



Spokane County Morbidity Report

December 2005

2000-2004 Communicable Disease Statistics

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This report presents summary communicable disease data reported to the Spokane Regional Health District (SRHD) from 2000 through 2004. Within each category of reportable communicable diseases, a brief description of the most commonly reported conditions is provided, followed by descriptive statistics about the cases with tables and graphs. Two emerging illnesses, avian influenza and West Nile Virus disease are also discussed.

Enteric Infections: Campylobacteriosis remains the most frequent cause of bacterial gastroenteritis in Spokane. Giardiasis is the second most frequently reported source of enteric infection. *E. coli* O157:H7 gastroenteritis gave rise to an outbreak in 2002. Rates of other enteric illness have generally remained stable.

Vaccine-Preventable Disease: In the last five years, there has been no significant change in overall rates for diseases prevented by standard childhood immunizations, except for pertussis, which was diagnosed in much greater numbers in 2004. There have been no reported cases of measles, mumps, rubella, tetanus, or diphtheria.

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Hepatitis: Hepatitis A has continued at a low rate locally in 2000-2004, decreasing since the year 2000, following the hepatitis A outbreak in Spokane from 1997 to 1998. Since SRHD began accepting reports of chronic hepatitis B in 2000, there was an initial surge in cases reported, probably reflecting prior cases coming to attention, followed by fairly consistent numbers of cases reported. Similarly, the initial surge in reported cases of hepatitis C was followed by fairly steady case reporting. Consistent with its capacity to produce chronic infection, hepatitis C constitutes the largest portion of hepatitis cases.

however, the case rate in 2004 was the highest reported since at least 1997. Herpes simplex initial infection counts and rates have risen consistently from year to year. Syphilis cases remain uncommon in Spokane. After an initial surge in case reports of HIV/AIDS in 2000, reports have remained steady in 2001-2004. The affected groups have shifted to include more people with heterosexual exposure and more women.

Sexually Transmitted Diseases: Rates of *Chlamydia trachomatis* cases gradually and consistently have risen. Rates of gonorrhea have not demonstrated a consistent trend over the last five years;

Communicable Disease Annual Totals, 2000-2004																																																																
as reported to Spokane Regional Health District																																																																
2000					2001					2002					2003					2004																																												
Enterics:					Sexually Transmitted Disease:					AIDS					37					15					20					22					15																													
Botulism					0					0					1					0					1					1					1					1																								
Campylobacteriosis					80					41					61					70					56					Chlamydia					688					736					905					988					1101									
<i>E. coli</i> O157:H7					20					12					40					10					2					Gonorrhea					108					102					124					97					152									
Giardiasis					41					63					70					46					47					Herpes simplex virus					94					123					147					163					172									
Listeriosis					1					0					2					0					0					HIV					63					21					24					11					8									
Salmonellosis					30					43					29					33					29					Syphilis					2					3					1					4					5									
Shigellosis					14					6					7					10					3					Vector-Borne:					Dengue fever*					1					0					0					0					0				
Yersiniosis					2					0					0					0					1					Lyme disease*					0					0					1					1					1									
Vaccine-Preventable:					<i>Haemophilus influenzae</i> B-invasive disease					0					0					0					1					1					Malaria*					1					0					1					3					1				
Measles (rubeola, red)					0					0					0					0					0					Tick-Borne Paralysis					2					0					0					0					0									
Meningitis (bacterial)					3					7					2					7					6					Tick-Borne Relapsing Fever (Borreliosis)					4					0					1					0					3									
Mumps					0					0					0					0					0					Tularemia*					0					0					0					0					1									
Pertussis (whooping cough)					11					1					7					4					49					Miscellaneous:					Group A <i>Streptococcus</i> -invasive disease					2					0					10					13					11				
Rubella (German Measles)					0					0					0					0					0					Rabies PEP					0					4					3					1					11									
Hepatitis:					Hepatitis A					11					3					4					3					2					Legionellosis					2					0					0					0					3				
Hepatitis B (acute & chronic)					32					96					52					60					34					Tuberculosis					11					11					7					4					4									
Hepatitis C (acute & chronic)					--					801					652					441					377					Valley Fever* (<i>Coccidioidomycosis immitis</i>)					0					0					0					1					1									

*Travel-related illnesses

2004 in Review

Avian/Pandemic Influenza: In January 2004, a person in Vietnam was infected with a strain of avian influenza (H5N1) that had been devastating poultry flocks in Southeast Asia since mid-December of 2003. Isolated cases of human disease continue to be identified in East Asia, primarily related to contact with infected birds. Efficient human-to-human transmission has not occurred, but experts at the Centers for Disease Control (CDC) and the World Health Organization (WHO) believe that the potential exists for this virus to cause an influenza pandemic in humans. SRHD is endeavoring to increase influenza surveillance in our community and continues to target emergency response planning toward this threat.

Gonorrhea: Spokane had 152 reports of gonorrhea in 2004, a 64% increase over 2003. Based upon 2004 data, women were 8-10 times more likely to be tested for gonorrhea than men, but men were 6 times more likely to test positive for gonorrhea. Although increasing rates of gonorrheal infection have been observed in men with male sexual partners in King County, that pattern has not been significant locally thus far. Expanded gonorrhea surveillance and partner notification in 2005 may clarify the emerging factors affecting the incidence and distribution of gonorrhea in Spokane County.

Influenza: The 2004-05 season was noteworthy not because of the severity of the season but because of the vaccine shortage which reduced available supply to Spokane County residents by approximately one half. SRHD initially prioritized the limited vaccine to those at highest risk for complications. Despite the early vaccine shortage and some unused vaccine at the end, Spokane County and the United States as a whole experienced a mild influenza season. No nursing home outbreaks were reported in Spokane County in 2004.

Pertussis: Forty-nine cases of pertussis were identified in Spokane County in 2004, which is the highest number of cases recorded in at least 20 years. Contributing to the increase in identified cases was widespread pertussis activity across Washington State, as well as more testing and greater utilization by health care providers of a more sensitive and specific test.

Viral Gastroenteritis: Norovirus and/or viral gastroenteritis were associated with several outbreaks investigated by the Spokane Regional Health District. Large outbreaks in 2004 occurred at Gonzaga University and four nursing homes.



Enteric Infections*

Campylobacteriosis

Campylobacter species cause an acute bacterial intestinal infection in humans and many other mammalian species.

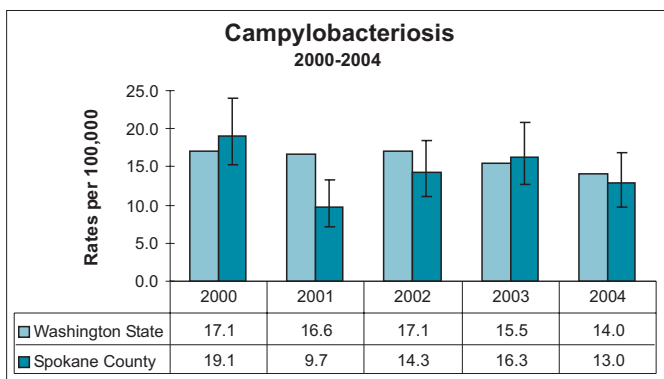
Reporting Requirement: 3 days

Symptoms: Diarrhea (sometimes bloody), abdominal cramps, fever, nausea, and vomiting. An uncommon sequel to *Campylobacter* infection is Guillain-Barré syndrome, a disabling nerve paralysis.

Transmission: Fecal contamination of foodstuffs, especially poultry, occasionally by person-to-person contact, and spread from infected animals, especially young ones.

In Spokane County and in Washington State, campylobacteriosis is the most frequently reported bacterial gastroenteritis. The Spokane County rate of campylobacteriosis varies more from year to year than does the state rate.

Although the incidence rate for 2001 was significantly less than the previous year, incidence rates for other years are not significantly different. The age at onset from 2000 to 2004 ranged from less than 1 year to 86 years with an average yearly median of 38 years.



*Enteric infections are diseases that affect the intestinal tract.

E. coli O157:H7

Escherichia coli bacteria are widely distributed in many species of animals, including humans, without causing disease. There are several classes of *E. coli*, however, which infect humans, including the enterohemorrhagic *E. coli* (EHEC) O157:H7 strain that produces bloody diarrhea.

Reporting Requirement: Immediately

Symptoms: Diarrhea (sometimes bloody), abdominal cramps, nausea, and vomiting. EHEC potentially can cause systemic disease leading to hemolytic-uremic syndrome (HUS), defined as the triad of thrombotic thrombocytopenic purpura (TTP), acute renal dysfunction, and hemolytic anemia.

Transmission: Usually by fecal contamination of foodstuffs, person-to-person contact, and spread from infected animals, such as cattle. Widespread outbreaks periodically occur from EHEC contamination in the food distribution system, e.g., regionally distributed ground beef, bottled fruit juices, dairy products, and a water distribution system.

