Public Health
Seattle & King County

2008

COMMUNICABLE DISEASE SURVEILLANCE SUMMARY

Communicable Disease Epidemiology and Immunization Section
401 Fifth Avenue, Suite 900
Seattle, Washington 98104
206-296-4774

HIV/AIDS Epidemiology Program
400 Yesler Way, 3rd Floor
Seattle, Washington 98104
206-296-4645

Sexually Transmitted Diseases (STD) Program
Harborview Medical Center
908 Jefferson St, Ste 1110
or PO Box 359777
Seattle, Washington 98104
206-744-3590

Tuberculosis (TB) Clinic
Harborview Medical Center
325 9th Avenue, PO Box 359776
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INTRODUCTION

The Communicable Disease Epidemiology & Immunization Section of Public Health – Seattle & King County is home to the health department's disease detectives. We investigate cases of infection and outbreaks of illness, instead of crime. Our work is filled with constant questioning: Who is infected? Are some people at higher risk than others? What organism is causing the infection? When were people exposed to that organism? How were they infected? And most important, how can we prevent others from becoming infected?

Our mission is to protect King County residents from infections with diseases of public health significance. We do this by:

- identifying and promoting the most effective prevention measures (such as vaccination);
- monitoring the occurrence of diseases in the community;
- taking action to stop the spread of infections from contaminated food, beverages, environmental sources or contact with ill persons; and
- helping people who have been exposed to infectious agents minimize their risk of getting sick and/or spreading infection to others.

Many infections require prompt intervention to reduce the severity and spread of illness in the community. In some cases giving specific treatment to a patient can be lifesaving, such as rabies shots for a person bitten by a rabid bat. In other cases, timely preventive treatment for close contacts of a person can reduce their risk of disease, such as antibiotics for family members of a child with meningococcal meningitis, antibiotics for infants and pregnant women exposed to pertussis, and preventive vaccination after exposure to hepatitis A or B. Sometimes bacteria such as *E. coli* O157:H7, *Salmonella,* and *Vibrio* contaminate food, making rapid identification of the source important to prevent people from becoming ill. We work tirelessly with the public, health care providers, and others to protect King County residents and the public generally from communicable diseases. In addition to regularly providing information and consultation to the public and healthcare providers during the work day, our team is always available after hours to provide consultation to King County health care providers about communicable disease issues that may need urgent public health action.

To conduct our investigative work, we've assembled a team with a diverse set of capabilities: public health nurses and other trained disease investigators who interview and educate; medical epidemiologists (physicians) experienced at diagnosing illness and providing consultation to community health care providers; veterinarians who specialize in diseases that can spread from animals to humans; epidemiologists who sift through mounds of data looking for patterns of infection and connections between cases; and a support staff with the organizational skills necessary to keep the entire operation running smoothly. In addition to communicable disease control and prevention, our section also participates in emergency preparedness planning for communicable disease emergencies such as West Nile virus, pandemic influenza and biological terrorism.

The 2008 annual report summarizes communicable disease surveillance conducted by the following sections of Public Health – Seattle & King County:

- Communicable Disease Epidemiology and Immunization Section (www.kingcounty.gov/health/cd)
- HIV/AIDS Program (www.kingcounty.gov/health/hiv)
- Tuberculosis Control Program (www.kingcounty.gov/health/tb)
- Sexually Transmitted Diseases Program (www.kingcounty.gov/health/std)

In public health, the word "surveillance" means that we collect data about diseases in a systematic and uniform way; we analyze those data to identify and describe health risks and patterns of disease in the community; and we interpret the data to guide disease prevention and control activities.

Each page of this report focuses on a particular disease or "notifiable condition" that laboratories and health care providers are required by law to report to Public Health. On each page you'll find tables and graphs of disease activity in King County in 2008 and how it compares to past years, as well as a brief summary of basic epidemiology, clinical features, prevention measures, and highlights relevant to our community.

In addition to surveillance of notifiable conditions, our section also investigates and responds to outbreaks of illness, cases of rare diseases, and other diseases with public health significance including emerging infections like the 2009 H1N1 influenza outbreak, SARS, and *Cryptococcus gattii*. Notable among the 43 outbreak investigations conducted in 2008 were the following:

- An outbreak of salmonellosis that sickened 81 people; the most likely source of infection was contaminated food from a local restaurant.
- Four children with *E. coli* O157:H7 at the same child care center; person-to-person transmission was suspected.
- A child who contracted Japanese encephalitis (a mosquito-borne viral infection of the brain and nervous system) while traveling in Southeast Asia. Although this often serious disease is preventable by vaccination, the child was not vaccinated.
- Investigations of two measles exposure incidents: One was by a traveler from Europe who passed through Seattle-Tacoma (Sea-Tac) International Airport while she was contagious with measles. The other was by an unimmunized child from another county who visited King County while infectious with measles. This child was exposed to several other unvaccinated children from the same county who were likely exposed to measles while attending an international church youth conference in King County during their exposure period.

We hope this report gives you a better understanding of communicable diseases and public health, and that you find it interesting and informative.

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DEFINITIONS OF TERMS USED IN THIS REPORT

Bacteremia: The presence of live bacteria in the blood stream.

CDC: Centers for Disease Control and Prevention.

Endemic: Prevalent in a particular geographic area or people.

Enteric infection: An infection of the gastrointestinal tract.

Exposure period: The time period during which a person was likely exposed to the infectious agent causing the illness. This is calculated using the typical range of the incubation period for the agent (see below).

Fecal-oral transmission: A means of disease transmission in which microscopic viruses, bacteria, or parasites in the stool of one person are swallowed by another person, causing infection. Usually this occurs when food, water, utensils, hands or other body parts are contaminated by small amounts of stool. The risk of fecal-oral transmission is increased by inadequate hand washing before preparing food or after activities such as using the toilet, assisting incontinent children or adults with toileting, diaper changing, and certain sexual practices.

Incidence rate: The number of new cases of a disease in a specified population divided by the person-time at risk during a specified time period. In this report, incidence rate is reported as the number of new cases of disease per 100,000 people per year, using 2008 King County population statistics from the State of Washington Office of Financial Management. The number of children under 12 months of age was estimated by using the proportion of the population under 12 months in the year 2000, the last year for which estimates for this age group are available.

Incubation period: The time between exposure to an infectious agent and the onset of symptoms of disease due to that agent.

Nosocomial: Originating or taking place in a hospital or other health care facility.

Prevalence: The number of individuals with a disease divided by the total number of people at risk for that disease at a specific time interval.

Prodrome: Early symptoms such as fever and fatigue that may precede the characteristic symptoms of an illness.

Prophylaxis: Treatment given before illness develops to prevent the subsequent occurrence of disease. Prophylactic treatment includes administration of antibiotics (e.g., to prevent certain bacterial infections such as pertussis or meningococcal disease), antivirals (e.g., influenza), anti-parasitics (e.g., malaria), immune-globulin (e.g., hepatitis B, tetanus, and rabies), or vaccine (e.g., hepatitis A, measles, and rabies).

Public Health: When capitalized this refers to Public Health-Seattle & King County; when in lower case, it refers to the general definition of public health.

Public Health Laboratory: The Public Health-Seattle & King County Laboratory located at 325 Ninth Avenue, Seattle, Washington 98104.

Sporadic case: A single, isolated case of disease not related to other cases or associated with an outbreak.

PUBLIC HEALTH CONTACT NUMBERS

	Phone	Fax
24-Hour disease report line (to leave a recorded message): ONLY for reporting **non-immediately notifiable** conditions	(206) 296-4782	
To report all other notifiable communicable diseases (daytime and after-hours)	(206) 296-4774	(206) 296-4803
24-Hour Communicable Disease Hotline (recorded information and updates on current public health issues)	(206) 296-4949	
HIV/AIDS Program and Report Line (mail or call in reports only)	(206) 296-4645	
Public Health Laboratory	(206) 744-8950	
Sexually Transmitted Diseases Report Fax Line (fax reports only)		(206) 744-5622
Sexually Transmitted Diseases Reporting Inquiries	(206) 744-3954	
Sexually Transmitted Disease (STD) Clinic	(206) 744-3590	
Tuberculosis Clinic and Report Line (daytime and after hours)	(206) 744-4579	(206) 744-4350

NOTIFIABLE COMMUNICABLE DISEASE CONDITIONS IN WASHINGTON STATE

Notification Timeframes, and Specimen Submission Requirements for Health Care Professionals and Laboratories

Notifiable Condition	Notifiable by Health Care Provider	Notifiable by Laboratory	Specimen Submission Required
Acquired Immunodeficiency Syndrome (AIDS)	Within 3 work days		
Animal Bites	Immediately		
Arboviral disease	Within 3 work days	Within 2 work days	
Botulism (Foodborne)	Immediately	Immediately	Serum and Stool - If available, submit suspect food (2 days)
Botulism (Infant)	Immediately	Immediately	Stool (2 days)
Botulism (Wound)	Immediately	Immediately	Culture, Serum, Debrided tissue, or Swab sample (2 days)
Brucellosis (Brucella species)	Immediately	Within 2 work days	Culture (2 days)
CD4+ (T4) lymphocyte counts less than 200 or 14%		Monthly	
Campylobacteriosis	Within 3 work days		
Chancroid	Within 3 work days		
Chlamydia trachomatis infection	Within 3 work days	Within 2 work days	
Cholera	Immediately	Immediately	Culture (2 days)
Cryptosporidiosis	Within 3 work days	Within 2 work days	
Cyclosporiasis	Within 3 work days	Within 2 work days	Specimen (2 days)
Diphtheria	Immediately	Within 2 work days	Culture (2 days)
Disease of Suspected Bioterrorism Origin:			
Anthrax	Immediately	Immediately	Culture (2 days)
Smallpox	Immediately	Immediately	Consult with Public Health
Disease of Suspected Foodborne Origin (clusters only)	Immediately		
Disease of Suspected Waterborne Origin (clusters only)	Immediately		
Enterohemorrhagic *E. coli*, including *E. coli* O157:H7 infection	Immediately	Within 2 work days	Culture (2 days)
Gonorrhea	Within 3 work days	Within 2 work days	
Granuloma Inguinale	Within 3 work days		
Haemophilus influenza invasive disease (under age 5 years, excluding otitis media)	Immediately		
Hantavirus Pulmonary Syndrome	Within 3 work days		
Hemolytic Uremic Syndrome	Immediately		
Hepatitis A	Immediately	IgM Positive, Within 2 work days	
Hepatitis B (acute)	Within 3 work days	Monthly	
Hepatitis B surface antigen positivity in pregnant women	Within 3 work days	Monthly	
Hepatitis B (chronic) Initial diagnosis, and previously unreported prevalent cases	Monthly	Monthly	
Hepatitis C (acute and chronic)	Monthly	Monthly	
Hepatitis, unspecified (infectious)	Within 3 work days		

NOTIFIABLE COMMUNICABLE DISEASE LIST, continued			
Notifiable Condition	**Notifiable by Health Care Provider**	**Notifiable by Laboratory**	**Specimen Submission Required**
Herpes simplex, neonatal and genital (initial infections only)	Within 3 work days		
Human immunodeficiency virus (HIV) infection (Western Blot assays, P24 antigen or viral culture)	Within 3 work days	Within 2 work days	
Human immunodeficiency virus (HIV) infection (RNA or DNA nucleic acid tests)		Monthly	
Immunization reactions, severe, adverse	Within 3 work days		
Legionellosis	Within 3 work days		
Leptospirosis	Within 3 work days		
Listeriosis	Immediately	Within 2 work days	
Lyme Disease	Within 3 work days		
Measles (rubeola)	Immediately	Immediately	Serum (2 days)
Meningococcal disease	Immediately	Within 2 work days	Culture from blood/CSF, or other sterile sites (2 days)
Paralytic Shellfish Poisoning	Immediately		
Pertussis	Immediately	Within 2 work days	
Plague	Immediately	Immediately	Culture or appropriate clinical material (2 days)
Poliomyelitis	Immediately		
Psittacosis	Within 3 work days		
Q Fever	Within 3 work days		
Rabies post-exposure prophylaxis	Immediately	Immediately	Tissue or other appropriate clinical material (upon request only)
Relapsing Fever	Immediately		
Rubella (including congenital rubella syndrome)	Immediately		
Salmonellosis (including Typhoid Fever)	Immediately	Within 2 work days	Culture (2 days)
Shigellosis	Immediately	Within 2 work days	Culture (2 days)
Syphilis (including congenital)	Within 3 work days		Serum (2 days)
Tetanus	Within 3 work days		
Trichinosis	Within 3 work days		
Tuberculosis	Immediately	Within 2 work days	Culture (2 days)
Tuberculosis (Antibiotic sensitivity for first isolates only)		Within 2 work days	
Tularemia	Within 3 work days		Culture or appropriate clinical material (2 days)
Typhus	Immediately		
Vibriosis	Within 3 work days		
Yellow Fever	Immediately		
Yersiniosis	Within 3 work days		
Other rare diseases of public health significance	Immediately	Immediately	
Unexplained critical illness or death	Immediately		

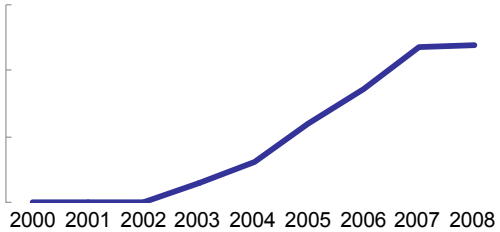
NOTIFIABLE COMMUNICABLE DISEASE REPORTS - KING COUNTY 2000-2008

Disease	2000	2001	2002	2003	2004	2005	2006	2007	2008
Animal Bites and other potential Rabies exposures	NR	NR	NR	106	223	430	633	878	905
Arboviral disease								8	7
Botulism, Infant	1	1	0	1	0	0	0	0	0
Botulism, Foodborne	0	0	0	0	0	0	0	0	0
Botulism, Wound	0	0	0	0	1	0	0	1	0
Brucellosis	0	0	0	1	0	0	0	2	0
Campylobacteriosis	320	325	300	262	264	337	258	262	296
Chlamydia	4,495	4,295	4,471	5,189	5,428	5,520	5,319	5,682	5,962
Cholera	0	1	1	1	0	0	0	0	0
Cryptosporidiosis	5	29	34	38	34	69	45	46	35
Cyclosporiasis	0	5	5	1	9	5	1	1	0
Diphtheria	0	0	0	0	0	0	0	0	0
Enterohemorrhagic *E. Coli* (including *E. coli* O157:H7)	60	36	32	43	42	45	42	37	49
Giardiasis	229	150	171	124	126	144	117	150	114
Gonorrhea	1,222	1,556	1,462	1,349	1,286	1,769	1,987	1,409	1,294
Haemophilus influenzae invasive disease (under age 5 years)	0	0	1	2	2	2	3	0	2
Hantavirus Pulmonary Syndrome	0	0	0	1	0	0	0	1	0
Hepatitis A	98	28	32	30	14	17	17	17	16
Hepatitis B, Acute	42	36	31	34	23	23	21	23	31
Hepatitis B, Chronic	397	628	581	522	629	708	840	839	878
Hepatitis C, Chronic	1,350	1,949	1,925	1,099	1,636	1,728	1,783	1,759	1,858
Hepatitis C, Acute	13	9	12	8	10	10	6	7	11
HIV/AIDS	242	320	278	653	555	568	478	404	359
Legionellosis	4	4	3	2	7	8	5	7	7
Leptospirosis	1	2	0	1	0	1	1	0	0
Listeriosis	8	4	4	6	4	3	7	10	15
Lyme disease	3	2	6	2	10	6	2	5	2
Malaria	20	9	15	16	12	12	25	15	14
Measles	2	12	0	0	6	1	0	1	0
Meningococcal disease	17	13	21	6	18	15	11	4	5
Mumps	9	1	0	0	1	1	2	8	1
Paralytic Shellfish Poisoning	0	0	0	0	0	0	0	0	0
Pertussis	207	39	156	280	201	217	105	119	78
Psittacosis	0	0	0	0	0	0	0	0	0
Q Fever	0	0	0	0	0	0	0	1	0
Relapsing Fever	1	0	5	2	1	0	0	2	1
Rubella	2	0	2	0	0	1	0	0	0
Salmonellosis	205	260	212	243	234	218	205	241	262
Shigellosis	156	111	86	88	63	72	52	50	41
Syphilis	117	110	96	84	166	188	185	194	191
Tetanus	0	0	0	0	0	1	0	0	0
Trichinosis	1	0	0	0	0	0	0	0	0
Tuberculosis	127	139	158	155	133	127	145	161	121
Tularemia	0	0	0	1	0	1	0	0	0
Typhoid Fever	3	4	4	2	4	7	3	4	8
Vibriosis	7	5	13	7	8	8	39	11	11
Yersiniosis	20	17	12	10	15	9	10	5	5
Total	**9,393**	**10,143**	**10,185**	**10,415**	**11,214**	**12,434**	**12,245**	**12,368**	**12, 572**

NR= Not Reportable

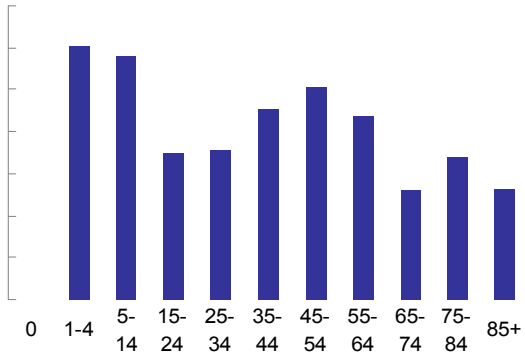
ANIMAL BITES AND OTHER POTENTIAL RABIES EXPOSURES

rate by year (cases per 100,000)



	2000	2001	2002	2003	2004	2005	2006	2007	2008
rate	0.0	0.0	0.0	6.0	12.5	23.8	34.5	47.2	48.0
cases	0	0	0	106	223	430	633	878	905

rate by age group (cases per 100,000) in 2008



	0	1-4	5-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	85+
rate	0.0	60.3	58.2	34.6	35.6	45.2	50.5	43.7	25.8	33.7	26.6
cases	0	54	125	88	108	129	149	93	27	23	9

In 2008, a total of 905 animal bites or other potential exposures to animal saliva were reported to Public Health. Of these, 593 (66%) were determined to be potential rabies exposures. Rabies post-exposure prophylaxis (PEP) was recommended for 142 people because the bite was considered a potential rabies exposure and 1) the animal was not a dog, cat, or ferret that could be watched for signs of illness during a 10 day quarantine period, or 2) the animal was not available for rabies testing, or 3) the animal tested positive for rabies.

Eighty two (58%) of the 142 rabies PEP recommendations resulted from exposures within King County to bats (41) and raccoons (38). Thirty four (24%) of the 142 were exposures that occurred outside of the U.S. to bats (11), cats (3), dogs (17), and monkeys (3). Of the 69 animals tested for rabies in King County in 2008, only one bat tested positive.

In Washington, most cases of animal rabies occur in bats. Most bats, however, do not carry rabies, and most of the bats tested for rabies in Washington are not infected. The last human cases of rabies in Washington State occurred in 1995 and 1997, both attributed to bat exposures. Prior to that, the last human case of rabies occurred in 1939 from the bite of a rabid dog.

Purpose of Surveillance:

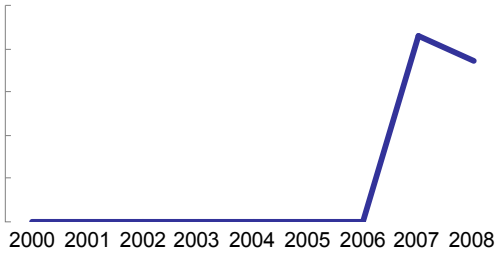
- To identify persons potentially exposed to rabies, and to ensure appropriate evaluation and preventive treatment if necessary
- To assure that potentially rabid animals are managed appropriately
- To identify animal sources of rabies and eliminate preventable sources of rabies transmission

Epidemiology: Animal bites are more common in the summer months. Children are at the greatest risk of being bitten. In King County, reported animal bites are assessed for the risk of rabies. The rabies virus is transmitted by the saliva of infected animals. Bats are the primary reservoir of rabies in Washington state. Wildlife most likely to carry rabies in the U.S. includes bats, skunks, raccoon, foxes, and coyotes. Washington has no known terrestrial reservoir of rabies; however, rabies is a dynamic disease among animal populations and may be introduced in the future. Domestic animals such as cats, dogs, ferrets, horses, cattle, goats, and llamas can also get rabies, usually from the bite of a wild animal or bat.

