

Public Health

Seattle & King County



**Sexually Transmitted Diseases
Epidemiology Report
2007**

Public Health – Seattle and King County 2007 Sexually Transmitted Diseases (STD) Epidemiology Report

Data sources

King County morbidity data:

This report describes case numbers and rates of infection for three sexually transmitted infections in the King County population. These three infections (chlamydial infection, 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 Public Health – Seattle & King County (Public Health). The Public Health STD Control Program forwards these reports to the Washington State Department of Health. For this report, yearly infection totals are based on year of diagnosis, rather than year of report. The numbers contained in the Chlamydial Infection, Gonorrhea, and Syphilis sections of this report are for cases diagnosed from 1992-2007 and reported through March 31, 2007.

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 data for 2000. Population data for 2007 are not yet available; for these years, population data from 2006 were utilized to calculate incidence figures for 2007.

Population estimates for men who have sex with men (MSM), and well as HIV positive and negative MSM, were provided by the Public Health HIV/AIDS Epidemiology Unit. The overall population estimate used for MSM (43,150 men) represents 5.8% of men ages 15 and older in King County in 2006; this figure is comparable to the estimates for the percent of the male population that is MSM from several population-based studies.¹⁻³

Data limitations: Notifiable disease data are subject to 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 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 underreporting by physicians and laboratories. Additionally, because undiagnosed infections cannot be reported, infections which are frequently experienced with no symptoms, such as chlamydia, may exist at higher levels in the population than notifiable disease data indicate.

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2007 Sexually Transmitted Diseases Epidemiology Report**

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Executive Summary

Chlamydial infection and gonorrhea are the two most commonly-reported notifiable diseases in the United States. If left untreated, these two infections may cause serious long term health consequences, including ectopic pregnancy and tubal infertility in women. Although syphilis occurs much less frequently, untreated syphilis can also result in long term complications, including stroke, blindness, hearing loss, dementia and cardiovascular complications. Untreated syphilis in pregnant women may lead to congenital syphilis or perinatal death. Other sexually transmitted infections can lead to a variety of other complications, as well as increase the risk of acquisition of HIV.

In this 2007 Sexually Transmitted Diseases Epidemiology Report, we describe recent trends in chlamydial infection, gonorrhea, and early syphilis among King County residents. We also provide information about patients using the Public Health – Seattle and King County STD Clinic, as well as trends in diagnoses of several other sexually transmitted infections in the STD Clinic. We hope that 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 developments in the epidemiology of sexually transmitted diseases (STD) in King County in 2007 include:

- **Gonorrhea incidence declined.** The incidence of gonorrhea in King County fell 29% from 2006 (108 per 100,000 persons) to 2007 (77 per 100,000 persons). This decline was observed among heterosexual men and women as well as among men who have sex with men (MSM). Incidence among women can be used to monitor the epidemic among heterosexuals. Among women ages 15-29, gonorrhea incidence also fell from 2006 (268 per 100,000) to 2007 (219 per 100,000), after a rapid increase in gonorrhea incidence from 2004 to 2006. Reported gonorrhea incidence among women in King County is now similar to that of women in other Washington counties (220 per 100,000), and is substantially lower than that among women ages 15-29 (511 per 100,000) nationally.
- **Drug resistance for gonococcal infections increased.** The proportion of gonococcal infections caused by quinolone resistance *Neisseria gonorrhoeae* (QRNG) in King County increased from 35% in 2006 to 39% in 2007 among men, and from 17% to 25% among women. In 2007, 46.5% of gonococcal isolates from men who have sex with men (MSM) and 30.7% from heterosexual men were QRNG.
- **Chlamydia remained the most commonly reported sexually transmitted disease, with the highest rates of reported infection observed among young women.** In 2007, the incidence¹ of chlamydial infection among King County residents increased to 310 per 100,000 persons from 290 per 100,000 persons in 2006. This gradual increase is similar to trends observed statewide and nationally. Since 2001, the reported incidence of chlamydia in King County has consistently been lower than the incidence in Washington State or the United States as a whole.

- **Chlamydial infection prevalence remains stable.** The prevalence of chlamydial infection ² (based on testing data from the Infertility Prevention Project) in King County women ages 15-24 in 2007 (5.9%) was similar to the prevalence observed in 2006 (5.6%), continuing a period of stable prevalence in this population which began in 2000. Among women in this age group in other Washington state counties, chlamydial prevalence increased rapidly from 2001 to 2004 and has since stabilized. The prevalence of chlamydia is consistently higher in Washington women outside of King County than within.
- **Early syphilis incidence remains stable.** Early syphilis incidence dropped slightly from 2006 (11 per 100,000 persons) to 2007 (10 per 100,000 persons). Early syphilis in King County continues to be concentrated among MSM (436 per 100,000), particularly among MSM who are HIV positive. The early syphilis epidemic among MSM began in 1997, and has continued to the present, with a sharp rise in syphilis both from 1997 to 1999, and from 2003 to 2004. Compared to previous years, in 2007 Public Health classified a larger proportion of early syphilis cases as early latent syphilis and a smaller proportion as primary or secondary syphilis.
- **MSM continued to experience high rates of all reportable STDs relative to heterosexuals.** In 2007, the estimated rates of gonorrhea, chlamydia and early syphilis among MSM were 786, 971 and 436 cases per 100,000, respectively. For comparison, rates of these infections among heterosexuals were 60, 294, and 0.33 per 100,000, respectively. Trends in the different reportable STDs among MSM displayed a disparate pattern in 2007. The rate of gonorrhea among MSM declined 14%, chlamydia rates increased 66%, and rates of early syphilis remained stable. Behavioral surveillance data obtained through the Public Health STD clinic suggest that the sexual behavior MSM evaluated in the clinic has remained relatively stable since 2000. (Part of the observed increase in chlamydia among MSM was likely due to improved ascertainment of MSM cases in 2007 relative to previous years.³)
- **Rates of all STD continue to show a marked racial disparity.** In 2007, incidence of chlamydial infection was 6.9 and 5.2 times greater among African American (1830 per 100,000) and Native American (1359 per 100,000) women, respectively, than among white women (262 per 100,000). The incidence of gonorrhea was 13.9 times higher among African American women (432 per 100,000), and 8.4 times higher among Native American women (260 per 100,000), than among white women (31 per 100,000). Similar, though somewhat attenuated, disparities occurred among men. While the incidence of reported gonorrhea decreased from 2006 to 2007 in all racial and ethnic groups among women, the disparities in incidence between African Americans and Native Americans and whites grew due to greater relative decreases in incidence among white women compared to other racial groups.

¹ Incidence is a measure describing the number of new cases of disease in a specific population over a period of time. In King County, incidence of sexually transmitted infections 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.

² Prevalence is a measure of all cases of disease present in a population during a specified time period. Prevalence is often expressed as a percentage, calculated as the number of cases of a disease divided by the number of individuals at risk.

³ In previous years, the number of MSM chlamydial infection and gonorrhea cases was estimated by adding the number of MSM cases diagnosed in the PHSKC STD Clinic to the number of rectal cases of infection diagnosed by non-STD Clinic providers. In 2007, MSM cases were identified by using information on gender of sex partners reported on the STD case report, as well as site of infection (male rectal infections were considered MSM cases) and information on gender of sex partners gathered through partner management interviews.

Chlamydial Infection

In 2007, 5682 cases of chlamydial infection were reported among King County residents, representing an overall reported incidence of 310 per 100,000 people (Table 1). This number represents an increase of 6.8% over the number of cases diagnosed in 2006 (Table 3). In 2007, 3860 cases were reported among women, for a reported incidence of 419 per 100,000 women, and 1812 cases were reported among men, for a reported incidence of 198 per 100,000 men (Table 1).

In keeping with historical patterns in King County, the incidence of reported chlamydial infection varied substantially by race and age in 2007:

- Among women, reported incidence was highest among black women (1830 per 100,000 women), followed by Native American (1359 per 100,000), Asian (428 per 100,000), and white (262 per 100,000) women (Table 2).
- Among men, incidence of reported chlamydial infection was more similar among Native American (210 per 100,000), Asian (146 per 100,000), and white men (140 per 100,000) than was the case among women (Table 2). Black men had the highest reported incidence of chlamydial infection among men, with an incidence of 1047 per 100,000).
- Among women, the incidence of chlamydial infection was highest among 15-19 year olds (2383 per 100,000) and 20-24 year olds (1947 per 100,000), while among men, reported incidence was highest among 20-24 and 25-29 year olds (722 per 100,000 and 507 per 100,000, respectively) [Table 2, Figure 4]. Higher rates among women than men both overall and within most age and race groups largely reflect differential screening practices in King County, whereby asymptomatic women are frequently screened for chlamydial infection and men are not.

Public Health evaluates three sources of data to assess trends in chlamydial infection in the population:

- 1) numbers of cases reported to PHSKC by diagnosing providers
- 2) prevalence in a sentinel population of women (the Infertility Prevention Project [IPP])
- 3) trends in infection in the Public Health STD clinic

In 2007, the incidence of reported chlamydial infection among 15-29 year old women in King County increased, after a downward trend in reported incidence observed from 2004 through 2005 (Table 4, Figure 1). In contrast, incidence of reported chlamydial infection among 15-19 year old women has stabilized on both a statewide (Washington state excluding King County) and national basis (Figure 1) in recent years, following a period of increasing incidence from 1999 through 2004.

Among 15-29 year old male residents of King County, reported chlamydia incidence remained stable from 2006 (564 per 100,000 men) to 2007 (572 per 100,000 men) [Table 4]. Public Health does not monitor the number of chlamydial tests performed in the population, and we cannot estimate the extent to which changes in the number of cases reported reflect true changes in incidence vs. increased case detection due either to changes in the number of tests performed or changes in the sensitivity of tests employed. The increase observed in national reported

chlamydial incidence from 1997 onward is likely due at least in part to increased screening among women in states which did not previously have screening programs. Changes in testing technology may also have influenced trends in reported incidence. Locally, Public Health began pilot testing nucleic acid amplification tests (NAATs) for chlamydial infection in 1994; this more sensitive test may have resulted in increases in chlamydia diagnoses in the years following 1994. All Public Health clinics were using NAATs by the end of 1999.

The Infertility Prevention Project (IPP) is a national program that provides routine screening and treatment services for chlamydial infection to patients seen in family planning, sexually transmitted disease, and selected other public clinics. All patients meeting selective screening criteria are tested in these clinics, thereby providing an estimate of the prevalence of infection among young women, regardless of symptoms. Figure 2 displays IPP chlamydia prevalence (the number of positive chlamydia tests divided by all chlamydia tests performed) among women ages 15-29 for King County and all other Washington counties for 1998-2007. Chlamydial infection prevalence has been stable among King County women since 2000 (Figure 2). In contrast, among other women in Washington state, chlamydial prevalence increased rapidly from 2001 to 2004, and has been roughly stable since. The number of tests for chlamydial infection performed in King County as a part of the IPP remained roughly stable in 2007, while among other Washington state counties the number of IPP tests fell substantially from 2006 to 2007 (Figure 3).

Finally, among patients evaluated at the Public Health STD Clinic, the prevalence of chlamydial infection in women declined from 2003 to 2007 as did the number of men seeking evaluation for symptomatic chlamydial urethritis (Figures 22 and 23). The extent to which divergent trends observed in the three data sources monitored by Public Health reflect true differences in chlamydial morbidity vs. changing patterns in the populations tested is not certain.

Because reporting is likely more complete among women than among men and morbidity associated with chlamydial infection is concentrated in women, age and race trends for reported chlamydial infection over time are shown for women only (Figures 4 and 5). Analysis of trends over time in race are also limited to women ages 15-29, the group in which incidence is highest. Reported chlamydia incidence increased slightly in all race groups from 2006 to 2007 (Figure 5). Similarly, incidence among 15-19, 20-24, and 25-29 year old women increased somewhat from 2006 to 2006, while incidence among younger and older women remained stable over the past year (Figure 4).

Table 1: Number of Reported Cases and Chlamydia Incidence, King County, WA, 2007

Sex		Cases	Incidence per 100,000 population
Sex	Women	3860	413
	Men	1812	195
Total cases		5682	305

Table 2: Number of Reported Cases and Chlamydia Incidence in Men and Women, by Age and Race King County, WA, 2007

Race*?		Women (N=3860)		Men (N=1812)	
		Cases	Incidence per 100,000 population	Cases	Incidence per 100,000 population
Race*?	White	1350	262	728	140
	Black	746	1830	459	1047
	Nat Am	83	1359	13	210
	Asian/PI	428	475	125	146
	Other	117		25	
	Multiple	167		42	
	Unknown	969		420	
	Age*	0-9 years	1	1	2
10-14 years		65	123	10	18
15-19 years		1324	2383	277	481
20-24 years		1300	1947	489	722
25-29 years		664	923	385	507
30-34 years		240	353	245	334
35-44 years		191	131	271	189
45-55 years		46	32	103	72
>=56 years		14	7	21	12
Unknown		15		9	

* Cases with unknown race or age were included in race and age specific rates after being distributed among race/age categories based on the distribution of cases with known race or age. In 2007, among women, 1021 case reports were missing race, and 18 missing age, and among men, 437 case reports were missing race, and 14 were missing age.

?? Race specific rates exclude cases reported with "multiple" or "other" races.

**Table 3: Number of Reported Chlamydia Cases and Incidence among Men and Women
King County, WA, 1992-2007**

Year	Women		Men		Total	
	Cases	Incidence per 100,000 population	Cases	Incidence per 100,000 population	Cases	Incidence per 100,000 population
1992	3030	379	968	124	3998	253
1993	2566	316	813	102	3379	210
1994	2745	335	811	101	3556	219
1995	2414	292	804	99	3218	196
1996	2359	282	880	107	3239	195
1997	2247	266	905	108	3152	188
1998	2454	287	1073	127	3527	207
1999**	2690	311	1336	156	4026	234
2000	3004	344	1441	167	4445	256
2001	2862	324	1390	159	4252	242
2002	3007	337	1468	166	4475	252
2003	3441	385	1748	197	5189	292
2004	3650	406	1782	200	5432	304
2005	3638	401	1889	210	5527	306
2006	3558	386	1761	193	5319	290
2007	3860	413	1812	195	5682	305

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

Table 4: Number of Reported Chlamydia Cases and Incidence among Men and Women ages 15-29, King County, WA, 1992-2007

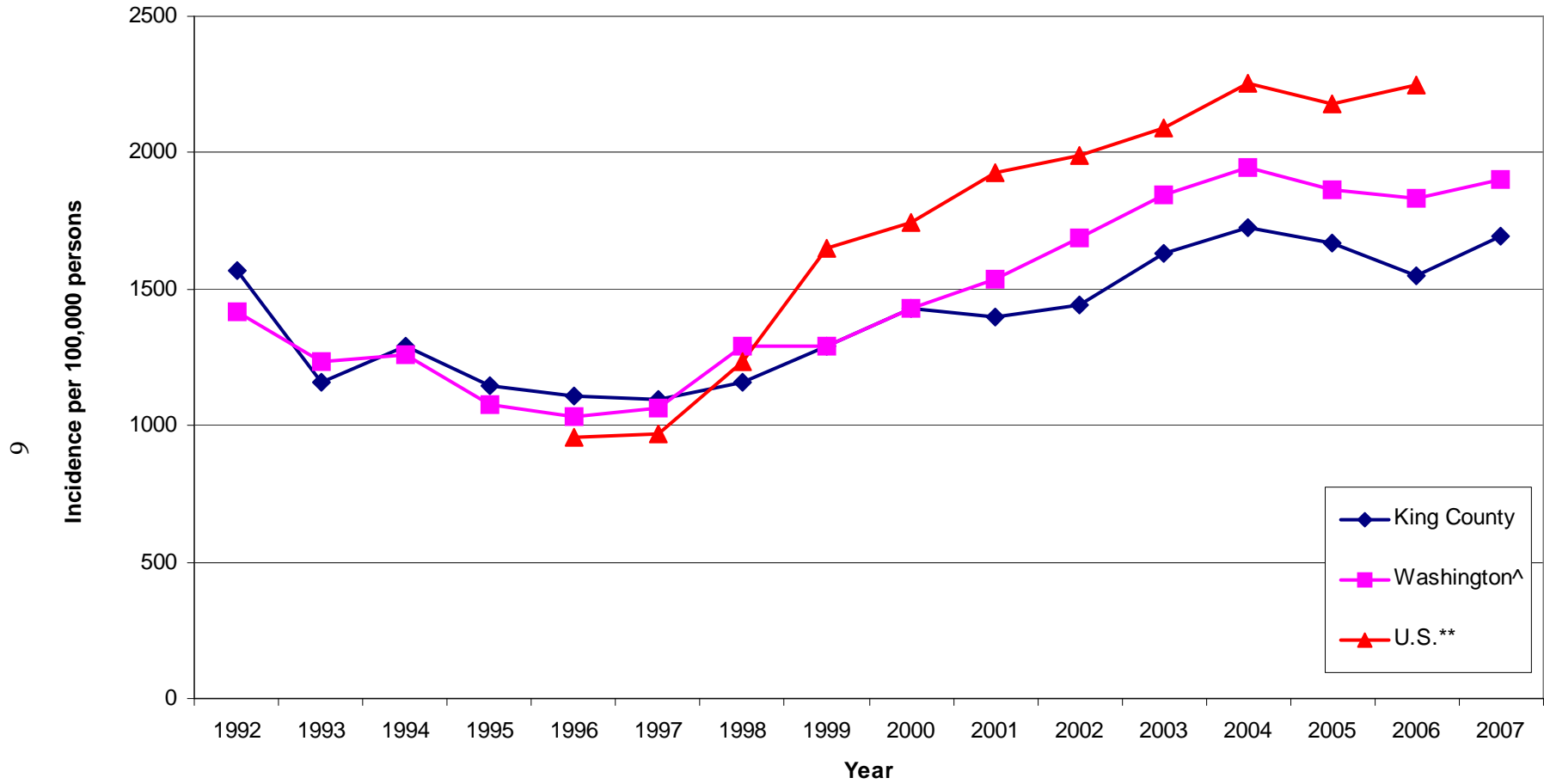
Year	Women, ages 15-29		Men, ages 15-29		Total, ages 15-29	
	Cases	Incidence per 100,000 population	Cases	Incidence per 100,000 population	Cases	Incidence per 100,000 population
1992	2718	1392	804	451	3522	1001
1993	2011	1160	688	386	2699	767
1994	2221	1290	632	355	2853	815
1995	1983	1149	629	351	2612	743
1996	1928	1108	658	364	2586	729
1997	1920	1093	636	348	2556	713
1998	2063	1160	773	417	2836	781
1999**	2306	1291	897	482	3203	879
2000	2569	1430	990	530	3559	971
2001	2528	1397	910	484	3438	932
2002	2630	1441	1026	542	3656	983
2003	2998	1634	1188	624	4186	1119
2004	3212	1747	1162	602	4374	1154
2005	3158	1721	1318	692	4476	1160
2006	3024	1551	1141	564	4164	1049
2007	3301	1652	1157	559	4458	1096

* Cases with unknown age were included age specific counts and rates after being distributed among age

categories based on the distribution of cases with known age.

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

**Figure 1: Chlamydia Incidence among Women ages 15-29*, 1992-2007
King County, Washington State^, and U.S.**

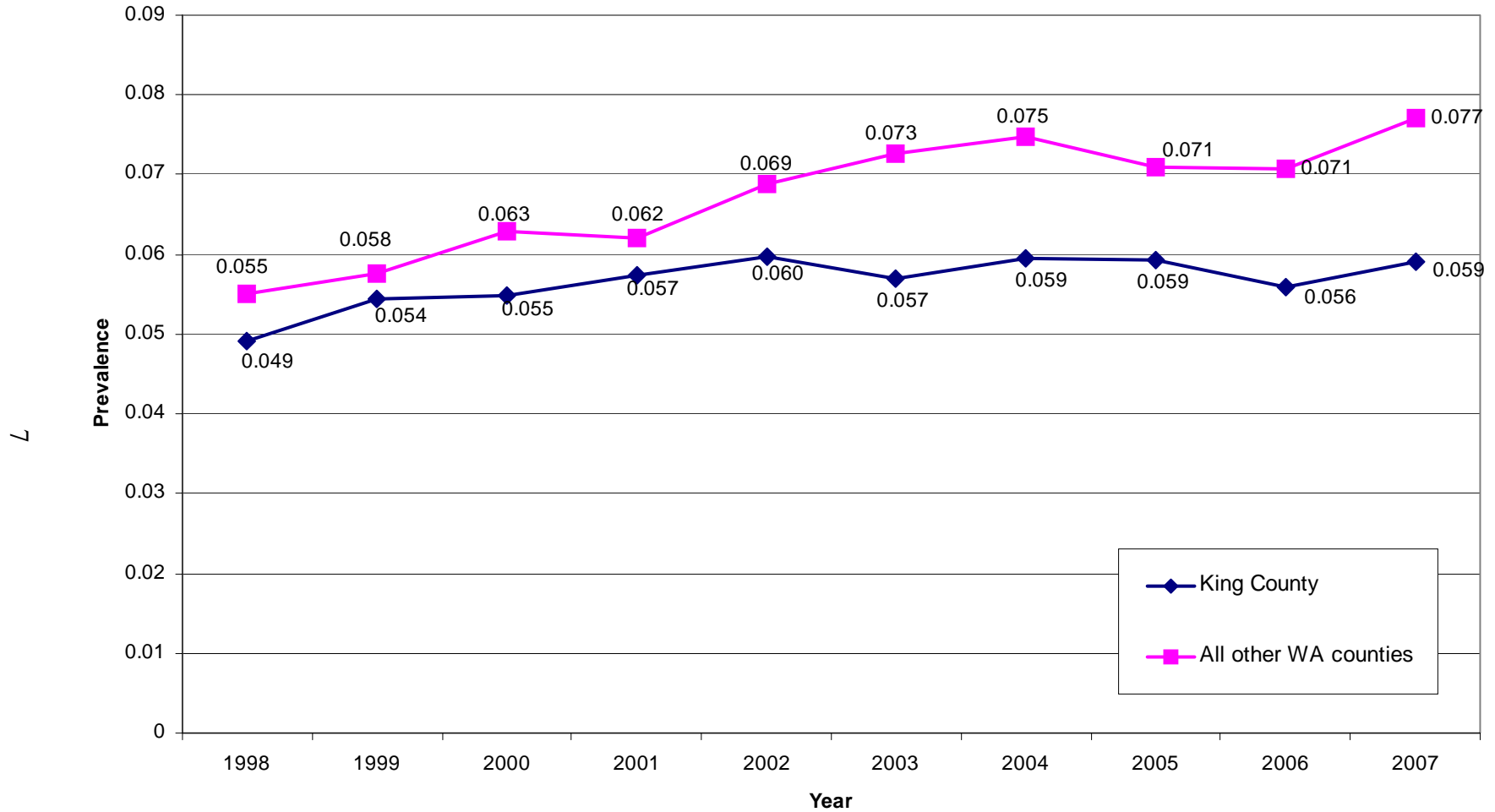


* Cases with unknown age were distributed according to annual age distributions among cases with known age and included in age-specific rates.

** National data for 2006 were not available at the time this report was prepared.

^ Washington State rates exclude King County.