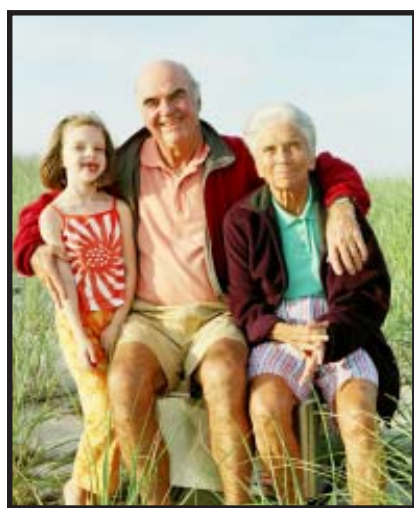
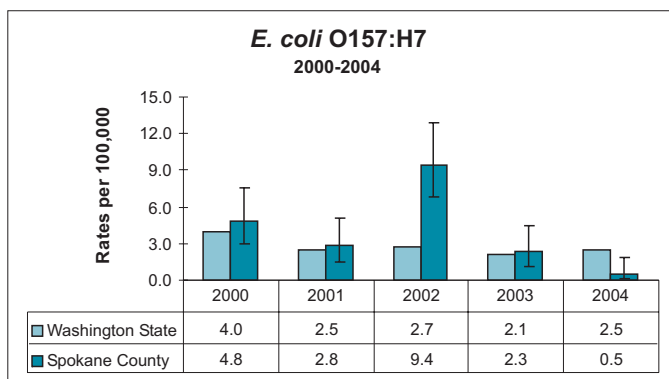
The incidence rate for 2002 significantly exceeded the previous year, reflecting a substantial *E. coli* O157:H7 outbreak involving a secondary-school girls' athletic camp. Within several weeks, 24 Spokane County cases were identified, including one that required prolonged hospitalization. Another probable secondary case was later identified who did not attend the girls' athletic camp, but did have indirect contact with several symptomatic campers. Although investigators found no contaminated food specimens, epidemiologic analysis of available data suggested an association with consuming salad vegetables at the camp food service site.

From 2000 to 2004, one case of hemolytic-uremic syndrome associated with *E. coli* O157:H7 was reported. One case of concurrent, fatal, ischemic bowel disease was reported.

In July 2003, five cases of *E. coli* O157:H7 gastroenteritis were reported with food consumption histories of all dining at the same restaurant. Isolates

sent to the Washington State Department of Health Laboratories were tested by pulsed field gel electrophoresis (PFGE) and were indistinguishable, indicating a likely common source. Interviews did not identify a single, suspect food item. No food items were available at the time of restaurant inspection to culture for bacterial contaminants, but inspections did identify lapses in food handling practices. Although efforts were made to correct foodhandling methods, the restaurant eventually was closed.

During 2000-2004, the age at onset ranged from 5 to 83 years with an average yearly median age of 21 reflecting the 2002 outbreak exclusively among young women. On average, the rate of cases in Spokane County is the same as state rates for *E. coli* enteritis.



Escherichia coli O157:H7
causes ~73,000 illnesses in the United States annually.

Giardiasis

Unlike many other reportable causes of gastroenteritis in Washington State, *Giardia lamblia* is not bacterial, but a protozoan organism. It is extremely hardy in cold, aqueous environments and frequently infects wild mammals. Exposure to *G. lamblia* as a surface water contaminant is common.

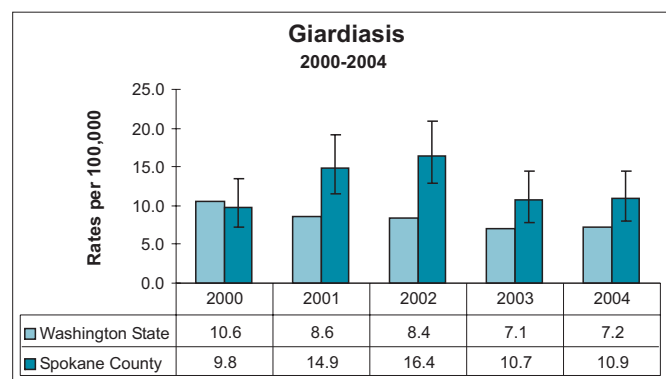
Reporting Requirement: 3 days

Symptoms: Intermittent diarrhea, abdominal cramps, flatulence, greasy stools, bloating and fatigue. Severity of illness may range from no symptoms to prolonged, chronic disease with malabsorption, weight loss, and growth retardation.

Transmission: Any mammal, including humans, can transmit *G. lamblia* infection by fecal-oral means: direct contact, food and drinking water contamination, and by recreational water activities. Asymptomatic cases pose a risk for transmission.

Beginning in 2001, Spokane County rates have been elevated as compared to state rates, possibly due to new reporting of cases from the refugee population.

From 2000 through 2004, yearly *G. lamblia* infection rates were not significantly different. The age at onset from 2000 to 2004 ranged from 1 to 84 years with a median age of 24.



Listeriosis

Reporting Requirement: Immediately

Symptoms: Typically, *Listeriae* cause only mild infections in healthy people, but pose a disease risk to people with an immunocompromising condition, such as chronic disease, pregnancy, infancy, or old age. It can seriously affect those with immune systems impaired by cancer or some medical treatments. Susceptible people are at risk for brain and nervous system infections and sepsis. *Listeriae* can cause fetal injury and death.

Transmission: *Listeria monocytogenes* survives well in cool, moist environments. It is found in animal feces, soil and dust, and cloudy, sediment-containing surface water. *Listeriae* can survive in cold conditions as a contaminant of refrigerated foods, such as raw milk, raw milk cheeses, and deli meats; e.g., hot dogs and sausages.

Spokane County has had very few cases of listeriosis. From 2000 through 2002, a total of three cases were reported ranging in age from infancy to elderly. In 2003 and 2004, no local cases of listeriosis were reported.



Salmonellosis

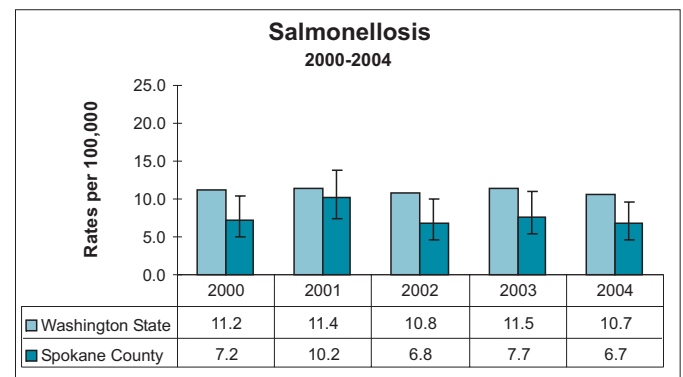
Salmonella enterica includes over 2,400 different bacterial strains distributed among five major groups. *Salmonellae* are very widely distributed among many species including mammals, birds, reptiles, and insects, as well as some strains that survive well in external, environmental conditions.

Reporting Requirement: Immediately

Symptoms: Diarrhea, fever, abdominal cramps, headache, nausea, and vomiting.

Transmission: Usually by fecal contamination of foodstuffs, especially meat products; person-to-person contact; and spread from infected animals, including domestic and wild birds, reptiles and amphibians, and various pets. Antimicrobial therapy can prolong excretion of the organism and a very small number of individuals become chronic carriers. Periodically, outbreaks occur from *Salmonella* contamination in the food distribution system, e.g., meats, poultry, and uncooked fruit and vegetable products tainted by animal exposure, sewage exposure, or unsafe foodhandling practices.

From 2000 through 2004, yearly incidence rates for *Salmonella* infection were not significantly different. The ages at onset from 2000 to 2004 ranged from < 1 to 87 years with an average yearly median of 31 years. Forty-eight percent (48%) of salmonellosis cases were male and 52% female. Spokane County rates are consistently below state rates for salmonellosis.



Shigellosis

Shigella species are bacteria that have humans as their sole natural hosts. Nonetheless, because they can persist as environmental contaminants in circumstances where hygienic practices are compromised and can cause infection with a very low-dose exposure, shigellosis can spread explosively.

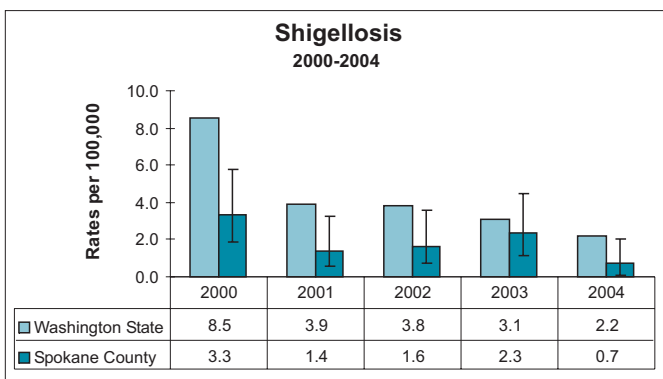
Reporting Requirement: Immediately

Symptoms: Diarrhea (sometimes bloody), abdominal cramps, nausea, and vomiting.

Transmission: Usually by fecal or sewage contamination of foodstuffs and person-to-person contact; spread from animals does not occur.

Some *Shigella* species potentially can cause systemic disease rarely leading to hemolytic-uremic syndrome (HUS) and toxic megacolon.

The reported case counts and case rates for shigellosis in Spokane County from 2000 through 2004 are shown at right. Elevated rates locally and statewide in 2000 were due to a widely distributed contaminated bean dip. Rates of shigellosis in Spokane County are generally lower than state rates. The age at onset from 2000 to 2004 ranged from 2 to 82 years with a median age of 37.



