Public Health
Seattle & King County

2010

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, Suite 1110
or PO Box 359777
Seattle, Washington 98104
206-744-3590

Tuberculosis (TB) Control Program
Harborview Medical Center
325 9th Avenue, PO Box 359776
Seattle, Washington 98104
206-744-4579

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Executive Summary

A core activity of public health is monitoring and responding to infectious diseases. Public Health – Seattle & King County's Communicable Disease Epidemiology and Immunization Section uses surveillance data — the systematic collection and analysis of disease data — to identify health risks and patterns of disease in King County. These surveillance data are used to control the spread of infectious disease and guide prevention activities, ultimately protecting King County residents from infectious diseases that could have significant impact on the health of our communities.

In 2010 more than 12,000 reports of communicable diseases were submitted to Public Health. Communicable disease highlights of 2010 include:

- **Enteric Diseases and Foodborne Illness:**
  - Shiga toxin-producing *E. coli* in cheese from an artisanal cheesemaker in Washington state sickened eight people, including three King County residents. The public health investigation led to a recall of the implicated cheese products.
  - Several national *Salmonella* outbreaks affected King County residents, including a *Salmonella* Newport outbreak linked to tomatoes grown in Florida that sickened ten King County residents, an outbreak of *S.* Montevideo linked to red and black pepper on Italian-style meats that sickened three King County residents in 2009 and three in 2010, and an outbreak of *S*. Typhimurium associated with African dwarf frogs that affected two King County residents in 2009 and one in 2010. The Centers for Disease Control and Prevention (CDC) estimate that for every report of salmonellosis around 29 cases go undiagnosed.
  - Public Health received 739 foodborne illness complaints. Norovirus was the most common cause of foodborne illness. At one catered banquet at least 60 attendees fell ill from norovirus, ill food workers and improper food handling procedures contributed to the spread of infection.
- **Chronic hepatitis infections:** A high number of chronic hepatitis B and chronic hepatitis C infections among adults continues to be reported each year. These individuals are at an increased risk of serious liver problems such as cirrhosis (scarring of the liver) and liver cancer.
- **Influenza:** After the 2009 H1N1 pandemic, influenza vaccine use increased to record levels. Influenza activity in the 2010-2011 flu season was similar to past years.
- **Measles:** One case of measles in a child was reported in King County. The child was infected during international travel. Over 100 King County residents were identified as potentially exposed to measles in public venues by the child.
- **Travel-associated diseases:** A variety of infections were acquired by King County residents during international travel, including measles, salmonellosis, typhoid fever, shigellosis, campylobacteriosis, giardiasis, and hepatitis A. Ten of the fifteen cases of typhoid fever reported in 2010 (the highest number in decades) were infected during international travel. Travelers also acquired insect-borne diseases not occurring in Washington state, such as chikungunya, dengue fever, malaria and African tick bite fever (a rare rickettsial disease). Many travel-associated infections can be prevented through pre-travel vaccinations and use of preventive therapy for malaria.
- **Suspicious substance incidents:** In addition to disease surveillance and prevention, Public Health also 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 five incidents that were deemed credible threats in 2010; testing was negative for bioterrorism agents in all cases.
- **Suspected rabies exposures:** Rabies post-exposure prophylaxis was recommended for 89 people. Forty animals that posed a potential risk for rabies transmission to humans were tested for rabies; none were positive. Two bats that exposed animals in King County tested positive for rabies. In Washington state, most cases of animal rabies occur in bats, Washington has no known terrestrial reservoir of rabies. However, most bats do not carry rabies, and most bats tested for rabies in Washington state are not infected.

About This Report

This report summarizes the work of the following Public Health – Seattle & King County programs:

- 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)

Each chapter focuses on a particular disease or notifiable condition* that laboratories and health care providers are required by Washington State law to report to Public Health. Included in each chapter are tables and graphs of disease activity in King County in 2010 and how it compares to past years, as well as a brief summary of basic epidemiology, clinical features, and prevention measures.

The HIV/AIDS Program, Tuberculosis Control Program, and Sexually Transmitted Diseases Program each produce separate annual reports with more details about their programs. The reports can be found on their respective websites.

* The list of legally notifiable conditions is updated periodically and can be found at www.kingcounty.gov/health/cd - click on Disease reporting: what to report and how to report it

Contents

Glossary

Arboviral disease: A group of viral diseases transmitted to humans by arthropods (e.g. mosquitoes and ticks).

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

CDC: Centers for Disease Control and Prevention, Atlanta, GA.

Endemic: The constant presence of a disease or infectious agent within a given geographic area or group.

Enteric infection: An infection of the gastrointestinal tract.

Epidemic: An increase in the number of cases beyond what is expected in a population.

Epidemiology: The study of the distribution and determinants of disease in a population.

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 infected persons 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.

Healthcare-associated: Originating or taking place in a hospital or other health care facility, also known as "nosomocial"

Incidence rate: The number of new cases of a disease in a specified population divided by the number of persons 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 2010 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 at the time of this report.

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

Outbreak: An increase in the number of cases beyond what is expected in a specific group of people or in a given area over a specified amount of time.

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 that may precede the main symptoms of an illness.

Prophylaxis: Treatment given during or after exposure to an infectious agent and before illness develops to prevent disease from occurring. Prophylactic treatment includes administration of antibiotics (e.g., to prevent 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.

Pulse Field Gel Electrophoresis (PFGE): a technique used to compare organisms to determine their genetic similarity. PFGE is a type of genetic fingerprinting.

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

Surveillance: monitoring disease through data collection and analysis.

The Communicable Disease Epidemiology and Immunization Section

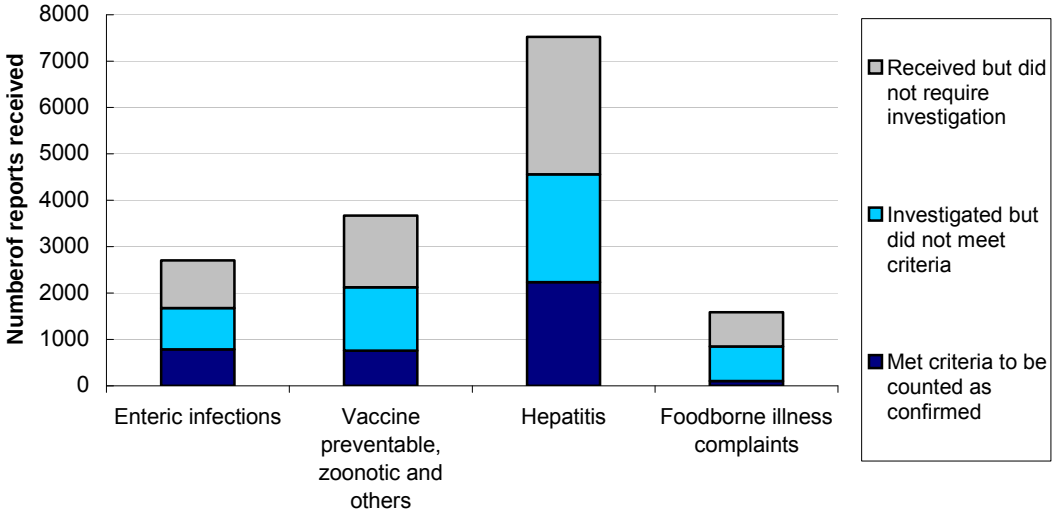
The Communicable Disease Epidemiology and Immunization Section's nurses, epidemiologists, physicians, veterinarians and administrative staff serve as the county's "disease detectives." Our mission is to protect King County residents from infectious diseases of public health significance. We do this by:

- identifying and promoting the most effective prevention measures (such as vaccination and infection control measures)
- 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 individuals
- helping people who have been exposed to infectious agents minimize their risk of getting sick and/or spreading infection to others
- providing information to health care providers and the public to help identify, manage and prevent infections

In addition to surveillance for notifiable conditions, we also investigate and respond to emerging infections such as novel influenza (including pandemic viruses and avian flu), severe acute respiratory syndrome (SARS), and *Cryptococcus gattii* (a rare cause of serious and potentially fatal lung infections).

The cases summarized in this report represent only part of the work done by our program. Most of the reports we receive are for notifiable conditions in King County residents. Sometimes however we investigate reports involving residents of other counties to determine if any King County residents are at risk of infection. Frequently, a report is investigated but does not meet the criteria of symptoms and laboratory results required to be counted as a case of a particular disease. Overall, only 62% of all reports received in 2010 were confirmed cases. Certain conditions were more likely than others to have reports that did not meet case definition. For example, out of 38 hepatitis A reports received, only seven were confirmed. Fourteen reports of possible mumps were received in 2010, and only one of these was confirmed. Only one of the 10 reports of possible measles reported in King County residents was confirmed to be measles infection; most of the remainder were rashes caused by less serious virus infections.

Number of Reports Received by the Communicable Disease Epidemiology and Immunization Program in 2010



Answering questions about communicable diseases from the public and health care providers is another important function not quantified in this report. Providing timely, accurate information on communicable diseases of public health significance in King County is one of our program's highest priorities.

Public Health Contact Numbers

	Phone
Communicable Disease Epidemiology & Immunizations	206-296-4774
24-Hour Communicable Disease Hotline (recorded information and updates on current public health issues)	206-296-4949
HIV/AIDS Program	206-296-4649
Public Health Veterinarian	206-205-4394
Sexually Transmitted Disease (STD) Clinic	206-744-3590
Tuberculosis Control Program	206-744-4579

For Health Care Providers Only

	Phone	Fax
Communicable diseases other than HIV, STDs, and TB (daytime and after hours – to report an immediately notifiable conditions after-hours and on weekends, ask operator to page the epidemiologist on call for Communicable Disease)	206-296-4774	206-296-4803
24-Hour disease report line to leave a recorded message (ONLY for reporting **non-immediately notifiable** conditions other than HIV, STDs, and TB)	206-296-4782	
HIV/AIDS Program and Report Line (mail or call in reports only)	206-296-4645	
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
Public Health Laboratory	206-744-8950	206-744-8963

NOTIFIABLE COMMUNICABLE DISEASE CONDITIONS IN WASHINGTON STATE - 2010

Not current - notification timeframes and specimen submission requirements for health care professionals and laboratories were implemented in February 2011

For updated timeframes and requirements please visit www.kingcounty.gov/health/cd and click on "Disease reporting: what to report and how to report it"

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 – 2010, 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 2000-2010

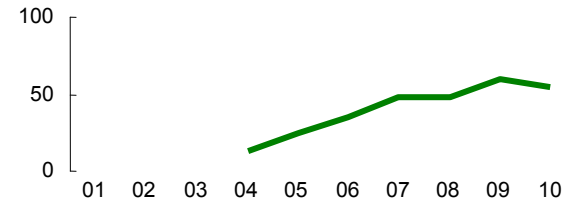
NR=Not reportable

Disease	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Animal Bites and other potential rabies exposures	NR	NR	NR	106	223	430	633	878	905	1,119	1,042
Arboviral disease	NR	NR	NR	NR	NR			8	7	9	10
Botulism, infant	1	1	0	1	0	0	0	0	0	0	0
Botulism, foodborne	0	0	0	0	0	0	0	0	0	0	0
Botulism, wound	0	0	0	0	1	0	0	1	0	1	0
Brucellosis	0	0	0	1	0	0	0	2	0	0	0
Campylobacteriosis	320	325	300	262	264	337	258	262	296	274	302
Chlamydia	4,495	4,295	4,471	5,189	5,428	5,520	5,319	5,682	5,962	5,807	5,946
Cholera	0	1	1	1	0	0	0	0	0	0	0
Cryptosporidiosis	5	29	34	38	34	69	45	46	35	31	16
Cyclosporiasis	0	5	5	1	9	5	1	1	0	0	1
Diphtheria	0	0	0	0	0	0	0	0	0	0	0
E. coli (including *E. coli* O157:H7 and other Shiga toxin-producing strains)	60	36	32	43	42	45	42	37	49	66	41
Giardiasis	229	150	171	124	126	144	117	150	114	100	130
Gonorrhea	1,222	1,556	1,462	1,349	1,286	1,769	1,987	1,409	1,294	1,084	1,570
Haemophilus influenzae invasive disease (under age 5 years)	0	0	1	2	2	2	3	2	0	1	4
Hantavirus Pulmonary Syndrome	0	0	0	1	0	0	0	1	0	0	0
Hepatitis A	98	28	32	30	14	17	17	17	16	15	7
Hepatitis B, acute	42	36	31	34	23	23	21	23	31	12	16
Hepatitis B, chronic	397	628	581	522	629	708	840	839	878	611	665
Hepatitis C, chronic	1,350	1,949	1,925	1,099	1,636	1,728	1,783	1,759	1,858	1,589	1538
Hepatitis C, acute	13	9	12	8	10	10	6	7	11	6	7
HIV/AIDS	242	320	278	653	555	568	478	404	359	344	337
Legionellosis	4	4	3	2	7	8	5	7	7	9	8
Leptospirosis	1	2	0	1	0	1	1	0	0	0	0

Disease	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Listeriosis	8	4	4	6	4	3	7	10	15	5	8
Lyme disease	3	2	6	2	10	6	2	5	2	8	4
Malaria	20	9	15	16	12	12	25	15	14	17	21
Measles	2	12	0	0	6	1	0	1	0	1	1
Meningococcal disease	17	13	21	6	18	15	11	4	5	5	7
Mumps	9	1	0	0	1	1	2	8	1	1	1
Paralytic Shellfish Poisoning	0	0	0	0	0	0	0	0	0	0	0
Pertussis	207	39	156	280	201	217	105	119	78	37	59
Psittacosis	0	0	0	0	0	0	0	0	0	0	0
Q Fever	0	0	0	0	0	0	0	1	0	0	1
Relapsing Fever	1	0	5	2	1	0	0	2	1	2	3
Rubella	2	0	2	0	0	1	0	0	0	0	1
Salmonellosis	205	260	212	243	234	218	205	241	262	250	229
Shigellosis	156	111	86	88	63	72	52	50	41	61	44
Syphilis	117	110	96	84	166	188	185	194	191	160	289
Tetanus	0	0	0	0	0	1	0	0	0	0	0
Trichinosis	1	0	0	0	0	0	0	0	0	0	0
Tuberculosis	127	139	158	155	133	127	145	161	121	130	116
Tularemia	0	0	0	1	0	1	0	0	0	1	1
Typhoid Fever	3	4	4	2	4	7	3	4	8	4	15
Vibriosis	7	5	13	7	8	8	39	11	11	20	20
Yersiniosis	20	17	12	10	15	9	10	5	5	10	7
Total	9,393	10,143	10,185	10,415	11,214	12,434	12,245	12,368	12, 572	13,799	12,467

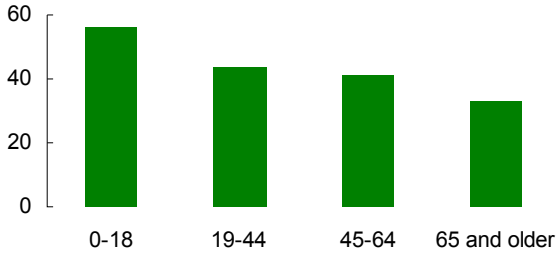
Animal Bites and Potential Rabies Exposures

rate by year (cases per 100,000)



	01	02	03	04	05	06	07	08	09	10
rate				12.5	24.0	35.0	47.8	48.6	59.4	54.6
cases			106	223	430	633	878	905	1119	1042

rate by age group (cases per 100,000) in 2010



	0-18	19-44	45-64	65 and older
rate	56.4	43.6	41.4	33.0
cases	238	332	219	73

Note: 180 cases lacked age data

In 2010, a total of 1,042 animal bites and other potential rabies exposures were reported. Of these, rabies post-exposure prophylaxis (PEP) was recommended for 89 people (9%).

