

Sexually Transmitted Infections

(Chlamydia, Gonorrhea and Syphilis)

Summary

Chlamydial infection is the most commonly reported sexually transmitted infection (STI) in Washington State and nationwide. Reported incidence of chlamydia has been increasing in Washington since 1997, due in part to better detection and reporting. In 2012, 24,600 cases of chlamydia were diagnosed and reported in Washington (an annual crude incidence rate of 361 per 100,000). With 3,282 new cases of gonorrhea reported in Washington in 2012 (annual crude incidence rate of 48 per 100,000), gonorrhea was the second most commonly reported sexually transmitted infection in the state. This number represents a sharp increase from the low of 1,880 cases reported in 1997. Cases of infectious primary and secondary syphilis have also increased in Washington since 1996 from a low of 11 cases annually to 300 cases in 2012 (an annual crude incidence rate of 4.4 per 100,000). Females are more likely than males to be diagnosed with chlamydia, although underlying rates might be similar. In contrast, gonorrhea and especially syphilis are more common in men.

Failure to diagnose and treat these diseases can result in serious long-term health consequences, such as infertility in women, harm to a developing fetus, and increased susceptibility to the human immunodeficiency virus (HIV).

Bacteria cause these STIs. The U.S. Centers for Disease Control and Prevention (CDC) recommends specific antibiotic treatments to cure each of the diseases. All recent sexual

Definition: This chapter provides information on three of the more than 25 diseases spread primarily through sexual activity: chlamydia (ICD-9 code 099.5), gonorrhea (ICD-9 code 098), and syphilis (ICD-9 codes 090-091). These diseases are caused by bacteria: *Chlamydia trachomatis*, *Neisseria gonorrhoeae*, and *Treponema pallidum*, respectively. Unless otherwise noted, data in this report include cases of disease that have been reported to the Washington State Department of Health. (See [Technical Note](#).) For syphilis, cases include those with primary or secondary disease, the two most infectious stages of syphilis. Symptoms of these diseases vary both by disease and individual affected and range from no symptoms, to mild to moderate symptoms such as discharge from the vagina or penis and painful urination, to causing serious complications such as infertility in women or harm to a developing fetus.

partners of a person diagnosed with an STI should be tested and treated to stop ongoing disease transmission. For people who are sexually active, barrier methods like male and female condoms can prevent infection. Routine screening for STI is recommended for groups at higher risk of infection, including people with new or multiple concurrent sexual partners.

Introduction

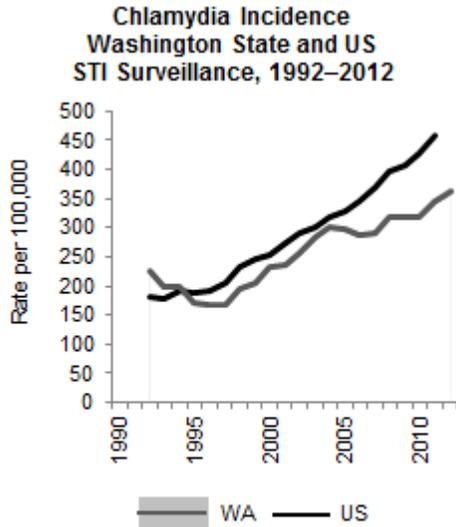
This chapter covers three sexually transmitted infections that healthcare providers are required to report to the Washington State Department of Health: chlamydia, gonorrhea and syphilis. The chapter first discusses each disease separately, describing how rates have changed over time, how Washington compares to national *Healthy People* goals, and how rates vary by county, age and gender. The chapter then provides information on economic factors, race and ethnicity; other measures of burden; risk and protective factors; and intervention strategies for all three diseases, highlighting commonalities and differences.