Yersiniosis

Yersinia can infect many mammalian species and often colonize pigs' throats. Human cases have been linked to ill household pets.

Reporting Requirement: 3 days

Symptoms: Diarrhea (sometimes bloody), fever, abdominal cramps, nausea, and vomiting. Symptomatically, *Yersinia* infections can mimic appendicitis or acute abdominal conditions.

Transmission: Usually by fecal contamination of foodstuffs, such as pork and dairy foods; zoonotic spread from infected animals such as swine; and (less frequently) person-to-person contact.

Spokane County had three cases of yersiniosis between 2000 and 2004 ranging in age from childhood to over 60 years. Despite dietary histories including pork and tofu products, the cases had no apparent exposure link to other cases, pets or livestock exposure, or identified food products.



During 1996-2004, substantial declines occurred in the estimated incidence of infections with *Campylobacter*, *Cryptosporidium*, *Listeria*, *S. typhimurium*, and *Yersinia*.

Vaccine-Preventable Disease

Invasive *H. influenzae*

Reporting Requirement: Immediately

Symptoms: *Haemophilus influenzae*, bacteria that act solely as a human infectious agent, can cause respiratory, bone and joint, central nervous system infections (e.g., meningitis), and sepsis.

Transmission: Exhaled or coughed respiratory droplets from an infectious person, which other people re-breathe, transmit the infection.

Once a leading cause of adverse outcomes from bacterial meningitis, *H. influenzae* infections have become less frequent in recent years since *H. influenzae* group B (Hib) vaccine was added as a standard childhood immunization. Spokane Regional Health District received reports of invasive *H. influenzae* in a young child in 2003 and an infant in 2004.

Few countries routinely use Hib vaccine, so invasive Hib disease remains common in infants and young children in many countries, and unvaccinated children who travel may be at risk.



Meningococcal Disease

Neisseria meningitidis (meningococcus) is a bacteria which infects the respiratory tract. It can colonize without causing symptomatic disease, but also routinely causes many respiratory infections. In some instances, meningococcal infection can progress rapidly to severe, invasive disease.

Reporting Requirement: Immediately for suspected or confirmed illness

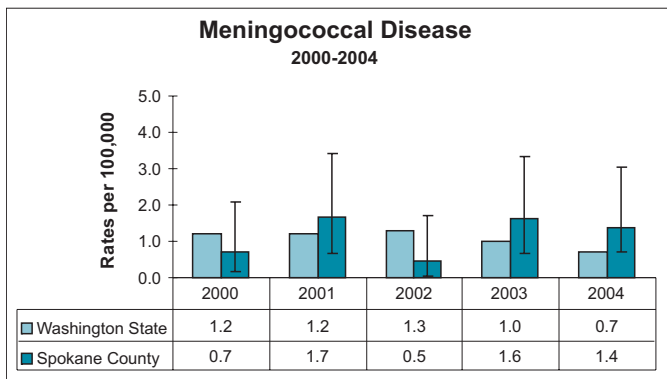
Symptoms: Meningococcal meningitis, a central nervous system infection, presents with fever, severe headache, stiff neck, malaise, rash, and altered mental status.

The infection often spreads through circulating blood to different organ systems causing widespread tissue destruction, clotting disorders, and shock. Even with medical care, many meningococcal meningitis and sepsis cases die or suffer serious injuries.

Transmission: Because meningococcal infection is transmissible by oral and respiratory secretions, close family, household, and intimate contacts are routinely treated within 10 days of exposure with short courses of antibiotics to prevent infection from occurring.

A new vaccine is used against *N. meningitidis* serogroups A, C, Y, and W-135; its use is recommended for those in congregate settings, such as college dormitories and military barracks, and for people potentially exposed in outbreaks causing progressive exposure. In Washington State, however, most meningococcal disease cases have been from infection with serogroup B, which is not included in the available vaccines.

From 2000 through 2004, there were 25 cases of meningococcal infection reported in Spokane County. Due to low numbers of cases, rates of meningococcal disease vary considerably from year to year in the county and can diverge considerably from state rates.



The age at onset of *N. meningitidis* infection ranged from 1 to 87 years during 2000-2004 with a median age of 20. Two cases died pursuant to outcomes of their infection.



Pertussis

Pertussis, or whooping cough, is a bacterial respiratory infection caused by *Bordetella pertussis*. Historically, it was a childhood disease that caused substantial injury and death. Morbidity and mortality due to pertussis have vastly diminished since pertussis vaccine was developed in the 1940s.

Reporting Requirement: Immediately for suspected or confirmed illness

Symptoms: As classically described, pertussis appears initially as a prolonged coughing illness (the catarrhal stage). It progresses to episodes of severe, repeated coughing with associated gasping for air or whooping, temporary cessation of breathing, violet coloration of the skin, and vomiting (the paroxysmal stage) which may continue for several weeks. Although symptoms gradually diminish in the convalescent stage, debilitating coughing spells can continue for months. In susceptible infants and young children, pertussis may give rise to pneumonia, encephalopathy, and hemorrhagic infarction in the brain and the eyes. In older children and adults, however, symptoms may be less distinctive, making pertussis harder to recognize and diagnose in these groups.

Transmission: Direct contact with aerosolized respiratory secretions of a coughing infected person.

Although childhood pertussis vaccination confers protective immunity in younger years, as children approach adolescence their immunity wanes. Adolescents and adults with less identifiable pertussis infections probably are a major exposure source for susceptible infants and children at risk for severe complications of pertussis.

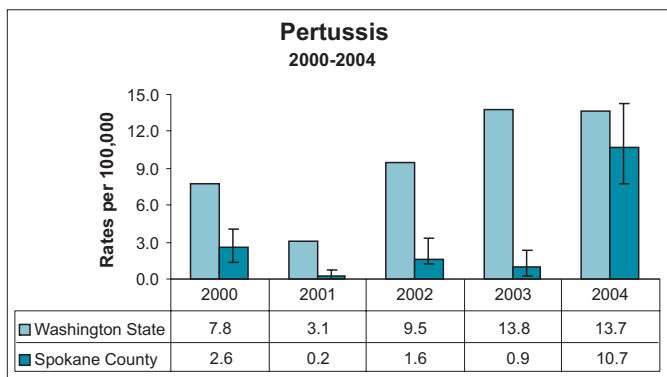
Laboratory testing for *B. pertussis* infection includes two methods, which are accepted by Washington State Department of Health (WSDOH) and CDC as case defining, PCR (polymerase chain reaction) and bacterial culture, but these tests are not always used in Spokane County. Consequently, many local cases reported have not been counted in county, state, and national data.

Viral Hepatitis

Note regarding chronic hepatitis reporting:

When reviewing chronic hepatitis, it is helpful to understand how chronic disease reporting differs from reporting of acute disease. Acute disease is reported as incidence, or new cases of the disease in question over a set time period. Chronic disease, such as chronic hepatitis B or C, is reported as the number of new or previously unreported chronic hepatitis carriers over a set time period. Over time, this allows us to estimate the prevalence of chronic disease within our community. Chronic disease cases reported often are not newly *diagnosed* but newly *reported* to public health. (Required reporting became effective December 2000.) In the early “catch up” period, the number of reported cases would be expected to be quite high, declining to more consistent, sustained levels once the backlog of old cases has been exhausted.

In 2004, in response to outbreaks of respiratory disease locally, health care providers obtained more PCR tests for pertussis, which identified substantially more cases. Of concern, there was a large number of false negative DFA (direct fluorescent antibody) tests (11 of 14; 79%) when both DFA and PCR were ordered. While the number of cases where both tests were ordered was small, it is suggestive that DFA is not as sensitive as PCR. For this reason, SRHD recommends that health care providers order PCR testing when evaluating patients for pertussis.



From 2000 to 2003, there were 14 cases of pertussis reported; in 2004 alone, 49 cases were identified. This represents a seven-fold increase in cases as compared to the year 2000 and more cases than had been reported in a single year in at least 20 years. Compared with other regions of Washington State, Spokane County appeared to have significantly fewer cases and lower rates of pertussis prior to 2004. It is uncertain whether this significant increase represents an outbreak of disease, an improvement in diagnostic methods employed in health care, or both. The resurgence of pertussis statewide in Washington suggests an actual increase in cases.

The age at onset of reported cases of *B. pertussis* infection ranged from less than one month to 59 years during 2000-2003 with a median age of 10 months. Eighteen cases were two years of age or younger. In 2004, the ages ranged from less than a year to 83 years of age with a median age of eight years. Twelve cases in 2004 were two years of age or younger.

Hepatitis A

Hepatitis A is a vaccine-preventable, acute viral infection.

Reporting Requirement: Immediately

Symptoms: Fatigue, malaise, jaundice, dark urine, abdominal pain, anorexia, nausea, vomiting, and mild fever may appear two to seven weeks following exposure. Only a third of children under the age of six who are infected with hepatitis A have symptoms.

Transmission: Person-to-person through the fecal-oral route. Common source foodborne outbreaks do occur and waterborne outbreaks are rare.

