



2006

# Communicable Disease Surveillance Summary

**Communicable Disease Epidemiology  
and Immunization Section**

401 Fifth Avenue, Suite 900  
Seattle, Washington 98104  
206-296-4774

**HIV/AIDS Epidemiology Program**

400 Yesler Way, 3rd Floor  
Seattle, Washington 98104  
206-296-4645

**Sexually Transmitted Diseases (STD) Program**

Harborview Medical Center  
325 9<sup>th</sup> Avenue, PO Box 359777  
Seattle, Washington 98104  
206-744-3590

**Tuberculosis (TB) Clinic**

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## Introduction

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

- Communicable Disease Epidemiology and Immunization Section ([www.metrokc.gov/health/prevcont/](http://www.metrokc.gov/health/prevcont/))
- HIV/AIDS program ([www.metrokc.gov/health/apu/epi/epipub.htm](http://www.metrokc.gov/health/apu/epi/epipub.htm))
- Tuberculosis Control Program ([www.metrokc.gov/health/tb/tbfacts.htm](http://www.metrokc.gov/health/tb/tbfacts.htm))
- Sexually Transmitted Diseases Program (<http://www.metrokc.gov/health/apu/std/summary.htm>)

The Communicable Disease Epidemiology and Immunization Section (CD-Imms) responds to reports from citizens and health care providers of all notifiable conditions except HIV/AIDS, tuberculosis, and sexually transmitted diseases. Detailed reports by the latter three programs are available from their respective websites.

During 2006, CD-Imms received 6,255 reports of notifiable conditions and investigated 5,201 of these. The purposes of case investigations are to:

- identify unusual cases and clusters of illness
- facilitate diagnosis and testing
- ensure that cases and 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)
- coordinate public health interventions and activities with local health care professionals and facilities
- when necessary, enact community containment measures to limit the spread of communicable diseases

Public Health works closely with other local health jurisdictions, the Washington State Department of Health, and the Centers for Disease Control and Prevention.

In addition to case investigations, CD-Imms also investigates communicable disease outbreaks. Among the 38 outbreak investigations conducted in 2006 there were a record-breaking outbreak of 60 cases of vibriosis from raw oysters, and an outbreak of carbon monoxide poisoning that affected 250 King County residents (including 6 deaths) that occurred in the wake of the December of 2006, “Hanukkah Eve” windstorm. Though carbon monoxide poisoning is not a communicable disease, investigation of the outbreak required the kind of epidemiology and investigative work that is the section’s strength.

Other communicable disease activities conducted by CD-Imms include year-round influenza surveillance that integrates data from sentinel clinics, area emergency rooms, laboratories, and schools; syndromic surveillance that electronically monitors emergency department visits and medical examiner reports for any indications of unusual cases or outbreaks of illness; and preparedness planning for public health emergencies such as pandemic influenza.

We hope you find this report interesting and informative.

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## Definitions of Terms Used in this Report

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

**CDC:** Centers for Disease Control and Prevention.

**Enteric infection:** An infection of the intestinal tract.

**Fecal-oral transmission:** A means of transmission in which 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. Inadequate hand washing prior to food preparation is especially dangerous.

**Incidence rate:** The number of new cases of a disease in a population over a defined time period. In this report, incidence rate is reported as the number of new cases of disease per 100,000 people per year, using 2005 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 initial 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.

**Prodrome:** Common symptoms such as fever and fatigue that precede the more characteristic symptoms of an illness.

**Prophylaxis:** Treatment given before or after exposure to an infectious agent to prevent the subsequent occurrence of disease. This can include 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
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 influenzae</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		

## Reported Notifiable Conditions, 2000-2006

Disease	2000	2001	2002	2003	2004	2005	2006
Animal Bites and other Potential Rabies Exposures	NR	NR	NR	106	223	430	633
Arboviral Disease	2	2	12	5	12		
Botulism, Infant	1	1	0	1	0	0	0
Botulism, Foodborne	0	0	0	0	0	0	0
Botulism, Wound	0	0	0	0	1	0	0
Brucellosis	0	0	0	1	0	0	0
Campylobacteriosis	320	325	300	262	264	337	258
Chlamydia	4,495	4,295	4,471	5,189	5,428	5,520	5,319
Cholera	0	1	1	1	0	0	0
Cryptosporidiosis	5	29	34	38	34	69	45
Cyclosporiasis	0	5	5	1	9	5	1
Diphtheria	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
Giardiasis	229	150	171	124	126	144	117
Gonorrhea	1,222	1,556	1,462	1,349	1,286	1,769	1,987
<i>Haemophilus influenzae</i> invasive disease (under age 5 years)	0	0	1	2	2	2	3
Hantavirus Pulmonary Syndrome	0	0	0	1	0	0	0
Hepatitis A	98	28	32	30	14	17	17
Hepatitis B, Acute	42	36	31	34	23	23	21
Hepatitis B, Chronic	398	629	585	526	632	692	840
Hepatitis C, Chronic (Probable or Confirmed)	775	1,314	1,417	758	1,285	1,331	1,521
Hepatitis C, Chronic (Possible)	577	639	507	343	359	394	261
Hepatitis C, Acute	13	9	12	8	10	10	6
HIV/AIDS	242	320	278	653	555	568	478
Legionellosis	4	4	3	2	7	8	5
Leptospirosis	1	2	0	1	0	1	1
Listeriosis	8	4	4	6	4	3	7
Lyme disease	3	2	6	2	10	6	2
Malaria	20	9	15	16	12	12	25
Measles	2	12	0	0	6	1	0
Meningococcal Disease	17	13	21	6	18	15	11
Mumps	9	1	0	0	1	1	2
Paralytic Shellfish Poisoning	0	0	0	0	0	0	0
Pertussis	207	39	156	280	201	318	105
Psittacosis	0	0	0	0	0	0	0
Q Fever	0	0	0	0	0	0	0
Relapsing Fever	1	0	5	2	1	0	0
Rubella	2	0	2	0	0	1	0
Salmonellosis	205	260	212	243	234	218	205
Shigellosis	156	111	86	88	63	72	52
Streptococcal, Group A Invasive Disease	4	36	41	35	26		
Syphilis	117	110	96	84	166	188	185
Tetanus	0	0	0	0	0	1	0
Trichinosis	1	0	0	0	0	0	0
Tuberculosis	127	139	158	155	133	127	145
Tularemia	0	0	0	1	0	1	0
Typhoid Fever	3	4	4	2	4	7	3
Vibriosis	7	5	13	7	8	8	39
Yersiniosis	20	17	12	10	15	9	10
<b>Total</b>	<b>9,393</b>	<b>10,143</b>	<b>10,185</b>	<b>10,415</b>	<b>11,214</b>	<b>12,535</b>	<b>12,245</b>

- Not reportable

## Animal Bites and Other Potential Rabies Exposures

### Disease Reporting Requirements

**Health care professionals:** Immediately report animal bites from potentially rabid animals, and all bat exposures to Public Health.

**Laboratories:** No requirement.

### Purpose of Surveillance:

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

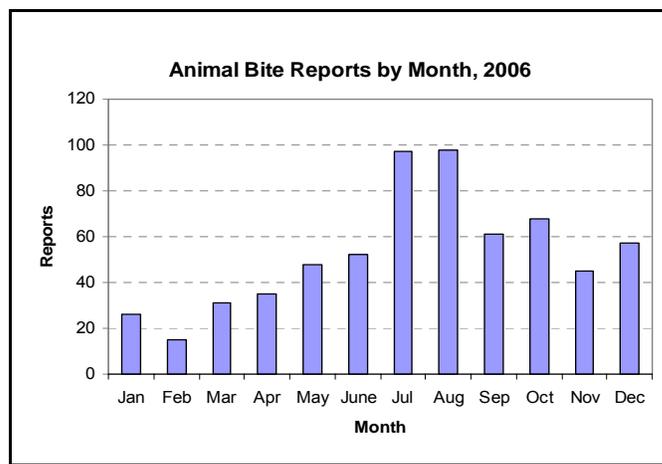
### Definition of Human Exposure to Rabies:

Any bite, scratch, or other situation in which saliva or central nervous system (CNS) tissue of a potentially rabid animal could have entered an open or fresh wound or come in contact with a mucous membrane by entering the eye, mouth or nose. Touching or handling a potentially rabid animal does not constitute an exposure unless wet saliva or CNS tissue entered a wound or had contact with a mucous membrane. Handling an inanimate object that has had contact with a rabid animal does not constitute an exposure. Likewise, contact with urine, feces, or blood of a potentially rabid animal does not constitute an exposure since rabies virus is primarily found in nerve tissue and saliva.

In 2006, a total of 633 animal bites, bat exposures or other animal exposures were reported to Public Health. Of these 478 were determined to be potential rabies exposures. Rabies post-exposure prophylaxis (PEP) was required for 101 persons because either (1) the animal was not a dog, cat, or ferret that could be kept and watched for signs of illness for 10 days (2) the animal or bat was not available for testing, or (3) the animal or bat tested positive for rabies.

Forty eight (48%) of the 101 rabies PEP recommendations resulted from exposures within King County to bats (27), cats (1), raccoons (13), coyotes (3) or dogs (3). One case received PEP after being bitten by a pet coatimundi, a member of the raccoon family native to Central and South America. Of the remaining 53 exposures (52%) resulting in PEP, 36 were attributed to bat exposures occurring outside King County. Twelve counselors at a Washington summer camp received rabies PEP after they discovered and cared for a bat, which died and was disposed of before rabies testing could be performed. The remaining 17 exposures outside of King County were attributed to dogs (12), cats (2), a horse (1), a monkey (1), and a raccoon (1).

The majority of animal bites that were determined not to be potential rabies exposures were provoked bites from cats, dogs, squirrels, and rats. Bites and possible exposures to rabies are most often reported during the summer months when the number of exposures to bats increases. 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.



## Animal Bites and Other Potential Rabies Exposures

### 2006 Potential Rabies Exposures and Recommendations for Rabies Post-Exposure Prophylaxis (PEP)

Animal	PEP Recommended		PEP Not Recommended		Total
	No Animal Available for Testing or Quarantine	Animal Tested Positive for Rabies	Animal Survived Quarantine	Animal Tested Negative for Rabies	
Bat	60	3	—	28	91
Cat	3	0	83	16	102
Coatimundi	1	0			1
Coyote	3	0			3
Dog	15	0	238	6	259
Ferret	0	0	0	2	2
Horse	1	0			1
Kinkajou	0	0		1	1
Monkey	1	0	—	0	1
Raccoon	14	0	—	3	17
<b>Total</b>	<b>98</b>	<b>3</b>	<b>321</b>	<b>56</b>	<b>478</b>

## Arboviral Disease

### Disease Reporting Requirements

**Health care professionals:** Arboviral disease (Arthropod-borne virus) is reportable within three working days. After February 14, 2005, viral encephalitis was no longer reportable. However, arboviral encephalitis is still a notifiable condition. This includes western equine encephalitis (WEE), eastern equine encephalitis (EEE), St. Louis encephalitis (SLE), West Nile Virus (WNV), Venezuelan equine encephalitis (VEE), Japanese encephalitis (JE), La Crosse encephalitis, dengue, and yellow fever.

**Laboratories:** Isolation of virus, detection of viral antibody or nucleic acid is notifiable within 2 working days.

#### Purpose of Surveillance:

- To identify cases and outbreaks, and monitor the extent of illness due to the agents of viral encephalitis.
- To detect locally acquired cases of WNV as soon as possible.
- To implement appropriate disease control activities to interrupt transmission of infection.
- To facilitate appropriate diagnostic testing.

**A**rboviruses, both locally and internationally acquired, became reportable in Washington State in 2006. Arboviruses are spread by insects primarily among wild birds and small mammals. Humans become “incidental hosts” when bitten by an infected insect. Western equine encephalitis (WEE), St. Louis encephalitis (SLE), and West Nile virus (WNV) are examples of arboviral diseases found in Washington State. They are transmitted from infected wild birds and small mammals to humans by certain species of mosquitoes. Arboviral diseases that should be considered in symptomatic persons with travel to certain countries include Japanese encephalitis, yellow fever, and dengue fever.

The majority of persons infected with these viruses are asymptomatic. Mild cases are characterized by low-grade fevers, headache, and body aches. More severe infections can be characterized by neurological symptoms.

#### West Nile Virus

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. Efforts to prevent person-to-person transmission include routine screening of donated blood, tissue, and organs for WNV.