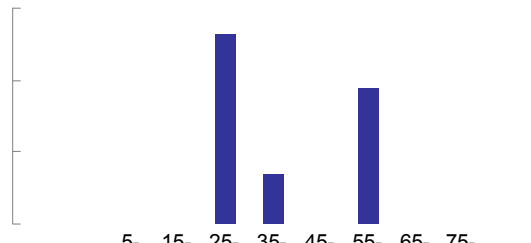
Clinical Aspects: Rabies is a viral disease of the central nervous system that is almost always fatal once symptoms begin. Signs and symptoms of rabies include behavior changes, difficulty swallowing, convulsions, and paralysis. In humans, death almost always occurs within 10 days of onset of symptoms.

Prevention: Keep rabies vaccinations up to date for all dogs, cats, and ferrets. Do not handle, feed, or unintentionally attract wild animals with open garbage cans, uncovered compost bins, or pet food left outside. Teach children never to approach or touch unfamiliar animals, wild or domestic, even if they appear friendly. Before traveling abroad, consult with a health care provider, travel clinic, or health department about the risk of exposure to rabies, get vaccinated if advised, and learn what to do if you are bitten by an animal.

ARBOVIRAL DISEASE



	2000	2001	2002	2003	2004	2005	2006	2007	2008
rate	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.4
cases	0	0	0	0	0	0	0	8	7



	0	1-4	5-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	85+
rate	0.0	0.0	0.0	0.0	1.3	0.4	0.0	0.9	0.0	0.0	0.0
cases	0	0	0	0	4	1	0	2	0	0	0

No cases of West Nile virus (WNV) infection acquired in King County were reported in 2008. One confirmed case was reported in a King County resident who was exposed in Central Washington. In addition, one blood donor was identified who had traveled to Yakima County and Oregon during the exposure period. In King County in 2008, three birds tested positive for WNV but no mosquito pools or other mammals tested positive.

Five probable or confirmed cases of dengue fever were reported in 2008 with likely exposures occurring in Central America, India, Mexico, and the Philippines.

One case of Japanese encephalitis (JE) was reported in a child in 2008. The child was likely exposed during travel in southern Vietnam. The child was hospitalized and has recovered after a long rehabilitation.

Purpose of Surveillance:

- To identify outbreaks, and monitor trends in illness due to the agents of arboviral encephalitis
- To detect and characterize the emergence and features of West Nile Virus (WNV) in King County
- To guide disease investigation and control activities to prevent human infections
- To facilitate appropriate diagnostic testing

Epidemiology: Arboviruses are spread by insects primarily among wild birds and small mammals. They are transmitted to humans ("incidental hosts") by certain species of mosquitoes that acquire the virus while feeding on infected wild birds and small mammals. Western equine encephalitis (WEE), St. Louis encephalitis (SLE), and West Nile virus (WNV) are examples of arboviral diseases found in Washington. Arboviral diseases that should be considered in symptomatic persons with travel to certain countries (particularly in tropical areas) include Japanese encephalitis, yellow fever, and dengue fever. Arboviruses are typically not spread from person to person, but in rare cases WNV has been spread through blood transfusions, organ transplants, breastfeeding, and perinatally. Arbovirus infections (regardless of where the infection was acquired) became reportable in Washington State in 2006.

Clinical Aspects: The majority of persons infected with arboviruses are asymptomatic. Mild cases are characterized by low-grade fevers, headache, and body aches. More severe infections can involve the brain, leading to neurological symptoms.

Prevention: For mosquito-borne diseases, use insect repellents and stay indoors at dawn and dusk when mosquitoes are the most active. Wear protective clothing (long sleeves and pants). Empty anything outdoors that holds standing water that could serve as a mosquito breeding site. Efforts to prevent person-to-person transmission of WNV include routine screening of donated blood, tissue, and organs for WNV. Vaccines against Japanese encephalitis and yellow fever are available for travelers to endemic areas.

No cases of chikungunya were reported in King County residents in 2008; one case was reported in a traveler to Sri Lanka in 2007.

BIOTERRORISM—
DISEASES OF SUSPECTED BIOTERRORISM ORIGIN

Diseases of suspected bioterrorism origin have been notifiable in Washington since 2001. This disease category includes, but is not limited to anthrax, brucellosis, Q fever, hemorrhagic fevers, plague, smallpox, and tularemia. No confirmed reports of diseases of bioterrorism origin have occurred in Washington state.

Public Health works closely with law enforcement agencies and Washington State Department of Health to investigate and respond to potential intentional exposures to biological agents and suspicious substances, focusing on threats deemed credible by law enforcement. Public Health investigated four incidents that were deemed credible threats in 2004, four incidents in 2005, none in 2006, one in 2007, and two in 2008. Testing was negative for bioterrorism agents in all cases.

Symptoms and Clinical Findings in Diseases of Possible Bioterrorism Origin

Agent	Disease	Symptoms and Clinical Findings
Bacillus anthracis	Inhalation Anthrax	Fever, malaise, cough, and mild chest discomfort progressing to severe respiratory distress with dyspnea, diaphoresis, stridor, cyanosis, and shock. X-ray may show mediastinal widening.
Yersinia pestis	Pneumonic Plague	High fever, chills, headache, followed by cough (often with hemoptysis) progressing rapidly to dyspnea, stridor, cyanosis, and death. Gastrointestinal (GI) symptoms are also often present.
Coxiella burnetii	Q fever	Fever, cough, and pleuritic chest pain.
Francisella tularensis	Typhoidal Tularemia	Fever, headache, malaise, substernal discomfort, prostration, weight loss, and non-productive cough.
Variola virus	Smallpox	Prodrome of malaise, fever, rigors, vomiting, headache, and backache. Two to three days later, macular lesions quickly progress to papular and then pustular lesions. Lesions develop synchronously and are more abundant on the extremities, helping to differentiate it from rash due to varicella.
Various	Hemorrhagic Fevers	Variable: Fever, flushing of the face and chest, petechiae, bleeding, edema, hypotension and shock; may include malaise, myalgias, headache, vomiting, and diarrhea.
Clostridium botulinum toxin	Inhalation Botulism	Cranial nerve palsies including ptosis, blurred vision, diplopia, dysphonia, dysphagia followed by symmetrical descending flaccid paralysis.

BOTULISM

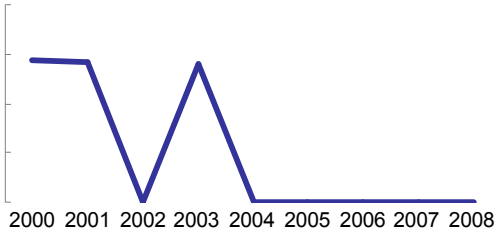
Foodborne Botulism

rate by year (cases per 100,000)

	2000	2001	2002	2003	2004	2005	2006	2007	2008
rate	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
cases	0	0	0	0	0	0	0	0	0

Infant Botulism

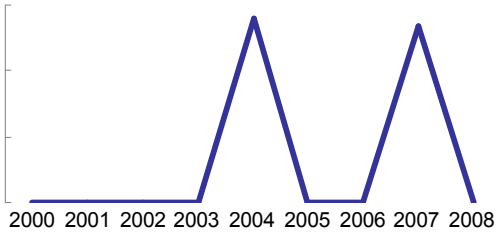
rate by year (cases per 100,000)



	2000	2001	2002	2003	2004	2005	2006	2007	2008
rate	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0
cases	1	1	0	1	0	0	0	0	0

Wound Botulism

rate by year (cases per 100,000)



	2000	2001	2002	2003	2004	2005	2006	2007	2008
rate	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0
cases	0	0	0	0	1	0	0	1	0

No cases of botulism were reported in 2008.

No cases of foodborne botulism have been reported in King County since 1993, when three cases occurred associated with home-canned beets. Between the years 1993 and 2003, there were eight reported cases of infant botulism, but none since.

Purpose of Surveillance:

- To facilitate diagnosis of suspected cases and treatment with botulinum antitoxin when indicated
- To identify other exposed persons requiring medical evaluation, monitoring and/or treatment
- To identify and investigate common source outbreaks
- To identify and remove contaminated food products that could cause further cases of foodborne botulism
- To identify and investigate cases resulting from a bioterrorism attack

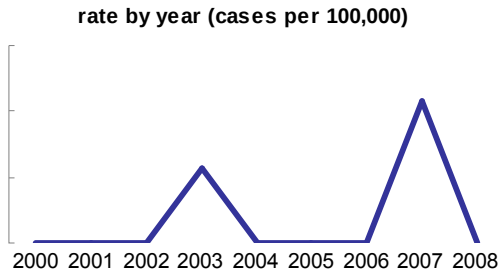
Epidemiology: Spores from *Clostridium botulinum* are found worldwide in soil, agricultural products, and animal intestinal tracts. Illness is caused by the toxin produced by the bacterium after germination. Foodborne botulism results from consuming food that has been improperly handled or preserved, allowing *C. botulinum* spores to germinate and produce botulinum toxin. Infant or intestinal botulism occurs almost exclusively in children under one year of age when ingested spores germinate and colonize the intestines. Wound botulism occurs when *C. botulinum* infects a break in the skin. Outbreaks of wound botulism have occurred among persons who inject illicit drugs.

Clinical Aspects: Symptoms of foodborne botulism include difficulty swallowing, difficulty speaking, and blurred vision. Gastrointestinal symptoms include constipation, vomiting and diarrhea. Infant botulism usually begins with constipation followed by lethargy, difficulty swallowing, and weakness. Symptoms of wound botulism are similar to those seen in foodborne botulism, without gastrointestinal symptoms. For all types of botulism, treatment is supportive care and early administration of botulinum antitoxin.

Prevention: Follow proper home canning techniques; know the time, pressure, and temperature required to destroy spores. Never eat food from damaged cans. Do not feed honey or honey water to infants.

Thirteen cases of wound botulism have been reported in Washington State since 1999, including two King County cases associated with injecting black tar heroin.

BRUCELLOSIS



	2000	2001	2002	2003	2004	2005	2006	2007	2008
rate	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0
cases	0	0	0	1	0	0	0	2	0

No cases of brucellosis were reported in 2008.

From 1994 through 2007 eight cases of brucellosis were reported in King County. One case was reported in an African immigrant in 2003. Two cases were reported in 2007; an infant and mother whose most likely source of infection was from consuming unpasteurized dairy products while travelling in India.

Purpose of Surveillance:
- To identify naturally occurring cases of brucellosis and common source outbreaks
- To identify and eliminate sources of transmission
- To identify cases resulting from a bioterrorism attack

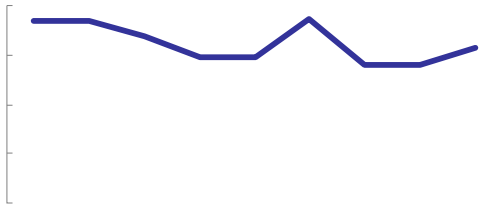
Epidemiology: Brucellosis is a bacterial infection that causes disease in many different mammals, especially sheep, goats, and cattle. Humans become infected by exposure to the tissues, blood, urine, vaginal discharge, aborted fetuses, and placentas of infected animals. Contaminated animal products (e.g., raw milk and dairy products) can also transmit the disease. Farmers, ranchers, and veterinarians, as well as slaughterhouse workers, meat inspectors, and laboratory personnel are at increased risk for brucellosis. In the United States, 100 to 200 brucellosis cases are reported each year. Most cases result from travel outside the United States and ingestion of unpasteurized milk products. Person-to-person transmission rarely has been documented. Because small amounts of aerosolized bacteria can cause disease, *Brucella* is considered a potential agent of bioterrorism.

Clinical Aspects: Most patients become ill within three to four weeks of exposure. In humans, brucellosis can cause a range of symptoms including fever, sweats, headaches, back pain, and weakness. Brucellosis can also cause chronic, recurrent fevers, joint pain, fatigue, and heart inflammation. Diagnosis of brucellosis is usually done by detecting antibodies in the blood.

Prevention: Do not consume unpasteurized milk, cheese, or ice cream. Hunters and animal herdsman should use protective gloves when handling animal parts. There is no vaccine available for humans.

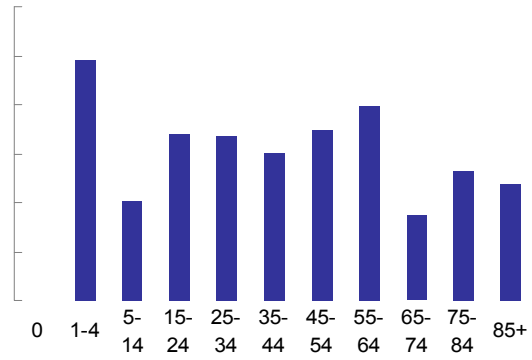
CAMPYLOBACTERIOSIS

rate by year (cases per 100,000)



	2000	2001	2002	2003	2004	2005	2006	2007	2008
rate	18.4	18.5	16.9	14.7	14.8	18.6	14.1	14.1	15.7
cases	320	325	300	262	264	337	258	262	296

rate by age group (cases per 100,000) in 2008



	0	1-4	5-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	85+
rate	0.0	24.6	10.2	16.9	16.8	15.1	17.3	19.7	8.6	13.2	11.8
cases	0	22	22	43	51	43	51	42	9	9	4

In 2008, 296 cases of campylobacteriosis were reported. *Campylobacter jejuni* (*C. jejuni*) accounted for 156 (96%) of the 162 isolates serotyped. *C. coli* (4) and *C. lardis* (2) accounted for the other six serotyped cases. International travel during the exposure period was reported by 31% (91 people (31% of cases, with travel to Africa (3), Asia/South Pacific (29), Canada (5), Caribbean (2), Europe (14), Mexico (18), Middle East (4), and South/Central America (16).

Outbreaks of campylobacteriosis are rarely identified. However in 2005, an outbreak of campylobacteriosis with four confirmed and ten probable cases was associated with a school camping trip. No specific source was identified, but high risk activities included consuming raw milk products and contact with farm animals and their fecal matter. Another outbreak associated with consumption of undercooked chicken liver pâté at a restaurant occurred in 2005, with seven confirmed cases.

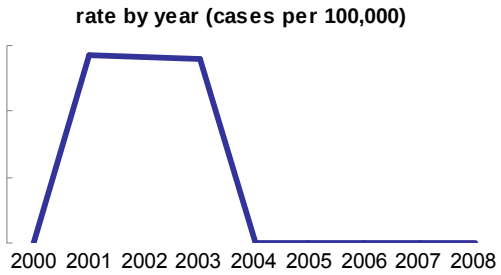
Purpose of Surveillance:
- To identify common source outbreaks
- To identify and eliminate sources of transmission including contaminated food and water

Epidemiology: Several species of *Campylobacter* bacteria cause disease in humans, with the most common being *Campylobacter jejuni*. Most cases of campylobacteriosis are associated with consumption of undercooked meat (especially poultry) or ready-to-eat foods that have been contaminated with juices from raw meat. Person-to-person transmission is uncommon. Large outbreaks due to *Campylobacter* are usually related to consumption of contaminated water, or unpasteurized milk, or cheese. Humans can become infected after contact with infected pets, especially puppies and kittens. Campylobacteriosis is common in the developing world, and travelers to foreign countries are at risk for infection.

Clinical Aspects: The illness usually lasts from two to five days, rarely longer than ten days. Symptoms include diarrhea (sometimes bloody), abdominal cramps, fever, nausea, and vomiting. Most cases recover without antibiotic treatment. Rare post-infectious complications include reactive arthritis and Guillain-Barré syndrome.

Prevention: Cook all meats thoroughly, particularly chicken and pork. Avoid cross-contamination by ensuring that other foods, such as fruits or vegetables, do not come into contact with cutting boards or knives that have been used with raw meat or poultry. Avoid storing ready–to-eat foods such as fruit and vegetables in places where they could come in contact with uncooked meat and poultry or their drippings. Disinfect food preparation surfaces and utensils after each use. Wash hands after handling animals or pets (and their waste), or visiting a farm. Drink and eat only pasteurized milk and pasteurized milk cheeses. Wash hands thoroughly after using the bathroom, changing diapers, before preparing or eating food and after cleaning up after sick pets.

CHOLERA



	2000	2001	2002	2003	2004	2005	2006	2007	2008
rate	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0
cases	0	1	1	1	0	0	0	0	0

No cases of cholera were reported in 2008.

One case of cholera was reported each year during 2001, 2002, and 2003. All three cases were associated with international travel. No cases of cholera have been reported in King County residents since 2003.

Purpose of Surveillance:
- To identify outbreaks
- To identify and eliminate sources of transmission including contaminated food and water

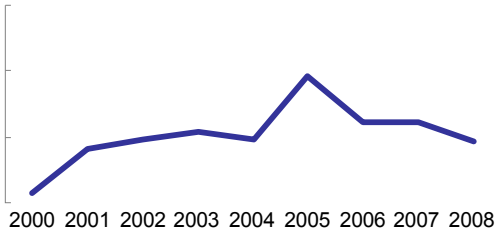
Epidemiology: Cholera is an often severe and potentially fatal diarrheal disease caused by toxin-producing strains of the bacteria *Vibrio cholera.* It is spread by food and water that is contaminated by the feces of an infected person. The disease can spread rapidly when outbreaks occur in areas of the world with inadequate sewage treatment and drinking water. The bacteria can also live in seawater in warmer climates, causing illness in persons eating raw or undercooked shellfish from contaminated waters. Cholera does not naturally occur in Washington.

Clinical Aspects: Symptoms usually begin two to three days after exposure and include: sudden onset of severe watery diarrhea, occasional vomiting and cramping, and dehydration. In severe untreated cases, death may occur in a few hours. Treatment is aggressive oral rehydration or intravenous hydration for persons unable to drink, and antibiotics.

Prevention: While traveling areas of the world where cholera is endemic, avoid water and food that may be contaminated (especially undercooked or raw shellfish, raw fruits, and raw vegetables).

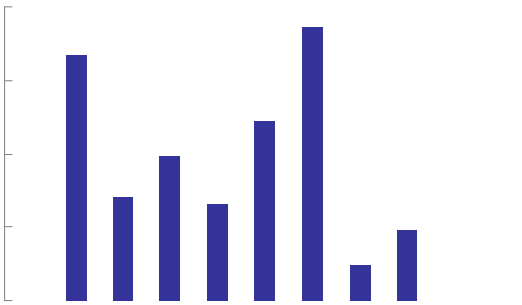
CRYPTOSPORIDIOSIS

rate by year (cases per 100,000)



	2000	2001	2002	2003	2004	2005	2006	2007	2008
rate	0.3	1.6	1.9	2.1	1.9	3.8	2.5	2.5	1.9
cases	5	29	34	38	34	69	45	46	35

rate by age group (cases per 100,000) in 2008



	0	1-4	5-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	85+
rate	0.0	3.4	1.4	2.0	1.3	2.5	3.7	0.5	1.0	0.0	0.0
cases	0	3	3	5	4	7	11	1	1	0	0

Thirty-five cases of cryptosporidiosis were reported in 2008. Rates of infection were highest in adults 45 through 54 years of age, and children one through four years of age. No clusters of illness were identified. Ten cases reported travel outside of King County during their exposure period.

Cryptosporidiosis has been reportable in Washington since December, 2000. Since that time, no large common-source outbreaks have been identified. The trend of increasing cases is likely due to better detection and more complete reporting of the organism.

