



2007

COMMUNICABLE DISEASE SURVEILLANCE SUMMARY

Communicable Disease Epidemiology
and Immunization Section
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Seattle, Washington 98104
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HIV/AIDS Epidemiology Program
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Seattle, Washington 98104
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Tuberculosis (TB) Clinic
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INTRODUCTION

This report summarizes communicable disease surveillance conducted by the following sections of Public Health – Seattle & King County:*

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

The Communicable Disease Epidemiology and Immunization Section (CD-Imms) monitors and responds to reports from residents and health care providers of all notifiable conditions except HIV/AIDS, tuberculosis, and sexually transmitted diseases. CD-Imms investigates cases of rare diseases of public health significance, conducts year-round influenza surveillance using data from sentinel clinics, area emergency rooms, laboratories, and schools; and monitors medical examiner reports for communicable disease cases of public health significance.

This report provides a summary of each notifiable condition with information on basic epidemiology, clinical features, prevention measures, and regional experience. During 2007, CD-Imms received 6,297 reports of notifiable conditions and investigated 5,623 reports.

The purpose of surveillance and case investigation is to:

- Identify unusual cases and clusters of illness requiring public health investigation or action
- Ensure appropriate diagnosis, testing and/or treatment in cases of public health significance
- Ensure that cases and persons exposed to infectious cases (contacts) receive appropriate counseling and preventive treatment (e.g., vaccine for a person exposed to hepatitis A, or antibiotics for close contacts of a person with meningococcal meningitis)
- Implement and/or facilitate disease control measures to prevent the spread of infection in the community, schools, workplaces, and healthcare facilities
- Coordinate public health surveillance and disease control measures with local health care professionals and facilities.

We hope you find this report interesting and informative.

* Detailed annual reports by the latter three programs are available from their respective websites. The 2007 Washington State Communicable Disease Report is available at <http://www.doh.wa.gov/notify/other/2007cdr/cdr2007.pdf>

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Measles	33
Meningococcal disease	34
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DEFINITIONS OF TERMS USED IN THIS REPORT

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

CDC: Centers for Disease Control and Prevention.

Enteric infection: An infection of the intestinal tract.

Fecal-oral transmission: A means of transmission in which microscopic viruses, bacteria, or parasites in the stool of one person are swallowed by another person, causing infection. The risk of fecal-oral transmission is increased by inadequate hand washing after activities such as using the toilet, assisting incontinent children or adults with toileting, diaper changing, and certain sexual practices.

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

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

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

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

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

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

PUBLIC HEALTH CONTACT NUMBERS

	Phone	Fax
24-Hour disease report line (voice mail): ONLY for reporting non-immediately notifiable conditions	(206) 296-4782	
All other notifiable communicable diseases (daytime and after-hours)	(206) 296-4774	(206) 296-4803
24-Hour Communicable Disease Hotline (recorded information and updates)	(206) 296-4949	
HIV/AIDS Program and Report Line (mail or call in reports only)	(206) 296-4645	
Public Health Laboratory	(206) 744-8950	
Sexually Transmitted Diseases Report Fax Line (fax reports only)		(206) 744-5622
Sexually Transmitted Disease (STD) Clinic	206-744-3590	
Tuberculosis Clinic and Report Line (daytime and after hours)	(206) 744-4579	(206) 744-4350

**NOTIFIABLE COMMUNICABLE DISEASE CONDITIONS
IN WASHINGTON STATE
Notification Timeframes, and Specimen Submission Requirements
for Health Care Professionals and Laboratories**

Notifiable Condition	Notifiable by Health Care Provider	Notifiable by Laboratory	Specimen Submission Required
Acquired Immunodeficiency Syndrome (AIDS)	Within 3 work days		
Animal Bites	Immediately		
Arboviral disease	Within 3 work days	Within 2 work days	
Botulism (Foodborne)	Immediately	Immediately	Serum and Stool - If available, submit suspect food (2 days)
Botulism (Infant)	Immediately	Immediately	Stool (2 days)
Botulism (Wound)	Immediately	Immediately	Culture, Serum, Debrided tissue, or Swab sample (2 days)
Brucellosis (Brucella species)	Immediately	Within 2 work days	Culture (2 days)
CD4+ (T4) lymphocyte counts less than 200 or 14%		Monthly	
Campylobacteriosis	Within 3 work days		
Chancroid	Within 3 work days		
<i>Chlamydia trachomatis</i> 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 <i>E. coli</i> , including <i>E. coli</i> 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		
<i>Haemophilus influenza</i> invasive disease (under age 5 years, excluding otitis media)	Immediately		
Hantavirus Pulmonary Syndrome	Within 3 work days		
Hemolytic Uremic Syndrome	Immediately		
Hepatitis A	Immediately	IgM Positive, Within 2 work days	
Hepatitis B (acute)	Within 3 work days	Monthly	
Hepatitis B surface antigen positivity in pregnant women	Within 3 work days	Monthly	
Hepatitis B (chronic) Initial diagnosis, and previously unreported prevalent cases	Monthly	Monthly	
Hepatitis C (acute and chronic)	Monthly	Monthly	
Hepatitis, unspecified (infectious)	Within 3 work days		

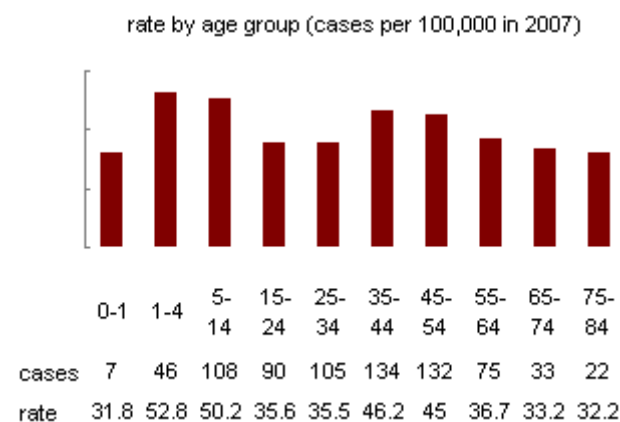
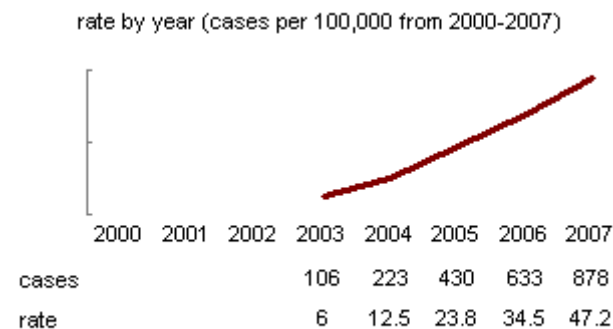
NOTIFIABLE COMMUNICABLE DISEASE LIST, continued			
Notifiable Condition	Notifiable by Health Care Provider	Notifiable by Laboratory	Specimen Submission Required
Herpes simplex, neonatal and genital (initial infections only)	Within 3 work days		
Human immunodeficiency virus (HIV) infection (Western Blot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

NOTIFIABLE COMMUNICABLE DISEASE REPORTS - KING COUNTY 2000-2007

Disease	2000	2001	2002	2003	2004	2005	2006	2007
Animal Bites and other potential Rabies exposures	NR	NR	NR	106	223	430	633	878
Arboviral disease								8
Botulism, Infant	1	1	0	1	0	0	0	0
Botulism, Foodborne	0	0	0	0	0	0	0	0
Botulism, Wound	0	0	0	0	1	0	0	1
Brucellosis	0	0	0	1	0	0	0	2
Campylobacteriosis	320	325	300	262	264	337	258	262
Chlamydia	4,495	4,295	4,471	5,189	5,428	5,520	5,319	5,682
Cholera	0	1	1	1	0	0	0	0
Cryptosporidiosis	5	29	34	38	34	69	45	46
Cyclosporiasis	0	5	5	1	9	5	1	1
Diphtheria	0	0	0	0	0	0	0	0
Enterohemorrhagic <i>E. Coli</i> (including <i>E. coli</i> O157:H7)	60	36	32	43	42	45	42	37
Giardiasis	229	150	171	124	126	144	117	150
Gonorrhea	1,222	1,556	1,462	1,349	1,286	1,769	1,987	1,409
<i>Haemophilus influenzae</i> invasive disease (under age 5 years)	0	0	1	2	2	2	3	0
Hantavirus Pulmonary Syndrome	0	0	0	1	0	0	0	1
Hepatitis A	98	28	32	30	14	17	17	17
Hepatitis B, Acute	42	36	31	34	23	23	21	23
Hepatitis B, Chronic	397	628	581	522	629	708	840	839
Hepatitis C, Chronic	1,350	1,949	1,925	1,099	1,636	1,728	1,783	1,759
Hepatitis C, Acute	13	9	12	8	10	10	6	7
HIV/AIDS	242	320	278	653	555	568	478	404
Legionellosis	4	4	3	2	7	8	5	7
Leptospirosis	1	2	0	1	0	1	1	0
Listeriosis	8	4	4	6	4	3	7	10
Lyme disease	3	2	6	2	10	6	2	5
Malaria	20	9	15	16	12	12	25	15
Measles	2	12	0	0	6	1	0	1
Meningococcal disease	17	13	21	6	18	15	11	4
Mumps	9	1	0	0	1	1	2	8
Paralytic Shellfish Poisoning	0	0	0	0	0	0	0	0
Pertussis	207	39	156	280	201	318	105	119
Psittacosis	0	0	0	0	0	0	0	0
Q Fever	0	0	0	0	0	0	0	1
Relapsing Fever	1	0	5	2	1	0	0	2
Rubella	2	0	2	0	0	1	0	0
Salmonellosis	205	260	212	243	234	218	205	241
Shigellosis	156	111	86	88	63	72	52	50
Syphilis	117	110	96	84	166	188	185	194
Tetanus	0	0	0	0	0	1	0	0
Trichinosis	1	0	0	0	0	0	0	0
Tuberculosis	127	139	158	155	133	127	145	161
Tularemia	0	0	0	1	0	1	0	0
Typhoid Fever	3	4	4	2	4	7	3	4
Vibriosis	7	5	13	7	8	8	39	11
Yersiniosis	20	17	12	10	15	9	10	5
Total	9,393	10,143	10,185	10,415	11,214	12,535	12,245	12,368

NR= Not Reportable

ANIMAL BITES AND OTHER POTENTIAL RABIES EXPOSURES



In 2007, a total of 879 animal bites or exposures were reported to Public Health. Of these 713 (81%) were determined to be potential rabies exposures. Rabies post-exposure prophylaxis (PEP) was recommended for 124 people because either 1) the animal was not a dog, cat, or ferret that could be watched for signs of illness for a 10 day quarantine period, 2) the animal was not available for testing, or 3) the animal tested positive for rabies.

Ninety four (76%) of the 124 rabies PEP recommendations resulted from exposures within King County to bats (63), coyotes (2), and raccoons (29). Sixteen (13%) of the 124 animal exposures occurred outside of the U.S. from bites of bats (5), cat (1), dogs (5), monkeys (4), and raccoon (1).

Of the 82 animals tested for rabies in King County, only 9 bats tested positive.

In Washington most cases of animal rabies occur in bats. Most bats, however, do not carry rabies, and

Purpose of Surveillance:

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

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

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

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

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

ARBOVIRAL DISEASE

No cases of West Nile virus infection acquired in King County were reported in 2007. One confirmed case and one possible case in King County residents infected out of state were reported. No birds, mosquito pools, or other mammals tested positive for WNV in King County in 2007.

Five probable dengue fever cases were reported in 2007 with likely exposures occurring in Costa Rica, Mexico, the Dominican Republic, Jamaica, and Cambodia.

One case of chikungunya was reported in a traveler to Sri Lanka. Chikungunya is an arboviral illness transmitted by the bite of infected mosquitoes, and has been the cause of several epidemics in Africa and Asia.

The first case of WNV in a Washington State resident occurred in 2006 in a person exposed while traveling out of state. At the close of 2007 there were no human cases of WNV acquired from exposure within Washington.

Purpose of Surveillance:

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

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

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

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

BIOTERRORISM— DISEASES OF SUSPECTED BIOTERRORISM ORIGIN

Diseases of suspected bioterrorism origin have been notifiable in Washington since 2001. This disease category includes, but is not limited to anthrax, brucellosis, Q fever, hemorrhagic fevers, plague, smallpox, and tularemia. There have never been any confirmed reports of diseases of bioterrorism origin 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, and one in 2007. Testing was negative for bioterrorism agents in all cases.