Fifty-one (57%) of the 89 rabies PEP cases resulted from exposures within King County to bats (20) and raccoons (31). Seventeen (19%) occurred outside of the U.S. to animals including bats, dogs, cats, monkeys, and a raccoon.

Forty animals potentially exposed humans and were tested for rabies; none were positive. Two bats that exposed animals in King County tested positive for rabies. In Washington state, most cases of animal rabies occur in bats. However, most bats do not carry rabies, and most bats tested for rabies in Washington state are not infected.

The last identified cases of rabies in humans in Washington occurred in 1995 and 1997, both attributed to bat exposures. Prior to that, the last identified 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 ensure that potentially rabid animals are managed appropriately
- To identify animal sources of rabies and risk factors for rabies transmission

Epidemiology: Animal bites and contact with bats 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.

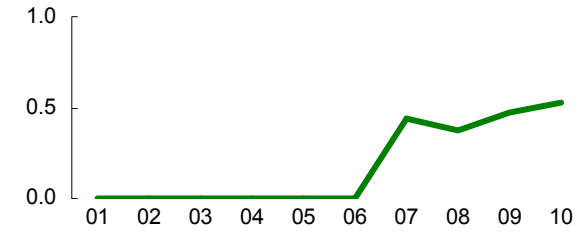
Clinical Aspects: Rabies is a viral disease of the central nervous system that is practically always fatal once symptoms begin. Signs of rabies include behavior changes, difficulty swallowing, convulsions, and paralysis. In humans, death almost always occurs within 10 days of onset of symptoms.

Prevention: Keep rabies vaccinations up to date for all dogs, cats, and ferrets. Seattle and King County regulations require that all dogs, cats and ferrets be vaccinated for rabies by 4 months of age and booster shots be kept current. 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. Safely capture any bat that is known or suspected to have bitten, scratched, or had direct contact with a person or pet, so that it can be tested for rabies (see www.kingcounty.gov/health/cd, and click on “R” to go to the rabies page, then click on “Bats and rabies”). 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.

In February of 2011, reporting requirements were changed so that only animal bites that are suspected rabies exposures are immediately notifiable.

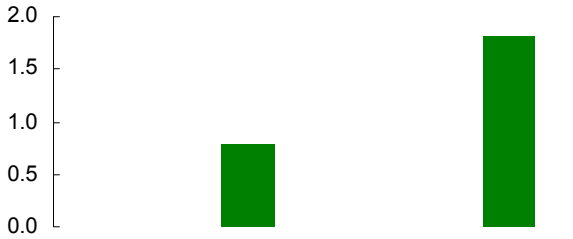
Arboviral Disease

rate by year (cases per 100,000)



	01	02	03	04	05	06	07	08	09	10
rate	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.4	0.5	0.5
cases							8	7	9	10

rate by age group (cases per 100,000) in 2010



	0-18	19-44	45-64	65 and older
rate	0.0	0.8	0.0	1.8
cases		6		4

Arboviral infections reported in 2010 included West Nile virus (WNV), dengue fever, and chikungunya.

One King County resident with neuroinvasive WNV reported in January 2010 was likely infected in Eastern Washington in the summer of 2009. No animals or birds tested positive for WNV in King County. In Central Washington, WNV was detected in two birds and 120 mosquito samples.

Eight cases of dengue fever (1 confirmed and 9 probable) were reported in 2010 in persons who had traveled to Africa, India, Mexico, and Southeast Asia during their exposure periods.

One case of chikungunya (a virus infection spread by infected mosquitoes) was reported in a person who was likely exposed during travel in Indonesia.

Purpose of Surveillance:

- To identify outbreaks and monitor trends in illness due to arboviruses, particularly 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 state. 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.

Clinical Aspects: The majority of persons infected with arboviruses are asymptomatic. Mild cases are characterized by low-grade fevers, headache, and body aches. Severe infections with certain arboviruses 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 sources of standing water outdoors that could serve as a mosquito breeding site. Measures 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.

Arbovirus infections became reportable in Washington state in 2006. The state receives fewer than 15 reports of dengue virus infections each year, with rare reports of other arboviral diseases.

Bioterrorism—Diseases of Suspected Bioterrorism Origin

Diseases of suspected bioterrorism origin have been notifiable in Washington state 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, two in 2008, three in 2009 and five in 2010. Testing was negative for bioterrorism agents in all cases.

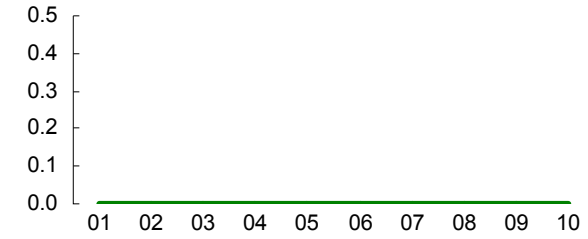
Symptoms and Clinical Findings in Diseases of Possible Bioterrorism Origin

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

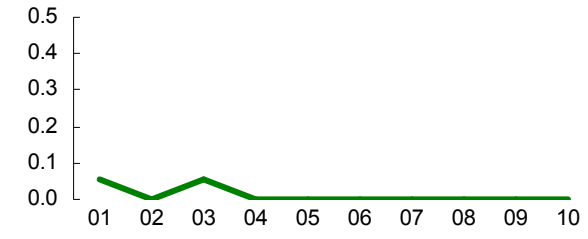
rate by year (cases per 100,000)



	01	02	03	04	05	06	07	08	09	10
rate	0.0	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	0

Infant Botulism

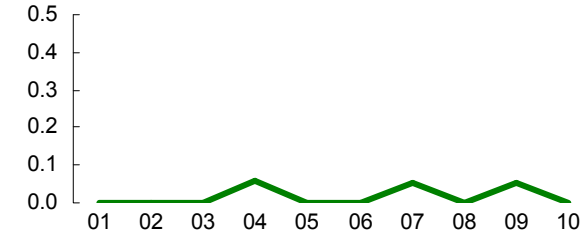
rate by year (cases per 100,000)



	01	02	03	04	05	06	07	08	09	10
rate	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
cases	1	0	1	0	0	0	0	0	0	0

Wound Botulism

rate by year (cases per 100,000)



	01	02	03	04	05	06	07	08	09	10
rate	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.1	0.0
cases	0	0	0	1	0	0	1	0	1	0

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 and 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 under 12 months old.

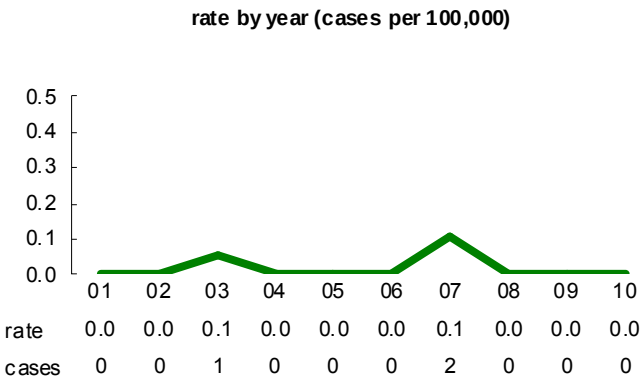
No cases of botulism were identified in 2010. Four reports were received, investigated, and determined not to be botulism. Each year King County receives 5 or fewer such reports where botulism is suspected.

The last cases of foodborne botulism reported in King County were in 1993, when three cases associated with home-canned beets occurred.

Between the years 1993 and 2003, there were eight reported cases of infant botulism, but none since. Since 1999, there have been three King County cases associated with injecting black tar heroin, all with toxin type A.

Each year in Washington state there are 0 to 4 reports of foodborne botulism, 0 to 9 reports of infant botulism and 0 to 7 reports of wound botulism.

Brucellosis



	01	02	03	04	05	06	07	08	09	10
rate	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0
cases	0	0	1	0	0	0	2	0	0	0

No cases of brucellosis were reported in 2010.

Public health received and investigated eight reports, none of these were confirmed.

Since 1994 there have been eight cases of brucellosis reported in King County. One case was reported in an African immigrant in 2003. Two cases were reported in 2007 - an infant and mother who were likely infected by consuming unpasteurized dairy products while traveling in India.

Purpose of Surveillance:

- To identify naturally occurring cases of brucellosis and common source outbreaks
- To facilitate diagnosis of suspected cases and appropriate treatment when indicated
- To identify other exposed persons requiring medical evaluation, monitoring and/or treatment
- To identify and eliminate sources of transmission
- To identify cases resulting from a bioterrorism attack

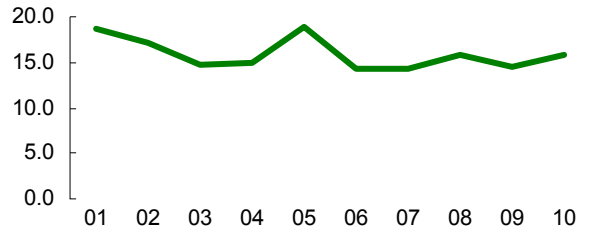
Epidemiology: Brucellosis is a bacterial infection that causes disease in mammals, especially sheep, goats, and cattle. Humans become infected by exposure to the tissues, blood, urine, vaginal discharge, aborted fetuses, and placentas of infected animals. Contaminated animal products (e.g., raw milk 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)



	01	02	03	04	05	06	07	08	09	10
rate	18.7	17.1	14.8	14.8	18.8	14.3	14.3	15.9	14.5	15.8
cases	325	300	262	264	337	258	262	296	274	302

rate by age group (cases per 100,000) in 2010

	0-18	19-44	45-64	65 and older
rate	14.2	15.6	18.0	12.7
cases	60	119	95	28

In 2010, 302 cases of campylobacteriosis were reported. Of the 136 isolates that were speciated, 130 (96%) were *Campylobacter jejuni* and six were *C. coli*. International travel during the exposure period was reported by 70 (23%) cases; travel destinations included Africa (5), Asia/South Pacific (25), Canada (1), Europe (20), Mexico (9), Middle East (2), and South/Central America (8).

Outbreaks of campylobacteriosis are rarely identified. However in King County 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. That same year saw another outbreak associated with consumption of undercooked chicken liver pâté at a restaurant, with seven confirmed cases.

Purpose of Surveillance:

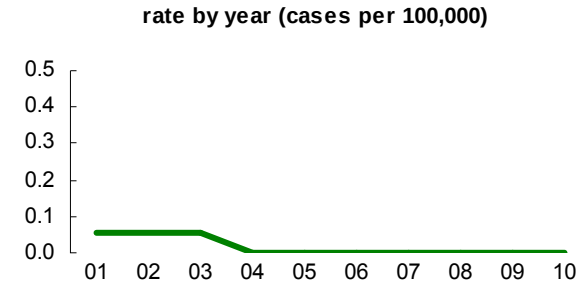
- To identify common source outbreaks
- To identify and eliminate sources of transmission including contaminated food and water

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, unpasteurized milk, or cheese. Humans can become infected after contact with infected pets, especially puppies and kittens. Campylobacteriosis is common in the developing world, so travelers to foreign countries are at higher risk of 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 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 pets.

Cholera



	01	02	03	04	05	06	07	08	09	10
rate	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
cases	1	1	1	0	0	0	0	0	0	0

No cases of toxigenic cholera were reported in 2010.

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 then.

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

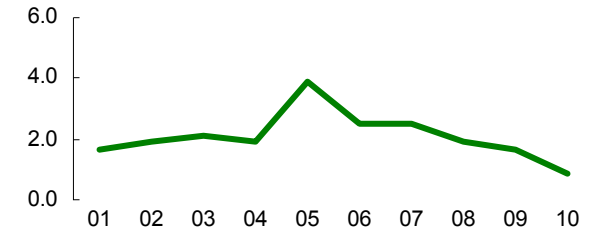
Epidemiology: Cholera is an often severe and potentially fatal diarrheal disease caused by toxin-producing strains of the bacteria *Vibrio cholerae.* It is spread by food and water that is contaminated by the feces of an infected person. The disease can spread rapidly when outbreaks occur in areas of 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 the United States and is primarily acquired during travel to Africa, Asia, or Latin America. Outbreaks have also been caused by contaminated seafood brought back to the U.S. by travelers.

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).

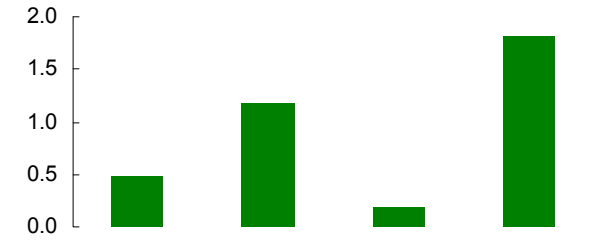
Cryptosporidiosis

rate by year (cases per 100,000)



	01	02	03	04	05	06	07	08	09	10
rate	1.7	1.9	2.1	1.9	3.9	2.5	2.5	1.9	1.6	0.8
cases	29	34	38	34	69	45	46	35	31	16

rate by age group (cases per 100,000) in 2010



	0-18	19-44	45-64	65 and older
rate	0.5	1.2	0.2	1.8
cases	2	9	1	4

Sixteen cases of cryptosporidiosis were confirmed in 2010. There were 36 reports that did not meet case definition for a confirmed case. To count as confirmed, a person must have a positive laboratory test as well as a clinically compatible illness.

Two cases reported international travel during their exposure period, one to Central America and one to Asia.

Cryptosporidiosis has been reportable in Washington state since December 2000. Since that time, no large common-source outbreaks have been identified.

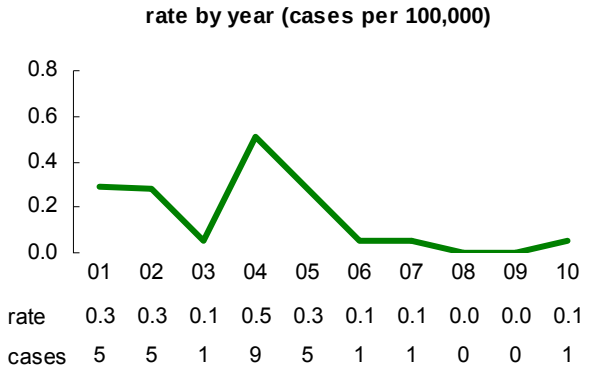
Purpose of Surveillance:
- To identify outbreaks
- To identify and eliminate sources of transmission including contaminated food and water

Epidemiology: Cryptosporidiosis is an intestinal parasitic infection caused by ingestion of *Cryptosporidium parvum* cysts (hardy, resistant 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 cysts are 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 warm, 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



One case of cyclosporiasis was reported in 2010. The case may have been exposed in Europe, as he reported frequently eating salads during his trip, and returned to the U.S. just a few days before the usual incubation period for cyclosporiasis.

