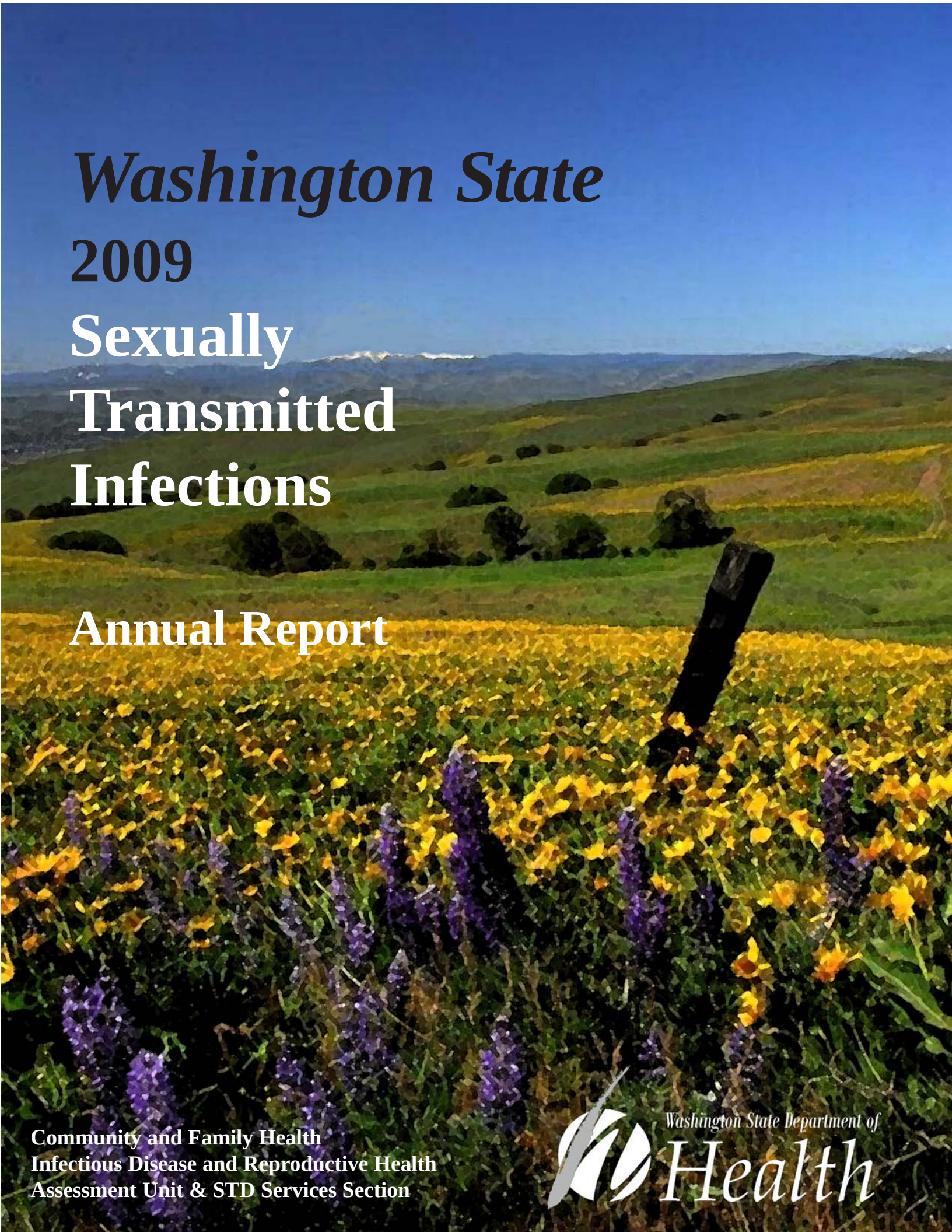

Washington State
2009
Sexually Transmitted Infections

Annual Report

Community and Family Health
Infectious Disease and Reproductive Health
Assessment Unit & STD Services Section

Washington State Department of Health

Washington State
2009
Sexually Transmitted Infection Morbidity

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Washington State
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Preface to the 2009 Edition

In 2008, the STD Services Section released a major revision of the STI Annual Report. The 2009 report retains this new format and contains updated charts, figures and discussions based on cases diagnosed in 2009 and reported through March 2010. Much of the background discussion contained in the 2008 STI Annual Report continues to be relevant and is reprinted here with revisions designed to better meet Washington State government 'plain talk' objectives. Subsequent editions of this report are planned to include analysis of the social determinants of STIs and enhanced interpretation of parallel epidemics across multiple disease categories such as HIV, viral hepatitis and tuberculosis.

EXECUTIVE SUMMARY

The 2009 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 2009, there were 21,178 cases diagnosed and reported for a statewide crude incidence rate of 317.6 per 100,000 persons. The 2009 incidence rate for females was 467.1 per 100,000, compared to an incidence rate for males of 167.3 per 100,000. The chlamydial infection incidence rate for 2009 was almost the same as the rate seen in 2008. Chlamydial infection rates have been increasing since the middle of the last decade but the rate of increase has slowed since 2003.

Gonorrhea

In 2009, 2,268 cases of gonorrhea were diagnosed and reported compared to 3,069 in 2008. The incidence rate of gonorrhea decreased steadily and significantly from 71.4 per 100,000 in 2006 to 34.0 per 100,000 in 2009. The burden of gonorrhea in 2009 continues to be highest in urban settings and among men who have sex with other men (MSM).

Syphilis

There were 135 cases of primary and secondary (P & S) syphilis diagnosed and reported in 2009. This is a significant decrease from the number of cases (177) reported in 2008. The statewide P & S syphilis rate decreased 18% to 2.2 cases per 100,000 in 2009 compared to 2.7 cases per 100,000 in 2008. Syphilis remains endemic at high levels among MSM in the state's largest urban centers. Persistent incidence among this population presents unique challenges to ongoing disease prevention and control efforts. One case of congenital syphilis was reported in 2009.

Other STDs

In 2009, 1,875 cases of initial genital herpes simplex virus (HSV-1 and/or HSV-2) were diagnosed and reported for an incidence rate of 28.1 per 100,000, a slight decrease from 2008. New genital herpes infections are often difficult to distinguish from old infections. Reports may not reflect all new infections. Yet the reported case rate has been stable over the last decade. The rate of new infections is likely stable as well.

Four cases of suspected neonatal herpes were reported among live births in Washington State in 2009. Two cases of lymphogranuloma (LGV) were reported in 2009. No cases of chancroid or of granuloma inguinale (GI) were reported in Washington State in 2009.

* 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. Missing cases were redistributed based on the proportion of known cases for calculating overall rates.

Beginning in January of 2008, LHJs in Washington State began using a statewide 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 management 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 2009 disease incidence rates for all Washington counties are calculated by dividing the number of cases diagnosed for that county in 2009 by the estimated 2009 population for each county and multiplying by 100,000. Official population forecasts were obtained from the Washington State Office of Financial Management, released in November of 2009.

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 with small cell sizes. Relative standard errors (RSE) are calculated and rates with RSE values of 30 percent or higher are noted in tables 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 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 HIV and STI case registries was performed and used first and last name, date of birth and gender to identify unique person-matches. Both registries also stored information on alternate patient names (such as change from maiden to married name) and these were matched as alias records. Potentially matching records were manually reviewed and all ambiguous matches were discarded.

Data Limitations

STI cases diagnosed in a clinic (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 2009 and reported through March of 2010. 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 STD Services Section at 360.236.3460.

All of the statistical analyses presented in this report were conducted using SAS 9.1.3 (SAS Institute Inc., Cary, NC), maps were produced with ArcMap 9.2 (ESRI, Redlands, CA) and charts produced using Microsoft Excel 2003 (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 2009. This report is intended to give public health professionals working at the local and state levels information to help direct policy and promote planning of disease prevention programs.

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 help shed light on broader health inequalities by gender, race, Hispanic ethnicity, age, and other markers of socioeconomic status. Understanding how social inequities emerge in the context of STIs may also provide the public health community with key insights into structural changes needed to address health related consequences of social, cultural, and economic inequities. These insights may be very timely in light of ongoing efforts to change health care delivery systems and to reform health insurance.

Infection with sexually transmitted infections is preventable through the adoption and consistent use of healthier sexual practices including; condom use, limiting the number of sex partners, avoiding more than one partner at the same time, and being abstinent where appropriate. Testing sexually active patients for STIs routinely is not yet the standard of care in all health care settings. Many people may not be aware of their STI status. Higher rates of STIs seen in some communities in Washington should raise questions about possible barriers to screening, diagnostic and treatment services. There may also be a gap in educational resources for persons at greatest risk for STIs. These and other issues should be kept in mind when comparing rates across jurisdictions where major differences are seen. There may also be a relationship between rates of human immunodeficiency virus (HIV) and other STIs. Understanding historical incidence 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 Washington 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 throughout Washington State, though not all of these are reported to the health department. These STIs are considered to be endemic, in that enough people are infected at any given time to sustain ongoing spread. 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 a specific risk factor.

Transmission Dynamics

It is very important to consider how STIs are spread when drawing conclusions from the data presented in this report. STIs are spread through sexual networks, the make-up and features of which are strongly influenced by cultural and social norms. Partner choice is consciously, and often unconsciously, guided by complex and subtle rules reflecting cultural beliefs as well as individual preferences. For some individuals and cultural groups, this may limit partner choice to a smaller network of individuals. Likewise, other groups may have more partner choices and have access to a much larger network of

partners. Smaller networks, with few out-of-network or 'bridging' partnerships and low prevalence of disease, may be somewhat protected from STIs. However, a few infections in these smaller networks can cause a cycle of high disease incidence within the network. 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 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 broader 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*, also evolve rapidly to become resistant to commonly used antibiotics. Others, such as those causing syphilis or chlamydial infection, have remained treatable by commonly available and widely recommended treatments.

Over the last several decades, strains of gonorrhea spreading globally have all become resistant to penicillin. Recently, resistance has expanded to another common class of antibiotics called quinolones. One remaining family of antibiotics, cephalosporins, is recommended as the most effective frontline treatment for gonorrhea. When resistant strains become common in a geographic area or among a particular population, use of less effective antibiotics to treat infections may lead to treatment failures. This can result in a rapid spread of resistant infections and an increase of disease. Changes in the medical and pharmaceutical marketplace may also impact disease trends.

Cefixime, an inexpensive cephalosporin, was withdrawn from the market in the early part of the decade and has just been reintroduced recently. This may have increased drug pressure on gonorrhea in the early 2000s which selected fluoroquinolone resistant organisms already in circulation. A fifteen-year high in gonorrhea incidence rates was seen in Washington State in 2006. Rates have since decreased dramatically. Several factors may have contributed to the fairly dramatic decreases in gonorrhea rates seen over the last three years. Those factors included campaigns to increase provider awareness of specific antibiotic resistance and wider availability of other cephalosporins. Stronger public health interventions such as enhanced partner management are likely contributing as well. More research is needed to fully reveal the connection between disease incidence and factors such as market-based changes in the availability of STI medications, changing clinical practices and public health interventions.

Behavior

Individual and social 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. Public awareness of HIV and the accompanying behavior changes may have recently begun to wane. This may be due to wide access to and use of highly active antiretroviral therapies, 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 observed population level changes in sexual behavior.

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 chlamydia 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 have also helped public health agencies to step up efforts to provide people diagnosed with chlamydial infection or gonorrhea with partner services. In addition to our EPT initiative, these resources have nearly doubled the number of people with STIs to whom public health workers have provided services. Within the framework of these efforts, Washington State can likely make 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 regimens. This in turn 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 provide partner services.

Finally, this report continues a major departure from historical reports in scope and comprehensive. 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 include HIV and viral hepatitis. 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. It is our intention to continue to encourage and inform efforts to collaborate across multiple disease-specific programs by providing additional information on STIs and the persons being infected.

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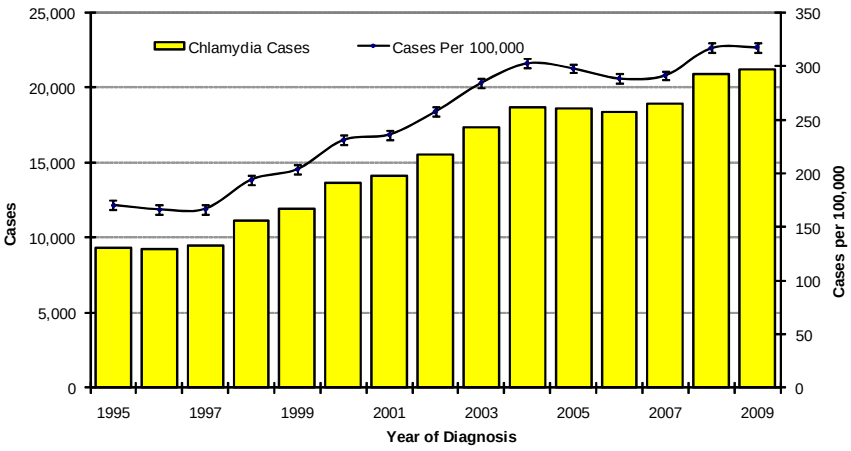
Chlamydial Infections

The most commonly reported bacterial STI in the United States and in Washington State is *Chlamydia trachomatis*. The Kaiser Family Foundation estimated in 1998 that more than 3 million new chlamydial infections occur in the U. S. each year and that only one-third are actually being reported to health departments. In 2008, the most recent year for which national data are available, over 1.2 million cases of chlamydial infection were reported to CDC with a national annual incidence rate of 401.3 per 100,000 (CDC 2009). In Washington State, 21,178 cases were reported in 2009 for an annual incidence rate of 317.6 per 100,000. While this compares favorably to the national incidence rate (Washington's rate in 2008 was 21% below the national rate) chlamydial infection continues to be a major cause of illness. 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, 1995 - 2009



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

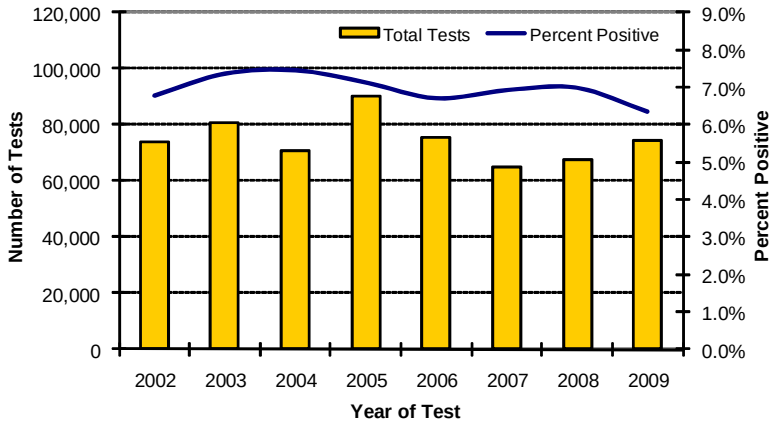
Chlamydial infections often do not show symptoms. A large number of infected individuals have little or no reason to seek screening or treatment. Coupled with less-than-desirable rates of routine chlamydial infection screening in many health care settings, this contributes to ongoing spread among sexually active people. With a majority of infected persons unaware of their infection, there is a good chance that they will infect their partners.

