

**British Columbia Annual Summary  
of Reportable Diseases**

**2009**



**BC Centre for Disease Control**  
An agency of the Provincial Health Services Authority





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An agency of the Provincial Health Services Authority

Above photo: BC Centre for Disease Control, 655 West 12th Avenue, Vancouver BC V5Z 4R4

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Report is available at [www.bccdc.ca](http://www.bccdc.ca)

*Cover image is an electron micrograph of the pandemic 2009 H1N1 influenza virus*

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## 2009 Highlights

### **Vaccine Preventable Diseases**

The most remarkable event in 2009 was the occurrence of the first pandemic of influenza in over 40 years, due to a novel swine-origin influenza A/H1N1 strain, which led to a large-scale response including infection control, antivirals, and vaccination. This event resulted in an out of season first wave of influenza in the spring, and was followed by a larger second wave beginning in early September and peaking the last week of October. There was little evidence of influenza activity due to seasonal strains of A/H3N2 and B subtypes. The pandemic virus caused 57 recognized deaths in BC. Illness rates were highest among school-age children and teens, and hospitalizations were highest in children under 4.

Other vaccine preventable diseases showed continuing declines. Only 1 case of invasive Hib disease was reported in a child, although one who had been fully immunized. The elevation in adult Hib disease observed in 2008 did not recur. Rates of chronic/ unknown and acute hepatitis B declined, as children and young adults are now increasingly vaccinated. No measles cases were reported. Mumps occurred at a rate comparable to 2007 following an outbreak in 2008, but has not returned to earlier very low rates observed in 2002-6. One case of rubella was confirmed in an unimmunized child with exposure to a returning traveller with rubella-compatible but unconfirmed illness. Invasive meningococcal disease remained stable compared to recent years but has declined since 2001, with 10-fold reductions in serogroup C disease attributable to vaccination of infants and children in grade 6 and higher. Most reported cases were due to serogroup B. Pertussis was at its lowest rate in 20 years. Rates of invasive pneumococcal disease showed declines overall compared to the prior 2 years, and none of the 8 cases reported in infants were due to vaccine preventable serotypes. No cases of tetanus were reported

following 4 and 1 case(s) reported in each of 2007 and 2008, respectively.

### **Sexually Transmitted and Bloodborne Pathogens**

The rate of new positive HIV tests decreases slightly in 2009 as 338 new cases were reported. Longer term declines since a peak in 2004 should be interpreted with caution because the introduction of legal reporting in 2003 has led to better follow-up and less risk of duplicate counting. In recent years, a notable decline in the HIV infection rate has occurred among injection drug users.

Chlamydia rates in British Columbia and Canada continue to increase and 11,173 cases were reported in the province in 2009. Reasons for this are under study but it appears that the strategy of detection and treatment continues to reduce the rates of pelvic inflammatory disease and tubal ectopic pregnancy. These complications are the main reasons for the screening and treatment program.

The rates of gonorrhea and infectious syphilis both declined in 2009 with 1307 and 216 cases reported respectively. A modest decline in the rate of hepatitis C was also observed.

### **Diseases Transmitted by Direct Contact and Respiratory Routes**

Invasive group A streptococcal disease reports declined for the first year since 2004, with 91 fewer cases reported compared to the prior year; otherwise this disease has shown an upward trend throughout the past decade. Highest rates were observed in 30-39 year old males. Toxic shock-like syndrome and necrotizing fasciitis were observed in a higher proportion of cases than the prior year, but case fatality rates were lower at 6.5%, suggestive of consistent trends in reporting rates.

## 2009 Highlights (continued)

The rate of tuberculosis declined by 8% from 2008. The highest rates were observed in Northwest, Richmond and Vancouver health service delivery areas. As in prior years, rates in men exceed those in women at ages 30 years and older.

### Antimicrobial Resistant Organisms

BCCDC continues to track antibiotic utilization and rates of antibiotic resistance with partners throughout the province.

The main observations of note during 2009 were:

- MRSA continues to represent a stable 1/4 of *S. aureus* isolates and this is largely driven by community-associated strains (CA-MRSA).
- Resistance to erythromycin (and related macrolides) is currently running at about 20% of *S. pneumoniae* isolates.
- Urinary tract pathogens such as *E. coli* and *P. mirabilis* are exhibiting increasing resistance toward fluoroquinolones as well as cotrimoxazole. *E. coli* remains largely susceptible to nitrofurantoin.
- Antimicrobial utilization rates overall have stabilized or declined from a peak in 2005 with clearest reductions in utilization for childhood respiratory infections – the main targets of the Do Bugs Need Drugs? Program.

### Enteric, Food and Waterborne Diseases

Overall rates for most food and waterborne diseases were stable or declining during 2009. Campylobacter remains our most frequently reported enteric infection with 1750 cases reported last year. Salmonellosis reporting has increased during 2008 and 2009 driven by observed increases in reports of *S. Enteritidis*, thought to be related to eggs. Collaborative work continues with the Ministry of Agriculture and Lands to bring these rates down. 2009 also saw a higher rate of *V. parahaemolyticus* infections than expected with 34 cases. This is consistent with an unusually warm summer

and high ocean temperatures in coastal BC. All health authorities continue to be engaged in containment of small facility and local outbreaks with a total of 80 reported during 2009. Most of these are caused by viruses.

