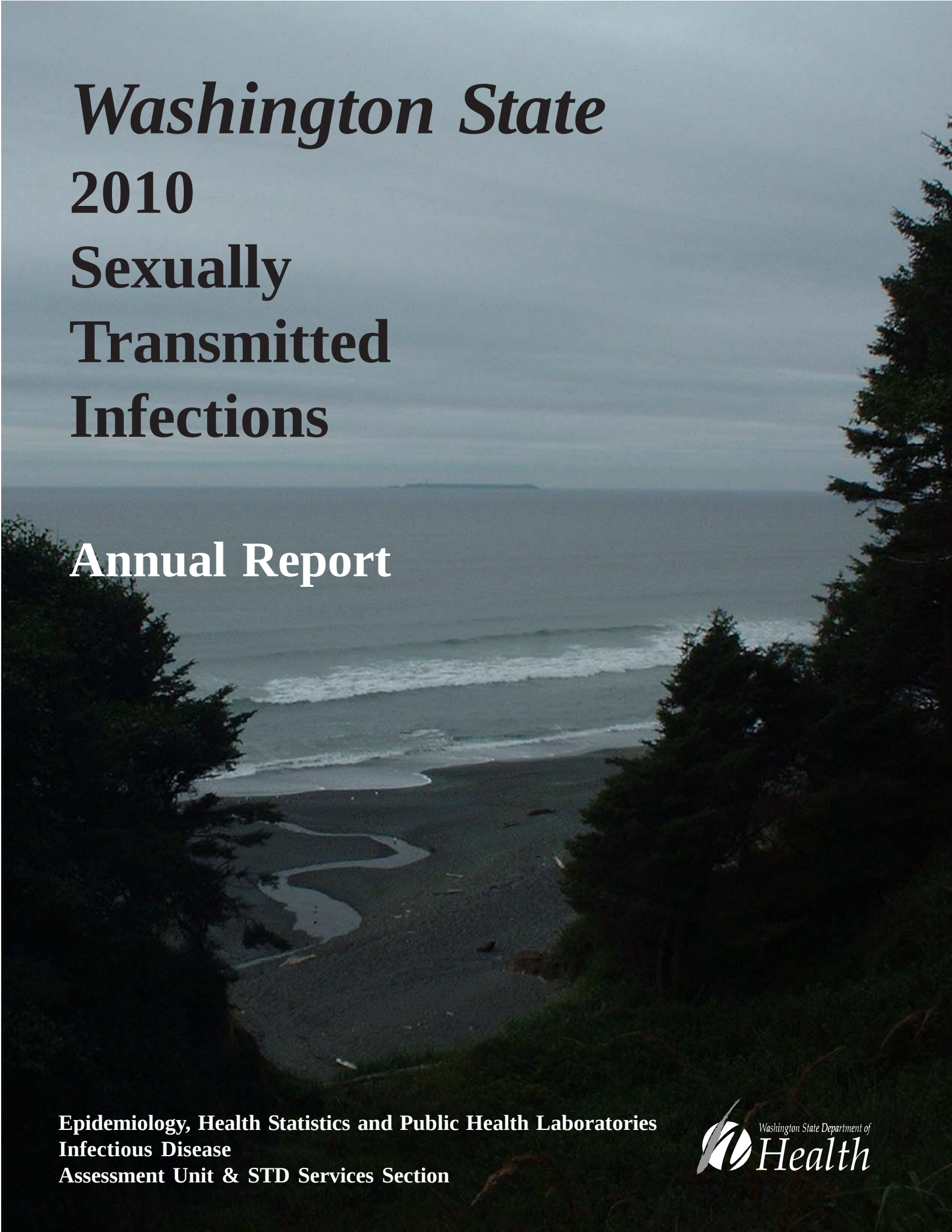

Washington State
2010 Sexually Transmitted Infections

Annual Report

Epidemiology, Health Statistics and Public Health Laboratories
Infectious Disease
Assessment Unit & STD Services Section

Washington State Department of Health

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Preface to the 2010 Edition

The 2010 STI Annual Report report retains formats from previous editions and contains updated charts, figures and discussions based on cases diagnosed in 2010 and reported through March 2011.

EXECUTIVE SUMMARY

The 2010 Annual Sexually Transmitted Infection (STI) Morbidity Report includes reported incidence rates and analyses of trends for Washington State's legally reportable STIs. These include chlamydial infection*, gonorrhea, syphilis, herpes simplex-initial genital infection, neonatal herpes infection, chancroid, lymphogranuloma venereum (LGV), and granuloma inguinale (GI). Sexually transmitted infections are the most commonly reported diseases in Washington State.

Chlamydial Infection

Chlamydial infection continues to be the most frequently reported STI. In 2010, there were 21,401 cases diagnosed and reported for a statewide crude incidence rate of 317.8 per 100,000 persons. The 2010 incidence rate for females was 464.3 per 100,000, compared to an incidence rate for males of 170.5 per 100,000. The chlamydial infection incidence rate for 2010 is statistically unchanged from 2009. Chlamydial infection rates in Washington State have been stable since 2008 and have only risen slightly since 2004.

Gonorrhea

In 2010, 2,865 cases of gonorrhea were diagnosed and reported compared to 2,283 in 2009. After decreasing steadily for four years, gonorrhea cases and incidence rate increased markedly in 2010. The burden of gonorrhea continues to be highest in urban settings and recent increases have been particularly pronounced among men who have sex with men (MSM). However, moderate increases were also observed for heterosexuals and in rural areas in 2010. Strains of *N. gonorrhoeae* that are less susceptible to commonly used antiobiotics were also detected locally in 2010.

Syphilis

There were 261 cases of primary and secondary (P & S) syphilis diagnosed and reported in 2010. This is a pronounced and significant increase from the number of cases (151) reported in 2009. The statewide P & S syphilis rate increased 70% to 3.9 cases per 100,000 in 2010 compared to 2.3 cases per 100,000 in 2009. Syphilis continues at epidemic levels among MSM in the state's largest urban centers. Persistent and increasing incidence among this population presents unique challenges to ongoing disease prevention and control efforts. One case of congenital syphilis was reported in 2010.

Other STDs

In 2010, 2,028 cases of initial genital herpes simplex virus (HSV-1 and/or HSV-2) were diagnosed and reported for an incidence rate of 30.12 per 100,000, a slight increase from 2009. New genital herpes infections are often difficult to distinguish from old infections. Reports may not reflect all new infections. The reported case rate has been stable over the last decade; the rate of new infections is likely stable as well.

Six cases of suspected neonatal herpes were reported among live births in Washington State in 2010. Two cases of lymphogranuloma (LGV) and one case of chancroid were diagnosed and reported in 2010. No cases of granuloma inguinale (GI) have been reported in Washington State since before 1992.

* Chlamydial infection rather than 'chlamydia' is used throughout this report to indicate infection with *C. trachomatis.*

Data Sources, Methods and Limitations

Public and private health care providers fill out confidential case reports, which are sent to local health jurisdictions (LHJs). These case reports are then entered into the statewide case reporting system. Case records entered into this system are the primary data source for diagnosed cases of sexually transmitted diseases. Laboratories providing diagnostic or screening services are also required to report positive test results to the local health jurisdiction where the patient lives. Positive laboratory reports are investigated by LHJs to assure that a confidential case report is received from the provider. Chlamydial infection, gonorrhea, and syphilis cases require laboratory confirmation. Genital herpes may be reported without confirmation.

Many different providers and agencies submit confidential case reports to LHJs; the completeness, quality and usefulness of specific data elements can vary widely. Information on race and Hispanic ethnicity are often missing on case reports for a number of reasons. In calculating rates by race and Hispanic ethnicity for this report, these data are treated as separate categories. Cases missing race and/or ehtnicity were redistributed based on the proportion of known cases for calculating overall rates.

Beginning in January of 2008, all LHJs in Washington State began using a statewide electronic reporting system to report cases to the STD Services Section. This system reduces the reporting delay of paper-based case reporting. Additionally, local disease intervention staff use this system to start case investigations when they get the initial laboratory report. This has led to an improvement in the speed of partner notification and treatment. Case information is updated as provider reports are received and interviews with patients are completed. Case reports are also now geocoded, providing assurance that cases are attributed to the right jurisdiction for official reporting purposes. This allows for the calculation of incidence rates at more useful geographic levels.

Crude incidence rates in this report are calculated based on cases diagnosed in the calendar year per 100,000 persons. The 2010 disease incidence rates for all Washington counties are calculated by dividing the number of cases diagnosed for that county in 2010 by the same year population for each county and multiplying by 100,000. Official population forecasts were obtained from the Washington State Office of Financial Management, updated in October of 2010.

Rates based on a small number of cases are often statistically unreliable, especially for counties with small populations or where rates are calculated for age, gender or race groups with very small numbers. Relative standard errors (RSE) are calculated and rates with RSE values of 30 percent or higher are noted in tables 1 through 5 to indicate that these are statistically unstable for comparison purposes. Poisson exact 95 percent confidence intervals are shown for rates in many charts to help gauge the significance of changes over time and to help compare rates between groups or jurisdictions. Crude age and gender specific incidence rates are used for the purposes of this report; age-adjusted rates are not shown because these may mask important trends in statewide data.

Record matching between Human Immunodefficiency Virus (HIV) and STI case registries is routine surveillance practice in Washington State. Matches use first and last name, date of birth and gender to identify unique person-matches. Records that do not match on all four variables are manually reviewed to exclude fasle matches.

Data Limitations

STI cases diagnosed (with or without laboratory results) may be under-reported through public health surveillance systems. Cases diagnosed without a test may not have been reported. However, recommendations from the Centers for Disease Control and Prevention (CDC) state that all bacterial STIs should be laboratory confirmed. Completeness of reporting may vary by source of report, particularly private versus publicly funded clinics. Care should be taken in interpreting these data in light of known limitations.

Guidelines to Prevent Misuse of Data

The following guidelines are provided to help prevent data misuse and should always be considered when reviewing data from any source.

1 Data in this report are for new cases of infection diagnosed during 2010 and reported through March of 2011. They are not for unique persons diagnosed with disease (e.g. a person may have more than one infection within a given year).

2 Data in this report are based on cases reported to local health jurisdictions and to the STD Services Section, Infectious Disease & Reproductive Health, Washington State Department of Health. These data represent infections among persons seeking and receiving care for STIs with or without symptoms, reproductive health services, or other care in both public and private care settings.

3 Small changes in numbers from year to year can look large if the actual number of cases is small. For example, if two cases of chlamydial infection are counted in a county in one year and three cases are counted the next year, this is an increase of 50%. While this may sound significant, a change of one case does not represent a meaningful increase in the burden of disease. Caution in interpreting trends or comparing across jurisdictions is advised.

We encourage anyone with questions about how these data should be interpreted to contact the STD Services Section at 360.236.3460.

All of the statistical analyses presented in this report were conducted using SAS 9.2 (SAS Institute Inc., Cary, NC), maps were produced with ArcMap 10.0 (ESRI, Redlands, CA) and charts produced using Microsoft Excel 2007 (Microsoft Corp., Redmond, WA). Desktop publishing and page layout was facilitated using PageMaker 7.0, (Adobe Systems, Inc. 2002)

Introduction

This report describes findings from disease surveillance activities for sexually transmitted infections (STIs) diagnosed in Washington State through December of 2010 and reported through March 2011. This report is intended to give public health professionals and other interested persons information to help direct policy and promote evidence-based planning of disease prevention programs at the state and local level.

The burden of STIs in a community can be viewed as a measure of the overall sexual health of the population when seen in context with other community wellness issues. The incidence of STIs can also shed light on other health inequalities by gender, race, Hispanic ethnicity, age, and measures of socioeconomic status. Understanding how social inequities emerge in the context of STIs may provide the public health community with key insights into structural changes needed to address a broad range of health-related consequences of social, cultural, and economic inequities. These may be particularly useful in light of ongoing efforts to reform health care delivery systems and to expand health insurance coverage to all people living in Washington State.

Sexually transmitted infections are preventable through the adoption and consistent use of healthier practices including: condom use, limiting the number of sex partners, avoiding concurrent partnerships, and abstinence from sexual activity where appropriate. All sexually active people should be tested for STIs routinely, yet this is not the standard of care in many health care settings.

Higher rates of STIs seen in some regions of the state should raise questions about possible barriers to screening, diagnostic and treatment services. There may also be gaps in educational resources for persons at greatest risk for STIs. These and other issues should be kept in mind when comparing rates across jurisdictions. There may also be a connection between rates of HIV and other STIs. Understanding historical trends, risk factors, and the current characteristics of STI cases is important in planning disease control efforts and contributes to the broader portrait of the health of our state's residents.

Infection with pathogens such as *Chlamydia trachomatis* (CT), genital herpes simplex virus (HSV), genital human papillomavirus (HPV) and *Trichomonas vaginalis* (Trich) is very common in many communities, though not all of these infections are reportable to the health department. These STIs are considered to be endemic, in that enough people are infected at any given time to sustain the ongoing spread of infection. Small annual changes in the incidence of disease are often seen. But changes over many years often show broader population level social, economic, and behavioral trends. Other diseases, such as those caused by HIV, *Neisseria gonorrhoeae* (GC) and *Treponema pallidum* (syphilis), result in far fewer infections on an annual basis. Yet these sometimes occur in sporadic, sustained outbreaks in limited geographic areas or among population groups sharing specific risk factors.

Transmission Dynamics

It is important to consider how STIs are spread when drawing conclusions from the data presented in this report. STIs spread through sexual networks, the make-up and features of which are greatly influenced by many social and geographic factors. Partner choice is often guided by complex and subtle rules reflecting cultural beliefs as well as personal preferences. For some people, and for some cultural groups, partner choice may be limited to relatively small networks of individuals. In contrast, other groups may have more partner choices and a much larger network of potential partners. Smaller sexual partner networks with a low prevalence

of disease and no partnerships that bridge to other networks, may be somewhat protected from STIs. However, a few infections in these smaller networks will often cause a cycle of high disease incidence within that group. Characteristics of sexual networks and the burden of prevalent infections within the network are often the most important factors in higher or lower rates of disease among ethnic, racial, and sexual minority populations. People in these groups do not necessarily have more risky or more frequent sexual contacts than people in other communities. Yet they may be much more likely to meet a partner who is infected than those with a greater choice of partners.

Biology & Clinical Practice

Biology and clinical practices also play a role in changes seen in STI rates over time and between populations at risk. These factors can be expressed in different ways, depending on the individual pathogen and on changing trends in clinical or public health practice. Some bacteria, such as *Neisseria gonorrheoeae*, evolve rapidly to become resistant to commonly used antibiotics. Others, such as those causing syphilis or chlamydial infection, change very slowly and have remained easily treatable by commonly available and widely recommended medicines.

Over the last several decades, strains of *Neisseria gonorrheoeae* circulating globally have all become resistant to penicillin. Recently, resistance to another common class of antibiotics called quinolones became widespread. One remaining family of antibiotics, cephalosporins, is recommended as the most effective frontline treatment for gonorrhea. Yet this class of antibiotics is also now at risk of becoming less effective. When resistant strains become common in a geographic area or in a particular population, use of less effective antibiotics may lead to treatment failures. This can result in a rapid spread of resistant infections and an overall increase in disease rates. Changes in the medical and pharmaceutical marketplace may also impact disease trends.

Cefixime, an inexpensive single-dose cephalosporin, was withdrawn from the market in the early part of the decade and was reintroduced after a several-year gap in availability in the United States. This may have increased quinolone pressure on gonorrhea in the early and middle 2000s, potentially selecting resistant organisms already in circulation. A fifteen-year high in gonorrhea incidence rates was seen in Washington State in 2006. Rates decreased dramatically in the following years. But this hopeful trend reversed again in 2010 with significant increases, particularly among MSM. The public health community is responding with campaigns to increase provider awareness of specific antibiotic resistance. Strengthening public health interventions such as partner management are likely to be components in an effective response to recent gonorrhea increases.

Behavior

Individual and society level changes in sexual behavior also contribute to trends in STI incidence. In reaction to the AIDS pandemic in the late 1980s there was a well documented decrease in unprotected sexual activity, as well as decreases in the number and frequency of partners. There was also a slight increase in the age of sexual debut. Along with a heightened national effort to screen for and diagnose STIs, these factors may have contributed to a broad decline in the rates of all nationally reportable STIs through the middle of the 1990s. Yet public fear of HIV and the accompanying behavior changes may have recently begun to wane. This may be due in part to wide access to highly active antiretroviral therapies (HAART), which have dramatically reduced the illness and deaths associated with HIV infection. The characteristic bowl-shaped incidence curves presented in this report for gonorrhea, chlamydia and syphilis are associated in time with these HIV-related factors.

The Bigger Picture

With all STIs, there are three important factors to consider when making sense of the incidence of disease and for planning infection control interventions. The first of these is the ease with which a pathogen infects a susceptible person. Vaccines are an example of interventions that can alter susceptibility to infection and lead to decreased transmission. The second factor is the duration of infection. The longer an individual remains infected and able to spread infection to others, the greater the likelihood that this will happen. Prompt diagnosis and treatment of cases and their partners decreases the duration of infection and helps limit the chance of new infections. Finally, the number of sexual exposures while infected is also directly related to the probability of transmission. Reducing the number of sexual partners and consistent use of condoms can decrease the number of exposures.

Despite increasing trends in some STIs in Washington State over the previous decade, there is cause for optimism when looking at the data from more recent years. Our communities continue to rank favorably in chlamydial infection and gonorrhea incidence when compared to national rates. The public health community in Washington State is also engaged in a long-term study of a new and very promising public health intervention for bacterial STIs called expedited partner therapy (EPT). This is intended to increase the number of partners who are treated in an appropriate and timely manner.

Additional resources allocated in 2007 by Washington State's legislature to our local partners also helped public health agencies to step up efforts to provide people diagnosed with chlamydial infection or gonorrhea with partner services. Along with our EPT initiative, these resources have nearly doubled the number of people with STIs to whom public health workers have provided services statewide. Within the framework of these efforts, Washington State is making real strides in the prevention and control of STIs.

However, there are also serious challenges which threaten progress and may even lead to a reversal of recent gains. Over the last decade, a large number of publicly funded clinics focused on diagnosing and treating STIs have closed. Clinicians practicing in STI-focused settings are more likely to be aware of changing treatment recommendations and to treat appropriately. This decreases the possibility of emergence of resistant strains. Our communities have lost a number of these resources over the last decade as well as essential staff capacity in local health departments to continue to provide partner services and assure appropriate treatment.

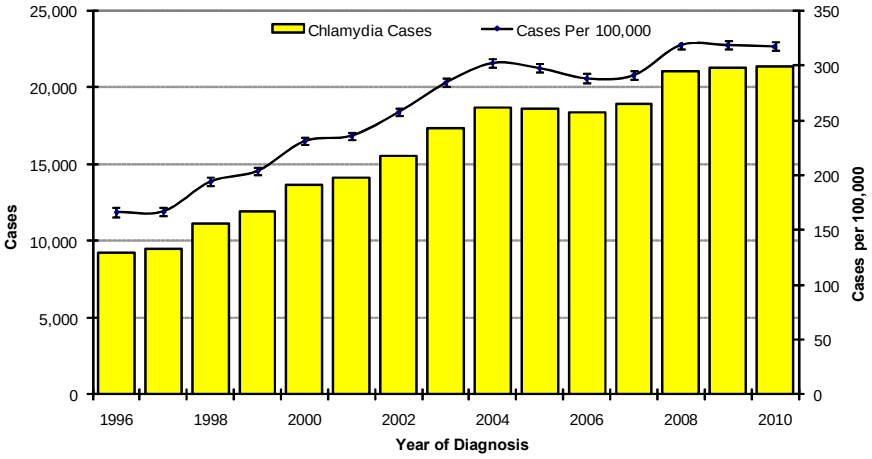
Finally, this report continues a major departure from historical reports in scope. National and local efforts are working to more fully integrate clinical services, public health interventions and prevention efforts across the spectrum of STIs. These efforts seek to include HIV and other infectious disease in intervention planning. Given the overlap in populations at risk for disease, this integration makes good sense for getting the most out of shrinking public health resources and in reducing overall health care costs associated with STIs. It is our intention to continue to encourage and inform efforts to collaborate across multiple disease-specific programs by providing additional information on overlapping and parallel epidemics.

.

Chlamydial Infections

The most commonly reported bacterial STI in the United States and in Washington State is *Chlamydia trachomatis*. The U.S. Centers for Disease Control and Prevention(CDC) estimates that more than 2.8 million new chlamydial infections occur in the U. S. each year and that only one-third are actually being reported to health departments. In 2009, the most recent year for which national data are available, over 1.24 million cases of chlamydial infection were reported with a national annual incidence rate of 409.2 per 100,000 (CDC 2010). In Washington State, 21,401 cases were reported in 2010 for an annual incidence rate of 317.8 per 100,000. While we compare favorably to the national incidence rate (Washington's rate in 2009 was 22% below the national rate) chlamydial infection continues to be a major health threat. It is a contributing factor to negative reproductive health outcomes, including pelvic inflammatory disease (PID), ectopic pregnancy and infertility.

Figure 1 - Chlamydia Cases and Incidence Rate*, Washington State, 1996 - 2010



* Crude incidence rate per 100,000 with Poisson exact 95% confidence intervals.