Figure 1 shows annual incidence rates of chlamydial infections in Washington State from 1993 through 2009. Rates declined through 1997 as screening programs identified and treated large numbers of prevalent cases. Cases and rates increased steadily through 2004. They were stable through 2007 and then reached a 17-year high in 2008. Rates are essentially unchanged in 2009 at 317.6 cases per 100,000. Some of the increase noted since 2007 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 which include sexually active, 24 years of age and younger are offered chlamydia screening through the IPP. Screening efforts are directed specifically at the female population in hopes of reducing negative reproductive health outcomes. These data also provide Washington State with a potential prevalence monitoring platform. **Figure 2** shows the total number of tests and the percent positive by year for tests conducted through the IPP from 2002 through 2009. Test positivity decreased from 7.0% in 2008 to 6.3% of all tests in 2009. While the overall rate of positive tests within the IPP has varied over the last several years, male positivity has been consistently higher than for females (8.7% versus 5.5%, respectively in 2009).

The volume of both male and female tests has increased since 2007 with tests among males accounting for 26% 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.

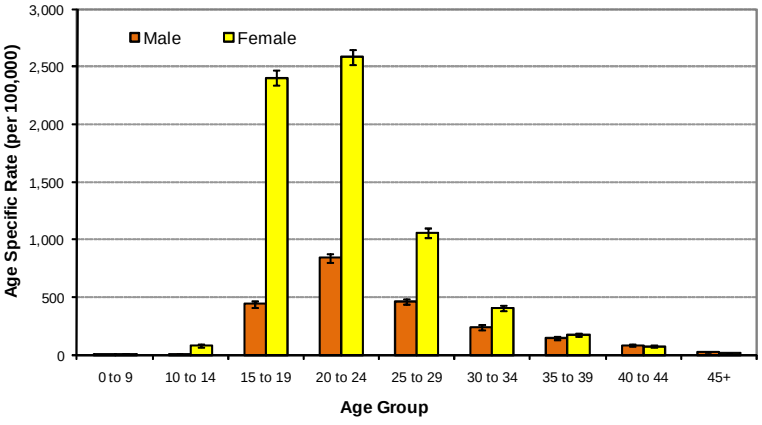
Figure 2 - Chlamydia Tests and Percent Positive, Infertility Prevention Project, Washington State, 2002 - 2009



Case rates per 100,000 also vary significantly between genders. **Figure 3** shows age and gender specific rates for cases diagnosed in 2009. The marked difference in case 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 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**.

Significant disparities in incidence exist by Hispanic ethnicity and by race. **Figures 5 and 6** show trends in case rates by Hispanic ethnicity and by race respectively. A large number of cases are reported without race and ethnicity indicated (16.2% missing race and 28.6% missing Hispanic ethnicity in 2009). To correct for these missing data, unknown cases have been redistributed for this report based on the proportions of cases reported with the race and ethnicity of the patient identified.

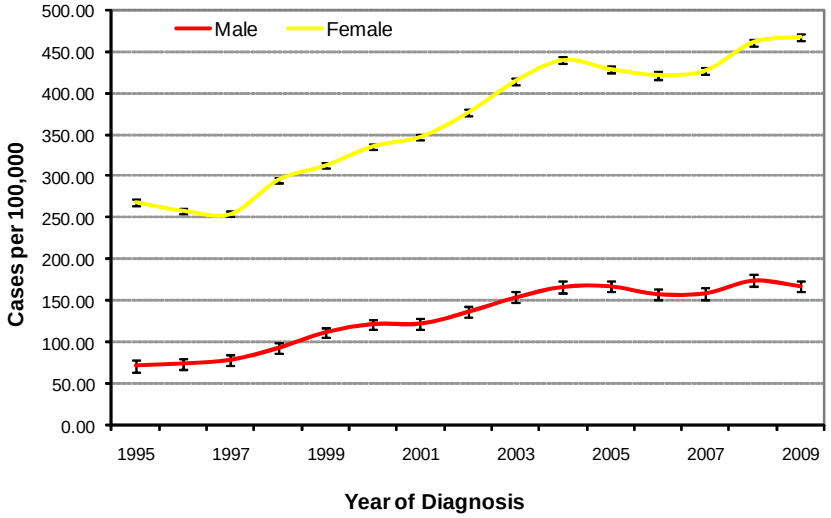
Figure 3 - Chlamydia Incidence Rate* by Gender and Age Group, Washington State, 2009



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

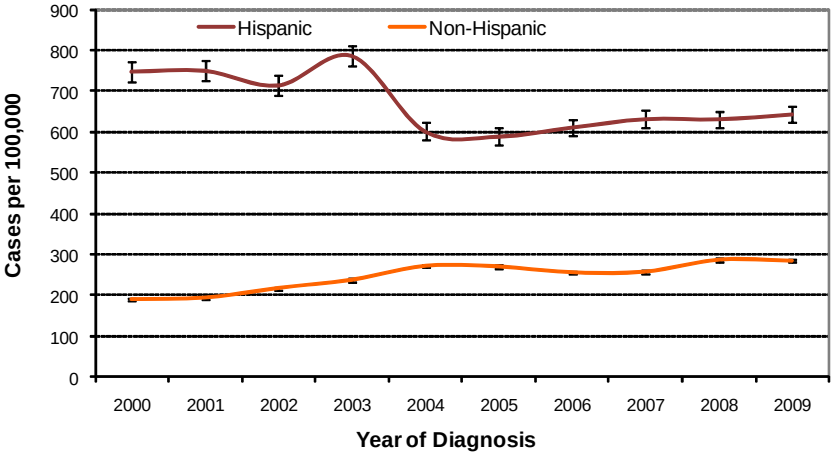
Inequities in the burden of disease by Hispanic ethnicity have persisted through the last decade with Hispanics having rates consistently between two and three times those of non-Hispanics. Likewise, rates for non-Hispanic Blacks, American Indians/Alaska Natives have been persistently higher than those for Whites. Inequality by race in 2009 was most acute between Whites and Blacks with cases rates of 231.1 and 1357.7 per 100,000, respectively. Many factors likely contribute to these observed differences. Those factors 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, 1995 - 2009



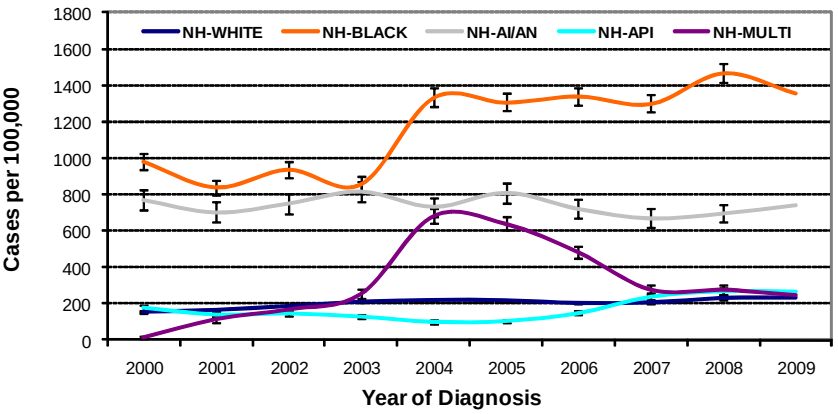
*Crude age specific incidence rate with 95% Poisson exact confidence intervals

Figure 5 - Chlamydia Incidence Rate* by Hispanic Ethnicity (all races), Washington State, 2000 - 2009**



* 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, 2000 - 2009**



* 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 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 a wide variety of 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. Yakima and Pierce counties lead the state in chlamydial infection incidence with rates of 494.9 and 474.6 per 100,000, respectively. Along with Franklin, Adams and Spokane counties, these five counties have case rates much higher than the overall state rate of 317.6 per 100,000.

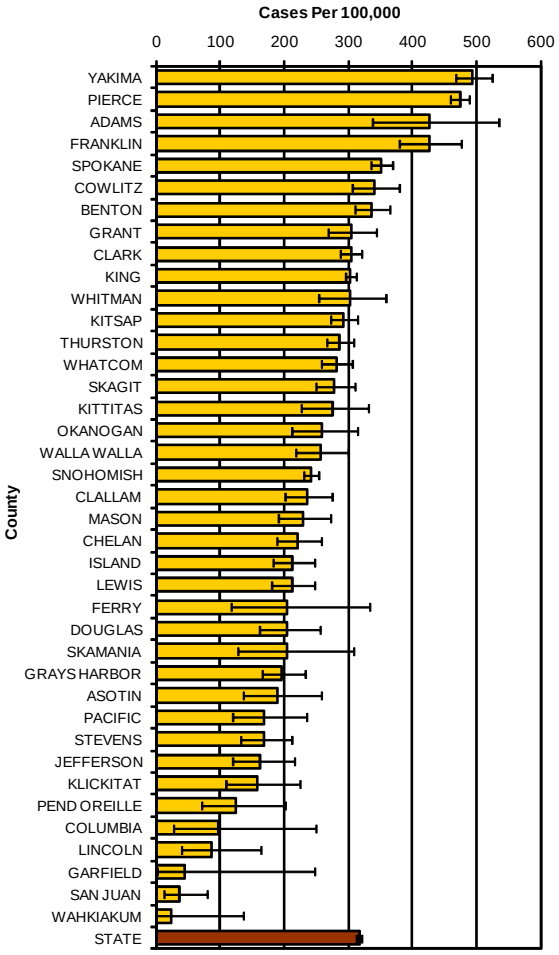
Care should be used in comparing across counties. For less populated counties with relatively few cases in any given year, incidence rates vary considerably from year to year. Ninety-five percent confidence intervals for each county have been included in **Figure 7** help to show this rate instability. Where ever 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 of cases within counties. **Figure 8** shows chlamydial infection rates for Washington State at the census tract level. This map reveals wide variation within counties. It shows that while a county may have higher or lower incidence rates than the state average, there may be specific areas within the 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 spread of incidence can also show differences in the burden of disease in several other important ways. Markers of socioeconomic status such as median income, educational attainment, and household poverty 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 as measured by the share of the adult population completing high school. Other factors like population density, housing traits, and density of venues for social mixing may also be related to variations in disease incidence.

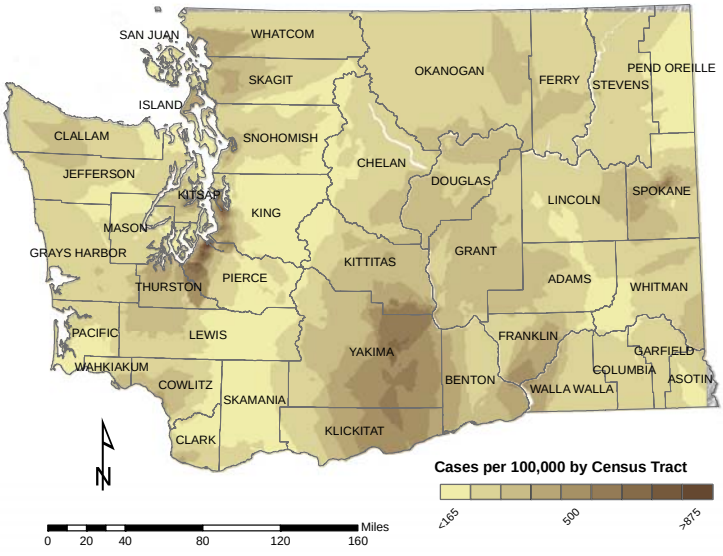
These factors may help explain the variations in chlamydial infection by geography. Efforts by all counties to

Figure 7 - Chlamydial Infection Incidence Rate* by County, Washington State, 2009



*Crude incidence rate with 95% Poisson exact confidence intervals

Figure 8 - Chlamydia Incidence Rate* by Census Tract, Washington State, 2009



* Smoothed (by Kriging) 2009 incidence rate per 100,000 by Census Tract based on residence of patient at diagnosis.

Figure 9 - Proportion of Chlamydia Cases with Treatment Reported by Year of Diagnosis, Washington State, 1995 - 2009

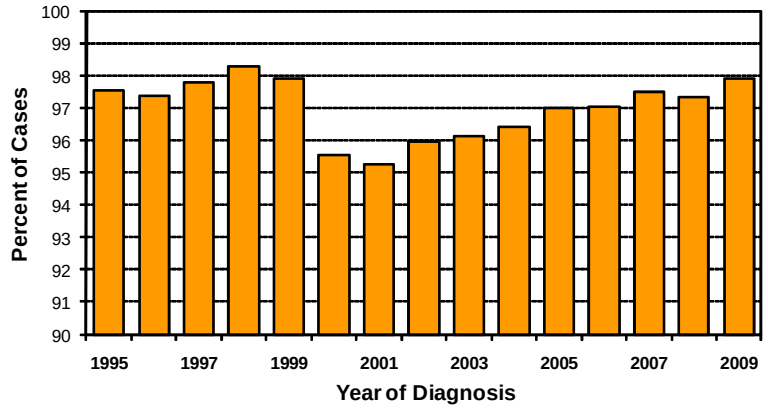
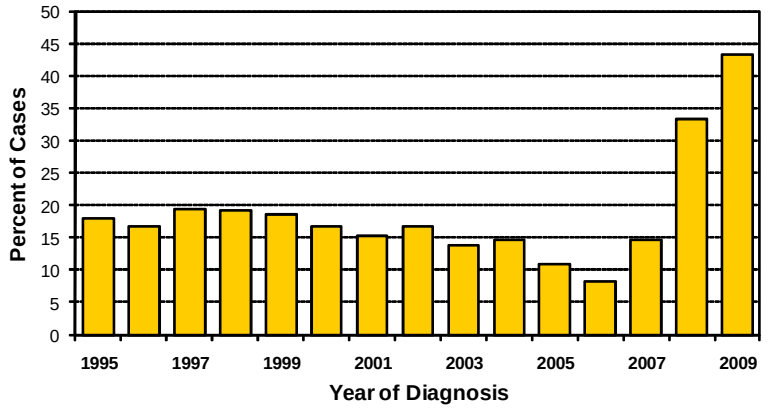


Figure 10 - Proportion of Chlamydia Cases Interviewed for Partner Management by Year of Diagnosis, Washington State, 1995 - 2009



assure proper treatment, which reduces the duration of infection and helps prevent ongoing transmission, have been met with great success. As of 2009, 98 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.

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 seen in this measure between 2007 and 2009.

In summary, chlamydial infection continues to be the most frequently reported STI in Washington State. Incident infections and trends can be further characterized by a number of specific observations:

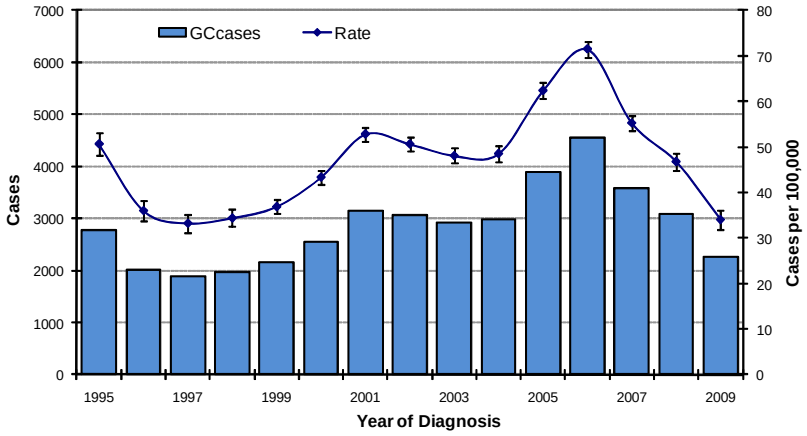
- √ **Reported chlamydial infection incidence declined significantly through the middle of the 1990s, increased through 2004, and has increased slightly through 2009**
- √ **Recent trends in chlamydia positivity among all tests provided through the Infertility Prevention Project reflect a decreasing trend since 2004, most dramtically noted among females**
- √ **The highest reported case incidence of chlamydial infections in 2009 is among females 20 to 24 years of age; the highest incidence for males is in the same age group and 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 non-Hispanic Blacks and American Indians/Alaska Natives experiencing higher incidence than Whites**
- √ **The highest overall observed case incidence rate in 2009 is for Yakima County; five counties significantly exceed the state incidence rate of 317.6 per 100,000**
- √ **A high proportion of cases in 2009 (97.9%) have had treatment assured and a significantly higher proportion of cases were provided partner management services (43.3%) in 2009 than in previous years**

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 gonococcal infection may include pelvic inflammatory disease (PID), infertility, ectopic pregnancy, and chronic pelvic pain. Many of these undesirable outcomes can occur long after chlamydial or gonococcal infections have been treated or naturally healed. Thus, the exact cause is often unclear and the relative role of either bacterial infection in overall rates of PID and ectopic pregnancy cannot be clearly ascertained. However, gonococcal infections are 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.