Hepatitis A is a self-limited, acute infection that does not progress to chronic infection. Treatment, if given, is supportive.

Although the incidence rate for 2000 was greater than in later years, incidence rates for other years are not significantly different. This is in keeping with the historical pattern of hepatitis A appearing as an

epidemic followed by an abrupt tapering down for 8 to 12 years. Spokane County was in epidemic mode with hepatitis A through 1997 and 1998. It is uncertain whether this pattern will be altered by the more frequent use of hepatitis A vaccination.

Hepatitis B

Hepatitis B is a vaccine-preventable, viral infection.

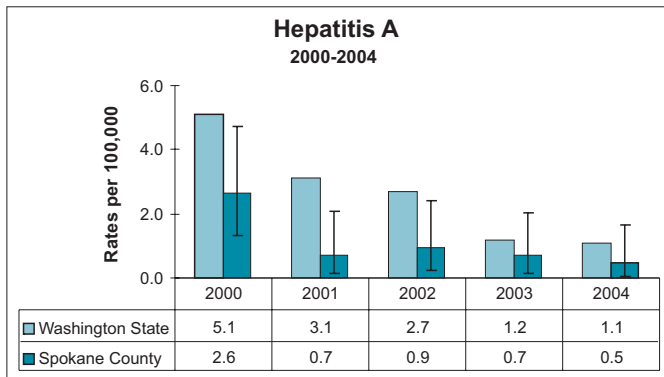
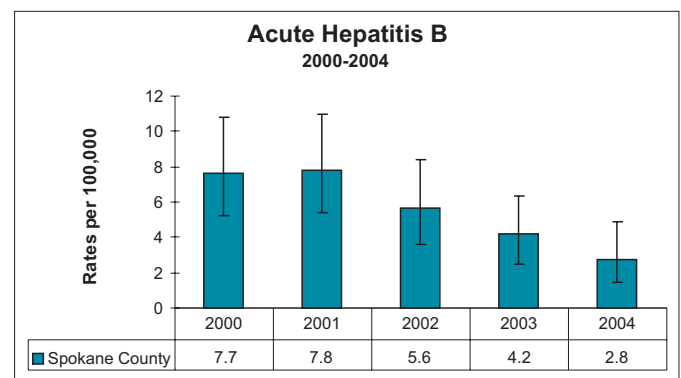
**Reporting Requirement: Acute - 3 days
Chronic - 1 month**

Symptoms: Acute disease may include fatigue, malaise, jaundice, dark urine, abdominal pain, anorexia, nausea, vomiting, and mild fever. People who are chronically infected with hepatitis B (i.e., persisting longer than six months) may have no symptoms to indicate chronic infection. Acute infection proceeds to chronic infection in approximately 5-10% of adults. Children infected with hepatitis B are less likely to have symptoms, but more likely to become chronically infected. Infants born to hepatitis B positive mothers, if untreated/unvaccinated, have the highest risk of chronic infection at about 90%.

Transmission: Through blood contact or sexual exposure to individuals infected with the hepatitis B virus (HBV) or vertical transmission during birth.

Acute Hepatitis B

2000 was the first year that Spokane Regional Health District began collecting chronic hepatitis data (the year before it was officially reportable). The ages at reported onset from 2000-2004 ranged from 15 to 78 years with a median age of 33. By gender, 58% were male and 42% female.



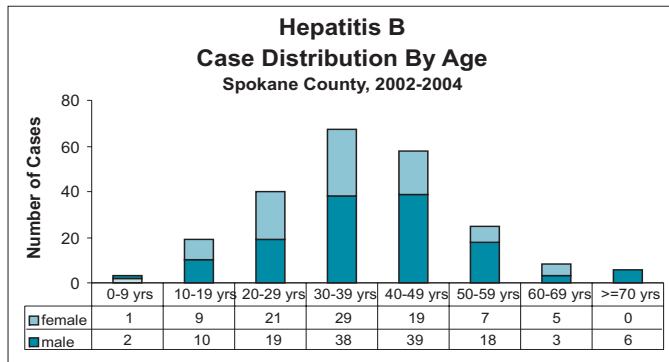
The ages at reported onset from 2000 to 2004 ranged from less than eight to 87 years with a median age of 37. Fifty-four percent (54%) of hepatitis A cases were male and 46% were female.

In 1999, the ACIP recommended routine hepatitis A vaccination for children living in 11 states, including Washington, with the highest rates of hepatitis A.



Chronic Hepatitis B

Chronic hepatitis B is treatable with medication. Death from liver disease, such as cirrhosis or liver cancer, occurs in 15-25% of those with chronic hepatitis B infection. In 2002 through 2004 in Spokane County, 230 reportable, confirmed cases of hepatitis B were identified: 51 acute disease, 119 chronic disease, and 60 of unknown chronicity. An additional 39 case report submissions were not reportable because they were not residents of Spokane County, their lab studies indicated past infection and current immunity, or their lab studies did not meet the surveillance case definition for hepatitis B.



Of the 230 confirmed cases, 158 cases were available to interview and 72 cases were not accessible. Cases included 137 males (60%) and 93 females (40%). The median ages for hepatitis B cases were 39 for men and 33 for women with the range for both sexes being 1 to 90 years.



The following chart illustrates the factors associated with hepatitis B infection in Spokane County, 2000 through 2004, as taken from direct case interviews. The predominant risk factors associated with illness were immigration from a country in which hepatitis B is endemic and injection drug use at any time.

Hepatitis B Risk Factors Spokane County, 2000-2004			
Factor	Men	Women	Total
Endemic country	21	34	55
Injection drug use	30	9	39
Tattoos	12	6	18
Sexual partner	4	6	10
Nasal drug use	5	0	5
Transfusions	2	2	4
Occupational blood exposure	3	0	3
Substantial exposure	2	0	2
Dialysis	1	0	1

Note: Cases may report multiple risk factors. Results should be interpreted with caution, as a substantial number of cases could not be interviewed, and there is no comparable data from otherwise similar individuals without hepatitis B.



Two hepatitis B vaccines are approved for use in the U.S. Each is usually given in three doses over a 6-month period. In 2001, a combined hepatitis A and hepatitis B vaccine became available.

Hepatitis C

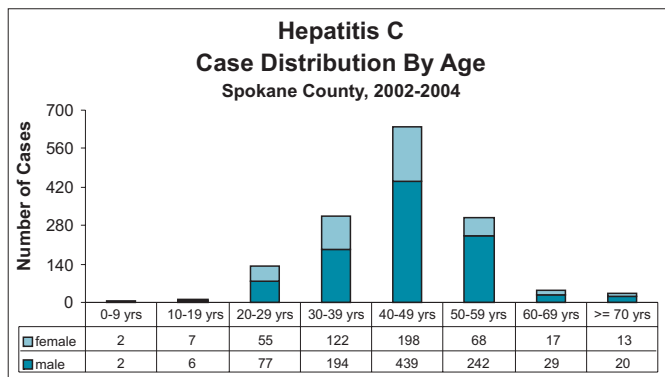
Reporting Requirement: 1 month

Symptoms: Acute disease symptoms are often mild, but may include fatigue, malaise, jaundice, dark urine, abdominal pain, anorexia, nausea, vomiting, and mild fever. People who are chronically infected with hepatitis C (having hepatitis C for more than six months) usually have minimal or no symptoms in the early years of their disease to indicate chronic infection. Acute infection proceeds to chronic infection in approximately 80-85% of adults. Death from liver disease such as cirrhosis or liver cancer occurs in 15-25% of those with chronic hepatitis C infection. Chronic hepatitis C is treatable with appropriate medication.

Transmission: Hepatitis C is a disease primarily transmitted through blood contact exposure to individuals infected with the hepatitis C virus (HCV).

Prior to 2001, acute hepatitis C was reported in the category non-A, non-B hepatitis, for which the majority of cases were hepatitis C. In 2001, non-A, non-B hepatitis was dropped from the list of reportable diseases in Washington State. Acute and chronic hepatitis C were then added to the notifiable conditions list.

Most hepatitis C is not discovered until many years after infection. The HCV serologies available do not distinguish between acute and chronic infection. The surveillance case definition for acute hepatitis C is stringent, calling for serologies to indicate hepatitis C coupled with simultaneous serologies to establish that neither acute hepatitis A nor acute hepatitis B is present.



Few acute hepatitis C cases are identified meeting these very specific criteria; in Spokane County there were only 16 such confirmed cases reported between 2000 and 2004. By contrast, chronic and indeterminate status hepatitis C account for greater than 70% of the viral hepatitis identified in this region and in the United States.

From 2002 through 2004 in Spokane County, 1,093 reportable cases of lab test confirmed hepatitis C were identified: 12 with acute disease, 77 with chronic disease, and 1,004 of unknown chronicity. Additionally, 385 probable cases and two suspect cases were reported. An additional 994 case report submissions were not reportable because either they were previously reported by the Department of Corrections or they did not reside in Spokane County. Of the 1,480 reported confirmed, probable, and suspect cases, 832 cases were available to interview and 648 cases were not accessible. Cases included 999 males (67.5%) and 481 females (32.5%).

The factors in the following table were associated with hepatitis C infection in Spokane County from 2000-2004 as taken from direct case interviews. The three predominant associated factors were recreational drug use at any time, having tattoos, and having had a blood transfusion prior to 1992.