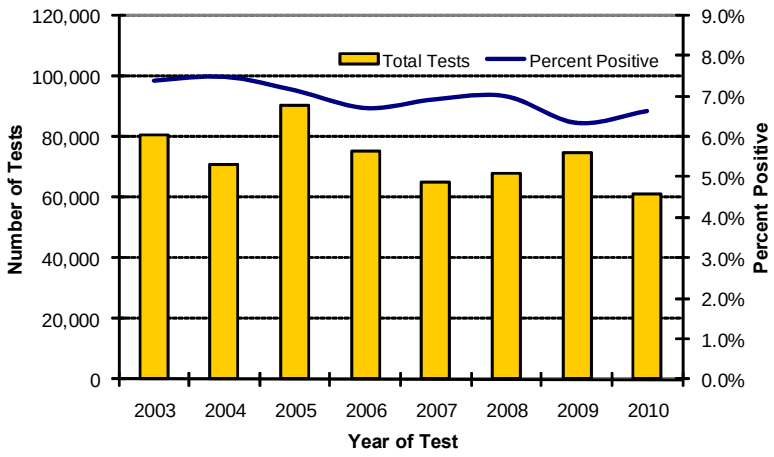
Chlamydial infections often do not show symptoms. A large number of infected individuals have little or no reason to seek screening or treatment. Coupled with less-than-desirable rates of routine chlamydial infection screening in many health care settings, this contributes to ongoing spread among sexually active people.

Figure 1 shows annual incidence rates of chlamydial infections in Washington State from 1996 through 2010. After reaching a low of 166.8 per 100,000 in 1997, rates increased steadily through 2004. Incidence decreased slightly through 2007 before increasing to the current levels in 2008. Rates have remainded virtually unchanged since then. Some of the increase noted between 2007 and 2008 can be attributed to enhanced case surveillance activities and faster follow-up of laboratory confirmed chlamydial infections.

Since 1988, Washington State has participated in chlamydia screening and prevalence monitoring activities through the federally funded Infertility Prevention Project (IPP). Women who meet selective screening criteria (sexually active and 24 years of age and younger) are offered chlamydia screening through the IPP. Screening efforts are directed towards the female population in hopes of reducing negative reproductive health outcomes. These data also provide Washington State with a potentially useful prevalence monitoring platform. **Figure 2** shows the total number of tests and the percent positive by year for tests conducted through the IPP from 2003 through 2010. Overall test positivity has been generally trending downward over the last decade, with slight fluctuations. While the rate of positive tests within the IPP has varied over the last several years, male positivity has been consistently higher than for females (8.8% versus 5.8%, respectively in 2010).

The volume of both male and female tests decreased in 2010; tests among males accounted for 27% of all tests. The largest proportion of males testing through the IPP are seeking services at the state's largest STD clinic and are more likely to test positive than males screened in other health care settings, though positive tests at multiple anatomic sites may inflate positivity rates.

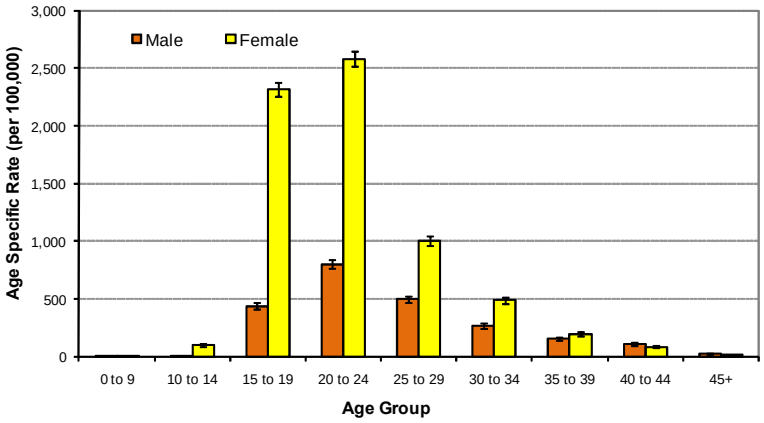
Figure 2 - Chlamydia Tests and Percent Positive for both Males and Females, Infertility Prevention Project, Washington State, 2003 - 2010



Case rates also vary significantly between genders. **Figure 3** shows age and gender specific rates for cases diagnosed in 2010. The marked difference in rates between males and females is primarily an artifact of screening efforts which selectively target females in reproductive health settings. To a lesser extent, this difference may also reflect the natural history of chlamydial infections; males may be somewhat less susceptible to infection, less likely to seek screening for STIs, and are less likely to access health services and be routinely screened. As a result of these factors, the burden of chlamydial infections among males remains largely undiagnosed, untreated and unreported. Trends in incidence by gender are presented in **Figure 4** on Page 16.

Significant disparities in incidence exist by Hispanic ethnicity and by race. **Figures 5 and 6** on page 16 show trends in case rates by Hispanic ethnicity and by race. A large number of cases are reported without race and ethnicity indicated (29% missing race and 21.7% missing Hispanic ethnicity in 2010). To adjust for these missing data, unknown cases have been redistributed based on the proportions of cases reported with the race and ethnicity of the patient identified.

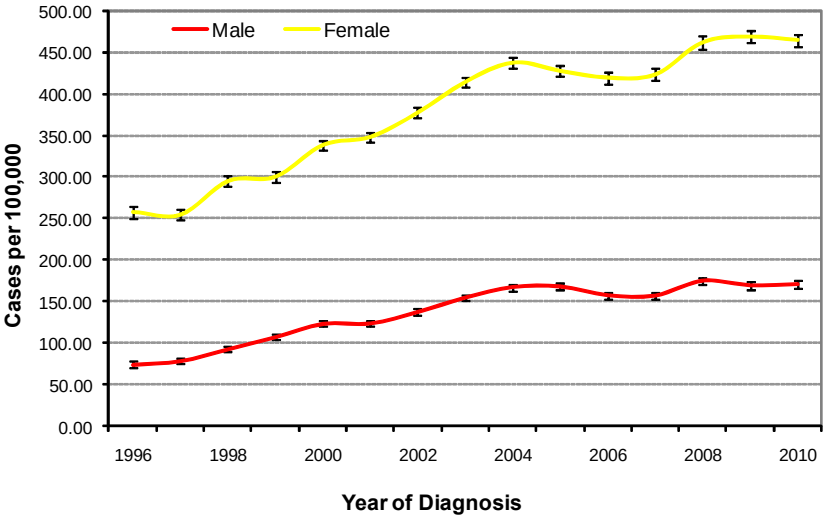
Figure 3 - Chlamydia Incidence Rate* by Gender and Age Group, Washington State, 2010



*Crude age specific incidence rate with 95% Poisson exact confidence intervals

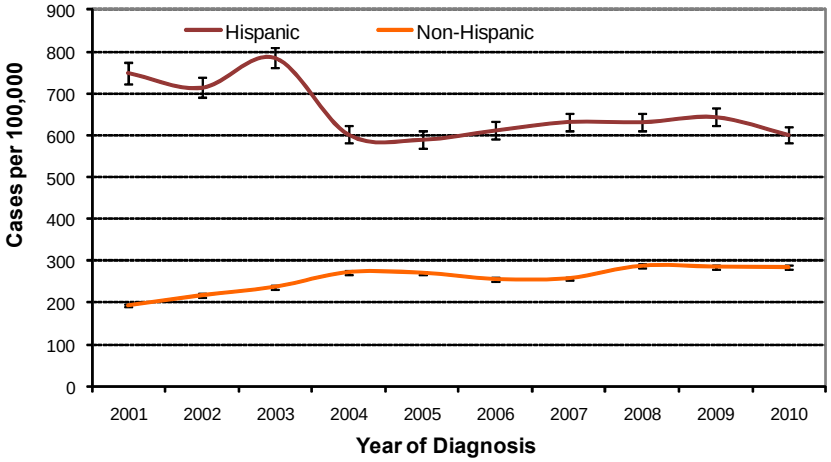
Inequities in the burden of disease by Hispanic ethnicity have persisted through the last decade with Hispanics having rates consistently between two and three times those of non-Hispanics. Likewise, rates for non-Hispanic Blacks, American Indians/Alaska Natives have been persistently higher than those for Whites. Inequality by race in 2010 was most acute between Whites and Blacks with case rates of 229.5 and 1252.1 per 100,000, respectively. Many factors likely contribute to these observed differences. Those factors may include differences in access to health care and screening services as well as sexual network traits and geographic issues.

Figure 4 - Chlamydia Incidence Rate* by Gender, Washington State, 1996 - 2010



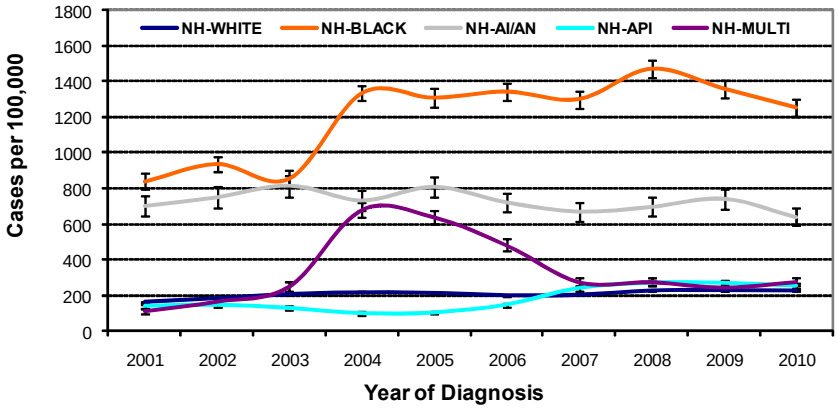
*Crude age specific incidence rate with 95% Poisson exact confidence intervals

Figure 5 - Chlamydia Incidence Rate* by Hispanic Ethnicity (all races), Washington State, 2001 - 2010**



* Crude incidence rate with Poisson exact 95% confidence intervals.
** UnknownHispanic ethnicity (all races) redistributed by proportion of known cases.

Figure 6 - Chlamydia Incidence Rate* by Non-Hispanic Race, Washington State, 2001 - 2010**



* Crude incidence rate with Poisson exact 95% confidence intervals.
** Unknown Race (non-Hispanic ethnicity) redistributed by proportion of known cases.

Inequities in disease burden by race and ethnicity should be viewed in a broader context than simply individual behavioral or economic factors. Higher rates for non-Whites and for Hispanics are likely a reflection of an array of population-level factors. Income and social status inequities at the population level, stress associated with disparity of wealth within communities and differences in educational attainment have been shown to have an impact on many health outcomes, including rates of sexually transmitted infections.

Rates also vary geographically in Washington State. **Figure 7** shows chlamydial infection incidence rates and rankings by county. Pierce and Yakima counties continue to lead the state in chlamydial infection incidence with rates of 468.3 and 464.2 per 100,000, respectively. These two, along with Spokane County, have case rates significantly higher than the overall state rate of 317.8 per 100,000.

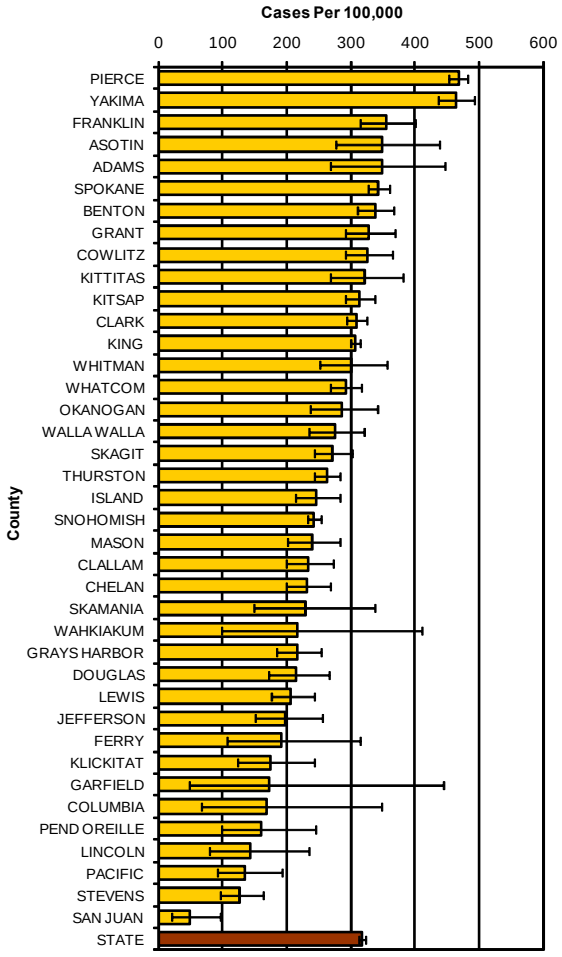
Care should be used in comparing across counties. For less populated counties with relatively few cases in any given year, incidence rates vary considerably from year to year. Ninety-five percent confidence intervals for each county have been included in **Figure 7** and help to show this rate instability. If upper and/or lower confidence intervals overlap, the differences between counties are not considered meaningful. Also, comparative rates at the county level can often mask large variation in incidence within counties. **Figure**

8 shows chlamydial infection rates for Washington State at the census tract level. This map reveals wide variation within counties. While a county may have higher or lower incidence rates than the state average, there may be specific areas within that county that have much greater or lower incidence. These data can be very useful in helping state and local public health workers target resources for disease prevention at the neighborhood level. They can also assist in identifying specific gaps in access to STI screening, diagnosis, and treatment services.

The geographic extent of cases can also show differences in the burden of disease in several other important ways. Markers of socioeconomic status such as poverty, educational attainment, and household income vary greatly across the landscape and can be measured at the neighborhood level using U.S. Census data. Analysis of chlamydial infection in Washington State by census tract shows that higher than average disease incidence is associated with lower than average median income. It is also linked with lower than average educational levels (measured by the share of the adult population completing high school). Other factors such as population density, housing traits, and density of venues for social mixing may also be related to variations in disease incidence.

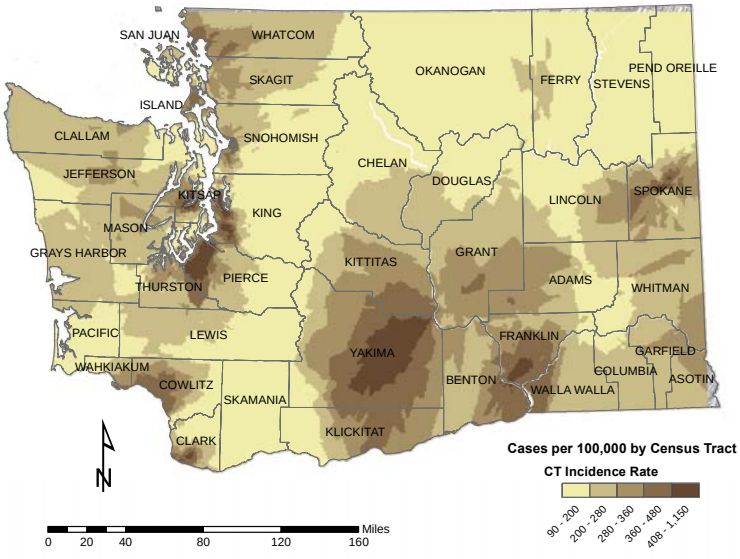
These factors may help explain the variations in chlamydial infection by geography. Efforts by all counties to assure proper treatment, to help reduces the duration of infection and prevent ongoing transmission, have been met with great success. As of 2010, 97.7

Figure 7 - Chlamydial Infection Incidence Rate* by County, Washington State, 2010



*Crude incidence rate with 95% Poisson exact confidence intervals

Figure 8 - Chlamydia Incidence Rate* by Census Tract, Washington State, 2010



*2010 incidence rate per 100,000 by Census Tract based on residence of patient at diagnosis. Rates smoothed by Kriging method.

Figure 9 - Proportion of Chlamydia Cases with Treatment Reported by Year of Diagnosis, Washington State, 2000 - 2010

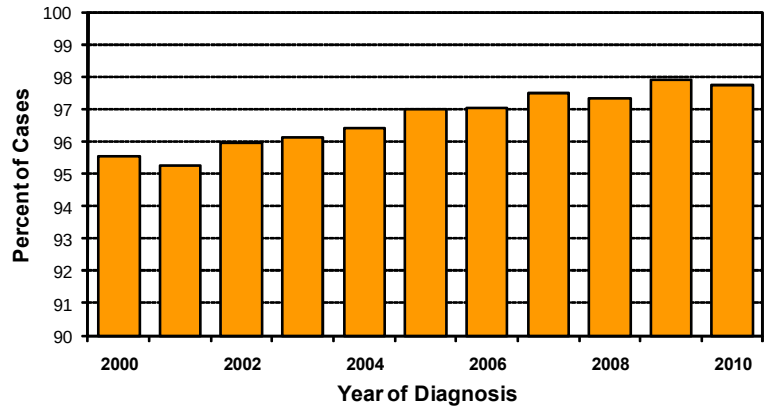
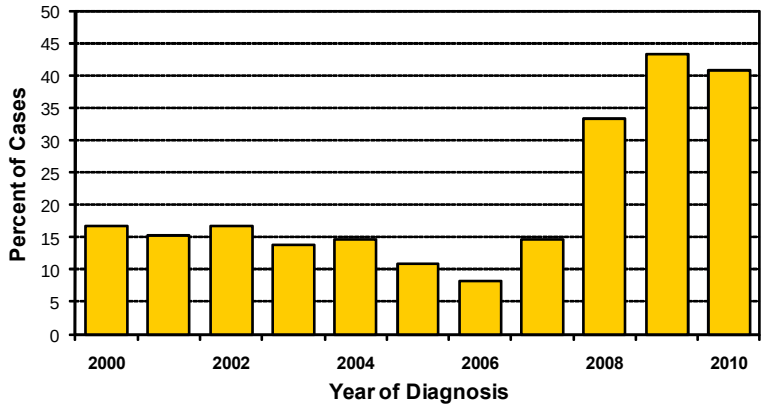


Figure 10 - Proportion of Chlamydia Cases Interviewed for Partner Management by Year of Diagnosis, Washington State, 2000 - 2010



percent of chlamydial infections reported in Washington State were treated. **Figure 9** shows the number of cases with treatment indicated by year of diagnosis. While there has been some change in this measure over time, antibiotic treatment has been assured for over 95% of cases diagnosed over the last decade.

Figure 10 shows the proportion of cases interviewed for partner management by year of diagnosis. Counties set their own criteria for prioritizing cases for interview. Added legislative resources and a statewide project to assess the population benefit of EPT, allowed counties to triple the share of cases contacted for partner management. This accounts for the large increase in this measure since 2008.

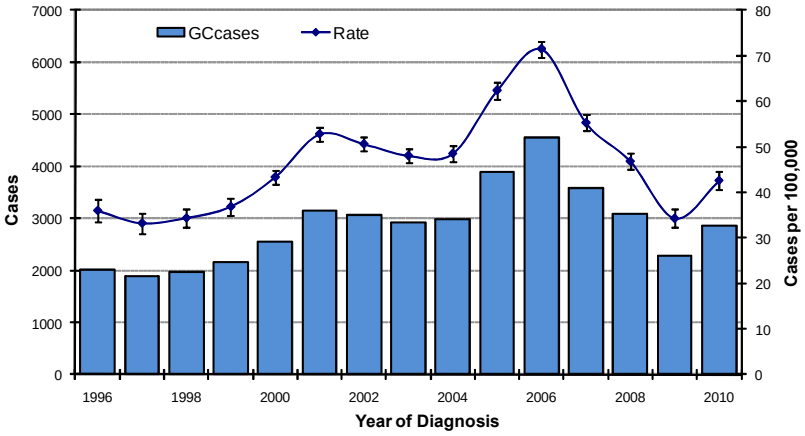
Chlamydial infection continues to be the most frequently reported STI in Washington State. Infections and trends can be further characterized by a few specific observations:

- √ **Reported chlamydial infection incidence rate has been virtually stable since 2008.**
- √ **Recent trends in chlamydia positivity among people screened through the Infertility Prevention Project reflect a decreasing trend since 2004, most dramtically noted among females.**
- √ **The highest reported case incidence of chlamydial infections in 2010 is among females 20 to 24 years of age; the highest incidence for males is in the same age group; marked disparities between males and females is considered primarily an artifact of screening practices.**
- √ **Incidence of chlamydial infection by race and Hispanic ethnicity reveals continuing inequalities in the burden of disease with Hispanics, non-Hispanic Blacks and American Indians/Alaska Natives experiencing higher incidence than non-Hispanic Whites or non-Hispanic Asians.**
- √ **The highest overall observed case incidence rate in 2010 is for Pierce County; three counties significantly exceed the state incidence rate of 317.9 per 100,000.**
- √ **A high proportion of cases in 2010 (97.7%) have been treated and a significant proportion of cases were provided with partner management services (40.7%).**

Gonorrhea

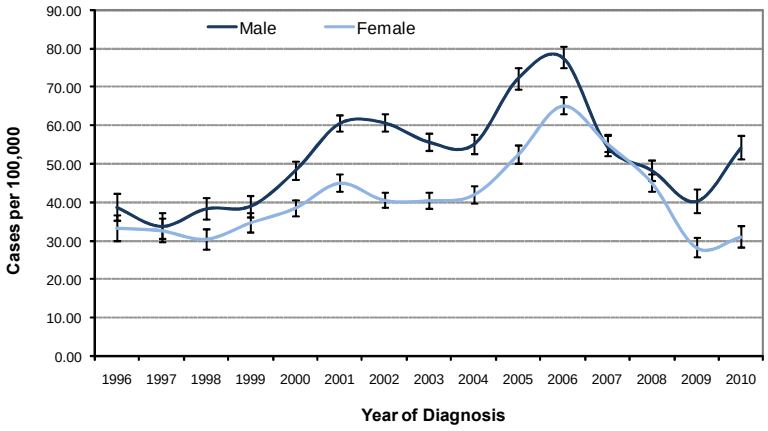
Infections due to *Neisseria gonorrhoeae* (GC) are an important cause of disease in the United States and are the second most often reported STI in Washington State. Similar to chlamydial infections, negative consequences of gonorrhea may include pelvic inflammatory disease (PID), infertility, ectopic pregnancy, and chronic pelvic pain. Many of these undesirable outcomes can occur long after infections have been treated or naturally healed. Thus, the exact cause is often unclear and the relative role of chlamydial infection and gonorrhea in overall rates of PID and ectopic pregnancy cannot be clearly ascertained. However, gonorrhea is more likely to cause symptoms than chlamydial infections. This is particularly true for males. This is shown in the greater parity observed in gender specific case rates.

