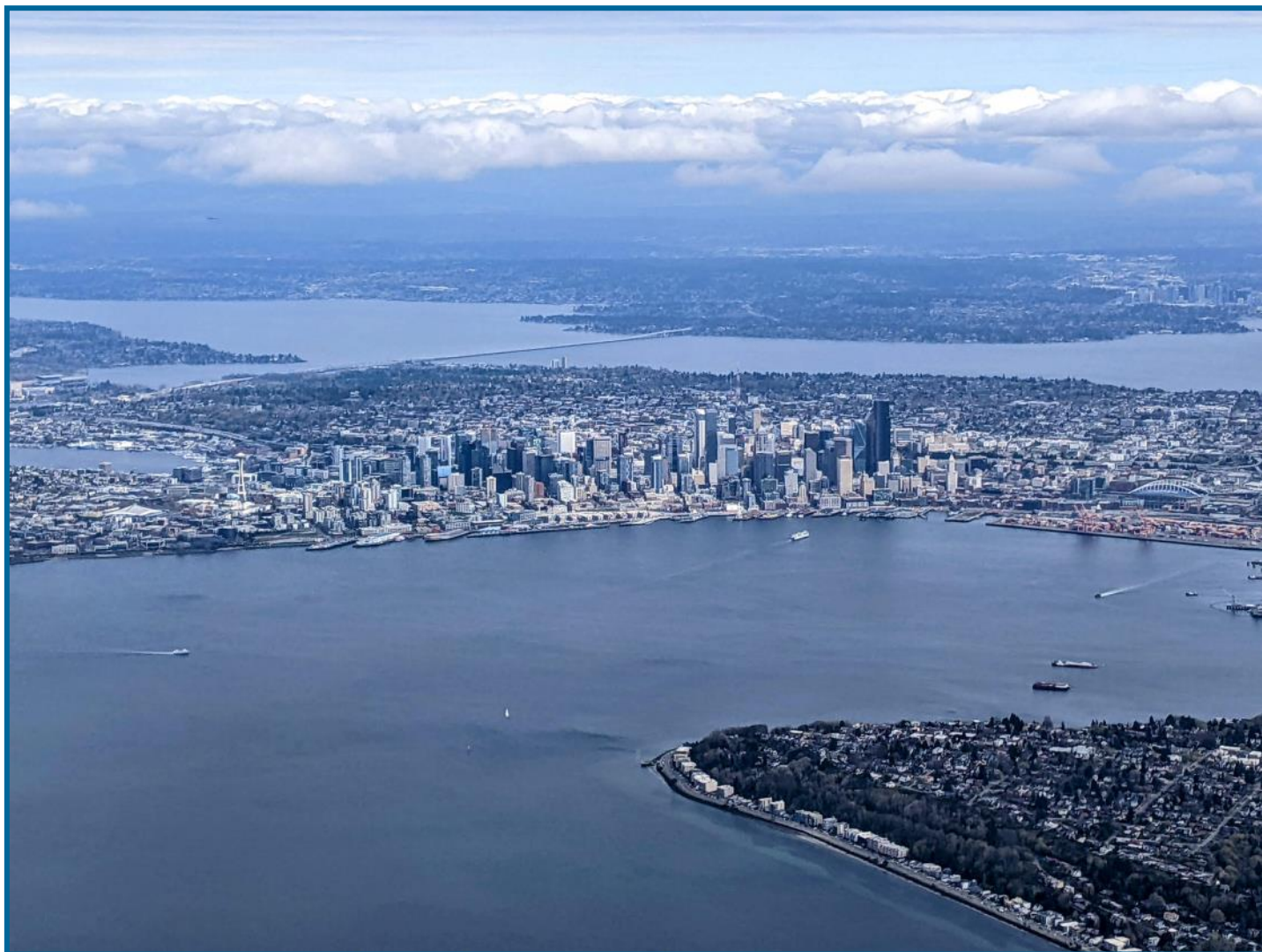


2020
King County
Sexually Transmitted Infection
Epidemiology Report



Public Health
Seattle & King County



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The 2020 Sexually Transmitted Infections (STI) Epidemiology report describes recent trends in syphilis, gonorrhea, and chlamydial infection among 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 STIs 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 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 2020 STI epidemiology findings in King County include:

- **Syphilis (all stages) rates among cisgender women increased 15% between 2019 and 2020 and 224% between 2011 and 2020.** 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 75% between 2019 and 2020 and by 878% between 2011 and 2020. Medical providers diagnosed 102 King County cisgender women with syphilis, including 57 cases of early syphilis, in 2020. One case of congenital syphilis occurred in King County in 2020 and preliminary data indicates 11 cases in King County in 2021. Increases in congenital syphilis are occurring in Washington state and nationally.

Recommendations for medical providers:

- 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).
- 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.

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.

- **Syphilis (all stages) rates among cisgender men who have sex with women only (MSW) increased 34% between 2019 and 2020 and has increased 230% since 2011.** In 2020, the incidence of early syphilis among cisgender increased 30% compared to 2019 and 305% compared to 2011. Overall, 85 syphilis cases were diagnosed among cisgender MSW in 2020, of which 57 were early syphilis.
- **Rates of bacterial STIs among cisgender men who have sex with men (MSM) decreased in 2020.** After a trend of increasing incidence, rates of syphilis and gonorrhea among MSM in King County declined. However, it is unknown how much of this decrease in STI incidence was due to the impacts of the COVID-19 pandemic. Despite the declines observed in 2020, 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: <http://www.kingcounty.gov/healthservices/health/communicable/hiv/providers.aspx>
- **Gonorrhea rates among cisgender heterosexuals continued to increase, with rates among cisgender MSW and women increasing 256% and 156% respectively in the last decade.** The rate of gonorrhea among cisgender heterosexuals in King County has increased steadily since 2012. Of note, these increases occurred despite evidence that STI screening decreased as a result of the COVID-19 pandemic, suggesting that the true increase in gonorrhea

in 2020 may have been substantially higher. 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 10% of gonorrhea in King County is resistant to azithromycin.** In 2020, 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 2020. Of the 403 unique gonorrhea cases with susceptibility results, 10% had decreased susceptibility to azithromycin, less than <1% to cefixime, and none to 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 heterosexuals and cisgender MSM decreased in 2020.** 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, and Hispanic/Latinx 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, and Hispanic/Latinx men experienced the highest incidences of gonorrhea infection.

²St. Cyr S, Barbee L, Workowski KA, et al. Update to CDC's Treatment Guidelines for Gonococcal Infection, 2020. MMWR Morb Mortal Wkly Rep 2020;69:1911–1916. DOI: <http://dx.doi.org/10.15585/mmwr.mm6950a6external icon>.

- **The PHSKC Sexual Health Clinic remains a vital resource, diagnosing a substantial proportion of all reportable STIs reported in King County.** In 2020, the clinic diagnosed 15% of early syphilis cases in the county, 12% of all cases of gonorrhea, 13% of all cases of HIV, and an estimated 6% 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 8% of all reported gonorrhea 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 1992-2020 and reported through June 1, 2021. 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. 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%

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. The increase observed in national reported chlamydial incidence from 1997 through 2004 is likely due, at least in part, to increased screening among women in states that did not previously have screening programs. Changes in testing technology may also have influenced trends in reported incidence as NAAT testing is more sensitive, which may have resulted in increases in chlamydia diagnoses. PHSKC began pilot testing NAATs for chlamydial infection in 1994 and all PHSKC clinics were using NAATs by the end of 1999 for chlamydia testing.

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 the number of chlamydial infections in King County in 2020 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.

Cases among transgender women and transgender men are reported but not included in case rates because 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 among 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 any of the following criteria were met: 1) medical provider indicated the case had male sex partners on the case report, 2) sex with men in the last year was reported during partner services interviews, or 3) were diagnosed with 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 2020, 20% of gonorrhea cases among cisgender men and 10% 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 1992-2020 and other analyses are limited to data from the current STI surveillance system (2007-2020).

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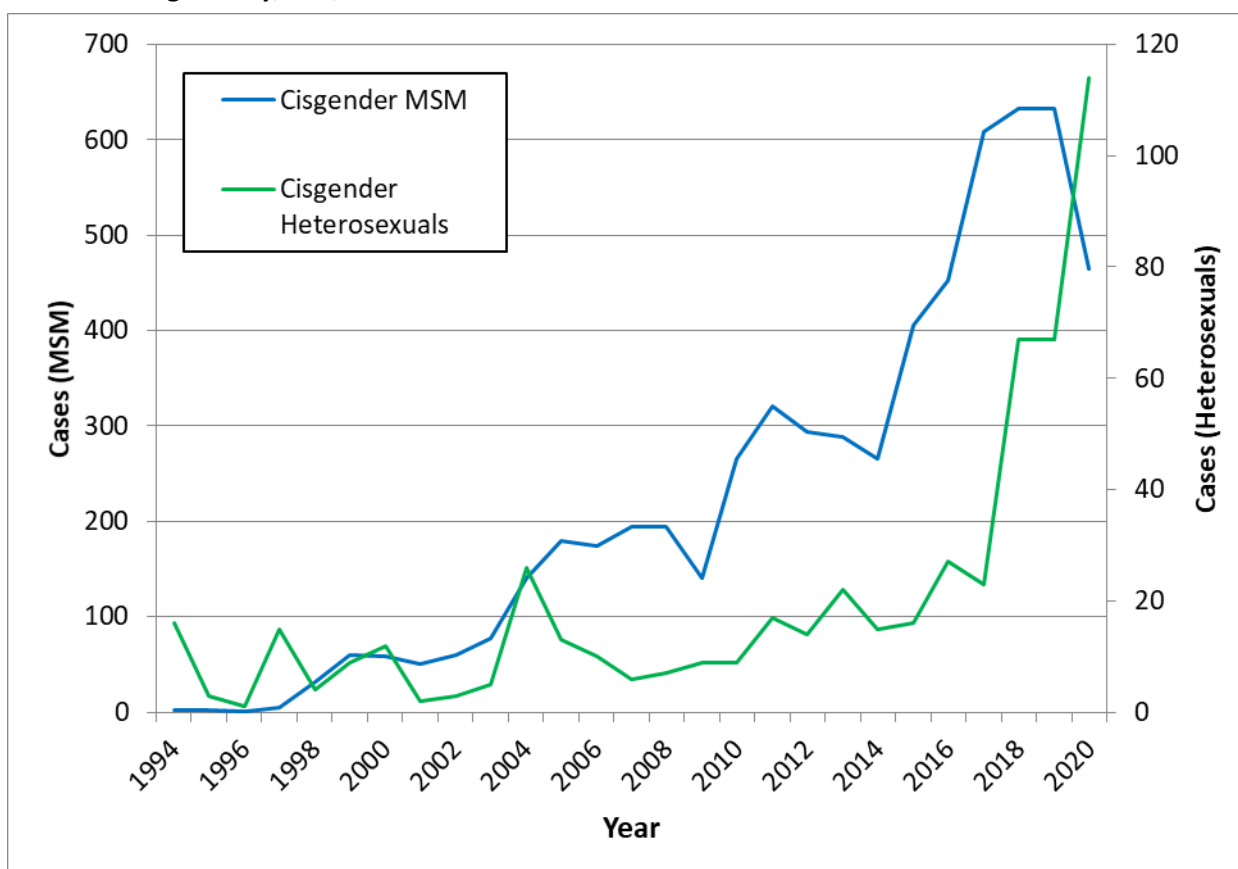
Overview

Trends in syphilis among MSM and heterosexuals in King County diverged in 2020. A total of 658 early syphilis (primary, secondary, and early non-primary non-secondary [previously early latent]) cases were reported in King County residents in 2020 for an overall incidence of 29.1 cases per 100,000 persons (Table 1-1). This incidence represents a 13% decrease compared to 2019. However, the decline in early syphilis incidence was due exclusively to a decrease in incidence among cisgender MSM; the rate of early syphilis among King County cisgender heterosexuals increased 67% between 2019 and 2020, continuing a trend that has been ongoing since 2016 (Figures 1-1, 1-2). This change was due to a

dramatic 78% increase in early syphilis among women (32 cases to 57 cases), with the rate of late latent syphilis or syphilis of unknown duration remaining roughly stable.

While the reason early syphilis has increased dramatically while diagnoses of latent syphilis have remained stable – a trend that antedates the COVID-19 epidemic – is uncertain, it suggests that possibility that there is a growing reservoir of undiagnosed latent syphilis among women that has not been identified due to inadequate screening of asymptomatic women. Syphilis case counts and incidence vary by Health Reporting Area³, with higher case counts and incidence observed in Seattle and south King County in 2020 (Figures 1-3 and 1-4).

Figure 1-1: Early Syphilis – Reported cases among cisgender men who have sex with men (MSM)* and cisgender heterosexuals King County, WA, 1994-2020



*Men were missing sexual orientation data in the following years (numbers missing are included in parentheses): 1998(2), 1999(1), 2000(1), 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).

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

Table 1-1: Early Syphilis (primary, secondary, and early non-primary non-secondary) – Number of reported cases and incidence by gender* King County, WA, 1992-2020

Year	Cisgender Women		Cisgender Men		Trans- gender Women	Trans- gender 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
1992	26	3.3	42	5.4				68	4.3
1993	21	2.6	15	1.9				36	2.2
1994	6	0.7	12	1.5				18	1.1
1995	1	0.1	4	0.5				5	0.3
1996	0	0.0	2	0.2				2	0.1
1997	10	1.2	10	1.2				20	1.2
1998	1	0.1	37	4.4				38	2.2
1999	3	0.3	67	7.8				70	4.1
2000	4	0.5	67	7.8				71	4.1
2001	1	0.1	51	5.8				52	3.0
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	286	29.7	0	0		290	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	32	2.9	692	63.2	5	0	0	730	33.3
2019	32	2.9	707	63.5	7	1	0	747	33.6
2020	57	5.0	581	51.3	13	0	7	658	29.1

*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.

Syphilis

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, 2007-2020

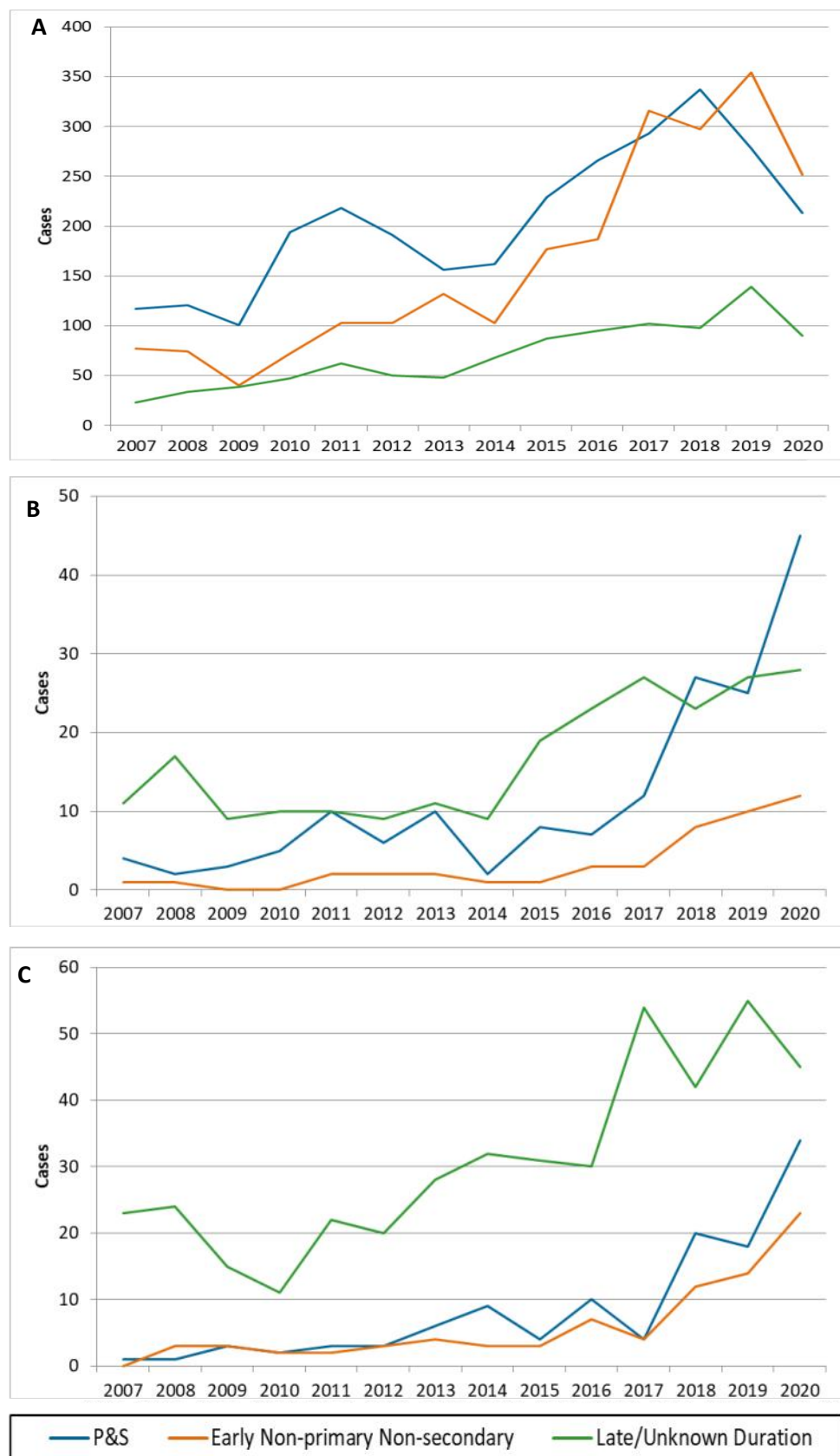


Figure 1-3: Syphilis (all stages)– Cases among cisgender men who have sex with men (A) and cisgender heterosexuals (B) by Health Reporting Area King County, WA, 2020

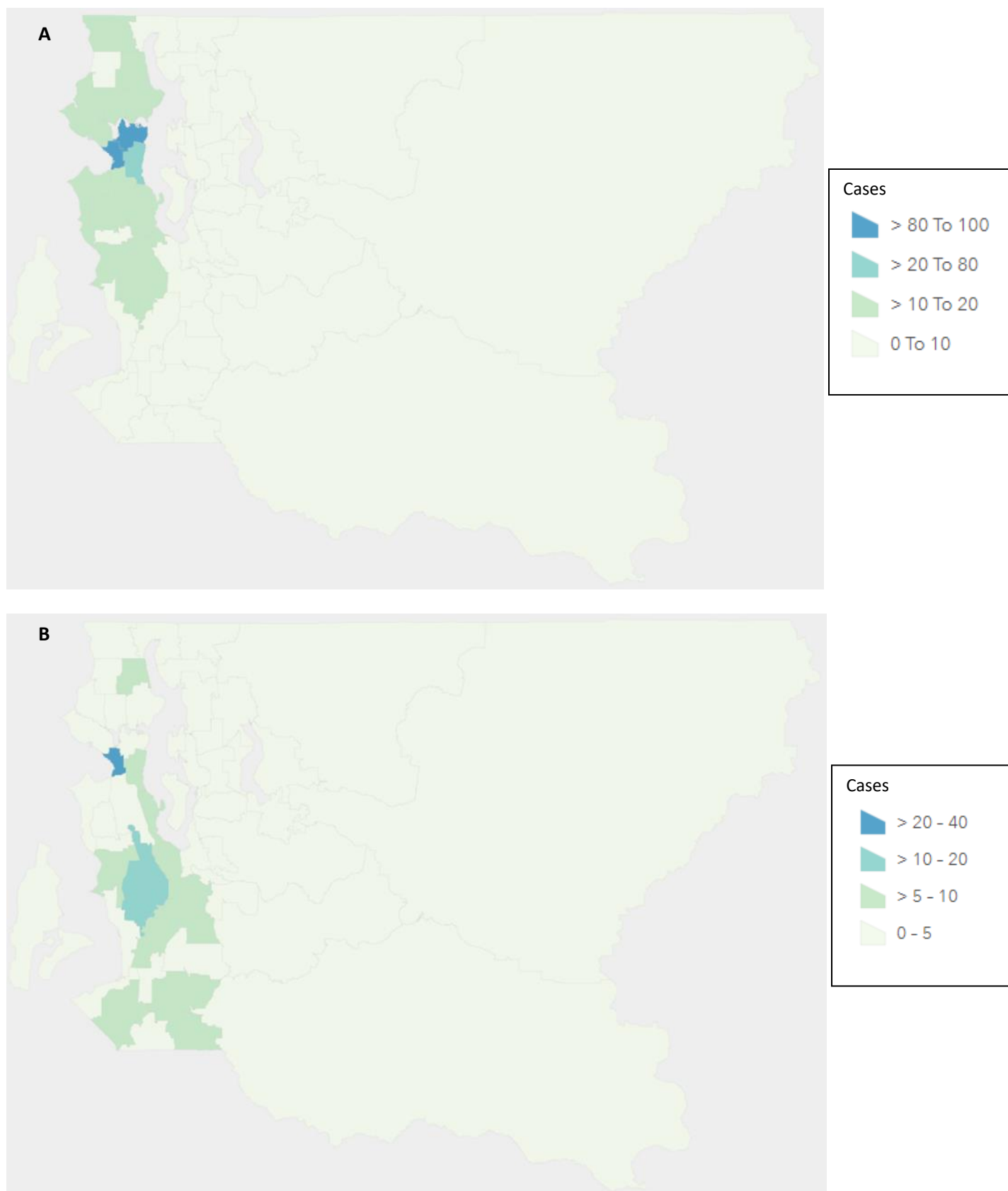
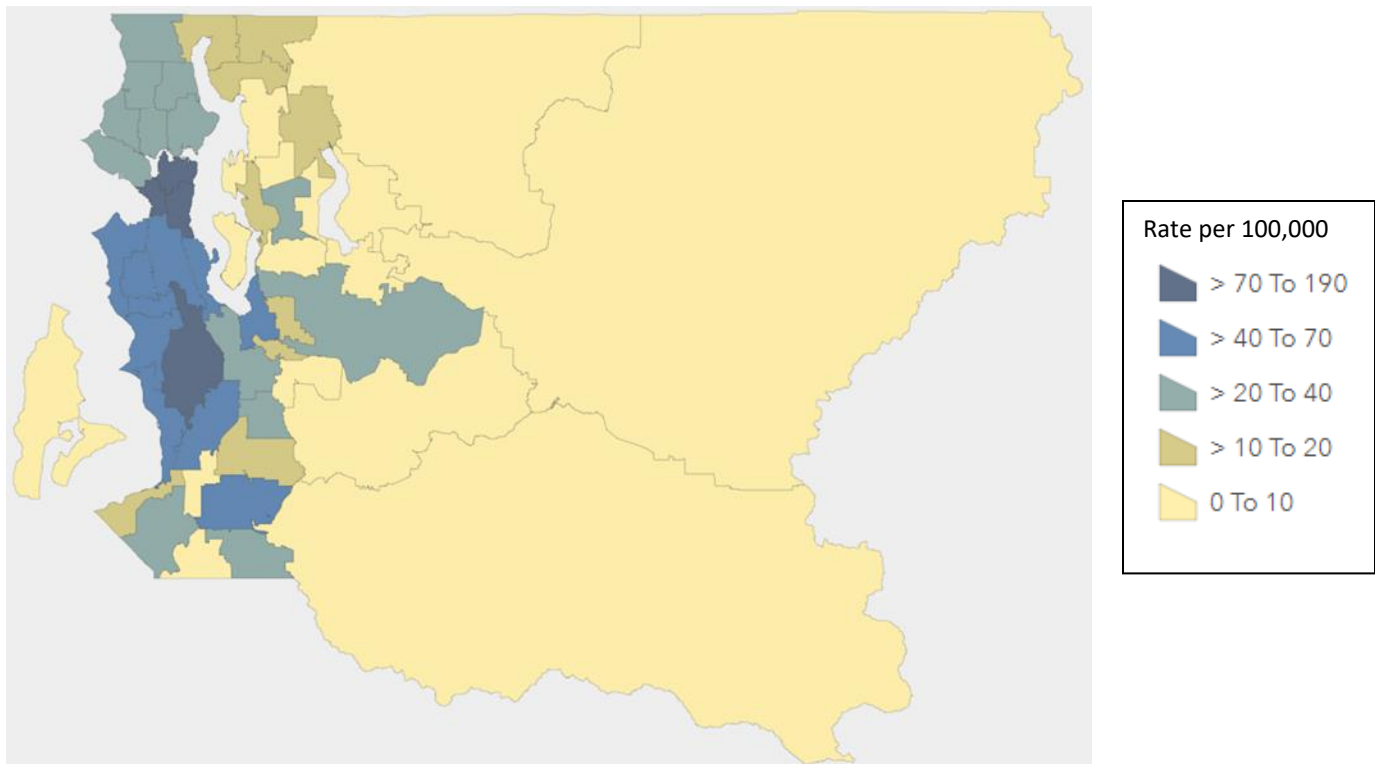


Figure 1-4: Syphilis (all stages)– Incidence by Health Reporting Area King County, WA, 2020

Cisgender MSM

Of all 2020 early syphilis cases, 71% (n=465) occurred in cisgender MSM. The incidence of early syphilis among cisgender MSM (777 per 100,000) in 2020 was 119 times the rate among cisgender MSW (6.5 per 100,000) (Table 1-2). Cases of syphilis among cisgender MSM have been increasing since 1997, but the pattern of increase has been somewhat inconsistent, with interspersed periods of rapid increase, plateauing of rates and declines (Figure 1-1). From 2014 to 2019 syphilis rates in MSM rose dramatically, though diagnoses dipped in 2020. The extent to which this reflects a true decline in syphilis incidence versus a decrease related to decreased testing is uncertain.