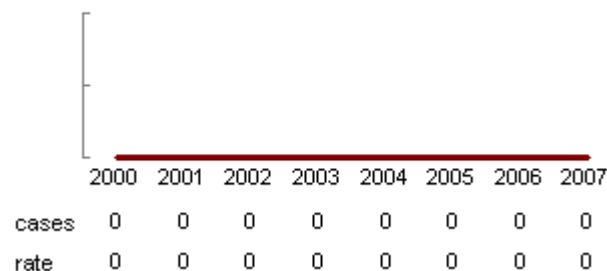
Symptoms and Clinical Findings in Diseases of Possible Bioterrorism Origin

Agent	Disease	Symptoms and Clinical Findings
<i>Bacillus anthracis</i>	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.
<i>Yersinia pestis</i>	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.
<i>Coxiella burnetii</i>	Q fever	Fever, cough, and pleuritic chest pain.
<i>Francisella tularensis</i>	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.
<i>Clostridium botulinum</i> toxin	Inhalation Botulism	Cranial nerve palsies including ptosis, blurred vision, diplopia, dysphonia, dysphagia followed by symmetrical descending flaccid paralysis.

BOTULISM

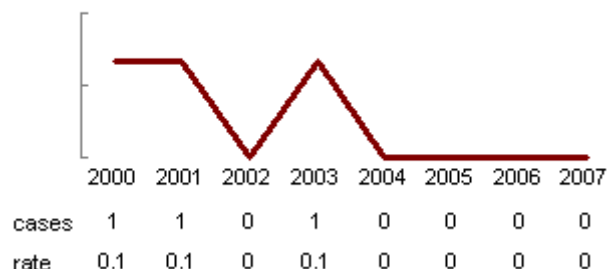
Foodborne Botulism

rate by year (cases per 100 000)



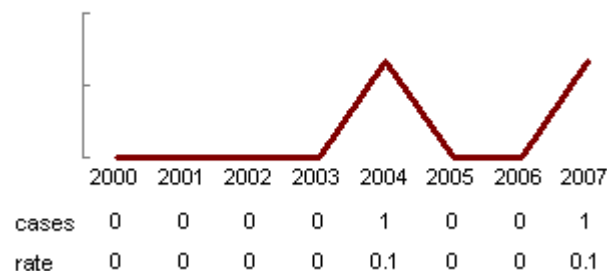
Infant Botulism

rate by year (cases per 100 000)



Wound Botulism

rate by year (cases per 100 000)



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 sometimes occur among persons who inject contaminated 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 by knowing the time, pressure, and temperature required to destroy spores. Never eat food from damaged cans. Do not feed honey or honey water to infants.

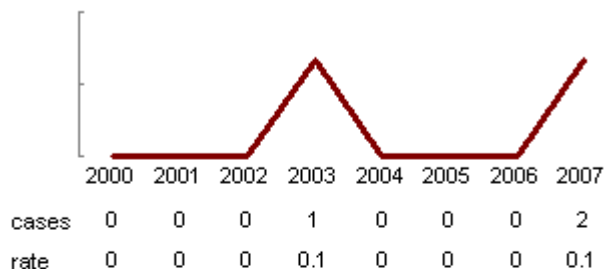
One case of wound botulism in a King County resident was reported in 2007. The illness occurred in an adult male who had injected “black tar” heroin.

No cases of foodborne botulism have been reported in King County since 1993, when 3 cases occurred associated with home-canned beets. Between the years 1993 and 2003, there were eight reported cases of infant botulism, but none since.

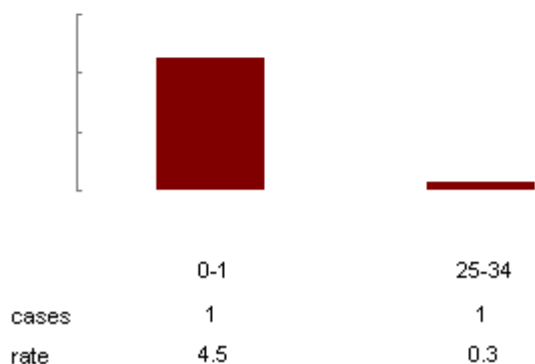
There have been 12 cases of wound botulism reported in Washington State since 1999, including a King County resident in 2004 who reported injecting black tar heroin.

BRUCELLOSIS

rate by year (cases per 100,000 from 2000-2007)



rate by age group (cases per 100,000 in 2007)



Two cases of brucellosis were reported in 2007, in a mother and her infant. The mother's infection was most likely acquired from consumption of unpasteurized dairy products in India. The infection may have been transmitted to the baby transplacentally, during delivery, or by breastfeeding. While the mother completely recovered, the baby presented with osteomyelitis more than a year after initial diagnosis.

Between 1994 and 2006 there were six cases of brucellosis reported in King County. One case was reported in an African immigrant in 2003. No cases were reported between 2004 and 2006.

Purpose of Surveillance:

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

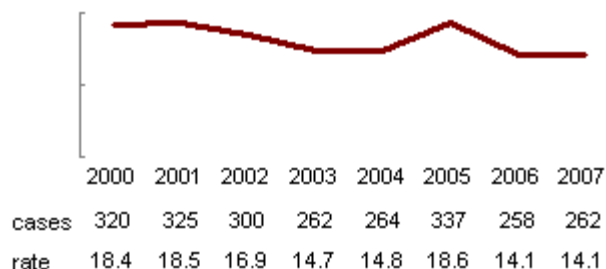
Epidemiology: Brucellosis is caused by bacteria of the genus *Brucella*. This organism causes disease in many different mammals, especially sheep, goats, and cattle. Humans become infected by exposure to the tissues, blood, urine, vaginal discharge, aborted fetuses, and placentas of infected animals.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

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

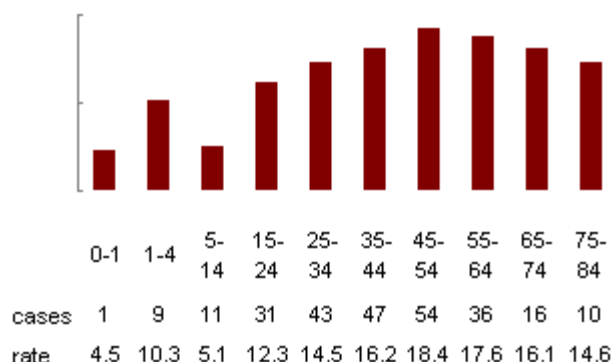
Prevention: Do not consume unpasteurized milk, cheese, or ice cream. Hunters and animal herdsman should use rubber gloves when handling animal parts. There is no vaccine available for humans.

CAMPYLOBACTERIOSIS

rate by year (cases per 100,000 from 2000-2007)



rate by age group (cases per 100,000 in 2007)



In 2007, 262 cases of campylobacteriosis were reported in King County. *C. jejuni* accounted for all of the 143 (55%) of isolates serotyped. International travel during their exposure period was reported by 24% (62) of cases, with travel to Africa (2), Asia/South Pacific (19) Australia (1), Canada (2), Caribbean (3), Europe (18), Mexico (11), and South/Central America (6).

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

Purpose of Surveillance:

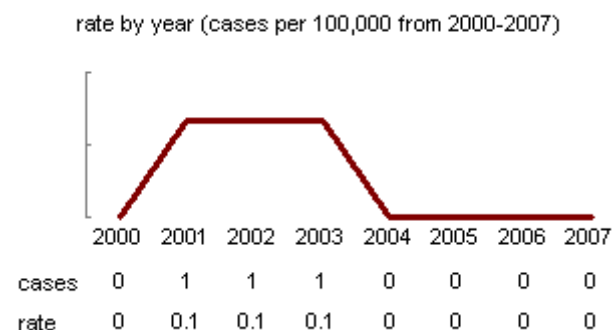
- To identify common source outbreaks
- To identify and eliminate sources of transmission including contaminated food and water

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

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

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

CHOLERA



No cases of cholera were reported in 2007.

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

Purpose of Surveillance:

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

Epidemiology: Cholera, a severe and potentially fatal diarrheal disease, is caused by certain toxin-producing strains of the bacteria *Vibrio cholera*. It is spread by food and water that is contaminated by the feces of an infected person. The disease can spread rapidly when there is inadequate sewage treatment and drinking water. The bacteria can also live in seawater, causing illness in persons eating raw or undercooked shellfish from contaminated waters.

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.

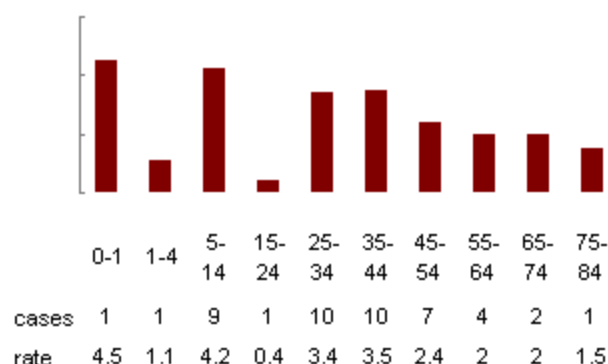
Prevention: While traveling areas of the world where cholera is endemic, avoid water and food that may be contaminated (especially undercooked or raw shellfish, raw fruits, and raw vegetables).

CRYPTOSPORIDIOSIS

rate by year (cases per 100,000 from 2000-2007)



rate by age group (cases per 100,000 in 2007)



Forty-six cases of cryptosporidiosis were reported in King County residents in 2007. Rates of infection were highest in infants and in children age five to 14 years. No clusters of illness were identified. Eighteen cases reported some travel outside of King County during their exposure period.

Cryptosporidiosis became a reportable disease in Washington State in December of 2000. Since that time, no large common source outbreaks have been identified. The trend of increasing cases is likely due to better detection and reporting of the organism.

Purpose of Surveillance:

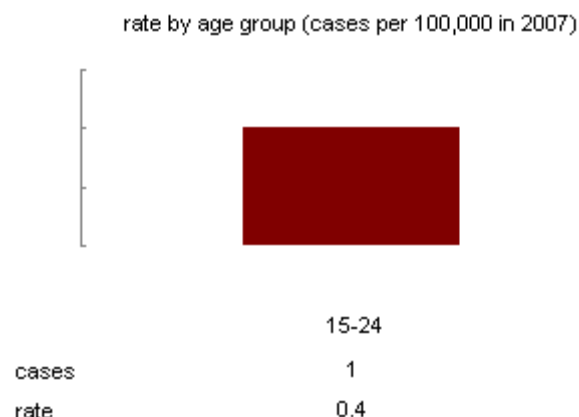
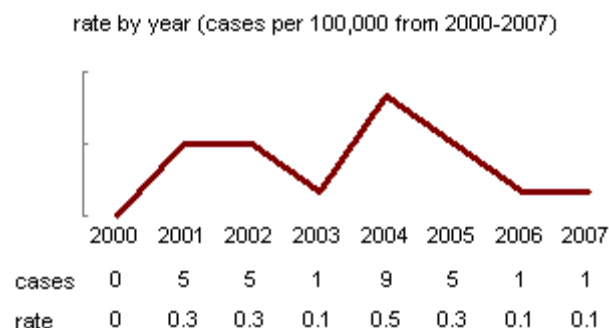
- To identify outbreaks
- To identify and eliminate sources of transmission including contaminated food and water

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

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

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

CYCLOSPORIASIS



One case of cyclosporiasis was reported in King County in 2007, in an adult female who had traveled to Panama and Guatemala.

Cyclosporiasis became reportable in Washington State in December of 2000. Since then one to five cases have been 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

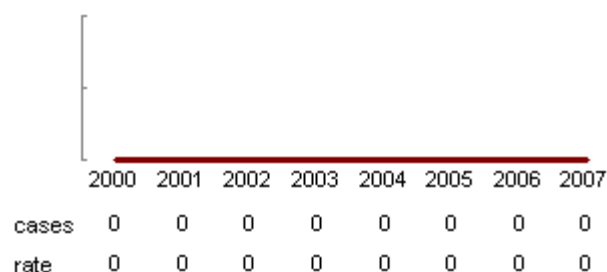
Cyclospora cayetanensis typically occurs when a person drinks, or swims in contaminated water, or eats fruits or vegetables that have been rinsed with contaminated water. Cyclospora infection cannot be spread from person to person. The infection is endemic in many developing countries. Domestic infections 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 normal immune systems typically recover on their own. Immune-compromised persons frequently require antibiotic 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

rate by year (cases per 100,000 from 2000-2007)



No cases of toxigenic diphtheria were reported to Public Health in 2007.