The most recent year for which incidence data are available for the entire country is 2008 with a national gonorrhea case incidence rate of 111.6 per 100,000. Washington State's overall case rate that year (46.7 per 100,000) compared well to the national case rate. **Figure 11** shows cases diagnosed each year and the incidence rate per 100,000 from 1993 through 2009.

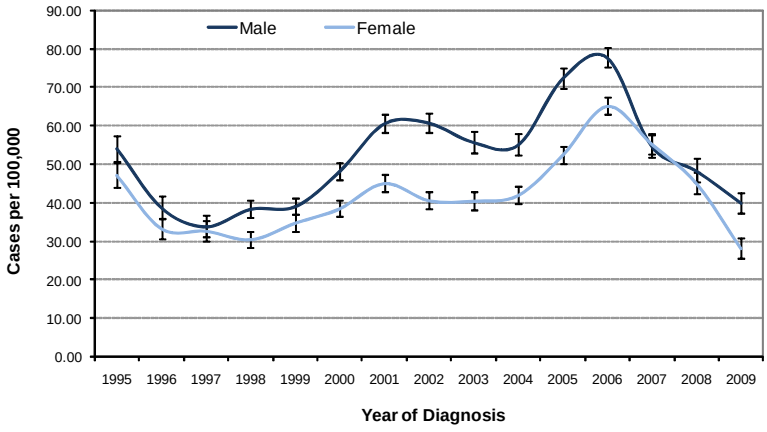
Figure 11 - Gonorrhea Cases and Incidence Rate* per 100,000, Washington State, 1995 - 2009



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

Of interest in this figure are the big declines in cases and rates seen through the middle of the 1990s to a low of 33.2 cases per 100,000 in 1997. Rates slowly increased through 2006 and have declined a great deal again to 1997 levels. The shape of the epidemic curve between 1993 and 2002 is seen in many other STIs in Washington State. It is also seen to some extent nationally. This may show population level changes in patterns of disease related to the public attention given the growing HIV epidemic. Rates and cases increased through 2006 to a 15 year high of 71.4 cases per 100,000 and have since fallen to the current rate of 34.0 per 100,000. The emergence of fluoroquinolone resistance early in the decade, as well as outbreaks in specific high-risk communities, provides likely reasons for the increases seen through 2006.

Figure 12 - Gonorrhea Incidence Rate* per 100,000, by Gender, Washington State, 1995 - 2009



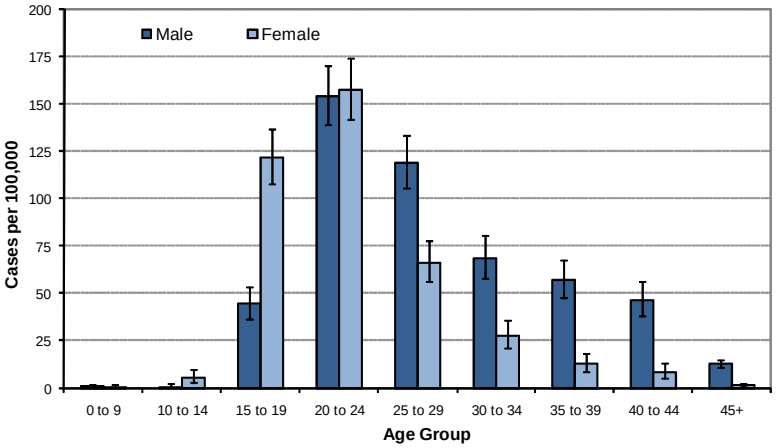
* Crude, gender-specific incidence rate with Poisson exact 95% confidence intervals.

A strong public health response, new interventions such as EPT, and outreach to clinical providers with information about appropriate antibiotic choices may have contributed to the reduction in cases and incidence rate observed over the last three years.

Gonorrhea incidence is much more concentrated in behaviorally and geographically distinct sexual networks than other STIs. Gonorrhea incidence rates in Washington State may also demonstrate two separate epidemic patterns. The first of these involves heterosexual transmission among men and women under the age of 30. The second epidemic pattern is gonorrhea transmission among MSM over 30 years of age.

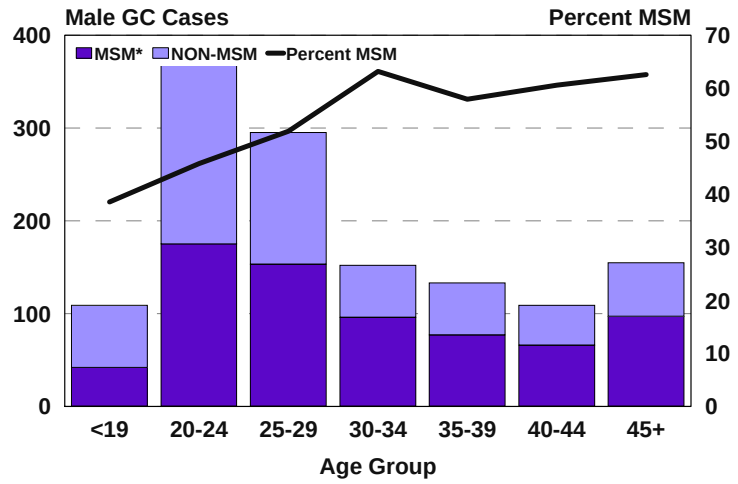
Figure 12 shows the gender-specific trends in gonorrhea incidence from 1993 through 2009. Male and female rates began to diverge greatly in 2000, supporting behavioral evidence from patient interviews suggesting a sharp increase in MSM gonorrhea transmission. Male and female rates converged in 2007, possibly reflecting a decrease in gonorrhea incidence among MSM. Yet disparities by gender have re-emerged, especially among older males; this pattern is consistent with an observed increase burden of incidence among MSM (**Figure 13**).The relative role of MSM in overall male gonorrhea morbidity exceeds 45% of all male cases diagnosed in 2009. As shown in **Figure 14**, this share varies by age group and exceeds 60% for males 30 to 34 years of age.

Figure 13 - Gonorrhea Incidence Rate by Gender and Age Group, Washington State, 2009



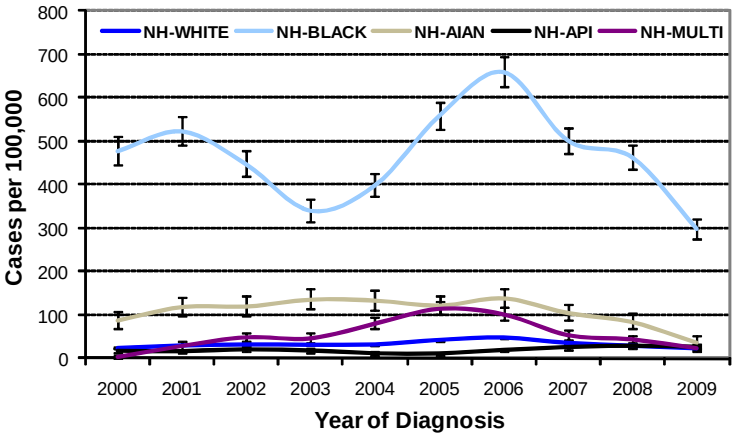
* Crude, age and gender specific incidence rate with Poisson exact 95% confidence intervals.

Figure 14 - Male Gonorrhea Cases Diagnosed by Age Group and MSM Status, Washington State, 2009



*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, 2000 - 2009**



* 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, 2000 - 2009

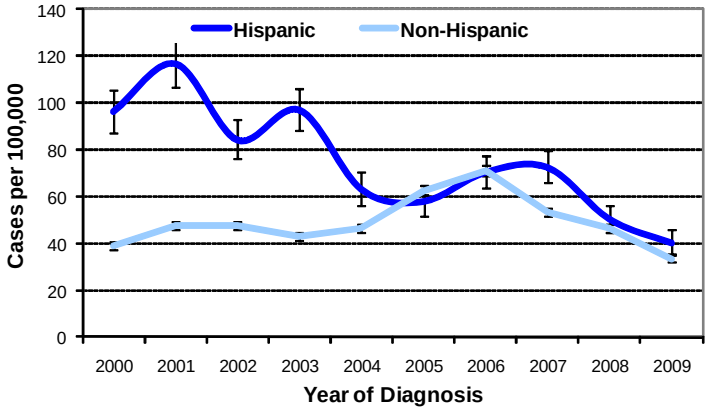
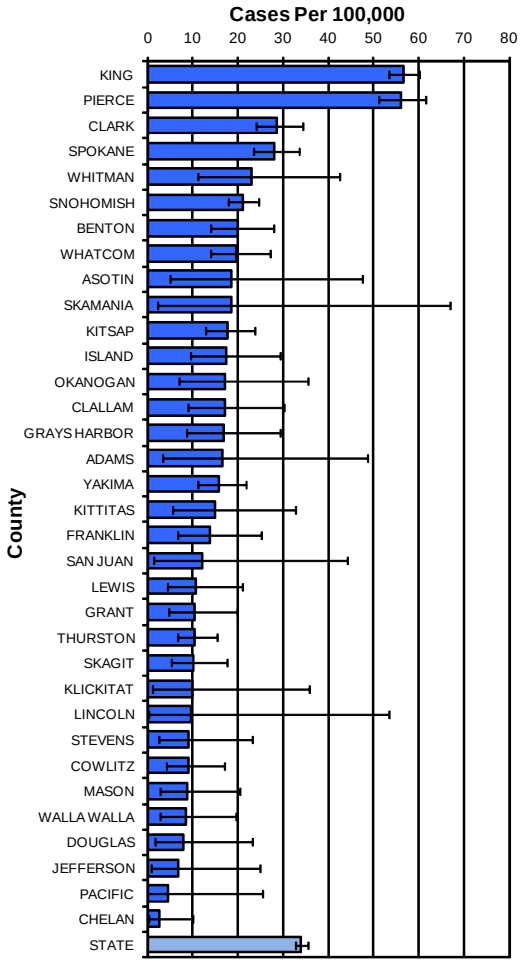


Figure 17 - Gonorrhea Incidence Rate* by County, Washington State, 2009



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

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

Of special concern, given MSM spread patterns, there is evidence that co-infection with bacterial STIs may aid HIV spread through a number of different means. In an epidemic context which includes significant incidence of gonorrhea among MSM, many of whom are HIV-positive, the possibility of ongoing transmission continues to warrant more monitoring and assessment by the public health community.

A recent analysis of gonorrhea incidence among HIV-positive males in Washington State between 1996 and 2007 found sizable disparity in rates between presumed HIV-negative men and those known to be HIV-positive at the time of their diagnosis with gonorrhea. This difference was most pronounced in 2005 where the rate of gonorrhea among HIV-positive males reached 2,848 per 100,000 compared to a case rate of 85.9 per 100,000 for presumed HIV-negative men. In addition to clear implications for HIV prevention, these data also show a large disparity in the burden of gonorrhea among HIV-positive persons and MSM versus the heterosexual male population.

Health inequities are also seen in gonorrhea rates by race and Hispanic ethnicity. **Figure 15** shows trends in gonorrhea rates by race for 2000 through 2009. As with chlamydial infection, disparities are seen between non-Hispanic Blacks and other races. This is seen as an average 5-fold difference persisting from the beginning of this decade.

With respect to Hispanic ethnicity (**Figure 16**), the disparity is not as large between non-Hispanics and persons of Hispanic ethnicity. Gonorrhea rates have been roughly equal between Hispanics and non-Hispanics since 2005. The 2009 rate among Hispanics was 40.4 per 100,000 versus 33.5 per 100,000 for non-Hispanics.

Unlike chlamydial infection, gonorrhea incidence tends to be more clustered in densely populated urban areas. Rates and rankings by county for 2009 are shown in **Figure 17**. Pierce and King Counties greatly exceeded the state rate of 34.0 per 100,000.

Figure 18 - Gonorrhea Incidence Rate* by County, Washington State 2009

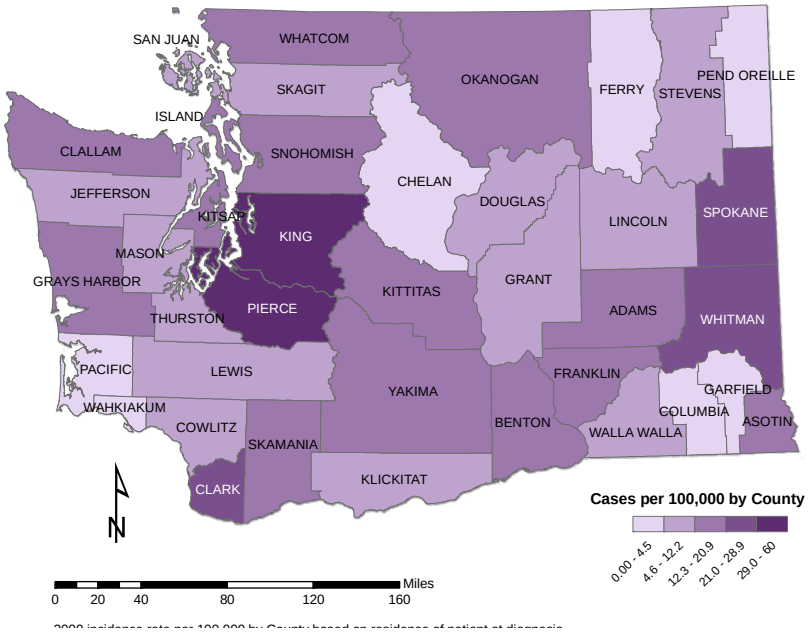
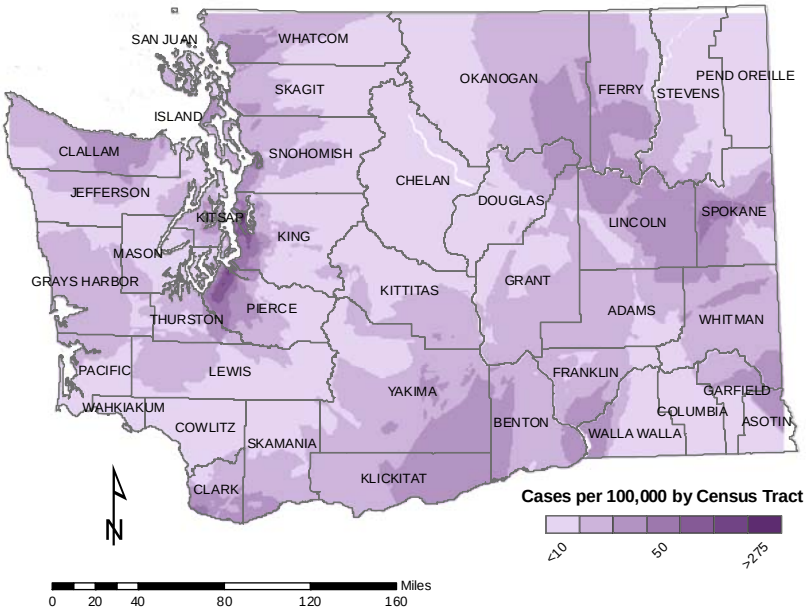


Figure 19 shows the gonorrhea incidence rate by census tract for 2009. Of note in this figure is that while there are many similarities with the county-level map (**Figure 18**); much more detail is shown at the census tract level. This shows specific areas within counties that have much higher morbidity. These data indicate a small number of census tracts with much higher rates, which should be considered as 'core' morbidity areas for targeting prevention and for assigning 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 2009 by major provider type. The largest share of cases (24 percent) was 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 were diagnosed in emergent/urgent care settings.