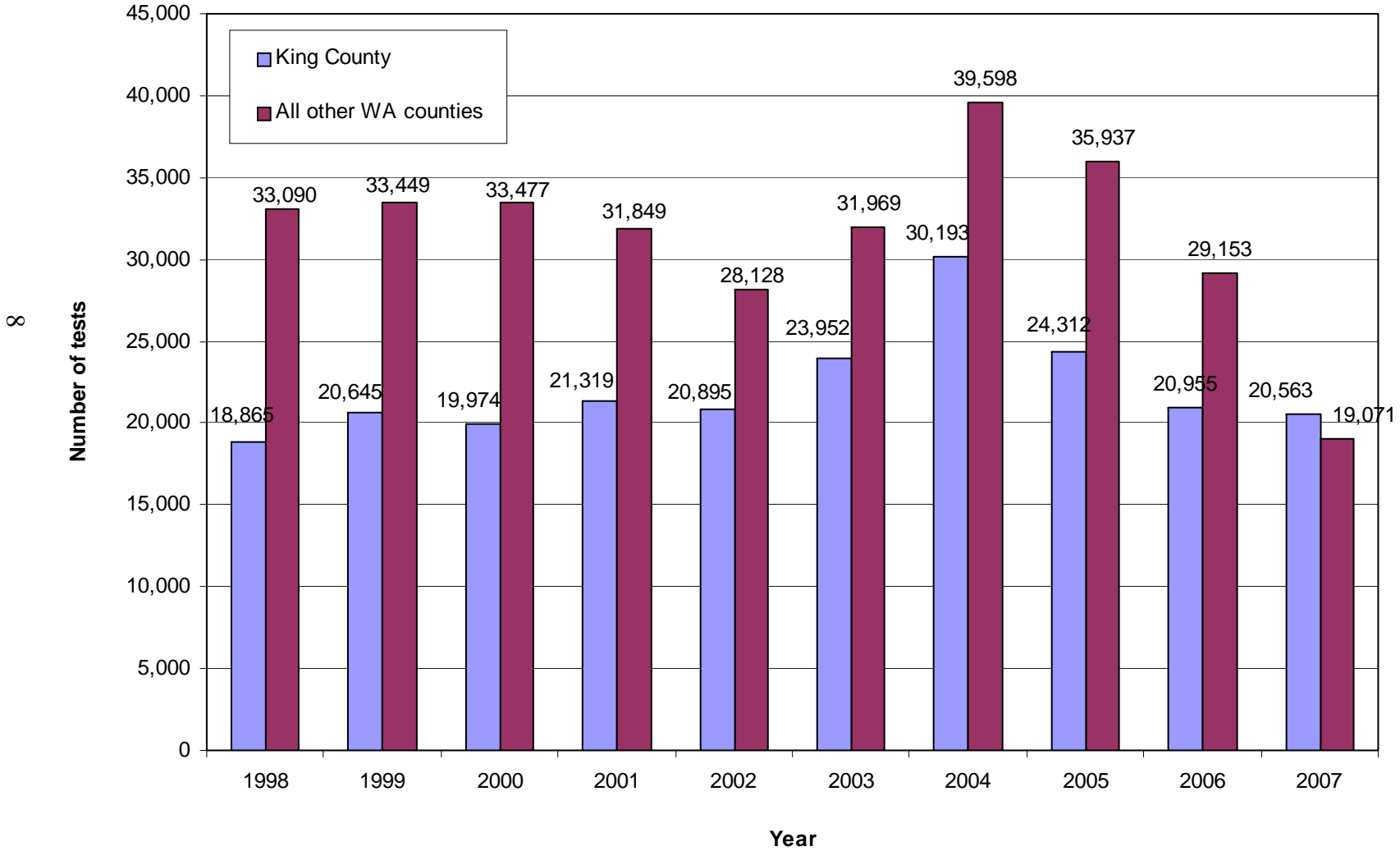
**Figure 2: Chlamydia Prevalence among Women ages 15-29 tested in King County and All Other Washington Counties*
Infertility Prevention Project, 1998-2007****



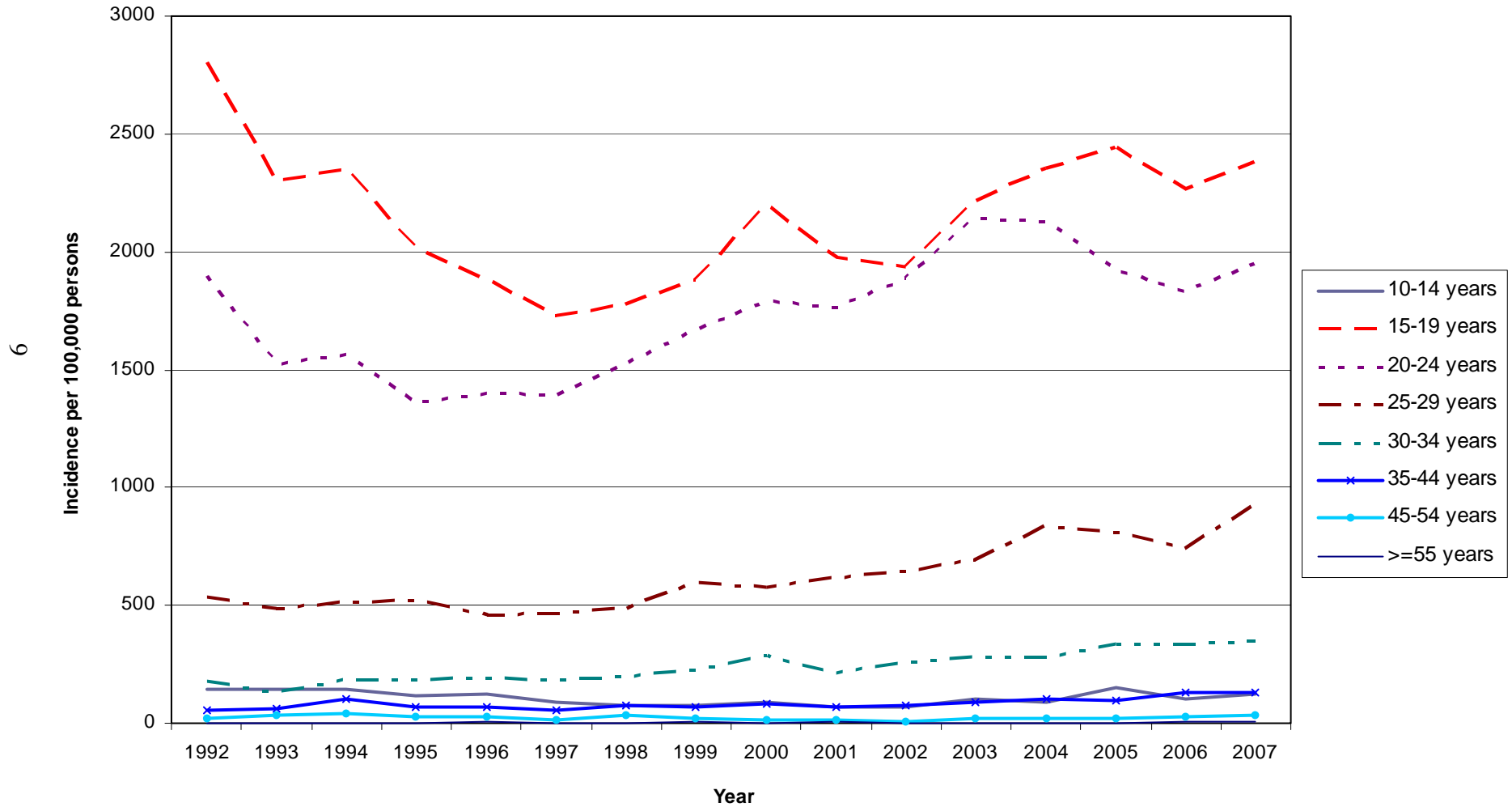
* County is based on the zip code of the reporting clinic

** The population tested through the IPP has changed over time; these changes, in addition to true changes in positivity, may influence trends in prevalence over time.

Figure 3: Chlamydia Laboratory Tests Performed in King County and All Other Washington Counties Through the Infertility Prevention Project, 1998-2007

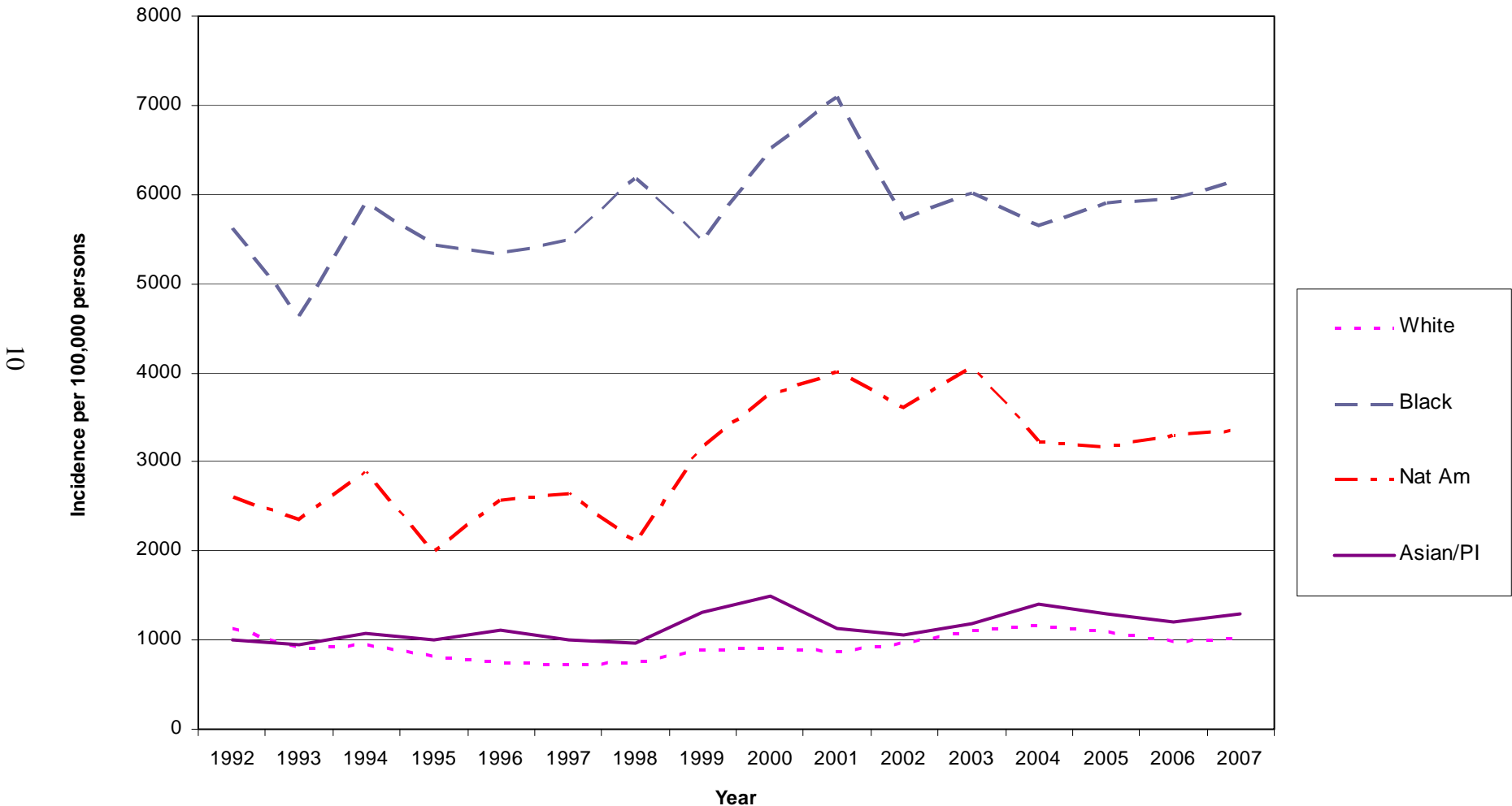


**Figure 4: Reported Chlamydial Infection by Age* Among Women
King County, WA, 1992-2007**



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

**Figure 5: Reported Chlamydial Infection by Race Among Women Ages 15-29*
King County, WA, 1992-2007**



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

Gonorrhea

In 2007, there were 1409 reported cases of gonorrhea in King County, resulting in an overall incidence of 77 per 100,000 persons (Table 5). After a period of increasing incidence from 2004 through 2006, the incidence of reported gonorrhea fell 29% in 2007. This downward trend in incidence was observed among both men and women (Table 7), and includes men who have sex with men (MSM, Figure 34). Continuing a longstanding trend, gonorrhea incidence among men (93 per 100,000 men) was higher in 2007 than that among women (60 per 100,000), most likely due to the relatively high rate of gonorrhea among MSM compared to heterosexual men and women (Figure 34).

Interpreting King County epidemiologic gonorrhea data is complicated by the fact that there are two ongoing, substantially separate epidemics, one among MSM, and another among heterosexuals. Because case report data on sexual orientation are incomplete, Public Health cannot reliably determine the sexual orientation of all male cases. As a result, the heterosexual epidemic is best monitored by concentrating on the occurrence of gonorrhea in women, while the epidemic among MSM is best monitored using data collected in sentinel populations, like STD clinic patients, among whom sexual orientation data are complete, in combination with case report data.

The incidence of gonorrhea was highest in the 15-19 and 20-24 year age groups among women in 2007, while in men, incidence was highest in the 20-24 and 25-29 year old age groups (Table 6). Continuing a longstanding pattern observed both nationally and in King County, large racial disparities in gonorrhea incidence were observed in 2007, with the highest incidence observed among African American men and women, and the lowest incidence occurring among white women and Asian and Pacific Islander men (Table 6). Women aged 15-29 years account for most of the gonorrhea morbidity among women in King County. In this group, incidence of gonorrhea fell sharply from 2006 to 2007 (Figure 6). In contrast, elsewhere in the state of Washington, gonorrhea incidence stabilized after a period of slowly rising incidence from 2003 through 2006. Nationally, incidence among women in this age group rose slightly from 2004 to 2006 (Figure 6). National data were not available for 2007 at the time this report was prepared.

The Neisseria Reference Laboratory, University of Washington performs susceptibility tests on gonococcal isolates received from private and public laboratories in Seattle-King County. Prior to 2003, resistance to the fluoroquinolones was detected in <1% of isolates. During 2003, the prevalence of fluoroquinolone resistance increased from ~1% in January-March to 18% in October-December (Figure 7). During late 2003, Public Health, Seattle & King County recommended that fluoroquinolones no longer be used for the treatment of gonococcal infection. From 2003-2005, >90% of quinolone resistant isolates were recovered from men who have sex with men (MSM). However, in 2006, the prevalence of fluoroquinolone resistance among women increased to 17%, and in 2007 it increased further to 25%. In 2007, 47% of gonorrhea isolates from MSM were quinolone resistant. The recommendation that fluoroquinolones not be used for gonorrhea treatment remains in place. [Reported by Olusegun O. Soge and William L. H. Whittington, Department of Medicine, University of Washington]

Figures 8 and 9 include women only to better illustrate trends in gonorrhea among heterosexuals. Historically, gonorrhea incidence in women has been highest among 15-19 and 20-24 year olds. This pattern continued in 2007. However, with the exception of 25-29 year olds, gonorrhea

incidence fell among women of all age groups in 2007 (Figure 8). Among 25-29 year old women, incidence remained stable. Trends were more variable across racial groups among 15-29 year old women from 2006 to 2007, with incidence increasing in some racial groups, and falling or remaining stable in others (Figure 9).

Data from the Public Health STD Clinic suggest that gonorrhea morbidity declined similarly among MSM over the past year. The total number of gonorrhea diagnoses among MSM STD Clinic patients dropped from 337 cases in 2006 to 220 cases in 2007 (Figure 18). Monitoring symptomatic urethral gonorrhea among men provides a measure of morbidity that is relatively unaffected by changes in screening and testing practices from year to year. The number of STD Clinic diagnoses among MSM patients with symptomatic urethral gonorrhea also fell substantially from 2006 to 2007 (Figure 19).

Table 5: Number of Reported Gonorrhea Cases and Gonorrhea Incidence, King County, WA, 2007

	Cases	Incidence per 100,000 population
Sex		
Women	551	59
Men	854	92
Total cases	1409	76

Table 6: Number of Reported Gonorrhea Cases and Incidence, in Men and Women, by Age and Race, King County, WA, 2007

	Women (N=551)		Men (N=854)	
	Cases	Incidence per 100,000 population	Cases	Incidence per 100,000 population
Race* ?^				
White	161	31	359	67
Black	189	432	266	588
Nat Am	16	260	3	47
Asian/PI	32	37	26	29
Other	2		2	
Multiple	22		21	
Unknown	129		177	
Age*				
0-9 years	0	0	0	0
10-14 years	11	21	3	5
15-19 years	183	332	70	122
20-24 years	144	217	166	245
25-29 years	95	133	182	240
30-34 years	41	61	114	155
35-44 years	54	37	214	149
45-55 years	15	10	85	59
>=56 years	2	1	16	9
Unknown	6		4	

* Cases with unknown race or age were included in race and age specific rates after being distributed among race/age categories based on the distribution of cases with known race or age. In 2007, among women, 129 case reports were missing race, and 6 missing age, and among men, 177 cases reports were missing race, and 4 were missing age.

?^ Race specific rates exclude cases reported with "multiple" or "other" races.

**Table 7: Number of Reported Gonorrhea Cases and Incidence among Men and Women
King County, WA, 1992-2007**

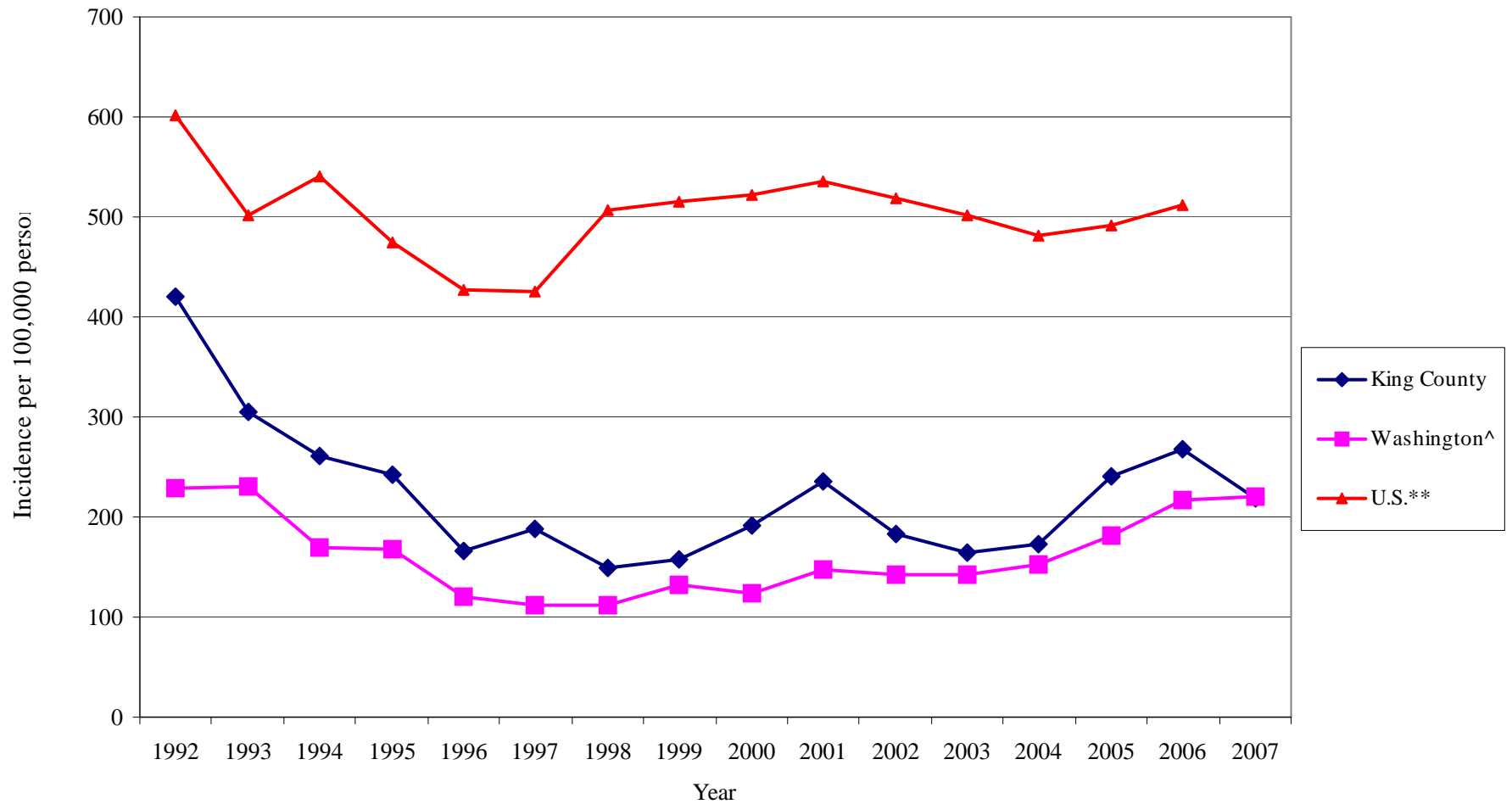
Year	Women		Men		Total	
	Cases	Incidence per 100,000 population	Cases	Incidence per 100,000 population	Cases	Incidence per 100,000 population
1992	903	113.0	1052	134.8	1955	123.8
1993	648	79.8	879	110.6	1527	95.1
1994	541	66.0	675	83.9	1216	74.9
1995	517	62.4	763	93.7	1280	77.9
1996	354	42.4	559	67.9	913	55.0
1997	396	46.9	519	62.2	915	54.5
1998	324	37.9	656	77.5	980	57.6
1999	342	39.6	605	70.7	947	55.1
2000	452	51.8	775	89.7	1227	70.6
2001	564	63.9	984	112.4	1548	88.0
2002	428	48.0	1025	116.1	1453	81.9
2003	403	45.1	946	106.8	1349	75.8
2004	414	46.1	872	98.0	1286	72.3
2005	581	64.0	1191	132.3	1772	99.0
2006	711	77.2	1276	139.6	1987	108.3
2007	551	59.0	854	92.1	1409	76.8

**Table 8: Number of Reported Gonorrhea Cases and Incidence
Among Men and Women ages 15-29,* King County, WA, 1992-2006**

Year	Women, ages 15-29		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	731	421.1	691	387.8	1422	404.2
1993	528	304.7	510	285.7	1038	295.0
1994	449	260.8	407	228.9	856	244.6
1995	417	241.7	410	229.5	828	235.5
1996	288	165.5	291	161.2	579	163.3
1997	329	187.3	243	132.9	572	159.6
1998	264	148.6	318	172.0	583	160.6
1999	281	157.5	297	159.5	578	158.6
2000	343	190.7	304	162.6	647	176.4
2001	425	234.9	422	224.6	847	229.7
2002	335	183.6	442	233.5	777	209.0
2003	301	164.3	368	193.2	669	179.0
2004	322	173.0	337	174.5	659	173.8
2005	457	241.1	518	263.4	974	252.5
2006	523	268.1	577	285.2	1099	276.8
2007	427	218.8	420	207.7	847	213.2

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

Figure 6: Gonorrhea Incidence among Women ages 15-29*, 1992-2007
King County, Washington State ^, and U.S.

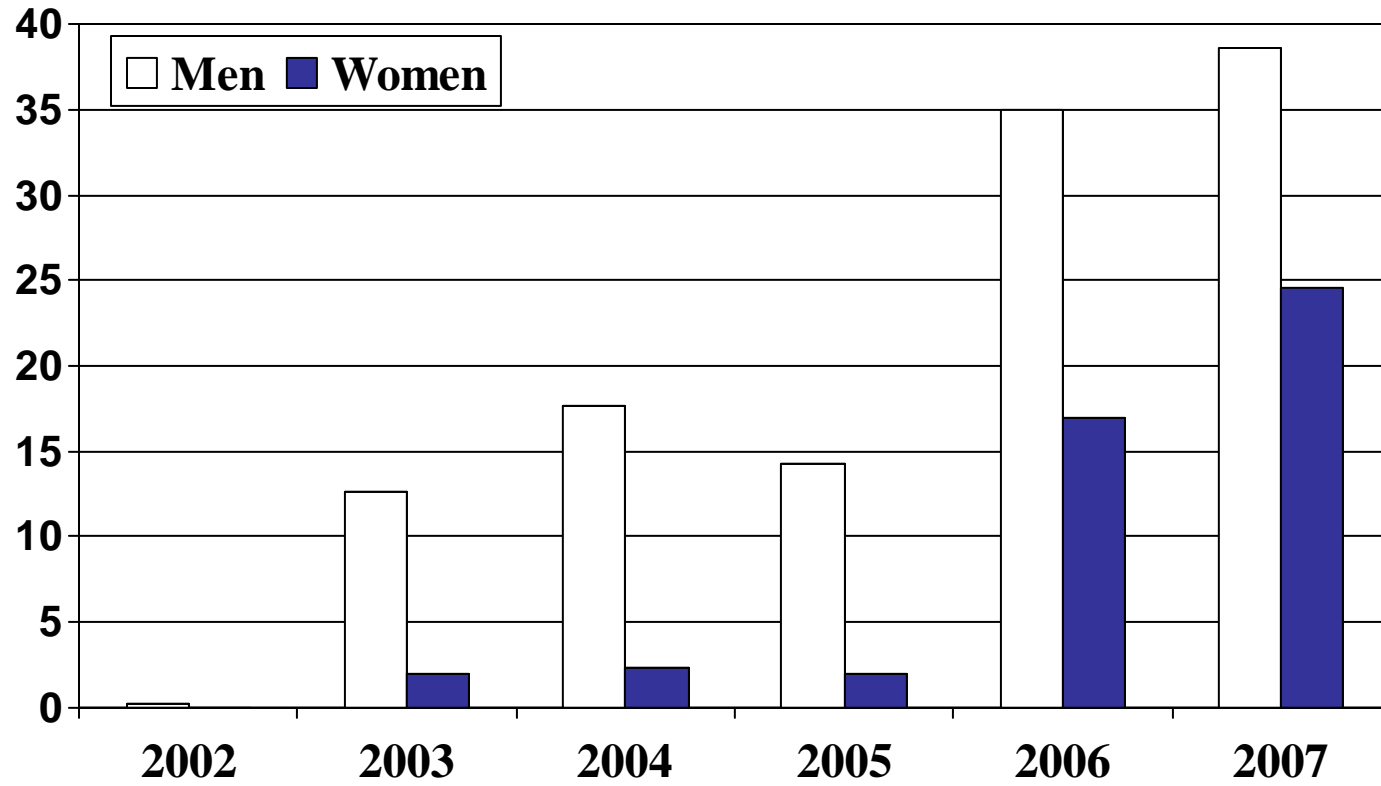


* Cases with unknown age were distributed according to annual age distributions among cases with known age and included in age-specific rates.