Incidence of syphilis among cisgender MSM differs by racial and ethnic group (Figure 1-5). In 2020, Latinx MSM had the highest rate of early syphilis among MSM (1,771 per 100,000). American Indian/Alaska Native MSM (1,529 per 100,000) had the second highest rate among MSM in 2020, followed by Black MSM (1,283 per 100,000). Latinx MSM and Black MSM both experienced higher incidence in 2020 compared to 2019. The

incidences among Latinx MSM and American Indian/Alaska Native MSM were both over double the incidence among White MSM (739 per 100,000) in 2020.

The incidence of early syphilis among MSM also varies by age group. In 2020, the incidence was highest among MSM 30 to 34 years and 25 to 29 years, 1,311 per 100,000 and 1,111 per 100,000, respectively. MSM ages 15 to 19 years had the lowest incidence (120 per 100,000) in 2020, however this was the only age group that experienced an increase in incidence compared to 2019, a 68% increase in incidence (Figure 1-6).

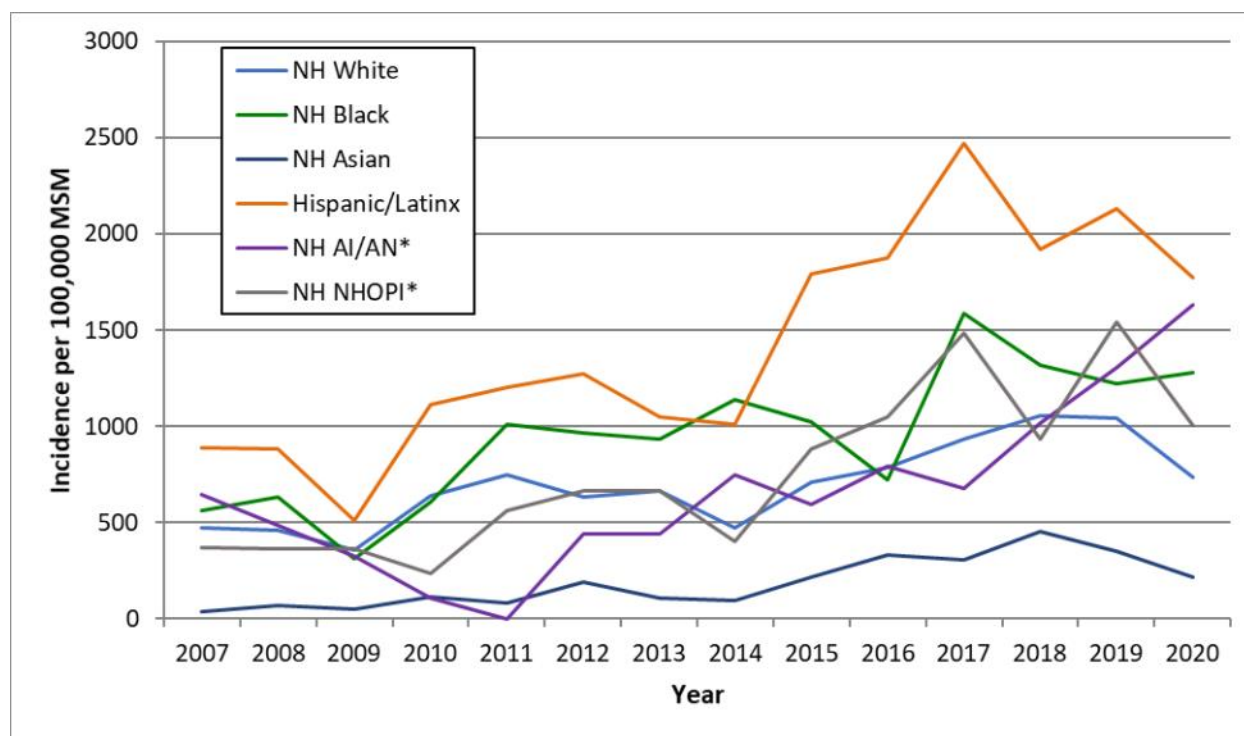
Throughout the ongoing syphilis epidemic, syphilis has disproportionately affected MSM living with HIV (Figure 1-7). In 2020, the estimated incidence of early syphilis among MSM living with HIV was nearly 9 times higher than in HIV-negative MSM (3,934 vs. 445 per 100,000). However, since 2015, early syphilis has increasingly affected the larger population of HIV-negative MSM, and in 2020, 52% of early syphilis cases occurred in HIV-uninfected MSM (Figure 1-8).

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, 1992-2020*

Year	Cisgender MSM		Cisgender MSW	
	Cases	Incidence per 100,000 population	Cases	Incidence per 100,000 population
1992	0	0	0	0.0
1993	1	3	5	0.8
1994	2	5	10	1.7
1995	2	5	2	0.3
1996	1	3	1	0.2
1997	5	13	5	0.8
1998	32	83	3	0.5
1999	60	153	6	0.9
2000	58	146	8	1.2
2001	50	124	1	0.2
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	266	594	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	633	1,049	35	4.2
2019	632	1,060	35	4.1
2020	465	777	57	6.5

Men were missing sexual orientation data in the following years (numbers missing are included in parentheses: 1992(42), 1993(9), 1998(2), 1999(1), 2000(1), 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).

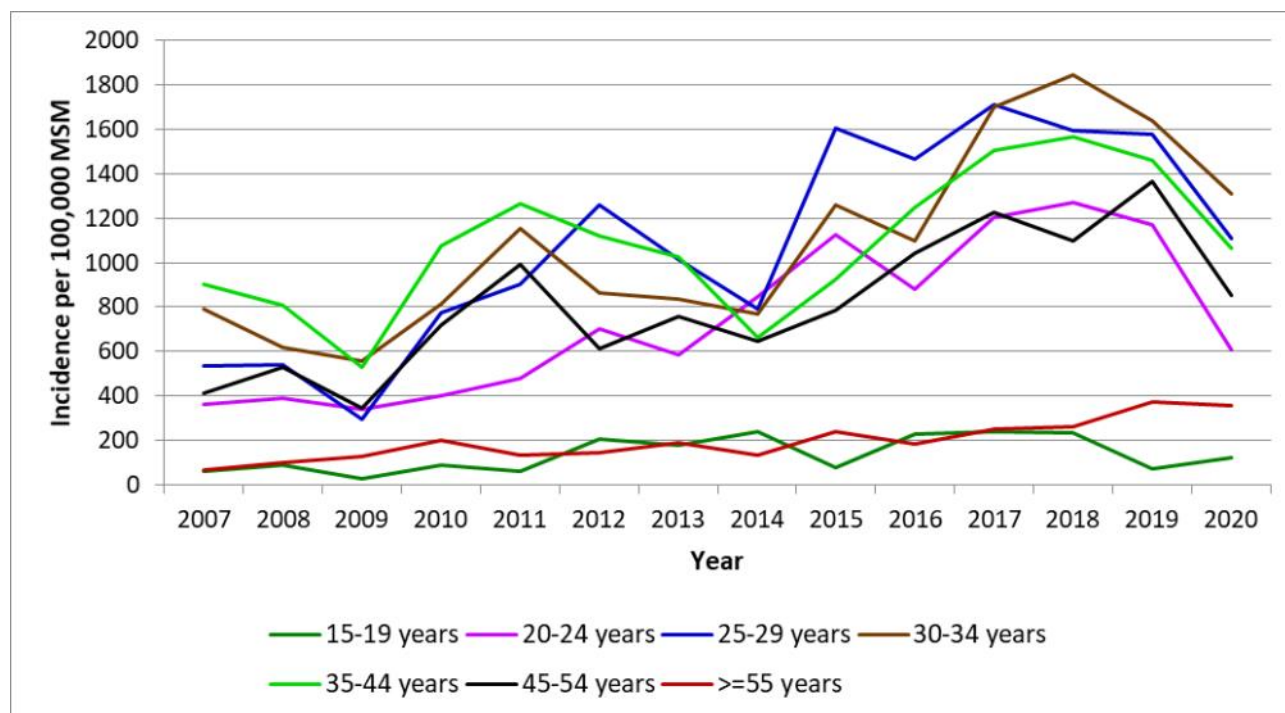
Figure 1-5: Early Syphilis - Incidence among cisgender men who have sex with men (MSM) by Race and Ethnicity*, King



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

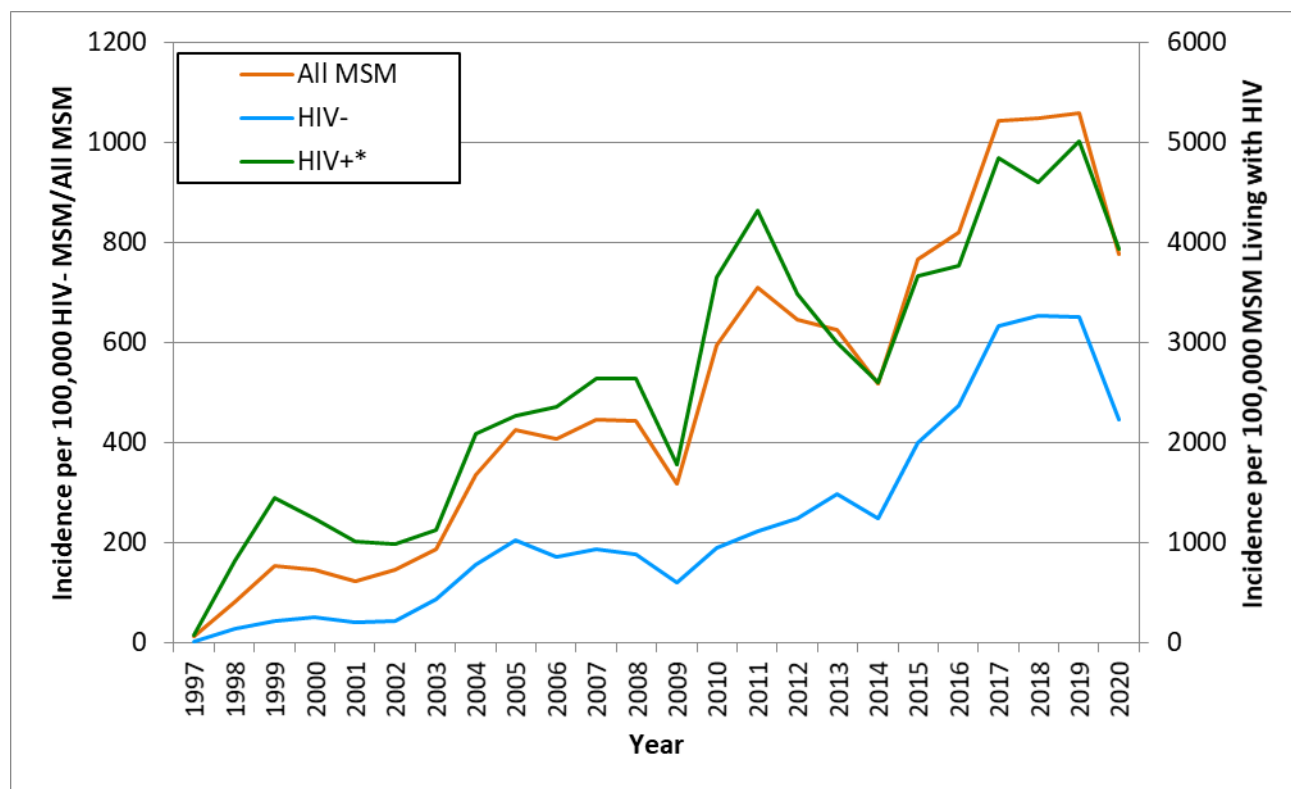
*Cases with unknown race and ethnicity were distributed according to annual race and ethnicity distributions among cases with known race and ethnicity and included in race/ethnicity-specific incidences. Rates for Native Hawaiian/Pacific Islander and American Indian/Alaska Native MSM Rates are presented 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, 2007-2020



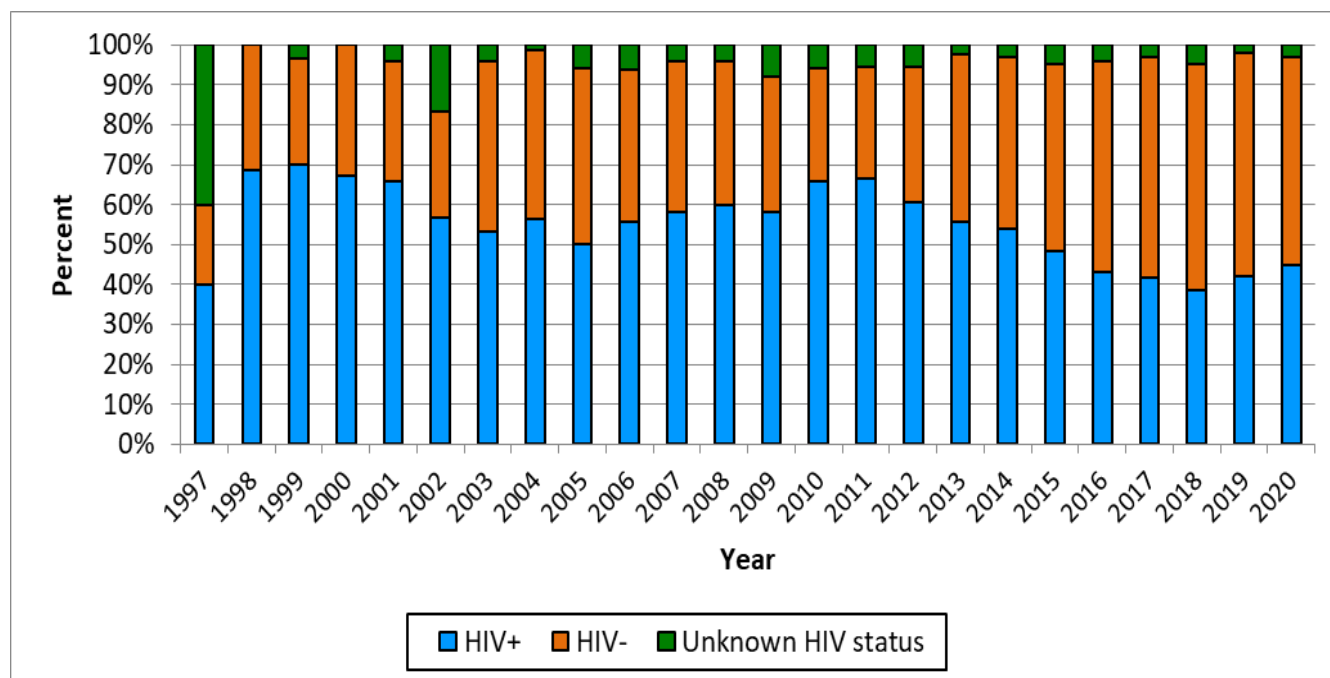
*Cases with unknown age were distributed according to annual age distributions among cases with known age and included in age-specific incidences.

Figure 1-7: Early Syphilis – Incidence among cisgender men who have sex with men (MSM) by HIV Status King County, WA, 1997-2020



*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, 1997-2020



Cisgender Heterosexuals and congenital syphilis

Although early syphilis incidence among cisgender heterosexuals remained a fraction of the incidence in cisgender MSM in 2020, (Tables 1-1 and 1-2) cases among cisgender heterosexuals (n=114, in 2020) have increased dramatically over the past five years. The increase in early syphilis cases among cisgender heterosexuals represents a 322% increase since 2016 (n=27 cases) and an 70% increase since 2019 (n=67 cases). Six of the early syphilis cases reported among cisgender women and MSW in 2020 were known to be

living with HIV.

The incidence of total syphilis (early and late/unknown duration stages) among cisgender women increased 278% from 2011 and 17% since 2019 (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.

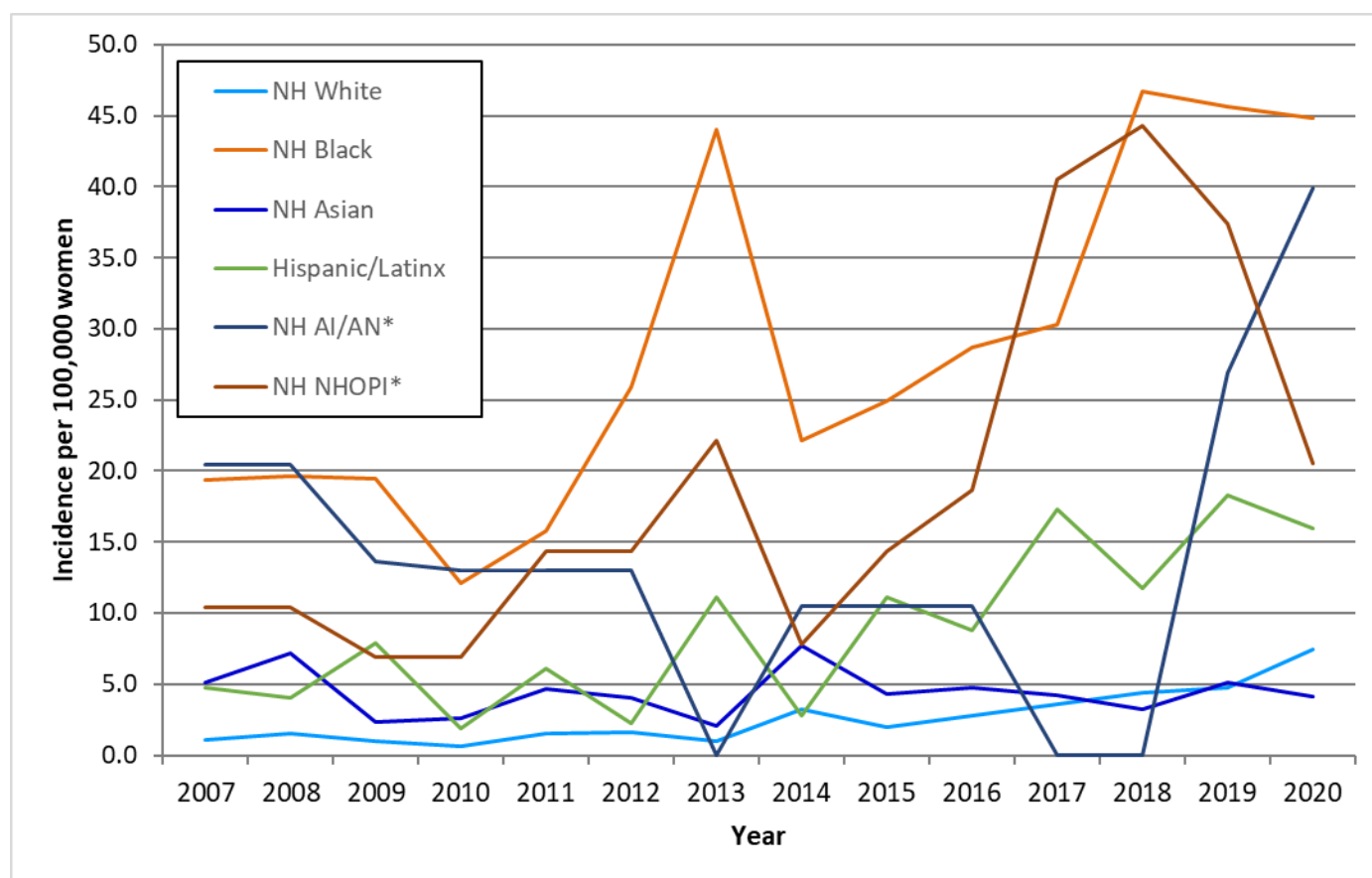
Table 1-3: Syphilis (all stages) – Number of reported cases and incidence among cisgender women and cisgender men who have sex with women (MSW) 15 years and older, King County, WA, 2007-2020

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	74	8.1	58	6.9
2019	87	9.4	62	7.2
2020	102	10.8	85	9.7

Rates of syphilis varied by racial and ethnic group (Figure 1-9). Black women had the highest rate (44.8 cases per 100,000) of syphilis in 2020, followed by American Indian/Alaska Native women (38.9 cases per 100,000), and Hispanic/Latinx women (15.9 cases per 100,000). The rates among American Indian/Alaska

Native women and Black women were 6.0 and 5.2 times higher than the rate among White women (7.4 cases per 100,000), respectively. MSW also experienced an increase in total syphilis incidence, from 7.2 cases per 100,000 in 2019 to 9.7 cases per 100,000 in 2020, a 34% percent increase (Table 1-3).

Figure 1-9: Syphilis (all stages) - Incidence among Cisgender Women by Race and Ethnicity*, King County, WA 2007-2020



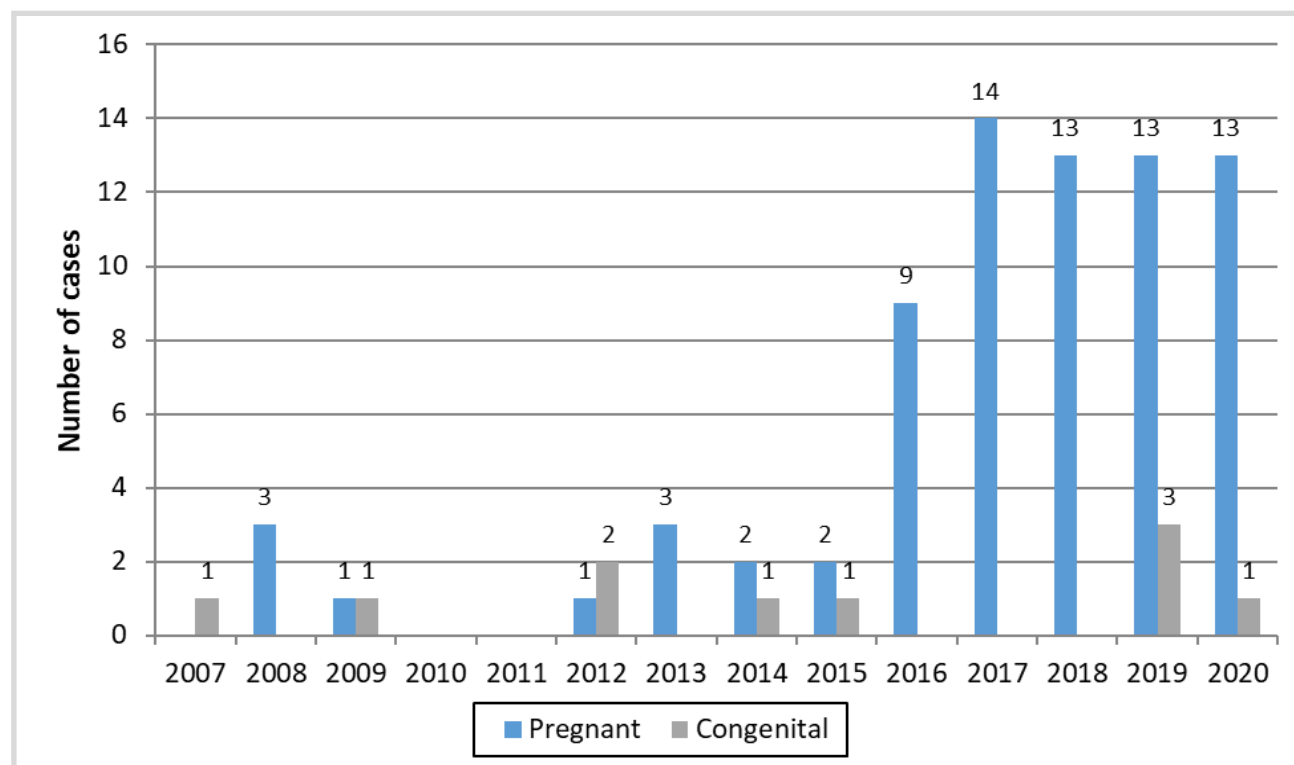
NH = Non-Hispanic, AI/AN = American Indian/Alaska Native, NHOPI = Native Hawaiian/Pacific Islander

*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.

Similar to national trends, congenital syphilis is increasing in Washington State and in King County⁴. Ten congenital cases were diagnosed in Washington State in 2020 and one of these cases was diagnosed in a King County resident (Figure 1-10). Trends in congenital syphilis usually mirror the trends in primary and secondary syphilis among reproductive age persons assigned female at birth, and the increase in syphilis among this population suggests that some pregnant persons in King County are at risk for syphilis during pregnancy and for transmitting the infection to their unborn children. Medical providers caring for pregnant patients should routinely test patients when they establish prenatal care and in the third trimester of pregnancy (24-28 weeks gestation). PHSKC prioritizes

pregnant cases for outreach and partner services to ensure that these cases receive adequate and appropriate treatment. In 2020, 13 syphilis cases among King County residents occurred in persons who were pregnant at the time of diagnosis (Figure 1-10). One case of congenital syphilis was diagnosed in 2020. Of pregnant cases, 13 (100%) received treatment for syphilis, which may represent additional cases of congenital syphilis averted due to clinical and public health interventions. Of note, preliminary 2021 data indicate that there were 11 cases of congenital syphilis in King County in 2021 and 50 cases in WA State, highlighting that the trends observed in 2020 foretold a dramatic increase in congenital syphilis that is now affecting King County and the state.