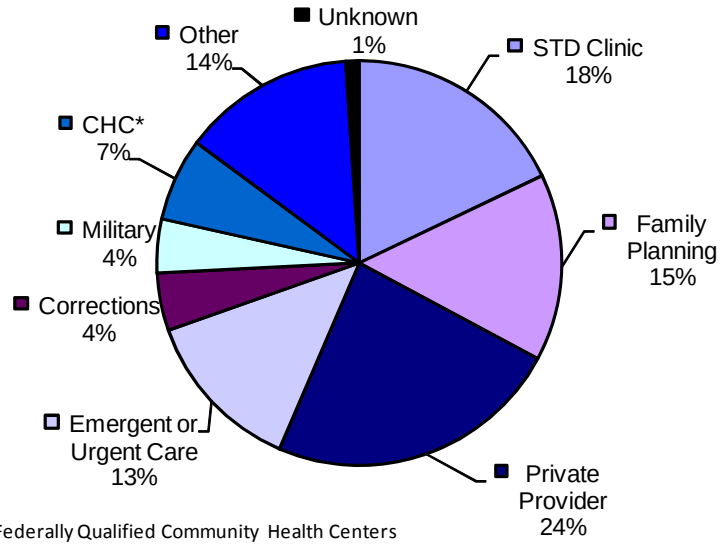
In light of the probable emergence of strains of gonorrhea resistant to common antibiotics, monitoring information on the treatment provided to patients continues to be important. **Figure 21** shows the

Figure 19 - Gonorrhea Incidence Rate* by Census Tract, Washington State, 2009



* Smoothed (by Kriging) 2009 incidence rate per 100,000 by Census Tract based on residence of patient at diagnosis.

Figure 20 - Proportion of Gonorrhea Cases Diagnosed by Provider Type, Washington State, 2009



*Federally Qualified Community Health Centers

Figure 21 - Proportion of Gonorrhea Cases with Treatment Reported by Year of Diagnosis, Washington State, 1995 - 2009

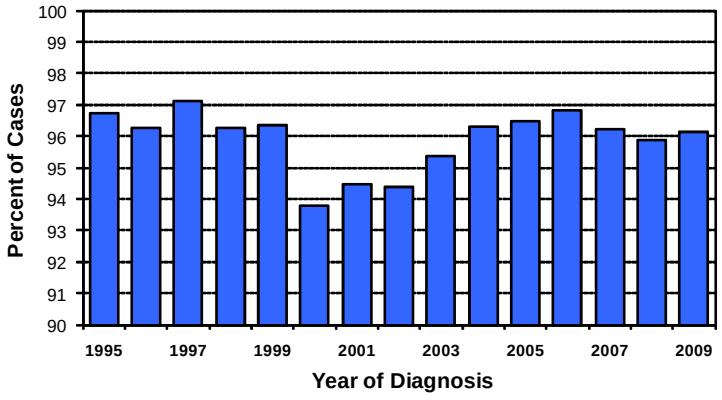
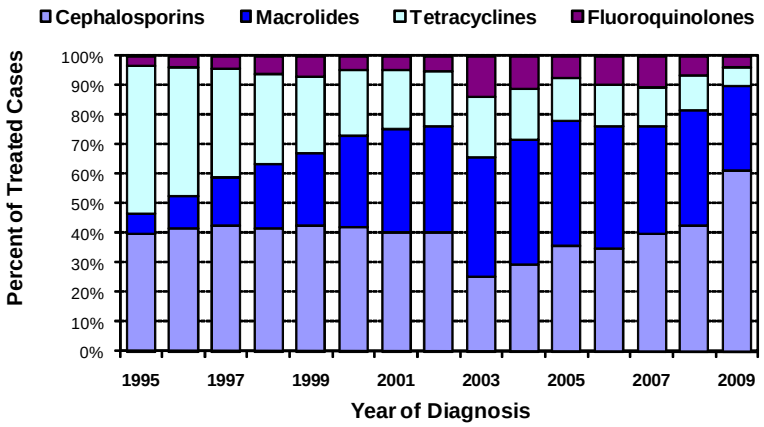


Figure 22 - Proportion of Gonorrhea Cases Treated by Antibiotic Class and Year of Diagnosis, Washington State, 1995 - 2009



proportion of cases with treatment reported by year of diagnosis 1993 through 2009. In 2009, 96.1 percent of cases were reported with treatment information provided.

The high proportion of cases with treatment reported allows analyses of trends in antibiotic use. Changes in case rates should be viewed in light of known issues with reduced antibiotic susceptibility. **Figure 22** illustrates the share of cases treated by antibiotic class. This clearly demonstrates an increase in quinolone use between 2002 and 2003 when gonorrhea rates increased and coincided with Cefixime becoming unavailable in the U.S. in this same time period. Cefixime is a low-cost oral cephalosporin and was the first tier treatment recommendation at the time.

A reduction in susceptibility to cephalosporins in the future is a distinct probability given the robust ability of *Neisseria gonorrhoeae* to develop resistance to a broad array of antibiotics. The Gonococcal Isolate Surveillance Project monitors a sentinel population of male patients diagnosed with gonorrhea in STD clinics in the U.S. for antibiotic susceptibility. This includes the STD clinic at Harborview Medical Center in Seattle. 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 summary, infections due to *Neisseria gonorrhoeae* have decreased significantly in Washington State since 2006. Incident infections and trends can be briefly characterized by a number of specific observations:

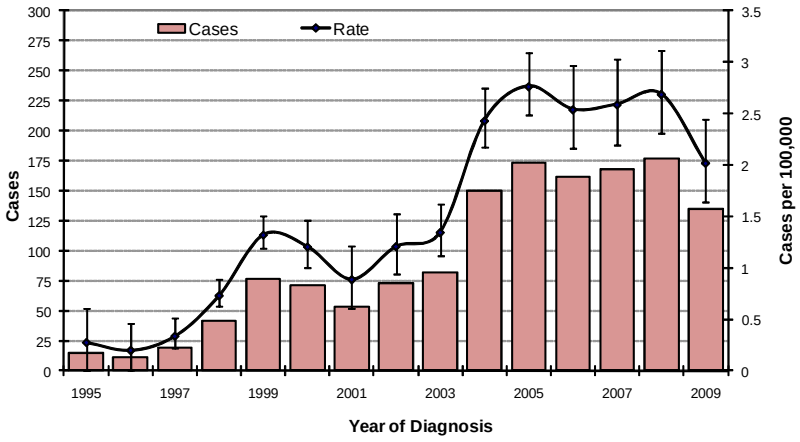
- √ **Gonorrhea incidence rate per 100,000 declined 27 percent in 2009 from the case rate observed in 2008**
- √ **The highest reported case incidence of gonorrhea infections in 2009 is among females 20 to 24 years of age; the highest incidence for males is in the same age group**
- √ **The burden of disease in 2009 continues to be higher among Black, Hispanics and American Indian/Alaska Natives than among Whites, non-Hispanics and Asians**
- √ **The highest overall observed case incidence rates at the county level in 2009 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 increased in 2009 to 1.4 male cases for each female case**
- √ **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 appropriate treatment**

Syphilis

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

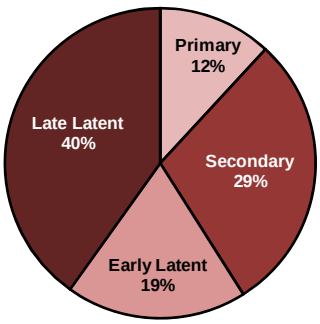
Primary and secondary syphilis are the infectious stages of disease. Epidemiologic analyses often focus on primary and secondary cases because of the chance of ongoing transmission. **Figure 23** shows cases diagnosed and incidence rate per 100,000 in Washington State for primary and secondary syphilis from 1993 to 2009. Most notable in this figure is the abrupt and steep rise in incidence from 1997 through 2004. Since reaching a high of 2.9 cases per 100,000 in 2005, incidence of primary and secondary syphilis has trended modestly downward but continues at high endemic levels. Washington State's rate remains somewhat below the national rate reported in 2008 of 4.5 per 100,000. However, specific traits of syphilis morbidity in Washington State also reflect broader trends in case rates seen elsewhere in the U.S.

Figure 23 - Primary & Secondary Syphilis Cases and Incidence Rate*, Washington State, 1995 - 2009



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

Figure 24 - Syphilis Cases by Stage at Diagnosis, Washington State, 2009



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 that time are considered late latent infections which can have persistent clinical impacts for life if the patient remains untreated. **Figure 24** shows the share of cases reported by stage of syphilis infection in Washington State in 2009.

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 19 percent in 2009.

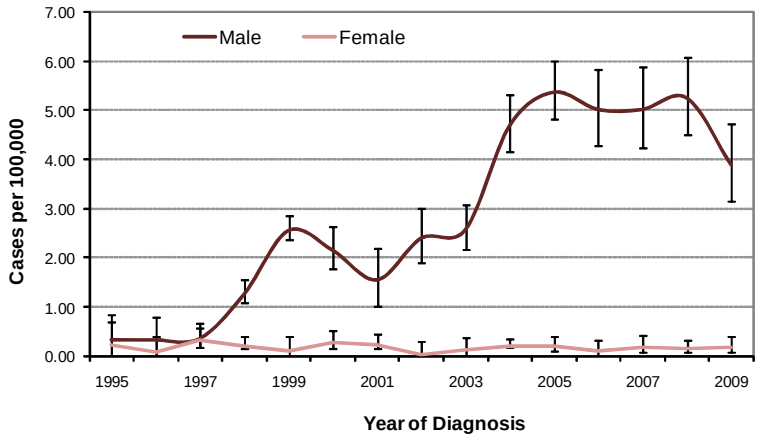
Transmission of syphilis from pregnant women to their unborn babies is a potential cause of fetal loss. Serious congenital harm can also occur at any stage of infection for pregnant patients if not promptly treated. One case of congenital syphilis was reported in 2009.

The overwhelming share of cases reported in the last decade has been among males, most of who 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.

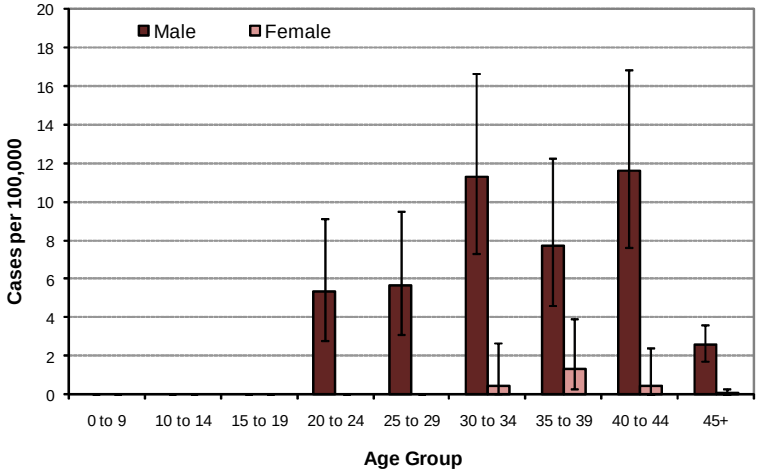
Most cases reported in 2009 were among men resident in King, Pierce, Kitsap and Snohomish counties (**Figure 27**). Local public health agencies in counties with the highest rates have mounted a robust response to reported syphilis cases. In 2009, 86% of cases were interviewed to assure treatment of possibly exposed partners.

Figure 25 - Primary & Secondary Syphilis Incidence Rate* by Gender, Washington State, 1995 - 2009



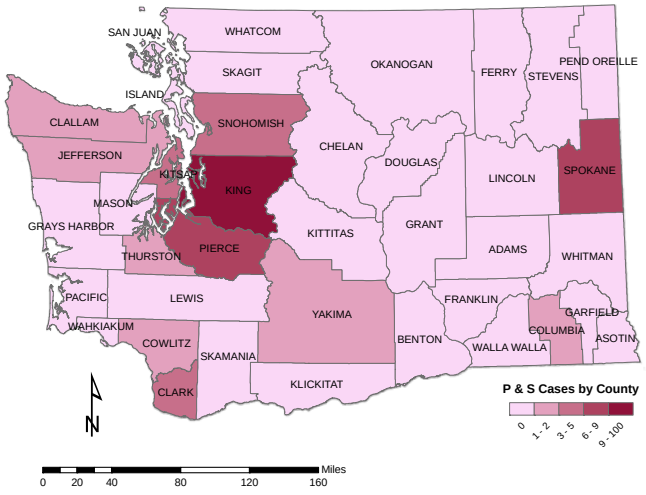
* Crude, gender-specific incidence rate with Poisson exact 95% confidence intervals.

Figure 26 - Primary & Secondary Syphilis Incidence Rate* by Gender and Age Group, Washington State, 2009



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

Figure 27 - Primary & Secondary Syphilis Cases Reported by County, Washington State, 2009



2009 P & S Cases by County based on residence of patient at diagnosis.

In summary, syphilis infection in Washington State in 2009 is primarily affecting urban MSM populations, reflecting broader trends in syphilis infection on the U.S. West coast. General characteristics of syphilis morbidity in 2009 include:

- √ **Primary and secondary syphilis incidence has decreased modestly in Washington State from 2.4 cases per 100,000 in 2008 to 2.0 per 100,000 in 2009**
- √ **The majority of primary and secondary cases continue to be diagnosed among males, the majority of whom report MSM risk behaviors**
- √ **Seventy-four percent of primary and secondary cases in 2009 were diagnosed among residents of King County**
- √ **One case of congenital syphilis was reported in 2009**
- √ **Incidence of primary and secondary syphilis was highest among males 40 - 44 years of age at 11.5 cases per 100,000**
- √ **Seventy-nine percent of primary and secondary syphilis cases were diagnosed among non-Hispanic Whites**

Genital Herpes Simplex Virus (HSV)

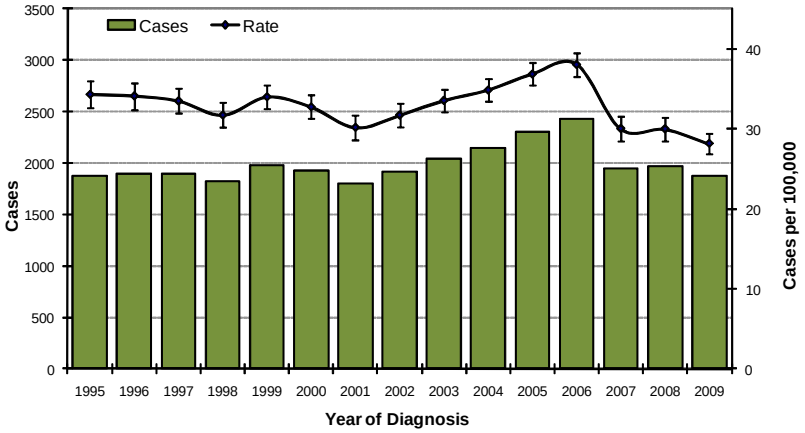
Two species of the *Herpesviridae* family, HSV 1 and 2, cause disease in humans and are lifelong infections. HSV infections have been implicated in a variety of illnesses. Initial genital infections with HSV are reportable in Washington State. Most genital infections are thought to be caused by HSV 2. 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 systemically 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 1995 through 2009. **Figure 29** shows age and gender specific incidence rates. Differences in rates by gender may reflect greater liklihood of female seeking diagnostic services in reproductive health settings.