### Vectorborne and Other Zoonotic Diseases

The most notable occurrence during 2009 was the arrival of West Nile Virus in British Columbia. Two residents of the southern Okanagan region were diagnosed with locally acquired infection. In addition, mosquito pools from the region showed the presence of the virus. Surveillance will continue during 2010 to determine if further cases or spread will be observed.

### Environmental Fungi

*Cryptococcus gattii* infections continue to be observed in British Columbia though there has been a slight drop in reporting into 2008 and 2009 with 24 cases reported last year. Acquisition of this infection continues to be limited to its ecological niche on Vancouver Island and in the Lower Mainland. (Cases are also reported south into the Pacific United States).

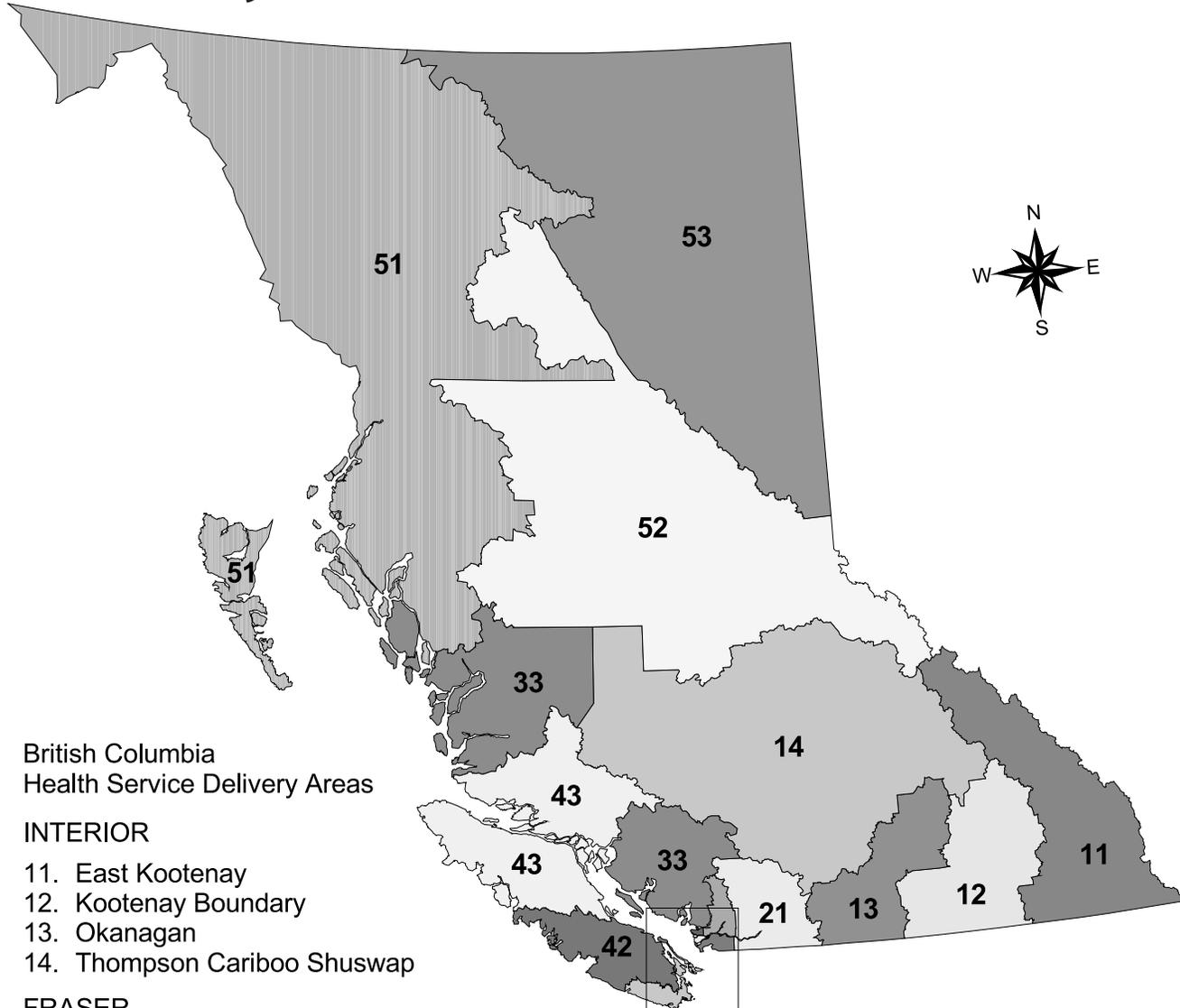
### Dr. Monika Naus

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Director, Epidemiology, BCCDC