Figure 1-10: Syphilis – Pregnant and Congenital Cases King County, WA 2007-2020*



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

⁴Centers 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

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 2020, 102 (89%) of the syphilis cases among cisgender heterosexuals were interviewed by King County public health staff. Twenty percent of both cisgender MSM and cisgender women reported experiencing homelessness in the prior three months. A higher proportion of

interviewed cisgender women reported injection drug use, methamphetamine, heroin, or crack/cocaine use in the past year than interviewed cisgender MSW (Table 1-4). Seven percent of cisgender women 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, 2020

Risk Factors	Cisgender MSW		Cisgender Women	
	Cases	Percent	Cases	Percent
<i>Total Interviewed</i>	41	100%	61	100%
Experienced homelessness (past 3 months)	8	20%	12	20%
Injection drug use (past year)	0	0%	7	11%
Methamphetamine (past year)	6	15%	18	30%
Heroin (past year)	3	7%	11	18%
Crack or Cocaine (past year)	0	0%	1	2%
Receive or give money or drugs in exchange for sex (past year)	1	2%	4	7%
Reported any of the above risks	12	29%	22	36%

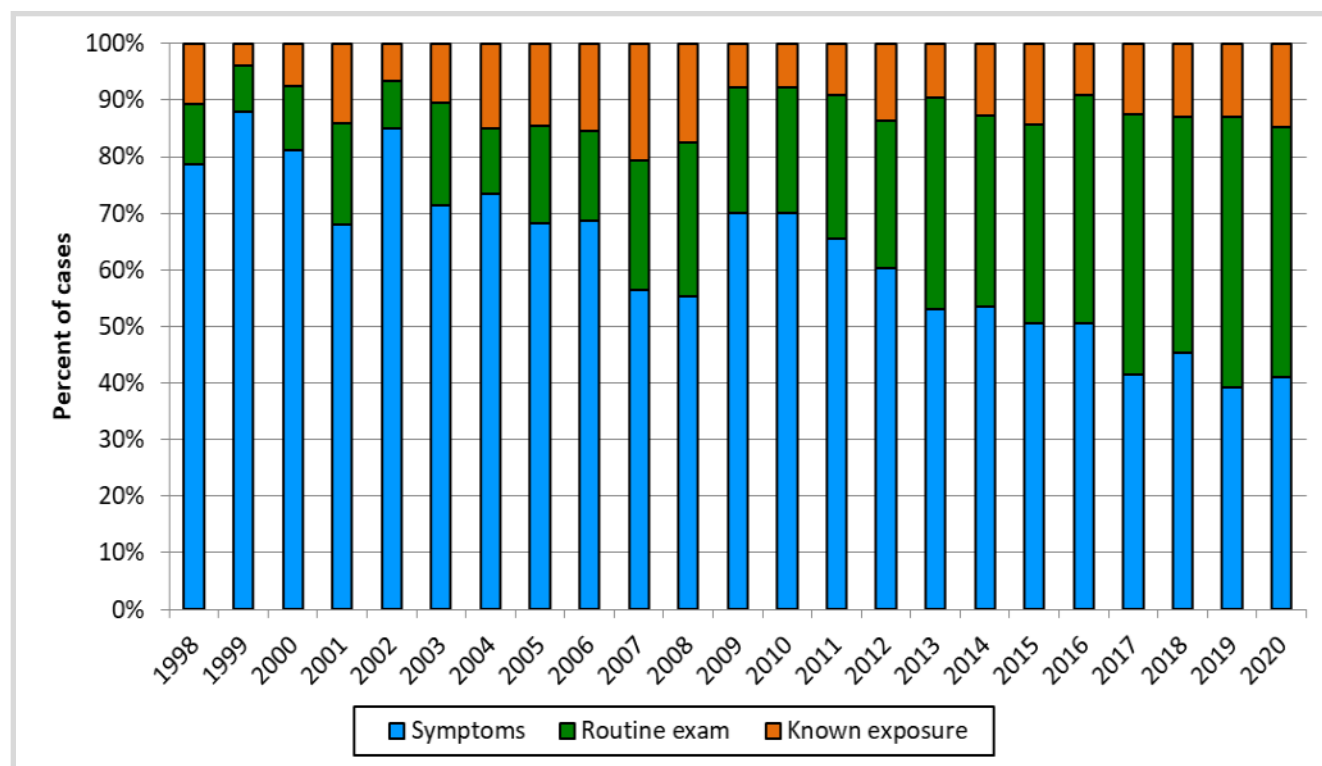
Stage of infection and reason for testing

In 2020, 46% of all early syphilis cases in cisgender MSM were staged as primary or secondary and 40% sought medical care because of symptoms (Table 1-5, Figure 1-11). While most early syphilis cases in King County have traditionally sought medical care because of symptoms of primary or secondary infection, the percentage of persons diagnosed through routine testing has increased over the last several years. In 2020, the percentage of

cases diagnosed through asymptomatic screening surpassed the percentage diagnosed due to symptomatic infection. Of the cases among cisgender MSM, 43% were diagnosed through asymptomatic screening and 14% because of a sex partner's syphilis diagnosis. Among cisgender heterosexual early syphilis cases, 61% tested due to symptoms. 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 symptomatic⁵. 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.)

Figure 1-11: Early Syphilis – Reason for Visit among cisgender men who have sex with men (MSM)*, King County, WA, 1998-2020



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

⁵Kerani 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

Syphilis

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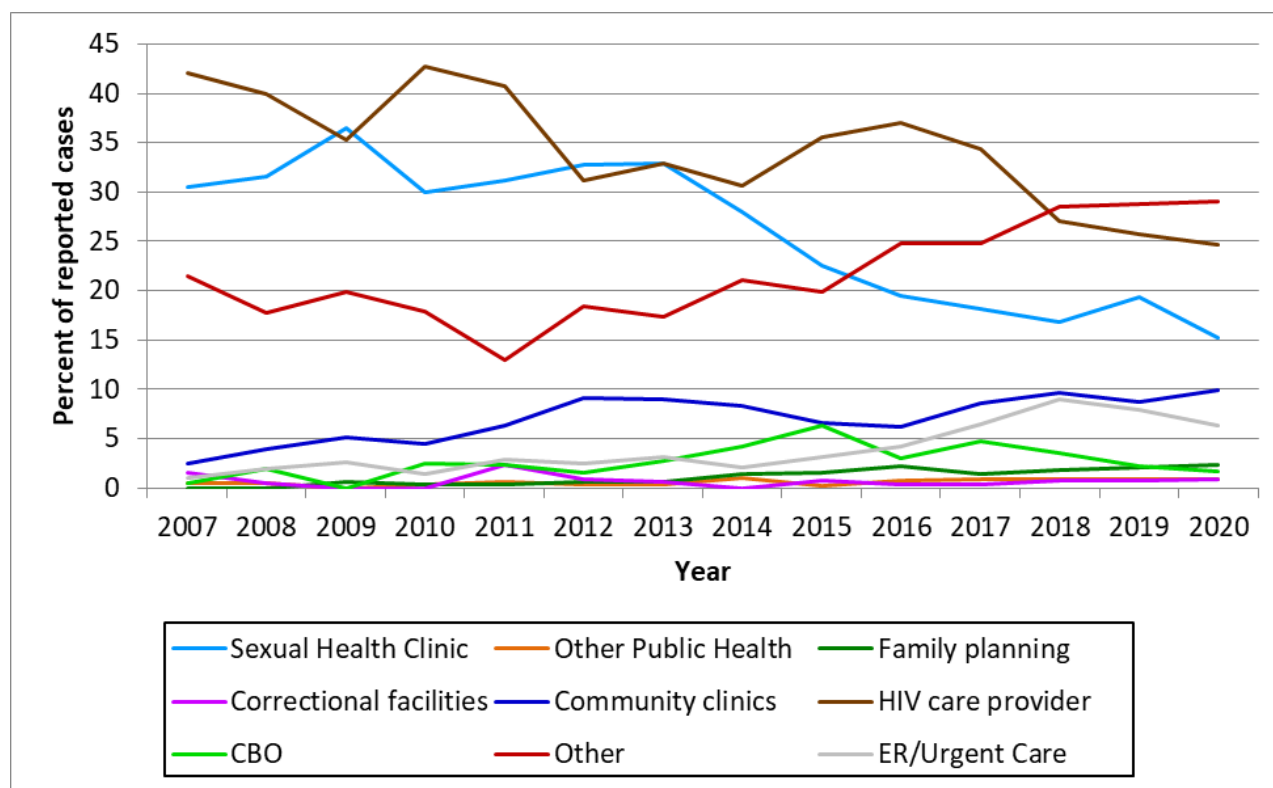
Table 1-5: Syphilis – Stage of infection, race/ethnicity, HIV status, and reason for testing among cisgender men who have sex with men (MSM), cisgender men who have sex with women (MSW), and cisgender women, King County, WA, 2020*

Early Syphilis					Late/Unknown Duration Syphilis			
	Cisgender MSM (N=465)		Cisgender MSW and Women (N=114)		Cisgender MSM (N=90)		Cisgender MSW and Women (N=73)	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Stage of Infection								
Primary	86	18%	29	25%				
Secondary	127	27%	50	44%				
Early latent (non-primary non-secondary)	252	54%	35	31%				
Late or unknown duration					90	100%	73	100%
Race/ethnicity								
American Indian/Alaska Native	5	1%	2	2%	1	1%	1	1%
Asian	21	5%	2	2%	5	6%	8	11%
Black	46	10%	35	31%	11	12%	22	30%
Hispanic/Latinx	92	20%	12	11%	20	22%	7	10%
Native Hawaiian/Pacific Islander	1	0%	1	1%	1	1%	1	1%
White	238	51%	41	36%	30	33%	19	26%
Multiple	6	1%	4	4%	3	3%	6	8%
Other	4	1%	1	1%	2	2%	1	1%
Unknown	52	11%	16	14%	17	19%	8	11%
HIV Status								
Positive	208	45%	6	5%	30	33%	1	1%
Negative	243	52%	91	80%	54	60%	63	86%
Unknown	14	3%	17	15%	6	7%	9	12%
Reason for Visit								
Routine exam	200	43%	14	12%	60	67%	54	74%
Symptoms^	185	40%	70	61%	20	22%	10	14%
Known exposure	67	14%	20	18%	6	7%	8	11%
None/other	13	3%	10	9%	4	4%	1	1%
Clinical Manifestations								
Neurologic	7	2%	1	1%	3	3%	0	0%
Ocular	7	2%	2	2%	3	3%	0	0%
Otic	6	1%	0	0%	0	0%	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.

Figure 1-12: Early Syphilis – Reporting Providers King County, WA, 2007-2020*



CBO = Community based organization

*Figure excludes cases missing diagnosing provider. In 2020, 9% of cases were missing diagnosing provider.

Many types of providers in King County are diagnosing early syphilis (Figure 1-12). In 2020, the PHSKC Sexual Health Clinic continued to be the largest single source of diagnosis for persons with early syphilis, accounting for 15% of all diagnoses. As a group, HIV care providers reported 25% of the 2020 cases. Family planning clinics, community clinics, county jails, community-based organizations, and other public health clinics combined to

account for 16% of cases. Emergency rooms and urgent care facilities accounted for 6% of the 2020 cases. Diagnoses from other providers (typically private practices and large healthcare organizations), continued to increase, accounting for 29% of the reported cases in 2020. For 9% of the cases diagnosing provider was missing.

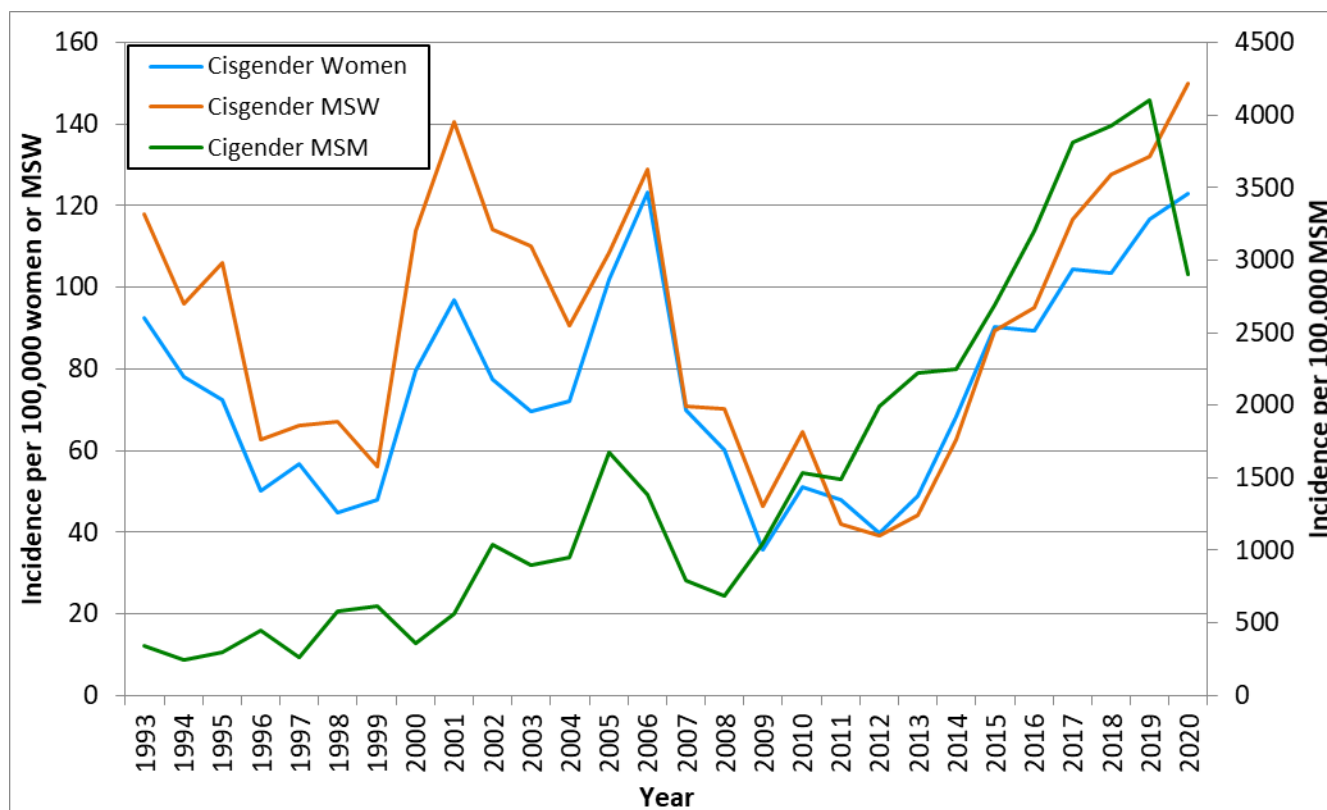
Overview

Trends in the rate of gonorrhea among MSM and heterosexuals in King County diverged in 2020. Among MSM, the rate of gonorrhea declined 29%; this drop likely reflects decreased screening in the context of the COVID-19 epidemic. In contrast, the rate of gonorrhea among persons with opposite gender sex partners continued to increase, a trend that has been ongoing since 2012 (Figure 2-1). Despite these divergent trends, the rate of gonorrhea among cisgender MSM remains

higher than the incidence among heterosexuals.

In 2020, the rate in cisgender women tied the historic peak observed in 2006 and the rate in cisgender MSW reached a new historic high (150 cases per 100,000). Among cisgender women, 1,157 cases of gonorrhea were reported in 2020 for an incidence of 123 per 100,000 women, a 6% increase since 2019, and a 156% increase since 2011.

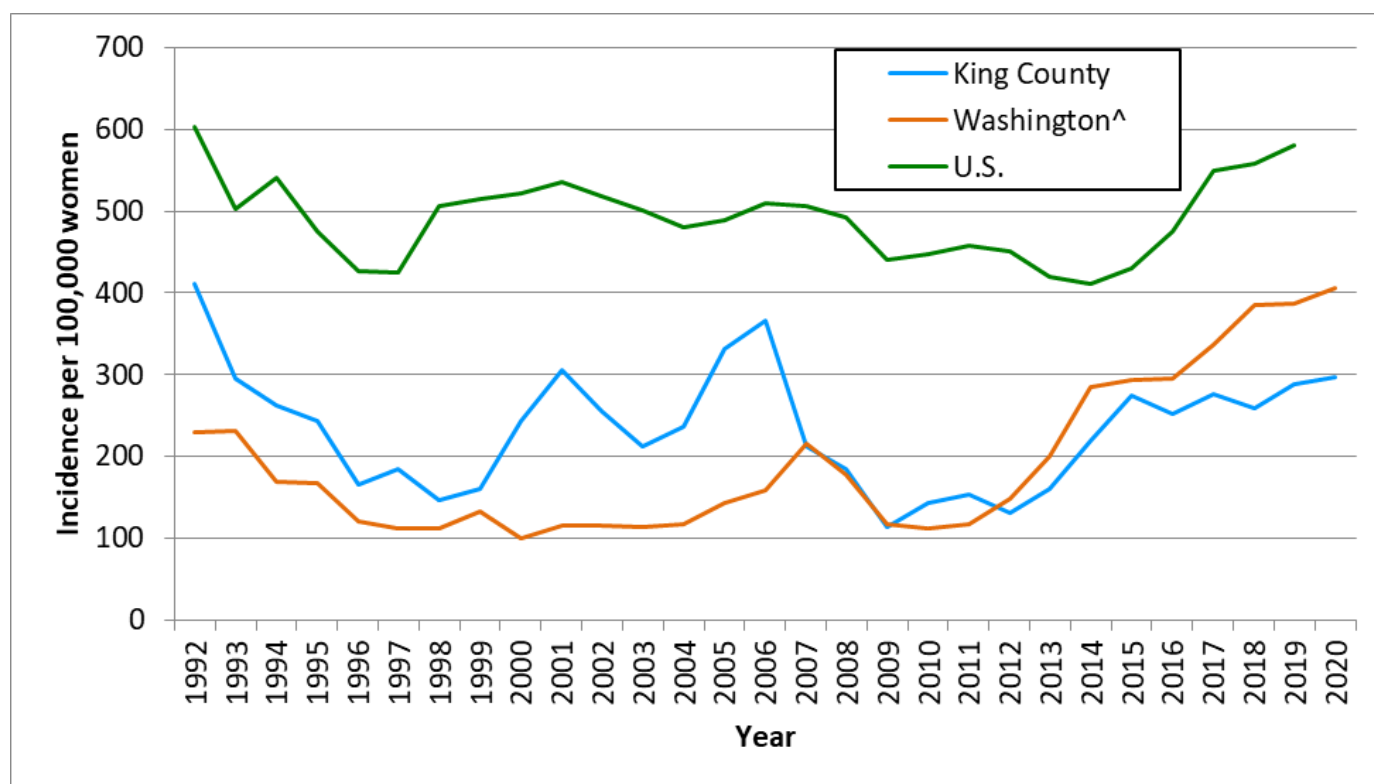
Figure 2-1: Gonorrhea –Incidence among Cisgender women, Cisgender Heterosexual Men (MSW), and Cisgender Men who have sex with men (MSM) ages 15 years and older, King County, WA, 2007-2020



Gonorrhea trends in King County are 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)⁶. Similar to syphilis, gonorrhea cases and incidence vary by Health Reporting Area with higher case counts and incidence observed in Seattle and south King County (Figures 2-3 and Figure 2-4).

Figure 2-2: Gonorrhea – Incidence among Cisgender women Ages 15-29 King County, Washington State (excluding King County), and U.S., 1992-2020



*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.

Table 2-1: Gonorrhea — Number of reported cases and incidence by gender* King County, WA, 1992-2020

Year	Cisgender Women		Cisgender Men		Trans- gender Women	Trans- gender 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
1992	900	113	1,052	135				1,952	124
1993	649	80	878	111				1,527	95
1994	543	66	675	84				1,218	75
1995	516	62	762	94				1,278	78
1996	354	42	559	68				913	55
1997	395	47	519	62				914	54
1998	324	38	655	77				979	58
1999	347	40	608	71				955	56
2000	583	67	894	103				1,477	85
2001	727	82	1,164	133				1,891	108
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	1,201	123	2	1		1,531	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	3,191	297	25	9	5	4,179	194
2018	955	87	3,441	314	22	7	8	4,435	202
2019	1,089	98	3,582	322	16	13	3	4,705	211
2020	1,167	103	3,053	270	24	11	11	4,277	189

*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, leading to an underestimate of cases among transgender persons. Cases with unknown sex are included in the total cases.

Figure 2-3: Gonorrhea – Cases among cisgender men who have sex with men (A) and cisgender heterosexuals (B) by Health Reporting Area King County 2020

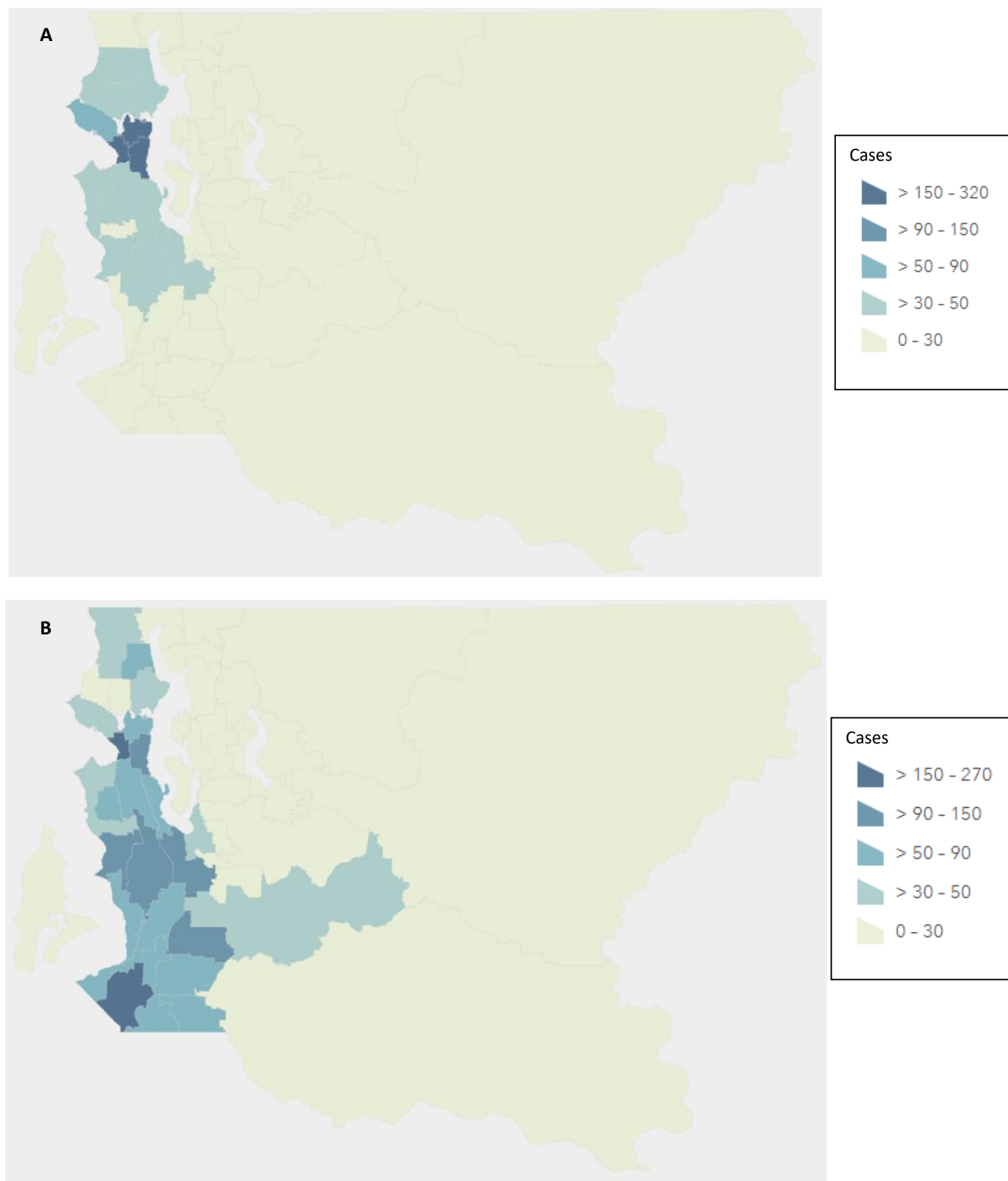


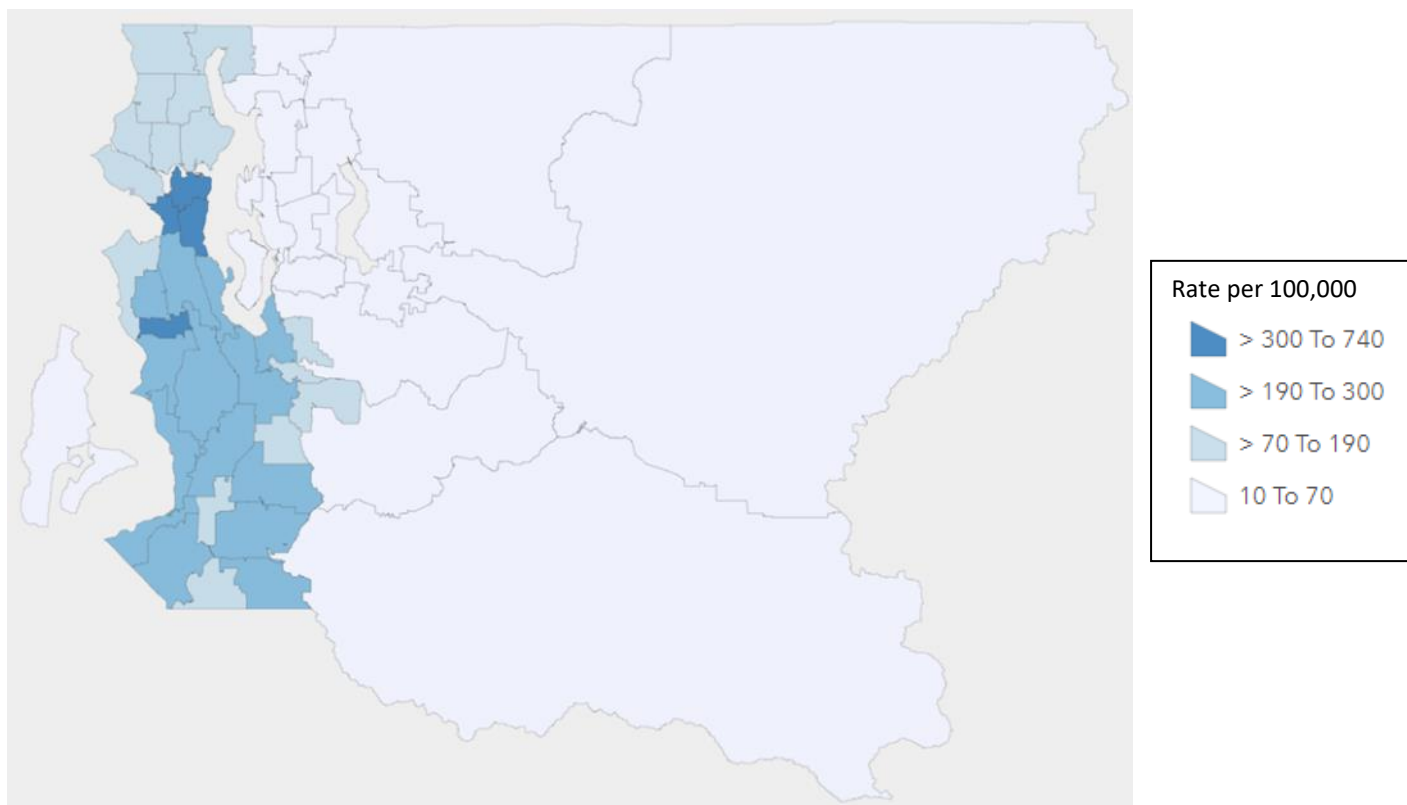
Figure 2-4: Gonorrhea – Incidence by Health Reporting Area, King County 2020