In 2006 there were 3 birds and a horse that were positive for WNV in King County, but no locally-

acquired human cases of WNV infection were reported.

#### Dengue Fever

Dengue Fever is associated with travel to tropical regions of the world. In 2006, there were 3 cases of dengue fever reported in King County residents; 1 person traveled to Ethiopia and Burundi, one to Honduras, and one to Costa Rica during their respective exposure periods.

#### Other Arboviruses

During 2006 there were no reported cases of yellow fever, JE, SLE, EEE, or WEE. JE was last reported in King County and Washington State in 2004. No cases of WEE have been reported in Washington State since 1988. No human cases of SLE have been reported in Washington State since 1972.

## Bioterrorism— Diseases of Suspected Bioterrorism Origin

### Disease Reporting Requirements

**Health care professionals:** Report diseases of suspected bioterrorism origin to Public Health immediately.

**Laboratories:** Report the receipt of any specimen in which the health care professional asks that an agent of possible bioterrorism be ruled out. For instance, report immediately any specimen labeled by the health care professional “rule out *Bacillus anthracis*,” or “rule out variola virus.” Report confirmed or suspected *Brucella*, *Bacillus anthracis*, *Francisella tularensis*, *Yersinia pestis*, and variola virus immediately. Consult with Public Health before transporting such specimens to the Public Health Laboratory.

### Purpose of Surveillance:

- To identify illnesses caused by the intentional release of a bioterrorism agent.

**S**ince January 2001, diseases of suspected bioterrorism origin have been notifiable in Washington State. This disease category includes, but is not limited to anthrax, brucellosis, Q fever, hemorrhagic fevers, plague, smallpox, and tularemia. Clinicians practicing in the community should be alert to any diseases of suspected bioterrorism origin, and report them immediately. There have never been any confirmed reports of diseases of suspected bioterrorism origin in Washington State.

Since 2001, a number of potentially suspicious letters and packages have been reported to federal, state, and local law enforcement, and emergency response agencies. In some instances these letters or packages have included powders, liquids, or other materials. Public Health responds to calls concerning suspicious substances by recommending testing when appropriate, and by working closely with law enforcement agencies and the State Department of Health. Public Health investigated four incidents that were deemed credible threats by law enforcement in 2004, and another four incidents in 2005. In 2006, there were no suspicious substance incidents in King County that were deemed credible threats.

### Some epidemiologic clues that a biologic or chemical attack has occurred:

- 1) Large numbers of ill persons with a similar disease or syndrome.
- 2) An increase in unexplained diseases or deaths.
- 3) Unusual illness in a population (e.g., renal disease in a large population may suggest exposure to a toxic agent such as mercury).
- 4) Higher than expected morbidity and mortality in association with a common disease or syndrome, or failure of such patients to respond to usual therapy.
- 5) A single case of a disease caused by an uncommon agent (e.g., *Burkholderia mallei* or *pseudomallei*, smallpox, viral hemorrhagic fever, pulmonary anthrax).
- 6) Several unusual or unexplained diseases coexisting in the same patient without any other explanation.
- 7) Disease with an unusual geographic or seasonal distribution (e.g., tularemia in a non-endemic area, influenza in the summer).
- 8) Illness that is unusual (or atypical) for a given population or age group (e.g., outbreak of atypical varicella-like rash in adults).
- 9) Unusual disease presentation (e.g., pulmonary instead of cutaneous anthrax).
- 10) Similar genetic type among agents isolated from distinct sources at different times and locations.
- 11) Unusual, atypical, genetically engineered, or antiquated strain of an agent or antibiotic resistance pattern.
- 12) Stable endemic disease with an unexplained increase in incidence (e.g., tularemia, relapsing fever).
- 13) Simultaneous clusters of similar illness in noncontiguous domestic or foreign areas.
- 14) Atypical disease transmission through aerosols, food, or water, which suggests deliberate sabotage.
- 15) Ill persons who seek treatment at about the same time (point source with compressed epidemic curve).
- 16) No illness in persons who have separate, closed ventilation systems when illness is seen in persons in close proximity who have a common ventilation system.
- 17) Unusual pattern of death or illness among animals, (which may be unexplained or attributed to an agent of bioterrorism) that precedes or accompanies illness or death in humans.

## Bioterrorism— Diseases of Suspected Bioterrorism Origin

### 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. 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 Fever	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

### Disease Reporting Requirements

**Health care professionals:** Report suspected cases immediately.

**Laboratories:** Report immediately and submit appropriate specimens to the Public Health Laboratory.

### Purpose of Surveillance:

- To confirm suspected cases and identify common source outbreaks.
  - To promptly identify cases and potentially exposed persons requiring medical evaluation, monitoring and/or treatment, including therapy with botulinum antitoxin.
  - To identify and remove contaminated food products that could cause further cases of foodborne botulism.
- To identify cases resulting from a bioterrorism attack

**S**pores from *Clostridium botulinum* are found worldwide in soil, agricultural products, and animal intestinal tracts. Neurotoxins produced by the bacterium cause the three forms of botulism: foodborne, infant, and wound botulism. Public Health facilitates testing for patients with suspected botulism. When indicated, Public Health can also assist in obtaining botulinum antitoxin from the CDC for treatment of foodborne or wound botulism, and botulism immune globulin through the California Department of Health Services Infant Botulism program for treatment of infant botulism.

**Foodborne botulism** results from eating improperly handled or preserved food contaminated with *C. botulinum* spores. In a low-oxygen environment, the spores germinate and produce the botulinum toxin. Improperly home-canned foods are frequently implicated. Botulism has also occurred with commercial products, in items such as foil-wrapped baked potatoes, sautéed onions, and cured foods in airtight packaging.

Symptoms of botulism include the four D's: dysphagia, diplopia, dry mouth and dysarthria, ptosis, and blurred vision. People may also have gastrointestinal symptoms including constipation, vomiting and diarrhea. Typically there is a bilateral, descending paralysis beginning with the facial muscles and progressing downward. Treatment is supportive care and early administration of botulinum antitoxin. With treatment, the mortality rate for foodborne botulism is 5-10%.

There have been no cases of foodborne botulism reported in King County since 1993, when three cases occurred which were associated with home-canned beets.

**Infant botulism** is the most common form of botulism reported in the United States. Illness occurs when a person ingests *C. botulinum* spores that germinate and colonize the intestines, releasing toxin upon growth. As the name indicates, infant botulism occurs almost exclusively in children under one year of age; however, there have also been cases in adults with altered gastrointestinal anatomy and microflora. Raw honey has been implicated in some cases of infant botulism. Symptoms usually begin with constipation followed by lethargy, difficulty swallowing, and weakness. Stool and sera should be submitted for diagnostic testing on suspected cases.

Infant botulism is rare in King County. Since 1993, there have been 8 reported cases of infant botulism. No source of exposure was determined for any of these cases. No cases of infant botulism or adult intestinal botulism have been reported in King County since 2003.

**Wound botulism** occurs when *C. botulinum* infects a wound or sinus cavity. Symptoms are similar to those seen in foodborne botulism, but gastrointestinal symptoms are generally absent. The treatment for wound botulism is the same as for foodborne botulism. Outbreaks have occurred among persons who used illicit drugs. Recent cases in Washington State have been associated with injection of "black tar" heroin. There have been 12 total cases of wound botulism reported in Washington State since 1999. There was one reported case of wound botulism in King County in 2004 in a person who reported injecting black tar heroin. There were no cases of wound botulism in 2005 or 2006 in King County.

## Brucellosis

### Disease Reporting Requirements

**Health care professionals:** Report suspected cases immediately.

**Laboratories:** Report within 2 working days, and submit isolate to the Public Health Laboratory. Consult the Public Health Laboratory before transporting isolates because special precautions should be taken to prevent transmission to laboratory workers.

### Purpose of Surveillance:

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

**B**rucellosis 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.

The incubation period varies from less than 1 week to several months, but most patients become ill within 3-4 weeks of exposure. In humans, brucellosis can cause a range of nonspecific symptoms including fever, sweats, headaches, back pain, and weakness. Brucellosis can also cause chronic, recurrent fevers, joint pain, fatigue, and myocarditis. Diagnosis of brucellosis is usually done by detecting a rise in serum antibody titer in acute and convalescent sera.

In the United States, 100 to 200 brucellosis cases are reported each year, with more than 90% of cases occurring in individuals over 20 years of age. Most cases result from travel outside the United States or from ingestion of unpasteurized milk products. Person-to-person transmission has been documented rarely. Because small amounts of aerosolized bacteria can cause disease, *Brucella* is considered a potential agent of bioterrorism.

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

## Campylobacteriosis

### Disease Reporting Requirements

Health care professionals: Report within three working days of diagnosis.

Laboratories: No requirement.

### Purpose of Surveillance:

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

**C**ampylobacteriosis is an acute infection that normally lasts from 2 to 5 days, rarely longer than 10 days. Symptoms include diarrhea (sometimes bloody), abdominal cramps, fever, nausea, and vomiting. Several species cause disease in humans, with the most prevalent being *Campylobacter jejuni*. Rare post-infectious complications include reactive arthritis and Guillain-Barré syndrome. Other serotypes, such as *C. coli* and *C. lari*, are associated with bloodstream infections among the elderly and immunocompromised.

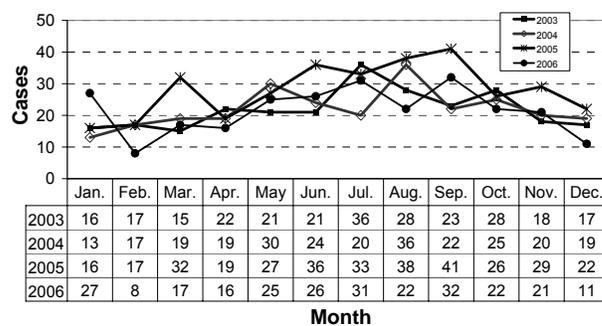
Most cases of campylobacteriosis occur as sporadic events associated with consumption of undercooked meat (especially poultry) or ready-to-eat foods that have been contaminated with juices from raw meat. Person-to-person transmission is uncommon. Large outbreaks due to *Campylobacter* are usually related 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.

In 2006, 258 cases of campylobacteriosis were reported in King County, for an annual incidence rate of 14.1 cases per 100,000 persons. Thirty-six percent of isolates were serotyped, and *C. jejuni* accounted for approximately 97% of typed isolates.

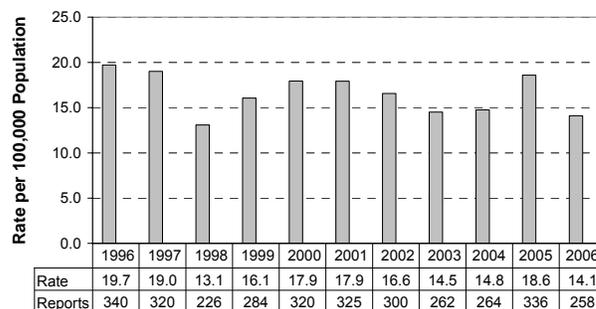
Outbreaks of campylobacteriosis are rarely identified, and none were documented in 2006. In 2005, an outbreak of campylobacteriosis with 4 confirmed and 10 probable cases was associated with a school camping trip. No specific source was identified, but high risk activities included consuming raw milk products and contact with farm animals and their fecal matter.

Another outbreak with 7 confirmed cases was identified in 2005, associated with consumption of undercooked chicken liver pâté at a restaurant.

**Campylobacteriosis by Month of Onset  
2003 - 2006**



**Campylobacteriosis Rates by Year  
1996 - 2006**



## Cholera

### Disease Reporting Requirements

Health care professionals: Report suspected cases immediately.

Laboratories: Report immediately and submit isolate to the Public Health Laboratory within two days.

### Purpose of Surveillance:

- To identify cases and common source outbreaks for investigation.
- To identify and eliminate sources of transmission including contaminated food and water.

**C**holera, a severe and potentially fatal diarrheal disease, is caused by certain toxin-producing strains of *Vibrio cholera* (serogroups O1 and O139). Eating contaminated food (especially undercooked or raw shellfish) or drinking contaminated water while traveling in the developing world is the main risk for acquiring cholera. Failure to keep shellfish cold after harvesting can contribute to bacterial growth, and increase the risk of infection.

One case of cholera was reported each year 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.