# British Columbia Health Services Delivery Areas



British Columbia  
Health Service Delivery Areas

## INTERIOR

- 11. East Kootenay
- 12. Kootenay Boundary
- 13. Okanagan
- 14. Thompson Cariboo Shuswap

## FRASER

- 21. Fraser East
- 22. Fraser North
- 23. Fraser South

## VANCOUVER COASTAL

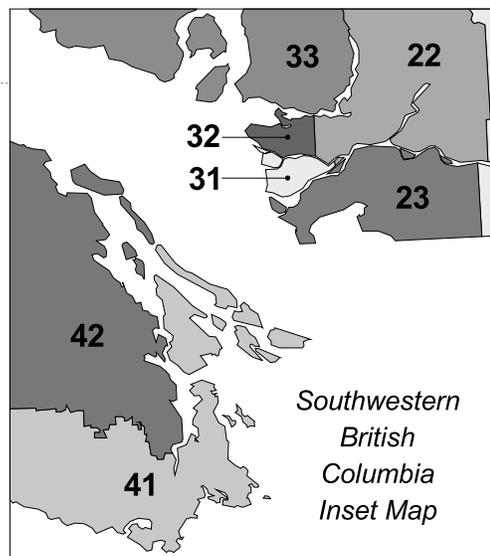
- 31. Richmond
- 32. Vancouver
- 33. North Shore/Coast Garibaldi

## VANCOUVER ISLAND

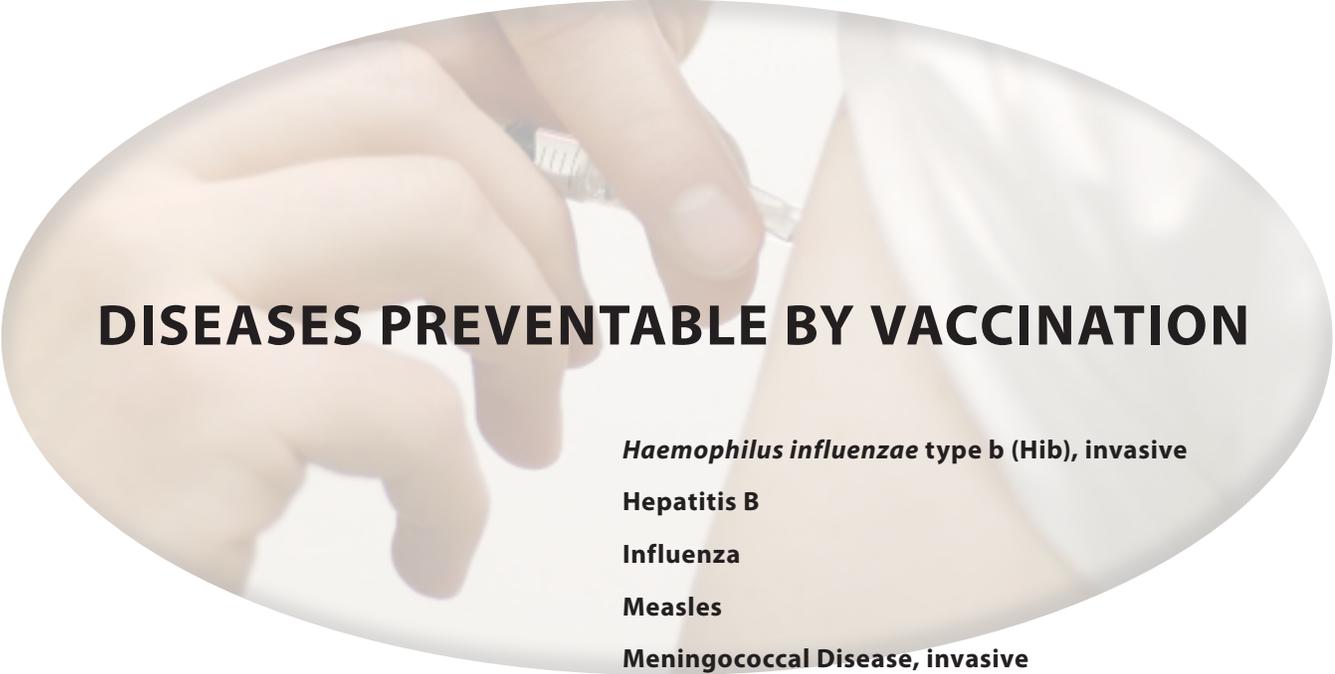
- 41. South Vancouver Island
- 42. Central Vancouver Island
- 43. North Vancouver Island

