

2019
King County
Sexually Transmitted Infection
Epidemiology Report



Public Health
Seattle & King County



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Executive Summary

The 2019 Sexually Transmitted Infections (STI) Epidemiology report describes recent trends in chlamydial infection, gonorrhea, and syphilis among King County residents and additional STIs, clinical services, and PrEP use among Public Health – Seattle & King County (PHSKC) Sexual Health Clinic (SHC, formerly the STD Clinic) patients. Left untreated, these infections may cause serious long-term health consequences including infertility and vision loss. The information contained in this report will be useful to providers, policy-makers, researchers and others interested in reducing the transmission of sexually transmitted infections in King County.

Key 2019 STI epidemiology findings in King County include:

- **Rates of bacterial STIs among cisgender men who have sex with men (MSM) continued to increase, reaching historic highs.** In 2019, rates of syphilis, gonorrhea, and chlamydia among MSM in King County reached their highest levels since data became available in 1992. While some of the observed increase in STI rates likely reflect increased screening, particularly increased testing of asymptomatic persons, consistently high rates of urethral gonorrhea and symptomatic syphilis strongly suggests that true increases in the rates of these infections are ongoing. The causes for these increases are uncertain, but likely include decreased condom use in an era of decreased HIV transmission. The rise in STI rates among cisgender MSM merit 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 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>

Executive Summary

- **Chlamydia rates among cisgender heterosexuals increased in 2019.** After a few years of relatively stable rates among cisgender women and cisgender men who have sex with women only (MSW), the rates increased 15% and 19% compared to 2018, respectively. Young cisgender women continue to experience high incidence of chlamydial infection.
- **Gonorrhea rates among cisgender heterosexuals increased and the rate among cisgender women increased 128% in the last decade.** The rate of gonorrhea among cisgender women in King County has increased steadily since 2012. This increase was first observed in Washington State and other western U.S. states 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.

PHSKC and the Washington State Department of Health (WA DOH) provide free medications for medical providers to use as expedited partner therapy (EPT). More information about EPT is available at:

<https://www.kingcounty.gov/depts/health/communicable-diseases/hiv-std/providers/partner-notification/ept-guidelines.aspx>

- **An estimated 9% of gonorrhea in King County is resistant to azithromycin.** In 2019, 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 13% of all reported gonorrhea cases for antimicrobial resistance in 2019. Of tested cases, 9% were resistant to azithromycin, 1% were resistant to cefixime, and 1% were resistant to ceftriaxone.

In the 2020 STD Update to the Gonorrhea Treatment Guidelines, the CDC recommended a single 500 mg intramuscular dose of ceftriaxone for uncomplicated gonorrhea¹. 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.

¹St. 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](http://dx.doi.org/10.15585/mmwr.mm6950a6external%20icon).

Executive Summary

- **Syphilis (all stages) rates among cisgender women increased 21% between 2018 and 2019 and have increased 400% since 2010.** Although the overall incidence of syphilis among cisgender women remains low, the incidence has increased substantially over the last decade. In 2019, medical providers diagnosed 86 King County cisgender women with syphilis, including 32 cases of early syphilis. Three cases of congenital syphilis occurred in King County in 2019 following several years without a single case of congenital syphilis.

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.
- **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, Hispanic/Latinx men experience the highest incidence of gonorrhea and chlamydial infection, with rates almost twice those observed in White MSM.
- **The PHSKC Sexual Health Clinic remains a vital resource, diagnosing a substantial proportion of all reportable STIs reported in King County.** In 2019, the clinic diagnosed 19% of early syphilis cases in the county, 17% 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.
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Executive Summary

- **Family planning clinics play a critical role in the control of STIs in King County.** Family planning clinics diagnosed 15% of the reported cases of chlamydial infections with a reported provider type, including 22% of cases among cisgender women in King County². Additionally, family planning clinics diagnosed 7% of all reported gonorrhea cases and 2% of all early syphilis cases.

²See data limitations for more information about chlamydia provider data.

Data Sources and Technical Notes

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 1992-2019 and reported through June 1, 2020. 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 2019. 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 2019 estimate uses data from 2017 and 2018).

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%

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

Data Sources and Technical Notes

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 young women be screened for chlamydia annually, and the absence of corresponding recommendations for young 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.

Due to lack of funding for staff to enter chlamydia cases into the surveillance system, only cases reported by providers were entered and those reported only by electronic laboratory report (ELR) were not entered starting in September 2019. The estimated the number of chlamydial infections in King County in 2019 was obtained by combining the entered case reports and the ELRs. However, ELR cases have limited patient data, including patient sex 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. MSM cases of chlamydial infection for 2019 were estimated using the average percentage of MSM cases among all reported cases among cisgender men of the past five years multiplied by the number of ELR chlamydial infections among men. In the last five years, MSM accounted for an average of 46% of cases of chlamydial infection among men. From September 2019 to December 2019, 1,293 ELRs for chlamydial infections among men were received and 46% for these were estimated to be MSM.

Data Sources and Technical Notes

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 2019, 13% of gonorrhea cases among cisgender men and 6% 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 1992-2019 and other analyses are limited to data from the current STI surveillance system (2007-2019).

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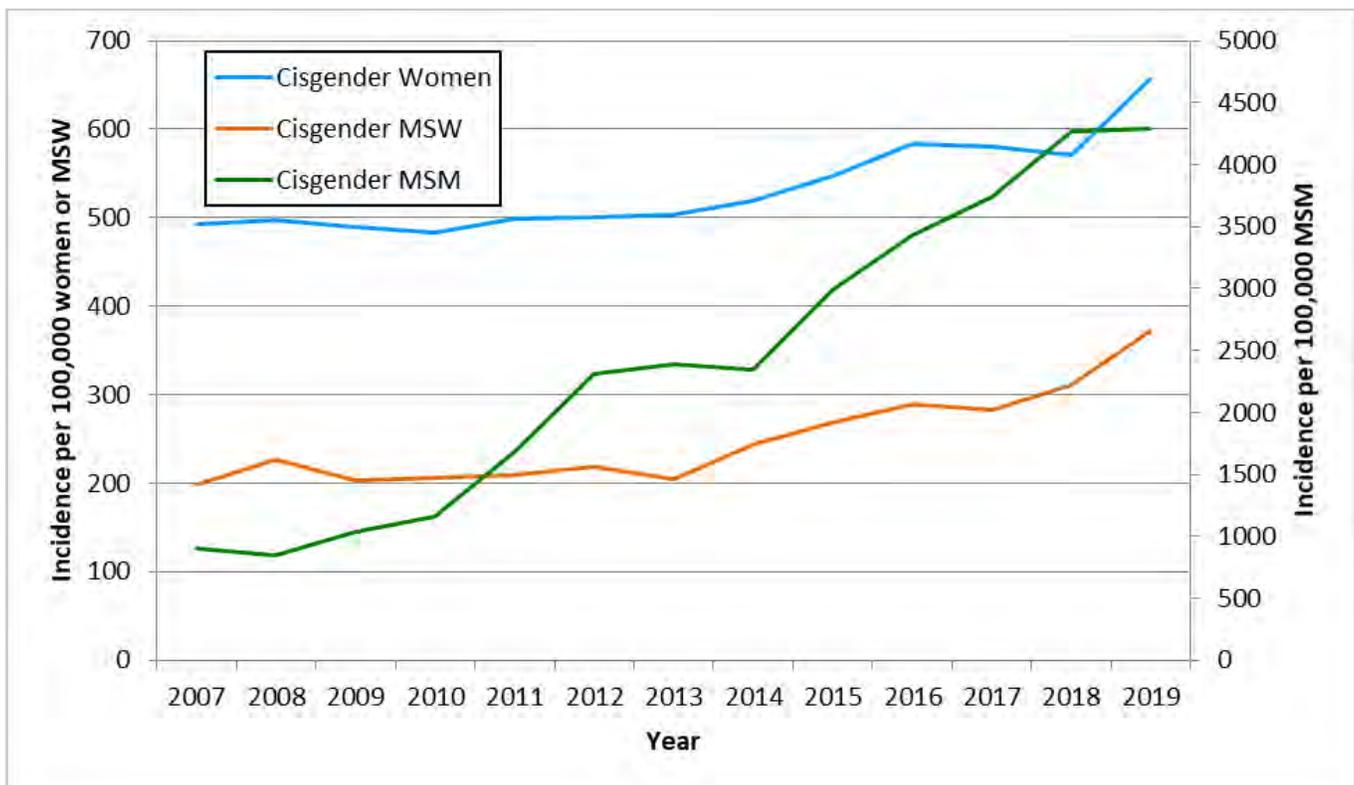
Chlamydial Infection

Overview

In 2019, an estimated 12,097 cases of chlamydial infection were reported among King County residents³, representing an overall reported incidence of 543 per 100,000 people (Table 1), a 14% increase over the incidence in 2018. Among cisgender women, 6,222 cases were reported for an incidence of 559 per 100,000 women, and 5,810 cases were reported among men for a reported incidence of 522 per 100,000 men (Table 1). However, similar incidence in cisgender men and women obscure substantial heterogeneity within these populations. The estimated incidence of reported

chlamydial infection in persons ages 15 years and older was much higher among MSM (4,291 per 100,000) than among cisgender women (658 per 100,000), and the rate in MSW (372 per 100,000) was substantially lower than that observed in cisgender women and less than 10% of that seen in MSM (Figure 1). In 2019, 27 cases of chlamydial infection were diagnosed among transgender women and 4 cases were diagnosed among transgender men. These numbers are almost certainly undercounts because laboratory reports do not contain gender identity information and 24% of cases reported in 2019 were missing gender identity.

Figure 1: Chlamydial Infection – Incidence among cisgender women, heterosexual cisgender men (MSW), and cisgender men who have sex with men (MSM) ages 15 years and older, King County, WA, 2007-2019



³See data limitations for changes to chlamydia case counts for 2019.

Chlamydial Infection

Table 1: Chlamydial Infection – Number of reported cases and incidence by gender*, King County, WA, 1992-2019

Year	Cisgender Women		Cisgender Men		Transgender Women	Transgender Men	Total	
	Cases	Incidence per 100,000 population	Cases	Incidence per 100,000 population	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	3,896	416	1,836	197	1	0	5,738	307
2008	3,969	419	2,028	215	0	0	5,997	317
2009	3,918	410	1,960	206	0	1	5,879	308
2010	3,929	405	2,056	214	1	0	5,986	310
2011	4,087	419	2,331	241	2	0	6,420	330
2012	4,110	419	2,690	276	4	1	6,805	348
2013	4,171	420	2,660	269	4	2	6,837	345
2014	4,383	434	3,099	308	12	3	7,497	372
2015	4,722	499	3,715	414	3	8	8,448	458
2016	5,130	487	4,244	404	18	7	9,401	447
2017	5,227	485	4,536	422	19	14	9,799	455
2018	5,221	477	5,210	476	26	13	10,478	478
2019	6,222	559	5,810	522	27	4	12,097	543

*Data for transgender cases are available starting in 2007 and rates 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.

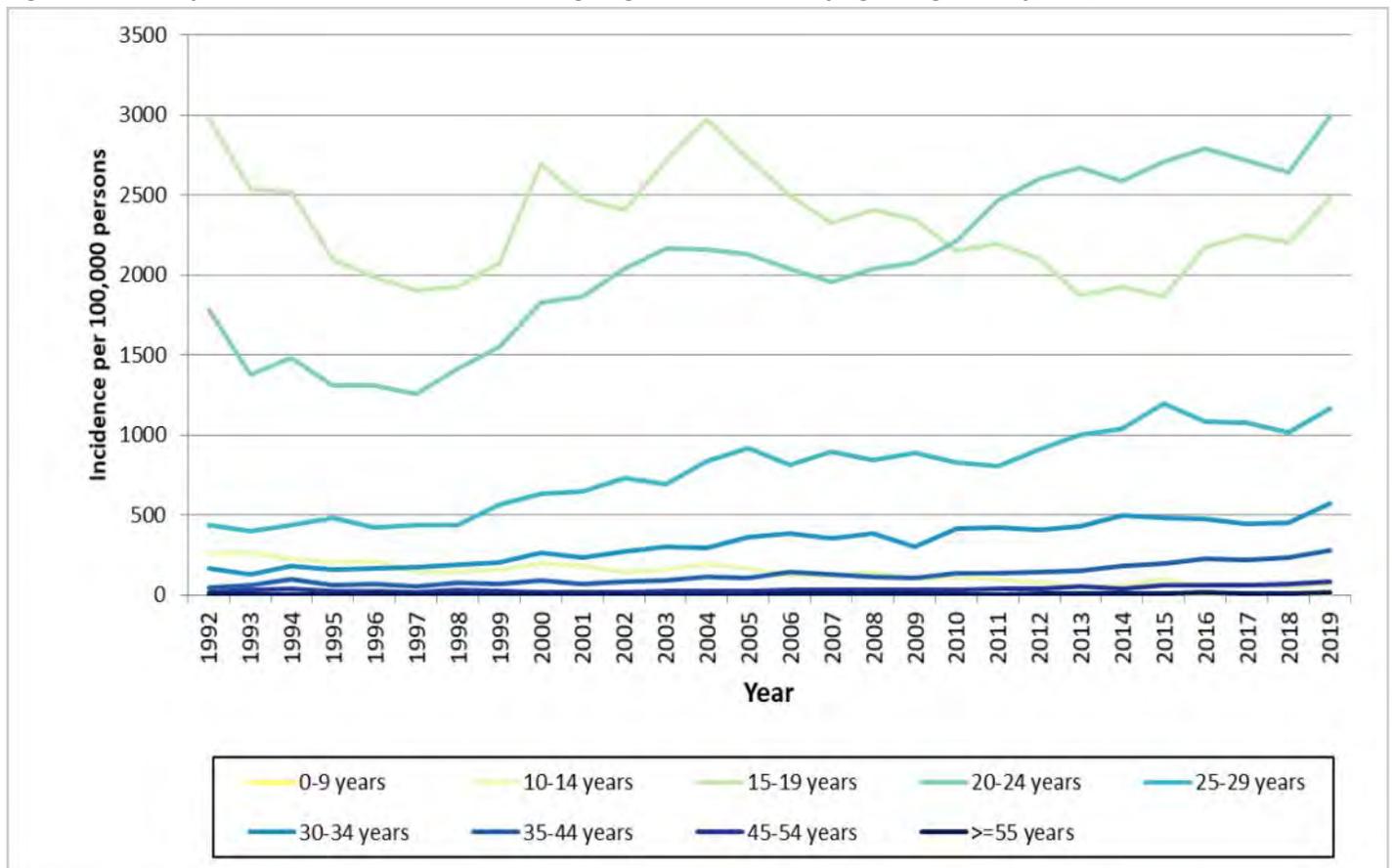
Chlamydial Infection

Age and gender

Among cisgender heterosexuals, chlamydia rates are highest among adolescents and young adults. In the 1980s and 1990s, adolescent ages 15-19 years had the highest rates of chlamydia diagnosis among cisgender women. However, since 2011 the rate among King County cisgender women ages 20-24 years has exceeded that of adolescents ages 15-19 years, reflecting a 37% reduction in the rate of chlamydia diagnoses among teens between 2004, when the rate was highest, and 2015, when the rate of chlamydial infection was lowest

(Figure 2). During this same period, the rate of chlamydial infection among cisgender women ages 20-24 consistently rose. The reasons for this change are uncertain but may reflect later age of sexual debut and increased condom use⁴. More recently, since 2015 the rate of chlamydia among cisgender women aged 15-24 has consistently risen, including among cisgender women ages 15-19, and in 2019, the rate of chlamydia in cisgender women aged 15-24 hit a new high (2,753 cases per 100,000).

Figure 2: Chlamydial Infection – Incidence among cisgender women by age King County, WA, 1992-2019*



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

⁴Abma 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.

Chlamydial Infection

Table 2: Chlamydial Infection – Incidence of reported among cisgender men and cisgender women ages 15-29, King County, WA, 1992-2019

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	2,658	1,531	805	452	3,464	985
1993	2,212	1,276	695	390	2,908	827
1994	2,302	1,337	637	358	2,939	840
1995	2,051	1,188	642	359	2,693	766
1996	1,976	1,136	664	367	2,640	744
1997	1,942	1,105	644	353	2,586	722
1998	2,081	1,170	788	426	2,869	790
1999*	2,357	1,320	934	502	3,291	903
2000	3,018	1,679	1,154	617	4,171	1,138
2001	2,877	1,595	1,065	569	3,942	1,072
2002	3,050	1,669	1,215	642	4,265	1,146
2003	3,312	1,795	1,385	725	4,698	1,251
2004	3,589	1,917	1,349	696	4,938	1,296
2005	3,536	1,860	1,508	768	5,045	1,305
2006	3,359	1,716	1,307	647	4,666	1,173
2007	3,319	1,660	1,168	567	4,487	1,106
2008	3,406	1,683	1,349	647	4,755	1,157
2009	3,439	1,690	1,340	640	4,779	1,157
2010	3,310	1,651	1,302	628	4,612	1,130
2011	3,462	1,737	1,408	682	4,870	1,200
2012	3,478	1,794	1,627	814	5,105	1,296
2013	3,497	1,789	1,530	762	5,027	1,269
2014	3,597	1,788	1,817	880	5,414	1,328
2015	3,864	1,869	2,056	969	5,920	1,413
2016	4,209	1,925	2,334	1,041	6,543	1,478
2017	4,325	1,901	2,499	1,074	6,824	1,483
2018	4,258	1,833	2,665	1,124	6,923	1,475
2019	4,896	2,069	2,963	1,230	7,859	1,646

*Some PHSKC clinics began using NAAT testing for chlamydial infection in 1994, and all PHSKC clinics were using NAATs by 1999.

Chlamydial Infection

Table 3: Chlamydial Infection – Number of reported cases and incidence among cisgender men and cisgender women by age King County, WA, 2019

Age	Cisgender Women (N=6,222)		Cisgender Men (N=5,810)	
	Cases	Incidence per 100,000 population	Cases	Incidence per 100,000 population
0-9 years	0	0	1	1
10-14 years	41	66	2	3
15-19 years	1,558	2,481	444	688
20-24 years	2,145	2,992	1,167	1,646
25-29 years	1,193	1,168	1,352	1,282
30-34 years	567	571	990	917
35-44 years	456	277	1,051	604
45-54 years	119	87	521	367
>=55 years	45	16	223	88
Unknown	98		59	

Among men, reported incidence was also highest among the 20-24 year age group. Higher rates among cisgender women than men largely reflect differential screening practices in King County, where asymptomatic cisgender women are more frequently screened for chlamydial infection compared to men (Tables 2 and 3).

Cisgender men who have sex with men

The incidence of reported chlamydial infection among MSM has increased 5-fold since 2008 (Figure 1), and in 2019, 2,559 cases of chlamydial infection were reported among MSM for an estimated incidence of 4,291 per 100,000 MSM, up from 2,999 per 100,000 in 2015. However, much of this increase reflects increasing screening for rectal chlamydia using highly

sensitive nucleic acid amplification tests. This is apparent when evaluating trends in the number of infections among MSM at different anatomic sites (Figure 2 3A and 3B). From 2010 to 2019⁵, the rate of reported rectal chlamydial infection among MSM rose from 464 to 4,148 cases per 100,000, more than a 790% increase. Meanwhile, the rate of urethral infection increased from 730 to 833 cases per 100,000, a 14% increase. Rectal chlamydia is usually an asymptomatic infection diagnosed through screening and changes in incidence reflects both changes in true incidence (the number of infections occurring in the population) and screening (the number of asymptomatic infections identified through testing). In 2019, 17% of MSM diagnosed with rectal infections reported symptoms as the reason testing (this excludes

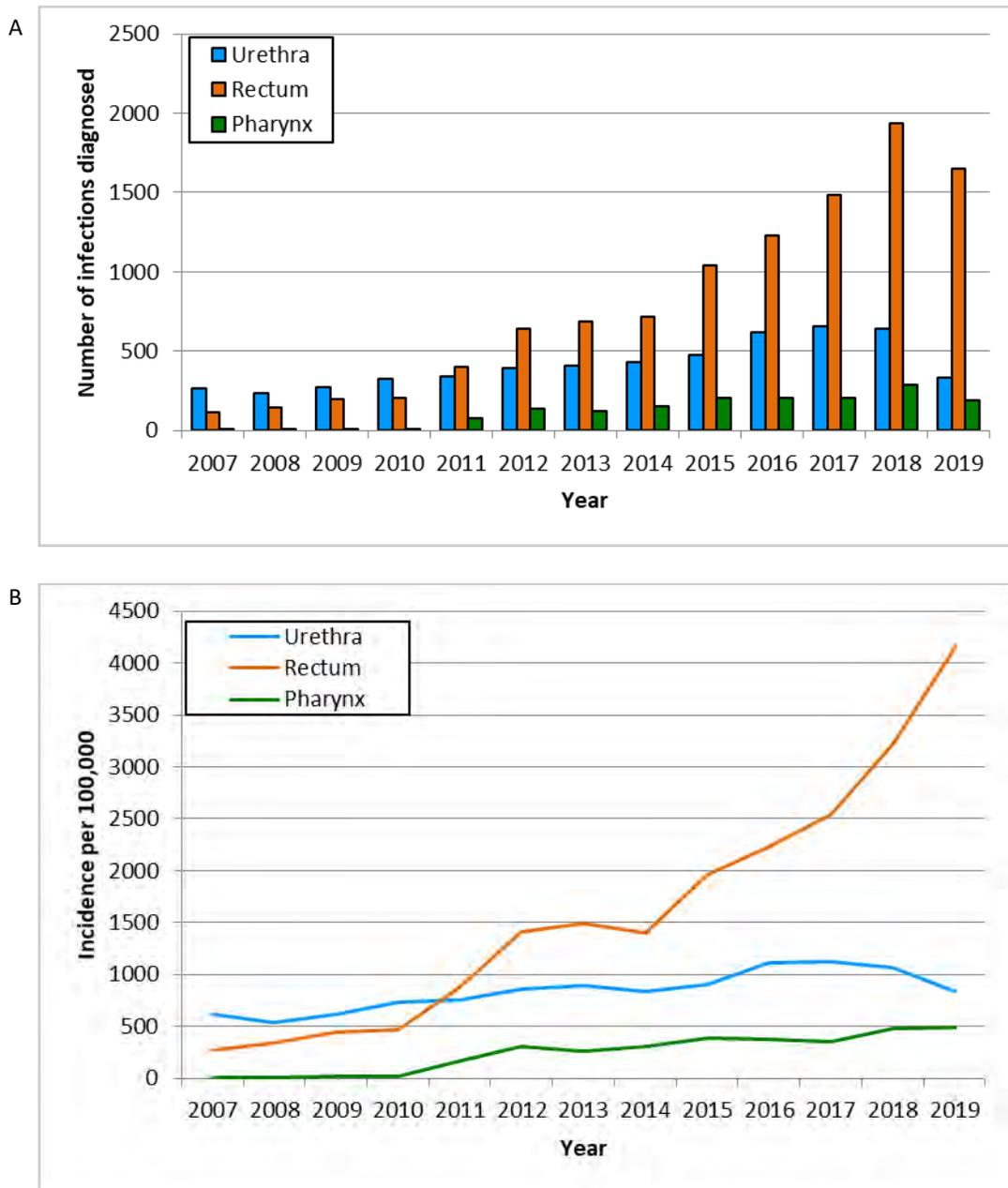
⁵2019 data for anatomic site of infection were limited to January 1 to August 30 and using these data we extrapolated the data for September 1 to December 31st.