## Cryptosporidiosis

### Disease Reporting Requirements

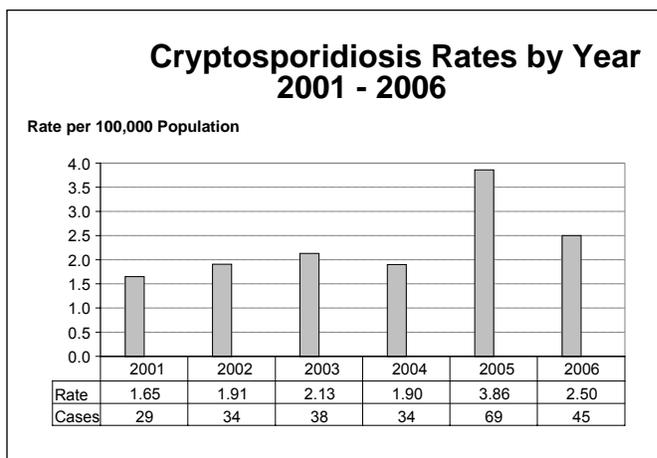
Health care professionals: Report within three working days of diagnosis.

Laboratories: Report within two working days.

### Purpose of Surveillance:

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

Infection with *Cryptosporidium parvum*, a protozoan organism, can cause fever, nausea, cramps, bloating, and watery diarrhea. Illness may last 1 to 14 days, but more severe and prolonged illness can occur in immunocompromised individuals. Exposure is through the fecal-oral route via untreated surface water, livestock, wild animals, pets, contaminated swimming pools, or person-to-person transmission. Boiling water for at least one minute kills the parasite, but chlorination will not kill the parasite. Most swimming pool filters do not remove *Cryptosporidia*, and exposures to contaminated pools have caused large outbreaks of cryptosporidiosis in other states.



Cryptosporidiosis became a reportable disease in Washington State in December of 2000. After a spike of 69 cases reported in 2005, 45 cases in 2006. The increase in the number of cryptosporidium cases in 2005 was also seen in other large metropolitan counties within Washington State, and coincided with the commencement of cryptosporidium testing at a local commercial laboratory. Since 2000, no clusters of illness or common risk factors have been identified. Thus, it is likely the trend of increasing cryptosporidium cases is due to better detection and reporting of the organism.

## Cyclosporiasis

### Disease Reporting Requirements

Health care professionals: Report within three working days of diagnosis.

Laboratories: Report within two working days and submit specimen to the Public Health Laboratory.

### Purpose of Surveillance:

- To identify common source outbreaks for investigation.
- To identify and eliminate sources of transmission including contaminated food or water.

Infection with the parasite *Cyclospora cayetanensis* causes persistent, watery diarrhea, nausea, fatigue, and weight loss. The incubation period for cyclosporiasis is about one week. Because *C. cayetanensis* must mature outside the human host for approximately one week before it can cause infection, cyclosporiasis cannot be spread directly from person-to-person. Cyclosporiasis is primarily waterborne, but may also be foodborne. Infection has been most often associated with consumption of imported berries and herbs sprayed with contaminated water.

Cyclosporiasis became reportable in Washington State in December of 2000. Since then there have been 1 to 5 cases reported each year. Only 1 case of cyclosporiasis was reported to Public Health in King County in 2006, likely acquired while traveling in Peru.

## Diphtheria

### Disease Reporting Requirements

Health care professionals: Report suspected cases immediately.

Laboratories: Report within two days and submit isolate to the Public Health Laboratory.

### Purpose of Surveillance:

- 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.

**D**iphtheria is an acute, toxin-mediated disease caused by infection with *Corynebacterium diphtheriae*. Diphtheria primarily involves the tonsils, pharynx, larynx, and nose. However, occasionally skin or membranes in other parts of the body, including the conjunctivae or vagina can be affected. A characteristic feature of pharyngeal diphtheria is an asymmetric, adherent, grayish-white membrane, with surrounding inflammation. Myocarditis with heart block and progressive, congestive heart failure may occur approximately one week after onset. Late complications include paralysis that can mimic Guillain-Barré syndrome. 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.

There have been no reported cases of toxigenic diphtheria in Washington State since 1979.

## Enterohemorrhagic *E. Coli*, including O157:H7

### Disease Reporting Requirements

**Health care professionals:** Report suspected cases immediately.

**Laboratories:** Report within two working days, and submit isolate to the Public Health Laboratory.

### Purpose of Surveillance:

- To identify sporadic cases and common source outbreaks for investigation.
- Implement disease control measures to prevent continued spread of the infection.
- To identify and eliminate sources of transmission including contaminated food and water.

Infections with *E. coli* O157:H7 and other Enterohemorrhagic *Escherichia coli* (EHEC) strains are characterized by diarrhea, abdominal cramps, and little or no fever. The diarrhea ranges from mild and non-bloody, to stools that appear to be mostly blood. The incubation period for EHEC including *E. coli* O157:H7 is typically 3 to 4 days, but can range from 1 to 8 days.

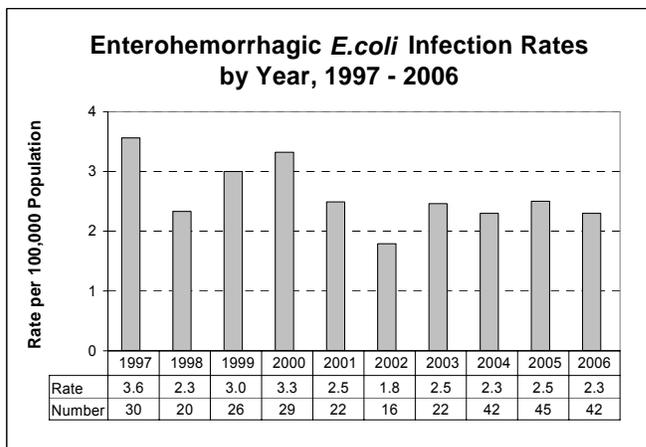
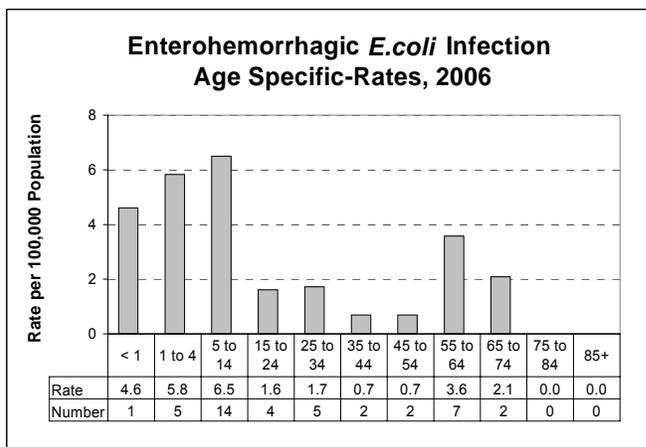
The most commonly reported EHEC strain in Washington State is *E. coli* O157:H7, for which cattle are the primary reservoir. Sources of transmission include consumption of undercooked ground beef and other beef products; unpasteurized milk, cheese, and juice; contaminated raw fruits, vegetables, and herbs; water contaminated with animal feces; direct contact with farm animals; and swimming or playing in contaminated lakes and pools. Person-to-person transmission can occur within households, child daycare centers, and long-term care facilities.

EHEC strains produce a Shiga toxin that contributes to the sometimes life-threatening complications of infection in humans. Such complications include hemolytic uremic syndrome (HUS), which occurs in 10% of infected children under 11 years of age, and in 2 to 7% of cases overall. It is estimated that about 90% of HUS cases in the United States are caused by EHEC.

In 2006, there were 42 cases of EHEC reported in King County; 40 of these were caused by *E. coli* O157:H7 and 2 were caused by non-O157 strains of EHEC. Sixteen cases required hospitalization; none developed HUS. Females accounted for 60% of reported cases, and incidence rates were highest for children under the age of 14.

Two Washington State cases, including one from

King County, were attributed to consumption of commercial unpasteurized cow's milk produced at a Washington State dairy. This was the second raw milk outbreak to occur in Washington State in the past 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

### Disease Reporting Requirements

**Health care professionals:** Report cases and clusters of suspect foodborne illness immediately.

**Laboratories:** No requirement.

### Purpose of Surveillance:

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

**F**oodborne illness (FBI) investigations are initiated in response to reports of suspected foodborne illnesses by citizens, health care professionals, and restaurants. FBI reports are evaluated to determine the likelihood that the reported illnesses are associated with food consumption at licensed food establishments in King County.

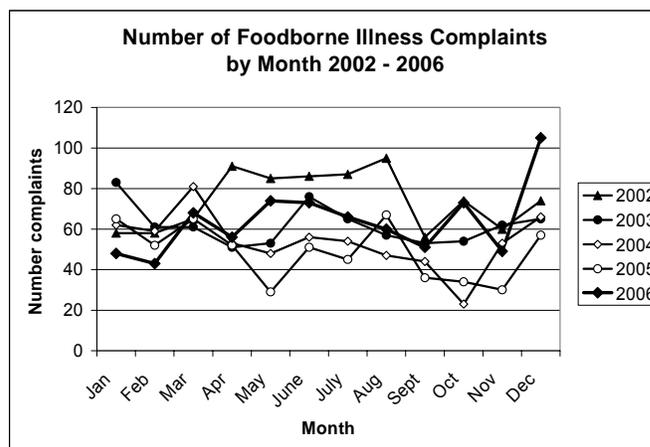
Public Health received 766 FBI complaints in 2006. Of these, 54 (7.0%) were determined to be "probable" outbreaks and 35 (4.6%) were "confirmed." For an outbreak to be classified as "confirmed," cases must have a cause identified by a laboratory test. Outbreaks classified as "probable" lack such supporting laboratory evidence. Both confirmed and probable outbreaks require either evidence of food handling violations from an environmental investigation or strong epidemiologic evidence of an outbreak.

Thirty-four out of the 35 confirmed foodborne complaints and many of the probable complaints were attributed to consumption of commercially-harvested Pacific Northwest shellfish contaminated with *Vibrio parahaemolyticus*. The summer months of 2006 saw the largest documented *Vibrio* outbreak in Washington history, coinciding with record high temperatures in the waters from which the shellfish were harvested.

Three outbreaks were reported in 2006 in which more than 40 people became ill. Two of these happened at large, one-time events. The third outbreak occurred over several days at a specialty restaurant. All three outbreaks were suspected to have been caused by norovirus, a common cause of gastroenteritis. While food was served at each event, no single food item was determined to be the source of the outbreak, and person-to-person

contact may have contributed to the spread of illness.

An increase in FBI complaints in December occurred shortly after the Hanukkah Eve windstorm that left many King County residents without power for several days. This also coincided with a national increase in the frequency of norovirus outbreaks, likely caused by two new co-circulating strains of norovirus. In addition to increased complaints against food establishments during this time, King County also received several reports of acute gastroenteritis outbreaks at long term care facilities.



## Giardiasis

### Disease Reporting Requirements

Health care professionals: Report within three working days of diagnosis.

Laboratories: No requirement.

### Purpose of Surveillance:

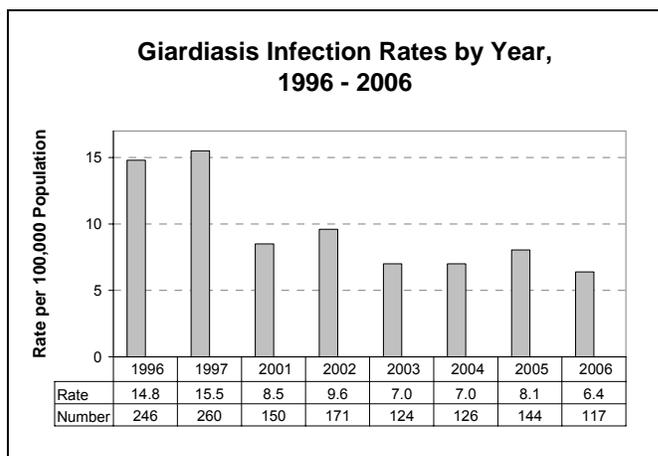
- To identify common source outbreaks for investigation.
- To identify and eliminate sources of transmission including contaminated food and water.
- To identify cases associated with child-care centers to control spread of infection.

**G***iardia lamblia* is a flagellate protozoan widely found in nature that infects the upper small intestine of humans and other mammals, especially beavers, puppies, cats, and kittens. Severity of disease ranges from asymptomatic to severe diarrhea, cramps, bloating, steatorrhea (oily stools), fatigue, and weight loss. Untreated, the illness can last weeks to months. Some individuals, particularly immigrants from developing countries, are chronic carriers. Serious complications may include malabsorption causing failure to thrive in children.