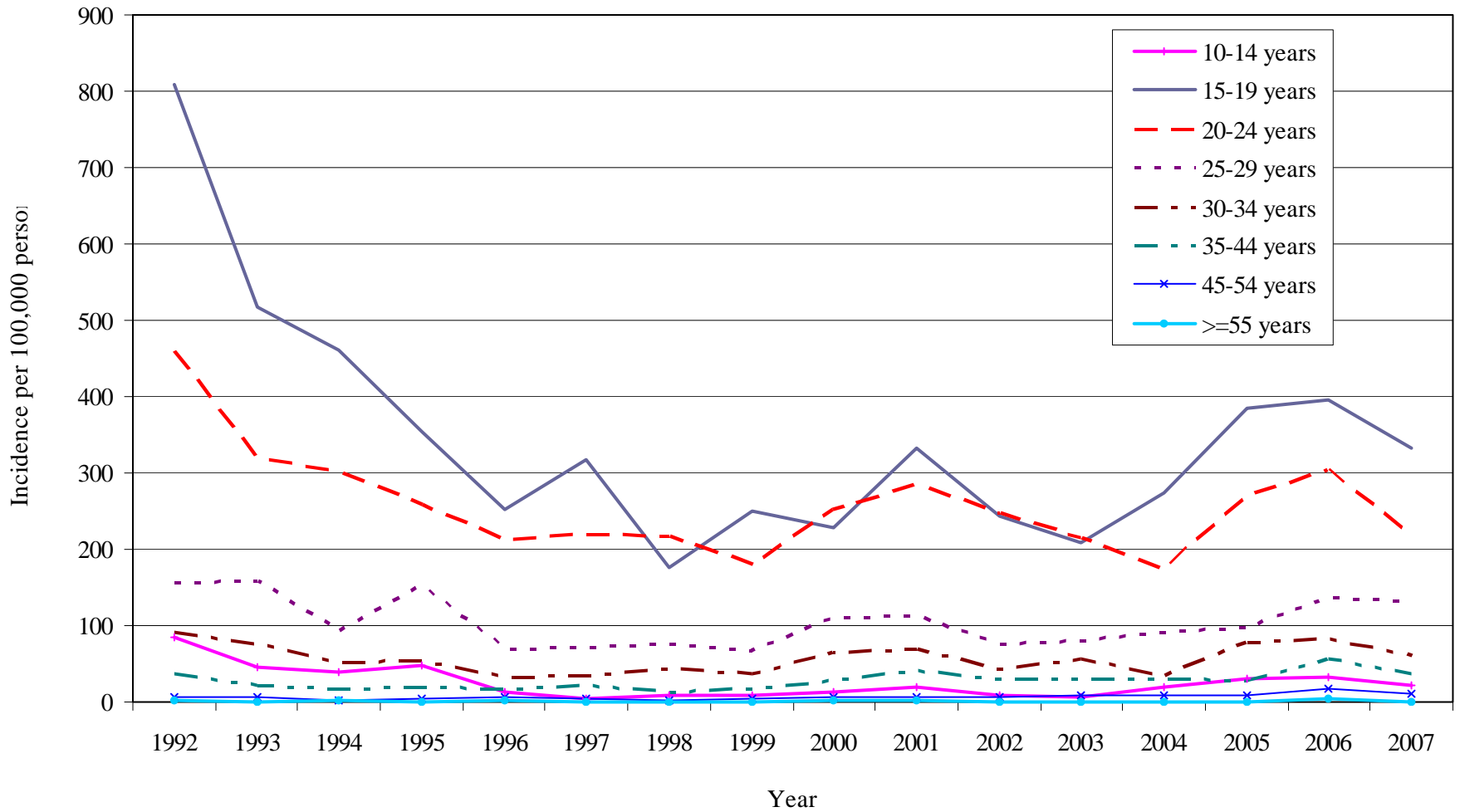
** National data for 2007 were not available at the time this report was prepared.

^ Washington State excludes King County.

Figure 7: Proportion of infections caused by fluoroquinolone resistant* gonococci by gender and year, 2002-2007

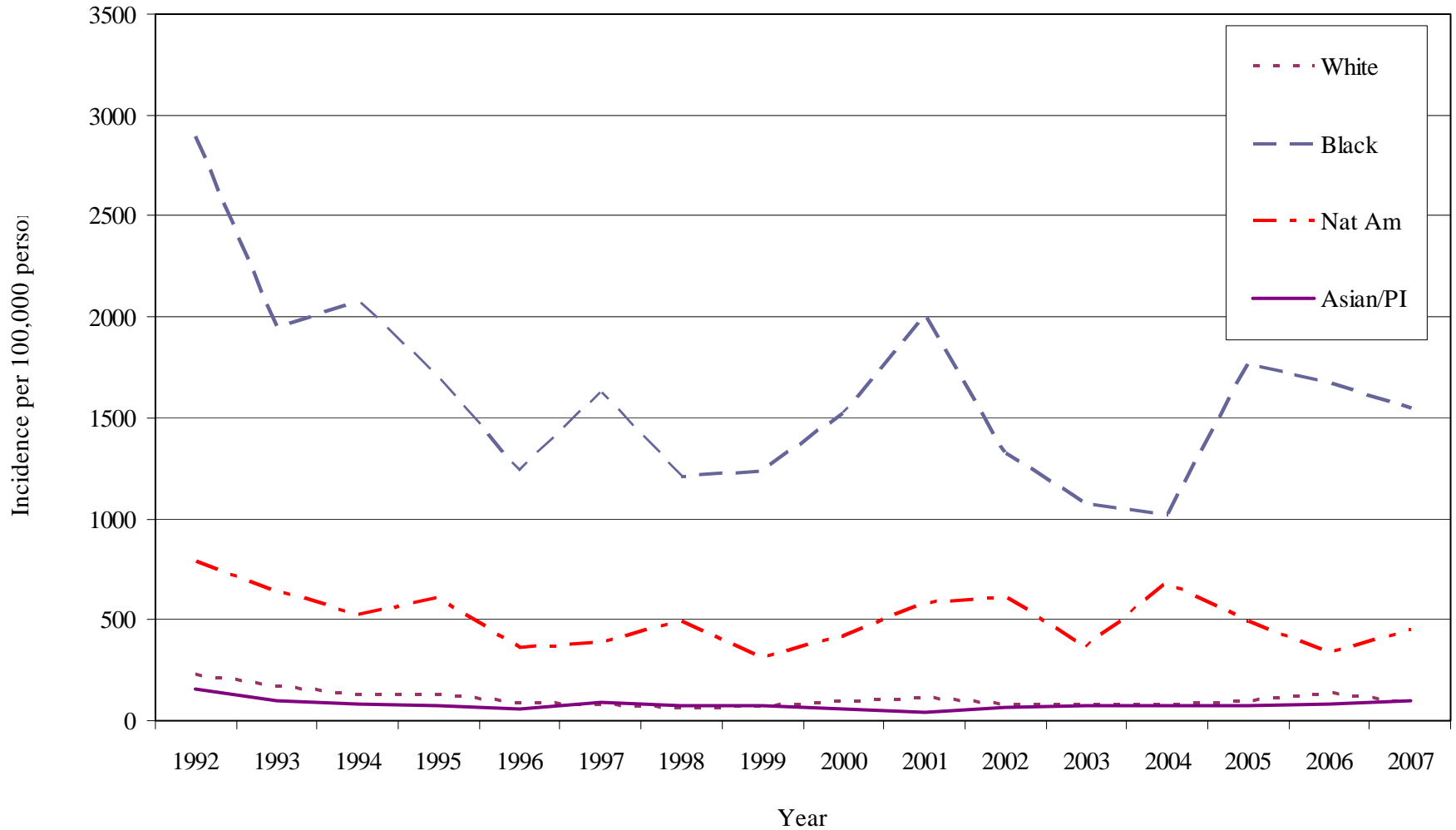


**Figure 8: Gonorrhea Incidence by Age* Among Women
King County, WA, 1992-2007**



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

**Figure 9: Gonorrhea Incidence by Race Among Women Ages 15-29*
King County, WA, 1992-2007**



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

Syphilis

King County is experiencing an ongoing epidemic of syphilis among MSM. The total number of early syphilis (primary, secondary, and early latent) cases grew slightly in 2007, from 185 in 2006 to 194 cases in 2007 (Tables 9 and 12). Of the 2007 cases, 188 (97%) were among MSM (Table 10, Figure 12). The overall 2007 incidence of early syphilis among King County residents was 11 per 100,000 persons (Table 9). The early syphilis incidence among MSM was over 800 times greater (436 per 100,000 MSM) than that among heterosexual men (0.5 per 100,000 men) [Table 13] in 2007.

HIV positive MSM have been disproportionately affected by the epidemic of syphilis among MSM since it began in 1997. In 2007, the estimated incidence of early syphilis among HIV positive MSM was 2,290 per 100,000 men, compared to 174 per 100,000 among HIV negative MSM (Figure 13), and since 2004, this disparity between HIV positive and negative MSM has grown. Despite the widening gap in incidence between HIV positive and negative MSM, MSM who are HIV negative or have an unknown HIV status have accounted for between 43 and 50% of early syphilis cases diagnosed among MSM since 2002 (Figure 13).

Early syphilis incidence among heterosexuals remained very low in 2007, with only 5 of 194 cases occurring among heterosexual men (4 cases) and women (1 case) [Tables 10, 12, and 13]. The percentage of early syphilis cases with primary, secondary, and early latent syphilis, with HIV, and who reported engaging in a variety of risk behaviors are presented in Table 10, both for heterosexuals and for MSM. In 2007, 57% of MSM syphilis cases were HIV positive. Thirty percent of MSM cases reported use methamphetamines in the past 12 months, and 29% and 41% reported use of bathhouses and the Internet to find sex partners, respectively.

MSM with early syphilis reported more total and anonymous sex partners while they were infectious than did heterosexuals. However, the number of heterosexual cases who provided partner information was small, making comparisons between MSM and heterosexuals difficult (Table 11).

Figure 14 displays reason for visit among MSM early syphilis cases from 1993-2007. Heterosexuals are excluded from this figure because of the small number of cases among heterosexuals occurring during this period. Since the MSM syphilis outbreak began in 1997, most cases have been diagnosed via patients seeking care for symptoms. This trend continued in 2007, with 56% of MSM cases diagnosed after seeking care for symptoms. However, over time the proportion of cases diagnosed after seeking care for symptoms has decreased, while the proportion diagnosed via routine care and through partner notification efforts has increased (Figure 14).

Figure 15 displays the reporting source for all cases of syphilis from 1997-2007. Since 1998, “other” (primarily private) providers have reported greater than half of the early syphilis cases each year (125 cases, 64% in 2007). Within this group, HIV care providers reported 18% of the cases in 2007. The Public Health STD Clinic reported 55 (28%) new early syphilis cases in 2007. Family planning clinics, community clinics, county jails, and other public health clinics

combined have consistently accounted for less than 15% of the annual total reported early syphilis cases in King County since 1998.

**Table 9: Reported Cases and Incidence of Early Syphilis
King County, WA, 2007**

		Cases	Percent	Incidence per 100,000 population
Sex	Men	193	99.5	21
	Women	1	0.5	0
Total cases		194		10

**Table 10: HIV Status and Risk Behaviors among Syphilis Cases
By Sexual Orientation, King County, WA, 2007**

		MSM* N=188		Heterosexual Men and Women N=5	
		Number	Percent	Number	Percent
Stage	Primary	31	16%	2	40%
	Secondary	82	44%	2	40%
	Early latent	75	40%	1	20%
HIV	Positive	108	57%	1	20%
	Negative	67	36%	3	60%
	Unknown	13	7%	1	20%
Methamphetamine Use					
	Yes	56	30%	1	20%
	No	114	61%	3	60%
	Unknown	18	10%	1	20%
Anonymous sex partners during infectious period					
	Yes	54	29%	0	0%
	No	120	64%	4	80%
	Unknown	14	7%	1	20%
Partners met in bathhouses					
	Yes	55	29%	0	0%
	No	131	70%	5	100%
	Unknown	2	1%	0	0%
Internet use to meet partners					
	Yes	78	41%	0	0%
	No	108	57%	5	100%
	Unknown	2	1%	0	0%
Has traded sex for money or drugs (sex worker)					
	Yes	12	6%	0	0%
	No	163	87%	4	80%
	Unknown	13	7%	1	20%
Sex with a known sex worker					
	Yes	3	2%	0	0%
	No	173	92%	4	80%
	Unknown	12	6%	1	20%
Reason for Visit					
	Routine exam	43	23%	0	0%
	Symptoms	105	56%	3	60%
	Exposed	40	21%	2	40%
	None/other	0	0%	0	0%

*MSM: all men who acknowledged sex with a man. 1 man with unknown MSM status was excluded.

Table 11: Total and Anonymous Sex Partners Reported by Syphilis Cases								
By Gender and Sexual Orientation								
King County, WA, 2007								
			MSM			Heterosexual Men and Women		
			N=188*			N=5		
			Total	Mean	Median	Total	Mean	Median
Total sex partners during infectious period			1,479	7.9	3	10	2	1
Anonymous sex partners* during infectious period			813	5.5	1	2	0.5	1

* 48 MSM and 1 heterosexual were missing information on number of sex partners

**Table 12: Number of Reported Early Syphilis Cases and Incidence among Men and Women
King County, WA, 1992-2007**

Year	Women		Men		Total	
	Cases	Incidence per 100,000 population	Cases	Incidence per 100,000 population	Cases	Incidence per 100,000 population
1992	26	3	42	5	68	4
1993	21	3	15	2	36	2
1994	6	1	12	1	18	1
1995	1	0	4	0	5	0
1996	0	0	2	0	2	0
1997	10	1	10	1	20	1
1998	1	0	37	4	38	2
1999	3	0	67	8	70	4
2000	4	0	67	8	71	4
2001	1	0	51	6	52	3
2002	0	0	64	7	64	4
2003	2	0	80	9	82	5
2004	7	1	159	18	166	9
2005	7	1	186	21	193	11
2006	2	0	183	20	185	10
2007	1	0	193	21	194	11

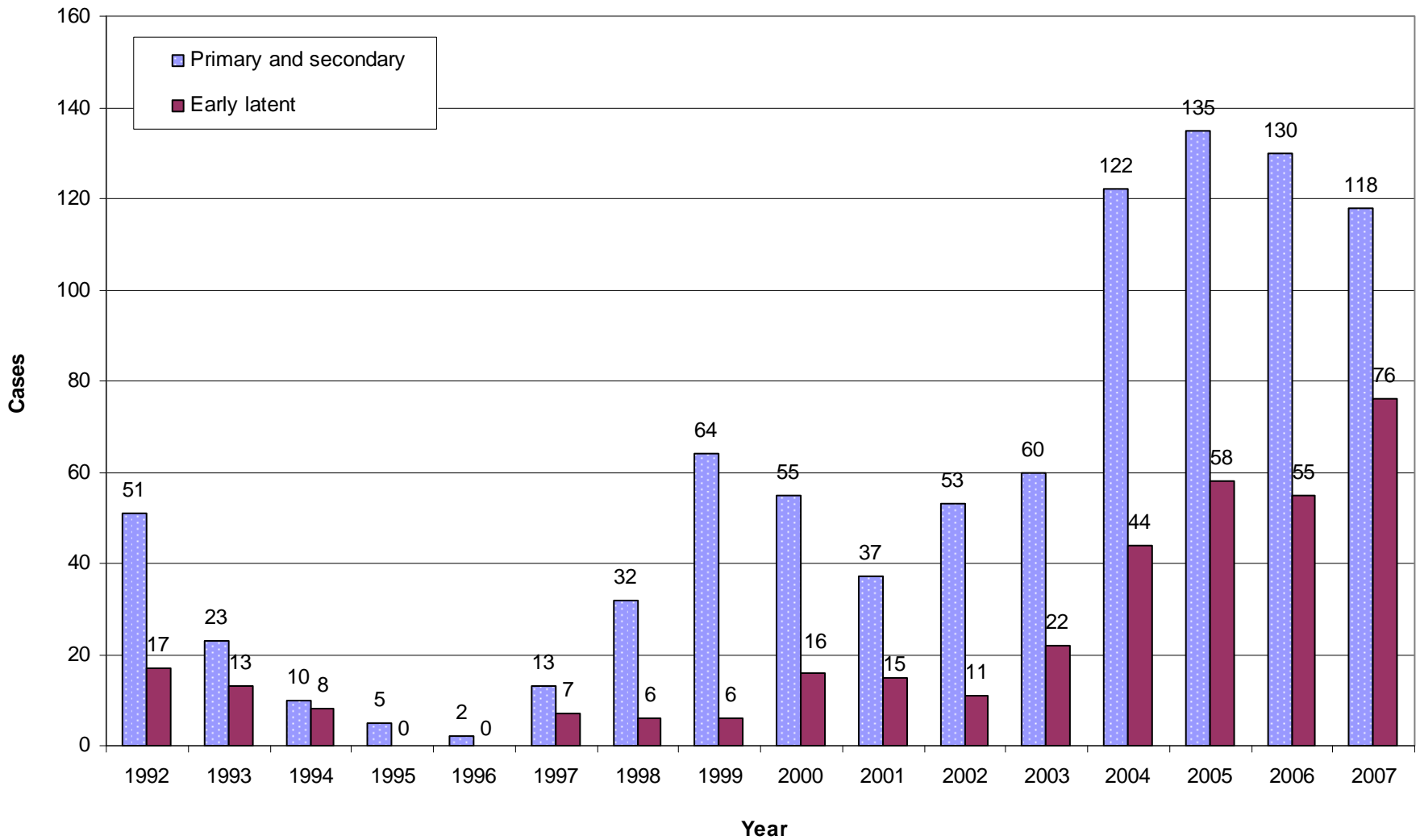
Table 13: Number of Reported Early Syphilis Cases and Incidence Among MSM and Heterosexual Men, King County, WA, 1992-2007

Year	MSM		Heterosexual Men	
	Cases	Incidence per 100,000 population**	Cases	Incidence per 100,000 population
1992*	0	0	0	0.0
1993*	1	2	5	0.6
1994	2	5	10	1.2
1995	2	5	2	0.2
1996	1	2	1	0.1
1997	5	12	5	0.6
1998*	32	74	3	0.4
1999*	60	139	6	0.7
2000*	58	134	8	1.0
2001	50	116	1	0.1
2002*	60	139	3	0.4
2003	77	178	3	0.4
2004	140	324	19	2.2
2005	179	415	6	0.7
2006	174	403	8	0.9
2007	188	436	4	0.5

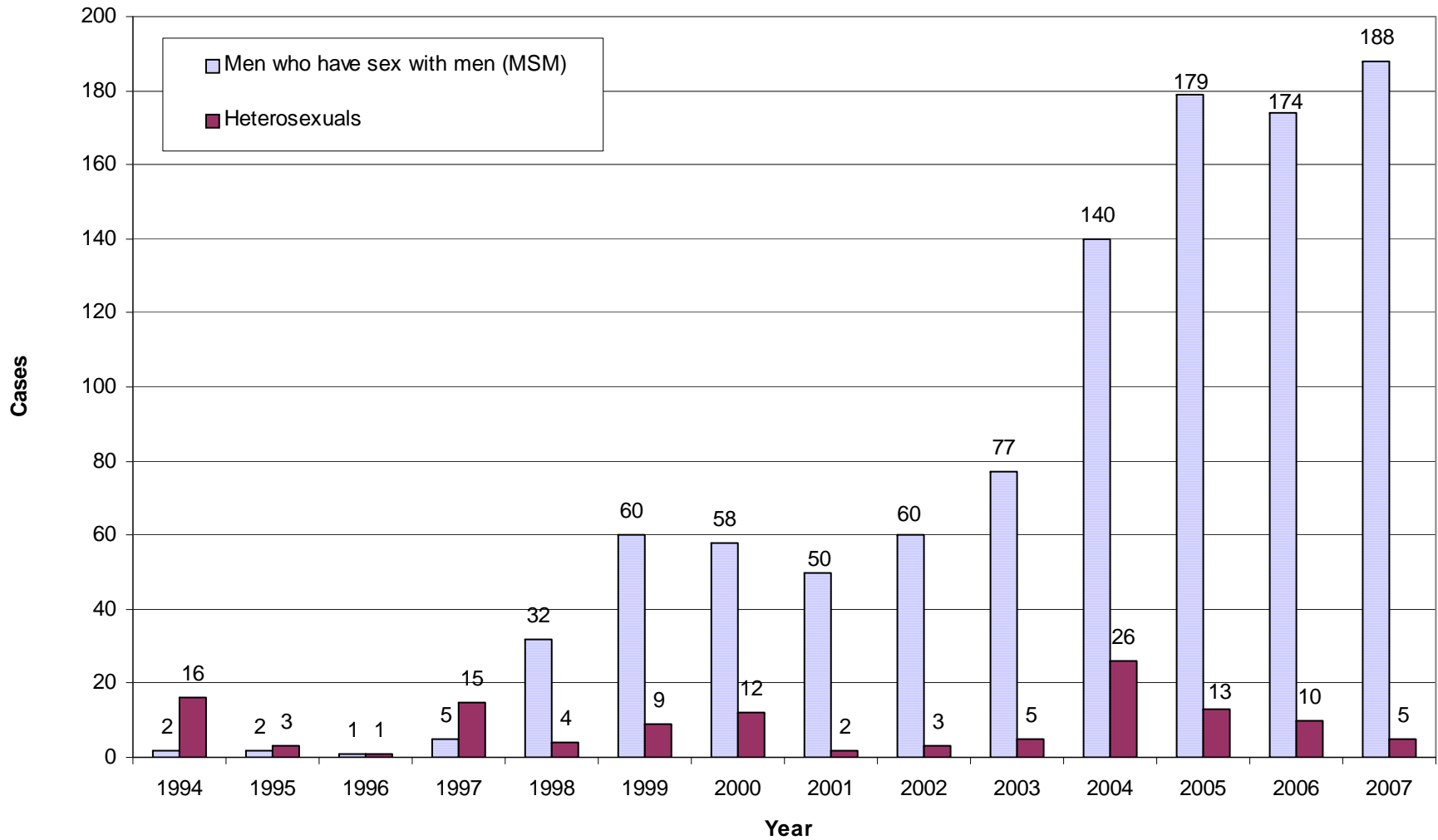
* Men were missing sexual orientation data in the following years (numbers missing are included in parentheses): 1992 (42), 1993 (9), 1998 (2), 1999 (1), 2000 (1), and 2002 (1), 2005(1), 2006(1), 2007(1)