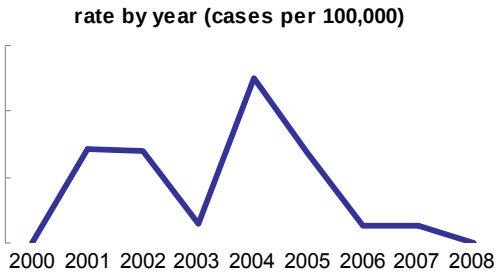
Purpose of Surveillance:
- To identify outbreaks
- To identify and eliminate sources of transmission including contaminated food and water

Epidemiology: Cryptosporidiosis is an intestinal parasitic infection caused by ingestion of *Cryptosporidium parvum* cysts (eggs). The parasite produces cysts which are passed from the body in the stool. The infection is spread through ingestion of cysts in untreated surface water and contaminated swimming pools or other recreational water; contact with infected livestock, wild animals, and pets; and through person-to-person transmission via the fecal-oral route. The organism is resistant to chlorine, and most swimming pool filters do not remove Cryptosporidia.

Clinical Aspects: Symptoms include fever, nausea, cramps, bloating, and watery diarrhea. Illness may last one to 14 days, but more severe and prolonged illness can occur in immunocompromised individuals. Special stool tests are required for diagnosis.

Prevention: Wash hands thoroughly with hot, soapy water after going to the bathroom, changing a diaper, before preparing meals, or eating. Disinfect diapering areas, toys, and cribs. Discourage children from putting shared objects in their mouths. Keep preschool children with diarrhea at home, away from other kids. Boiling water for at least one minute kills the parasite, but chlorination does not.

CYCLOSPORIASIS



	2000	2001	2002	2003	2004	2005	2006	2007	2008
rate	0.0	0.3	0.3	0.1	0.5	0.3	0.1	0.1	0.0
cases	0	5	5	1	9	5	1	1	0

No cases of cyclosporiasis were reported in 2008.

Cyclosporiasis is reportable in Washington since December of 2000. One to five cases are typically reported each year.

Purpose of Surveillance:
- To identify common source outbreaks
- To identify and eliminate sources of transmission including contaminated food or water

Epidemiology: Infection with the parasite *Cyclospora cayetanensis* typically occurs when a person drinks, or swims in contaminated water, or eats fruits or vegetables that have been rinsed with contaminated water. Cyclospora infection cannot be spread from person to person. The infection is endemic in many developing countries. Domestic infections can result from eating imported, contaminated produce, such as berries or herbs.

Clinical Aspects: *Cyclospora cayetanensis* invades the small intestine and causes persistent, watery diarrhea, nausea, fatigue, and weight loss. The incubation period for cyclosporiasis is about one week. Persons with healthy immune systems typically recover on their own. Immune-compromised persons may require treatment.

Prevention: Avoid consuming water that may be contaminated with stool, or food that has been washed in contaminated water. When traveling in developing countries, avoid drinking unpurified water and eating raw fruits and vegetables (unless you have peeled them yourself).

DIPHTHERIA

	2000	2001	2002	2003	2004	2005	2006	2007	2008
rate	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
cases	0	0	0	0	0	0	0	0	0

No cases of toxigenic diphtheria were reported in 2008.

No cases of toxigenic diphtheria have been reported in Washington since 1979.

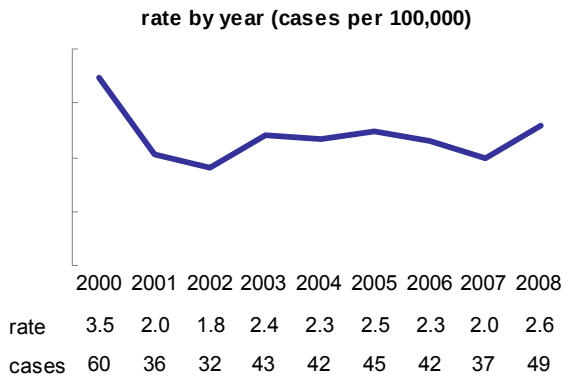
Purpose of Surveillance:
- To facilitate diagnosis of toxigenic diphtheria infections
- To facilitate appropriate treatment of cases, disease control measures, and preventive treatment for contacts of cases
- To identify other exposed persons at risk for diphtheria

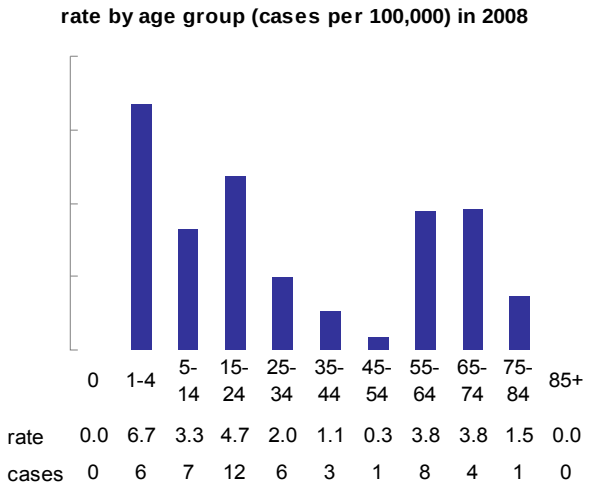
Epidemiology: Diphtheria is an acute, toxin-mediated disease caused by infection with *Corynebacterium diphtheriae.* It is primarily spread by contact with an infected person. Less often, it is spread by contact with articles soiled with the discharge from skin lesions of infected people or by ingestion of raw milk. Since universal vaccination began in the 1940s, diphtheria has been uncommon in the United States; however, the disease still occurs in developing countries, and countries of the former Soviet Union. Diphtheria-infected travelers returning to the United States with incubating or untreated disease can transmit *C. diphtheriae* to their close contacts.

Clinical Aspects: Diphtheria primarily involves the tonsils, mouth, throat, and nose. Occasionally skin or membranes in other parts of the body, including the eyes or vagina, can be affected. A characteristic feature of diphtheria is grayish-white membrane in the throat, with surrounding inflammation. Inflammation of the heart with progressive heart failure may occur. Late complications include paralysis. Mortality rates for non-cutaneous diphtheria are 5% to 10%. The lesions of cutaneous diphtheria vary, and may look very much like impetigo. Strains of *Corynebacterium diphtheriae* in cutaneous lesions are not usually toxin-producing.

Prevention: Immunization with a vaccine-containing diphtheria toxoid such as DTaP or Tdap is the best means of prevention. Both vaccines are part of routine childhood and teenage immunization series. All international travelers, regardless of age or destination, should ensure that they are up to date with all recommended vaccinations.

ENTEROHEMORRHAGIC *E. COLI* INCLUDING O157:H7





Purpose of Surveillance:
- To identify outbreaks
- To implement disease control measures to prevent spread of the infection
- To identify and eliminate sources of transmission including contaminated food and water

Epidemiology: Cattle are the primary reservoir of enterohemorrhagic *Escherichia coli* (EHEC). Sources of transmission include undercooked ground beef and other beef products; unpasteurized milk, cheese, and juice; contaminated raw fruits, vegetables, and herbs; water contaminated with animal feces; and direct contact with farm animals or their environment. Person-to-person transmission can occur within households, child daycare centers, and long-term care facilities.

Clinical Aspects: *E. coli* O157:H7 and other EHEC strains cause diarrhea and abdominal cramps but little or no fever. The diarrhea can be mild and non-bloody, or appear to be mostly blood. The incubation period is typically three to four days. The bacteria produce *Shiga toxin* that contributes to the sometimes life-threatening complications of infection, including hemolytic uremic syndrome (HUS), which affects the blood and kidneys. HUS occurs in 10% of infected children under 11 years of age.

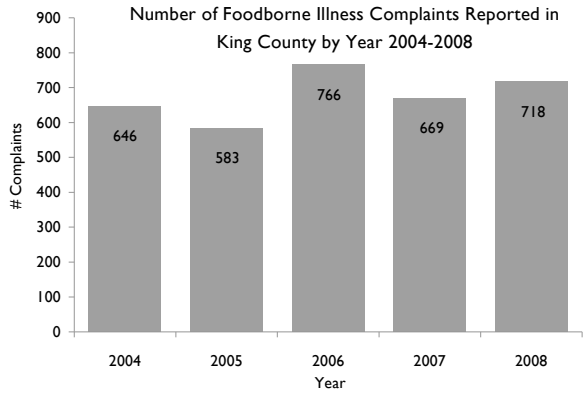
Prevention: Cook all meat, especially ground beef, thoroughly (to 160° F). Clean all utensils and surfaces that come into contact with raw meat using a dilute bleach solution. Wash fruit and vegetables thoroughly. Wash hands thoroughly with soap and warm water after using the toilet, changing diapers, and before preparing or eating food. Eat and drink only pasteurized dairy products. Keep children with diarrhea away from other children and the elderly.

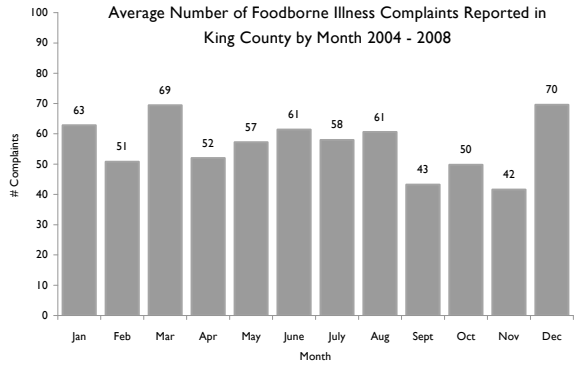
Forty-nine cases of enterohemorrhagic *Escherichia coli* (EHEC) were reported in 2008. Forty-four (90%) cases were caused by *E. coli* O157, and five (10%) by non-O157 strains of EHEC. Fifteen patients required hospitalization, and three patients developed hemolytic-uremic syndrome (HUS). Four cases (8%) reported international travel during their exposure period.

There was one national multi-state outbreak of *E. coli* O157 identified in 2008, without any of those cases reported in Washington State. Forty-nine confirmed infections were linked to this outbreak. As a result of the investigation 531,707 pounds of ground beef and beef trimmings were recalled.

In 1993, a large outbreak in Washington, Idaho, California, and Nevada linked to a fast-food hamburger chain sickened more than 500 people and caused four deaths. In 2006, two people from Washington, including one from King County, were infected after drinking unpasteurized cow's milk produced at a Washington dairy. The same year a multi-state outbreak of *E. coli* O157 was linked to consumption of pre-packaged spinach from the Salinas Valley in California. Over 200 cases from 26 states were laboratory confirmed, though no King County cases were identified.

FOODBORNE ILLNESS





Purpose of Surveillance:
- To identify outbreaks
- To identify and eliminate sources of transmission including contaminated food and water

Epidemiology: Foodborne illnesses (FBIs) are caused by eating food contaminated with:
- pathogenic bacteria, viruses or parasites (i.e., *Salmonella*, norovirus, or *Cyclospora*),
- toxins produced by bacteria i.e., botulism),
- naturally occurring toxins (i.e., poisonous mushrooms, fish and shellfish toxins), or
- chemical poisons (i.e., detergents, pesticides, metals)

FBI reports tend to be higher in the summer months when warm weather favors proliferation of bacteria in food, and during the winter holiday season when group meals are common. Investigations are initiated in response to reports of suspected foodborne illnesses by citizens, health care professionals, and restaurants.

Clinical Aspects: FBI symptoms vary by the organism or substance causing the illness. Clinical manifestations include:
- Gastroenteritis characterized by inflammatory diarrhea (i.e., salmonellosis, campylobacteriosis); non-inflammatory diarrhea (i.e., norovirus); or persistent diarrhea (i.e. giardiasis, and other parasitic infections)
- Neurologic illness (botulism, paralytic shellfish poisoning, mushroom poisoning)
- Systemic illness (listeriosis, typhoid fever, hepatitis A)

Prevention: Proper food handling procedures are key to preventing foodborne illness, including frequent handwashing, cooking and storing foods at correct temperatures, appropriate cooling, and preventing cross-contamination.

Public Health received 718 foodborne illness (FBI) complaints in 2008. Of these, 115 (16.0%) resulted in inspections of the food service establishment by Public Health's Environmental Health Division, and 85 (11.8%) were categorized as probable or confirmed outbreaks. Both confirmed and probable outbreaks require either evidence of food handling violations during an environmental investigation, or strong epidemiologic evidence of an outbreak. Confirmed outbreaks also require laboratory confirmation of the suspected pathogen.

In 2008, one large outbreak of norovirus ("stomach flu") was investigated where half of the attendees of a wedding rehearsal dinner catered by a King County facility became ill. Norovirus outbreaks are often difficult to solve, since the virus can easily spread through food or through direct contact with an infected person, and a very small amount of the virus is required to cause illness. Most people shed the virus for several days and can still be infectious even after symptoms resolve.

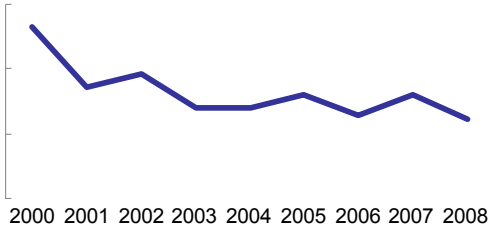
Two workplace outbreaks involved 25 or more people who became sick with symptoms likely caused by ingestion of a bacterial toxin. For one of the outbreaks, the meal was purchased from an unlicensed caterer who prepared all of the food at a private residence. *Clostridium perfringens* bacteria were isolated out of stool specimens and leftover food from the event. *C. perfringens* outbreaks are often associated with meats, stews and gravies that are not maintained at appropriate temperatures.

A *Salmonella* outbreak at a King County restaurant resulted in over 80 confirmed and probable salmonellosis cases. Pork fried rice and sprouts were implicated as the cause of illness.

Five complaints of scombroid (histamine) poisoning were linked to consumption of ahi tuna, mahi mahi, and imported milkfish, all purchased in King County. High levels of histamine can be found in certain types of fish that have been improperly kept and have started to decompose. Fourteen complaints were attributed to consumption of contaminated oysters; most of the ill patrons had positive laboratory tests for the bacteria *Vibrio parahaemolyticus,* which is commonly found in marine environments.

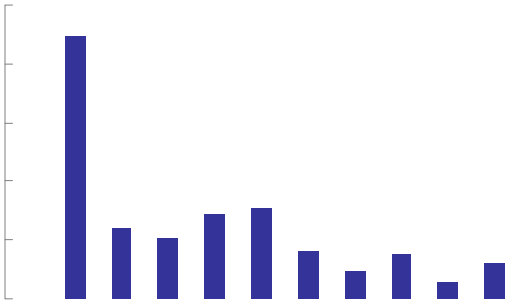
GIARDIASIS

rate by year (cases per 100,000)



	2000	2001	2002	2003	2004	2005	2006	2007	2008
rate	13.2	8.5	9.6	7.0	7.0	8.0	6.4	8.1	6.1
cases	229	150	171	124	126	144	117	150	114

rate by age group (cases per 100,000) in 2008



	0	1-4	5-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	85+
rate	0.0	22.3	6.1	5.1	7.3	7.7	4.1	2.4	3.8	1.5	3.0
cases	0	20	13	13	22	22	12	5	4	1	1

In 2008, 114 cases of giardiasis were reported, with the highest rate of illness in the one to four-year-old age group.

Thirty-four cases occurred among international travelers, most commonly to Asia (11 cases), Central or South America (8 cases) and Africa (7 cases).

Four hundred to 700 cases are reported statewide each year.

Purpose of Surveillance:
- To identify outbreaks
- To identify and eliminate sources of transmission including contaminated food and water
- To identify cases associated with child-care centers and implement disease control measures

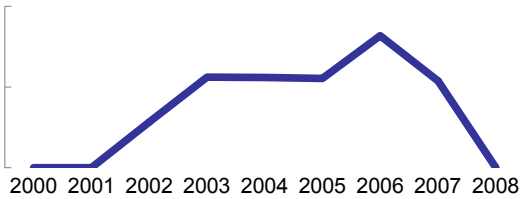
Epidemiology: G*iardia lamblia* is a flagellate protozoan widely found in nature. It is transmitted by ingesting food or water contaminated with the feces of infected humans and other mammals, especially beavers, puppies, and cats. Fecal-oral transmission can occur in childcare centers, households, and during sexual contact. Childcare center outbreaks are often associated with toddler wading pools where several diapered children share the same water. Like other enteric infections, rates of giardiasis increase during warmer months, probably because of more frequent exposure to contaminated water through swimming or camping. Travelers to developing countries are at increased risk of giardiasis as well.

Clinical Aspects: The typical incubation period is seven to 10 days, but can vary from five days to more than 25 days. Persons with giardiasis shed infectious cysts in their stool. The severity of illness ranges from asymptomatic to severe diarrhea, cramps, bloating, oily stools, fatigue, and weight loss. Untreated, the illness can last weeks to months.

Prevention: As with other diseases spread through the fecal-oral route, hand washing and good sanitation are the best strategies to prevent illness.

HAEMOPHILUS INFLUENZAE INVASIVE DISEASE

rate by year (cases per 100,000)



	2000	2001	2002	2003	2004	2005	2006	2007	2008
rate	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.1	0.0
cases	0	0	1	2	2	2	3	2	0

In 2008 no cases of invasive disease due to *Haemophilus influenzae* type b were reported in King County.

Statewide, four to13 cases are reported each year in children under five years of age.

Purpose of Surveillance:

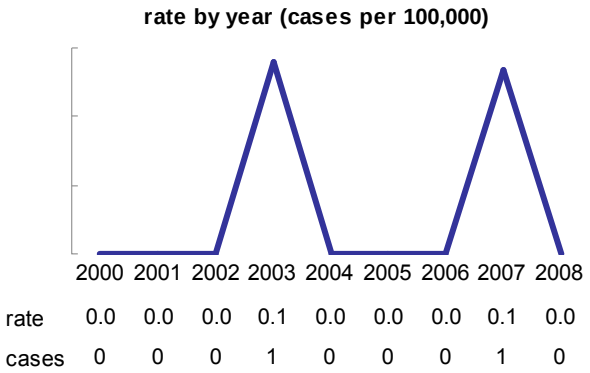
- To identify cases of *Haemophilus influenzae* serotype b (Hib) disease for investigation
- To monitor for occurrence of invasive disease due to non-serotype b *Haemophilus influenzae*
- To identify contacts of persons with *Haemophilus influenzae* serotype b (Hib) infection, and assure administration of post-exposure prophylaxis

Epidemiology: Prior to the introduction of Hib conjugate vaccine in 1987, Hib was the leading cause of bacterial meningitis (causing over 20,000 cases per year), and a major cause of other serious bacterial infections among children under five years of age in the United States. After 1987, Hib cases rapidly declined, and invasive disease due to Hib is rare today. Non-typeable *H. influenzae* is rarely responsible for serious illness, but is a common cause of ear infections in children.

Clinical Aspects: *H. influenzae* type b can cause serious invasive illness such as meningitis, bacteremia, epiglottitis, and pneumonia. Before Hib vaccine was widely available, meningitis accounted for approximately 50-60% of invasive cases, and led to neurologic complications such as hearing impairment and permanent disability in 15-30% of cases. The diagnosis of invasive *H. influenzae* disease is made by isolating the organism from blood, cerebrospinal fluid (CSF), or another normally sterile body site.

Prevention: Routine childhood immunization is the best means of prevention.

HANTAVIRUS PULMONARY SYNDROME



No cases of hantavirus pulmonary syndrome (HPS) were reported in 2008.

Between 1997 and 2007, a total of four cases of HPS have been reported in King County; all cases occurred in adult males. No deaths have occurred since 1997 when there was a single fatal case. Except for the 2007 case who was most likely exposed in Idaho, all cases were most likely exposed in Eastern or Central Washington.

Purpose of Surveillance:
- To identify sources of infection
- To facilitate diagnostic testing of suspected cases
- To facilitate environmental clean up of rodent-infested areas where cases have occurred

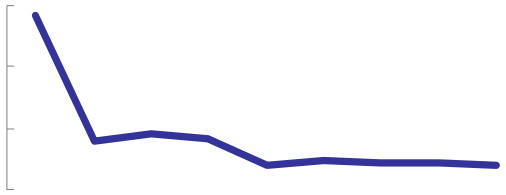
Epidemiology: Hantavirus pulmonary syndrome (HPS) was first reported in the United States in the Southwest in 1993. The *Sin Nombre* virus is the main cause of HPS reported in the United States, but other hantaviruses cause similar diseases in other countries. In the U.S, the deer mouse is the main carrier of the virus. Other wild rodents can also be carriers. Infected rodents shed the virus in their urine, saliva, and droppings, but do not show any signs of illness. Illness in humans results from inhalation of aerosolized virus-containing rodent excreta. The disease is not spread person-to-person.