Chlamydia

Time Trends

Healthcare providers in Washington State have been required to report cases of chlamydial infection since 1987, seven years before all states were required to report cases nationally to the CDC. The reported incidence rate of chlamydia in Washington reached a low of 166 per 100,000 in 1997. Since that time, incidence rates increased sharply before leveling off in 2004 through 2007. Rates then increased sharply to the 2012 incidence rate of 361

per 100,000. Expansion of screening activities, more sensitive test technologies, and increased use of laboratory reporting for case finding may have contributed to the rate increases in the past decade.



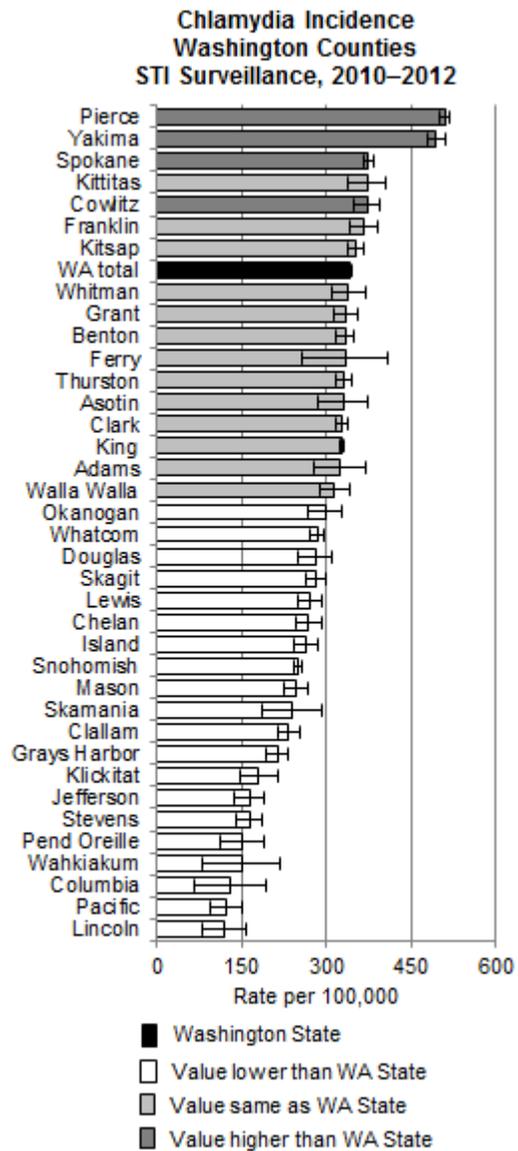
2010 and 2020 Goals

The *Healthy People 2010* goal was a chlamydial infection rate of no more than 3.0% among people 15–24 years screened in sexually transmitted infection (STI) and family planning clinics. Washington did not meet these goals. For 2011, the chlamydia infection rate for people screened in Washington STI clinics participating in the federal [Infertility Prevention Project \(IPP\)](#) was 7.0% for males and 7.9% for females ages 25 or younger. The chlamydia infection rate for females ages 25 or younger screened at Washington IPP family planning clinics was 15.0% in 2011.

The *Healthy People 2020* goals were changed to remove STI clinic monitoring and instead target males and females under 24 years old enrolled in a National Job Training Program. The Washington IPP does not include any National Job Training Programs and so attainment of this goal cannot be estimated. The 2020 family planning clinic goal was revised to a chlamydia infection rate of 6.7% for screened females ages 15–24 years. Increased efforts and resources for screening and treating all potentially exposed women will be required to attain the *Healthy People 2020* goals for chlamydial infection.