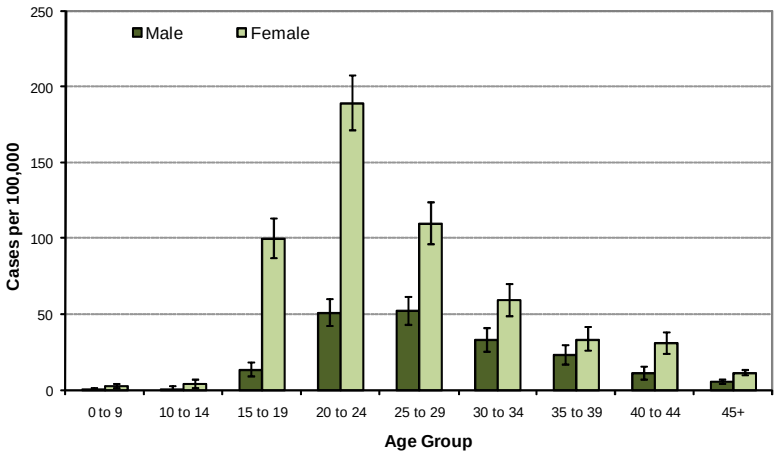
Neonatal herpes infections result from an initial episode of genital infection among women late in pregnancy and can lead to severe, long-term complications for newborns; these infections are of sufficient urgency and seriousness to warrant ongoing surveillance. Four cases of neonatal herpes infection were reported in Washington State in 2009.

Figure 28 - Initial Genital HSV Cases and Incidence Rate* by Year of Diagnosis, Washington State, 1995 - 2009



* 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, 2009



* 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 2009.

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. No cases were reported in Washington State in 2009 and a total of 14 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, 2009

	Cases Diagnosed	Cases Sampled*	Cases Interviewed**	% of Total Cases
Chlamydial Infection	21178	6261	3994	18.9%
Gonorrhea	2268	767	563	24.8%
P&S Syphilis	135	N/A	128	94.8%

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

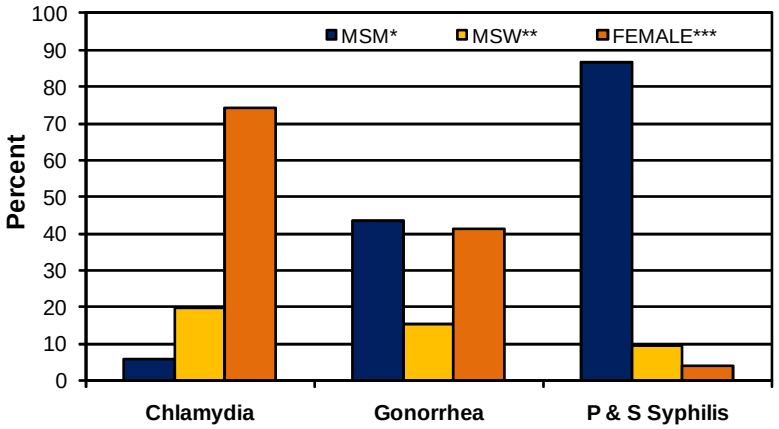
** Of those sampled, cases completing full or partial behavioral interviews

Some domains of behavioral data are available for all cases reported, such as gender of sex partners, 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**).

Interview data have been weighted for analysis to be representative of all cases diagnosed with chlamydial infection or gonorrhea in 2009. Stratification weights were developed to correct for different sample sizes across jurisdictions and post stratification weights were applied to correct for response bias by gender, disease (CT, GC or both) and age group of respondent. Patients reported with MSM behavioral risk were oversampled in several 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 with respect to sexually transmitted infections. Comparable characteristics of primary and secondary syphilis cases are based on a census of cases. All incident P & S cases are actively followed up for interview by public health staff.

Gender Category of Patients

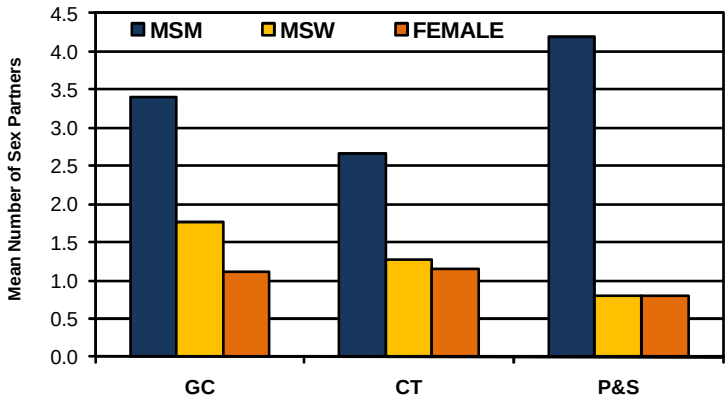
Figure 31 - Gender Category by STI for Cases Diagnosed in Washington State, 2009



Figures 31 shows the gender category of patients diagnosed with chlamydial infection, gonorrhea and primary or secondary syphilis in 2009. Of note, only 6 percent of men diagnosed with chlamydial infection report having male sex partners. In contrast, over 43 percent of males with gonorrhea and almost 86 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 incidence is increasingly concentrated among MSM.

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, 2009

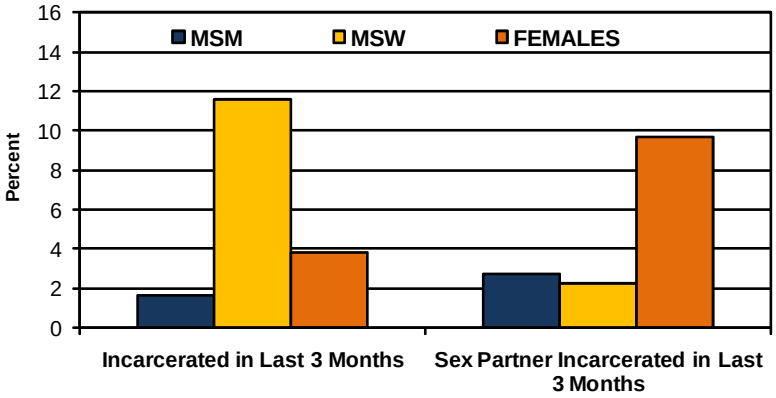


Primary or secondary syphilis cases are reported almost exclusively among men, the majority of whom also report same-sex partnerships.

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 2009. 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 3.41 versus 1.28, respectively.

Figure 33 - Proportion of Patients by Gender Category Reporting Recent Incarceration and Sex with Recently Incarcerated Person by STI, Washington State, 2009



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. Not surprisingly, MSW are more likely to report having been incarcerated themselves. These data suggest that screening males 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 2009 remains quite low (**Figure 34**); MSW diagnosed with P & S syphilis report the highest rate of exchange with 28 percent reporting exchanging money for sex, though this is based on a very small number of cases. For chlamydial infection and gonorrhea cases, MSM report significantly higher rates of exchange than their heterosexual counterparts. 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 and/or secondary syphilis cases in 2009. Among chlamydial infection and gonorrhea cases, the most frequently reported venue for meeting sex

Figure 34 - Proportion of Patients Reporting Exchange of Money or Drugs for Sex by Gender Category and Diagnosis, Washington State, 2009

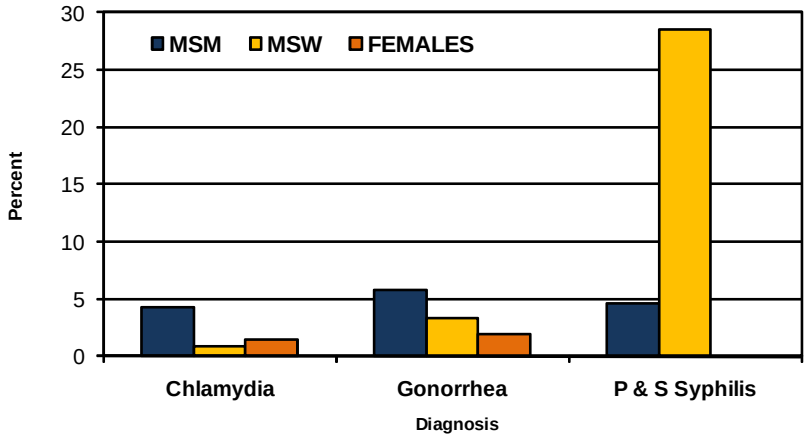


Figure 35 - Venues For Meeting Partners in the Last Year, Chlamydial Infection Patients, Washington State 2009

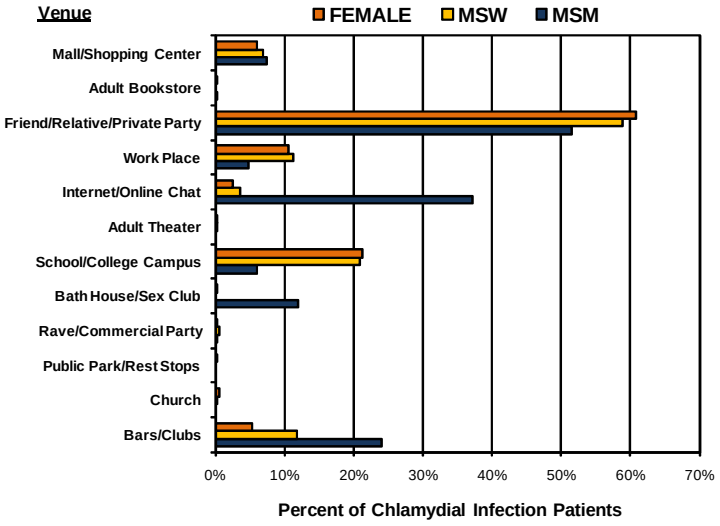


Figure 36 - Venues For Meeting Partners in the Last Year, Gonorrhea Patients, Washington State 2009

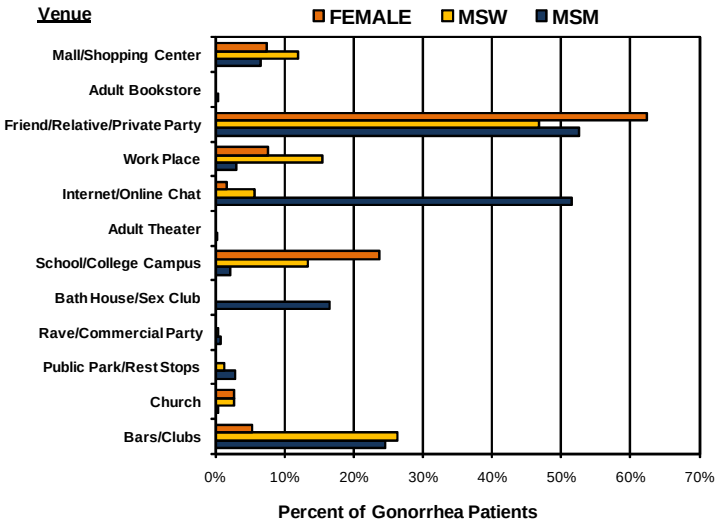


Figure 37 - Venues For Meeting Partners in the Last Year, Primary & Secondary Syphilis Cases, Washington State 2009

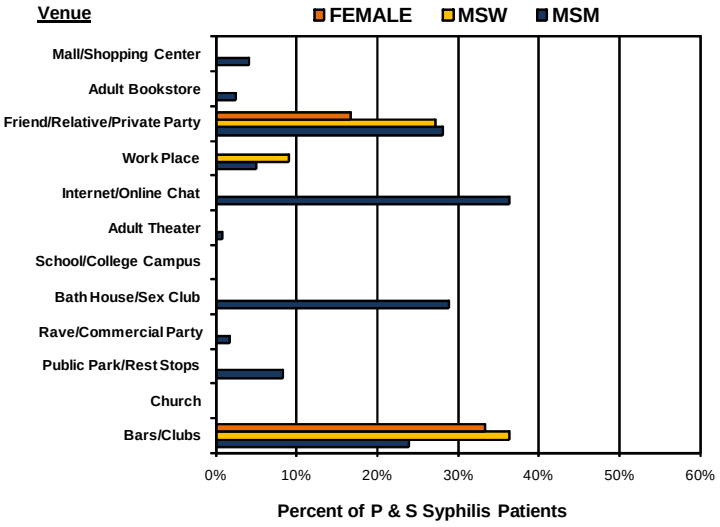


Figure 38 - Drug Use/Risk Reported in Last Year, Chlamydial Infection Patients, Washington State 2009

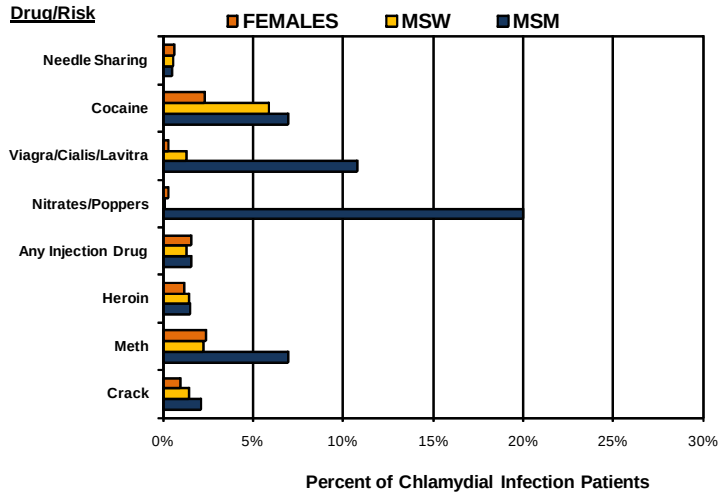
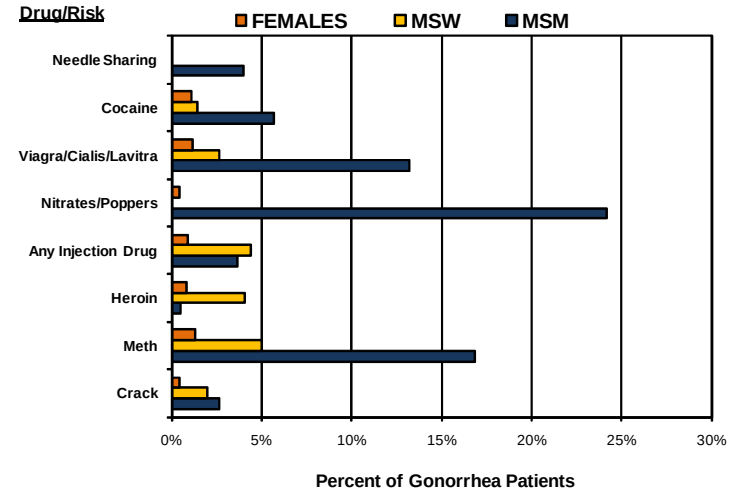


Figure 39 - Drug Use/Risk Reported in Last Year, Gonorrhea Patients, Washington State 2009



partners was at a friend or relative's 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 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 and these data support this hypothesis, with over 10 percent of MSM reporting using performance enhancing drugs. 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 for HIV infection among people diagnosed with bacterial and other viral STIs, especially among MSM, the proportion of patients knowledgeable about their HIV status and sufficiently aware of their risks to seek HIV testing 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, 57.1 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 MSM interviewed who were diagnosed with gonorrhea or chlamydial infection in 2009, over 17 percent report being HIV-positive reflecting a disproportionate burden of HIV disease among MSM.