Chlamydial Infection

cases missing reason for testing). In contrast, 52% of MSM diagnosed urethral infections in 2019 reported symptoms as the reason for testing, and this percentage has remained relatively stable since 2011. Thus, trends in urethral chlamydia probably provide a

more accurate estimate of true changes in incidence and suggest that the true incidence of chlamydial infection among MSM has risen by approximately 14%, while detection of asymptomatic infections has increased much more dramatically.

Figure 3A and 3B: Chlamydial Infection - Number of infections (A) and incidence (B) among cisgender men who have sex with men (MSM) by anatomic site, King County, WA 2007-2019*



*2019 data are limited to January-August 30 and are extrapolated for September-December. Each case can have more than one site of infection. Approximately 10% of MSM diagnosed with chlamydial infection were infected at more than one anatomic site.

Gonorrhea

Table 4: Gonorrhea — Number of reported cases and incidence by gender* King County, WA, 1992-2019

Year	Cisgender Women		Cisgender Men		Transgender Women	Transgender Men	Total	
	Cases	Incidence per 100,000 population	Cases	Incidence per 100,000 population	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	288	30	807	85	0	2	1,097	57
2010	411	42	1,166	121	1	2	1,580	82
2011	390	40	989	102	1	1	1,381	71
2012	326	33	1,201	123	3	1	1,531	78
2013	404	41	1,362	138	2	2	1,770	89
2014	583	58	1,637	163	8	2	2,230	111
2015	786	76	2,129	208	2	3	2,920	142
2016	786	75	2,542	242	10	8	3,346	159
2017	947	88	3,197	297	25	9	4,180	194
2018	952	87	3,444	315	26	9	4,435	202
2019	1,089	98	3,583	322	16	15	4,706	211

*Data for transgender cases are available starting in 2007 and rates 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.

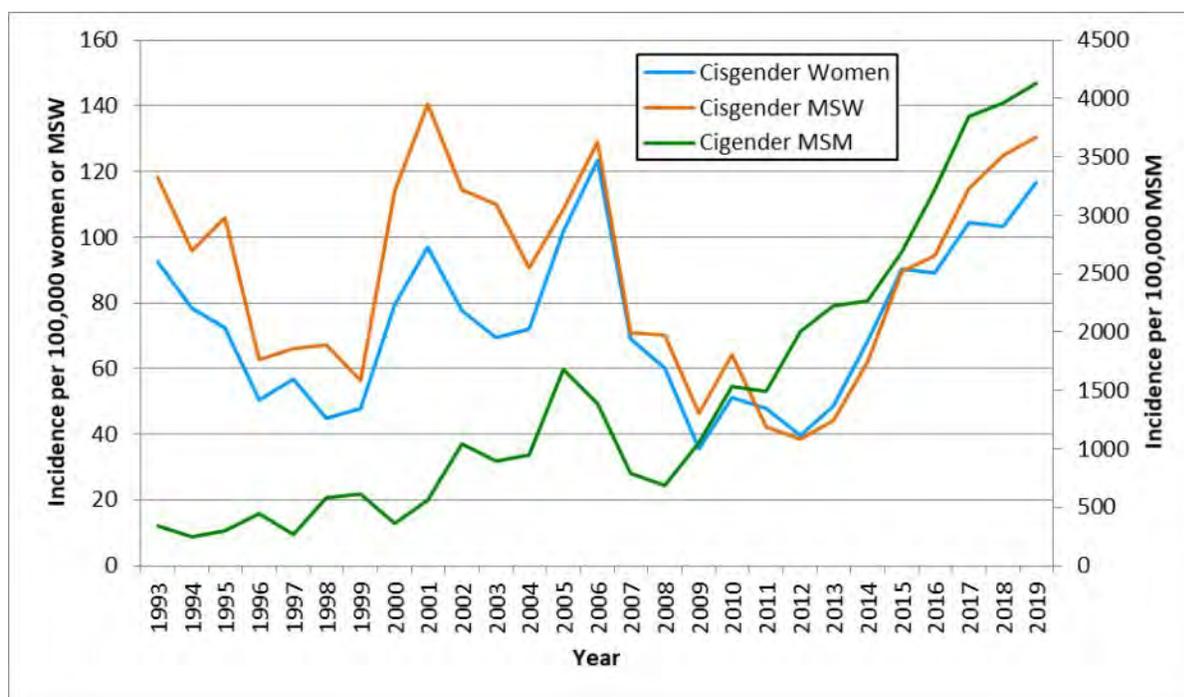
Gonorrhea

Overview

King County continues to experience increasing epidemics of gonorrhea among both cisgender heterosexuals and MSM. The rate of infection among cisgender MSM reached a historic high, while the rate in cisgender women is at its highest level in over a decade, nearly surpassing the peak observed in 2006. Both epidemics reflect broader international trends in rates of STIs that are ongoing in North America⁶, Europe⁷, and Australia⁸. In 2019, 4,706 cases of gonorrhea were reported among residents of King County, resulting in an overall incidence of 211 per 100,000 persons, a 4% increase since 2018 and a 158% increase since 2010 (Table 4). Among cisgender women, 1,089 cases of

gonorrhea were reported in 2019 for an incidence of 98 per 100,000 women, a 13% increase since 2018, and a 131% increase since 2010. Among men, 3,583 cases were reported in 2019, a 2% increase since 2018, and a 165% increase over the last decade. In 2019, 16 cases of gonorrhea were diagnosed among transgender women and 15 cases were diagnosed among transgender men. The rates of gonorrhea among MSM, MSW and women have been rising in parallel over the last several years, though the increase among MSM started in 2009, while the increase among cisgender women and MSW was not evident until 2013 (Figure 4).

Figure 4: 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, 2007-2019



⁶Centers 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

⁷Mitchell H, Allen H, Sonubi T, KuyumdzhievaG, HarbA, ShahA, GlancyM, ChecchiM, MilbournH, FolkardK, MohammedHand contributors. Sexually transmitted infections and screening for chlamydia in England, 2019. September 2020, Public Health England, London

⁸National update on HIV, viral hepatitis and sexually transmissible infections in Australia: 2009–2018. Sydney: Kirby Institute, UNSW Sydney

Gonorrhea

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 5)⁹.

Figure 5: Gonorrhea – Incidence among cisgender women ages 15-29 King County, Washington State, and U.S., 1992-2019

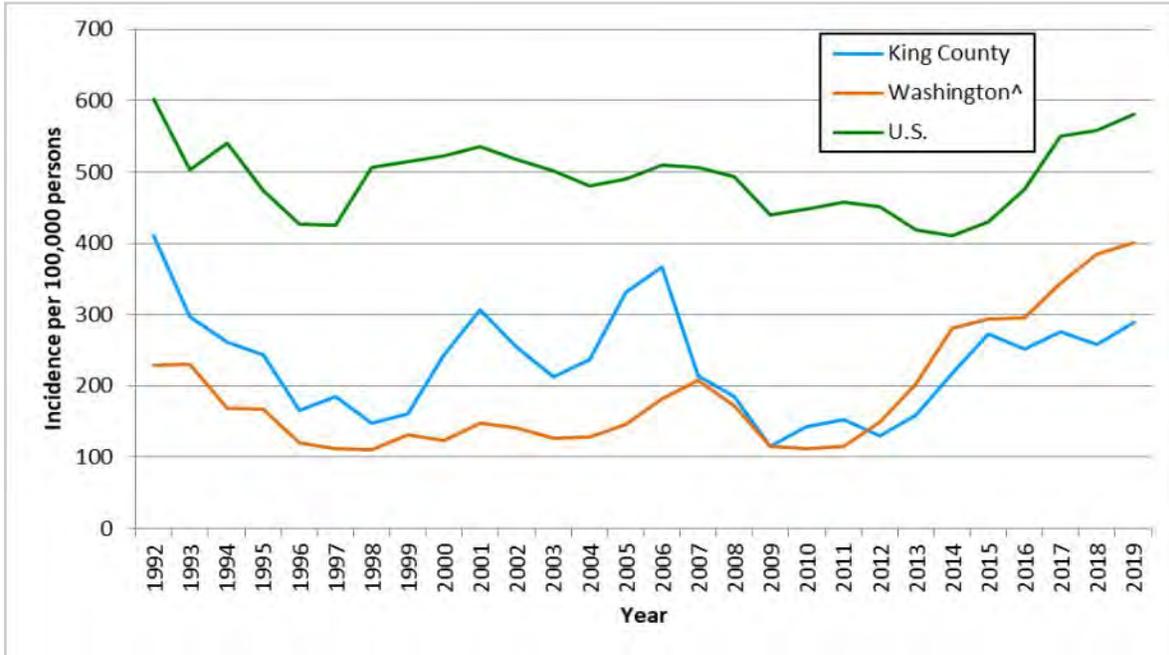
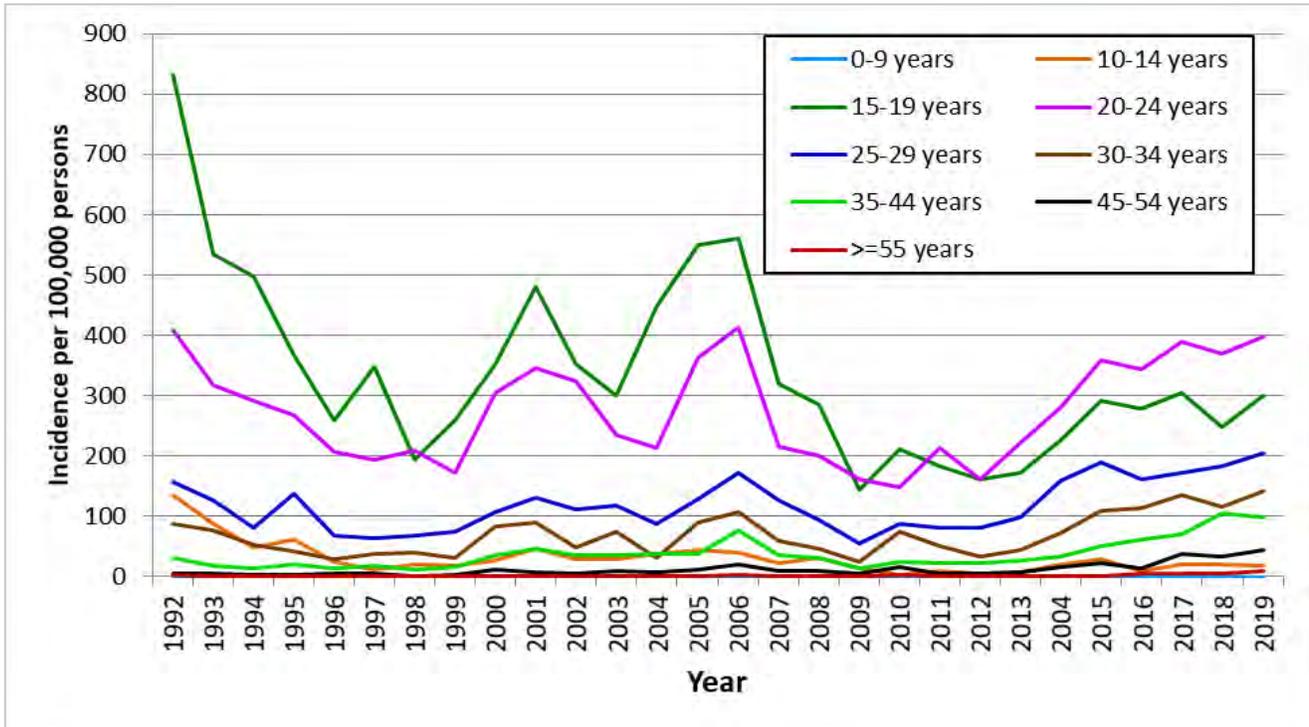


Figure 6: Gonorrhea – Incidence among cisgender women by age King County, WA, 1992-2019*



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

⁹Centers 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

Gonorrhea

Age and gender

Among cisgender women, the incidence of gonorrhea was highest among 20-24 year olds (398 per 100,000), followed by 15-19 year olds (299 per 100,000) in 2019 (Tables 5 and 6). This epidemiologic pattern, with higher rates among 20-24 years olds than among 15-19 year olds, is similar to that observed in chlamydial infection and, like chlamydia, represents a change compared to the period from 1990-2010 (Figure 6). As with chlamydial infection, the reasons for this change are uncertain, but may reflect later age of sexual debut and increased condom use¹⁰. Among men, the rate of gonorrhea was highest in the 25-29 years age group (773 per 100,000), followed by the 20-24 age group (708 per 100,000).

Table 5: Gonorrhea — Number of reported cases and incidence among cisgender men and cisgender women, by age and race, King County, WA, 2019

	Cisgender Women (N=1089)		Cisgender Men (N=3583)	
	Cases	Incidence per 100,000 population	Cases	Incidence per 100,000 population
Race/ethnicity*^				
White	283	60	1433	272
Black	235	455	588	959
American Indian/Alaska Native	28	570	17	312
Asian	48	31	234	151
Hispanic/Latinx	121	155	472	483
Other	49		26	
Multiple	11	28	85	205
Native Hawaiian/Pacific Islander	16	230	25	331
Unknown	298		703	
Age				
0-9 years	0	0	1	1
10-14 years	11	18	1	2
15-19 years	188	299	119	184
20-24 years	285	398	503	710
25-29 years	210	206	815	773
30-34 years	142	143	764	708
35-44 years	162	98	787	452
45-54 years	62	45	429	302
>=55 years	29	10	164	65
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.

¹⁰Abma 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.

Gonorrhea

Race and ethnicity

Among both cisgender women and men, gonorrhea rates vary substantially among different racial and ethnic groups (Table 5). In 2019, American Indian/Alaska Native women (570 per 100,000) had the highest rate of

gonorrhea among women, reflecting a dramatic increase in infections in that population since 2013, followed by Black women (455 per 100,000). Among women ages 15-29, the age group with the highest rate of gonococcal infection, the incidence rates of gonorrhea among

Table 6: Gonorrhea — Number of reported cases and incidence among cisgender men and cisgender women ages 15-29* King County, WA, 1992-2019

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	429	214	423	205	852	210
2008	373	184	401	192	774	188
2009	233	114	408	195	641	155
2010	286	143	467	225	753	185
2011	304	153	469	227	773	191
2012	253	131	542	271	795	202
2013	311	159	610	304	921	232
2014	438	218	805	390	1,243	305
2015	565	273	988	466	1,553	371
2016	550	252	1,128	503	1,678	379
2017	626	275	1,364	586	1,990	432
2018	600	258	1,345	567	1,945	414
2019	683	289	1,437	597	2,120	444

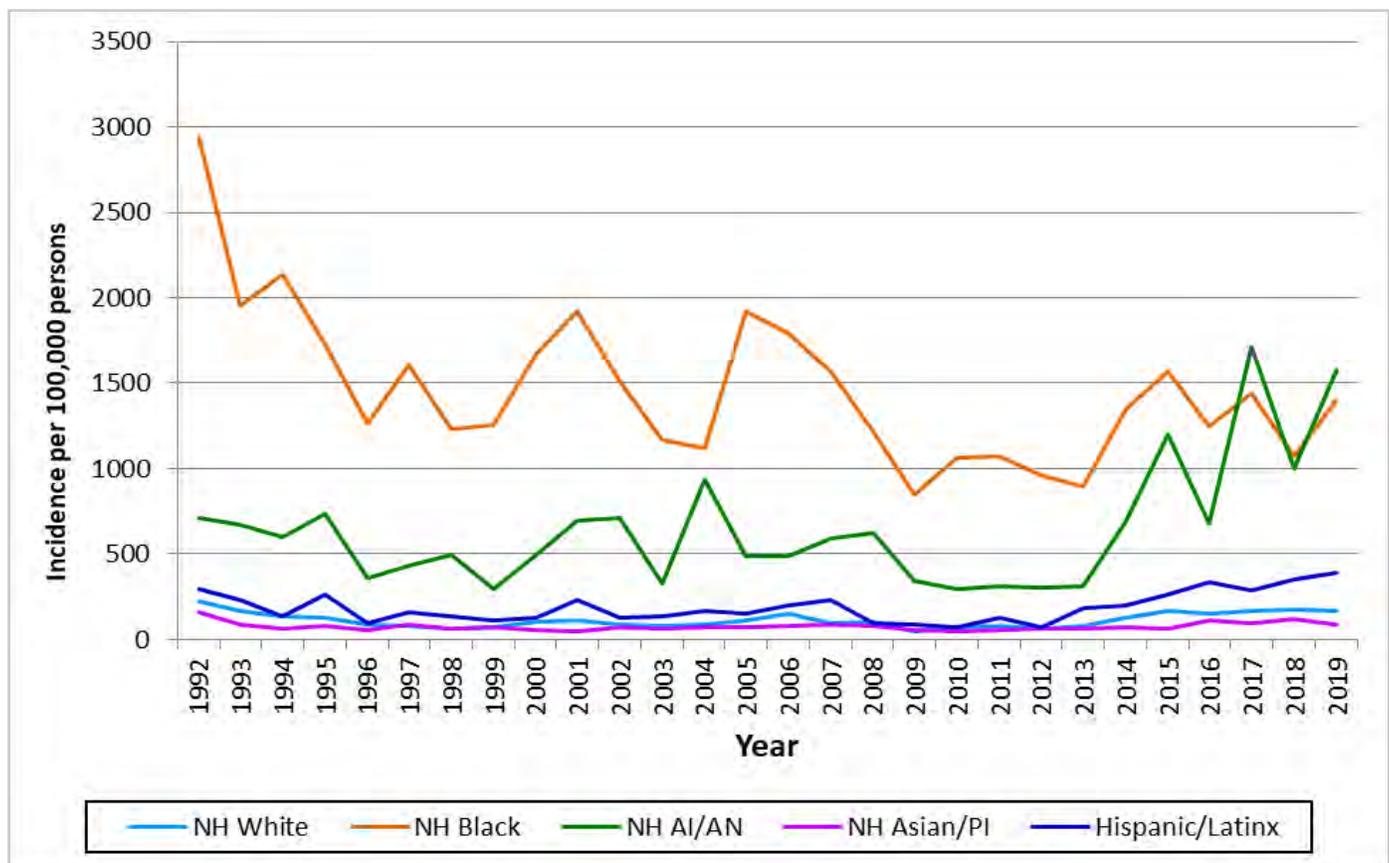
*Cases with unknown age were included in age-specific counts and rates after being distributed among age categories based on the distribution of cases with known age.

Gonorrhea

American Indian/Alaska Native women and among Black women were nine and eight times higher than among White cisgender women, respectively (Figure 7). Since 2010, 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: Latina (438% increase), American Indian/Alaska Native (428% increase), White (139% increase), Asian/Pacific Islander (104% increase), and Black (32%

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 8).

Figure 7: Gonorrhea – Incidence among cisgender women ages 15-29 by race and ethnicity, King County, WA, 1996-2019*



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.

Gonorrhea

Figure 8: Gonorrhea – Relative rate disparities among Black, Hispanic/Latinx, and American Indian/Alaska Native populations compared to Whites by gender, King County, WA 2019

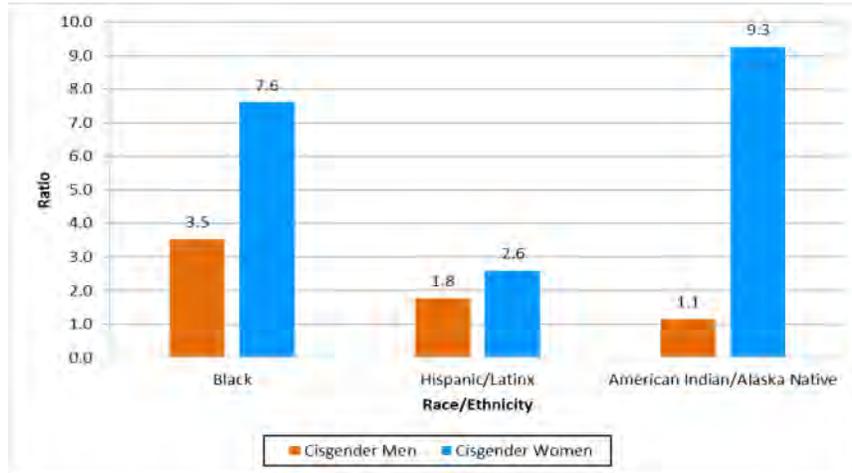
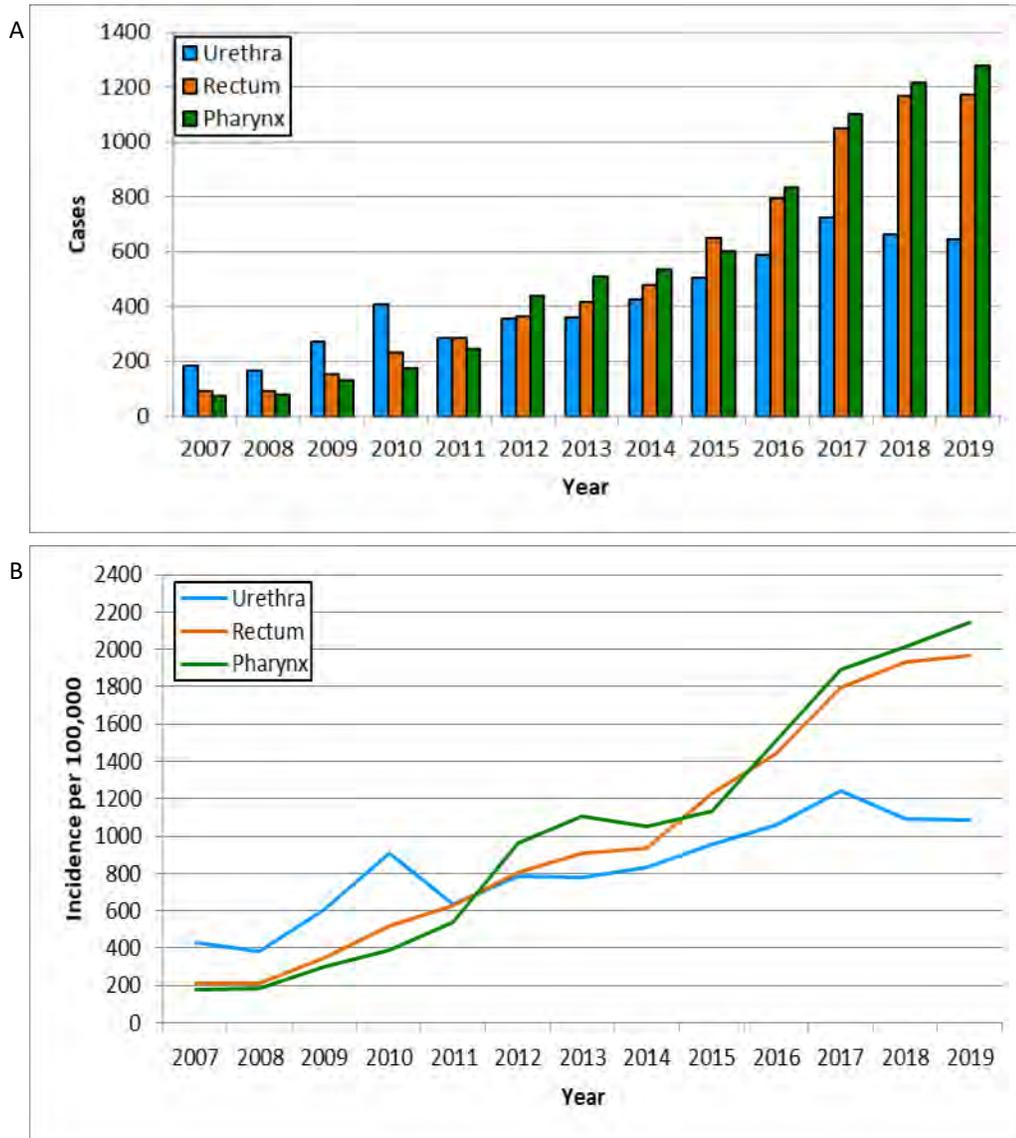


Figure 9A and 9B: Gonorrhea – Number of reported infections (A) and incidence (B) among cisgender men who have sex with men (MSM) by anatomic site* King County, WA, 2007-2019



*Each case can have more than one site of infection. In 2019, 24% of MSM diagnosed with gonorrhea were infected at more than one anatomic site.

