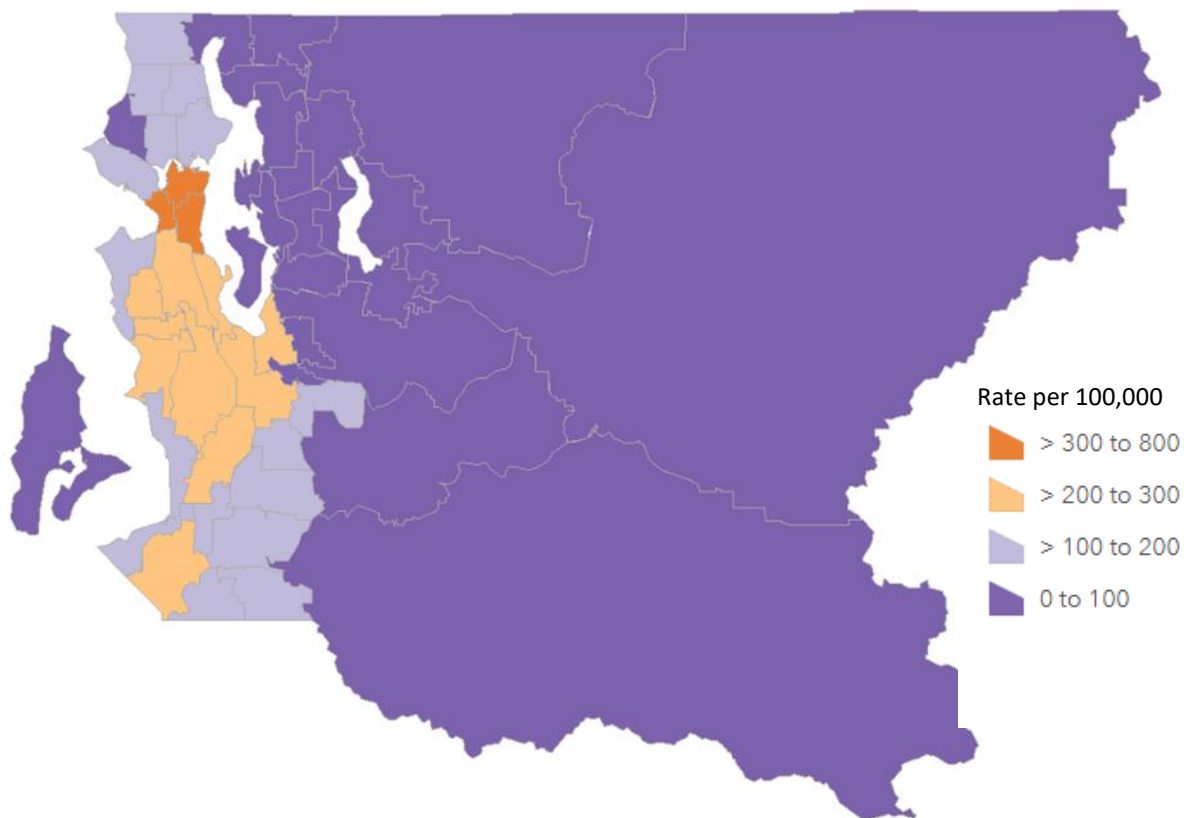
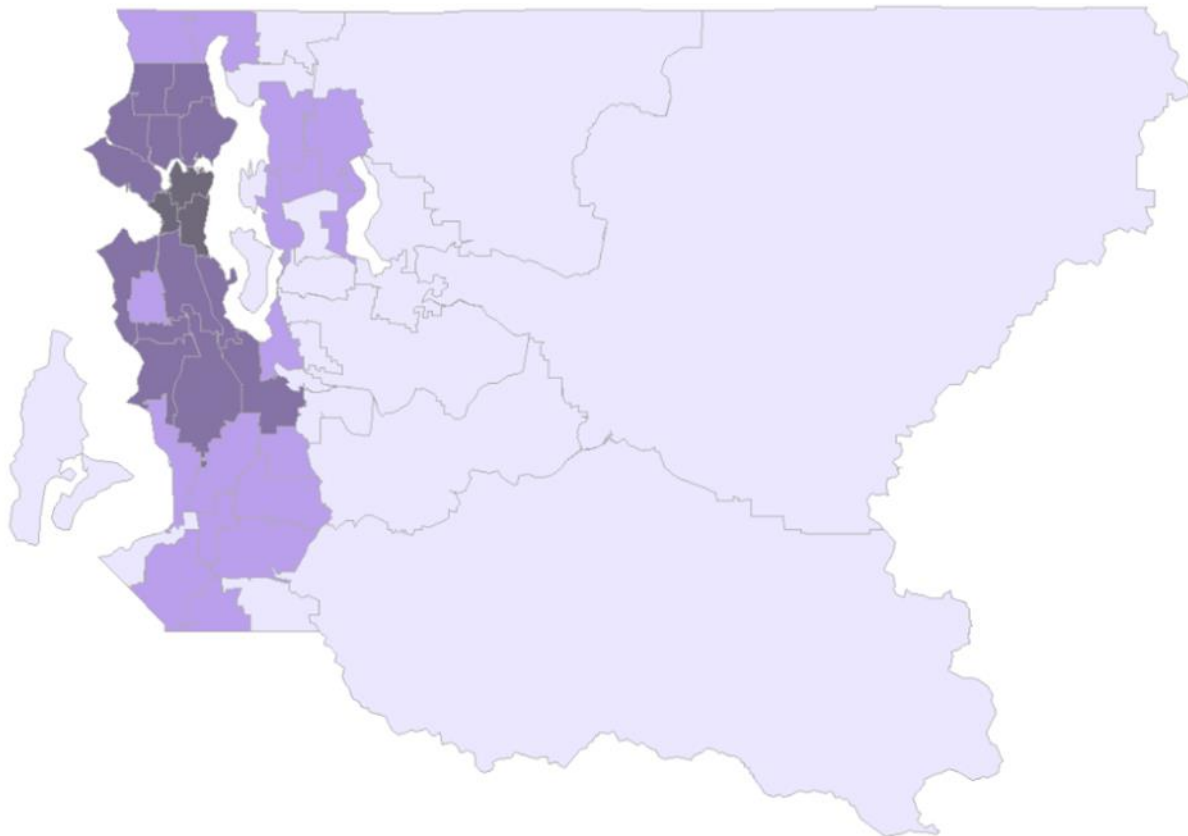


Figure 2-4: Gonorrhea – Cases among cisgender men who have sex with men (A) and cisgender heterosexuals (B) by Health Reporting Area King County 2021

A



B

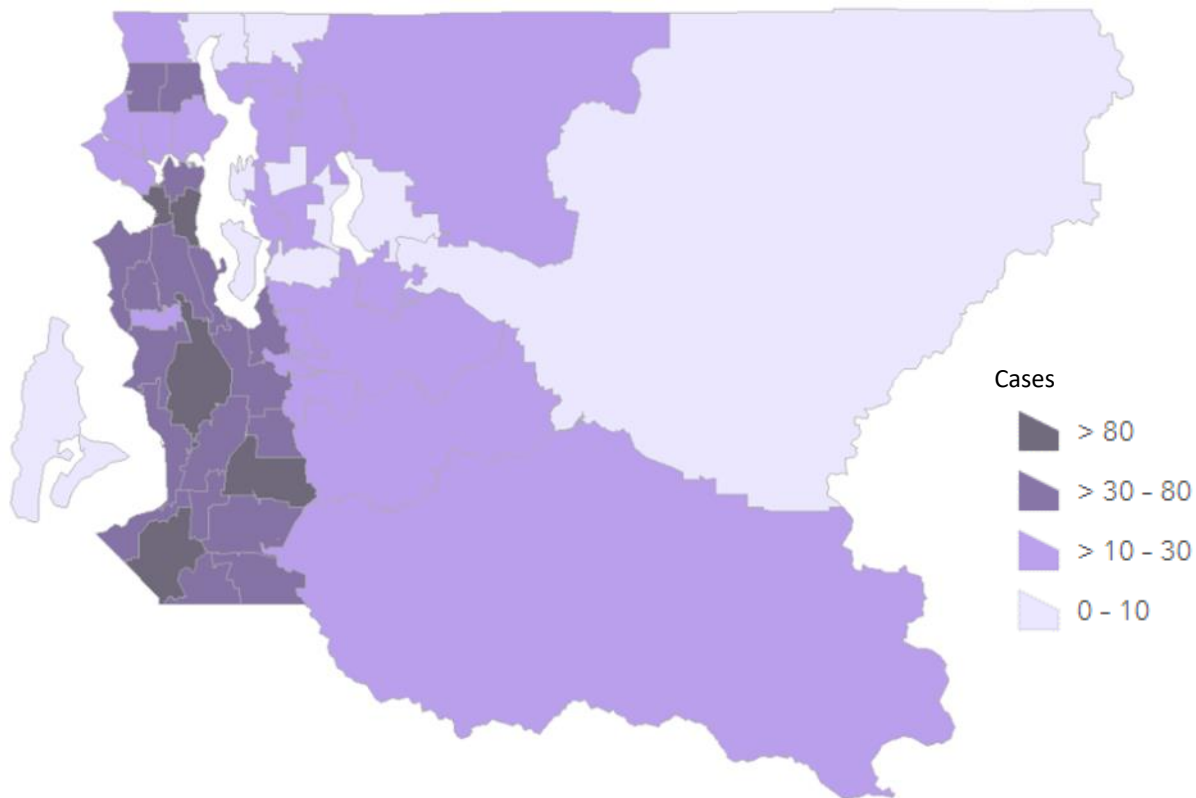


Table 2-2: Gonorrhea — Number of Reported Cases and Incidence among Cisgender Men and Cisgender Women, by Age and Race, King County, WA, 2021

	Cisgender Women (N=1080)		Cisgender Men (N=3090)	
	Cases	Incidence per 100,000 population	Cases	Incidence per 100,000 population
Race/ethnicity*^				
American Indian/Alaska Native	35	685	38	654
Asian	44	26	220	128
Black	240	437	597	888
Hispanic/Latinx	100	122	433	411
Native Hawaiian/Pacific Islander	14	190	40	487
White	318	66	1169	211
Multiple	20	49	71	160
Other	36		47	
Unknown	273		475	
Age				
0-9 years	4	3	1	1
10-14 years	5	8	3	4
15-19 years	135	218	106	167
20-24 years	295	440	378	554
25-29 years	203	211	694	682
30-34 years	153	151	633	567
35-44 years	179	103	766	408
45-54 years	83	58	358	239
>=55 years	22	7	150	55
Unknown	1		1	

*Cases with unknown race and ethnicity were included in race/ethnicity-specific rates after being distributed among race/ethnicity categories based on the distribution of cases with known race/ethnicity.

^Race/ethnicity specific rates exclude cases reported with "other" races.

Table 2-3: Gonorrhea — Number of reported cases and incidence among cisgender men and cisgender women ages 15-29* King County, WA, 2002-2021

Year	Cisgender Women, ages 15-29		Cisgender Men, ages 15-29		Total, ages 15-29	
	Cases	Incidence per 100,000 population	Cases	Incidence per 100,000 population	Cases	Incidence per 100,000 population
2002	466	255	557	294	1,023	275
2003	392	212	464	243	856	228
2004	444	237	419	216	864	227
2005	630	331	648	330	1,278	331
2006	716	366	699	346	1,416	356
2007	424	212	421	204	845	208
2008	373	184	401	192	774	188
2009	233	114	408	195	641	155
2010	286	143	467	225	753	185
2011	305	153	468	227	773	191
2012	253	131	541	271	794	202
2013	312	160	610	304	922	233
2014	440	219	803	389	1,243	305
2015	566	274	988	466	1,554	371
2016	552	252	1,126	502	1,678	379
2017	627	276	1,360	584	1,987	432
2018	601	259	1,342	566	1,943	414
2019	684	289	1,437	597	2,121	444
2020	718	297	1,235	504	1,953	401
2021	633	281	1,178	505	1,811	395

*Cases with unknown age were included in age-specific counts and rates after being distributed among age categories based on the distribution of cases with known age.

Age and gender

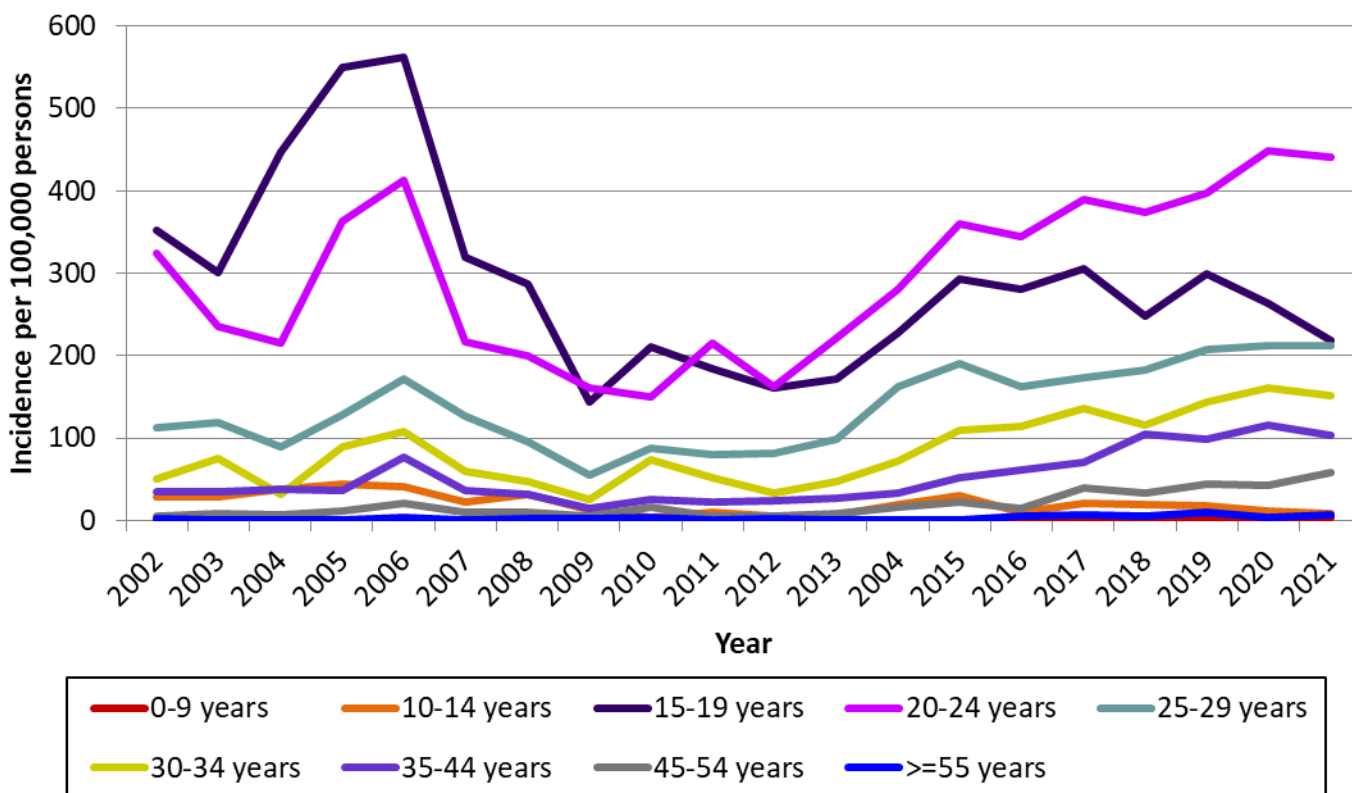
Among cisgender women, the incidence of gonorrhea was highest among women aged 20-24 years (440 per 100,000), followed by those aged 15-19 years (2018 per 100,000) (Tables 2-2 and 2-3, Figure 2-5). Among cisgender men, the rate of gonorrhea was highest in the 25-29 years age group (682 per 100,000), followed by the 30-34 age group (567 per 100,000).

Race and ethnicity

Among both cisgender women and men, gonorrhea rates vary substantially among different racial and ethnic groups (Table 2-2). In 2021, American Indian/

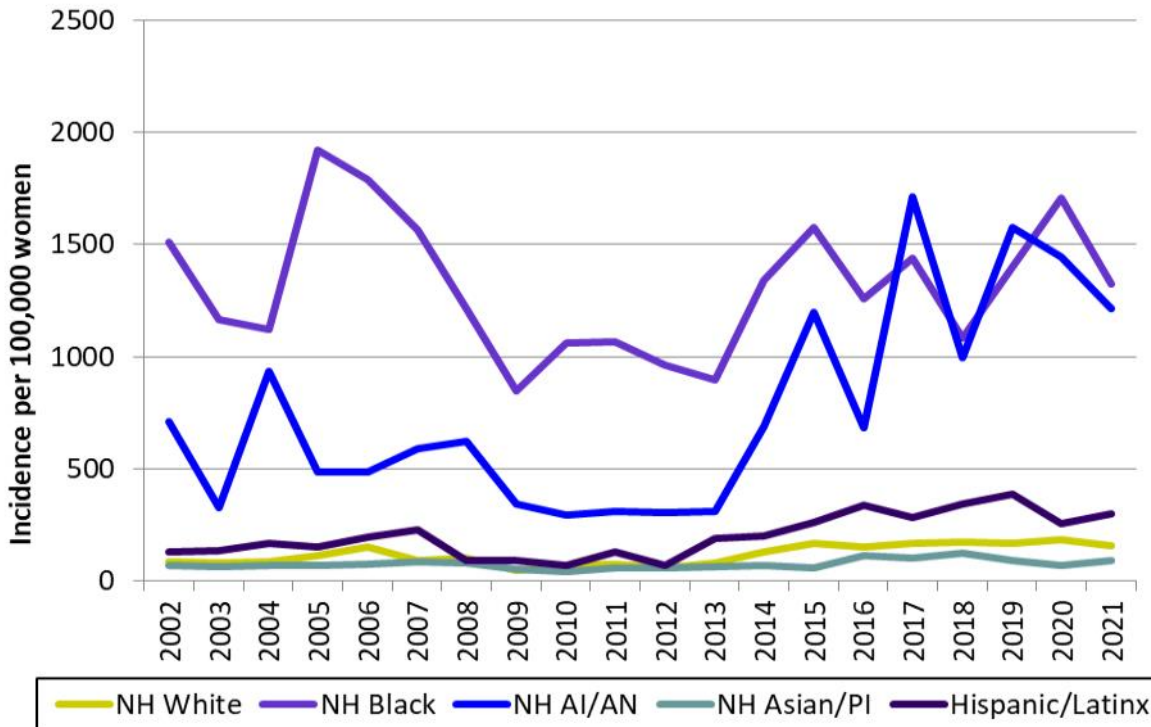
Alaska Native women had the highest rate of gonorrhea among cisgender women (685 per 100,000). Black women had the second highest rate among women in 2021 (437 per 100,000). Among women ages 15-29, the age group with the highest rate of gonococcal infection, the incidence rates of gonorrhea among Black women and American Indian/Alaska Native women were both 8 times higher than among White cisgender women, respectively (Figure 2-6). The persistence of very large racial disparities in gonorrhea incidence represents a major challenge in King County and in the rest of the U.S. and is a critical area in need of additional clinical and public health intervention (Figure 2-7).