Geographic Variation

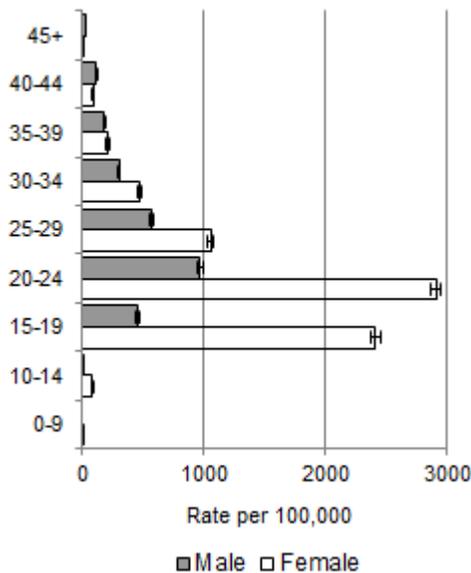
Chlamydial infection is widely spread among all sexually active residents of Washington. Providers reported cases from all 39 Washington counties during 2010–2012, though too few cases were reported from Garfield County to calculate stable rates. Based on the average annual incidence rate for 2010–2012, Pierce County had the greatest burden of disease (510 per 100,000) and Yakima County had a similarly high incidence rate (495 per 100,000). Cowlitz and Spokane counties also had higher incidence rates than the overall state rate.



Age and Gender

Many more reports of chlamydial infection are received from providers for women than men; therefore, men and women have very different reported chlamydia incidence rates. Chlamydia screening initiatives target younger women who access care in family planning and reproductive health settings. Providers do not routinely screen men in these settings unless they accompany their female partners to the healthcare visit. Thus, a large portion of male partners of infected women remain unscreened, undiagnosed or untreated. This contributes to ongoing chlamydia transmission and re-infection. Given the disparities in screening between men and women, it is likely that the true incidence of chlamydial infection among men is similar to the rate among women for all age groups. The highest incidence rates for females occur among those ages 15–24. Among males, the highest rate is in the 20–24 year age group.

**Chlamydia Incidence
Age and Gender
STI Surveillance, 2010–2012**

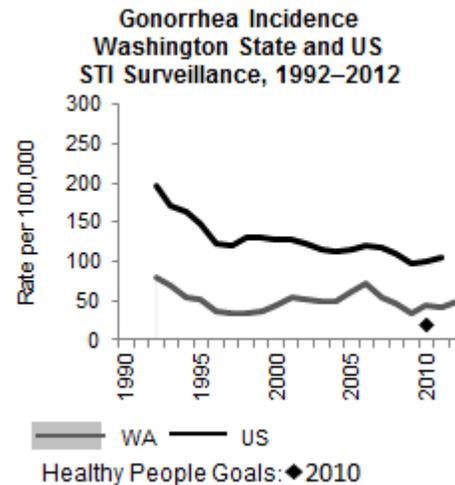


Gonorrhea

Time Trends

Gonorrhea incidence declined steeply both nationally and in Washington during the middle of the 1990s. Since 1997, gonorrhea incidence among Washington residents sharply increased

through 2006. This pattern is consistent with trends seen elsewhere on the U.S. West Coast.¹ The rate of new cases decreased steadily through 2009 perhaps in response to widespread implementation of improved treatment resulting in decreased transmission of the disease. The rate of gonorrhea has since sharply increased through 2012 to 48 cases of gonorrhea per 100,000.



2010 and 2020 Goals

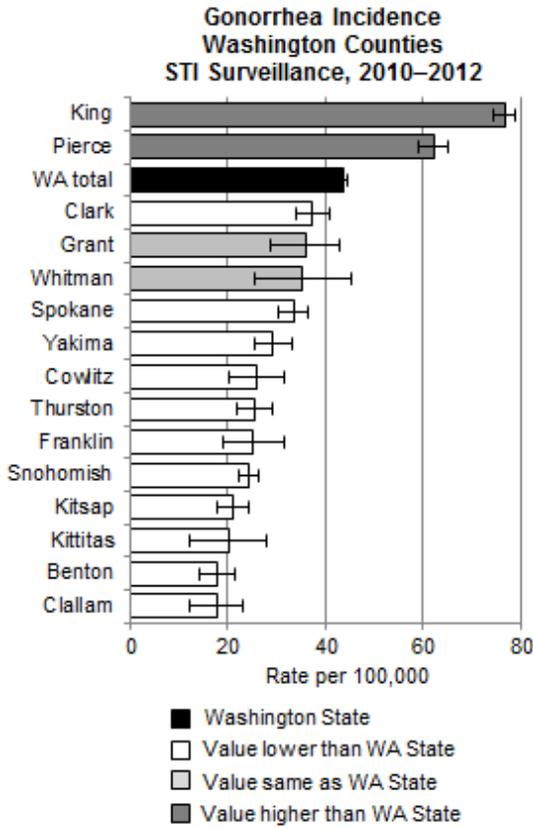
Healthy People 2010 had a goal of no more than 19 cases of gonorrhea per 100,000 residents. Washington did not meet this goal. At 42 per 100,000 residents in 2010, Washington's rate was more than double the goal.