Gonorrhea

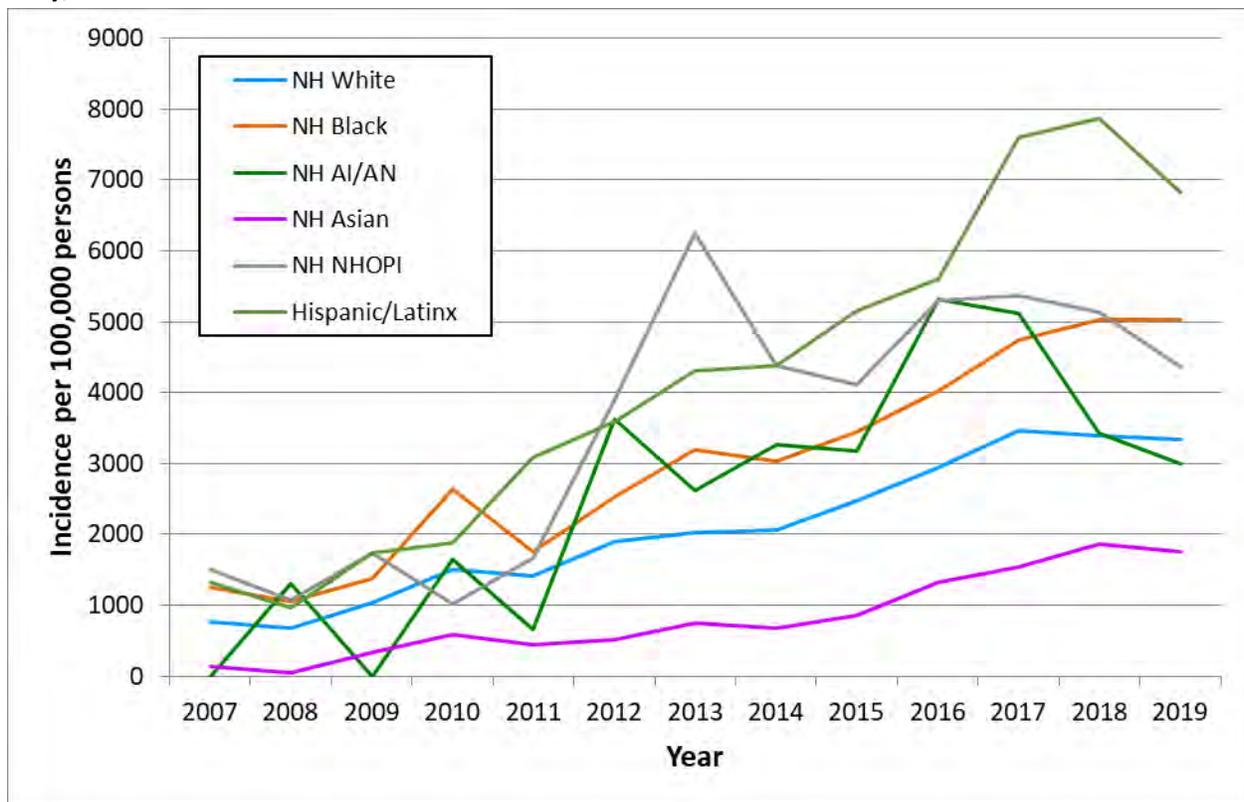
MSM

Gonorrhea diagnoses among cisgender MSM have steadily increased since 2008, with incidence reaching a historic high of 4,129 per 100,000 in 2019 (Figure 4). As with chlamydia, trends in the number of reported gonorrhea cases among MSM vary by anatomic site (Figure 9A). The incidences of reported rectal and pharyngeal infections have increased steadily over the last decade. While the incidence of urethral infection decreased somewhat from 2017 to 2019. Even with the slight declining trend, the urethral incidences remained much higher than that reported from 2007-2016 (Figure 9B). Since urethral gonorrhea is almost always a symptomatic infection, the observed increase in urethral

gonorrhea (from 406 in 2010 to 647 in 2019) likely represents a true increase in the rate of gonorrhea over the last decade and not simply an increase in diagnoses due to increased screening.

The incidence of gonorrhea has increased in all racial and ethnic groups of MSM over last decade, however rates vary greatly by race/ethnicity (Figure 10). Continuing a trend observed since 2015, Latino MSM had the highest rate of gonorrhea infection (6,831 infections per 100,000 MSM) in 2019. Black MSM (5,030 per 100,000) had the second highest rate, followed by Native Hawaiian/Pacific Islander (4,359 per 100,000), and White (3,338 per 100,000) MSM.

Figure 10: Gonorrhea - Incidence among cisgender men who have sex with men (MSM) by race and ethnicity*, King County, WA 2007-2019



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

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

Gonorrhea

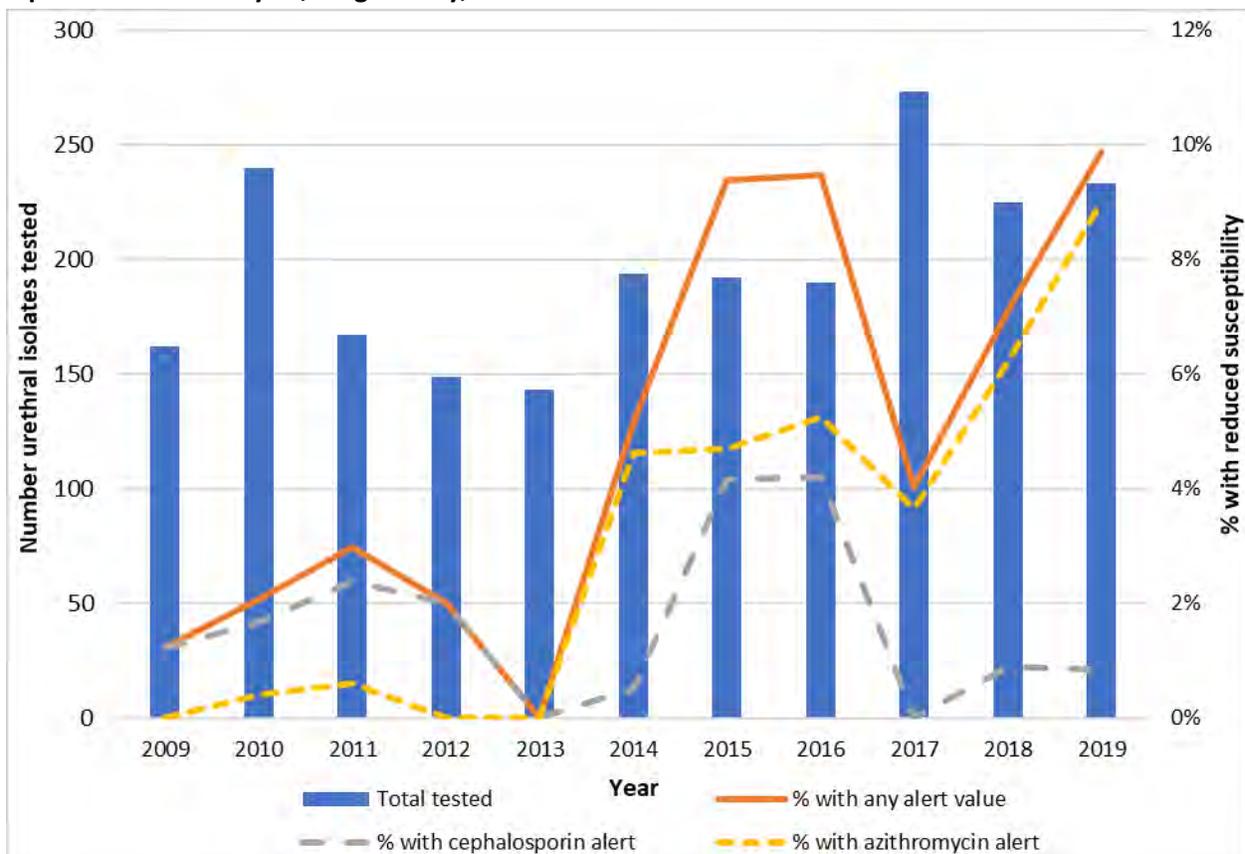
Antimicrobial resistant gonorrhea

PHSKC conducts ongoing surveillance of antimicrobial-resistant *Neisseria gonorrhoeae* (ARNG). Since 1986, the PHSKC SHC has participated in CDC's 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 a CDC-funded project called 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. Nearly 12% of gonorrhea cases diagnosed in King County in 2019 had a gonococcal isolate tested for antimicrobial susceptibility.

From 2009 to 2014, the proportion of GISP urethral isolates with alert values to azithromycin or oral third generation cephalosporins (i.e. cefixime) ranged from 0% to 5% (Figure 11). The percentage of urethral isolates with alert values increased sharply to 9% in 2015 and 2016, declined to 4% in 2017, and then increased again, reaching 10% in 2019. CDC defines gonococci as

Figure 11: Percentage of male Gonococcal Isolate Surveillance Project urethral isolates with alert values for cephalosporins or azithromycin, King County, WA 2009-2019



Gonorrhea

Table 7: Neisseria gonorrhoea isolates with antimicrobial resistance by anatomic site, SURRG, King County, WA 2019

	Number isolates tested	% w/reduced susceptibility
Endocervical	28	4%
Pharyngeal	133	10%
Rectal	250	12%
Urethral	265	10%

Table 8: Characteristics of unique gonorrhoea cases with reduced antimicrobial susceptibility, SURRG, King County, WA, 2019

Total N=66		
	Number	Percent
Age		
<25 years	7	11%
25-34 years	31	47%
35-44 years	13	20%
>=45 years	15	23%
Gender		
Male	63	95%
Transgender or Nonbinary	3	5%
Risk		
Cisgender men who have sex with men	60	95%
Cisgender men who have sex with women	3	5%
Transgender women	1	2%
Transgender men	1	2%
Nonbinary	1	2%
Elevated MIC*		
Azithromycin (MIC \geq 2.0 $\mu\text{g/ml}$)	58	88%
Ceftriaxone (MIC \geq 0.125 $\mu\text{g/ml}$)	5	8%
Cefixime (MIC \geq 0.25 $\mu\text{g/ml}$)	5	8%

*Minimum Inhibitory Concentration

Gonorrhea

Table 9: Percentage of persons with alert values to azithromycin or cefixime among persons tested for antimicrobial resistant *Neisseria gonorrhoeae*, King County 2019

	Azithromycin MIC* \geq 1 μ g/ml** N (%)	Azithromycin MIC \geq 2 μ g/ml N (%)	Cefixime MIC \geq 0.25 μ g/ml N (%)	Ceftriaxone MIC \geq 0.125 μ g/ml N (%)
Cisgender men who have sex with men (n=439)	86 (20%)	52 (12%)	5 (1%)	5 (1%)
Cisgender men who have sex with women (n=81)	7 (9%)	3 (4%)	0	0
Cisgender men, unknown sex partners (n=43)	2 (5%)	0	0	0
Cisgender women (n=28)	2 (7%)	0	0	0
Transgender women (n=3)	1 (33%)	1 (33%)	0	0
Transgender men (n=6)	1 (17%)	1 (17%)	0	0
Nonbinary (n=13)	2 (15%)	1 (8%)	0	0
Total (n=613)	101 (16%)	58 (9%)	5 (1%)	5 (1%)

*Minimum Inhibitory Concentration

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

having an alert value if they have laboratory evidence of being relatively resistant to antimicrobial treatment. For azithromycin, alert values have an MIC \geq 2.0 μ g/ml and organisms with alert values are considered to be resistant to azithromycin. CDC alert values for ceftriaxone or cefixime are MIC \geq 0.125 μ g/ml and MIC \geq 0.25 μ 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 \geq 0.5 μ g/ml are defined as having reduced susceptibility.

There were 613 unique cases of gonorrhea infection that had at least one gonorrhea culture isolate (genital or extragenital) submitted for antimicrobial susceptibility testing in 2019. Reduced susceptibility

was most commonly found in rectal isolates (12%), followed by pharyngeal (10%), urethral (10%) and endocervical (4%) (Table 7). Most cases with reduced susceptibility were MSM (95%) (Table 8). Of the 613 unique gonorrhea cases with susceptibility results, 58 (9%) were had decreased susceptibility to azithromycin, five (1%) to ceftriaxone, and five (1%) to cefixime (two isolates had decreased susceptibility to both ceftriaxone and cefixime) (Table 9). Azithromycin resistance occurred in 55 (11%) of 505 MSM and 3 (3%) of 93 isolates from MSW or women. All five cases of gonorrhea with decreased susceptibility to cefixime and ceftriaxone occurred in MSM.

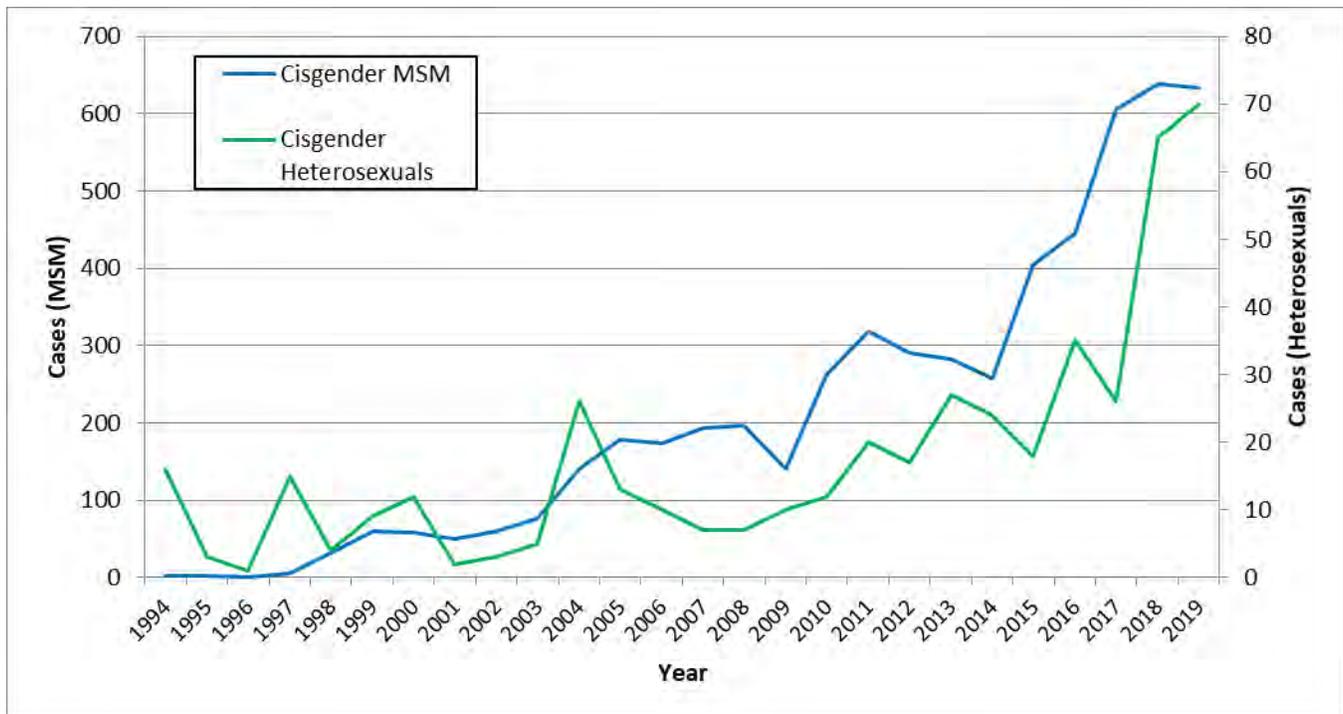
Syphilis

Overview

King County has experienced a growing epidemic of syphilis among MSM since 1997 and a rapid increase in cases among cisgender heterosexuals since 2017 (Figure 12). In 2019, the total number of early syphilis (primary, secondary, and early non-primary non-secondary [previously early latent]) cases reported in King County reached its highest level since data became available, with 747 cases and an overall incidence of 33.6 cases per 100,000 persons (Table 10). Of the early syphilis cases, 46% were diagnosed as primary or secondary syphilis (n=346) and the other 54% were diagnosed as early non-primary non-secondary (n=401) infection (Figure 13). In 2019, 94% (n=705) early syphilis cases occurred in cisgender men, mostly among MSM, with 4% (n=32) of

the cases among cisgender women, and transgender women (n=8) and transgender men (n=1) each accounting for less than 1%. Although cisgender women account for only 4% of cases, the number of early syphilis cases among cisgender women has increased 700% since 2010 (4 cases to 32 cases) and the rate of early syphilis among this population is at the highest since 1993. Additionally, many cases of syphilis among cisgender women were diagnosed as late latent infections or infections of unknown duration (63%), in part due to infrequent screening; the incidence of syphilis of all stages among cisgender women has varied substantially from year to year but has been consistently increasing since 2015 (Figure 14).

Figure 12: Early Syphilis – Reported cases among cisgender men who have sex with men (MSM)* and cisgender heterosexuals King County, WA, 1994-2019



*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(8), 2015(17), 2016(23), 2017(22), 2018(25), 2019(34).

Syphilis

Table 10: Early Syphilis (primary, secondary, and early non-primary non-secondary) – Number of reported cases and incidence by gender* King County, WA, 1992-2019

Year	Cisgender Women		Cisgender Men		Transgender Women	Transgender Men	Total	
	Cases	Incidence per 100,000 population	Cases	Incidence per 100,000 population	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	339	35.0	2	0	346	17.8
2012	6	0.6	320	32.8	0	1	327	16.7
2013	10	1.0	311	31.5	1	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	16	1.5	487	46.3	0	0	503	23.9
2017	7	0.6	647	60.1	0	0	656	30.5
2018	29	2.6	692	63.2	8	0	730	33.3
2019	32	2.9	705	63.3	8	1	747	33.6

*Data for transgender cases are available starting in 2007 and rates 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 13: Early Syphilis – Reported cases of primary and secondary (P&S) vs. early non-primary non-secondary syphilis King County, WA, 1992-2019