Cyclosporiasis has been reportable in Washington state since December 2000. One to five cases are typically reported each year.

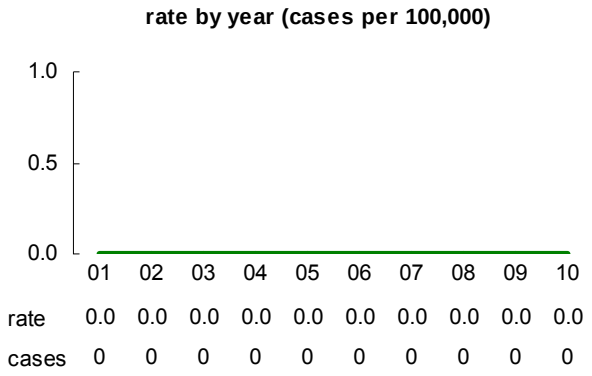
Purpose of Surveillance:
- To identify common source outbreaks
- To identify and eliminate sources of transmission including contaminated food or water

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



	01	02	03	04	05	06	07	08	09	10
rate	0.0	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	0

No cases of toxigenic diphtheria have been reported in Washington state since 1981.

Purpose of Surveillance:

- To facilitate diagnosis of toxin-producing 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

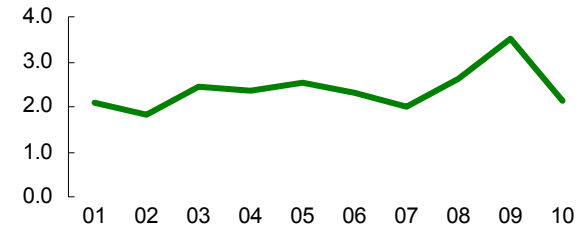
Epidemiology: Diphtheria is an acute, toxin-mediated and vaccine-preventable disease caused by infection with *Corynebacterium diphtheriae.* It is primarily spread by contact with an infected person. Less often, it is spread by contact with articles soiled with the discharge from skin lesions of infected 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 for children and Tdap or Td for adolescents and adults is the best means of prevention. All international travelers, regardless of age or destination, should ensure that they are up to date with all recommended vaccinations.

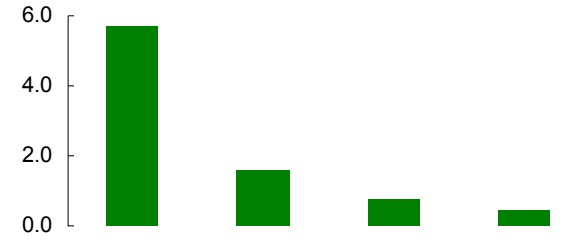
E. coli O157:H7 And Other Shiga Toxin-Producing Strains

rate by year (cases per 100,000)



	01	02	03	04	05	06	07	08	09	10
rate	2.1	1.8	2.4	2.4	2.5	2.3	2.0	2.6	3.5	2.1
cases	36	32	43	42	45	42	37	49	66	41

rate by age group (cases per 100,000) in 2010



	0-18	19-44	45-64	65 and older
rate	5.7	1.6	0.8	0.5
cases	24	12	4	1

Purpose of Surveillance:

- To identify outbreaks
- To facilitate prompt and accurate diagnosis of cases
- To identify other exposed persons requiring medical evaluation or monitoring and/or treatment
- 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 Shiga toxin-producing *Escherichia coli* (STEC). 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 day-care centers, and long-term care facilities. Large multi-state outbreaks involving commercially distributed food products including beef, produce and cheese have occurred in recent years.

Clinical Aspects: *E. coli* O157:H7 and other STEC 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.

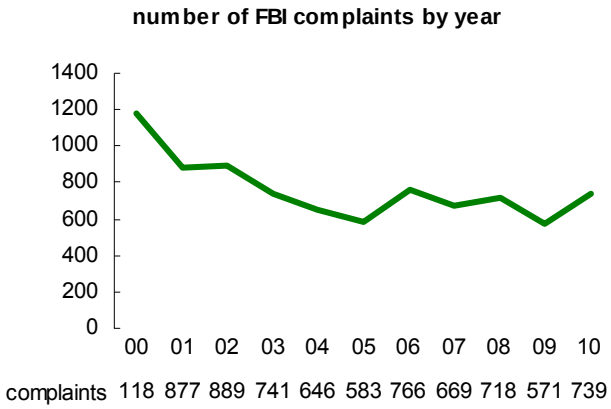
Forty-one cases of Shiga toxin-producing *Escherichia coli* (STEC) were reported in 2010. Twenty-seven (66%) cases were *E. coli* O157, and 14 (34%) were non-O157 strains of STEC. One child with *E. coli* O157 was infected by drinking raw milk. Twelve patients were hospitalized; three patients had hemolytic-uremic syndrome (HUS). Five cases (12%) reported international travel in their exposure period.

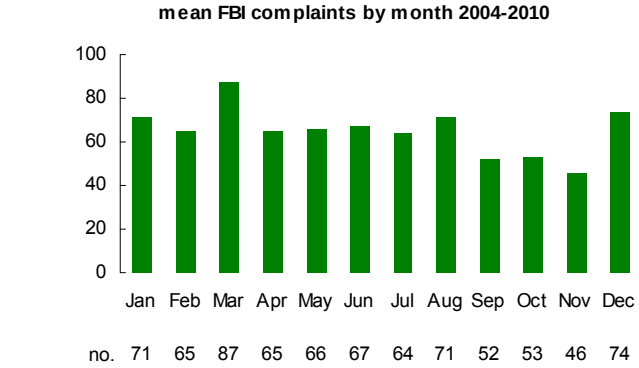
Pulsed-field gel electrophoresis testing of isolates identified a cluster of three King County cases of *E. coli* O157 and five additional cases from Minnesota (2), Oregon (1), Vermont (1), and another county in Washington (1). Seven of these cases reported consuming artisanal cheese. The Washington creamery producing the suspected cheese recalled the product after laboratory testing linked a strain of STEC in found in the cheese to the cases.

In 2006, two people from Washington state, including one from King County, were infected after drinking unpasteurized cow's milk produced at a Washington dairy. In 1993, a large outbreak in Washington, Idaho, California, and Nevada linked to a fast-food hamburger chain sickened more than 500 people including four deaths.

In February 2011, reporting requirements were updated: the condition "Enterohemorrhagic *E. coli*" was renamed STEC and HUS was deleted as a separate condition.

Foodborne Illness





Purpose of Surveillance:
- To identify outbreaks
- To identify and eliminate sources of transmission including contaminated food and water
- To identify unsafe food preparation and handling practices, particularly in commercial food establishments

Epidemiology: Foodborne illnesses (FBIs) are caused by eating food contaminated with:
- pathogenic bacteria, viruses or parasites (e.g., *Salmonella*, *E. coli* 0157:H7, norovirus, hepatitis A, *Cyclospora*)
- toxins produced by bacteria (e.g., *Staph aureus*, *Bacillus cereus, Clostridium perfringens*, botulism)
- naturally occurring toxins (e.g., poisonous mushrooms, fish and shellfish toxins), or
- chemical poisons (e.g. detergents, pesticides, metals)

Foodborne illness 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 diarrhea and/or vomiting (bacteria, viruses, parasites)
- Neurologic illness (botulism, paralytic shellfish poisoning, mushroom poisoning)
- Systemic illness (listeriosis, typhoid fever, hepatitis A)

Prevention: Proper food handling procedures are key to preventing most foodborne illnesses. These measures include frequent handwashing, cooking and storing foods at correct temperatures, cooling foods appropriately, and preventing cross-contamination.

Public Health received 739 foodborne illness (FBI) complaints in 2010. Of these, 94 (13%) resulted in an inspection of the food service establishment by Public Health's Environmental Health Division, and 61 (8%) were categorized as probable or confirmed complaints, representing 53 unique outbreaks. To count as a probable outbreak, there must either be evidence of food handling violations during an environmental investigation or strong epidemiologic evidence of an outbreak linked to the food source. In addition to meeting the definition for a probable outbreak, confirmed outbreaks must also have laboratory confirmation of the suspected pathogen.

The most common cause of foodborne illness is norovirus, which causes the sudden onset of diarrhea and vomiting and resolves within 24 to 72 hours.

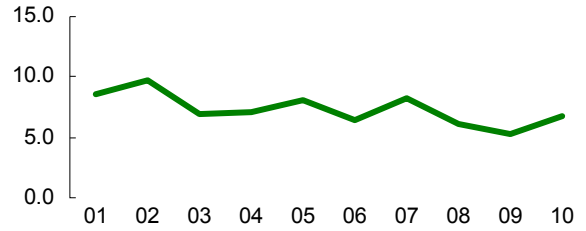
Notable FBI investigations in 2010 included a catered banquet at which at least 60 attendees became ill from norovirus. In another outbreak, norovirus sickened at least 15 people who consumed food sold from a truck. In both of these clusters of illness, ill foodworkers and improper food handling procedures were implicated.

There were two probable cases of scombroid poisoning, an illness caused by the build-up of histamine in the meat of fish. Symptoms include flushing, dizziness, headache, palpitations, and mouth numbness and tingling.

Nineteen of the 61 confirmed and probable FBI reports were parties where one or more persons tested positive for *Vibrio parahaemolyticus*, a bacterial infection most commonly acquired from eating contaminated raw shellfish.

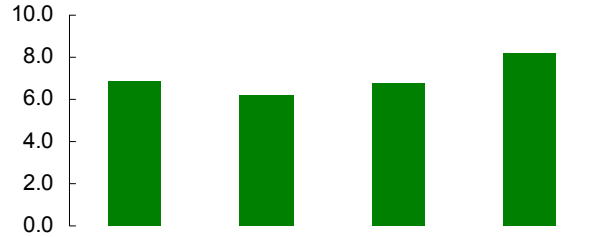
Giardiasis

rate by year (cases per 100,000)



	01	02	03	04	05	06	07	08	09	10
rate	8.6	9.7	7.0	7.1	8.1	6.5	8.2	6.1	5.3	6.8
cases	150	171	124	126	144	117	150	114	100	130

rate by age group (cases per 100,000) in 2010



	0-18	19-44	45-64	65 and older
rate	6.9	6.2	6.8	8.1
cases	29	47	36	18

In 2010, 130 cases of giardiasis were reported.

Twenty-seven (21%) cases occurred among international travelers. South and Central America were the most common travel destinations with eight cases, followed by Africa (7), Mexico (6), Asia(5) and the Middle East (1).

Each year 400 to 700 cases are reported statewide.

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

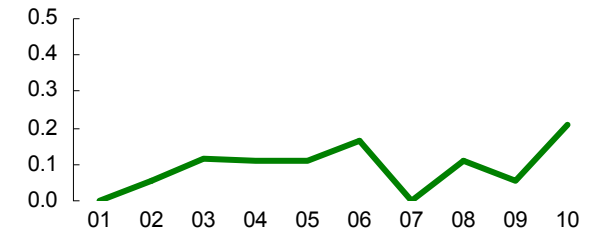
Epidemiology: *Giardia lamblia* is a flagellate protozoan widely found in nature. It is transmitted by ingesting food or water contaminated with the feces of infected humans and other mammals, especially beavers, puppies, and cats. Fecal-oral transmission can occur in child-care centers, households, and during sexual contact. Child-care 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)



	01	02	03	04	05	06	07	08	09	10
rate	0.0	0.1	0.1	0.1	0.1	0.2	0.0	0.1	0.1	0.2
cases	0	1	2	2	2	3	0	2	1	4

rate by age group (cases per 100,000) in 2010

	0-18	19-44	45-64	65 and older
rate	0.9	0.0	0.0	0.0
cases	4			

Four cases of invasive disease due to *Haemophilus influenzae* were reported in 2010, none were type b. Three of the four children required hospitalization, and all four recovered.

Statewide, four to 13 cases are reported each year in children less than five years of age.

Purpose of Surveillance:

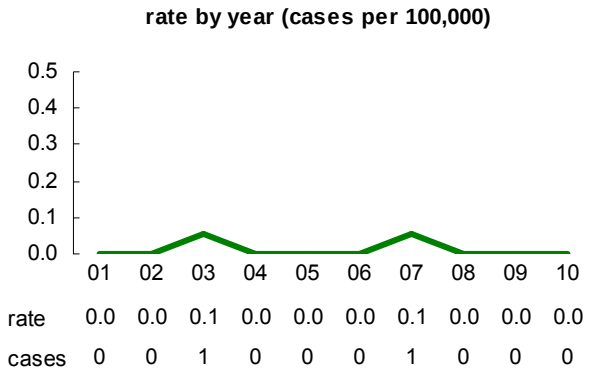
- To facilitate prompt and accurate diagnosis of cases of *Haemophilus influenzae* serotype b (Hib) disease for investigation
- To identify contacts of persons with *Haemophilus influenzae* serotype b (Hib) infection, and ensure administration of appropriate post-exposure prophylaxis
- To monitor the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

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 2010.

Since 1997, four cases of HPS have been reported in King County; three cases occurred in adult males and one in an adult female. Three cases were most likely exposed in Eastern or Central Washington and one in Idaho. No deaths have occurred since 1997 when one fatal case occurred.

Washington state sees one to five cases of HPS reported each year, usually from the eastern parts of the state.

Purpose of Surveillance:

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

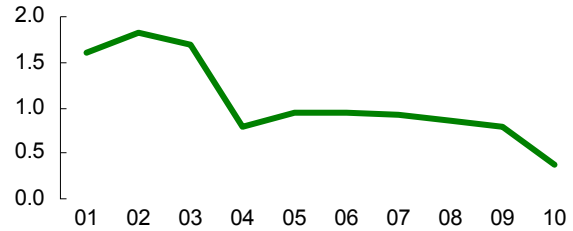
Epidemiology: Hantavirus pulmonary syndrome (HPS) was first reported in the United States in the Southwest in 1993. The *Sin Nombre* virus is the main cause of HPS reported in the U.S., but other hantaviruses cause similar diseases in other countries. In the U.S., the deer mouse is the main reservoir 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. Store pet food in rodent-proof containers. Tightly cover outdoor garbage cans and raise them 12 inches off the ground. Take precautions when entering or cleaning rodent-infested areas including seasonal cabins.