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

Purpose of Surveillance:

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

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

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

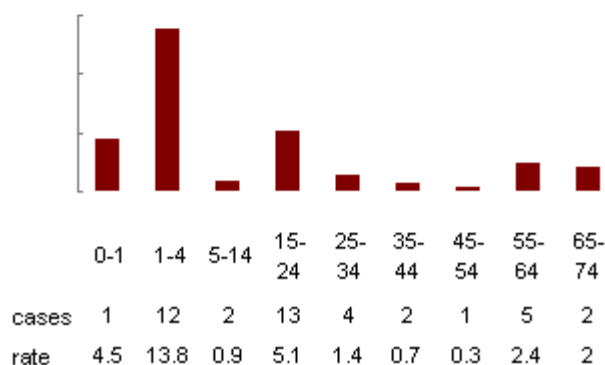
Prevention: Immunization with a vaccine-containing diphtheria toxoid such as DTaP or Tdap is the best means of prevention. Both vaccines are part of routine childhood and teenage immunization series. All international travelers, regardless of age or destination, should ensure that they are up to date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

ENTEROHEMORRHAGIC *E. COLI*, INCLUDING O157:H7

rate by year (cases per 100,000 from 2000-2007)



rate by age group (cases per 100,000 in 2007)



Forty-three cases of Enterohemorrhagic *Escherichia coli* (EHEC) were reported in King County in 2007. Thirty-seven (86%) cases were caused by *E. coli* O157, and six (14%) by non-O157 strains of EHEC. Thirteen patients required hospitalization, and one patient developed hemolytic-uremic syndrome (HUS). Four cases (9%) reported international travel during their exposure period, all with travel to Mexico.

There were two national outbreaks of *E. coli* O157 in 2007, neither of which included cases from Washington. The first outbreak included 40 cases and was linked to contaminated frozen ground beef patties. The second outbreak, with ten cases, was linked to frozen pizza containing pepperoni.

In 1993, a large outbreak in Washington, Idaho, California, and Nevada linked to a fast-food hamburger chain sickened more than 500 people and caused four deaths. In 2006, two people from

Purpose of Surveillance:

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

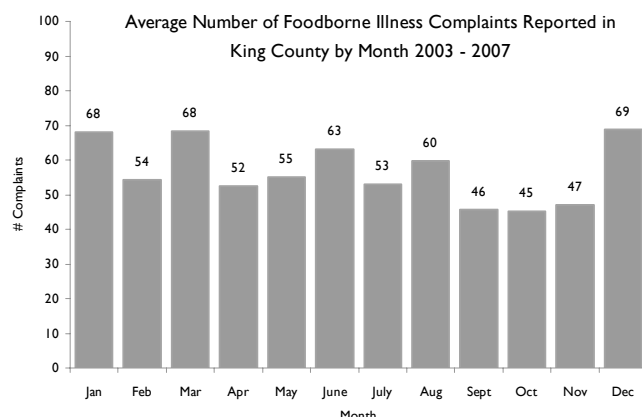
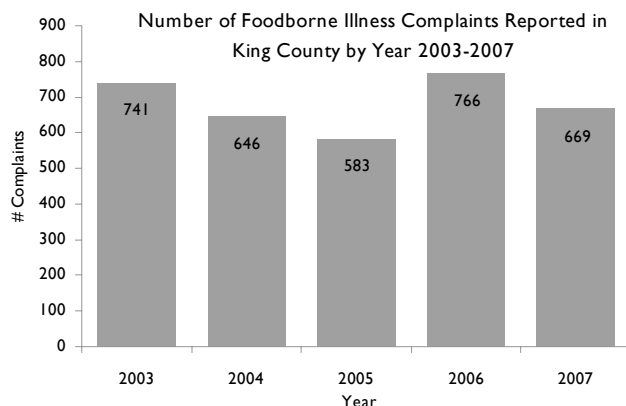
Epidemiology: Cattle are the primary reservoir of enterohemorrhagic *Escherichia coli* (EHEC). Sources of transmission include undercooked ground beef and other beef products; unpasteurized milk, cheese, and juice; contaminated raw fruits, vegetables, and herbs; water contaminated with animal feces;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

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

Prevention: Cook all meat, especially ground beef, thoroughly (to 160°F). Clean all utensils and surfaces after contact with raw meat. 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.

Washington, including one from King County, were infected after drinking unpasteurized cow's milk produced at a Washington dairy. The same year a multi-state outbreak of *E. coli* O157 was linked to consumption of pre-packaged spinach from the Salinas Valley in California. Over 200 cases from 26 states were laboratory confirmed, though no King County cases were identified.

FOODBORNE ILLNESS



Public Health received 669 FBI complaints in 2007. Of these, 55 (8.2%) resulted in environmental health inspections of the food service establishment, and 38 (5.7%) were categorized as probable or confirmed outbreaks. Both confirmed and probable outbreaks require either evidence of food handling violations during an environmental investigation, or strong epidemiologic evidence of an outbreak. Confirmed outbreaks also require laboratory confirmation of the suspected pathogen, while probable outbreaks lack laboratory confirmation.

In 2007, two outbreaks were reported in which 20 or more people became ill. One was a confirmed norovirus outbreak where two separate parties became ill after consuming submarine sandwiches prepared by the same restaurant. The second outbreak occurred at a private club where

Purpose of Surveillance:

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

Epidemiology: Foodborne illnesses (FBIs) are caused by eating food contaminated with:

- pathogenic bacteria, viruses or parasites (i.e., salmonella, norovirus, or cyclospora),
- toxins produced by bacteria (i.e., botulism),
- naturally occurring toxins (i.e., poisonous mushrooms, fish and shellfish toxins), or
- chemical poisons (i.e., detergents, pesticides, metals)

FBI reports tend to be higher in the summer months when warm weather favors proliferation of bacteria in food, and during the winter holiday season when group meals are common.

Investigations are initiated in response to reports of suspected foodborne illnesses by citizens, health care professionals, and restaurants.

Clinical Aspects: FBI symptoms vary by the organism or substance causing the illness. Clinical manifestations include:

- Gastroenteritis characterized by inflammatory diarrhea (i.e., salmonellosis, campylobacteriosis); non-inflammatory diarrhea (i.e., norovirus); or persistent diarrhea (i.e. giardiasis, and other parasitic infections)
- Neurologic illness (botulism, paralytic shellfish poisoning, mushroom poisoning)
- Systemic illness (listeriosis, typhoid fever, hepatitis A)

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

attendees became ill with symptoms suggestive of a bacterial toxin shortly after eating potato salad that had been kept at room temperature for several hours.

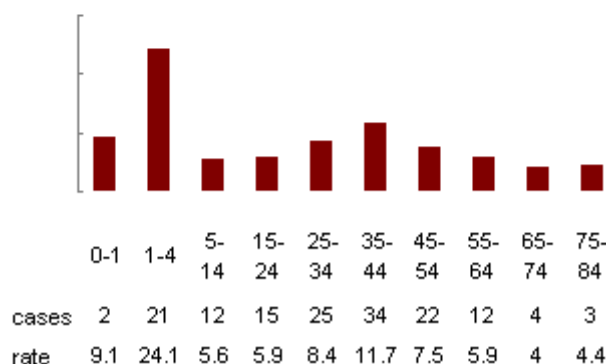
Seven confirmed *Vibrio parahaemolyticus* outbreaks were attributed to consumption of raw oysters in 2007, and a single case of scombroid (histamine) poisoning was identified in a person who ate ahi tuna shortly before developing symptoms.

GIARDIASIS

rate by year (cases per 100,000 from 2000-2007)



rate by age group (cases per 100,000 in 2007)



In 2007, 150 cases of giardiasis were reported in King County, with the highest rate of illness in the one to four-year-old age group.

Three cases of giardiasis were linked to a university study abroad program based in Ghana. Forty-five cases occurred among international travelers, most commonly to Central and South America (8 cases), Africa (10 cases) and Asia (17 cases).

Four hundred to 700 cases are reported statewide each year.

Purpose of Surveillance:

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

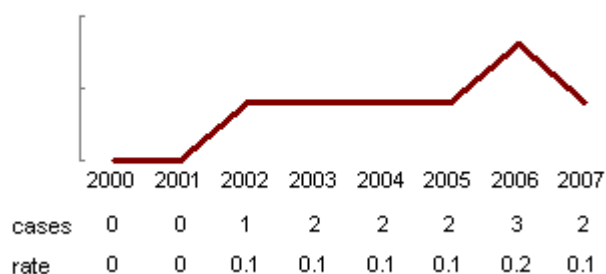
Epidemiology: *Giardia lamblia* is a flagellate protozoan widely found in nature. It is transmitted by ingesting food or water contaminated with the feces of infected humans and other mammals, especially beavers, puppies, and cats. Fecal-oral transmission can occur in childcare centers, households, and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

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

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

HAEMOPHILUS INFLUENZAE INVASIVE DISEASE

rate by year (cases per 100,000 from 2000-2007)



In 2007, two cases of invasive *H. influenzae* type b disease (blood stream infections) were reported in a King County newborn and a 14-month-old child. Neither child was vaccinated: the newborn was too young for vaccine and the parents of the 14-month-old declined vaccine. Both cases required hospitalization and survived the illness.

Statewide, four to 13 cases are reported each year in children under age five.

Purpose of Surveillance:

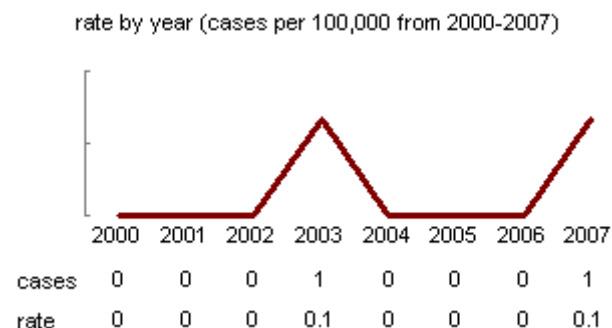
- To identify cases of *Haemophilus influenzae* serotype b (Hib) disease for investigation
- To monitor for occurrence of invasive disease due to non-serotype b *Haemophilus influenzae*
- To identify contacts of persons with *Haemophilus influenzae* serotype b (Hib) infection, and assure administration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

Epidemiology: Prior to 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 the introduction Hib conjugate vaccine in 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



One non-fatal case of Hantavirus Pulmonary Syndrome (HPS) was reported in King County in 2007. The patient was likely exposed in Idaho after cleaning wild rodent nests and sleeping in a rustic, rodent-infested cabin.

Between 1997 and 2007, a total of three cases of HPS have been reported in King County. A 23-year-old man died of HPS in 1997, a 35-year-old man survived infection in 1999, and a 19-year-old man survived infection in 2003. All three cases were most likely exposed in Eastern or Central Washington.

Purpose of Surveillance:

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

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

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

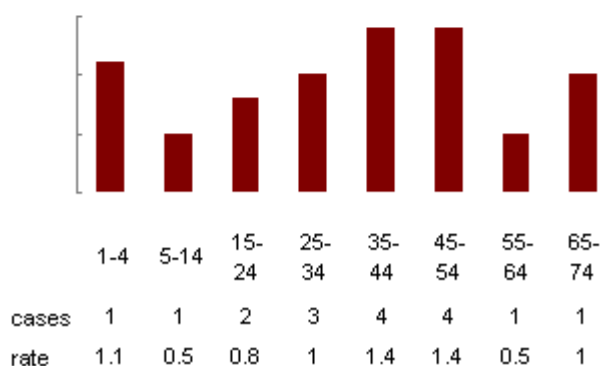
Prevention: Keep mice and other rodents away from home, workplace, and places such as cabins, sheds, barns, garages, and storage facilities. Use a plastic trash can with a lid for kitchen garbage and food scraps. Tightly cover outdoor garbage cans and raise them 12 inches off the ground. Take precautions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

HEPATITIS A

rate by year (cases per 100,000 from 2000-2007)



rate by age group (cases per 100,000 in 2007)



Seventeen cases of hepatitis A were reported in King County in 2007. Eight cases (47%) were travel-associated, reporting travel to Indonesia (1), Pakistan (1), Mexico (5) and Swaziland (1). A small cluster was reported involving close contact between a child and a caregiver.