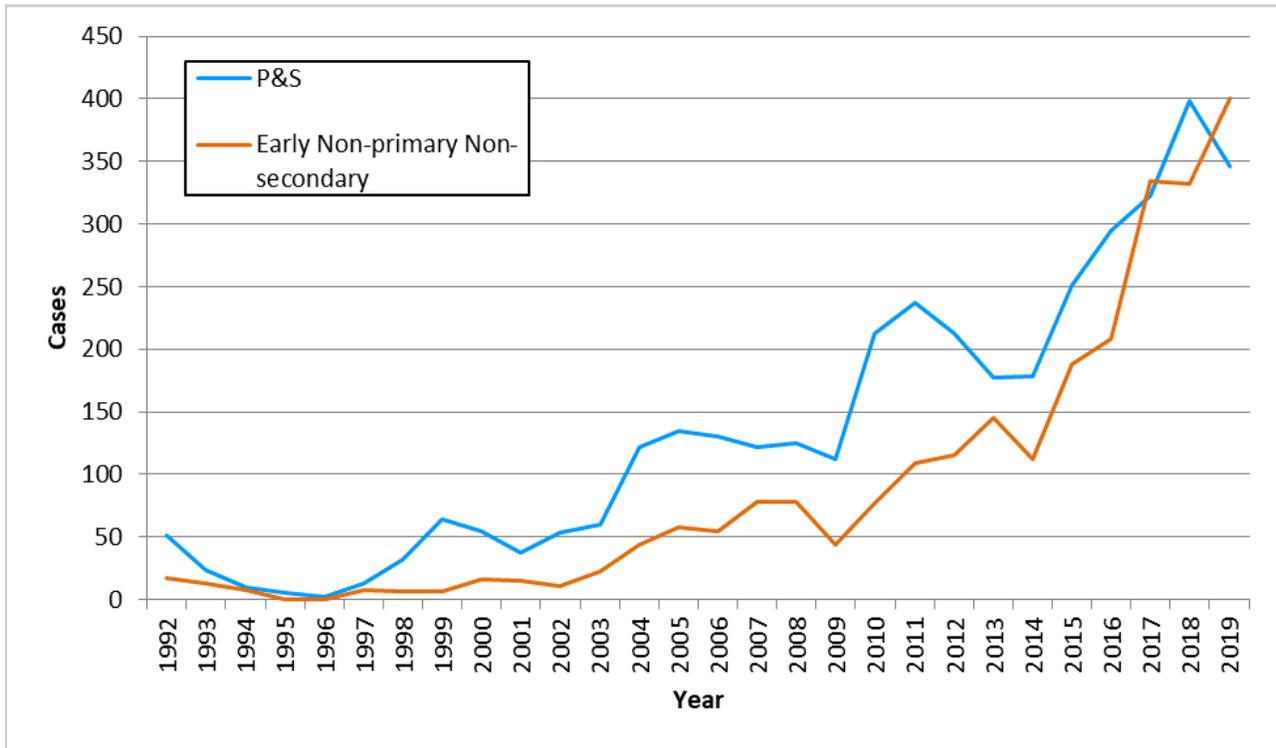
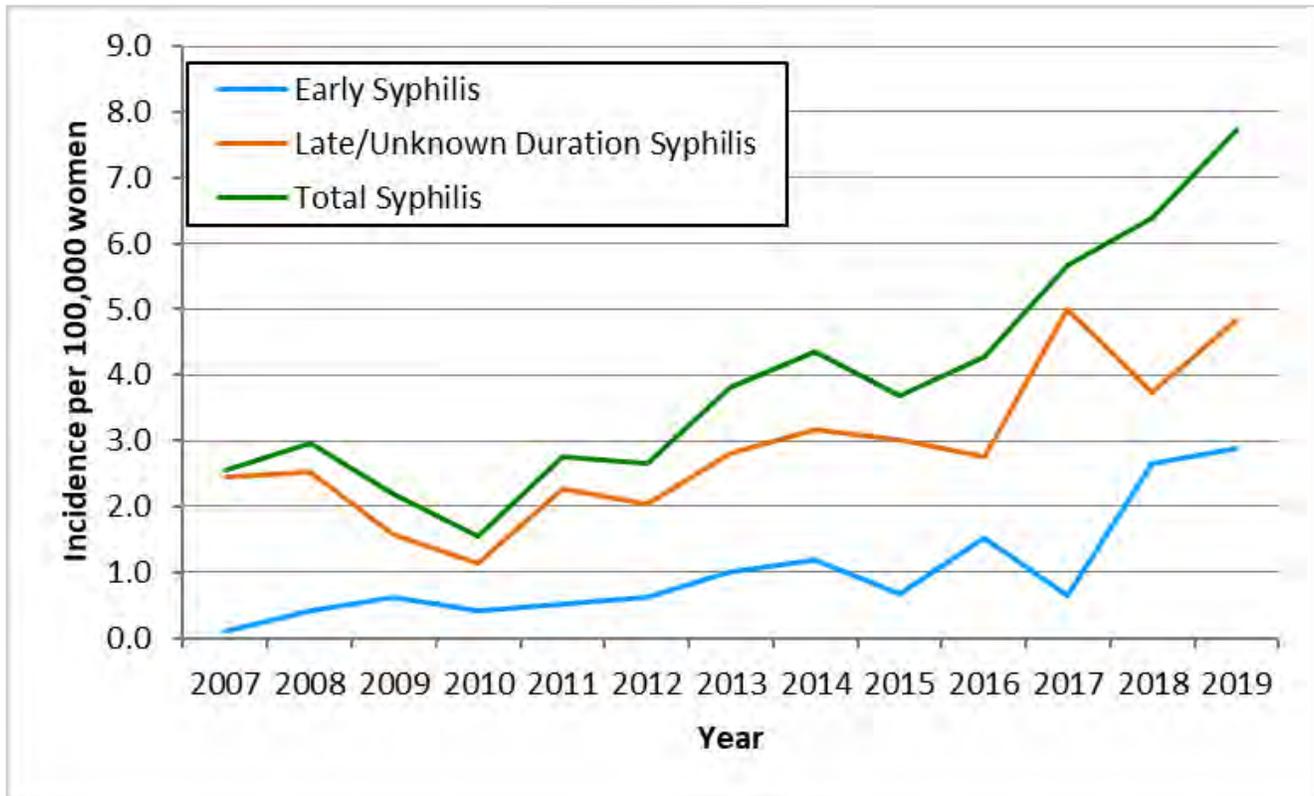


Figure 14: Syphilis - Incidence among cisgender women, King County, WA, 2007-2019



Syphilis

Table 11: 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, 1992-2019*

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	193	444	6	0.8
2008	196	446	3	0.4
2009	140	315	4	0.5
2010	263	587	8	1.1
2011	319	707	15	2.0
2012	290	638	11	1.5
2013	283	614	17	2.2
2014	257	503	12	1.6
2015	404	763	11	1.4
2016	445	805	19	2.4
2017	606	1,039	19	2.3
2018	639	1,059	36	4.3
2019	634	1,063	38	4.4

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(8), 2015(17), 2016(23), 2017 (22), 2018(25), 2019(34).

Syphilis

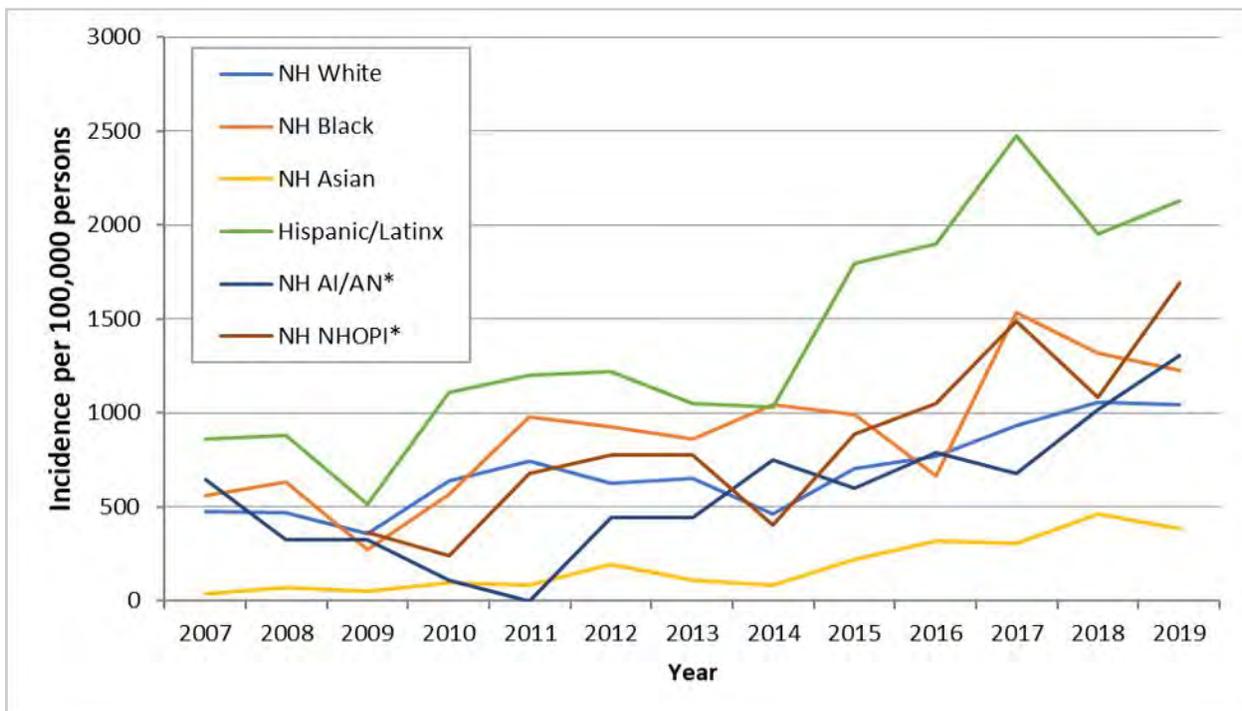
Cisgender MSM

Of all 2019 early syphilis cases, 85% (634) occurred in cisgender MSM. The incidence of early syphilis among cisgender MSM (1,063 per 100,000) in 2019 was 240 times the rate among cisgender MSW (4.4 per 100,000) (Table 11). 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 12). However, since 2014, the rate of early syphilis in MSM has dramatically increased and in 2019 the rate reached a historical high. The recent rise in syphilis among MSM appears to reflect a combination of increased ascertainment of asymptomatic infections, perhaps resulting from increased screening, and an

increase in syphilis rates associated with an extension of the epidemic into populations of MSM who have traditionally been at lower risk for infection. In 2017, the rate of early non-primary non-secondary syphilis exceeded the rate of primary and secondary syphilis for the first time since the start of the current syphilis epidemic, a trend also observed in 2019.

Racial and ethnic differences in early syphilis among cisgender MSM are similar to those observed with gonorrhea. In 2019, Native Hawaiian/Pacific Islander MSM had the highest rate of early syphilis among MSM, although this only represented 11 cases. Latinx MSM continued to experience a high incidence of early syphilis (2,322 per 100,000) in 2019 and had the second highest

Figure 15: Early Syphilis — Incidence among cisgender men who have sex with men (MSM) by race and ethnicity*, King County, WA, 2007-2019

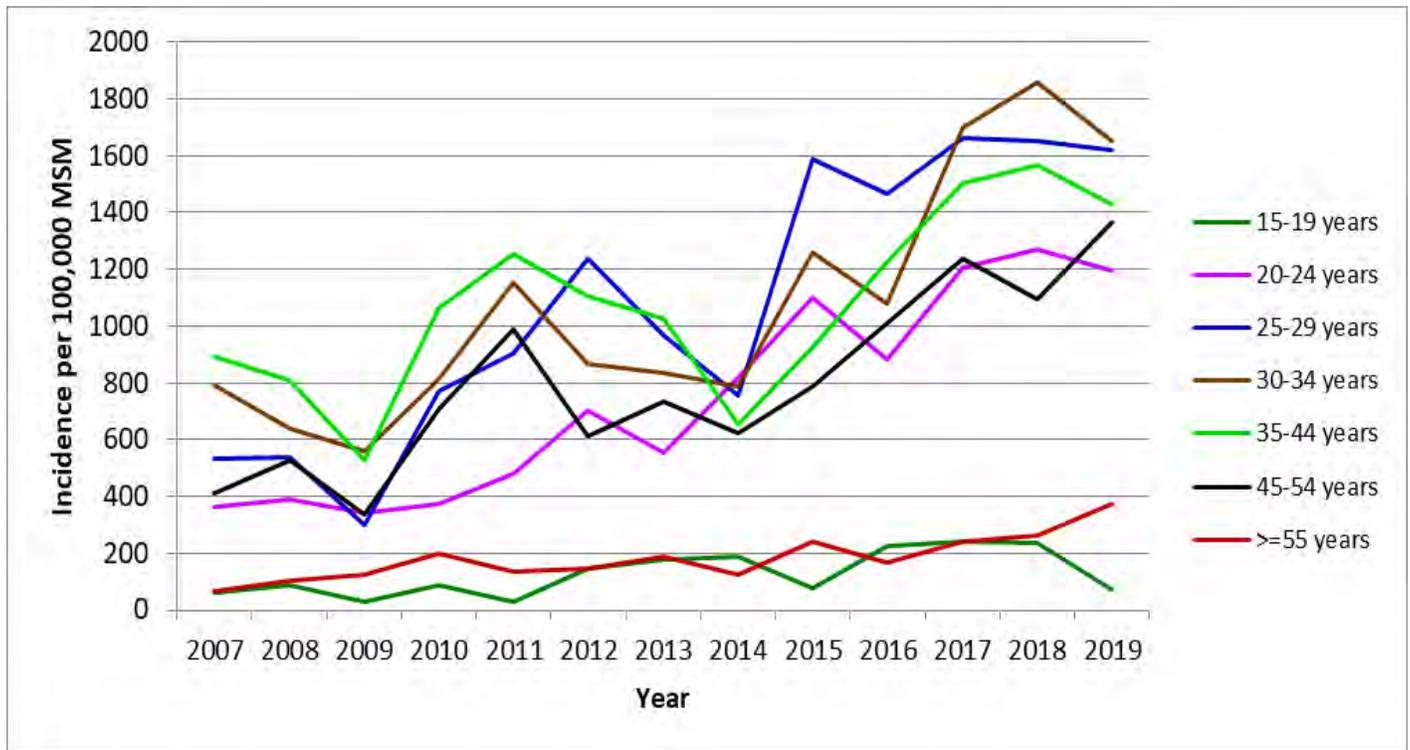


NH = Non-Hispanic, AI/AN = American Indian/Alaska Native, NHOPI = Native Hawaiian/Pacific Islander

*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.

Syphilis

Figure 16: Early Syphilis — Incidence among cisgender men who have sex with men (MSM) by age*, King County, WA, 2007-2019



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

rate among MSM (Figure 15). The incidences among Native Hawaiian/Pacific Islander MSM and Latinx MSM were both over double the incidence among White MSM (1,043 per 100,000) in 2019.

The incidence of early syphilis among MSM varies by age group. In 2019, the incidence was highest among MSM 30 to 34 years and 25 to 29 years, 1,654 per 100,000 and 1,620 per 100,000, respectively. MSM ages 15 to 19 years had the lowest incidence (72 per 100,000) in 2019 and experienced a 70% decrease in

incidence compared to 2018 (235 per 100,000) (Figure 16).

Throughout the ongoing epidemic, syphilis has disproportionately affected MSM living with HIV (Figure 17). In 2019, the estimated incidence of early syphilis among MSM living with HIV was nearly 8 times higher than in HIV-negative MSM (5,024 vs. 654 per 100,000). However, since 2015, early syphilis has increasingly affected the larger population of HIV-negative MSM, and in 2019, 56% of early syphilis cases occurred in HIV-uninfected MSM (Figure 18).

Syphilis

Figure 17: Early Syphilis – Incidence among cisgender men who have sex with men (MSM) by HIV status King County, WA, 1997-2019

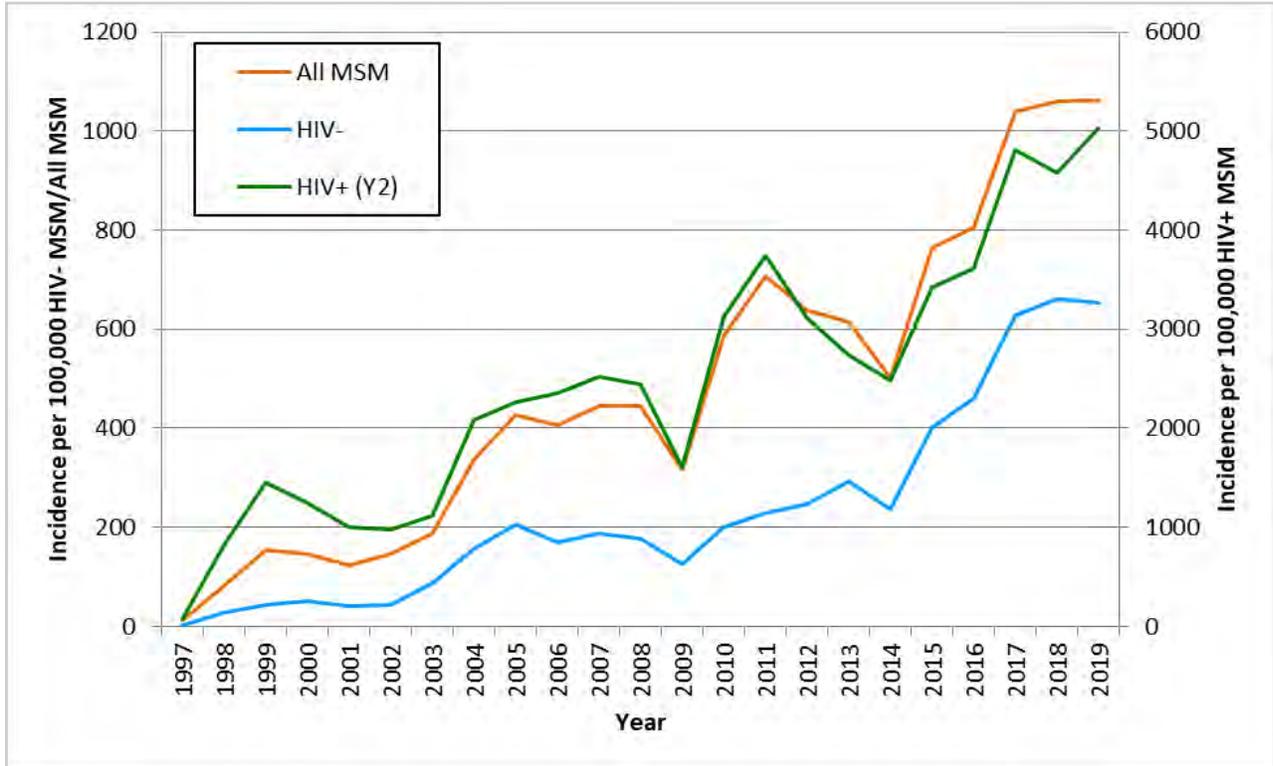
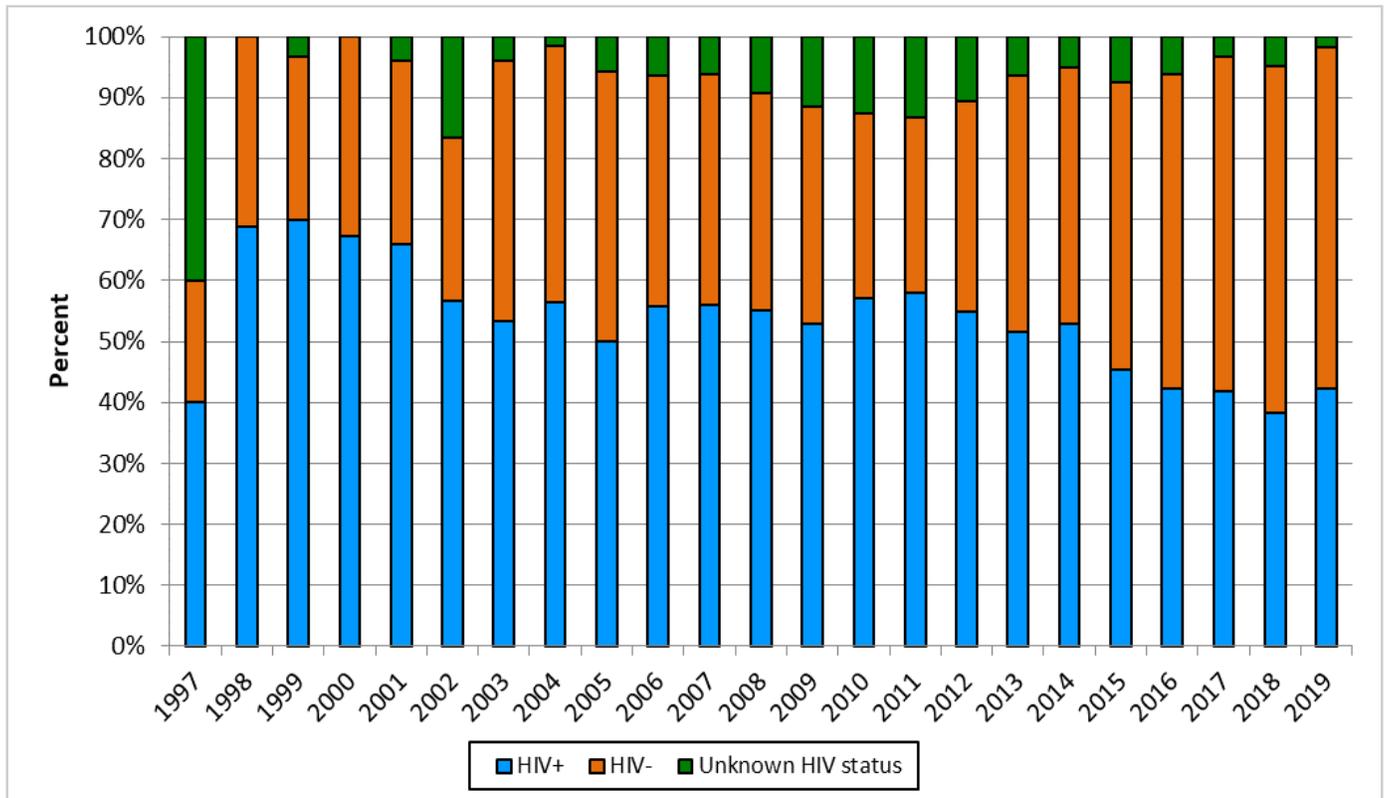


Figure 18: Early Syphilis – Percent of reported cases among cisgender men who have sex with men (MSM) by HIV status King County, WA, 1997-2019



Syphilis

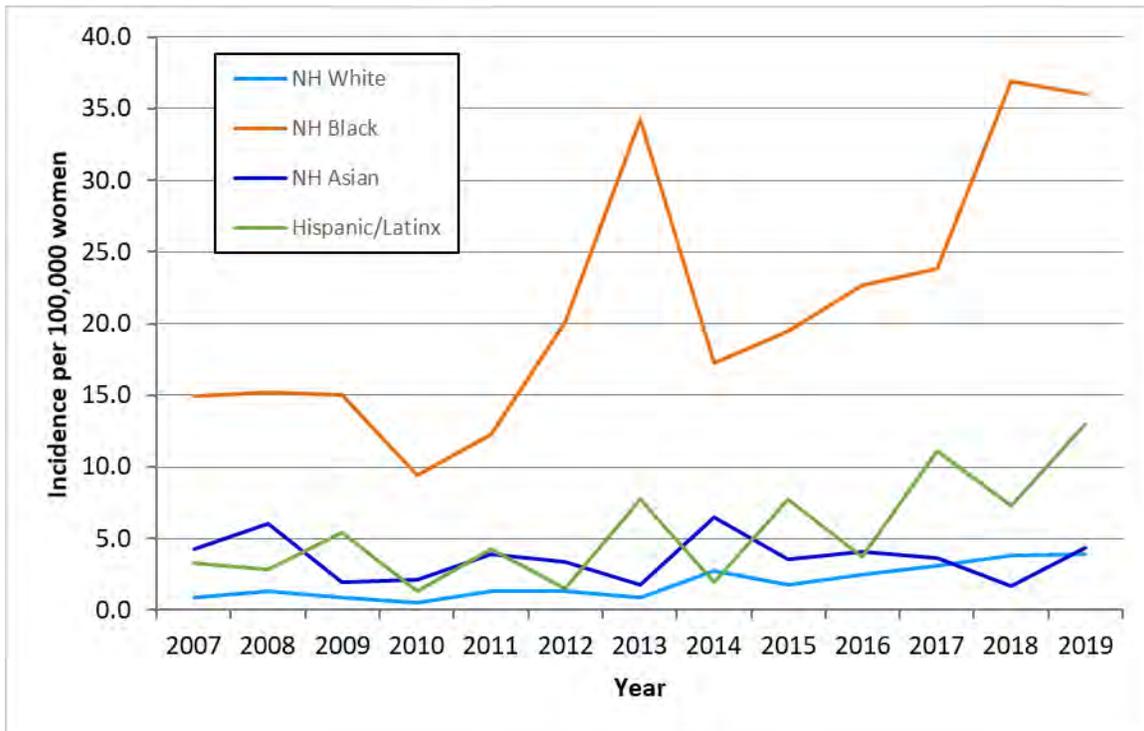
Cisgender Heterosexuals and congenital syphilis

Early syphilis incidence among cisgender heterosexuals remained much lower than incidence among cisgender MSM in 2019, with 70 of 747 cases occurring among cisgender MSW (n=38 cases) and cisgender women (n=32 cases) (Tables 10 and 11). However, cases among cisgender heterosexuals have increased dramatically in the past five years. The increase in syphilis cases among cisgender heterosexuals represents a 169% increase since 2017 (n=26 cases) and an 8% increase since 2018 (n=65 cases). Two of the early syphilis cases reported among cisgender women and MSW in 2019 were known to be living with HIV.