The incubation period varies from 5 days to more than 25 days, though the average incubation period is 7 to 10 days. Persons with giardiasis shed cysts in their stool and are infectious for the entire period of their illness. Fecal-oral transmission can occur in child-care centers, households, and during sexual contact. Child-care center outbreaks are often associated with toddler wading pools where several diapered children share the same water.

Like other enteric infections, rates of giardiasis increase during warmer months, probably because of more frequent exposure to contaminated water through swimming or camping.

In 2006, there were 117 cases reported to Public Health in King County, with a wide distribution of cases among all ages, ranging from 13 months to 88 years old. Thirty-one percent of cases were acquired during international travel.



## *Haemophilus influenzae* Invasive Disease

### Disease Reporting Requirements

**Health care professionals:** Report cases of invasive disease in persons under age 5 years (excluding cases of otitis media) immediately.

**Laboratories:** No requirement.

### Purpose of Surveillance:

- To identify *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.

**P**rior to 1987, most invasive *Haemophilus influenzae* infections were due to *H. influenzae* serotype b (Hib). The introduction of the Hib conjugate vaccine in 1987 led to a rapid decline in the number of pediatric invasive *H. influenzae* infections, including meningitis, bacteremia, epiglottitis, and pneumonia. Meningitis accounts for approximately 50 to 60 percent of invasive cases, and can lead to complications such as hearing impairment and neurologic sequelae 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.

There were 2 reported cases in 2005 in King County: a 2-year-old with *H. influenzae* type a bacteremia and a 5-month-old with *H. influenzae* type f meningitis.

Three cases of *H. influenzae* were reported in King County in 2006, including a 20-month-old with *H. influenzae* type a bacteremia, a 3-day-old with *H. influenzae* type a bacteremia and a 3-month-old with *H. influenzae* type b meningitis. The 3-month-old had received one dose of Hib vaccine. All three were hospitalized and no deaths were reported.

## Hantavirus Pulmonary Syndrome

### Disease Reporting Requirements

Health care professionals: Report within three working days of diagnosis.

Laboratories: No requirement.

### Purpose of Surveillance:

- To facilitate diagnostic testing.
- To facilitate environmental clean up of rodent-infested areas where cases have occurred.

**H**antavirus 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. The deer mouse *Peromyscus maniculatus* is the main carrier of the virus in the U.S. 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 incubation period is approximately 2 weeks, with a range of a few days to 6 weeks. The first symptoms are nonspecific, including fever, myalgias, and gastrointestinal symptoms, progressing abruptly to hypotension, and ventilatory compromise, often requiring mechanical ventilation. Most cases have an elevated hematocrit, hypoalbuminemia, and thrombocytopenia.

Since 1997, a total of 3 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.

## Hepatitis A

### Disease Reporting Requirements

**Health care professionals:** Report suspected cases immediately.

**Laboratories:** Report positive hepatitis A IgM antibody results within two days.

### Purpose of Surveillance:

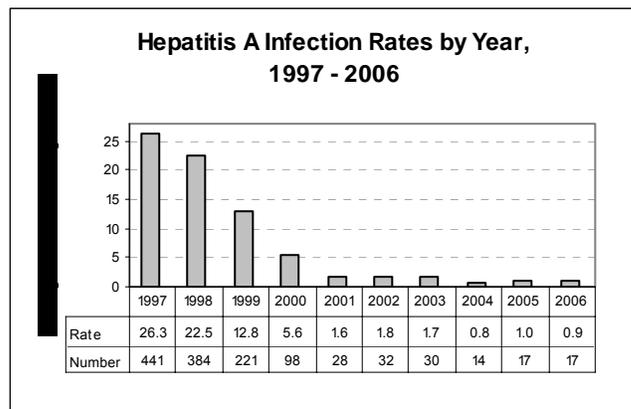
- To promptly identify persons exposed to cases of infectious hepatitis so that preventive treatment can be administered.
- To identify common source outbreaks.
- To identify and eliminate sources of transmission including contaminated food and water.

**H**epatitis A virus (HAV) 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 children are often asymptomatic. HAV does not cause chronic infection or carriage.

The reported case-fatality is typically low (0.1% to 0.3%), but it can be up to 1.8% for adults over 50 years of age. The risk of severe disease, including acute liver failure and death, is increased among persons with chronic liver disease.

The incubation period is typically 28 to 30 days (range is 15 to 50 days). HAV infection is primarily acquired via the fecal-oral route, either through person-to-person contact, or by ingestion of fecally-contaminated food or water. 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, hepatitis A cases have been declining in King County.

There were 17 cases of HAV reported in 2006 for an overall incidence of about 1 case per 100,000 persons. Sixty five percent (11/17) of the cases were in males. Adults 25 to 64 years old accounted for 76% (13/17) of cases, and there was only one case in a child under 15 years old. Travel was the most common risk factor, reported by 59% (10/17) of cases.



## Hepatitis B—Acute and Chronic Infections

### Disease Reporting Requirements

**Health care professionals:** Report cases of acute hepatitis B, or chronic hepatitis B in pregnant women within three working days. Report other cases of chronic hepatitis B within one month.

**Laboratories:** Report within one month.

### Purpose of Surveillance:

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

**S**ymptoms of acute hepatitis B virus (HBV) infection range from no symptoms to severe illness, and may include abdominal pain, loss of appetite, nausea, and vomiting. Because most infected infants and children and up to 50% of adults have no symptoms, many infections go undetected.

Most infected adults (90 to 95%) will resolve their acute infection within 6 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.

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. The incubation period is 6 weeks to 6 months.

Acute HBV cases reported in King County and nationally have been declining since the 1980's. The decrease in the number of cases is attributed primarily to HIV prevention efforts, and increasing hepatitis B vaccine use among injection drug users and men who have sex with men (MSM).

Twenty-one cases of acute hepatitis B were reported in 2006 and the majority (16/21) were men. The highest incidence of HBV infection is among men aged 25 to 44 years.

In the U.S., babies who are born to women with acute or chronic HBV infections and develop hepatitis B by 24 months of age are classified as

acute prenatal hepatitis B cases. Four perinatally acquired acute hepatitis B infections were reported in 2006, after no cases in 2005.

Chronic HBV infection was made reportable in December of 2000, and since then the number of reports has ranged from 400 to 708 reports per year. In 2006, there were 840 reports, of which 51% were in men.

## Hepatitis C – Acute and Chronic Infections

### Disease Reporting Requirements

Health care professionals: Report acute and chronic cases within one month.

Laboratories: Report within one month.

### Purpose of Surveillance:

- To identify risk factors for acquisition of hepatitis C virus (HCV).
- 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.

**H**epatitis C virus (HCV) 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, the most likely way to acquire HCV infection is through injection drug use (IDU). The risk of perinatal transmission from an HCV-infected pregnant woman is about 5%. No post-exposure prophylaxis is available. The risk of sexual transmission is low among long-term, monogamous partners and higher for persons with multiple sexual partners. The risk for sexual transmission appears to be increased for women, similar to other bloodborne viruses.

Eighty-five percent of persons with acute hepatitis C virus (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 to 15% of them will go on to develop cirrhosis within 20 years after infection.

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 consistent at less than 1% of all reports (between 6 and 13 new cases per year). Of the persons reported with acute HCV infections between 1998 and 2002, 63% reported a history of IDU. In 2006, 67% (4/6) of cases reported recent IDU during the exposure period.

Chronic HCV infection became reportable in December 2000.

Chronic HCV infection, which became reportable in December 2000, can be classified as confirmed, probable, or possible. A confirmed case of chronic HCV infection is a case that has tested positive for HCV by anti-HCV enzyme immunoassay (EIA), plus supplemental confirmatory testing by recombinant immunoblot assay (RIBA) or anti-HCV screening-test-positive with a signal to cut-off ratio predictive of a true positive as determined for the particular assay and posted by CDC; or any case with positive qualitative or quantitative HCV RNA testing. A probable case is defined as a positive HCV EIA test result with no confirmatory testing in a person at high risk for HCV infection, such as an injection drug user. Cases with a positive HCV EIA test who don't meet the "confirmed" or "probable" case definitions are classified as possible HCV cases.

In 2006, there were 1,782 reports of chronic hepatitis C. One-thousand-five-hundred-twenty-one (85%) of these cases were classified as probable or confirmed and 261 (14.6%) were classified as possible. Reports of chronic HCV cases are expected to remain high because of the sometimes 20 to 30 year delay between the time of infection and diagnosis.

## Hepatitis E

### Disease Reporting Requirements

**Health care professionals:** Report suspected cases immediately (reportable as hepatitis, unspecified, infectious).

**Laboratories:** Voluntary reporting of positive hepatitis E IgM antibody results within two days.

### Purpose of Surveillance:

- To promptly identify persons exposed to cases of infectious hepatitis so that counseling on preventing transmission can be given.
- To assure that other causes of infectious viral hepatitis have been appropriately ruled out.
- To identify common source outbreaks.
- To identify and eliminate sources of transmission including contaminated food and water.
- To better understand the incidence of disease in King County.

**H**epatitis E virus (HEV) infects the liver, causing an illness clinically similar to hepatitis A virus (HAV) infection. The illness is acute and self-limited, without a chronic state. HEV is a common cause of viral hepatitis worldwide, especially in poor countries where most infections occur in childhood and are mild or asymptomatic.

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 incubation period is 15 to 64 days. Secondary transmission in households through person-to-person transmission appears limited.

HEV is primarily acquired via the fecal-oral route, usually through consumption of contaminated water. Outbreaks in poor countries often occur after floods, monsoon rains, or other events that release raw sewage into the water supply. There is no vaccine to prevent HEV infection. Treatment with immune globulin (IG) in the U.S. is not effective in preventing infection in potentially exposed persons.

Health care professionals should consider HEV infection in persons with a history of international travel to HEV endemic areas, with a clinical illness consistent with HAV infection but negative serologic tests for HAV, HBV, or HCV.

In 2006, there was one case of HEV infection reported in an adult traveler exposed in India. A

probable case of HEV was reported in 2005, also with travel history to India. The possible case reported in 2005 had serologic evidence consistent with HEV, but testing for HAV, HBV, and HCV was not done.

No other cases of HEV infection have been reported in King County residents in the past 10 years.

## HIV and AIDS

### Disease Reporting Requirements:

**Health Care Professionals:** Report within 3 working days any new diagnosis of HIV infection, or a new diagnosis of AIDS.

**Laboratories:** Report within 2 working days any HIV diagnosis (Western blot or other antibody test, P-24 antigen, or viral culture), and report monthly associated clinical indicators (any HIV viral load any result, any CD4 test result)

### Purposes of Surveillance:

- To monitor the occurrence of HIV, AIDS, and HIV-related mortality in King County
- Identify and screen partners to reduce further spread of HIV and to facilitate referral to appropriate care and other services
- To describe characteristics of people with HIV and changes over time
- To facilitate special laboratory testing among newly diagnosed people to estimate length of time infected, and whether the virus is resistant to medication.
- To target prevention efforts to specific populations where infections are occurring.

**H**uman Immunodeficiency Virus (HIV) infection generates a specific, life-long antibody response. Diagnoses of HIV infection are typically made with a non-specific ELISA screening test, and a specific confirmatory Western Blot test. In addition, donated blood and tissue specimens are required to be tested for HIV. Surveillance data suggest that one-quarter of infections are diagnosed within the first year while as many as one-quarter of HIV infections are not diagnosed until the person develops symptoms of AIDS, which may occur 10 or more years after infection. Recent CDC guidance recommends that health care providers routinely offer HIV testing to all patients aged 13-64 years.

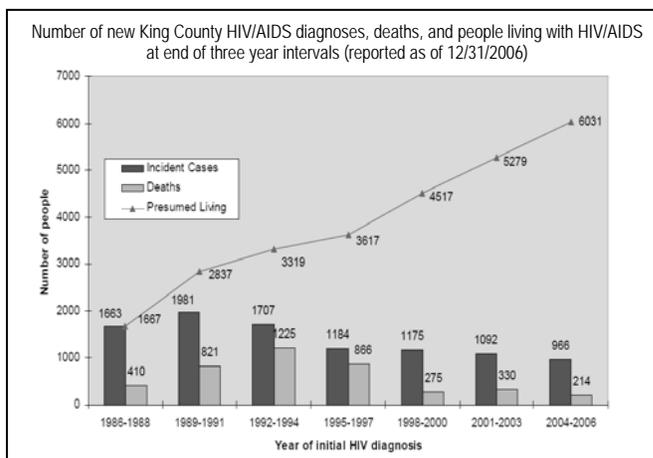
In King County, HIV is transmitted through sexual exposure (69% of cases), sharing of injection drug use equipment (IDU, 6%), or among people with both exposures (8%). The vast majority of sexual transmission is among men who have sex with men (MSM).