Prior to the introduction of hepatitis A vaccine in 1995, the incidence of reported hepatitis A cases in King County fluctuated, with cyclical peaks occurring approximately every five years. Since 1997, reported hepatitis A cases have been declining in King County.

Purpose of Surveillance:

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

Epidemiology: Hepatitis A virus (HAV) infects the liver. It is primarily acquired via the fecal-oral route, either through person-to-person contact or by ingestion of fecally-contaminated food or water. Unlike hepatitis B or C, HAV does not cause chronic infection or carriage. HAV is more common in developing countries where sanitation is poor and vaccine is not available.

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

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

HEPATITIS B - ACUTE AND CHRONIC INFECTIONS

Acute Hepatitis B

rate by year (cases per 100,000 from 2000-2007)



In 2007, 23 cases of acute hepatitis B were reported. The majority of cases (78%) were men. Eleven (48%) cases were suspected to have a sexual exposure to hepatitis B. Three (13%) of the acute cases were identified through the Public Health – Seattle & King County Perinatal Hepatitis B Prevention Program, and were exposed perinatally to hepatitis B virus. One of the infants infected was born premature and did not receive HBIG and vaccine according to recommendations to prevent infection. The other two children received the full vaccination series and tested positive for infection in their post-vaccination testing.

Chronic Hepatitis B

rate by year (cases per 100,000 from 2000-2007)



In 2007, 839 cases of chronic hepatitis B were reported. Roughly half (53%) of chronic cases were in men.

In December 2000, chronic HBV infection became reportable in Washington and since then the number of reports in King County has ranged from 400 to

Purpose of Surveillance:

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

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

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

Prevention: Vaccinate children against hepatitis B as part of routine childhood immunizations, as well as 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.

840 reports per year. Acute HBV cases reported in King County and nationally have been declining since the 1980s. The decrease in the number of cases is attributed primarily to increasing use of hepatitis B vaccine and human immunodeficiency virus (HIV) prevention efforts among high-risk populations.

HEPATITIS C – ACUTE AND CHRONIC INFECTIONS

Acute Hepatitis C

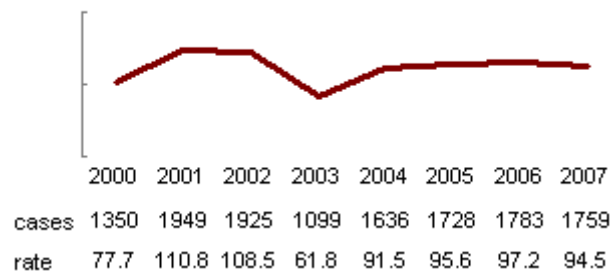
rate by year (cases per 100,000 from 2000-2007)



Seven acute cases of hepatitis C were reported in King County in 2007. Two of the cases (29%) reported injection drug use during the exposure period.

Chronic Hepatitis C

rate by year (cases per 100,000 from 2000-2007)



In 2007 there were 1,759 reports of chronic hepatitis C.

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

Purpose of Surveillance:

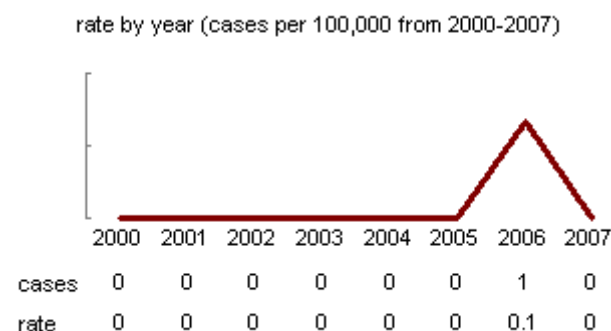
- To identify risk factors for hepatitis C virus (HCV) infection
- To identify and eliminate sources of transmission
- To provide education to cases in order to minimize risk of transmission and to reduce risk factors for development of chronic liver disease
- To monitor the prevalence of disease and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

Epidemiology: HCV infects the liver. It is transmitted primarily by direct exposure to the blood of an infected person. Before 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). The risk of a baby of an HCV-infected pregnant woman becoming infected during delivery is about 5%. 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. There is no vaccine for hepatitis C.

HEPATITIS E



No cases of hepatitis E were reported in 2007.

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

Purpose of Surveillance:

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

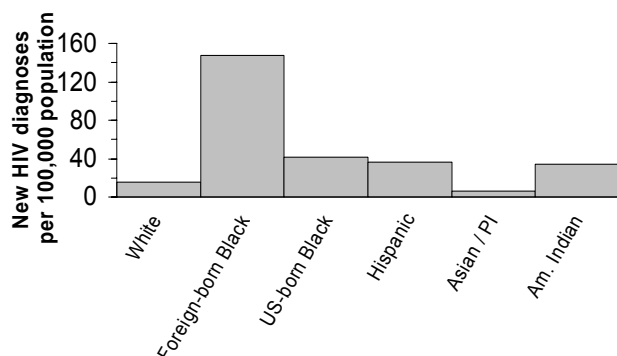
Epidemiology: Hepatitis E virus (HEV) is rare in the United States but is a common cause of viral hepatitis in developing countries. HEV is primarily acquired via the fecal-oral route, usually through contaminated drinking water. Outbreaks often occur after floods, monsoon rains, or other events that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

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

Prevention: There is no vaccine or treatment 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 use measures recommended to prevent hepatitis A and other enteric infections.

HIV AND AIDS

2007 rate of new HIV diagnoses
by race, ethnicity, and place of birth



In recent years, 350 to 400 King County residents have been diagnosed with Human Immuno-deficiency Virus (HIV) annually. An estimated 7,200 to 7,800 King County residents live with HIV or AIDS, including 6,178 cases diagnosed through the end of 2007. In 2007, 404 HIV cases, 234 Acquired Immune Deficiency Syndrome (AIDS) cases, and 82 deaths were reported. Some of these diagnoses and deaths occurred in previous years.

Overall, about 0.5% of all county residents are infected. HIV infection rates are highest MSM. An estimated 15% of all MSM are infected, while 25% of MSM who inject drugs may be infected.

The rate of new HIV diagnoses is highest among foreign-born Blacks, and similar among U.S.-born Blacks, Hispanics, and Native Americans as shown above. Rates are lowest among Whites and Asians.

HIV is concentrated in urban areas, and 2/3 of Washington HIV cases occur in King County. Between 11,000 and 12,000 Washington residents are infected with HIV.

Purposes of Surveillance:

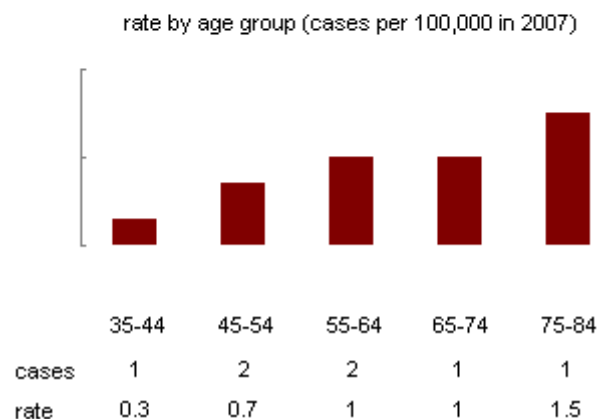
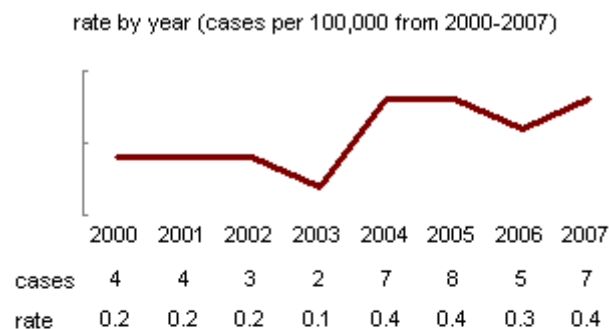
- Monitor the occurrence of HIV, AIDS, and HIV-related mortality in King County and describe characteristics of people with HIV
- Facilitate special laboratory testing among newly diagnosed people to estimate length of time infected and to measure resistance to medication
- Target prevention efforts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

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

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

Prevention: Knowledge of HIV status, consistent and correct use of condoms, and use of needle exchange programs all can dramatically reduce new infections among high-risk individuals. Transmission from donated blood and tissue specimens has been virtually eliminated in the U.S. through required testing for HIV. Transmission from mothers to infants has been reduced to fewer than 150 infections per year nationally because of testing and treatment of pregnant women and prophylaxis of the infant.

LEGIONELLOSIS



Seven cases of legionellosis were reported to Public Health in 2007, all were *L. pneumophila*. The cases ranged in age from 42 to 81 years old. All were hospitalized and two deaths were reported.

In general, most cases of legionellosis are sporadic, with no source identified. There have been 2 to 7 cases reported per year in King County since 2000.

Purpose of Surveillance:

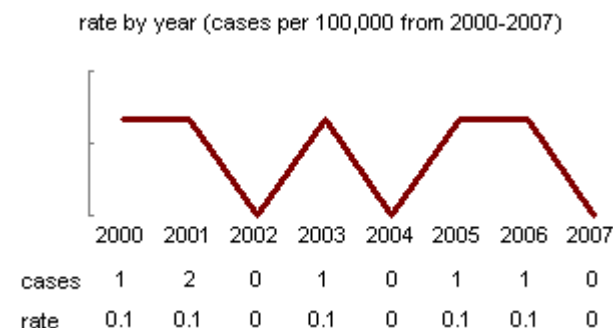
- To identify common source outbreaks and nosocomial cases for investigation
- To identify and eliminate preventable sources of transmission

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

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

Prevention: There is no vaccine or preventive treatment for legionellosis.

LEPTOSPIROSIS



No cases of human leptospirosis were reported in 2007. However, there were 30 reports of leptospirosis in dogs throughout King County. Most occurred during the rainy seasons of winter and early spring.

Most cases occur in international travelers or participants in outdoor recreational activities, including adventure races.

Purpose of Surveillance:

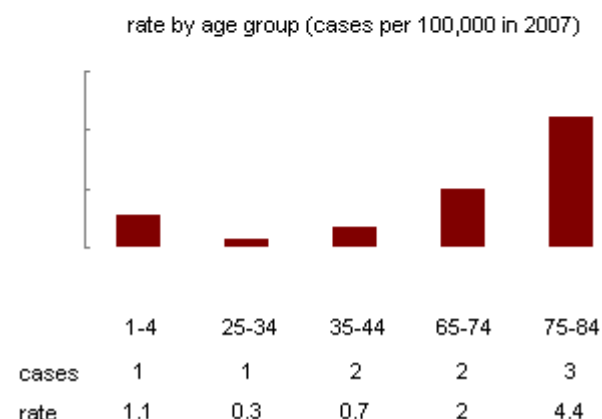
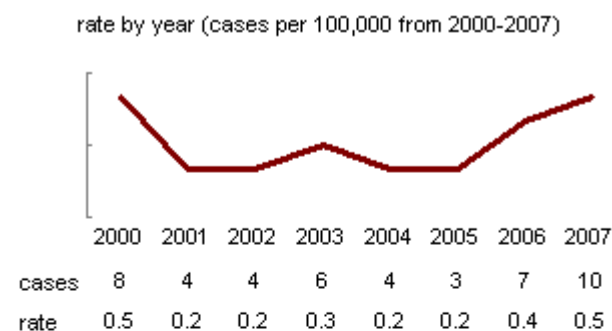
- To identify common source outbreaks
- To identify and eliminate preventable sources of transmission

Epidemiology: Leptospirosis is a zoonotic disease caused by the bacteria *Leptospira interrogans*. Leptospirosis occurs worldwide, and is more common in temperate and tropical areas. It is estimated that 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. Leptospirosis is rarely spread from person to person. People are often exposed through recreational activities such as swimming, canoeing, or participating in open water events such as triathlons or adventure racing. 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 contact with water, soil and vegetation contaminated with animal urine. Avoid direct contact with animal urine. Wear gloves if contact with urine is likely to occur, and wash hands after any exposure to animal urine. Wear protective clothing and footwear in areas possibly contaminated with animal urine. Vaccinate farm animals and dogs for leptospirosis. Control rodents around the home and in recreational areas with human presence.