Clinical Aspects: The incubation period is approximately two weeks, with a range of a few days to six weeks. The first symptoms are non-specific, including fever, muscle aches, and gastrointestinal symptoms, progressing rapidly to severe respiratory illness with hypotension that often requires mechanical ventilation.

Prevention: Keep mice and other rodents away from home, workplace, and places such as cabins, sheds, barns, garages, and storage facilities. Use a plastic trash can with a lid for kitchen garbage and food scraps. Tightly cover outdoor garbage cans and raise them 12 inches off the ground. Take precautions when entering or cleaning rodent-infested areas.

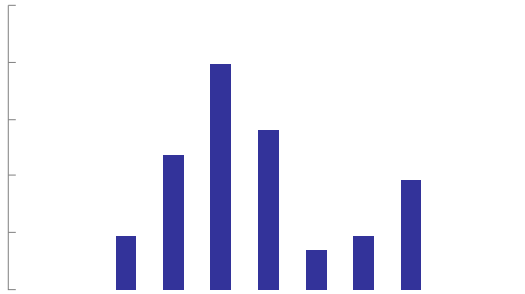
HEPATITIS A

rate by year (cases per 100,000)



	2000	2001	2002	2003	2004	2005	2006	2007	2008
rate	5.6	1.6	1.8	1.7	0.8	0.9	0.9	0.9	0.8
cases	98	28	32	30	14	17	17	17	16

rate by age group (cases per 100,000) in 2008



	0	1-4	5-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	85+
rate	0.0	0.0	0.5	1.2	2.0	1.4	0.3	0.5	1.0	0.0	0.0
cases	0	0	1	3	6	4	1	1	1	0	0

Sixteen cases of hepatitis A were reported in 2008. Twelve cases (75%) were associated with international travel to India (6), Mexico (3), Africa (1), South America (1), South Korea (1).

Prior to the introduction of hepatitis A vaccine in 1995, hundreds of cases of hepatitis A occurred every year in King County with cyclical peaks occurring approximately every five years. After hepatitis A vaccine was introduced in1995 and later became required for school children, hepatitis A cases have progressively declined in King County and the United States.

Purpose of Surveillance:

- To promptly identify persons exposed to cases of infectious hepatitis so that preventive treatment can be administered
- To identify common source outbreaks
- To identify and eliminate sources of transmission including contaminated food and water

Epidemiology: Hepatitis A virus (HAV) infects the liver. It is primarily acquired via the fecal-oral route, either through person-to-person contact or by ingestion of fecally-contaminated food or water. Hepatitis A has also been linked to sexual activity among men who have sex with men when oral contact with stool-contaminated skin occurs. Unlike hepatitis B or C, HAV does not cause chronic infection or carriage. HAV is more common in developing countries where sanitation is poor and vaccine is not available.

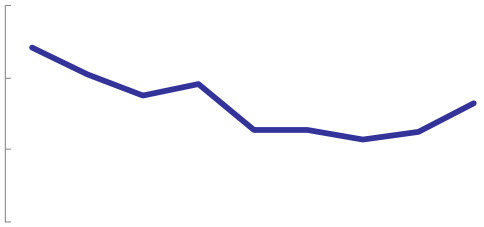
Clinical Aspects: Hepatitis A infection is characterized by an abrupt onset of fever, malaise, nausea, vomiting, and abdominal pain. Jaundice typically follows within a few days. Illness ranges from a mild illness lasting a few weeks to a severe illness lasting several months. Severity of illness increases with age, and young children often have mild or no symptoms. The incubation period is typically 28 to 30 days, but can be anywhere from 15 to 50 days. The risk of acute liver failure and death is low, but is higher for those over 50 years of age, and persons with chronic liver disease.

Prevention: Hepatitis A vaccine provides long term protection against hepatitis A and is recommended for all children starting at age one, travelers to certain countries, and others at risk. Wash hands thoroughly with soap and warm water after using the toilet, changing diapers, and before preparing or eating food. Keep bathrooms clean and supplied with soap and clean towels. Travelers to areas where hepatitis A is common should avoid potentially contaminated water or food such as beverages of unknown purity, uncooked shellfish, and uncooked fruits or vegetables that they have not peeled or prepared. Boiling or cooking food and beverage items for at least 1 minute to 185° F (85° C) inactivates HAV.

HEPATITIS B - ACUTE AND CHRONIC INFECTIONS

Acute Hepatitis B

rate by year (cases per 100,000)

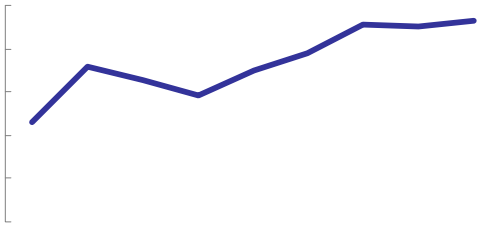


	2000	2001	2002	2003	2004	2005	2006	2007	2008
rate	2.4	2.0	1.7	1.9	1.3	1.3	1.1	1.2	1.6
cases	42	36	31	34	23	23	21	23	31

In 2008, 31 cases of acute hepatitis B virus (HBV) infection were reported, the majority of whom (68%) were men. Twenty two (71%) cases were suspected to have been exposed to hepatitis B through either sexual or injection drug exposure.

Chronic Hepatitis B

rate by year (cases per 100,000)



	2000	2001	2002	2003	2004	2005	2006	2007	2008
rate	22.9	35.7	32.7	29.3	35.2	39.2	45.8	45.1	46.6
cases	397	628	581	522	629	708	840	839	878

Eight hundred seventy eight, cases of chronic hepatitis B were reported in 2008. Roughly half (54%) of chronic cases were in men.

In December 2000, chronic HBV infection became reportable in Washington, and since then the number of reports in King County has ranged from 400 to 878 a year. Reports of acute HBV cases in King County and nationally have been declining since the 1980s. The decrease in the number of cases is attributed primarily to increasing use of hepatitis B vaccine and human immunodeficiency virus (HIV) prevention efforts among high-risk populations.

Purpose of Surveillance:
- To identify infectious cases and outbreaks
- To identify exposed persons eligible for post-exposure prophylaxis
- To identify and eliminate sources of transmission
- To identify pregnant women with hepatitis B, and ensure prompt preventive treatment to prevent infection of the newborn

Epidemiology: Hepatitis B virus (HBV) infects the liver. HBV is spread through infected blood and body fluids. Risk factors include being born to an HBV-infected woman, having unprotected sex, sharing injection drug equipment, sharing personal hygiene items (e.g., razors, nail clippers, toothbrushes), and living in a household with infected persons.

Clinical Aspects: The incubation period is six weeks to six months. Symptoms of acute HBV infection range from no symptoms to severe illness, and may include abdominal pain, loss of appetite, nausea, vomiting, and jaundice. Many infections go undetected; most infected infants and children, and up to 50% of adults have no symptoms. Acute infection in 90-95% of adults will resolve within six months. However, 50% of children and over 90% of infants with acute HBV infection develop chronic infection, which increases the risk of later liver disease including cirrhosis and liver cancer. One quarter of infants with chronic HBV infection develop liver disease later in life.

Prevention: Vaccinate children against hepatitis B as part of routine childhood immunizations. Also vaccinate adults at increased risk for infection. All pregnant women should be screened for HBV carriage, and children of carriers should be treated promptly with post-exposure prophylaxis of vaccine and hepatitis B immune globulin. Practice safe sex and avoid use of illicit injection drugs. Avoid exposure to contaminated blood and body fluids.

HEPATITIS C – ACUTE AND CHRONIC INFECTIONS

Acute Hepatitis C

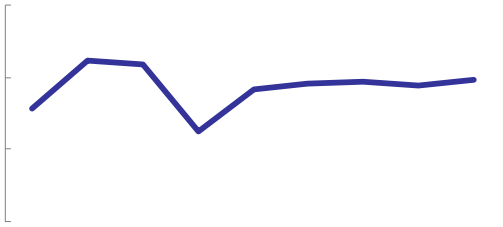
rate by year (cases per 100,000)

	2000	2001	2002	2003	2004	2005	2006	2007	2008
rate	0.7	0.5	0.7	0.4	0.6	0.6	0.3	0.4	0.6
cases	13	9	12	8	10	10	6	7	11

Eleven acute cases of hepatitis C virus (HCV) infection were reported in King County in 2008. Nine (82%) occurred in men, and six of the 11 (55%) either reported or had laboratory evidence of injection drug use during their exposure periods.

Chronic Hepatitis C

rate by year (cases per 100,000)



	2000	2001	2002	2003	2004	2005	2006	2007	2008
rate	77.7	110.8	108.5	61.8	91.5	95.6	97.2	94.5	98.6
cases	1350	1949	1925	1099	1636	1728	1783	1758	1858

In 2008, 1,858 chronic hepatitis C cases were reported, compared with 1,758 reports in 2007.

Prior to 2000, acute HCV infection was reportable as acute non-A, non-B hepatitis. The number of cases that meet the criteria for acute infection remains consistently less than 1% of all reports (between six and 13 new cases per year). Because of the sometimes 20 to 30 year delay between the time of infection and diagnosis, reports of chronic HCV cases are expected to remain high.

Purpose of Surveillance:

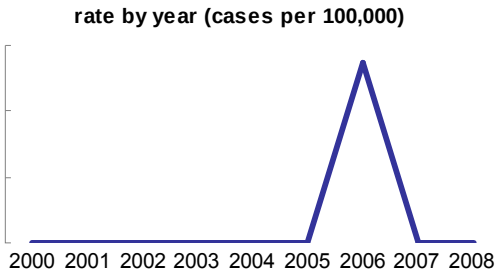
- To identify risk factors for hepatitis C virus (HCV) infection
- To identify and eliminate sources of transmission
- To provide education to cases in order to minimize risk of transmission and to reduce risk factors for development of chronic liver disease
- To monitor the prevalence of disease and associated disease burden in the community
- To identify epidemiological features of hepatitis C for prioritization of prevention activities and other HCV-related services

Epidemiology: HCV infects the liver and is transmitted primarily by direct exposure to the blood of an infected person. Before HCV screening was introduced in 1992, blood and blood-product transfusions accounted for a large proportion of infections. Today, most infections are associated with injection drug use (IDU). HCV can also be spread during childbirth. About 5% of children born to HCV-infected women will acquire HCV this way. Although sexual transmission of hepatitis C can occur, it is an uncommon route of infection. No post-exposure prophylaxis is available.

Clinical Aspects: Eighty-five percent of persons with acute HCV infections are asymptomatic. Symptoms of acute infection may include abdominal pain, anorexia, nausea, vomiting, rash, and jaundice. Sixty to 85% of persons infected with hepatitis C develop chronic infections, and approximately 10-15% will develop cirrhosis within 20 years after infection.

Prevention: Practice safe sex and avoid use of illicit injection drugs. Avoid exposure to contaminated blood and body fluids. No vaccine exists for hepatitis C.

HEPATITIS E



	2000	2001	2002	2003	2004	2005	2006	2007	2008
rate	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
cases	0	0	0	0	0	0	1	0	0

No cases of hepatitis E were reported in 2008.

The only cases of HEV infection reported in the past ten years were a probable case in a traveler to India in 2005, and a confirmed case in 2006, also in a traveler exposed in India.

Purpose of Surveillance:

- To identify persons exposed to cases of infectious hepatitis E and provide counseling to prevent transmission
- To describe risk factors for the disease in King County residents

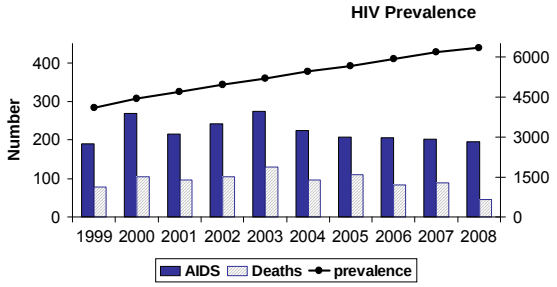
Epidemiology: Hepatitis E virus (HEV) is rare in the United States but is a common cause of viral hepatitis in developing countries. HEV is primarily acquired via the fecal-oral route, usually through contaminated drinking water. Outbreaks often occur after floods, monsoon rains, or other events that release raw sewage into the water supply. In the U.S., most cases occur among travelers to areas where HEV is endemic. Rare cases have occurred among persons that have not traveled.

Clinical Aspects: HEV causes an illness similar to hepatitis A virus (HAV) infection. The illness is acute and self-limited, without a chronic state. HEV infection is characterized by an abrupt onset of fever, malaise, nausea, vomiting, and abdominal pain. Jaundice follows within a few days. The spectrum of disease ranges from a mild illness lasting a few weeks to a severe illness lasting several months. Severity of illness appears to increase with age, and children are often asymptomatic and anicteric. The illness is often more severe in pregnant women. The incubation period is 15 to 64 days. Secondary transmission in households through person-to-person transmission appears limited.

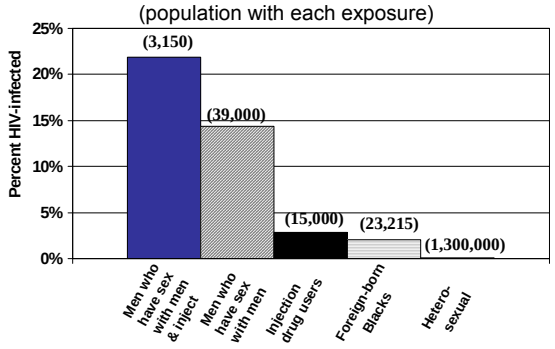
Prevention: No vaccine or treatment is available for HEV. Treatment with immune globulin (IG) is not effective in preventing infection in potentially exposed persons. The best methods of prevention are to avoid potentially contaminated water and food, and to use prevention measures recommended for hepatitis A and other enteric infections.

HIV AND AIDS

AIDS, Deaths and HIV Prevalence
King County, 1999-2008, as of June 30, 2009



King County Residents Living with HIV/AIDS
Estimated percent infected by mode of exposure
(population with each exposure)



In 2008, 349 HIV cases, 195 Acquired Immune Deficiency Syndrome (AIDS) cases, and 123 deaths were reported.

In recent years (2005-08), approximately 330 King County residents have been diagnosed with Human Immunodeficiency Virus (HIV) annually, a decrease from 350-400 per year in the few years prior. An estimated 7,200 to 8,000 King County residents live with HIV or AIDS, including 6,341 cases diagnosed through the end of 2008. Estimates are that 11,500 to 12,700 people in Washington are currently infected with HIV.

About 0.4% of all King County residents are HIV infected, and the rates are highest in men who have sex with men (MSM). An estimated 15% of all MSM are infected, while 22% of MSM who inject drugs may be infected.

The rate of new HIV diagnoses per 100,000 population is highest among foreign-born Blacks (118.6), and similar among U.S.-born Blacks (32.0) and Hispanics (36.8). Rates are lowest among Whites (12.9), Asians (8.0), and Native Americans (6.6).

Purposes of Surveillance:

- Monitor the occurrence of HIV, AIDS, and HIV-related mortality in King County and describe characteristics of people with HIV
- Facilitate special laboratory testing among newly diagnosed people to estimate length of time infected and to measure resistance to medication
- Target prevention efforts to specific populations where infections are occurring
- Reduce spread of HIV through identification and screening of partners
- Facilitate referral to appropriate care and other services

Epidemiology: In King County, HIV is transmitted primarily through sexual exposure (84% of cases) sharing of injection drug use equipment (5%), or both (11%). Three-quarters of sexual transmission is among men who have sex with men (MSM). HIV infection may be diagnosed weeks, months, or years after infection occurs. One-quarter of cases are diagnosed within 12 months after infection, and one-quarter are not diagnosed until the person develops symptoms of AIDS, which may occur 10 or more years after infection.

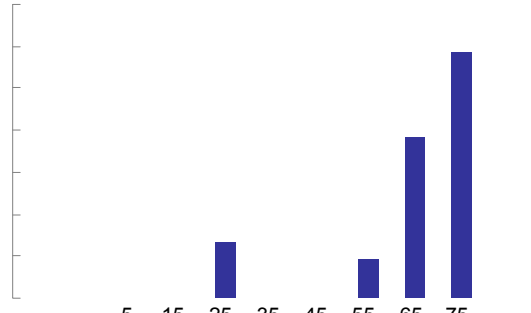
Clinical aspects: If untreated, HIV infection attacks the CD4 cells of the immune system. Severe immune deficiency, or AIDS, occurs years after infection and is detected when an opportunistic infection or a low CD4 level (below 200 cells per microliter) is diagnosed. HIV infection generates a specific, life-long antibody response that is diagnosed with an ELISA screening test, and a specific confirmatory Western Blot test. CDC guidance recommends that health care providers routinely offer HIV testing to all patients aged 13-64 years, and that persons at high-risk test frequently.

Prevention: Knowledge of HIV status, consistent and correct use of condoms, and use of needle exchange programs all can dramatically reduce new infections among high-risk individuals. Mandatory HIV testing of blood and tissue donors has virtually eliminated transmission from transfusions and transplants in the U.S. HIV testing and treatment of pregnant women and prophylaxis of the infant has drastically reduced perinatal transmission to fewer than 150 infections per year nationally.

HIV is concentrated in urban areas; from 2000-2008, 59% of Washington state HIV cases occurred in King County.

LEGIONELLOSIS

	2000	2001	2002	2003	2004	2005	2006	2007	2008
rate	0.2	0.2	0.2	0.1	0.4	0.4	0.3	0.4	0.4
cases	4	4	3	2	7	8	5	7	7



	0	1-4	5-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	85+
rate	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.5	1.9	2.9	0.0
cases	0	0	0	0	2	0	0	1	2	2	0

Seven cases of legionellosis were reported in 2008. Six were cases of *L. pneumophila and one of L. micdadei.* The cases ranged in age from 28 through 81 years old. All were hospitalized and no deaths were reported.

In general, most cases of legionellosis are sporadic, with no source identified. Two to seven cases have been reported annually in King County since 2000.

Purpose of Surveillance:

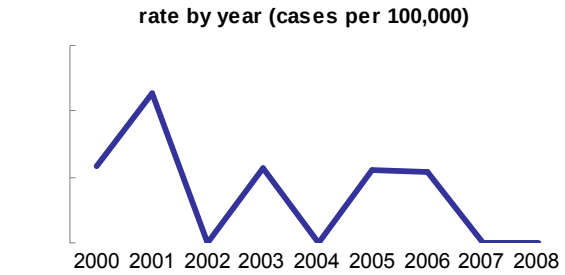
- To identify common source outbreaks and nosocomial cases for investigation
- To identify and eliminate preventable sources of transmission

Epidemiology: Legionellosis ("Legionnaires' disease") is a bacterial infection that was first identified after a 1976 outbreak in Philadelphia among attendees of the American Legion's annual convention. In the U.S., an estimated 8,000 to 18,000 cases occur each year. *Legionella* live in soil, natural bodies of water, water distribution systems, and building cooling towers. Disease occurs when the organism is inhaled in aerosolized water droplets, causing pneumonia. It has also been associated with inhalation of aerosols generated when using potting soil. Persons at increased risk for legionellosis include the elderly as well as those with underlying lung and heart disease, cancer, organ transplants, and other immune system disorders. Legionellosis outbreaks have occurred in hospitals and long-term care facilities, where residents are at higher risk due to advanced age and other chronic conditions. It is not spread person-to-person.