Table 2-2: Gonorrhea — Number of reported cases and Incidence among cisgender men and cisgender women, by age and race, King County, WA, 2020

	Cisgender Women (N=1167)		Cisgender Men (N=3053)	
	Cases	Incidence per 100,000 population	Cases	Incidence per 100,000 population
Race/ethnicity*^				
American Indian/Alaska Native	20	531	29	580
Asian	25	20	163	110
Black	214	528	616	1065
Hispanic/Latinx	62	103	297	328
Native Hawaiian/Pacific Islander	18	332	21	297
White	250	70	992	208
Multiple	19	63	72	189
Other	35		33	
Unknown	524		830	
Age				
0-9 years	3	2	5	4
10-14 years	7	11	1	2
15-19 years	166	263	94	145
20-24 years	327	448	424	588
25-29 years	225	213	718	663
30-34 years	169	161	622	544
35-44 years	200	116	726	395
45-54 years	58	43	319	226
>=55 years	12	4	144	57
Unknown	0		0	

*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.

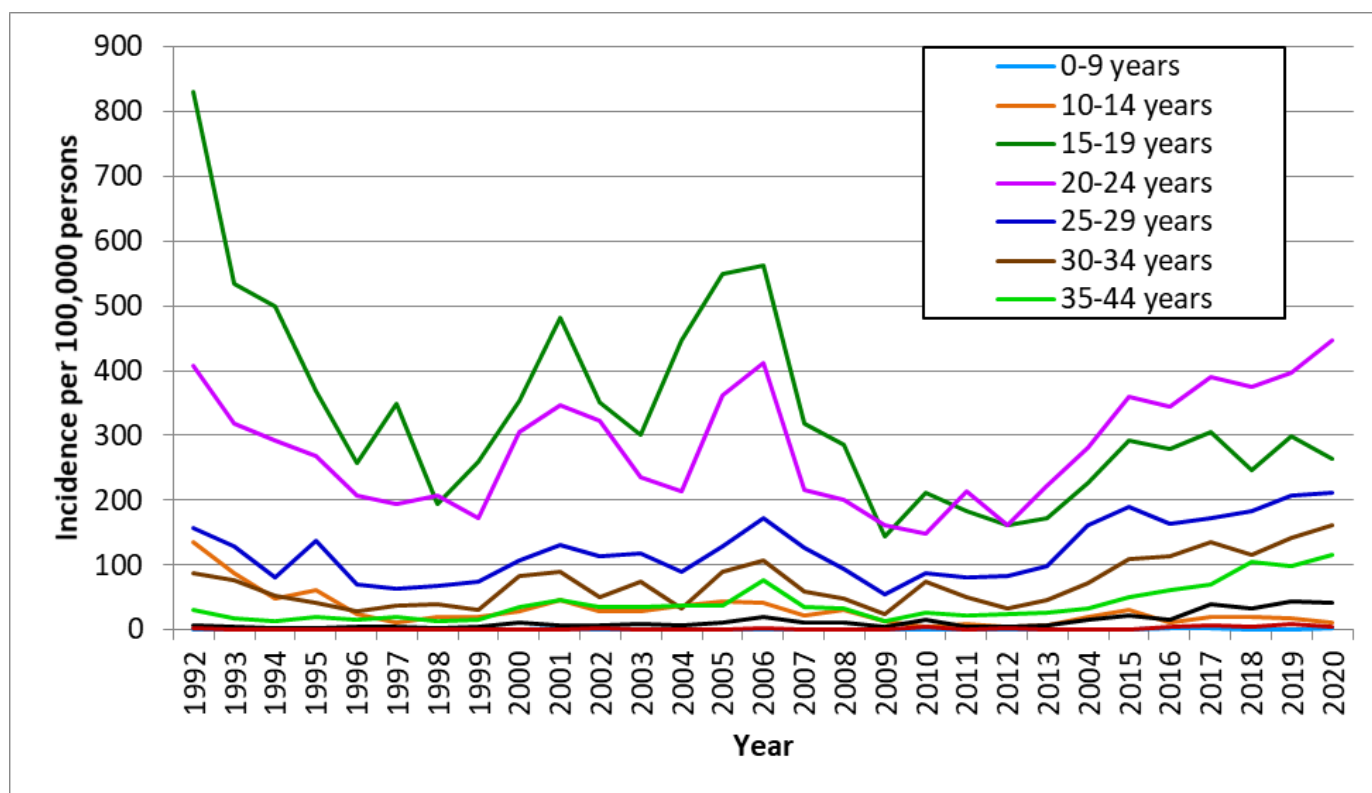
^Race/ethnicity specific rates exclude cases reported with "other" races.

Table 2-3: Gonorrhea — Number of reported cases and incidence among cisgender men and cisgender women ages 15-29* King County, WA, 1992-2020

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
1992	713	411	706	396	1,419	403
1993	514	296	530	297	1,044	297
1994	451	262	421	237	872	249
1995	420	243	422	236	842	240
1996	287	165	302	167	589	166
1997	325	185	258	141	583	163
1998	262	147	334	180	596	164
1999	286	160	317	171	603	166
2000	436	243	378	202	815	222
2001	552	306	549	293	1,101	300
2002	466	255	557	294	1,023	275
2003	392	212	464	243	856	228
2004	444	237	419	216	864	227
2005	630	332	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	542	271	795	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	1,359	584	1,986	432
2018	601	259	1,342	566	1,943	414
2019	684	289	1,437	597	2,121	444
2020	718	297	1,236	504	1,954	401

*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.

Figure 2-5: Gonorrhea – Incidence among Cisgender Women by Age King County, WA, 1992-2020*



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

Age and gender

Among cisgender women, the incidence of gonorrhea was highest among 20-24 year olds (448 per 100,000), followed by 15-19 year olds (263 per 100,000) in 2020 (Tables 2-2 and 2-3). This epidemiologic pattern, with higher rates among 20-24 years olds than among 15-19 year olds, represents a change compared to the period from 1990-2010 (Figure 2-5). The reasons for this change are uncertain, but may reflect later age of sexual debut and increased condom use⁷. Among men, the rate of gonorrhea was highest in the 25-29 years age group (663 per 100,000), followed by the 20-24 age group (588 per

100,000).

Race and ethnicity

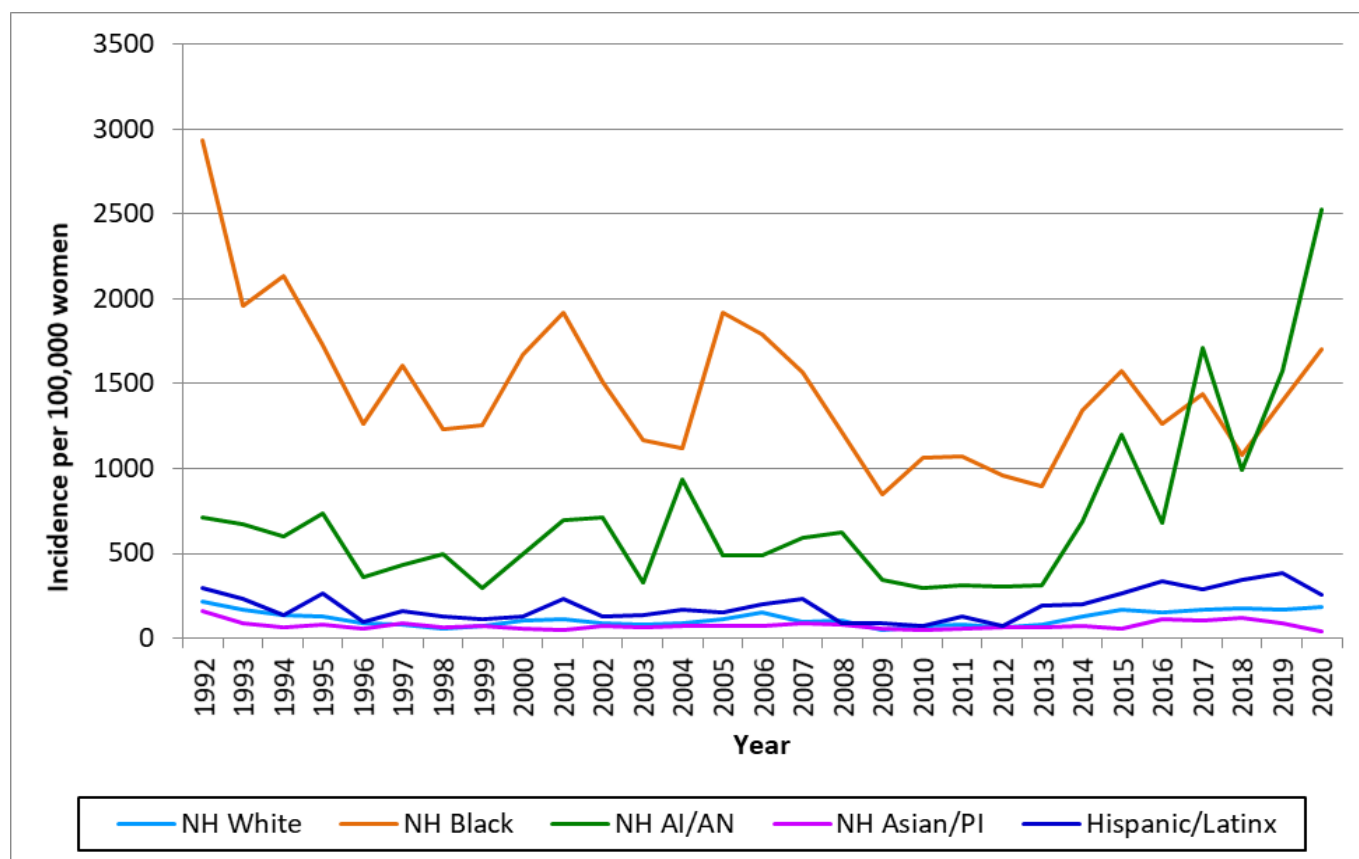
Among both cisgender women and men, gonorrhea rates vary substantially among different racial and ethnic groups (Table 2-2). In 2020, American Indian/Alaska Native women had the highest rate of gonorrhea among women (531 per 100,000), reflecting a 5-fold increase in infections in that population since 2013. Black women had the second highest rate among women in 2020 (528 per 100,000). Among women ages 15-29, the age group with the highest rate of gonococcal infection, the incidence rates of gonorrhea among American Indian/

⁷Abma 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.

Alaska Native women and among Black women were 14 and 9 times higher than among White cisgender women, respectively (Figure 2-6). Since 2011, the rate of gonorrhea has increased among most racial and ethnic subgroups of cisgender women ages 15-29. The relative magnitude of these increases (the percentage increase in each group relative to the past) has varied substantially between groups defined by race/ethnicity: American Indian/Alaska Native (708% increase), White (132% increase), Latina (96% increase), and Black (60% increase). However, it should be noted that while the relative

increase in the rate of infection was smaller for Black cisgender women in King County than White or Latina cisgender women, the absolute increase in the rate of infection (i.e., the number of infections per 100,000) has been highest for Black and American Indian/Alaska Native cisgender women. 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).

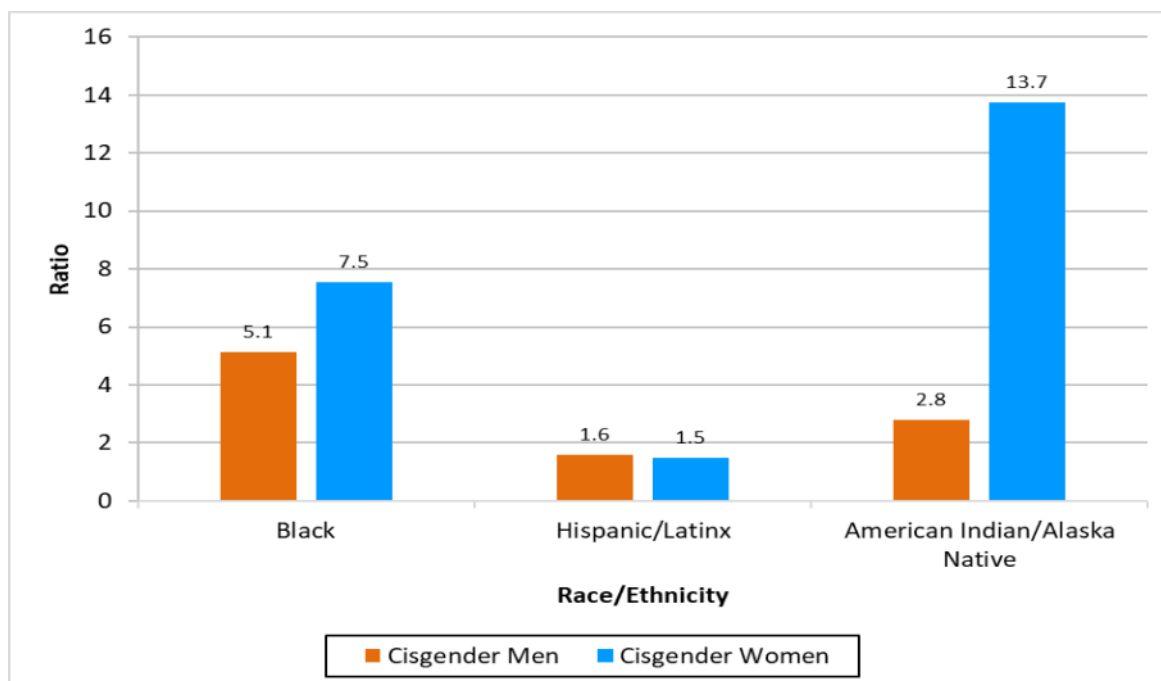
Figure 2-6: Gonorrhea – Incidence among Cisgender Women Ages 15-29 by Race and Ethnicity, King County, WA, 1992-2020*



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 2020



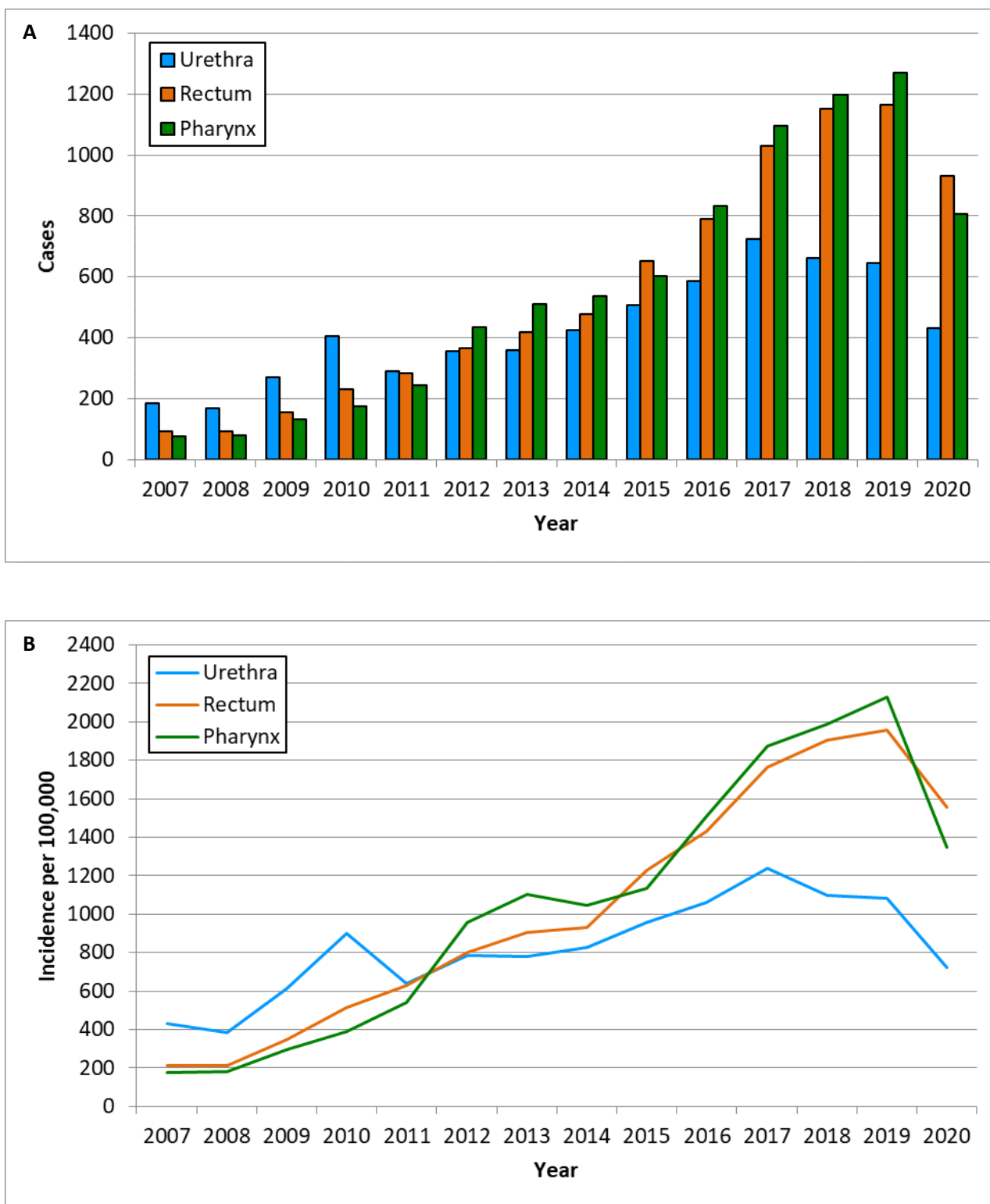
Relative rate disparities were calculated using a ratio of the rates. Relative rates represent a measure of health disparity on the relative scale regardless of the sizes of racial/ethnic groups, and a value of 1 corresponds to no disparity.

MSM

Gonorrhea diagnoses among cisgender MSM have steadily increased since 2008 until declining in 2020 (Figure 2-1). Trends in the number of reported gonorrhea cases among MSM vary by anatomic site (Figure 2-8A). The incidences of reported rectal and pharyngeal infections have increased steadily over the last decade before declining in 2020. Rectal and pharyngeal gonorrhea are primarily asymptomatic infections and case detection reflects screening practices. At the same time, the incidence of urethral infection had been relatively stable and began decreasing in the few years prior to 2020 (Figure 2-8B). Since urethral gonorrhea is

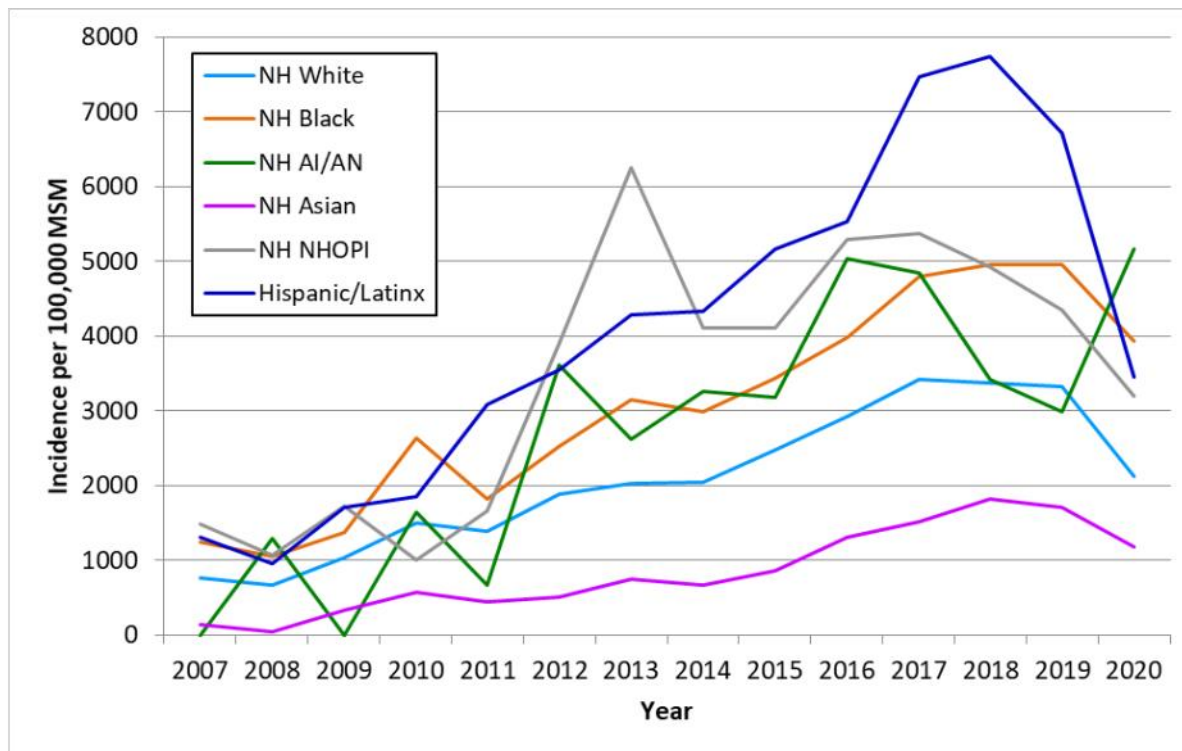
almost always a symptomatic infection, the previously observed increase in urethral gonorrhea (from 404 in 2010 to 646 in 2019) likely represents a true increase in the rate of gonorrhea over the last decade and not simply an increase in diagnoses due to increased screening. The extent to which the decline in urethral gonorrhea represents a true decrease is less certain; the COVID-19 epidemic could have led to a decline in gonorrhea incidence due changes in sexual behavior related to social distancing, but it is also possible that more men were treated without diagnostic testing as a result of the COVID-19 epidemic.

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, 2007-2020



*Each case can have more than one site of infection. In 2020, 24% of MSM diagnosed with gonorrhea were infected at more than one anatomic site.

Figure 2-9: Gonorrhea - Incidence among cisgender men who have sex with men (MSM) by Race and Ethnicity*, King County, WA 2007-2020



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

The incidence of gonorrhea has increased in all racial and ethnic groups of MSM over last decade, however rates vary greatly by race/ethnicity (Figure 2-9).