Healthy People 2020 revised the goal and has different goals for females and males. For females ages 15–44 years, the goal is 257 cases per 100,000, and for males of the same age, the goal is 198 per 100,000. In 2012, Washington met both of these goals with rates of 87 per 100,000 for females and 126 per 100,000 for males ages 15–44. Continued resources for diagnosis and treatment and to identify, screen and treat all exposed partners are needed to maintain attainment of the *Healthy People 2020* goals.

Geographic Variation

Gonorrhea cases have historically been concentrated in urban areas in Washington. For 2010–2012 combined, the state's two largest urban counties, King and Pierce, had higher incidence rates than the overall state rate. A high incidence of gonorrhea among urban gay, bisexual and other men who have sex with men (MSM) contributes to the high rates of disease in these counties. The

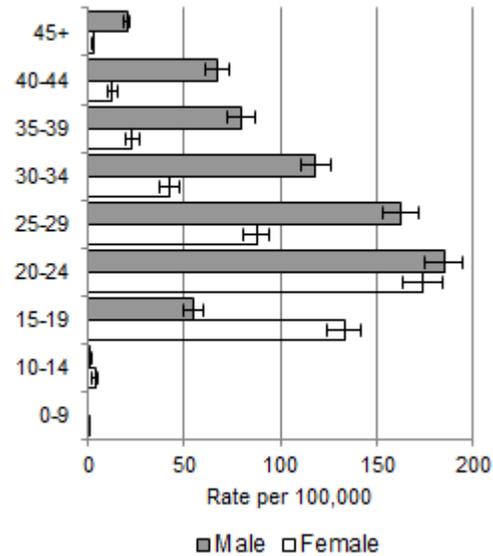
rates for Grant and Whitman counties were similar to the state rate. Fourteen counties had too few cases for calculating reliable rates, and the remaining counties had incidence rates lower than the statewide average incidence rate of 48 cases per 100,000.



Age and Gender

The number of gonorrhea cases reported among males is higher than among females. In 2012, about 1.6 cases among males were reported for every female case. For both men and women, gonorrhea rates peak at ages 20–24. The large differences in rates between men and women ages 25 and older occurs because of the high incidence of gonorrhea among MSM. Gonorrhea incidence among males 15–19 years is less than half that of females in the same age group, suggesting that younger men might be less likely to access screening and diagnostic services.

Gonorrhea Incidence Age and Gender STI Surveillance, 2010–2012

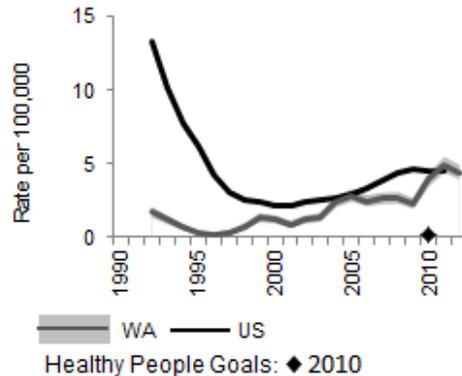


Syphilis

Time Trends

Washington experienced an outbreak of heterosexual syphilis in the late 1980s and early 1990s. Shortly after that the number of cases decreased to a low of 11 cases in 1996. Most of these infections were acquired out of the state. Starting in 1997, infectious syphilis reemerged in Washington primarily among urban MSM. A sharp increase in incidence rates of primary and secondary syphilis has been observed since that time.