The incidence of total syphilis (early and late/unknown duration stages) among cisgender women increased

400% from 2008 and 21% since 2018 (Table 12, Figure 14). 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. Like gonorrhea, rates of syphilis varied by racial and ethnic group. American Indian/Alaska Native women had the highest rate (68.7 cases per 100,000) of syphilis in 2019, followed by Black women (36.0 cases per 100,000), and Hispanic/Latinx women (13.0 cases per 100,000). The rates among Black women and Latinx women were nine and three times higher than the rate among White women (3.9 cases per 100,000), respectively (Figure 19). Women aged 20-24 years had the highest incidence of syphilis in 2019 (25.1 cases per 100,000), followed by women in

Figure 19: Syphilis - Incidence among cisgender women by race and ethnicity*, King County, WA 2007-2019



*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 women are not shown due to small numbers. NH =Non-Hispanic.

Syphilis

the 25-29 years age group (15.7 cases per 100,000). MSW had also experienced an increase in total syphilis, from 7.1 cases per 100,000 in 2018 to 7.8 cases per 100,000 in 2019, a 9% percent increase (Table 12).

Similar to national trends, congenital syphilis is increasing in Washington State and in King County¹¹. Seventeen congenital cases were diagnosed in Washington State in 2019, which is nearly triple the 6 cases diagnosed in 2018¹². Three of the cases diagnosed in Washington State in 2019 occurred in King County residents, the first diagnoses of congenital syphilis in the county since 2015. Trends in congenital syphilis usually mirror the trends in primary and secondary syphilis among reproductive age women, and the increase in

syphilis among this population suggests that some pregnant women in King County are at risk for syphilis during pregnancy and for transmitting the infection to their unborn children. Medical providers caring for pregnant women should routinely test women when they establish prenatal care and in the third trimester of pregnancy (24-28 weeks gestation). PHSKC prioritizes pregnant women for outreach and partner services to ensure that these cases receive adequate and appropriate treatment. In 2019, 13 (15%) of the syphilis cases among King County residents were pregnant at the time of diagnosis. Of these cases, 12 (92%) received treatment for syphilis, which may represent additional cases of congenital syphilis averted due to public health interventions.

Table 12: 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, 2007-2019

Year	Cisgender Women		Cisgender MSW	
	Cases	Incidence per 100,000 population	Cases	Incidence per 100,000 population
2007	24	3.1	17	2.4
2008	28	3.6	21	2.9
2009	21	2.7	13	1.8
2010	15	1.9	18	2.4
2011	27	3.3	25	3.3
2012	26	3.2	20	2.7
2013	38	4.6	29	3.8
2014	44	5.3	22	2.8
2015	38	4.5	31	3.9
2016	45	5.2	42	5.2
2017	61	6.8	47	5.7
2018	70	7.7	60	7.1
2019	86	9.3	67	7.8

¹¹Centers 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

¹²WA DOH DCHS ID Assessment Unit and STD Services. <https://www.doh.wa.gov/YouandYourFamily/IllnessandDisease/SexuallyTransmittedDisease>

Syphilis

Table 13: 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, 2019*

	Early Syphilis				Late/Unknown Duration Syphilis			
	Cisgender MSM (N=634)		Cisgender MSW and Women (N=70)		Cisgender MSM (N=138)		Cisgender MSW and Women (N=83)	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Stage of Infection								
Primary	96	15%	19	27%				
Secondary	184	29%	24	34%				
Early latent	354	56%	27	39%				
Late latent					138	100%	83	100%
Race/ethnicity								
White	360	57%	36	51%	52	38%	12	14%
Black	45	7%	17	24%	20	14%	25	30%
American Indian/Alaska Native	5	1%	2	3%	1	1%	3	4%
Asian	37	6%	4	6%	12	9%	9	11%
Hispanic/Latinx	115	18%	3	4%	31	22%	14	17%
Other	6	1%	3	4%	1	1%	5	6%
Multiple	17	3%	1	1%	0	0%	0	0%
Native Hawaiian/Pacific Islander	10	2%	0	0%	4	3%	2	2%
Unknown	39	6%	4	6%	17	12%	13	16%
HIV Status								
Positive	268	42%	2	3%	51	37%	4	5%
Negative	355	56%	61	87%	76	55%	72	87%
Unknown	11	2%	7	10%	11	8%	7	8%
Reason for Visit								
Routine exam	302	48%	18	26%	98	71%	67	81%
Symptoms	247	39%	40	57%	27	20%	10	12%
Known exposure	82	13%	11	16%	11	8%	6	7%
None/other	3	0%	1	1%	2	1%	0	0%
Neurosyphilis								
Reported Neurosyphilis								
Symptoms	45	7%	8	11%	10	7%	3	4%
Neurosyphilis Diagnosis	24	4%	3	4%	15	11%	3	4%

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

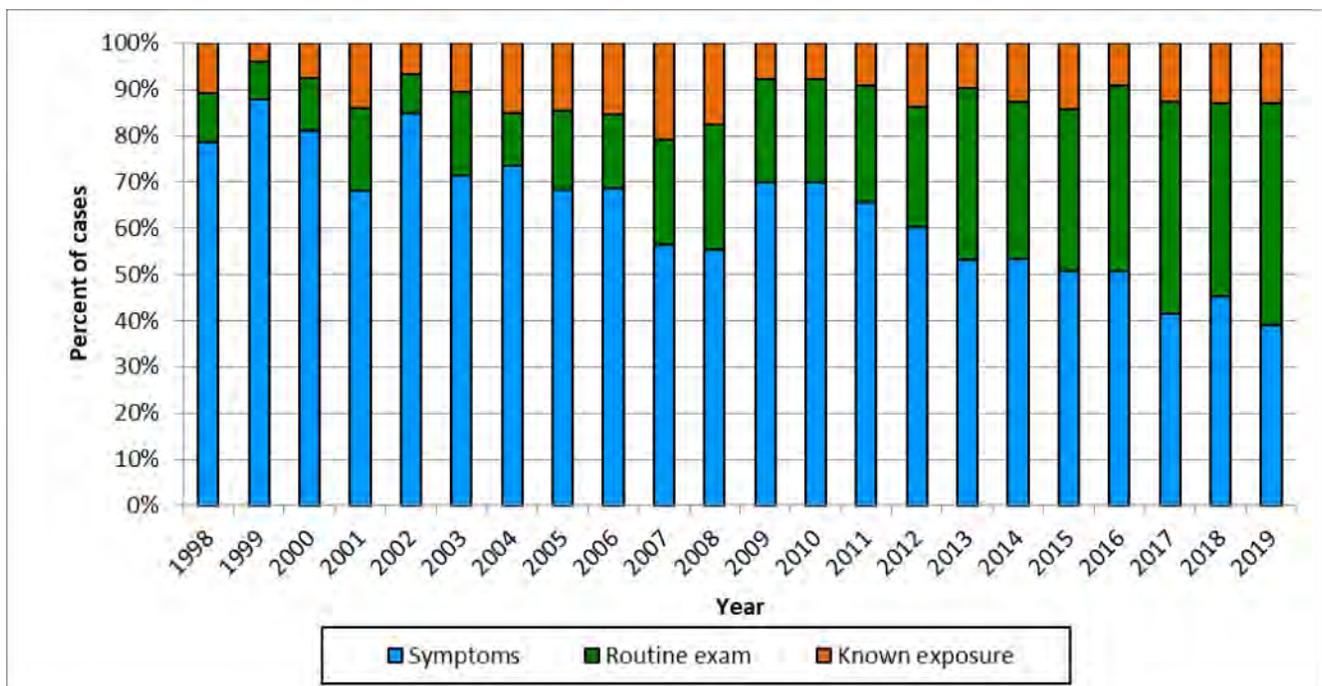
Syphilis

Stage of infection and reason for testing

In 2019, 44% of all early syphilis cases in cisgender MSM were staged as primary or secondary and 39% sought medical care because of symptoms (Table 13, Figure 20). 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 2019, the percentage of cases diagnosed through asymptomatic screening surpassed the percentage diagnosed due to symptomatic infection. Of the cases among cisgender MSM, 48% were diagnosed through asymptomatic screening and 13% because of a sex partner's syphilis diagnosis. Among cisgender heterosexual cases, 57% 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 symptomatic¹³. 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 20: Early Syphilis – Reason for visit among cisgender men who have sex with men (MSM)*, King County, WA, 1998-2019



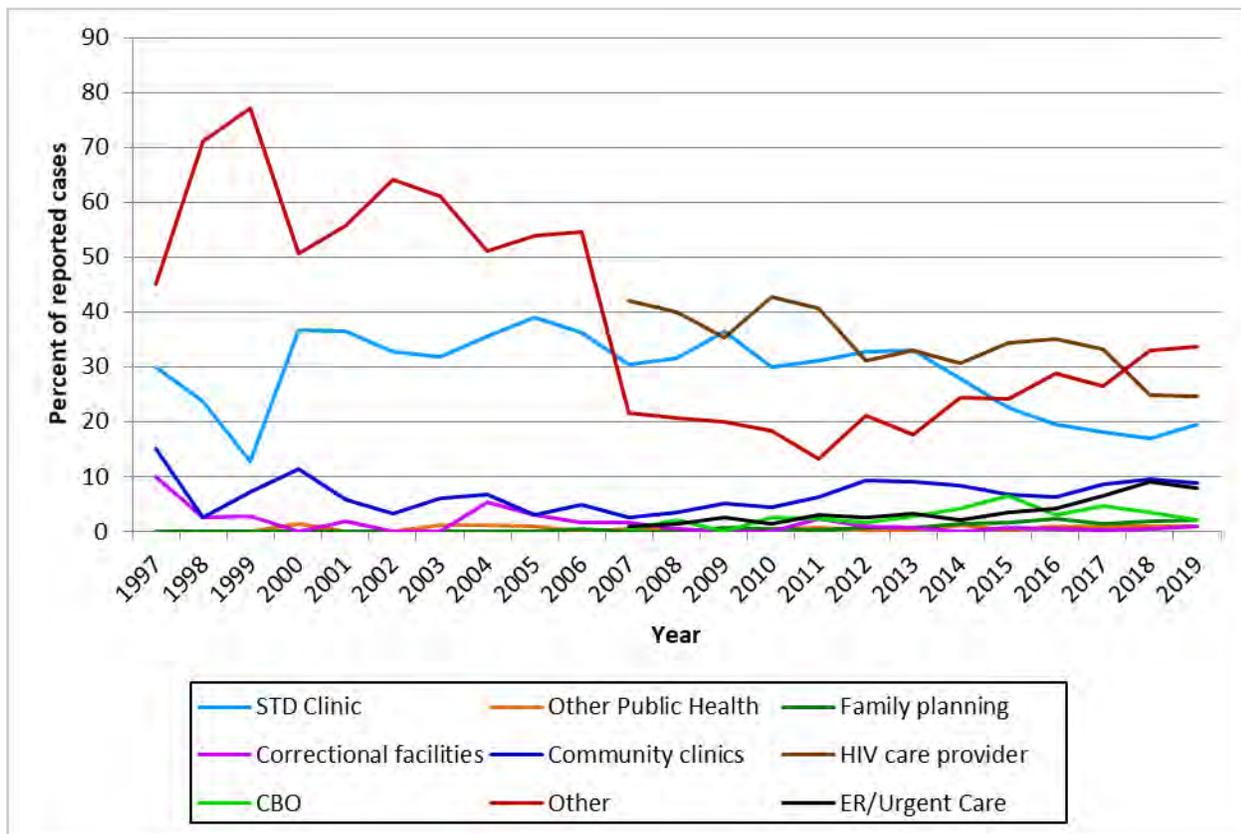
*Excludes MSM who did not report a reason for visit.

¹³Kerani 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

Many types of providers in King County are diagnosing early syphilis (Figure 21). In 2019, the PHSKC Sexual Health Clinic continued to be the largest single source of diagnosis for persons with early syphilis, accounting for 19% of all diagnoses. As a group, HIV care providers reported 24% of the 2019 cases. Family planning clinics, community clinics, county jails, community-based organizations, and other public health clinics combined to account for 15% of cases. Emergency rooms and urgent care facilities accounted for 8% of the 2019 cases. Diagnoses from other providers (typically private practices and large healthcare organizations), continued to increase, accounting for 34% of the reported cases in 2019.

Figure 21: Early Syphilis – Reported cases by provider type King County, WA, 1997-2019



CBO = Community based organization; HIV care providers and CBOs are included in the Other category prior to 2007.

PHSKC Sexual Health Clinic

Overview

In 2019, the PHSKC SHC provided care to 5,988 unique patients during 11,489 visits (Tables 14 and 15). This reflects a 25% increase in the number of patient visits to the clinic compared to 2015, the year in which visits was lowest, and a very slight increase from 11,446 visits in 2018. In 2019, MSM accounted for 63% of the SHC visits,

while MSW and cisgender women accounted for 21% and 14% of these visits, respectively. The number of visits made by MSM to the clinic continued to increase in 2019, while the number of visits by MSW and cisgender women remained relatively stable (Figure 22). This reflects continuation of the long-term trends in the population served by the clinic, with the number of MSM visits and

Table 14: Number of Public Health – Seattle King County (PHSKC) Sexual Health Clinic visits, 1993-2019

Year	Cisgender Women	Cisgender MSW [^]	Cisgender MSM [^]	Cisgender Men with Unknown Sexual Orientation	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

[^]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.

*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.

PHSKC Sexual Health Clinic

patients consistently rising (Figure 23). In 2019, the clinic provided services to 2,953 unique MSM patients during 7,200 visits, which is the highest number of visits by MSM. On intake forms patients are asked about

current gender identity and sex assigned at birth. In 2019, approximately 2% (n=145) of patients identified as transgender, non-binary, or genderqueer accounting for 253 total visits to the SHC.

Table 15: Number of Public Health – Seattle King County (PHSKC) Sexual Health Clinic patients (unduplicated visits per year), 1993-2019

Year	Cisgender Women	Cisgender MSW [^]	Cisgender MSM [^]	Cisgender Men with Unknown Sexual Orientation	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

[^]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.

*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.

PHSKC Sexual Health Clinic

Figure 22: Number of visits, Public Health - Seattle King County (PHSKC) Sexual Health Clinics, 1993-2019

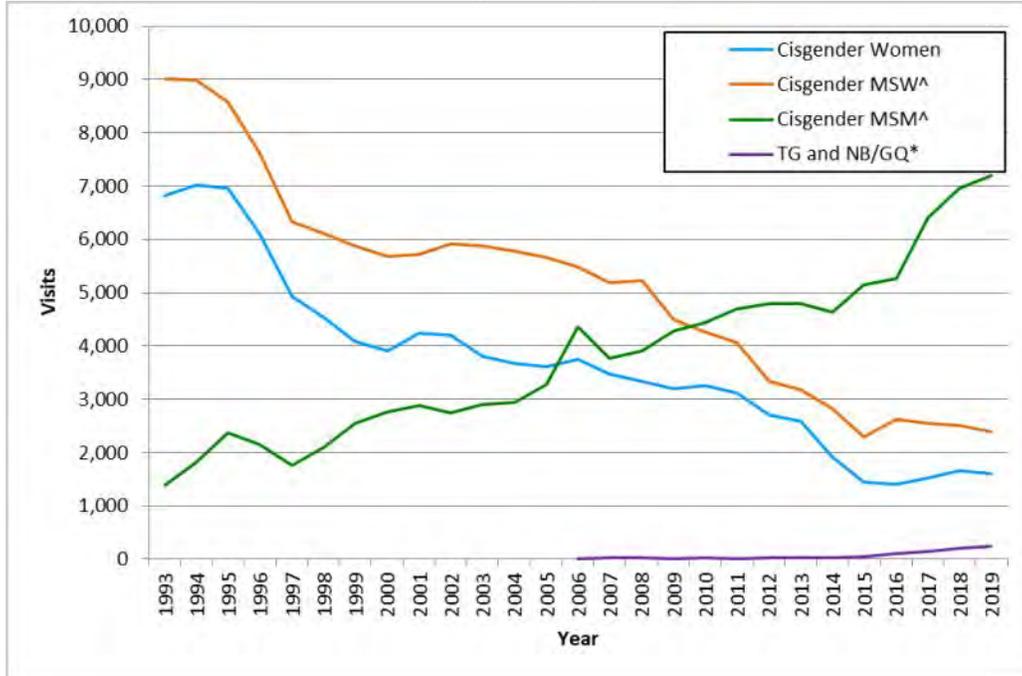
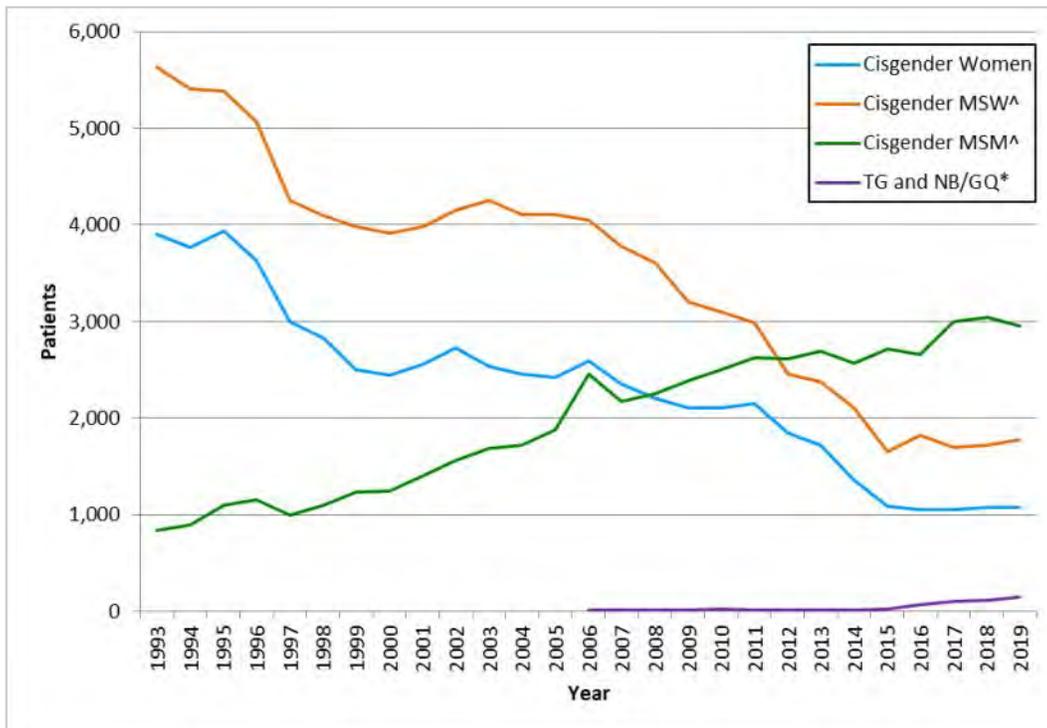


Figure 23: Number of patients (unduplicated visits), Public Health - Seattle King County (PHSKC) Sexual Health Clinics, 1993-2019



[^]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.

PHSKC Sexual Health Clinic

White patients accounted for highest number of patients among 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 16). Overall, 16% of all clinic patients, including 26% of cisgender MSW and 19% of cisgender women patients, were Black, but only 7% of all King County residents are Black.

Table 16: Age and race/ethnicity of Public Health – Seattle King County (PHSKC) Sexual Health Clinic patients, 2019

	Cisgender Women		Cisgender MSW*		Cisgender MSM*		Transgender and Non-binary/ Genderqueer		Total [^]	
	Number	(%)	Number	(%)	Number	(%)	Number	(%)	Number	(%)
Total	1,076	(100.0)	1,775	(100.0)	2,953	(100.0)	145	(100.0)	5,988	(100.0)
Race										
White	492	(45.7)	850	(47.9)	1,691	(57.3)	92	(63.4)	3,145	(52.5)
Black	209	(19.4)	456	(25.7)	297	(10.1)	11	(7.6)	978	(16.3)
American Indian/ Alaska Native	23	(2.1)	20	(1.1)	17	(0.6)	4	(2.8)	64	(1.1)
Asian	121	(11.2)	166	(9.4)	285	(9.7)	8	(5.5)	587	(9.8)
Hispanic/Latinx	123	(11.4)	151	(8.5)	472	(16.0)	16	(11.0)	768	(12.8)
Multiple	47	(4.4)	22	(1.2)	60	(2.0)	4	(2.8)	133	(2.2)
Native Hawaiian/ Pacific Islander	15	(1.4)	8	(0.5)	24	(0.8)	1	(0.7)	48	(0.8)
Unknown	46	(4.3)	102	(5.7)	107	(3.6)	9	(6.2)	265	(4.4)
Age										
10-14 years	0	(0.0)	1	(0.1)	0	(0.0)	0	(0.0)	1	(0.0)
15-19 years	65	(6.0)	39	(2.2)	42	(1.4)	4	(2.8)	150	(2.5)
20-24 years	205	(19.1)	199	(11.2)	345	(11.7)	26	(17.9)	778	(13.0)
25-29 years	243	(22.6)	348	(19.6)	700	(23.7)	45	(31.0)	1,343	(22.4)
30-34 years	194	(18.0)	331	(18.6)	629	(21.3)	29	(20.0)	1,188	(19.8)
35-44 years	211	(19.6)	416	(23.4)	641	(21.7)	30	(20.7)	1,308	(21.8)
45-54 years	106	(9.9)	249	(14.0)	353	(12.0)	7	(4.8)	719	(12.0)
>=55 years	52	(4.8)	192	(10.8)	243	(8.2)	4	(2.8)	501	(8.4)
Unknown	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)

*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.