American Indian/Alaska Native MSM had the highest incidence in 2020 (5,161 cases per 100,000) and this was the only racial and ethnic group with an increase in incidence compared to 2019. Black MSM (3,937 cases per 100,000) had the second highest rate in 2020, followed by Latinx MSM (3,453 infections 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. A similar, disproportionate decline in new HIV diagnoses among

Latinx MSM in King County also occurred in 2020 suggesting that differential screening rates occurred in this population.

Antimicrobial resistant gonorrhea

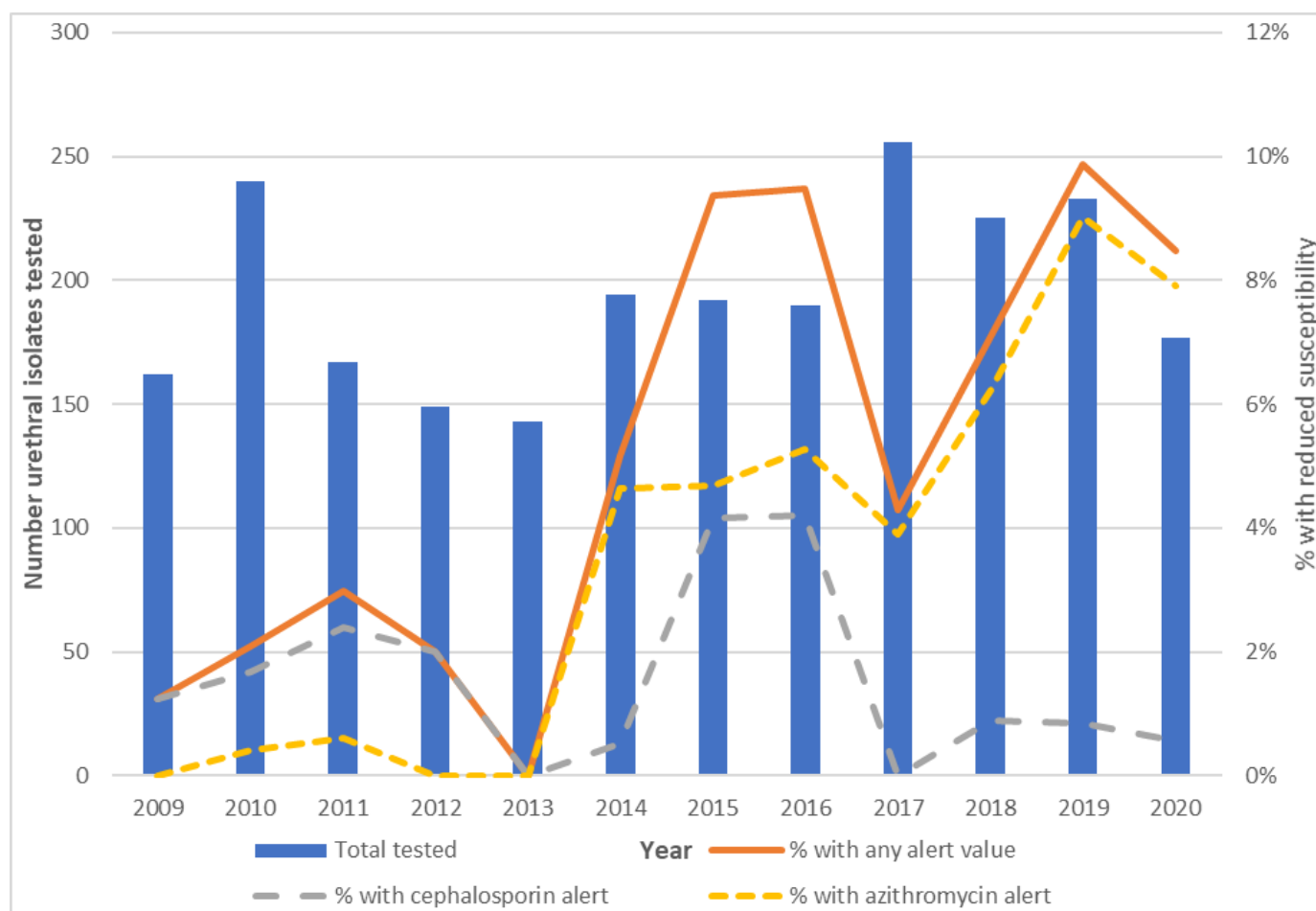
PHSKC conducts ongoing surveillance of antimicrobial-resistant *Neisseria gonorrhoeae* (ARNG). Since 1986, the PHSKC SHC has participated in CDC's Gonococcal Isolate Surveillance Project (GISP) in which up to 25 men diagnosed with urethral gonorrhea each month have a culture specimen tested for resistance 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 is partnering with several private clinics in King County to expand the coverage of gonococcal specimens collected and submitted for antimicrobial resistance testing. Over 8% of gonorrhea cases diagnosed in King County in 2020 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.

From 2009 to 2013, the proportion of GISP urethral isolates with alert values to azithromycin or oral third generation cephalosporins (i.e. cefixime) ranged from 0% to 2% (Figure 2-10). The percentage of urethral isolates

Figure 2-10: Percentage of Male Gonococcal Isolate Surveillance Project Urethral Isolates with Alert Values for Cephalosporins or Azithromycin, King County, WA 2009-2020



with alert values to azithromycin increased sharply to 5% in 2014, held steady through 2017 (4-6%), then increased again in 2019-2020 (8-9%). The percentage of urethral isolates with alert values to cephalosporins rose to 4% in 2015-2016, then decreased during 2017-2020 (0-1%). CDC defines gonococci as having an alert value if they have laboratory evidence of being relatively resistant to antimicrobial treatment. For azithromycin, alert values have a minimum inhibitory concentration (MIC) ≥ 2.0 $\mu\text{g/ml}$ and organisms with alert values are considered to be resistant to azithromycin. CDC alert values for ceftriaxone or cefixime are MIC ≥ 0.125 $\mu\text{g/ml}$ and MIC ≥ 0.25 $\mu\text{g/ml}$, respectively; the U.S. has not defined a specific laboratory value above which gonococci are considered resistant to ceftriaxone or cefixime, but organisms with MICs ≥ 0.5 $\mu\text{g/ml}$ are defined as having reduced susceptibility.

There were 403 unique cases of gonorrhea infection that had at least one gonorrhea culture isolate (genital or extragenital) submitted for antimicrobial susceptibility testing in 2020. Reduced susceptibility was most commonly found in rectal isolates (20%), followed by pharyngeal (17%), urethral (13%) and endocervical (6%) (Table 2-4). Most cases with reduced susceptibility were MSM (Table 2-5). Of the 403 unique gonorrhea cases with susceptibility results, 41 (10%) had decreased susceptibility to azithromycin, one (<1%) to cefixime, and none to ceftriaxone (Table 2-6). Azithromycin resistance occurred in 37 (15%) of 241 MSM and 3 (3%) of 95 isolates from MSW or women. The only case of gonorrhea with decreased susceptibility to a cephalosporin (cefixime) occurred in an MSM patient.

Table 2-4: *Neisseria gonorrhea* isolates with antimicrobial resistance by anatomic site, SURRG, King County, WA 2020

	Number isolates tested	% w/reduced susceptibility*
Endocervical	17	6%
Pharyngeal	92	17%
Rectal	150	20%
Urethral	205	13%

*Reduced susceptibility to azithromycin and/or cephalosporins

Table 2-5: Characteristics of unique gonorrhea cases with reduced antimicrobial susceptibility, SURRG, King County, WA, 2020

Azithromycin reduced susceptibility N=41		
	Number	Percent
Age		
<25 years	5	12%
25-34 years	14	34%
35-44 years	13	32%
>=45 years	9	22%
Gender		
Male	38	93%
Female	2	5%
Transgender or Nonbinary	1	2%
Risk		
Cisgender men who have sex with men	37	90%
Cisgender men who have sex with women	1	2%
Cisgender women	2	5%
Transgender or Nonbinary	1	2%
Elevated MIC*		
Azithromycin (MIC \geq 2.0 μ g/ml)	41	100%
Ceftriaxone (MIC \geq 0.125 μ g/ml)	0	0%
Cefixime (MIC \geq 0.25 μ g/ml)	0	0%

*Minimum Inhibitory Concentration

In 2020, one case with cephalosporin reduced susceptibility was identified in an MSM patient and this case is not included above.

Table 2-6: Percentage of persons with alert values to azithromycin or cefixime among persons tested for antimicrobial resistant *Neisseria gonorrhoeae*, King County 2020

	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=241)	85 (35%)	37 (15%)	1 (<1%)	0 (0%)
Cisgender men who have sex with women (n=78)	5 (6%)	1 (1%)	0 (0%)	0 (0%)
Cisgender men, unknown sex partners (n=52)	10 (19%)	0 (0%)	0 (0%)	0 (0%)
Cisgender women (n=17)	4 (24%)	2 (12%)	0 (0%)	0 (0%)
Transgender women (n=4)	1 (25%)	0 (0%)	0 (0%)	0 (0%)
Transgender men (n=2)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Nonbinary (n=9)	4 (44%)	1 (11%)	0 (0%)	0 (0%)
Total (n=403)	109	41	1 (<1%)	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

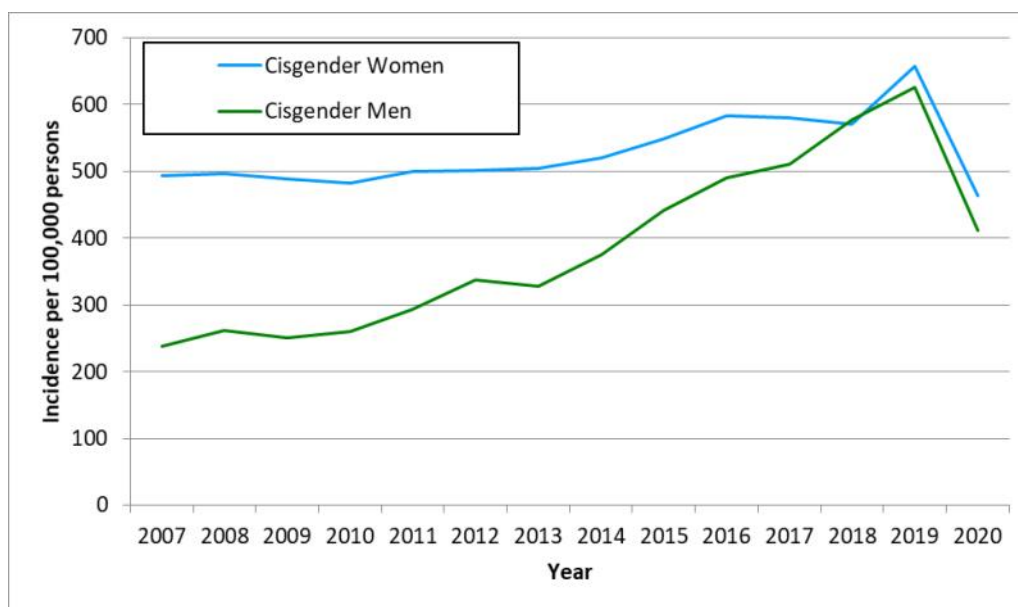
Overview

In 2020, an estimated 8,290 cases of chlamydial infection were reported among King County residents⁸, representing an overall reported incidence of 367 per 100,000 people (Table 3-1), a 33% decrease compared to the incidence in 2019 (544 per 100,000). Decreases in reported chlamydia cases in 2020 were also experienced nationally⁹. Among cisgender women, 4,392 cases were reported for an incidence of 389 per 100,000 women, and 3,854 cases were reported among cisgender men for a reported incidence of 341 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 2020 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 medicine 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 changed our reporting practice for chlamydia surveillance to rely 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 (464 per 100,000) than the rate in cisgender men (411 per 100,000) was (Figure 3-1). The incidence of chlamydia infection among MSM and MSW

Figure 3-1: Chlamydial Infection – Estimated Incidence among Cisgender Women and Cisgender Men ages 15 years and older, King County, WA, 2007-2020*



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

⁸See data limitations for changes to chlamydia case counts for 2019 and 2020.

⁹<https://www.cdc.gov/std/statistics/2020/overview.htm#Chlamydia>

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.

Chlamydial Infection

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Table 3-1: Number of Reported Chlamydia Cases and Incidence by Gender*, King County, WA, 1992-2020

Year	Cisgender Women		Cisgender Men		Trans-gender Women	Trans-gender 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
1992	3,000	375	965	124				3,965	251
1993	2,563	316	813	102				3,376	210
1994	2,742	334	811	101				3,553	219
1995	2,410	291	802	98				3,212	196
1996	2,356	282	880	107				3,236	195
1997	2,247	266	903	108				3,150	188
1998	2,447	286	1,071	127				3,518	207
1999**	2,719	315	1,357	158				4,076	237
2000	3,388	388	1,653	191				5,041	290
2001	3,285	373	1,612	184				4,897	279
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	3,898	416	1,834	196	1	0	0	5,738	307
2008	3,969	419	2,028	215	0	0	0	5,997	317
2009	3,919	410	1,959	206	0	1	0	5,879	308
2010	3,929	405	2,055	214	1	0	0	5,985	310
2011	4,088	419	2,330	241	2	0	0	6,420	330
2012	4,113	419	2,687	275	3	1	0	6,804	348
2013	4,173	420	2,659	269	3	2	0	6,837	345
2014	4,385	434	3,100	308	11	2	0	7,498	372
2015	4,725	460	3,713	362	3	7	0	8,448	412
2016	5,132	487	4,244	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	6,223	559	5,811	522	28	4	1	12,100	544
2020	4,392	389	3,854	341	13	0	9	8,290	367

*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.

**Some Public Health – Seattle & King County (PHSKC) clinics began using NAATS testing for chlamydial infection in 1994, and all PHSKC clinics were using NAATs by 1999.

in 2020 is not available because data on gender of sex partners are not available from ELRs. In 2020, 13 cases of chlamydial infection occurred in transgender women, 9 cases in non-binary/genderqueer persons, and no cases were reported among transgender men. These case counts are certainly undercounts because laboratory reports do not contain gender identity information.

Age and gender

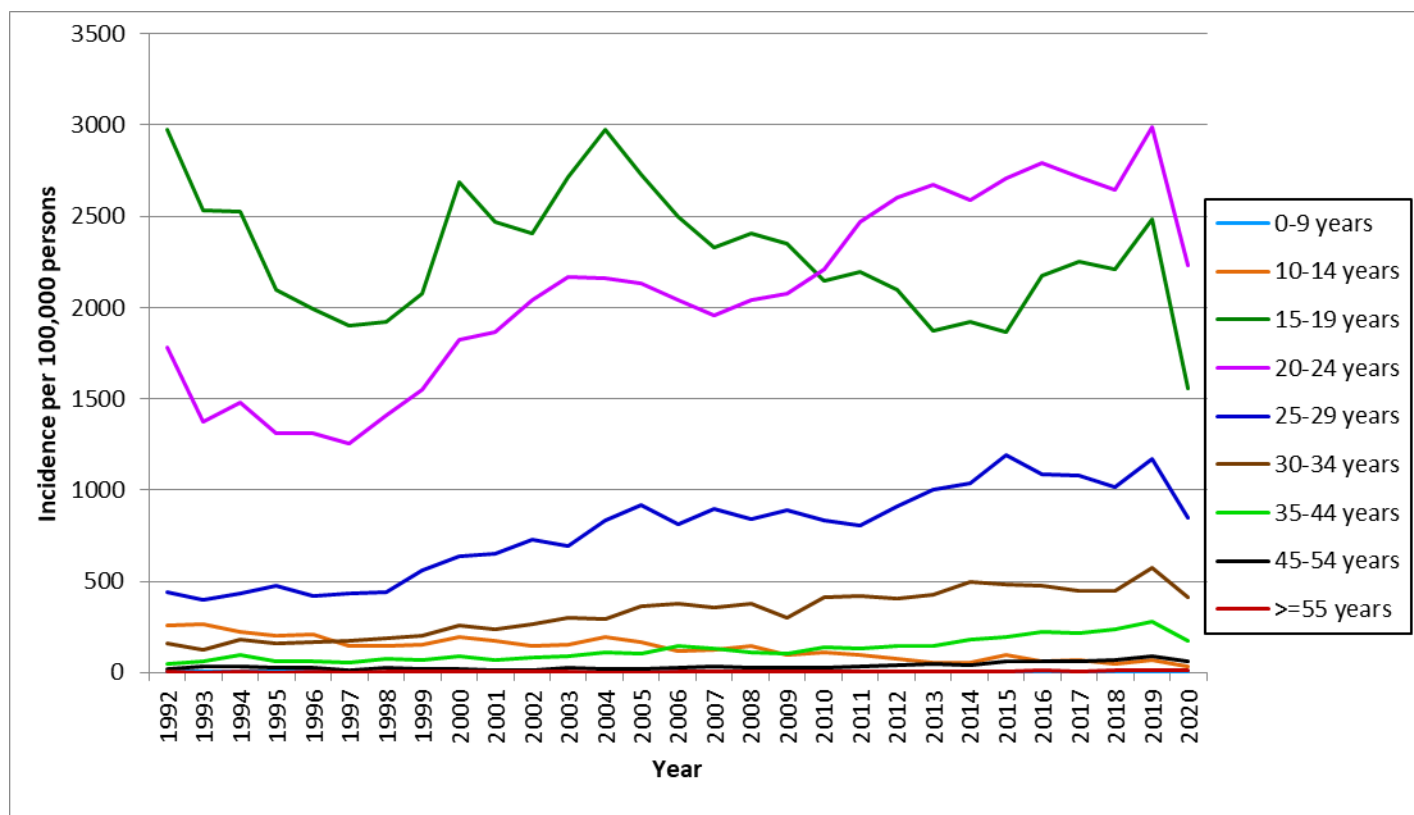
Among both cisgender women and men, persons ages 20-24 had the highest rates of chlamydial infection in King County (Table 3-2). For cisgender women, this age group

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 2020 (Figure 3-2). The reasons for this change are uncertain but may reflect later age of sexual debut and increased condom use. 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 2020.

Table 3-2: Chlamydial Infection – Number of Reported Cases and Incidence among Cisgender Men and Cisgender Women by Age King County, WA, 2020

	Cisgender Women (N=4,392)		Cisgender Men (N=3,854)	
	Cases	Incidence per 100,000 population	Cases	Incidence per 100,000 population
Age				
0-9 years	3	2	2	2
10-14 years	22	35	7	3
15-19 years	981	1,556	274	422
20-24 years	1,630	2,232	773	1,072
25-29 years	901	851	906	837
30-34 years	430	410	720	629
35-44 years	306	177	728	396
45-54 years	86	63	287	204
>=55 years	32	11	157	63
Unknown	1		0	

Figure 3-2: Chlamydial Infection – Incidence among Cisgender women by Age King County, WA, 1992-2020*

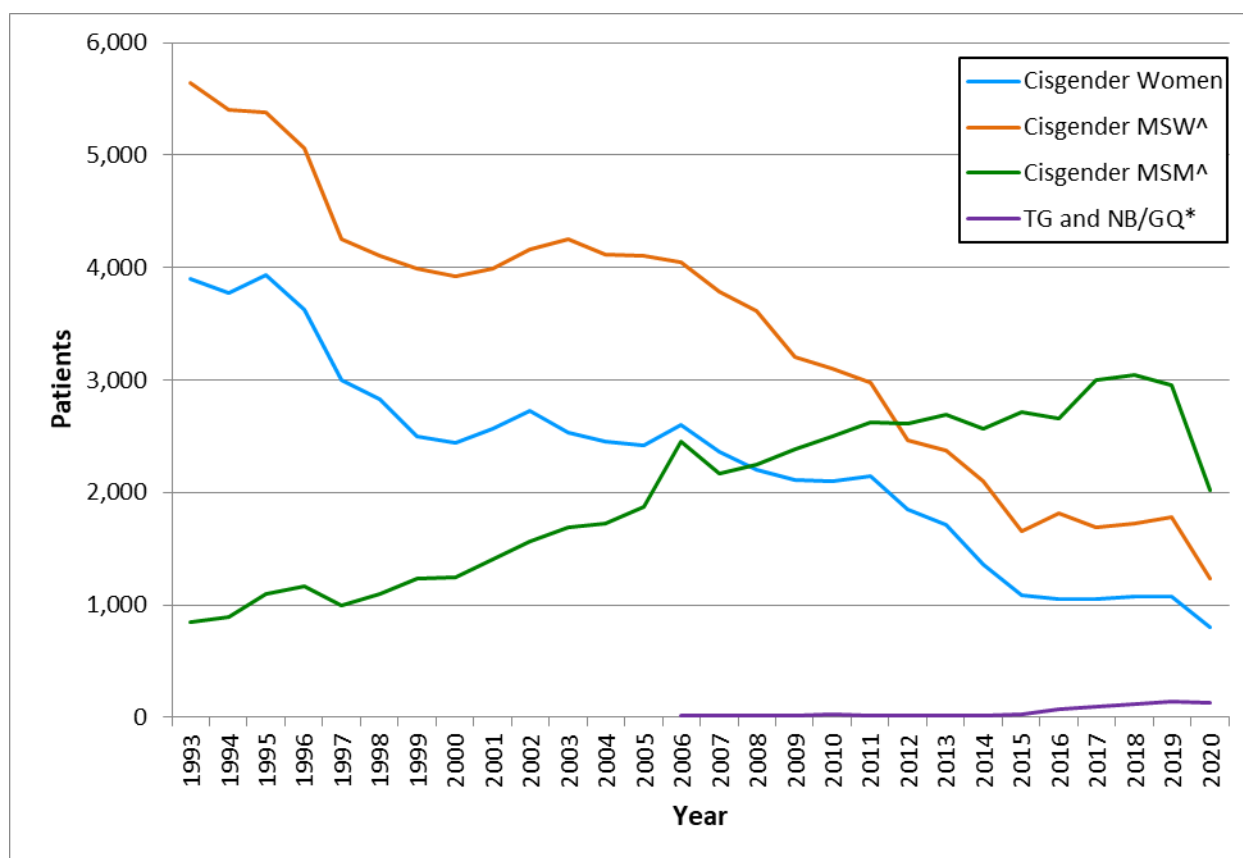
*Cases with unknown age were distributed according to annual age distributions among cases with known age and included in age-specific incidences.

Overview

In 2020, despite the challenges of providing medical care during the COVID-19 pandemic, the PHSKC SHC provided care to 4,261 unique patients during 7,865 visits (Tables 4-1 and 4-2). This reflects a 32% decrease in the number of patient visits to the clinic compared to 2019 and this decline is largely influenced by reduced clinic capacity starting in March 2020 following the first COVID-19

pandemic stay-at-home orders in King County. Although SHC staff had to manage many changes in clinic operations, including, but not limited to, reducing walk-in visits, prioritizing symptomatic patients and patients with known contact to HIV or STI, providing telehealth visits, lower staffing levels as staff were redirected to the COVID-19 response, the PHSKC SHC continued to provide vital sexual health services to the community.

Figure 4-1: Number of Visits, Public Health - Seattle King County (PHSKC) Sexual Health Clinics, 1993-2020



^MSM includes cisgender men who have sex with men are men who acknowledged 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 sexual orientation data

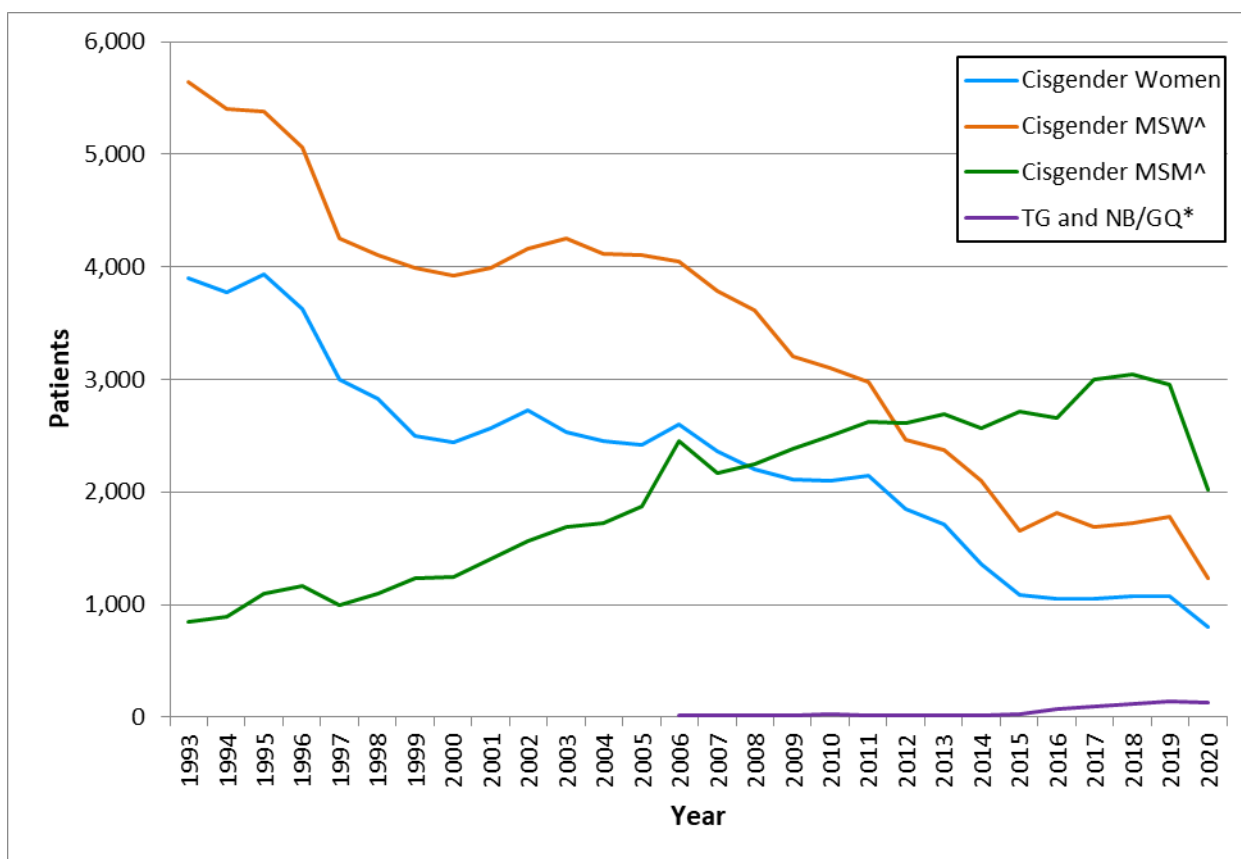
*TG and NB/GQ = transgender and non-binary/genderqueer (data not available prior to 2006).