Once HIV is diagnosed, routine laboratory reporting helps ensure that completeness of reporting exceeds 90%. For a majority of new diagnoses, Public Health conducts additional testing for HIV incidence and drug resistance. Since 1999, about 11% of all new diagnoses occur in people infected with a virus that is already resistant to one or more medications used for treating HIV infection.

If untreated, HIV infection attacks the immune system, specifically the CD4 cells. AIDS occurs when the CD4 level is shown to drop below 200 cells per microliter, or when an opportunistic

infection occurs (typically these occur some time after the CD4 drops below 200). Each year, about 200-250 HIV infected people progress to AIDS.

In recent years 350-400 King County residents have been diagnosed with HIV annually. In 2006 there were 478 new HIV/AIDS cases reported, including 4 pediatric cases. An estimated total of 6,031 King County residents were presumed living with HIV/AIDS.



## Legionellosis

### Disease Reporting Requirements

Health care professionals: Report within three working days of diagnosis.

Laboratories: No requirement.

### Purpose of Surveillance:

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

**L**egionellosis (“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. Various species of *Legionella*, most commonly *L. pneumophila*, cause pneumonia and febrile illness. Other possible symptoms include diarrhea, abdominal pain, headache, and neurologic changes. In the U.S., an estimated 8,000 to 18,000 cases occur each year. However, it is likely that many cases are not diagnosed or reported.

*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. The incubation period is typically 2 to 10 days, but can be longer. 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.

Of the 33 reported cases between 2000 and 2006 in King County, 64% were male, and over 90% have been in persons over 40 years of age or who are immunosuppressed. The age range of the 33 cases is 28 to 85 years. In 2003 there were 2 cases (both *L. pneumophila*), 7 cases in 2004 (5 due to *L. pneumophila*, and one each due to *L. micdadei* and *L. longbeachae*), and 8 cases in 2005, all due to *L. pneumophila*.

In 2006, there were 5 cases of legionellosis reported in King County, all *L. pneumophila*. The cases ranged from 57 to 85 years old, with 80% being men. Three cases traveled during the exposure period, 2 internationally. All 5 cases were hospitalized, and there was one reported death.

## Leptospirosis

### Disease Reporting Requirements

**Health care professionals:** Report within three working days of diagnosis.

**Laboratories:** No requirement. Voluntary submission of isolates for molecular testing is encouraged.

### Purpose of Surveillance:

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

**L**eptospirosis is a zoonotic disease caused by the bacteria *Leptospira interrogans*. Over 200 pathogenic serovars have been identified, of which the most commonly identified in the U.S. are *L. icterohaemorrhagiae*, *L. canicola*, *L. autumnalis*, *L. hebdomidis*, *L. australis*, and *L. Pomona*.

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. However, this is likely an underestimate because leptospirosis is not legally notifiable in all states, and mild cases are often not diagnosed.

Some wild and domestic animals, such as rodents, raccoons, cattle, pigs, and dogs carry the *Leptospira* bacteria and pass them in their urine. Not all animals become sick when they are infected with *Leptospira*, and some can excrete the bacteria in their urine for months to years.

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.

The incubation period for leptospirosis is typically 10 days (range 2 to 30 days). The illness lasts from a few days to several weeks with a case fatality rate of 1-5%. 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. In some people the symptoms improve briefly before the development of more severe illness that may be complicated by anemia, liver and kidney failure (i.e., Weil's disease), meningitis, mental confusion, and depression.

Leptospirosis is diagnosed by a fourfold or greater increase in *Leptospira* agglutination titers on paired sera or isolation of the bacteria from a clinical specimen.

In 2005, there was only one human case of leptospirosis reported in a King County, an adult who was one of a number of confirmed cases participating in an adventure race in Florida. There were also 32 canine leptospirosis cases reported in King County (23 confirmed and 9 probable), most of which occurred during the rainy seasons of winter and early spring.

In 2006, there was one human case of leptospirosis, serovar *tarassovi*, reported in King County. The case occurred in a teen who traveled to Costa Rica and had significant exposure to potentially contaminated water.

## Listeriosis

### Disease Reporting Requirements

**Health care professionals:** Report suspected or confirmed cases immediately.

**Laboratories:** Report within two working days.

### Purpose of Surveillance:

- To identify common source outbreaks for investigation.
- To identify and eliminate sources of transmission including contaminated food products.

**L**isteriosis is a bacterial infection caused by *Listeria monocytogenes*. Persons at increased risk for severe infections such as meningoencephalitis and sepsis include immunocompromised persons, the elderly, pregnant women, and newborn infants. Persons with healthy immune systems who are infected may have no symptoms or only mild flu-like symptoms. The median incubation period is 3 weeks (range 3 to 70 days).

The primary reservoir of *L. monocytogenes* is the feces of mammals and birds. Therefore, the organism is found in soil, water, mud, and animal feed. 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. Intrauterine transmission 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.

Three to six cases were reported each year in King County from 2001 through 2005. Of note, in 2001, three pregnant Hispanic residents of King County developed listeriosis after consuming privately distributed queso fresco, a soft Mexican cheese that is 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. In 2003 and 2004, respectively, there were 6 and 4 cases reported. One case in 2004 was in a pregnant woman who experienced fetal demise at 20 weeks of pregnancy.

In Washington State, 18 cases of listeriosis were reported in 2006, seven of which were King County

residents. Six of seven King County cases were over the age of 50. Six cases required hospitalization, and three cases were fatal. One case in a pregnant Hispanic woman resulted in miscarriage. The cases did not report significant travel outside of King County.

## Lyme Disease

### Disease Reporting Requirements

**Health care professionals:** Report cases within three working days of diagnosis.

**Laboratories:** No requirement.

### Purpose of Surveillance:

- To detect and investigate any increase in the incidence of disease.
- To facilitate appropriate diagnostic testing and treatment for infected persons.

**L**yme disease is caused by the spirochete *Borrelia burgdorferi*, which is transmitted by the bite of infected *Ixodes* ticks. Ticks are infected by feeding on infected deer and deer mice. The incubation period is typically 7 to 10 days, but ranges from 3 to 32 days.

Seventy to eighty percent of infections begin with a classic “bulls-eye” appearing rash that slowly expands in diameter (erythema migrans). Other symptoms include malaise, fever, headache, arthralgias, myalgias, and lymphadenopathy. With appropriate and timely antibiotic treatment most acute infections resolve without complications. However, serious neurologic and cardiac sequelae may result from untreated infections. Chronic arthritis may develop years after an untreated infection.

In the U.S., exposure to 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. Lyme disease is uncommon in much of Washington State, and the Pacific Northwest in general. 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.

Two to 10 cases (5 on average) of Lyme disease have been reported in King County each year from 1996 through 2005. Statewide, fewer than 20 cases of Lyme disease are reported each year. In 2006, there were 2 case reports of Lyme disease, both of which occurred in adults exposed during travel outside of Washington State.

## Malaria

### Disease Reporting Requirements

Health care professionals: Report within three working days of diagnosis.

Laboratories: No requirement.

### Purpose of Surveillance:

- To identify risk factors for malaria among King County residents.
- To guide targeted interventions to prevent malaria among travelers to malaria-endemic regions.

**M**alaria 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.

Symptoms of malaria include malaise, anorexia, chills, sweats, fever, and headache. The illness may last for days and present in a cyclical fever pattern with a relief of symptoms during non-febrile periods. The incubation period is 9 to 40 days, and varies by species. Suboptimal malaria chemoprophylaxis may increase the incubation period.

Untreated *P. falciparum* malaria has a high mortality rate. According to the World Health Association, 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. No locally acquired malaria cases have been reported in King County; however, travelers to endemic countries are at risk for infection and should take precautionary measures to prevent infection.

In 2006, 25 cases of malaria among King County residents were reported to Public Health. Of these, 22 cases were likely infected while traveling in the following malaria-endemic countries: Afghanistan (1), Cameroon (2), Ethiopia (1), Ghana (4), Guinea (1), India (4), Kenya (1), Nigeria (3), South Africa (1), Sudan (1), and Uganda (3). The remaining 3 of the 25 cases visited more than one country where infection may have occurred: Kenya and Uganda (2), and South Africa and Uganda (1). One reported case was detected following recent immigration.

Of the 25 reported cases, 9 (36%) were identified as *P. falciparum*, 6 (24%) were *P. vivax*, 3 (12%) were *P. malariae*, and 7 (28%) were not typed. Nine of the cases were hospitalized, and 1 person died from

infection with *P. falciparum*. This is only the second fatal malaria case on record in King County during the past 18 years.

Eleven of the 25 reported malaria cases in 2006 did not take any type of anti-malarial prophylaxis to prevent infection, 11 took some form of anti-malarial but may not have completed the recommended therapy, and prophylaxis use is unknown for the remaining 3 cases.

In the seven-year period between 2000 and 2006, 109 malaria cases were reported with 75% speciated by a laboratory. Overall, 48 (44%) of the cases were *P. falciparum*, 29 (27%) were *P. vivax*, 4 (3.7%) were *P. malariae*, 2 (1.8%) were *P. ovale*, and 26 (24%) were untypeable or unknown.

Country	Number of Cases*
Afghanistan	1
Cameroon	2
Ethiopia	1
Ghana	4
Guinea	1
India	4
Kenya	3
Kuwait	1
Liberia	1
Malawi	1
Nigeria	3
Sudan	1
Uganda	6
Vanuatu	1

\*Five cases traveled to 2 countries during the incubation period: 2 persons traveled to Uganda and Kenya, 1 person traveled to Uganda and Malawi, 1 person traveled to Ghana and Liberia, and one person traveled to Afghanistan and Kuwait.

## Measles

### Disease Reporting Requirements

**Health care professionals:** Report suspected cases immediately.

**Laboratories:** Report immediately and submit specimen to the Public Health Laboratory.

### Purpose of Surveillance:

- To rapidly 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.

**M**easles is one of the most highly infectious diseases known, but is preventable through vaccination. It is an acute viral respiratory illness that is accompanied by a characteristic full body “morbilliform” rash. Symptoms begin with fever, coryza, conjunctivitis, and cough. After 2 to 4 days the rash begins on the face and spreads downward to the rest of the body. The rash usually lasts 4 to 7 days. Complications of measles can include otitis media, 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. This can be done by serologic testing, viral isolation from nasopharyngeal secretions, conjunctiva, blood or urine, or identification of viral antigen in blood or tissues. Public Health can facilitate expedited laboratory testing for suspected cases.

In 2004, there were 6 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.

In 2005, one case of measles was reported in a King County resident who traveled internationally during the incubation period. Public Health also investigated a second measles case in a child visiting from Romania, where the World Health Organization reported an outbreak of measles. No secondary cases occurred following either of these cases.

There were no reported measles cases in King County residents in 2006. Public Health investigated one case of measles in a foreign national who visited several states while contagious. No secondary cases were reported.

## Meningococcal Disease

### Disease Reporting Requirements

**Health care professionals:** Report suspected cases immediately.

**Laboratories:** Report within two working days and submit appropriate specimen to the Public Health Laboratory.

### Purpose of Surveillance:

- To identify cases and exposed persons, and implement appropriate disease control measures including post-exposure prophylaxis.
- To identify outbreaks of disease requiring use of meningococcal vaccine.
- To monitor trends in the incidence of specific serotypes and strains of *Neisseria meningitidis*.

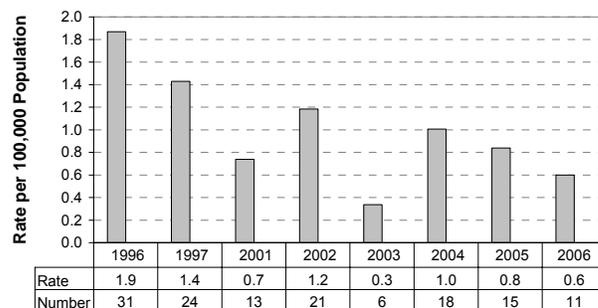
**M**eningococcal disease is caused by the bacterium *Neisseria meningitidis*. Meningitis is the most common presentation of invasive disease and is characterized by sudden onset of fever accompanied by severe headache, nausea, and vomiting, stiff neck, and often a petechial rash. Meningococcal sepsis, or meningococemia, is characterized by abrupt onset of fever and a petechial or purpuric rash, often associated with hypotension, shock, acute adrenal hemorrhage, and multiorgan failure. Even when treated, approximately 8 to 15% of cases of invasive meningococcal disease are fatal. Long-term sequelae, which occur in 10 to 20% of those who survive, include mental retardation, hearing loss, and amputation.