Figure 11 - Gonorrhea Cases and Incidence Rate* per 100,000, Washington State, 1996 - 2010



* Crude incidence rate with Poisson exact 95% confidence intervals.

Figure 12 - Gonorrhea Incidence Rate* per 100,000, by Gender, Washington State, 1996 - 2010



* Crude, gender-specific incidence rate with Poisson exact 95% confidence intervals.

The most recent year for which incidence data are available for the entire country is 2009 with a national gonorrhea case incidence rate of 99.1 per 100,000. Washington State's overall case rate that year (34.2 per 100,000 in 2009) compared well to the national case rate. **Figure 11** shows cases diagnosed each year and the incidence rate per 100,000 from 1996 through 2010.

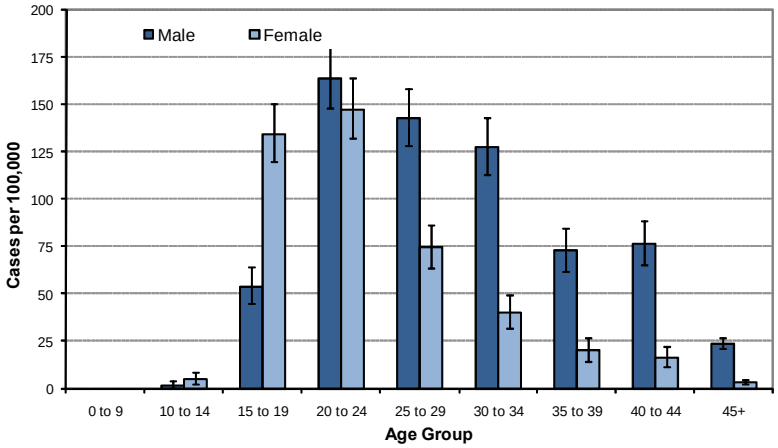
Of particular interest in this figure is the decline in cases and rates between 2006 and 2009 to almost record lows. More appropriate treatment choices by providers and an aggressive effort to provide partner services to a much larger proportion of persons with GC likely contributed to this decrease.

Yet in 2010, rates have begun to rebound. The most pronounced increases have been among men and especially among MSM in urban areas. Gonorrhea incidence over the last several decades in Washington has been increasingly concentrated in behaviorally and geographically distinct sexual networks. Evidence suggests that there are two parallel epidemic patterns and that incidence rises and falls in tandem with the timing depending on the amount of bridging between distinct sexual networks. The first of these parallel epidemics involves heterosexual transmission among men and women under the age of 30. The second epidemic pattern involves higher levels of transmission among MSM over 30 years of age.

Figure 12 on page 19 shows the gender-specific trend in gonorrhea incidence from 1996 through 2010. Male and female rates diverged significantly from 2000 through 2006, which supported behavioral evidence from patient interviews suggesting a sharp increase in MSM gonorrhea transmission during that time. Male and female rates converged in 2007, reflecting a decrease in gonorrhea incidence among MSM. Yet disparities by gender have re-emerged and are quite pronounced again in 2010. This pattern is consistent with an observed increase in the burden of incidence among older males, much higher than females in the same age groups (**Figure 13**). Among males, the proportion of cases accounted for by MSM exceeds 40% for all age groups 20 years of age and older (**Figure 14).** In an epidemic context of high bacterial STI incidence among MSM, many of whom are also HIV-positive, the possibility of HIV transmission must also be considered.

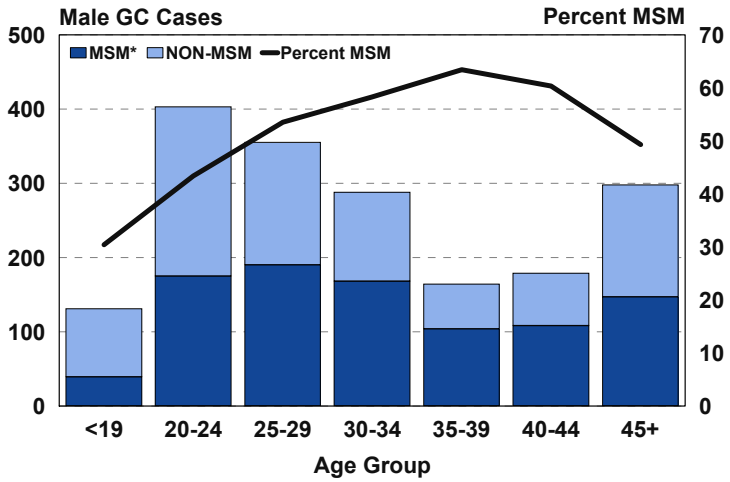
Health inequities are seen in gonorrhea rates by race and Hispanic ethnicity. **Figure 15** shows trends in gonorrhea rates by race for 2001 through 2010. Disparities are seen between non-Hispanic Blacks and other races. However, significant strides have been made with respect to closing the gap in incidence among non-Hispanic Blacks and the trend continues to be quite promising. With respect to Hispanic ethnicity (**Figure 16**), there was rough parity between Hispanics and non-Hispanics

Figure 13 - Gonorrhea Incidence Rate by Gender and Age Group, Washington State, 2010



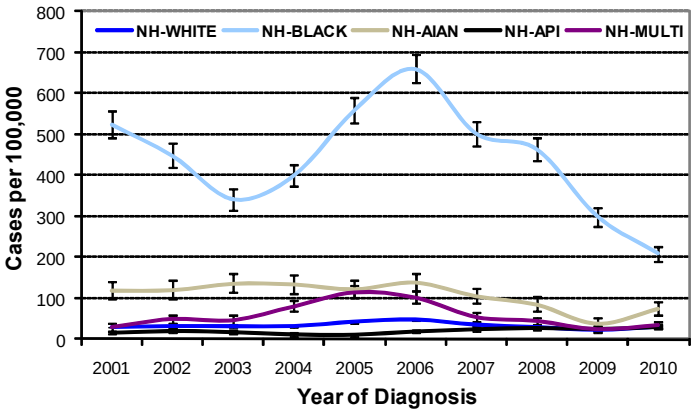
* Crude, age and gender specific incidence rate with Poisson exact 95% confidence intervals.

Figure 14 - Male Gonorrhea Cases Diagnosed by Age Group and MSM Status, Washington State, 2010



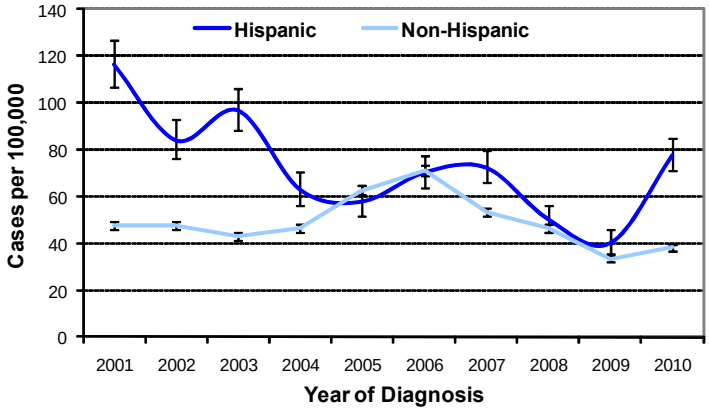
*Self-reported MSM status; cases missing sex partner gender presumed to be NON-MSM

Figure 15 - Gonorrhea Incidence Rate* by Non-Hispanic Race, Washington State, 2001 - 2010**



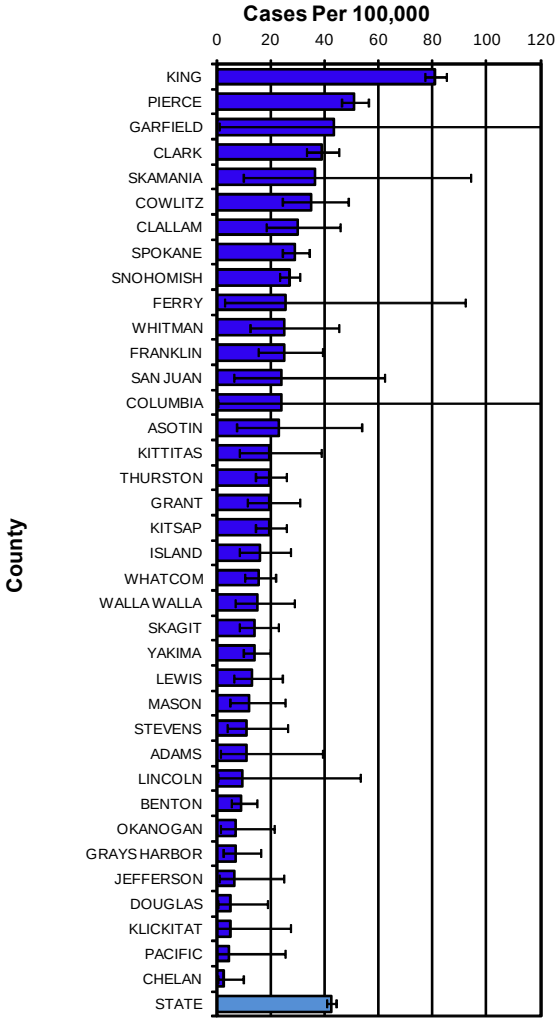
* Crude incidence rate with Poisson exact 95% confidence intervals.
** Unknown Race (non-Hispanic) redistributed by proportion of known cases.

Figure 16 - Gonorrhea Incidence Rate* by Hispanic Ethnicity (all races), Washington State, 2001 - 2010



* Crude incidence rate with Poisson exact 95% confidence intervals.

Figure 17 - Gonorrhea Incidence Rate* by County, Washington State, 2010



* Crude incidence rate with Poisson exact 95% confidence intervals.
** Unknown Hispanic ethnicity (all Races) redistributed by proportion of known cases.

between 2005 and 2009. Yet the 2010 rate among Hispanics increased more dramatically than among non-Hispanics.

Unlike chlamydial infection, gonorrhea incidence tends to be more concentrated in densely populated urban areas. Rates and rankings by county for 2010 are shown in **Figure 17**. King and Pierce Counties are the only jurisdictions exceeding the statewide rate of 44.1 per 100,000.

Figure 19 on page 22 shows the gonorrhea incidence rate by census tract for 2010. Of note in this figure is that while there are many similarities with the county-level map (**Figure 18**); much more detail is shown at the census tract level. Specific areas within counties that have much higher morbidity are visible at this level. These data indicate a small number of census tracts with much higher rates, which should be considered as 'core' morbidity areas for targeting prevention activities and for prioritizing disease intervention assets.

Likewise, the distribution of cases by type of clinic is also useful for interpreting disease trends. **Figure 20** shows the share of gonorrhea cases diagnosed in 2010 by major provider type. A rising share of cases (28 percent) are being diagnosed in private health care settings such as physicians in private practice or clinics serving major private insurance plans. Of note as well, a large share of cases continue to be diagnosed in emergent/urgent care settings.

In light of the probable emergence of strains of gonorrhea resistant to common antibiotics, monitoring information on the treatment provided to patients continues to be important. **Figure 21** shows the proportion of cases with treatment reported by year of diagnosis 1994 through 2010. In 2010, 97 percent of cases were reported with treatment information provided.

The high proportion of cases with treatment reported allows analyses of trends in antibiotic use. **Figure 22** illustrates the share of cases treated by antibiotic class.

Reduced susceptibility to the cephalosporin class in the future is a distinct probability given the robust ability of *N. gonorrhoeae* to develop resistance to commonly used antibiotics. The Gonococcal Isolate Surveillance Project (GISP) monitors a sentinel population of male patients diagnosed with gonorrhea in STD clinics in the U.S. for gonococcal antibiotic susceptibility. This includes the STD clinic at Harborview Medical Center in Seattle. In 2009 and 2010, reduced suceptibility to cefpodoxime, a marker for the cephalosporin class, has been observed. These data continue to be invaluable for informing the public health community of emergent gonorrhea treatment issues and in providing appropriate treatment guidance to clinicians.

In addition to the GISP study, Washington State participates in a CDC-sponsored, 14-site enhanced surveillance project called the STD Surveillance Network (SSuN).

Figure 18 - Gonorrhea Incidence Rate* by County Washington State, 2010

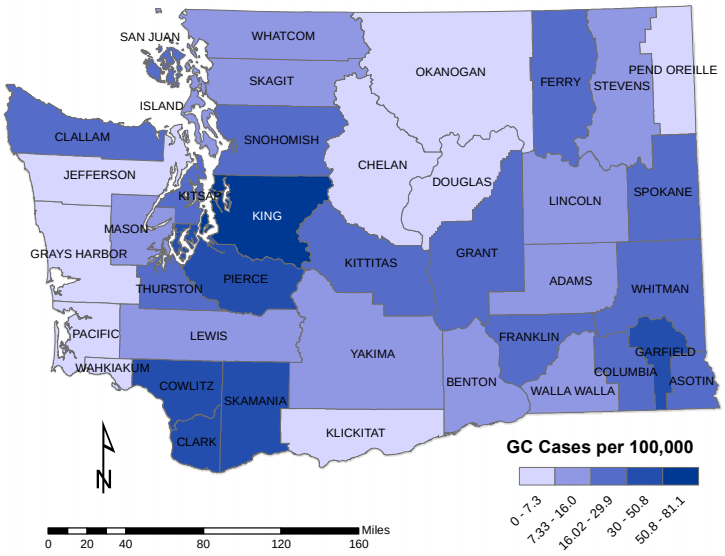
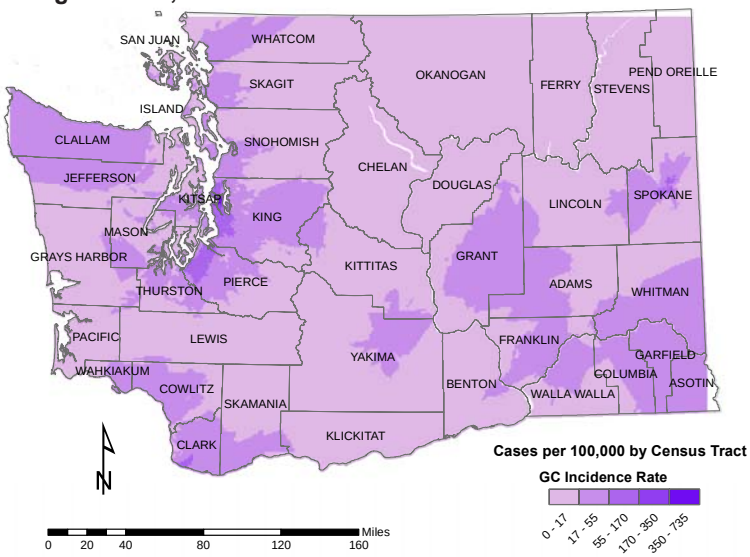
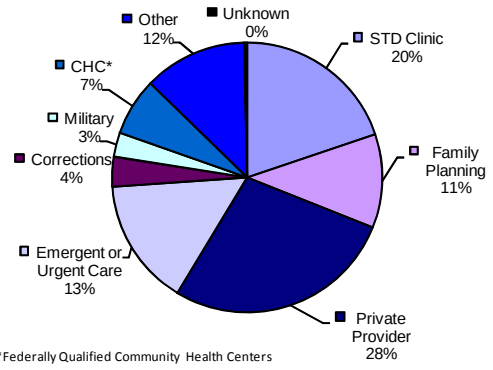


Figure 19 - Gonorrhea Incidence Rate* by Census Tract, Washington State, 2010



*2010 incidence rate per 100,000 by Census Tract based on residence of patient at diagnosis. Rates smoothed by Kriging method.

Figure 20 - Proportion of Gonorrhea Cases Diagnosed by Provider Type, Washington State, 2010



*Federally Qualified Community Health Centers

Figure 21 - Proportion of Gonorrhea Cases with Treatment Reported by Year of Diagnosis, Washington State, 1996 - 2010

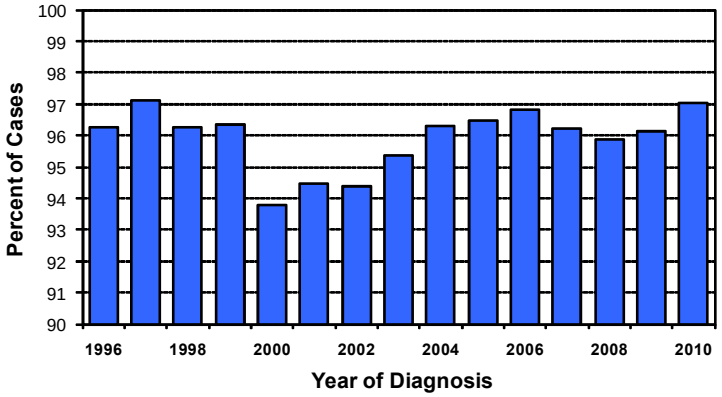
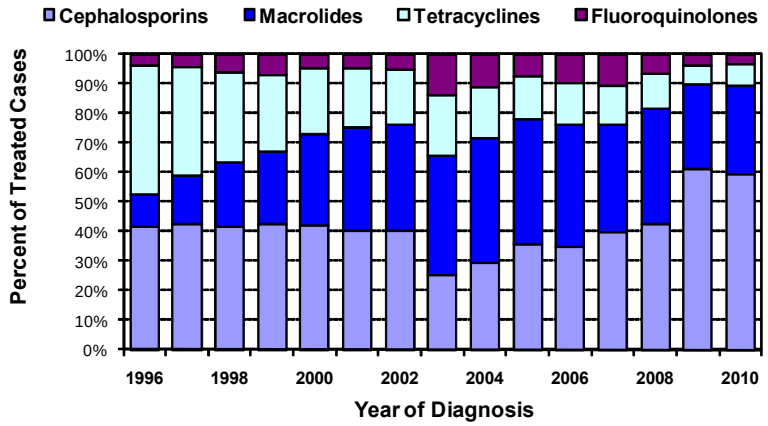


Figure 22 - Proportion of Gonorrhea Cases Treated by Antibiotic Class and Year of Diagnosis, Washington State, 1996 - 2010



Protocols for this sentinel surveillance project include collecting enhanced behavioral information on patients diagnosed with gonorrhea at STD clinics as well as those diagnosed in community provider settings.

In summary, infections due to *Neisseria gonorrhoeae* decreased significantly in Washington State between 2006 and 2009 but increased sharply again in 2010. Incident infections and trends can be briefly characterized by a number of specific observations:

- √ **Gonorrhea incidence increased 25 percent in 2010 over rates observed in 2009.**
- √ **The highest reported case incidence in 2010 was among males 20 to 24 years of age; the highest incidence for females was also among the 20 to 24 age group.**
- √ **Black, American Indian/Alaska Natives and Hispanics had higher rates than Whites, non-Hispanics or Asians.**
- √ **The highest overall incidence rates at the county level in 2010 are for King and Pierce counties with case incidence rates of 56.7 and 56.1 cases per 100,000, respectively.**
- √ **The male-to-female case ratio continued to increase in 2010 to 1.7 male cases for each female case reported.**
- √ **An increasing proportion of males diagnosed with gonorrhea report MSM risk, providing evidence for increased incidence among MSM in urban settings.**
- √ **Concerns continue over the potential emergence of antibiotic resistant strains of gonorrhea; clinicians are urged to be vigilant for treatment failure and to assure treatment in accordance with the most recent treatment guidelines.**

Notes from the field...

"A man and his wife presented at our Health District office saying the husband had just been diagnosed with gonorrhea the day before. Stating that his wife did not have a doctor or health insurance, they were concerned that they couldn't afford to get her treated and he would have trouble coming up with the $16 co-pay needed to get the medicine his doctor had called in to the pharmacy for him. We called his doctor's office to verify his diagnosis and to see if they would be OK with the Health District using the free EPT partner meds we got from the state Department of Health to treat him and his wife; they confirmed this would be appropriate.

They were both very appreciative for the help as they probably would not have been able to get their medicine any other way. As our staff talked with his wife, to verify that she met our standing orders criteria before providing her EPT meds, her symptom history had us concerned. Convinced that she needed a comprehensive exam – yet knowing that without insurance there was no way she could be seen at the same provider her husband saw without having to pay in advance, our staff member called her local contact at Planned Parenthood and they agreed to squeeze her in the next day by double booking appointments for a full pelvic exam.

We discovered though a record search in the state's PHIMS-STD system that she had been diagnosed with gonorrhea several months previously in Seattle, but was homeless at the time and the Seattle Public Health staff were not able to locate her to assure treatment. Knowing that history, we stressed how important it was for her to be examined. Yet she was still concerned about the cost of going to see a doctor, saying that if she got really sick she could go to the emergency room instead. But we convinced her that Planned Parenthood was the best place for her to go and would ultimately cost less than a visit to the ER.

The next day, they came by unexpectedly after her appointment. She had been diagnosed with acute PID and it was suggested that she should be hospitalized if no improvement was seen. She had been provided with antibiotics and given a prescription for additional treatment but was again concerned with the cost. Our staff recalled that the prescribed medication was on the $4 co-pay list at a local super-store, which they said they could probably afford. We called and confirmed this with the pharmacist but after checking their pockets, they didn't have enough for both the co-pay and for bus fare. Fortunately, our health district has a few remaining funds to purchase bus passes for situations such as these. We gave them enough passes to get to the pharmacy as well as to her follow-up appt on Monday. They were so appreciative and surprised at our being able to help that they broke down and started cry. Needless to say, we all went home that evening feeling very good about the work we do in Public Health!"