## NORTHERN

- 51. Northwest
- 52. Northern Interior
- 53. Northeast







# **DISEASES PREVENTABLE BY VACCINATION**

*Haemophilus influenzae* type b (Hib), invasive

**Hepatitis B**

**Influenza**

**Measles**

**Meningococcal Disease, invasive**

**Mumps**

**Pertussis**

**Pneumococcal Disease, invasive**

**Rubella**

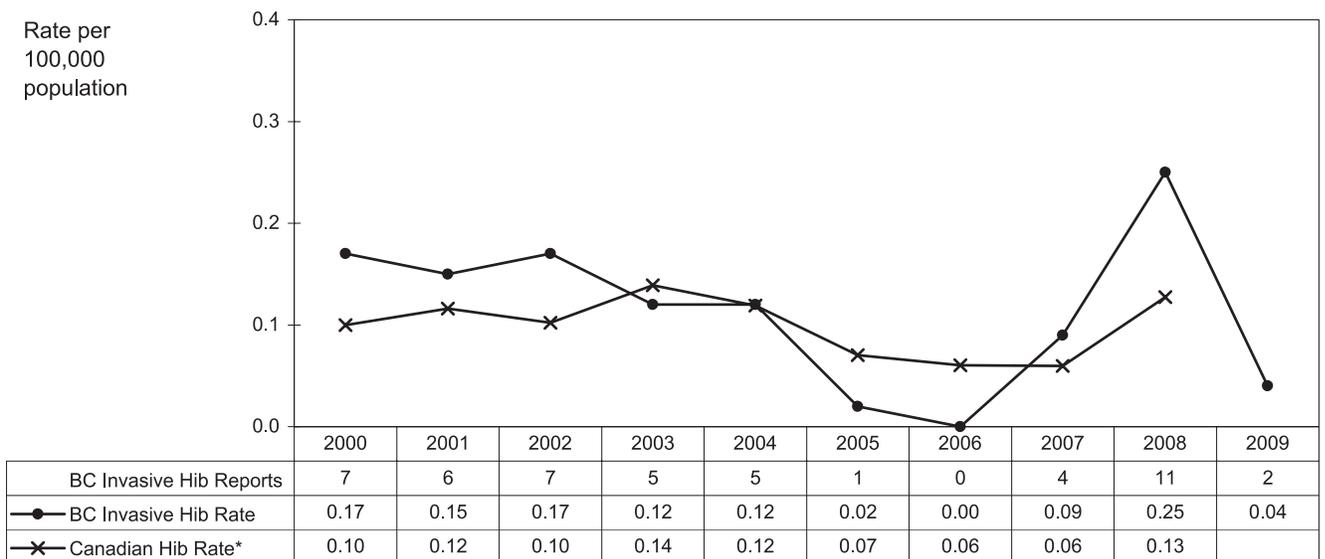
**Tetanus**

# Haemophilus influenzae type b (Hib), invasive

Two cases of invasive Hib disease were reported in 2009, a notable decrease compared to eleven cases reported in 2008. One case was an infant aged 11 months who

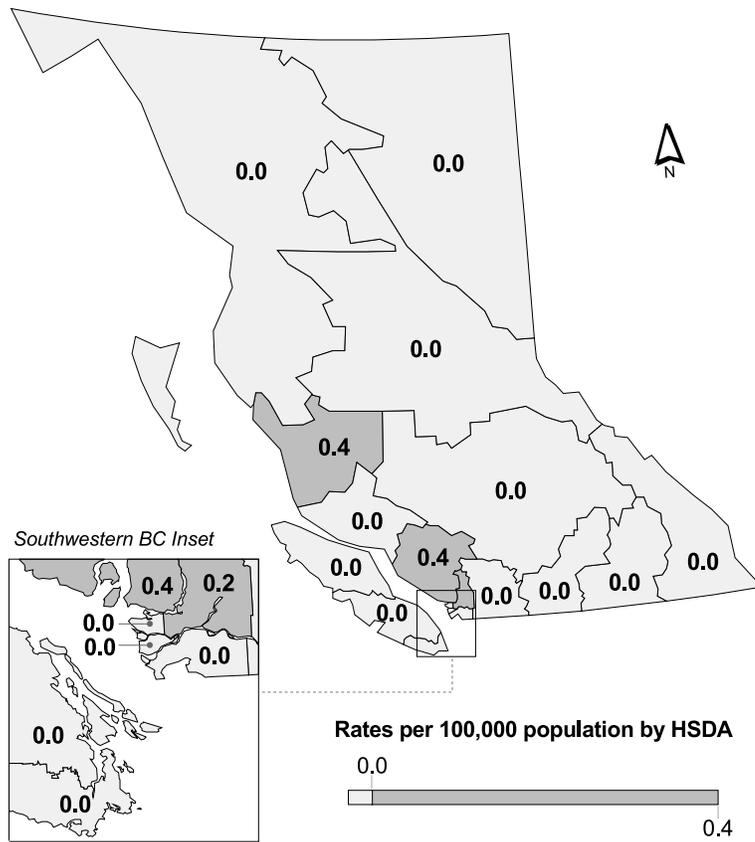
had received the three primary doses of Hib vaccine and developed Hib meningitis. The other case was a male adult aged 86 years.