PHSKC's satellite Broadway STD Clinic was in operation from 1993-1998.

On clinic intake forms patients are asked about current gender identity and sex assigned at birth. In 2020, MSM accounted for 60% of the SHC visits, while MSW and cisgender women accounted for 20% and 15% of visits, respectively. Approximately 3% (n=130) of patients identified as transgender, non-binary, or genderqueer accounting for 253 total visits to the SHC

in 2020. The clinic provided services to 2,021 unique MSM patients during 4,747 visits in 2020 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 4-2: Number of Patients (Unduplicated Visits), Public Health - Seattle King County (PHSKC) Sexual Health Clinics, 1993-2020



^MSM includes cisgender men who have sex with men are men who acknowledged 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 sexual orientation data

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

PHSKC's satellite Broadway STD Clinic was in operation from 1993-1998.

Table 4-1: Number of Public Health – Seattle King County (PHSKC) Sexual Health Clinic visits, 1993-2020

Year	Cisgender Women	Cisgender MSW^	Cisgender MSM^	Cisgender Men Unknown^	Transgender Women	Transgender Men	Non-Binary/ Genderqueer	Total
1993	6,826	9,003	1,386	514	n/a	n/a	n/a	17,729
1994	7,017	8,986	1,829	578	n/a	n/a	n/a	18,410
1995	6,951	8,567	2,377	509	n/a	n/a	n/a	18,404
1996	6,117	7,635	2,152	292	n/a	n/a	n/a	16,196
1997*	4,929	6,340	1,753	333	n/a	n/a	n/a	13,355
1998	4,541	6,111	2,106	248	n/a	n/a	n/a	13,006
1999**	4,085	5,879	2,550	189	n/a	n/a	n/a	12,703
2000	3,904	5,671	2,769	218	n/a	n/a	n/a	12,562
2001	4,244	5,725	2,878	299	n/a	n/a	n/a	13,146
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

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

*In 1997, the PHSKC Sexual Health Clinic eliminated its Saturday and evening clinic hours.

**PHSKC's satellite Broadway STD Clinic was in operation from 1993-1998.

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 patients (unduplicated visits per year), 1993-2020

Year	Cisgender Women	Cisgender MSW^	Cisgender MSM^	Cisgender Men Unknown^	Transgender Women	Transgender Men	Non-Binary/ Genderqueer	Total
1993	3,902	5,639	843	443	n/a	n/a	n/a	10,827
1994	3,770	5,406	891	398	n/a	n/a	n/a	10,465
1995	3,935	5,383	1,102	305	n/a	n/a	n/a	10,725
1996	3,629	5,067	1,161	184	n/a	n/a	n/a	10,041
1997*	3,000	4,252	993	222	n/a	n/a	n/a	8,467
1998	2,830	4,101	1,099	198	n/a	n/a	n/a	8,228
1999**	2,503	3,986	1,236	150	n/a	n/a	n/a	7,875
2000	2,446	3,918	1,243	169	n/a	n/a	n/a	7,776
2001	2,561	3,987	1,401	230	n/a	n/a	n/a	8,179
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

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

*In 1997, the PHSKC Sexual Health Clinic eliminated its Saturday and evening clinic hours.

**PHSKC's satellite Broadway STD Clinic was in operation from 1993-1998.

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, 19% of all clinic patients, including 29% of cisgender MSW and 24% of cisgender women patients, were Black, though only 7% of all King County residents are Black.

Table 4-3: Age and race/ethnicity of Public Health – Seattle King County (PHSKC) Sexual Health Clinic patients, 2020

	Cisgender Women		Cisgender MSW*		Cisgender MSM*		Transgender and Non-binary/Genderqueer		Total^	
	Number	(%)	Number	(%)	Number	(%)	Number	(%)	Number	(%)
Total	796	100%	1,236	100%	2,021	100%	130	100%	4,261	100%
Race										
American Indian/Alaska Native	7	1%	6	0%	14	1%	1	1%	28	1%
Asian	81	10%	93	8%	197	10%	10	8%	386	9%
Black	193	24%	361	29%	195	10%	19	15%	789	19%
Hispanic/Latinx	89	11%	116	9%	371	18%	24	18%	610	14%
Native Hawaiian/Pacific Islander	7	1%	4	0%	11	1%	0	0%	23	1%
White	342	43%	559	45%	1,076	53%	68	52%	2,083	49%
Multiple	24	3%	15	1%	52	3%	4	3%	95	2%
Unknown	53	7%	82	7%	105	5%	4	3%	247	6%
Age										
10-14 years	1	0%	0	0%	0	0%	1	1%	2	0%
15-19 years	44	6%	23	2%	27	1%	7	5%	101	2%
20-24 years	138	17%	152	12%	240	12%	36	28%	574	13%
25-29 years	205	26%	264	21%	477	24%	41	32%	1,003	24%
30-34 years	143	18%	252	20%	428	21%	22	17%	859	20%
35-44 years	154	19%	272	22%	462	23%	19	15%	925	22%
45-54 years	78	10%	150	12%	231	11%	3	2%	474	11%
>=55 years	33	4%	123	10%	156	8%	1	1%	323	8%

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

^78 men with unknown sexual orientation are excluded from the race/age distributions for MSW and MSM, but are included in total race and age distributions

The PHSKC SHC continued to play an important role in diagnosing reportable STIs in King County. In 2020, the clinic diagnosed 15% (99 of 658) of early syphilis cases in the county, 12% (523 of 4,277) of all gonorrhea cases, 13% (20 of 157) of all HIV cases, and an estimated 6% (496 of 8,290) 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.

Chlamydial infection

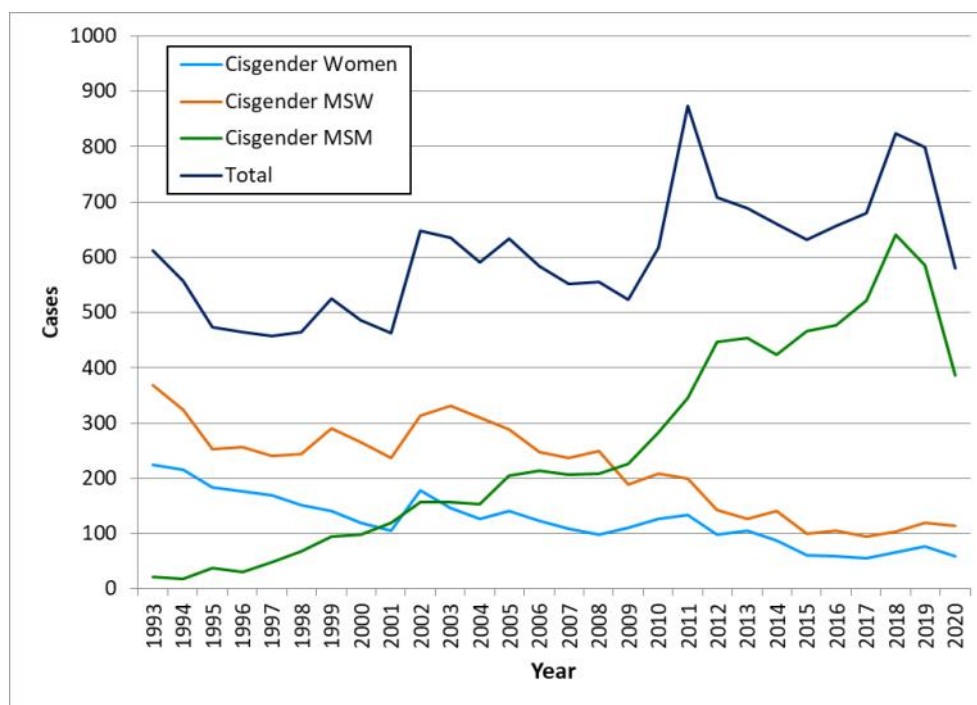
In 2020, the SHC diagnosed 580 cases of chlamydial

infection, which is a 27% decrease from 2019 (n=798).

This decrease most likely reflects changes in the clinic's capacity during the COVID-19 pandemic (Figure 4-3).

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 in 2020 (Figure 4-4). The number of chlamydial diagnoses occurring among women and MSW in the clinic have been relatively stable since 2015 and remain well below numbers from the first decade of the 21st century, reflecting the long-term decline in the number of women and MSW seen in the clinic. The

Figure 4-3: Chlamydial Infection – Number of diagnoses by gender and gender of sex partners Public Health – Seattle King County Sexual Health Clinic, 1993-2020*



*Transgender and non-binary genderqueer patients and cisgender men with unknown gender of sex partners are not shown but are included in the total. MSM includes men who have sex with men are men who acknowledged sex with men during any clinic visit and MSW includes men who reported sex with women only. More sensitive NAATs for extragenital chlamydia screening were adopted in November 2010.

positivity of chlamydial infection among asymptomatic women ages 15-29 has varied over the years; it peaked in 2019 at 12% and declined to 9% in 2020 (Figure 4-5). In 2020, 19 cases of chlamydia infection were diagnosed

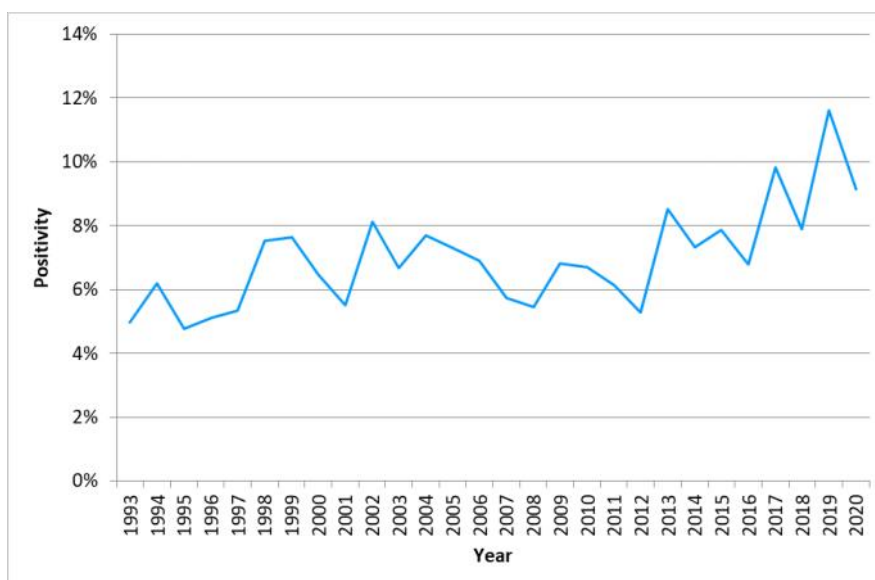
among transgender and non-binary/genderqueer patients, 5 (26%) were transgender women and 14 (74%) were non-binary/genderqueer patients.

Figure 4-4: 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, 1993-2020*



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

Figure 4-5: Chlamydial Infection – Positivity among asymptomatic cisgender women ages 15-29 Public Health – Seattle King County Sexual Health Clinic, 1993-2020



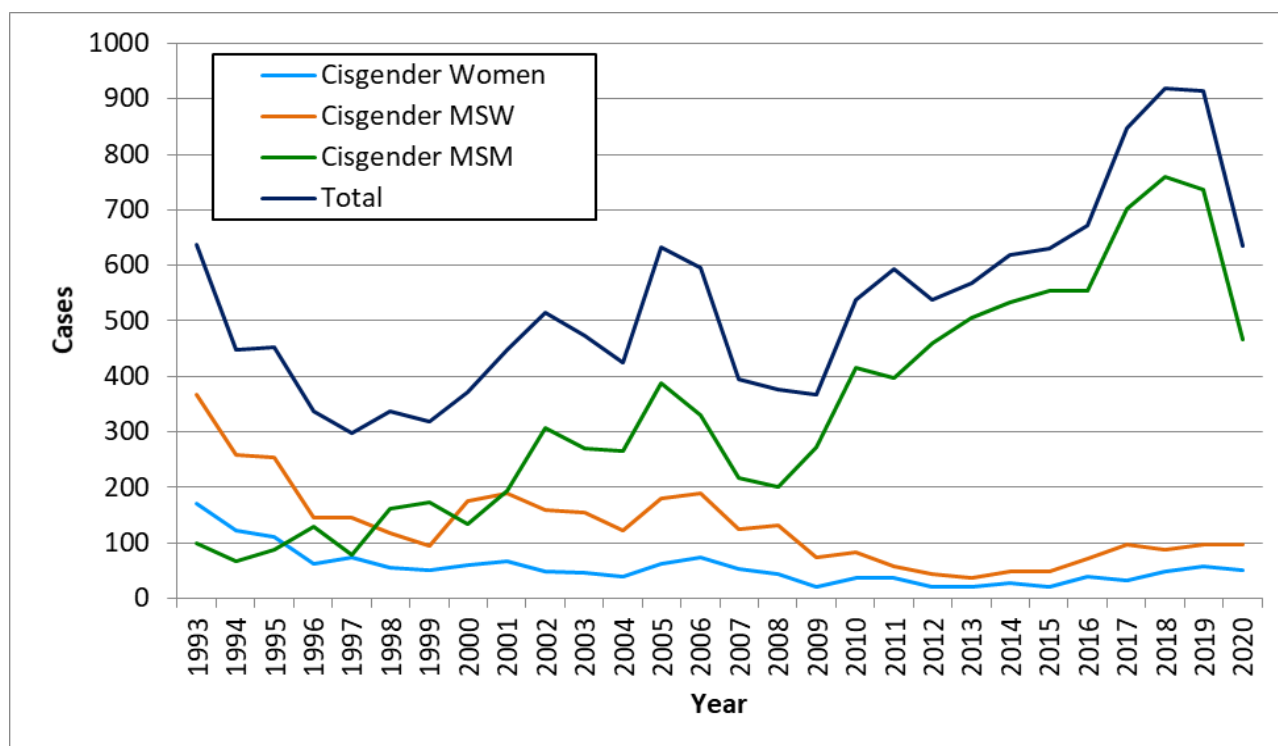
*Chlamydia positivity is defined as the number of cases divided by the total number of cisgender women tested.

Gonorrhea

In 2020, clinicians in the SHC diagnosed 634 cases of gonorrhea, which is a 44% decrease compared to the 914 cases diagnosed in 2019. (Figure 4-6). Gonorrhea diagnoses among MSW remained stable in 2020, while diagnoses among 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

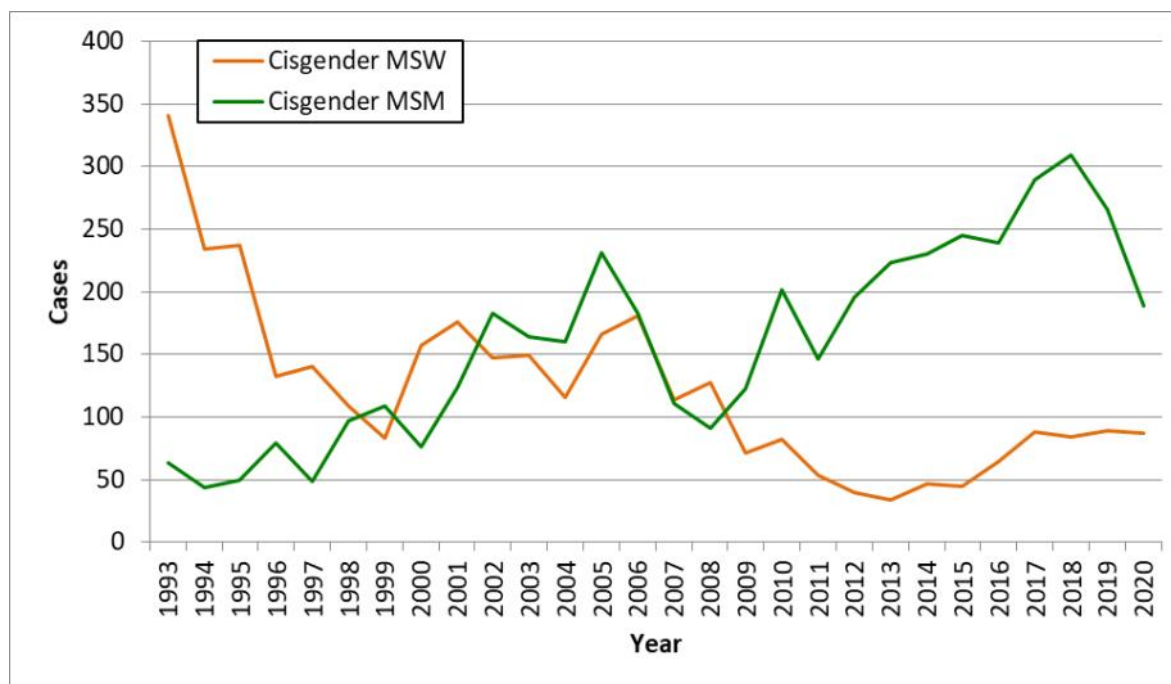
increases in the number of infections diagnosed in men with symptomatic gonococcal urethritis (Figures 4-7 and 4-8). The overall decline in gonococcal infections among MSM observed in 2020 is reflected in all three anatomic sites. In 2020, 18 gonorrhea cases were diagnosed among transgender and non-binary/genderqueer patients, 1 (6%) were transgender men, 5 (28%) were transgender women, and 12 (67%) were non-binary/genderqueer.

Figure 4-6: Gonorrhea – Number of diagnoses by gender and gender of sex partners Public Health – Seattle King County Sexual Health Clinic, 1993-2020*



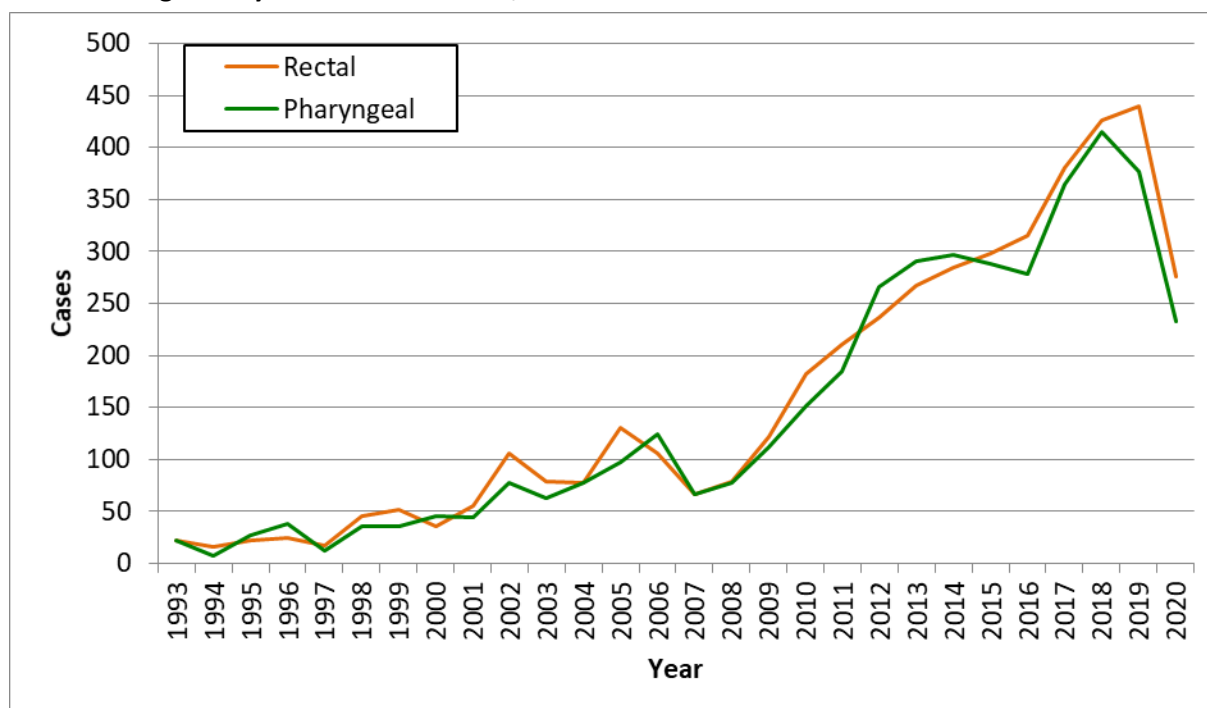
*Transgender and non-binary genderqueer patients and cisgender men with unknown gender of sex partners are not shown but are included in the total. Increased screening for rectal and pharyngeal gonorrhea among MSM was implemented in the late 1990s. More sensitive NAATs for extragenital gonorrhea screening were adopted in November 2010.

Figure 4-7: Gonorrhea – Symptomatic Gonococcal Urethritis among Cisgender MSM and MSW Public Health - Seattle King County Sexual Health Clinic, 1993-2020*



*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. These data exclude 70 cases of symptomatic urethral gonorrhea among men who were missing sexual orientation information across all years.

Figure 4-8: Gonorrhea – Rectal and Pharyngeal Infections among Cisgender Men who have sex with men Public Health – Seattle King County Sexual Health Clinic, 1993-2020*



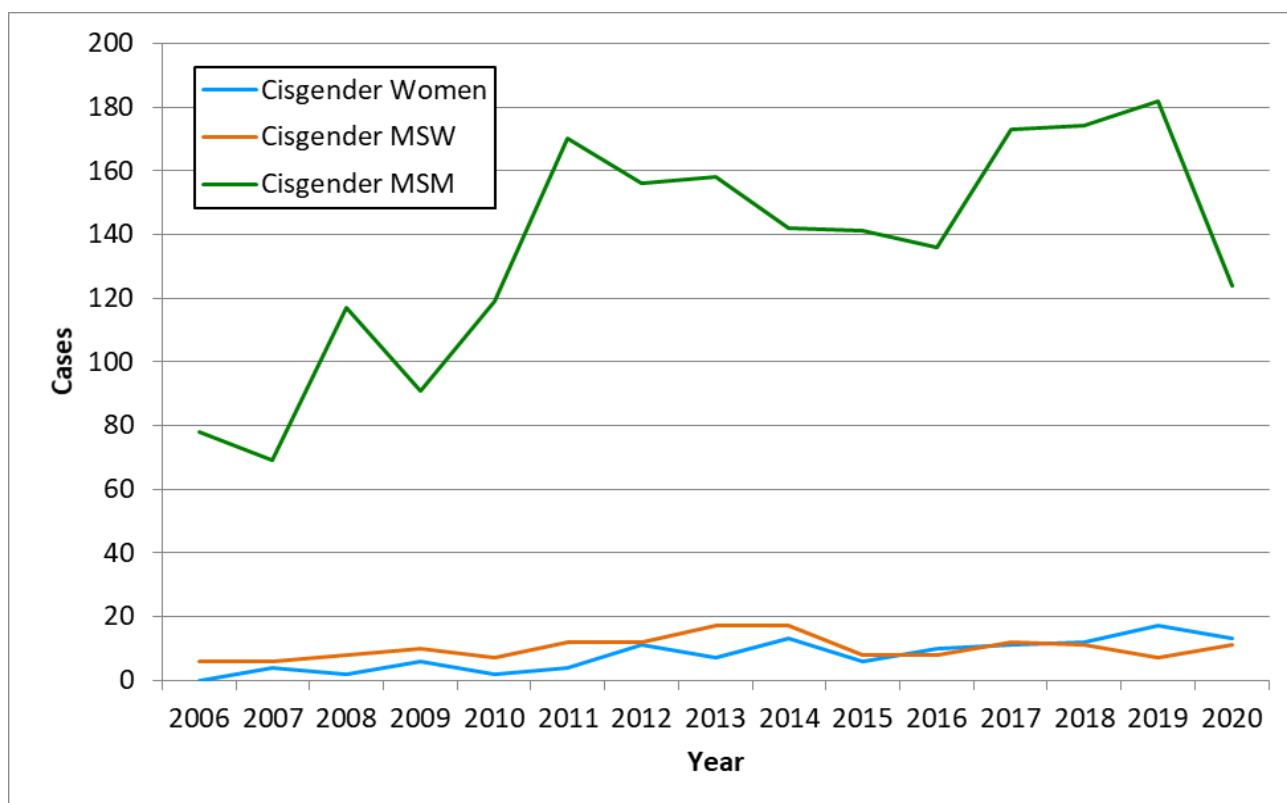
*MSM includes men who have sex with men are men who reported sex with men during any clinic visit.