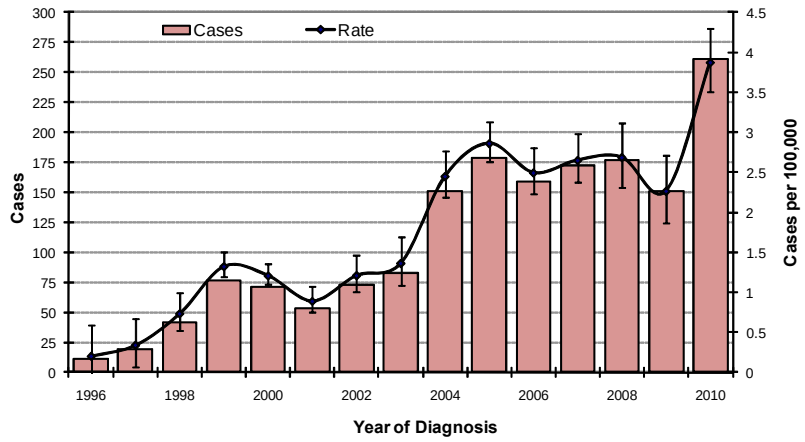
Public Health Worker
Local Health Jurisdiction

Syphilis

Syphilis is caused by infection with *Treponema pallidum*, a spiral-shaped, highly mobile bacterium known as a spirochete. Syphilis infection is chronic and systemic. It exhibits four clinically meaningful stages - primary, secondary, early latent, and late depending on the time since initial infection and symptoms experienced. A painless genital ulcer that heals without treatment typifies primary syphilis infection. Secondary stage indicates disseminated infection, most often presenting as a general feeling of discomfort with a rash of varying duration and location.

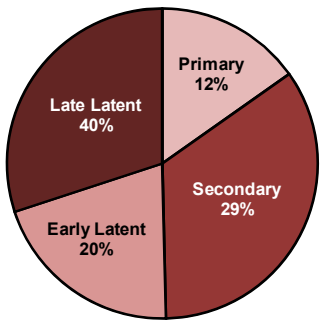
Primary and secondary syphilis are the infectious stages of disease. Epidemiologic analyses often focus on primary and secondary cases because of the chance of ongoing transmission. **Figure 23** shows cases diagnosed and incidence rate per 100,000 in Washington State for primary and secondary syphilis from 1996 to 2010. Most notable in this figure is the abrupt and steep rise in incidence since 2009. Since reaching 2.9 cases per 100,000 in 2005, incidence of primary and secondary syphilis trended modestly downward through 2009, though still at high endemic levels. In 2010, however, incidence increased by 71%. Washington State's rate remains somewhat below the national rate reported in 2009 of 4.6 per 100,000.

Figure 23 - Primary & Secondary Syphilis Cases and Incidence Rate*, Washington State, 1996 - 2010



* Crude incidence rate with Poisson exact 95% confidence intervals.

Figure 24 - Syphilis Cases by Stage at Diagnosis, Washington State, 2010



An infected person who does not get treatment may infect others during the first two stages (primary, secondary). However, all infections, regardless of disease progression, have potential for very serious health problems. Early latent syphilis is defined as an asymptomatic stage of infection less than one year from initial exposure. A relapse to secondary symptoms within a year of initial infection would be re-staged as a secondary infection. Infections beyond one year are considered late latent infections which can have persistent and serious clinical consequences for life if the patient remains untreated. **Figure 24** shows the share of cases reported by stage of syphilis infection in Washington State in 2010.

Patients with an initial diagnosis of primary or secondary syphilis who are treated may become reinfected if they are exposed again. The share of overall syphilis cases first diagnosed as early latent has increased from 12

percent of all cases in 2000 to 20 percent in 2010.

Transmission of syphilis from pregnant women to their unborn babies is a potential cause of fetal loss. Serious congenital harm can also occur at any stage of infection for pregnant patients if not promptly treated. One case of congenital syphilis was reported in 2010.

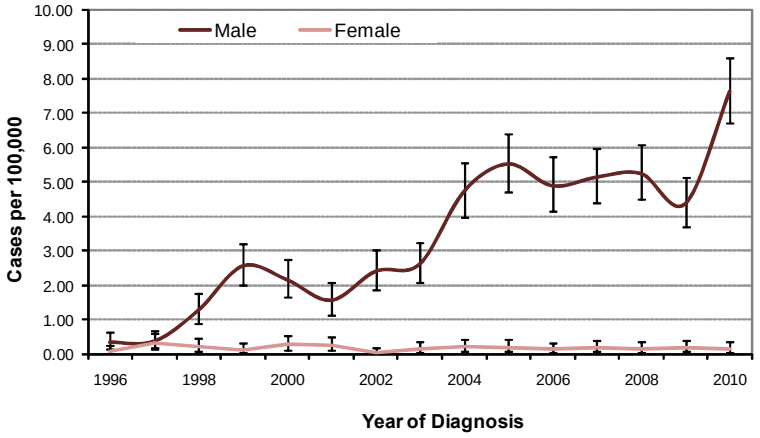
The overwhelming proportion of cases reported in the last decade have been among males, most of whom report MSM behaviors. (**Figures 25 & 26**.) This pattern of case incidence is quite different from that seen in the late 1980s and early 1990s where cases were primarily diagnosed among heterosexuals.

The rate among women at that time was roughly the same as among men. More recent trends however show the reemergence of syphilis among urban MSM. This reflects a pattern similar to the endemic levels of syphilis observed among MSM in the late 1970s, which foreshadowed - and may even have aided - the rapid spread of HIV early in the epidemic.

Most cases reported in 2010 were among men resident in King County (**Figure 27**). Local public health agencies in counties with the highest rates have mounted a robust response to reported syphilis cases. In 2010, 77% of cases were interviewed to assure treatment of possibly exposed partners.

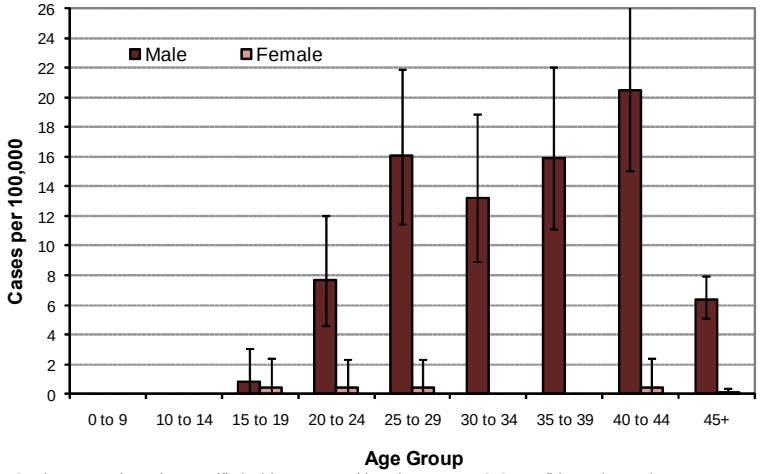
In summary, syphilis infection in Washington State in 2010 continued to affect primarily urban MSM

Figure 25 - Primary & Secondary Syphilis Incidence Rate* by Gender, Washington State, 1996 - 2010



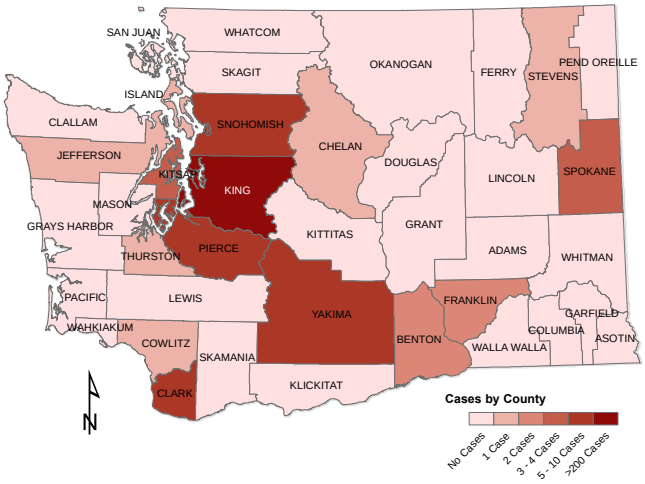
* Crude, gender-specific incidence rate with Poisson exact 95% confidence intervals.

Figure 26 - Primary & Secondary Syphilis Incidence Rate* by Gender and Age Group, Washington State, 2010



* Crude, age and gender-specific incidence rate with Poisson exact 95% confidence intervals.

Figure 27 - Primary & Secondary Syphilis Cases Reported by County, Washington State, 2010



populations, reflecting broader trends in syphilis infection on the U.S. West coast. General characteristics of syphilis morbidity in 2010 include:

- √ **Primary and secondary syphilis incidence increased significantly in Washington State from 2.3 cases per 100,000 in 2009 to 3.9 per 100,000 in 2010.**
- √ **The majority of primary and secondary cases continue to be diagnosed among males, the majority of whom report MSM risk behaviors.**
- √ **Eighty-one percent of primary and secondary cases in 2010 were diagnosed among residents of King County.**
- √ **One case of congenital syphilis was reported in 2010.**
- √ **Incidence of primary and secondary syphilis was highest among males 40 - 44 years of age at 20.4 cases per 100,000.**
- √ **Eighty percent of primary and secondary syphilis cases were diagnosed among non-Hispanic Whites.**

Genital Herpes Simplex Virus (HSV)

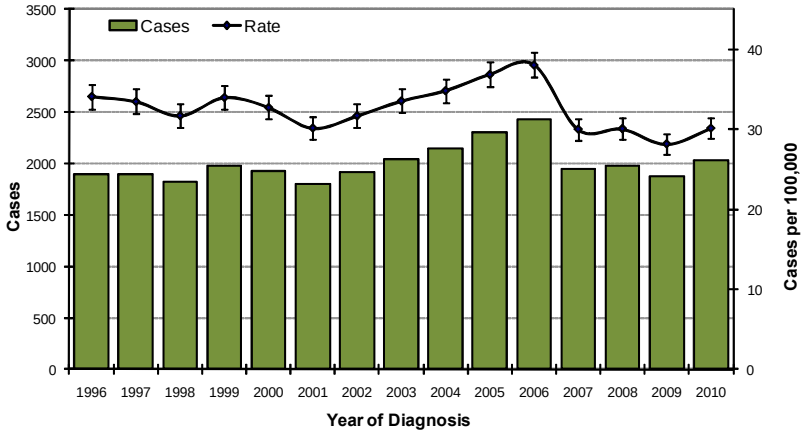
Two species of the *Herpesviridae* family, HSV 1 and 2, cause disease in humans which are lifelong infections. HSV infections have been implicated in a variety of illnesses. Initial genital infections with HSV are reportable in Washington State. Most genital infections are thought to be caused by HSV 2. Either type may infect genital regions and cause the blister-like lesions typical of genital herpes outbreaks. It is estimated that as many as 45 million people over the age of 12 have genital HSV infections in the U.S. Some may never know they are infected but many others experience a severe initial outbreak of symptoms with sporadic and decreasing outbreaks over the following months and years.

Herpes infections may be much more pathogenic among persons with suppressed immune systems. It has been suggested that this highly prevalent viral infection may play a role in the ongoing spread of HIV. People with HSV infections may be more susceptible to HIV infection and people with HIV may be more likely to shed virus and infect others if they are also infected with HSV.

Initial infections are often not recognized for a number of reasons. On the other hand, long-standing infections may be mistaken for new infections. Thus, data on the rate of initial genital infections based on provider diagnoses is historically un-representative of the true rate of HSV infection in the population. **Figure 28** shows the cases reported and case incidence rate per 100,000 for Washington State 1996 through 2010. **Figure 29** shows age and gender specific incidence rates. Differences in rates by gender may reflect greater likelihood of females seeking diagnostic services in reproductive health settings.

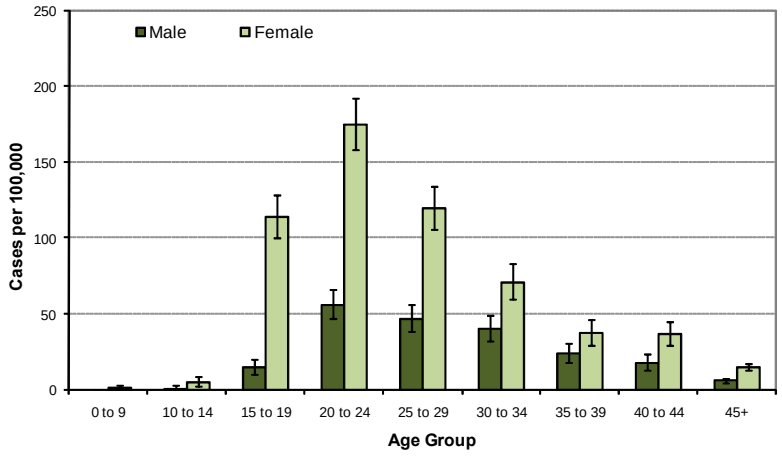
Neonatal herpes infections result from initial episodes of genital infection among women late in pregnancy and can lead to severe, long-term complications for newborns; these infections are of sufficient urgency and seriousness to warrant ongoing surveillance. Six cases of neonatal herpes infection were reported in Washington State in 2010.

Figure 28 - Initial Genital HSV Cases and Incidence Rate* by Year of Diagnosis, Washington State, 1996 - 2010



* Crude incidence rate with Poisson exact 95% confidence intervals.

Figure 29 - Initial Genital HSV Cases and Incidence Rate* by Gender and Age Group, Washington State, 2010



* Crude, age and gender-specific incidence rate with Poisson exact 95% confidence intervals.

Less Commonly Diagnosed STIs

Granuloma Inguinale

Granuloma inguinale (GI) is a sexually transmitted bacterial infection that is endemic in many developing countries but is relatively rare in the United States. Caused by infection with *Klebsiella granulomatis*, GI is an ulcerative disease causing genital lesions. No cases of GI have been reported in Washington State over the last two decades.

Lymphogranuloma Venereum

Lymphogranuloma venereum (LGV) is an ulcerative STI caused by three variants of *Chlamydia trachomatis.* Usually rare in the United States, recent outbreaks of LGV have occurred among MSM in northern Europe and in large urban centers in this county. LGV is often difficult to diagnose as the symptoms may be quite similar to other ulcerative STIs like syphilis, genital herpes, and chancroid. Two cases of LGV were reported in Washington State in 2010.

Chancroid

Chancroid is genital ulcer disease caused by the streptobacillus *Haemophilus ducreyi* and is found commonly in the developing world but remains relatively uncommon in developed countries. Many of the cases identified and reported in the United States are among immigrants or among people with a history of recent travel in developing nations. One case was reported in Washington State in 2010; a total of 15 cases have been reported since 1992.

Selected Behavioral Characteristics of STIs

Washington State participates in CDC-sponsored and other initiatives to collect enhanced behavioral information from patients interviewed in the course of partner management. These data are collected as an integral part of routine public health activities focused on assuring appropriate and prompt treatment of patients and their sex partners. This behavioral risk information is also very useful in planning interventions and in better understanding how STIs reflect other issues of public health importance such as illicit drug use, incarceration, and other social determinants of health such as education and poverty.

Figure 30 - Proportion of Cases Completing Interviews by Diagnosis, Washington State, 2010

	Cases Diagnosed	Cases Sampled*	Cases Interviewed**	% of All Cases Interviewed
Chlamydial Infection	21401	3821	2252	10.5%
Gonorrhea	2865	394	237	8.3%
P&S Syphilis	261	N/A	203	77.8%

* Cases randomly selected for interview at time of data entry into surveillance system

** Of those sampled, cases completing full or partial behavioral interviews

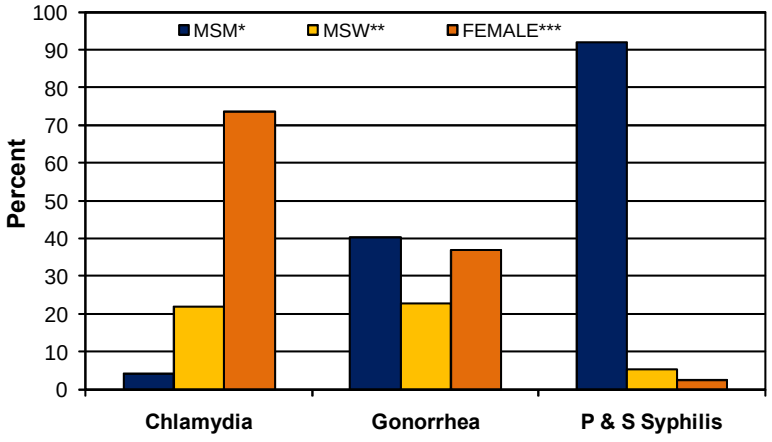
Some domains of behavioral data, such as gender of sex partners, are available for all cases reported while supplemental information on other behavioral risks are determined from patient self-report on interviews conducted for partner management and for evaluation purposes. The data presented in this chapter describe selected behavioral characteristics based on a random sample interviewed by public health staff (**Figure 30**). The percent of all cases interviewed shown in Figure 30 does not include interviews for patients not in the random sample.

Interview data have been weighted for analysis to be representative of all cases diagnosed with chlamydial infection or gonorrhea in 2010. Stratification weights were developed to adjust for different sample sizes across jurisdictions. The analyses presented below are stratified by three gender/behavioral categories including MSM, men-who-have-sex only with women (MSW) and females to better characterize health inequalities observed for MSM. Comparable characteristics of primary and secondary syphilis cases are based on a census of all cases. All P & S cases are actively followed up for interview by public health staff.

Gender Category of Patients

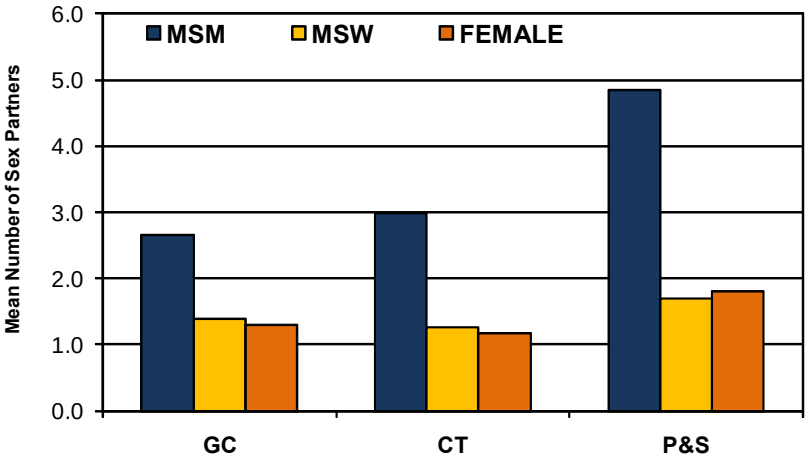
Figures 31 shows the gender category of patients diagnosed with chlamydial infection, gonorrhea and primary or secondary syphilis in 2010. Of note, only 4.2 percent of men diagnosed with chlamydial infection report having male sex partners. In contrast, over 40 percent of males with gonorrhea and almost 92 percent of men with primary or secondary syphilis report same-sex partners. The difference between men with gonorrhea and men with chlamydial infection reporting MSM behavior is statistically significant. This reflects trends noted in previous sections of this report and provides additional evidence that gonorrhea cases among MSM are an increasingly important component of overall gonorrhea incidence.

Figure 31 - Gender Category by STI for Cases Diagnosed in Washington State, 2010



Abbreviations used in graphs throughout this section:
* Includes men who report having sex with men
** Includes men reporting only sex with women
*** Includes all female cases

Figure 32 - Mean Number of Sex Partners Reported by Gender Category, STI Cases Diagnosed in Washington State, 2010

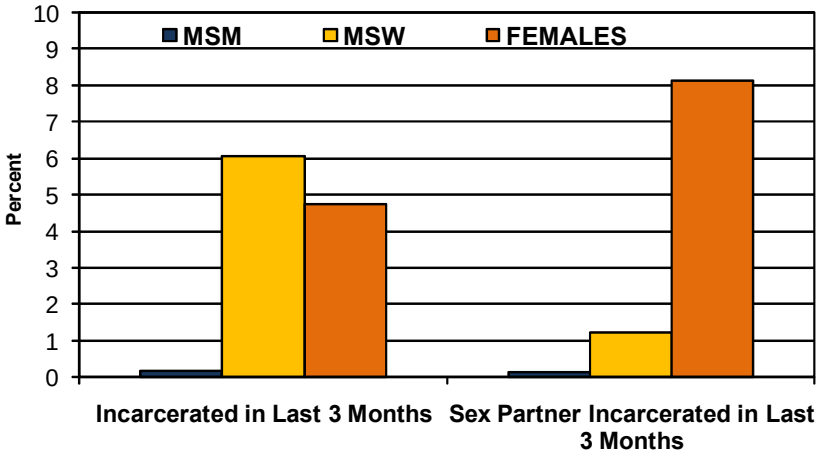


Primary or secondary syphilis cases are reported almost exclusively among men, the overwhelming majority of whom also report same-sex partnerships.