Clinical Aspects: The incubation period is typically two to ten days, but can be longer. Various species of *Legionella*, most commonly *L. pneumophila*, cause pneumonia and febrile illness. Other possible symptoms include diarrhea, abdominal pain, headache, and neurologic changes. Legionellosis should be considered in all cases of severe community-acquired pneumonia. Culture, urine antigen testing, direct fluorescent antibody and special stains for *Legionella* are the diagnostic tests of choice. Legionellosis is treated with antibiotics.

Prevention: No vaccine or preventive treatment exists for legionellosis.

LEPTOSPIROSIS



	2000	2001	2002	2003	2004	2005	2006	2007	2008
rate	0.1	0.1	0.0	0.1	0.0	0.1	0.1	0.0	0.0
cases	1	2	0	1	0	1	1	0	0

No cases of human leptospirosis were reported in 2008.

Most human cases occur in international travelers or participants in outdoor recreational activities, including adventure races. Leptospirosis is present in wildlife in King County and cases of leptospirosis in dogs are reported each year, usually during the rainy seasons of winter and early spring.

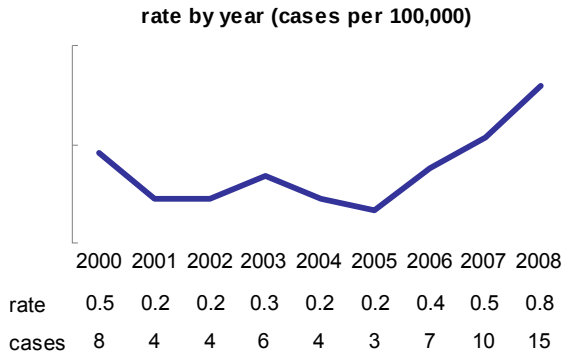
Purpose of Surveillance:
- To identify common source outbreaks
- To identify and eliminate preventable sources of transmission

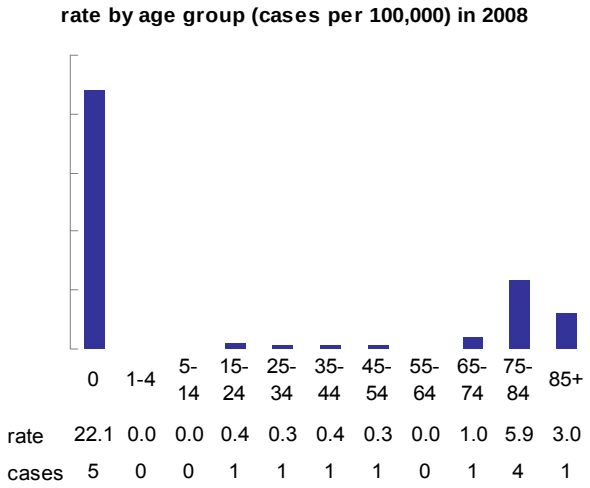
Epidemiology: Leptospirosis is a zoonotic disease caused by the bacteria *Leptospira interrogans*. Leptospirosis occurs worldwide, and is more common in temperate and tropical areas. Approximately 100 to 200 cases are identified annually in the U.S., of which half are reported in Hawaii. Some wild and domestic animals, such as rodents, raccoons, cattle, pigs, and dogs carry the *Leptospira* bacteria and pass them in their urine. Exposure occurs when water contaminated with the urine of infected animals is ingested or comes into contact with mucous membranes or breaks in the skin. People are often exposed through recreational activities such as swimming, canoeing, or participating in open water events such as triathlons or adventure racing. Leptospirosis is rarely spread from person to person. Occupations at greater risk include farmers, rice and sugarcane field workers, miners, slaughterhouse workers, sewer workers, and veterinarians. Non-severe cases of leptospirosis are likely under-recognized and under-reported.

Clinical Aspects: The incubation period for leptospirosis is typically ten days (with a range of two to 30 days). The illness lasts from a few days to several weeks. Most people have mild disease, but severity ranges from asymptomatic infections to life-threatening illness. Initial symptoms can include the insidious onset of fever, severe headache, back and leg pain, vomiting, and diarrhea. Some persons develop jaundice, kidney failure, or meningitis. Leptospirosis is diagnosed by testing for antibodies in the blood or by isolation of the bacteria from a clinical specimen.

Prevention: Avoid direct contact with animal urine and with water, soil and vegetation contaminated with animal urine. Wear gloves if contact with animal urine is likely to occur, and wash hands afterwards. Wear protective clothing and footwear in areas possibly contaminated with animal urine. Control rodents around the home and in recreational areas. Consult with a veterinarian about the need to vaccinate farm animals and dogs for leptospirosis.

LISTERIOSIS





Purpose of Surveillance:
- To identify common source outbreaks
- To identify and eliminate sources of transmission, including contaminated food products

Epidemiology: Listeriosis is an infection caused by the bacteria *Listeria monocytogenes*. Persons at increased risk for severe infections include immunocompromised persons, the elderly, pregnant women, and newborn infants. The bacterium is unusual among foodborne pathogens in that it multiplies in refrigerated foods. Transmission occurs primarily through ingestion of contaminated drinks and foods, including raw (unpasteurized) or contaminated milk, soft cheeses, vegetables, and ready-to-eat meats. During pregnancy, infection can lead to spontaneous abortion, stillbirth, or premature birth. Transmission during delivery can cause severe, often fatal, infections in the newborn, even if the mother is asymptomatic.

Clinical Aspects: The median incubation period is three weeks (with a range of three to 70 days). Listeriosis can cause fever, muscle aches, nausea, vomiting and diarrhea. It also can cause infections with no symptoms or very mild symptoms. *Listeria* can infect the bloodstream and brain as well as the uterus and cervix. Miscarriages or fetal death can result even when the mother does not feel ill, especially when the infection has occurred late in pregnancy. Serious infections are treated with antibiotics in the hospital.

Prevention: Thoroughly cook and properly store foods. Wash raw produce. Do not consume unpasteurized milk products. In addition to these measures, pregnant women and persons with weakened immune systems should avoid hot dogs, deli meats, soft cheeses, and refrigerated smoked fish, and meat spreads.

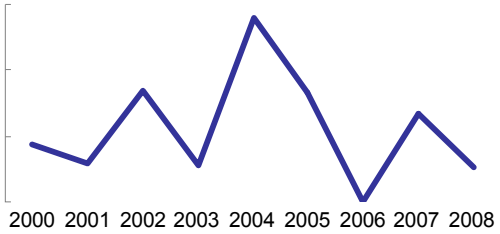
In 2008, 15 cases of listeriosis were reported in King County. Fourteen cases were hospitalized and one case was fatal. The fatal case was linked to consumption of *queso fresco* (a soft Mexican cheese often made with unpasteurized milk) purchased from an unlicensed door-to-door vendor. The organisms isolated from the cheese and blood cultures from the case matched by DNA testing at the Washington State Public Health Laboratory.

Five cases occurred in newborns in 2008. In all cases, the suspected exposure was consumption of high-risk foods by the pregnant women.

Most listeriosis cases occur among the elderly, persons with weakened immune systems, and pregnant women. An average of six cases per year is reported in King County. In 2001, three pregnant Hispanic residents of King County developed listeriosis after consuming *queso fresco.* One of the women delivered an infected stillborn infant at 23 weeks gestation, and the other two women delivered infants that suffered serious medical complications requiring lengthy hospitalizations.

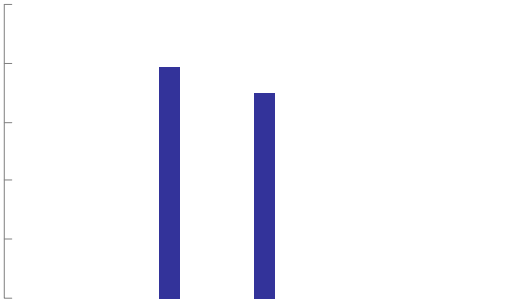
LYME DISEASE

rate by year (cases per 100,000)



	2000	2001	2002	2003	2004	2005	2006	2007	2008
rate	0.2	0.1	0.3	0.1	0.6	0.3	0.0	0.3	0.1
cases	3	2	6	2	10	6	0	5	2

rate by age group (cases per 100,000) in 2008



	0	1-4	5-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	85+
rate	0.0	0.0	0.0	0.4	0.0	0.4	0.0	0.0	0.0	0.0	0.0
cases	0	0	0	1	0	1	0	0	0	0	0

Two cases of Lyme disease were reported in 2008. Both cases had likely exposures outside of Washington with travel to Wisconsin and Minnesota (1) and Pennsylvania (1).

Most cases thought to be acquired in Washington State have had outdoor exposure in counties west of the Cascade Mountains or in the Cascade foothills, where *Ixodes* ticks, along with their deer and rodent hosts, are located. Statewide, fewer than 20 cases of Lyme disease are reported each year, most are exposed outside Washington.

Purpose of Surveillance:

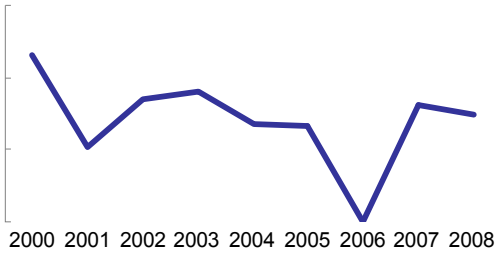
- To detect any increase in cases and investigate associated environmental risk factors
- To facilitate appropriate diagnostic testing and treatment for infected persons

Epidemiology: Lyme disease is caused by the bacteria *Borrelia burgdorferi*, which is transmitted by the bite of infected *Ixodes* ticks. In the U.S., Lyme disease is common in the northeastern states, Atlantic coastal states, and the upper Midwest. Infections occur most often in late spring and summer when ticks are most prevalent. Generally, Lyme disease is uncommon in the Pacific Northwest, including in Washington state where it occurs primarily in Western Washington.

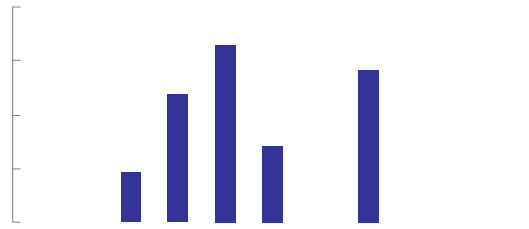
Clinical Aspects: The incubation period is typically seven to ten days, but ranges from three to 32 days. Seventy to 80% of infections begin with a classic “bulls-eye” shaped rash that slowly expands in diameter (erythema migrans). Other symptoms include malaise, fever, headache, joint and muscle pain, and swollen lymph nodes. With appropriate and timely antibiotic treatment most acute infections resolve without complications. However, long term neurologic and heart problems may result from untreated infections. Chronic arthritis may develop years after an untreated infection.

Prevention: When outdoors in areas with ticks, wear light colored, long-sleeved shirts, long pants tucked into socks, and closed shoes (not sandals). To prevent tick bites, use insect repellent with 20% - 30% DEET on exposed skin and clothing, and treat clothing with permethrin. After outdoor activities, wash clothing and check each person’s body, including hair, for ticks. Prompt removal of ticks can prevent disease transmission because ticks must be attached for at least 24 to 36 hours for transmission to occur.

MALARIA



	2000	2001	2002	2003	2004	2005	2006	2007	2008
rate	1.2	0.5	0.8	0.9	0.7	0.7	0.0	0.8	0.7
cases	20	9	15	16	12	12	0	15	14



	0	1-4	5-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	85+
rate	0.0	0.0	0.5	1.2	1.6	0.7	0.0	1.4	0.0	0.0	0.0
cases	0	0	1	3	5	2	0	3	0	0	0

Eleven of the 14 malaria cases reported in 2008 occurred among international travelers, and two additional cases were recent immigrants or refugees to the United States. One case was not able to be interviewed.

Cases were infected in Africa (10); Asia (2), and South America (1). One case was lost to follow-up with no travel history available.

Nine (64%) cases were identified as due to *Plasmodium falciparum (P. falciparum),* three (22%) were *P. vivax*, and two (14%) were *P. ovale.* Seven cases required hospitalization, and no deaths occurred. None of the cases reported taking anti-malarial prophylaxis according to recommendations by CDC to prevent infection.

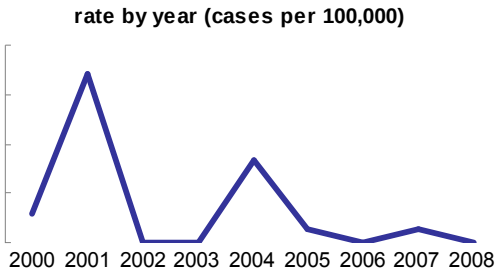
Purpose of Surveillance:
- To identify risk factors for malaria among King County residents
- To guide in malaria prevention measures for travelers to malaria-endemic regions

Epidemiology: Malaria is an infection caused by a parasite of the genus *Plasmodium*, of which there are four species: *malariae, vivax, ovale*, and *falciparum*. The parasite is transmitted to humans in warmer climates through the bite of infected *Anopheles* mosquitoes. Untreated *P. falciparum* malaria has a high mortality rate. According to the World Health Organization, an estimated 500 million people worldwide become ill from malaria each year, mostly young children. In the United States, the last outbreak of locally acquired malaria occurred in Florida during 2003.

Clinical Aspects: The incubation period varies by species from seven to 40 days. Symptoms of malaria include malaise, anorexia, chills, sweats, fever, and headache. The illness may last for days and has cycles of fever with relief of symptoms between peaks in temperature. Anti-malarial medications can delay symptoms by weeks or months, especially if the medications are not taken properly.

Prevention: Travelers to endemic countries are at risk for infection. Before travel, see a health care provider to discuss ways to prevent malaria, such as mosquito repellents, protective clothing, and taking precautions at dusk and dawn when mosquitoes are most active, and using preventive medications.

MEASLES



	2000	2001	2002	2003	2004	2005	2006	2007	2008
rate	0.1	0.7	0.0	0.0	0.3	0.1	0.0	0.1	0.0
cases	2	12	0	0	6	1	0	1	0

No cases of measles were reported in 2008.

In 2007 one case of measles was reported in King County in an unvaccinated child exposed to the virus while traveling in India. In 2004, six cases of measles in toddlers adopted from orphanages in China were investigated, with one secondary case in a family member visiting from California. In 2001, 12 cases of measles were reported, all linked to an outbreak in Korea.

Purpose of Surveillance:
- To facilitate prompt diagnostic testing for measles
- To identify cases and exposed persons at risk for transmitting measles to others
- To identify susceptible contacts of cases for measles post-exposure prophylaxis or preventive treatment
- To implement disease control measures to prevent transmission and community outbreaks

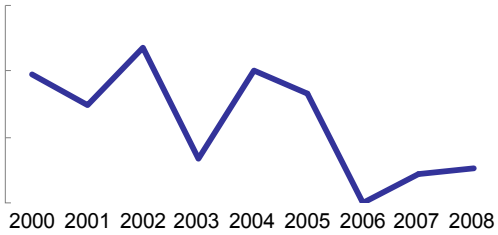
Epidemiology: Measles is one of the most highly contagious diseases known, but is preventable through vaccination. It is spread through coughing and sneezing. Measles is common in many parts of the world, including Europe. Local cases of measles are often linked to travel or exposure to recent travelers. Worldwide, more than 20 million people are infected each year. Measles is the leading cause of vaccine-preventable death among children in the world.

Clinical Aspects: Measles is an acute viral respiratory illness that is accompanied by a characteristic rash. Symptoms begin with fever, coryza, conjunctivitis, and cough. After two to four days the rash begins on the face and spreads downward to the rest of the body. The rash usually lasts four to seven days. Persons are considered contagious from four days before the onset of rash to four days after.

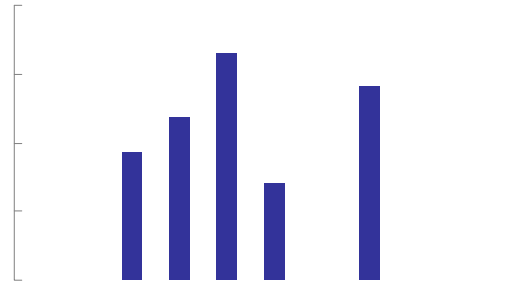
Complications of measles can include ear infections, pneumonia, and encephalitis. These complications can occur in all age groups, but are most severe in infants and adults. Diagnosis of measles must be confirmed by laboratory testing.

Prevention: Measles can be prevented through vaccination. The MMR vaccine combines protection against measles, mumps and rubella. In Washington state, all children are required to have documented measles immunization for entry into a school or childcare center. All international travelers should be up-to-date on measles vaccine. People exposed to measles should consult their health care provider immediately. Measles vaccine given within three days of exposure can help prevent infection in healthy non-pregnant persons.

MENINGOCOCCAL DISEASE



	2000	2001	2002	2003	2004	2005	2006	2007	2008
rate	1.0	0.7	1.2	0.3	1.0	0.8	0.0	0.2	0.3
cases	17	13	21	6	18	15	0	4	5



	0	1-4	5-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	85+
rate	0.0	0.0	0.9	1.2	1.6	0.7	0.0	1.4	0.0	0.0	0.0
cases	0	0	2	3	5	2	0	3	0	0	0

Five cases of laboratory-confirmed meningococcal disease were reported in 2008. All five cases were hospitalized, one died. Three people had bacteremia and two had meningitis. One of the isolates was serotype B, two were serotype Y, and two were serotype W135. Since 1995 there has been a significant decrease in type C (the most prevalent vaccine-preventable strain) with no cases reported in the past two years.

In recent years, 40 to 80 cases of meningococcal disease have been reported annually in Washington.

Purpose of Surveillance:

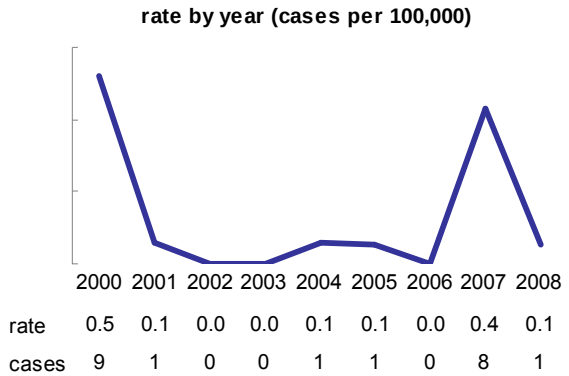
- To identify outbreaks and implement appropriate disease control measures including vaccine and/or post-exposure prophylaxis
- To identify exposed persons for post-exposure prophylaxis to prevent the spread of infection
- To monitor trends in the incidence of specific serotypes and strains of *Neisseria meningitides*

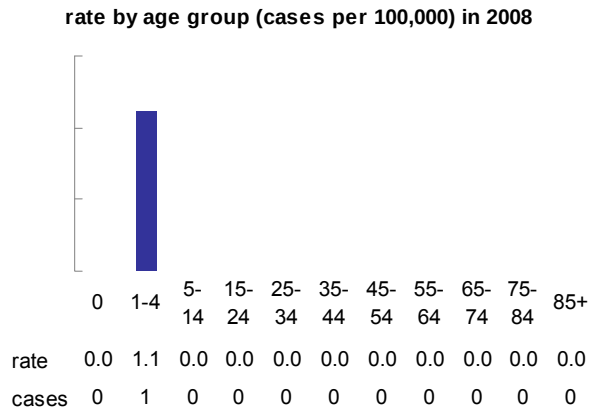
Epidemiology: Meningococcal disease is caused by the bacterium *Neisseria meningitidis*. The bacteria is present in the nose and throat and spreads through direct contact with saliva and respiratory droplets when talking, coughing, sneezing, kissing, etc. Meningococcal infection is spread by close contact (for example, among household members) and is not spread simply by being in the same room with an infected person. Rarely, transmission occurs by sharing eating utensils, glassware, cigarettes, or toothbrushes. Other risk factors for meningococcal disease include being less than one year of age, smoking, having had a recent viral respiratory infection, and living in crowded settings (such as college dormitories or military barracks).

Clinical Aspects: Meningitis is characterized by sudden onset of fever accompanied by severe headache, nausea, vomiting, stiff neck, and often a petechial rash. Meningococcal bloodstream infection or sepsis (meningococcemia) is characterized by abrupt onset of fever and a petechial or purpuric rash, often associated with low blood pressure, shock, and multi-organ failure. Even when treated, approximately 8-15% of cases of invasive meningococcal disease are fatal. Long term effects, which occur in 10-20% of those who survive, include mental retardation, hearing loss, and amputation.