** MSM incidence is based on an MSM population size estimate of 43,150

**Figure 10: Reported Cases of Primary and Secondary vs. Early Latent Syphilis
King County, WA 1992-2007**

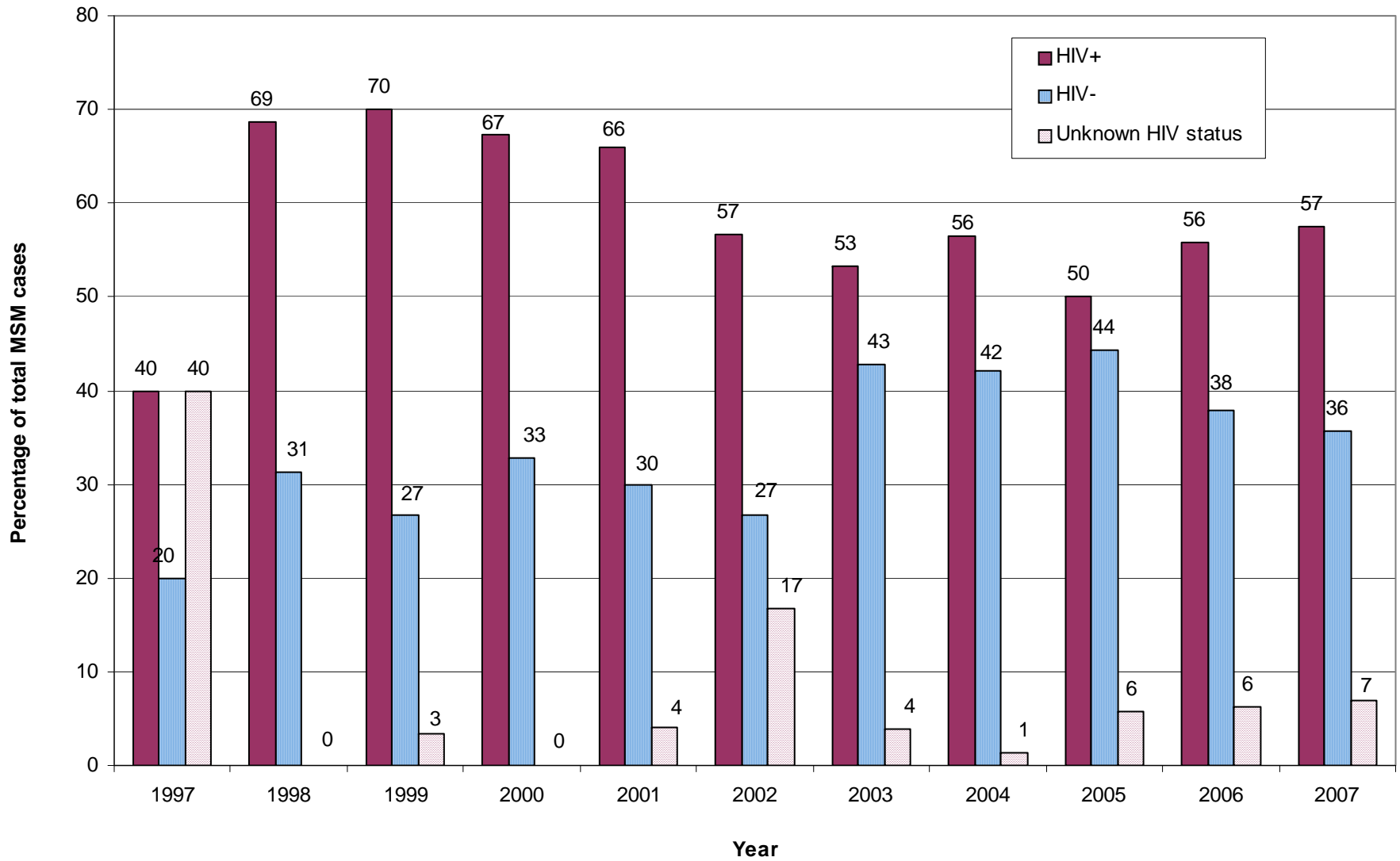


**Figure 11: Reported Cases of Early Syphilis by Sexual Orientation*,
King County, WA, 2007**

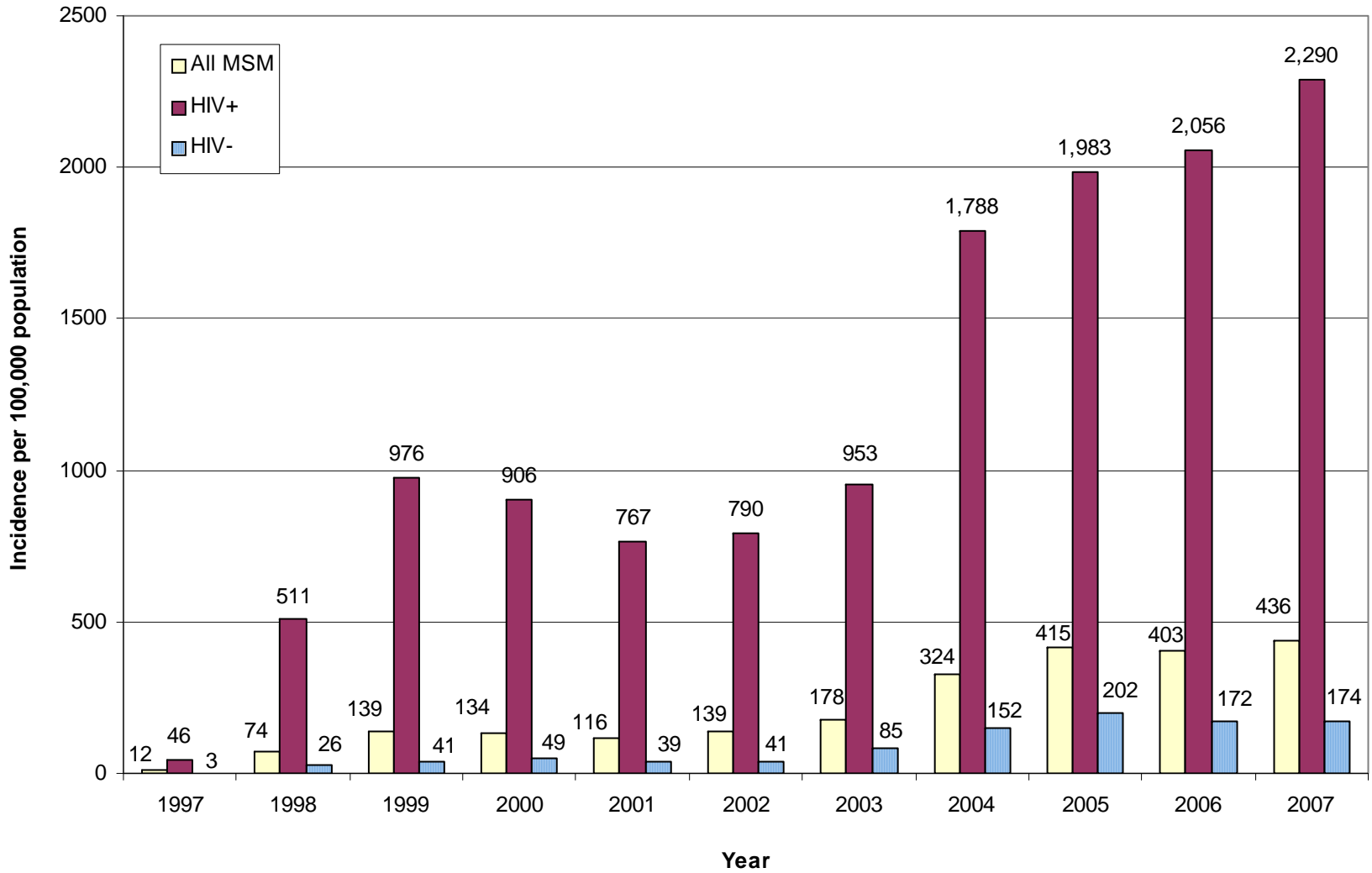


*Data on sexual orientation were missing for men in the following years: 2 men in 1998, and 1 man in 1999, 2000, 2002, 2005, 2006, and 2007.

**Figure 12: Percent of Reported Early Syphilis Cases Among MSM by HIV Status
King County, WA, 1997-2007**



**Figure 13: Early Syphilis Incidence Among MSM by HIV Status
King County, WA, 1997-2007**



**Figure 14: Reason for Visit among MSM reported with Early Syphilis
King County, WA, 1993-2007**

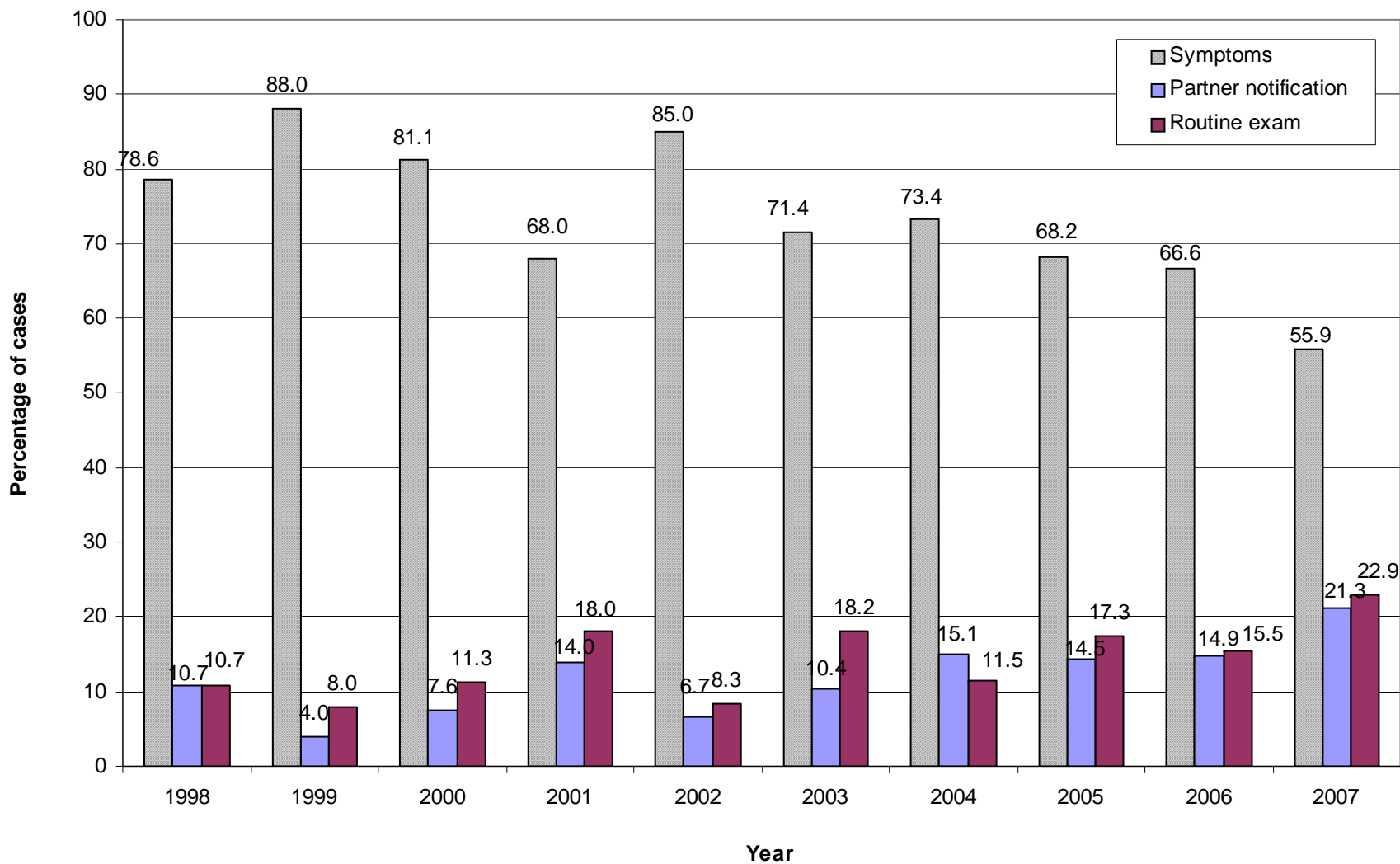
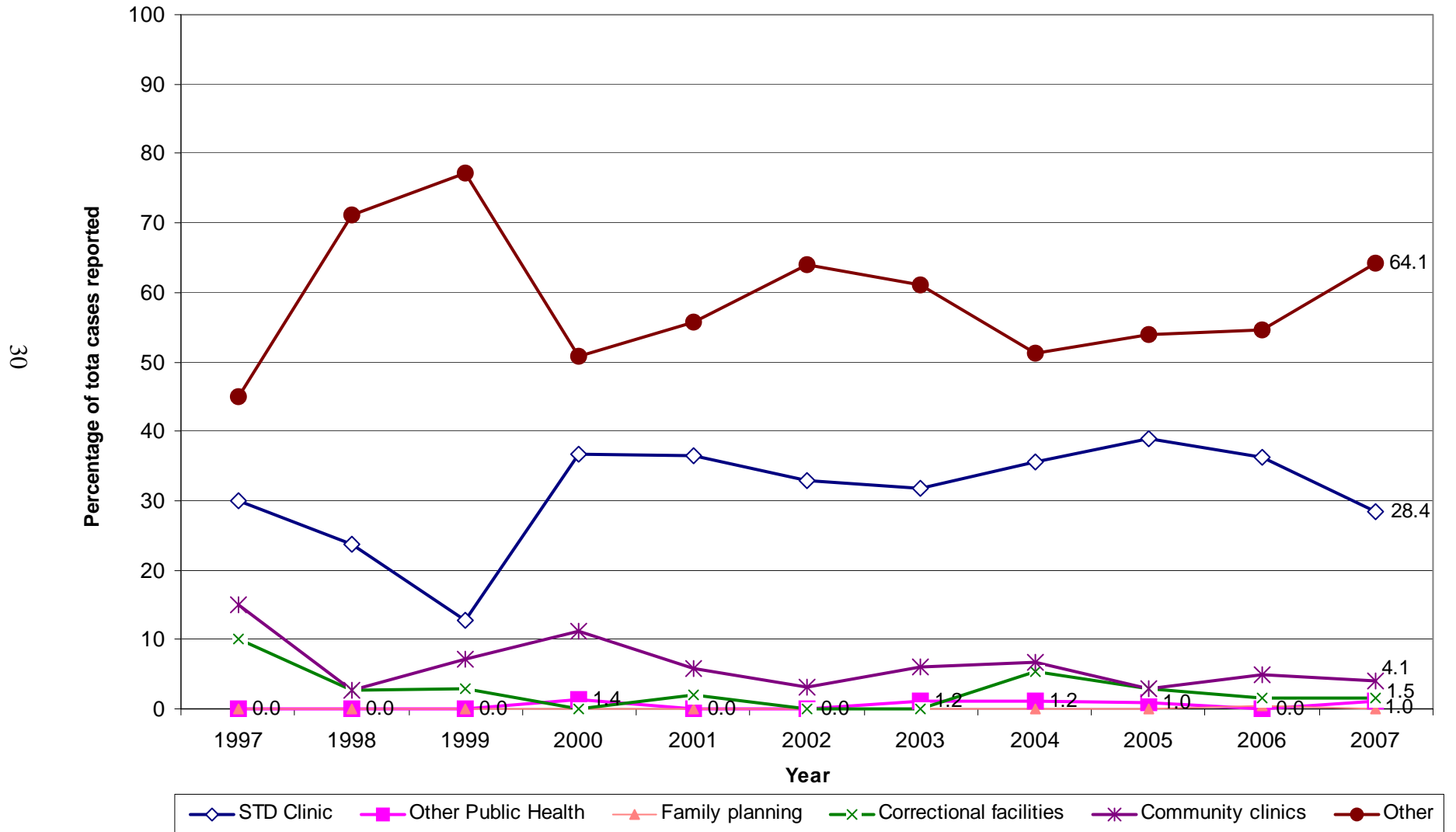


Figure 15: Reporting Provider for Reported Early Syphilis Cases, King County, WA 1992-2007



Public Health – Seattle & King County STD Clinic

In 2007, 8,589 patients made 12,858 visits to the Public Health STD Clinic. Of these, 11,471 visits were made by patients seeking STD Clinic services, while 1,387 visits were made by patients seeking an HIV test only; patients seeking only HIV testing were seen by Disease Intervention Specialists (DIS), public health staff who perform HIV testing and counseling among other functions [Table 14]. Prior to 2006, data on patients tested for HIV by DIS were not a part of the Public Health STD Clinic database and did not contribute to annual counts of STD Clinic visits. In 2007, heterosexual men made 44% of the visits among patients seeking STD Clinic services, while MSM and women accounted for 26% and 28% of these visits respectively. Among clients seen by DIS, 42% of visits were made by heterosexual men, 34% by heterosexual men, and 23% by women. Among patients seeking STD Clinic services, the number of visits made by MSM, heterosexual men, and women decreased slightly in 2007 (Table 18, Figure 16). These patterns are also reflected in trends among unduplicated patients seeking STD Clinic services (Table 19, Figure 17).

Tables 15-17 display the race and age distribution for STD Clinic patients in 2007. MSM patients are more likely to be white and tend to be older than heterosexual patients. This was true for both STD Clinic and HIV testing only visits in 2007. The primary difference between these two groups in 2007 was that the HIV testing only patients were older, on average, than patients seeking STD Clinic services.

Mirroring declines in reported cases of gonorrhea overall in King County in 2007 (Table 7), the number of cases of gonorrhea diagnosed in the Public Health STD Clinic dropped by approximately one-third in 2007 (398 cases, Figure 18). A similar decline was observed among women, heterosexual men, and MSM. While longer term increases in gonorrhea diagnoses among MSM had been observed in the STD Clinic, some of these increases may be related to increased screening for rectal and pharyngeal gonorrhea among MSM implemented in the late 1990s. In order to examine trends in gonorrhea diagnoses among MSM not influenced by this increase in screening, Figure 19 displays urethral gonorrhea diagnoses among men experiencing symptoms. Figure 19 demonstrates both the long term trend toward more symptomatic urethral gonorrhea among MSM since the late 1990s, and a recent decline in symptomatic urethral gonorrhea among MSM and heterosexual men.

In 2007, STD Clinic clinicians diagnosed 547 cases of chlamydial infection (Figure 21), a small drop in the number of diagnoses from 2006 (587 cases). The overall number of chlamydia diagnoses has dropped for the past three years, driven for the most part by a decline in chlamydial infection among MSM clinic patients. However, in 2007, the number of diagnoses of chlamydia among MSM remained relatively stable, as did diagnoses among heterosexual men. In contrast, diagnoses of women have fallen for the past two years. There were 69 early syphilis diagnoses among individuals for whom a sexual preference could be determined in the STD Clinic in 2006 (Figure 24); 93% of these occurred among MSM, reflective of an ongoing syphilis epidemic among MSM in King County (Figure 11). Figure 25 displays new HIV diagnoses from both the STD Clinic (1993-2006) and the HAP program (2000-2006). While the overall number of new HIV diagnoses has been variable for the past several years, MSM continue to account for the majority of new HIV diagnoses made via the STD and HAP programs.

Following a long term decreasing trend in trichomoniasis, the number of trichomoniasis cases diagnosed in the STD Clinic remained relatively stable from 2003 to 2006, but then increased from 2006 to 2007, with 116 trichomoniasis diagnoses in 2007 (Figure 26). Figure 26 also displays trichomoniasis prevalence, calculated as the number of women with a positive culture or wet mount divided by the total number of these tests performed each year. Trichomoniasis prevalence has increased for the past two years. Both the number of bacterial vaginosis diagnoses and bacterial vaginosis prevalence (calculated as the total number of bacterial vaginosis diagnoses divided by the number of women tested for vaginal PH and the presence of vaginal clue cells on wet preparations) fell somewhat from 2006 to 2007, with 709 cases and a prevalence of 0.35 (Figure 27).

While initial genital herpes diagnoses increased slightly from 2006 (136 cases) to 2007 (156 cases, Figure 28), the number of diagnoses of recurrent genital herpes was relatively unchanged during this time (Figure 29). The majority of both initial and recurrent herpes diagnoses were in heterosexual men (45% and 44% of cases, respectively) followed by women (36% and 32%) and MSM (18% and 23% respectively, Figures 28 and 29). Among 2,305 asymptomatic patients tested for HSV-2 in 2007, there were 47 HSV-2 diagnoses among MSM, 112 among heterosexual men, and 74 in women (Figure 30).

Table 14: Number of Public Health STD Clinic Visits and Patients, 2007

(A) Clients seen for services other than HIV tests only

	Women	Heterosexual Men	MSM*	Men with Unknown Sexual Orientation	Total
Visits	3171	5034	3004	262	11471
Patients (unduplicated visits)	2146	3720	1711	126	7703

(B) Clients seen for HIV tests only

	Women	Heterosexual Men	MSM*	Men with Unknown Sexual Orientation	Total
Visits	318	584	471	14	1387
Patients (unduplicated visits)	218	347	310	11	886

(C) Clients seen for all services

	Women	Heterosexual Men	MSM*	Men with Unknown Sexual Orientation	Total
Visits	3489	5618	3475	276	12858
Patients (unduplicated visits)	2364	4067	2021	137	8589

* Men who have sex with men are men who acknowledged sex with another man in the preceding year during any clinic visit.

Table 15: Age and Race of Public Health STD Clinic Patients, 2007

	Women		Heterosexual Men [^]		MSM* [^]		Total [^]	
	Number	(%)	Number	(%)	Number	(%)	Number	(%)
Race								
White	1265	(53.5)	2266	(55.7)	1509	(74.7)	5132	(59.8)
Black	547	(23.1)	1007	(24.8)	136	(6.7)	1711	(19.9)
Native America	65	(2.7)	42	(1.0)	28	(1.4)	140	(1.6)
Asian	176	(7.4)	247	(6.1)	102	(5.0)	529	(6.2)
Multiple Race	109	(4.6)	101	(2.5)	36	(1.8)	247	(2.9)
Pacific Islander	31	(1.3)	25	(0.6)	27	(1.3)	84	(1.0)
Unknown	171	(7.2)	379	(9.3)	183	(9.1)	746	(8.7)
Age								
10-14 years	9	(0.3)	4	(0.1)	1	(0.0)	14	(0.1)
15-19 years	262	(10.1)	125	(2.9)	60	(2.5)	454	(4.8)
20-24 years	677	(26.0)	756	(17.6)	348	(14.8)	1796	(19.0)
25-29 years	550	(21.2)	983	(22.9)	427	(18.1)	1985	(21.0)
30-34 years	318	(12.2)	687	(16.0)	362	(15.4)	1395	(14.8)
35-44 years	455	(17.5)	918	(21.4)	699	(29.6)	2133	(22.6)
45-55 years	249	(9.6)	584	(13.6)	358	(15.2)	1213	(12.9)
>=56 years	77	(3.0)	235	(5.5)	99	(4.2)	432	(4.6)
Unknown	3	(0.1)	4	(0.1)	4	(0.2)	14	(0.1)

* Men who have sex with men are men who acknowledged sex with men in the current visit, or for follow-up visits, the associated new problem visit

[^] 147 men with unknown sexual orientation are excluded from the race/age distributions for heterosexual men and MSM, but are included in total race and age distributions

**Table 16: Age and Race of Public Health STD Clinic Patients
Seen for Services Other than HIV Tests Only, 2007**

	Women		Heterosexual Men [^]		MSM* [^]		Total [^]	
	Number	(%)	Number	(%)	Number	(%)	Number	(%)
Race								
White	1146	(53.4)	2082	(56.0)	1284	(75.0)	4598	(59.7)
Black	498	(23.2)	936	(25.2)	114	(6.7)	1567	(20.3)
Native American	60	(2.8)	39	(1.0)	25	(1.5)	129	(1.7)
Asian	165	(7.7)	222	(6.0)	84	(4.9)	475	(6.2)
Multiple Race	99	(4.6)	88	(2.4)	29	(1.7)	217	(2.8)
Pacific Islander	30	(1.4)	22	(0.6)	25	(1.5)	78	(8.3)
Unknown	148	(6.9)	331	(8.9)	150	(8.8)	639	(1.0)
Age								
10-14 years	8	(0.3)	2	(0.0)	1	(0.1)	11	(0.1)
15-19 years	247	(10.5)	117	(2.9)	49	(2.6)	418	(5.0)
20-24 years	620	(26.2)	736	(18.3)	293	(15.7)	1663	(19.8)
25-29 years	505	(21.4)	930	(23.1)	356	(19.1)	1811	(21.5)
30-34 years	282	(11.9)	644	(16.0)	298	(16.0)	1245	(14.8)
35-44 years	399	(16.9)	854	(21.2)	527	(28.3)	1832	(21.8)
45-55 years	227	(9.6)	535	(13.3)	262	(14.1)	1042	(12.4)
>=56 years	72	(3.0)	210	(5.2)	73	(3.9)	369	(4.4)
Unknown	3	(0.1)	4	(0.1)	14	(0.2)	14	(0.2)

* Men who have sex with men are men who acknowledged sex with men in the current visit, or for follow-up visits, the associated new problem visit

[^] 147 men with unknown sexual orientation are excluded from the race/age distributions for heterosexual men and MSM, but are included in total race and age distributions

Table 17: Age and Race of Public Health STD Clinic Patients Seen for HIV Tests Only, 2007

	Women		Heterosexual Men [^]		MSM* [^]		Total [^]	
	Number	(%)	Number	(%)	Number	(%)	Number	(%)
Race								
White	119	(54.6)	184	(53.0)	225	(72.6)	534	(60.3)
Black	49	(22.5)	71	(20.5)	22	(7.1)	144	(16.3)
Native America	5	(2.3)	3	(0.9)	3	(1.0)	11	(1.2)
Asian	11	(5.0)	25	(7.2)	18	(5.8)	54	(6.1)
Multiple Race	10	(4.6)	13	(3.7)	7	(2.3)	30	(3.4)
Pacific Islander	1	(0.5)	3	(0.9)	2	(0.6)	6	(0.7)
Unknown	23	(10.6)	48	(13.8)	33	(10.6)	107	(12.1)
Age								
10-14 years	1	(0.4)	2	(0.8)	0	(0.0)	3	(0.3)
15-19 years	15	(6.3)	8	(3.0)	11	(2.2)	36	(3.5)
20-24 years	57	(24.1)	20	(7.6)	55	(11.1)	133	(12.9)
25-29 years	45	(19.0)	53	(20.1)	71	(14.3)	174	(16.9)
30-34 years	36	(15.2)	43	(16.3)	64	(12.9)	150	(14.5)
35-44 years	56	(23.6)	64	(24.2)	172	(34.7)	301	(29.2)
45-55 years	22	(9.3)	49	(18.6)	96	(19.4)	171	(16.6)
>=56 years	5	(2.1)	25	(9.5)	26	(5.3)	63	(6.1)
Unknown	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)