Number of Sex Partners

A critical component of partner management interventions is to elicit contact information for partners who may have been exposed to infection, or may have been the source of the index patient's infection. Public health staff work with the patient to assure that their partners are evaluated and treated as appropriate. The number of partners reported during the exposure period also provides insight into the patient's overall risk of repeat infection and helps direct partner management and risk reduction counseling. Persons reporting relatively large numbers of recent sex partners may occupy key positions in wider sexual networks and be critical in helping limit the spread of infection. **Figure 32** shows the mean number of sex partners reported by patients with chlamydial infection, gonorrhea, and primary & secondary syphilis by category in 2010. MSW generally report the same mean number of partners as females for chlamydial infections. Among male cases with all diagnoses, MSM report significantly more partners than their presumed heterosexual counterparts with a mean number of partners of 3.49 versus 1.44, respectively.

Figure 33 - Proportion of Cases by Gender Category Reporting Recent Incarceration and Sex with Recently Incarcerated Person by STI, Washington State, 2010



Recent Incarceration

Patients reporting incarceration in the previous three months or sex with a partner who had recently been incarcerated reveals differences by gender category (**Figure 33**). Women are significantly more likely to report having a sex partner who was recently incarcerated. MSM were less likely to report being incarcerated or having a recently incarcerated partner than heterosexuals. These data suggest that screening for STIs in correctional settings in higher morbidity areas may be a productive case finding activity.

Exchange of Money or Drugs for Sex

The proportion of patients reporting exchange of money or drugs for sex in 2010 remains quite low (**Figure 34**, page 32). For chlamydial infection, MSM report significantly higher rates of exchange than their heterosexual counterparts yet this is reversed for gonorrhea. The exchange of sex for drugs, money, housing, food, or other survival goods may contribute to the ongoing spread of STIs and act as a bridge between otherwise unconnected

sexual networks. Monitoring the proportion of cases associated with prostitution or other forms of exchange such as survival sex, continues to be important.

Venue for Meeting Sex Partners

There are significant differences by disease and MSM-status with respect to where people report meeting their sex partners. These data may have implications for venue-based interventions and provide insight into the characteristics of specific sexual networks. Geographic distribution of cases based on their residence at the time of diagnosis is used to calculate rates by county and other geographic units. Yet another crucial concept in characterizing transmission dynamics of STIs is the notion of 'risk space.' Understanding venues and places where people meet their sex partners and have sex with others provides important clues into the characteristics of sexual networks which are often anchored in physical space as well as within prescribed social and cultural groupings. Specific types of venues such as bath houses and other public sex venues are frequently associated with higher STI risk behavior and can serve as a focal point in clusters of new cases.

Knowing the place and type of venue where partners are met may reveal significant outreach opportunities for risk reduction, active case finding, and prevention activities. **Figures 35 - 37** show the proportion of male and female cases reporting meeting partners by venue type for chlamydia, gonorrhea, and for male primary or secondary syphilis cases in 2010. Among chlamydial infection and gonorrhea cases, the most frequently reported venue for meeting sex partners was at a friend or relative's

Figure 34 - Proportion of Cases Reporting Exchange of Money or Drugs for Sex by Gender Category and Diagnosis, Washington State, 2010

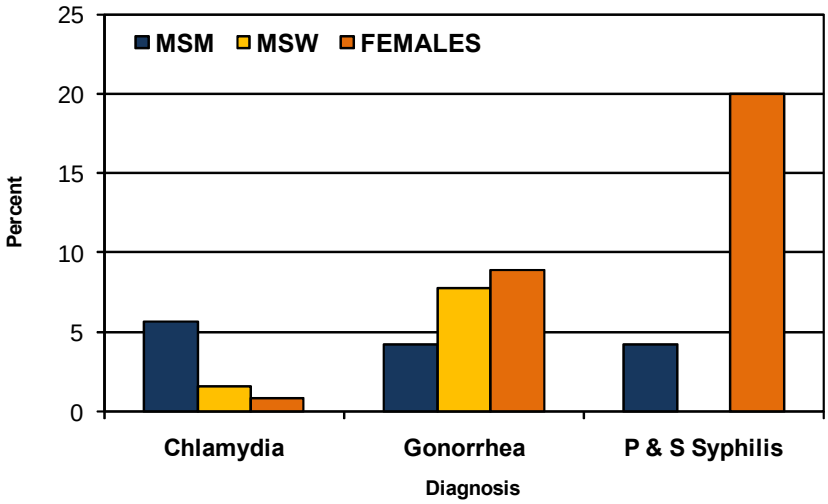


Figure 35 - Venues For Meeting Partners in the Last Year, Chlamydial Infection Cases, Washington State, 2010

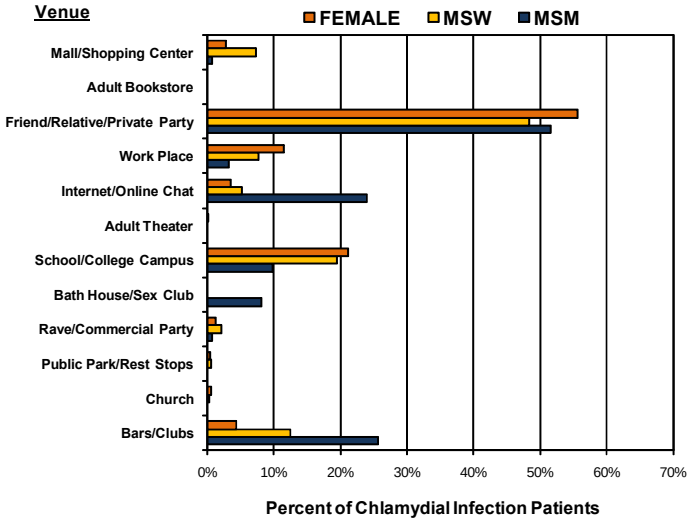


Figure 36 - Venues For Meeting Partners in the LastYear, Gonorrhea Cases, Washington State, 2010

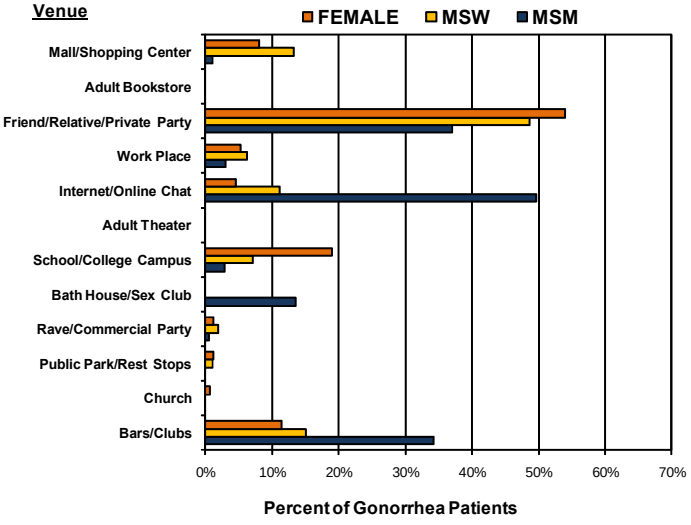


Figure 37 - Venues For Meeting Partners in the Last Year, Primary & Secondary Syphilis Cases, Washington State, 2010

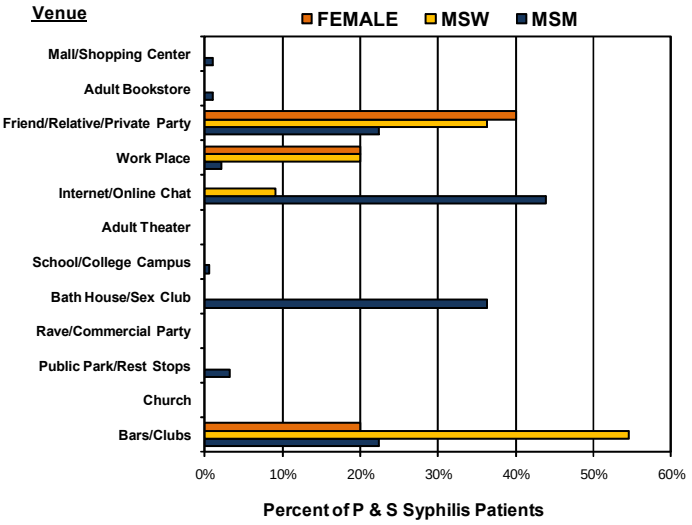


Figure 38 - Drug Use/Risk Reported in Last Year, Chlamydial Infection Cases, Washington State, 2010

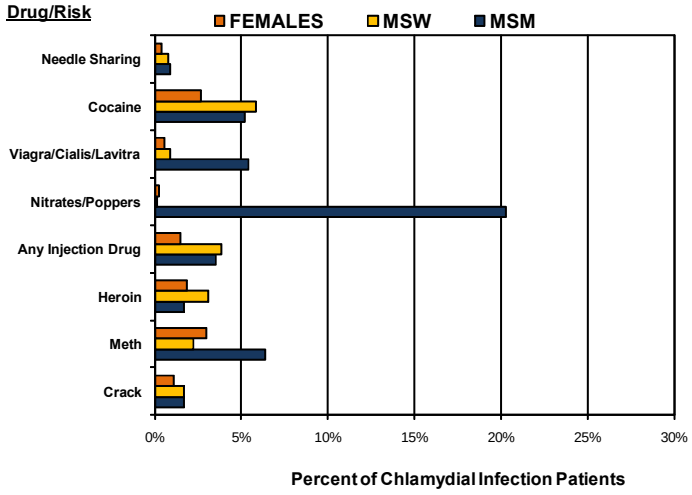
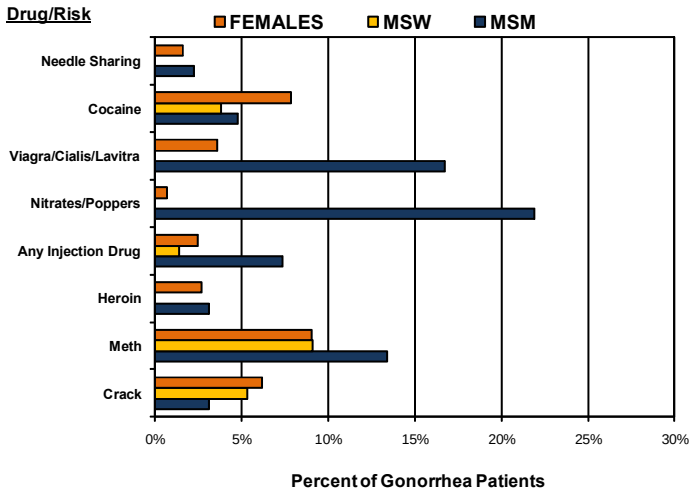


Figure 39 - Drug Use/Risk Reported in Last Year, Gonorrhea Cases, Washington State, 2010



house or private party with over half of all patients reporting meeting partners in this setting in the previous year. MSM were more likely than MSW or females to report meeting partners at bars/clubs, malls, or to use the internet to meet partners. MSM were significantly more likely to report use of the internet to meet partners than presumed heterosexuals, suggesting that use of social media presents continuing opportunities for STI education and risk reduction counseling targeted specifically to MSM.

Illicit Drug Use

Illicit drug use may be a key characteristic of certain social and sexual networks. Some well-documented outbreaks of STIs in Washington State and elsewhere have been associated with illicit drug use in tightly defined drug and sex partner networks.

In addition to being a characteristic element defining some social networks, illicit drug use may be suggestive of overall risk-taking behaviors - another expression of which may be unprotected sexual activity. Multiple factors may be associated with increased risk of illicit drug use, some of which may also be determinants of sexual health. **Figures 38 - 40** show the proportion of cases reporting illicit drug use and other associated HIV and STI risks. This list also includes erectile dysfunction medications, which have anecdotally been reported as being used recreationally by MSM. These data support this hypothesis, with over 15 percent of MSM reporting using performance enhancing drugs across all diagnoses. While the overall proportion of MSW and females reporting drug use or risk in the

previous year is relatively small, the proportion of MSM reporting drug use risk is considerably higher across all disease categories.

HIV Status and Testing

In light of the heightened risk of HIV infection among people diagnosed with bacterial and other viral STIs, especially among MSM, the proportion of patients who know their HIV status and aware of their risk becomes quite relevant. **Figures 41 - 43** present the proportion of cases self-reporting HIV-positive status, reporting ever having had an HIV test and reporting testing for HIV at their most recent STI diagnosis.

Among primary and secondary syphilis cases, 57.3 percent report being HIV positive, which reflects the fact that the majority of cases are diagnosed among urban MSM who have the highest prevalence of HIV of any behavioral or demographic group in Washington State. Likewise, among all MSM interviewed who were diagnosed with gonorrhea or chlamydial infection in 2010, over 15 percent report being HIV-positive reflecting the disproportionate burden of HIV disease among MSM in Washington State.

In light of higher HIV prevalence observed among people being diagnosed with chlamydial infection, gonorrhea or syphilis than those in the general population, it is encouraging that a majority report a history of having been tested for HIV. Yet these data are mute with respect to how recently patients tested for HIV and whether they returned for their results. More revealing is the proportion of patients who were offered testing at the time they were diagnosed with their most recent STI. Over 45 percent of MSM report getting an HIV test at

Figure 40 - Drug Use/Risk Reported in Last Year, Primary & Secondary Syphilis Cases*, Washington State, 2010

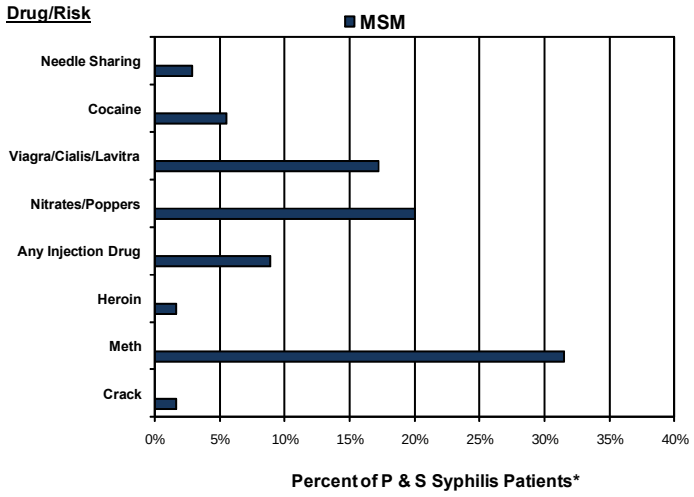


Figure 41 - Self-Reported HIV-Positive Status by Gender Category and STI Diagnosis, Washington State, 2010

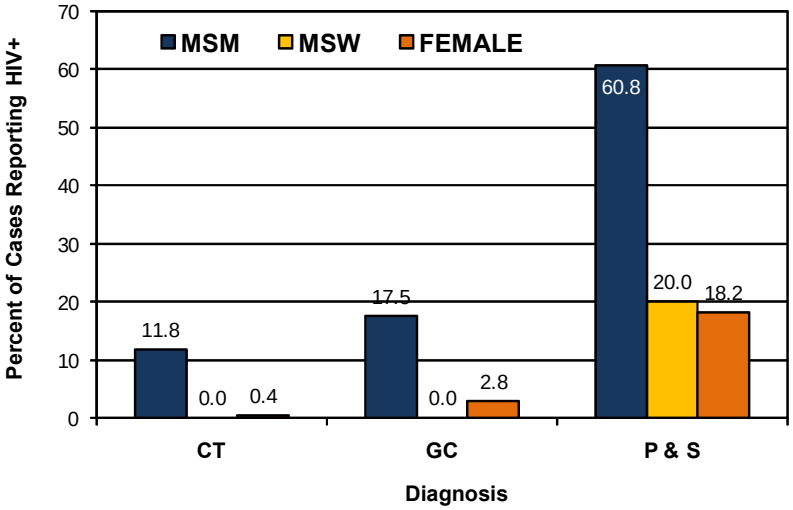


Figure 42 - History of Ever Having Had an HIV Test by Gender Category and STI Diagnosis, Washington State, 2010

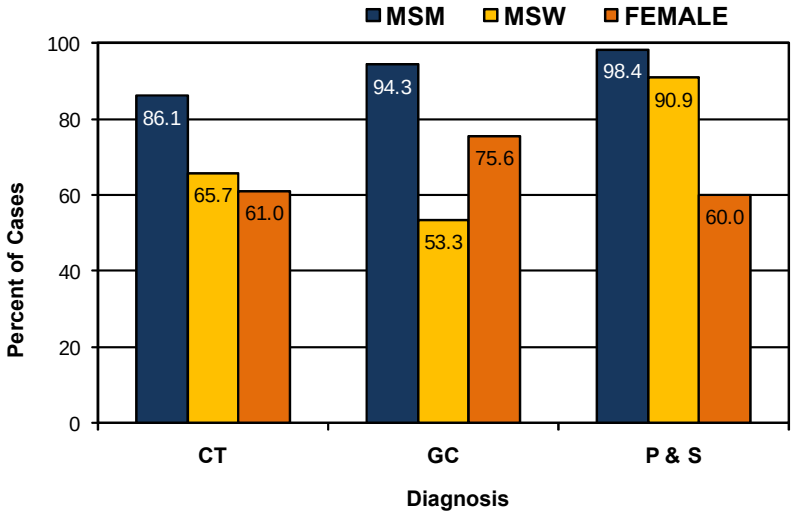
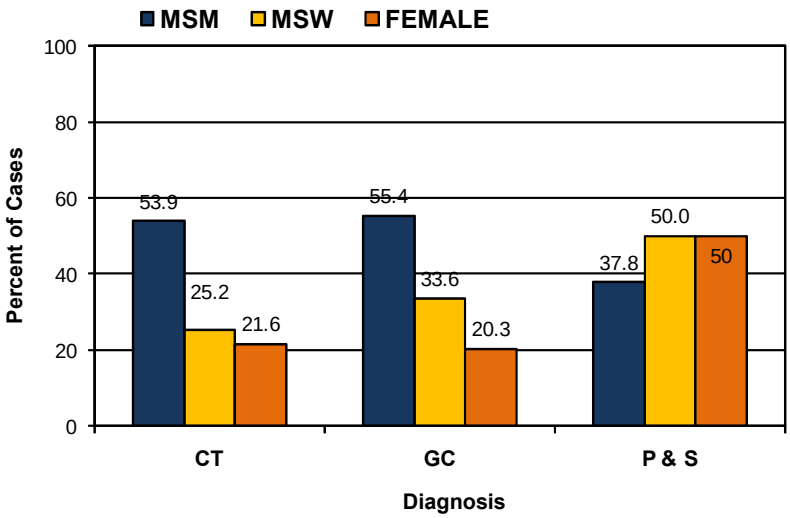


Figure 43 - HIV Testing at Most Recent STI Diagnoses by Gender Category and STI, Washington State 2010



their recent STI diagnosis across all disease categories while fewer than 30 percent of all MSW and females report being tested.

Behavioral data collected in the course of routine public health follow-up of STI cases to assure appropriate and timely treatment and manage potential exposure of sex partners provides a wealth of information useful for better understanding the population being diagnosed with STIs. In general, risk behaviors differ by STI being diagnosed and the behavioral risk of the patient; MSM report the highest levels of many behavioral risks including number of partners, drug use, anonymous venues for meeting partners and self-reported HIV status. Persons with chlamydial infection report the lowest level of behavioral risks overall and persons with gonorrhea report slightly higher risks, in part reflecting the different demographic profile of persons being diagnosed with these three STIs.

Trends in HIV/STI Co-Infection

The prevalence of HIV among persons being diagnosed with STIs can be assessed through self-reported HIV status for those patients interviewed in the course of routine partner services activities. However, matching of disease registries provides a more comprehensive basis for assessing trends in HIV/STI coinfection. Separate surveillance registries are maintained for HIV disease and for other STIs, yet both of these registries are person-based and contain sufficient data to match patients across registries. Once matched, information in the HIV surveillance system on date of initial HIV infection can be used to determine if the patient was HIV-positive at the time they were diagnosed with chlamydial infection, gonorrhea, syphilis, or other STIs. These data are valuable in helping assess the risk of ongoing HIV infection. STIs among HIV-positive persons also provides biologic evidence of unprotected sexual behavior, creating the potential for HIV transmission if their sex partners are uninfected. Moreover, STIs among persons with HIV may be more complicated to treat, present more frequently with complications and, at the population level, demonstrate a higher burden of disease in a medically fragile population.

Figures 44 - 46 show the prevalence of HIV among people diagnosed with chlamydial infection, gonorrhea, and primary or secondary syphilis from 1994 through 2010. Data for these charts are based on registry matching for patients diagnosed and reported with HIV and through March of 2011 and for STI cases diagnosed through December 2010. There are often delays in reporting to the HIV and STI surveillance registries, so matching data for the most recent complete year may underestimate co-infection by a modest amount. Additionally, patient records are matched on a number of data elements, including name, date of birth, and gender. While every effort is made to account for misspellings and other inconsistencies in the underlying data, matching methods may miss a small number of true matches. STI and HIV matches have been manually reviewed to exclude possible false matches so the direction of error is to underestimate incidence of STIs among HIV-positive people and prevalence of HIV among reported STI cases. The data presented here should be viewed as minimum estimates of co-infection.