Figure 2-5: Gonorrhea – Incidence among cisgender women by age King County, WA, 2002-2021*



*Cases with unknown age were distributed according to annual age distributions among cases with known age and included in age-specific incidences.

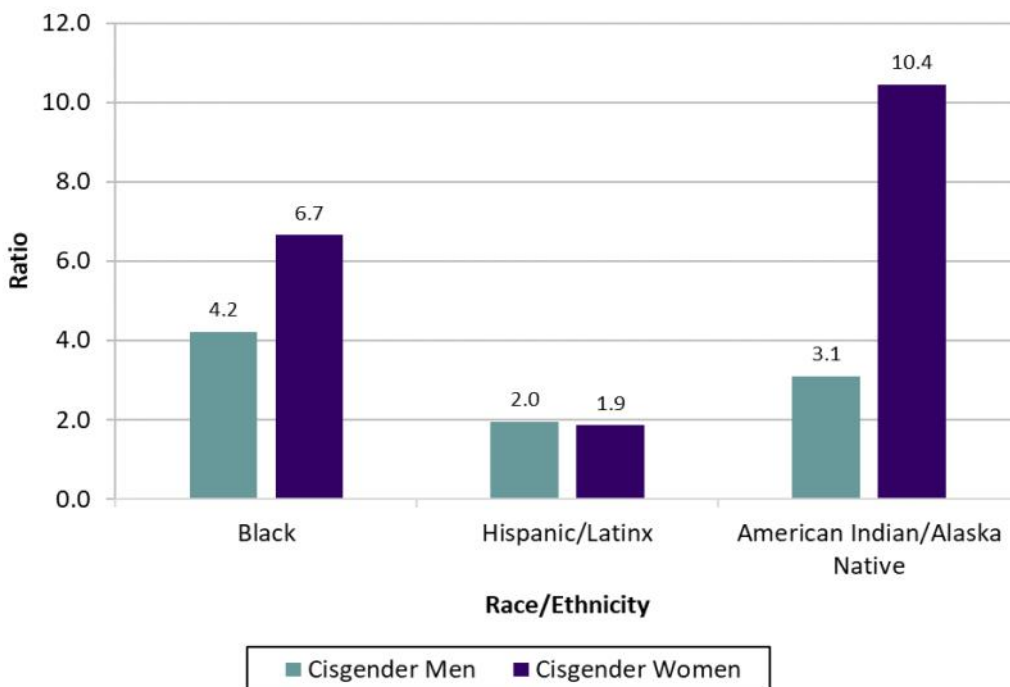
Figure 2-6: Gonorrhea – Incidence among Cisgender Women Ages 15-29 by Race and Ethnicity, King County, WA, 2002-2021*



NH = Non-Hispanic, AI/AN = American Indian/Alaska Native, PI = Pacific Islander

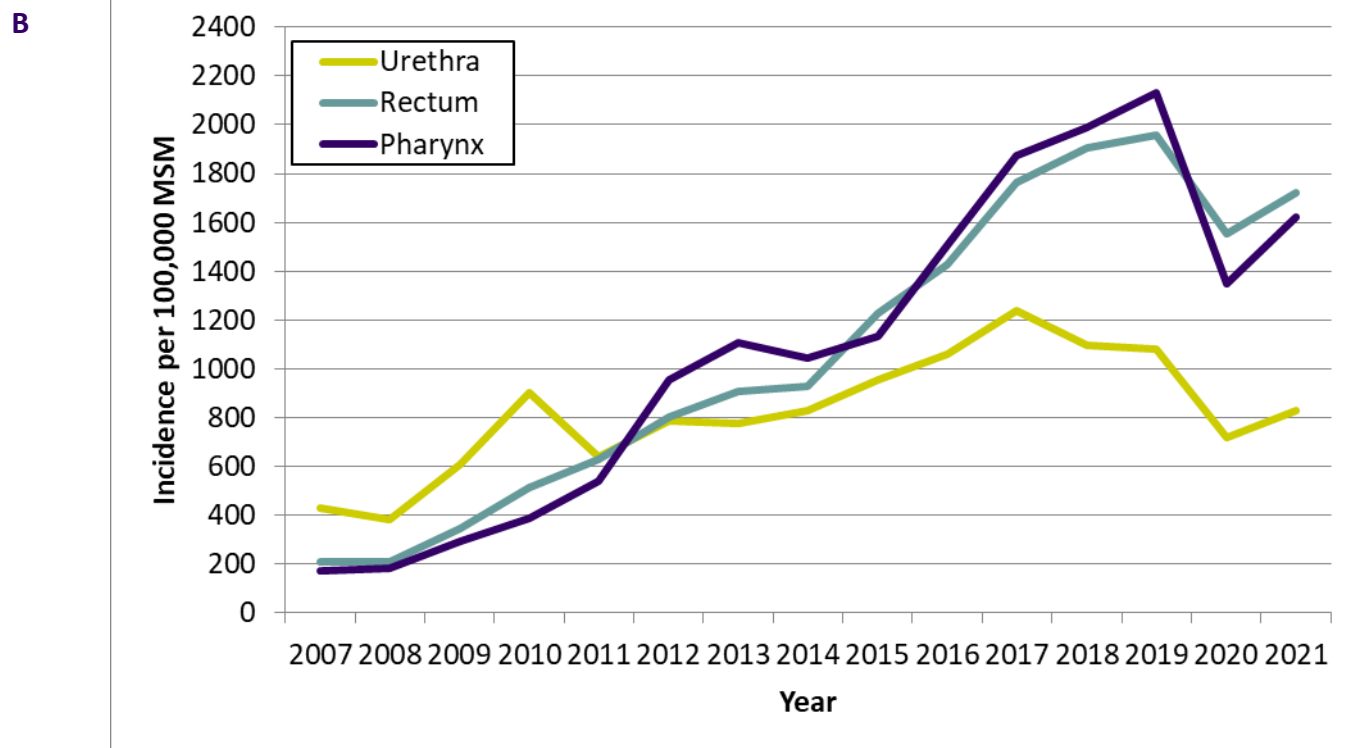
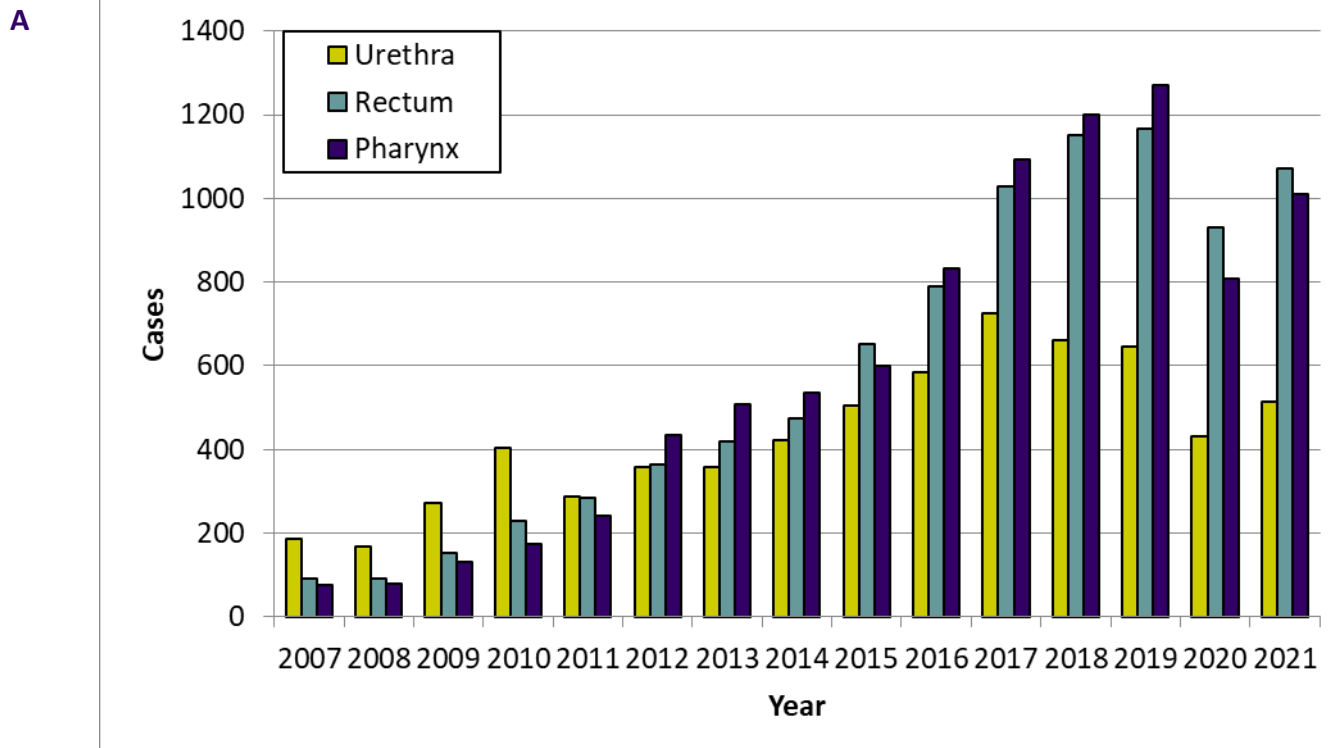
*Cases with unknown race, ethnicity, and age were distributed according to annual race, ethnicity, and age distributions among cases with known race, ethnicity, and age and included in race/ethnicity-specific incidences.

Figure 2-7: Gonorrhea – Relative Rate Disparities among Black, Hispanic/Latinx, and American Indian/Alaska Native Populations Compared to Whites by Gender, King County, WA 2021



Relative rate disparities were calculated using a ratio of the rates. Relative rates represent a measure of health disparity on the relative scale regardless of the sizes of racial/ethnic groups, and a value of 1 corresponds to no disparity.

Figure 2-8: Gonorrhea – Number of reported infections (A) and incidence (B) among cisgender men who have sex with men (MSM) by anatomic site* King County, WA, 2007-2021



*Each case can have more than one site of infection. In 2021, 24% of MSM diagnosed with gonorrhea were infected at more than one anatomic site.

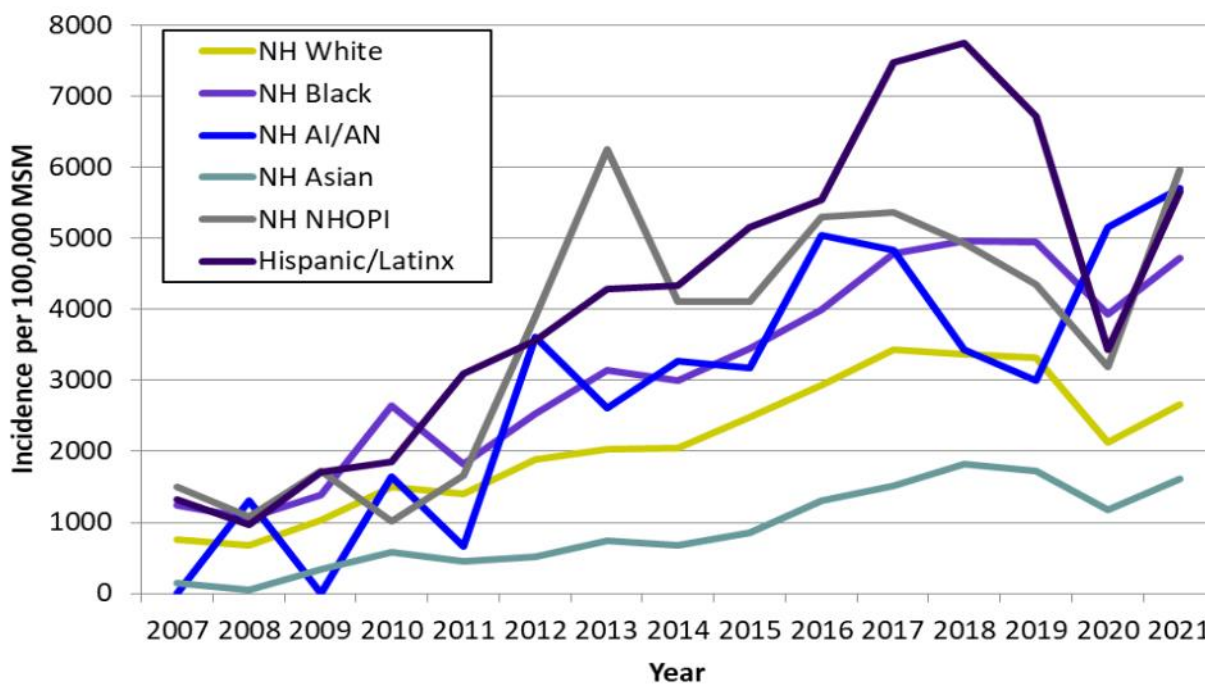
MSM

Gonorrhea diagnoses among cisgender MSM steadily increased from 2008 to 2019 and declined in 2020, concurrent with the COVID-19 epidemic (Figure 2-1). In 2021, incidence increased again but remained below the historic high observed in 2019. Trends in the number of reported gonorrhea cases among MSM vary by anatomic site (Figure 2-8A). Except for 2020, the incidences of reported rectal and pharyngeal infections have increased steadily over the last decade. These incidences rose again in 2021, though they remained below the rates observed in 2019. Rectal and pharyngeal gonorrhea are primarily asymptomatic infections and case detection reflects screening practices, which were likely impacted by COVID-19. In contrast, the incidence of urethral infection increased from 2011 to 2016 and has been declining since that time (Figure 2-8B). While

incidence did increase between 2020 and 2021, the incidence of urethral infection remained lower than the rate in 2017. Since urethral gonorrhea is almost always a symptomatic infection, the previously observed increase in urethral gonorrhea (from 404 in 2010 to 645 in 2019) likely represents a true increase in the rate of gonorrhea over the last decade and not simply an increase in diagnoses due to increased screening.

The incidence of gonorrhea has increased in all racial and ethnic groups of MSM over the last decade, however rates vary greatly by race/ethnicity (Figure 2-9). Rates increased among all racial and ethnic groups in 2021 compared to 2021. Native Hawaiian/Pacific Islander MSM had the highest incidence in 2021 (5,964 cases per 100,000), followed closely by American Indian/

Figure 2-9: Gonorrhea - Incidence among cisgender men who have sex with men (MSM) by Race and Ethnicity*, King County, WA 2007-2021



NH = Non-Hispanic, AI/AN = American Indian/Alaska Native, NHOPI = Native Hawaiian or Pacific Islander

*Cases with unknown race and ethnicity were distributed according to annual race and ethnicity distributions among cases with known race and ethnicity and included in race/ethnicity-specific incidences.

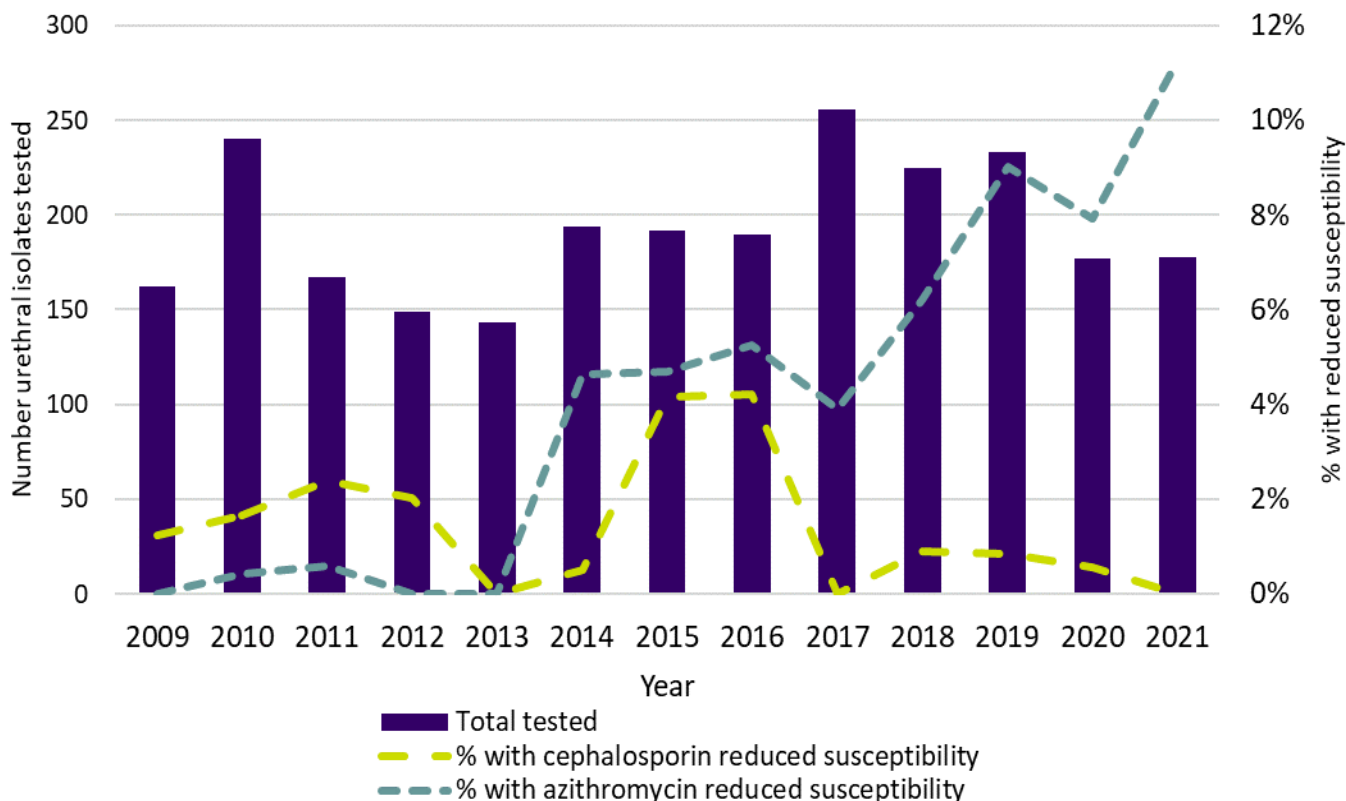
Alaska Native MSM (5,704 cases per 100,000), and Latinx MSM (5,658 cases per 100,000 MSM). The rate of gonorrhea among Latinx MSM declined by 49% between 2019 and 2020; the extent to which this drop represents a true decline in incidence versus a decline in testing that disproportionately affected Latinx men is unknown. In 2021, the rate among Latinx MSM increased 65% compared to 2020.