*N. meningitidis* is spread from person to person via respiratory droplets. The risk of transmission is increased by close contact. Many people are “carriers” who have the bacteria in their nose and mouth but have no symptoms or only mild respiratory symptoms. Risk factors for meningococcal disease include being less than one year of age, smoking, recent viral respiratory infection, and living in crowded settings (such as college dormitories or barracks for military recruits). In 2005, a new meningococcal vaccine became available in the United States, and young adolescents were added to the list of people for whom routine immunization is recommended. Two meningococcal vaccines approved in the United States protect against 4 common types of *N. meningitidis* (A, C, Y, and W-135), but does not protect against all types causing disease.

There were 11 laboratory confirmed cases of *N. meningitidis* reported in King County in 2006. Two

cases had a clinical illness consistent with *N. meningitidis*, but were not laboratory confirmed. Nine of 11 had laboratory cultures that were typed by the Washington State Department of Health (5 type Y, 2 type B, and 2 type C). Eight of the reported cases had bacteremia and 3 had meningitis. Ninety-percent of the cases required hospitalization. No deaths were reported.

**Meningococcal Disease Rates by Year, 1996 - 2006**



Rate	1.9	1.4	0.7	1.2	0.3	1.0	0.8	0.6
Number	31	24	13	21	6	18	15	11

## Mumps

### Disease Reporting Requirements

Health care professionals: Report within three working days of diagnosis.

Laboratories: No requirement.

### Purpose of Surveillance:

- To identify cases and susceptible persons exposed to mumps cases in order to implement disease control interventions.

**M**umps is an acute viral disease characterized by fever and swelling of the salivary (typically parotid) glands. Orchitis occurs in 20-30% of males infected after puberty. Mastitis occurs in 31% of females over the age of 15 years. Rare complications include meningitis, encephalitis, sterility, arthritis, renal involvement, thyroiditis, and hearing impairment.

In 2006, the U.S. experienced the largest mumps outbreak in twenty years. During January 1 to October 7, 2006, a total of 45 states and the District of Columbia reported 5,783 confirmed and probable mumps cases. The majority of cases occurred among college students (median age 22 years). Among 1,798 cases with completed follow-up reports, 123 (7%) were unvaccinated; 245 (14%) had received 1 dose of measles, mumps, and rubella (MMR) vaccine, and 884 (49%) had received  $\geq 2$  doses of MMR vaccine. The vaccination status of 546 (30%) cases, the majority of whom were adults, was unknown. Because 2 doses of mumps-containing vaccine are not 100% effective, and vaccination coverage is high in the United States, most mumps cases likely will occur in persons who have received 2 doses of vaccine. Factors that may have contributed to the spread of the mumps outbreak include the crowded living conditions in college dormitories, and varying college admissions requirements for MMR vaccination.

In 2006, 32 probable and 2 confirmed cases of mumps were reported in King County. The 2 confirmed cases were among travelers to the Philippines and a non-traveling household contact. In 2004 and 2005, single mumps cases were reported in travelers to Japan and Pakistan, respectively.

## Paralytic Shellfish Poisoning

### Disease Reporting Requirements

Health care professionals: Report suspected cases immediately.

Laboratories: No requirement.

### Purpose of Surveillance:

- To identify common source outbreaks for investigation.
- To identify and eliminate distribution of contaminated shellfish.

**P**aralytic 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.

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.

The last case of PSP reported in King County was in 1998 when 5 cases occurred as part of a PSP outbreak. A total of 14 cases were reported in Washington State between 1997 and 2006. Surveillance for PSP cases supplements environmental monitoring for saxitoxin contamination in Washington shellfish harvesting areas and in imported shellfish.

## Pertussis

### Disease Reporting Requirements

**Health care professionals:** Report suspected and confirmed cases immediately.

**Laboratories:** Report within two working days.

### Purpose of Surveillance:

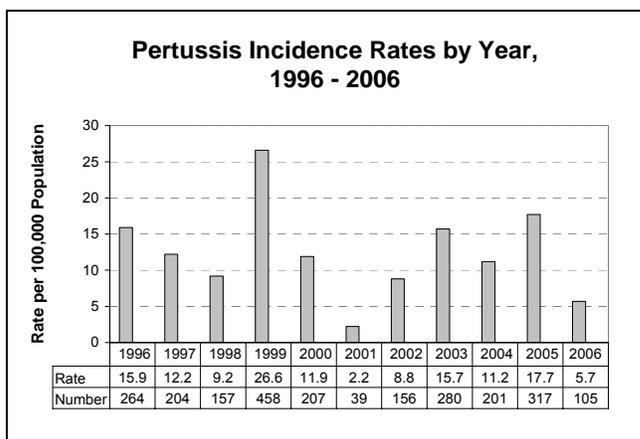
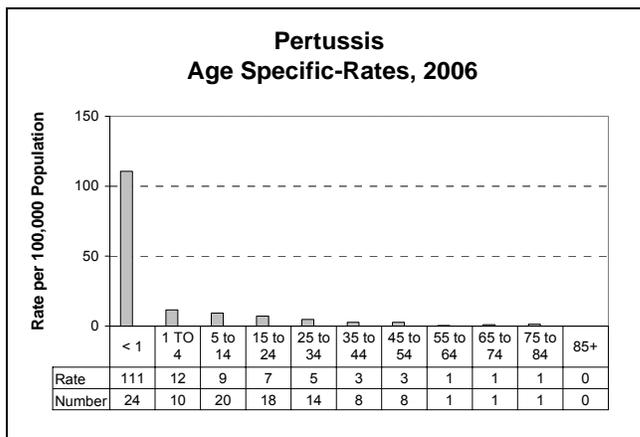
- To prevent transmission of pertussis to persons at high risk for severe illness and complications.
- To identify outbreaks and implement disease control measures including early recognition, testing, and treatment of cases.

**P**ertussis, also known as “whooping cough”, is a toxin-mediated disease caused by *Bordetella pertussis*. Classic symptoms include a persistent, paroxysmal cough of 2 or more week’s duration that is worse at night and often followed by vomiting. In infants, apnea and cyanosis are also seen. Fever is usually low grade or absent. Symptoms may last for two to three months or even longer despite antibiotic treatment as respiratory cilia recover from the effect of the pertussis toxin.

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 effect of pertussis vaccine wanes with time, similar to disease-mediated immunity. Unrecognized infections in older children and adults are thought to be the reservoir for pertussis in the community.

In order to reduce the burden of pertussis disease in adolescents and adults, the Advisory Committee on Immunization Practice (ACIP) made recommendations on use of a tetanus toxoid, reduced diphtheria toxoid and acellular pertussis vaccine (Tdap) in 2006. Tdap is recommended for use in children 11 to 18 years old and as a single dose booster immunization against tetanus, diphtheria, and pertussis for persons aged 19–64 years of age.

In 2006, 105 cases of pertussis were reported in King County. Twenty-three percent of cases occurred in children aged less than 1 year, of which 37% were hospitalized. There were no pertussis-associated fatalities reported in King County.



## Plague

### Disease Reporting Requirements

**Health care professionals:** Report suspected and confirmed cases immediately.

**Laboratories:** Report the isolation of *Yersinia pestis* immediately, and submit the isolate to the Public Health Laboratory. Consult with the Public Health Laboratory before submission for precautions to prevent transmission to laboratory workers.

### Purpose of Surveillance:

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

**P**lague is caused by infection with the bacterium *Yersinia pestis*. This bacterium is found in rodents and their fleas in many areas of the world, including the United States. Clinical forms of plague include bubonic, septicemic, pneumonic, and pharyngeal.

**Bubonic plague** is the most common form of this infection, and is transmitted by the bite of an infected flea, or through the contamination of a break in the skin with *Y. pestis*. Symptoms 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 adequate therapy for primary pneumonic plague within 18 hours after onset of respiratory symptoms 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. Septicemic plague can also be acquired directly from the bite of an infected flea, or through the contamination of a break in the skin with *Y. pestis*. Patients have fever, chills, abdominal pain, shock, and bleeding into the skin and other organs. Septicemic plague does not spread from person to person.

Human plague in the western U.S. is sporadic, with only single cases or small common source clusters in an area. Since 1907 only one case of human plague has been reported in Washington, occurring in an

animal trapper in 1984 in bubonic form. Potential reservoirs for plague in Washington include wild animals; however, cases are most likely to be travel-related. One case of pneumonic plague without travel to an endemic area may indicate an act of terrorism and constitute a public health emergency.

## Poliomyelitis

### Disease Reporting Requirements

Health care professional: Report suspected cases immediately.

Laboratories: No requirement.

### 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 institute infection control measures.

**P**oliomyelitis (polio) is a paralytic disease classically caused by poliovirus, a highly infectious virus. At its peak in the United States, an estimated 21,000 cases of poliomyelitis were recorded in 1952. Poliovirus was declared eradicated from the Western Hemisphere in 1991, from the Western Pacific in 1997, and from Europe in 1998.

Poliovirus is transmitted primarily from person to person via the fecal-oral route. The majority of cases are asymptomatic, with flaccid paralysis occurring in less than 1% of all infections. A polio-like illness can be caused by non-polio enteroviruses such as echovirus, enterovirus, and coxsackie virus, or West Nile virus. Accordingly, a thorough travel and immunization history should be taken and appropriate targeted diagnostic testing obtained for persons with a polio-like illness.

## Psittacosis

### Disease Reporting Requirements

**Health care professionals:** Report suspected or confirmed cases within three working days of diagnosis.

**Laboratories:** No requirement.

### 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 monitor clean-up of contaminated areas and management of infected birds.

**P**sittacosis (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 healthy birds can also carry the organism.

The last reported human case of psittacosis in King County occurred in 1998.

## Q Fever

### Disease Reporting Requirements

**Health care professionals:** Report within three working days of diagnosis.

**Laboratories:** No requirement.

### Purpose of Surveillance:

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

**A**cute *Coxiella burnetii* infection is a febrile illness, usually accompanied by rigors, myalgias, 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. Elevated liver enzyme levels are common. 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%.

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 from premises 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. Airborne particles containing organisms may be carried downwind for as much as one-half mile or more. The incubation period is typically 2 to 3 weeks. *C. burnetii* is considered a potential agent of bioterrorism.

Q fever is endemic in areas where reservoir animals are present, and occupationally affects veterinarians, meat workers, sheep (and occasionally dairy) workers, and farmers. Epidemics have occurred among workers in stockyards, meat packing and rendering plants, laboratories, and in medical and

veterinary centers that use sheep (especially pregnant ewes) in research.

There are 0-2 cases of Q fever in Washington State annually; the last death associated with Q fever occurred in 1987. In 2006, one case of Q fever was reported in King County. The case, an out-of-state resident who was a veterinary student at the time of the report, had evidence of a previous infection with Q fever. Prior to 2006, the last case of Q fever reported in King County occurred in 1990.

## Relapsing Fever

### Disease Reporting Requirements

**Health care professionals:** Report suspected or confirmed cases immediately.

**Laboratories:** No requirement.

### Purpose of Surveillance:

- To identify common source outbreaks.
- To identify and eliminate sources of transmission.
- To facilitate environmental clean-up.
- To facilitate appropriate treatment and to provide disease prevention information.

**R**elapsing fever is a systemic disease caused by different strains of the spirochete *Borrelia*. In the United States, relapsing fever is a tickborne disease that typically occurs in the western states. It is transmitted to humans by the bites of argasid tick species (most commonly *Ornithodoros hermsi* and *O. turicata*) that become infected with the *Borrelia* spirochete when feeding on infected rodents and squirrels. These ticks are found where rodents burrow and nest, often in older buildings, and are difficult to eradicate. 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.

The illness is characterized by recurrent fevers of up to 105°F, lasting 2 to 9 days, followed by afebrile periods lasting 2 to 4 days. The number of relapses can be one to 10 or more. Other symptoms can include headache, chills, body aches, prostration, nausea, and vomiting, and in some cases, a rash. The incubation period is typically 7 to 8 days (with a range of 4 to 18 days).