## 1.1 Haemophilus influenzae type b (Hib), invasive Rates by Year, 2000-2009



\*Please see Sources and Explanatory Remarks, Section 11 on Page 123 in regard to the national rate

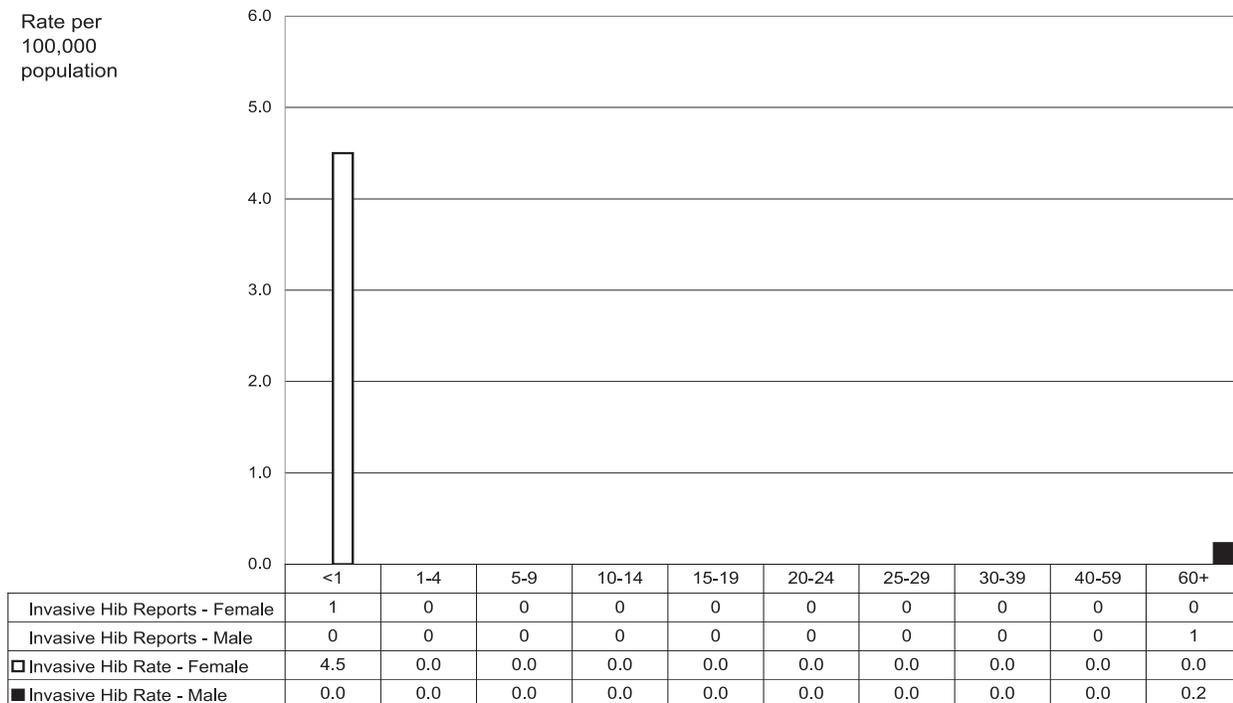
### 1.2 Haemophilus influenzae type b (Hib), invasive Rates by HSDA, 2009



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	0	0.0
12	Kootenay Boundary	0	0.0
13	Okanagan	0	0.0
14	Thompson Cariboo Shuswap	0	0.0
21	Fraser East	0	0.0
22	Fraser North	1	0.2
23	Fraser South	0	0.0
31	Richmond	0	0.0
32	Vancouver	0	0.0
33	North Shore/Coast Garibaldi	1	0.4
41	South Vancouver Island	0	0.0
42	Central Vancouver Island	0	0.0
43	North Vancouver Island	0	0.0
51	Northwest	0	0.0
52	Northern Interior	0	0.0
53	Northeast	0	0.0

Note: Map classification by Jenks natural breaks method.

### 1.3 Haemophilus influenzae type b (Hib) invasive Rates by Age Group and Sex, 2009



# Hepatitis B

## **Hepatitis B Chronic, Unknown and Acute Infections**

Most hepatitis B cases reported each year in BC are reported as chronic infections. The majority of these are persons who have emigrated from a country where hepatitis B infection is endemic. Persons infected at birth have a high likelihood of developing chronic hepatitis B infection. Chronic cases may be asymptomatic and detected during a routine medical or prenatal testing or cases may be tested due to symptoms of chronic infection such as cirrhosis. Acute hepatitis B is suspected when a person is symptomatic (e.g. jaundice) and is confirmed by anti-hepatitis B core IgM. As the numbers of acute cases are very small, to interpret trends meaningfully it is important to determine which cases are acute and which are chronic. Some cases are reported as unknown/undetermined, but as these are usually asymptomatic they are considered likely chronically infected.

## **Chronic and Unknown Hepatitis B**

Since 1992, more than 35,000 cases of hepatitis B have been reported. Newly identified cases of chronic and unknown hepatitis B have continued to decline annually. In 2009, 1,311 cases were reported, however this information is not collected nationally, therefore BC rates cannot be compared with national rates.