Antimicrobial resistant gonorrhea

PHSKC conducts ongoing surveillance of antimicrobial-resistant *Neisseria gonorrhoeae* (ARNG). Since 1986, the PHSKC SHC has participated in CDC’s Gonococcal

Isolate Surveillance Project (GISP), in which up to 25 men diagnosed with urethral gonorrhea each month have a culture specimen tested for resistance to antimicrobial drugs used to treat gonorrhea. Since 2017, PHSKC has participated in the CDC’s Strengthening the U.S. Response to Resistant Gonorrhea (SURRG) which expands ARNG surveillance to include all (genital and extragenital) anatomic sites and includes specimens from all genders. The goal of SURRG is to closely monitor trends in ARNG and to rapidly identify and respond to cases of ARNG in order to limit transmission of gonococcal strains that are relatively resistant to antimicrobial drugs. PHSKC

Figure 2-10: Percentage of Male Gonococcal Isolate Surveillance Project Urethral Isolates with Alert Values for Cephalosporins or Azithromycin, King County, WA 2009-2021



partners with several private clinics in King County to expand the coverage of gonococcal specimens collected and submitted for antimicrobial resistance testing. Eight percent of gonorrhea cases diagnosed in King County in 2021 had a gonococcal isolate tested for antimicrobial susceptibility. In late 2020, the CDC's recommended treatment for uncomplicated gonorrhea infection changed from 1g azithromycin and 250 mg ceftriaxone IM to 500 mg ceftriaxone IM alone. This change was recommended due to increases in azithromycin resistance observed in both GISP and SURRG.

CDC defines gonococci as having an alert value if they have laboratory evidence of being relatively resistant to antimicrobial treatment. The alert value for azithromycin is defined as a minimum inhibitory concentration (MIC) $\geq 2.0 \mu\text{g/ml}$, ceftriaxone is defined as MIC $0.125 \mu\text{g/ml}$, and cefixime is MIC $\geq 0.25 \mu\text{g/ml}$.

From 2009 to 2013, the proportion of GISP urethral isolates with alert values to azithromycin or cephalosporins (cefixime or ceftriaxone) ranged from 0% to 2% (Figure 2-10). The percentage of urethral isolates with alert values to azithromycin increased sharply to 5% in 2014, held steady through 2017 (4-6%), then steadily increased through 2021 (11%). The percentage of urethral isolates with alert values to cephalosporins rose to 4% in 2015-2016 and then decreased 2017-2021 (0-1%).

There were 432 gonorrhea culture isolates from 387 unique person-cases submitted for antimicrobial susceptibility testing in 2021. None of the isolates had reduced cephalosporin susceptibility (Table 2-4). Reduced azithromycin susceptibility was more common in extragenital isolates (rectal, 20%; pharyngeal, 17%) than in genital isolates (urethral, 13%; endocervical, 6%).

Table 2-4: *Neisseria gonorrhoea* isolates with antimicrobial resistance by anatomic site, SURRG, King County, WA 2021

	Number isolates tested	% w/reduced susceptibility to azithromycin	% w/reduced susceptibility to cephalosporins*
Endocervical	11	9%	0%
Pharyngeal	91	13%	0%
Rectal	134	19%	0%
Urethral	196	12%	0%

*Ceftriaxone or cefixime

Of the 387 unique gonorrhea cases with susceptibility results, 57 (15%) had decreased susceptibility to azithromycin, and none had decreased susceptibility to ceftriaxone or cefixime. Azithromycin resistance occurred in 46 (19%) of 248 MSM and 3 (3%) of 71 isolates from MSW or women (Table 2-5).

Table 2-5: Percentage of persons with alert values to azithromycin, ceftriaxone, or cefixime among persons tested for anti-microbial resistant *Neisseria gonorrhoeae*, King County 2021

	Azithromycin MIC* \geq 1 μ g/ml**	Azithromycin MIC \geq 2 μ g/ml	Cefixime MIC \geq 0.25 μ g/ml	Ceftriaxone MIC \geq 0.125 μ g/ml
	N (%)	N (%)	N (%)	N (%)
Cisgender men who have sex with men (n=227)	78 (34%)	44 (19%)	0 (0%)	0 (0%)
Cisgender men who have sex with women (n=62)	8 (13%)	3 (5%)	0 (0%)	0 (0%)
Cisgender men, unknown sex partners (n=71)	22 (31%)	6 (8%)	0 (0%)	0 (0%)
Cisgender women (n=14)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Transgender women (n=6)	1 (17%)	1 (17%)	0 (0%)	0 (0%)
Transgender men (n=0)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Nonbinary (n=7)	3 (43%)	3 (43%)	0 (0%)	0 (0%)
Total (n=387)	112 (29%)	57 (15%)	0 (0%)	0 (0%)

*Minimum Inhibitory Concentration

**Azithromycin MIC \geq 1 μ g/ml is a European Committee on Antimicrobial Susceptibility Testing (EUCAST) epidemiological cut-off value

Table 3-1: Chlamydial Infection — Number of Reported Cases and Incidence by Gender*, King County, WA, 2002-2021

Year	Cisgender Women		Cisgender Men		Transgender Women	Transgender Men	Non-binary/ Genderqueer	Total	
	Cases	Incidence per 100,000 population	Cases	Incidence per 100,000 population	Cases	Cases	Cases	Cases	Incidence per 100,000 population
2002	3,483	390	1,750	198				5,233	294
2003	3,796	423	2,031	228				5,827	326
2004	4,108	455	2,061	230				6,172	343
2005	4,070	447	2,188	242				6,261	345
2006	3,956	428	2,016	219				5,974	324
2007	3,897	416	1,834	196	1	0	0	5,737	307
2008	3,968	419	2,028	215	0	0	0	5,996	317
2009	3,919	410	1,958	205	0	1	0	5,878	308
2010	3,930	406	2,055	214	1	0	0	5,986	310
2011	4,088	419	2,329	241	2	0	0	6,419	330
2012	4,113	419	2,687	275	3	1	0	6,804	348
2013	4,174	420	2,659	269	3	2	0	6,838	345
2014	4,385	434	3,101	308	11	2	0	7,499	372
2015	4,726	460	3,713	362	3	7	0	8,449	412
2016	5,133	487	4,243	404	16	7	0	9,401	447
2017	5,227	485	4,532	421	19	14	1	9,796	455
2018	5,223	477	5,208	476	24	12	3	10,477	478
2019	6,224	559	5,811	522	28	4	1	12,100	544
2020	4,392	389	3,854	341	13	0	8	8,290	367
2021	4,063	358	3,565	309	17	1	5	7,673	335

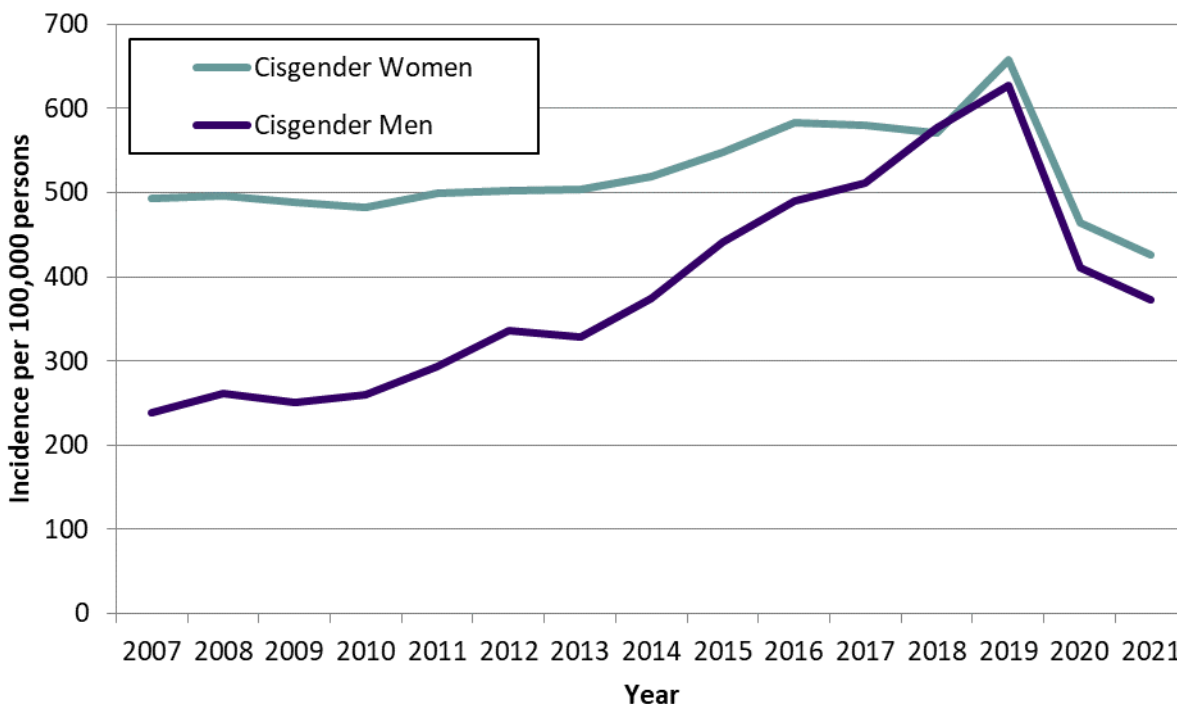
*Data for transgender cases are available starting in 2007 and for non-binary/genderqueer cases starting in 2017. Rates for transgender and non-binary/genderqueer populations cannot be calculated due to no available population estimate. Cases with sex at birth but unknown gender identity are assumed to be cisgender. Cases with unknown sex are included in the total cases.

Overview

In 2021, an estimated 7,673 cases of chlamydial infection were reported among King County residents⁸, representing an overall reported incidence of 335 cases per 100,000 people (Table 3-1), a 9% decrease compared to the incidence in 2020 (367 cases per 100,000) and a 38% decrease compared to 2019 (544 cases per 100,000). Decreases in reported chlamydia cases in 2020 were also experienced nationally, and while incidence increased in 2021, it was lower than the incidence in 2019⁹. Among cisgender women, 4,063 cases were reported for an incidence of 358 per 100,000 women, and 3,565 cases were reported among cisgender men for a reported incidence of 309 per 100,000 men. Higher rates among cisgender women

than cisgender men largely reflect differential screening practices, where asymptomatic cisgender women are more frequently screened for chlamydial infection compared to men. The incidence of chlamydial infection in both 2020 and 2021 should be interpreted with caution due to two limitations and the decrease in incidence compared to 2019 may not reflect a true decline in chlamydial infection. First, the COVID-19 pandemic impacted access to care, especially for preventive medicinal care such as STI screening, which reduced the ability to detect asymptomatic infections¹⁰. It is also unknown how many patients may have received treatment for infection without diagnostic laboratory testing. Second, starting September 2019 we

Figure 3-1: Chlamydial Infection – Estimated incidence among cisgender women and cisgender men ages 15 years and older, King County, WA, 2007-2021*



*Gender of sex partners data was not available for chlamydia cases starting in 2020.

⁸See data limitations for changes to chlamydia case counts for 2019-2021.

⁹<https://www.cdc.gov/std/statistics/2021/>

¹⁰Pinto CN, Niles JK, Kaufman HW, Marlowe EM, Alagia DP, Chi G, Van Der Pol B. Impact of the COVID-19 Pandemic on Chlamydia and Gonorrhea Screening in the U.S. *Am J Prev Med.* 2021 Sep;61(3):386-393.

changed our reporting practice for chlamydia surveillance to rely solely on electronic laboratory reports (ELR), it is unknown if this impacted reporting completeness.

The estimated incidence of reported chlamydial infection in persons ages 15 years and older was higher among cisgender women (427 per 100,000) than the rate in cisgender men (372 per 100,000) was (Figure 3-1). The incidence of chlamydia infection among MSM and MSW in starting in 2020 is not available because data on gender of sex partners are not available from ELRs. In 2021, 17 cases of chlamydial infection occurred in transgender women, 5 cases in non-binary/genderqueer persons, and one case was reported among transgender men. These case counts are certainly undercounts because laboratory reports do

not contain gender identity information.

Age and gender

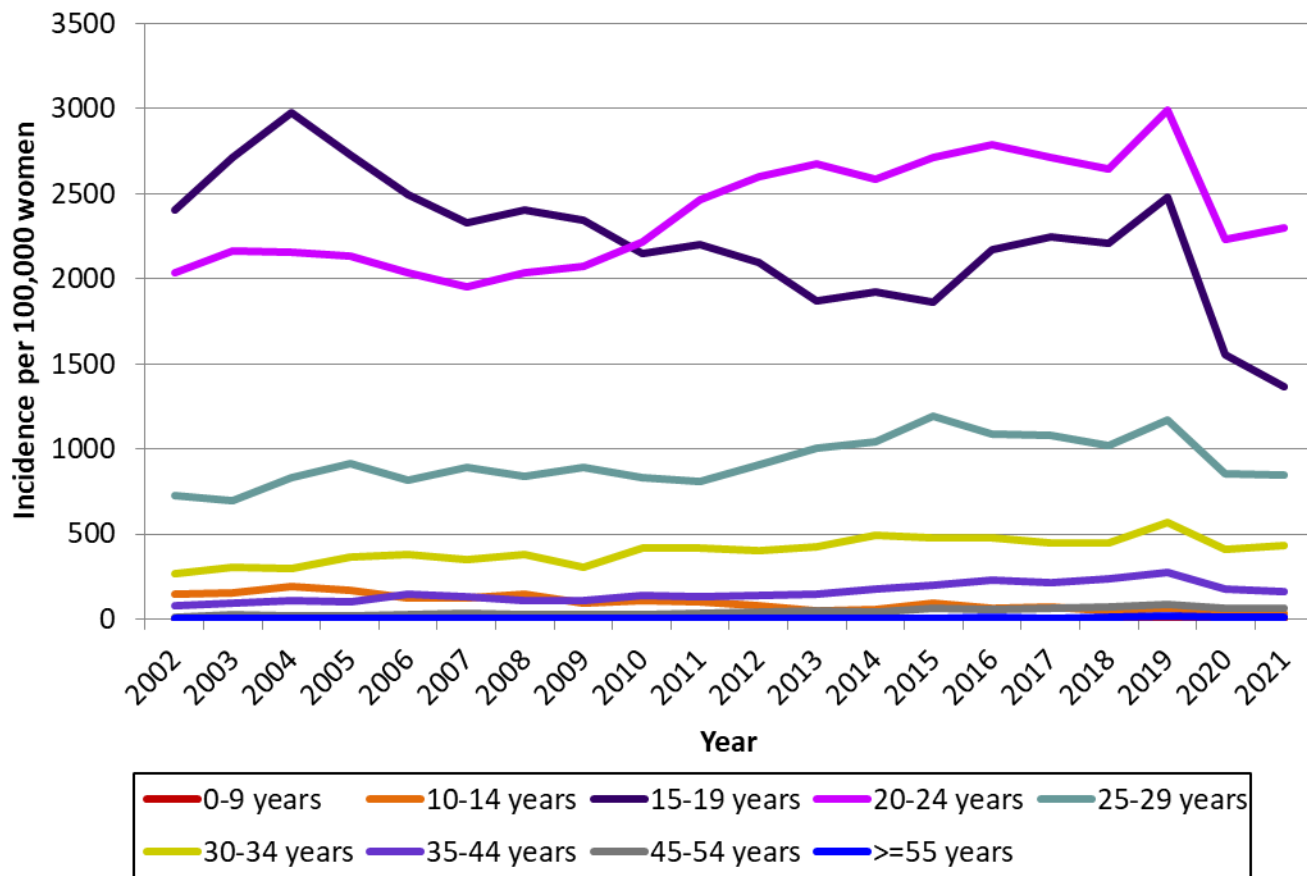
Among both cisgender women and men, persons ages 20-24 had the highest rates of chlamydial infection in King County (Table 3-2). For cisgender women, this age group has had the highest rate since 2011 when it exceeded the rate of adolescents aged 15-19 years, the age group with the second highest incidence in 2021 (Figure 3-2). The reasons for this change are uncertain but may reflect later age of sexual debut and increased condom use¹¹. The declines among cisgender women in the age groups recommended for screening (<25 years) suggests that the decrease in incidence of chlamydial infection may reflect decreases in screening during the COVID-19 pandemic. Among cisgender men, ages 25-29 had the second highest incidence in 2021.

Table 3-2: Chlamydial Infection – Number of Reported Cases and Incidence among Cisgender Men and Cisgender Women by Age King County, WA, 2021

Age	Cisgender Women (N=4,063)		Cisgender Men (N=3,565)	
	Cases	Incidence per 100,000 population	Cases	Incidence per 100,000 population
0-9 years	1	1	1	1
10-14 years	24	38	1	1
15-19 years	848	1,367	262	413
20-24 years	1,542	2,302	707	1,036
25-29 years	811	844	794	780
30-34 years	438	432	688	616
35-44 years	276	159	679	362
45-54 years	94	66	291	195
>=55 years	29	10	142	52

¹¹Abma JC, Martinez GM. Sexual activity and contraceptive use among teenagers in the United States, 2011–2015. National health statistics reports; no 104. Hyattsville, MD: National Center for Health Statistics. 2017.

Figure 3-2: Chlamydial Infection – Incidence among cisgender women by age King County, WA, 2002-2021*



*Cases with unknown age were distributed according to annual age distributions among cases with known age and included in age-specific incidences.

Table 4-1: Number of Public Health – Seattle King County (PHSKC) Sexual Health Clinic visits, 2002-2021

Year	Cisgender Women	Cisgender MSW^	Cisgender MSM^	Cisgender			Non-Binary/ Genderqueer	Total
				Men Unknown^	Transgender Women	Transgender Men		
2002	4,208	5,909	2,752	325	n/a	n/a	n/a	13,194
2003	3,812	5,874	2,906	257	n/a	n/a	n/a	12,849
2004	3,681	5,781	2,949	316	n/a	n/a	n/a	12,727
2005	3,603	5,670	3,274	295	n/a	n/a	n/a	12,842
2006	3,742	5,487	4,360	520	12	2	n/a	14,123
2007	3,483	5,182	3,779	386	16	6	n/a	12,852
2008	3,334	5,230	3,910	299	17	6	n/a	12,796
2009	3,196	4,490	4,276	299	8	8	n/a	12,277
2010	3,263	4,266	4,439	331	15	11	n/a	12,325
2011	3,128	4,065	4,700	367	9	9	n/a	12,278
2012	2,705	3,340	4,788	405	16	8	n/a	11,262
2013	2,587	3,186	4,791	204	15	11	n/a	10,794
2014	1,927	2,818	4,646	205	14	9	n/a	9,619
2015	1,455	2,289	5,139	240	23	22	n/a	9,168
2016	1,401	2,635	5,271	109	47	21	47	9,531
2017	1,520	2,558	6,405	160	39	10	104	10,796
2018	1,673	2,507	6,951	117	39	18	141	11,446
2019	1,599	2,391	7,200	46	60	24	169	11,489
2020	1,182	1,599	4,747	84	74	25	154	7,865
2021	1,469	1,905	5,532	63	96	41	270	9,376

^MSM includes men who have sex with men are men who reported sex with men during any clinic visit and MSW includes men who reported sex with women only. Cisgender men unknown includes men with unknown gender of sex partners.

n/a = gender category not captured at this time and patient gender may be misclassified.