Relapsing fever is diagnosed by identification of spirochetes from blood drawn during a febrile episode, bone marrow aspirates, or cerebrospinal fluid in a symptomatic person. Relapsing fever is not spread from person to person, although infection can be acquired in utero. Treatment is with an appropriate antibiotic. Prophylaxis is not recommended for asymptomatic persons who were possibly exposed; instead, these persons should be monitored for fever for 18 days after the last exposure.

There have been 9 cases of relapsing fever reported in King County since 1999, all associated with exposures outside of western Washington. Exposure locations include Idaho, Montana, Oregon, and eastern Washington. In 2003 there were 2 cases and in 2004 there was one case, all of which were exposed while visiting cabins in eastern Washington. No cases were reported in 2005 or 2006.

## Rocky Mountain Spotted Fever

### Disease Reporting Requirements

**Health care professionals:** As a rare disease of public health importance, health care professionals should report cases immediately.

**Laboratories:** No reporting requirements.

**Purpose of Surveillance:**

- To identify cases associated with travel
- To better understand the epidemiology of the disease

**R**ocky 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.

Following the bite of an infected tick, a person often experiences sudden onset of fever and rash, beginning 3 to 14 days after infection. A macular or maculopapular rash generally appears on the 3rd to 5th 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 2 to 3 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 in symptomatic persons demonstrating a significant rise in antibody against *R. rickettsii* antigens in paired serum specimens, detection of *R. rickettsii* antibodies by enzyme-linked immunosorbent assay (ELISA), by demonstration of *R. rickettsii* by PCR, or by isolation of the bacteria from a clinical specimen or culture.

One probable case of RMSF was reported to Public Health in 2006, likely acquired while hunting in Kittitas County. Only two reports of RMSF have been reported in King County since 2001, the former case traveled to Colorado.

## Rubella

### Disease Reporting Requirements

Health care professionals: Report suspected cases immediately.

Laboratories: No requirement.

### Purpose of Surveillance:

- To identify cases and implement disease control interventions.
- To prevent transmission to susceptible pregnant women and resultant congenital rubella syndrome.
- To identify risk factors for rubella infection.

**R**ubella (German measles) is a viral illness that is important because of its ability to produce congenital anomalies in a developing fetus. Congenital rubella syndrome (CRS) occurs in up to 90% of infants born to women who are infected with rubella during the first trimester. 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 lymphadenopathy. Adults may have an extended illness, but other than chronic arthritis, complications are rare.

Diagnostic tests for rubella include antibody titers, virus isolation, and identification of viral antigen in blood or tissues. Congenital infection is confirmed by IgM antibody titers in the affected infant.

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.

There were no reported rubella cases to Public Health in 2006.

## Salmonellosis

### Disease Reporting Requirements:

Health care professionals: Report cases immediately.

Laboratories: Report within two working days and submit the isolate to the Public Health Laboratory.

### Purpose of Surveillance:

- To identify common source outbreaks.
- To identify and eliminate sources of transmission including contaminated food and water.
- To educate cases on disease control measures to prevent continued transmission and re-infection.

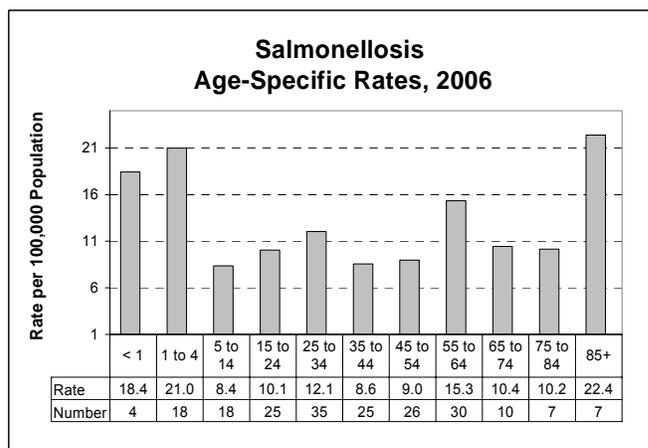
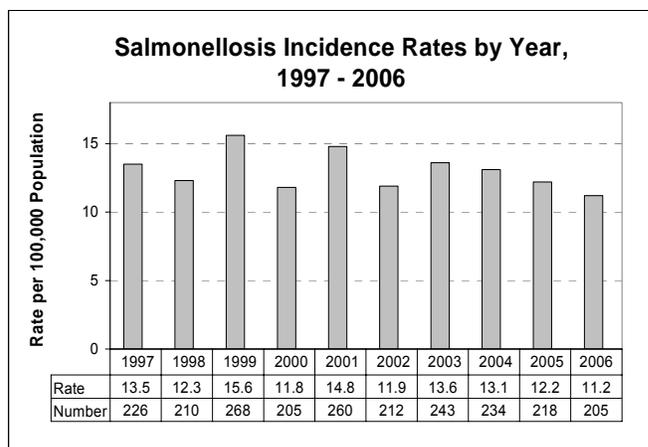
**S**almonellosis is a bacterial infection of the colon characterized by fever, abdominal pain, diarrhea, headache, nausea, and in some cases, vomiting. *Salmonella* is spread through ingestion of food or water contaminated by the fecal matter of an infected animal or human, and through direct and indirect contact with infected animals and their environments. Animals associated with transmission of salmonellosis include reptiles (e.g., lizards, snakes, turtles, and iguanas), amphibians (e.g., newts, salamanders, and toads), birds (e.g., chickens, ducks, and turkeys) and mammals (e.g., cows, dogs, cats, and hedgehogs). The incubation period is generally 12 to 36 hours (range 6 to 72 hours), and illness typically lasts 4 to 7 days.

Person-to-person spread of *Salmonella* is not common because the infective dose is relatively high (100 to 1000 organisms). Children and individuals with poor hygiene who are infected 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. Up to 5% of infected children less than 5 years of age shed the organism for more than a year.

Complications of salmonellosis include extra-intestinal spread (abscesses, arthritis, bacteremia, and meningitis). Infants, the elderly, and the immunocompromised are at increased risk of serious complications including death. Tracking of *Salmonella* serotypes allows early identification of outbreaks.

In 2006, there were 205 salmonellosis cases reported in King County. Washington State typically receives 600 to 800 reports of *Salmonella* infection each year. Among King County cases, *S. enteritidis* (60 cases) and *S. typhimurium* (21 cases) accounted for forty

percent of the reported salmonellosis cases. The highest incidence rates occurred among children under the age of five and adults aged 85 and over. Fifty-six cases (27%) were attributed to travel, 75% of which occurred outside of the United States.



## Sexually Transmitted Diseases: Chlamydia

### Disease Reporting Requirements

**Health care providers:** Report cases of chlamydia to Public Health's Sexually Transmitted Disease Program within three business days.

**Laboratories:** Report positive results to Public Health's Sexually Transmitted Disease Program within three business days.

### Purpose of Surveillance:

- To identify and screen contacts of chlamydia to reduce further spread.
- To identify infected pregnant women and provide treatment in order to reduce the risk of infection in the newborn.
- To identify high risk populations for prevention activities.
- To monitor changes in chlamydia trends over time and across subpopulations.

**C**hlamydia 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. 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 in women, including pelvic inflammatory disease, infertility, ectopic pregnancy, and/or chronic pelvic pain.

Adolescent and young adult women may be particularly susceptible to chlamydial infection because their cervical tissue is immature. Because many infections among women cause no discernible symptoms, and young sexually active women are at high risk for becoming infected, it is recommended that sexually active women ages 14-24 be screened for chlamydia annually.

Chlamydial infection is often asymptomatic, and so rates of disease based on case reports almost certainly underestimate the true incidence of infection. Following the advent of widespread screening for chlamydial infection among women in the late 1980s and early 1990s, rates of chlamydial infection declined from 1992 through 1997, but began to increase in 1998. This trend continued until 2004, when rates stabilized among King County residents (2004 rates: 406 per 100,000 women, 200 per 100,000 men, 304 per 100,000 total King County residents).

In 2006, 5,319 cases of chlamydial infection were reported among residents of King County, for a crude incidence of 294 per 100,000 persons. 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. In 2006, 3558 and 1761 cases were reported respectively among women and men, yielding chlamydial infection rates of 392 per 100,000 women and 196 per 100,000 men. Age-specific rates were highest among 15-20 year old women (2298 cases per 100,000 persons) and 20-24 year old men (759 cases per 100,000 persons), likely reflecting the increased biological susceptibility of young women, low rates of condom use among adolescents and young adults, and age discordant sexual partnerships between young women and older men.

## Sexually Transmitted Diseases: Gonorrhea

### Disease Reporting Requirements

**Health care providers:** Report cases of gonorrhea to Public Health's Sexually Transmitted Disease Program within three business days.

**Laboratories:** Report positive results to Public Health's Sexually Transmitted Disease Program within two business days.

### Purpose of Surveillance:

- To identify and screen contacts of gonorrhea to reduce further spread.
- To identify infected pregnant women and provide treatment in order to reduce the risk of infection in the newborn.
- To identify high risk populations for prevention activities.
- To monitor changes in gonorrhea trends over time and across subpopulations.

**G**onorrhea is transmitted through unprotected sex (oral, anal, and vaginal). Gonorrhea can also be transmitted from mother to infant during vaginal delivery.

Gonococcal infection is often experienced without symptoms, particularly among women. 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. Because gonorrhea is often asymptomatic, many cases go unreported and rates based on case reports are an underestimate of the true burden of disease.

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.

Electronic data for reported cases of sexually transmitted infections in King County date back to 1992. 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.

Over the past two years, gonorrhea rates have risen rapidly. In 2006, 1,987 cases of gonorrhea were reported among King County residents, representing a 54% increase over the number reported in 2004 (1,286). Crude gonorrhea incidence in 2006 was 109.9 per 100,000 persons. Of the reported 2006 cases, 711 occurred among women, for a rate of 78.3 per 100,000, and 1,276 occurred among men, for an incidence of 141.7 per 100,000. This gender differential probably reflects a higher incidence of gonorrhea among men who have sex with men (MSM).

## Sexually Transmitted Diseases: Syphilis

### Disease Reporting Requirements

**Health care providers:** Report cases of syphilis to Public Health's Sexually Transmitted Disease Program within three business days.

**Laboratories:** Report positive results to Public Health's Sexually Transmitted Disease Program within two working days.

### Purpose of Surveillance:

- To identify and screen contacts of syphilis to reduce further spread.
- To identify infected pregnant women and provide treatment in order to reduce the risk of infection in the newborn.
- To identify high risk populations for prevention activities.
- To monitor changes in syphilis trends over time and across subpopulations.

**S**yphilis 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.

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 3-6 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. By definition, 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.

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 1992, there were 68 reported cases of early (primary, secondary, and early latent) syphilis in King County, yielding an overall rate of 4 per 100,000 persons. Rates of infection among heterosexuals subsequently declined, but sporadic cases continue to occur, particularly among crack cocaine users, and the county experienced a small epidemic of heterosexual syphilis in 2004.

An epidemic of syphilis among men who have sex with men (MSM) in King County began in 1997 and has persisted since that time. This epidemic has affected cities throughout North America, Europe, Australia, and some other parts of the world. Of the 185 total cases of early syphilis in King County in 2006, 174 (94%) were among MSM, for an incidence of 403 in MSM (based on a population estimate of 43,150 MSM in King County). In comparison, the estimated 2006 incidence among heterosexual men was 1.0 per 100,000. HIV positive MSM have been particularly affected by the epidemic. In 2006, 97 of the 174 early syphilis cases in MSM occurred in HIV positive MSM, resulting in an incidence of 2,195 cases per 100,000 HIV positive MSM, compared to an incidence of 170 cases per HIV negative MSM.

Of the 185 cases reported in 2006, 34 were diagnosed with primary syphilis, 95 with secondary syphilis, and 55 with early latent syphilis. The overall incidence of early syphilis in King County was 10 per 100,000 in 2004. There were no cases of congenital syphilis in 2006.

## Shigellosis

### Disease Reporting Requirements

Health care professionals: Report cases immediately.

Laboratories: Report within two working days and submit the isolate to the Public Health Laboratory.