Hepatitis C Risk Factors Spokane County, 2000-2004			
Factor	Men	Women	Total
Injection drug use	292	158	450
Tattoos	217	111	328
Transfusions	97	66	163
Nasal drug use	105	44	149
Sexual partner	38	71	109
Occupational blood exposure	46	36	82
Non-occupational blood exposure	19	14	33
Dialysis	3	1	4

Note: Cases may report multiple risk factors. Results should be interpreted with caution, as a substantial number of cases could not be interviewed, and there is no comparable data from otherwise similar individuals without hepatitis C.

Sexually Transmitted Disease

The Washington State Department of Health oversees sexually transmitted disease (STD) management via regional staff who work in conjunction with local public health agencies. STD data is available in yearly county profiles at www.doh.wa.gov/cfh/STD/countyprofile_bob.htm. HIV/AIDS data is available in cumulative state profiles with county-specific sections at www.doh.wa.gov/cfh/hiv_aids/Prev_Edu/Statistics/0312.pdf.

Note: STD yearly case counts and case rates presented here are based upon standardized population data from the Washington State Office of Financial Management, adjusted to account for in-migration, out-migration, births, and deaths within communities.

Chlamydia

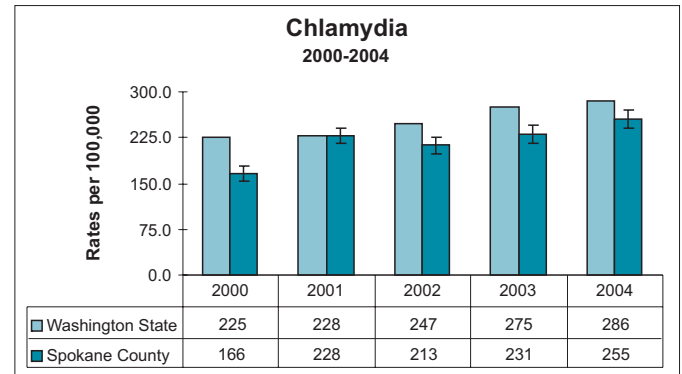
Chlamydial infections are more common than all other sexually transmitted infections combined. The causative agent, *Chlamydia trachomatis*, is similar to bacteria and treatable with antibiotics.

Reporting Requirement: 3 days

Symptoms: Typical symptoms, when they appear, are burning urethral pain upon urination and a urethral discharge. In women, chlamydial infections can progress symptomatically or asymptotically to internal sexual organs causing pelvic inflammatory disease, which increase the risk of ectopic pregnancy and sterility. Similarly, urethritis in men can progress to epididymitis, prostatitis, and proctitis. Neonatal infections that occur during birth can cause pneumonia and conjunctivitis.

Transmission: Chlamydia is transmitted sexually. Although many infected people show no symptoms, they still can transmit the infection to sexual partners. People with chlamydia can more easily contract HIV and HIV-infected people with chlamydia are more likely to transmit HIV to someone else due to an increased concentration of cells (such as CD4 cells) in genital secretions that can serve as targets for HIV.

Case counts and rates have risen consistently from one year to the next and comparably to increased chlamydia case rates throughout Washington State. This may represent an actual increase in infections in the Spokane community, but many factors affect the number of cases reported. They include the true incidence of disease, access to medical care among people at increased risk for infection, improved diagnostic accuracy of the laboratory test methods and acceptability of test methods to clients, and consistency of reporting among health care providers.



Of note, chlamydia screening tests are performed far more often for young women than men. Chlamydia infections often are asymptomatic (approximately 75% of women and 50% of men have no symptoms) so reported rates probably underestimate the true incidence of chlamydia in the community.

Any sexually active person can be infected with chlamydia. The greater the number of sex partners, the greater the risk of infection.



Gonorrhea

Gonorrhea is caused by infection with *Neisseria gonorrhoeae* bacteria.

Reporting Requirement: 3 days

Symptoms: Like chlamydia, it often presents as a sexually transmitted urethral infection. People with gonorrhea are less likely than chlamydia cases to be infected asymptotically, but asymptomatic cases can still transmit gonorrhea to sexual partners.

Typical symptoms, when they appear, are burning urethral pain upon urination and urethral discharge. In women, gonorrhea can progress symptomatically or asymptotically to internal sexual organs causing pelvic inflammatory disease increasing the risk of ectopic pregnancy and sterility. Similarly, urethritis in men can progress to epididymitis, prostatitis, and proctitis. Neonatal infections that occur during birth can cause pneumonia and conjunctivitis. Gonorrhea also can spread to other sites causing eye infections, joint infections, and mouth and throat infections.



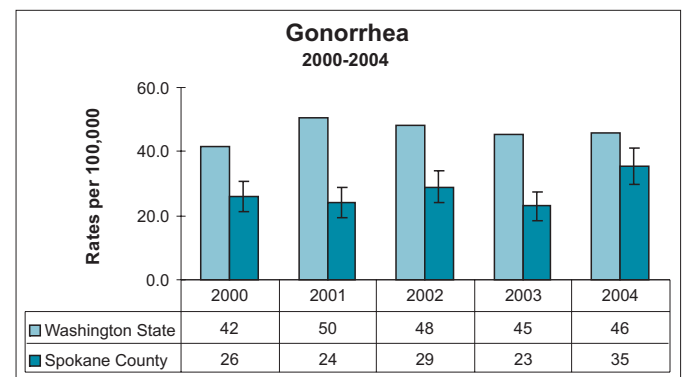
Transmission: Gonorrhea is transmitted sexually and during birth. People with gonorrhea can more easily contract HIV and HIV-infected people with gonorrhea are more likely to transmit HIV to someone else due to an increased concentration of cells (such as CD4 cells) in genital secretions that can serve as targets for HIV.

Case counts and rates have varied in no consistent pattern over the last five years. Case counts in 2004 were significantly greater than in 2003. By contrast, during the time period from 2003 to 2004, reported gonorrhea infection rates for Washington State demonstrated fairly consistent levels from 45 cases per 100,000 in 2003 to 45.6 cases per 100,000 in 2004. Beginning in 2002, the Washington State Infertility Prevention Project put in place a nucleic acid amplification test (NAT) for chlamydia and gonorrhea.

This method enables testing either urine specimens or swabs with comparable specificity and sensitivity and is more sensitive than culture methods. Because it does not rely on specimens obtained by urethral swab in males, it has much improved client acceptance. In 2003-2004, urine testing for females also increased substantially.

In 2003, of the 97 local gonorrhea cases reported to SRHD, 52 positive results were obtained from 9,884 test specimens by urine NAT testing at SRHD laboratory with a ratio of 0.53%. In 2003, of 8,959 women tested, 33 or 0.37% were positive for gonorrhea. Of 925 men tested, 19 or 2.1% were positive for gonorrhea. In 2004, of the 152 local gonorrhea cases reported to SRHD, 102 or 0.67% positive results were obtained from 15,135 specimens by this test method at SRHD laboratory. Of 13,522 women tested, 58 or 0.43% were positive for gonorrhea. Of 1,613 men tested, 44 or 2.7% were positive for gonorrhea.

Because gonorrhea is more consistently symptomatic than chlamydia infection and test methods are more sensitive as well as better accepted, the reported case rate is considered to be a more accurate reflection of true incidence than is the rate for chlamydia. Statewide, cases of gonorrhea have declined dramatically since the end of the 1980s when rates were greater than 150/100,000.



In Spokane County in 2004, there was a significant increase in the count and rate of gonorrhea cases. The number of tests obtained through clinical encounters with Infertility Prevention Project health care providers increased substantially and the ratio of positive gonorrhea test results per test specimen obtained rose for both men and women. Although women were 8-10 times more likely to be tested for gonorrhea than men, men were approximately six times more likely to test positive for gonorrhea. Whether this discrepancy represents differences in access to essential service providers for a target population, in-migration of cases, different responses to public health education messages, or changes in the symptomatic appearance of circulating strains is uncertain. Although increasing rates of gonorrheal infection have been observed in men with male sexual partners in King County, the same pattern has not been significant locally thus far. Continuing gonorrhea case interviewing and partner notification in 2005 may clarify the emerging factors affecting the incidence and distribution of gonorrhea in Spokane County.

Herpes Simplex Virus

Reporting Requirement: 3 days

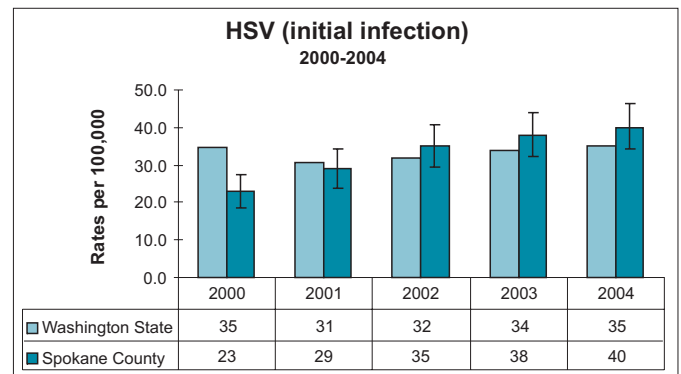
Symptoms: Herpes Simplex Virus (HSV) causes chronic infections that intermittently erupt in skin lesions. The primary site of infection depends upon where the virus was introduced; genital, oral, and anal lesions all are common. Symptoms of HSV infection may range from completely asymptomatic infection to frequently recurring, painful, blistering clusters of lesions. Neonatal infection during birth presents a risk for eye infections and central nervous system infections frequently enough that Caesarian section births are used for delivering babies of women with active genital lesions.