LISTERIOSIS



In 2007, ten cases of listeriosis were reported in King County residents. Nine of the patients required hospitalization and two cases were fatal. No cases occurred in pregnant women in 2007, and no specific food product was identified as the suspected exposure for any of the cases.

Most cases occur among the elderly, persons with weakened immune systems, and pregnant women. 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*, a soft Mexican cheese often made with unpasteurized milk. 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.

Purpose of Surveillance:

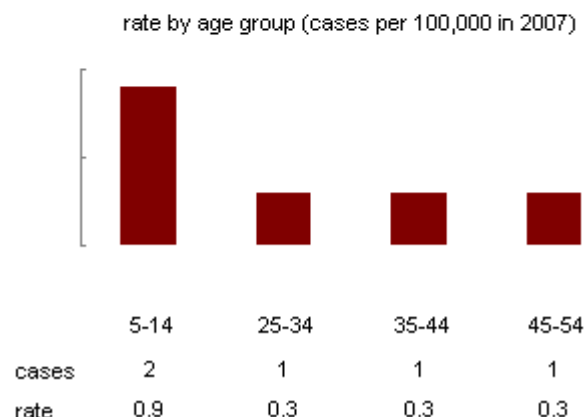
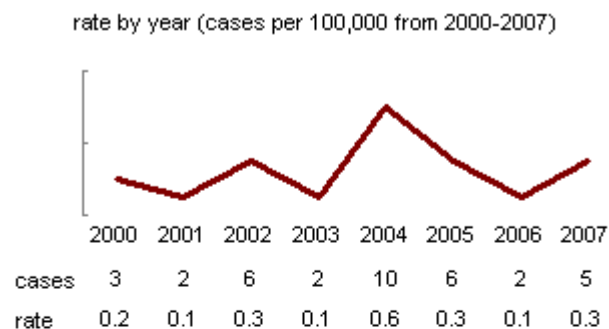
- To identify common source outbreaks
- To identify and eliminate sources of transmission, including contaminated food products

Epidemiology: Listeriosis is a bacterial infection caused by *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 causes fever and flu-like symptoms such as fever, muscle aches, and gastrointestinal symptoms such as nausea, vomiting and diarrhea. *Listeria* can infect the bloodstream and brain as well as the uterus and cervix. Miscarriages or fetal death can result, 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.

LYME DISEASE



Five cases of Lyme disease were reported to Public Health in 2007. All cases had likely exposures outside of Washington with travel to Wisconsin (2), Oregon (1) and Europe (2). No cases were hospitalized.

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

Purpose of Surveillance:

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

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

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

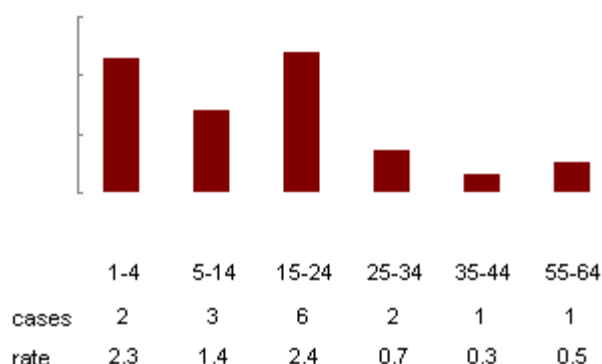
Prevention: When outdoors in areas with ticks, wear light colored, long-sleeved shirts, long pants tucked into socks, and closed shoes (not sandals). Use DEET containing repellent on exposed areas of skin and permethrin-containing repellent on clothing. After outdoor activities, wash clothing and check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

MALARIA

rate by year (cases per 100,000 from 2000-2007)



rate by age group (cases per 100,000 in 2007)



Eight of the 15 malaria cases reported in King County in 2007 occurred among international travelers, while the remaining seven were recent immigrants or refugees to the United States. Five individuals, who were among Burundian refugees arriving in the U.S. from refugee camps in Tanzania, were among a cluster of 29 symptomatic cases in twelve states. The following countries were likely sources of infection: Cameroon (1), Ethiopia (1), Gambia (1), Ghana (1), Honduras (1), India (3), Kenya (1), Papua New Guinea (1), and Tanzania (5).

Six (40%) of the 15 cases reported in King County were identified as *P. falciparum*, seven (47%) were *P. vivax*, one (7%) was a coinfection with both *P. falciparum* and *P. ovale*, and one (7%) case was untyped. Nine of the 15 cases required

Purpose of Surveillance:

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

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

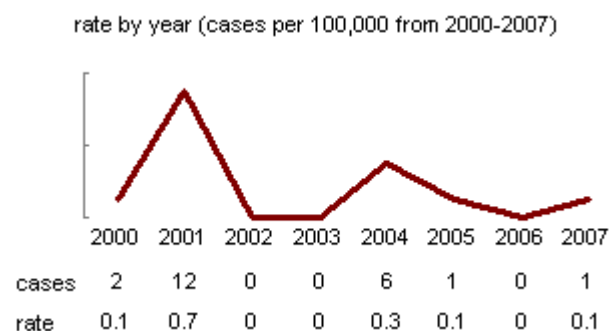
Clinical Aspects: The incubation period varies by species from seven to 40 days. Symptoms of malaria include malaise, anorexia, chills, sweats, fever, and headache. The illness may last for days and have cycles of fever with relief of symptoms between peaks in temperature. Antimalarial medications can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

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

hospitalization and none died. Only five (33%) cases reported taking anti-malarial prophylaxis to prevent infection.

Many cases in King County are among travelers who did not take anti-malarial preventive medication, or did not complete the recommended regimen. Other cases are among travelers and recent immigrants and refugees.

MEASLES



In 2007, one case of measles was reported in King County in an unvaccinated child who was exposed to the virus while traveling in India. The case was no longer contagious upon returning to the U.S. No secondary cases were reported.

In 2004, there were 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 linked to an outbreak in Korea were reported.

Purpose of Surveillance:

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

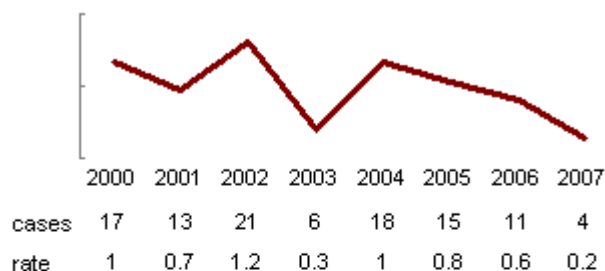
Epidemiology: Measles is one of the most highly contagious diseases known, but is preventable through vaccination. It is spread through coughing and sneezing. Measles is common in many parts of the world, including Europe. Local cases of measles are often linked to travel or exposure to recent travelers.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

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

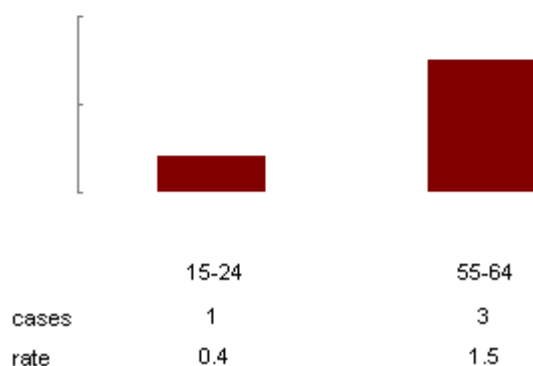
Prevention: Measles can be prevented through vaccination. In Washington State, all children are required to have documented measles immunization for entry into a school or childcare center. All international travelers should be up to date on measles vaccine. The MMR combination vaccine combines protection against measles, mumps and rubella. 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 from 2000-2007)



rate by age group (cases per 100,000 in 2007)



Four cases of laboratory-confirmed meningococcal disease were reported to Public Health in 2007. The specimens were serotyped at the Washington State Department of Health (two were type B and two were type Y). All four cases were hospitalized and no deaths were reported.

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

Purpose of Surveillance:

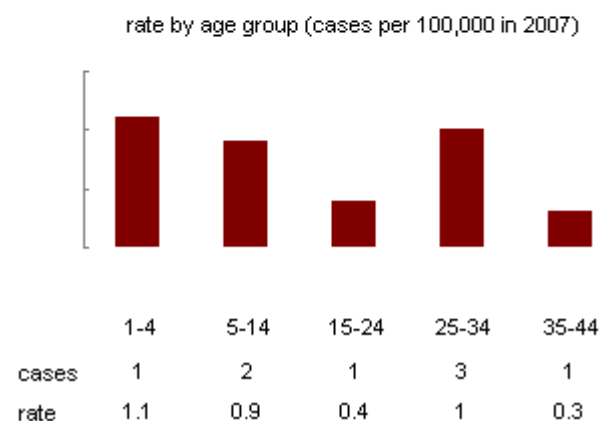
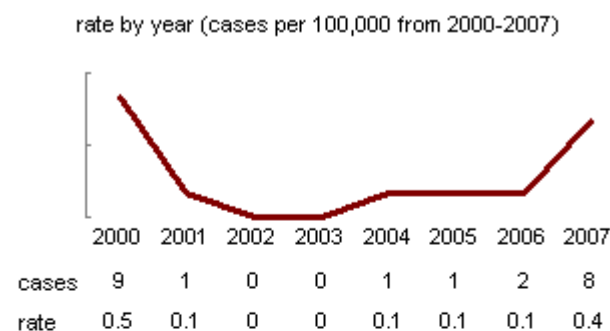
- To identify outbreaks and implement appropriate disease control measures including vaccine and/or post-exposure prophylaxis
- To identify exposed persons for post-exposure prophylaxis to prevent the spread of infection
- To monitor trends in the incidence of specific serotypes and strains of *Neisseria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

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

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

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

MUMPS



Eight confirmed cases of mumps were reported in King County in 2007. Of these, four were epidemiologically linked to an outbreak of mumps occurring in an Ethiopian refugee camp, two were likely exposed while traveling in Japan, and no source was identified for two cases.

Nineteen probable mumps cases were reported in King County in 2007 in people who met the clinical case definition for mumps, but for whom confirmatory lab testing was not available.

Usually less than a dozen cases a year occur statewide. In 2006, the U.S. experienced the largest mumps outbreak in twenty years, originating in the Midwest and involving nine states. Increased testing for mumps contributed to the identification of 42 cases in Washington State that year, but none were linked to the Midwest outbreak.

Purpose of Surveillance:

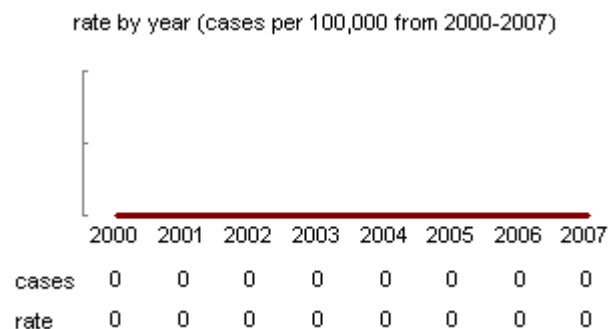
- To facilitate diagnostic testing for mumps
- To identify susceptible persons exposed to mumps in order to implement disease control interventions
- To detect outbreaks

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

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

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

PARALYTIC SHELLFISH POISONING



No cases of paralytic shellfish poisoning were reported in 2007.