* Men who have sex with men are men who acknowledged sex with men in the current visit, or for follow-up visits, the associated new problem visit

[^] 35 men with unknown sexual orientation are excluded from the race/age distributions for heterosexual men and MSM, but are included in total race and age distributions

Table 18: Number of Public Health STD Clinic Visits, 1993-2007

	Women	Heterosexual Men	MSM*	Men with Unknown Sexual Orientation	HIV Test Only Visits	Total
1993	6826	9003	1386	514		17729
1994	7017	8986	1829	578		18410
1995	6951	8567	2377	509		18404
1996	6117	7635	2152	292		16196
1997*	4929	6340	1753	333		13355
1998	4541	6111	2106	248		13006
1999**	4085	5879	2550	189		12703
2000	3954	5762	2937	220		12873
2001	4312	5883	3160	307		13662
2002	4277	6037	2958	338		13610
2003	3906	6030	3055	268		13259
2004	3771	5935	3072	327		13105
2005	3656	5808	3344	314		13122
2006	3389	5359	3364	301	1726	14139
2007	3171	5034	3004	262	1387	12858

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

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

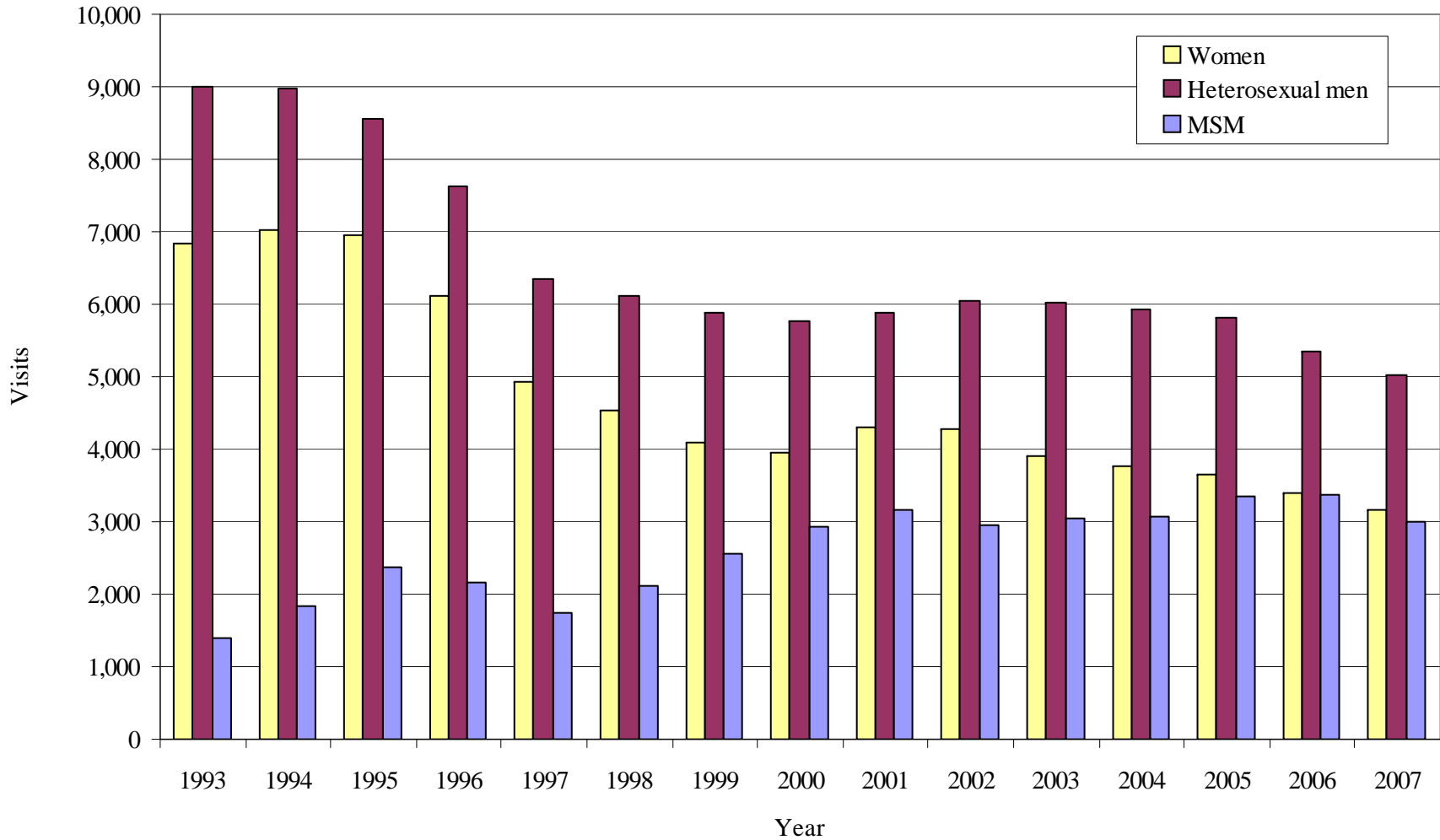
Table 19: Number of Public Health STD Clinic Patients (Unduplicated Visits per Year), 1993-2007

	Women	Heterosexual Men	MSM*	Men with Unknown Sexual Orientation	HIV Test Only Patients	Total
1993	3903	5639	843	443		10828
1994	3771	5406	891	398		10466
1995	3939	5383	1102	305		10729
1996	3630	5067	1161	184		10042
1997*	3001	4252	993	222		8468
1998	2831	4102	1099	197		8229
1999**	2503	3987	1236	150		7876
2000	2450	3926	1247	168		7791
2001	2568	4004	1411	229		8212
2002	2746	4183	1581	257		8767
2003	2559	4291	1715	204		8769
2004	2480	4139	1747	198		8564
2005	2435	4128	1885	186		8634
2006	2363	4032	1863	147	1031	9436
2007	2146	3720	1711	126	886	8589

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

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

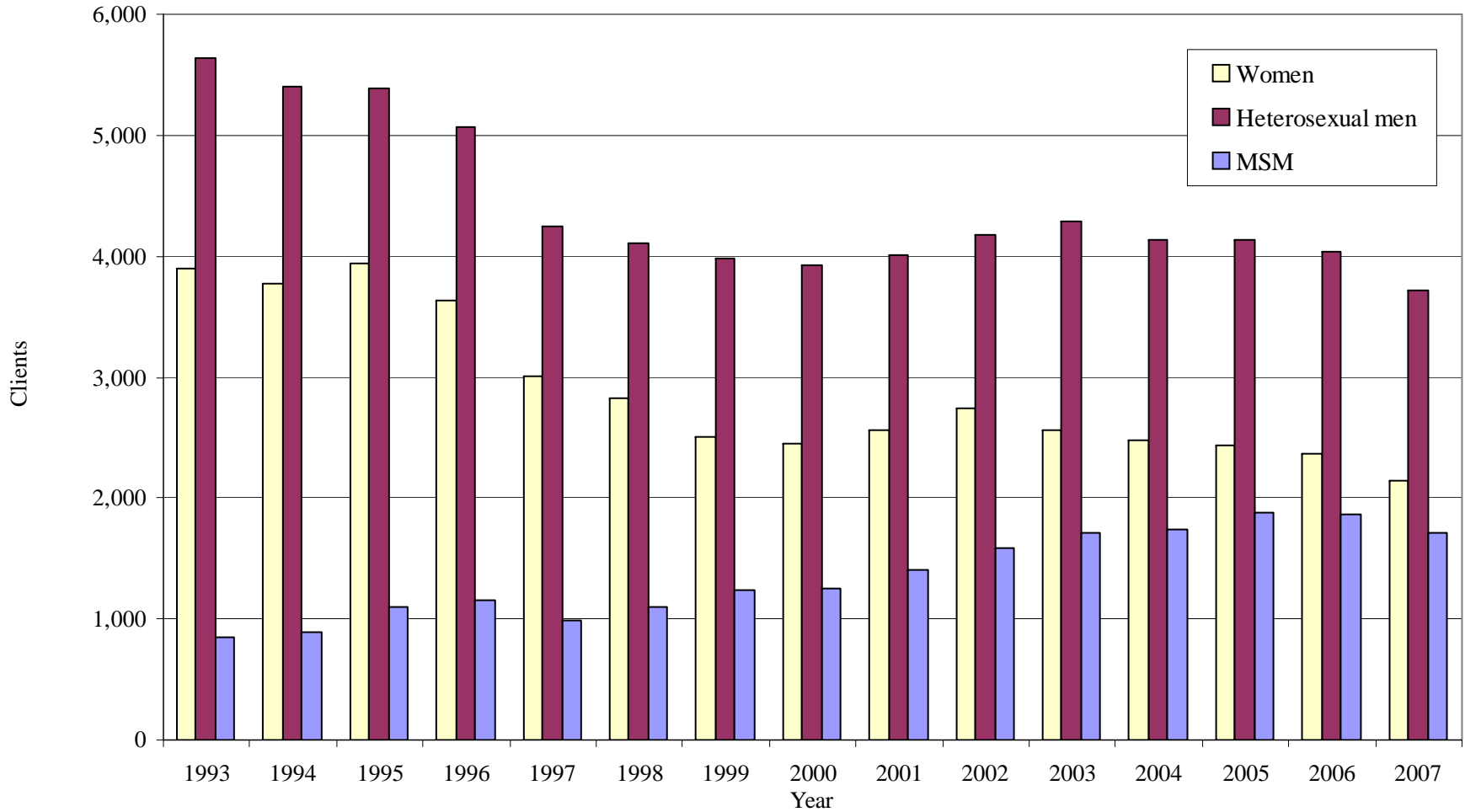
Figure 16: Visits* to Public Health - Seattle and King County STD Clinics**, 1993-2007



*This figure excludes men with missing sexual orientation data, and HIV testing visits provided through the HIV/AIDS Program (HAP).

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

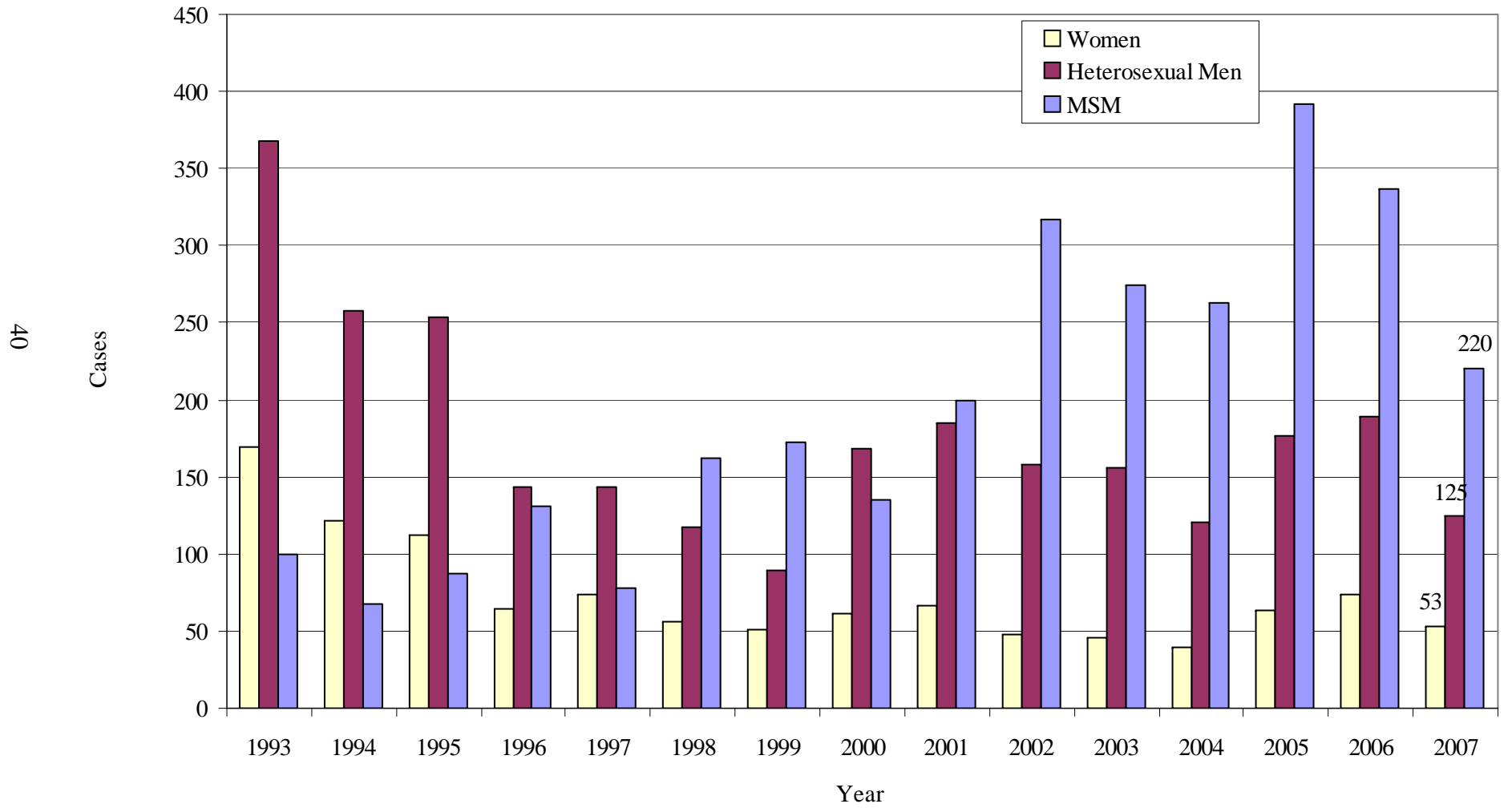
**Figure 17: Patients* Visiting the Public Health STD Clinics by Year
(Unduplicated Visits), 1993-2007**



*This figure excludes men with missing sexual orientation data, and HIV testing visits provided through the HIV/AIDS Program. (HAP).

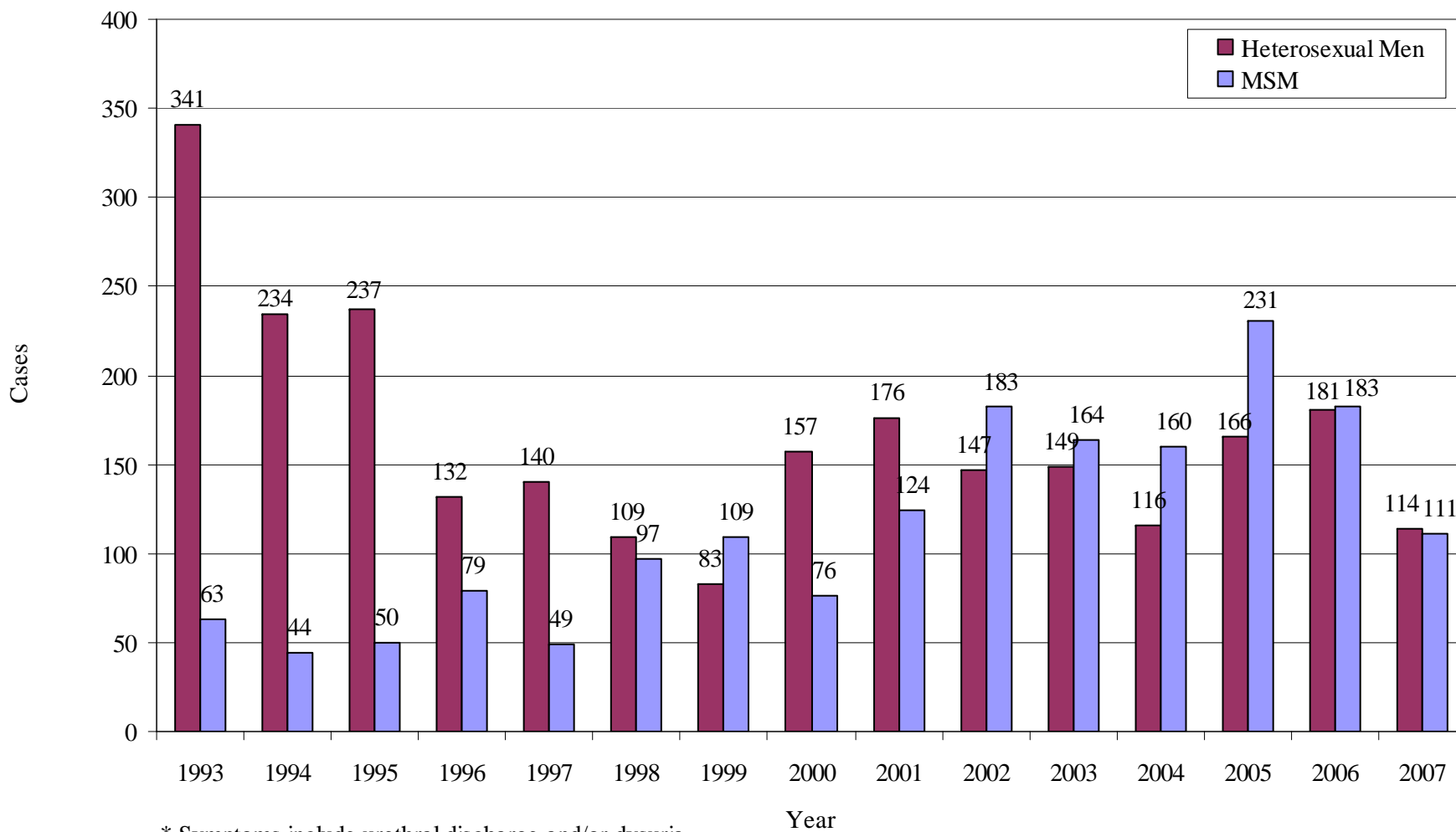
** PHSKC's satellite Broadway STD Clinic was in operation from 1993-1998.

**Figure 18: Gonorrhea Diagnoses*, Public Health STD Clinic
1993-2007**



* These data exclude 60 cases of gonorrhea among men who were missing sexual orientation information

Figure 19: Symptomatic* Gonococcal Urethritis among Men
Public Health STD Clinic, 1993-2007**



* Symptoms include urethral discharge and/or dysuria

** These data exclude 50 cases of symptomatic urethral gonorrhea among men who were missing sexual orientation information

Figure 20: Symptomatic and Asymptomatic* Gonococcal Urethritis among MSM
Public Health STD Clinic, 1993-2007**

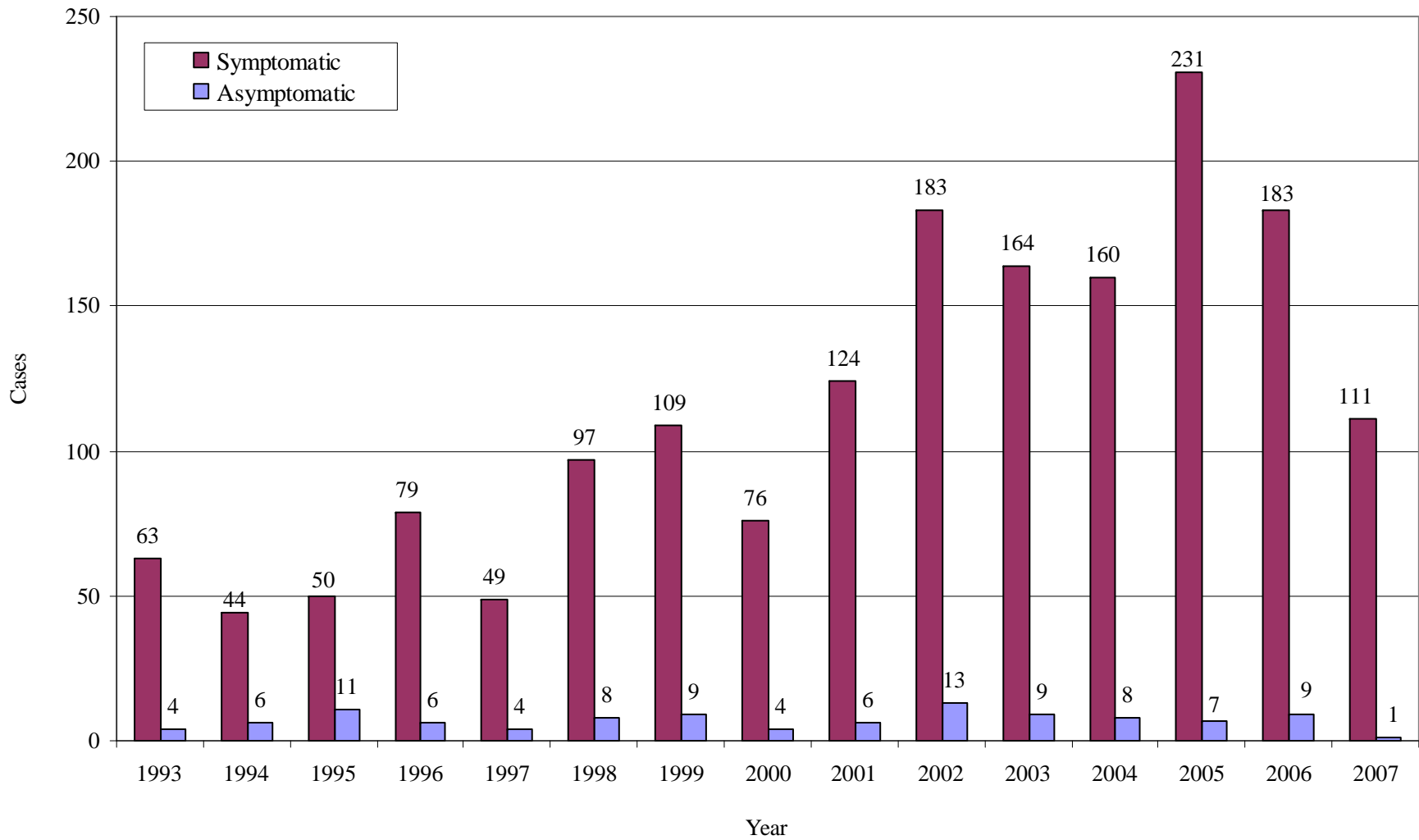
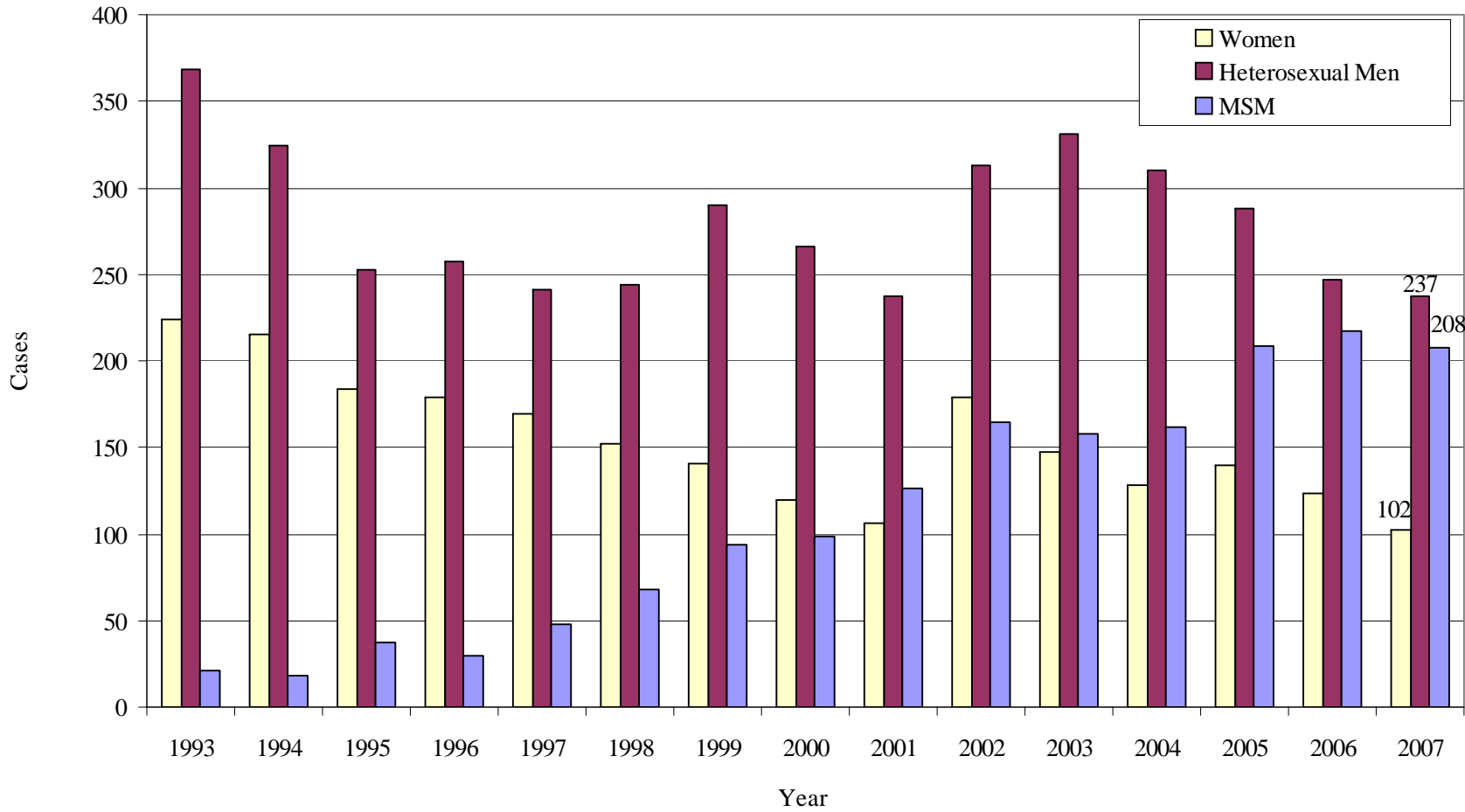
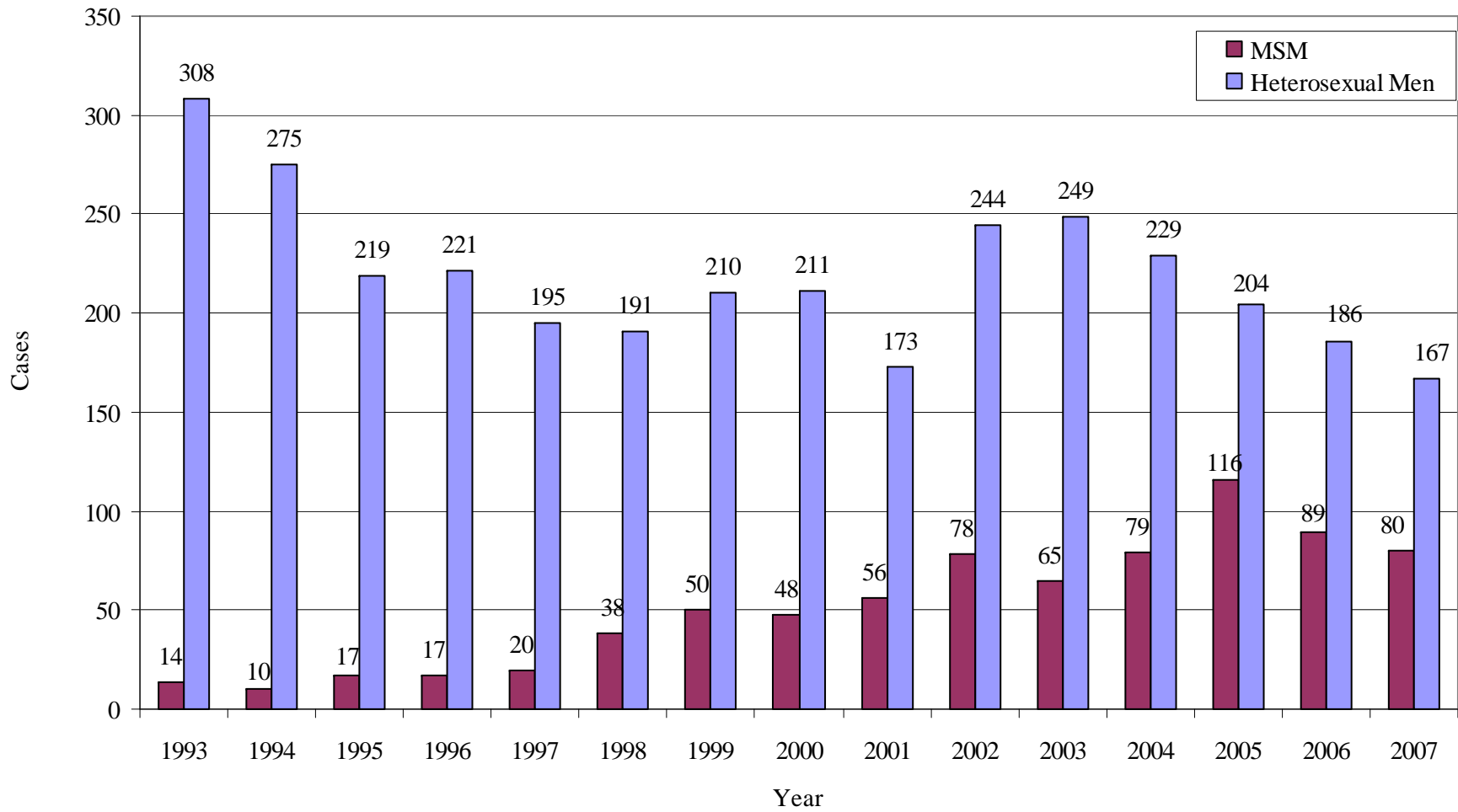