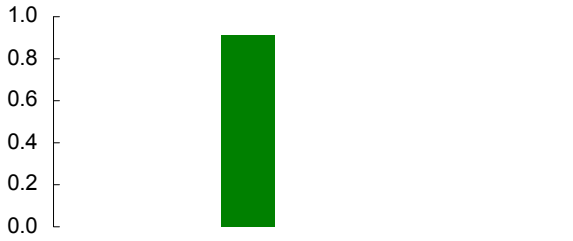
Hepatitis A

rate by year (cases per 100,000)



	01	02	03	04	05	06	07	08	09	10
rate	1.6	1.8	1.7	0.8	1.0	0.9	0.9	0.9	0.8	0.4
cases	28	32	30	14	17	17	17	16	15	7

rate by age group (cases per 100,000) in 2010



	0-18	19-44	45-64	65 and older
rate	0.0	0.9	0.0	0.0
cases		7		

Seven cases of hepatitis A were reported in 2010, all in adults. Five cases (71%) were associated with international travel to Asia (1), Mexico (2), and South America (2).

One case occurred in a food worker who worked while infectious. Public Health provided post-exposure prophylaxis to susceptible food worker contacts at the restaurant and conducted surveillance for secondary cases; none were detected.

An additional 31 reports were received and investigated, and determined not to be cases. Prior to the introduction of hepatitis A vaccine in 1995, hundreds of cases occurred every year in King County with cyclical peaks occurring approximately every five years. Since the introduction of hepatitis A vaccine in 1995, cases have progressively declined nationally and locally.

Purpose of Surveillance:

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

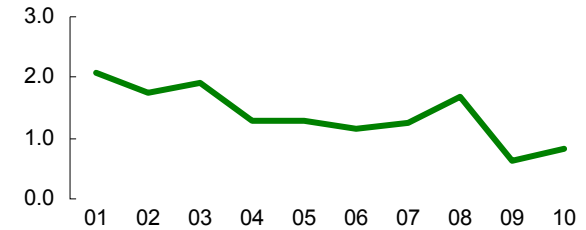
Epidemiology: Hepatitis A virus (HAV) infects the liver. It is primarily acquired via the fecal-oral route, either through person-to-person contact or by ingestion of fecally-contaminated food or water. Before routine childhood vaccination against hepatitis A, infection was common among children. Today adults account for the majority of cases. Most cases occur through consumption of contaminated food during travel. Hepatitis A has also been linked to sexual activity among men who have sex with men when oral contact with stool-contaminated skin occurs and to illicit drug use. 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, 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)

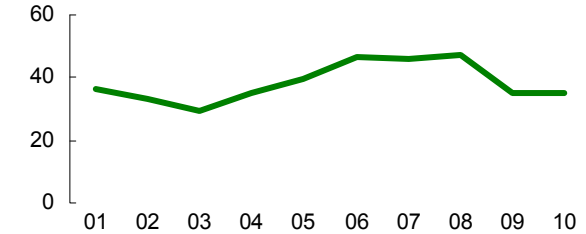


	01	02	03	04	05	06	07	08	09	10
rate	2.1	1.8	1.9	1.3	1.3	1.2	1.3	1.7	0.6	0.8
cases	36	31	34	23	23	21	23	31	12	16

Sixteen cases of acute hepatitis B virus (HBV) infection were reported in 2010: 13 cases in adults, and three cases of perinatal hepatitis B in infants born to infected women. Of the adult cases, the majority were men (85%), and eight (62%) cases were suspected to have been exposed to hepatitis B through either sexual activity or injection drug use.

Chronic Hepatitis B

rate by year (cases per 100,000)



	01	02	03	04	05	06	07	08	09	10
rate	36	33	29	35	40	46	46	47	35	35
cases	628	581	522	629	708	840	839	878	666	665

Six hundred sixty-five cases of chronic hepatitis B were reported in 2010. Roughly half (53%) were in men. Thirty-two percent (99/312) of the female cases were pregnant and were enrolled in the Perinatal Hepatitis B Prevention Program. The program's goal is to prevent hepatitis B in infants born to infected women by ensuring these infants receive appropriate preventive treatment.

Since chronic HBV infection became reportable in Washington state in December 2000, the number of Reports in King County has ranged from 400 to 878 each 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 as well as 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 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.

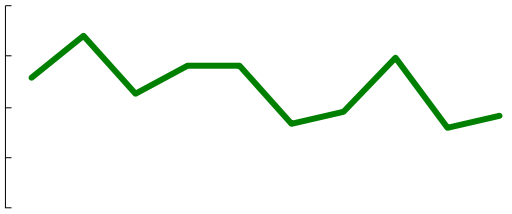
Clinical Aspects: The incubation period is six weeks to six months. Symptoms of acute HBV infection range from no symptoms to severe illness, and may include abdominal pain, loss of appetite, nausea, vomiting, and jaundice. Many infections go undetected; most infected infants and children, and up to 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 beginning with at birth. 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)

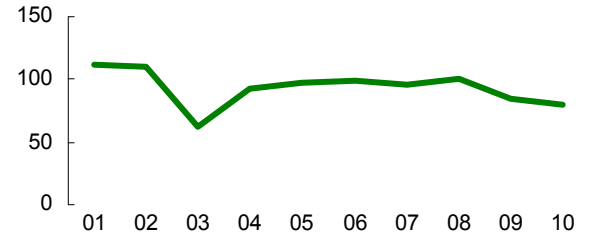


	01	02	03	04	05	06	07	08	09	10
rate	0.5	0.7	0.5	0.6	0.6	0.3	0.4	0.6	0.3	0.4
cases	9	12	8	10	10	6	7	11	6	7

Seven acute cases of hepatitis C virus (HCV) infection were reported in King County in 2010. Three (43%) occurred in men, and five of the seven (71%) either reported or had laboratory evidence of past or present injection drug use.

Chronic Hepatitis C

rate by year (cases per 100,000)



	01	02	03	04	05	06	07	08	09	10
rate	112	109	62	92	97	99	96	100	84	81
cases	1949	1925	1099	1636	1728	1783	1759	1858	1589	1538

In 2010, 1,538 chronic hepatitis C cases were reported.

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 12 new cases per year). Because of the long delay between infection and development of symptoms leading to diagnosis, reports of chronic HCV cases are expected to remain high.

Purpose of Surveillance:

- To identify risk factors for 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 to guide prevention activities and HCV-related services

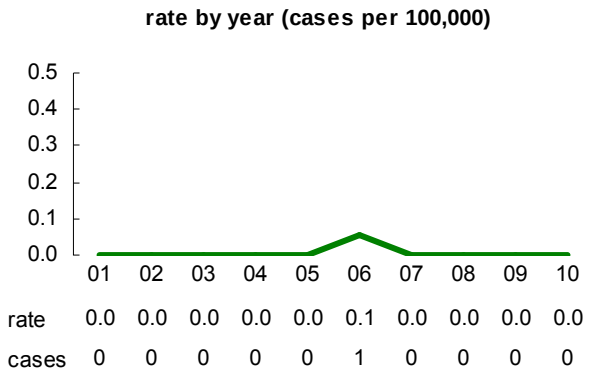
Epidemiology: HCV infects the liver and is transmitted primarily by direct exposure to the blood of an infected person. Before HCV screening was introduced in 1992, blood and blood-product transfusions accounted for a large proportion of infections. Today, most infections are associated with injection 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 HCV.

In recent years Washington state has reported 5,000 to 6,000 cases of chronic HCV annually.

Hepatitis E



No cases of hepatitis E were reported in 2010.

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

Purpose of Surveillance:

- To identify persons exposed to infectious cases 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 who have not traveled.

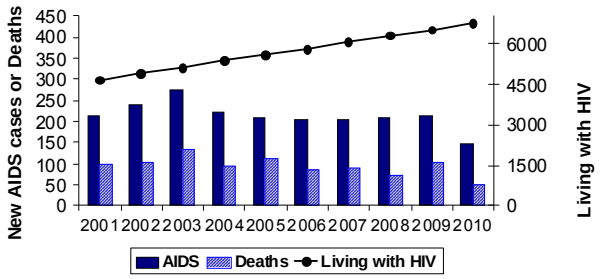
Clinical Aspects: HEV causes an illness similar to hepatitis A virus (HAV) infection. The illness is acute and self-limited, without a chronic state. HEV infection is characterized by an abrupt onset of fever, malaise, nausea, vomiting, and abdominal pain. Jaundice follows within a few days. The spectrum 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 without jaundice. 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

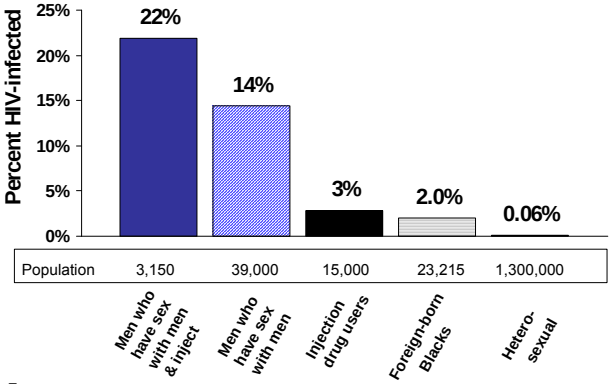
AIDS, Deaths and Number Living with HIV

King County, 2001-2010, data as of March 31, 2011



King Co. Residents Living with HIV/AIDS

Estimated percent infected by mode of exposure
(population with each exposure)



In 2010, 337 Human Immunodeficiency Virus (HIV) cases, 140 Acquired Immune Deficiency Syndrome (AIDS) cases, and 121 deaths were reported.

In recent years (2005-10), approximately 330 King County residents have been diagnosed with HIV annually, a decrease from 350-400 per year in the few years prior. An estimated 7,200 to 8,000 (0.4%) King County residents live with HIV or AIDS, including 6,749 cases diagnosed through the end of 2010. Estimates are that 11,500 to 12,700 people in Washington state are currently infected with HIV.

HIV infection rates are highest in men who have sex with men (MSM). An estimated 14% of all MSM are infected, while 22% of MSM who inject drugs may be infected. About 3% of injection drug users are infected.

The annual rate of new HIV diagnoses (average 2008-2010) per 100,000 population among demographically defined groups is highest among foreign-born Blacks (99.9), and similar among U.S.-born Blacks (29.8) and Hispanics (36.1). Rates are lowest among Whites (13.1), Asians (6.8), and Native Americans (10.4).

Purpose of Surveillance:

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

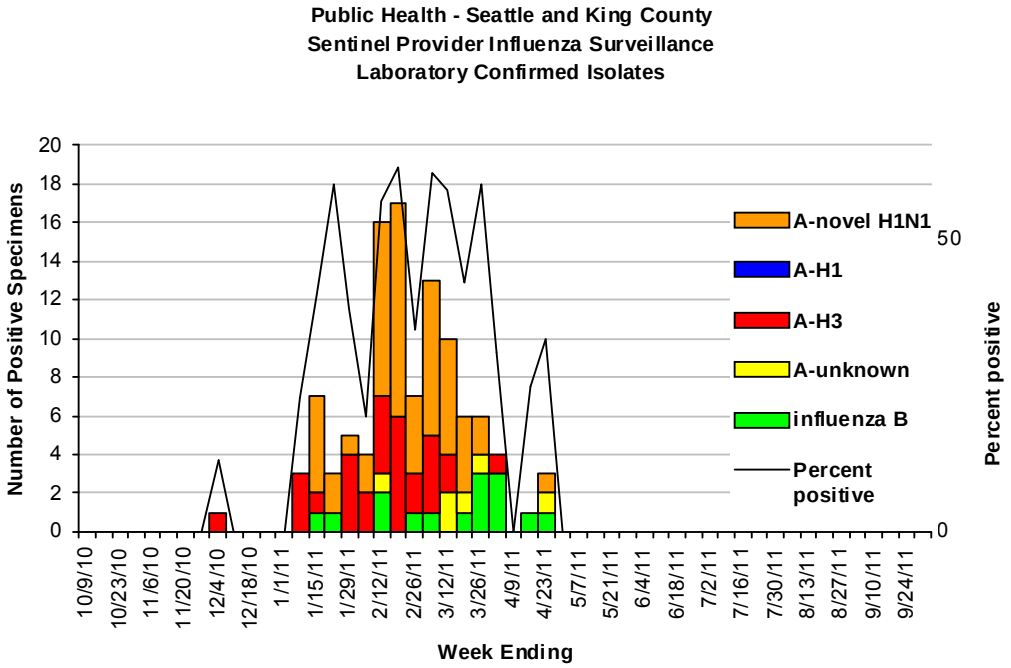
Epidemiology: In King County, HIV is transmitted primarily through sexual exposure (90-95% of cases) or sharing of injection drug use equipment (5-9%). Three-quarters of sexual transmission is among men who have sex with men (MSM). HIV infection may be diagnosed weeks, months, or years after infection occurs. One quarter of cases are first diagnosed with HIV within 12 months of becoming infected, while one-third are not diagnosed until late in the course of HIV disease after CD4 cell levels have dropped substantially.

Clinical aspects: If untreated, HIV infection attacks the CD4 cells of the immune system. Severe immune deficiency, or AIDS, occurs on average 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 recommends that everyone aged 13-64 years test for HIV at least once in their life, and that persons at high-risk test every 3-12 months.

Prevention: Knowledge of HIV status, early diagnosis and treatment, consistent and correct use of condoms, and not sharing drug injection equipment as promoted by needle exchange programs all can dramatically reduce new infections among high-risk individuals. 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 2002-2010, 59% of new HIV diagnoses in Washington state occurred among residents of King County, which has only 29% of the state population.

Influenza



After the 2009-10 H1N1 pandemic outbreak, influenza activity during the 2010-2011 season was at levels typically seen in past seasons, with circulation of 2009 influenza A (H1N1), influenza A (H3) and influenza B.

The emergency order mandating reporting of lab confirmed influenza hospitalizations expired on May 15, 2010. Lab-confirmed influenza deaths continued to be notifiable to Public Health, as were intensive care unit admissions for pregnant women.

From January 1, 2010 to May 15, 2010, 13 lab-confirmed influenza hospitalizations were reported. There was one laboratory-confirmed influenza death reported in 2010. No reports of critically ill pregnant women with lab-confirmed influenza were received in 2010.

Other components of King County's influenza surveillance system include the reporting of outbreaks of influenza like illness in institutional settings, sentinel surveillance clinics' testing of patients for influenza and other respiratory viruses, monitoring of clinical laboratory rapid antigen testing, analyzing school absenteeism data, and tracking death certificates with pneumonia or influenza listed as a cause of death.

For more information see the Public Health - Seattle & King County influenza surveillance page www.kingcounty.gov/health/flu.

Purpose of Surveillance

- To detect the emergence of novel influenza
- To monitor influenza activity in the community
- To identify clusters of severe illness and outbreaks of influenza in institutional settings

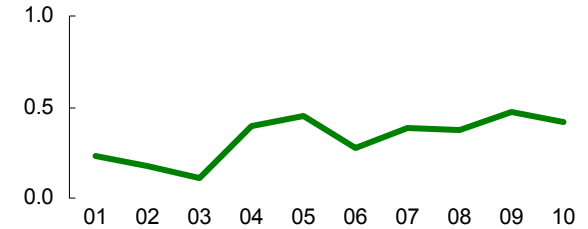
Epidemiology: The influenza virus is spread person to person via respiratory droplets. Infected individuals shed virus one day before onset of symptoms and five to ten days after. Children and immune-compromised individuals can be infectious even longer.