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

Purpose of Surveillance:

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

Epidemiology: Paralytic Shellfish Poisoning (PSP)

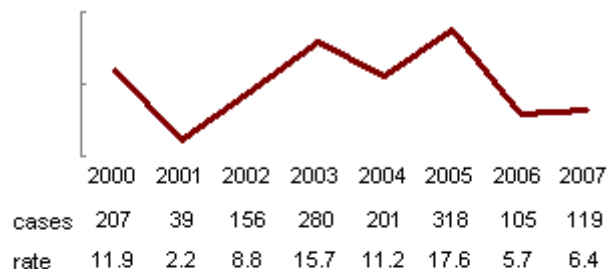
is a neurologic syndrome caused by consuming shellfish contaminated with naturally-occurring toxic substances called "saxitoxins." High concentrations of these toxins occur in shellfish during algae blooms known as "red tides," but can also occur in the absence of a recognizable algae bloom. Saxitoxin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

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

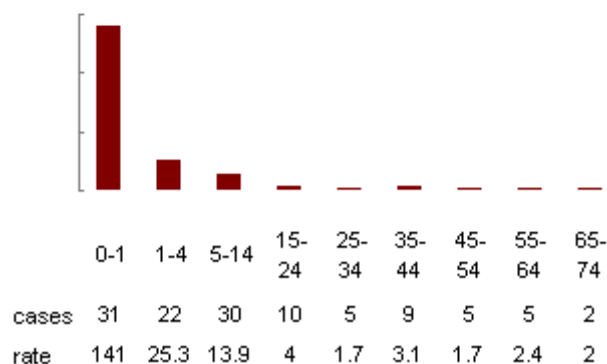
Prevention: Do not eat shellfish harvested from beaches known to be contaminated. The toxin is not affected by standard cooking or steaming.

PERTUSSIS

rate by year (cases per 100,000 from 2000-2007)



rate by age group (cases per 100,000 in 2007)



In 2007, 119 cases of pertussis reported in King County. Children under the age of one year accounted for 26% of cases. Ten cases were hospitalized and no fatalities were reported. Exposure to an ill household member was the suspected source for 41% of cases.

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

Purpose of Surveillance:

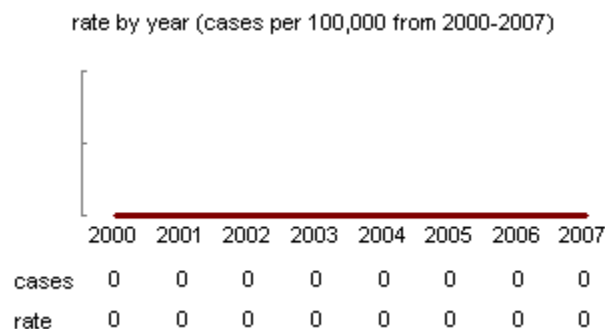
- To prevent transmission of pertussis to persons at high risk for severe illness and complications
- To identify outbreaks and implement disease control measures including early recognition, testing, and treatment of cases

Epidemiology: Pertussis, also known as “whooping cough,” is a toxin-mediated disease caused by *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 hospitalization, pneumonia, and death compared with older children and adults. Pertussis vaccination reduces the frequency and severity of disease among young children. However, the protective effects of natural pertussis infection and pertussis vaccine wane with time. Unrecognized infections in older children and adults are thought to be the most common source of pertussis transmission to infants in the community.

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

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

PLAGUE



No cases of plague were reported in 2007.

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

Purpose of Surveillance:

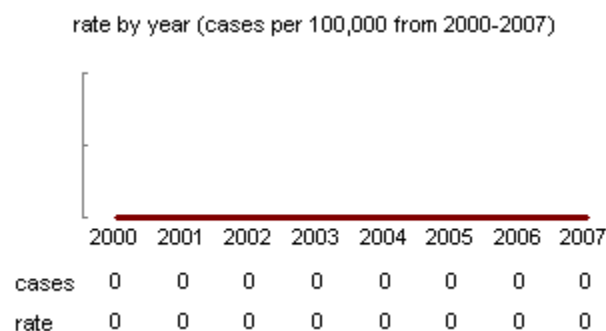
- To investigate cases caused by potential agents of bioterrorism
- To identify naturally occurring sources of infection
- To confirm reported cases and to ensure that exposed persons receive post-exposure prophylaxis and/or monitoring

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. is sporadic, with only single cases or small common source clusters in an area. 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. Patients who do not receive prompt antibiotic treatment are not likely to survive. *Septicemic plague* refers to an infection of the bloodstream, and can be a complication of bubonic or pneumonic plague, or can occur by itself. Symptoms include fever, chills, abdominal pain, shock, and bleeding into the skin and other organs.

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

POLIOMYELITIS



No cases of polio were reported in 2007.

The last case identified in Washington occurred in 1977. Vaccine-associated paralytic polio (VAPP) is rare, with one case in Washington in 1993.

Purpose of Surveillance:

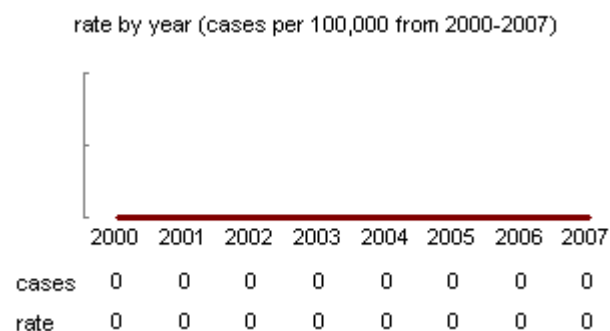
- To identify cases of imported poliomyelitis
- To identify cases and susceptible contacts of cases for post-exposure prophylaxis (e.g., immunization) and to institute infection control measures
- To differentiate naturally-occurring and vaccine-associated polio viruses

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

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

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

PSITTACOSIS



No cases of psittacosis were reported in 2007.

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

Purpose of Surveillance:

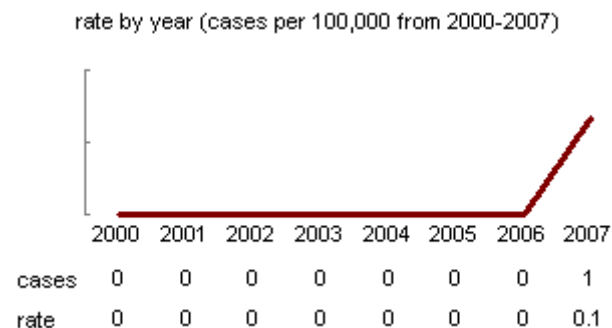
- To identify source of transmission (i.e., infectious birds), and eliminate risk to others
- To facilitate appropriate diagnostic testing and treatment for infected persons
- To implement control measures for contaminated areas and management of infected birds

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

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

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

Q FEVER



There was one case of Q fever reported in 2007 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.

There are zero to two cases of Q fever in Washington State annually. The last death associated with Q fever occurred in 1987.

Purpose of Surveillance:

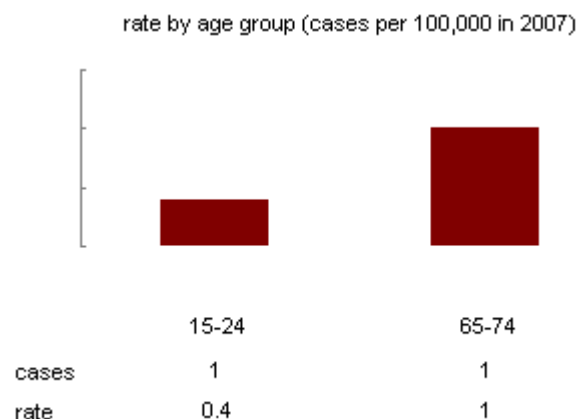
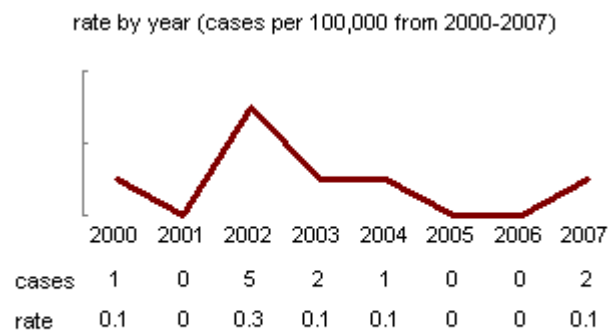
- To identify sources of transmission and reduce the risk to others
- To identify cases caused by potential agents of bioterrorism

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

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

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

RELAPSING FEVER



In 2007, two cases of tick-borne relapsing fever (TBRF) were reported in King County. Both cases traveled outside King County: one case spent time in Idaho and British Columbia, and the other case spent time in Chelan County during the likely exposure period. Both cases were hospitalized. There were no reported deaths.

Washington State has two to eight cases of tick-borne relapsing fever (TBRF) reported each year, most occurring while vacationing in rural, mountainous areas between May and September. There have been 11 cases of relapsing fever reported in King County since 1999, all associated with exposures outside of western Washington.

Purpose of Surveillance:

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

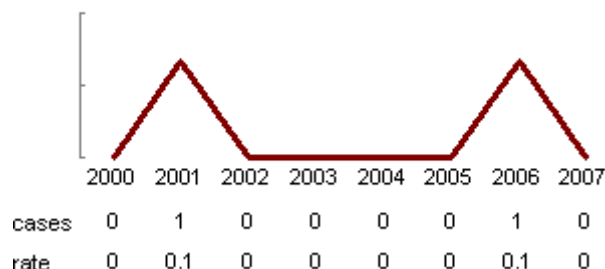
Epidemiology: Relapsing fever is caused by the bacteria *Borrelia*. In the United States it typically occurs in mountainous areas of the western states. It is transmitted to humans by the bites of argasid (soft) ticks that become infected when feeding on infected rodents, frequently squirrels and chipmunks.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

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

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

ROCKY MOUNTAIN SPOTTED FEVER

rate by year (cases per 100,000 from 2000-2007)



No cases of Rocky Mountain spotted fever were reported in 2007.

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

Purpose of Surveillance:

- To identify risk factors for infection
- To identify locally occurring cases

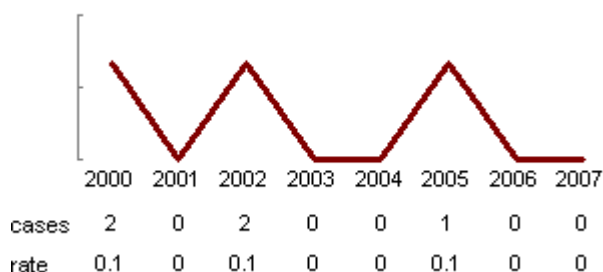
Epidemiology: Rocky Mountain spotted fever (RMSF) is caused by the bacterium *Rickettsia rickettsii*, and is considered the most severe tick-borne infection. *R. rickettsii* is transmitted via infected ticks, most commonly by the species *Dermacentor*. These 'hard ticks' are more commonly found in the western, south, and southeast regions of Washington 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.

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

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

RUBELLA

rate by year (cases per 100,000 from 2000-2007)



There were no cases of rubella reported in King County in 2007.

Washington State has five to 15 cases reported each year. In King County, one adult case of rubella was reported in 2005. The case had traveled internationally and was exposed to ill family members. Two cases of rubella were reported in King County during 2002, both in unvaccinated, recent immigrants.

Purpose of Surveillance:

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

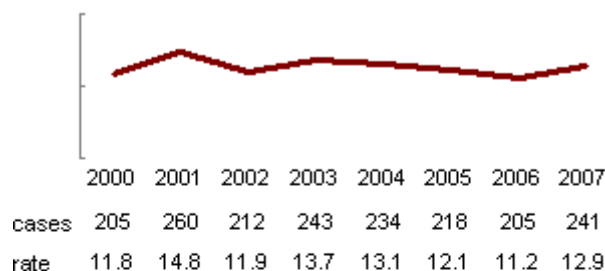
Epidemiology: Rubella (German measles) is a viral illness spread through coughing and sneezing. When acquired by a mother early in pregnancy it can lead to premature delivery, congenital defects, and fetal death, depending on gestational age at time of infection. Congenital rubella syndrome (CRS) occurs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

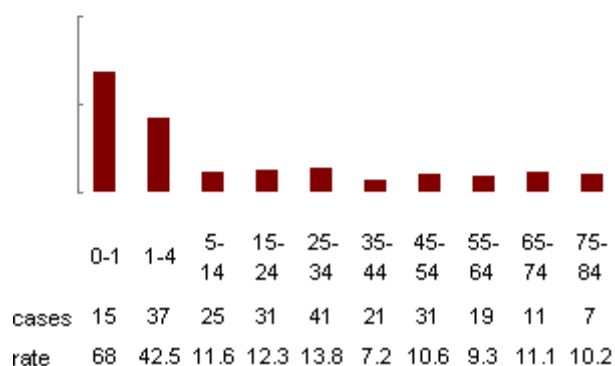
Prevention: Immunization is the best way to prevent rubella. Rubella vaccine is included in the MMR combination vaccine which provides protection against measles, mumps and rubella. People exposed to rubella should consult their health care provider immediately.