Table 4-2: Number of Public Health – Seattle King County (PHSKC) Sexual Health Clinic unique patients per year, 2002-2021

Year	Cisgender Women	Cisgender MSW [^]	Cisgender MSM [^]	Cisgender			Non-Binary/ Genderqueer	Total
				Men Unknown [^]	Transgender Women	Transgender Men		
2002	2,728	4,156	1,562	248	n/a	n/a	n/a	8,694
2003	2,534	4,256	1,686	200	n/a	n/a	n/a	8,676
2004	2,451	4,112	1,726	193	n/a	n/a	n/a	8,482
2005	2,422	4,110	1,875	173	n/a	n/a	n/a	8,580
2006	2,597	4,049	2,456	313	11	1	n/a	9,427
2007	2,356	3,780	2,169	260	14	5	n/a	8,584
2008	2,204	3,611	2,248	199	12	6	n/a	8,280
2009	2,108	3,208	2,386	229	7	8	n/a	7,946
2010	2,101	3,102	2,498	196	12	10	n/a	7,919
2011	2,148	2,982	2,625	286	6	8	n/a	8,055
2012	1,851	2,459	2,613	324	11	5	n/a	7,263
2013	1,716	2,378	2,689	133	9	8	n/a	6,933
2014	1,356	2,104	2,566	162	12	5	n/a	6,205
2015	1,089	1,658	2,718	150	19	11	n/a	5,645
2016	1,052	1,818	2,663	81	27	13	32	5,686
2017	1,049	1,694	2,994	105	26	8	65	5,941
2018	1,074	1,722	3,040	78	25	11	76	6,026
2019	1,076	1,775	2,953	39	33	16	96	5,988
2020	796	1,236	2,021	78	34	14	82	4,261
2021	1,036	1,496	2,251	57	45	23	139	5,047

[^]MSM includes men who have sex with men are men who reported sex with men during any clinic visit and MSW includes men who reported sex with women only. Cisgender men unknown includes men with unknown gender of sex partners.

n/a = gender category not captured at this time and patient gender may be misclassified.

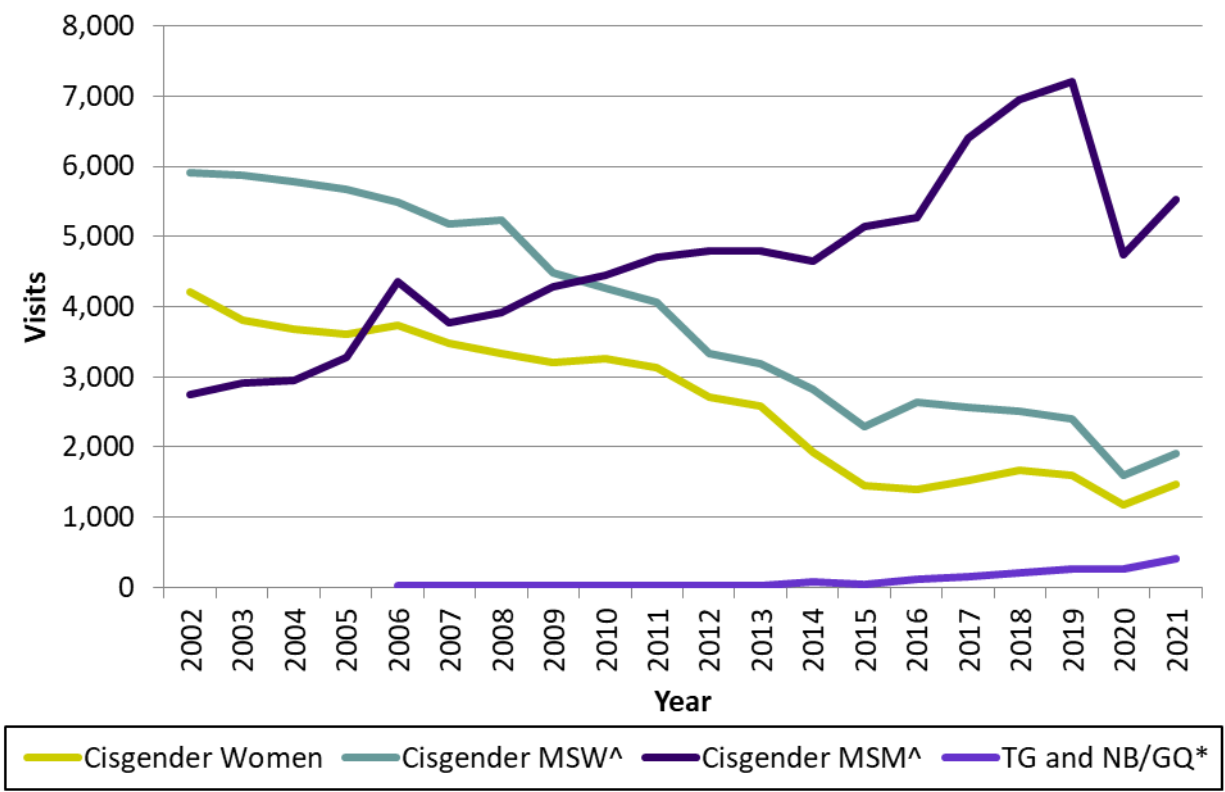
Overview

In 2021, despite the ongoing challenges of providing medical care during the COVID-19 pandemic, the PHSKC SHC provided care to 5,047 unique patients during 9,376 visits (Tables 4-1 and 4-2). This reflects a 19% increase in the number of patient visits to the clinic compared to 2020, though patient visits were down 18% from 2019, largely influenced by impacts to clinic operations due to the COVID-19 pandemic.

On clinic intake forms patients are asked about current

gender identity and sex assigned at birth. In 2021, MSM accounted for 59% of the SHC visits, while MSW and cisgender women accounted for 20% and 16% of visits, respectively. Approximately 4% (n=207) of patients identified as transgender, non-binary, or genderqueer accounting for 407 total visits to the SHC in 2021. The clinic provided services to 2,251 unique MSM patients during 5,532 visits in 2021 and the number of MSM visits and patients continued to remain higher than visits by MSW, cisgender women, or transgender, non-binary, or genderqueer patients (Figures 4-1 and 4-2).

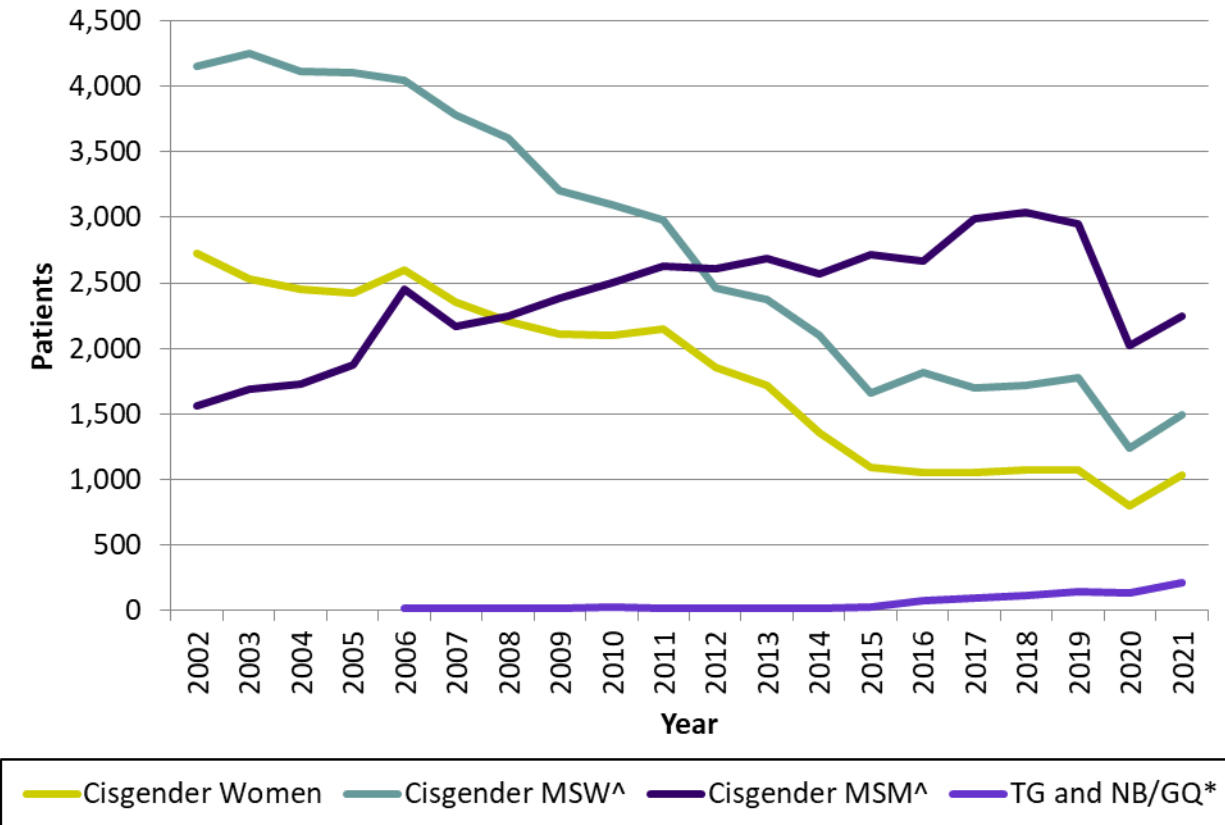
Figure 4-1: Number of Visits, Public Health - Seattle King County (PHSKC) Sexual Health Clinics, 2002-2021



^MSM includes cisgender men who have sex with men are men who reported sex with men during any clinic visit and MSW includes cisgender men who reported sex with women only. This figure excludes cisgender men with missing gender of sex partner data.

*TG and NB/GQ = transgender and non-binary/genderqueer (data not available prior to 2006).

Figure 4-2: Number of Unique Patients, Public Health - Seattle King County (PHSKC) Sexual Health Clinics, 2002-2021



^MSM includes cisgender men who have sex with men are men who reported sex with men during any clinic visit and MSW includes cisgender men who reported sex with women only. This figure excludes cisgender men with missing gender of sex partner data.
 *TG and NB/GQ = transgender and non-binary/genderqueer (data not available prior to 2006).

White patients accounted for highest number of patients among both cisgender and transgender populations. Among cisgender MSW and women, Black patients accounted for the second highest number of patients. Latinx patients accounted for the second highest number of patients among cisgender MSM and transgender/non-binary patients (Table 4-3). Overall, 17% of all clinic patients, including 25% of cisgender MSW and 19% of cisgender women patients, were Black, though only 7% of all King County residents are Black.

The PHSKC SHC continued to play an important role in diagnosing reportable STIs in King County. In 2021, the clinic diagnosed 14% (138 of 1,002) of early syphilis cases in the county, 13% (559 of 4,277) of all gonorrhea cases, 5% (8 of 163) of all HIV cases, and an estimated 8% of all chlamydial infections. In addition to cases diagnosed among King County residents, the SHC serves many patients living in neighboring counties. Clinic diagnoses described below include all patients diagnosed at the SHC, regardless of county of residence unless otherwise indicated.

Table 4-3: Age and race/ethnicity of Public Health – Seattle King County (PHSKC) Sexual Health Clinic patients, 2021

	Cisgender Women		Cisgender MSW*		Cisgender MSM*		Transgender and Non-binary/Genderqueer		Total [^]	
	Number	(%)	Number	(%)	Number	(%)	Number	(%)	Number	(%)
Total	1,036	100%	1,496	100%	2,251	100%	207	100%	5,047	100%
Race										
American Indian/ Alaska Native	8	1%	5	0%	13	1%	0	0%	26	1%
Asian	114	11%	146	10%	229	10%	13	6%	506	10%
Black	201	19%	375	25%	247	11%	19	9%	853	17%
Hispanic/Latinx	114	11%	135	9%	434	19%	38	18%	730	14%
Native Hawaiian/ Pacific Islander	5	0%	4	0%	19	1%	1	0%	29	1%
White	491	47%	686	46%	1,132	50%	115	56%	2,450	49%
Multiple	24	2%	14	1%	38	2%	8	4%	87	2%
Unknown	79	8%	131	9%	139	6%	13	6%	366	7%
Age										
10-14 years	0	0%	0	0%	0	0%	1	0%	1	0%
15-19 years	40	4%	19	1%	25	1%	7	3%	91	2%
20-24 years	240	23%	210	14%	235	10%	45	22%	742	15%
25-29 years	282	27%	382	26%	538	24%	70	34%	1,282	25%
30-34 years	203	20%	307	21%	529	24%	38	18%	1,092	22%
35-44 years	172	17%	292	20%	508	23%	36	17%	1,017	20%
45-54 years	64	6%	161	11%	246	11%	8	4%	485	10%
>=55 years	35	3%	125	8%	170	8%	2	1%	337	7%

*MSM includes men who have sex with men are men who reported sex with men during any clinic visit and MSW includes men who reported sex with women only.

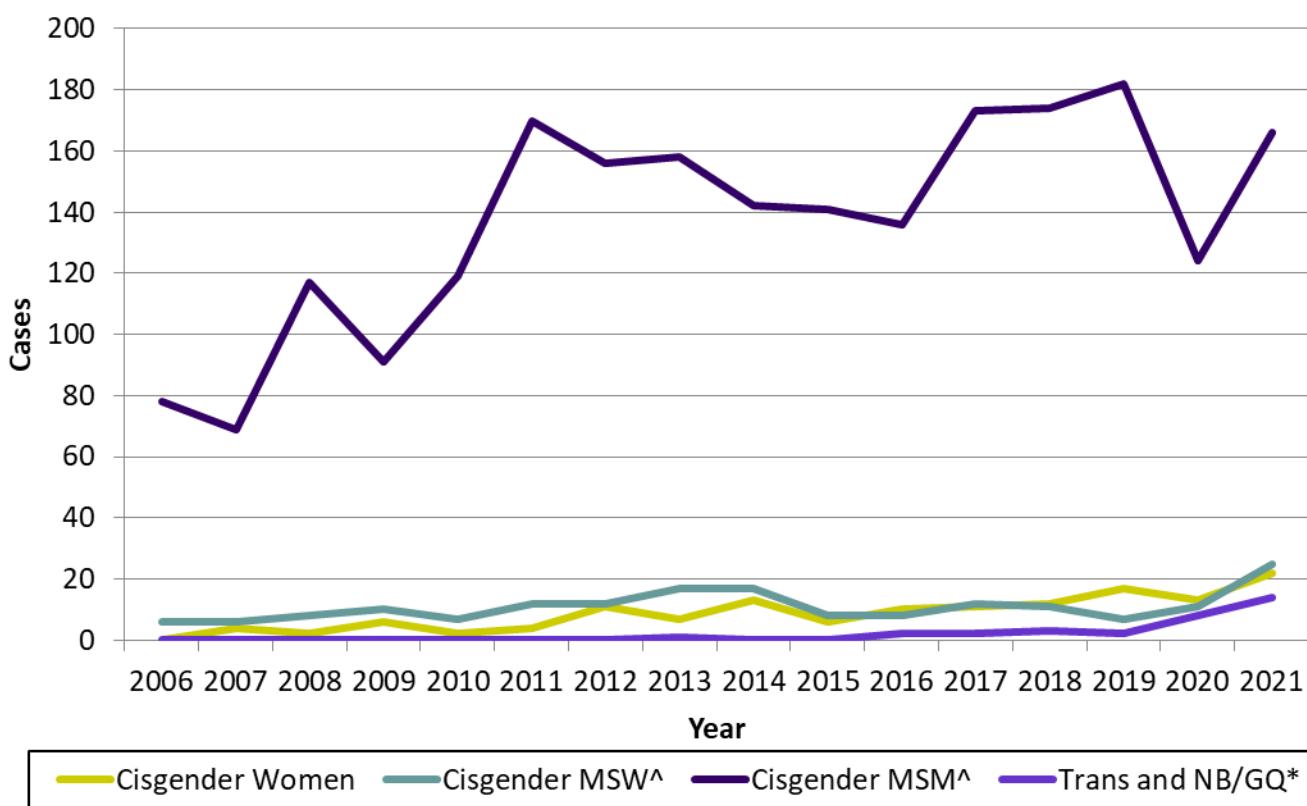
[^]57 cisgender men with unknown gender of sex partners are excluded from the race/age distributions for MSW and MSM, but are included in total race and age distributions

Syphilis

In 2021, clinicians at the SHC diagnosed 227 syphilis cases, of which 73% (n=166) were cisgender MSM, 11% (n=25) were cisgender MSW, 10% (n=22) were cisgender women, and 6% (n=14) were transgender or non-binary/genderqueer (Figure 4-3). Seventy-eight

percent of syphilis cases diagnosed at the SHC in 2021 (n=177) were early syphilis and 22% (n=50) were late or unknown duration syphilis. Syphilis diagnoses in the SHC increased 46% compared to 2020 (n=156), diagnoses among cisgender women and MSW increasing 69% and 127%, respectively.

Figure 4-3: Syphilis (all stages) – Number of diagnoses at Public Health – Seattle King County Sexual Health Clinic by gender and gender of sex partners, 2006-2021



^MSM includes cisgender men who have sex with men are men who reported sex with men during any clinic visit and MSW includes cisgender men who reported sex with women only. This figure excludes cisgender men with missing gender of sex partner data.

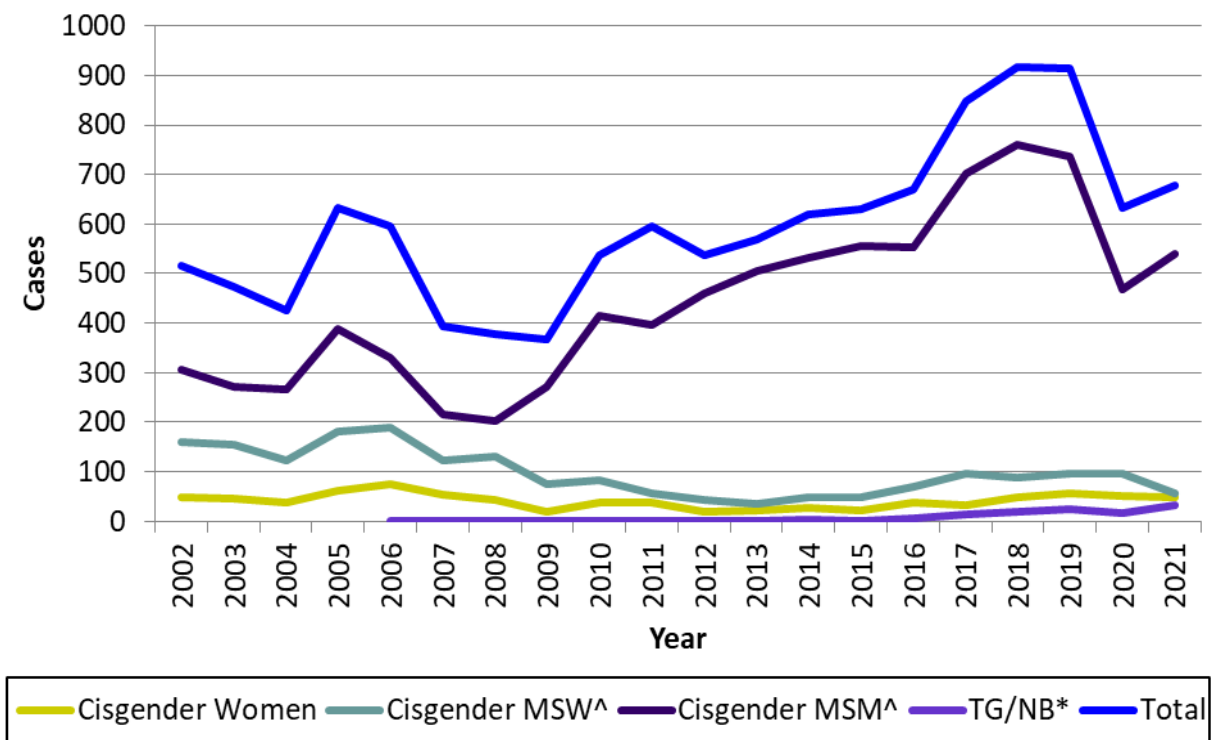
*TG and NB/GQ = transgender and non-binary/genderqueer (data not available prior to 2006).