[^]39 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

PHSKC Sexual Health Clinic

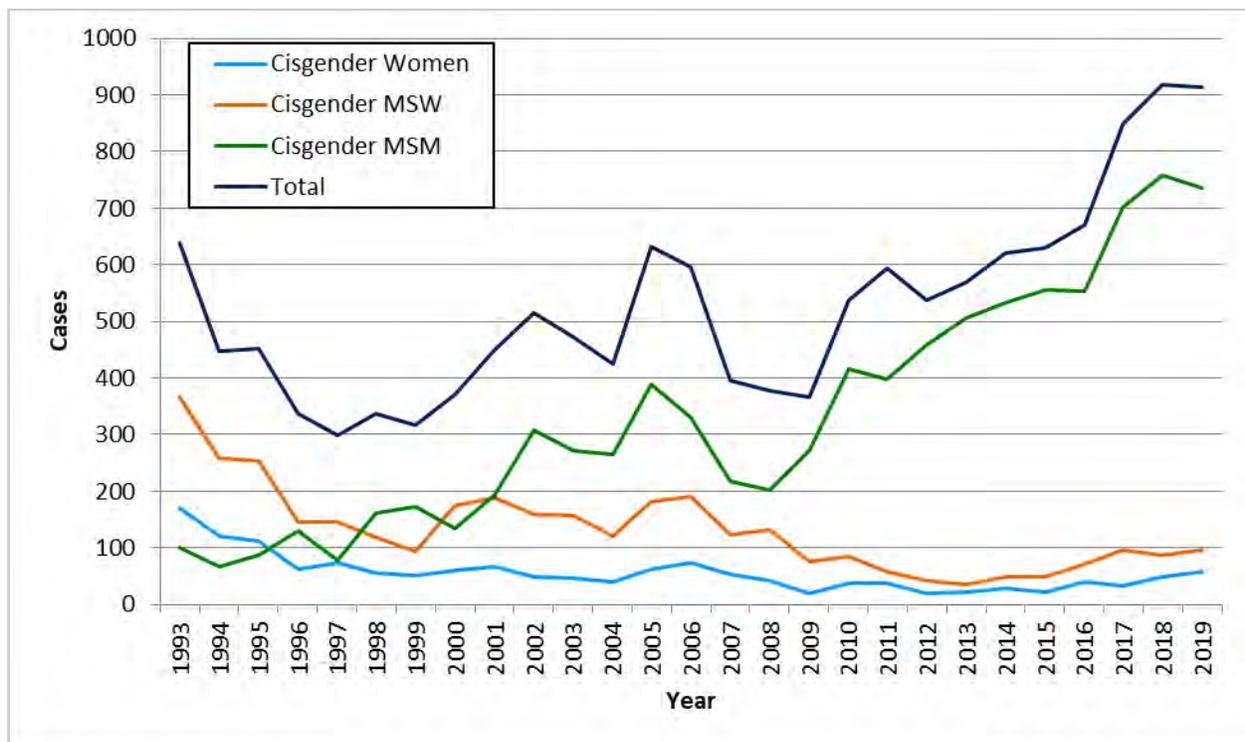
The PHSKC SHC continued to play an important role in diagnosing reportable STIs in King County. In 2019, the clinic diagnosed 19% (145 of 747) of early syphilis cases in the county, 17% (781 of 4,706) of all gonorrhea cases, 13% (24 of 183) of all HIV cases, and an estimated 6% (716 of 12,097) of all 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.

Gonorrhea

In 2019, clinicians in the SHC diagnosed 914 cases of gonorrhea, continuing a trend of increasing of gonorrhea

diagnoses (Figure 24). This is very similar to the 918 cases diagnosed in 2018 and represents a 70% increase since 2010 when 537 cases were diagnosed. This trend is largely driven by continued increases in gonorrhea diagnoses among MSM, though diagnoses among MSW and women have also increased in recent years. The observed increase in gonorrhea among MSM 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 25 and 26). In 2019, 24 gonorrhea cases were diagnosed among transgender and non-binary/genderqueer patients, 4 (17%) were transgender men, 4 (17%) were transgender women, and 16 (67%) were non-binary/genderqueer.

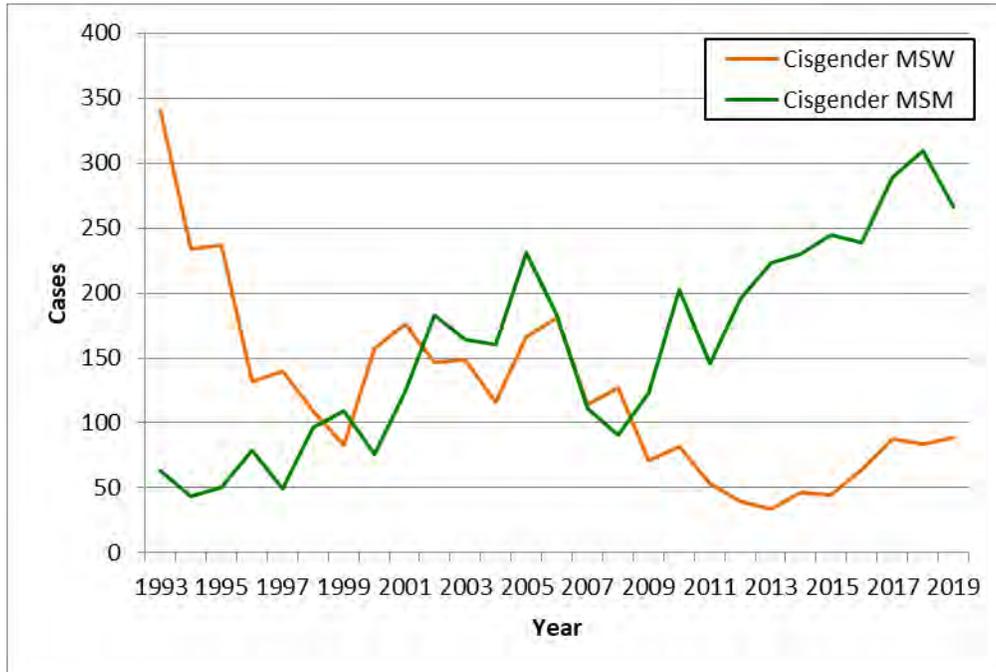
Figure 24: Gonorrhea – Number of diagnoses by gender and gender of sex partners, Public Health - Seattle King



*Data limited to cisgender patients. These data exclude 121 cases of gonorrhea among men who were missing sexual orientation information across all years. 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.

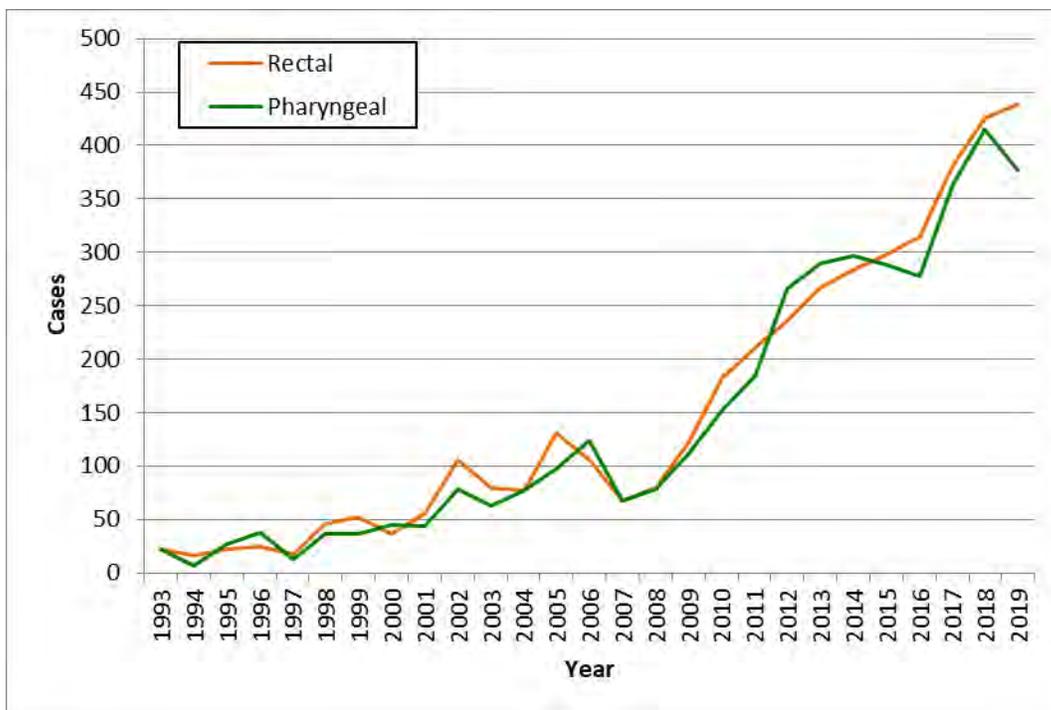
PHSKC Sexual Health Clinic

Figure 25: Gonorrhea – Symptomatic gonococcal 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, 1993-2019*



*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. These data exclude 63 cases of symptomatic urethral gonorrhea among men who were missing sexual orientation information across all years.

Figure 26: Gonorrhea – Rectal and pharyngeal infections among cisgender men who have sex with men Public Health – Seattle King County Sexual Health Clinic, 1993-2019



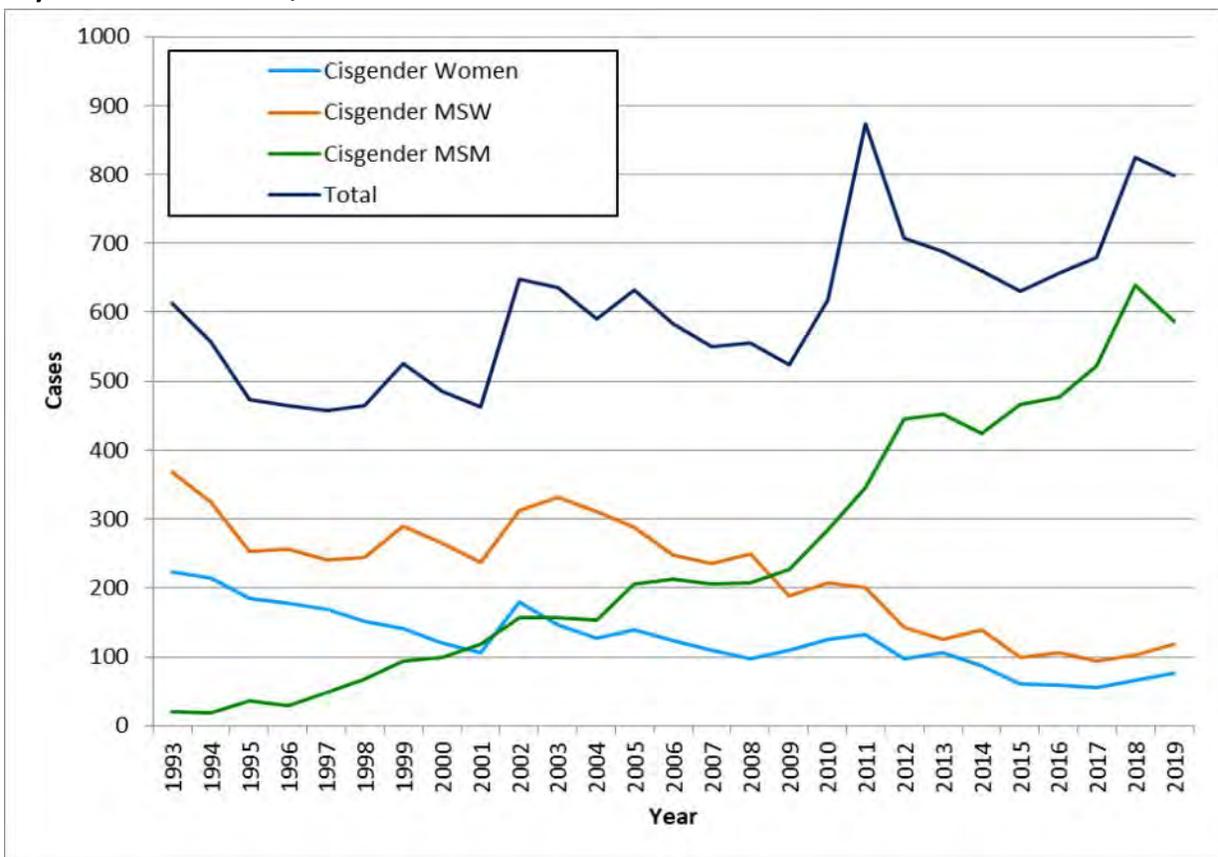
PHSKC Sexual Health Clinic

Chlamydial infection

In 2019, the SHC diagnosed 798 cases of chlamydial infection, which is a 3% decrease from 2018 (n=824), but a 29% increase since 2010 (n=618) and reflects a rise in chlamydial infections among MSM (Figure 27). 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, remains higher than cases diagnosed prior to 2015 (Figure 28). 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 positivity of chlamydial infection among asymptomatic women ages 15-29 has varied over the years and reached a peak in 2019 at 12% (Figure 29). In 2019, 17 cases of chlamydia infection were diagnosed among transgender and non-binary/genderqueer patients, 5 (29%) were transgender women and 12 (71%) were non-binary/genderqueer.

Figure 27: Chlamydial Infection – Number of diagnoses by gender and gender of sex partners Public Health – Seattle King County Sexual Health Clinic, 1993-2019*



*Data are limited to cisgender patients. 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. These data exclude 2018 cases of chlamydial infection among men who were missing sexual orientation information across all years. More sensitive NAATs for extragenital chlamydia screening were adopted in November 2010.

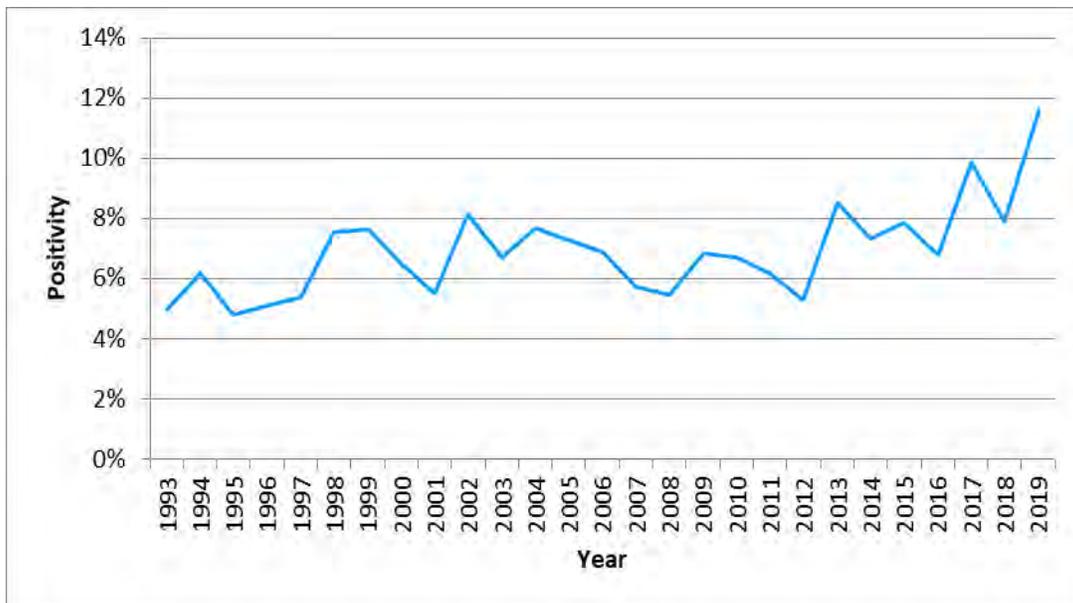
PHSKC Sexual Health Clinic

Figure 28: 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, 1993-2019*



*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 29: Chlamydial Infection – Positivity among asymptomatic cisgender women ages 15-29 Public Health – Seattle King County Sexual Health Clinic, 1993-2019*



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

PHSKC Sexual Health Clinic

Syphilis

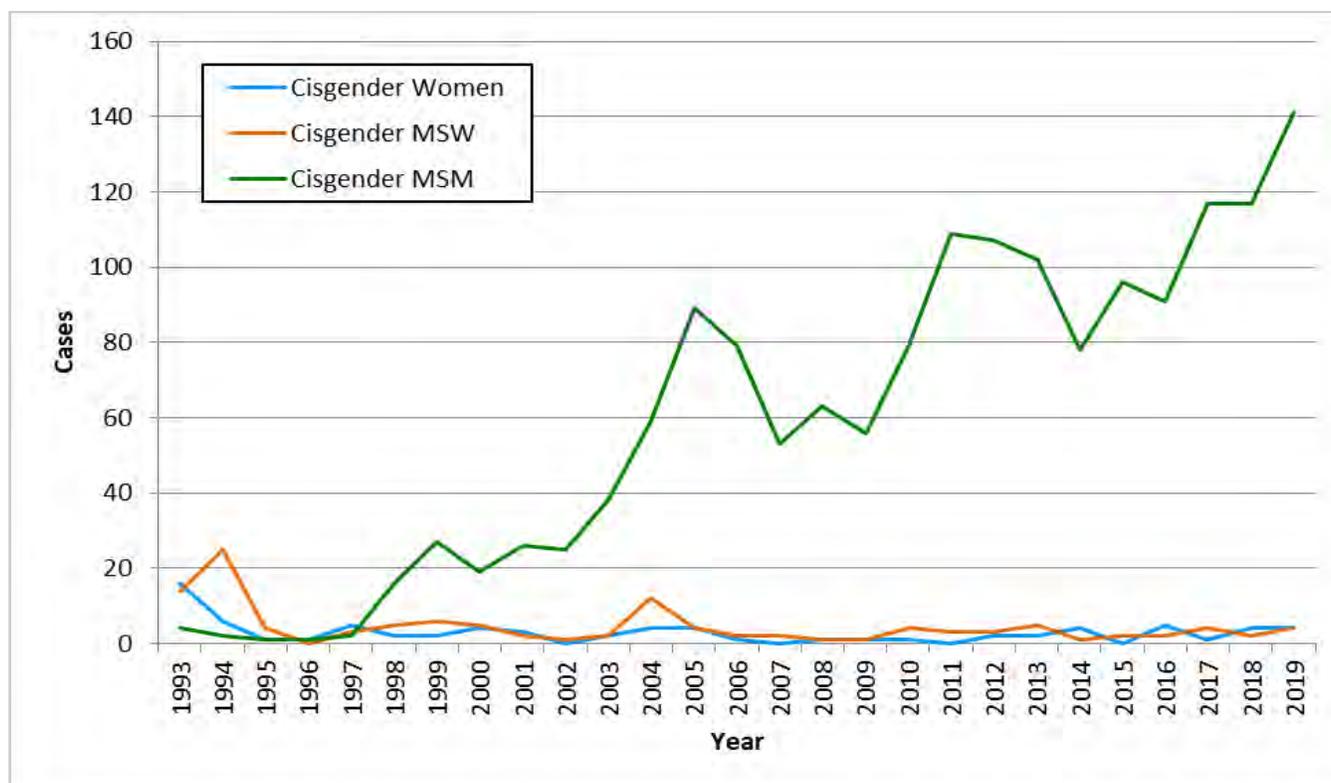
In 2019, clinicians at the SHC diagnosed 149 early syphilis cases among King County residents for whom the gender of sex partners could be determined (Figure 30). Of these cases, 95% occurred among cisgender MSM. Overall, 226 cases of syphilis were diagnosed at the SHC in 2019, of which 81% (n=183) were early syphilis, 14% (n=31) were late latent or unknown duration syphilis, and 5% (n=12) were neurosyphilis. Of the early cases, 91% (n=167) were among cisgender MSM, 4% (n=7) were among cisgender MSW, 4% (n=7) were among cisgender women, and 1% (n=2) were transgender or non-binary/genderqueer. Of the late

latent or unknown duration syphilis diagnoses, 77% (n=24) were cisgender MSM and 23% (n=7) were cisgender women. Of the neurosyphilis cases diagnosed in the SHC, 75% (n=9) were cisgender MSM and 35% (n=3) were cisgender women.
information across all years.

HIV

Sexual Health Clinic clinicians diagnosed 24 new cases of HIV infection among King County residents in 2019, similar to the 32 cases newly diagnosed in 2018, but dramatically lower than the 65 cases newly diagnosed in 2008 (Figure 31). MSM accounted for 88% of the cases diagnosed in the Sexual Health Clinic in 2019.

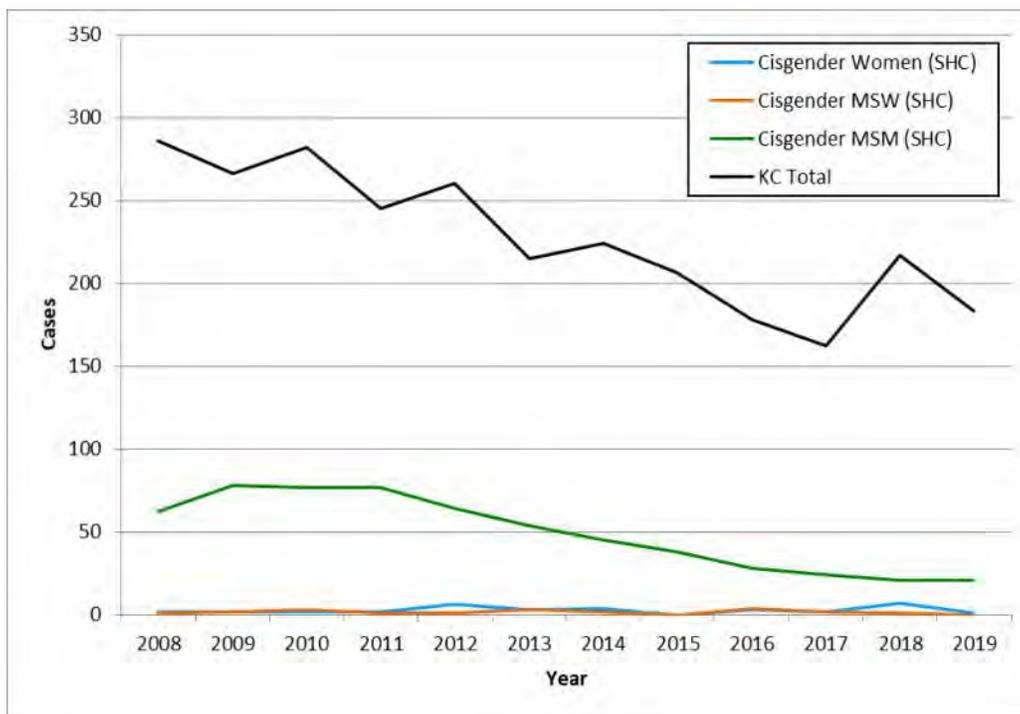
Figure 30: Early Syphilis – Number of diagnoses at Public Health – Seattle King County Sexual Health Clinic by gender and gender of sex partners among King County Residents, 1993-2019*



*Includes primary, secondary, and early non-primary, non-secondary syphilis. MSM includes men who have sex with men and MSW includes men who reported sex with women only. These data exclude 60 cases among men who were missing sexual orientation information across all years.

PHSKC Sexual Health Clinic

Figure 31: HIV Infection – Diagnoses by gender and gender of sex partners*, Public Health – Seattle King County Sexual Health Clinic (PHSKC SHC) and total HIV diagnoses in King County (KC), 2008-2019



*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.