Transmission: There are two serotypes, HSV-1 and HSV-2, with the latter being much more common. Although HSV-2 infections are more typically sexually transmitted and HSV-1 is more often contracted in childhood by casual contact, they both can be the outcome of sexual contact. Herpes may play a role in the spread of HIV. Herpes can make people more susceptible to HIV infection and HIV-infected individuals more infectious.

Herpes Simplex initial infection counts and rates have risen consistently from year to year. This may represent an actual increase in infections in the Spokane community, but many factors affect the number of cases reported. They include the true incidence of cases, access to medical care among people at increased risk for infection, improved diagnostic accuracy of the



Health care providers in Washington should not use fluoroquinolones (ciprofloxacin, levofloxacin, and ofloxacin) as first line therapy for gonorrhea, due to drug resistance.



laboratory test methods and acceptability of test methods to clients, and consistency of reporting among health care providers. Furthermore, in recent years since SRHD public health liaison staff have improved awareness of STD reporting requirements among health care providers, HSV reporting has been more reliable.



HIV/AIDS

In fall 2004, Washington State participated in a nationwide exercise that helped to identify duplicate HIV/AIDS cases. This process led to the removal of many cases that had been reported multiple times. Due to this fact, the figures below differ from figures previously reported.

Reporting Requirement: 3 days

Symptoms: Human Immunodeficiency Virus (HIV) initially causes a mild, nonspecific viral syndrome or an asymptomatic infection. Gradually, HIV infects and disables the formative cells of the immune system, undermining immunologic responses and defenses against infection and neoplastic disease (cancers). Eventually, the HIV-infected person with the late-stage condition Acquired Immunodeficiency Syndrome (AIDS) is subject to an array of infections ranging from common human pathogens to potentially lethal, opportunistic infections that rarely affect people with normal, intact immunity. AIDS patients also are subject to particular cancers (e.g., Kaposi's sarcoma and various lymphomas) that occur more frequently in other immunodeficient patients. Although anti-retroviral treatments now available may suppress HIV infection temporarily, the infection is held in check only so long as treatment continues. HIV typically evolves over time into resistant strains.

Transmission: HIV is transmissible sexually as well as by contact of blood with non-intact skin, such as by piercing the skin via needle injection or tattooing. HIV also can be transmitted as a gestational or perinatal infection. If an HIV-infected individual is also infected with another STD, that person is more likely to transmit HIV through sexual contact than other HIV-infected persons.

HIV did not become reportable until September 1999, so the large case count in 2000 reflects that initial reporting of cases.

The process of AIDS case counting requires that local diagnoses are corroborated at the state level before cases are accepted as bona fide. This can prolong the

reporting process by months, so that the time at which an AIDS case is accepted may vary substantially and may not reflect the time of clinical diagnosis. There often is a delay of many years from the time of initial HIV infection until immune system suppression is sufficient to diagnose AIDS. This makes AIDS diagnoses a poor indicator of the patterns of HIV infection currently taking place. In fact, many patients are diagnosed with HIV and AIDS at the same time.

According to Washington State Department of Health's Office of Infectious Disease and Reproductive Health (IDRH) data, HIV prevalence as of December 31, 2004 outside the Puget Sound area was 71.1 per 100,000. HIV/AIDS statistics are collected for Region I, which includes Spokane and 11 other eastern Washington counties. Spokane County residents accounted for 76% of the HIV/AIDS Region I cases presumed living as of December 31, 2004.

From 1982 to 1989 in Eastern Washington, 18% of AIDS diagnoses were in people between ages 25 to 29 and only 7% were age 50 and older. Infections ascribed to heterosexual contact were estimated then as 0%. From 1998 to 2004, 15% of AIDS diagnoses were in people between ages 25 to 29 while 18% were age 50 and older. Infections reportedly resulting from heterosexual contact rose to 13%.

HIV/AIDS					
Cases Reported to SRHD					
Spokane County, 2000-2004					
	2000	2001	2002	2003	2004
HIV	63	21	24	11	8
AIDS	37	15	20	22	15

Syphilis

Syphilis, caused by the bacterial spirochete *Treponema pallidum*, is a complex disease with four different stages that affect many organ systems.

Reporting Requirement: 3 days

Symptoms: Typically, primary syphilis appears as a painless ulcer at the site where the infection was introduced; genital, oral, and anal lesions all are common. After three to six weeks, a secondary syphilis case may experience fever, skin rash and hair loss, headache, muscle aches and fatigue. Even without antibiotic treatment, symptoms may resolve although the case remains infected. Syphilis may progress as a systemic disease injuring the heart and blood vessels, the central and peripheral nervous systems, and other organs. Congenital syphilis can cause severe malformations and deformities.

Transmission: Syphilis is sexually transmissible and at later stages, transmissible by contact with skin lesions. Genital sores caused by syphilis make it easier to transmit and acquire HIV infection sexually. There is an estimated 2-5 times increased risk of acquiring HIV when syphilis is present.

Only three cases of early syphilis were identified between 2000 and 2004. No cases of congenital syphilis were reported. Late/latent syphilis was reported at a consistent level of three cases each in 2000, 2001 and 2003; two cases were identified in 2002 and four cases in 2004.



Latent syphilis is defined as having serologic proof of infection without signs or symptoms of disease. Late latent syphilis is infection for more than one year but having no clinical evidence of disease.

Vector-Borne Disease

Vector-borne diseases are infections that are carried and transmitted by ticks, mosquitoes, flies, or other invertebrates.

Tick-borne Paralysis

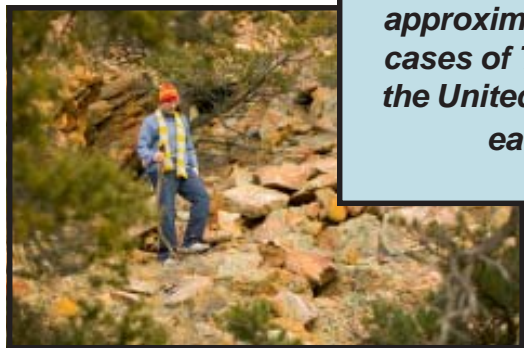
Reporting Requirement: 3 days

Symptoms: Tick-borne paralysis, one of the eight most common tick-borne diseases in the United States, is an acute, ascending, flaccid motor paralysis. Tick paralysis occurs worldwide.

Transmission: It is caused by the introduction of a neurotoxin into humans during attachment and feeding by the female of several tick species, usually during the spring and early summer months.

If unrecognized, tick paralysis can progress to respiratory failure and may be fatal in approximately 10% of cases. Prompt removal of the feeding tick usually is followed by complete recovery. The risk for tick paralysis in the Northwest may be greatest for children in rural areas, especially during the spring. The risk can be reduced by scanning for and removing ticks after outdoor activities, using repellents on skin, and using permethrin-containing acaricides on clothing.

In Spokane County, two cases of tick-borne paralysis in children were reported between 2000 and 2004. For further discussion, see the articles addressing tick-borne paralysis at www.cdc.gov/mmwr/preview/mmwrhtml/0040975.htm.



There are approximately 25 cases of TBRF in the United States each year.

Tick-borne Relapsing Fever (TBRF)

Tick-borne relapsing fever is caused by *Borrelia hermsii* (and other related species) transmitted by *Ornithodoros* ticks.

Reporting Requirement: Immediately

Symptoms: After incubating for a few days to several weeks, the case abruptly develops high fever, chills, sweats, headache, and stiff neck, which may continue for several days until the fever “breaks.” After five to nine days, the signs and symptoms recur in repeated cycles.

Transmission: The ticks principally feed on mice and other wild species, as well as humans, often feeding so quickly and painlessly that the bite goes unnoticed. Human exposure usually involves outdoor activities or time spent in rodent-infested dwellings.

The course of relapsing fever can be stopped with effective antibiotic treatment, which often may produce transient, shock-like symptoms. Although the infection is not usually transmitted person-to-person, it can be transmitted transplacentally in pregnant women or by blood transfusion.

From 2000 through 2004, there were eight cases of relapsing fever reported to Spokane Regional Health District. All described exposure to outdoor activities and rustic or rodent-infested dwellings, except one, an infant, with no obvious exposure sources by history.

Tularemia

Tularemia is a zoonotic bacterial infection.

Reporting Requirement: 3 days

Symptoms: Clinically it can appear as skin lesions, systemic illness, severe gastroenteritis, or pneumonia.

Transmission: Tularemia is transmitted by exposure to contaminated foodstuffs and water, skin exposure, or inhalation of aerosolized bacteria. Usual routes of exposure are direct animal contact, tick or fly bite, or contact with contaminated substances.

Prior to 2005, Tularemia was not commonly diagnosed in humans in the Northwest. In the last five years, it has been reported in one local resident with a history of local outdoor activities.