Syphilis

In 2020, clinicians at the SHC diagnosed 156 syphilis cases, of which 79% (n=124) were cisgender MSM, 8% (n=13) were cisgender women, 7% (n=11) were cisgender MSW, and 5% (n=8) were transgender or non-binary/genderqueer (Figure 4-9). Seventy-six percent of syphilis

cases diagnosed at the SHC in 2020 (n=118) were early syphilis and 17% (n=27) were late latent or unknown duration syphilis; 7% (n=11) were complicated by neurosyphilis. Syphilis diagnoses in the SHC decreased 25% compared to 2019 (n=208), though diagnoses among cisgender women and MSW remained relatively stable.

Figure 4-9: Syphilis (all stages) – Number of diagnoses at Public Health – Seattle King County Sexual Health Clinic by gender and gender of sex partners, 2006-2020*



*MSM includes men who have sex with men and MSW includes men who reported sex with women only. These data exclude 86 cases among men who were missing sexual orientation information across all years.

HIV

Sexual Health Clinic clinicians diagnosed 20 new cases of HIV infection among King County residents in 2020, similar to the 24 cases newly diagnosed in 2019 (Figure 4-10). MSM accounted for 95% of the cases diagnosed in the Sexual Health Clinic in 2020.

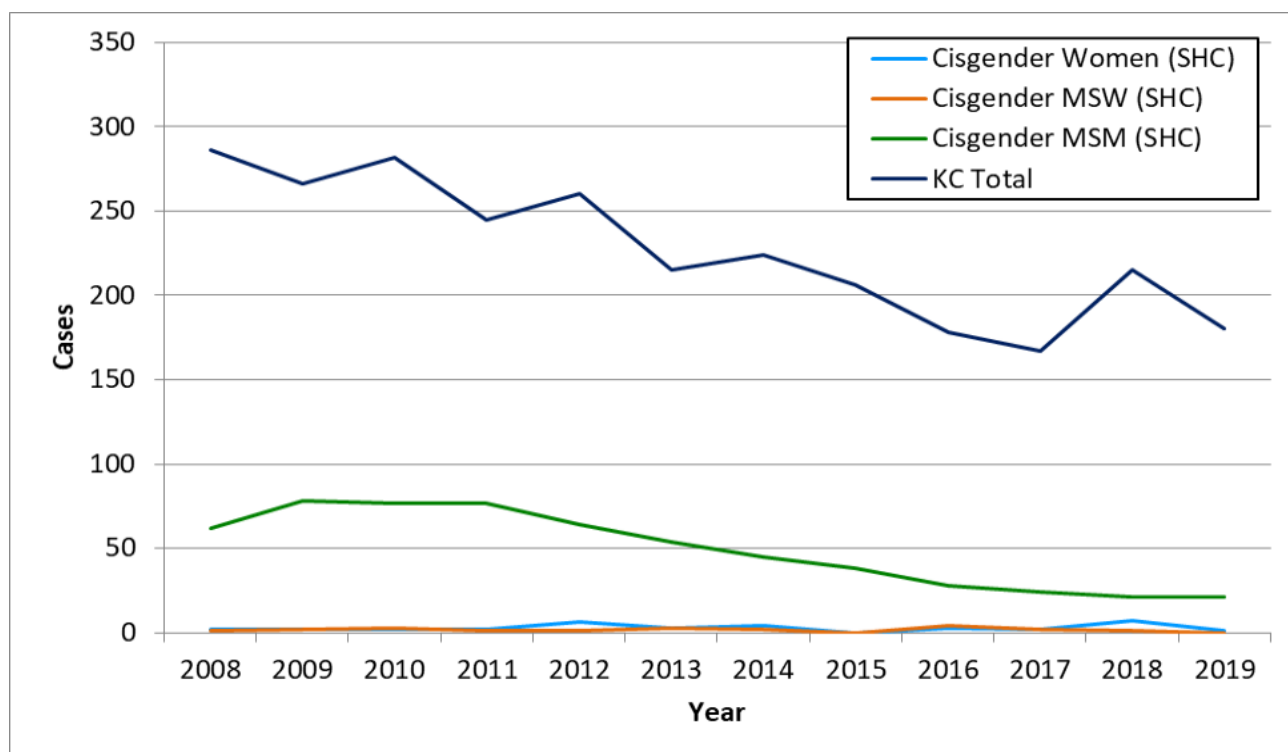
Trichomoniasis and Bacterial Vaginosis

In 2020, 47 cases of trichomoniasis were diagnosed among cisgender women in the SHC, which is a slight decrease from the 55 cases diagnosed in 2019 (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 8.1% among tested cisgender

women in 2020. Although number of cases has decreased, reflecting the pattern of fewer cisgender women SHC patients, positivity has increased among tested cisgender women.

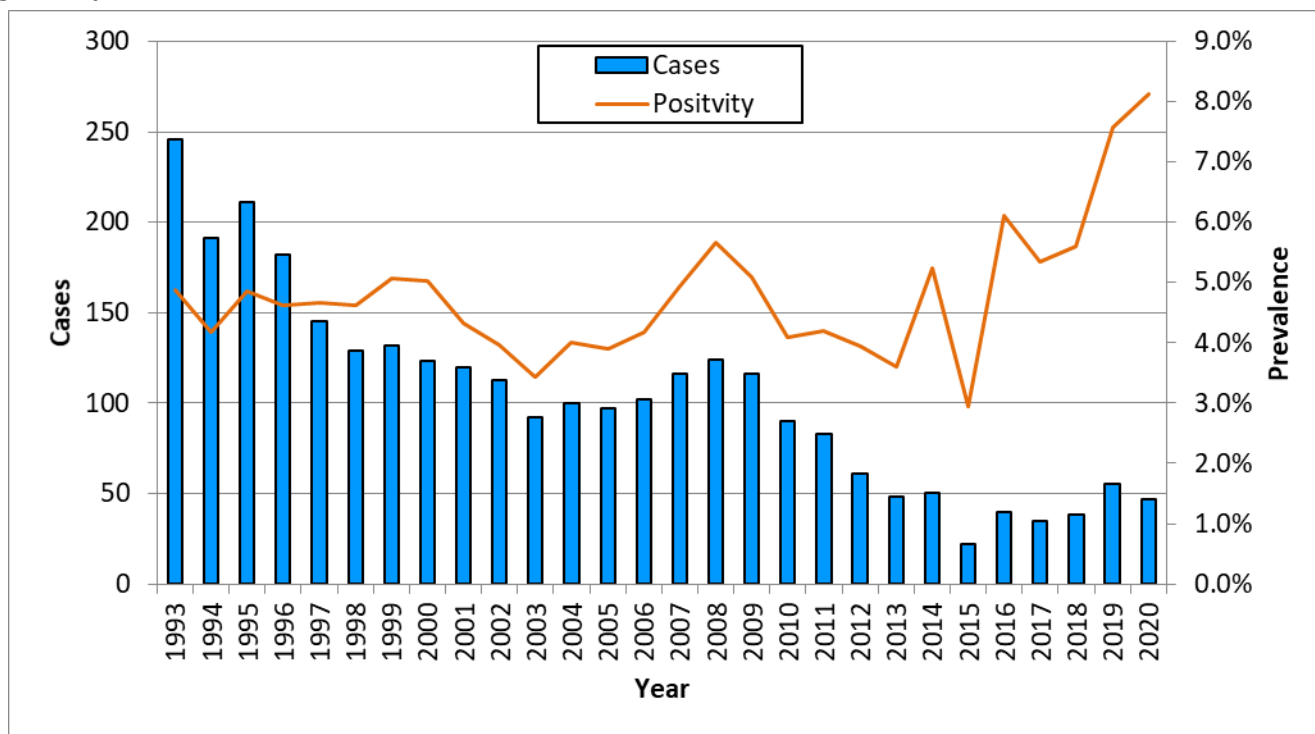
The number of cisgender women diagnosed with bacterial vaginosis in the SHC declined from 796 in 2010 to 204 in 2020, and the prevalence of bacterial vaginosis among cisgender women has remained relatively stable since 2015 (Figure 4-12). Bacterial vaginosis prevalence is calculated as the total number 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), 2008-2020



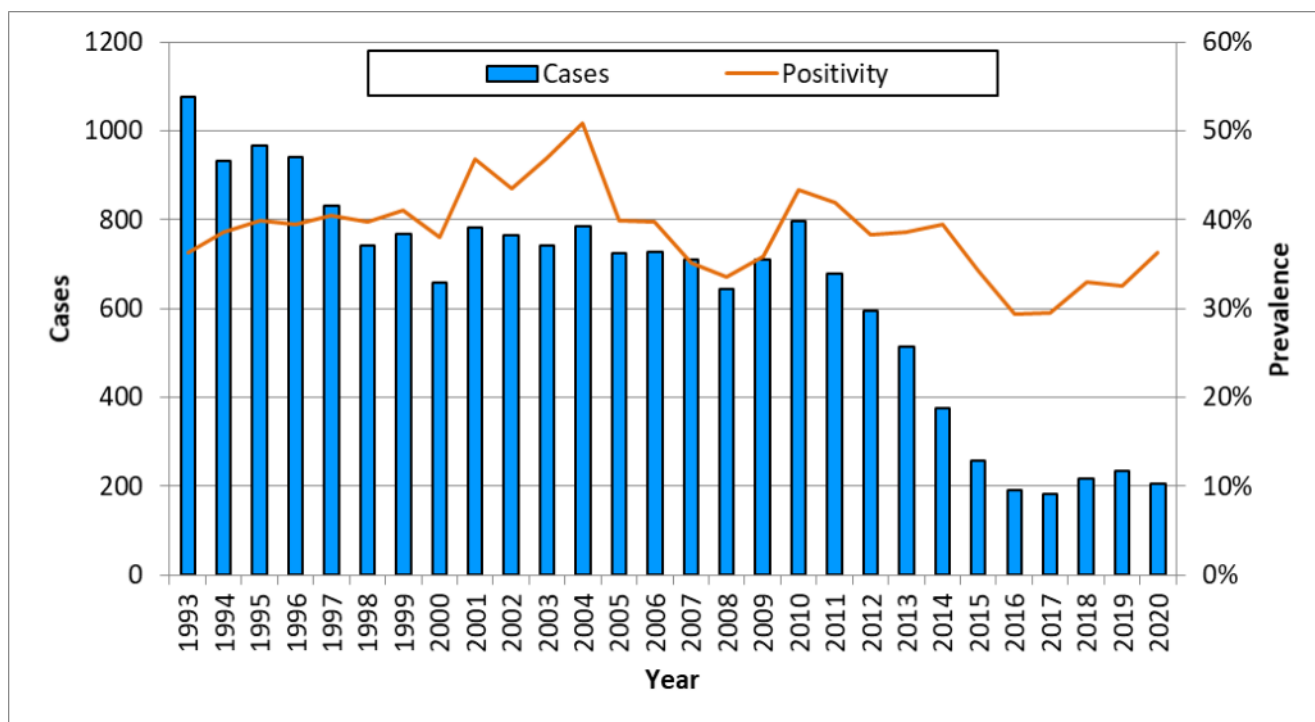
*MSM includes men who have sex with men are men who acknowledged sex with men and MSW includes men who reported sex with women only. Data limited to King County residents.

Figure 4-11: Trichomoniasis – Number of diagnoses and positivity among cisgender women Public Health – Seattle King County Sexual Health Clinic, 1993-2020



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, 1993-2020



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, and HIV pre-exposure prophylaxis (PrEP) (Table 4-4). 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) 2020

	Doses or Visits	Unique patients receiving at least one dose
	Number	Number
Immunizations		
Hepatitis A	111	105
Hepatitis B	142	120
Hepatitis A & B	175	152
Human papillomavirus	512	405
LARC		
Intrauterine device insertion	8	
Implant insertion	5	

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.

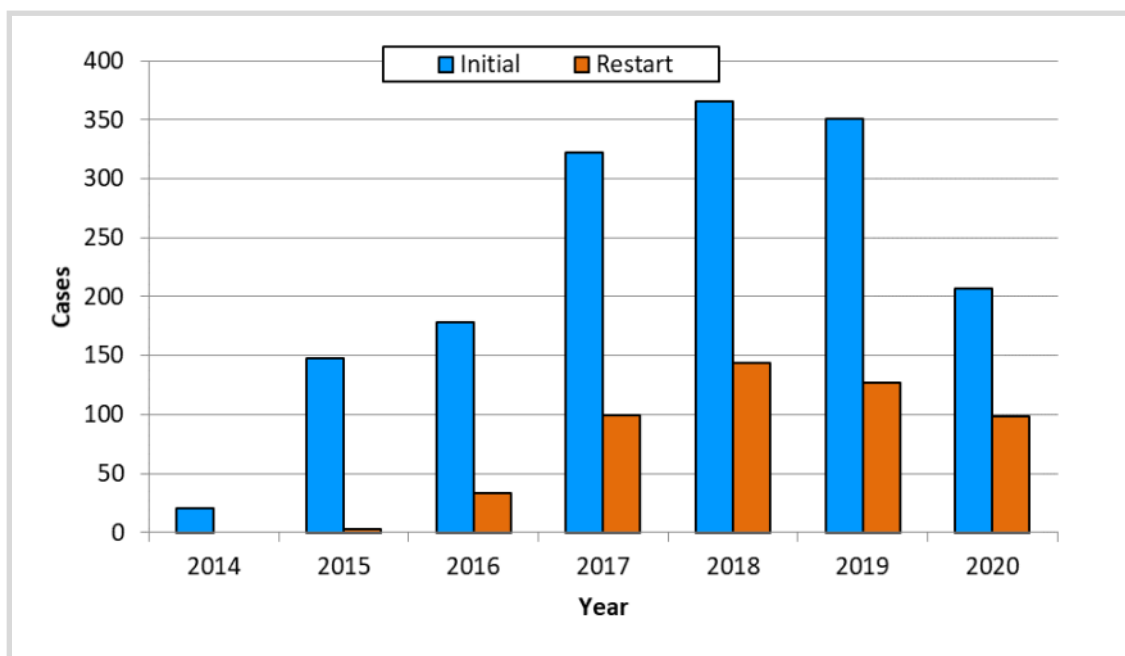
As of 2020, patients eligible to receive PrEP at the SHC include:

- Cisgender MSM and transgender patients who have sex with men
- Female sex workers who are experiencing homelessness
- 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.

Figure 5-1: Initial* and restart PrEP Visits Public Health – Seattle King County Sexual Health Clinic, 2014-2020**



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

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

Table 5-1: Public Health – Seattle King County Sexual Health Clinic patients attending initial* or restart PrEP Visits, 2014-2020**

	Initial Visits 2014 -2020		Initial Visits 2020		Restart Visits 2020	
	N	%	N	%	N	%
<i>Total</i>	<i>1,592</i>	<i>100%</i>	<i>207</i>	<i>100%</i>	<i>88</i>	<i>100%</i>
Race/ethnicity						
American Indian/Alaska Native	18	1%	2	1%	0	0%
Asian	163	10%	25	12%	12	14%
Black	156	10%	24	12%	17	19%
Hispanic/Latinx	404	25%	42	20%	18	20%
Native Hawaiian/Pacific Islander	30	2%	6	3%	1	1%
White	777	49%	102	49%	38	43%
Unknown	44	3%	6	3%	2	2%
Age						
<15 years	1	0%	0	0%	0	0%
15-19 years	54	3%	4	2%	1	1%
20-24 years	337	21%	40	19%	18	20%
25-29 years	477	30%	68	33%	26	30%
30-34 years	331	21%	41	20%	18	20%
35-44 years	246	15%	34	16%	20	23%
45-54 years	113	7%	16	8%	5	6%
>=55 years	33	2%	4	2%	0	0%
Gender						
Cisgender Men	1,484	93%	189	91%	85	97%
Cisgender Women	50	3%	9	4%	1	1%
Non-binary/Genderqueer	16	1%	2	1%	2	2%
Transgender Men	10	1%	3	1%	0	0%
Transgender Women	31	2%	4	2%	0	0%
Unknown	1	0%	0	0%	0	0%
Filled First Prescription						
Yes	1,412	89%	187	90%	76	86%
No	180	11%	20	10%	12	14%

*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 2020 are only counted once.

Table 5-2: Public Health – Seattle King County Sexual Health Clinic PrEP patients, 2020

	On PrEP at any point*		On PrEP at Year End)**	
	N	%	N	%
<i>Total</i>	773	100%	528	100%
Race/ethnicity				
American Indian/Alaska Native	5	1%	4	1%
Asian	93	12%	68	13%
Black	73	9%	43	8%
Hispanic/Latinx	195	25%	153	29%
Native Hawaiian/Pacific Islander	10	1%	4	1%
White	378	49%	246	47%
Unknown	19	2%	10	2%
Age				
<15 years	0	0%	0	0%
15-19 years	11	1%	1	0%
20-24 years	110	14%	54	10%
25-29 years	225	29%	144	27%
30-34 years	178	23%	144	27%
35-44 years	166	21%	120	23%
45-54 years	57	7%	40	8%
>=55 years	26	3%	25	5%
Gender				
Cisgender Men	736	95%	508	96%
Cisgender Women	10	1%	4	1%
Non-binary/Genderqueer	9	1%	6	1%
Transgender Men	5	1%	2	0%
Transgender Women	13	2%	8	2%
Unknown	0	0%	0	0%

*Patients were classified as on PrEP at any point in 2020 if any of their 2020 visits were coded as on PrEP.

**Patients were classified as on PrEP at year end if their last visit date in 2020 was coded as on PrEP.

Table 5-3: Public Health – Seattle King County Sexual Health Clinic patients discontinuing PrEP, 2020

	N	%
<i>Total</i>	352	100%
Race/ethnicity		
American Indian/Alaska Native	3	1%
Asian	36	10%
Black	37	11%
Hispanic/Latinx	74	21%
Native Hawaiian/Pacific Islander	8	2%
White	181	51%
Unknown	13	4%
Age		
<15 years	0	0%
15-19 years	10	3%
20-24 years	52	15%
25-29 years	103	29%
30-34 years	76	22%
35-44 years	75	21%
45-54 years	30	9%
>=55 years	6	2%
Gender		
Cisgender Men	327	93%
Cisgender Women	9	3%
Non-binary/Genderqueer	6	2%
Transgender Men	4	1%
Transgender Women	6	2%
Unknown	0	0%
Reason for Discontinuation		
HIV Positive Test at Initial Visit	4	1%
HIV Positive following missed pills	1	0%
Jail/Incarceration	0	0%
Lost to Follow-Up	183	52%
Monogamous Relationship	24	7%
Moved	55	16%
No longer at risk for HIV (as determined by patient)	31	9%
Side Effects	6	2%
Transferred	40	11%
Unknown/Other	8	2%

Patients who stop taking PrEP must be seen for a restart visit before beginning PrEP again.

PrEP capacity has greatly increased since the SHC started offering PrEP in October 2014, although the number of initial visits and restart visits declined in 2020 compared to 2019 due to the impacts of the COVID-19 pandemic (Figure 5-1). Between October 2014 and December 2020, 1,592 unique patients attended initial PrEP visits, among whom 89% filled an initial PrEP prescription (Table 5-1). As of the end of 2020, 528 SHC PrEP patients were receiving PrEP through the clinic and 773 had received PrEP through the clinic during at least one PrEP visit in 2020 (Table 5-2).

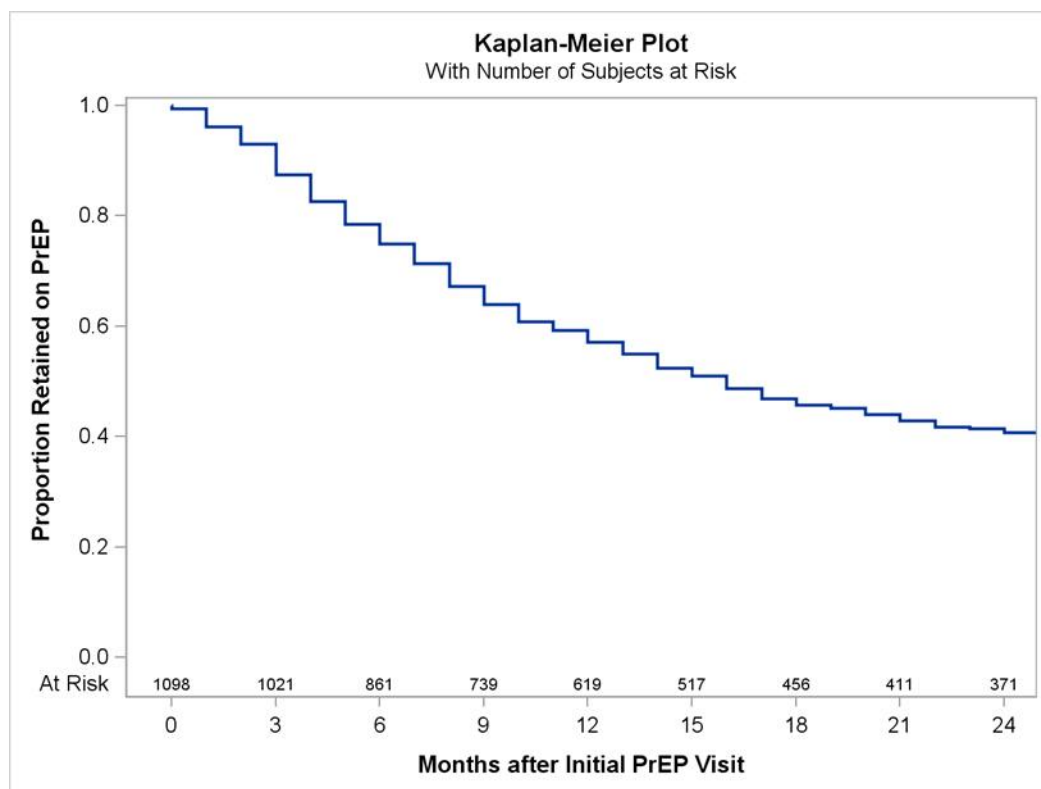
In 2020, 207 patients attended an initial PrEP visit, 90% of whom filled their first prescription (Table 5-1). Of these patients, 91% were cisgender men, 49% were White, 20%

were Hispanic/Latinx, and 52% were between the ages of 20 and 29. Eighty-eight unique patients attended a PrEP restart visit in 2020 (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, 86% filled their restart prescription. In 2020, 352 PrEP patients stopped receiving PrEP through the SHC and did not restart (Table 5-3). Over half (52%) of these patients were lost to follow-up. Transferring PrEP care to another provider (11%) and moving (16%) were the other top reasons for PrEP discontinuation at the SHC.