Clinical Aspects: The incubation period is usually one to four days but can be as long as seven days. Influenza symptoms include the abrupt onset of fever, sore throat, runny or stuffy nose, body aches, headache, chills and fatigue. Influenza is often diagnosed clinically. Laboratory confirmation is done via rapid testing, virus culture, or tests for viral DNA. Individuals with severe illness or those with predisposing conditions may benefit from prompt antiviral therapy. When treatment is indicated, it should be started empirically, without waiting for laboratory confirmation of infection.

Prevention: Vaccination is the most important tool for prevention. Additionally, handwashing, cough etiquette and staying home when ill can reduce transmission. Prophylactic antiviral medication may be useful in preventing illness in high risk individuals, as well as for controlling outbreaks in institutional settings.

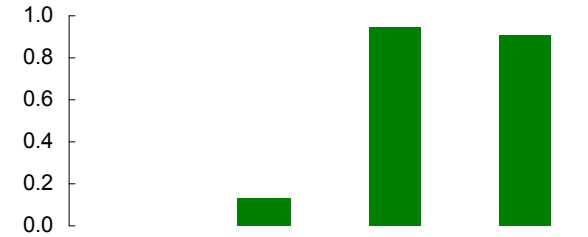
Legionellosis

rate by year (cases per 100,000)



	01	02	03	04	05	06	07	08	09	10
rate	0.2	0.2	0.1	0.4	0.4	0.3	0.4	0.4	0.5	0.4
cases	4	3	2	7	8	5	7	7	9	8

rate by age group (cases per 100,000) in 2010



	0-18	19-44	45-64	65 and older
rate	0.0	0.1	0.9	0.9
cases		1	5	2

Eight cases of legionellosis were reported in 2010, all from *L. pneumophila.* The cases ranged from 22 to 66 years of age, all were hospitalized, and one death was reported.

Among the eight cases, four were likely exposed in King County, and two were likely exposed outside King County (one in Mexico, one in the U.S.). Two other cases spent time in both King County and other parts of the U.S. during their exposure periods.

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

Washington State receives as many as 30 reports of legionellosis a year, with one to four deaths.

Purpose of Surveillance:

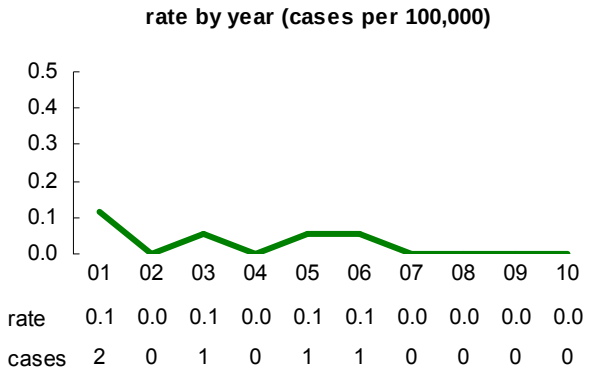
- To identify common source outbreaks and nosocomial cases
- To identify and eliminate preventable sources of transmission

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 and hospital-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



No cases of leptospirosis were reported in 2010.

Most 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. In 2010 there were 18 confirmed cases of leptospirosis in dogs in King County.

Washington State reports fewer than 5 cases of human leptospirosis each year.

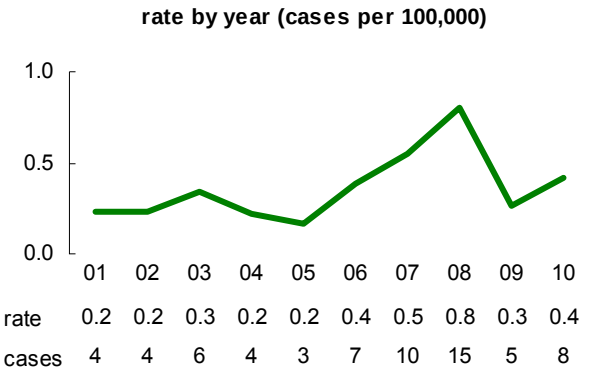
Purpose of Surveillance:
- To identify common source outbreaks
- To identify and eliminate preventable sources of transmission

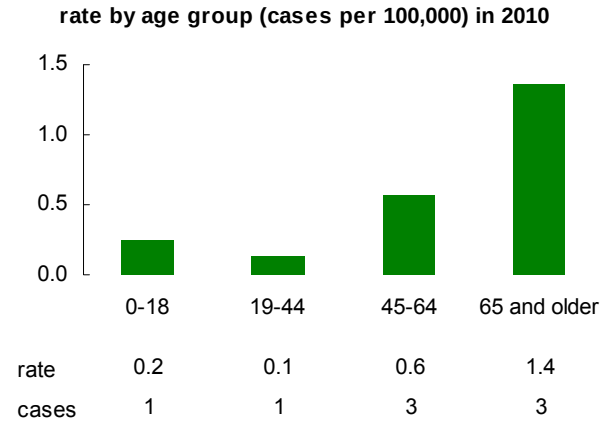
Epidemiology: Leptospirosis is a zoonotic disease caused by the bacteria *Leptospira interrogans*. Leptospirosis occurs worldwide, and is more common in temperate and tropical areas. Approximately 100 to 200 cases are identified annually in the U.S., of which half are reported in Hawaii. Some wild and 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 travel. 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





In 2010, eight cases of listeriosis were reported in King County. All eight cases were hospitalized, with one fatality in an elderly male.

Two cases were exposed while staying at a King County Hospital. One pregnant woman developed listeriosis after consuming commercially prepared pasteurized *queso fresco*; the product tested positive for *Listeria monocytogenes*, resulting in a multi-state recall. Her infant was not infected. Another case was part of a cluster of four PFGE-matched cases occurring in 2008 and 2010 linked to a King County sushi restaurant, where *Listeria monocytogenes* was isolated from a bamboo rolling mat.

Most listeriosis cases occur among the elderly, persons with weakened immune systems, and pregnant women.

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.

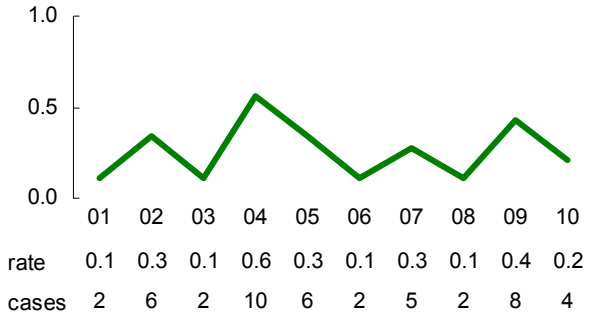
Clinical Aspects: The median incubation period is three weeks (with a range of three to 70 days). Listeriosis can cause fever, muscle aches, nausea, vomiting and diarrhea. It also can cause infections with no symptoms or very mild symptoms. *Listeria* can infect the bloodstream and brain as well as the 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.

An average of six cases per year are 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.

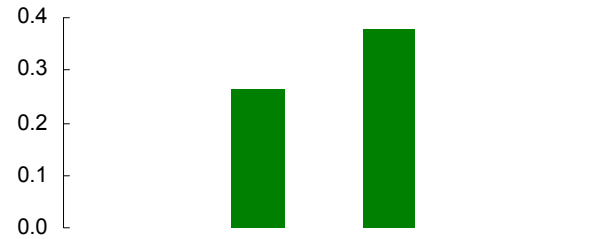
Lyme Disease

rate by year (cases per 100,000)



	01	02	03	04	05	06	07	08	09	10
rate	0.1	0.3	0.1	0.6	0.3	0.1	0.3	0.1	0.4	0.2
cases	2	6	2	10	6	2	5	2	8	4

rate by age group (cases per 100,000) in 2010



	0-18	19-44	45-64	65 and older
rate	0.0	0.3	0.4	0.0
cases		2	2	

Four cases of Lyme disease were reported in 2010. All had exposures in Lyme endemic areas outside of Washington state. Three had traveled to endemic areas on the East Coast of the United States, and one had traveled to Sweden.

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 as well as their deer and rodent hosts are located.

Statewide fewer than 20 cases of Lyme disease are reported each year, and most are exposed outside Washington state.

Purpose of Surveillance:

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

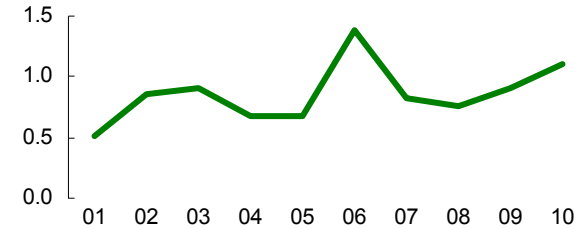
Epidemiology: Lyme disease is caused by the bacteria *Borrelia burgdorferi*, which is transmitted by the bite of infected *Ixodes* ticks. In the U.S., Lyme disease is common in the northeastern states, Atlantic coastal states, and the upper Midwest. Infections occur most often in late spring and summer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

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 called erythema migrans that slowly expands in diameter. 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 infection to occur.

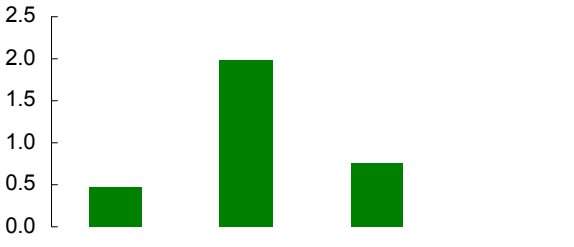
Malaria

rate by year (cases per 100,000)



	01	02	03	04	05	06	07	08	09	10
rate	0.5	0.9	0.9	0.7	0.7	1.4	0.8	0.8	0.9	1.1
cases	9	15	16	12	12	25	15	14	17	21

rate by age group (cases per 100,000) in 2010



	0-18	19-44	45-64	65 and older
rate	0.5	2.0	0.8	0.0
cases	2	15	4	

Twenty-one cases of malaria were reported in 2010. Eighteen occurred among international travelers, and three were recent immigrants or refugees to the United States. Thirteen cases were exposed in Africa, seven in Asia, and one in Central America.

Ten (48%) cases were due to *Plasmodium falciparum* and seven (33%) were *P. vivax.* The species of *Plasmodium* was not determined in four cases (19%). Thirteen (62%) of the cases were hospitalized; none died. A cluster of three malaria cases was identified among college students who had visited India as part of a study abroad program.

Seven of the 21 cases (33%) reported taking prophylaxis. However, some of these persons reported problems with appropriate administration of prophylaxis, including missing doses and incomplete courses of prophylaxis.

Purpose of Surveillance:

- To identify risk factors for malaria among King County residents
- To guide malaria prevention measures for travelers to malaria-endemic regions
- To identify areas of malaria transmission

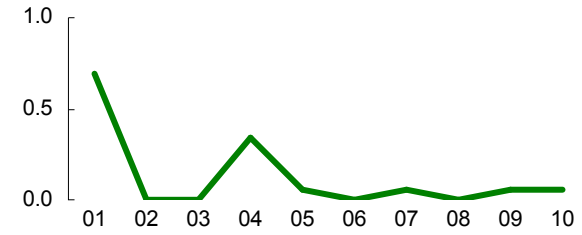
Epidemiology: Malaria is a serious infection caused by a parasite of the genus *Plasmodium*, of which there are four species: *malariae, vivax, ovale*, and *falciparum*. The parasite is transmitted to humans in warmer climates through the bite of infected *Anopheles* mosquitoes. Untreated *P. falciparum* malaria has a high mortality rate. Hundreds of millions of 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 or longer. Symptoms of malaria include malaise, anorexia, chills, sweats, fever, and headache. The illness 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 to an area with malaria, see a health care provider to discuss prevention methods. These include mosquito repellents, protective clothing, preventive medications, and taking precautions at dusk and dawn when mosquitoes are most active.

Measles

rate by year (cases per 100,000)



	01	02	03	04	05	06	07	08	09	10
rate	0.7	0.0	0.0	0.3	0.1	0.0	0.1	0.0	0.1	0.1
cases	12	0	0	6	1	0	1	0	1	1

rate by age group (cases per 100,000) in 2010

	0-18	19-44	45-64	65 and older
rate	0.2	0.0	0.0	0.0
cases	1			

One case of measles was reported in King County in 2010. The case was a child who was recently adopted from India and was infected before arriving in the US. Over 100 King County residents were identified as potentially exposed to measles by the child in public venues.

A Canadian resident also potentially exposed many King County residents to measles when she visited the area while contagious. In separate incidents there were five King County residents identified as contacts of non-King County measles cases.

In recent years, measles in King County has been imported from other countries. One woman in 2009 was infected while traveling in India. An unvaccinated child in 2007 was also exposed in India. In 2004, there was a cluster of six cases of measles in toddlers adopted from orphanages in China, 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.

Washington state typically has fewer than ten cases reported each year.

Purpose of Surveillance:

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

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.

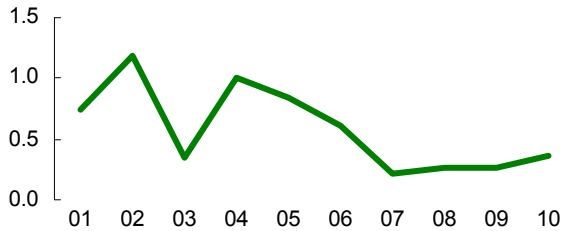
Clinical Aspects: Measles is an acute viral respiratory illness that is accompanied by a characteristic rash. Symptoms begin with fever, coryza, conjunctivitis, and cough. After two to four days the rash begins on the face and spreads downward to the rest of the body. The rash usually lasts four to seven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

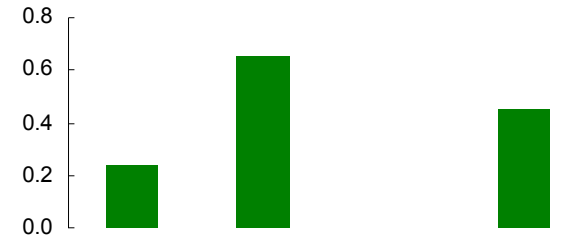
Meningococcal Disease

rate by year (cases per 100,000)



	01	02	03	04	05	06	07	08	09	10
rate	0.7	1.2	0.3	1.0	0.8	0.6	0.2	0.3	0.3	0.4
cases	13	21	6	18	15	11	4	5	5	7

rate by age group (cases per 100,000) in 2010

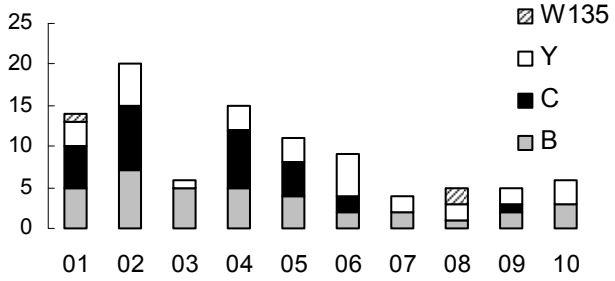


	0-18	19-44	45-64	65 and older
rate	0.2	0.7	0.0	0.5
cases	1	5		1

Seven cases of laboratory-confirmed invasive meningococcal disease were reported in 2010, including five cases of bacteremia, one meningitis, and one pneumonia. The cases ranged from 16 years to 75 years of age. Five cases were hospitalized; two were seen in emergency departments and discharged; one case died.