Prevention: Routine meningococcal vaccination is recommended for adolescents and college freshmen living in dormitories. Travelers to areas of the world with high levels of meningococcal disease and persons with certain underlying immune system disorders should also be vaccinated.

MUMPS





Purpose of Surveillance:
- To facilitate diagnostic testing for mumps
- To identify susceptible persons exposed to mumps in order to implement disease control interventions
- To detect outbreaks

Epidemiology: Mumps is an acute viral illness caused by the mumps virus. The virus is found most often in saliva. It is spread by direct contact or by droplets through sneezes and coughs. Mumps is most easily spread 48 hours before the symptoms begin. Most adults born before 1957 have been infected naturally and are probably immune. Mumps can occur in unimmunized children, or adolescents and young adults who graduated from school prior to the law requiring mumps immunization.

Clinical Aspects: Mumps is characterized by fever and swelling of the salivary glands, giving the appearance of enlarged cheeks. Testicular inflammation occurs in 20-30% of males infected after puberty. Breast inflammation occurs in 31% of females over the age of 15 years. Rare complications include meningitis, encephalitis, sterility, arthritis, kidney disease, thyroid disease, and hearing impairment.

Prevention: Immunization is the best way to prevent mumps. Mumps protection is provided in the combination MMR vaccine together with measles and rubella.

One confirmed case of mumps was reported in 2008. The likely source of infection was travel to Mexico during the exposure period.

In addition, six probable mumps cases were reported in 2008 in people who met the clinical case definition for mumps, but for whom confirmatory lab testing was not available.

An unusually high number of mumps cases (53) were reported in Washington state in 2007, reflecting in part a change in reporting criteria, as well as increased testing following a very large outbreak in the Midwest in 2006.

PARALYTIC SHELLFISH POISONING

	2000	2001	2002	2003	2004	2005	2006	2007	2008
rate	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
cases	0	0	0	0	0	0	0	0	0

No cases of paralytic shellfish poisoning (PSP) were reported in 2008.

The last case of PSP reported in King County was in 1998 when an outbreak with five cases occurred. A total of 14 cases were reported in Washington between 1997 and 2006.

Purpose of Surveillance:
- To identify common source outbreaks
- Prevent consumption of contaminated shellfish
- To identify the source and prevent further distribution of contaminated shellfish

Epidemiology: Paralytic Shellfish Poisoning (PSP) is a neurologic syndrome caused by consuming shellfish contaminated with naturally-occurring toxic substances called "saxitoxins." High concentrations of these toxins occur in shellfish during algae blooms known as “red tides,” but can also occur in the absence of a recognizable algae bloom. Saxitoxin contamination is monitored in Washington shellfish harvesting areas and in imported shellfish.

Clinical Aspects: Neurologic symptoms may begin within minutes to hours after eating contaminated shellfish, and include tingling, burning, numbness, drowsiness, incoherent speech, and respiratory paralysis. Additionally, gastrointestinal symptoms may occur. Symptoms usually resolve within a few days, and death is uncommon. Diagnosis is based entirely on symptoms and recent dietary history. Infection is confirmed by detection of the toxin in epidemiologically implicated food.

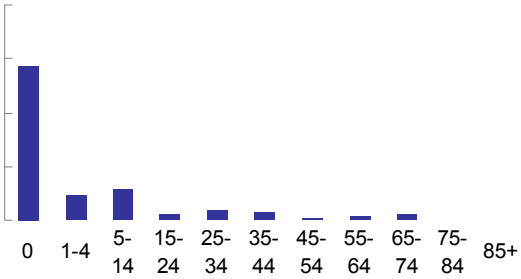
Prevention: Do not eat shellfish harvested from beaches known to be contaminated. The toxin is not inactivated by usual cooking or steaming.

PERTUSSIS

rate by year (cases per 100,000)

	2000	2001	2002	2003	2004	2005	2006	2007	2008
rate	11.9	2.2	8.8	15.7	11.2	12.0	5.7	6.4	4.1
cases	207	39	156	280	201	217	105	119	78

rate by age group (cases per 100,000) in 2008



	0	1-4	5-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	85+
rate	57.4	8.9	11.2	2.4	3.6	2.8	1.0	1.4	1.9	0.0	0.0
cases	13	8	24	6	11	8	3	3	2	0	0

In 2008, 78 cases of pertussis were reported. Children under the age of one year accounted for 18% of cases. Four cases were hospitalized and no fatalities were reported. Exposure to an ill household member was the suspected source for 33% of cases overall and for 64% of cases in children under the age of one.

In Washington state usually 400 to 1,000 cases of pertussis are reported annually. On average, the state has one death due to pertussis each year.

Purpose of Surveillance:

- To prevent transmission of pertussis to persons at high risk for severe illness
- To identify outbreaks and implement disease control measures including early recognition, testing, and treatment of cases

Epidemiology: Pertussis, also known as "whooping cough," is a toxin-mediated disease caused by the bacteria *Bordetella pertussis*. It is spread through droplets from the mouth and nose when a person with pertussis coughs, sneezes, or talks. The disease is of particular concern in infants because they have higher rates of pneumonia, hospitalization, and death compared with older children and adults. Pertussis vaccination reduces the frequency and severity of disease among young children. However, the protective effects of natural pertussis infection and pertussis vaccine wane with time. Unrecognized infections in older children and adults are thought to be the most common source of pertussis transmission to infants in the community.

Clinical Aspects: "Classic" symptoms include a persistent, paroxysmal cough lasting two or more weeks that is worse at night and often followed by vomiting, although many cases are less severe and difficult to recognize. Infants can have poor feeding, pauses in breathing, or episodes of turning blue. Fever is usually low grade or absent. Symptoms may last for two to three months or even longer despite antibiotic treatment.

Prevention: Immunization is the best way to prevent pertussis. Diphtheria, tetanus, and acellular pertussis (DTaP) combination vaccine is recommended for all children. Tetanus toxoid, reduced diphtheria toxoid and acellular pertussis combination vaccine (Tdap) is recommended for use in children 11 to 18 years old, and as a single dose booster immunization for persons aged 19 to 64 years of age. Antibiotics can be used to prevent illness among close contacts of persons with pertussis.

PLAGUE

	2000	2001	2002	2003	2004	2005	2006	2007	2008
rate	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
cases	0	0	0	0	0	0	0	0	0

No cases of plague were reported in 2008.

Since 1907, only one case of human plague has been reported in Washington, occurring in bubonic form in an animal trapper in 1984.

Purpose of Surveillance:
- To investigate cases caused by potential agents of bioterrorism
- To identify naturally occurring sources of infection
- To confirm reported cases and to ensure that exposed persons receive post-exposure prophylaxis and/or monitoring

Epidemiology: Plague is caused by infection with the bacterium *Yersinia pestis*, found in rodents and their fleas in many areas of the world, including the United States. Human plague in the western U.S. occurs sporadically. Potential reservoirs for plague in Washington include wild animals; however, cases are most likely to be travel-related. Plague is a potential agent of biological terrorism. One case of pneumonic plague without travel to an endemic area may indicate an act of terrorism and constitutes a potential public health emergency.

Clinical Aspects: Forms of plague include bubonic, septicemic, pneumonic, and pharyngeal. *Bubonic plague* is the most common form and is transmitted by the bite of an infected flea, or through the contamination of a break in the skin with *Y. pestis*. Symptoms of Bubonic plague include swollen, tender lymph glands (called buboes), fever, headache, chills, and weakness. Bubonic plague is not spread from person-to-person. *Pneumonic plague* occurs when a person inhales *Y. pestis* suspended in respiratory droplets from an infected person (or animal), or from the spread of bubonic or septicemic plague to the lungs. People who do not receive prompt antibiotic treatment are not likely to survive. *Septicemic plague* refers to an infection of the bloodstream, and can be a complication of bubonic or pneumonic plague, or can occur by itself. Symptoms include fever, chills, abdominal pain, shock, and bleeding into the skin and other organs.

Prevention: In areas where plague exists, eliminate sources of food and nesting places for rodents around homes, work places, and recreation areas; remove brush, rock piles, junk, cluttered firewood, and potential food supplies, such as domestic pet food and wild animal food. Make your home rodent-proof.

POLIOMYELITIS

	2000	2001	2002	2003	2004	2005	2006	2007	2008
rate	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
cases	0	0	0	0	0	0	0	0	0

No cases of polio were reported in 2008.

The last case identified in Washington occurred in 1977.

Purpose of Surveillance:
- To identify cases of imported poliomyelitis
- To identify cases and susceptible contacts of cases for post-exposure prophylaxis (e.g., immunization) and to institute infection control measures
- To differentiate naturally-occurring and vaccine-associated polio viruses

Epidemiology: Poliomyelitis (polio) is a paralytic disease classically caused by poliovirus, a highly infectious virus. Poliovirus is transmitted primarily from person-to-person via the fecal-oral route. At its peak in the United States, an estimated 21,000 cases of poliomyelitis were recorded in 1952. Polio vaccine was introduced in 1955, and the disease was declared eradicated from the Western Hemisphere in 1991, from the Western Pacific in 1997, and from Europe in 1998. The illness still occurs in some developing countries such as Afghanistan, India, Nigeria, and Pakistan.

Clinical Aspects: The majority of cases have no symptoms, with flaccid paralysis occurring in less than 1% of all infections. When illness occurs, it starts with fever and may progress to meningitis and/or lifelong paralysis. Polio can be fatal. There is no treatment for polio. In areas of the world where live virus vaccine is in use, rare cases of vaccine-associated polio can occur.

Prevention: Inactivated polio vaccine (IPV) is recommended routinely for children up through age 18 years. IPV may be given to certain adults age 19 and older traveling to areas of the world with an increased risk of polio.

PSITTACOSIS

	2000	2001	2002	2003	2004	2005	2006	2007	2008
rate	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
cases	0	0	0	0	0	0	0	0	0

No cases of psittacosis were reported in 2008.

Less than five cases of human psittacosis are reported each year in Washington state. The last reported human case in King County occurred in 1998.

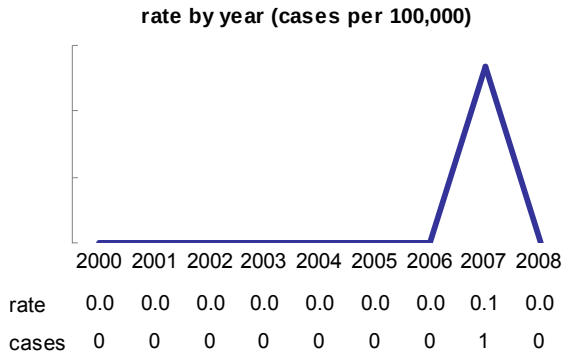
Purpose of Surveillance:
- To identify source of transmission (i.e., infectious birds), and eliminate risk to others
- To facilitate appropriate diagnostic testing and treatment for infected persons
- To implement control measures for contaminated areas and management of infected birds

Epidemiology: Psittacosis (parrot fever, chlamydiosis or ornithosis) is caused by inhalation of the desiccated droppings, secretions, or dust from the feathers of birds infected with the bacterium *Chlamydia psittaci*. Psittacine birds such as parrots, parakeets, and cockatiels are the most common reservoir, but infection may also occur in other wild, domestic, or pet birds. Birds may be symptomatic, particularly if stressed, but birds appearing healthy can also carry the organism.

Clinical Aspects: The incubation period may range from five days to four weeks but is usually within ten days. Symptoms of human psittacosis include fever, headache, chills, muscle aches, sensitivity to light, and cough. Elderly and immunosuppressed people are most susceptible to infection. Psittacosis is usually diagnosed by its symptoms and a history of exposure to birds. Blood tests collected at the time of illness and again two to three weeks later can confirm the diagnosis.

Prevention: Do not purchase birds with signs of psittacosis or those kept in dirty or crowded conditions. Consult a veterinarian if a pet bird becomes ill.

Q FEVER



No cases of Q fever were reported in 2008.

In 2007 there was one case reported in a traveler to a remote area in Australia. The person was exposed to newborn calves, and also reported hunting and skinning cattle, camels, and kangaroos.

Fewer than three cases of Q fever are reported annually in Washington state. The last death associated with Q fever occurred in 1987.

Purpose of Surveillance:
- To identify sources of transmission and reduce the risk to others
- To identify cases caused by potential agents of bioterrorism

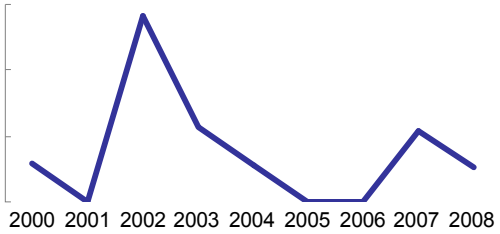
Epidemiology: Q fever is caused by the bacterium *Coxciella Burnetii.* The infection occurs in animals including sheep, goats, cattle, some wild mammals, dogs, cats, birds, and ticks. Human exposure is typically through inhalation of dust that is contaminated with animal matter such as excrement and placental or birth fluids. Transmission also occurs by direct contact with infected animals and other contaminated materials, such as wool, straw, fertilizer, and laundry. Ingestion of raw milk from infected cows may be a potential source of exposure. Direct transmission by blood or marrow transfusion has been reported. Q fever is endemic in areas where reservoir animals are present, and occupationally affects veterinarians, meat workers, sheep (and occasionally dairy) workers, and farmers.

Clinical Aspects: The incubation period is typically two to three weeks. Symptoms of acute infection include fever, usually accompanied by rigors, muscle aches, malaise, and headache. There is considerable variation in severity and duration; infections may be unapparent or present as a nonspecific fever of unknown origin. Severe disease can include acute hepatitis, pneumonia, and meningoencephalitis. Asymptomatic and chronic infections may also occur. Chronic Q fever manifests primarily as endocarditis, which is potentially fatal and may evolve months to years after acute infection, particularly in persons with underlying valve disease. A chronic-fatigue-like syndrome has been reported in some Q fever patients. The case fatality rate in untreated patients is less than 1%.

Prevention: Avoid exposure to infected animals, especially if you have heart-valve disease or vascular grafts. Consume only pasteurized milk and milk products.

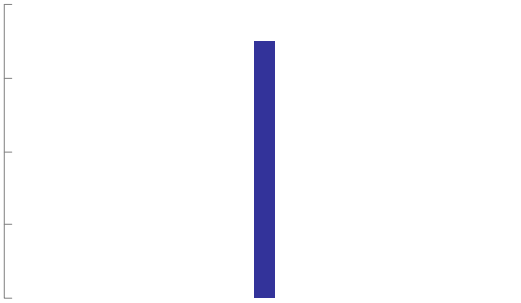
RELAPSING FEVER

rate by year (cases per 100,000)



	2000	2001	2002	2003	2004	2005	2006	2007	2008
rate	0.1	0.0	0.3	0.1	0.1	0.0	0.0	0.1	0.1
cases	1	0	5	2	1	0	0	2	1

rate by age group (cases per 100,000) in 2008



	0	1-4	5-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	85+
rate	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0
cases	0	0	0	0	0	1	0	0	0	0	0

In 2008, one case of tick-borne relapsing fever (TBRF) was reported. The case spent time in Kittitas County during the likely exposure period. The case was not hospitalized and recovered fully.

Washington state reports two to eight cases of tick-borne relapsing fever (TBRF) each year. Most infections are acquired while vacationing in rural, mountainous areas between May and September. 12 cases of relapsing fever have been reported in King County since 1999, all associated with exposures outside of Western Washington.

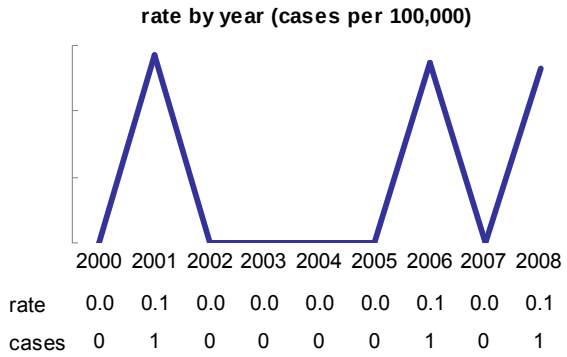
Purpose of Surveillance:
- To identify common source outbreaks
- To identify and eliminate sources of transmission
- To facilitate environmental clean-up
- To facilitate appropriate treatment

Epidemiology: Relapsing fever is caused by the bacteria *Borrelia*. In the United States it typically occurs in mountainous areas of the western states. It is transmitted to humans by the bites of argasid (soft) ticks that become infected when feeding on infected rodents, frequently squirrels and chipmunks. These ticks are found where rodents burrow and nest, often in older buildings. The ticks typically feed only at night and, unlike the ticks that cause Lyme disease, do not remain attached for prolonged times. They can survive for long periods between blood meals, and typically do not leave a noticeable bite wound. In the western United States and British Columbia, exposure commonly occurs in older buildings and cabins located in higher elevations.

Clinical Aspects: Recurring fevers of up to 105°F and lasting two to nine days are followed by afebrile periods lasting two to four days. Other symptoms can include headache, chills, body aches, prostration, nausea, and vomiting, and in some cases, a rash. The incubation period is typically seven to eight days (with a range of four to 18 days). Relapsing fever is diagnosed by examination of blood drawn during a febrile episode, bone marrow aspirates, or cerebrospinal fluid in a symptomatic person. Treatment is with an appropriate antibiotic.

Prevention: Avoid sleeping in rodent-infested buildings. Check sleeping areas in cabins for evidence of rodents. Avoid sleeping on the floor, and move beds away from walls to limit the possibility of contact with ticks. Make buildings rodent-proof, and remove rodent nesting materials from walls, ceiling, and floors. Use DEET-containing insect repellant on skin or clothing, and wear long sleeve shirts and long pants when in areas with ticks. If you find a tick on your body, remove it by grasping its head with a set of tweezers and pulling straight out with a smooth, steady motion.

ROCKY MOUNTAIN SPOTTED FEVER



One case of Rocky Mountain spotted fever (RMSF) was reported in 2008 in an adult male. The case was associated with travel to Eastern Washington and Yellowstone Park.

A probable case of RMSF was reported in 2006, likely acquired while hunting in Kittitas County. In 2001 a confirmed case with a history of travel to Colorado was reported.

In Washington state one or two cases of RMSF are reported each year.

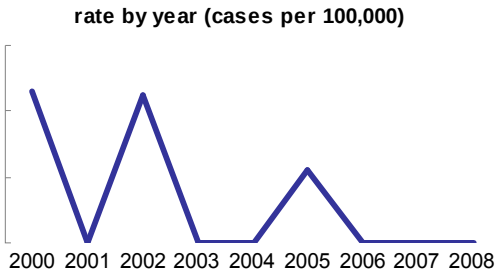
Purpose of Surveillance:
- To identify risk factors for infection
- To identify locally occurring cases

Epidemiology: Rocky Mountain spotted fever (RMSF) is caused by the bacterium *Rickettsia rickettsii,* and is considered the most severe tick-borne infection. *R. rickettsii* is transmitted via infected ticks, most commonly by the species *Dermacentor*. These 'hard ticks' are more commonly found in the western, south, and southeast regions of Washington. Activities where people are more likely to have contact with ticks include hiking or walking in wooded and dense brush areas, meadows, and in areas with weeds and tall grass. Over half of the nationally reported cases occur in the south-Atlantic region of the United States.

Clinical Aspects: Following the bite of an infected tick, a person often experiences sudden onset of fever and rash, beginning three to 14 days after infection. A rash generally appears on the third to fifth day after the onset of fever, often including the palms and soles, spreading over the body. If untreated, symptoms of fever, malaise, muscle pain, severe headache, chills, and conjunctival injection may continue for two to three weeks. Treatment is recommended without laboratory diagnosis when epidemiologic risk factors and a compatible clinical illness are present. RMSF is fatal in approximately 20% of untreated cases. Diagnosis of RMSF is made through blood tests or by isolation of the bacteria from a clinical specimen or culture.