Identification of chronic hepatitis B will depend on testing. Hepatitis B testing is part of the routine prenatal testing, therefore the higher prevalence of chronic hepatitis B identified in females compared to males in the 20-39 year age groups may be due to more frequent testing rather than a true higher prevalence. Infants born to hepatitis B infected mothers receive hepatitis B immune globulin and vaccine at birth and 3 subsequent vaccine doses at 2, 4 and 6 months of age. However despite full post exposure prophylaxis some infants will become infected. Testing is therefore

recommended 1 to 6 months post vaccine series completion and may identify chronic infection in these infants.

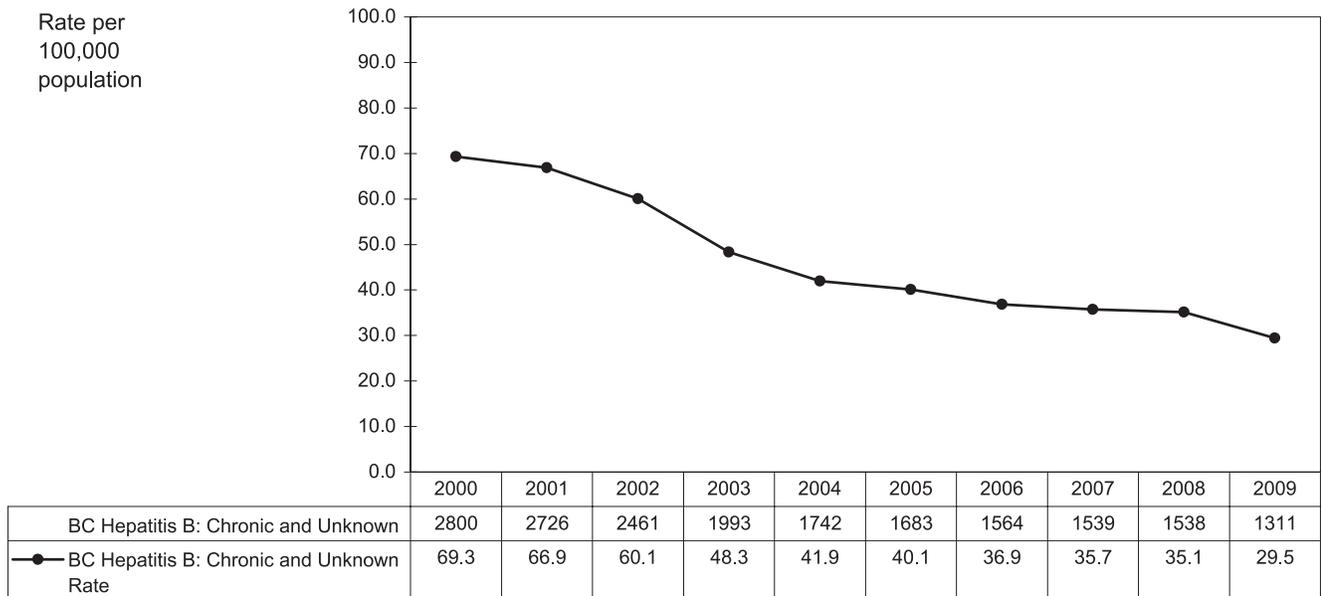
There are seven fold variations in the rates of hepatitis B between health service delivery areas in BC. Areas with highest rates correspond to areas with high immigration.

## **Acute Hepatitis B**

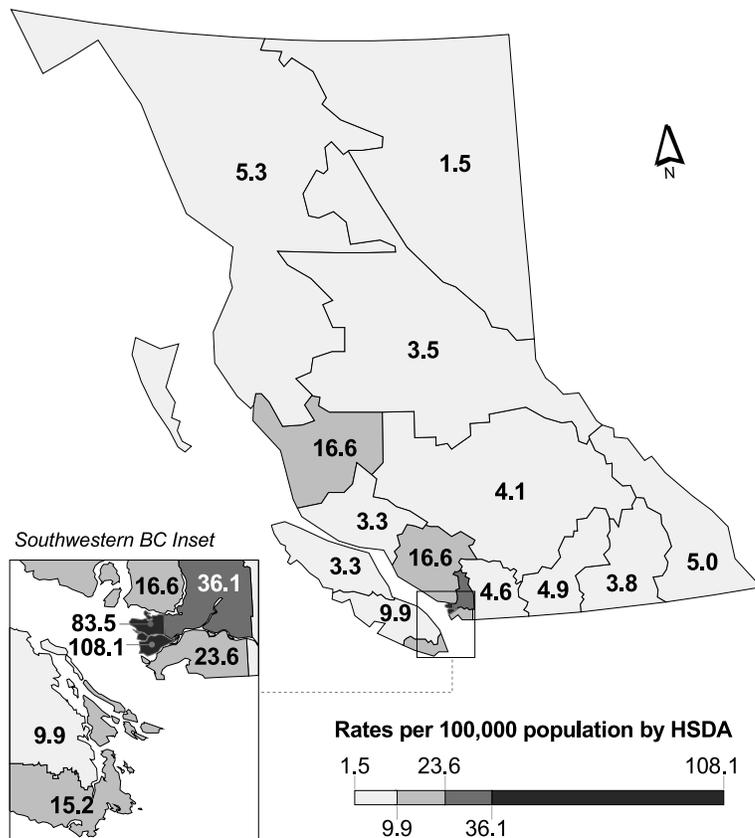
The annual number of acute hepatitis B cases reported in BC continues to decline as seen in Figure 2.4. The national acute hepatitis B rate is not available before 2005; the rate for 2005 onwards is based on only 4 provinces that report acute hepatitis B (including BC). When hepatitis B is newly identified without symptoms of acute infection or a known history of past infection it may be necessary to perform follow-up testing at 6 months to determine if the case represents acute or chronic infection. Therefore the 2009 data (27 cases) should be considered provisional.