Primary & Secondary Syphilis Washington State and US STI Surveillance 1992–2012



In 2012, there were 300 cases of primary and secondary syphilis reported in Washington for an incidence rate of 4.4 cases per 100,000. In 2011, the incidence rate in Washington was higher than the U.S. rate for the first time.

In 2000, national primary and secondary syphilis incidence rates fell to their lowest rate (2.1 cases per 100,000) since reporting began in 1941. Because of these dramatic reductions in disease, the CDC launched the National Syphilis Elimination Project. Despite much work to reduce transmission in selected high-incidence populations nationwide, syphilis continues to be of particular concern in the southern United States and among urban MSM populations.

2010 and 2020 Goals

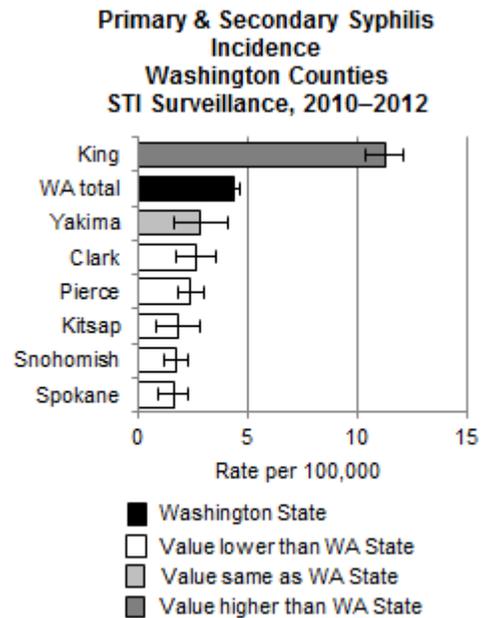
The *Healthy People 2010* goal was to reduce the national incidence of primary and secondary stage syphilis to 0.2 cases per 100,000. Washington achieved this benchmark for only one year in the past decade, 1996. The 2010 incidence rate of primary and secondary syphilis (3.9 cases per 100,000) was almost 20 times the *Healthy People 2010* goal.

Healthy People 2020 revised the goal and developed different goals for females and males. The new goal is 1.4 cases per 100,000 for females and 6.8 per 100,000 for males. In 2012, Washington met the 2020 goal for females (0.2 per 100,000) but not for males (8.5 cases per 100,000). Public health agencies are working to control the current outbreak among males through efforts to encourage providers to screen MSM and by ensuring the testing and treatment of exposed partners. Given the growing number of cases, additional resources will be needed if Washington is to meet the goal for primary and secondary syphilis incidence.

Geographic Variation

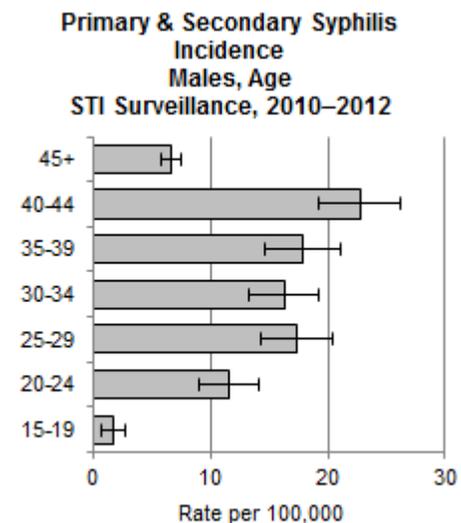
Primary and secondary syphilis transmission is mainly an urban phenomenon affecting MSM populations in King County or those who travel to King County to find sex partners. King County reported 70% of all cases in 2012 and had an incidence rate of 11.3 primary and secondary stage syphilis cases per 100,000. This was considerably higher than the statewide rate of 4.4 cases per 100,000 that year. Six additional counties reported sufficient cases to calculate stable rates for this period. Five of these six

other counties have rates lower than the overall statewide rate.



Age and Gender

There were too few females with syphilis in Washington from 2010–2012 to reliably calculate incidence rates for different age groups. Male case rates by age are distributed in a pattern characteristic of STIs among MSM, with the highest rates among those 40–44 years old (22.7 cases per 100,000).