SALMONELLOSIS

rate by year (cases per 100,000 from 2000-2007)



rate by age group (cases per 100,000 in 2007)



In 2007, 241 cases of salmonellosis were reported in King County. The highest incidence was among infants and young children. Five cases were part of a multi-state outbreak of *S. Wandsworth* associated with consumption of a commercially-prepared puffed vegetable snack. Other multi-state outbreaks in 2007 included an outbreak of *S. Tennessee* linked to consumption of contaminated peanut butter, *S. 14, [5], 12:i:-* (pronounced “four five twelve eye minus”) associated with contaminated frozen pot pies, and *S. Java*, which was associated with exposure to turtles. Three King County cases genetically matched the pot pie outbreak but did not report pot pie consumption. Two King County and one Snohomish county case were linked to exposure at an adult care facility.

In 2007, forty-nine (23%) cases were attributed to international travel. Forty-two (17%) cases required hospitalization, and one died.

Purpose of Surveillance:

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

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

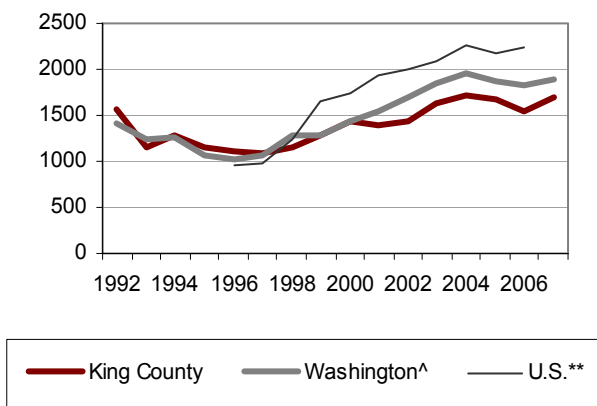
Clinical Aspects: The incubation period is generally 12 to 36 hours (range 6 to 72 hours), and illness typically lasts four to seven days. Symptoms include fever, abdominal pain, diarrhea, headache, nausea, and in some cases, vomiting. Complications of salmonellosis include abscesses, arthritis, bacteremia,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

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

Washington State typically receives 600 to 800 reports of *Salmonella* infection each year, while King County receives between 200 to 300 reports annually. In recent years, “genetic fingerprinting” has facilitated the identification of cases linked to nationwide outbreaks. In 2006, there were 205 salmonellosis cases reported in King County.

SEXUALLY TRANSMITTED DISEASES: CHLAMYDIA

Chlamydia Incidence per 100,000
among Women ages 15-29*, 1992-2007



* 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 2006 were not available at the time this report was prepared.

^ Washington State rates exclude King County.

In 2007, 5,682 cases of chlamydial infection were reported among residents of King County, for a crude incidence of 310 per 100,000 persons. In 2006, 3,860 and 1,812 cases were reported respectively among women and men, yielding chlamydial infection rates of 419 per 100,000 women and 198 per 100,000 men (see sidebar regarding differences in screening practices among men and women). Age-specific rates were highest among 15-20 year old women (2,283 cases per 100,000 persons) and 20-24 year old men (722 cases per 100,000 persons), likely reflecting the increased biological susceptibility of young women, low rates of condom use and relative high rates of partnership change among adolescents and young adults, and age discordant sexual partnerships between young women and older men.

Following the advent of widespread screening for chlamydial infection among women in the early 1990s, local and statewide rates of chlamydial infection 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

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.

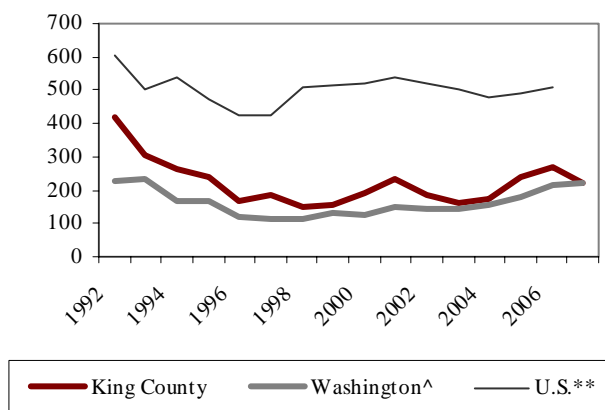
Clinical Aspects: Symptoms in women can include burning with urination or vaginal discharge, due to urethral or cervical infection respectively. Symptoms in men include burning during urination and discharge from the penis. Symptoms of rectal infection may include discharge, pain, or bleeding. If left 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. Because many infections among women cause no symptoms or only mild symptoms, and young sexually active women are at high risk for becoming infected, CDC and Public Health – Seattle & King County recommend that sexually active women ages 14 to 24 be screened for chlamydia annually.

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.

counties followed a similar pattern, but increased more rapidly from 1998 to 2003, leading to consistently lower rates of chlamydial infection among King County women when compared to other Washington women.

SEXUALLY TRANSMITTED DISEASES: GONORRHEA

Gonorrhea Incidence per 100,000
among Women ages 15-29*, 1992-2007



* 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 2007 were not available at the time this report was prepared.

^ Washington State excludes King County.

In 2007, 1,409 cases of gonorrhea were reported among King County residents, representing a 29% drop from the number reported in 2006 (1,987 cases). Crude gonorrhea incidence in 2006 was 77.0 per 100,000 persons. Of the reported 2007 cases, 551 occurred among women, for a rate of 59.3 per 100,000, and 854 occurred among men, for an incidence of 93.4 per 100,000. This gender differential probably reflects a higher incidence of gonorrhea among men who have sex with men (MSM).

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

Purpose of Surveillance:

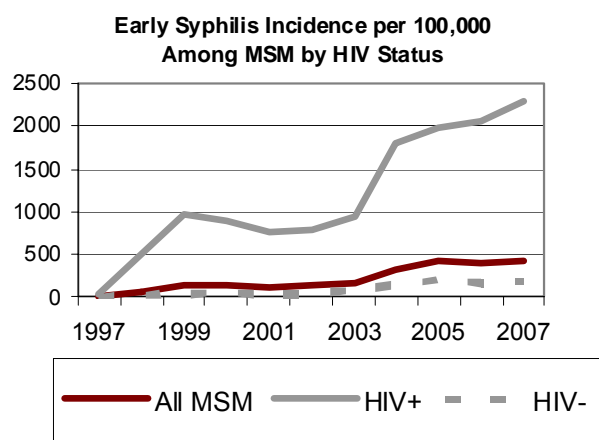
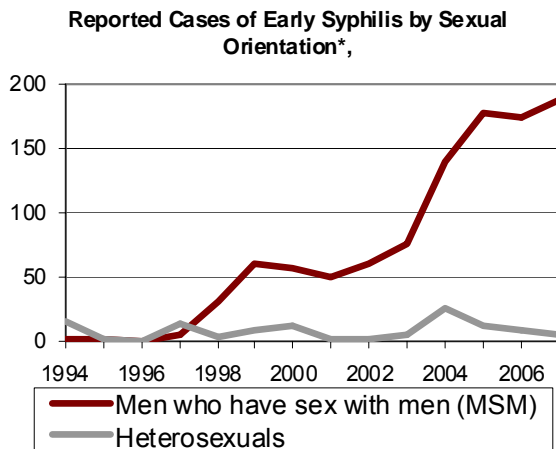
- To identify high risk populations for prevention activities
- To monitor trends in gonorrhea and associated morbidity over time and across subpopulations

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

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

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

SEXUALLY TRANSMITTED DISEASES: SYPHILIS



Of the 194 cases reported in 2007, 33 were diagnosed with primary syphilis, 85 with secondary syphilis, and 76 with early latent syphilis. The overall incidence of early syphilis in King County was 11 per 100,000 in 2007. Heterosexuals accounted for six cases (0.3 cases per 100,000), and men who have sex with men (MSM) accounted for 188 cases (436 per 100,000). In 2007, 108 of the 188 early syphilis cases in MSM occurred in HIV positive MSM, resulting in an incidence of 2,290 cases per 100,000 HIV positive MSM, compared to an incidence of 174 cases per HIV negative MSM. There were no cases of congenital syphilis in 2007.

Since the late 1980s, there have been two distinct epidemics of syphilis in King County. The first epidemic occurred primarily among heterosexuals who reported use of crack cocaine in the late 1980s and early 1990s. An epidemic of syphilis among

Purpose of Surveillance:

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

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

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

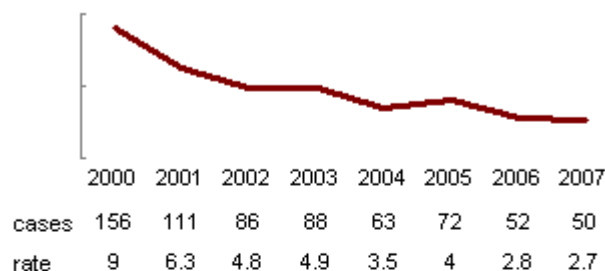
A pregnant woman who transmits syphilis to her fetus risks premature delivery and neonatal death. If untreated, an infected infant may develop late lesions resulting in blindness, deafness, mental retardation, bone deformities, and death.

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

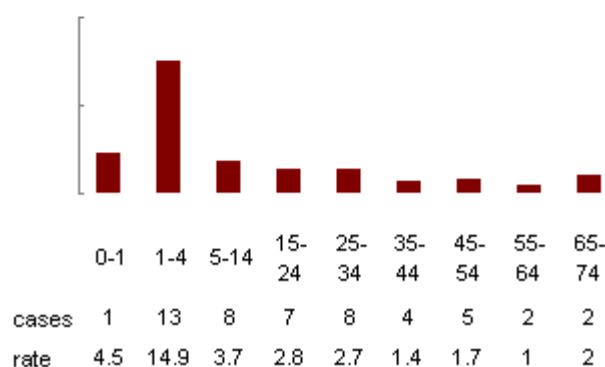
MSM in King County began in 1997 and has persisted since that time. HIV positive MSM have been particularly affected by the epidemic.

SHIGELLOSIS

rate by year (cases per 100,000 from 2000-2007)



rate by age group (cases per 100,000 in 2007)



Fifty cases of shigellosis were reported in King County in 2007 with highest rates of illness occurring in children under the age of five. Overall, the rate of infection was the lowest in ten years. Twenty-eight (66%) of the cases were female. The majority of cases (56%) were caused by *S. sonnei* (28), 32% (16) were caused by *S. flexneri* and five cases (10%) were caused by infection with *S. boydii*. One case was untyped. Fifteen (30%) cases acquired their infection while traveling internationally. Three small household clusters were reported and no other outbreaks were identified.

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

Purpose of Surveillance:

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

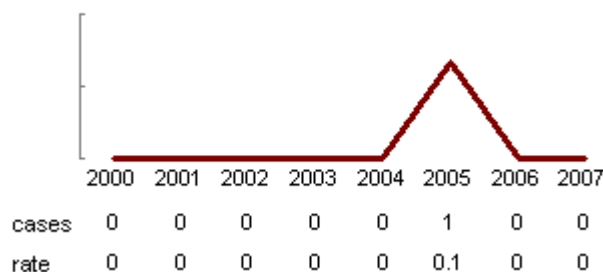
Epidemiology: Shigellosis is an enteric bacterial infection caused by *Shigella* species, most commonly *S. sonnei* and *S. flexneri*. The organism is spread through the fecal-oral route and humans are the only known host. Food and water contaminated with human fecal matter are common vehicles of transmission.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

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

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

TETANUS

rate by year (cases per 100,000 from 2000-2007)



There were no cases of tetanus reported to Public Health in 2007.

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

Purpose of Surveillance:

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

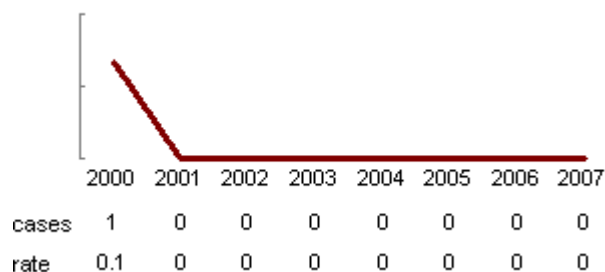
Epidemiology: Tetanus results from the action of a neurotoxin produced in infected tissues by *Clostridium tetani*, resulting in severe, potentially life-threatening muscle spasms. In the U.S., tetanus is predominately due to infected injuries, including acute wounds contaminated with dirt, saliva, or 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. This makes it difficult to open the mouth. Other symptoms include stiffness of stomach and back muscles and contraction of facial muscles. Eventually painful muscle spasms develop. If they affect the chest and airways, the person can suffocate. Mortality from tetanus can be high even with appropriate treatment.