Figure 21: Chlamydial Infection Diagnoses*
Public Health STD Clinic, 1993-2007



* These data exclude 116 cases of chlamydial infection among men who were missing sexual orientation information

Figure 22: Symptomatic* Chlamydial Urethritis among Men
Public Health STD Clinic, 1993-2007**



**Figure 23: Chlamydia Prevalence among Asymptomatic Women Ages 15-29
Public Health STD Clinic, 1993-2007**

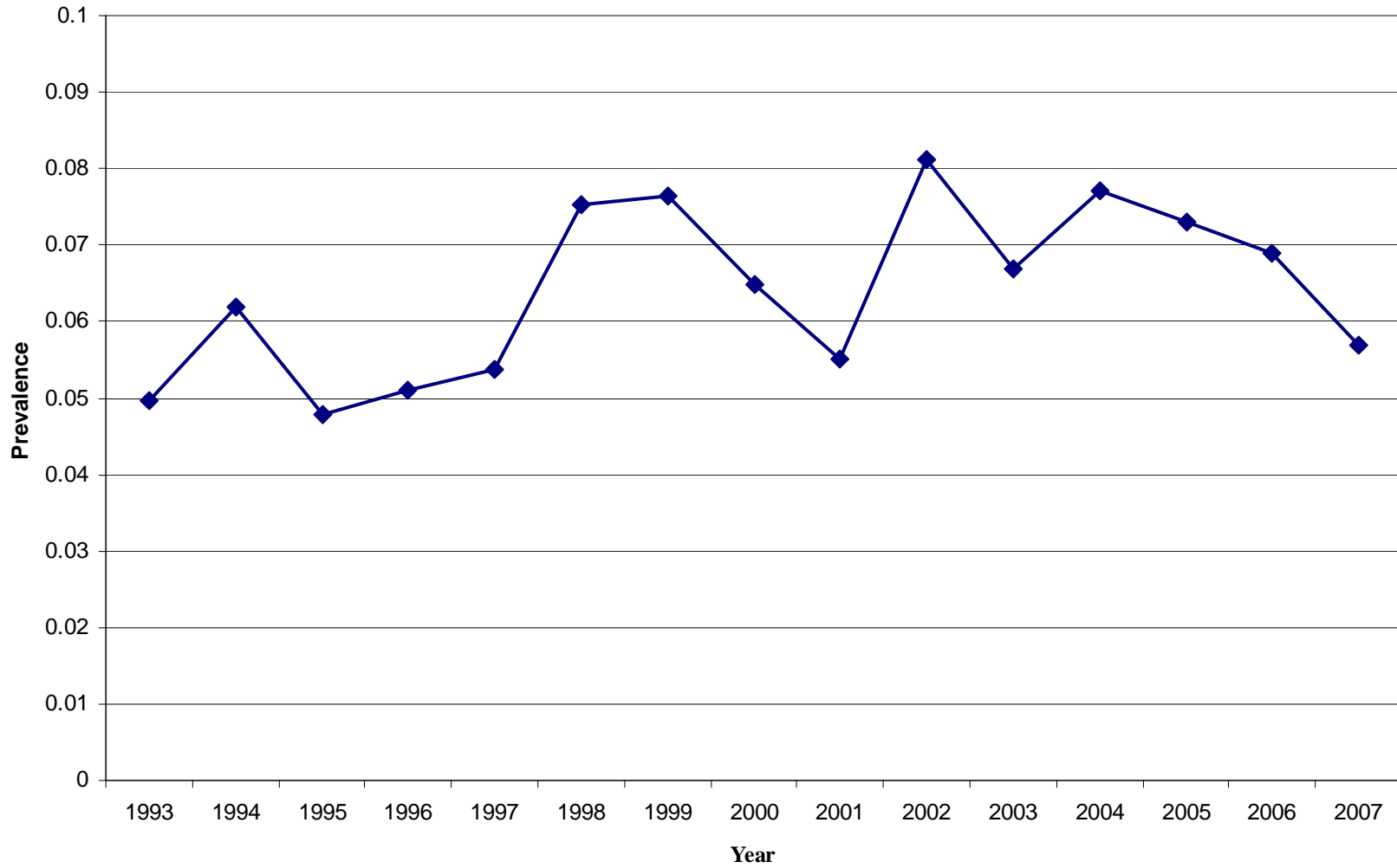
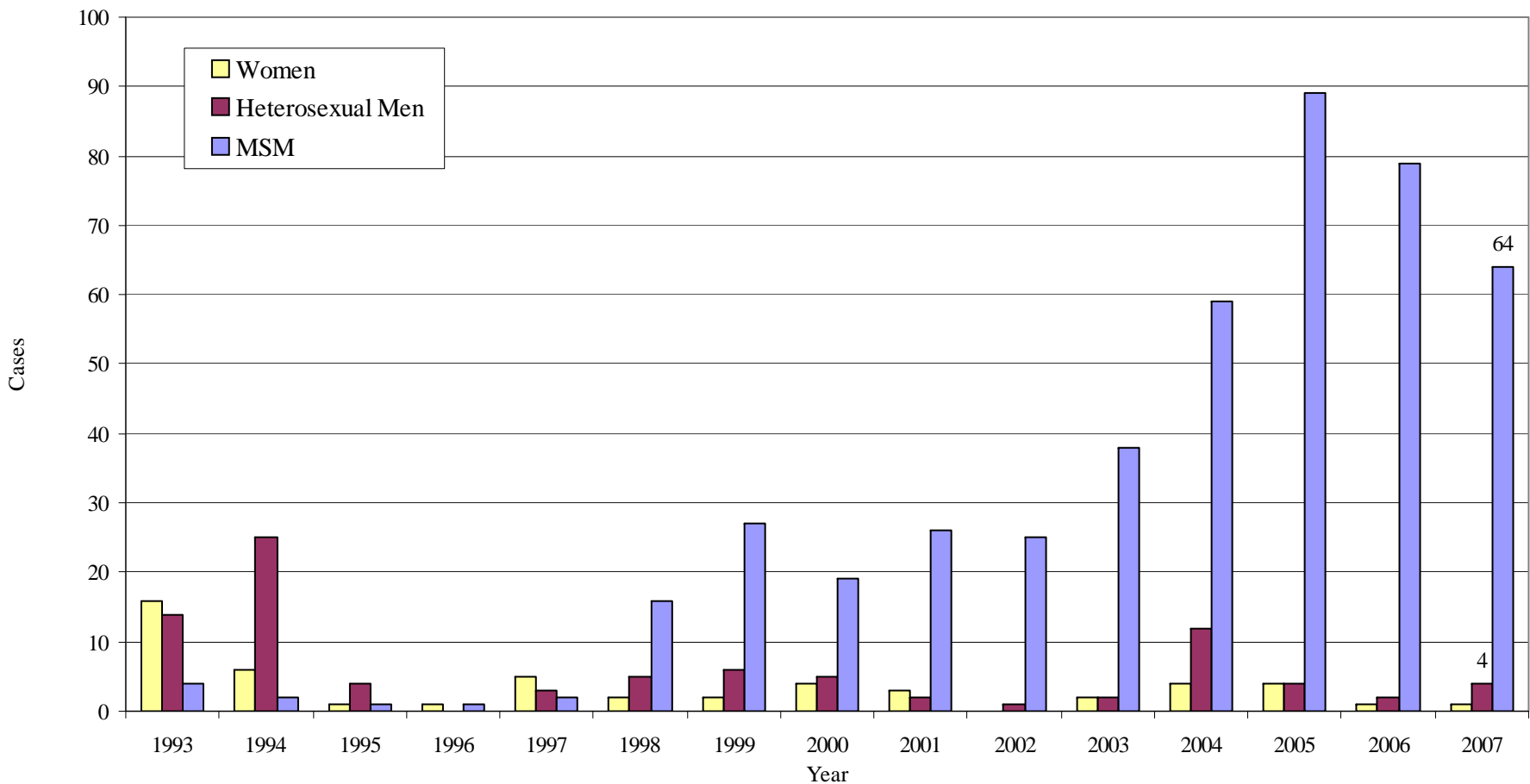


Figure 24: Early* Syphilis Diagnoses^
Public Health STD Clinic, 1993-2007**

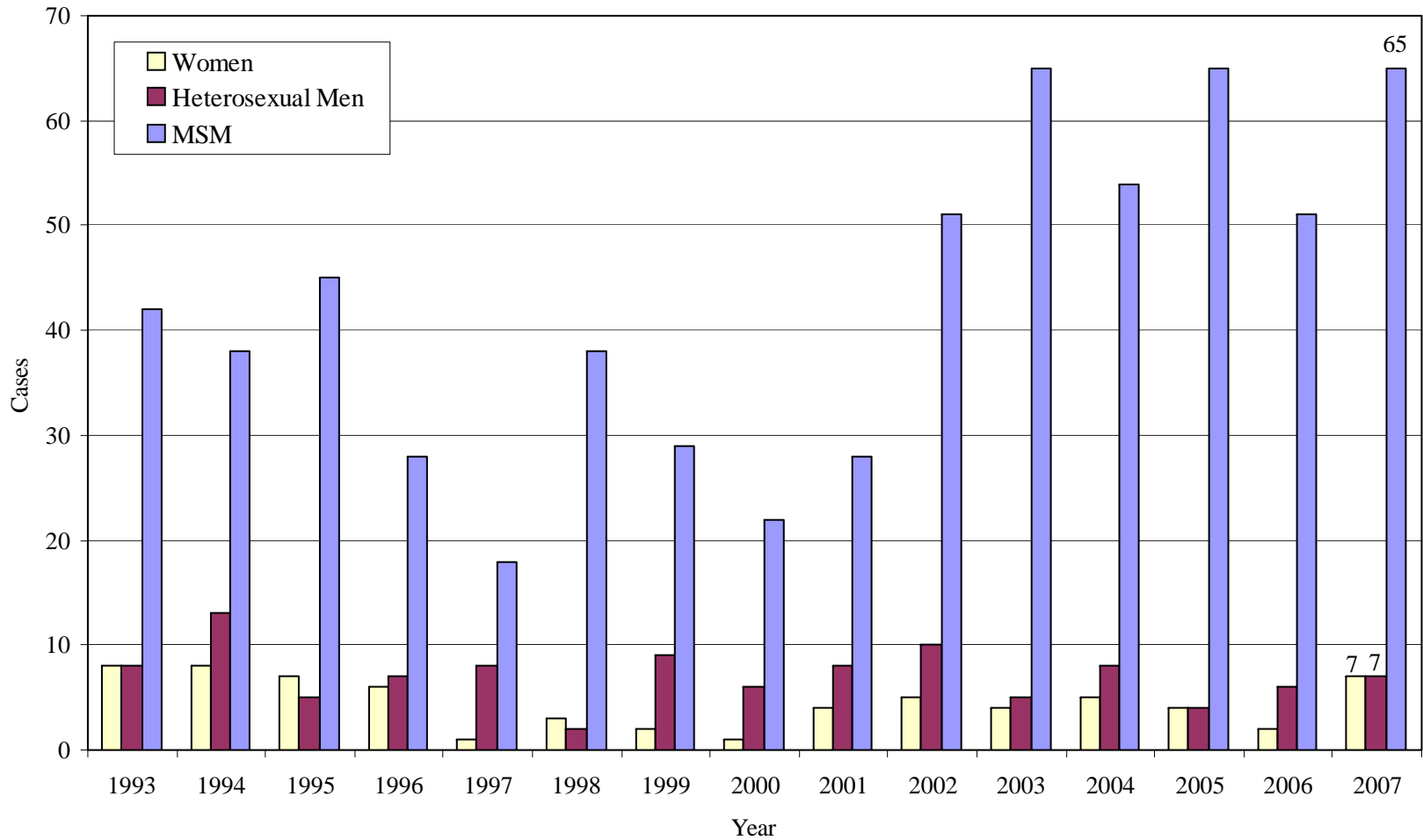


* Includes primary, secondary, and early latent syphilis diagnoses

** These data exclude 56 cases of early syphilis among men who were missing sexual orientation information

^ Some patients may have been diagnosed by outside providers and referred to the PHSKC STD Clinic for follow up

Figure 25: HIV Diagnoses*, Public Health STD Clinic
1993-2007**



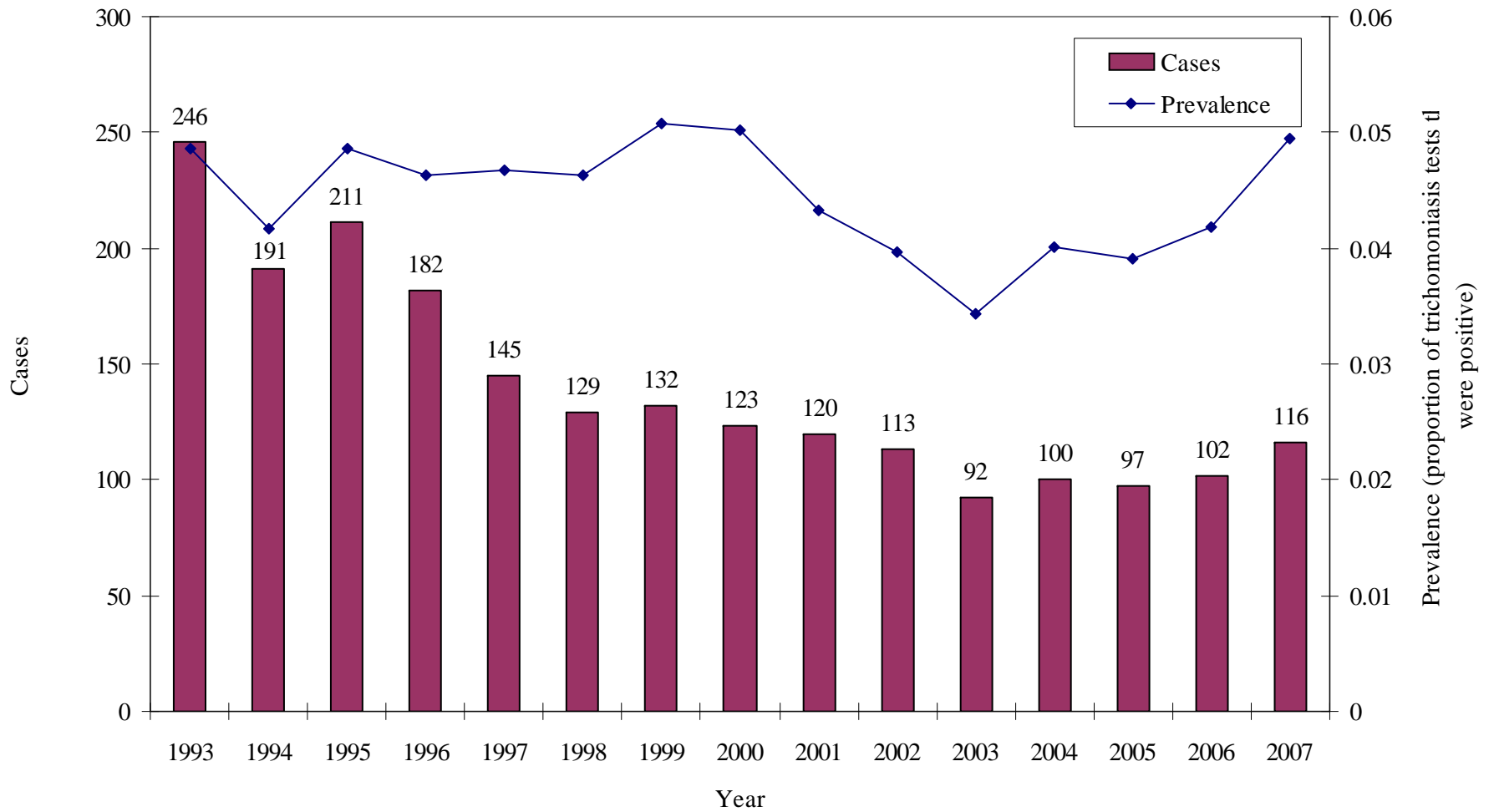
* These data exclude 7 cases of HIV among men who were missing sexual orientation information

** Includes tests performed through the HIV AIDS Program (HAP), which joined the PHSKC STD Clinic in 2000.

^ As of September 2003, all MSM tested for HIV in the PHSKC STD Clinic also received an HIV RNA test.