Chlamydia, Gonorrhea, Syphilis

Economic Factors and Education

Providers are not required to report the income level and educational attainment of patients diagnosed with STIs. However, chlamydia rates diagnosed during 2004–2006 were higher in census tracts with a lower proportion of people with at least a high school diploma. Census tracts with lower median household incomes also had higher rates of chlamydia than those with higher median incomes.² (See [Technical Notes](#).) Similar associations nationally show relationships of poverty, lower educational attainment and unemployment with higher STI rates.³

Race and Hispanic Origin

Washington's rates of chlamydia and gonorrhea by race and Hispanic origin are not reliable due to missing data. In 2012, 20% of case reports did not identify the race of the patient, and 30% were missing information about Hispanic origin.

National data suggest disparities in rates of chlamydia and gonorrhea by race and Hispanic origin. In 2011, all groups except Asians and Pacific Islanders combined had higher rates of chlamydia and gonorrhea than did non-Hispanic whites. Nationally, rates are highest among non-Hispanic blacks who have reported rates over seven times higher for chlamydia and 17 times higher for gonorrhea than the rates among non-Hispanic whites.⁴

Data on race and ethnicity are more complete for primary and secondary syphilis due to the routine public health investigation and partner services activities. In 2012, 58% of reported primary and secondary syphilis in Washington was among non-Hispanic white residents. However, as is true nationally rates for Washington's non-Hispanic black residents are higher than rates for residents of other races or Hispanic ethnicity. During 2010–2012, combined, Washington's non-Hispanic black residents had a rate of 11.8 cases per 100,000 compared to a rate of 3.9 per 100,000 for non-Hispanic white residents.

Other Measures of Impact and Burden

Resistance to antibiotics. Worldwide, gonorrhea is becoming increasingly resistant to

the antibiotics that providers use to treat it. Quinolone-resistant *N. gonorrhoeae* strains are common in the United States and as of 2007, this group of antibiotics is no longer recommended for the treatment of gonorrhea. In 2011, 49% of samples from the Gonococcal Isolate Surveillance Project (GISP) collected in Seattle's primary STI clinic from men with gonorrhea showed resistance to antibiotics formerly used to treat the disease.⁵ Overuse or incorrect use of antibiotics and gonorrhea's ability to mutate rapidly in response to treatment are believed to be the main reasons the bacteria is becoming resistant to available treatments.

Currently, only the cephalosporin class of antibiotic is recommended for gonorrhea treatment. GISP project monitoring for patients with decreased susceptibility to these drugs is ongoing in Washington. Nationally, laboratory data suggest gonorrhea is becoming less susceptible to cefixime, the previous recommended oral medication used to effectively treat the disease.⁶ As a result, STI treatment guidelines now advise combination therapy that includes intramuscular ceftriaxone plus an oral drug.⁷ The possibility that reduced susceptibility may result in treatment failure in the future requires ongoing clinical vigilance to ensure patients are cured of gonorrhea infection.

HIV and STI co-infection. The prevalence of human immunodeficiency virus (HIV) among people with gonorrhea in Washington doubled from 6% in 2005 to 12% in 2012. The prevalence of HIV among people with chlamydia in 2012 was only 2%, though this represents a similar number of individuals as are gonorrhea co-infected. More than half (59%) of the cases of primary and secondary syphilis diagnosed during 2012 in Washington were among people who were also HIV positive. Infection with bacterial STIs with accompanying inflammation and ulcers increases the risk that a person will either acquire HIV or pass the virus to someone else.^{8,9} Programs to screen and treat for STIs contribute to HIV prevention efforts. (See [Health of Washington State HIV](#) chapter.)