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 40 percent of MSM report getting an HIV test at

Figure 40 - Drug Use/Risk Reported in Last Year, Primary & Secondary Syphilis Cases*, Washington State 2009

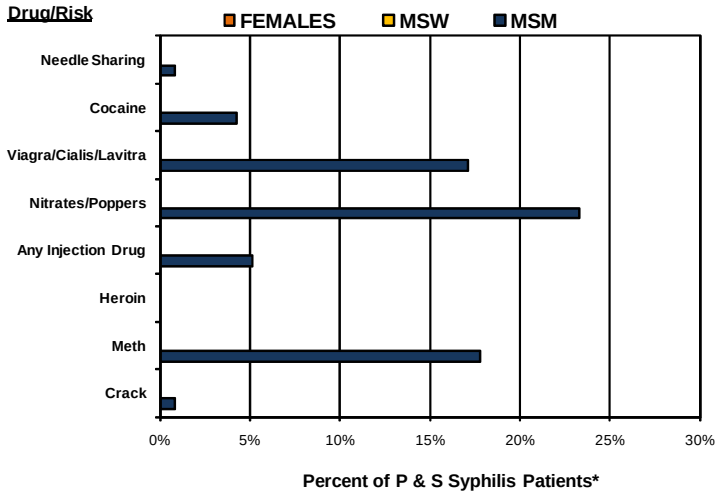


Figure 41 - Self-Reported HIV-Positive Status by Gender Category and STI Diagnosis, Washington State 2009

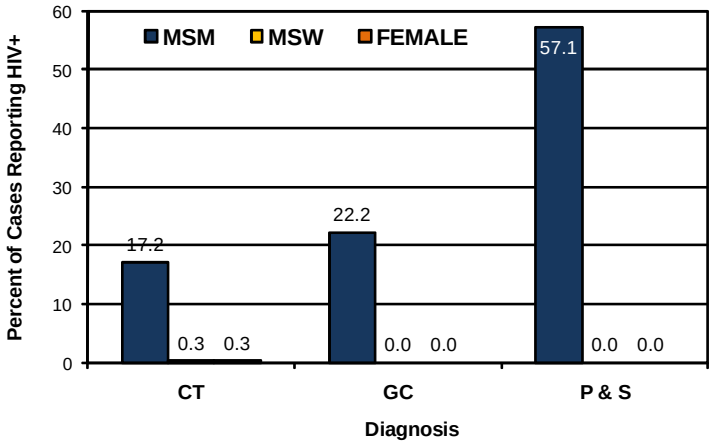


Figure 42 - History of Ever Having Had an HIV Test by Gender Category and STI Diagnosis, Washington State 2009

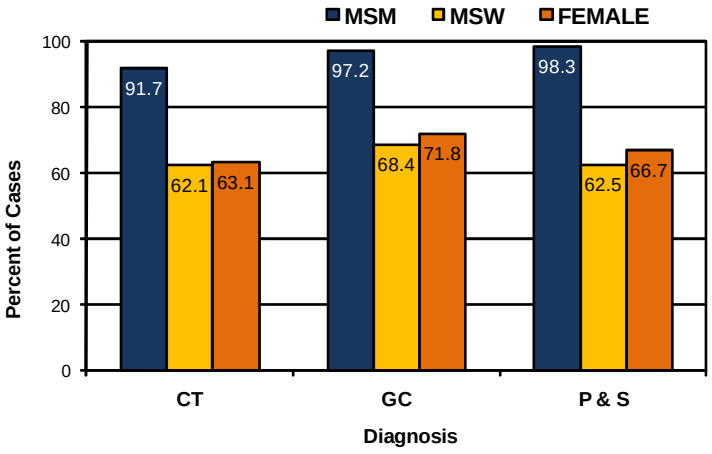
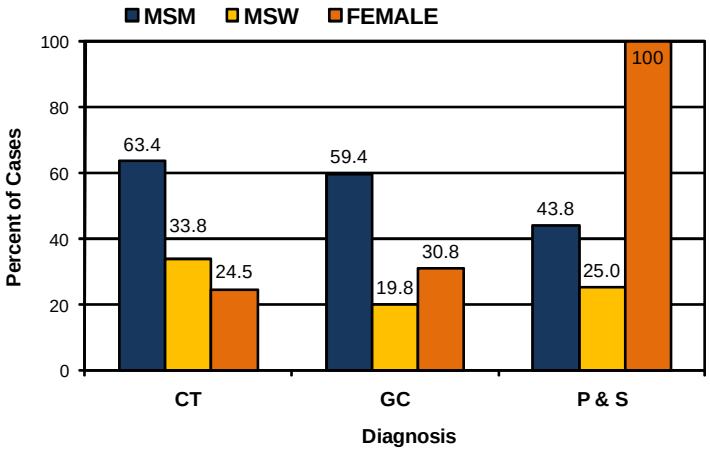


Figure 43 - HIV Testing at Most Recent STI Diagnoses by Gender Category and STI, Washington State 2009



their recent STI diagnosis across all disease categories while fewer than 30 percent of 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 risk potential 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 1993 through 2009. Data for these charts are based on registry matching for patients reported with HIV through June of 2010 and for STI cases diagnosed through December 2009. 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 2009 at 0.5 percent. This HIV

Figure 44 - Total Chlamydia Cases and Percent HIV+ by Year of Diagnosis, Washington State 1993 - 2009

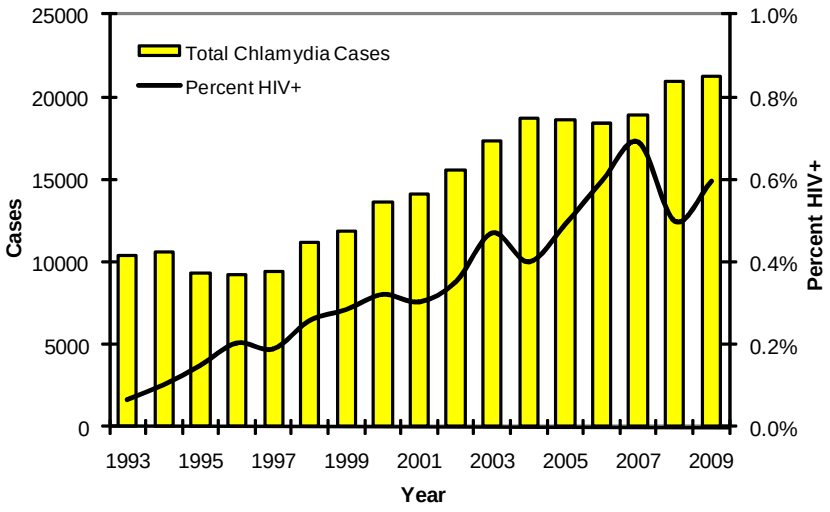


Figure 45 - Total Gonorrhea Cases and Percent HIV+ by Year of Diagnosis, Washington State 1993 - 2009

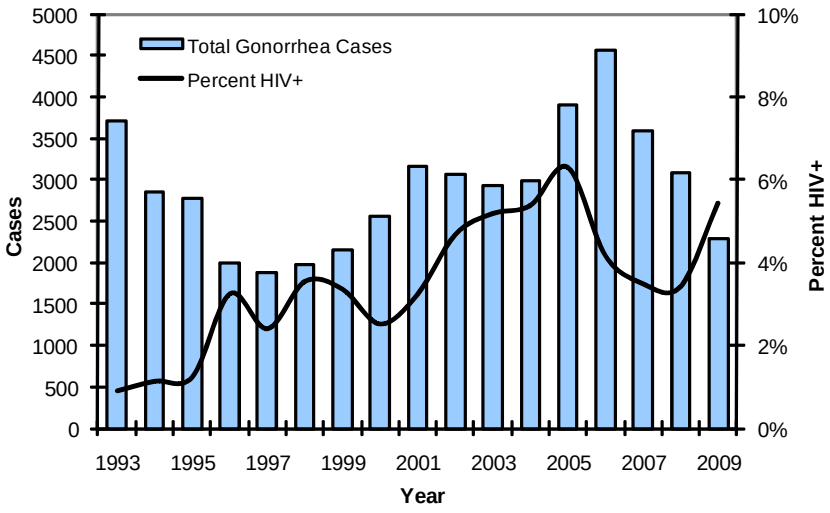


Figure 46 - Total P & S Syphilis Cases and Percent HIV+ by Year of Diagnosis, Washington State 1993 - 2009

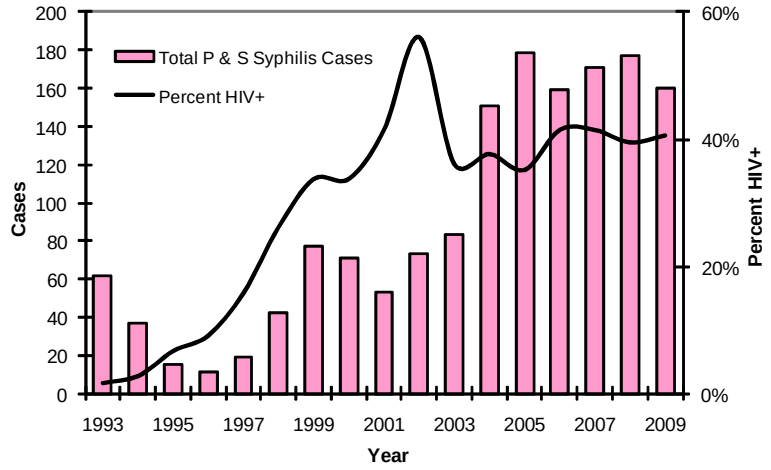
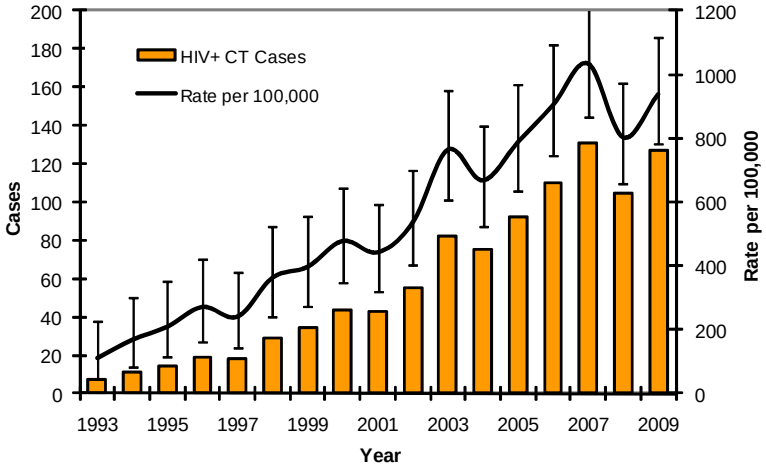
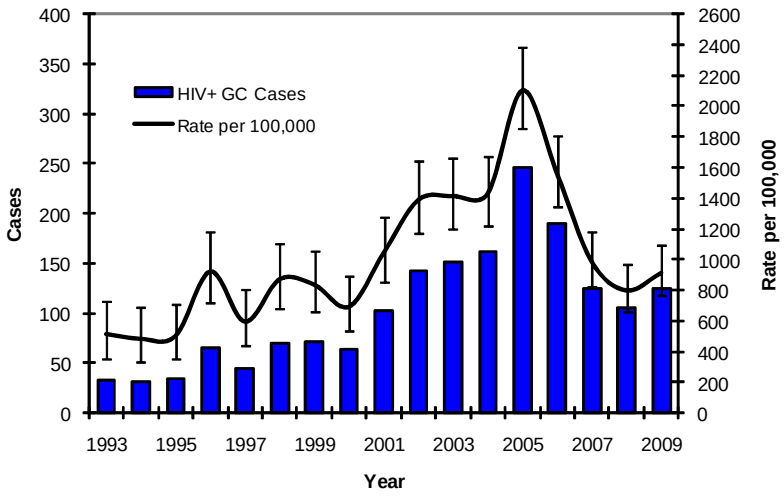


Figure 47 - Chlamydial Infection Cases and Incidence Rate Among People Living with HIV by Year, Washington State 1993 - 2009



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

Figure 48 - Gonorrhea Cases and Incidence Rate Among People Living with HIV by Year, Washington State 1993 - 2009



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

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

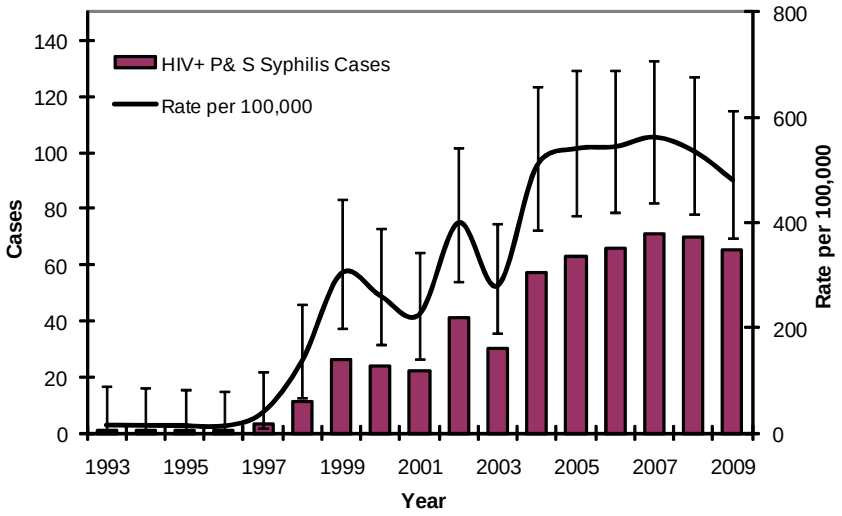
Among people diagnosed with gonorrhea, the HIV prevalence is considerably higher; 5.4 percent of gonorrhea cases diagnosed in 2009 were found to be HIV-positive at the time of their gonorrhea diagnosis. In part, as previously noted, this level of HIV prevalence is a reflection of the proportion of men 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 40 percent found to be HIV-positive in 2009. In contrast, 57.1 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 several 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 2009 was 917 per 100,000 versus 34.0 per 100,000 in the general population, *a 25-fold difference*.

Figure 49 - Primary or Secondary Syphilis Cases and Incidence Rate Among People Living with HIV by Year, Washington State 1993 - 2009



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

Among persons with HIV disease, the incidence of STIs appears to be decreasing or stabilizing in recent years following a decade of steady increases. A welcome development, these moderate declines in STI incidence may reflect recent programmatic emphasis on prevention for HIV-positives and a more comprehensive partner services infrastructure for newly diagnosed HIV cases.

However, optimism should be tempered by the knowledge that 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 must continue 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 1998 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 ther STD Services Section for additional information.