Prevention: Use insect repellent containing DEET on skin or clothing and wear long sleeve shirts and long pants when in areas with ticks. Check sleeping areas in cabins for evidence of rodents. Avoid sleeping on the floor and move beds away from walls to limit the possibility of contact with ticks. Make buildings rodent-proof, and remove rodent nesting materials from walls, ceiling, and floors. If you find a tick on your body, remove it by grasping its head with a set of tweezers and pulling straight out with a smooth, steady motion.

RUBELLA



	2000	2001	2002	2003	2004	2005	2006	2007	2008
rate	0.1	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0
cases	2	0	2	0	0	1	0	0	0

No cases of rubella were reported in 2008.

One adult case of rubella associated with international travel was reported in 2005 and two cases of rubella were reported in 2002 among unvaccinated, recent immigrants.

Washington state reports five to 15 cases each year.

Purpose of Surveillance:
- To prevent transmission to susceptible pregnant women and resultant congenital rubella syndrome
- To identify risk factors for rubella infection

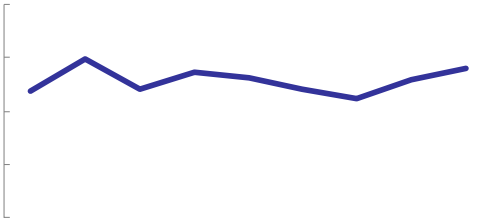
Epidemiology: Rubella (German measles) is a viral illness spread through coughing and sneezing. When acquired by a mother early in pregnancy it can lead to premature delivery, congenital defects, and fetal death, depending on gestational age at time of infection. Congenital rubella syndrome (CRS) occurs in up to 85% of infants born to women who are infected with rubella during the first trimester. An average of five cases of CRS has been reported annually in the U.S. since 1980. Most reported post-natal rubella in the U.S. since the mid-1990s has occurred among Hispanic young adults who were born in Latin America and the Caribbean where rubella vaccine is not routinely used.

Clinical Aspects: Vision and hearing impairment or loss are among the many potential manifestations of CRS. In children and adults, rubella causes a usually mild illness consisting of a rash accompanied by mild fever and swollen lymph nodes. Adults may have an extended illness with arthritis, but other complications are rare. Diagnostic tests for rubella include antibody titers, virus isolation, and identification of viral antigen in blood or tissues.

Prevention: Immunization is the best way to prevent rubella. Rubella vaccine is included in the MMR combination vaccine which provides protection against measles, mumps and rubella. People exposed to rubella should consult their health care provider immediately.

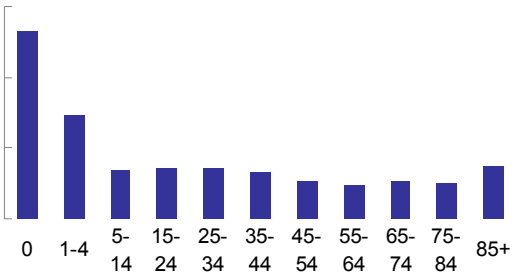
SALMONELLOSIS

rate by year (cases per 100,000)



	2000	2001	2002	2003	2004	2005	2006	2007	2008
rate	11.8	14.8	11.9	13.7	13.1	12.1	11.2	12.9	13.9
cases	205	260	212	243	234	218	205	241	262

rate by age group (cases per 100,000) in 2008



	0	1-4	5-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	85+
rate	53.0	29.0	14.0	14.6	14.5	13.3	10.8	9.4	10.5	10.3	14.8
cases	12	26	30	37	44	38	32	20	11	7	5

In 2008, 262 cases of salmonellosis were reported. The highest incidence was among infants and young children.

An outbreak involving 37 laboratory-confirmed and 45 probable cases (i.e. persons with clinically compatible illness without laboratory confirmation) was linked to eating contaminated food from a King County food establishment. In addition, two large, multi-state outbreaks occurred in 2008: an outbreak of *Salmonella* Saintpaul tied to consumption of tomatoes, jalapeño and Serrano peppers (one confirmed case from King County); and an outbreak of *Salmonella* Typhimurium linked to peanuts and peanut-containing products (three confirmed cases from King County).

In 2008, 46 (17.6%) cases were attributed to international travel. Forty-one (15.6%) cases required hospitalization, and one died.

Purpose of Surveillance:
- To identify common source outbreaks
- To identify and eliminate sources of transmission including contaminated food and water

Epidemiology: *Salmonella* infection is spread through the fecal-oral route, through contaminated food and water, and through direct and indirect contact with infected animals and their environments. Animals commonly infected with *Salmonella* include chickens, ducks, pigs, cows, rodents, and reptiles such as snakes, lizards, and turtles. Pets are a common source of infection. Infected children and individuals with poor hygiene can contaminate the household environment, leading to household transmission. Persons with salmonellosis can remain infected even after symptoms resolve and spread infection for several days to weeks, and in some cases longer.

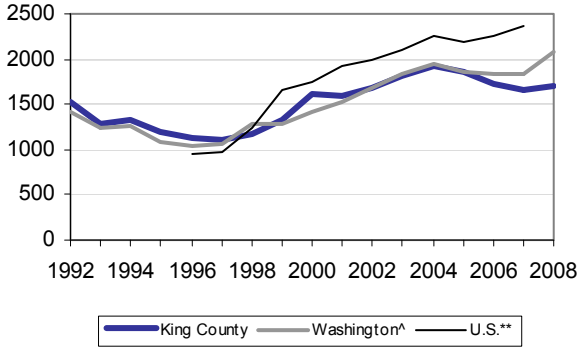
Clinical Aspects: The incubation period is generally 12 to 36 hours (range 6 to 72 hours), and illness typically lasts four to seven days. Symptoms include fever, abdominal pain, diarrhea, headache, nausea, and in some cases, vomiting. Complications of salmonellosis include abscesses, arthritis, bacteremia, and meningitis. Infants, the elderly, and the immunocompromised are at increased risk of serious complications including death.

Prevention: Handwashing and careful food preparation are the keys to preventing salmonellosis. Infected individuals should be restricted from attending or working in child care, food service, and health care work while they have symptoms. Do not eat raw or uncooked eggs, poultry or meat. Always wash hands after contact with pets, especially reptiles and birds. Reptiles and turtles should not be kept as pets for small children or infants.

Washington state typically reports 650 to 800 *Salmonella* cases each year, while King County reports between 200 to 300 cases annually. In recent years, “genetic fingerprinting” of salmonella isolates has facilitated the identification of cases linked to nationwide outbreaks.

SEXUALLY TRANSMITTED DISEASES: CHLAMYDIA

Chalmydia Incidence per 100,000 among Women ages 15-29*, 1992-2008



* Cases with unknown age were distributed according to annual age distributions among cases with known age and included in age-specific rates.
** National data for 2008 were not available at the time this report was prepared.
^ Washington state rates exclude King County.

In 2008, 5,962 cases of chlamydial infection were reported among residents of King County, for a crude incidence of 320 per 100,000 persons. In 2008, 3,956 and 2,006 cases were reported respectively among women and men, yielding chlamydial infection rates of 423 per 100,000 women and 216 per 100,000 men (see sidebar regarding differences in screening practices among men and women). Age-specific rates were highest among 15 to 19 year old women (2,444 cases per 100,000 persons) and 20-24 year old men (888 cases per 100,000 persons), likely reflecting the increased biological susceptibility of young women, low rates of condom use and relative high rates of partnership change among adolescents and young adults, and age discordant sexual partnerships between young women and older men.

Following the advent of widespread screening for chlamydial infection among women in the early 1990s, local and statewide rates declined from 1992 through 1997, but began to increase in 1998. This trend continued until 2003, when rates stabilized among King County women. Rates among women in other Washington counties followed a similar pattern, but increased more rapidly from 1998 to 2003, leading to consistently lower rates of chlamydial infection among King County women when compared to other Washington women.

Purpose of Surveillance:
- To identify high risk populations for prevention activities
- To monitor trends in chlamydial infection and morbidity over time and across subpopulations

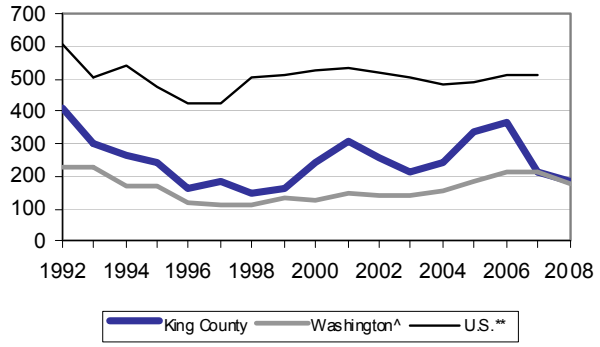
Epidemiology: Chlamydia is the most commonly reported infection in the United States. It is transmitted through unprotected sex (vaginal, anal, and possibly oral), and can be transmitted from a mother to her infant during childbirth. Chlamydial infection is often asymptomatic, so rates of disease incidence based on case reports underestimate the true incidence of infection. Recommended routine chlamydial screening for young women results in many more cases of chlamydia being detected among women then men, although the true incidence of disease is probably similar in men and women.

Clinical Aspects: Symptoms in women include burning with urination or vaginal discharge, due to urethral or cervical infection respectively. Symptoms in men include burning during urination and discharge from the penis. Symptoms of rectal infection may include discharge, pain, or bleeding. If left untreated, chlamydia can result in serious long term complications including pelvic inflammatory disease (PID), infertility, ectopic pregnancy, and/or chronic pelvic pain in women, and epididymitis in men. Many infections among women cause no or only mild symptoms and young sexually active women are at high risk for becoming infected. Therefore the CDC and Public Health – Seattle & King County recommend that sexually active women ages 14 to 24 are screened annually for chlamydia.

Prevention: The use of condoms during vaginal, anal, and oral sex, and treating contacts to infection are important in reducing the spread of chlamydial infection. Likewise, screening and treatment of infected persons and their sex partners are important prevention activities.

SEXUALLY TRANSMITTED DISEASES: GONORRHEA

Gonorrhea Incidence per 100,000 among Women ages 15-29*, 1992-2008



* Cases with unknown age were distributed according to annual age distributions among cases with known age and included in age-specific rates.
** National data for 2008 were not available at the time this report was prepared.
^ Washington State rates exclude King County.

In 2008, 1,294 cases of gonorrhea were reported among King County residents, which is a small decrease from the number of cases reported in 2007 (1,404 cases). Crude gonorrhea incidence in 2006 was 70.0 per 100,000 persons. Of the reported 2007 cases, 482 occurred among women, for a rate of 51.6 per 100,000, and 812 occurred among men, for an incidence of 87.6 per 100,000. This gender differential probably reflects a higher incidence of gonorrhea among men who have sex with men (MSM).

In 1992, the total crude incidence of gonorrhea was 123.8 per 100,000 persons. Rates of gonorrhea fell from 1992 until 1996, at which time they began to plateau (1996 rate: 55.5 per 100,000 persons). This trend continued until 2000, when gonorrhea rates began to rise in King County (2000 rate: 70.6). Since that time, rates have risen among both men and women in King County, although this trend has been somewhat variable from year to year. The slight decline in gonorrhea rates observed in 2008 continues the steep decrease in rates observed in 2007, following a marked increase in gonorrhea during 2005 to 2006.

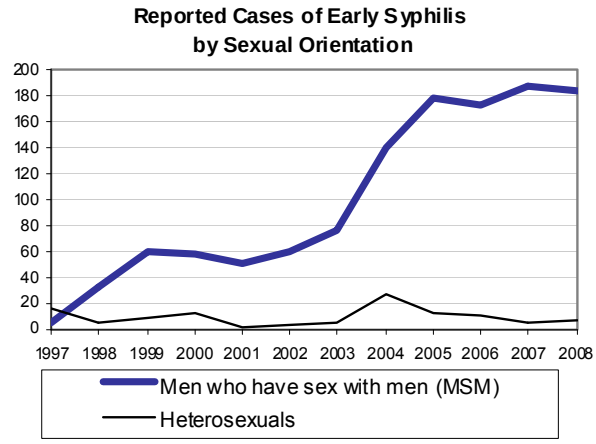
Purpose of Surveillance:
- To identify high risk populations for prevention activities
- To monitor trends in gonorrhea and associated morbidity over time and across subpopulations

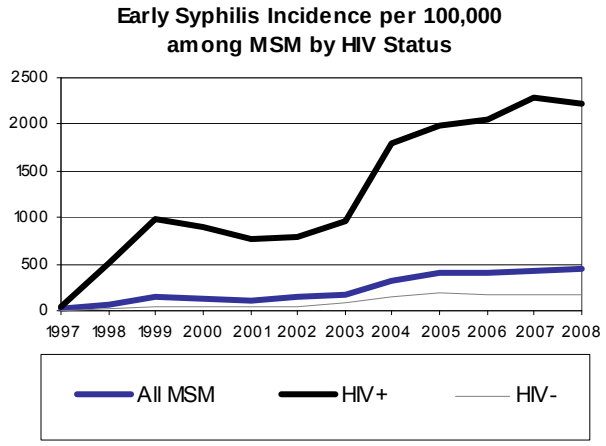
Epidemiology: Gonorrhea is transmitted through unprotected sex (oral, anal, and vaginal). Gonorrhea can also be transmitted from mother to infant during vaginal delivery. Because gonorrhea is often asymptomatic, many cases go unreported and rates based on case reports are an underestimate of the true burden of disease.

Clinical Aspects: Infected persons, particularly women, often experience gonococcal infection without symptoms. About 10% of men and 50% of women with gonorrhea are asymptomatic. Symptoms of urethral infection among men may include discharge from the penis or burning during urination. In women, symptoms may include pain or vaginal discharge, burning during urination, irregular bleeding between menstrual periods, lower abdominal pain, or pain with intercourse. Symptoms of rectal infection in both women and men may include discharge, anal itching, painful bowel movements, or bleeding. Gonococcal infection in the throat may cause a sore throat, but more often results in no symptoms. If left untreated, gonorrhea may result in serious long term sequelae, including pelvic inflammatory disease (PID), infertility, ectopic pregnancy, and/or chronic pelvic pain in women, and epididymitis among men. Individuals with gonorrhea are also at higher risk for acquisition of HIV.

Prevention: The use of condoms during vaginal, anal, and oral sex, and treating contacts to infection are important in reducing the spread of gonorrhea. Likewise, screening and treatment of infected persons and their sex partners are important prevention activities.

SEXUALLY TRANSMITTED DISEASES: SYPHILIS





Of the 191 early syphilis cases reported in 2008, 34 were diagnosed with primary syphilis, 81 with secondary syphilis, and 76 with early latent syphilis. The overall incidence of early syphilis in King County was 10 per 100,000 in 2008. Heterosexuals accounted for six cases (0.3 cases per 100,000), and men who have sex with men (MSM) accounted for 185 cases (442 per 100,000). In 2008, 108 of the 185 early syphilis cases in MSM occurred in HIV positive MSM, resulting in an incidence of 2,215 cases per 100,000 HIV positive MSM, compared to an incidence of 176 cases per HIV negative MSM. There were no cases of congenital syphilis in 2008.

Since the late 1980s, two distinct epidemics of syphilis have occurred in King County; The first epidemic was primarily among heterosexuals who reported use of crack cocaine in the late 1980s and early 1990s. A second epidemic of syphilis among MSM in King County began in 1997 and has persisted since that time. HIV positive MSM have been particularly affected by the epidemic.

Purpose of Surveillance:
- To identify high risk populations for prevention activities
- To monitor trends in syphilis and associated morbidity over time and across subpopulations

Epidemiology: Syphilis is transmitted most often through unprotected sex (oral, anal, and vaginal). *Treponema pallidum* can also be transmitted from mother to infant during pregnancy, at any time during pregnancy, and result in neonatal death, or congenital syphilis

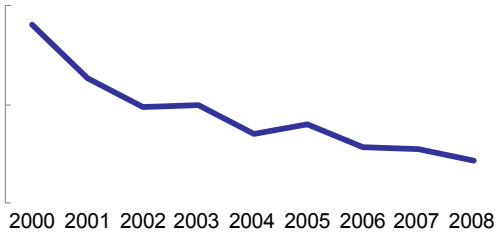
Clinical Aspects: If untreated, persons with syphilis typically experience four clinical stages of infection. Primary infection is characterized by a painless chancre at the site of infection an average of three weeks from the time of exposure. Symptoms of secondary syphilis usually occur three to six weeks later and include a rash which characteristically includes the palms and soles, lymphadenopathy, and malaise. Mucosal lesions of the oropharynx and genitals may also occur. Latent syphilis is characterized by positive serologic test with a lack of clinical symptoms, although patients may have spontaneous infectious relapses during this stage, usually in the first year following infection. Early latent syphilis is defined as infection less than one year and late latent syphilis is infection of one year or greater in duration. Neurosyphilis, the symptomatic manifestation of *T. pallidum's* invasion of the central nervous system, can occur at any stage of syphilis infection.

A pregnant woman who transmits syphilis to her fetus risks premature delivery and neonatal death. If untreated, an infected infant may develop late lesions resulting in blindness, deafness, mental retardation, bone deformities, and death.

Prevention: Condom use during oral, anal, and vaginal sex are important in preventing syphilis. Treating the partners of known syphilis cases is also key to reducing the spread of syphilis.

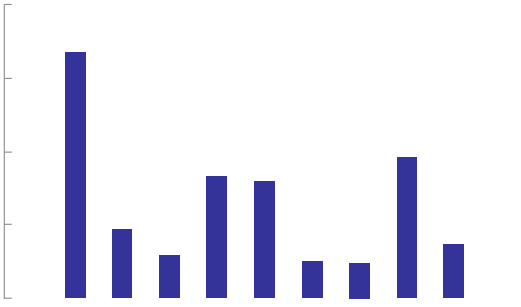
SHIGELLOSIS

rate by year (cases per 100,000)



	2000	2001	2002	2003	2004	2005	2006	2007	2008
rate	9.0	6.3	4.8	4.9	3.5	4.0	2.8	2.7	2.2
cases	156	111	86	88	63	72	52	50	41

rate by age group (cases per 100,000) in 2008



	0	1-4	5-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	85+
rate	0.0	6.7	1.9	1.2	3.3	3.2	1.0	0.9	3.8	1.5	0.0
cases	0	6	4	3	10	9	3	2	4	1	0

Forty-one cases of shigellosis were reported in 2008 with highest rates of illness occurring in children under the age of five. Overall, the rate of infection was the lowest in ten years. Fifty-one percent of infections were caused by *S. sonnei* (21 cases), 27% (11 cases) were caused by *S. flexneri* and 5% (2 cases) were caused by *S. dysenteriae.* S. *boydii* caused one infection, and one isolate was untyped. Fourteen (33%) cases likely acquired their infection while traveling internationally. No outbreaks were identified in 2008.

In Washington, about 130 to 250 cases are reported annually. In recent years, Seattle and other cities in the U.S. and overseas have had outbreaks of shigellosis among men who have sex with men (MSM) who may become infected through oral-anal contact (direct or indirect). In King County, international travel is the most common risk factor identified among shigellosis cases.

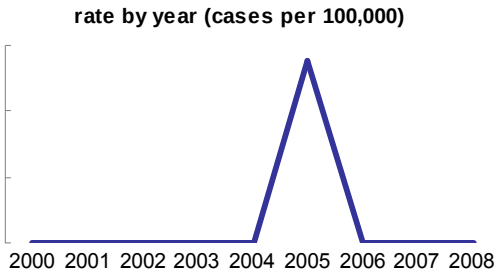
Purpose of Surveillance:
- To identify common source outbreaks
- To identify and eliminate sources of transmission including contaminated food and water
- To identify and eliminate person-to-person spread of infection

Epidemiology: Shigellosis is an enteric bacterial infection caused by *Shigella* species, most commonly *S. sonnei* and *S. flexneri*. The organism is spread through the fecal-oral route and humans are the only known host. Food and water contaminated with human fecal matter are common vehicles of transmission. Because the infective dose of *Shigella* bacteria is very low, this infection is commonly transmitted via household or sexual contact. Travelers to developing countries with poor sanitation are also at risk for infection.