STIs and reproductive health. Untreated or repeat chlamydia or gonorrhea infections can cause pelvic inflammatory disease (PID). Women with PID have infections of the uterus, fallopian tubes or other reproductive organs. Pelvic inflammatory disease can lead to scarring which increases risk of ectopic pregnancy, a condition in which the pregnancy occurs outside of the womb. PID is a leading cause of female infertility.¹⁰

Economic burden. The diagnosis, treatment, and longer-term medical and reproductive health consequences of STIs consume both public and private healthcare resources, as well as result in lost wages and productivity. Recent national estimates indicate that bacterial STIs might cost as much as eight billion dollars annually in direct medical costs.¹¹

Risk and Protective Factors

The sole risk factor for chlamydia, gonorrhea and syphilis infection is unprotected vaginal, oral or anal intercourse. People who are not sexually active are not at risk for disease. Most people, however, will become sexually active at some time in their lives. Use of physical barriers, such as male and female condoms, can prevent the transmission of STIs. Among people screened in the Infertility Prevention Project in 2011, those who had multiple sex partners, a new sex partner or a sex partner with symptoms of chlamydia or gonorrhea were more likely to be diagnosed with these diseases than those without these factors.¹²

Intervention Strategies

Three key factors determine ongoing spread of STIs:

- The rate at which uninfected people have unprotected sexual contact with infected people (exposure)
- The probability that an uninfected person will become infected if exposed (transmissibility)
- The length of time an infected person is infectious and able to transmit the pathogen (duration)

Preventive strategies such as abstinence from sexual activity, consistent and correct use of condoms, regular screening if sexually active, and prompt treatment if infected can limit exposure. Early identification and treatment reduces duration, which then reduces the risk of exposure to sexual partners. Public health approaches to STI control—such as assuring prompt treatment with curative antibiotics, interviewing infected individuals to identify others exposed through sexual activity, and contacting exposed partners—help to limit the spread of disease. Additional strategies include the promotion of healthy sexual behaviors across the lifespan such as comprehensive sexual education of adolescents, clinician

training to integrate sexual health into primary care, and positive messaging to normalize conversations about STIs. (See *Health of Washington State* chapter on [Sexual Health](#)) Ideally, multiple interventions are implemented simultaneously to provide a variety of prevention opportunities among sexual partners, as well as between individuals and their healthcare providers.¹³

Recent developments in comprehensive STI control methods include emphasis on Expedited Partner Treatment (EPT). EPT refers to the practice of allowing potentially exposed partners of infected cases to be treated without a clinical evaluation. This model recognizes that a proportion of asymptomatic partners are not being evaluated and, therefore, not being treated if infected. Such lack of treatment leads to ongoing potential for disease transmission. Clinical trials have shown that EPT reduced the likelihood of reinfection of patients with chlamydia or gonorrhea. EPT also resulted in a higher proportion of potentially exposed partners being treated than traditional partner management methods.^{14,15} In light of this and similar studies, the CDC released comprehensive guidance to STI programs nationwide recommending EPT as an additional strategy for reducing the rate of STIs.^{16,17}

In 2006, the increasing volume of chlamydial and gonococcal infections in Washington led to an initiative to implement comprehensive EPT strategies for people diagnosed with STIs statewide. However, this strategy is not currently considered suitable for people with syphilis infections or for MSM because of the higher potential for HIV co-infection. The sex partners of MSM and patients with syphilis infection should continue to be clinically evaluated for STIs, including HIV, and be treated appropriately. In addition, EPT for gonorrhea is not preferred given the current concern of drug resistance, but may still be considered for partners who otherwise are unlikely to access testing and treatment.¹⁸

STI control efforts also can prevent HIV transmission or detect recent infection especially among people at the greatest risk for HIV. HIV testing is strongly recommended for individuals being treated for an STI.¹⁹ In Washington, public health priorities for HIV testing include MSM diagnosed with STIs and heterosexual men with gonorrhea. (See *Health of Washington State* [HIV](#) chapter.)

See Related Chapters: [HIV](#), [Sexual Health](#)

Data Sources

STI State Surveillance Data: Washington State Department of Health Public Health Issues Management System – Sexually Transmitted Diseases (PHIMS-STD) 1992-2012.