The lowest prevalence of HIV is observed among persons being diagnosed with chlamydial infection in 2010 at 0.9 percent. This HIV

Figure 44 - Total Chlamydia Cases and Percent HIV+ by Year of Diagnosis, Washington State, 1994 - 2010

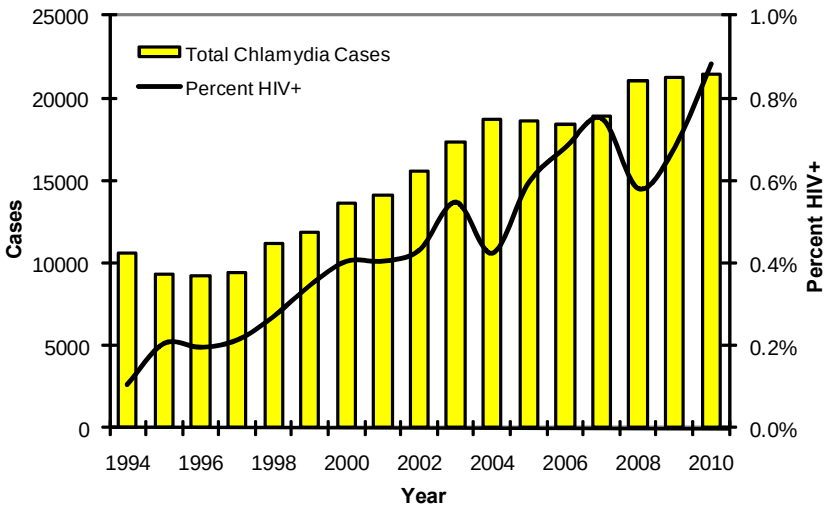


Figure 45 - Total Gonorrhea Cases and Percent HIV+ by Year of Diagnosis, Washington State, 1994 - 2010

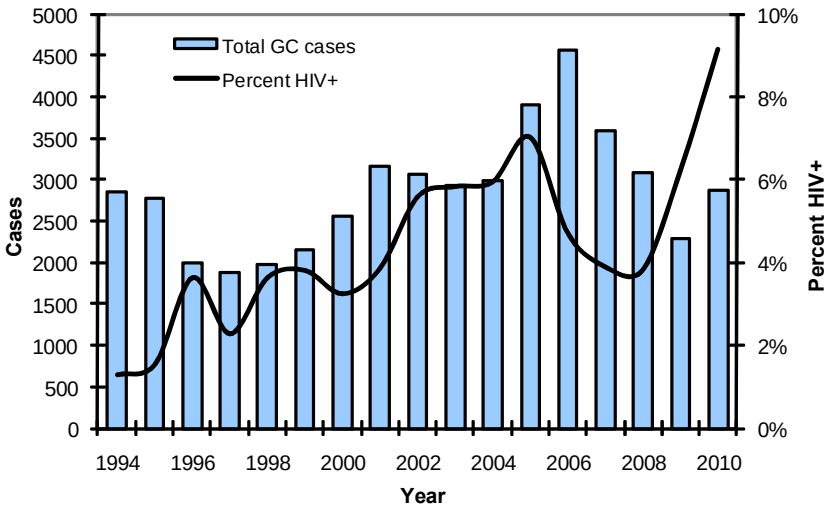


Figure 46 - Total P & S Syphilis Cases and Percent HIV+ by Year of Diagnosis, Washington State, 1994 - 2010

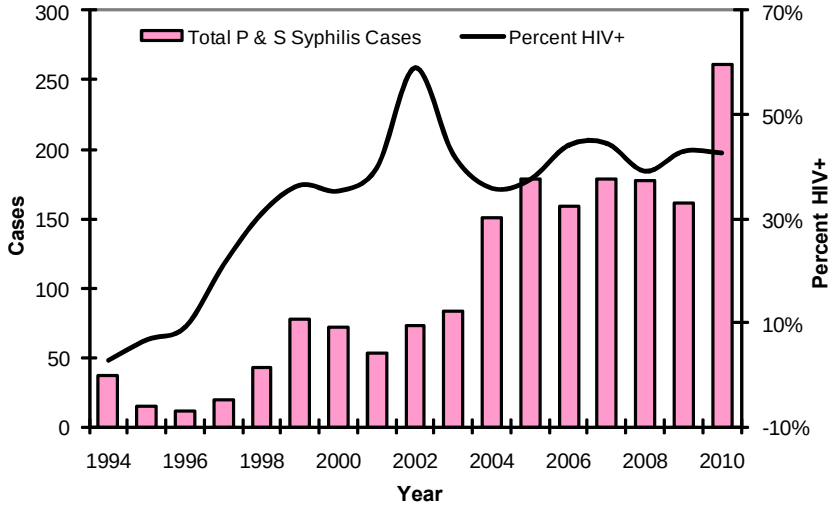


Figure 47 - Chlamydial Infection Cases and Incidence Rate* Among People Living with HIV by Year, Washington State, 1994 - 2010

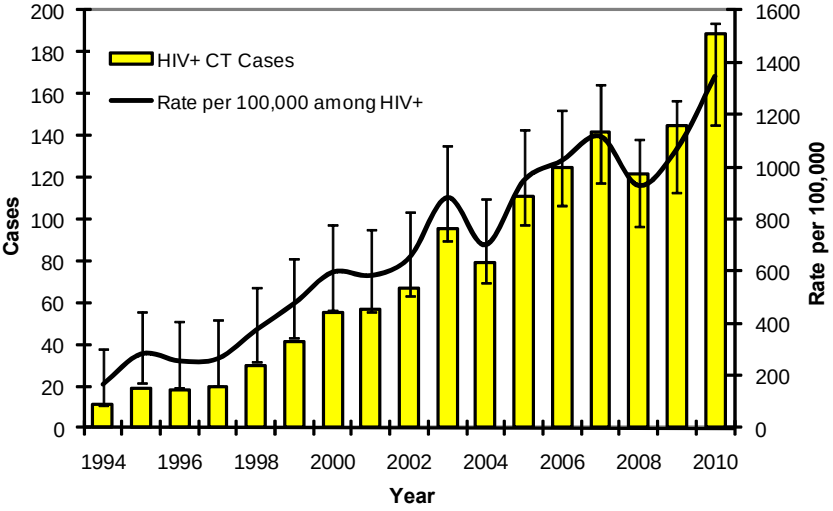
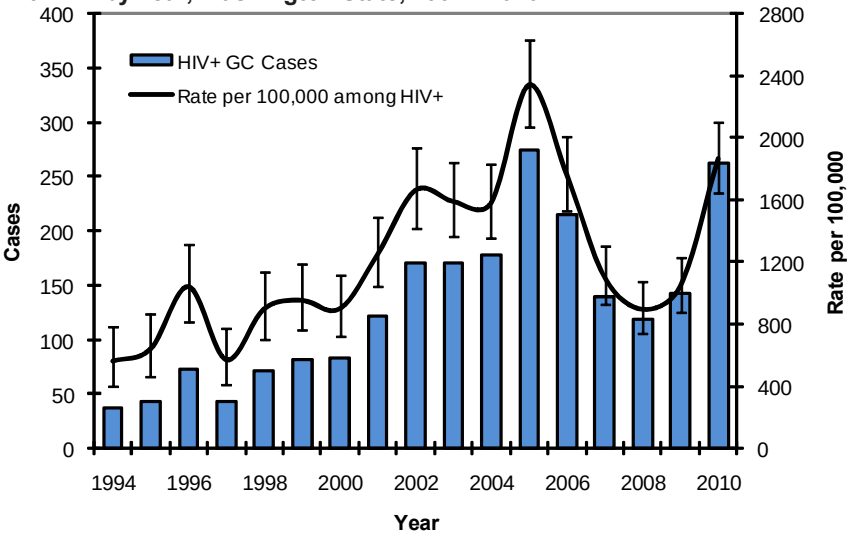


Figure 48 - Gonorrhea Cases and Incidence Rate* Among People Living with HIV by Year, Washington State, 1994 - 2010



* Crudeincidence rate per 100,000 with Poisson exact 95% confidence intervals.

prevalence rate is considerably higher than that estimated among all Washington State residents without any other specific risk factors (~0.2 percent).

Among people diagnosed with gonorrhea, the HIV prevalence is considerably higher; 9.1 percent of gonorrhea cases diagnosed in 2010 were found to be HIV-positive at the time of their gonorrhea diagnosis. In part, as previously noted, this level of HIV prevalence is a reflection of the proportion of men diagnosed with gonorrhea who are MSM. Among all MSM, HIV prevalence is estimated to be approximately 11 percent. The incidence of gonorrhea is considerably higher among MSM than for heterosexual males.

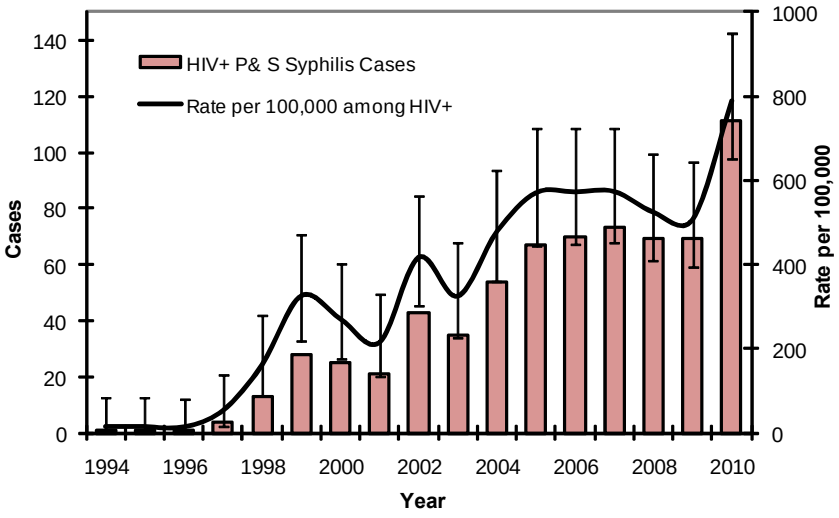
The highest prevalence of HIV is found among people diagnosed with primary or secondary syphilis with over 42 percent found to be HIV-positive in 2010. In contrast, 57.3 percent of cases report being HIV-positive on partner management interviews. This difference is likely due to HIV reporting delays and sensitivity issues with the matching algorithm used. The proportion of cases found to be HIV-positive at the time of their syphilis diagnosis steadily increased through 2002 to a high of 56 percent. Since then, the prevalence of HIV among primary or secondary syphilis cases has been stable at around 40 percent of diagnosed cases based on registry matching.

People living with HIV are disproportionately affected by incident STIs and represent a population with special prevention and partner management needs. **Figures 47 - 49** show the incidence of chlamydial infection, gonorrhea, and primary or secondary syphilis among persons with HIV. By comparison, the rate of

these STIs among HIV-positive persons is orders of magnitude higher than among persons not known to be infected with HIV. This is perhaps best illustrated by the incidence of gonorrhea among persons with HIV. The gonorrhea rate among HIV-positive persons in 2010 was 1,865 per 100,000 versus 42.5 per 100,000 in the general population, *a 44-fold difference*.

Among persons with HIV disease, the incidence of STIs appears to be increasing rapidly over the past year. A worrisome development, these increases in STI incidence may reflect changes in behavior and the higher burden of prevalent STIs among MSM.

Figure 49 - Primary or Secondary Syphilis Cases and Incidence Rate Among People Living with HIV byYear, Washington State, 1994 - 2010



* Crudeincidence rate per 100,000 with Poisson exact 95% confidence intervals.

The number of persons living with HIV in Washington State continues to grow by approximately 5 percent annually; prompt diagnosis, treatment, and prevention of STIs among this population continues to be a very high priority for public health agencies in order to prevent ongoing HIV transmission. Reducing inequality in the burden of gonorrhea and other STIs among persons with HIV disease is also fundamentally important given the mounting evidence for synergy between the HIV epidemic and incidence of other STIs.

Guidance on the Use of Tabular Data

Tabular data are provided in hopes that community, agency, and local government partners will use these historical data as a valuable resource for future health planning and to provide state-level data to inform comparisons with STI incidence at the local level. Tables include case counts and rates for the current year as well as historical data back through 1999 for a variety of STIs and by age group and gender. Users of these data should keep in mind that small numbers often produce rates that can be unstable from year to year and may not be reliable when comparing across strata within a particular year.

Missing data, such as cases reported without date of birth, race, Hispanic heritage or where the gender of the case is not definatively known (see Table 2), can affect case rates presented throughout this report and in the tabular data. Caution should be used in comparing across categories; additional data may be available from the Washington State Department of Health, STD Services Section, for many of the categories presented in these tables; researchers, public health workers, and others are encouraged to contact the STD Services Section for additional information.

Table 1 - Notifiable STI Cases Diagnosed and Reported by Disease in Washington State, 2009 - 2010 with Annual Percent Change

Disease	2009 Cases	2010 Cases*	Annual % Change
Chlamydia (CT)	21,281	21,401	0.6%
Gonorrhea (GC)	2,283	2,865	25.5%
Primary & Secondary Syphilis	151	261	72.8%
Early and Late Latent Syphilis	227	264	16.3%
Congenital Syphilis	1	1	-
Herpes, Initial Infection	1,877	2,028	8.0%
Neonatal Herpes	4	6	50.0%
Lymphogranuloma Venereum	2	2	0.0%
Chancroid/GI	0	1	-
Total Reportable STIs	**25,826**	**26,829**	3.9%

*Cases diagnosed in the calendar year and reported as of Mar 7th 2011

Table 2 - STI Cases Reported with Missing Demographic Data by Disease and Data Element, Washington State, 2010

	Percent Missing Specific Data Element		
Disease	Date of Birth	Race	Hispanic Ethnicity
Chlamydia (CT)	0.08	24.5	29.59
Gonorrhea (GC)	0.04	21.5	28.3
Primary & Secondary Syphilis	0	8.61	15.23
Total	0.03%	25.18%	33.06%

*Cases diagnosed in the calendar year and reported as of March 2010

Table 3 - Chlamydia and Gonorrhea Cases Diagnosed and Incidence Rate with Rankings by County, 2010

County	2010 Population*	Chlamydia			Gonorrhea		
		Cases†	Rate‡	Rank	Cases†	Rate‡	Rank
Adams	18300	64	349.7	5	2	10.9	28
Asotin	21700	76	350.2	4	5	23.0	15
Benton	172900	585	338.3	7	16	9.3	30
Chelan	73300	170	231.9	24	2	2.7	37
Clallam	70100	164	234.0	23	21	30.0	7
Clark	435600	1347	309.2	12	170	39.0	4
Columbia	4150	7	168.7	34	1	24.1	14
Cowlitz	100000	327	327.0	9	35	35.0	6
Douglas	38500	83	215.6	28	2	5.2	34
Ferry	7850	15	191.1	31	2	25.5	10
Franklin	75500	268	355.0	3	19	25.2	12
Garfield	2300	4	173.9	33	1	43.5	3
Grant	87700	288	328.4	8	17	19.4	18
Grays Harbor	71600	155	216.5	27	5	7.0	21
Island	81100	200	246.6	20	13	16.0	20
Jefferson	29300	58	198.0	30	2	6.8	33
King	1933400	5945	307.5	13	1568	81.1	1
Kitsap	248300	780	314.1	11	48	19.3	19
Kittitas	40500	130	321.0	10	8	19.8	16
Klickitat	20500	36	175.6	32	1	4.9	35
Lewis	75600	157	207.7	29	10	13.2	25
Lincoln	10500	15	142.9	36	1	9.5	29
Mason	57100	137	239.9	22	7	12.3	26
Okanogan	40900	117	286.1	16	3	7.3	31
Pacific	22100	30	135.7	37	1	4.5	36
Pend Oreille	13100	21	160.3	35	0	0.0	38
Pierce	814600	3815	468.3	1	414	50.8	2
San Juan	16500	8	48.5	39	4	24.2	13
Skagit	119300	324	271.6	18	17	14.2	23
Skamania	10900	25	229.4	25	4	36.7	5
Snohomish	711100	1729	243.1	21	191	26.9	9
Spokane	470300	1617	343.8	6	137	29.1	8
Stevens	44300	56	126.4	38	5	11.3	27
Thurston	252400	663	262.7	19	49	19.4	17
Wahkiakum	4150	9	216.9	26	0	0.0	38
Walla Walla	59600	164	275.2	17	9	15.1	22
Whatcom	195500	571	292.1	15	30	15.3	21
Whitman	43600	131	300.5	14	11	25.2	11
Yakima	239100	1110	464.2	2	34	14.2	24
State Total	6733250	21401	**317.8**	**-**	**6733250**	**42.6**	**-**

*Official Washington State population estimates (OFM, April 2011)

†Cases diagnosed in 2010 and reported as of March 2011

‡ Incidence rates based on small numbers are unstable; rates in red exceed 25% relative standard error

Table 4 - Chlamydia - Cases Diagnosed and Incidence Rate by Gender and County, 2010

County	2010 Population*		Chlamydia Cases & Rates†			
	Male	Female	Male	Rate‡	Female	Rate‡
Adams	9357	8943	7	74.8	57	637.4
Asotin	10348	11352	21	202.9	55	484.5
Benton	86153	86747	121	140.4	464	534.9
Chelan	36566	36734	45	123.1	124	337.6
Clallam	34742	35358	38	109.4	126	356.4
Clark	216601	218999	317	146.4	1030	470.3
Columbia	2028	2122	1	49.3	6	282.7
Cowlitz	49651	50349	75	151.1	252	500.5
Douglas	19125	19375	17	88.9	66	340.6
Ferry	4089	3761	8	195.7	7	186.1
Franklin	39451	36049	54	136.9	214	593.6
Garfield	1142	1158	1	87.5	3	259.1
Grant	44907	42793	46	102.4	242	565.5
Grays Harbor	35667	35933	23	64.5	132	367.3
Island	40682	40418	76	186.8	124	306.8
Jefferson	14604	14696	13	89.0	45	306.2
King	963340	970060	2036	211.3	3908	402.9
Kitsap	126101	122199	196	155.4	584	477.9
Kittitas	20170	20330	41	203.3	89	437.8
Klickitat	10276	10224	8	77.9	28	273.9
Lewis	37555	38045	22	58.6	135	354.8
Lincoln	5220	5280	4	76.6	11	208.3
Mason	29539	27561	36	121.9	101	366.5
Okanogan	20480	20420	21	102.5	96	470.1
Pacific	10980	11120	10	91.1	20	179.9
Pend Oreille	6624	6476	5	75.5	16	247.1
Pierce	405630	408970	1028	253.4	2787	681.5
San Juan	8111	8389	2	24.7	6	71.5
Skagit	59210	60090	84	141.9	240	399.4
Skamania	5504	5396	5	90.8	20	370.7
Snohomish	356136	354964	428	120.2	1301	366.5
Spokane	231047	239253	381	164.9	1235	516.2
Stevens	22160	22140	11	49.6	45	203.2
Thurston	123970	128430	129	104.1	534	415.8
Wahkiakum	2081	2069	5	240.3	4	193.3
Walla Walla	30334	29266	42	138.5	122	416.9
Whatcom	96600	98900	135	139.8	436	440.9
Whitman	22111	21489	39	176.4	92	428.1
Yakima	119384	119716	195	163.3	915	764.3
State Total	**3357676**	**3375574**	**5726**	**170.5**	**15672**	**464.3**

*Official Washington State population estimates (OFM, April 2011)

†Crude incidence rate per 100,000, based on cases diagnosed in 2010 and reported as of March 2011

‡ Rates based on small numbers can be unstable; rates in red exceed 25%relative standard error

Table 5 - Gonorrhea - Cases Diagnosed and Incidence Rate by Gender and County, 2010

County	2009 Population*		Gonorrhea Cases & Rates†			
	Male	Female	Male	Rate‡	Female	Rate‡
Adams	9357	8943	1	10.7	1	11.2
Asotin	10348	11352	2	19.3	3	26.4
Benton	86153	86747	7	8.1	9	10.4
Chelan	36566	36734	1	2.7	1	2.7
Clallam	34742	35358	5	14.4	16	45.3
Clark	216601	218999	77	35.5	93	42.5
Columbia	2028	2122	0	0.0	1	47.1
Cowlitz	49651	50349	16	32.2	19	37.7
Douglas	19125	19375	1	5.2	1	5.2
Ferry	4089	3761	1	24.5	1	26.6
Franklin	39451	36049	8	20.3	11	30.5
Garfield	1142	1158	0	0.0	1	86.4
Grant	44907	42793	8	17.8	9	21.0
Grays Harbor	35667	35933	3	8.4	2	5.6
Island	40682	40418	9	22.1	4	9.9
Jefferson	14604	14696	2	13.7	0	0.0
King	963340	970060	1164	120.8	402	41.4
Kitsap	126101	122199	27	21.4	21	17.2
Kittitas	20170	20330	5	24.8	3	14.8
Klickitat	10276	10224	1	9.7	0	0.0
Lewis	37555	38045	4	10.7	6	15.8
Lincoln	5220	5280	1	19.2	0	0.0
Mason	29539	27561	5	16.9	2	7.3
Okanogan	20480	20420	1	4.9	2	9.8
Pacific	10980	11120	0	0.0	1	9.0
Pend Oreille	6624	6476	0	0.0	0	0.0
Pierce	405630	408970	198	48.8	216	52.8
San Juan	8111	8389	2	24.7	2	23.8
Skagit	59210	60090	10	16.9	7	11.6
Skamania	5504	5396	2	36.3	2	37.1
Snohomish	356136	354964	128	35.9	63	17.7
Spokane	231047	239253	71	30.7	66	27.6
Stevens	22160	22140	1	4.5	4	18.1
Thurston	123970	128430	25	20.2	24	18.7
Wahkiakum	2081	2069	0	0.0	0	0.0
Walla Walla	30334	29266	2	6.6	7	23.9
Whatcom	96600	98900	13	13.5	17	17.2
Whitman	22111	21489	2	9.0	9	41.9
Yakima	119384	119716	15	12.6	19	15.9
State Total	**3357676**	**3375574**	**1818**	**54.1**	**1045**	**31.0**

*Official Washington State population estimates (OFM, April 2011)

†Crude incidence rate per 100,000, based on cases diagnosed in 2009 and reported as of March 2010

‡ Rates based on small numbers are unstable; rates in red exceed 25% relative standard error

Table 6 - Chlamydia Cases Diagnosed and Incidence Rate by Age Group and Gender, 1999 - 2010