Table 1 - Notifiable STI Cases Diagnosed and Reported by Disease in Washington State, 2008 - 2009 with Annual Percent Change

Disease	2008 Cases*	2009 Cases*	Annual % Change
Chlamydia (CT)	20,882	21,178	1.4%
Gonorrhea (GC)	3,069	2,268	-26.1%
Primary & Secondary Syphilis	177	135	-23.7%
Early and Late Latent Syphilis	244	194	-20.5%
Congenital Syphilis	0	1	-
Herpes, Initial Infection	1,971	1,875	-4.9%
Neonatal Herpes	9	4	-55.6%
Lymphogranuloma Venereum	4	2	-50.0%
Chancroid/GI	1	0	-100.0%
Total Reportable STIs	**26,357**	**25,657**	**-2.7%**

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

Table 2 - STI Cases Reported with Missing Demographic Data by Disease and Data Element, Washington State, 2009

	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, 2009

		Chlamydia			Gonorrhea		
County	2009 Population*	Cases†	Rate‡	Rank	Cases†	Rate‡	Rank
Adams	18000	77	427.8	3	3	16.7	16
Asotin	21500	41	190.7	29	4	18.6	9
Benton	169300	570	336.7	7	34	20.1	7
Chelan	72600	161	221.8	22	2	2.8	34
Clallam	69500	164	236.0	20	12	17.3	14
Clark	431200	1312	304.3	9	124	28.8	3
Columbia	4100	4	97.6	35	0	0.0	35
Cowlitz	99600	340	341.4	6	9	9.0	28
Douglas	37600	77	204.8	26	3	8.0	31
Ferry	7800	16	205.1	25	0	0.0	35
Franklin	72700	310	426.4	4	10	13.8	19
Garfield	2250	1	44.4	37	0	0.0	35
Grant	86100	262	304.3	8	9	10.5	22
Grays Harbor	71200	140	196.6	28	12	16.9	15
Island	80300	171	213.0	23	14	17.4	12
Jefferson	29000	47	162.1	32	2	6.9	32
King	1909300	5805	304.0	10	1083	56.7	1
Kitsap	247600	725	292.8	12	44	17.8	11
Kittitas	39900	110	275.7	16	6	15.0	18
Klickitat	20200	32	158.4	33	2	9.9	25
Lewis	75200	160	212.8	24	8	10.6	21
Lincoln	10450	9	86.1	36	1	9.6	26
Mason	56800	130	228.9	21	5	8.8	29
Okanogan	40500	105	259.3	17	7	17.3	13
Pacific	21800	37	169.7	30	1	4.6	33
Pend Oreille	12900	16	124.0	34	0	0.0	35
Pierce	813600	3861	474.6	2	457	56.2	2
San Juan	16300	6	36.8	38	2	12.3	20
Skagit	118900	331	278.4	15	12	10.1	24
Skamania	10800	22	203.7	27	2	18.5	10
Snohomish	704300	1701	241.5	19	148	21.0	6
Spokane	465000	1637	352.0	5	131	28.2	4
Stevens	44000	74	168.2	31	4	9.1	27
Thurston	249800	716	286.6	13	26	10.4	23
Wahkiakum	4100	1	24.4	39	0	0.0	35
Walla Walla	59200	152	256.8	18	5	8.4	30
Whatcom	193100	544	281.7	14	38	19.7	8
Whitman	43300	131	302.5	11	10	23.1	5
Yakima	238400	1180	495.0	1	38	15.9	17
State Total	**6668200**	**21178**	**317.6**	**-**	**2268**	**34.0**	**-**

*Official Washington State population estimates (OFM, April 2010)

†Cases diagnosed in 2009 and reported as of March 2010

‡ Incidence rates based on small numbers are unstable; rates in red exceed 30% relative standard error

Table 4 - Chlamydia - Cases Diagnosed and Incidence Rate by Gender and County, 2009

County	2009 Population*		Chlamydia Cases & Rates†			
	Male	Female	Male	Rate‡	Female	Rate‡
Adams	9205	8795	7	76.0	70	795.9
Asotin	10253	11247	9	87.8	32	284.5
Benton	84351	84949	119	141.1	451	530.9
Chelan	36216	36384	28	77.3	133	365.5
Clallam	34440	35060	34	98.7	130	370.8
Clark	214395	216805	296	138.1	1016	468.6
Columbia	2003	2097	1	49.9	3	143.1
Cowlitz	49449	50151	91	184.0	249	496.5
Douglas	18677	18923	17	91.0	60	317.1
Ferry	4061	3739	5	123.1	11	294.2
Franklin	37990	34710	58	152.7	252	726.0
Garfield	1118	1132	0	0.0	1	88.3
Grant	44092	42008	48	108.9	214	509.4
Grays Harbor	35464	35736	25	70.5	115	321.8
Island	40280	40020	37	91.9	134	334.8
Jefferson	14447	14553	9	62.3	38	261.1
King	951290	958010	1905	200.3	3900	407.1
Kitsap	125739	121861	161	128.0	564	462.8
Kittitas	19864	20036	45	226.5	65	324.4
Klickitat	10120	10080	8	79.0	24	238.1
Lewis	37353	37847	34	91.0	126	332.9
Lincoln	5194	5256	2	38.5	7	133.2
Mason	29385	27415	35	119.1	95	346.5
Okanogan	20273	20227	27	133.2	78	385.6
Pacific	10831	10969	11	101.6	26	237.0
Pend Oreille	6517	6383	4	61.4	12	188.0
Pierce	405168	408432	1064	262.6	2797	684.8
San Juan	8005	8295	0	0.0	6	72.3
Skagit	59006	59894	79	133.9	252	420.7
Skamania	5452	5348	6	110.1	16	299.2
Snohomish	352758	351542	445	126.1	1256	357.3
Spokane	228450	236550	397	173.8	1240	524.2
Stevens	21999	22001	20	90.9	54	245.4
Thurston	122672	127128	140	114.1	576	453.1
Wahkiakum	2055	2045	0	0.0	1	48.9
Walla Walla	30141	29059	30	99.5	122	419.8
Whatcom	95383	97717	130	136.3	413	422.6
Whitman	21952	21348	41	186.8	90	421.6
Yakima	119050	119350	195	163.8	985	825.3
State Total	**3325097**	**3343103**	**5563**	**167.3**	**15614**	**467.1**

*Official Washington State population estimates (OFM, April 2010)

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

‡ Rates based on small numbers can be unstable; rates in red exceed 30% relative standard error

Table 5 - Gonorrhea - Cases Diagnosed and Incidence Rate by Gender and County, 2009

County	2009 Population*		Gonorrhea Cases & Rates†			
	Male	Female	Male	Rate‡	Female	Rate‡
Adams	9205	8795	3	32.6	0	0.0
Asotin	10253	11247	0	0.0	4	35.6
Benton	84351	84949	14	16.6	20	23.5
Chelan	36216	36384	0	0.0	2	5.5
Clallam	34440	35060	2	5.8	10	28.5
Clark	214395	216805	54	25.2	70	32.3
Columbia	2003	2097	0	0.0	0	0.0
Cowlitz	49449	50151	3	6.1	6	12.0
Douglas	18677	18923	1	5.4	2	10.6
Ferry	4061	3739	0	0.0	0	0.0
Franklin	37990	34710	5	13.2	5	14.4
Garfield	1118	1132	0	0.0	0	0.0
Grant	44092	42008	4	9.1	5	11.9
Grays Harbor	35464	35736	4	11.3	8	22.4
Island	40280	40020	9	22.3	5	12.5
Jefferson	14447	14553	1	6.9	1	6.9
King	951290	958010	797	83.8	284	29.6
Kitsap	125739	121861	21	16.7	23	18.9
Kittitas	19864	20036	4	20.1	2	10.0
Klickitat	10120	10080	1	9.9	1	9.9
Lewis	37353	37847	4	10.7	4	10.6
Lincoln	5194	5256	1	19.3	0	0.0
Mason	29385	27415	2	6.8	3	10.9
Okanogan	20273	20227	4	19.7	3	14.8
Pacific	10831	10969	0	0.0	1	9.1
Pend Oreille	6517	6383	0	0.0	0	0.0
Pierce	405168	408432	207	51.1	250	61.2
San Juan	8005	8295	2	25.0	0	0.0
Skagit	59006	59894	4	6.8	8	13.4
Skamania	5452	5348	1	18.3	1	18.7
Snohomish	352758	351542	83	23.5	65	18.5
Spokane	228450	236550	51	22.3	80	33.8
Stevens	21999	22001	2	9.1	2	9.1
Thurston	122672	127128	9	7.3	17	13.4
Wahkiakum	2055	2045	0	0.0	0	0.0
Walla Walla	30141	29059	1	3.3	4	13.8
Whatcom	95383	97717	17	17.8	21	21.5
Whitman	21952	21348	4	18.2	6	28.1
Yakima	119050	119350	12	10.1	26	21.8
State Total	**3325097**	**3343103**	**1327**	**39.9**	**939**	**28.1**

*Official Washington State population estimates (OFM, April 2010)

†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 30% relative standard error

Table 6 - Chlamydia Cases Diagnosed and Incidence Rate by Age Group and Gender, 1998 - 2009

	Age Group	Total		Males		Females	
		Cases	Rate	Cases	Rate	Cases	Rate
2009	0-9	37	4.3	9	2.0	28	6.6
	10-14	188	43.2	17	7.6	171	80.6
	15-19	6565	1,394.4	1061	439.0	5504	2,402.3
	20-24	7951	1,664.8	2054	840.4	5897	2,528.8
	25-29	3597	749.2	1136	461.1	2461	1,052.9
	30-34	1379	319.2	528	238.3	851	404.5
	35-39	707	155.6	328	141.2	379	170.6
	40-44	359	78.2	194	83.2	165	73.0
	45+	386	14.9	233	18.8	153	11.3
	Missing	8	0.0	3	0.0	5	0.0
	All Ages	21178	317.6	5563	167.3	15614	467.1
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	6413	1,358.3	1042	429.7	5371	2,338.8
	20-24	7736	1,629.8	2109	867.4	5627	2,430.7
	25-29	3537	756.2	1175	489.2	2362	1,037.9
	30-34	1435	339.4	566	261.4	869	421.2
	35-39	699	151.0	317	133.8	382	169.1
	40-44	383	82.5	214	91.1	169	73.7
	45+	396	15.7	249	20.6	147	11.1
	Missing	92	0.0	26	0.0	66	0.0
	All Ages	20983	318.5	5719	174.1	15213	460.6
2007	0-9	10	1.2	7	1.6	3	0.7
	10-14	207	47.4	16	7.1	191	89.8
	15-19	5737	1,226.5	922	384.2	4815	2,114.0
	20-24	6893	1,468.5	1807	750.2	5086	2,225.8
	25-29	3147	699.4	1021	442.7	2126	969.3
	30-34	1269	305.0	527	247.4	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	217	0.0	64	0.0	153	0.0
	All Ages	18915	291.5	5075	156.9	13755	422.7
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	6701	1,452.2	1768	745.1	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	18397	288.6	4995	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	5880	1,305.5	941	407.7	4939	2,249.1
	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	18646	298.0	5228	167.7	13408	427.1
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	6149	1,388.5	987	435.1	5162	2,389.7
	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	18674	302.8	5132	167.0	13532	437.1

	Age Group	Total		Males		Females	
		Cases	Rate	Cases	Rate	Cases	Rate
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	896	397.7	4970	2,322.7
	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	4691	154.5	12667	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
1998	0-9	19	2.3	9	2.1	10	2.5
	10-14	283	66.8	13	6.0	270	131.4
	15-19	4262	1,022.0	595	276.6	3667	1,816.4
	20-24	3584	988.7	938	501.8	2646	1,507.1
	25-29	1481	352.7	534	248.0	947	462.9
	30-34	609	138.7	233	103.8	376	175.3
	35-39	349	71.5	144	58.6	205	84.6
	40-44	159	33.1	65	27.1	94	39.1
	45+	146	7.7	65	7.3	81	8.1
	Missing	273	0.0	57	0.0	216	0.0
	All Ages	11165	194.2	2653	92.6	8512	294.9

Table 7 - Gonorrhea - Cases Diagnosed and Incidence Rate by Age Group and Gender, 1998 - 2009

	Age Group	Total		Males		Females	
		Cases	Rate	Cases	Rate	Cases	Rate
2009	0-9	5	0.6	3	0.7	2	0.5
	10-14	13	3.0	1	0.4	12	5.7
	15-19	386	82.0	107	44.3	279	121.8
	20-24	743	155.6	376	153.8	367	157.4
	25-29	448	93.3	293	118.9	155	66.3
	30-34	210	48.6	152	68.6	58	27.6
	35-39	160	35.2	132	56.8	28	12.6
	40-44	127	27.7	108	46.3	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	2268	34.0	1327	39.9	939	28.1
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	934	196.8	437	179.7	497	214.7
	25-29	560	119.7	316	131.6	244	107.2
	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	16.2	34	2.6
	Missing	9	0.0	5	0.0	4	0.0
	All Ages	3079	46.7	1586	48.3	1489	45.1
2007	0-9	1	0.1	0	0.0	1	0.2
	10-14	42	9.6	7	3.1	35	16.4
	15-19	789	168.7	230	95.8	559	245.4
	20-24	1006	214.3	429	178.1	577	252.5
	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	3582	55.2	1768	54.7	1798	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
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

	Age Group	Total		Males		Females	
		Cases	Rate	Cases	Rate	Cases	Rate
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
1998	0-9	4	0.5	1	0.2	3	0.7
	10-14	31	7.3	1	0.5	30	14.6
	15-19	427	102.4	113	52.5	314	155.5
	20-24	503	138.8	216	115.5	287	163.5
	25-29	389	92.6	287	133.3	102	49.9
	30-34	248	56.5	180	80.2	68	31.7
	35-39	169	34.6	140	57.0	29	12.0
	40-44	93	19.4	80	33.4	13	5.4
	45+	62	3.3	54	6.1	8	0.8
	Missing	49	0.0	26	0.0	23	0.0
	All Ages	1975	34.3	1098	38.3	877	30.4

Table 8 - Primary & Secondary Syphilis Cases Diagnosed and Incidence Rate by Age Group and Gender, 1998 - 2009

	Age Group	Total		Males		Females	
		Cases	Rate	Cases	Rate	Cases	Rate
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	0	0.0	0	0.0	0	0.0
	20-24	13	2.7	13	5.3	0	0.0
	25-29	14	2.9	14	5.7	0	0.0
	30-34	26	6.0	25	11.3	1	0.5
	35-39	21	4.6	18	7.7	3	1.4
	40-44	28	6.1	27	11.6	1	0.4
	45+	33	1.3	32	2.6	1	0.1
	Missing	0	0.0	0	0.0	0	0.0
	All Ages	135	2.0	129	3.9	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
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

	Age Group	Total		Males		Females	
		Cases	Rate	Cases	Rate	Cases	Rate
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
1998	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	2	0.9	1	0.5
	20-24	2	0.6	2	1.1	0	0.0
	25-29	11	2.6	7	3.3	4	2.0
	30-34	8	1.8	8	3.6	0	0.0
	35-39	7	1.4	7	2.8	0	0.0
	40-44	5	1.0	4	1.7	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	42	0.7	36	1.3	6	0.2

Table 9 - Initial Genital Herpes Cases Diagnosed and Incidence Rate by Age Group and Gender, 1998 - 2009