Clinical Aspects: Shigellosis causes diarrhea, often accompanied by fever, nausea, vomiting, and cramps. The illness typically lasts four to seven days. The incubation period is approximately one to three days (range 12 to 96 hours, and up to one week for *S. dysenteriae*). Antibiotic resistance to a number of antibiotics, including ampicillin and trimethoprim-sulfamethoxazole (TMP-SMX) is common among *Shigella* strains reported in King County. Clinicians should consider requesting antibiotic sensitivity testing of *Shigella* isolates.

Prevention: Shigellosis can be prevented by washing hands carefully with soap and warm water after using the bathroom, changing diapers, before preparing food, and before eating. Pay special attention to the proper disposal of soiled diapers and other human waste. Keep kitchen work surfaces clean. Children and adults with diarrhea should not use public swimming areas until they have recovered. When traveling, take precautions to avoid traveler's diarrhea.

TETANUS



	2000	2001	2002	2003	2004	2005	2006	2007	2008
rate	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0
cases	0	0	0	0	0	1	0	0	0

No cases of tetanus were reported to Public Health in 2008.

The last case of tetanus reported in King County was in 2005 in an adult over 60 years of age. Gardening and a minor finger wound were the only risk factors identified. The patient was seriously ill, but survived. This was the first case of tetanus since 1996, when two cases were reported.

Purpose of Surveillance:

- To facilitate prompt, appropriate diagnostic testing and management of cases

Epidemiology: Tetanus results from the action of a neurotoxin produced in infected tissues by the bacterium *Clostridium tetani*, resulting in severe, potentially life-threatening muscle spasms. In the U.S., tetanus is predominately due to infected injuries, including acute wounds contaminated with dirt, saliva, or feces, puncture wounds, crush injuries, and unsterile injections. In the U.S., tetanus typically occurs in adults over 60 years of age, reflecting a lack of immunity in this population. In some developing countries, neonatal tetanus (in infants born to unvaccinated mothers) is the most common form.

Clinical Aspects: The most common symptom is stiffness of the jaw, commonly known as lockjaw, which makes it difficult to open the mouth. Other symptoms include stiffness of stomach and back muscles and contraction of facial muscles. Eventually painful muscle spasms develop. If they affect the chest and airways, the person can suffocate. Mortality from tetanus can be high even with appropriate treatment.

Prevention: Tetanus can be prevented with a vaccine. DTaP vaccine—a combined vaccine against diphtheria, pertussis (whooping cough), and tetanus—is one of the routine childhood immunizations. Teenagers and adults get additional doses of tetanus-containing vaccine every ten years. Tdap (tetanus toxoid, reduced diphtheria toxoid and acellular pertussis) vaccine is recommended for use in children 11 to 18 years old, and as a single dose booster immunization for persons aged 19 to 64 years of age.

TRICHINOSIS

	2000	2001	2002	2003	2004	2005	2006	2007	2008
rate	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
cases	1	0	0	0	0	0	0	0	0

No cases of trichinosis have been reported in King County since 2000.

The last reported human case in King County occurred in 2000, and was due to consumption of homemade cougar jerky. Seven cases have been reported in Washington state since 1986.

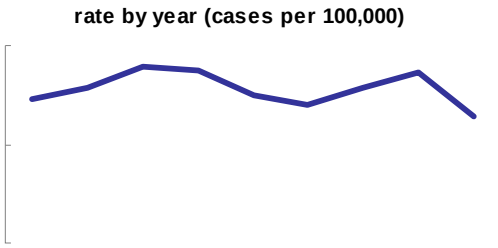
Purpose of Surveillance:
- To identify common source exposures
- To identify and eliminate infected food products in order to prevent further consumption

Epidemiology: Trichinosis is caused by an intestinal roundworm, *Trichinella spiralis*, which infects many wild mammals. Human infection results from eating undercooked pork or wild game harboring the encapsulated cysts of *T. spiralis*. Encysted larvae survive some preparation methods for wild meat jerky, and some strains resist freezing. The larvae may infect persons if the meat is consumed without further cooking.

Clinical Aspects: Illness typically develops eight to 15 days (range five to 45 days) after ingestion of food containing the parasites. Symptoms are variable, and include vomiting, diarrhea, fatigue, and abdominal discomfort, followed by muscle and joint aches, weakness, chills, and eye swelling. Severity of disease is related to the number of worms consumed. Many infections are asymptomatic; mild to moderate infections can last several months.

Prevention: Cook meat products until the juices run clear or to an internal temperature of at least 160°F (180°F is recommended for whole game). Freeze pieces of pork up to 15 cm thick for 30 days at 5°F to kill any worms. Cook wild game meat thoroughly. Freezing wild game meats (unlike freezing pork products), even for long periods of time, may not effectively kill all worms. Cook all meat, scraps, and garbage fed to pigs or other wild animals. Clean meat grinders thoroughly if you prepare your own ground meats. Curing (salting), drying, smoking, or microwaving meat does not consistently kill infective worms.

TUBERCULOSIS



	2000	2001	2002	2003	2004	2005	2006	2007	2008
rate	7.3	7.9	8.9	8.7	7.4	7.0	7.9	8.6	6.4
cases	127	139	158	155	133	127	145	161	120

In 2008, King County received reports of 121 cases of active tuberculosis (TB). The county's rate of 6.5 cases per every 100,000 individuals remains higher than the national rate of 4.2 per 100,000. Eighty one percent of cases were born outside the United States. The highest numbers came from the Somalia, Mexico, Ethiopia, the Philippines, and Vietnam. The median age of TB cases in 2008 was 41 years. Blacks and Asians have disproportionately higher rates of TB, and Hispanics continue to have higher rates than non-Hispanics. There were eight TB cases among HIV-infected persons, representing eight percent of TB cases with known HIV serostatus. Eight percent of TB cases in King County were resistant to at least one TB medication.

TB Incidence 2005-2008 for the U.S., Washington State, and Seattle & King County

		2005	2006	2007	2008
U.S.	Count	14,093	13,767	13,293	12,898
	Incidence†	4.8	4.6	4.4	4.2
Washington state	Count	256	262	291	228
	Incidence†	4	4.1	4.4	3.5
Seattle & King County	Count	125*	145	161	121
	Incidence†	6.9	7.9	8.6	6.5

*Due to classification modifications there have been slight changes in counts and rates for 2005 King County cases.
†Incidence per 100,000 people

In 2008, nine pediatric cases (age zero to14 years), were diagnosed, six of whom through contact investigations (i.e., family members or caretakers had active TB). Five pediatric cases were born in countries where TB is highly prevalent, and all were diagnosed within one year after emigrating from their counties of birth.

Program Priorities:

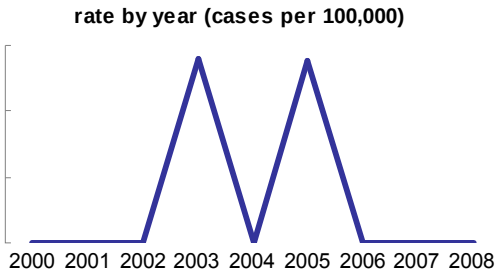
- To ensure that persons with active TB are found and fully treated
- To ensure that contacts of persons with infectious TB are screened and offered appropriate preventive therapy
- To ensure that persons at high risk for TB infection and reactivation receive appropriate screening and preventive therapy
- To monitor the trend of TB in Seattle and King County

Epidemiology: TB, caused by *Mycobacterium tuberculosis*, is spread through airborne transmission. Individuals exposed to someone with active infectious TB may develop "latent TB" infection that has no symptoms and is not contagious. About one-third of the world's population and five to ten percent of the U.S. population has latent TB. King County has an estimated 100,000 people with latent TB. About ten percent of those with latent TB infection will develop active TB disease in their lifetime. Those who have a weakened immune system have a higher risk of developing TB.

Clinical Aspects: TB usually affects the lungs, but sometimes other parts of the body such as the brain, kidneys, or spine are affected. Symptoms of active TB disease include: cough, weight loss, fatigue, fever, night sweats, chills, loss of appetite, pain when breathing or coughing, and coughing up bloody sputum. TB disease can be cured with appropriate treatment.

Prevention: Those with latent TB should be appropriately evaluated and treated. Individuals can decrease their risk of active TB disease by keeping their immune systems healthy and taking preventive therapy if diagnosed with latent TB.

TULAREMIA



	2000	2001	2002	2003	2004	2005	2006	2007	2008
rate	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0
cases	0	0	0	1	0	1	0	0	0

No cases of tularemia were reported in 2008.

Approximately 200 human cases of tularemia are reported annually in the U.S., mostly in persons living in the south-central and western states. In Washington two to eight reports of tularemia infections occur annually. Identified exposures include farming and rabbit skinning. The last case of tularemia in King County was reported in 2005, which may have been acquired from an arthropod bite while camping outside of King County.

Purpose of Surveillance:
- To identify and eliminate sources of transmission including contaminated food and water
- To identify cases caused by potential agents of bioterrorism

Epidemiology: Tularemia is caused by the bacterium *Francisella tularensis* which naturally infects animals, especially rodents, rabbits, and hares. Infected wildlife may be obviously ill (depressed, anorexic, ataxic, inactive, have a roughened coat, have eye drainage) or may be found dead. People become infected by the bite of an arthropod (most commonly ticks and deerflies) that has fed on an infected animal, or by being bitten by an infected animal, handling infected animal carcasses, eating or drinking contaminated food or water, or by inhaling infected aerosols in a laboratory setting. The use of *F. tularensis* as a weapon of bioterrorism is of concern because it is highly infectious. As few as 10 to 50 organisms can cause disease.

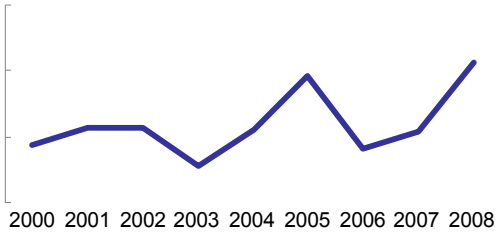
Clinical Aspects: The incubation period is usually three to five days with a range of one to 14 days. Tularemia causes fever, chills, muscle aches, headache, and nausea and may present in one of several distinct forms; the most common is caused by arthropod bites and is characterized by a painful ulcer with swelling of regional lymph nodes. Ingestion of organisms in food or water can cause painful pharyngitis (sore throat), abdominal pain, diarrhea, and vomiting. Inhalation of *F. tularensis* can cause severe respiratory illness, including life-threatening pneumonia and systemic infection.

Prevention: Use insect repellant containing DEET on skin or clothing, and wear long sleeve shirts and long pants when in areas with ticks. Avoid dead or sick animals, and wear gloves when handling or dressing wild animals.

TYPHOID AND PARATYPHOID FEVER

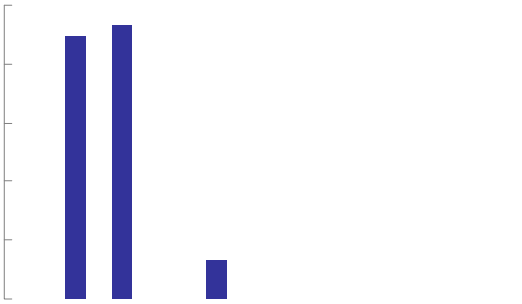
Typhoid Fever

rate by year (cases per 100,000)



	2000	2001	2002	2003	2004	2005	2006	2007	2008
rate	0.2	0.2	0.2	0.1	0.2	0.4	0.2	0.2	0.4
cases	3	4	4	2	4	7	3	4	8

rate by age group (cases per 100,000) in 2008



	0	1-4	5-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	85+
rate	0.0	2.2	2.3	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0
cases	0	2	5	0	1	0	0	0	0	0	0

In 2008, eight typhoid fever cases were reported. Of these, five were exposed during international travel to India, the Philippines, or Nepal. The other three cases did not have recent foreign travel; however, all had contact with persons who had traveled internationally or were from countries where typhoid fever is endemic. During 2008, two cases of paratyphoid fever were reported, both of whom had recent travel to India.

Fewer than ten cases per year are reported in Washington state.

Purpose of Surveillance:

- To identify and track chronic typhoid carriers who can transmit the disease
- To identify and eliminate sources of transmission, including contaminated food and water

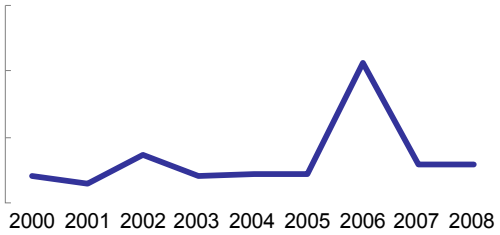
Epidemiology: Typhoid and paratyphoid fever are caused by infection with the bacterium *Salmonella enterica* subspecies *enterica* serovar Typhi or Paratyphi. Humans are the only reservoirs of *S. Typhi* and *S. Paratyphi*. Typhoid is spread when a person drinks or eats food and water contaminated by human waste (stool or urine) containing *Salmonella* Typhi bacteria. The organism is often shed by chronic carriers of the bacteria. Typhoid and paratyphoid fever are not endemic in the United States.

Clinical Aspects: Typhoid and paratyphoid fever are potentially severe, systemic infections characterized by fever, headache, loss of appetite, malaise, lymph node inflammation, cough, and a rash ("rose" spots) on the trunk; constipation is reported more commonly than diarrhea. Children frequently experience only fever. The incubation period is typically eight to 14 days (range three to 60 days). The case-fatality rate is less than 1% with appropriate antibiotic therapy, but 15-20% of persons treated with antibiotics may experience relapses. Two to 5% of infected persons become chronic carriers, and can shed the organisms intermittently in their feces and urine for prolonged periods. The chronic carrier state is more common among middle-age persons, particularly women, and carriers often have biliary tract or gallbladder disease.

Prevention: Wash hands well with soap and water after going to the bathroom and before preparing food items. If traveling to a foreign country, be sure the drinking water is safe; take precautions to avoid traveler's diarrhea. Maintain cleanliness and proper sanitation at all times, especially after a flood or other natural disasters. Vaccination against typhoid fever is usually recommended only for travelers going to developing countries where exposure to contaminated food or water is likely.

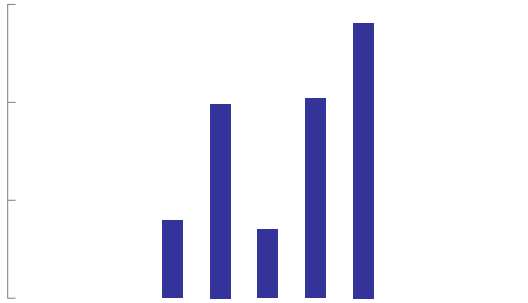
VIBRIOSIS (Non-Cholera)

rate by year (cases per 100,000)



	2000	2001	2002	2003	2004	2005	2006	2007	2008
rate	0.4	0.3	0.7	0.4	0.4	0.4	2.1	0.6	0.6
cases	7	5	13	7	8	8	39	11	11

rate by age group (cases per 100,000) in 2008



	0	1-4	5-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	85+
rate	0.0	0.0	0.0	0.4	1.0	0.4	1.0	1.4	0.0	0.0	0.0
cases	0	0	0	1	3	1	3	3	0	0	0

Eleven cases of vibriosis were reported in 2008, ten of which were *V. parahaemolyticus*. One case of *V. alginolyticus* occurred in a traveler who developed a skin infection after swimming in the ocean. The remaining ten cases were infected by consuming locally acquired shellfish including oysters and crab.

From 1998 through 2008, an average of 12 vibriosis cases was reported in King County each year. The last outbreak of vibriosis occurred in 2006, when a total of 50 cases of vibriosis (39 laboratory-confirmed and 11 probable) were reported in King County residents.

The number of cases reported in Washington state varies year to year depending on environmental conditions.

Purpose of Surveillance:
- To identify common source outbreaks
- To identify and eliminate sources of transmission including contaminated food and water

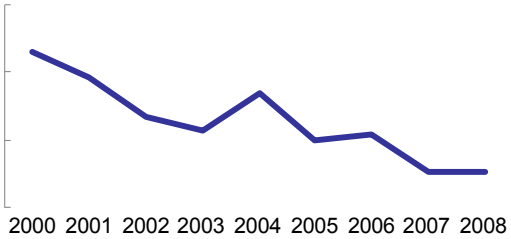
Epidemiology: *Vibrio* species are bacteria that occur naturally in marine waters, and can cause intestinal, bloodstream, or wound infections. Eating undercooked or raw shellfish, especially raw oysters, is the main risk for acquiring vibriosis due to infection with *Vibrio parahaemolyticus*. Growth of *Vibrio* species in seawater is amplified during the warm months and *Vibrio* levels in shellfish increase during the summer. *Vibrio cholera* causes potentially severe diarrhea that does not occur naturally in the United States.

Clinical Aspects: Symptoms occur 12 to 24 hours after consumption of food contaminated with the bacteria (range 4 to 30 hours) and include abdominal cramps, severe watery diarrhea, vomiting, headache, and fever. The illness typically lasts 1 to 7 days. Infections with *Vibrio vulnificus*, which is also associated with consumption of raw shellfish, can cause septicemia in persons with weakened immune systems and certain chronic illnesses.

Prevention: Thoroughly cook shellfish and finfish before eating. Keep raw or cooked shellfish or finfish well refrigerated before serving. Do not harvest or consume shellfish from closed beds.

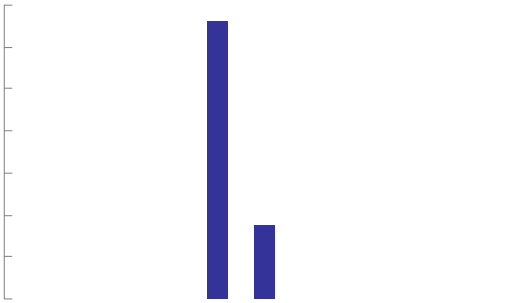
YERSINIOSIS

rate by year (cases per 100,000)



	2000	2001	2002	2003	2004	2005	2006	2007	2008
rate	1.2	1.0	0.7	0.6	0.8	0.5	0.5	0.3	0.3
cases	20	17	12	10	15	9	10	5	5

rate by age group (cases per 100,000) in 2008



	0	1-4	5-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	85+
rate	0.0	0.0	0.0	0.0	1.3	0.4	0.0	0.0	0.0	0.0	0.0
cases	0	0	0	0	4	1	0	0	0	0	0

Five cases of yersiniosis were reported in 2008. Three cases most likely acquired their infection through consumption of contaminated food while traveling in Europe.

In King County, 136 cases were reported from 1998 through 2007. About one-third of these cases occurred in children less than five years of age.

Washington usually receives 20 to 40 reports of yersiniosis each year. The national rate of *Yersinia* infection has not changed significantly over the last several years.

Purpose of Surveillance:
- To identify common source outbreaks
- To identify and eliminate sources of transmission

Epidemiology: *Yersinia enterocolitica*, and less commonly other *Yersinia* species, are bacteria that cause acute diarrhea. Infection is usually spread by food or water contaminated by feces or urine from infected humans, animals or pets, and raw pork or pork products. Rarely, blood products contaminated with *Yersinia* from an infected donor cause transfusion-associated infection. Yersiniosis is likely underdiagnosed because in many laboratories it is not included in routine stool culture for gastrointestinal pathogens.

Clinical Aspects: The incubation period is three to seven days. Illness typically lasts one to three weeks or longer, and fecal shedding can persist for months. Yersinia infection can cause mesenteric lymphadenitis, with symptoms that mimic those of appendicitis, which occasionally leads to surgery where a normal appendix is discovered. Complications from infection with *Yersinia* infection include arthritis, skin ulcers, bone infections, exudative pharyngitis, liver or spleen abscesses, and sepsis.

Prevention: Cook meat thoroughly, especially pork. Drink and eat only pasteurized dairy products. Wash hands well after going to the bathroom, after changing diapers, after animal contact, and before and after preparing food. Dispose of human, dog, and cat feces properly. Protect water supplies from human and animal waste. Discard soiled diapers properly.