	Age Group	Total		Males		Females	
		Cases	Rate	Cases	Rate	Cases	Rate
2010	0-9	23	2.6	5	1.1	18	4.2
	10-14	208	47.9	8	3.6	200	94.5
	15-19	6269	1,350.6	1036	435.4	5233	2,313.4
	20-24	8018	1,666.4	1968	798.9	6050	2,576.6
	25-29	3609	742.9	1236	496.2	2373	1,002.5
	30-34	1639	371.0	595	262.6	1044	485.1
	35-39	765	173.1	346	153.2	419	193.8
	40-44	431	93.4	246	104.7	185	81.6
	45+	431	16.3	283	22.4	148	10.7
	Missing	5	0.0	3	0.0	2	0.0
	All Ages	21401	317.8	5726	170.5	15672	464.3
2009	0-9	5	0.6	2	0.4	3	0.7
	10-14	189	43.5	17	7.6	172	81.0
	15-19	6600	1,401.8	1077	445.6	5523	2,410.5
	20-24	8014	1,677.8	2092	855.9	5922	2,539.3
	25-29	3613	752.5	1145	464.7	2468	1,055.8
	30-34	1383	320.1	531	239.6	852	405.0
	35-39	714	157.1	331	142.5	383	172.4
	40-44	359	78.2	194	83.2	165	73.0
	45+	386	14.9	233	18.8	153	11.3
	Missing	17	0.0	4	0.0	13	0.0
	All Ages	21281	319.1	5626	169.2	15654	468.2
2008	0-9	15	1.7	2	0.5	13	3.1
	10-14	226	52.0	19	8.5	207	97.6
	15-19	6433	1,362.7	1046	431.4	5387	2,346.0
	20-24	7752	1,633.4	2119	871.6	5633	2,433.7
	25-29	3542	757.3	1178	490.5	2364	1,038.9
	30-34	1437	339.9	566	261.4	871	422.3
	35-39	701	151.5	318	134.2	383	169.5
	40-44	386	83.2	214	91.1	172	75.0
	45+	396	15.7	249	20.6	147	11.1
	Missing	92	0.0	26	0.0	66	0.0
	All Ages	21031	319.3	5737	174.7	15243	461.5
2007	0-9	10	1.2	7	1.6	3	0.7
	10-14	208	47.6	16	7.1	192	90.2
	15-19	5737	1,226.4	921	383.7	4816	2,114.3
	20-24	6892	1,468.2	1807	750.1	5085	2,225.1
	25-29	3147	699.3	1021	442.6	2126	969.2
	30-34	1269	304.9	527	247.3	742	365.4
	35-39	685	147.1	319	133.8	366	161.1
	40-44	327	69.2	183	76.7	144	61.6
	45+	338	13.7	209	17.8	129	10.0
	Missing	216	0.0	63	0.0	153	0.0
	All Ages	18914	291.5	5073	156.9	13756	422.8
2006	0-9	9	1.1	3	0.7	6	1.5
	10-14	213	48.4	15	6.7	198	92.5
	15-19	5685	1,237.6	854	362.6	4831	2,158.5
	20-24	6702	1,452.4	1769	745.5	4933	2,200.8
	25-29	2973	688.7	1043	471.5	1930	917.1
	30-34	1233	296.5	528	248.1	705	347.2
	35-39	711	154.6	324	137.9	387	172.0
	40-44	360	74.6	214	87.9	146	61.0
	45+	315	13.2	190	16.6	125	10.0
	Missing	192	0.0	56	0.0	136	0.0
	All Ages	18398	288.6	4996	157.2	13397	418.9
2005	0-9	12	1.5	3	0.7	9	2.3
	10-14	247	55.9	14	6.2	233	108.3
	15-19	5879	1,305.3	941	407.7	4938	2,248.6
	20-24	6967	1,552.1	1971	853.9	4996	2,291.1
	25-29	2910	706.1	1088	514.2	1822	908.5
	30-34	1185	280.4	482	223.0	703	340.6
	35-39	615	136.6	296	129.0	319	144.6
	40-44	326	66.4	206	83.4	120	49.2
	45+	262	11.3	160	14.5	102	8.4
	Missing	232	0.0	67	0.0	165	0.0
	All Ages	18645	298.0	5228	167.7	13407	427.1

	Age Group	Total		Males		Females	
		Cases	Rate	Cases	Rate	Cases	Rate
2004	0-9	9	1.1	3	0.7	6	1.5
	10-14	271	60.8	21	9.2	250	115.3
	15-19	6148	1,388.3	987	435.1	5161	2,389.3
	20-24	6990	1,589.5	1916	846.7	5074	2,377.1
	25-29	2739	683.9	964	468.7	1775	911.0
	30-34	1158	267.4	521	235.2	637	301.2
	35-39	593	132.7	294	129.4	299	136.2
	40-44	317	64.0	192	77.1	125	50.8
	45+	255	11.3	182	17.0	73	6.2
	Missing	183	0.0	52	0.0	131	0.0
	All Ages	18673	302.7	5132	167.0	13531	437.1
2003	0-9	11	1.4	5	1.2	6	1.5
	10-14	284	63.6	19	8.3	265	122.0
	15-19	5866	1,335.4	895	397.2	4971	2,323.2
	20-24	6483	1,512.6	1772	803.1	4711	2,265.3
	25-29	2392	609.0	895	444.4	1497	782.0
	30-34	1065	241.0	455	201.0	610	283.1
	35-39	528	116.8	286	124.8	242	108.5
	40-44	238	48.1	129	51.9	109	44.2
	45+	221	10.1	149	14.3	72	6.3
	Missing	270	0.0	85	0.0	185	0.0
	All Ages	17358	284.6	4690	154.4	12668	413.8
2002	0-9	18	2.2	13	3.1	5	1.3
	10-14	262	58.8	14	6.1	248	114.4
	15-19	5363	1,224.9	845	375.5	4518	2,123.1
	20-24	5645	1,354.6	1516	708.1	4129	2,037.7
	25-29	2247	575.3	791	395.1	1456	764.9
	30-34	959	214.2	431	187.8	528	241.9
	35-39	463	100.2	236	100.9	227	99.4
	40-44	238	47.9	126	50.5	112	45.2
	45+	184	8.6	116	11.5	68	6.1
	Missing	190	0.0	45	0.0	145	0.0
	All Ages	15569	257.7	4133	137.4	11436	377.1
2001	0-9	13	1.6	5	1.2	8	2.0
	10-14	252	57.2	18	8.0	234	109.1
	15-19	5062	1,164.0	747	333.5	4315	2,046.3
	20-24	4976	1,230.9	1324	637.6	3652	1,857.3
	25-29	1943	493.0	691	342.2	1252	651.6
	30-34	866	194.6	373	163.9	493	226.7
	35-39	438	92.4	232	96.8	206	87.9
	40-44	216	43.6	128	51.5	88	35.6
	45+	164	7.9	105	10.7	59	5.4
	Missing	182	0.0	53	0.0	129	0.0
	All Ages	14112	236.2	3676	123.6	10436	347.9
2000	0-9	22	2.7	6	1.4	16	4.0
	10-14	298	68.5	15	6.7	283	133.6
	15-19	5042	1,178.1	828	375.7	4214	2,030.3
	20-24	4608	1,181.0	1263	628.9	3345	1,766.4
	25-29	1849	458.1	670	324.0	1179	598.9
	30-34	821	187.7	375	167.8	446	208.3
	35-39	436	90.1	205	84.0	231	96.3
	40-44	204	41.5	107	43.4	97	39.6
	45+	153	7.6	89	9.4	64	6.1
	Missing	189	0.0	53	0.0	136	0.0
	All Ages	13622	231.1	3611	123.1	10011	338.2
1999	0-9	18	2.2	5	1.2	13	3.2
	10-14	252	58.8	12	5.4	240	115.3
	15-19	4408	1,029.2	698	315.7	3710	1,790.4
	20-24	3924	1,048.0	1073	556.5	2851	1,569.5
	25-29	1629	398.2	582	277.7	1047	524.9
	30-34	734	168.4	347	155.0	387	182.5
	35-39	353	72.2	174	70.6	179	73.9
	40-44	170	35.0	85	35.0	85	35.0
	45+	139	7.1	78	8.5	61	5.9
	Missing	263	0.0	58	0.0	205	0.0
	All Ages	11890	203.9	3112	107.1	8778	300.0

Table 7 - Gonorrhea - Cases Diagnosed and Incidence Rate by Age Group and Gender, 1999 - 2010

	Age Group	Total		Males		Females	
		Cases	Rate	Cases	Rate	Cases	Rate
2010	0-9	0	0.0	0	0.0	0	0.0
	10-14	13	3.0	3	1.3	10	4.7
	15-19	432	93.1	128	53.8	304	134.4
	20-24	749	155.7	403	163.6	346	147.4
	25-29	531	109.3	355	142.5	176	74.4
	30-34	374	84.7	288	127.1	86	40.0
	35-39	207	46.8	164	72.6	43	19.9
	40-44	215	46.6	179	76.2	36	15.9
	45+	342	12.9	298	23.5	44	3.2
	Missing	0	0.0	0	0.0	0	0.0
	All Ages	2865	42.6	1818	54.1	1045	31.0
2009	0-9	2	0.2	0	0.0	2	0.5
	10-14	13	3.0	1	0.4	12	5.7
	15-19	387	82.2	108	44.7	279	121.8
	20-24	749	156.8	382	156.3	367	157.4
	25-29	453	94.3	296	120.1	157	67.2
	30-34	212	49.1	152	68.6	60	28.5
	35-39	162	35.6	134	57.7	28	12.6
	40-44	129	28.1	110	47.2	19	8.4
	45+	173	6.7	155	12.5	18	1.3
	Missing	1	0.0	0	0.0	1	0.0
	All Ages	2283	34.2	1338	40.2	943	28.2
2008	0-9	3	0.3	1	0.2	2	0.5
	10-14	36	8.3	3	1.3	33	15.6
	15-19	642	136.0	172	70.9	470	204.7
	20-24	936	197.2	439	180.6	497	214.7
	25-29	561	120.0	316	131.6	245	107.7
	30-34	282	66.7	177	81.7	105	50.9
	35-39	226	48.8	163	68.8	63	27.9
	40-44	154	33.2	117	49.8	37	16.1
	45+	229	9.1	195	16.1	34	2.6
	Missing	9	0.0	5	0.0	4	0.0
	All Ages	3081	46.8	1588	48.3	1490	45.1
2007	0-9	1	0.1	0	0.0	1	0.2
	10-14	43	9.8	7	3.1	36	16.9
	15-19	790	168.9	230	95.8	560	245.9
	20-24	1005	214.1	429	178.1	576	252.0
	25-29	661	146.9	367	159.1	294	134.0
	30-34	361	86.8	219	102.8	142	69.9
	35-39	272	58.4	195	81.8	77	33.9
	40-44	197	41.7	133	55.8	64	27.4
	45+	205	8.3	173	14.7	32	2.5
	Missing	32	0.0	15	0.0	17	0.0
	All Ages	3583	55.2	1768	54.7	1799	55.3
2006	0-9	3	0.4	0	0.0	3	0.7
	10-14	38	8.6	4	1.8	34	15.9
	15-19	858	186.8	243	103.2	615	274.8
	20-24	1196	259.2	556	234.3	640	285.5
	25-29	804	186.3	490	221.5	314	149.2
	30-34	502	120.7	318	149.4	184	90.6
	35-39	401	87.2	275	117.0	126	56.0
	40-44	346	71.7	262	107.7	84	35.1
	45+	368	15.4	304	26.6	64	5.1
	Missing	37	0.0	18	0.0	19	0.0
	All Ages	4555	71.4	2470	77.7	2083	65.1
2005	0-9	2	0.2	1	0.2	1	0.3
	10-14	38	8.6	2	0.9	36	16.7
	15-19	723	160.5	205	88.8	518	235.9
	20-24	1081	240.8	530	229.6	551	252.7
	25-29	631	153.1	407	192.3	224	111.7
	30-34	430	101.8	288	133.3	142	68.8
	35-39	361	80.2	287	125.1	74	33.5
	40-44	305	62.1	256	103.7	49	20.1
	45+	297	12.8	262	23.7	35	2.9
	Missing	28	0.0	14	0.0	14	0.0
	All Ages	3900	62.3	2252	72.2	1644	52.4

	Age Group	Total		Males		Females	
		Cases	Rate	Cases	Rate	Cases	Rate
2004	0-9	4	0.5	3	0.7	1	0.3
	10-14	38	8.5	5	2.2	33	15.2
	15-19	603	136.2	147	64.8	456	211.1
	20-24	758	172.4	394	174.1	364	170.5
	25-29	465	116.1	272	132.2	193	99.1
	30-34	330	76.2	238	107.4	92	43.5
	35-39	311	69.6	240	105.6	71	32.3
	40-44	230	46.4	180	72.3	50	20.3
	45+	230	10.2	204	19.0	26	2.2
	Missing	18	0.0	7	0.0	11	0.0
	All Ages	2991	48.5	1690	55.0	1297	41.9
2003	0-9	2	0.2	0	0.0	2	0.5
	10-14	35	7.8	1	0.4	34	15.7
	15-19	507	115.4	125	55.5	382	178.5
	20-24	733	171.0	353	160.0	380	182.7
	25-29	488	124.2	311	154.4	177	92.5
	30-34	391	88.5	266	117.5	125	58.0
	35-39	293	64.8	241	105.1	52	23.3
	40-44	220	44.4	181	72.9	39	15.8
	45+	232	10.6	200	19.2	32	2.8
	Missing	29	0.0	14	0.0	15	0.0
	All Ages	2930	48.0	1692	55.7	1238	40.4
2002	0-9	2	0.2	0	0.0	2	0.5
	10-14	29	6.5	1	0.4	28	12.9
	15-19	593	135.4	187	83.1	406	190.8
	20-24	856	205.4	444	207.4	412	203.3
	25-29	481	123.2	314	156.8	167	87.7
	30-34	372	83.1	296	129.0	76	34.8
	35-39	316	68.4	251	107.3	65	28.5
	40-44	195	39.2	160	64.1	35	14.1
	45+	195	9.2	161	15.9	34	3.0
	Missing	18	0.0	13	0.0	5	0.0
	All Ages	3057	50.6	1827	60.7	1230	40.6
2001	0-9	4	0.5	1	0.2	3	0.8
	10-14	37	8.4	3	1.3	34	15.9
	15-19	653	150.2	181	80.8	472	223.8
	20-24	889	219.9	479	230.7	410	208.5
	25-29	481	122.1	295	146.1	186	96.8
	30-34	387	87.0	278	122.1	109	50.1
	35-39	306	64.5	243	101.4	63	26.9
	40-44	190	38.3	151	60.7	39	15.8
	45+	171	8.3	151	15.4	20	1.8
	Missing	35	0.0	20	0.0	15	0.0
	All Ages	3153	52.8	1802	60.6	1351	45.0
2000	0-9	2	0.2	1	0.2	1	0.3
	10-14	28	6.4	4	1.8	24	11.3
	15-19	528	123.4	145	65.8	383	184.5
	20-24	658	168.6	305	151.9	353	186.4
	25-29	391	96.9	249	120.4	142	72.1
	30-34	338	77.3	229	102.5	109	50.9
	35-39	261	53.9	200	82.0	61	25.4
	40-44	150	30.5	121	49.1	29	11.8
	45+	172	8.6	147	15.5	25	2.4
	Missing	25	0.0	13	0.0	12	0.0
	All Ages	2553	43.3	1414	48.2	1139	38.5
1999	0-9	4	0.5	0	0.0	4	1.0
	10-14	27	6.3	3	1.4	24	11.5
	15-19	526	122.8	127	57.4	399	192.6
	20-24	557	148.8	265	137.4	292	160.8
	25-29	375	91.7	243	115.9	132	66.2
	30-34	247	56.7	185	82.6	62	29.2
	35-39	187	38.3	134	54.4	53	21.9
	40-44	114	23.5	94	38.7	20	8.2
	45+	76	3.9	65	7.1	11	1.1
	Missing	35	0.0	17	0.0	18	0.0
	All Ages	2148	36.8	1133	39.0	1015	34.7

Table 8 - Primary & Secondary Syphilis Cases Diagnosed and Incidence Rate by Age Group and Gender, 1999 - 2010

	Age Group	Total		Males		Females	
		Cases	Rate	Cases	Rate	Cases	Rate
2010	0-9	0	0.0	0	0.0	0	0.0
	10-14	0	0.0	0	0.0	0	0.0
	15-19	3	0.6	2	0.8	1	0.4
	20-24	20	4.2	19	7.7	1	0.4
	25-29	41	8.4	40	16.1	1	0.4
	30-34	30	6.8	30	13.2	0	0.0
	35-39	36	8.1	36	15.9	0	0.0
	40-44	49	10.6	48	20.4	1	0.4
	45+	82	3.1	81	6.4	1	0.1
	Missing	0	0.0	0	0.0	0	0.0
	All Ages	261	3.9	256	7.6	5	0.1
2009	0-9	0	0.0	0	0.0	0	0.0
	10-14	0	0.0	0	0.0	0	0.0
	15-19	1	0.2	1	0.4	0	0.0
	20-24	17	3.6	17	7.0	0	0.0
	25-29	15	3.1	15	6.1	0	0.0
	30-34	29	6.7	28	12.6	1	0.5
	35-39	22	4.8	19	8.2	3	1.4
	40-44	30	6.5	29	12.4	1	0.4
	45+	37	1.4	36	2.9	1	0.1
	Missing	0	0.0	0	0.0	0	0.0
	All Ages	151	2.3	145	4.4	6	0.2
2008	0-9	0	0.0	0	0.0	0	0.0
	10-14	0	0.0	0	0.0	0	0.0
	15-19	5	1.1	4	1.6	1	0.4
	20-24	22	4.6	21	8.6	1	0.4
	25-29	21	4.5	21	8.7	0	0.0
	30-34	25	5.9	24	11.1	1	0.5
	35-39	23	5.0	23	9.7	0	0.0
	40-44	29	6.2	28	11.9	1	0.4
	45+	52	2.1	51	4.2	1	0.1
	Missing	0	0.0	0	0.0	0	0.0
	All Ages	177	2.7	172	5.2	5	0.2
2007	0-9	0	0.0	0	0.0	0	0.0
	10-14	0	0.0	0	0.0	0	0.0
	15-19	6	1.3	4	1.7	2	0.9
	20-24	13	2.8	13	5.4	0	0.0
	25-29	16	3.6	16	6.9	0	0.0
	30-34	29	7.0	29	13.6	0	0.0
	35-39	36	7.7	35	14.7	1	0.4
	40-44	25	5.3	24	10.1	1	0.4
	45+	47	1.9	45	3.8	2	0.2
	Missing	0	0.0	0	0.0	0	0.0
	All Ages	172	2.7	166	5.1	6	0.2
2006	0-9	0	0.0	0	0.0	0	0.0
	10-14	0	0.0	0	0.0	0	0.0
	15-19	5	1.1	5	2.1	0	0.0
	20-24	10	2.2	9	3.8	1	0.4
	25-29	18	4.2	17	7.7	1	0.5
	30-34	24	5.8	23	10.8	1	0.5
	35-39	27	5.9	27	11.5	0	0.0
	40-44	32	6.6	32	13.2	0	0.0
	45+	41	1.7	40	3.5	1	0.1
	Missing	2	0.0	2	0.0	0	0.0
	All Ages	159	2.5	155	4.9	4	0.1
2005	0-9	0	0.0	0	0.0	0	0.0
	10-14	0	0.0	0	0.0	0	0.0
	15-19	5	1.1	5	2.2	0	0.0
	20-24	24	5.3	22	9.5	2	0.9
	25-29	24	5.8	23	10.9	1	0.5
	30-34	17	4.0	17	7.9	0	0.0
	35-39	47	10.4	45	19.6	2	0.9
	40-44	37	7.5	37	15.0	0	0.0
	45+	24	1.0	23	2.1	1	0.1
	Missing	0	0.0	0	0.0	0	0.0
	All Ages	179	2.9	172	5.5	6	0.2