Universal hepatitis B vaccine became available in BC for Grade 6 students in 1992 and the infant program was introduced province-wide in 2001. The first recipients of the adolescent school based program were aged 28 years in 2009. Only 3 cases were identified in persons less than 30 years of age. The vaccine is also publicly funded for individuals at high risk of infection including persons who use intravenous drugs and men who have sex with men. As in previous years the majority of cases (78%) were male. The largest number of cases reported was in Vancouver (11), Fraser North (5) and Fraser South (4). However due to small numbers the rates in other Health Service Delivery Areas are likely to be unstable.

## 2.1 Chronic and Unknown Hepatitis B Rates by Year, 2000-2009



## 2.2 Chronic and Unknown Hepatitis B Rates by HSDA, 2009

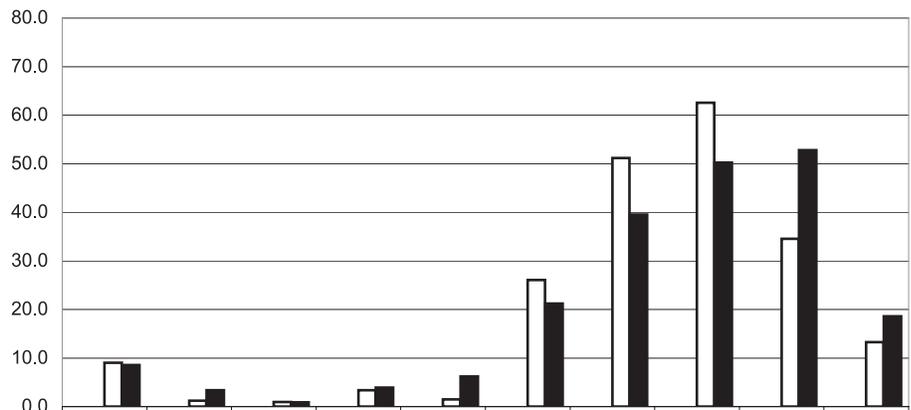


HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	4	5.0
12	Kootenay Boundary	3	3.8
13	Okanagan	17	4.9
14	Thompson Cariboo Shuswap	9	4.1
21	Fraser East	13	4.6
22	Fraser North	216	36.1
23	Fraser South	164	23.6
31	Richmond	208	108.1
32	Vancouver	535	83.5
33	North Shore/Coast Garibaldi	46	16.6
41	South Vancouver Island	56	15.2
42	Central Vancouver Island	26	9.9
43	North Vancouver Island	4	3.3
51	Northwest	4	5.3
52	Northern Interior	5	3.5
53	Northeast	1	1.5

Note: Map classification by Jenks natural breaks method.

### 2.3 Chronic and Unknown Hepatitis B Rates by Age Group and Sex, 2009

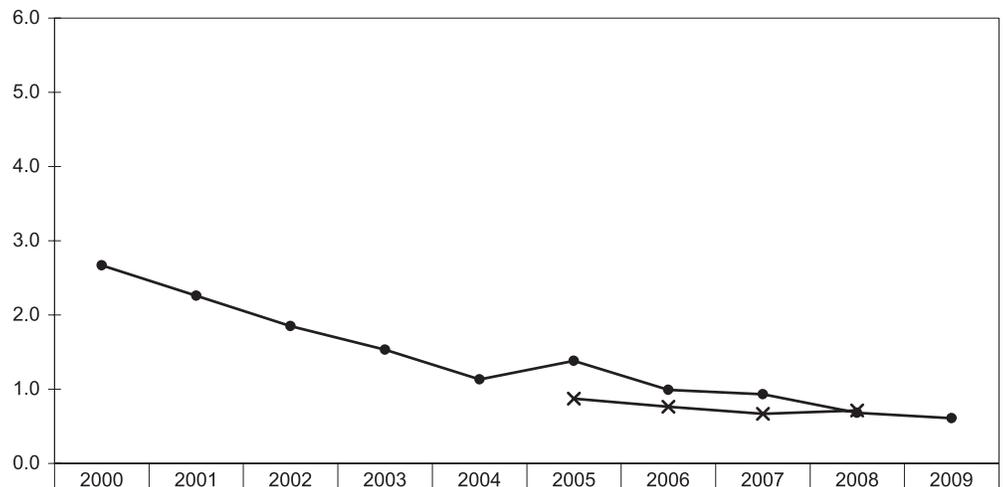
Rate per  
100,000  
population



Hepatitis B: Chronic and Unknown Reports - Female	2	1	1	4	2	39	79	186	236	65
Hepatitis B: Chronic and Unknown Reports - Male	2	3	1	5	9	34	61	147	353	80
□ Hepatitis B: Chronic and Unknown Rate - Female	9.0	1.2	0.9	3.3	1.5	26.1	51.2	62.6	34.5	13.3
■ Hepatitis B: Chronic and Unknown Rate - Male	8.6	3.4	0.9	3.9	6.2	21.2	39.5	50.2	52.8	18.6