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

TRICHINOSIS

rate by year (cases per 100,000 from 2000-2007)



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

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

Purpose of Surveillance:

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

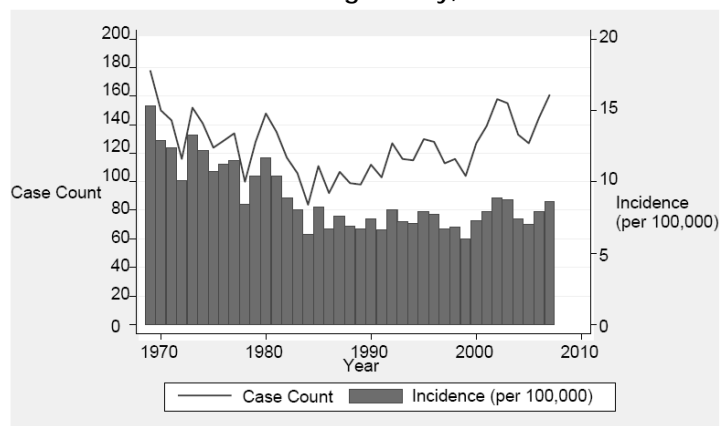
Epidemiology: Trichinosis is a disease caused by an intestinal roundworm, *Trichinella spiralis*, which infects many wild mammals. Human infection results from eating undercooked pork or wild game harboring the encapsulated cysts of *T. spiralis*. Encysted larvae survive some preparation methods for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

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

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

TUBERCULOSIS

Tuberculosis Incidence and Cases,
Seattle & King County, 1969-2007



In 2007, King County received reports of 161 cases of active tuberculosis (TB), an 11% increase from 2006. The county's rate of 8.6 cases per every 100,000 individuals remains higher than the national rate of 4.4 per 100,000. 76% of cases were born outside the United States. The highest numbers came from the Philippines, Vietnam, Ethiopia, India, and Mexico. In King County, 35% of the cases are between 25 and 44 years old. Blacks and Asians have disproportionately higher rates of TB, and Hispanics continue to have higher rates than non-Hispanics. In 2007, there was also an outbreak among individuals from the Marshall Islands. There were nine TB cases among HIV-infected persons, representing six percent of all TB cases. 16% of TB cases in King County were resistant to at least one TB medication.

TB Case Rates 2003-2007 for the U.S., Washington State, and Seattle & King County

		2004	2005	2006	2007
U.S.	Count	14,517	14,093	13,767	13,293
	Rate	4.9	4.8	4.6	4.4
Washington State	Count	245	256	262	291
	Rate [†]	3.9	4	4.1	4.4
Seattle & King County	Count	134*	125*	145	161
	Rate [†]	7.4	6.9	7.9	8.6

*Due to classification modifications there have been slight changes in counts and rates for 2004 and 2005 King County cases.

[†] Rate per 100,000 people

Notable outbreaks in the past years include a 2004 outbreak among young men of East African origin associated with "hotboxing," (the practice of smoking

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

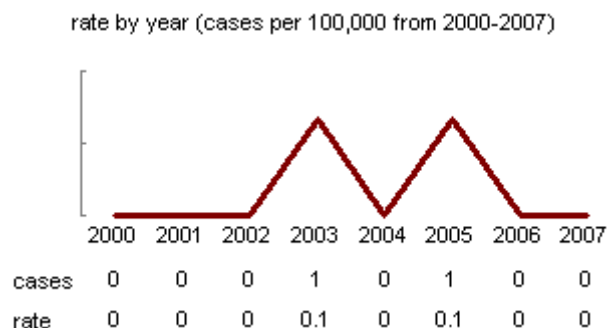
Epidemiology: TB, caused by *Mycobacterium tuberculosis*, is spread through airborne transmission. Individuals exposed to someone with active infectious TB may develop "latent TB" infection that has no symptoms and is not contagious. About one-third of the world's population and five to ten percent of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

marijuana with others in a vehicle with closed windows), and, in 2002, an outbreak among the homeless detected and brought under control with intensive effort by 2004. While these outbreaks are contained, genetic analysis shows the homeless outbreak strain is still in the community. Due to the large number of individuals with latent TB infection, lack of convenient preventive medications, and lack of an effective vaccine, it is unlikely that TB will be eliminated anytime soon.

TULAREMIA



No cases of tularemia were reported to Public Health in 2007.

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, there are two to eight reports of tularemia infections annually. Exposures identified in Washington cases include farming and rabbit skinning. The last case of tularemia in King County was reported in 2005, which may have been acquired from an arthropod bite while camping at Ross Lake in Whatcom County.

Purpose of Surveillance:

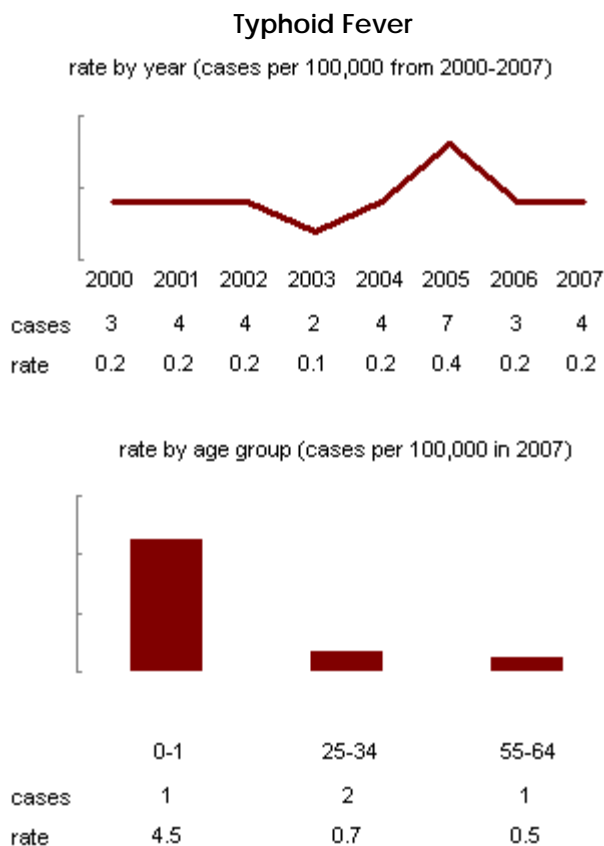
- To identify and eliminate sources of transmission including contaminated food and water
- To identify cases caused by potential agents of bioterrorism

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

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

Prevention: Use insect repellent 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



In 2007, four typhoid fever cases were reported in King County. Of these, three had been exposed during international travel to India, the Philippines, and Indonesia. The fourth case was a close contact of the case exposed in Indonesia. One case of paratyphoid fever was diagnosed in a child who was exposed while traveling in Pakistan.

Typhoid and paratyphoid fever are not endemic in the United States. In 2006, three cases of typhoid fever were reported in King County residents, all among international travelers. Fewer than ten cases per year are reported in Washington State.

Purpose of Surveillance:

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

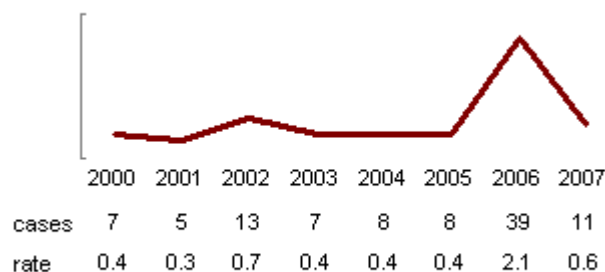
Epidemiology: Typhoid and paratyphoid fever are caused by infection with *Salmonella enterica* subspecies *enterica* serovar Typhi or Paratyphi. Humans are the only reservoirs of *S. Typhi* and *S. Paratyphi*. Typhoid is spread when a person drinks or eats food and water contaminated by human waste (stool or urine) containing *Salmonella* Typhi bacteria. The organism is often shed by chronic carriers of the bacteria.

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

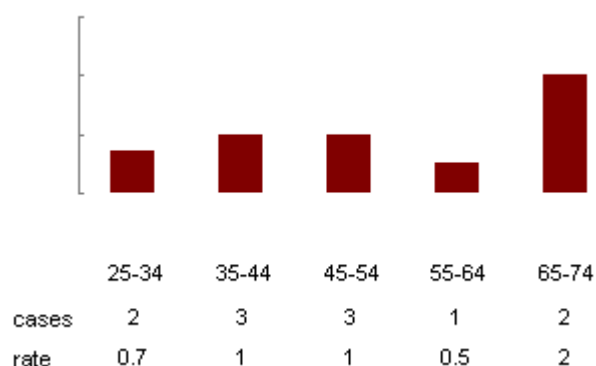
Prevention: Wash hands well with soap and water after going to the bathroom and before preparing food items. If traveling to a foreign country, be sure the drinking water is safe; take precautions to avoid traveler's diarrhea. Maintain cleanliness and proper sanitation at all times, especially after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

VIBRIOSIS

rate by year (cases per 100,000 from 2000-2007)



rate by age group (cases per 100,000 in 2007)



Purpose of Surveillance:

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

Epidemiology: *Vibrio* species occur naturally in marine waters, and can cause intestinal, bloodstream, or wound infections. Eating undercooked or raw shellfish, especially raw oysters, is the main risk for acquiring vibriosis due to infection with *Vibrio parahaemolyticus*. Growth of *Vibrio* species in seawater is amplified during the warm months and *Vibrio* levels in shellfish increase during the summer.

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

Prevention: Thoroughly cook shellfish and finfish before eating. Keep raw or cooked shellfish or finfish well refrigerated before serving.

Eleven cases of vibriosis were reported in King County in 2007, ten of which were *V. parahaemolyticus*. One case of *V. alginolyticus* occurred in a traveler who developed an ear infection after swimming in the ocean. One case was exposed while traveling in the Philippines, and the remaining cases were infected by consuming shellfish harvested in the Pacific Northwest. The rate of illness declined sharply from 2006, when the largest vibriosis outbreak on record in Washington State occurred. The decline coincided with a new vibrio control plan adopted by the Washington State Department of Health Shellfish Program.

From 1996 through 2005, an average of 11 vibriosis cases were reported in King County each year. In 2006, a total of 50, including 39 laboratory-confirmed, and 11 probable cases of vibriosis were reported in King County residents. Forty-seven cases were associated with consumption of shellfish from the

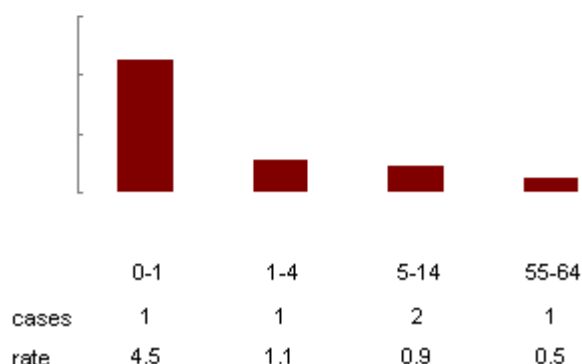
Pacific Northwest. Nationwide between May and July of 2006, 177 cases (72 confirmed and 105 probable) associated with shellfish harvested in Washington and British Columbia, Canada, were reported in New York, Oregon, and Washington. The number of confirmed cases associated with this outbreak exceeded the average number of cases reported for the entire United States each year from 2000 to 2004 during May through July.

YERSINIOSIS

rate by year (cases per 100,000 from 2000-2007)



rate by age group (cases per 100,000 in 2007)



Five cases of yersiniosis were reported in King County in 2007. None of the cases reported travel outside of King County, and all were likely exposed through consumption of either undercooked pork or ready-to-eat foods contaminated with raw pork or pork products.

Washington State receives 20 to 40 reports of yersiniosis each year. Ten cases of yersiniosis were reported in King County in 2006; a total of 152 cases were reported from 1997 through 2006. About one-third of these cases occurred in children less than five years of age.

Purpose of Surveillance:

- To identify common source outbreaks
- To identify and eliminate sources of transmission

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

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

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