	Age Group	Total		Males		Females	
		Cases	Rate	Cases	Rate	Cases	Rate
2004	0-9	0	0.0	0	0.0	0	0.0
	10-14	0	0.0	0	0.0	0	0.0
	15-19	2	0.5	0	0.0	2	0.9
	20-24	18	4.1	18	8.0	0	0.0
	25-29	19	4.7	17	8.3	2	1.0
	30-34	32	7.4	32	14.4	0	0.0
	35-39	36	8.1	36	15.8	0	0.0
	40-44	29	5.9	27	10.8	2	0.8
	45+	15	0.7	15	1.4	0	0.0
	Missing	0	0.0	0	0.0	0	0.0
	All Ages	151	2.4	145	4.7	6	0.2
2003	0-9	0	0.0	0	0.0	0	0.0
	10-14	0	0.0	0	0.0	0	0.0
	15-19	3	0.7	3	1.3	0	0.0
	20-24	7	1.6	7	3.2	0	0.0
	25-29	13	3.3	12	6.0	1	0.5
	30-34	22	5.0	21	9.3	1	0.5
	35-39	19	4.2	18	7.9	1	0.4
	40-44	10	2.0	10	4.0	0	0.0
	45+	9	0.4	8	0.8	1	0.1
	Missing	0	0.0	0	0.0	0	0.0
	All Ages	83	1.4	79	2.6	4	0.1
2002	0-9	0	0.0	0	0.0	0	0.0
	10-14	0	0.0	0	0.0	0	0.0
	15-19	1	0.2	1	0.4	0	0.0
	20-24	4	1.0	3	1.4	1	0.5
	25-29	11	2.8	11	5.5	0	0.0
	30-34	10	2.2	10	4.4	0	0.0
	35-39	21	4.5	21	9.0	0	0.0
	40-44	16	3.2	16	6.4	0	0.0
	45+	10	0.5	10	1.0	0	0.0
	Missing	0	0.0	0	0.0	0	0.0
	All Ages	73	1.2	72	2.4	1	0.0
2001	0-9	0	0.0	0	0.0	0	0.0
	10-14	0	0.0	0	0.0	0	0.0
	15-19	4	0.9	1	0.4	3	1.4
	20-24	7	1.7	5	2.4	2	1.0
	25-29	8	2.0	8	4.0	0	0.0
	30-34	15	3.4	14	6.2	1	0.5
	35-39	9	1.9	9	3.8	0	0.0
	40-44	6	1.2	6	2.4	0	0.0
	45+	4	0.2	3	0.3	1	0.1
	Missing	0	0.0	0	0.0	0	0.0
	All Ages	53	0.9	46	1.5	7	0.2
2000	0-9	0	0.0	0	0.0	0	0.0
	10-14	0	0.0	0	0.0	0	0.0
	15-19	3	0.7	1	0.5	2	1.0
	20-24	5	1.3	4	2.0	1	0.5
	25-29	11	2.7	11	5.3	0	0.0
	30-34	14	3.2	13	5.8	1	0.5
	35-39	14	2.9	12	4.9	2	0.8
	40-44	10	2.0	9	3.7	1	0.4
	45+	14	0.7	13	1.4	1	0.1
	Missing	0	0.0	0	0.0	0	0.0
	All Ages	71	1.2	63	2.1	8	0.3
1999	0-9	0	0.0	0	0.0	0	0.0
	10-14	0	0.0	0	0.0	0	0.0
	15-19	1	0.2	1	0.5	0	0.0
	20-24	2	0.5	2	1.0	0	0.0
	25-29	15	3.7	15	7.2	0	0.0
	30-34	20	4.6	19	8.5	1	0.5
	35-39	18	3.7	17	6.9	1	0.4
	40-44	15	3.1	14	5.8	1	0.4
	45+	6	0.3	6	0.7	0	0.0
	Missing	0	0.0	0	0.0	0	0.0
	All Ages	77	1.3	74	2.5	3	0.1

Table 9 - Initial Genital Herpes Cases Diagnosed and Incidence Rate by Age Group and Gender, 1999 - 2010

	Age Group	Total		Males		Females	
		Cases	Rate	Cases	Rate	Cases	Rate
2010	0-9	5	0.6	0	0.0	5	1.2
	10-14	11	2.5	1	0.4	10	4.7
	15-19	291	62.7	34	14.3	257	113.6
	20-24	547	113.7	137	55.6	410	174.6
	25-29	398	81.9	116	46.6	282	119.1
	30-34	242	54.8	90	39.7	152	70.6
	35-39	133	30.1	53	23.5	80	37.0
	40-44	123	26.6	41	17.5	82	36.2
	45+	275	10.4	73	5.8	202	14.6
	Missing	3	0.0	1	0.0	2	0.0
	All Ages	2028	30.1	546	16.3	1482	43.9
2009	0-9	8	0.9	2	0.4	6	1.4
	10-14	9	2.1	1	0.4	8	3.8
	15-19	261	55.4	32	13.2	229	99.9
	20-24	566	118.5	124	50.7	442	189.5
	25-29	385	80.2	128	51.9	257	109.9
	30-34	198	45.8	73	32.9	125	59.4
	35-39	127	27.9	53	22.8	74	33.3
	40-44	94	20.5	25	10.7	69	30.5
	45+	222	8.6	69	5.6	153	11.3
	Missing	7	0.0	0	0.0	7	0.0
	All Ages	1877	28.1	507	15.2	1370	41.0
2008	0-9	0	0.0	0	0.0	0	0.0
	10-14	8	1.8	2	0.9	6	2.8
	15-19	279	59.1	24	9.9	255	111.1
	20-24	544	114.6	130	53.5	414	178.9
	25-29	388	83.0	110	45.8	278	122.2
	30-34	210	49.7	77	35.6	133	64.5
	35-39	144	31.1	50	21.1	94	41.6
	40-44	113	24.3	38	16.2	75	32.7
	45+	241	9.5	70	5.8	171	12.9
	Missing	31	0.0	8	0.0	23	0.0
	All Ages	1980	30.1	509	15.5	1449	43.9
2007	0-9	4	0.5	0	0.0	4	1.0
	10-14	8	1.8	1	0.4	7	3.3
	15-19	291	62.2	31	12.9	260	114.1
	20-24	559	119.1	148	61.4	411	179.8
	25-29	351	78.0	114	49.4	237	108.0
	30-34	182	43.7	61	28.6	121	59.6
	35-39	148	31.8	49	20.6	99	43.6
	40-44	110	23.3	38	15.9	72	30.8
	45+	203	8.2	47	4.0	156	12.1
	Missing	72	0.0	22	0.0	50	0.0
	All Ages	1946	30.0	511	15.8	1417	43.5
2006	0-9	3	0.4	1	0.2	2	0.5
	10-14	6	1.4	0	0.0	6	2.8
	15-19	330	71.8	34	14.4	296	132.3
	20-24	734	159.1	170	71.6	564	251.6
	25-29	477	110.5	139	62.8	338	160.6
	30-34	241	58.0	69	32.4	172	84.7
	35-39	162	35.2	53	22.6	109	48.4
	40-44	122	25.3	37	15.2	85	35.5
	45+	296	12.4	75	6.6	221	17.6
	Missing	55	0.0	18	0.0	37	0.0
	All Ages	2426	38.1	596	18.8	1830	57.2
2005	0-9	3	0.4	1	0.2	2	0.5
	10-14	9	2.0	0	0.0	9	4.2
	15-19	361	80.2	35	15.2	326	148.4
	20-24	677	150.8	158	68.4	519	238.0
	25-29	393	95.4	141	66.6	252	125.7
	30-34	249	58.9	92	42.6	157	76.1
	35-39	176	39.1	57	24.8	119	53.9
	40-44	138	28.1	46	18.6	92	37.7
	45+	246	10.6	65	5.9	181	14.9
	Missing	54	0.0	19	0.0	35	0.0
	All Ages	2306	36.9	614	19.7	1692	53.9

	Age Group	Total		Males		Females	
		Cases	Rate	Cases	Rate	Cases	Rate
2004	0-9	2	0.2	1	0.2	1	0.3
	10-14	7	1.6	0	0.0	7	3.2
	15-19	381	86.0	46	20.3	335	155.1
	20-24	645	146.7	146	64.5	499	233.8
	25-29	370	92.4	97	47.2	273	140.1
	30-34	192	44.3	76	34.3	116	54.8
	35-39	161	36.0	57	25.1	104	47.4
	40-44	126	25.4	53	21.3	73	29.6
	45+	206	9.1	61	5.7	145	12.3
	Missing	58	0.0	17	0.0	41	0.0
	All Ages	2148	34.8	554	18.0	1594	51.5
2003	0-9	0	0.0	0	0.0	0	0.0
	10-14	11	2.5	0	0.0	11	5.1
	15-19	358	81.5	33	14.6	325	151.9
	20-24	588	137.2	128	58.0	460	221.2
	25-29	381	97.0	122	60.6	259	135.3
	30-34	208	47.1	83	36.7	125	58.0
	35-39	149	32.9	51	22.2	98	43.9
	40-44	92	18.6	33	13.3	59	23.9
	45+	182	8.3	53	5.1	129	11.2
	Missing	76	0.0	16	0.0	60	0.0
	All Ages	2045	33.5	519	17.1	1526	49.9
2002	0-9	0	0.0	0	0.0	0	0.0
	10-14	5	1.1	0	0.0	5	2.3
	15-19	318	72.6	46	20.4	272	127.8
	20-24	560	134.4	156	72.9	404	199.4
	25-29	305	78.1	104	51.9	201	105.6
	30-34	219	48.9	76	33.1	143	65.5
	35-39	143	30.9	62	26.5	81	35.5
	40-44	113	22.7	43	17.2	70	28.3
	45+	191	9.0	65	6.4	126	11.3
	Missing	60	0.0	15	0.0	45	0.0
	All Ages	1914	31.7	567	18.8	1347	44.4
2001	0-9	0	0.0	0	0.0	0	0.0
	10-14	10	2.3	1	0.4	9	4.2
	15-19	276	63.5	37	16.5	239	113.3
	20-24	497	122.9	122	58.8	375	190.7
	25-29	306	77.6	107	53.0	199	103.6
	30-34	206	46.3	75	32.9	131	60.3
	35-39	156	32.9	62	25.9	94	40.1
	40-44	111	22.4	36	14.5	75	30.4
	45+	182	8.8	48	4.9	134	12.3
	Missing	57	0.0	17	0.0	40	0.0
	All Ages	1801	30.1	505	17.0	1296	43.2
2000	0-9	3	0.4	2	0.5	1	0.3
	10-14	15	3.4	0	0.0	15	7.1
	15-19	346	80.8	37	16.8	309	148.9
	20-24	538	137.9	136	67.7	402	212.3
	25-29	362	89.7	116	56.1	246	125.0
	30-34	187	42.7	53	23.7	134	62.6
	35-39	171	35.3	68	27.9	103	42.9
	40-44	108	22.0	34	13.8	74	30.2
	45+	150	7.5	45	4.7	105	9.9
	Missing	48	0.0	13	0.0	35	0.0
	All Ages	1928	32.7	504	17.2	1424	48.1
1999	0-9	1	0.1	0	0.0	1	0.2
	10-14	13	3.0	0	0.0	13	6.2
	15-19	326	76.1	57	25.8	269	129.8
	20-24	563	150.4	133	69.0	430	236.7
	25-29	346	84.6	124	59.2	222	111.3
	30-34	227	52.1	86	38.4	141	66.5
	35-39	146	29.9	51	20.7	95	39.2
	40-44	117	24.1	44	18.1	73	30.0
	45+	159	8.2	38	4.1	121	11.8
	Missing	83	0.0	22	0.0	61	0.0
	All Ages	1981	34.0	555	19.1	1426	48.7

Summary of 2010 Treatment Guidelines

These guidelines for the treatment of patients with STDs reflect the 2010 CDC Sexually Transmitted Diseases Treatment Guidelines. They are intended as a brief source of clinical guidance; they are not a comprehensive list of all effective regimens, and should not be construed as standards. The focus is primarily on STDs encountered in office practice and treatment regimens for infants, children, HIV infected patients, or pregnant women are not included (see complete Guidelines). The complete guidelines are available from the STD Program at (360) 236-3460 or the website www.doh.wa.gov/cfh/STD. Confidential notification of sexual partners is an important component of STD treatment.

DISEASE	RECOMMENDED RX	DOSE/ROUTE	ALTERNATIVES
CHLAMYDIAL INFECTIONS[1] Adults or adolescents with uncomplicated infection of the cervix, urethra or rectum. Pregnant women[5]	Azithromycin[2] OR Doxycycline[3]	1 g orally in a single dose 100 mg orally 2x/day for 7 days	Erythromycin base 500 mg orally 4x/day for 7 days OR Erythromycin ethylsuccinate 800mg orally 4x/day for 7 days OR Levofloxacin[3,4] 500 mg orally once daily for 7 days OR Ofloxacin[3,4] 300 mg orally 2x/day for 7 days
GONOCOCCAL INFECTIONS[1] Adults or adolescents with uncomplicated infection of the cervix, urethra or rectum. *Regimen recommended for treatment of pharyngeal infection with *Neisseria gonorrhoeae*. Pregnant women[5]	*Ceftriaxone PLUS Azithromycin[2] OR Doxycycline[3]	250 mg IM in a single dose 1 g orally in a single dose 100 mg orally 2x/day for 7 days	Cefixime 400 mg orally in a single dose PLUS Azithromycin[2] 1 g orally in a single dose OR Doxycycline[3] 100 mg orally 2x/day for 7 days OR Azithromycin[2] 2 g orally in a single dose Fluoroquinolones (levofloxacin, ciprofloxacin, etc.) are no longer recommended for the treatment of gonorrhea due to increased prevalence of quinolone-resistant *Neisseria gonorrhoeae* (QRNG)[5]
NONGONOCOCCAL URETHRITIS (NGU) Recurrent/persistent urethritis[5]	Azithromycin OR Doxycycline	1 g orally in a single dose 100 mg orally 2x/day for 7 days	Erythromycin base 500 mg orally 4x/day for 7 days OR Erythromycin ethylsuccinate 800 mg orally 4x/day for 7 days OR Levofloxacin 500 mg orally once daily for 7 days OR Ofloxacin 300 mg orally 2x/day for 7 days
EPIDIDYMITIS[6]	Ceftriaxone PLUS Doxycycline (For acute epididymitis most likely caused by gonococcal or chlamydial infection)	250 mg IM in a single dose 100 mg orally 2x/day for 10 days	Levofloxacin 500 mg orally once daily for 10 days OR Ofloxacin 300 mg orally 2x/day for 10 days (For acute epididymitis most likely caused by enteric organisms)
PELVIC INFLAMMATORY DISEASE[5,6] **Outpatient management** Pregnant women[5]	Ceftriaxone PLUS Doxycycline[3] WITH OR WITHOUT Metronidazole[7] OR	250 mg IM in a single dose 100 mg orally 2x/day for 14 days 500 mg orally 2x/day for 14 days	
	Cefoxitin AND Probenecid PLUS Doxycycline[3] WITH OR WITHOUT Metronidazole[7] OR	2 g IM in a single dose 1 g orally in a single dose concurrently 100 mg orally 2x/day for 14 days 500 mg orally 2x/day for 14 days	
	Other parenteral 3rd generation cephalosporin[5] PLUS Doxycycline[3] WITH OR WITHOUT Metronidazole[7]	 100 mg orally 2x/day for 14 days 500 mg orally 2x/day for 14 days	
SYPHILIS[5] Early-primary, secondary or latent < 1 year	Benzathine penicillin G	2.4 million units IM in a single dose	Doxycycline[3,8,9] 100 mg orally 2x/day for 14 days OR Tetracycline[3,8,9] 500 mg orally 4x/day for 14 days OR Azithromycin[10] 2 g orally in a single dose
Latent > 1 year, latent of unknown duration, tertiary (cardiovascular, gummatous)	Benzathine penicillin G	2.4 million units IM for 3 doses at 1 week intervals (7.2 million units total)	Doxycycline[3,8,9] 100 mg orally 2x/day for 28 days OR Tetracycline[3,8,9] 500 mg orally 4x/day for 28 days
HUMAN PAPILLOMAVIRUS External genital and perianal warts Pregnant women[5]	Patient Applied Podofilox[11] OR Imiquimod[11,12] OR Sinecatechins[11,12] Provider Applied Cryotherapy with liquid nitrogen or cryoprobe OR Podophyllin resin [11] OR Trichloroacetic acid (TCA) or Bichloroacetic acid (BCA) OR Surgical removal	 0.5% solution or gel, apply to visible warts 2x/day for 3 days, rest 4 days, 4 cycles max 5% cream, apply once daily at bedtime, 3x/wk for up to 16 wks, wash off after 6-10 hrs 15% ointment, apply 3x/day for ≤16 weeks Repeat application every 1-2 weeks 10%-25% in a compound tincture of benzoin, apply small amount, dry, wash off in 1-4 hrs 80%-90%, apply small amount, dry. Apply weekly if necessary.	Intralesional interferon OR Photodynamic therapy OR Topical cidofovir[5] Note: Two HPV vaccines are available, both of which offer protection against the HPV types that cause 70% of cervical cancers; the quadrivalent vaccine (Gardisil) also protects against the types that cause 90% of genital warts. These vaccines are most effective when all doses are administered before sexual contact.
TRICHOMONIASIS Pregnant women[5]	Metronidazole[7] OR Tinidazole[7]	2 g orally in a single dose 2 g orally in a single dose	Metronidazole[7] 500 mg orally 2x/day for 7 days
BACTERIAL VAGINOSIS Pregnant women[5]	Metronidazole[7] OR Metronidazole[7] Clindamycin[12] OR	500 mg orally 2x/day for 7 days 0.75% gel, one full applicator (5 g) intravaginally once a day for 5 days 2% cream, one full applicator (5 g) intravaginally at bedtime for 7 days	Tinidazole[7] 2g orally once daily for 2 days OR Tinidazole[7] 1 g orally once daily for 5 days OR Clindamycin 300 mg orally 2x/day for 7 days OR Clindamycin ovules[12] 100 mg intravaginally once at bedtime for 3 days

VULVOVAGINAL CANDIDIASIS	Over-the-Counter			
Uncomplicated – see complete guidelines for recurrent, severe, or non-albicans candidiasis[5]	Butoconazole[12]	OR	2% cream 5 g intravaginally for 3 days	
	Clotrimazole[12]	OR	1% cream 5 g intravaginally for 7-14 days	
	Clotrimazole[12]	OR	2% cream 5 g intravaginally for 3 days	
Pregnant women[5]	Miconazole[12]	OR	2% cream 5 g intravaginally for 7 days	
	Miconazole[12]	OR	4% cream 5 g intravaginally for 3 days	
	Miconazole[12]	OR	100 mg vaginal suppository, one suppository for 7 days	
	Miconazole[12]	OR	200 mg vaginal suppository, one suppository for 3 days	
	Miconazole[12]	OR	1200 mg vaginal suppository, one suppository for 1 day	
	Tioconazole[12]	OR	6.5% ointment 5 g intravaginally in a single application	
	Prescription			
	Butoconazole[12]	OR	2% cream 5 g (single dose bioadhesive product) intravaginally for 1 day	
	Nystatin[12]	OR	100,000 U vaginal tablet, 1 tablet for 14 days	
	Terconazole[12]	OR	0.4% cream 5 g intravaginally for 7 days	
	Terconazole[12]	OR	0.8% cream 5 g intravaginally for 3 days	
	Terconazole[12]	OR	80 mg vaginal suppository, one suppository for 3 days	
	Fluconazole[3]		150 mg oral tablet, one tablet in a single dose	
GENITAL HERPES SIMPLEX	Acyclovir[11]	OR	400 mg orally 3x/day for 7-10 days[13]	
First clinical episode of genital herpes	Acyclovir[11]	OR	200 mg orally 5x/day for 7-10 days[13]	
	Famciclovir[11]	OR	250 mg orally 3x/day for 7-10 days[13]	
	Valacyclovir[11]		1 g orally 2x/day for 7-10 days[13]	
Episodic recurrent infection	Acyclovir[11]	OR	400 mg orally 3x/day for 5 days	
HIV-infected persons[5]	Acyclovir[11]	OR	800 mg orally 2x/day for 5 days	
	Acyclovir[11]	OR	800 mg orally 3x/day for 2 days	
	Famciclovir[11]	OR	125 mg orally 2x/day for 5 days	
	Famciclovir[11]	OR	1000 mg orally 2x/day for 1 day	
	Famciclovir[11]	OR	500 mg orally once, followed by 250mg 2x/day for 2 days	
	Valacyclovir[11]	OR	500 mg orally 2x/day for 3 days	
	Valacyclovir[11]		1 g orally once a day for 5 days	
Suppressive therapy[14]	Acyclovir[11]	OR	400 mg orally 2x/day	
	Famciclovir[11]	OR	250 mg orally 2x/day	
HIV-infected persons[5]	Valacyclovir[11]	OR	500 mg orally once a day[15]	
	Valacyclovir[11]		1 g orally once a day	
PEDICULOSIS PUBIS	Permethrin	OR	1% cream rinse, apply to affected area, wash off after 10 minutes	Malathion 0.5% lotion applied for 8-12 hours and washed OR
	Pyrethrins with piperonyl butoxide		Apply to affected area, wash off after 10 mins	Ivermectin 250 ug/kg orally, repeated in 2 weeks
SCABIES	Permethrin	OR	5% cream, apply to all areas of body from neck down, wash off after 8-14 hours	Lindane 1%[16] 1 oz. of lotion or 30 g of cream applied thinly to all areas of the body from the neck down, wash off after 8 hours
	Ivermectin		200ug/kg orally, repeated in 2 weeks	

1. Providers should advise all persons with chlamydial or gonococcal infection to be rescreened 3 months after treatment, to detect possible reinfection.
2. Clinical experience and studies suggest that azithromycin is safe and effective for use in pregnant women.
3. Contraindicated during pregnancy.
4. Quinolones other than ofloxacin and levofloxacin are not reliably effective against chlamydial infection or have not been evaluated adequately.
5. Please refer to the complete 2010 CDC Guidelines for recommended regimens.
6. Patients who do not respond to out-patient therapy (within 3 days for PID or epididymitis) should be re-evaluated.
7. Patients should be advised to avoid consuming alcohol during treatment.
8. No alternatives to penicillin have been proven effective for treatment of syphilis during pregnancy. Close serological and clinical follow-up should be undertaken with these therapies.
9. Patients with penicillin allergy whose compliance with therapy and/or clinical and serological follow-up cannot be ensured should be desensitized and treated with benzathine penicillin.
10. Azithromycin should not be used for early syphilis in MSM (men who have sex with men) or pregnant women.
11. Safety during pregnancy has not been established.
12. Presence of treatment may weaken condoms and vaginal diaphragms. Refer to product labeling for further information.
13. Treatment may be extended if healing is incomplete after 10 days of therapy.
14. During suppressive treatment (e.g., once a year) providers should discuss the need to continue therapy with the patient.
15. Valacyclovir 500mg once a day might be less effective than other dosing regimens in patients who have very frequent recurrences (i.e., e”10 episodes per year).
16. Should not be used immediately after a bath or shower, or by persons who have extensive dermatitis, pregnant or lactating women, or children aged <2 years.

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FieldNote

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