**Figure 26: Trichomoniasis Diagnoses* and Prevalence Among Female Patients
Public Health STD Clinic, 1993-2007**

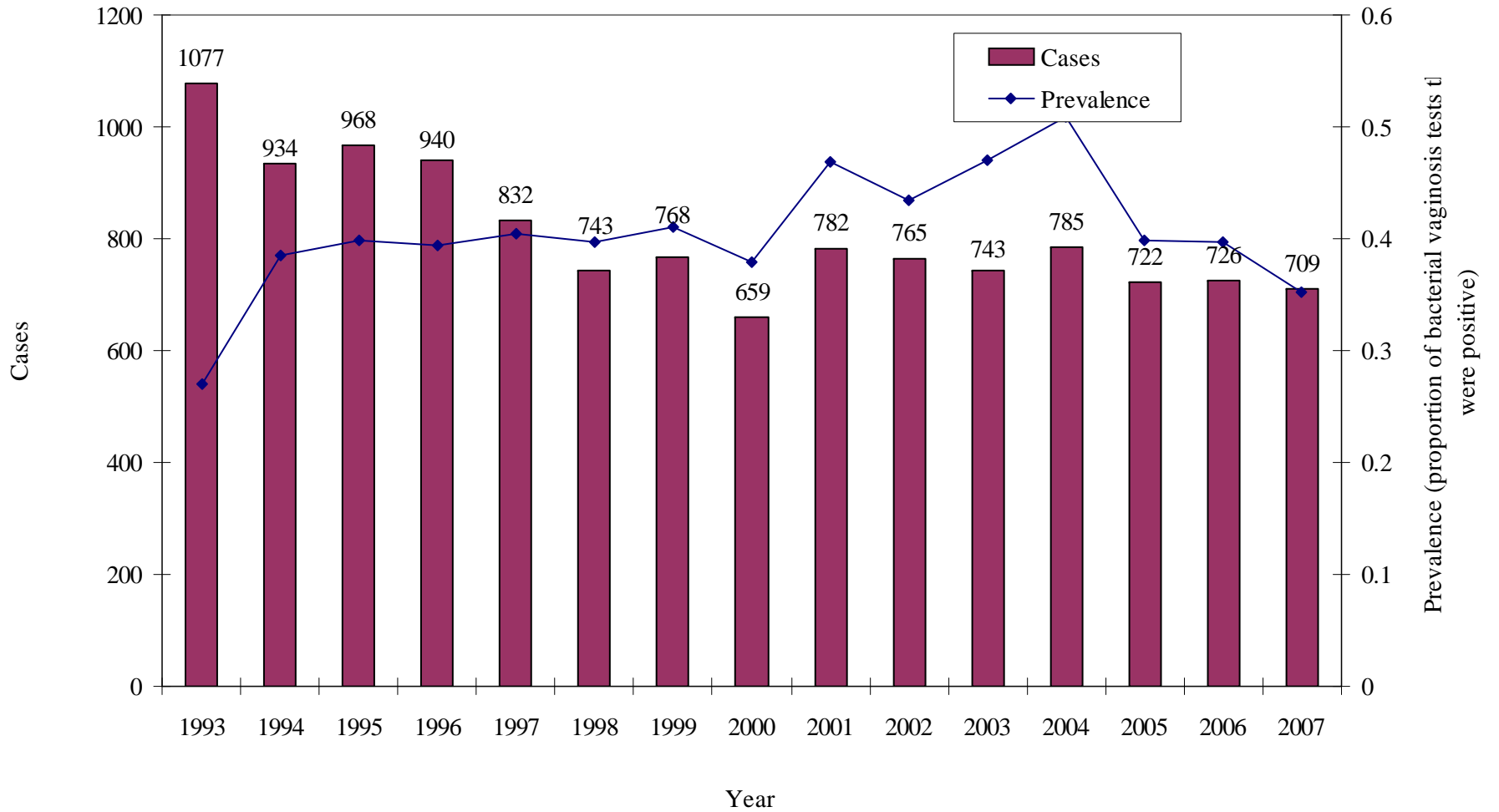
48



*Diagnoses are based on culture and/or wet mount tests

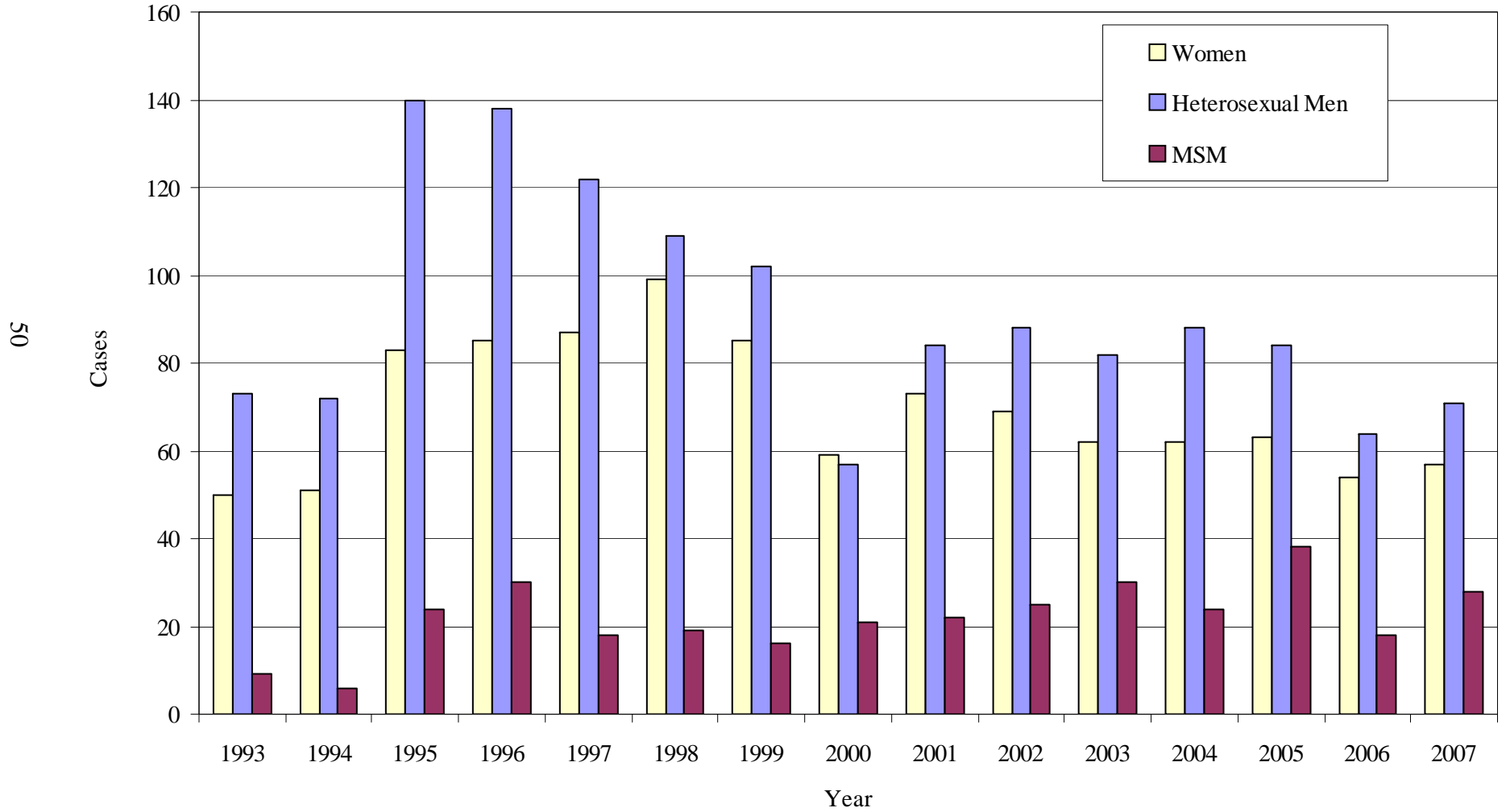
**Prevalence is calculated as total annual diagnoses/total annual tests (culture and/or wet mount)

Figure 27: Bacterial Vaginosis Diagnoses and Prevalence Among Female Patients
Public Health STD Clinic, 1993-2007**



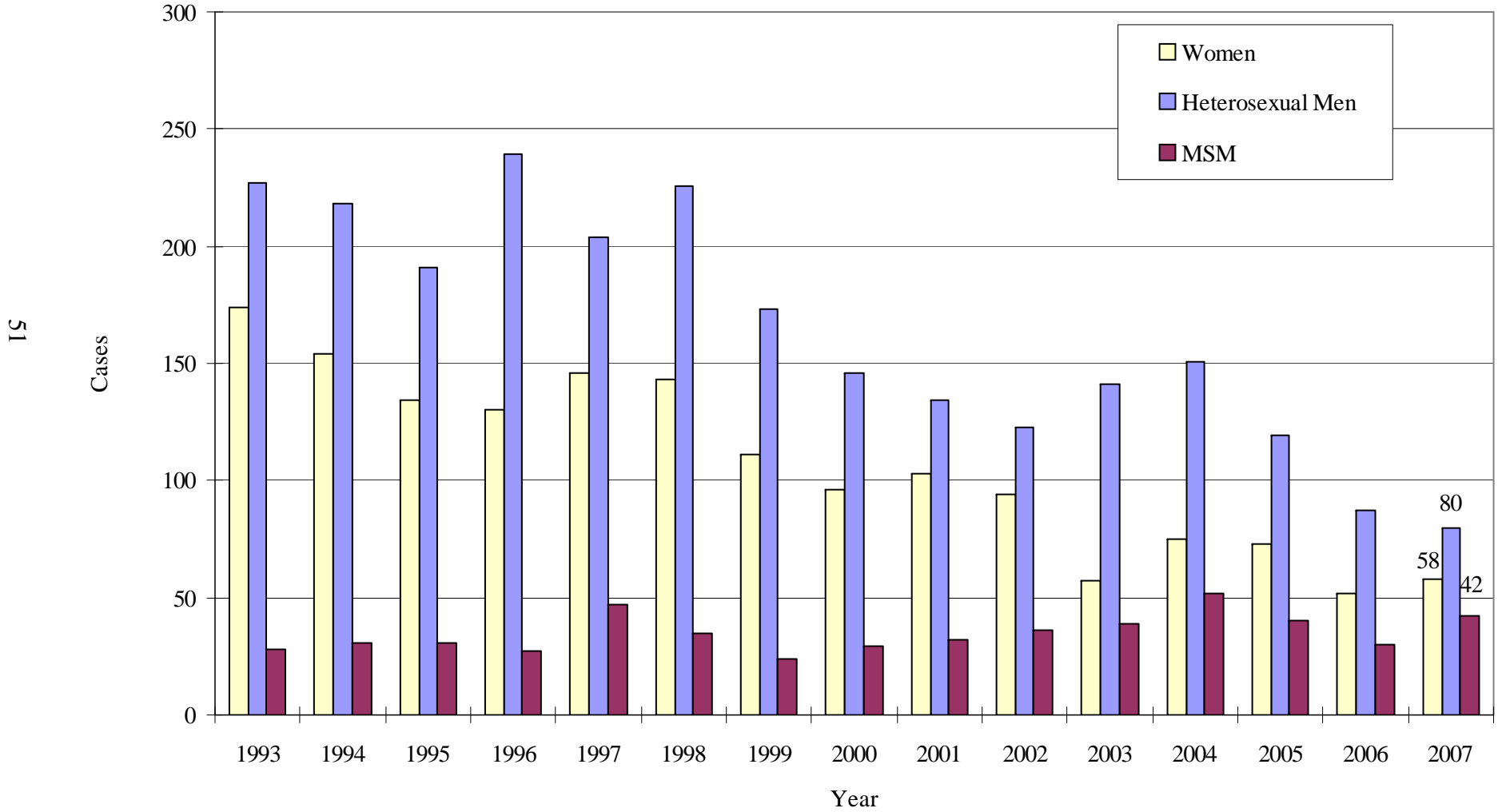
*Prevalence is calculated as total annual diagnoses/annual patients with tests for both vaginal PH and clue cells.

Figure 28: Initial Genital Herpes Diagnoses*
Public Health STD Clinic, 1993-2007



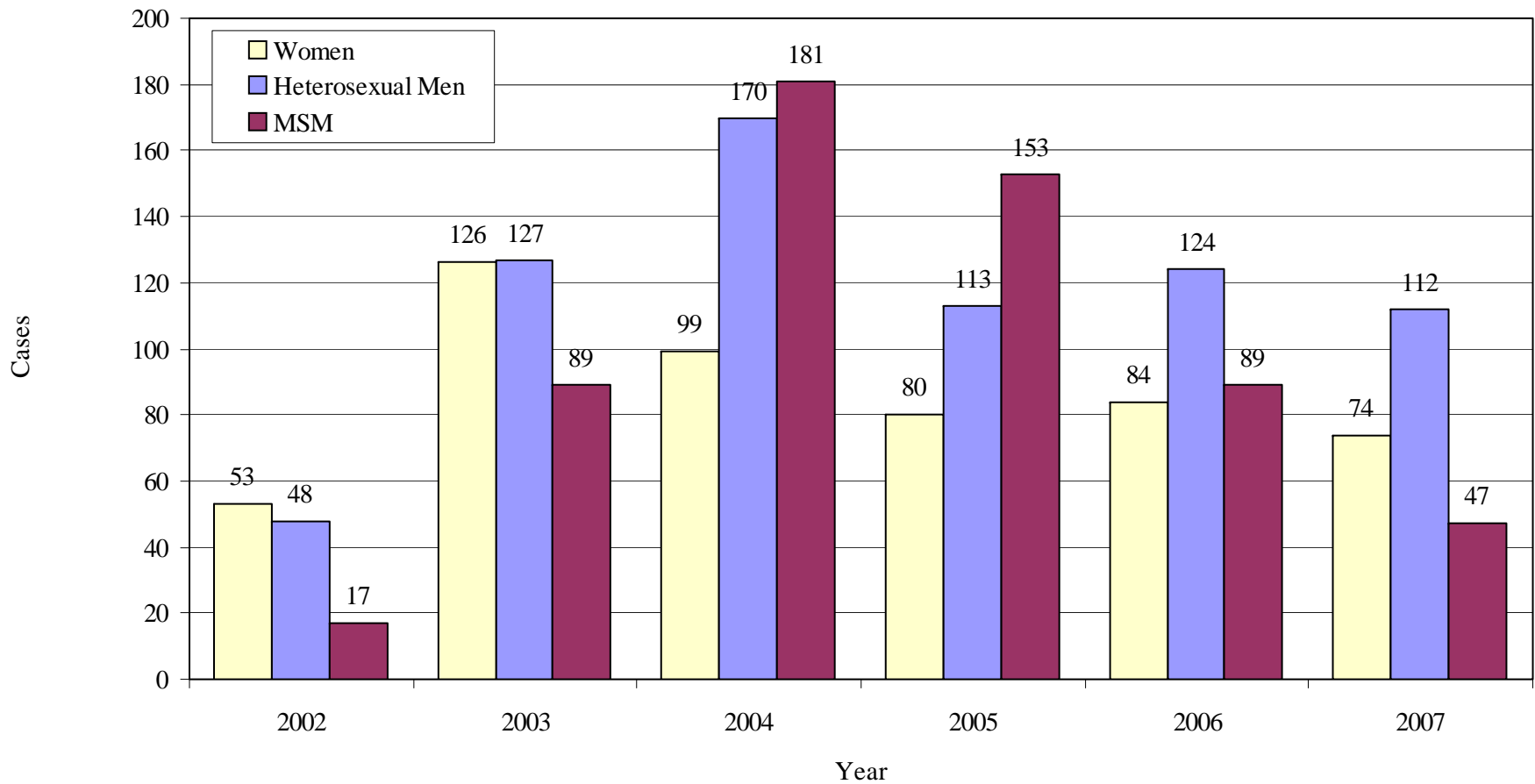
* These data exclude 37 cases of initial genital herpes among men who were missing sexual preference information

Figure 29: Recurrent Genital Herpes Diagnoses*
Public Health STD Clinic, 1993-2007



* These data exclude 93 cases of recurrent genital herpes among men who were missing sexual preference information

**Figure 30: Serologic Diagnoses of HSV-2 in Patients* without Symptoms
Public Health STD Clinic, 1993-2007****



52

Number tested: 198 362 75 586 1178 523 567 1263 1068 589 1190 1038 579 1361 599 522 1385 398

* These data exclude 16 cases of serologic herpes among men who were missing sexual preference information

** Free serologic testing for HSV-2 was available for MSM STD Clinic patients through a research project from October 15, 2003 - April 30, 2006

Men Who Have Sex with Men (MSM)

In 2007, King County experienced a decline in gonorrhea and in primary and secondary syphilis cases among MSM, an increase in the number of cases of early latent syphilis and the reported number of cases chlamydia, and stable levels of high-risk sexual behavior, at least among MSM STD clinic patients.

Interpreting recent data on reported numbers of STD cases among MSM is complicated by recent changes in reporting practices. In 2007, the algorithm used to determine whether King County gonorrhea and chlamydial infection cases occurred among MSM or heterosexual men changed. Data on sexual orientation were not routinely collected as part of STD case reports before 2004; in 2004, the Washington State Department of Health added a question regarding the gender of sex partners to the case report.

However, between 2004 and 2006, providers often did not report this information. Thus, until 2007, the number of MSM cases was estimated by adding the numbers of each infection diagnosed among Public Health STD Clinic MSM patients to the number of rectal gonorrhea and chlamydia infections reported by non-Public Health STD Clinic providers. These earlier estimates were an underestimate of MSM cases for these two infections, as they excluded non-rectal infections among MSM diagnosed by non-Public Health STD Clinic providers. In 2007, gender of sex partners was reported on 78% of case reports for gonococcal and chlamydial infections among men. For male cases missing this information on the case report in 2007, any rectal infection diagnosed in a man was categorized as an MSM case. Further, male cases reported without gender of sex partners on the case report were defined as MSM if they acknowledged a male sex partner during a partner management interview.

Therefore, ascertainment of MSM status is much more complete for 2007 than in previous years. Figures 31 and 32 display the number of MSM gonorrhea and chlamydia cases using both the previous and current method to estimate the number of MSM cases, with numbers using the current definition much higher, even for years prior to 2007 when the gender of sex partners was often missing on case reports.

As shown in Figure 33, the number of gonorrhea, chlamydia, and early syphilis cases diagnosed among King County MSM have increased substantially over time. However, in recent years this pattern has been less consistent. Gonorrhea diagnoses have decreased since 2005, while trends in chlamydial infection among MSM have been consistently upward since 2004. This trend in chlamydial diagnoses in MSM is somewhat at odds with data from the STD Clinic, where the number of MSM with symptomatic chlamydial urethritis has been relatively stable (Figure 22). While it appears that the increase in the number of reported chlamydial infections among MSM was substantial from 2006 to 2007, Figure 31 shows that this large increase is primarily an artifact of the changing method used to estimate MSM case numbers in King County in 2007. Using the method utilized in 2007 to estimate the number of chlamydial infections among MSM from 2004 to 2006 results in a more gradual upward trend in chlamydial infection cases (Figure 31).

In contrast, diagnoses and rates of early syphilis among MSM have stabilized somewhat over the past three years (Figures 33, 34), with a decline in primary and secondary syphilis in 2007 and a concurrent increase in early latent disease. The extent to which these divergent trends may reflect changing testing practices is uncertain. Monitoring the occurrence of symptomatic urethral gonorrhea among MSM STD clinic patients provides a measure of gonococcal morbidity that is relatively unaffected by changing STD testing practices over time. However, this measure could be affected by changing patterns of where MSM seek medical care. After increasing substantially between 2004 and 2005, the number of symptomatic urethral gonorrhea cases among MSM treated in the Public Health STD Clinic has declined steadily since 2005 (Figure 19), returning to a level of morbidity last observed in 2001.

In addition to observed increases in reported sexually transmitted infections among MSM, PHSKC collects data on the sexual behavior of MSM seen in the Public Health STD. These behavioral data suggest an increasing pattern of risk between 1993 and 2000, with more stable patterns of behavior since that time. Figure 36 demonstrates that the proportion of MSM STD Clinic patients reporting two or more sex partners in the preceding two months increased consistently from 1993-2000, but has been stable for the past several years. The proportion of MSM STD Clinic patients reporting unprotected anal intercourse in the preceding two months likewise increased from 1993 through 2002, but has stabilized since that time (Figure 37). Finally, although MSM seen in the clinic report lower levels of sexual risk with partners of discordant HIV status, a substantial portion of both HIV positive and HIV negative MSM seen in the STD Clinic from 2000-2007 reported unprotected insertive and/or receptive anal intercourse with partners of unknown or discordant HIV status (Figure 38).

Taken together, these data suggest that sexual risk behaviors now appear to be roughly stable among the MSM seen in the STD clinic, at least insofar as risk can be gauged by the limited data collected as part of clinical evaluations. The generalizability of these data to MSM in the larger population is uncertain.

Figure 32: Number of MSM cases of chlamydial infection using current and previous method of defining MSM cases, King County, WA, 2004-2007

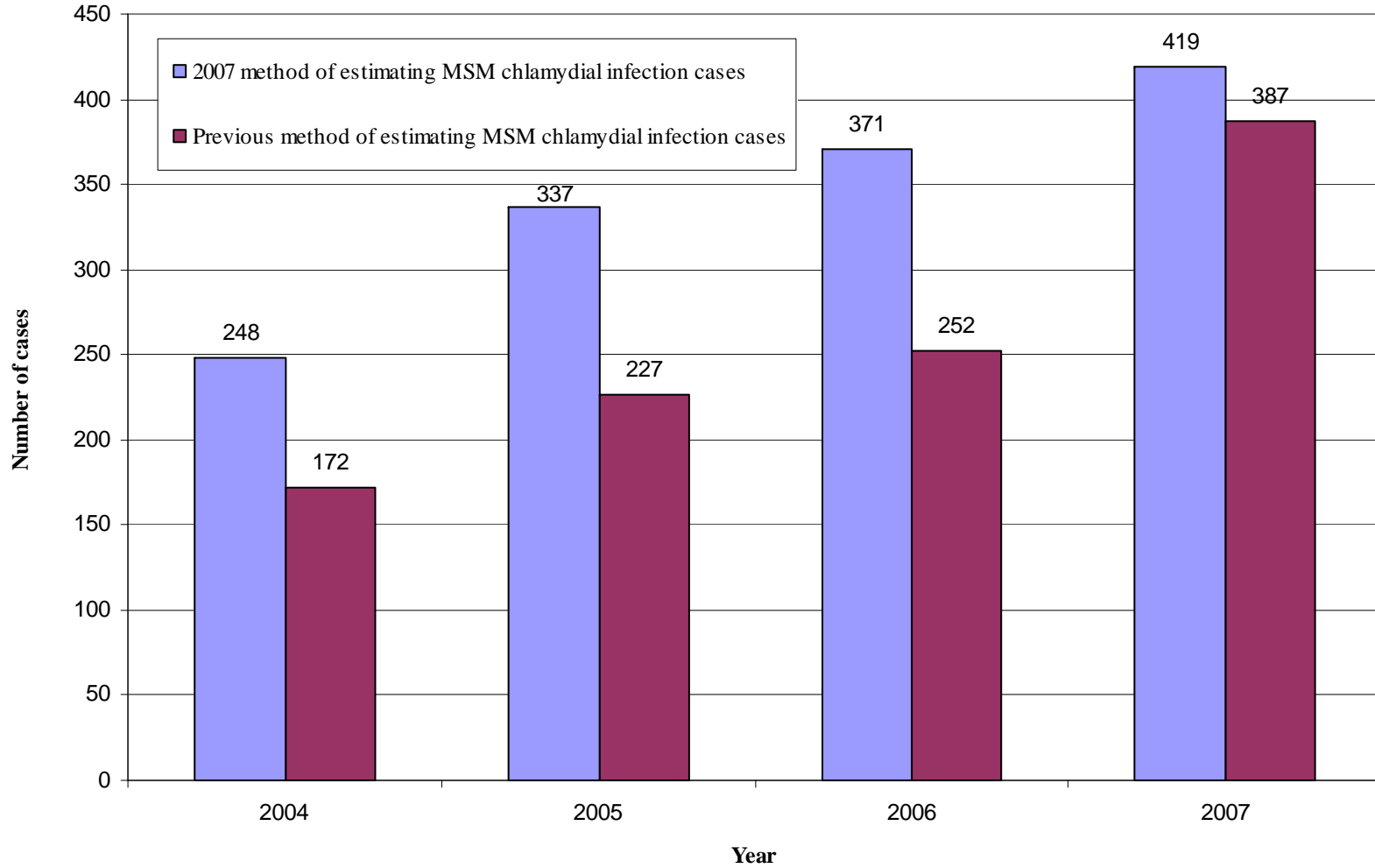
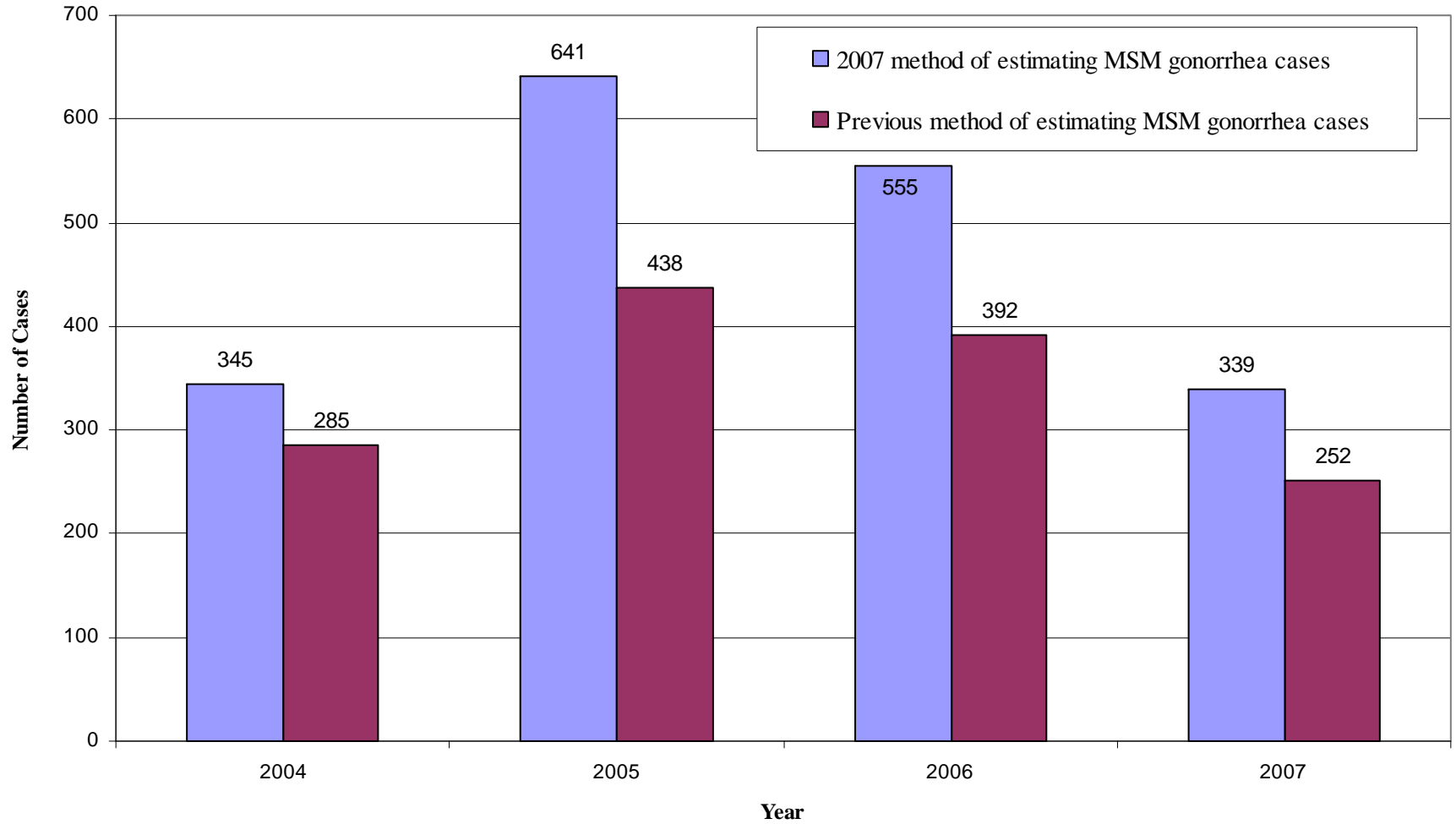
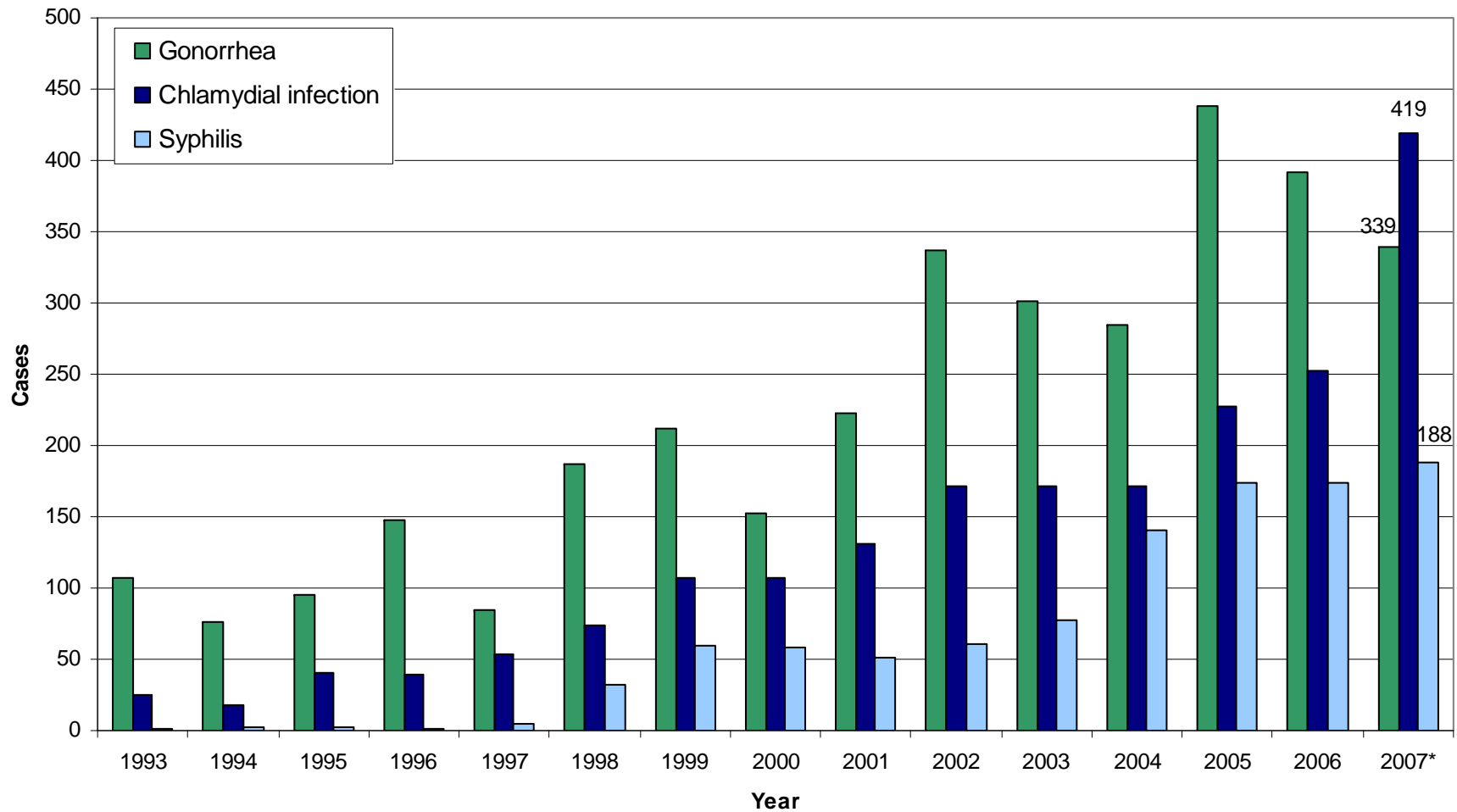