Three of the isolates were serotype B, which is not covered by meningococcal vaccination, three were serotype Y, and one was not typed. Serogroups B and Y have been the predominant serogroup reported in recent years, accounting for 80% of the 30 cases reported from 2006 through 2010 for which serogroup data is available.

meningococcal cases by year and serotype



Purpose of Surveillance:

- To identify, and monitor trends in incidence of, specific serogroups of *N. meningiditis* causing invasive disease in King County
- To identify outbreaks and implement appropriate disease control measures including vaccination
- To identify exposed persons for post-exposure prophylaxis to prevent infection

Epidemiology: Meningococcal disease is caused by certain serogroups (primarily B, C and Y in the US) of the bacterium *Neisseria meningitidis*. The bacteria is present in the nose and throat and spreads by direct contact with saliva and respiratory droplets of infected persons through 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 a crowded setting (such as a freshman college dormitory or military barracks).

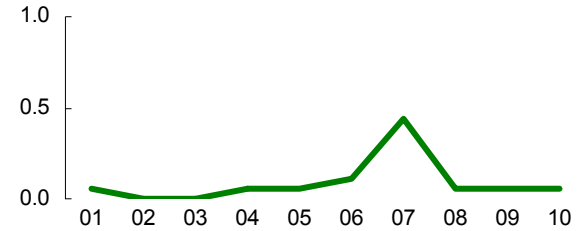
Clinical Aspects: Meningitis is characterized by sudden onset of fever accompanied by severe headache, nausea, vomiting, stiff neck, and often a petechial rash. Meningococcal bloodstream infection or sepsis (meningococcemia) is characterized by abrupt onset of fever and a petechial or purpuric rash, often associated with low blood pressure, shock, and multi-system 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: Meningococcal vaccination protects against serogroups A, C, Y and W-135 and 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. There is currently no vaccine for serogroup B disease.

Over the past 10 years there has been a decline in cases of serogroup C, which is covered by meningococcal vaccine. Of the cases reported from 2006 through 2010, 10% were serogroup C compared to 34% of the 66 cases reported from 2001-2005. In recent years, 40 to 80 cases of meningococcal disease have been reported annually in Washington state.

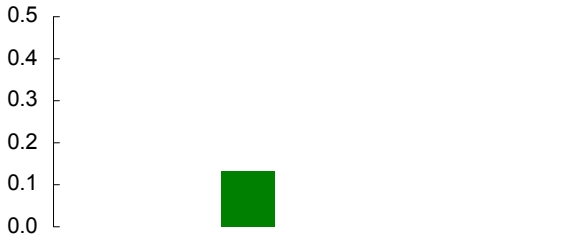
Mumps

rate by year (cases per 100,000)



	01	02	03	04	05	06	07	08	09	10
rate	0.1	0.0	0.0	0.1	0.1	0.1	0.4	0.1	0.1	0.1
cases	1	0	0	1	1	2	8	1	1	1

rate by age group (cases per 100,000) in 2010



	0-18	19-44	45-64	65 and older
rate	0.0	0.1	0.0	0.0
cases		1		

One confirmed case of mumps was reported in 2010. The case was a recent immigrant from a country with endemic mumps. Sixteen reports of clinically suspected mumps were received in 2010, but only one of these was confirmed by laboratory testing. Because mumps symptoms are non-specific, laboratory testing is required to count cases for surveillance purposes.

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 large outbreak in the Midwest in 2006.

Purpose of Surveillance:

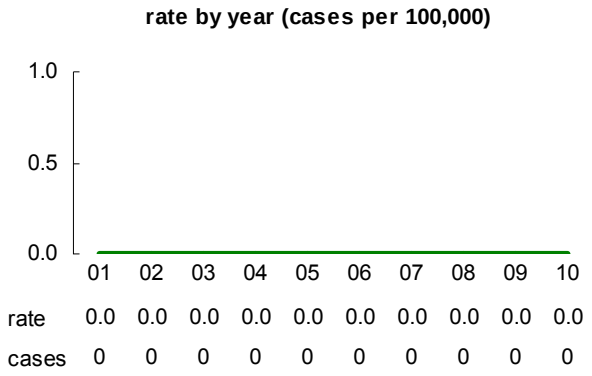
- To facilitate diagnostic testing for mumps
- To identify susceptible persons exposed to mumps in order to implement disease control interventions
- To detect outbreaks

Epidemiology: Mumps is an acute viral illness caused by the mumps virus. The virus is present in saliva and spreads 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.

Paralytic Shellfish Poisoning



No cases of paralytic shellfish poisoning (PSP) were reported in 2010.

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 state between 1997 and 2006.

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

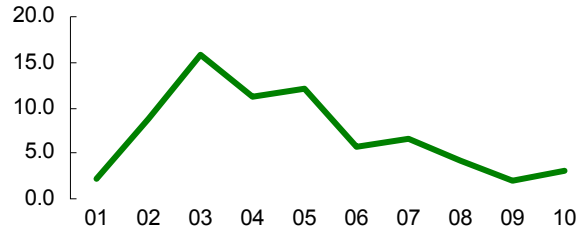
Epidemiology: Paralytic Shellfish Poisoning (PSP) is a neurologic syndrome caused by consuming shellfish contaminated with naturally-occurring toxic substances called "saxitoxins." High concentrations of these toxins occur in shellfish during algae blooms known as “red tides,” but can also occur in the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

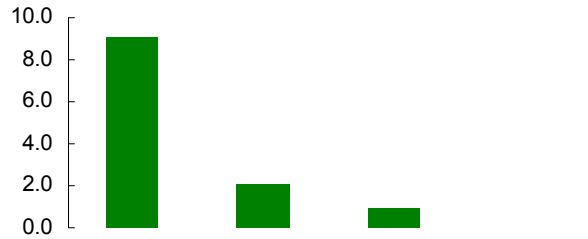
Pertussis

rate by year (cases per 100,000)



	01	02	03	04	05	06	07	08	09	10
rate	2.2	8.9	15.8	11.3	12.1	5.8	6.5	4.2	2.0	3.1
cases	39	156	280	201	217	105	119	78	37	59

rate by age group (cases per 100,000) in 2010



	0-18	19-44	45-64	65 and older
rate	9.0	2.1	0.9	0.0
cases	38	16	5	

In 2010, 59 cases of pertussis were reported. Children under the age of one year accounted for 28% of cases. Seven cases were hospitalized. No fatalities were reported. A household member was the suspected source for 25% of cases overall and for 44% of cases in children under the age of one.

Peaks in pertussis activity are typically observed every three to five years. 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. In 2010 there were 2 deaths from pertussis in Washington state, both children under one year of age.

Purpose of Surveillance:

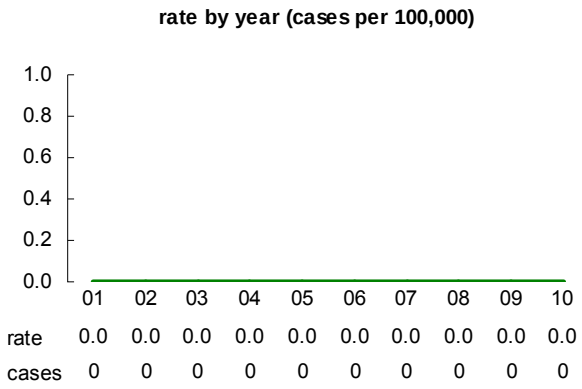
- To prevent transmission of pertussis to infants and other persons
- To identify outbreaks and implement disease control measures including vaccination and early recognition, testing, and treatment of cases

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. Pertussis in adolescents and adults may lack the classic symptoms. 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 and adults of any age who have or anticipate close contact with an infant less than 12 months of age. Antibiotics can be used to prevent illness among close contacts of persons with pertussis.

Plague



	01	02	03	04	05	06	07	08	09	10
rate	0.0	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	0

No cases of plague were reported in 2010.

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

Purpose of Surveillance:

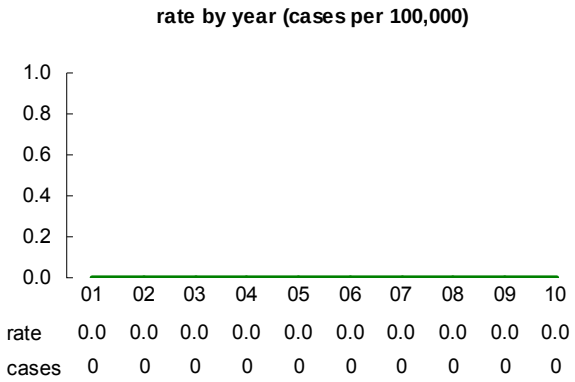
- To investigate cases caused by potential agents of bioterrorism
- To identify naturally occurring sources of infection
- To confirm reported cases and to ensure that exposed persons receive post-exposure prophylaxis and/or monitoring

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 food for pets or wild animals. Make your home rodent-proof by repairing holes or gaps in outside walls.

Poliomyelitis



	01	02	03	04	05	06	07	08	09	10
rate	0.0	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	0

The last case of poliomyelitis identified in Washington state occurred in 1977.

Purpose of Surveillance:

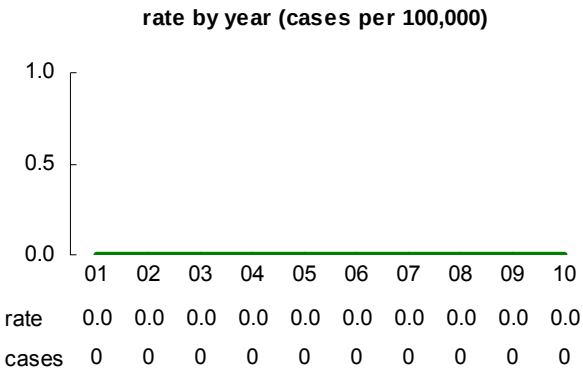
- To identify cases of imported poliomyelitis
- To identify cases and susceptible contacts of cases for immunization and to institute infection control measures
- To differentiate naturally-occurring and vaccine-associated polio viruses

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 and can be imported into countries where the disease has been eradicated, causing infections in susceptible or unvaccinated persons.

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 should be given to certain adults age 19 and older traveling to areas of the world where polio is still occurring.

Psittacosis



	01	02	03	04	05	06	07	08	09	10
rate	0.0	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	0

No cases of psittacosis were reported in 2010.

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.

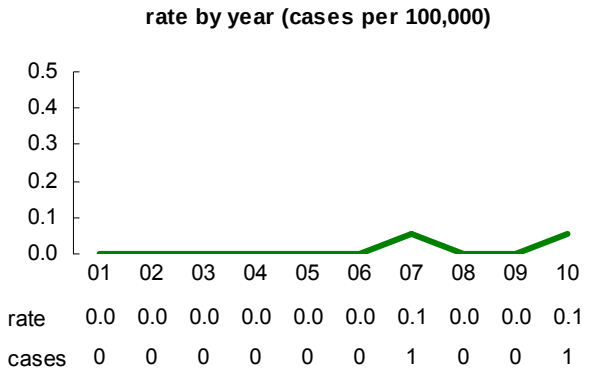
Purpose of Surveillance:
- To identify sources of infected birds associated with human infections
- To facilitate appropriate diagnostic testing and treatment for infected persons
- To implement control measures for contaminated areas and management of infected birds to decrease risk to humans

Epidemiology: Psittacosis (parrot fever, avian 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 or pet birds. Birds may be symptomatic, particularly if stressed, but healthy-appearing birds 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



One confirmed case of chronic Q fever and one probable case of acute Q fever were reported in 2010. The confirmed chronic case was an adult who died of the illness and who had multiple rural and farm exposures in the U.S. over his lifetime. The probable case of acute Q fever was likely exposed during travel in the northeast U.S. or in Puerto Rico.

In 2007 one case was 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. Prior to the death in the King County case in 2010, the last death associated with Q fever in a King County resident occurred in 1987.

Purpose of Surveillance:
- To identify sources of transmission and reduce the risk of infection
- 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 workers, farmers, and occasionally dairy workers.

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.

Rare Diseases of Public Health Significance

Creutzfeldt-Jakob Disease

Creutzfeldt-Jakob Disease (CJD) is a rapidly progressive neurodegenerative disorder that is always fatal, typically causing death within a year of onset. CJD is caused by prions, infectious proteins that cause illness when they fold abnormally in the brain. Classic CJD has been recognized since the early 1920s. The precise trigger is unknown. Most CJD cases are sporadic (85%), and some are familial (15%). The diagnosis is confirmed by laboratory tests on brain tissue obtained by biopsy or autopsy. In recent years, the United States has reported fewer than 300 cases of CJD a year.

In 1996, a new type of CJD was recognized in the United Kingdom, called "variant" CJD (vCJD). This type is associated with Bovine Spongiform Encephalopathy (BSE), a neurodegenerative disorder in cattle also called "mad cow disease." As of June 2008, only three vCJD cases have been identified in residents of the United States. All three likely were infected by eating cattle products contaminated with BSE while residing in the United Kingdom (two cases) or Saudi Arabia (one case).

In 2010, three cases of CJD were reported in King County residents. All three persons died. Two were laboratory confirmed and likely sporadic cases, one was a probable case. The cases ranged in age from 58 to 84 years of age.

Rocky Mountain spotted fever

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 state. 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.

No cases of RMSF were reported in King County in 2010. There was a confirmed case in 2008 with a history of travel to eastern Washington and Yellowstone, as well as a probable case of RMSF in 2006 likely acquired while hunting in Kittitas County and a confirmed case in 2001 with a history of travel to Colorado.

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

Purpose of surveillance:
- To detect cases of rare and emerging diseases
- To understand the epidemiology of rare and emerging diseases

Definition: "Rare diseases of public health significance" are defined as diseases or conditions of public health concern that are not commonly diagnosed in Washington residents. Examples include anthrax, babesiosis, *Cryptococcus gattii*, prion disease, and viral hemorrhagic fevers. Unexplained critical illnesses or unexplained deaths are reported separately as immediately notifiable conditions.

Cryptococcus gattii

Cryptococcus gattii is a fungus closely related to *C. neoformans* that infects the pulmonary and central nervous systems of animals and humans.