Gonorrhea

In 2021, clinicians in the SHC diagnosed 678 cases of gonorrhea, which is a 7% increase compared to the 634 cases diagnosed in 2020 (Figure 4-4). Gonorrhea diagnoses among MSM and transgender and non-binary/genderqueer patients increased in 2021, while diagnoses among cisgender MSW and women declined. The observed increase in gonorrhea among MSM through 2019 reflects a combination of increased screening and identification of

asymptomatic rectal and pharyngeal gonorrhea and increases in the number of infections diagnosed in men with symptomatic gonococcal urethritis (Figures 4-5 and 4-6). The overall increase in gonococcal infections among MSM observed in 2021 is reflected in all three anatomic sites. In 2021, 32 gonorrhea cases were diagnosed among transgender and non-binary/genderqueer patients, 2 (6%) were transgender men, 10 (31%) were transgender women, and 20 (63%) were non-binary/genderqueer.

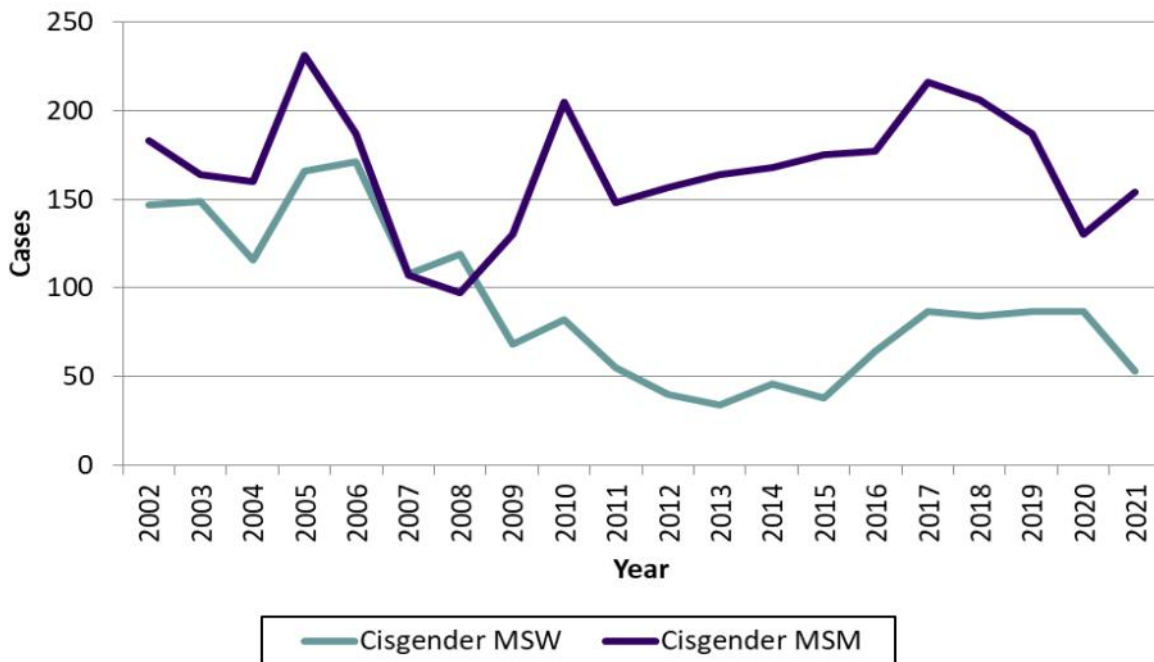
Figure 4-4: Gonorrhea – Number of diagnoses by gender and gender of sex partners Public Health – Seattle King County Sexual Health Clinic, 2002-2021



^MSM includes cisgender men who have sex with men are men who reported sex with men during any clinic visit and MSW includes cisgender men who reported sex with women only. This figure includes cisgender men with missing gender of sex partner data in the total.
 *TG and NB/GQ = transgender and non-binary/genderqueer (data not available prior to 2006).

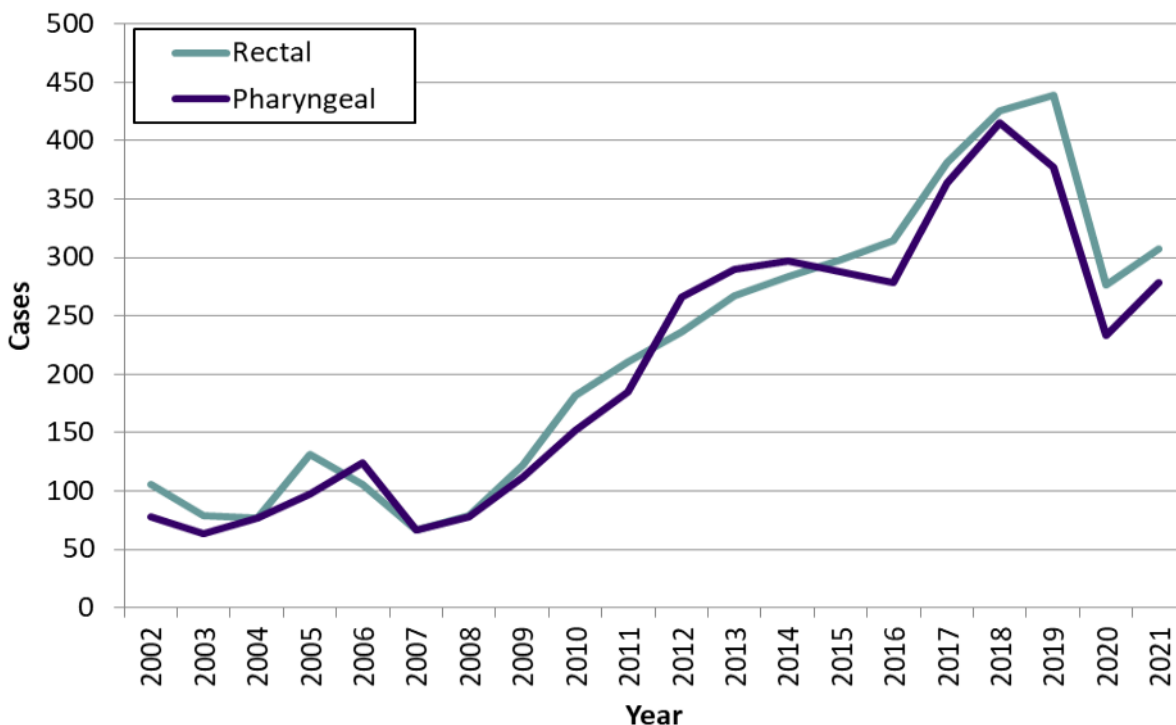
Note: More sensitive NAATs for extragenital gonorrhea screening were adopted in November 2010.

Figure 4-5: Gonorrhea – Symptomatic Gonococcal Urethritis among Cisgender MSM and MSW Public Health - Seattle King County Sexual Health Clinic, 2002-2021*



*MSM includes men who have sex with men are men who reported sex with men during any clinic visit and MSW includes men who reported sex with women only.

Figure 4-6: Gonorrhea – Rectal and Pharyngeal Infections among Cisgender Men who have sex with Men Public Health – Seattle King County Sexual Health Clinic, 2002-2021

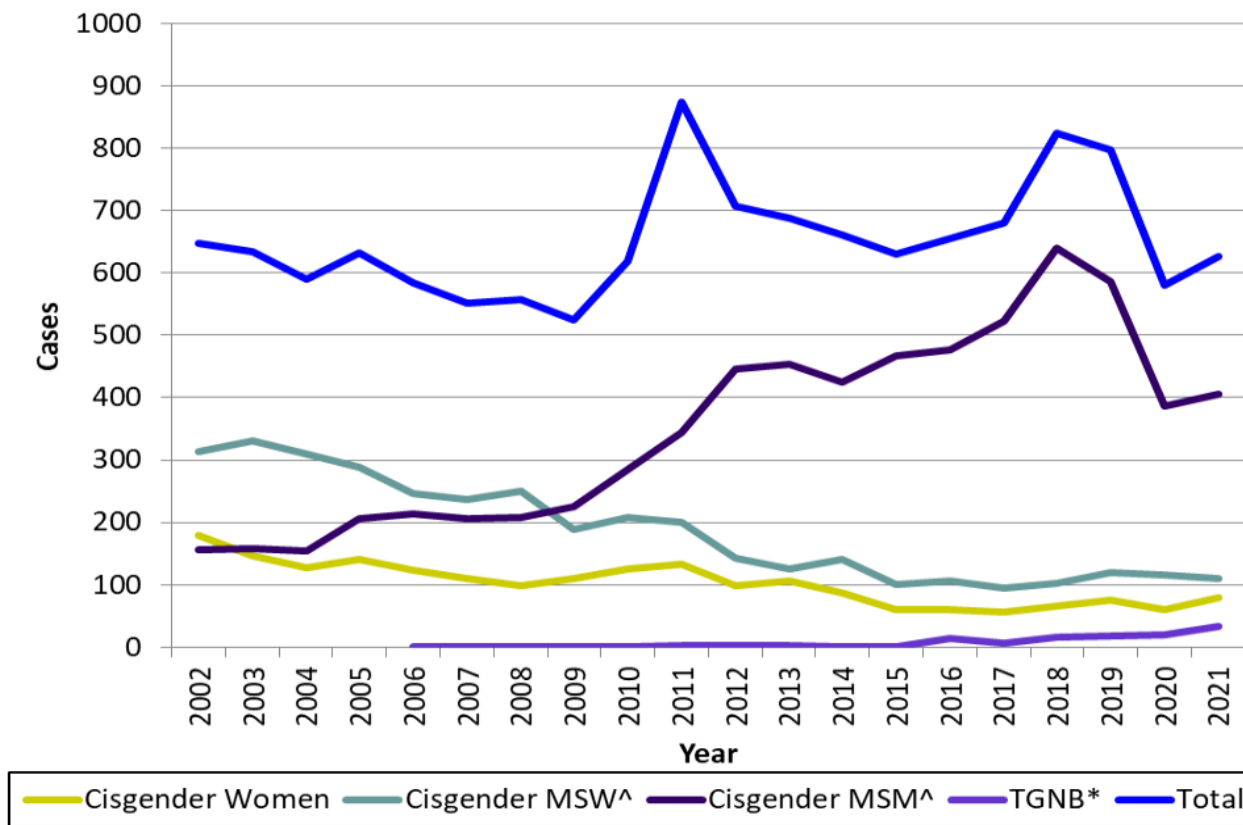


Chlamydial infection

In 2021, the SHC diagnosed 626 cases of chlamydial infection, which is an 8% increase from 2020 (n=580) (Figure 4-7). The clinic initiated routine rectal and pharyngeal screening of MSM using NAATs in late 2010, which contributed to the increase in chlamydial diagnoses among MSM. However, the number of MSM with symptomatic chlamydial urethritis, which is not affected by changes in screening practices, had been trending up until declining starting in 2020 (Figure 4-8). The number of chlamydial diagnoses occurring among women and MSW in the clinic decreased between 2002

and 2014 and have been relatively stable since 2015, reflecting the long-term decline in the number of women and MSW seen in the clinic. The positivity of chlamydial infection among asymptomatic women ages 15-29 has varied over the years; it peaked in 2019 at 12% and declined to 7% in 2021 (Figure 4-9). In 2021, 33 cases of chlamydia infection were diagnosed among transgender and non-binary/genderqueer patients, 13 (39%) were transgender women, 2 (6%) were transgender men, and 18 (55%) were non-binary/genderqueer patients.

Figure 4-7: Chlamydial Infection – Number of diagnoses by gender and gender of sex partners Public Health – Seattle King County Sexual Health Clinic, 2002-2021

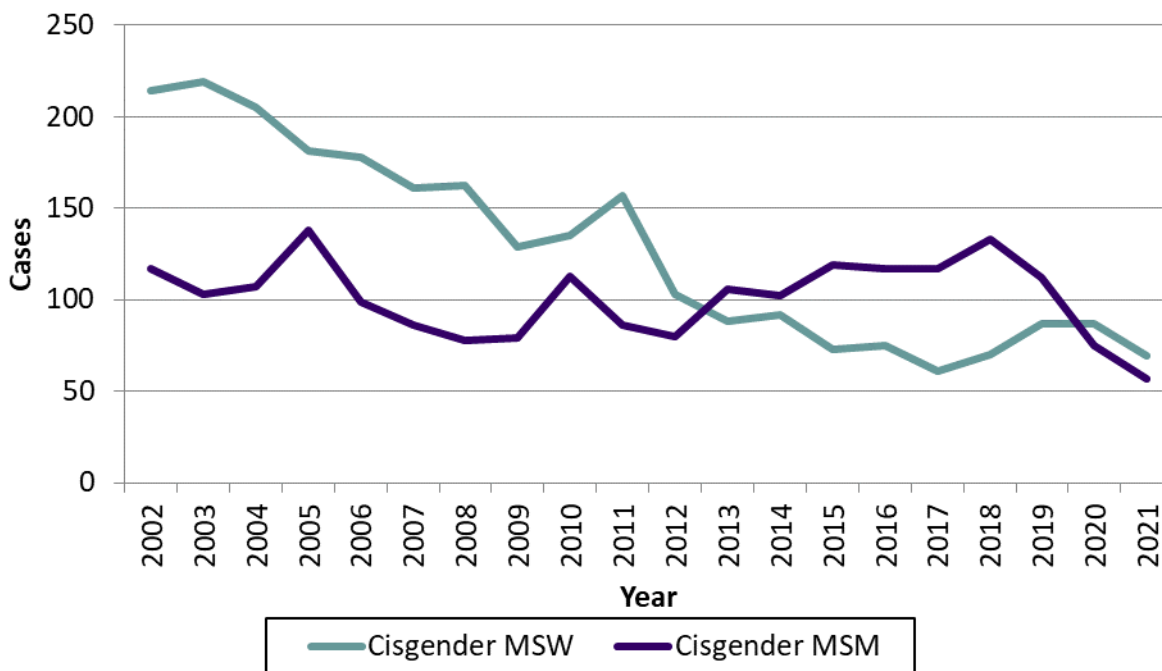


^MSM includes cisgender men who have sex with men are men who reported sex with men during any clinic visit and MSW includes cisgender men who reported sex with women only. This figure includes cisgender men with missing gender of sex partner data in the total.

*TG and NB/GQ = transgender and non-binary/genderqueer (data not available prior to 2006).

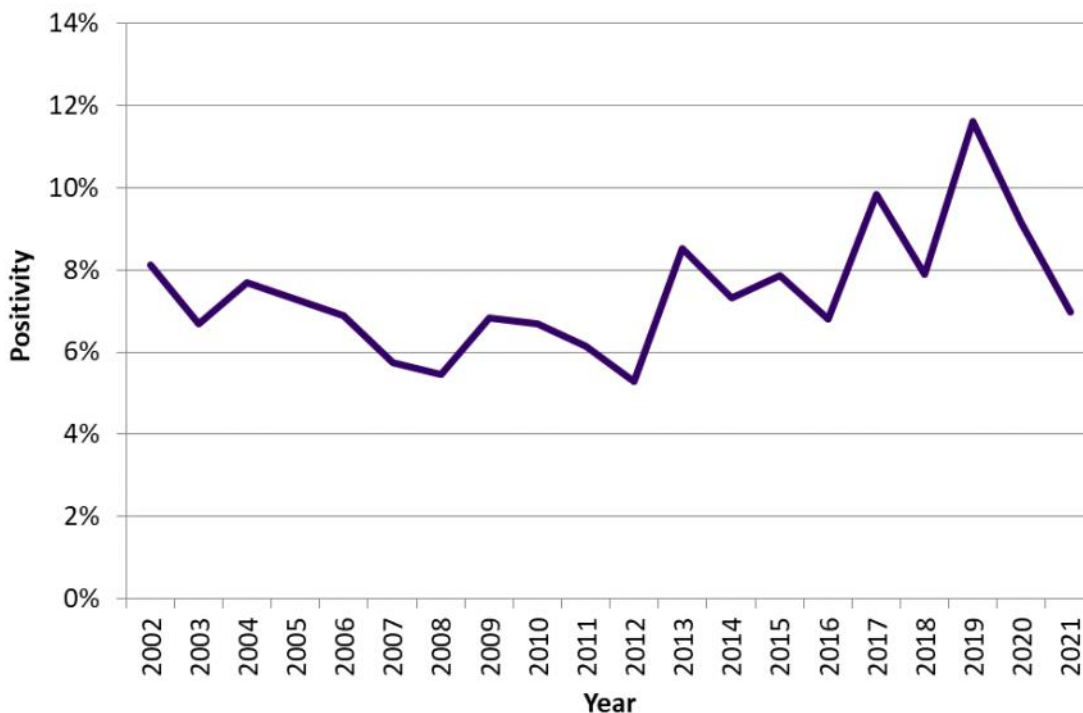
Note: More sensitive NAATs for extragenital gonorrhea screening were adopted in November 2010.

Figure 4-8: Chlamydial Infection – Symptomatic Chlamydial urethritis among cisgender men who have sex with men (MSM) and men who have sex with women (MSW), Public Health – Seattle King County Sexual Health Clinic, 2002-2021*



*MSM includes men who have sex with men are men who reported sex with men during any clinic visit and MSW includes men who reported sex with women only.

Figure 4-9: Chlamydial Infection – Positivity among asymptomatic cisgender women ages 15-29 Public Health – Seattle King County Sexual Health Clinic, 2002-2021*



*Chlamydia positivity is defined as the number of cases divided by the total number of cisgender women tested.

HIV

Sexual Health Clinic clinicians diagnosed eight new cases of HIV infection among King County residents in 2021, a decrease from the 20 cases newly diagnosed in 2020 (Figure 4-10). MSM accounted for 88% of the cases diagnosed in the Sexual Health Clinic in 2021.