Figure 31: Number of MSM cases of gonorrhea using current and previous method of defining MSM cases, King County, WA, 2004-2007

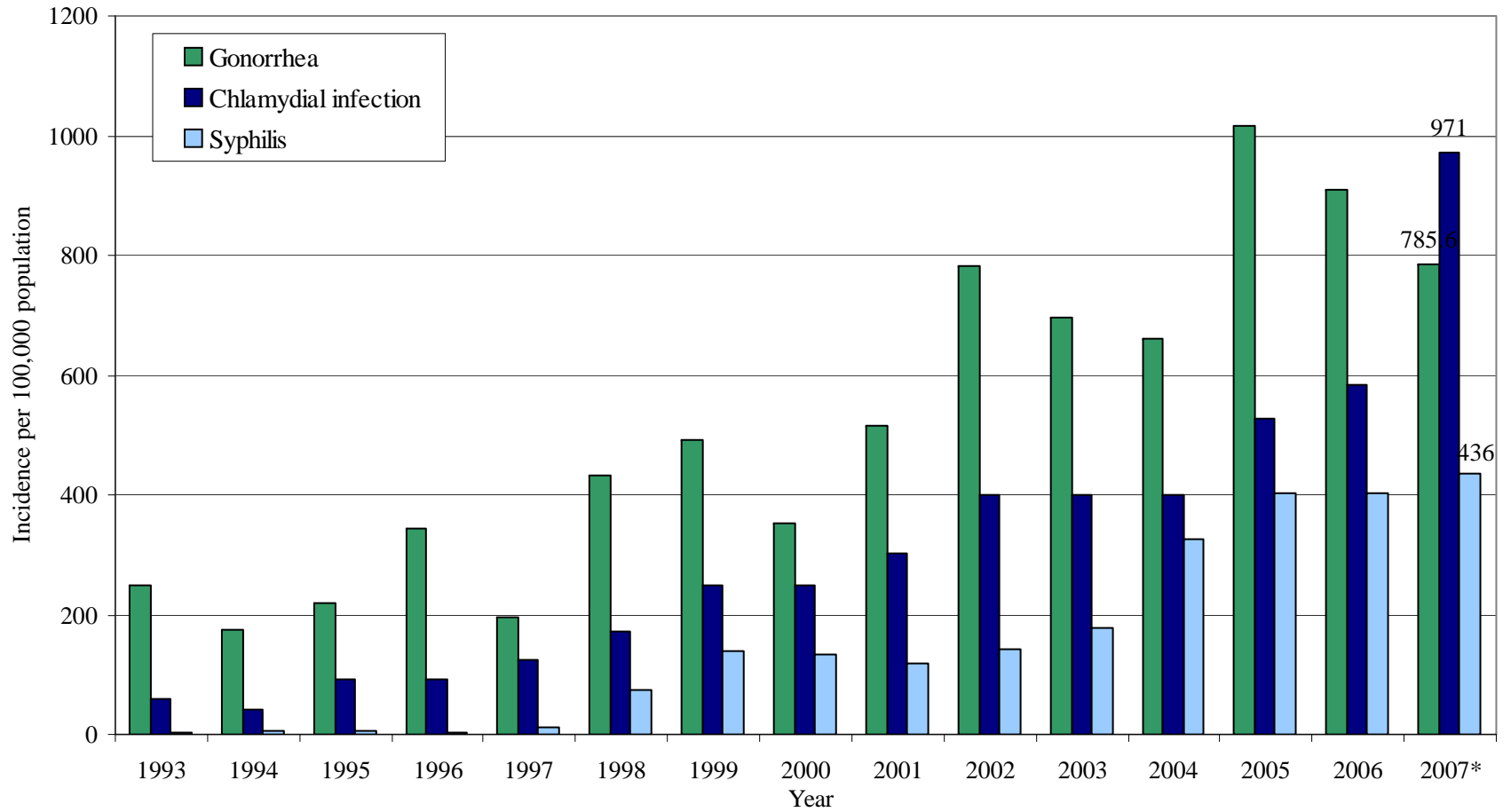


**Figure 33: Gonorrhea*, Chlamydia*, and Early Syphilis among MSM
King County, WA, 1993-2007**



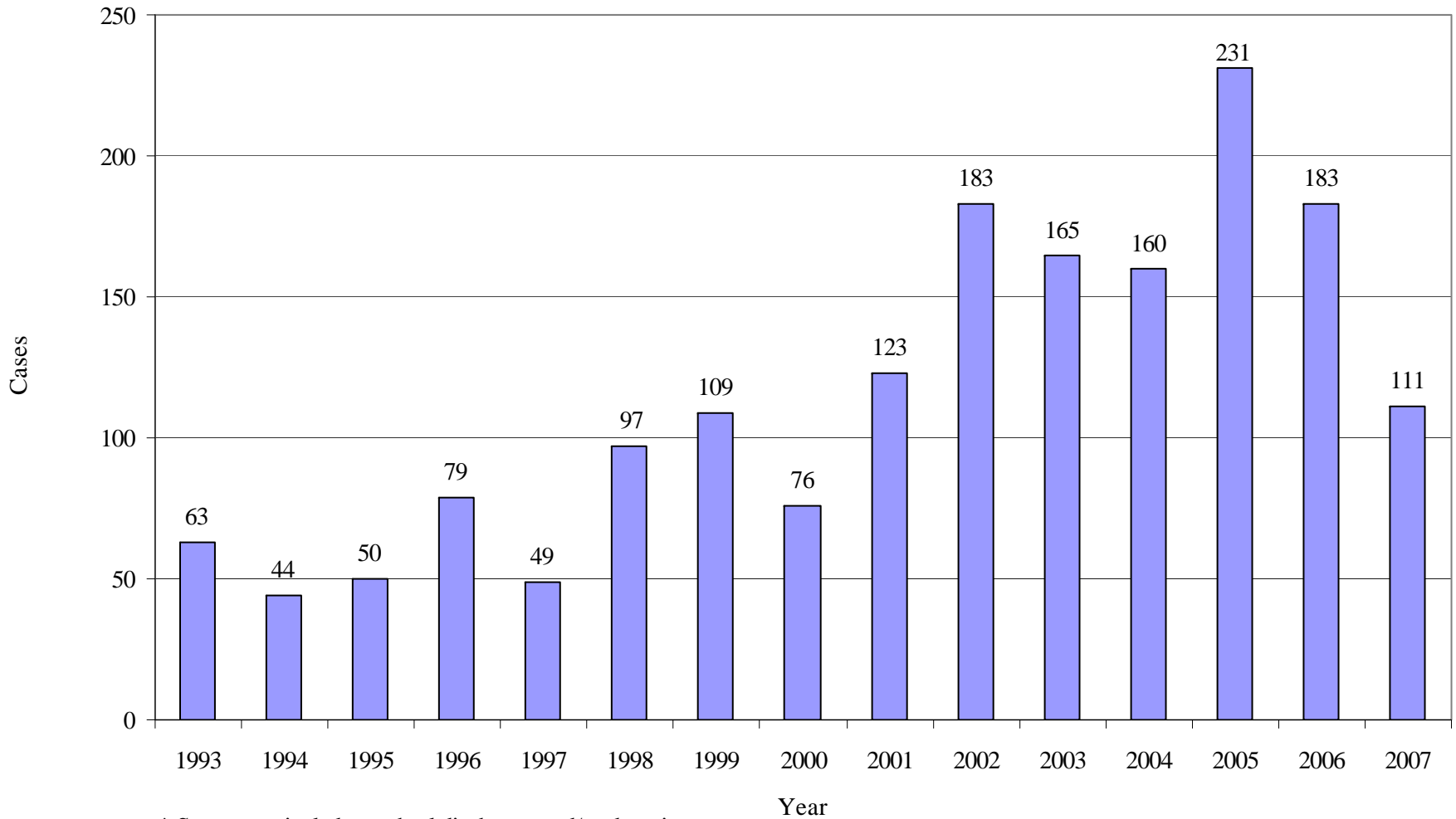
*From 1993-2006, MSM cases were calculated by summing all PHSKC STD Clinic diagnoses among MSM with all rectal infections reported to PHSKC by other providers. In 2007, men were assigned MSM status if the reporting provider indicated they had male sex partners, or they had a rectal infection.

**Figure 34: Incidence of Gonorrhea*, Chlamydial Infection*, and Early Syphilis Among MSM
King County, WA 1993-2007**



*From 1993-2006, MSM cases were calculated by summing all PHSKC STD Clinic diagnoses among MSM with all rectal infections reported to PHSKC by other providers. In 2007, men were assigned MSM status if the reporting provider indicated they had male sex partners, or they had a rectal infection.

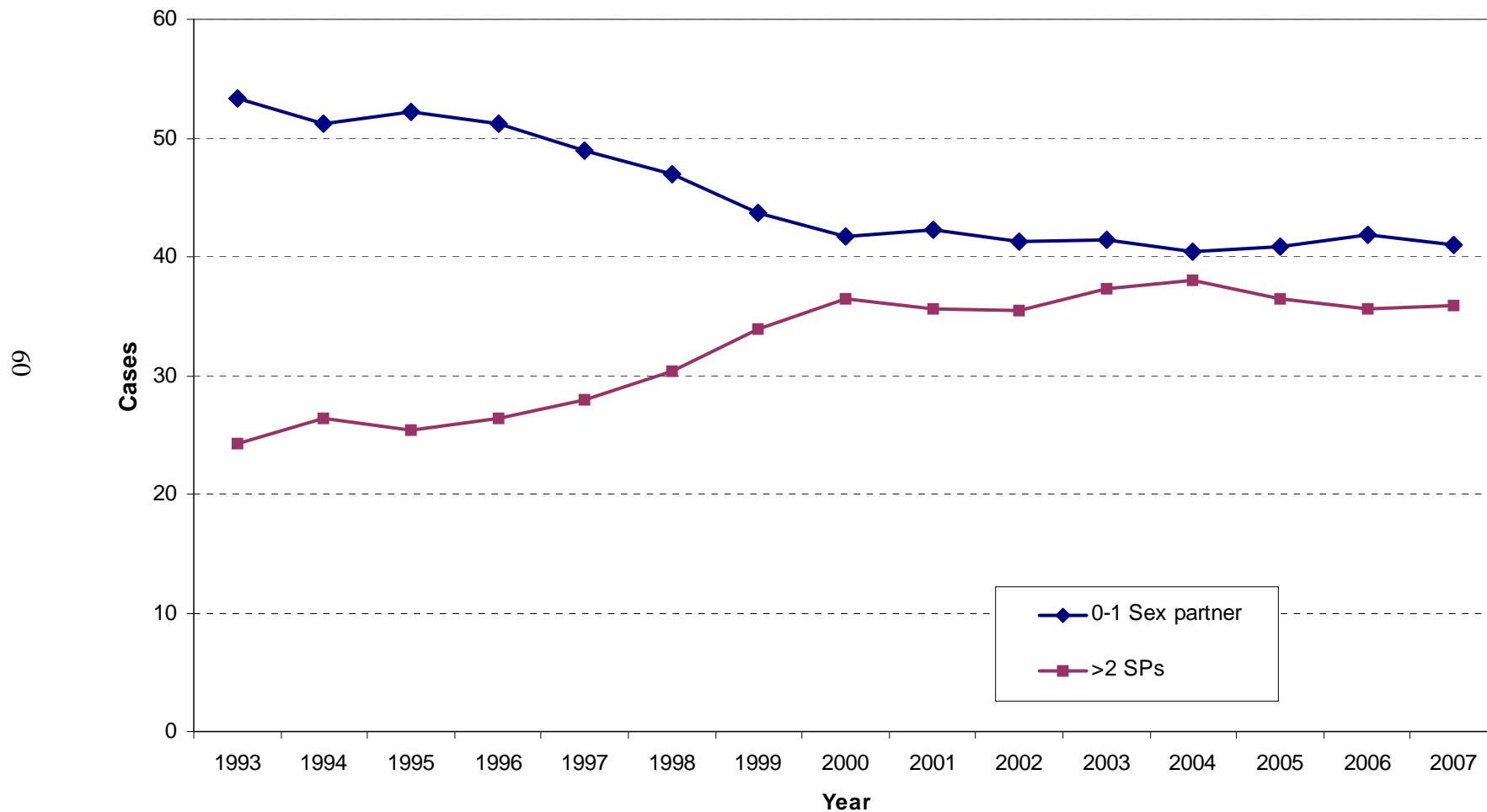
Figure 35: Symptomatic* Gonococcal Urethritis among MSM
PHSKC STD Clinic, 1993-2007**



* Symptoms include urethral discharge and/or dysuria

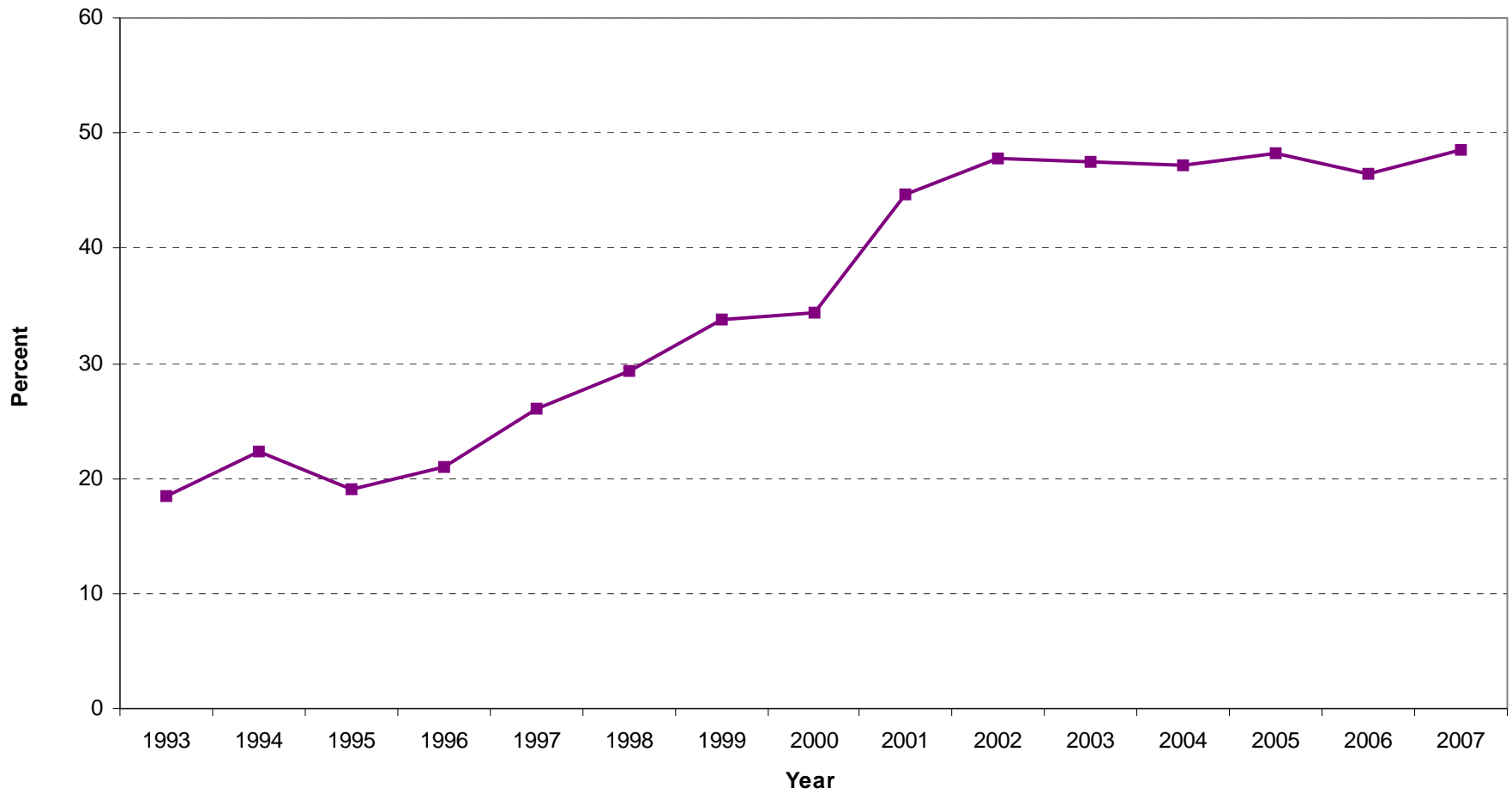
** These data exclude 50 cases of symptomatic urethral gonorrhea among men who were missing sexual orientation

Figure 36: Numbers of sex partners in preceding 2 months among MSM* seen at the PHSKC STD Clinic, 1993-2007



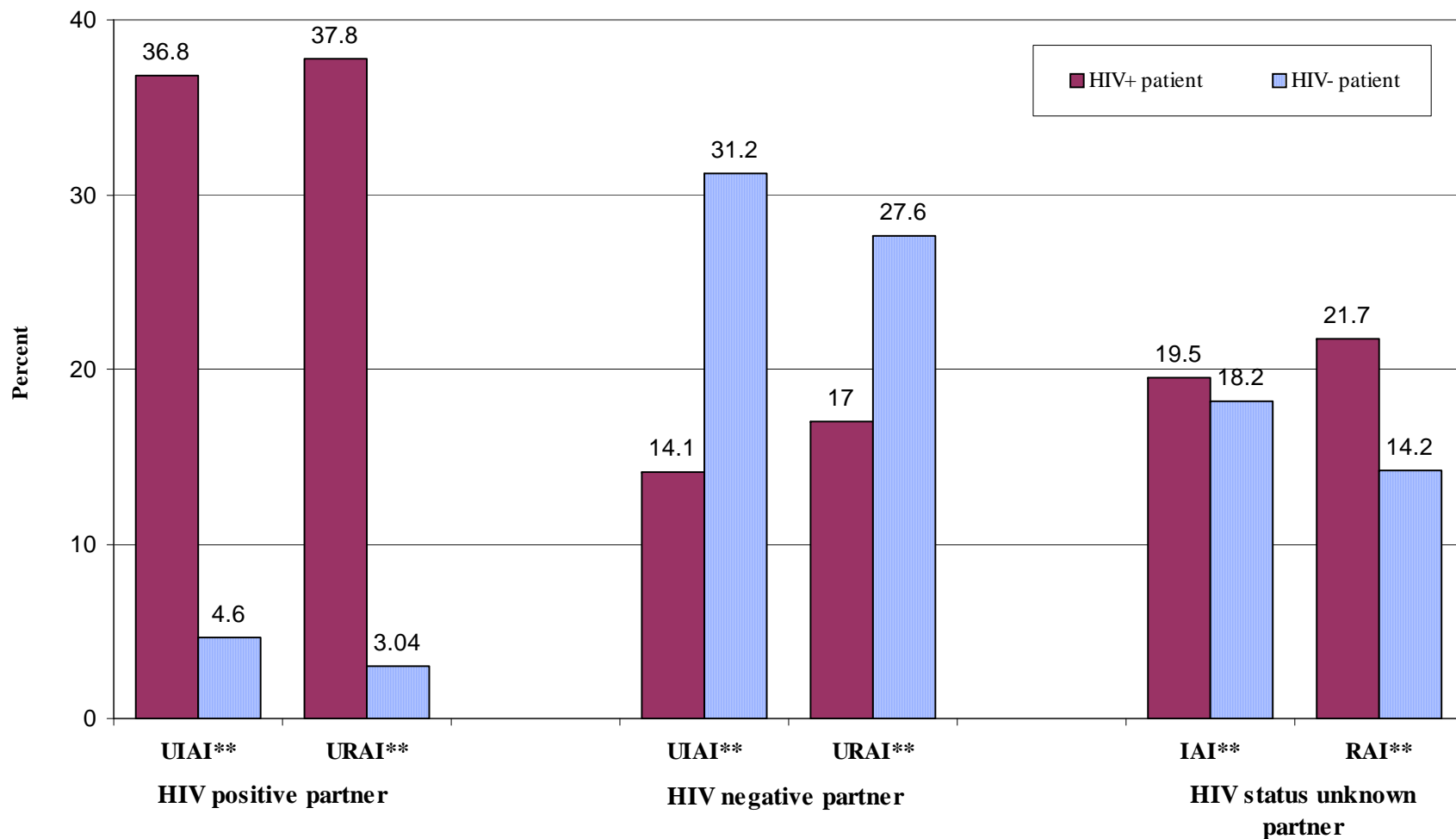
* Patients are unduplicated; each patient is represented only once per year.

**Figure 37: Percent of MSM Patients* Reporting Unprotected Anal Intercourse in Preceding 2 Months
PHSKC STD Clinic, 1993-2007**



* Patients are unduplicated; each patient is represented only once per year.

Figure 38: Sexual Mixing by HIV Status among MSM: PHSKC STD Clinic 2000-2007*



*N=4291

** UIAI = Unprotected insertive anal intercourse, URAI = Unprotected receptive anal intercourse, IAI/RAI = Insertive/receptive anal intercourse

References

1. Anderson JE, Mosher WD, Chandra A. Measuring HIV risk in the U.S. population aged 15-44: results from Cycle 6 of the National Survey of Family Growth. *Adv Data*. Oct 23 2006(377):1-27.
2. Laumann EO, Gagnon JH, Michael RT, Michaels S. *The Social Organization of Sexuality: Sexual Practices in the United States*. Chicago: University of Chicago Press; 1994.
3. Brewer DD, Golden MR, Handsfield HH. Unsafe sexual behavior and correlates of risk in a probability sample of men who have sex with men in the era of highly active antiretroviral therapy. *Sex Transm Dis*. Apr 2006;33(4):250-255.