Infertility Prevention Project Data: Washington State Department of Health IPP database and Region X Infertility Prevention Project Ahlers & Associates database, 1988-2011.

STI National Surveillance data, 1992–2011: Centers for Disease Control and Prevention notifiable disease reporting 2011.

Washington State population counts: 2000 and 2010 U.S. Census and 2001–2009 intercensal and 2011 post-censal estimates, Washington State Office of Financial Management, Forecasting Division (OFM), released January 25, 2013; 1992–1999, OFM intercensal estimates, Vista Partnership and Krupski Consulting, released October 2007. (Note: 2011 population counts were used as the 2012 denominator in trend graph and for 2012 in combined 2010–2012 data, except for race and ethnicity; population estimates for 2010–2012 race and ethnicity used 2011 data as the mid-point estimate for the time period.)

For More Information

Washington State Department of Health, Infectious Disease Office, Assessment Unit, (360) 236-3455
<http://www.doh.wa.gov/YouandYourFamily/IllnessandDisease/SexuallyTransmittedDisease.aspx>

U.S. Centers for Disease Control and Prevention, Division of STD Prevention, <http://www.cdc.gov/STD/default.htm>

Henry J Kaiser Family Foundation:
<http://www.kaisernetwork.org/index.cfm>

American Social Health Association:
<http://www.ashaSTD.org/>

Technical Notes

WAC 246-101 requires healthcare providers and laboratories to report cases of chlamydia, gonorrhea, and syphilis to local health jurisdictions. The Washington State Department of Health receives these reports from local health and compiles them into a confidential STI case registry. Not all cases of disease are reported, primarily because not everyone experiences symptoms or seeks medical care. About 70% of women infected with chlamydia have few or no symptoms; symptoms are often mild or absent in men. Approximately 50% of women do not experience symptoms of gonorrhea and early stages of syphilis can also be asymptomatic. Data for this report are based on cases diagnosed through December 31, 2012

and reported to the department as of February 27, 2013. An individual person may be diagnosed and reported with STIs more than once over time and thus multiple episodes of disease in an individual person could be counted in a given time period.

The Infertility Prevention Project is a collaborative initiative between the U.S. Centers for Disease Control and Prevention and the Office of Population Affairs, providing funds to screen for chlamydial and gonorrhea infection in all categorical sexually transmitted disease clinics and 95% of family planning clinics throughout Washington. For additional information see: <http://www.cdc.gov/STD/infertility/ipp-archive.htm>

A census tract is a small unit of geography defined by the US Census to provide a useful statistical subdivision of a county. Census tracts vary in size, but usually contain about 4000 persons and are designed to be homogenous as to the characteristics of the population residing in the area. For additional information see: <http://www.census.gov/>

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Unless otherwise noted, authors and reviewers are with the Washington State Department of Health.

Author:

Julieann Simon, MSPH

Reviewers:

Roxanne Kerani, PhD
University of Washington

Lisa St. John, M.Ed, MBA
Spokane Regional Health District

Endnotes

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⁴ Centers for Disease Control and Prevention. *Sexually Transmitted Disease Surveillance 2011.* Atlanta, GA: U.S. Department of Health and Human Services; 2012.

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⁶ Centers for Disease Control and Prevention. Cephalosporin Susceptibility Among *Neisseria gonorrhoeae* Isolates – United States, 2000–2010. *MMWR Morb Mortal Wkly Rep.* 2011;60(26):873-977.

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¹⁰ Centers for Disease Control and Prevention. *Pelvic Inflammatory Disease (PID) – CDC Fact Sheet.* Atlanta, GA: U. S. Department of Health and Human Services; 2011. <http://www.cdc.gov/STD/pid/STDFact-PID.htm>. Accessed December 27, 2012.

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¹⁴ Golden MR, Whittington WL, Handsfield HH, et al. Effect of expedited treatment of sex partners on recurrent or persistent gonorrhea or chlamydial infection. *N Engl J Med.* 2005;352(7):676-685.

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