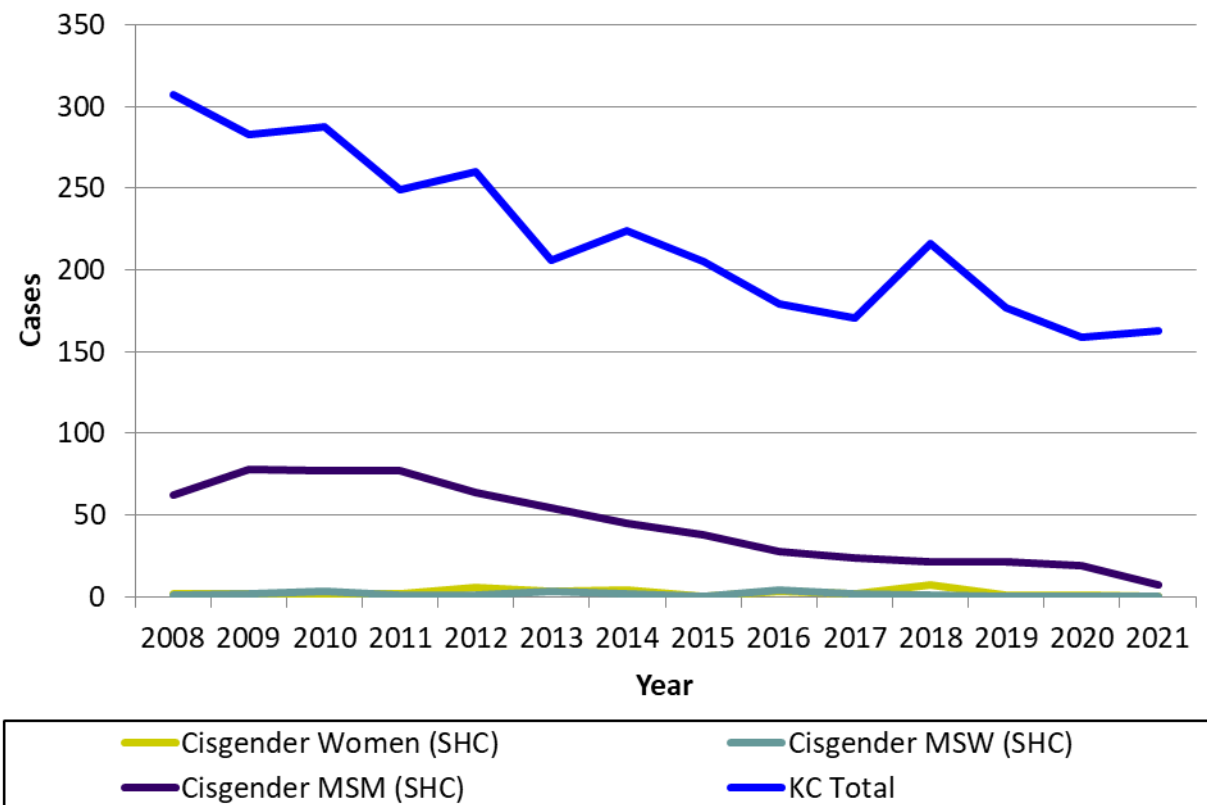
Trichomoniasis and Bacterial Vaginosis

In 2021, 50 cases of trichomoniasis were diagnosed among cisgender women in the SHC, which is a slight increase from 47 cases diagnosed in 2020 (Figure 4-11). Trichomoniasis positivity, which is calculated as the total number of diagnoses divided by the number of cisgender women tested by culture, NAAT, and/or wet

mount microscopy, was 5% among tested cisgender women in 2020, a decrease from the 8% positivity in 2020.

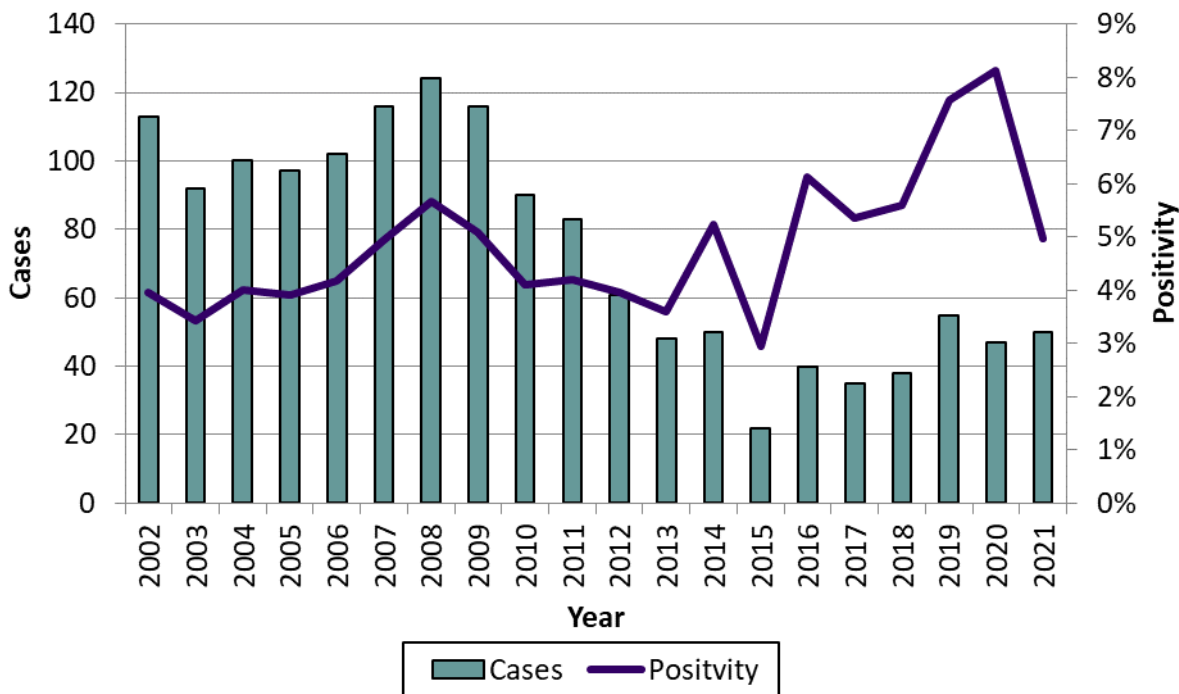
The number of cisgender women diagnosed with bacterial vaginosis in the SHC declined from 796 in 2010 to 201 in 2020, and the prevalence of bacterial vaginosis among cisgender women has remained relatively stable since 2015 (Figure 4-11). Bacterial vaginosis prevalence is calculated as the total number of bacterial vaginosis diagnoses divided by the number of cisgender women tested for vaginal PH and the presence of vaginal clue cells on wet preparations.

Figure 4-10: HIV Infection – Diagnoses by gender and gender of sex partners*, Public Health – Seattle King County Sexual Health Clinic (SHC) and total HIV diagnoses in King County (KC), 2008-2021



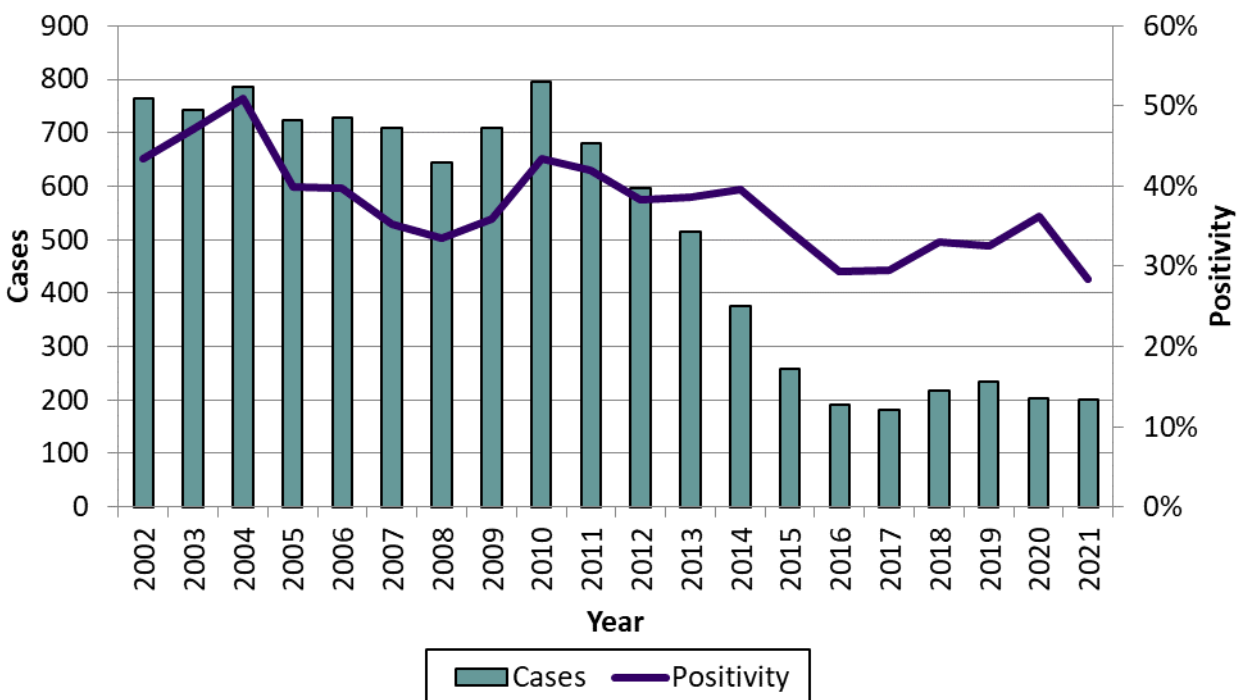
*MSM includes men who have sex with men are men who reported sex with men and MSW includes men who reported sex with women only. Data limited to King County residents.

Figure 4-11: Trichomoniasis – Number of diagnoses and positivity among cisgender women Public Health – Seattle King County Sexual Health Clinic, 2002-2021*



*Diagnoses are based on culture, NAAT, and/or wet mount tests. Positivity is calculated as total diagnoses divided by total annual tests (culture, NAAT and/or wet mount). NAAT testing began in 2012.

Figure 4-12: Bacterial Vaginosis – Number of diagnoses and positivity among cisgender women Public Health – Seattle King County Sexual Health Clinic, 2002-2021*



*Positivity is calculated as total diagnoses divided by number of patients with tests for both vaginal PH and clue cells.

Other clinical services

In addition to HIV testing and STI testing and treatment, the SHC provides other health services to patients including immunizations, long-acting reversible contraception, (Table 4-4) and HIV pre-exposure prophylaxis (PrEP). SHC patients can received hepatitis A, hepatitis B, and human papillomavirus

immunizations. The SHC provides long-acting reversible contraception (LARC) insertions and removals for both implant and intrauterine devices (IUD). For additional information about PrEP, refer to the PHSKC PrEP section of the report.

Table 4-4: Immunizations and long-acting reversible contraception (LARC) visits, Public Health – Seattle King County Sexual Health Clinic (PHSKC SHC) 2021

	Doses/Visits Number	Unique patients receiving at least one Number
Immunizations		
Hepatitis A	57	55
Hepatitis B	139	110
Hepatitis A & B	127	102
Human papillomavirus	345	279
LARC		
Intrauterine device insertion	9	
Implant insertion	13	

Table 5-1: Public Health – Seattle King County Sexual Health Clinic patients attending initial* or restart PrEP Visits, 2014-2021**

	Initial Visits 2014-2021		Initial Visits 2021		Restart Visits 2021	
	N	%	N	%	N	%
Total	1,960	100%	368	100%	143	100%
Race/ethnicity						
American Indian/Alaska Native	18	1%	1	0%	2	1%
Asian	195	10%	32	9%	8	6%
Black	189	10%	40	11%	19	13%
Hispanic/Latinx	480	24%	88	24%	44	31%
Native Hawaiian/Pacific Islander	21	1%	1	0%	3	2%
White	971	50%	187	51%	55	38%
Multiple	52	3%	7	2%	8	6%
Unknown	34	2%	12	3%	4	3%
Age						
<15 years	2	0%	1	0%	0	0%
15-19 years	64	3%	10	3%	2	1%
20-24 years	397	20%	60	16%	20	14%
25-29 years	591	30%	114	31%	39	27%
30-34 years	403	21%	72	20%	38	27%
35-44 years	320	16%	74	20%	32	22%
45-54 years	139	7%	26	7%	9	6%
>=55 years	44	2%	11	3%	3	2%
Gender						
Cisgender Men	1,820	93%	342	93%	134	94%
Cisgender Women	59	3%	9	2%	2	1%
Non-binary/Genderqueer	29	1%	9	2%	3	2%
Transgender Men	15	1%	5	1%	1	1%
Transgender Women	36	2%	3	1%	3	2%
Unknown	1	0%	0	0%	0	0%
Filled First Prescription						
Yes	1,753	89%	341	93%	133	93%
No	207	11%	27	7%	10	7%

*Initial visit is the first clinic a patient attends to begin PrEP

**Restart visits include patients who started PrEP at the clinic and stopped as well as patients who attended initial visit but never started PrEP. Patients with multiple restart visits in 2021 are only counted

Table 5-2: Public Health – Seattle King County Sexual Health Clinic PrEP patients, 2021

	On PrEP at any point*		On PrEP at Year End)**	
	N	%	N	%
Total	922	100%	666	100%
Race/ethnicity				
American Indian/Alaska Native	7	1%	6	1%
Asian	99	11%	78	12%
Black	86	9%	56	8%
Hispanic/Latinx	237	26%	174	26%
Native Hawaiian/Pacific Islander	5	1%	3	0%
White	445	48%	327	49%
Multiple	25	3%	14	2%
Unknown	18	2%	8	1%
Age				
<15 years	1	0%	1	0%
15-19 years	11	1%	6	1%
20-24 years	110	12%	65	10%
25-29 years	259	28%	174	26%
30-34 years	232	25%	157	24%
35-44 years	203	22%	182	27%
45-54 years	67	7%	48	7%
>=55 years	39	4%	33	5%
Gender				
Cisgender Men	872	95%	631	95%
Cisgender Women	13	1%	6	1%
Non-binary/Genderqueer	16	2%	12	2%
Transgender Men	6	1%	5	1%
Transgender Women	15	2%	12	2%
Unknown	0	0%	0	0%

*Patients were classified as on PrEP at any point in 2021 if any of their 2021 visits were coded as on PrEP.

**Patients were classified as on PrEP at year end if their last visit date in 2021 was coded as on PrEP.

Table 5-3: Public Health – Seattle King County Sexual Health Clinic patients discontinuing PrEP, 2021

	N	%
Total	303	100%
Race/ethnicity		
American Indian/Alaska Native	2	1%
Asian	24	8%
Black	34	11%
Hispanic/Latinx	73	24%
Native Hawaiian/Pacific Islander	2	1%
White	147	49%
Multiple	12	4%
Unknown	9	3%
Age		
<15 years	0	0%
15-19 years	3	1%
20-24 years	39	13%
25-29 years	90	30%
30-34 years	82	27%
35-44 years	57	19%
45-54 years	24	8%
>=55 years	8	3%
Gender		
Cisgender Men	288	95%
Cisgender Women	7	2%
Non-binary/Genderqueer	5	2%
Transgender Men	1	0%
Transgender Women	2	1%
Unknown	0	0%
Reason for Discontinuation		
HIV Positive Test at Initial Visit	0	0%
HIV Positive following missed pills	1	0%
Jail/Incarceration	0	0%
Lost to Follow-Up	151	50%
Monogamous Relationship	20	7%
Moved	51	17%
No longer at risk for HIV (as determined by patient)	26	9%
Side Effects	5	2%
Transferred Care	47	16%
Unknown/Other	2	1%

PrEP Eligibility and Recommendations

Clinicians in the SHC clinic ask all MSM and transgender patients about their use of and interest in PrEP.

Eligibility criteria for receiving PrEP services through the SHC have varied based on resources and priority populations. Clinic staff refer patients who want to initiate PrEP but are not eligible to receive it through the SHC to PrEP medical providers in the community.

As of 2021, patients eligible to receive PrEP at the SHC include:

- Cisgender MSM and transgender patients who have sex with men
- Persons who report trading sex for money or drugs in the past 12 months
- Persons who inject drugs who are experiencing homelessness
- Patients who are HIV negative whose partner is living with HIV and is not on antiretroviral therapy (ART) or who is within 6 months of starting ART
- Cases determined by the provider to be at increased risk for HIV acquisition and eligible for PHSKC PrEP who do not fit the above criteria.

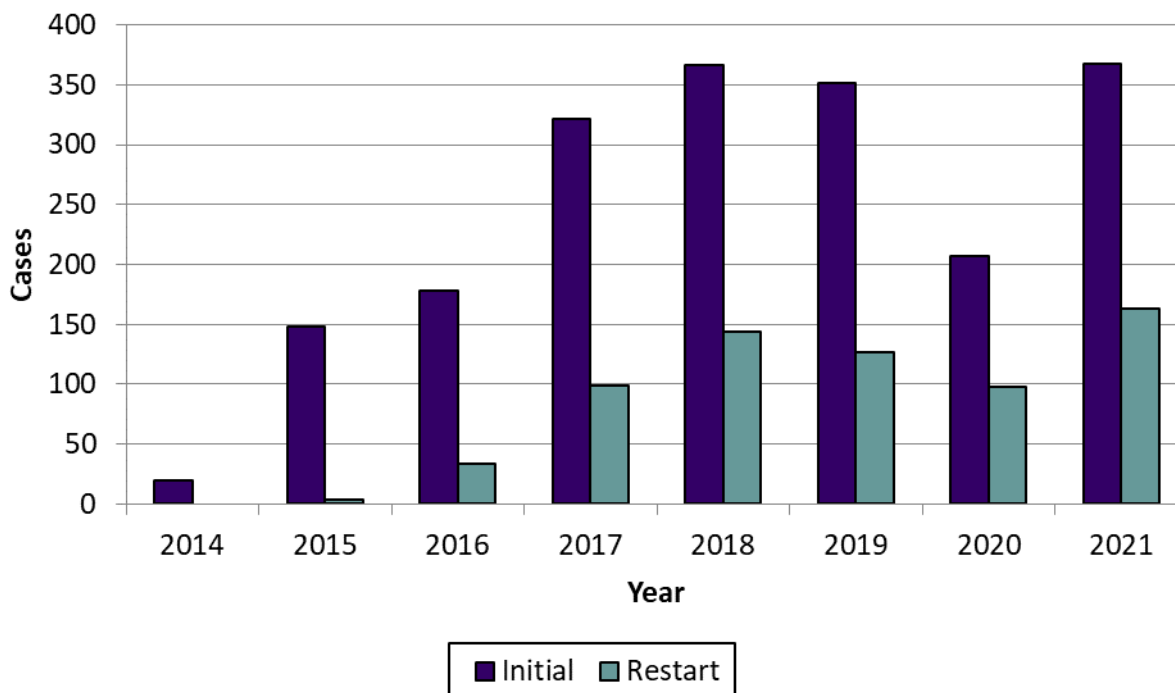
Patients receiving PrEP through the SHC are seen by a clinician at an initial visit and, in the absence of medical complaints, annually thereafter. Non-medical clinic staff follow-up with PrEP patients one month after starting

medication and every three months thereafter. We consider PrEP patients to have stopped their medication if they notify clinic staff that they discontinued PrEP or if they fail to attend a three-month follow-up appointment. Patients who stop taking PrEP must be seen for a restart visit before beginning PrEP again.