Miscellaneous Conditions

Antibiotic-Resistant Infections

Staphylococcus aureus (“staph,” SA) is a common bacterial infection to which everyone is exposed intermittently. Infection with SA can range from asymptomatic carriage on the skin or in the respiratory passages to lesser infections, such as boils and other skin lesions, to life-threatening, bloodborne infections in the heart and lungs. SA survives well as an infectious surface contaminant in medical and home settings and resists drying and sunlight. SA has gradually developed resistance to standard antibiotics.

Methicillin-resistant *Staphylococcus aureus* (MRSA) has become an increasingly prominent concern in most health care settings. Surveillance, management and educational efforts concerning MRSA and antibiotic resistance extend not only to hospital settings, but also to ambulatory care and the public. As of 2003, 95% of United States *S. aureus* isolates are resistant to penicillin. Initially, extended spectrum penicillin-like drugs, like methicillin, were effective against SA, but since the 1960s, SA gradually has evolved resistance mechanisms, producing methicillin-resistant *S. aureus* (MRSA) strains. MRSA is more difficult and more expensive to treat effectively than methicillin-sensitive *S. aureus* (MSSA) with diminishing antibiotic options.

Reporting Requirement: None

Data from the *Washington Antibiotic Resistance Sentinel Network Update* report on MRSA susceptibility testing indicates a remarkable increase in the past two years. The percentage of MRSA among *S. aureus* isolates has increased from 25% to 43% since 2002. In outpatient settings, MRSA was found in 19% of *S. aureus* isolates in 2002, increasing to 35% in 2004.

During the first six months of 2004, Spokane Regional Health District collected voluntary reports of MRSA cases in Spokane County. Due to the nature of the voluntary reporting, these numbers are not all-inclusive.

The total number of MRSA cases reported was 373. Of these, 163 cases were from inpatient settings, 29 were from long-term care settings, and 157 cases were diagnosed and reported from outpatient settings, including physician offices, urgent care facilities, and emergency departments. The remaining 24 cases were reported from correctional facilities and home health care settings. Community-acquired MRSA cases are most often reported from outpatient settings and correctional facilities.

Legionellosis

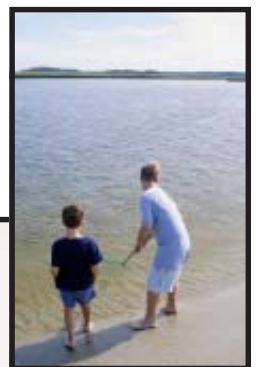
Legionellosis is an infection caused by *Legionella* bacteria, organisms commonly found in moist, warm environments. There are two typical, clinical profiles: Pontiac fever, a self-limited, influenza-like illness and Legionnaire's disease, the more serious form. Both profiles present with fever, malaise, and myalgias, but Legionnaire's disease usually involves pneumonia resistant to treatment, frequent cardiac events and stroke, and high mortality. Outbreaks have been associated with aerosolized water, such as fountains, spray nozzles, and evaporative coolers. People at risk include the elderly, the immune compromised, and patients with other underlying lung disease.

Reporting Requirement: 3 days

From 2000 through 2004, *Legionella* infections were reported in four Spokane County residents.



Legionella bacteria got its name in 1976 when many people who attended a Philadelphia convention of the American Legion suffered from an outbreak of this disease.



Invasive Group A *Streptococcus*

Infection with Group A *Streptococcus* (*S. pyogenes*, GAS) is common, often producing pharyngitis (sore throat), otitis media (middle ear infection), and dermatitis (impetigo), especially in children. In some circumstances, GAS can progress from a simple, superficial infection or colonization to an aggressive infection in a normally sterile site. Such deep-tissue infections would include sepsis, meningitis, and necrotizing fasciitis (NF), a process whereby bacteria proliferate along the fascial layers, encasing muscles, causing rapidly advancing infection and tissue death. GAS is one of the two usual bacterial agents that cause necrotizing fasciitis. The other agent is a mixed bacterial infection with anaerobic bacteria, such as *Clostridium perfringens*. Underlying medical conditions, such as damaged blood vessels limiting circulation, impaired immunity from diabetes, and recent infection with varicella-zoster virus (chicken pox), can predispose patients to deep-tissue infections causing necrotizing fasciitis.

Reporting Requirement: As of January 2005, invasive Group A streptococcus infection is no longer a reportable condition, per WAC 246-101.

Because Group A *Streptococci* often colonize the respiratory tract, the surveillance case definition stipulates that GAS must be cultured from a “normally sterile site”; e.g., blood, muscle tissue layers, central nervous system, and other deep-tissue structures. Culturing GAS from a superficial cellulitis or a wound site would not indicate invasive disease. However, if the tissues underlying such sites become infected (as in necrotizing fasciitis) that would be considered invasive infection.

In Spokane County from 2000 through 2004, 36 cases were reported that met the case definition for invasive GAS. The median age of cases was 58 with a range from 23 to 86 years. Three cases died as a result of the GAS infection.

Associated factors were as follows:

- √ 20 had a history of chronic disease, mostly diabetes mellitus.
- √ 11 had history of traumatic wound infection or post-operative surgical site infection.
- √ 4 had history of injection drug use and/or alcoholism.

Rabies Post-Exposure Prophylaxis (PEP)

Although rabies has been identified in animal reservoirs, Washington State has been fortunate to have had little human disease. Testing at WSDOH Laboratory over the last 15 years has shown between 6-11% of bat specimens tested positive for rabies, but human exposures to bats are relatively limited. Other animals that might pose a greater risk, such as dogs, cats, and horses, rarely test positive in Washington. Nonetheless, because of the uniformly fatal outcome of rabies infection, when humans are substantially exposed (e.g., by a bite wound or scratch) to a potentially rabid animal, procedures are in place to observe the suspect animal in quarantine for ten days (when possible) or to test it. In instances of an exposure to a known rabid animal or to an animal unavailable to test or observe, the general recommendation is for PEP with rabies vaccine and rabies immune globulin.

Reporting Requirement: 3 days for post-exposure prophylaxis (PEP), immediately for rabies illness.

Two cases of human rabies have been reported in Washington State since 1960, but none in Spokane County. In 2003, Spokane Regional Health District submitted 37 specimens for testing to the WSDOH Laboratory, of which none was rabid. They included 21 cats, six dogs, nine bats, and one raccoon. In 2004, SRHD submitted 36 specimens for testing to the WSDOH Laboratory, of which three were rabid (all bats) and four were indeterminate. They included 13 cats, 10 dogs, 10 bats, and two raccoons, and one skunk. More frequently, though, the biting animal may be unavailable to test; in those instances, the bite victim

and his/her physician must decide whether to follow Spokane Regional Health District and CDC recommendations for post-exposure prophylaxis or not. PEP is a notifiable treatment, but reporting is not common. SRHD recommends that physicians report cases in which PEP is given so the need for treatment can be better described in our community.

In Spokane County, most PEP is administered in hospital settings such as emergency departments. The standard course of post-exposure medication to prevent rabies is a single dose of human rabies immune globulin (HRIG), followed by five doses of rabies vaccine given over a month's time. In 2003, hospital pharmacy records show that 10 PEP sequences were begun using HRIG in the five largest acute care hospitals. Thirty-two vaccine doses were administered, reflecting beginning and completing the vaccine series locally, vaccine sequences begun elsewhere and continued locally, and vaccine series begun locally and continued elsewhere. In 2004, health care providers reported initiating or continuing 11 PEP sequences in Spokane County. Several were begun at hospitals in Idaho and continued in Spokane; one was initiated in Spokane to be completed in California; and the rest were done completely in Spokane County hospitals.



Travel-Related Diseases

Several communicable diseases are reported sporadically which affect those who have traveled to other regions of the United States and other countries. Usually these are vector-borne diseases for which the natural host is not part of the local ecology, eliminating the prospect of a local exposure.

Lyme disease

Lyme disease is caused by *Borrelia burgdorferi*, a spirochetal bacterial infection occurring in many regions of North America and Europe.

Reporting Requirement: 3 days

Symptoms: It produces a characteristic “bull’s eye” skin rash, along with fluctuating arthritis, myocarditis and cardiac arrhythmias, meningitis and cranial neuritis, uveitis, and other systemic derangements. Antibiotic treatment early in the course of Lyme disease can suppress further symptoms from appearing.

Transmission: The bacteria are transmitted by the bite of various species of *Ixodes* ticks. Fortunately, the ixodid species in eastern Washington, *I. angustus*, does not appear to harbor *B. burgdorferi* in its natural setting. A challenging aspect of diagnosing Lyme disease is that the serologic assay for it also may be weakly positive in response to some unrelated autoimmune conditions. This makes a suggestive exposure history an essential component of the diagnosis.

From 2000 to 2004, there were three cases of Lyme disease corroborated both by laboratory studies and travel history.

Malaria

Malaria is a parasitic infection transmitted by mosquito vectors. Each of the four types of malaria has specific host mosquitos in various countries and geographic regions that harbor the parasite.

Reporting Requirement: 3 days

Symptoms: Clinically, it presents as recurrent fevers and chills, sweats, headache and backache, and can progress to catastrophic outcomes unless identified and treated early.