	Age Group	Total		Males		Females	
		Cases	Rate	Cases	Rate	Cases	Rate
2009	0-9	12	1.4	2	0.4	10	2.4
	10-14	9	2.1	1	0.4	8	3.8
	15-19	260	55.2	32	13.2	228	99.5
	20-24	565	118.3	124	50.7	441	189.1
	25-29	384	80.0	128	52.0	256	109.5
	30-34	197	45.6	73	32.9	124	58.9
	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	5	0.0	0	0.0	5	0.0
	All Ages	1875	28.1	507	15.2	1368	40.9
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	277	58.7	24	9.9	253	110.2
	20-24	543	114.4	130	53.5	413	178.4
	25-29	387	82.7	110	45.8	277	121.7
	30-34	209	49.4	76	35.1	133	64.5
	35-39	143	30.9	50	21.1	93	41.2
	40-44	112	24.1	38	16.2	74	32.3
	45+	241	9.5	70	5.8	171	12.9
	Missing	31	0.0	8	0.0	23	0.0
	All Ages	1973	30.0	508	15.5	1443	43.7
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	32	13.3	259	113.7
	20-24	559	119.1	148	61.4	411	179.9
	25-29	351	78.0	114	49.4	237	108.1
	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	512	15.8	1416	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	240	57.7	68	32.0	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	2425	38.0	595	18.7	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	676	150.6	157	68.0	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	2305	36.8	613	19.7	1692	53.9
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

	Age Group	Total		Males		Females	
		Cases	Rate	Cases	Rate	Cases	Rate
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
1998	0-9	2	0.2	1	0.2	1	0.2
	10-14	7	1.7	0	0.0	7	3.4
	15-19	275	65.9	34	15.8	241	119.4
	20-24	452	124.7	95	50.8	357	203.3
	25-29	376	89.5	122	56.7	254	124.2
	30-34	214	48.7	74	33.0	140	65.3
	35-39	138	28.3	52	21.2	86	35.5
	40-44	92	19.2	29	12.1	63	26.2
	45+	159	8.4	43	4.8	116	11.7
	Missing	107	0.0	26	0.0	81	0.0
	All Ages	1822	31.7	476	16.6	1346	46.6

Summary of 2006 Treatment Guidelines

DISEASE	RECOMMENDED RX	DOSE/ROUTE	ALTERNATIVES
CHLAMYDIAL INFECTIONS[1] Adults or Adolescents with uncomplicated infection of the cervix, urethra or rectum. Pregnant women[7]	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 800 mg orally 4x/day for 7 days OR Ofloxacin[3] 300 mg orally 2x/day for 7 days OR Levofloxacin[3] 500 mg orally once daily for 7 days Note[4]
GONOCOCCAL INFECTIONS[5] Adults or Adolescents with uncomplicated infection of the cervix, urethra or rectum. [Drugs with * designation are recommended for treatment of pharyngeal infection with *Neisseria gonorrhoeae*] Pregnant women[7]	*Ceftriaxone OR Cefpodoxime [8] OR Cefixime PLUS, IF CHLAMYDIAL INFECTION IS NOT RULED OUT Azithromycin[2] OR Doxycycline[3]	125 mg IM in a single dose 400 mg orally in a single dose 400 mg orally in a single dose 1 g orally in a single dose 100 mg orally 2x/day for 7 days	Ofloxacin 400 mg orally in a single dose[**] OR Levofloxacin 250 mg orally in a single dose[**] OR Spectinomycin[6] 2 g IM in a single dose OR *Ciprofloxacin 500 mg orally in single dose[**] **Since March 2, 2004, Health care providers in Washington State should no longer use fluoroquinolones as first line therapy due to increased prevalence of quinolone-resistant *Neisseria gonorrhoeae* (QRNG) in Washington state. If quinolones are used due to patient allergy or other contraindications, follow treatment with a test of cure.
NONGONOCOCCAL URETHRITIS (NGU)	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 Ofloxacin 300 mg orally 2x/day for 7 days OR Levofloxacin 500 mg orally once daily for 7 days
EPIDIDYMITIS[10]	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	Ofloxacin 300 mg orally 2x/day for 10 days OR Levofloxacin 500 mg orally once daily for 10 days (For acute epididymitis most likely caused by enteric organisms or for patients allergic to cephalosporins and/or tetracyclines)
PELVIC INFLAMMATORY DISEASE[7,9,10] **Outpatient management** Pregnant women[7]	Ofloxacin[3,9] WITH OR WITHOUT Metronidazole[11] OR Levofloxacin[3,9] WITH OR WITHOUT Metronidazole[11] OR Ceftriaxone PLUS Doxycycline[3] WITH OR WITHOUT Metronidazole[11] OR Cefoxitin AND Probenecid PLUS Doxycycline[3] WITH OR WITHOUT Metronidazole[11]	400 mg orally 2x/day for 14 days 500 mg orally 2x/day for 14 days 500 mg orally once daily for 14 days 500 mg orally 2x/day for 14 days 250 mg IM in a single dose 100 mg orally 2x/day for 14 days 500 mg orally 2x/day for 14 days 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	
SYPHILIS[7] Early-primary, secondary or latent < 1 year	Benzathine penicillin G	2.4 million units IM in a single dose	Doxycycline[3,12,13] 100 mg orally 2x/day for 14 days OR Tetracycline[3,12,13] 500 mg orally 4x/day for 14 days
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[3,12,13] 100 mg orally 2x/day for 28 days OR Tetracycline[3,12,13] 500 mg orally 4x/day for 28 days
HUMAN PAPILLOMAVIRUS External genital and perianal warts Pregnant women[7]	<u>Patient Applied</u> Podofilox 0.5%[14] solution or gel OR Imiquimod 5%[14] cream OR <u>Provider Applied</u> Cryotherapy with Liquid nitrogen or cryoprobe OR Podophyllin resin 10%-25%[14] OR Trichloroacetic acid or Bichloroacetic acid 80%-90% OR Surgical removal	 Apply to visible warts 2x/day for 3 days, rest 4 days, 4 cycles max. Apply once daily at bedtime, wash off with soap after 6-10 hours. Use 3x/week for up to 16 weeks. Repeat application every 1-2 weeks. Apply small amount, dry, wash off in 1-4 hours. Repeat weekly if necessary. Apply small amount, dry. Apply weekly if necessary.	Intralesional interferon OR Laser surgery
TRICHOMONIASIS	Metronidazole[11] OR Tinidazole[11]	2 g orally in a single dose 2 g orally in a single dose	Metronidazole[11] 500 mg 2x/day for 7 days
BACTERIAL VAGINOSIS Pregnant women[7]	Metronidazole[11] OR Metronidazole gel 0.75%	500 mg orally 2x/day for 7 days One full applicator (5 g) intravaginally once a	Clindamycin 300 mg orally 2x/day for 7 days OR

These guidelines for the treatment of patients with STDs reflect the 2006 <u>CDC Sexually Transmitted Diseases Treatment Guidelines</u>. They are intended as a brief source of clinical guidance; they are <u>not</u> 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 <u>www.doh.wa.gov/cfh/STD</u>. Confidential notification of sexual partners is an important component of STD treatment.

BACTERIAL VAGINOSIS Pregnant women[7]	Metronidazole[11] Metronidazole gel 0.75% Clindamycin cream 2%[15]	OR OR	500 mg orally 2x/day for 7 days One full applicator (5 g) intravaginally once a day for 5 days One full applicator (5 g) intravaginally at bedtime for 7 days	Clindamycin 300 mg orally 2x/day for 7 days OR Clindamycin ovules[15] 100 g intravaginally once at bedtime for 3 days
VULVOVAGINAL CANDIDIASIS **Uncomplicated** – see complete guidelines for recurrent, severe or nonalbicans Pregnant women[7]	Butoconazole[15] Butoconazole[15] Clotrimazole[15] Clotrimazole[15] Clotrimazole[15] Miconazole[15] Miconazole[15] Miconazole[15] Miconazole [15] Nystatin[15] Tioconazole[15] Terconazole[15] Terconazole[15] Terconazole[15] Fluconazole[3]	OR OR OR OR OR OR OR OR OR OR OR OR OR OR	2% cream 5 g intravaginally for 3 days 2% cream 5 g (Butaconazole1-sustained release), single intravaginal application 1% cream 5 g intravaginally for 7-14 days 100 mg vaginal tablet for 7 days 100 mg vaginal tablet, 2 tablets for 3 days 2% cream 5 g intravaginally for 7 days 100 mg vaginal suppository, one suppository for 7 days 200 mg vaginal suppository, one suppository for 3 days 1200 mg vaginal suppository, one suppository a day 100,000 U vaginal tablet, 1 tablet for 14 days 6.5% ointment 5 g intravaginally in a single application 0.4% cream 5 g intravaginally for 7 days 0.8% cream 5 g intravaginally for 3 days 80 mg vaginal suppository, one suppository for 3 days 150 mg oral tablet, one tablet in a single dose	
GENITAL HERPES SIMPLEX First clinical episode of genital herpes	Acyclovir[14] Acyclovir[14] Famciclovir[14] Valacyclovir[14]	OR OR OR	400 mg orally 3x/day for 7-10 days[16] 200 mg orally 5x/day for 7-10 days[16] 250 mg orally 3x/day for 7-10 days[16] 1 g orally 2x/day for 7-10 days[15]	
Episodic recurrent infection	Acyclovir[14] Acyclovir[14] Acyclovir[14] Famciclovir[14] Famciclovir [14] Valacyclovir[14] Valacyclovir[14]	OR OR OR OR OR OR	400 mg orally 3x/day for 5 days 800 mg orally 3x/day for 2 days 800 mg orally 2x/day for 5 days 125 mg orally 2x/day for 5 days 1000mg orally 2x/day for 1 day 500 mg orally 2x/day for 3 days 1 g orally once a day for 5 days	
Suppressive therapy[17]	Acyclovir[14] Famciclovir[14] Valacyclovir[14] Valacyclovir[14]	OR OR OR	400 mg orally 2x/day 250 mg orally 2x/day 500 mg orally once a day 1 g orally once a day	
PEDICULOSIS PUBIS	Permethrin 1% creme rinse Pyrethrins with Piperonyl Butoxide	OR	Apply to affected area, wash off after 10 minutes Apply to affected area, wash off after 10 minutes	Malathion .5% lotion applied for 8-12 hours and washed off OR Ivermectin 250 ug/kg repeated in 2 weeks
SCABIES	Permethrin 5% cream Ivermectin	OR	Apply to all areas of body from neck down, wash off after 8-14 hours 200ug/kg orally, repeated in 2 weeks	Lindane 1%[18] 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

1. Providers should advise all women with chlamydial infection to be rescreened 3 months after treatment, to rule out subsequent 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 adequately evaluated.
5. Patients with gonococcal infection should be tested or presumptively treated for chlamydial infection.
6. For patients who cannot tolerate cephalosporins or quinolones.
7. Please refer to the complete 2006 CDC Guidelines for recommended regimens.
8. Washington State STD guidelines recommend cefpodoxime as first line of therapy due to quinolone-resistant *Neisseria gonorrhoeae* (QRNG) and limited supply of cefixime.
9. Quinolones should not be used for gonococcal infections in MSM or in those with a history of recent foreign travel or partners' travel, infections acquired in California or Hawaii, or in other areas including Washington State with increased QRNG prevalence.
10. Patients who do not respond to oral therapy (within 72 hours for PID or epididymitis) should be re-evaluated.
11. Patients should be advised to avoid consuming alcohol during treatment.
12. 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
13. 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.
14. Safety during pregnancy not established.
15. These creams and suppositories are oil-based and may weaken latex condoms and diaphragms. Refer to product labeling for further information.
16. Treatment may be extended if healing is incomplete after 10 days of therapy.
17. During suppressive treatment (e.g., once a year) discontinuation of therapy should be discussed with patient to reassess the need for continued therapy.
18. Should not be used immediately after a bath or shower, and should not be used by persons who have extensive dermatitis, pregnant or lactating women, or children aged <2 years.

Updated recommended treatment regimens for gonococcal infections in the United States, April 2007

Ongoing data from CDC 's Gonococcal Isolate Surveillance Project, including preliminary findings from 2006, demonstrate that fluoroquinolone-resistant gonorrhea is continuing to spread and is now widespread in the United States. As a consequence, and as reported in the MMWR, April 13, 2007, this class of antibiotics is no longer recommended for the treatment of gonorrhea in the United States. Treatment recommendations have been updated accordingly, and are provided below.

Uncomplicated Gonococcal Infections of the Cervix, Urethra, and Rectum*

Recommended Regimens

Ceftriaxone 125 mg IM in a single dose **OR**
Cefixime 400 mg orally in a single dose or 400 mg by suspension (200 mg/5ml)

PLUS

TREATMENT FOR CHLAMYDIA IF CHLAMYDIAL INFECTION IS NOT RULED OUT

Alternative Regimens

Spectinomycin† 2 g in a single intramuscular (IM) dose **OR**
Single-dose cephalosporin regimens

Other single-dose cephalosporin therapies that are considered alternative treatment regimens for uncomplicated urogenital and anorectal gonococcal infections include ceftizoxime 500 mg IM; or cefoxitin 2 g IM, administered with probenecid 1 g orally; or cefotaxime 500 mg IM. Some evidence indicates that cefpodoxime 400 mg and cefuroxime axetil 1 g might be oral alternatives.

Uncomplicated Gonococcal Infections of the Pharynx*

Recommended Regimens

Ceftriaxone 125 mg IM in a single dose

PLUS

TREATMENT FOR CHLAMYDIA IF CHLAMYDIAL INFECTION IS NOT RULED OUT

* These regimens are recommended for all adult and adolescent patients, regardless of travel history or sexual behavior. Source: CDC/NCHHSTP/DSTDP http://www.cdc.gov/STD/treatment/ 4/12/2007

†Spectinomycin is currently not available in the United States.

Disseminated Gonococcal Infection (DGI)

Recommended Regimen

Ceftriaxone 1 g IM or IV every 24 hours

Alternative Regimens

Cefotaxime 1 g IV every 8 hours **OR**
Ceftizoxime 1 g IV every 8 hours **OR**
Spectinomycin † 2 g IM every 12 hours

A cephalosporin-based intravenous regimen is recommended for the initial treatment of DGI. This is particularly important when gonorrhea is detected at mucosal sites by nonculture tests. Spectinomycin is not currently available in the United States; updated information regarding its availability can be found at http://www.cdc.gov/std/gonorrhea/arg. Treatment should be continued for 24–48 hours after clinical improvement, at which time therapy may be switched to one of the following regimens to complete at least 1 week of antimicrobial therapy.

Cefixime 400 mg orally twice daily **OR**
Cefixime suspension 400 mg by suspension (200 mg/5ml) twice daily **OR**
Cefpodoxime 400 mg orally twice daily

Fluoroquinolones may be an alternative treatment option if antimicrobial susceptibility can be documented by culture. With use of nonculture tests to diagnose *N. gonorrhoeae* increasing and with local data on antimicrobial susceptibility less available, laboratories should maintain the capacity to conduct such testing or form partnerships with laboratories that can.

Special Note on Possible Emergence of Cephalosporin Resistant *Neisseria gonorrhoeae*

Clinicians should consider the following for uncomplicated gonococcal infections of the cervix, urethra, and rectum:

Recommended Regimen

Ceftriaxone 250 mg IM in a single dose
PLUS
TREATMENT FOR CHLAMYDIA IF CHLAMYDIAL INFECTION IS NOT RULED OUT

Alternative Regimens

Cefixime 400 mg orally in a single dose or 400 mg by suspension (200 mg/5ml)
Spectinomycin† 2 g in a single intramuscular (IM) dose **OR**
Single-dose cephalosporin regimens

†Spectinomycin is currently not available in the United States.

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Field Note

"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

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