Overview

PrEP capacity has greatly increased since the SHC started offering PrEP in October 2014. Following a decline in 2020, due to the impacts of the COVID-19 pandemic, PrEP capacity increased in 2021 and 368 patients attended an initial visit (Figure 5-1). Between October 2014 and December 2021, 1,960 unique patients attended initial PrEP visits, among whom 89% filled an initial PrEP prescription (Table 5-1). As of the end of 2021, 666 SHC PrEP patients were receiving PrEP through the clinic and 922 had received PrEP through the clinic during at least one PrEP visit in 2021 (Table 5-2). In 2021, 368 patients attended an initial PrEP visit, 93% of whom filled their first prescription. Of these patients, 93% were cisgender men, 51% were White, 24% were Hispanic/Latinx, and 50% were between the ages of 20 and 29. In 2021, 143 unique patients attended a PrEP restart visit (Table 5-1). These visits occurred among persons who have discontinued PrEP or attended an initial PrEP visit but never initiated PrEP. Of the restart patients, 93% filled their restart prescription.

Figure 5-1: Initial* and restart** PrEP Visits Public Health – Seattle King County Sexual Health Clinic, 2014-2021



*Initial visit is the first clinic a patient attends to begin PrEP

**Restart visits include patients who started PrEP at the clinic and stopped as well as patients who attended initial visit but never started PrEP.

PrEP Discontinuation

In 2021, 303 PrEP patients stopped receiving PrEP through the SHC and did not restart (Table 5-3). Half (50%) of these patients were lost to follow-up and the reason for discontinuation could not be assessed. Transferring PrEP care to another provider (16%) and moving (17%) were the other top reasons for PrEP discontinuation at the SHC. We used Kaplan-Meier analysis to assess factors associated with PrEP discontinuation among patients who enrolled in the Sexual Health Clinic PrEP program from October 2014 to December 2021¹². Of the 1,960 patients with initial visits for PrEP, 1,347 were included in the discontinuation analysis. Patients were excluded if their first prescription was not filled or they reported never

starting PrEP (n=232), if they moved (n=194) or transferred care (n=180), or they tested positive for HIV at their initial visit (n=7). There were no significant differences in race/ethnicity, age, gender, or methamphetamine use between the excluded and included populations. Observation time for each patient was calculated as the time from initial visit to either first PrEP stop date or September 30, 2022. The median observation time was 13 months (interquartile range, 6-28 months). After starting, 927 patients (68%) stopped using PrEP. In the months after the initial PrEP visit, the proportion of patients on PrEP declined steadily with approximately 56% retained on PrEP by 12 months (Figure 5-2).

¹²Dombrowski JC, Golden MR, Barbee, LA, et al. Patient disengagement from an HIV preexposure prophylaxis program in a sexually transmitted disease clinic. *Sex Transm Dis* 2018; 45(9): e62–e64.

Figure 5-2: Timing of PrEP Discontinuation among Patients Filling First Prescription Public Health – Seattle King County Sexual Health Clinic, 2014-2021

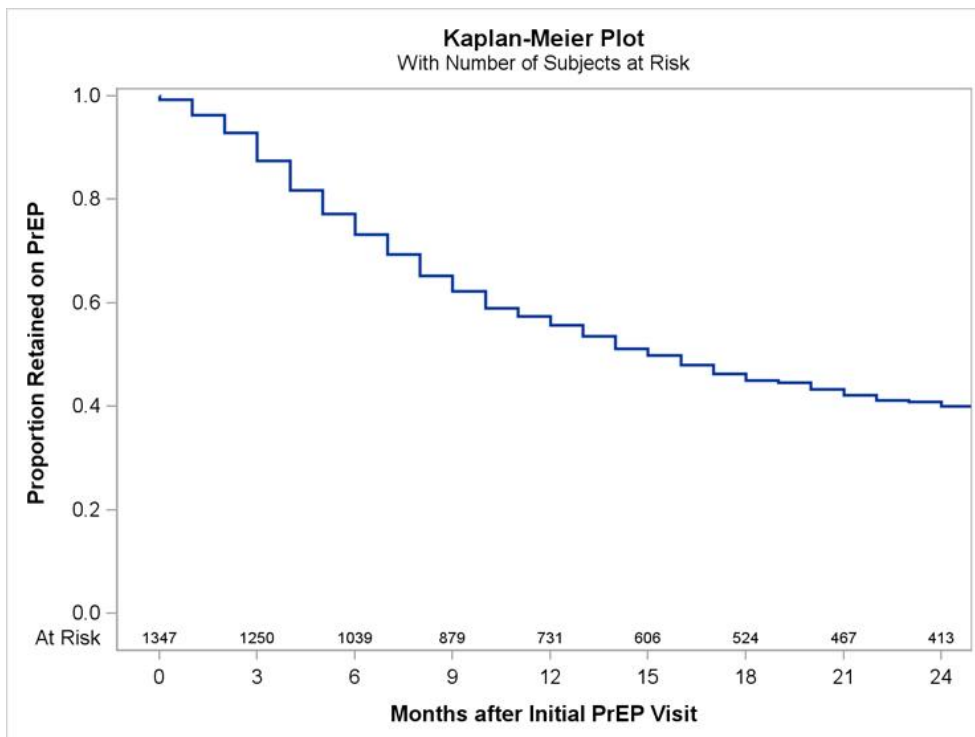
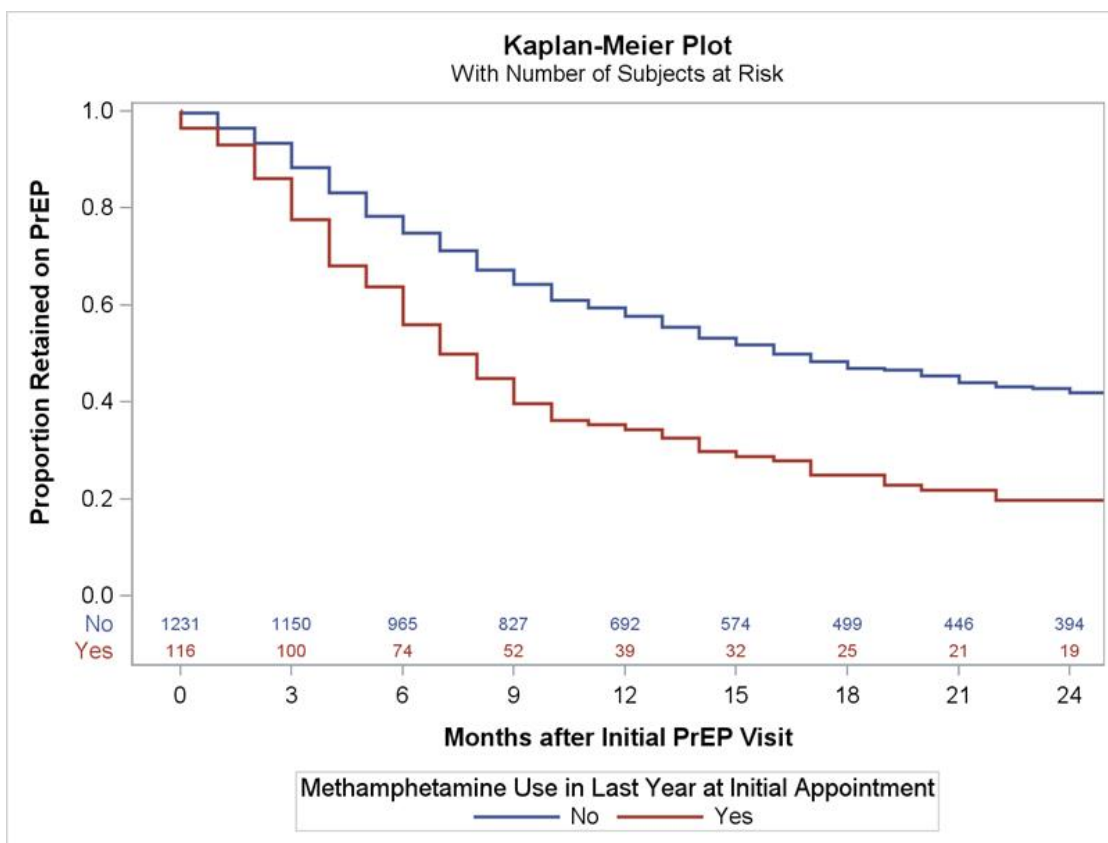


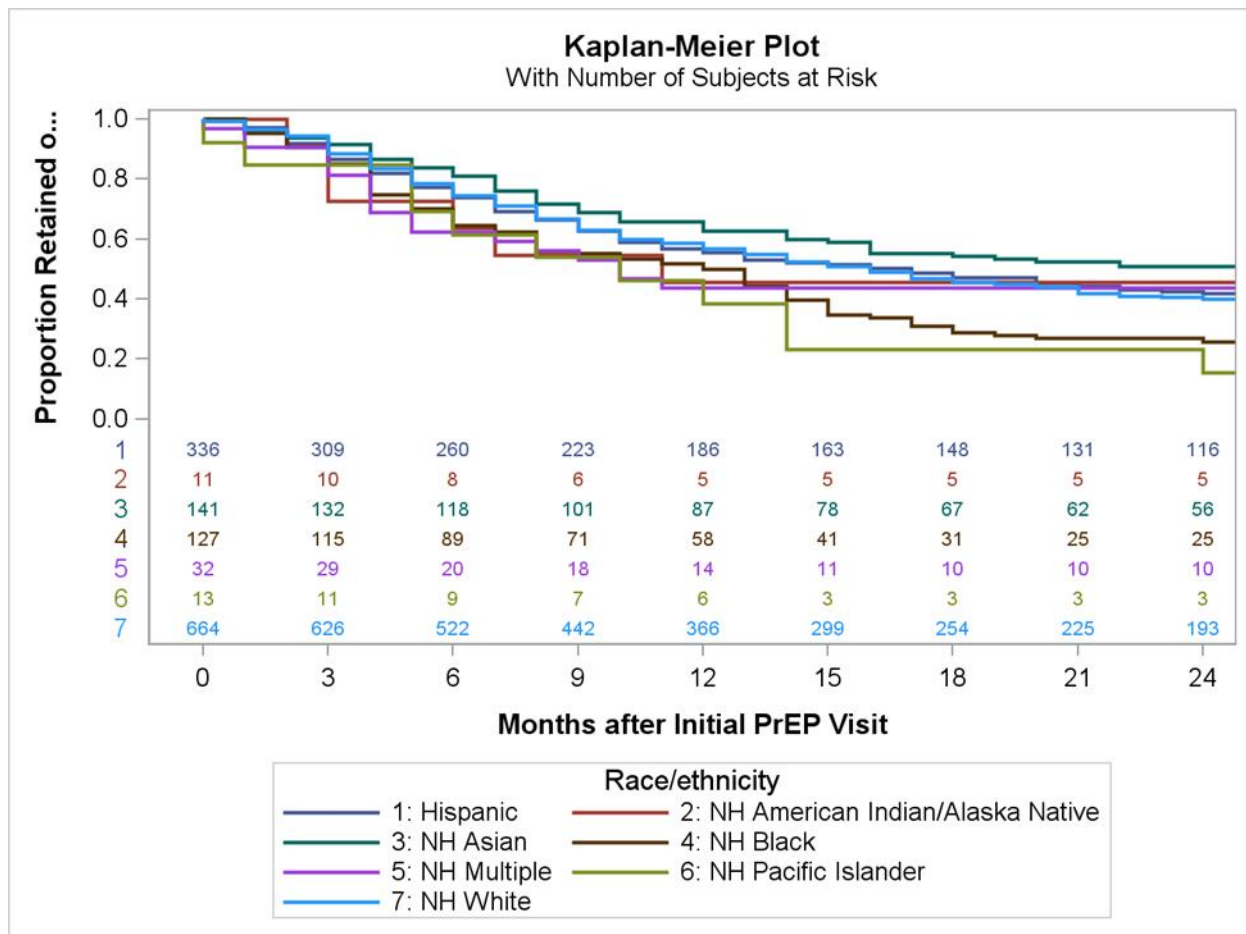
Figure 5-3: Timing of PrEP Discontinuation among Patients Filling First Prescription by Methamphetamine Use Public Health – Seattle King County Sexual Health Clinic, 2014-2021



Timing of discontinuation was associated with Black race and methamphetamine use in the prior year as ascertained at the time of PrEP initiation, and younger age. Only 34% of patients who reported methamphetamine use in the past year continued PrEP at 12 months compared to 58% of patients who did not report methamphetamine use in the past year (Figure 5-3). Black patients had lower PrEP retention at 12 months (50%) compared to Hispanic (56%), Asian (63%), and White (57%) PrEP patients (Figure 5-4). Patients ages 15-19 had the lowest retention at 12

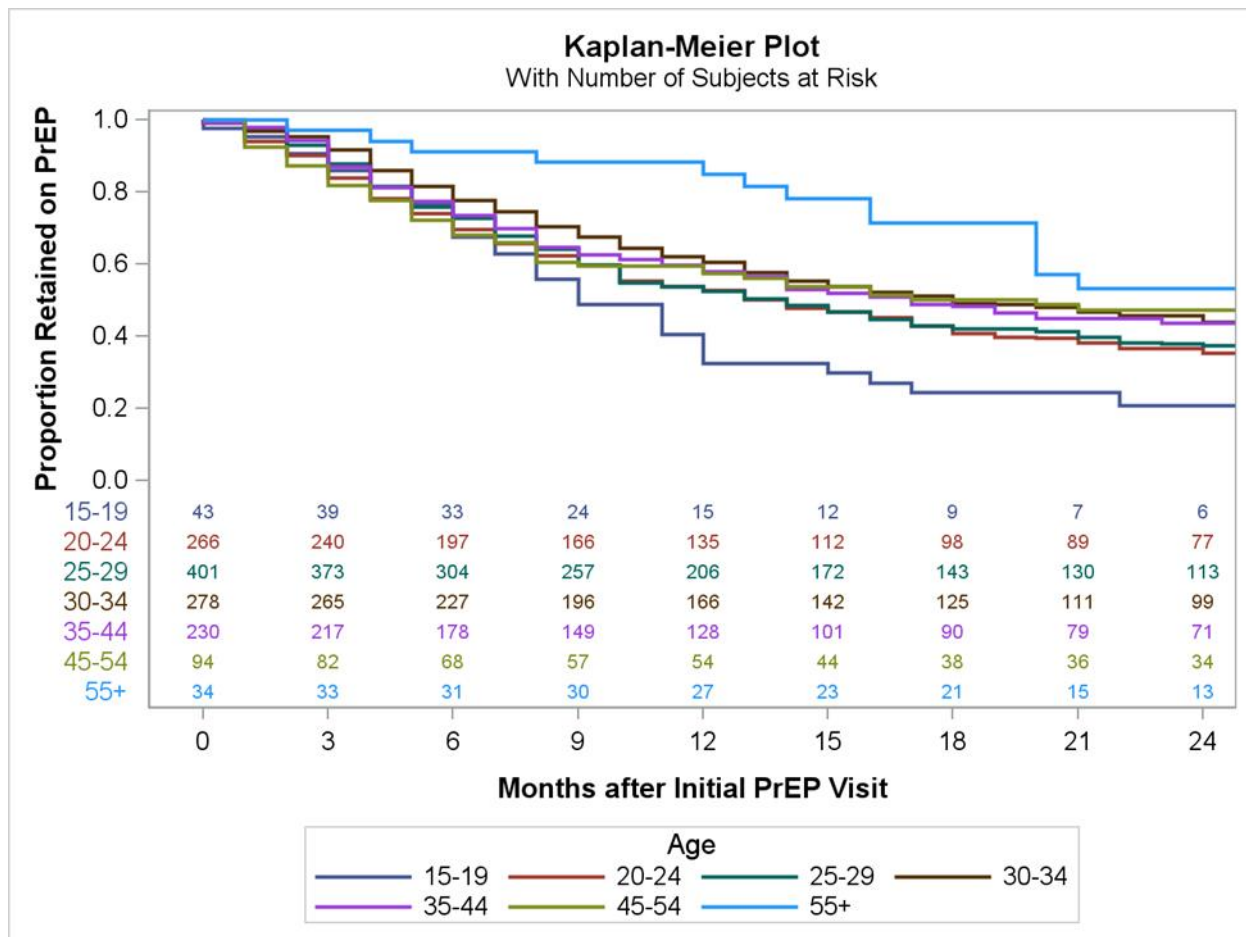
months compared to all other age groups (Figure 5-5). Understanding the reasons for PrEP discontinuation is difficult as 68% (n=631) of the patients were lost to follow-up and for an additional 4% (n=37) the reason was unknown or other. Of the 259 patients with a known reason, 45% (n=116) discontinued because they were in a monogamous relationship with an HIV-seronegative partner or partner with undetectable HIV, 36% (n=94) determined they were no longer at risk for HIV, and 14% (n=36) due to side effects.

Figure 5-4: Timing of PrEP Discontinuation among Patients Filling First Prescription by Race/Ethnicity Public Health – Seattle King County Sexual Health Clinic, 2014-2021



NH = Non-Hispanic/Latinx

Figure 5-5: Timing of PrEP Discontinuation among Patients Filling First Prescription by Age Public Health – Seattle King County Sexual Health Clinic, 2014-2021



Overview

PHSKC plays a critical role in controlling STIs in King County by offering partners services to individuals who are infected with STIs and their partners. Historically, partner services focused on identifying and locating sexual contacts of infected persons and referring them for testing and treatment. In recent years, the intervention has evolved to include a broad array of activities designed to assist persons infected with STIs and advance public health prevention objectives. These services include, but are not limited to, notifying sex and needle sharing partners of potential exposure to HIV or STIs, providing testing and treatment to partners, providing patients with expedited partner therapy (EPT)

to give to their partners, referring out-of-care HIV positive persons for care, referring eligible persons to PrEP, and providing education about STI prevention. In King County, disease intervention specialists (DIS) are responsible for offering partner services to eligible index cases. Due to resource limitations, PHSKC cannot provide partner services to all persons with reportable STIs and medical providers diagnosing patients with STIs should advise their patients to notify their sex partners of their diagnosis and encourage their partners to seek medical care. Partner services activities are vital from identifying risk factors for STIs and populations to target with public health interventions.