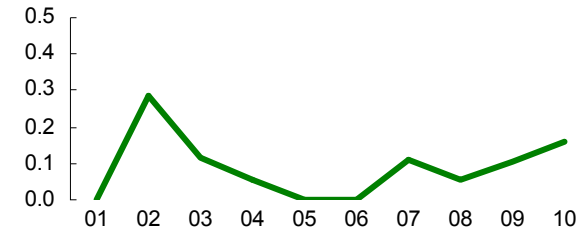
Until recently, *C. gattii* was only found in certain subtropical and tropical environments. In 1999 it emerged on Vancouver Island, British Columbia and since then has been detected in other areas of the Pacific Northwest. The exact geographic distribution of the fungus is not known, and may be expanding.

C. gattii was first detected in Washington state In 2005 in three cats that lived near the Canadian border but had not been in Canada. The first human case in Washington state was identified in 2006. As of December 2010, 17 human cases (including three deaths) and 23 animal cases have been identified in Washington state. Since the exposure period can be long, determining exposure location may be difficult. Of the human cases, 3 residents did not travel out of state during their exposure period, indicating likely in-state acquisition. Environmental sampling has also identified the fungus in Washington state.

Only two cases of *C. gattii* have been reported in King County. Both occurred in 2007 in immune suppressed adults who did not have an acute onset of illness. One was hospitalized and neither died.

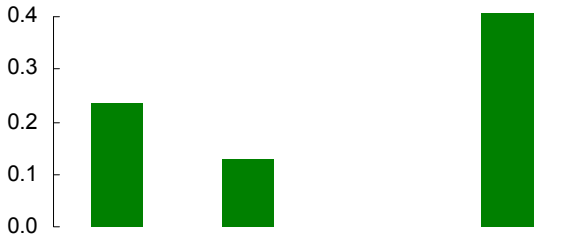
Relapsing Fever

rate by year (cases per 100,000)



	01	02	03	04	05	06	07	08	09	10
rate	0.0	0.3	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.2
cases	0	5	2	1	0	0	2	1	2	3

rate by age group (cases per 100,000) in 2010



	0-18	19-44	45-64	65 and older
rate	0.2	0.1	0.0	0.5
cases	1	1		1

Three cases of tick-borne relapsing fever were reported in 2010, all associated with the same family cabin in Kittitas County. Two of the cases were hospitalized, and all three recovered fully.

Seventeen cases of relapsing fever have been reported in King County since 1999, all associated with exposures outside of Western Washington.

Washington State reports two to eight cases of tick-borne relapsing fever each year. Most infections are acquired while vacationing in rural, mountainous areas between May and September.

Purpose of Surveillance:

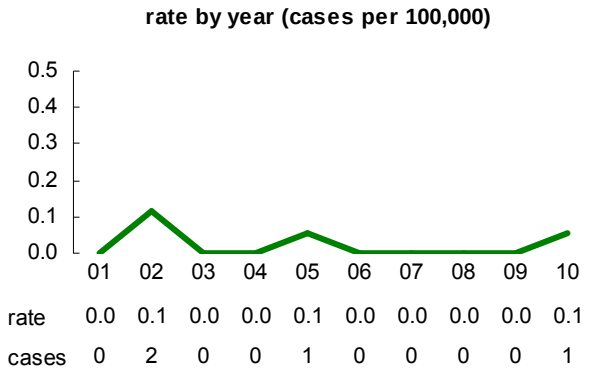
- To identify common source outbreaks
- To identify and eliminate sources of transmission
- To facilitate environmental clean-up
- To facilitate appropriate treatment of infected persons

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 fever-free 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. Check your body regularly for ticks. If you find one, remove it by grasping its head with a set of tweezers and pulling straight out with a smooth, steady motion.

Rubella



One case of rubella was reported in 2010. The case was a recent immigrant from Vietnam who was exposed to rubella prior to arrival in King County. The case was not hospitalized and no secondary cases were identified.

Prior to the 2010 case, the last reported case was in 2005 in an adult with international travel. 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

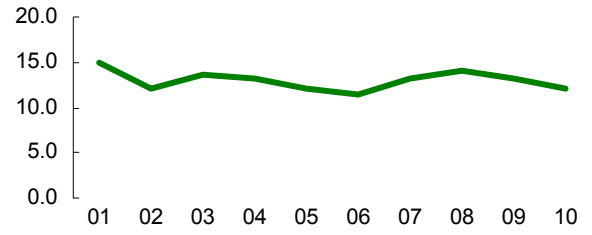
Epidemiology: Rubella (German measles) is a viral illness spread through coughing and sneezing. When acquired by a mother early in pregnancy it can lead to premature delivery, congenital defects, and fetal death, depending on gestational age at time of infection. Congenital rubella syndrome (CRS) occurs 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.

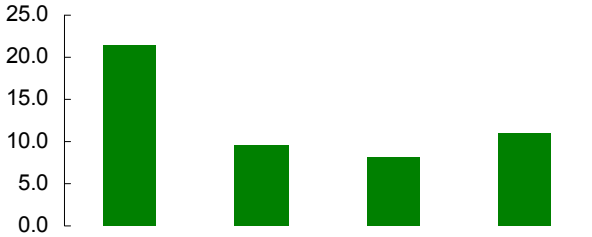
Salmonellosis

rate by year (cases per 100,000)



	01	02	03	04	05	06	07	08	09	10
rate	15.0	12.1	13.7	13.2	12.2	11.3	13.1	14.1	13.3	12.0
cases	260	212	243	234	218	205	241	262	250	229

rate by age group (cases per 100,000) in 2010



	0-18	19-44	45-64	65 and older
rate	21.3	9.5	8.1	10.9
cases	90	72	43	24

In 2010, 229 cases of salmonellosis were reported. Forty-two cases (18%) were attributed to international travel. Forty-nine (21%) were hospitalized, and none died. Three cases of *S.* Uganda were linked to a private party where raw beef was served. Two cases of *S.* Enteriditis were linked to a music festival in central Washington.

There were three multistate salmonellosis outbreaks in 2010 that affected King County residents. Ten *S.* Newport cases were linked to an outbreak associated with tomatoes grown in Florida. Each of the cases had consumed tomatoes in deli sandwiches from chain supermarkets. Red and black pepper used in the manufacture of Italian-style meats was the culprit in an outbreak of *S.* Montevideo that sickened three King County residents in 2009 and three in 2010. Washington State was instrumental in determining the source of this outbreak through the use of purchase records obtained from patrons with shopper cards. Two 2009 and one 2010 case were infected with a strain of *S*. Typhimurium that is associated with African dwarf frogs.

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. Salmonella outbreaks have been associated with contamination of a variety of commercially distributed food products, including produce, nuts, and poultry.

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.

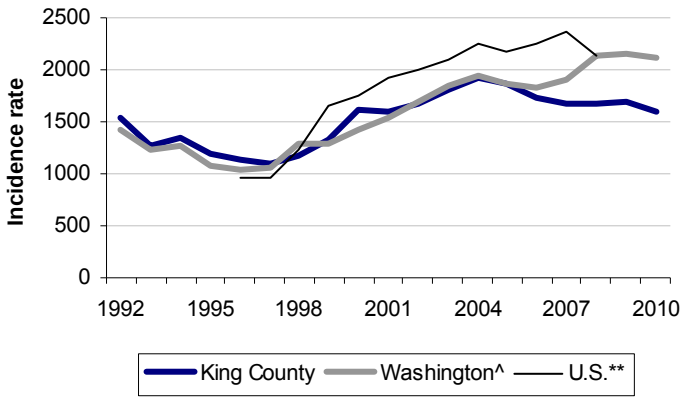
Prevention: Handwashing and careful food preparation are the keys to preventing salmonellosis. Infected individuals should be restricted from attending or working in child care, food service, and health care work while they have symptoms. Do not eat raw or uncooked eggs, poultry or meat. Infants, elderly and immunocompromised persons should avoid certain high-risk foods such as sprouts. 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.

Other national outbreaks of salmonellosis in 2010 were attributed to alfalfa sprouts, shell eggs, commercial frozen entrees, and frozen rodents. King County had no cases identified with these outbreaks.

Washington State typically reports 650 to 800 *Salmonella* cases each year, of which 200 to 300 are in King County. In recent years, “genetic fingerprinting” of *Salmonella* isolates has facilitated the identification of cases linked to nationwide outbreaks.

Sexually Transmitted Diseases: Chlamydia

Chlamydia Incidence per 100,000 among women ages 15-29*, 1992-2010



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

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 than 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.

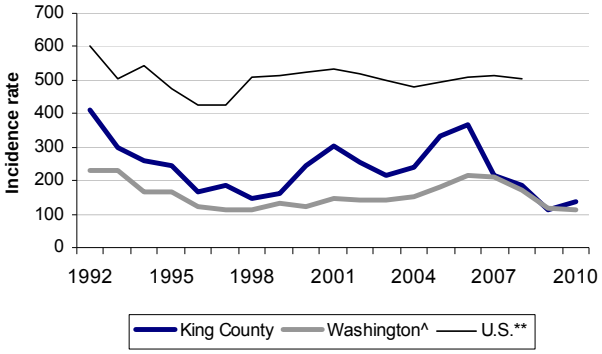
In 2010, 5,946 cases of chlamydial infection were reported among residents of King County, for a crude incidence of 311 per 100,000 persons. In 2010, 3,906 and 2,039 cases were reported among women and men respectively, yielding chlamydial infection rates of 407 per 100,000 women and 214 per 100,000 men (see sidebar regarding differences in screening practices among men and women).

Age-specific rates were highest among 15 to 19 year old women (2,155 cases per 100,000 persons) and 20-24 year old men (832 cases per 100,000 persons), likely reflecting the increased biological susceptibility of young women, low rates of condom use, relatively 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; however, rates among women in other Washington counties stabilized at a higher level, and increased from 2007-2008, leading to consistently lower rates of chlamydial infection among King County women when compared to other Washington women for the past several years.

Sexually Transmitted Diseases: Gonorrhea

Gonorrhea Incidence per 100,000 among women ages 15-29*, 1992-2010



* 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 2009-2010 were not available at the time this report was prepared.
^ Washington state rates exclude King County.

In 2010, 1,570 cases of gonorrhea were reported among King County residents. Crude gonorrhea incidence in 2009 was 82 per 100,000 persons. This represents an increase in incidence of 44% from 2009 to 2010. Gonorrhea incidence increased among men and women in 2010, but the increase was sharpest among men. Of the reported 2010 cases, 404 occurred among women, for a rate of 42 per 100,000, and 1,166 occurred among men, for an incidence of 123 per 100,000. This gender differential probably reflects a higher incidence of gonorrhea among men who have sex with men (MSM). Among MSM, gonorrhea rates have increased sharply in the past two years, from 301 per 100,000 in 2008 to 695 per 100,000 in 2010.

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 level off (1996 rate: 56 per 100,000 persons). This trend continued until 2000, when gonorrhea rates began to rise in King County (2000 rate: 71 per 100,000). For several years, rates rose among both men and women and peaked at an incidence of 135 per 100,000 in 2006. This was followed by a sharp decline in incidence in 2007, and moderate decreases in 2008 and 2009. As noted above, in 2010 gonorrhea rates rose substantially, particularly among men.

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

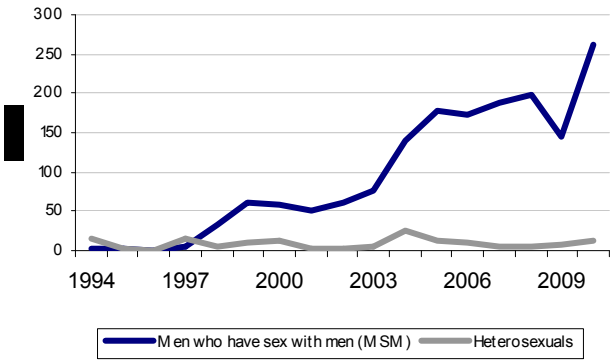
Epidemiology: The bacteria *Neisseria gonorrhoeae* is transmitted through unprotected sex (oral, anal, and vaginal). Gonorrhea can also be transmitted from mother to infant during vaginal delivery. Because gonorrhea is often asymptomatic, many cases go unreported and rates based on case reports are an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

Clinical Aspects: Infected persons, particularly women, often do not have 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 for infection are important in reducing the spread of gonorrhea. Likewise, screening and treatment of infected persons and their sex partners are important prevention activities.

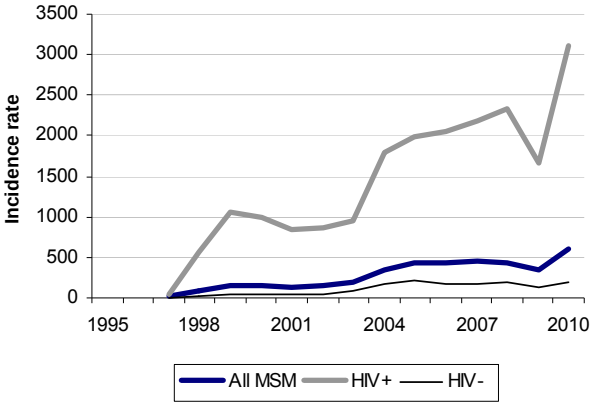
Sexually Transmitted Diseases: Syphilis

Reported cases of early syphilis by sexual orientation



*Data on sexual orientation were missing for men in the following years: 2 men in 1998, and 1 man in 1999, 2000, 2002, 2005, 2006, and 2007, and 7 men in 2009.

Early syphilis incidence per 100,000 among MSM by HIV status



Of the 289 early syphilis cases reported in 2010, 67 were diagnosed with primary syphilis, 143 with secondary syphilis, and 79 with early latent syphilis. The overall incidence of early syphilis in King County was 15 per 100,000 in 2010.

Heterosexuals accounted for 13 cases (1.65 case per 100,000), and MSM accounted for 263 cases (611 per 100,000). The number of early syphilis cases among MSM increased significantly from 2009 (145 cases) to 2010. A similar increase in early syphilis has not been observed among heterosexuals. In 2010, 155 of the 263 early syphilis cases in MSM occurred in HIV positive MSM, resulting in an incidence of 3,116 cases per 100,000 HIV positive MSM, compared to a rate of 198 cases per 100,000 HIV negative MSM.

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, caused by the bacteria *Treponema pallidum,* is transmitted most often through unprotected sex (oral, anal, and vaginal). It 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 a 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.

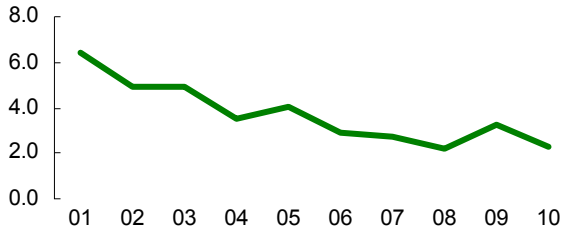
Prevention: Condom use during oral, anal, and vaginal sex are important in preventing syphilis. Treating the partners of known syphilis cases is also key to reducing the spread of syphilis.

There were no cases of congenital syphilis in 2010.