### Purpose of Surveillance:

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

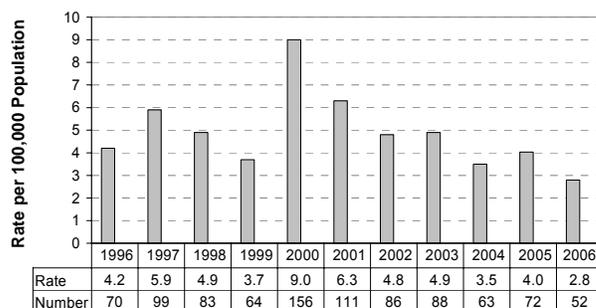
**S**higellosis is an enteric bacterial infection caused by *Shigella* species, most commonly *S. flexneri* and *S. sonnei*. The organism is spread through the fecal-oral route and humans are the only known host. Shigellosis is characterized by diarrhea, often accompanied by fever, nausea, vomiting, and cramps. The illness typically lasts 4 to 7 days. The incubation period is approximately one to three days (range 12 to 96 hours, and up to 1 week for *S. dysenteriae*).

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 from person to person through household or sexual contact. 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.

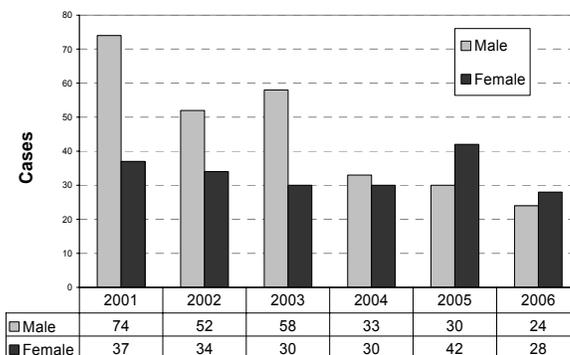
In 2006, 52 cases of shigellosis were reported in King County. This is the fewest annual number of cases reported in the past 10 years. Only 46.1 % of cases (24/52) occurred in men during 2006 compared to 67% (74/111) in 2001. Of the 52 reported cases, 33 were typed *S. sonnei*, 16 were *S. flexneri*, 1 was *S. dysenteriae*, 1 was *S. boydii*, and 1 *Shigella* organism was not able to be categorized in the common nomenclature. International travel was the identified risk factor for 28.8 percent (15) of these cases; 80 percent (12) of international travel associated cases were caused by *S. sonnei*, and 3 were caused by *S. flexneri*. There were no outbreaks of shigellosis identified in King County during 2006. 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. Treatment is recommended if the patient is at high risk for spreading the infection to others, as is the case with those who are foodhandlers, child care attendees or workers, and sexually active men who have sex with men (MSM). Appropriate antibiotic treatment shortens the duration of shedding of the organism and decreases the incidence of secondary cases.

Shigellosis Incidence Rates by Year, 1996 - 2006



Shigellosis Cases by Sex, 2001 to 2006



## Tetanus

### Disease Reporting Requirements

Health care professionals: Report cases within three working days.

Laboratories: No requirement.

### Purpose of Surveillance:

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

**T**etanus 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 infection complicating injuries, including acute wounds contaminated with dirt, saliva, or feces, puncture wounds, crush injuries, and unsterile injections.

Mortality from tetanus can be high even with appropriate treatment. Tetanus is preventable with immunization. After an initial tetanus vaccination series, boosters should be administered every 10 years throughout life. For animal bites and injuries other than clean, minor wounds, an additional dose is recommended if the time interval since the most recent tetanus immunization has been more than 5 years. In late 2006, the Advisory Committee on Immunization Practices (ACIP) recommended a tetanus toxoid, reduced diphtheria toxoid and acellular pertussis vaccine (Tdap). Tdap is recommended for use in children 11 to 18 years old and as a single dose booster immunization against tetanus, diphtheria, and pertussis for persons aged 19 to 64 years of age.

One case of tetanus was reported in King County in 2005 in an adult over 60 years of age. Gardening and a sliver in a finger were the only risk factors identified. The patient was seriously ill, but survived. In the U.S., tetanus typically occurs in adults over 60 years of age, reflecting a lack of immunity in this population. This was the first case of tetanus since 1996, when two cases were reported.

There were no cases of tetanus reported to Public Health in 2006.

## Trichinosis

### Disease Reporting Requirements

Health care professionals: Report cases within three working days.

Laboratories: No requirement.

### Purpose of Surveillance:

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

**T**richinosis 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.

Illness typically develops 8 to 15 days (range 5 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.

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.

## Tuberculosis

### Disease Reporting Requirements

**Health care providers:** Report suspected cases of tuberculosis to Public Health within one day (do not wait for laboratory results in order to report a suspected case). For hospitalized patients, obtain TB Control Program approval of outpatient management plans prior to discharge, including discussion of directly observed therapy and public health nurse case management records.

**Laboratories:** Report isolation of *Mycobacterium tuberculosis* within two working days to the Department of Health, and submit the isolate to the Public Health Laboratory.

### Purpose of Surveillance:

- 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.

**T**uberculosis (TB), caused by *Mycobacterium tuberculosis*, is spread through airborne exposure, usually affecting the lungs, but sometimes other parts of the body such as the brain, kidneys, or spine. TB disease can be cured with appropriate treatment. Individuals exposed to someone with active TB may develop asymptomatic “latent TB” infection that is not contagious. About one-third of

the world’s population and 5-10% of the U.S. population has latent TB. King County has around 100,000 people with latent TB. About 10% of those with latent TB infection will develop active TB disease in their lifetime. Those who are immune-compromised have an even higher risk of developing TB (e.g., 8-10% per year in an HIV-infected person). This risk can be reduced with preventive medications.

**Tuberculosis Case Rates 2001-2006 for the U.S., Washington and Seattle & King County**

		2001	2002	2003	2004	2005	2006
U.S.	Count	15,945	15,057	14,852	14,517	14,093	13,767
	rate/100,000	5.6	5.2	5.1	4.9	4.8	4.6
Washington State	Count	261	252	250	245	256	262
	rate/100,000	4.3	4.1	4.0	3.9	4.0	4.1
Seattle & King County	Count	139	158	155	134*	125*	145
	rate/100,000	7.9	8.9	8.7	7.4	6.9	7.9

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

In 2006, King County reported 145 cases of active TB, an 18% increase from 2005. The county’s rate of 7.9 cases per every 100,000 individuals remains higher than the national rate of 4.6 per 100,000. Eighty percent of cases were born outside the United States, an increase from 75% in 2005. The highest numbers came from the Philippines, Vietnam, Ethiopia, India, and Mexico. The largest proportion of cases in the county is among those 25-44 years old (39%). Blacks and Asians have disproportionately higher rates of TB, and Hispanics continue to have higher rates than non-Hispanics. There were ten TB cases among HIV-infected persons, representing 6.9% of all TB cases. This is an increase from 2004-2005, but is consistent with proportions from 2001-2003.

Sixteen percent of TB cases in King County were resistant to at least one TB medication.

Notable outbreaks in the past few years include a 2004 outbreak among young men of East African origin associated with “hotboxing,” (the practice of smoking marijuana with others in a vehicle with closed windows), and an outbreak among the homeless detected in 2002 and brought under control with intensive effort by 2004. While these outbreaks are contained, genetic analysis shows the 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.

To read the full 2006 TB report, please visit: [www.metrokc.gov/health/tb/tbfacts.htm](http://www.metrokc.gov/health/tb/tbfacts.htm)

## Tularemia

### Disease Reporting Requirements

**Health care professionals:** Report cases within three working days.

**Laboratories:** Submit appropriate specimens to the Public Health Laboratory. Consult with the Public Health Laboratory before transporting specimens regarding precautions to prevent transmission to laboratory workers.

### Purpose of Surveillance:

- To facilitate prompt and appropriate treatment for persons with tularemia.
- To identify and eliminate sources of transmission including contaminated food and water.
- To identify cases caused by potential agents of bioterrorism.

**T**ularemia 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, 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.

The incubation period is usually 3 to 5 days with a range of 1 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.

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 2 to 8 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.

## Typhoid & Paratyphoid Fever

### Disease Reporting Requirements

**Health care professionals:** Report suspected cases immediately.

**Laboratories:** Report within two working days and submit the isolate to the Public Health Laboratory.

### 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.

**T**ypoid and paratyphoid fever are caused by infection with *Salmonella enterica* subspecies *enterica* serovar Typhi or Paratyphi<sup>1</sup>. 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 8 to 14 days (range 3 to 60 days). Typhoid and paratyphoid fever are acquired by drinking water, or eating food contaminated with *S. Typhi* or *S. Paratyphi*. The organism is often shed by chronic carriers of the bacteria and transmitted via contaminated food.

Humans are the only reservoirs of *S. Typhi* and *S. Paratyphi*. The case-fatality rate is less than 1 percent with appropriate antibiotic therapy, but 15 to 20 percent of persons treated with antibiotics may experience relapses. Two to five percent 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.

Two typhoid vaccines are currently licensed in the United States, which protect 50 to 80 percent of recipients and need to be repeated every 2 to 5 years. There is no paratyphoid vaccine.

Typhoid and paratyphoid fever are not endemic in the United States. In 2006, 3 cases of typhoid fever were reported in King County residents, all among international travelers. Fewer than 10 cases per year are reported in Washington State.

<sup>1</sup> One strain of *S. Paratyphi* (group B var. L- tartrate+, also known as *S. Paratyphi* B var. Java) does not cause paratyphoid fever but causes a salmonellosis-like enterocolitis.

## Vibriosis

### Disease Reporting Requirements

**Health care professionals:** Report cases within three working days.

**Laboratories:** No requirement.

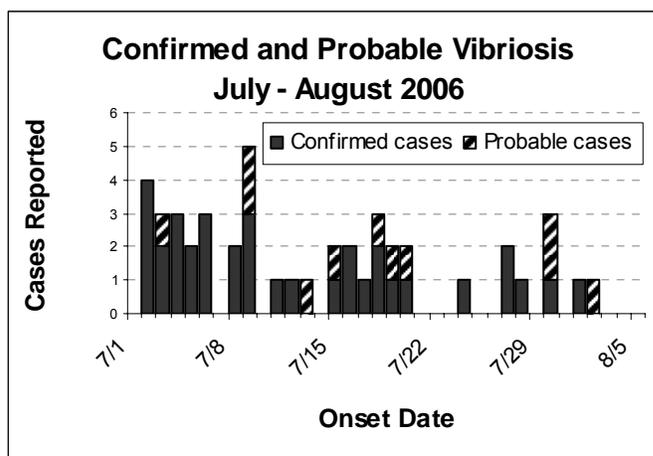
### Purpose of Surveillance:

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

*Vibrio* species occur naturally in marine waters, and different species can cause intestinal illness, septicemia, 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. 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 immunosuppression, chronic liver disease, chronic alcoholism, or hemochromatosis.

From 1996 through 2005, 106 vibriosis cases were reported in King County (average 11 per 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. A total of 177 confirmed (72) and probable (105) cases from New York, Oregon and Washington were reported between May and July, all associated with consumption of shellfish harvested in Washington and British Columbia, Canada. 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

### Disease Reporting Requirements

Health care professionals: Report cases within three working days.

Laboratories: No requirement.

### Purpose of Surveillance:

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

*Yersinia enterocolitica*, and less commonly *Y. pseudotuberculosis*, *Y. kristensenii*, and *Y. frederiksenii*, cause acute bacterial infections with diarrhea that often becomes bloody, abdominal pain, fever, headache, and vomiting. The incubation period is 3 to 7 days. Illness typically lasts 1 to 3 weeks or longer, and fecal shedding can persist for months. Complications from infection with *Yersinia* infection include arthritis, skin ulcers, bone infections, exudative pharyngitis, liver or spleen abscesses, and sepsis. Because its symptoms strongly mimic those of appendicitis, persons with *Yersinia* infections have often undergone appendectomies or laparoscopic surgery prior to diagnosis with yersiniosis. Rarely, blood products contaminated with *Yersinia* from an infected donor cause transfusion-associated cases.

Wild and domestic animals, especially pigs, are reservoirs for *Yersinia*. Consumption of raw or undercooked pork (especially pork chitterlings), unpasteurized dairy products, and contact with animals are all risk factors for infection. Unlike most bacteria, *Yersinia* is resistant to cold, and can multiply in refrigerated food. Infants can be infected when caretakers handle bottles or pacifiers after preparing raw pork in the home. Person-to-person transmission has also been reported, but is uncommon.

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. Yersiniosis is likely underdiagnosed because in many laboratories it is not included in routine stool culture for gastrointestinal pathogens.