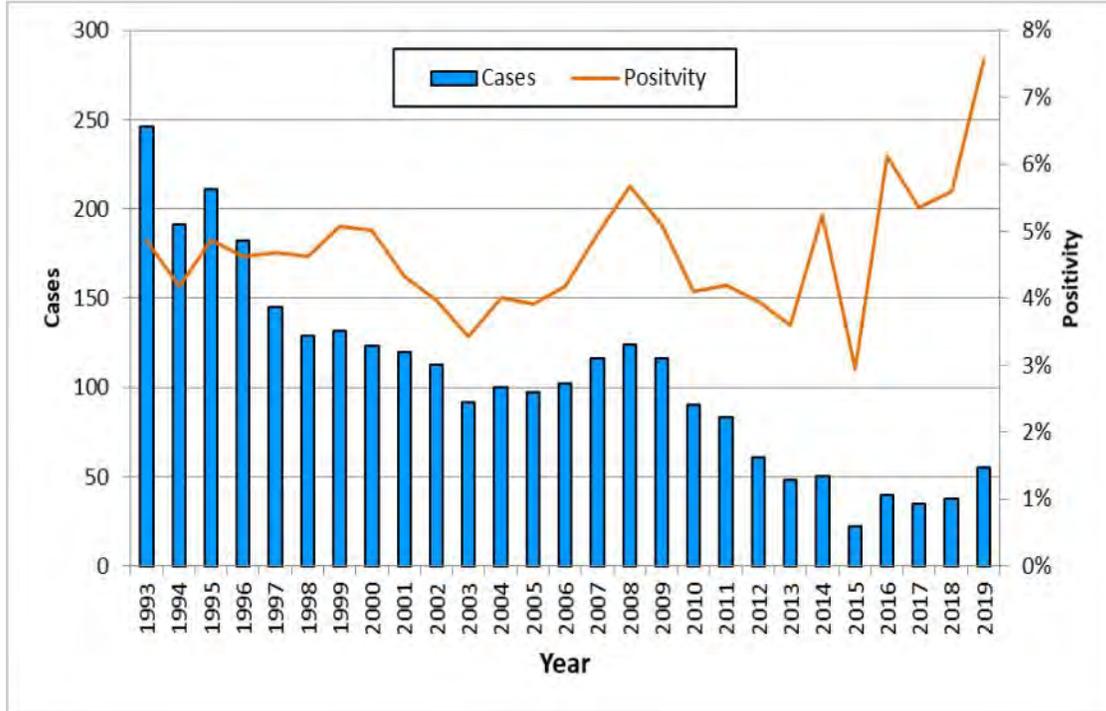
Trichomoniasis and Bacterial Vaginosis

In 2019, 55 cases of trichomoniasis were diagnosed among cisgender women in the SHC. The number of trichomoniasis cases has increased from a low of 22 in 2015, but still represents a decrease from 90 diagnoses in 2010 (Figure 32). 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 7.6% among tested cisgender women in 2019. 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 234 in 2019, and the prevalence of bacterial vaginosis among cisgender women has remained relatively stable since 2015 (Figure 33). 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. These decreases in diagnoses of trichomoniasis and bacterial vaginosis without significant changes in prevalence appear to result from decreases in the number of cisgender women tested for these conditions, which mirrors a trend towards fewer visits to the clinic by cisgender women.

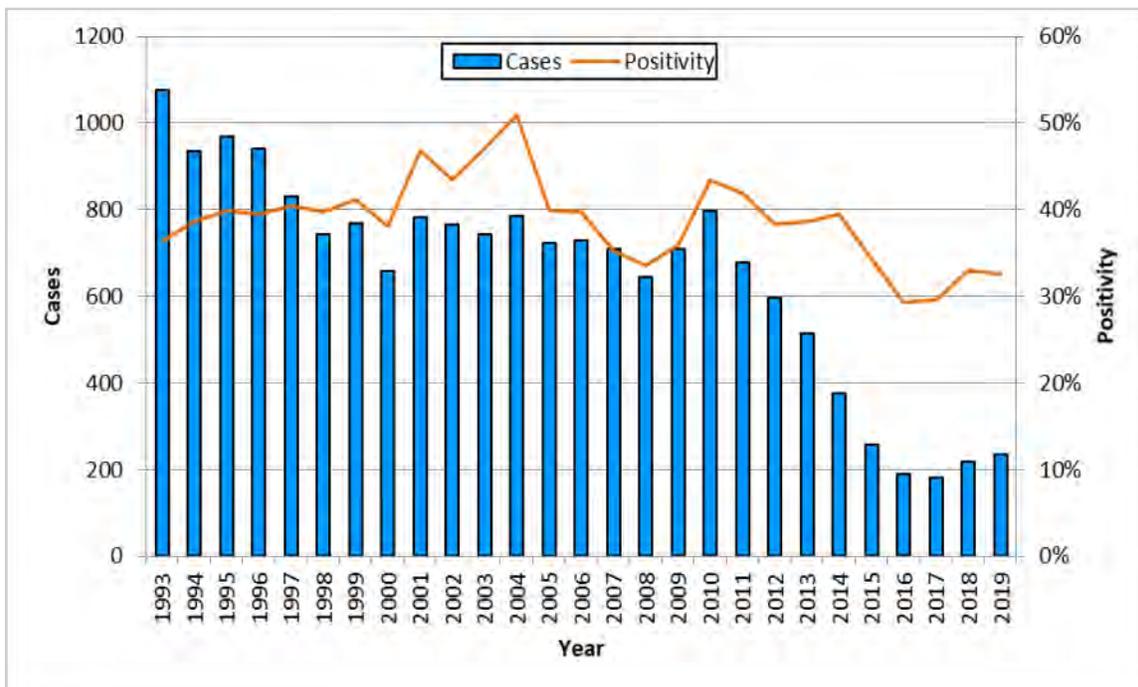
PHSKC Sexual Health Clinic

Figure 32: Trichomoniasis – Number of diagnoses and positivity among cisgender women Public Health – Seattle King County Sexual Health Clinic, 1993-2019



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).

Figure 33: Bacterial Vaginosis – Number of diagnoses and positivity among cisgender women Public Health – Seattle King County Sexual Health Clinic, 1993-2019



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

PHSKC Sexual Health Clinic

Human papillomavirus (HPV) Vaccination among cisgender MSM HPV vaccine series was 61% in 2019, slightly lower, but similar to the proportion reported in 2017 and 2018.

The percentage of cisgender MSM patients aged 30 and younger reporting ever receiving a dose of the HPV vaccine increased from 54% to 65% over the past three years (Table 17). However, the 18% of patients in this population who reported never receiving a dose of the vaccine and the 17% whose vaccine status was unknown represent a potential missed opportunity for intervention. Among those reporting ever receiving the HPV vaccine, the proportion of patients who reported completing the

Among patients of all ages, 882 unique patients were vaccinated for HPV at the clinic in 2019, of which 581 (66%) were cisgender MSM, 169 (19%) were cisgender MSW, 103 (12%) were cisgender women, 24 (3%) were transgender or non-binary/genderqueer, and 39 (1%) were cisgender men with unknown gender of sex partners.

**Table 17: Human papillomavirus (HPV) vaccination among cisgender men who have sex with men (MSM)*
Public Health – Seattle King County Sexual Health Clinic (PHSKC SHC) patients ages 30 and under, 2017-2019**

	2017		2018		2019	
	Number	(%)	Number	(%)	Number	(%)
Ever Received HPV Vaccine						
Yes	705	(54)	734	(56)	799	(65)
No	385	(30)	354	(27)	215	(18)
Unknown	212	(16)	223	(17)	207	(17)
Among Ever Received: HPV Vaccine Series Complete						
Yes	482	(68)	520	(71)	488	(61)
No	202	(29)	183	(25)	259	(32)
Unknown	21	(3)	31	(4)	52	(7)
Among Ever Received: Number of Doses Completed						
1	134	(19)	112	(15)	138	(17)
2	68	(10)	71	(10)	121	(15)
3	482	(68)	520	(71)	488	(61)
Unknown	21	(3)	31	(4)	52	(7)
Number of Vaccine Doses Given in PHSKC SHC	157		341		441	
Number of Unique Patients Vaccinated in PHSKC SHC	141		243		303	

*MSM are cisgender men who acknowledged sex with men in any visit to the clinic

PHSKC Sexual Health Clinic - PrEP

HIV Pre-Exposure Prophylaxis (PrEP)

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

Clinicians recommend that MSM or transgender patients who have sex with men initiate PrEP if they meet the any of following criteria:

- A diagnosis of urethral or rectal gonorrhea or syphilis in the previous 12 months
- Methamphetamine in the previous 12 months
- History of exchange sex for money or drugs in previous 12 months
- Patient has an HIV-positive partner who is not virally suppressed

In addition to the patients who meet any of the above criteria, Black or Hispanic/Latinx MSM and transgender persons who have sex with men, female sex workers who are experiencing homelessness, and persons who inject drugs who are experiencing homelessness are eligible to receive ongoing PrEP care through the SHC. 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. The above criteria were used for PrEP initiation in 2019 and as of 2020, all cisgender MSM and transgender patients in the SHC are offered PrEP through the clinic.

Patients receiving PrEP through the SHC are seen by a clinician at an initial visit and, in the absence of medical complaints, annually thereafter. Non-medical clinic staff

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

Between October 2014 and December 2019, 1,386 unique patients attended initial PrEP visits, among whom 88% filled an initial PrEP prescription (Table 18). As of the end of 2019, 664 SHC PrEP patients were receiving PrEP through the clinic and 854 had received PrEP through the clinic during at least one PrEP visit in 2019 (Table 19). In 2019, 351 patients attended an initial PrEP visit, 91% of whom filled their first prescription (Table 18). Of these patients, 93% were cisgender men, 51% were White, 23% were Hispanic/Latinx, and 50% were between the ages of 20 and 29. There were 106 patients who had attended an initial visit but never started or who had previously taken PrEP but discontinued use that attended restart PrEP visits in 2019 (Table 18). Of the restart patients, 90% filled their restart prescription. In 2019, 243 PrEP patients discontinued PrEP use and did not restart (Table 20). Over half (52%) of these patients were lost to follow-up. Transferring care (12%) and moving (14%) were the other top reasons for PrEP discontinuation at the SHC.

PHSKC Sexual Health Clinic - PrEP

Table 18: Public Health – Seattle King County Sexual Health Clinic patients attending initial* or restart PrEP Visits, 2014-2019**

	Initial Visits 2014-2019 (N=1386)		Initial Visits 2019 (N=351)		Restart Visits 2019 (N=106)	
	N	(%)	N	(%)	N	(%)
Race/ethnicity						
American Indian/Alaska Native	16	(1)	1	(0)	3	(3)
Asian	136	(10)	32	(9)	5	(5)
Black	131	(9)	35	(10)	19	(18)
Hispanic/Latinx	363	(26)	82	(23)	25	(24)
Native Hawaiian/Pacific Islander	25	(2)	6	(2)	0	(0)
White	676	(49)	183	(52)	48	(45)
Unknown	39	(3)	12	(3)	6	(6)
Age						
<15 years	1	(0)	0	(0)	0	(0)
15-19 years	50	(4)	13	(4)	3	(3)
20-24 years	297	(21)	72	(21)	19	(18)
25-29 years	410	(30)	105	(30)	41	(39)
30-34 years	290	(21)	86	(25)	20	(19)
35-44 years	212	(15)	48	(14)	16	(15)
45-54 years	97	(7)	20	(6)	6	(6)
>=55 years	29	(2)	7	(2)	1	(1)
Gender						
Cisgender Women	41	(3)	12	(3)	2	(2)
Cisgender Men	1,299	(94)	328	(93)	100	(94)
Non-binary/Genderqueer	12	(1)	4	(1)	2	(2)
Transgender Men	7	(1)	2	(1)	0	(0)
Transgender Women	26	(2)	5	(1)	2	(2)
Unknown	1	(0)	0	(0)	0	(0)
Filled First Prescription						
Yes	1,226	(88)	319	(91)	95	(90)
No	160	(12)	32	(9)	11	(10)

*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.

PHSKC Sexual Health Clinic - PrEP

Table 19: Public Health – Seattle King County Sexual Health Clinic PrEP patients, 2019

	On PrEP at any point (N=854)*		On PrEP at Year End (N=664)**	
	N	(%)	N	(%)
Race/ethnicity				
American Indian/Alaska Native	6	(1)	5	(1)
Asian	91	(11)	74	(11)
Black	76	(9)	53	(8)
Hispanic/Latinx	228	(27)	180	(27)
Native Hawaiian/Pacific Islander	9	(1)	6	(1)
White	419	(49)	328	(49)
Unknown	25	(3)	18	(3)
	854	100	664	100
Age				
<15 years	0	(0)	0	(0)
15-19 years	19	(2)	12	(2)
20-24 years	142	(17)	89	(13)
25-29 years	244	(29)	189	(28)
30-34 years	210	(25)	172	(26)
35-44 years	154	(18)	128	(19)
45-54 years	62	(7)	51	(8)
>=55 years	23	(3)	23	(3)
Gender				
Cisgender Women	16	(2)	5	(1)
Cisgender Men	810	(95)	638	(96)
Non-binary/Genderqueer	10	(1)	8	(1)
Transgender Men	3	(0)	3	(0)
Transgender Women	15	(2)	10	(2)
Unknown	0	(0)	0	(0)

*Patients were classified as on PrEP at any point in 2019 if any of their 2019 visits were coded as on PrEP.

**Patients were classified as on PrEP at year end if their last visit date in 2019 was coded as on PrEP.

PHSKC Sexual Health Clinic - PrEP

Table 20: Public Health – Seattle King County Sexual Health Clinic patients discontinuing PrEP, 2019

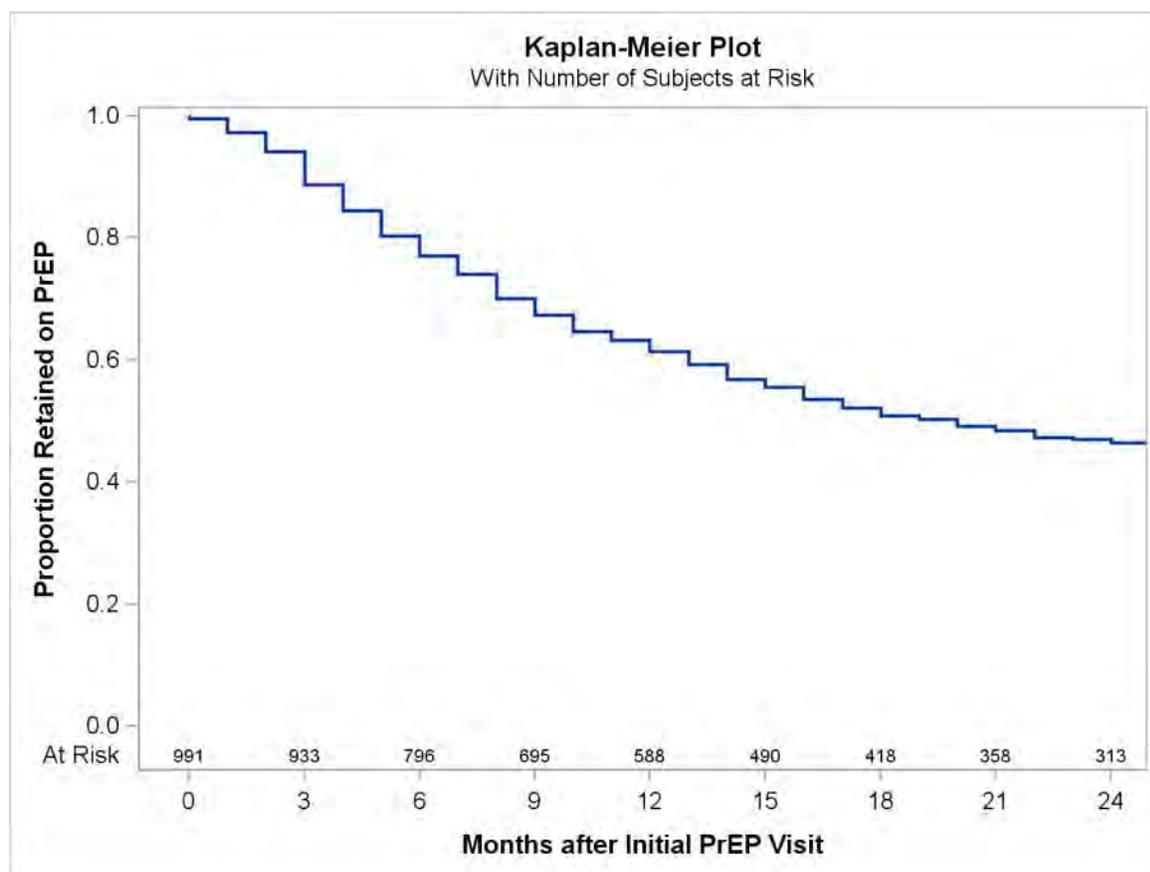
N=243		
	N	(%)
Race/ethnicity		
American Indian/Alaska Native	2	(1)
Asian	18	(7)
Black	26	(11)
Hispanic/Latinx	62	(26)
Native Hawaiian/Pacific Islander	5	(2)
White	121	(50)
Unknown	9	(4)
Age		
<15 years	0	(0)
15-19 years	3	(1)
20-24 years	43	(18)
25-29 years	66	(27)
30-34 years	55	(23)
35-44 years	54	(22)
45-54 years	18	(7)
>=55 years	4	(2)
Gender		
Cisgender Women	11	(5)
Cisgender Men	223	(92)
Non-binary/Genderqueer	3	(1)
Transgender Men	1	(0)
Transgender Women	4	(2)
Unknown	1	(0)
Reason for Discontinuation		
HIV Positive at Initial Visit	3	(1)
HIV positive due to missed pills	3	(1)
Jail/Incarceration	4	(2)
Lost to Follow-Up	127	(52)
Monogamous Relationship	18	(7)
Moved	34	(14)
No longer at risk for HIV (as determined by patient)	7	(3)
Side Effects	8	(3)
Transferred	28	(12)
Unknown/Other	11	(5)

PHSKC Sexual Health Clinic - PrEP

We used Kaplan-Meier analysis to assess factors associated with PrEP discontinuation among patients who enrolled in the Sexual Health Clinic PrEP program from October 2014 to December 2019¹⁴. Of the 1,386 patients with initial visits for PrEP, 991 were included in the discontinuation analysis. Patients were excluded if their first prescription was not filled (n=172), if they moved or transferred care (n=217), or they tested positive for HIV at their initial visit (n=6). Methamphetamine use was higher in the excluded population (15% vs 9%), 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, 2020. The median observation time was 14 months (interquartile range, 7-28 months). After starting, 566 patients (57%) stopped using PrEP. In the months after the initial PrEP visit, the proportion of patients on PrEP declined steadily with approximately 61% retained on PrEP by 12 months (Figure 34).

Figure 34: Timing of PrEP discontinuation among patients filling first prescription Public Health – Seattle King County Sexual Health Clinic, 2014-2019



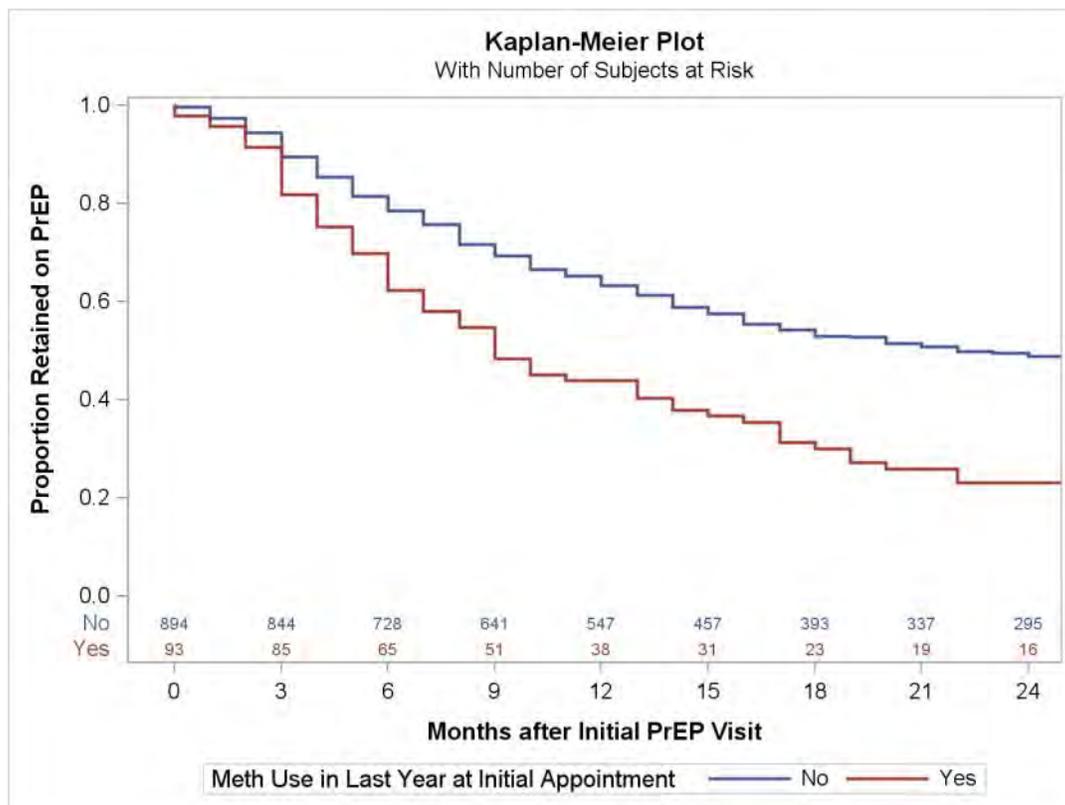
¹⁴Dombrowski JC, Golden MR, Barbee, LA, et al. Patient disengagement from an HIV preexposure prophylaxis program in a sexually transmitted disease clinic. *Sex Transm Dis* 2018; 45(9): e62–e64.