Transmission: Malaria is transmitted by the bite of an infected mosquito. Drugs are available for preventive treatment for travelers to malaria-endemic regions and to treat those who become infected. Because malaria has regionally disparate drug resistance, the medicines must be chosen on the basis of regional patterns.

Fortunately, eastern Washington has no host mosquitos or indigenous malaria. Six cases of malaria, all from *Plasmodium vivax*, were diagnosed from 2000 to 2004 among travelers from Spokane to countries with malaria and among immigrants to Spokane. Three had taken a complete course of preventive medicine, two others had taken a partial course, and one had taken no prophylaxis.



Tuberculosis

Tuberculosis (TB), usually an infection with *Mycobacterium tuberculosis*, is a disease with many different clinical appearances.

Reporting Requirement: Immediately

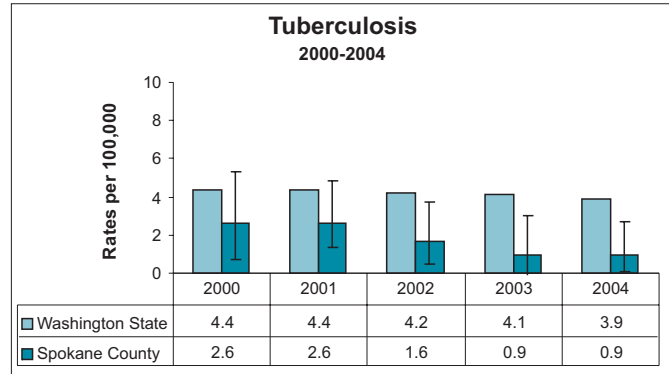
Symptoms: The usual course of illness is a lung infection, but other systems can be affected. Pulmonary TB symptoms may include fever, cough (sometimes producing bloody sputum), chest pain, night sweats, weight loss, malaise and fatigue; TB in other sites (lymphatic, skin, kidneys, etc.) has different findings. TB in children often infects many organs and is more difficult to identify.

Transmission: People infected and ill with TB transmit the infection as an aerosol of respiratory droplets containing bacilli, typically by coughing. People in prolonged, close contact with confirmed cases of active TB are more likely to become infected, but may show no symptoms of illness. In those with normal, intact immune systems, the lifetime chance of developing active TB illness is about 10%. Patients with impaired immunity (e.g., hereditary, due to infections such as HIV, medically induced such as in cancer or organ transplant patients) are much more likely to become ill after TB infection. Those identified with latent TB are given a course of antituberculous agents to prevent active TB infection from emerging.

In Spokane County, 42 actively infected cases were identified from January 2000 through December 2004. These cases included 57% male and 43% female patients. Self-identified race categories were: 20 White, 17 Asian, and five others.

Historically, tuberculosis has been associated with both social and cultural determinants and outcomes. It is endemic in many geographic regions today and linked to malnutrition, HIV infection, and other chronic diseases. For country of origin, 38% of Spokane TB cases indicated the United States and 62% were from other countries. Four cases had been homeless within the year preceding diagnosis and one case was incarcerated at the time of diagnosis. Within two years

preceding diagnosis, 28 had been unemployed. One case had a history of injection drug use within the year preceding diagnosis and 8 cases had a history of alcohol misuse within the year preceding diagnosis.



Between 2000 and 2004, 244 contacts of active Spokane TB cases were identified. Of those 192 (79%) were PPD tested and 57/192 (30%) infected contacts were identified. Sixty eight percent of infected contacts started and completed preventive treatment with antituberculous agents.



Emerging Surveillance Issues

West Nile Virus Disease

West Nile Virus (WNV) is an arthropod-borne virus which primarily afflicts birds, especially corvids (crows, jays, magpies and ravens).

Reporting Requirement: 3 days

Symptoms: Although most (~80%) people infected with WNV remain asymptomatic, approximately 20% of those infected will develop symptoms including fever, headache, body aches, gastrointestinal complaints, eye pain, swollen lymph nodes, and generalized rash. One in 150 persons infected with WNV develops a more severe form of the disease, which may include encephalitis or meningitis. Symptoms may include headache, high fever, neck stiffness, stupor, disorientation, coma, tremors, convulsions, and muscle weakness. A poliomyelitis-like illness of acute asymmetrical flaccid paralysis in the absence of pain or sensory loss has also been reported. Symptoms of both fever and severe illness can last weeks to months and some permanent neurologic impairment may occur. The paralysis syndrome is variable, but limited recovery occurs, especially after 3 or 4 months post onset. Males have a higher incidence of severe illness than do females as do those > 50 years of age, as well as immunocompromised and transplant patients.

Transmission: WNV is transmitted by the bite of an infected mosquito. In rare cases, it has been transmitted by blood transfusion, transplanted organs, breast milk, and transplacentally.

WNV meningitis/encephalitis epidemics resurfaced during 1994-2000 all over North Africa, Europe, the Middle East, and in North America. Recent outbreaks in Romania (1996), Russia (1999), Israel (2000), and the ongoing outbreak in the U.S. and Canada have affected hundreds to thousands of humans, causing severe neurologic disease coincident with the emergence of new, closely related WNV strains.

WNV was initially identified on the eastern seaboard of the U.S. in 1999 and has continued its westward spread, now well established in most of the continental U.S. WNV was detected in Washington State in a few birds and horses in the fall of 2002, but no further activity was seen in Washington State through 2004. Human and animal cases were reported in southwestern Idaho and in southern Oregon in 2004. Monitoring of birds, mosquitoes, horses, and humans continues under the same guidelines enacted in 2000.

Avian Influenza

Increasing highly pathogenic avian influenza (HPAI) H5N1 activity in wild and domestic fowl in Southeast Asia and related sporadic, often fatal, cases of human disease (69/135) have professionals in public health, health care, and other fields anxious wondering if avian influenza will be the pandemic of this new century. At the time of this writing, HPAI H5N1 has been found in birds in more than a dozen Asian and European countries, where over 150 million domestic chickens, ducks and other fowl have been destroyed in an effort to prevent this virus from mutating into a strain easily transmissible and sustainable in human populations.

The World Health Organization has developed a phased flu virus “mutation” scheme to describe an influenza pandemic. We are currently in phase three, “human infection(s) with a new subtype, but no human-to-human spread, or at most rare instances of spread to a close contact.” Fortunately, human-to-human spread to date has been rare. Although it is impossible to predict whether the H5N1 strain currently circulating will actually be the next pandemic strain, or whether it will be some other strain, there is widespread agreement that the population is overdue for our next influenza pandemic. With that in mind, public and private agencies worldwide, including Spokane County, are busy planning for this eventuality.



The diagnosis of WNV infection relies on a high index of clinical suspicion and on results of specific laboratory tests.



Considerations about Communicable Disease Reports

1. Criteria are set by state departments of health regarding which communicable diseases must be reported; these largely correspond to CDC guidelines. For CDC surveillance case definitions, see MMWR 1997;46(RR-10):1-57, at www.cdc.gov/mmwr/PDF/RR/RR4610.pdf.
2. RCW 43.20.050 and WAC 246-101 mandate that health care providers, diagnostic laboratories, hospitals, schools, and others notify local public health jurisdictions of cases of reportable diseases, as listed at www.doh.wa.gov/notify/list.htm.
3. For many diseases, only a small portion of actual cases are reported. This reflects many factors, including limited access to medical care, lapses in reporting by health care providers, inadequate documentation of cases, and lack of confirmatory testing.
4. In outbreak circumstances, some communicable disease diagnoses have several defined levels of certainty, such as: laboratory confirmed, epidemiologically linked, probable, or possible.
5. Reported cases can be described in several ways, including:
 - a. A case count, which is the actual number of cases identified at a certain place and time. The case count is a useful index of the magnitude of the particular disease problem that must be addressed, such as the number of ill people in need of treatment or with a substantial exposure.
 - b. A case rate, which is the quotient of the case count in a time period (usually a year), divided by the reference population and standardized to a population unit (usually 100,000 people). The case rate indicates the extent of that disease in the affected population group. The significance of the rate varies substantially according to the size of the case count and the

population size. Generally speaking, smaller values yield more variable results over time. In particular, rates based upon calculations with counts of fewer than five events should be interpreted with caution.

There are several ways to evaluate how reliable and significant a rate may be, including confidence intervals. (See www.doh.wa.gov/Data/Guidelines/guidelines.htm.) Rate calculations for which confidence intervals of 95% do not overlap are considered significantly different.

6. The value of reporting communicable disease data must be weighed against the need to preserve the confidentiality of patients' medical records. If case or event counts are fewer than three, confidentiality breaches can be avoided by combining categories of stratified data into a larger, "collapsed" category.

Data Sources

Spokane Regional Health District (SRHD):

Assessment/Epidemiology Center
1101 W. College Avenue, Suite 360
Spokane, WA 99201
(509) 324-1442
www.srhd.org

Washington State Department of Health (WSDOH):

WSDOH Community and Family Health Division,
Office of Infectious Disease and Reproductive Health
(360) 236-3466
www.doh.wa.gov/cfh/IDRH/default.htm

Washington State Office of Financial Management (OFM):

www.ofm.wa.gov