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

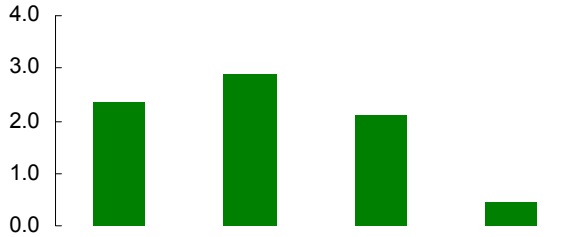
Shigellosis

rate by year (cases per 100,000)



	01	02	03	04	05	06	07	08	09	10
rate	6.4	4.9	5.0	3.5	4.0	2.9	2.7	2.2	3.2	2.3
cases	111	86	88	63	72	52	50	41	61	44

rate by age group (cases per 100,000) in 2010



	0-18	19-44	45-64	65 and older
rate	2.4	2.9	2.1	0.5
cases	10	22	11	1

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 easily 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*). Resistance to a number of antibiotics including ampicillin and trimethoprim-sulfamethoxazole is common among *Shigella* strains reported in King County. Clinicians should consider routinely requesting antibiotic sensitivity testing of *Shigella* isolates to guide treatment.

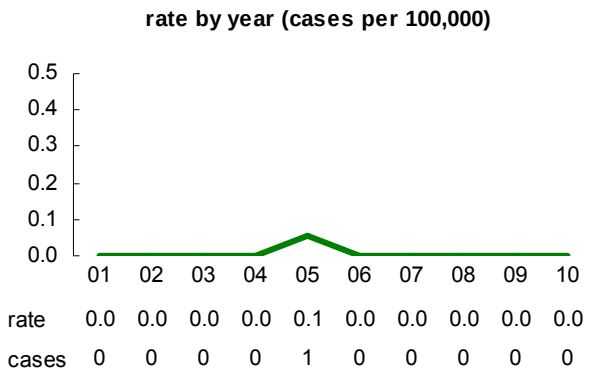
Prevention: Shigellosis can be prevented by washing hands carefully with soap and warm water after using the bathroom, changing diapers, before preparing food, and before eating. Pay special attention to the proper disposal of soiled diapers and other human waste. Keep kitchen work surfaces clean. Children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

Forty-four cases of shigellosis were reported in 2010, no outbreaks were identified. The majority of cases were *Shigella sonnei* (32), followed by *S. flexneri* (10), *S. boydii* (1) and *S. dysenteriae* (1). The most common risk factor for infection was international travel, with 18 cases reporting travel during their exposure period to Asia (9), Mexico (3), Central America (2), Africa (2), Europe (1), and the Middle East (1).

Among the twenty-six shigellosis cases in 2010 that were not related to international travel, 13 were in men and 8 (62%) of these were in men who were most likely infected through sexual contact with another man during their exposure periods. This represents 30% of all non-travel associated cases, which is slightly lower than the proportion (40%) reported in 2009. Seattle and other cities in the US have in the past had outbreaks of shigellosis among men who have sex with men.

In Washington state, about 130 to 250 cases are reported annually.

Tetanus



No cases of tetanus were reported to Public Health in 2010.

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. Prior to 2005, there were two cases of tetanus reported in 1996.

Purpose of Surveillance:

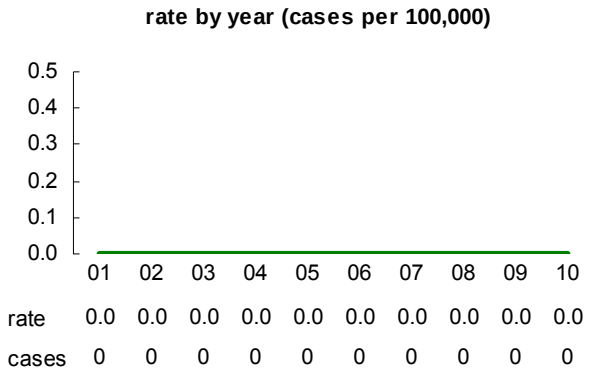
- To facilitate prompt, appropriate diagnostic testing and management of cases

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 vaccination. 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 routinely 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



No cases of trichinosis have been reported in King County since 2000, when there was a human case 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

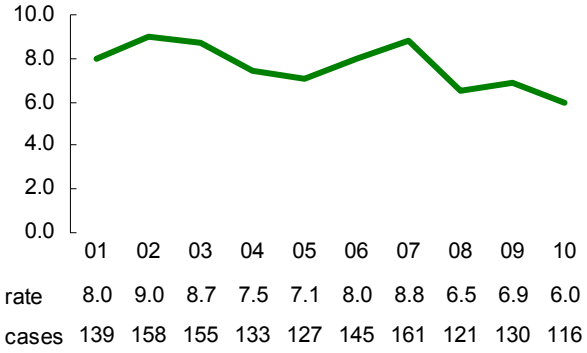
Epidemiology: Trichinosis is caused by an intestinal roundworm, *Trichinella spiralis*, which infects wild mammals. Human infection results from eating undercooked pork or wild game harboring the encapsulated cysts of *T. spiralis*. Encysted larvae survive some preparation methods for wild meat jerky, 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: Thoroughly cook meat products until the juices run clear or to an internal temperature of at least 160°F (or 180°F for whole game). Freeze pieces of pork up to 15 cm thick for 30 days at 5°F to kill any worms. 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

rate by year (cases per 100,000)



	01	02	03	04	05	06	07	08	09	10
rate	8.0	9.0	8.7	7.5	7.1	8.0	8.8	6.5	6.9	6.0
cases	139	158	155	133	127	145	161	121	130	116

TB Incidence 2006-2009 for the U.S., Washington State, and Seattle & King County

		2007	2008	2009	2010
U.S.	Count	13,293	12,898	11,540	11,181
	Incidence*	**4.4**	**4.2**	**3.8**	**3.6**
WA state	Count	291	228	256	239
	Incidence*	**4.4**	**3.5**	**3.8**	**3.5**
Seattle & King County	Count	161	121	130	116
	Incidence*	**8.6**	**6.4**	**6.8**	**6.0**

*Incidence per 100,000 people

In 2010, King County received reports of 116 cases of active tuberculosis (TB). The county's rate of 6.0 cases per every 100,000 individuals remains higher than the national rate of 3.6 per 100,000.

Eighty-four percent of cases were born outside the United States. The highest numbers came from the Philippines, Somalia, Ethiopia, Vietnam, and India. Native Hawaiians and other Pacific Islanders, Blacks and Asians have disproportionately higher rates of TB, and Hispanics continue to have higher rates than non-Hispanics.

There were three TB cases among HIV-infected persons, representing three percent of TB cases with known HIV serostatus. Seventeen percent of TB cases in King County were resistant to at least one TB medication. Two multi-drug resistant TB (MDR-TB) cases were diagnosed in King County in 2010.

Five pediatric cases (age 0-14 years) were diagnosed, all US-born, and all through contact investigations (i.e., family members or caretakers had active TB).

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

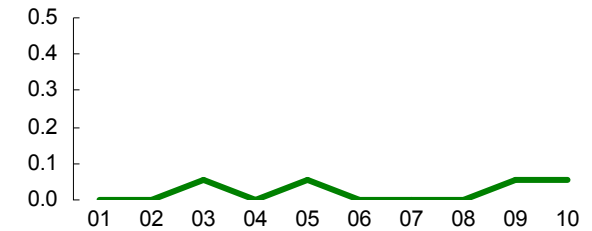
Epidemiology: TB, caused by *Mycobacterium tuberculosis*, is spread through airborne transmission. Individuals exposed to someone with active infectious TB may develop "latent TB" infection that has no symptoms and is not contagious. About one-third of the world's population and five to ten percent of 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.

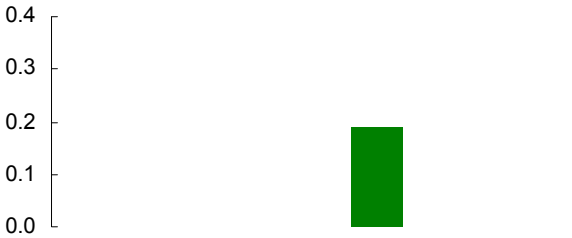
Tularemia

rate by year (cases per 100,000)



	01	02	03	04	05	06	07	08	09	10
rate	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.1
cases	0	0	1	0	1	0	0	0	1	1

rate by age group (cases per 100,000) in 2010



	0-18	19-44	45-64	65 and older
rate	0.0	0.0	0.2	0.0
cases			1	

One case of tularemia was reported in 2010 in an adult who developed an ulcer on his lower leg. The case was not hospitalized. The case was likely exposed during outdoor activities in King County.

In 2009 one case of tularemia was reported in an adolescent with wounds from his pet falcon's talons. Prior to 2009, the last case of tularemia in King County was reported in 2005 in a person who may have been infected from an arthropod bite while camping outside of King County.

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 state two to eight reports of tularemia infections occur annually. Identified exposures include farming and rabbit skinning.

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, roughened coat, 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.

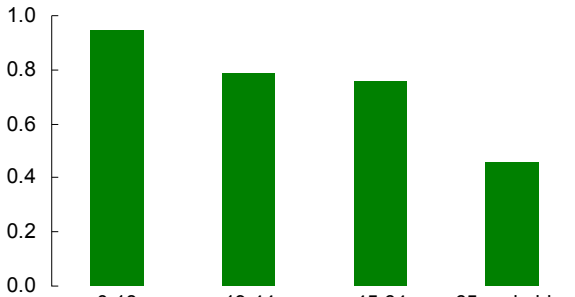
Prevention: Use insect repellant containing DEET on skin or clothing, and wear long sleeve shirts and long pants when in areas with ticks. Avoid dead or sick animals, and wear gloves when handling or dressing wild animals.

Typhoid and Paratyphoid Fever

rate by year (cases per 100,000)

	01	02	03	04	05	06	07	08	09	10
rate	0.2	0.2	0.1	0.2	0.4	0.2	0.2	0.4	0.2	0.8
cases	4	4	2	4	7	3	4	8	4	15

rate by age group (cases per 100,000) in 2010



	0-18	19-44	45-64	65 and older
rate	0.9	0.8	0.8	0.5
cases	4	6	4	1

Fifteen cases of typhoid fever were reported in 2010, representing the greatest annual number of cases on record in King County. Two thirds of the cases were hospitalized, and none died.

Of these 15 cases, ten were exposed during international travel to countries where typhoid fever is endemic, including India (7), Pakistan (1), Hong Kong (1), and Indonesia (1). One additional case may have been exposed during international travel to India, although the travel was outside the typical exposure period.

The four cases with no history of recent international travel included one case exposed by an asymptomatic household member; one occupational infection in a laboratory worker who then infected a household member; and a case whose source was not identified.

Typically, five to fifteen cases of typhoid fever are reported yearly in Washington state.

Purpose of Surveillance:

- To identify and track chronic typhoid carriers to prevent transmission of 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.

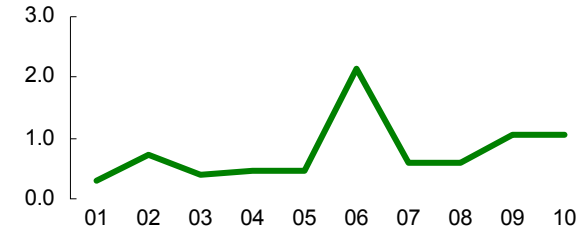
Clinical Aspects: Typhoid and paratyphoid fever are potentially severe, systemic infections characterized by fever, headache, loss of appetite, malaise, lymph node inflammation, cough, and a rash ("rose" spots) on the trunk; constipation is reported more commonly than diarrhea. Children frequently experience 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.

During 2010, there was one case of paratyphoid fever reported, with recent travel to India. Typically, fewer than ten cases of paratyphoid fever per year are reported in Washington state.

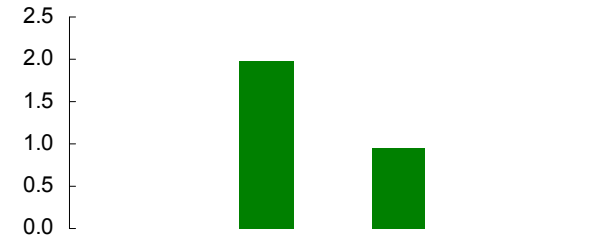
Vibriosis (Non-Cholera)

rate by year (cases per 100,000)



	01	02	03	04	05	06	07	08	09	10
rate	0.3	0.7	0.4	0.4	0.4	2.2	0.6	0.6	1.1	1.0
cases	5	13	7	8	8	39	11	11	20	20

rate by age group (cases per 100,000) in 2010



	0-18	19-44	45-64	65 and older
rate	0.0	2.0	0.9	0.0
cases		15	5	

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. 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 (see Cholera chapter).

Clinical Aspects: *Vibrio* species can cause intestinal, bloodstream, or wound infections. Symptoms of gastrointestinal infection occur 12 to 24 hours after consumption of food contaminated with the bacteria (range four to 30 hours) and include abdominal cramps, severe watery diarrhea, vomiting, headache, and fever. The illness typically lasts one to seven 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 beds that have been closed to harvesting.

Twenty cases of vibriosis were reported in 2010.

Eighteen cases were due to *V. parahaemolyticus*, one to *V. fluvialis* and one to non-toxigenic *V. cholerae*. All of the cases were infected after consuming raw or undercooked shellfish, including oysters, crab and shrimp.

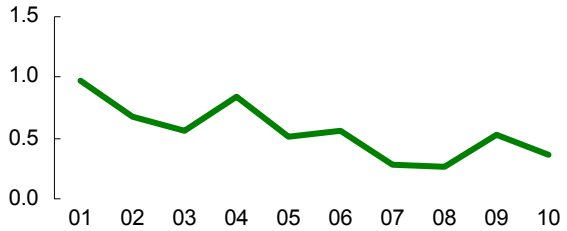
Twelve cases were linked to food establishments in King County, three to food establishments elsewhere in Washington state, two to food establishments outside Washington, and two to recreational harvesting in Washington. One case was exposed while in Indonesia.

From 2000 through 2010 an average of 14 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.

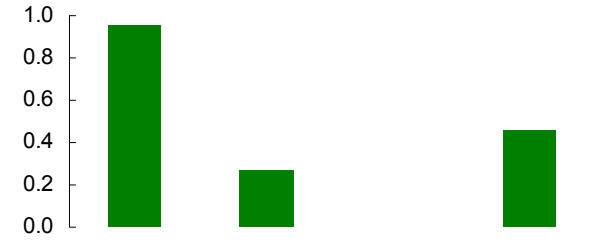
Yersiniosis

rate by year (cases per 100,000)



	01	02	03	04	05	06	07	08	09	10
rate	1.0	0.7	0.6	0.8	0.5	0.6	0.3	0.3	0.5	0.4
cases	17	12	10	15	9	10	5	5	10	7

rate by age group (cases per 100,000) in 2010



	0-18	19-44	45-64	65 and older
rate	0.9	0.3	0.0	0.5
cases	4	2		1

Seven cases of yersiniosis were reported in 2010. All were exposed in King County.

In King County, 61 cases were reported from 2004 to 2010. More than one-third of these cases occurred in children less than five years of age.

Washington State usually receives 20 to 40 reports of yersiniosis each year.

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. Occasionally this 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.