PrEP Discontinuation

We used Kaplan-Meier analysis to assess factors associated with PrEP discontinuation among patients who enrolled in the Sexual Health Clinic PrEP program from

Figure 5-2: Timing of PrEP Discontinuation among Patients Filling First Prescription Public Health – Seattle King County Sexual Health Clinic, 2014-2020



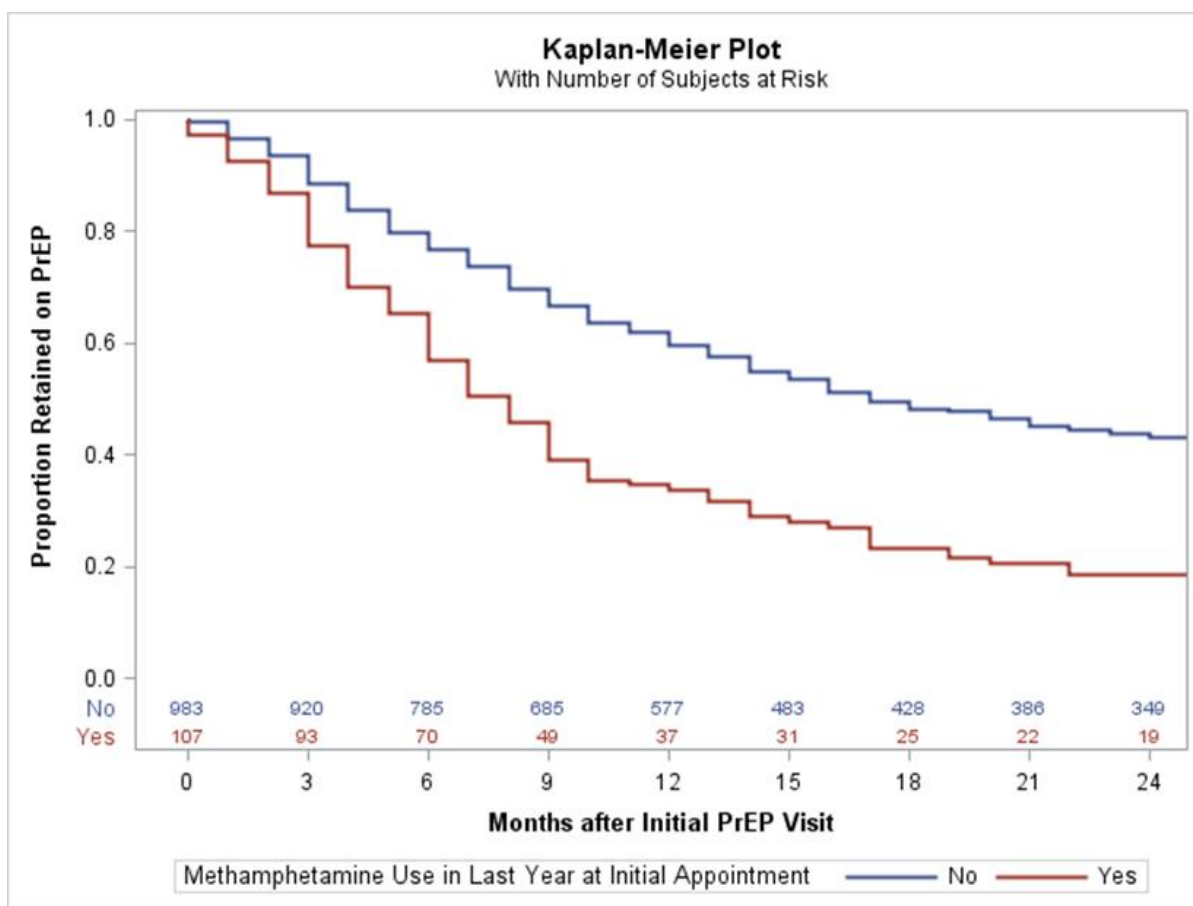
October 2014 to December 2020. Of the 1,592 patients with initial visits for PrEP, 1,098 were included in the discontinuation analysis. Patients were excluded if their first prescription was not filled ($n=194$), if they moved ($n=159$) or transferred care ($n=134$), or they tested positive for HIV at their initial visit ($n=7$).

Methamphetamine use was higher in the excluded population (13% vs 10%), but this was the only significant difference 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, 2021. The median observation time was 14 months (interquartile range, 6-

30 months). After starting, 746 patients (68%) stopped using PrEP. In the months after the initial PrEP visit, the proportion of patients on PrEP declined steadily with approximately 57% retained on PrEP by 12 months (Figure 5-2).

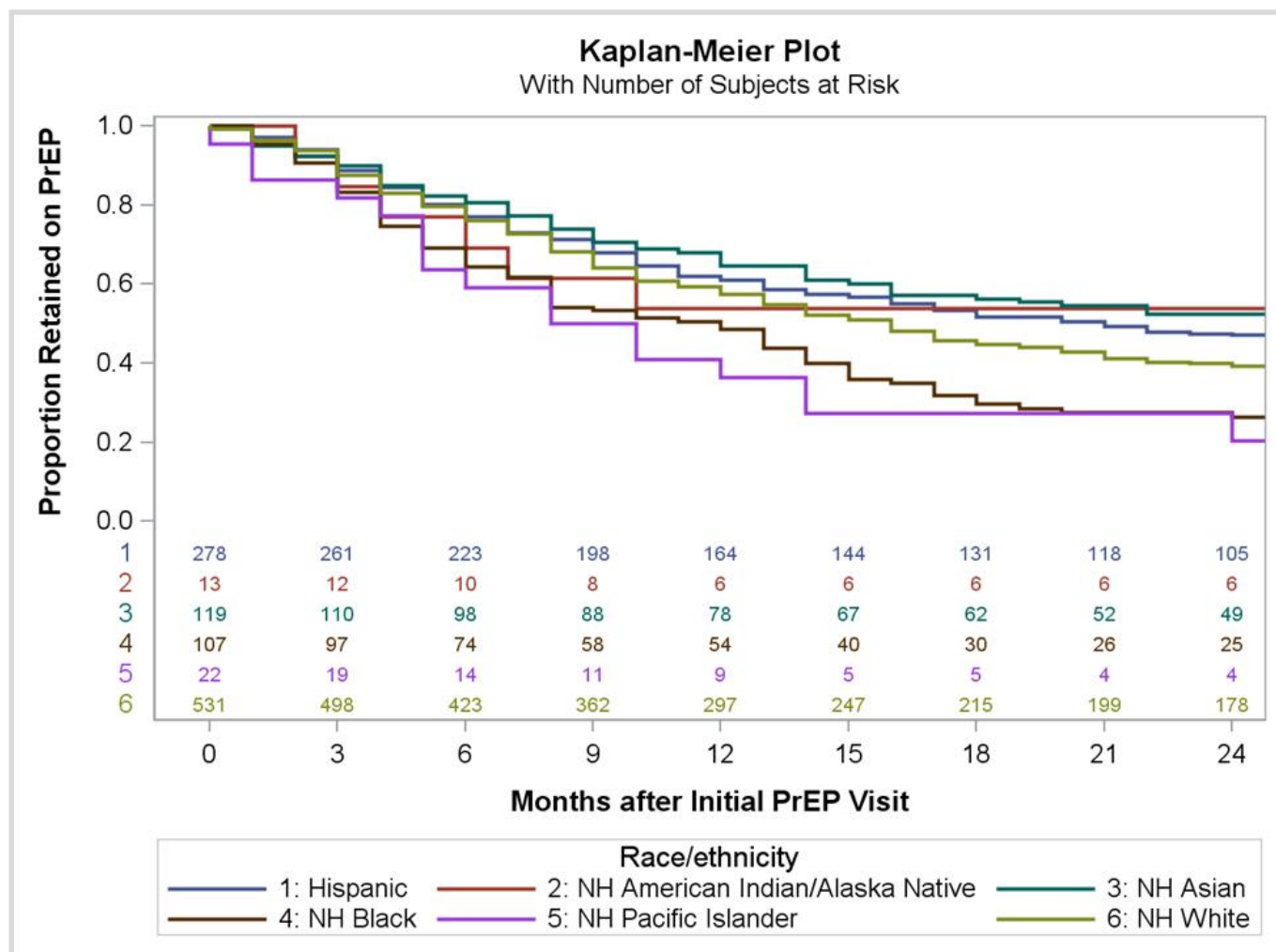
Timing of discontinuation was associated with Black race and methamphetamine use in the prior year as ascertained at the time of PrEP initiation, and young age. Only 34% of patients who reported methamphetamine use in the past year continued PrEP at 12 months compared to 60% of patients who did not report methamphetamine use in the past year (Figure 5-3). Black

Figure 5-3: Timing of PrEP Discontinuation among Patients Filling First Prescription by Methamphetamine Use Public Health – Seattle King County Sexual Health Clinic, 2014-2020



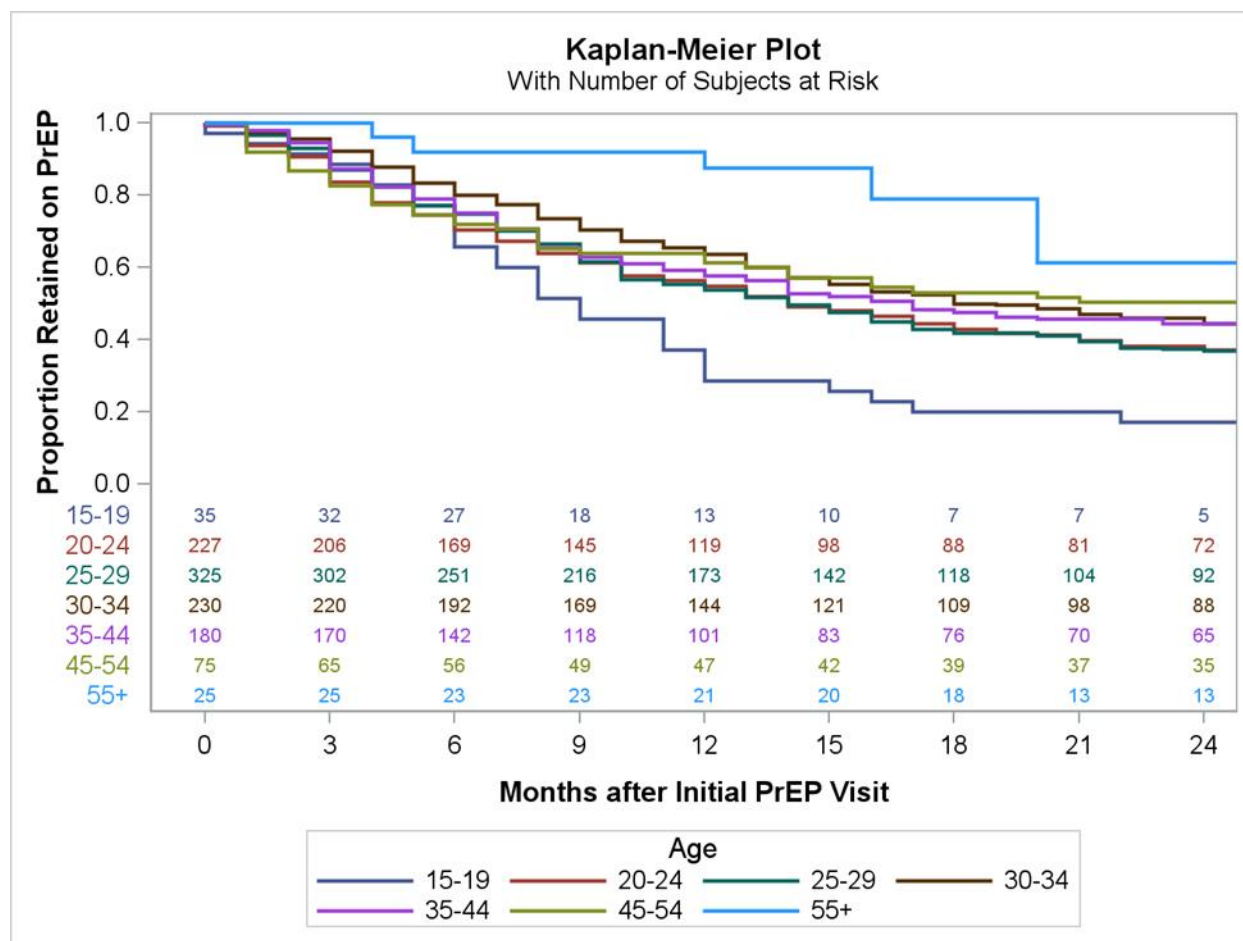
patients had lower PrEP retention at 12 months (49%) compared to Hispanic (61%), Asian (65%), and White (57%) PrEP patients (Figure 5-4). Patients ages 15-19 had the lowest retention at 12 months compared to all other age groups (Figure 5-5). Understanding the reasons for PrEP discontinuation is difficult as 69% (n=516) of the patients were lost to follow-up and for an additional 4% (n=32) the reason was unknown or other. Of the 198 patients with a known reason, 45% (n=90) discontinued because they were in a monogamous relationship with an HIV-seronegative partner or partner with undetectable HIV, 33% (n=65) determined they were no longer at risk for HIV, and 16% (n=31) 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, 2014-2020



NH = Non-Hispanic

Figure 5-5: Timing of PrEP Discontinuation among Patients Filling First Prescription by Age Public Health – Seattle King County Sexual Health Clinic, 2014-2020



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.

Syphilis

In 2020, 658 early syphilis cases and 195 late/unknown

duration cases were diagnosed among residents of King County (Table 6-1). DIS initiated investigations of 441 cases, of whom 304 (69%) were interviewed for partner services, while 36 (8%) refused partner services and 79 (18%) were not located or did not respond to contact attempts. Of the index cases interviewed by DIS, 97 cases (32%) named at least one notifiable partner with 167 total partners named (Figure 6-1). Fifty-three percent of the notifiable partners (n=89) were notified of their potential exposure and DIS confirmed that 54% (n=48) tested for syphilis. Among the tested partners, 21 cases of syphilis were newly diagnosed, which reflects 13% of the notifiable partners and 29% 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 50 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 notified 48 (54%) of the total notified partners of their potential exposure. Forty-five (27%) of the partners tested after the partner services interview, 4% (n=7) were newly diagnosed following the interview and all of these received syphilis

Table 6-1: Partner Services — Outcomes among early, late or unknown duration, and total syphilis cases, King County, WA, 2020

	Early Syphilis		Late or Unknown Syphilis		Total Syphilis	
	Number (%)	Index	Number (%)	Index	Number (%)	Index
Index Cases Diagnosed	658		195		853	
Index Cases Initiated	322 (49)		119 (61)		441 (52)	
Index Cases Interviewed	224 (70)		80 (67)		304 (69)	
Median Days from Treatment to Interview (Interquartile Range)	5 (0-18)		6.5 (0-15.5)		6 (0-18)	
Index Cases Naming ≥1 Contact	76 (34)		21 (26)		97 (32)	
Number of Partners Named	145		22		167	
Contact Index		0.65		0.28		0.55
Notified based on Index Case Report	75 (52)		14 (64)		89 (53)	
Notified by DIS	42 (56)		6 (43)		48 (54)	
Notification Index (DIS)		0.19		0.08		0.16
Tested for Syphilis	61 (42)		12 (55)		73 (44)	
Testing Index		0.27		0.15		0.24
Before Interview	22 (15)		6 (27)		28 (17)	
After Interview	39 (27)		6 (27)		45 (27)	
Testing Index (DIS)		0.17		0.08		0.15
Newly Diagnosed with Syphilis	18 (12)		3 (14)		21 (13)	
Before Interview	12 (8)		2 (9)		14 (8)	
After Interview	6 (4)		1 (5)		7 (4)	
Treated	18 (12)		3 (14)		21 (13)	
Brought to Treatment Index		0.08		0.04		0.07
Before Interview	13 (9)		2 (9)		15 (9)	
After Interview	5 (3)		1 (5)		6 (4)	
Brought to Treatment Index (DIS)		0.02		0.01		0.02
Partners Epi Treated	60 (41)		11 (50)		71 (43)	
Epi Index		0.27		0.14		0.23
Before Interview	21 (14)		5 (23)		26 (16)	
After Interview	39 (27)		6 (27)		45 (27)	
Epi Index (DIS)		0.17		0.08		0.15

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 — Outcomes among syphilis cases by gender and gender of sex partners*, King County, WA, 2020

	Cisgender Men who have sex with men				Cisgender Heterosexuals			
	Early Syphilis		Late or Unknown Syphilis		Early Syphilis		Late or Unknown Syphilis	
	Number (%)	Index	Number (%)	Index	Number (%)	Index	Number (%)	Index
Index Cases Diagnosed	465		90		114		73	
Index Cases Initiated	181 (39)		56 (62)		108 (95)		57 (78)	
Index Cases Interviewed	141 (78)		39 (70)		64 (59)		38 (67)	
Median Days from Treatment to Interview (Interquartile Range)	2.5 (0-18)		7.5 (0-12.5)		7 (0-16)		6 (0-19)	
Index Cases Naming ≥1 Contact	46 (33)		11 (28)		25 (39)		10 (26)	
Number of Partners Named	94		11		41		11	
Contact Index		0.67		0.28		0.64		0.29
Notified based on Index Case Report	50 (53)		6 (55)		24 (59)		8 (73)	
Notified by DIS	30 (32)		4 (36)		11 (27)		2 (18)	
Notification Index (DIS)		0.21		0.10		0.17		0.05
Tested for Syphilis	36 (38)		4 (36)		18 (44)		8 (73)	
Testing Index		0.26		0.10		0.28		0.21
Before Interview	16 (17)		1 (9)		6 (15)		5 (45)	
After Interview	20 (21)		3 (27)		12 (29)		3 (27)	
Testing Index (DIS)		0.14		0.08		0.19		0.08
Newly Diagnosed with Syphilis	10 (11)		1 (9)		7 (17)		3 (27)	
Before Interview	8 (9)		1 (9)		3 (7)		2 (18)	
After Interview	2 (2)		0 (0)		4 (10)		1 (9)	
Treated for Syphilis	11 (12)		0 (0)		4 (10)		3 (27)	
Brought to Treatment Index		0.08		0.00		0.06		0.08
Before Interview	9 (10)		0 (0)		4 (10)		2 (18)	
After Interview	2 (2)		0 (0)		3 (7)		1 (9)	
Brought to Treatment Index (DIS)		0.01		0.00		0.05		0.03
Partners Epi Treated:	38 (40)		3 (27)		13 (32)		8 (73)	
Epi Index		0.27		0.08		0.20		0.21
Before Interview	15 (16)		0 (0)		6 (15)		5 (45)	
After Interview	23 (24)		3 (27)		10 (24)		3 (27)	
Epi Index (DIS)		0.16		0.08		0.16		0.08

*Excludes 90 cases among men missing gender of sex partner information and 21 transgender or non-binary/genderqueer cases.

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

treatment. Of the 71 partners were receiving treatment for syphilis, including those who did not test positive for syphilis or were not tested (i.e., treated for possible incubating syphilis), 64% (n=45) received treatment following the partner services interview. Partner services outcomes were similar between cisgender MSM and heterosexuals (Table 6-2).

Gonorrhea

In 2020, DIS initiated investigations of 1,162 gonorrhea index cases for partner services, of which 676 (58%) were interviewed. Cisgender MSM accounted for 394 (34%) of the initiated cases and cisgender heterosexuals accounted for 768 (66%) (Tables 6-3 and 6-4). Among cisgender MSM, 268 (68%) cases were interviewed, 45 (11%) refused interview, and 49 (12%) were not located or did not respond to contact attempts. Among the cisgender heterosexual cases, 408 (53%) were interviewed, 102 (13%) refused interview, and 215 (28%) were not located or did not respond to contact attempts. The overall contact index among interviewed clients (partners named per index case) was 0.29 and was slightly higher among cisgender MSM cases compared to heterosexual cases. A total of 135 partners tested for gonorrhea and chlamydial infection, of whom 40 (30%)

tested positive for gonorrhea or chlamydial infection.

However, only 11 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 421 interviewed cases of syphilis and gonorrhea among cisgender MSM in 2020, 78 (19%) were persons living with HIV, 147 (48%) were currently taking PrEP, and 196 (47%) were eligible for PrEP, 120 of whom were offered a referral for PrEP. Of the 70 cases who accepted a referral for PrEP services through partner services, 46 (66%) accepted a referral to the PHSKC SHC PrEP program and 24 (34%) accepted a referral to another provider (Figure 6-2). Of those who accepted a referral to the PHSKC SHC, 18 (39%) started PrEP at the PHSKC SHC.

Table 6-3: Partner Services — Outcomes among cisgender MSM* gonorrhea cases, King County, WA, 2020

	Number (%)	Index
Index Cases Diagnosed	1,735	
Index Cases Assigned to DIS for Initiation	394 (23)	
Index Cases Interviewed	268 (68)	
Index Cases Naming ≥ 1 Contact	46 (17)	
Median Days from Assigned to Interview (Interquartile Range)	0 (0-3)	
Number of Partners Named	86	
Contact Index		0.32
Notified based on Index Case Report	46 (53)	
Notified by DIS	27 (31)	
Notification Index (DIS)		0.10
Tested for Chlamydia/Gonorrhea	60 (70)	
Testing Index		0.22
Newly Diagnosed with Chlamydia and/or Gonorrhea	11 (13)	
Before Interview	7 (8)	
After Interview	4 (5)	
Case Finding Index (DIS)		0.01
Treated for Chlamydia and/or Gonorrhea	11 (13)	
Treatment Verified	10 (12)	
Brought to Treatment Index		0.04
Before Interview	5 (6)	
After Interview	6 (7)	
Brought to Treatment Index (DIS)		0.02

*MSM = cisgender men who have sex with men

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

Table 6-4: Partner Services — Outcomes among cisgender heterosexual gonorrhea cases, King County, WA, 2020

	Number (%)	Index
Index Cases Diagnosed	2,469	
Number of Index Cases Assigned for Initiation	768 (31)	
Number of Index Cases Interviewed	408 (53)	
Number of Index Cases Naming ≥1 Contact		
Median Days from Assigned to Interview (Interquartile Range)	1 (0-6)	
Number of Interviewed Index Cases:		
With any untreated partners	47 (12)	
Accepting DIS Partner Notification Assistance	23 (6)	
Number of Partners Named	109	
Contact Index		0.27
Index Case Requested DIS/Staff Contact	26 (24)	
Notified by DIS	7 (6)	
Notification Index (DIS)		0.02
Tested for Chlamydia and/or Gonorrhea	75 (69)	
Testing Index		0.18
Newly Diagnosed with Chlamydia or Gonorrhea	29 (27)	
Before Interview	24 (22)	
After Interview	5 (5)	
Case Finding Index (DIS)		0.01
Treated for Chlamydia or Gonorrhea	28 (26)	
Treatment Verified	27 (25)	
Brought to Treatment Index		0.07
Before Interview	22 (20)	
After Interview	6 (6)	
Brought to Treatment Index (DIS)		0.02

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

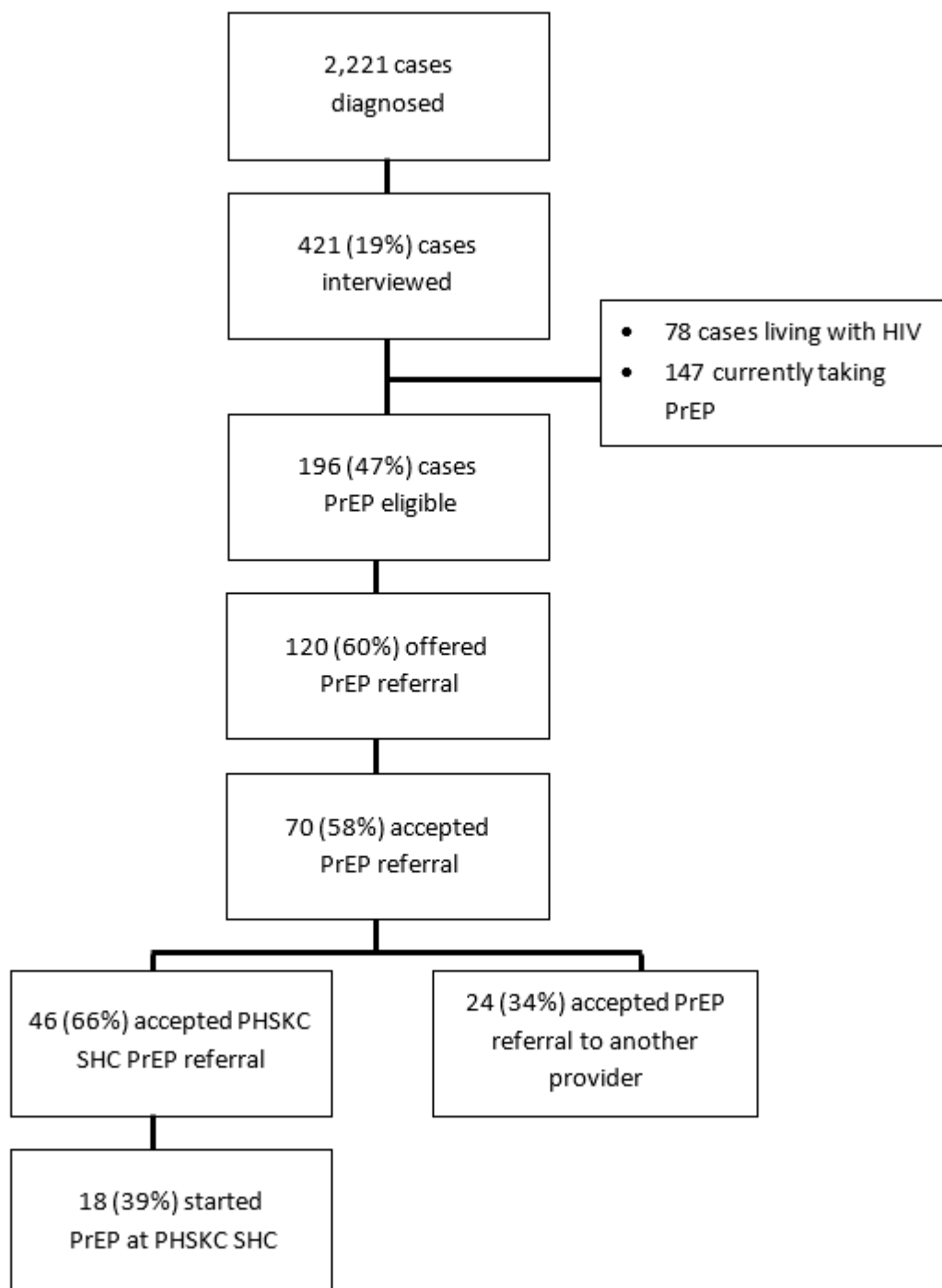
Case finding index = partners identified as new chlamydia and/or gonorrhea cases per index case interviewed

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

Figure 6-1: Flowchart of partner services outcomes among syphilis cases, King County, WA 2020



Figure 6-2: PrEP among cisgender men who have sex with men (MSM) syphilis and gonorrhea cases, King County, WA 2020



*MSM = men who have sex with men

**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 SHC.