Table 6-1: Partner Services — Outcomes among early, late or unknown duration, and total syphilis cases, King County, WA, 2021

	Early		Late or Unknown Duration		Total Syphilis	
	Number (%)	Index	Number (%)	Index	Number (%)	Index
Index Cases Diagnosed	993		324		1317	
Index Cases Initiated	549 (55)		245 (76)		794 (60)	
Index Cases Interviewed	306 (56)		137 (56)		443 (56)	
Median Days from Initial Lab to Interview (Interquartile Range)	15 (6-29)		19 (11-36.5)		15 (7-31)	
Index Cases Naming ≥1 Contact	86 (28)		52 (38)		138 (31)	
Number of Partners Named	176		84		260	
Contact Index		0.58		0.61		0.59
Notified based on Index Case Report	52 (30)		27 (32)		79 (30)	
Notified by DIS	27 (52)		12 (44)		39 (49)	
Notification Index (DIS)		0.09		0.09		0.09
Tested for Syphilis	18 (10)		12 (14)		30 (12)	
Testing Index		0.06		0.09		0.07
Before Interview	9 (5)		7 (8)		16 (6)	
After Interview	9 (5)		5 (6)		14 (5)	
Testing Index (DIS)		0.03		0.04		0.03
Newly Diagnosed with Syphilis	6 (3)		5 (6)		11 (4)	
Before Interview	4 (2)		3 (4)		7 (3)	
After Interview	2 (1)		2 (2)		4 (2)	
Case Finding Index (DIS)		0.01		0.01		0.01
Treated	6 (3)		5 (6)		11 (4)	
Brought to Treatment Index		0.02		0.04		0.02
Before Interview	4 (2)		3 (4)		7 (3)	
After Interview	2 (1)		2 (2)		4 (2)	
Brought to Treatment Index (DIS)		0.01		0.01		0.01
Partners Epi Treated	32 (18)		13 (15)		45 (17)	
Epi Index		0.10		0.09		0.10
Before Interview	15 (9)		7 (8)		22 (8)	
After Interview	17 (10)		6 (7)		23 (9)	
Epi Index (DIS)		0.06		0.04		0.05

DIS = disease intervention specialist

Indices noted as (DIS) include the number of partners after the interview in the numerator. Indices were calculated as follows:

Contact index = partners contacted per index case interviewed

Notification index = partners notified of exposure per index case interviewed

Testing index = partners tested per index case interviewed

Brought to treatment index = infected partners treated for new syphilis infection per index case interviewed

Epi index = partners receiving syphilis treatment regardless of syphilis infection status per index case interviewed

Table 6-2: Partner Services — Syphilis outcomes among cisgender men who have sex with men (MSM) and cisgender heterosexual (cisgender women and men who have sex with women), King County, WA, 2021

	Cisgender MSM				Cisgender Heterosexuals			
	Early		Late or Unknown Duration		Early		Late or Unknown Duration	
	Number (%)	Index	Number (%)	Index	Number (%)	Index	Number (%)	Index
Index Cases Diagnosed	618		119		275		166	
Index Cases Initiated	213 (34)		59 (50)		268 (97)		156 (94)	
Index Cases Interviewed	148 (69)		41 (69)		147 (55)		92 (59)	
Median Days from Initial Lab to Interview (Interquartile Range)	12.5 (5-27)		19 (11-32)		20 (8-33)		20.5 (11-40)	
Index Cases Naming ≥1 Contact	27 (18)		10 (24)		55 (37)		40 (43)	
Number of Partners Named	60		17		97		65	
Contact Index		0.41		0.41		0.66		0.71
Notified based on Index Case Report	15 (25)		4 (24)		35 (36)		23 (35)	
Notified by DIS	9 (15)		0 (0)		16 (16)		12 (18)	
Notification Index (DIS)		0.06		0.00		0.11		0.13
Tested for Syphilis	5 (8)		3 (18)		13 (13)		8 (12)	
Testing Index		0.03		0.07		0.09		0.09
Before Interview	2 (3)		2 (12)		7 (7)		5 (8)	
After Interview	3 (5)		1 (6)		6 (6)		3 (5)	
Testing Index (DIS)		0.02		0.02		0.04		0.03
Newly Diagnosed with Syphilis	0 (0)		2 (12)		6 (6)		2 (3)	
Before Interview	0 (0)		1 (6)		4 (4)		2 (3)	
After Interview	0 (0)		1 (6)		2 (2)		0 (0)	
Case Finding Index (DIS)		0.00		0.05		0.04		0.02
Treated for Syphilis	0 (0)		2 (12)		6 (6)		2 (3)	
Brought to Treatment Index		0.00		0.05		0.04		0.02
Before Interview	0 (0)		1 (6)		4 (4)		2 (3)	
After Interview	0 (0)		1 (6)		2 (2)		0 (0)	
Brought to Treatment Index (DIS)		0.00		0.02		0.01		0.00
Partners Epi Treated:	9 (15)		2 (12)		22 (23)		10 (15)	
Epi Index		0.06		0.05		0.15		0.11
Before Interview	3 (5)		1 (6)		12 (12)		6 (9)	
After Interview	6 (10)		1 (6)		10 (10)		4 (6)	
Epi Index (DIS)		0.04		0.02		0.07		0.04

DIS = disease intervention specialist

Indices noted as (DIS) include the number of partners after the interview in the numerator. Indices were calculated as follows:

Contact index = partners contacted per index case interviewed

Notification index = partners notified of exposure per index case interviewed

Testing index = partners tested per index case interviewed

Brought to treatment index = infected partners treated for new syphilis infection per index case interviewed

Epi index = partners receiving syphilis treatment regardless of syphilis infection status per index case interviewed

Table 6-3: Partner Services — Gonorrhea outcomes among cisgender men who have sex with men (MSM) and cisgender heterosexual (cisgender women and men who have sex with women), King County, WA, 2021

	Cisgender MSM		Cisgender Heterosexuals	
	Number (%)	Index	Number (%)	Index
Index Cases Diagnosed	2,057		2,113	
Index Cases Assigned to DIS	517 (25)		917 (43)	
Index Cases Interviewed	330 (64)		474 (52)	
Index Cases Naming ≥ 1 Contact	18 (5)		65 (14)	
Median Days from Assigned to Interview (Interquartile Range)	2 (0-7)		3 (0-8)	
Number of Partners Named	27		79	
Contact Index		0.08		0.17
Notified based on Index Case Report	5 (19)		31 (39)	
Notified by DIS	4 (15)		12 (15)	
Notification Index (DIS)		0.01		0.03
Tested for Chlamydia/Gonorrhea	6 (22)		27 (34)	
Testing Index		0.02		0.06
Newly Diagnosed with Chlamydia and/or Gonorrhea	2 (7)		9 (11)	
Before Interview	1 (4)		5 (6)	
After Interview	1 (4)		4 (5)	
Case Finding Index (DIS)		0.00		0.01
Treated for Chlamydia and/or Gonorrhea	2 (7)		8 (10)	
Treatment Verified	2 (7)		8 (10)	
Brought to Treatment Index		0.01		0.02
Before Interview	1 (4)		5 (6)	
After Interview	1 (4)		3 (4)	
Brought to Treatment Index (DIS)		0.00		0.01

DIS = Disease intervention specialist

Indices noted as (DIS) include the number of partners after the interview in the numerator. Indices were calculated as follows:

Contact index = partners contacted per index case interviewed

Notification index = partners notified of exposure per index case interviewed

Testing index = partners tested per index case interviewed

Case finding index = partners identified as new chlamydia and/or gonorrhea cases per index case interviewed

Brought to treatment index = partners treated for new chlamydia and/or gonorrhea infection per index case interviewed

Syphilis

In 2021, 993 early syphilis cases and 324 late/unknown duration cases were diagnosed among residents of King County (Table 6-1). DIS initiated investigations of 794 cases, of whom 443 (56%) were interviewed for partner services, while 107 (13%) refused partner services and 205 (26%) were not located or did not respond to contact attempts. Of the index cases interviewed by DIS, 138 cases (31%) named at least one notifiable partner with 260 total partners named (Figure 6-1). Thirty percent of the notifiable partners (n=79) were notified of their potential exposure and DIS confirmed that 38% (n=30) of notified partners tested for syphilis. Among the tested partners, 11 cases of syphilis were newly diagnosed, which reflects 4% of the notifiable partners and 37% of partners tested being identified as new syphilis cases. Additional partners likely had incubating syphilis, meaning they were infected but had not yet developed a positive syphilis blood test. All the partners with a new syphilis diagnosis received treatment and an additional 34 partners were treated for syphilis based on known contact to an infected person. In order to estimate the impact of public health partner services, we categorized the timing of testing, diagnosis, and treatment as occurring before and after DIS interviews with index patients (persons diagnosed with syphilis); partner notification or treatment occurring before DIS interview could not plausibly be a consequence of DIS-mediated partner

services. DIS directly notified 39 (49%) of the total notified partners of their potential exposure. Fourteen (5%) of the partners tested after the partner services interview, 2% (n=2) were newly diagnosed following the interview and both of these partners received syphilis treatment. Of the 45 partners receiving treatment for syphilis, including those who did not test positive for syphilis or were not tested (i.e., treated for possible incubating syphilis), 51% (n=23) received treatment following the partner services interview. Partner services outcomes were similar between cisgender MSM and heterosexuals with a higher proportion of heterosexual cases initiated for partner services (Table 6-2).

Gonorrhea

In 2021, DIS initiated investigations of 1,434 gonorrhea index cases for partner services, of which 804 (56%) were interviewed. Cisgender MSM accounted for 330 (36%) of the initiated cases and cisgender heterosexuals accounted for 917 (64%) (Table 6-3). Among cisgender MSM, 330 (64%) cases were interviewed, 65 (13%) refused interview, and 59 (11%) were not located or did not respond to contact attempts. Among the cisgender heterosexual cases, 474 (52%) were interviewed, 138 (15%) refused interview, and 239 (26%) were not located or did not respond to contact attempts. The overall contact index among interviewed clients (partners named per index

case) was 0.13 and was slightly higher among cisgender heterosexuals compared MSM cases. A total of 33 partners tested for gonorrhea and chlamydial infection, of whom 11 (33%) tested positive for gonorrhea or chlamydial infection. Five of these partners were diagnosed with gonorrhea or chlamydial infection after a DIS interview. Some index patients may have been prompted to notify additional partners because of partner services but have been unwilling to report the names of those partners, perhaps resulting in an underestimate of the impact of partner services.

Partner Services to Promote PrEP

PHSKC DIS routinely offer persons receiving partner services referral to receive PrEP. In accordance with local PrEP implementation guidelines, this effort focuses primarily on MSM and transgender persons who have sex with men. Of the 493 interviewed cases of syphilis and gonorrhea among cisgender MSM in 2021, 76 (15%) were persons living with HIV, 181 (37%) were currently taking PrEP, and 236 (48%) were eligible for PrEP, 162 of whom were offered a referral for PrEP. Of the 72 cases who accepted a referral for PrEP services through partner services, 46 (64%) accepted a referral to the PHSKC SHC PrEP program and 26 (36%) accepted a referral to another provider (Figure 6-2). Of those who accepted a referral to the PHSKC SHC, 7 (15%) started PrEP at the PHSKC SHC.

Figure 6-1: Flowchart of partner services outcomes among syphilis cases, King County, WA 2021

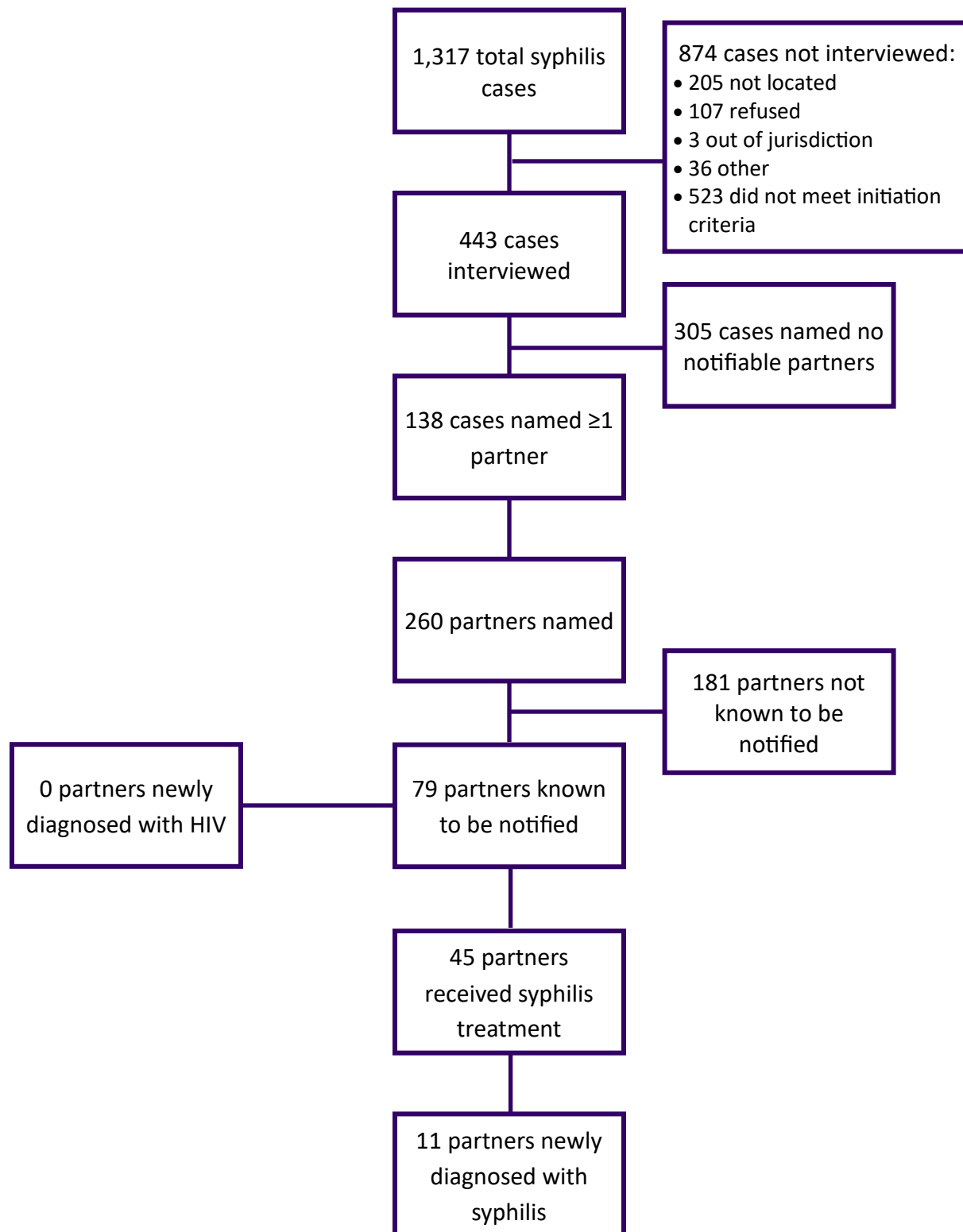
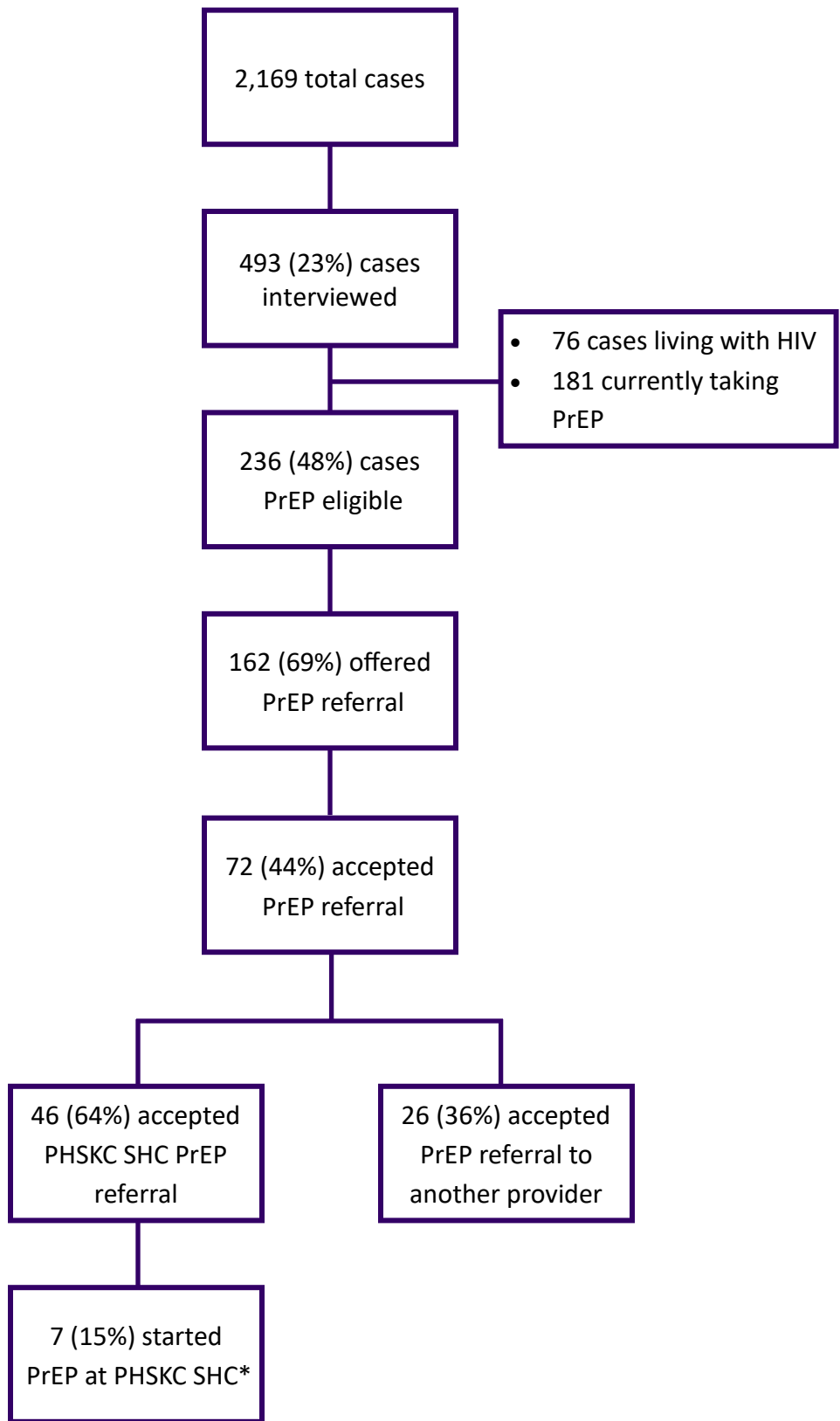


Figure 6-2: PrEP among cisgender men who have sex with men (MSM) syphilis and gonorrhea cases, King County, WA 2021



*PHSKC SHC = Public Health Seattle & King County Sexual Health Clinic (SHC). All MSM or transgender patients who have sex with men are eligible for PrEP at the PHSKC SHC.