PHSKC Sexual Health Clinic - PrEP

Timing of discontinuation was not associated with age but was associated with Black race and methamphetamine use in the prior year as ascertained at the time of PrEP initiation. Only 44% of patients who reported methamphetamine use in the past year continued PrEP at 12 months compared to 63% of patients who did not report methamphetamine use in the past year (Figure 35). Black patients had lower PrEP retention at 12 months (52%) compared to Hispanic (55%), Asian (66%), and White (64%) PrEP patients

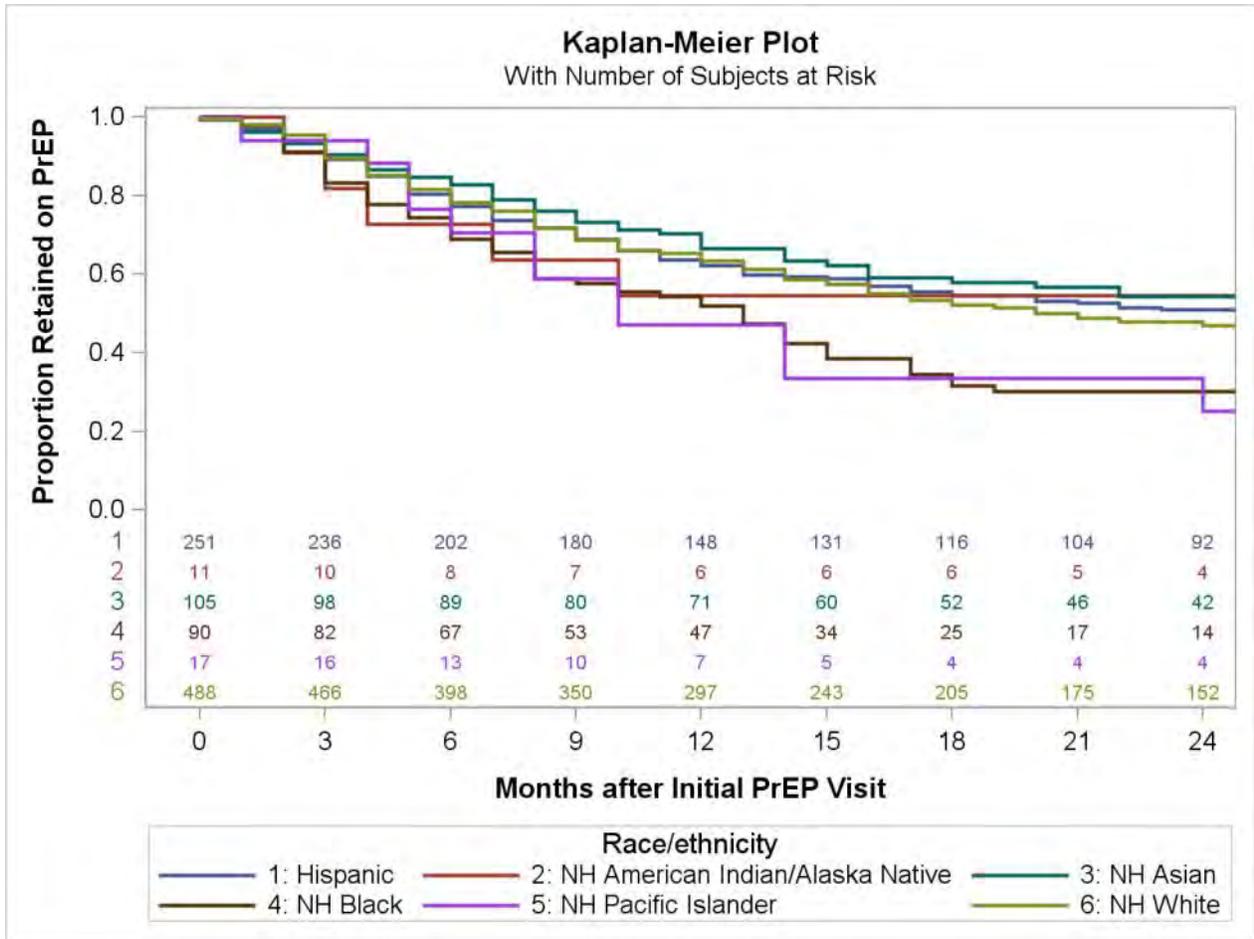
(Figure 36). Understanding the reasons for PrEP discontinuation is difficult as 68% (n=384) of the patients were lost to follow-up and for an additional 5% (n=30) the reason was unknown or other. Of the 152 patients with a known reason, 44% (n=67) discontinued because they were in a monogamous relationship with an HIV-seronegative partner or partner with undetectable HIV, 28% (n=43) determined they were no longer at risk for HIV, and 19% (n=29) due to side effects.

Figure 35: Timing of PrEP discontinuation among patients filling first prescription by methamphetamine use
Public Health – Seattle King County Sexual Health Clinic, 2014-2019



PHSKC Sexual Health Clinic - PrEP

Figure 36: Timing of PrEP discontinuation among patients filling first prescription by race/ethnicity Public Health – Seattle King County Sexual Health Clinic, 2014-2019



NH = Non-Hispanic

PHSKC Partner Services

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.

Syphilis

In 2019, 747 early syphilis cases and 244 late/unknown duration cases were diagnosed among residents of King County (Table 21). DIS initiated investigations of 641 cases, of whom 477 (74%) were interviewed for partner

services, while 20 (3%) refused partner services and 130 (20%) were not located or did not respond to contact attempts. Of the index cases interviewed by DIS, 176 cases (37%) named at least one notifiable partner with 407 total partners named (Figure 37). Over 63% of the notifiable partners (n=257) were notified of their potential exposure and DIS confirmed that 52% (n=212) tested for syphilis. Among the tested partners, 44 cases of syphilis were newly diagnosed, which reflects nearly 11% of the notifiable partners and nearly 21% 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 162 uninfected 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 145 (55%) partners of their potential exposure. After the partner services interview, 145 partners tested for syphilis, 19 were newly diagnosed, 18 were treated for their infection, and 120 partners were epi treated for syphilis (i.e. treated for possible incubating syphilis). Partner services outcomes were similar between cisgender MSM and heterosexuals (Table 22).

PHSKC Partner Services

Table 21: Partner Services — Outcomes among early, late, and total syphilis cases, King County, WA, 2019

	Early Syphilis (N=747)		Late Syphilis (N=244)		Total Syphilis (N=991)	
	Number (%)	Index	Number (%)	Index	Number (%)	Index
Index Cases Diagnosed	747		244		991	
Index Cases Initiated	508 (68)		133 (55)		641 (65)	
Index Cases Interviewed	379 (75)		98 (74)		477 (74)	
Median Days from Treatment to Interview (Interquartile Range)	4 (0-12)		0 (0-11)		4 (0-12)	
Index Cases Naming ≥1 Contact	137 (36)		39 (40)		176 (37)	
Number of Partners Named	341		66		407	
Contact Index		0.90		0.67		0.85
Notified based on Index Case Report	215 (63)		42 (64)		257 (63)	
Notified by DIS	122 (36)		23 (35)		145 (36)	
Notification Index (DIS)		0.32		0.23		0.30
Tested for Syphilis	179 (52)		33 (50)		212 (52)	
Testing Index		0.47		0.34		0.44
Before Interview	53 (16)		14 (21)		67 (16)	
After Interview	126 (37)		19 (29)		145 (36)	
Testing Index (DIS)		0.33		0.19		0.30
Newly Diagnosed with Syphilis	42 (12)		2 (3)		44 (11)	
Before Interview	23 (7)		2 (3)		25 (6)	
After Interview	19 (6)		0 (0)		19 (5)	
Case Finding Index (DIS)		0.11		0.02		0.09
Treated	42 (12)		2 (3)		44 (11)	
Brought to Treatment Index		0.11		0.02		0.09
Before Interview	24 (7)		2 (3)		26 (6)	
After Interview	18 (5)		0 (0)		18 (4)	
Brought to Treatment Index (DIS)		0.05		0		0.04
Partners Epi Treated	177 (52)		29 (44)		206 (51)	
Epi Index		0.47		0.30		0.43
Before Interview	57 (17)		11 (17)		68 (17)	
After Interview	120 (35)		18 (27)		138 (34)	
Epi Index (DIS)		0.32		0.18		0.29

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 syphilis cases per index case interviewed

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

Epi index = partners receiving preventive syphilis treatment per index case interviewed

PHSKC Partner Services

Table 22: Partner Services — Outcomes among syphilis cases by gender and gender of sex partners*, King County, WA, 2019

	Cisgender Men who have sex with men				Cisgender Heterosexuals			
	Early Syphilis		Late Syphilis		Early Syphilis		Late Syphilis	
	Number (%)	Index	Number (%)	Index	Number (%)	Index	Number (%)	Index
Index Cases Diagnosed	634		138		71		83	
Index Cases Initiated	416 (66)		67 (49)		70 (99)		63 (76)	
Index Cases Interviewed	322 (77)		54 (81)		55 (79)		43 (68)	
Median Days from Treatment to Interview (Interquartile Range)	4 (0-13)		1 (0-11)		5.5 (0-9)		0 (0-12)	
Index Cases Naming ≥1 Contact	109 (34)		20 (37)		28 (51)		19 (44)	
Number of Partners Named	304		40		37		26	
Contact Index		0.94		0.74		0.67		0.60
Notified based on Index Case Report	188 (62)		26 (65)		27 (73)		16 (62)	
Notified by DIS	116 (38)		17 (43)		6 (16)		6 (23)	
Notification Index (DIS)		0.36		0.31		0.11		0.14
Tested for Syphilis	154 (51)		16 (40)		25 (68)		17 (65)	
Testing Index		0.48		0.30		0.45		0.40
Before Interview	37 (12)		7 (18)		16 (43)		7 (27)	
After Interview	117 (38)		9 (23)		9 (24)		10 (38)	
Testing Index (DIS)		0.36		0.17		0.16		0.23
Newly Diagnosed with Syphilis	30 (10)		1 (3)		12 (32)		1 (4)	
Before Interview	14 (5)		1 (3)		9 (24)		1 (4)	
After Interview	16 (5)		0 (0)		3 (8)		0 (0)	
Case Finding Index (DIS)		0.05		0.00		0.05		0.00
Treated for Syphilis	30 (10)		1 (3)		12 (32)		1 (4)	
Brought to Treatment Index		0.09		0.02		0.22		0.02
Before Interview	14 (5)		1 (3)		10 (27)		1 (4)	
After Interview	16 (5)		0 (0)		2 (5)		0 (0)	
Brought to Treatment Index (DIS)		0.05		0.00		0.04		0.00
Partners Epi Treated:	153 (50)		17 (43)		24 (65)		12 (46)	
Epi Index		0.48		0.31		0.44		0.28
Before Interview	40 (13)		7 (18)		17 (46)		4 (15)	
After Interview	113 (37)		10 (25)		7 (19)		8 (31)	
Epi Index (DIS)		0.35		0.19		0.13		0.15

*Excludes 51 cases among men missing gender of sex partner information and 9 transgender 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

Case finding index = partners identified as new syphilis cases per index case interviewed

Brought to treatment index = 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

PHSKC Partner Services

Gonorrhea

In 2019, DIS initiated investigations of 2,402 gonorrhea index cases for partner services, of which 1,452 (61%) were interviewed. Cisgender MSM accounted for 921 (39%) of these cases and cisgender heterosexuals accounted for 1,471 (61%) (Tables 23 and 24). Among cisgender MSM, 711 (77%) cases were interviewed, 63 (7%) refused interview, and 125 (14%) were not located or did not respond to contact attempts. Among the cisgender heterosexual cases, 741 (51%) were interviewed, 130 (9%) refused interview, and 521 (35%) were not located or did not respond to contact attempts. The overall contact index among interviewed clients (partners named per index case) was 0.41 and was slightly higher among cisgender MSM cases compared to heterosexual cases. A total of 575 partners tested for gonorrhea and chlamydial infection, of whom 188 (33%) tested positive for gonorrhea or chlamydial infection. However, only 53 partners were diagnosed with gonorrhea after a DIS interview, meaning that at least 27 index cases needed to receive partner services to ensure that one infected partner received verified treatment. 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 1,035 interviewed cases of syphilis and gonorrhea among cisgender MSM, 178 (17%) were persons living with HIV, 496 (48%) were already taking PrEP, and 362 (35%) were eligible for PrEP. Most of the cases (87%) were eligible to receive PrEP at the PHSKC SHC and of those offered a referral 60% accepted. DIS offered to refer the remaining 13% of cases to other PrEP providers; 84% of patients accepted such a referral (Figure 38). Overall, partner services resulted in 170 cases accepting PrEP referrals. Of those who accepted a referral and were eligible to receive PrEP at the PHSKC SHC, 37% started PrEP at the PHSKC SHC.

PHSKC Partner Services

Table 23: Partner Services — Outcomes among cisgender MSM* gonorrhea cases, King County, WA, 2019

	Number (%)	Index
Index Cases Diagnosed	2,462	
Index Cases Assigned to DIS	921 (37)	
Index Cases Interviewed	711 (77)	
Index Cases Naming ≥ 1 Contact	182 (62)	
Median Days from Assigned to Interview (Interquartile Range)	1 (0-4)	
Number of Partners Named	389	
Contact Index		0.55
Notified based on Index Case Report	264 (68)	
Notified by DIS	89 (23)	
Notification Index (DIS)		0.10
Tested for Chlamydia/Gonorrhea	316 (81)	
Testing Index		0.34
Newly Diagnosed with Chlamydia and/or Gonorrhea	94 (24)	
Before Interview	55 (14)	
After Interview	39 (10)	
Case Finding Index (DIS)		0.10
Treated for Chlamydia and/or Gonorrhea	86 (22)	
Treatment Verified	78 (20)	
Brought to Treatment Index		0.09
Before Interview	53 (14)	
After Interview	33 (8)	
Brought to Treatment Index (DIS)		0.04

*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

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Table 24: Partner Services — Outcomes among cisgender heterosexual gonorrhea cases, King County, WA, 2019

	Number (%)	Index
Index Cases Diagnosed	1,913	
Number of Index Cases Assigned	1,471 (76)	
Number of Index Cases Interviewed	741 (50)	
Number of Index Cases Naming ≥1 Contact	244 (33)	
Median Days from Assigned to Interview (Interquartile Range)	1 (0-5)	
Number of Interviewed Index Cases:		
With any untreated partners	156 (21)	
Accepting EPT from DIS	11 (1)	
Accepting EPT from Provider	23 (3)	
Accepting DIS Partner Notification Assistance	48 (6)	
Number of Partners Named		
Contact Index		0.40
Index Case Requested DIS/Staff Contact	47 (16)	
Notified by DIS	14 (4)	
Notification Index (DIS)		0.02
Accepting EPT from DIS	14 (4)	
Tested for Chlamydia and/or Gonorrhea	259 (88)	
Testing Index		0.35
Newly Diagnosed with Chlamydia or Gonorrhea	94 (32)	
Before Interview	74 (25)	
After Interview	20 (7)	
Case Finding Index (DIS)		0.03
Treated for Chlamydia or Gonorrhea	90 (30)	
Treatment Verified	76 (26)	
Brought to Treatment Index		0.12
Before Interview	72 (24)	
After Interview	18 (6)	
Brought to Treatment Index (DIS)		0.02

DIS = Disease intervention specialist; EPT = Expedited partner therapy

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

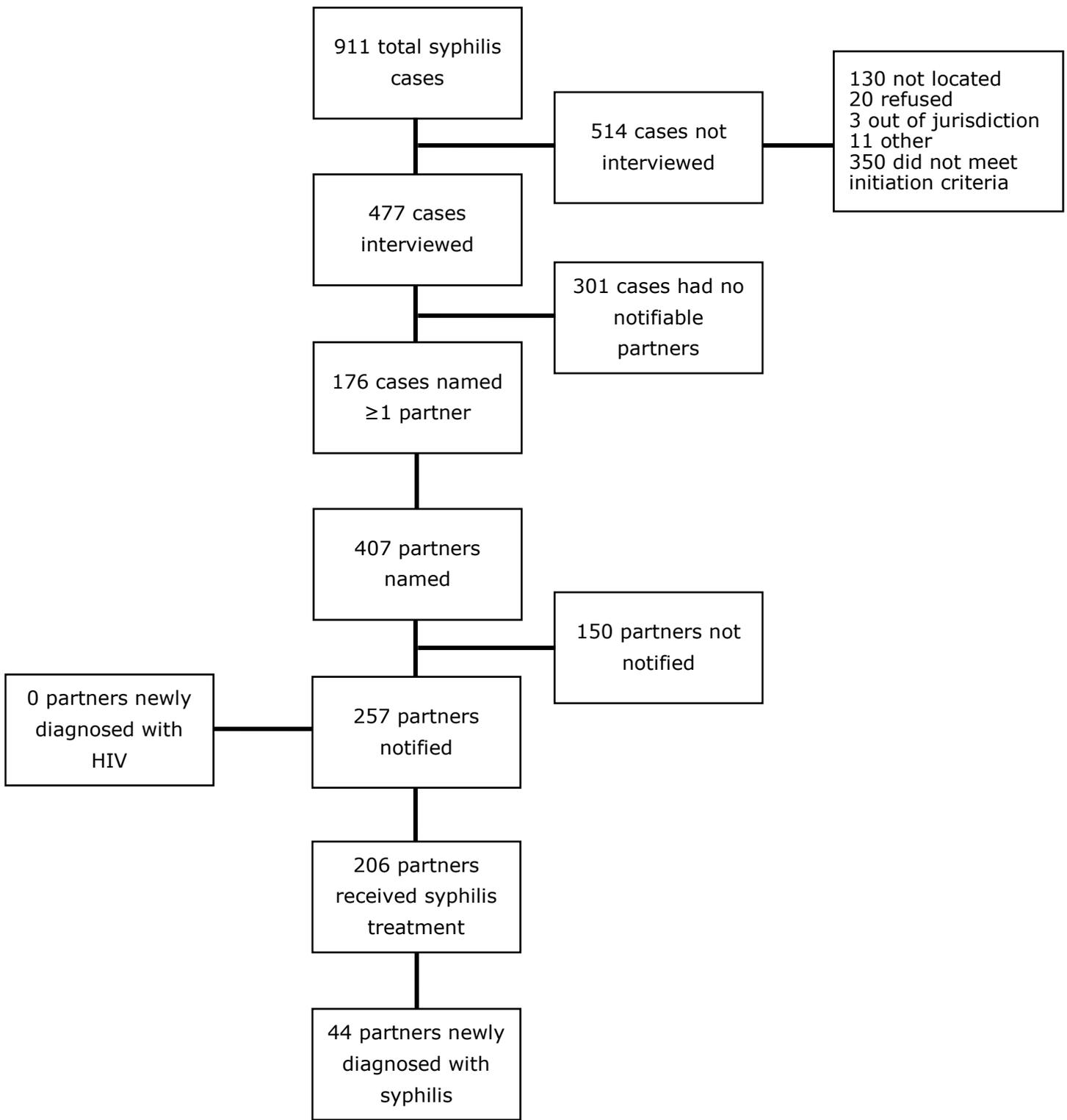
Testing index = partners tested per index case interviewed

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

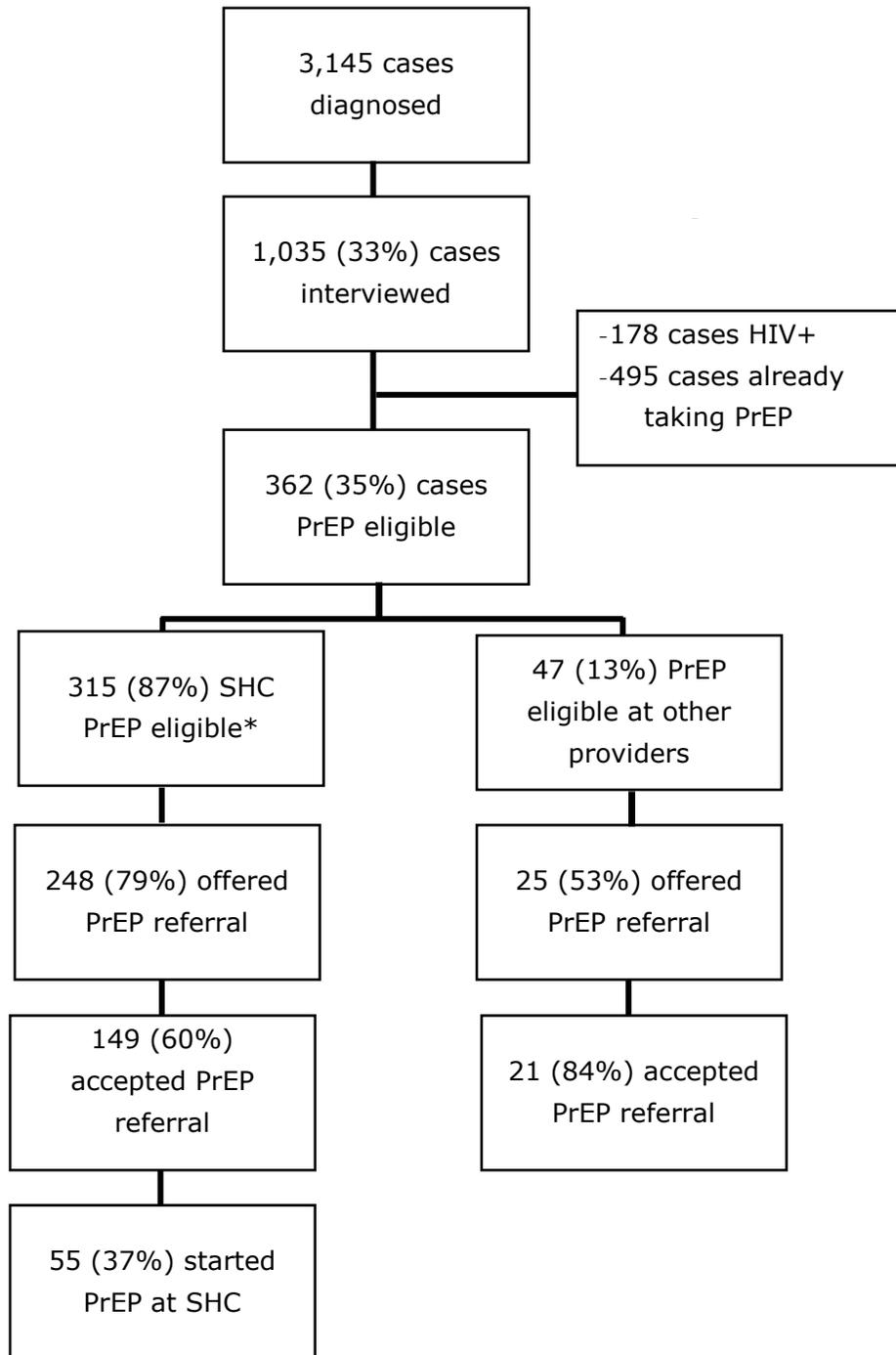
PHSKC Partner Services

Figure 37: Flowchart of partner services outcomes among syphilis cases, King County, WA 2019



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Figure 38: PrEP among cisgender men who have sex with men (MSM) syphilis and gonorrhea cases, King County, WA 2019



*PrEP eligibility at Sexual Health Clinic (SHC) in 2019 included MSM or transgender patients who have sex with men with any of the following in the previous 12 months: diagnosis of rectal or urethral gonorrhea or syphilis, methamphetamine use, or exchange sex for money or drugs. All Black or Hispanic/Latinx MSM are also eligible for PrEP at the Sexual Health Clinic.