### 2.4 Acute Hepatitis B Rates by Year, 2000-2009

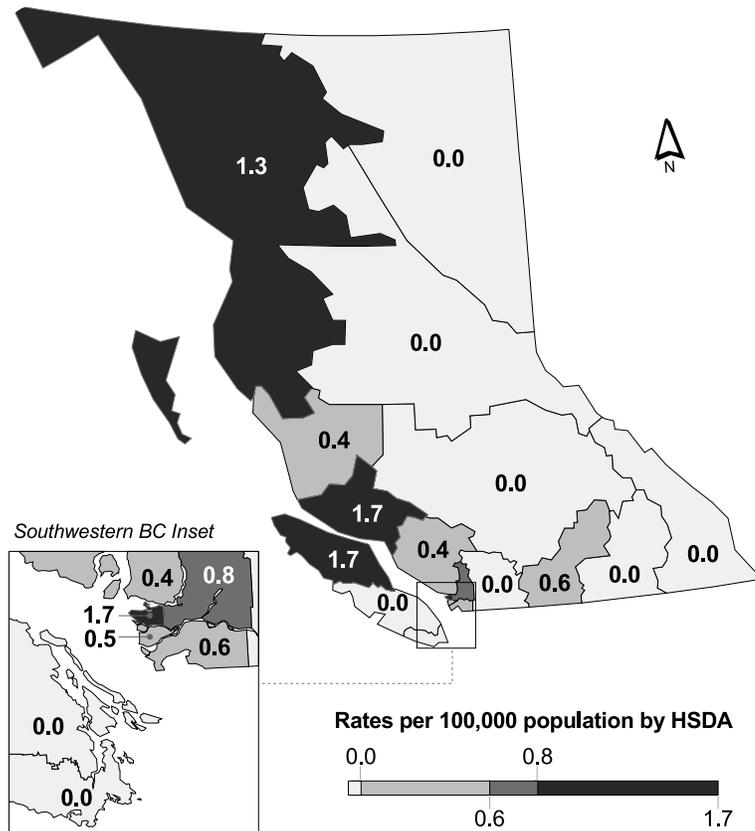
Rate per  
100,000  
population



BC Hepatitis B: Acute Reports	108	92	76	63	47	58	42	40	30	27
● BC Hepatitis B: Acute Rate	2.7	2.3	1.9	1.5	1.1	1.4	1.0	0.9	0.7	0.6
✕ Canadian Acute Hepatitis B Rate*						0.9	0.8	0.7	0.7	

\*The national acute hepatitis B rate is not available before 2005; the rate for 2005 onwards is based on only 4 provinces (Alberta, British Columbia, Quebec and Saskatchewan) that report acute hepatitis B.

## 2.5 Acute Hepatitis B Rates by HSDA, 2009

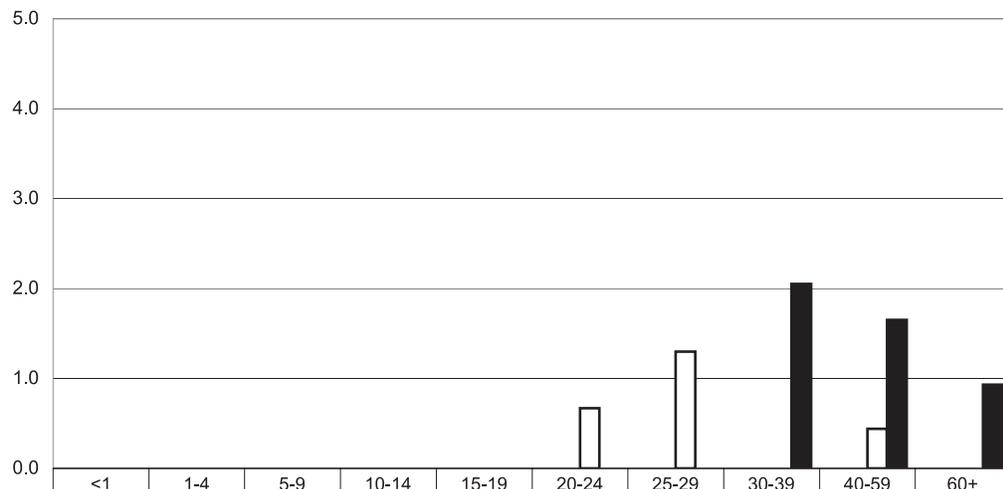


HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	0	0.0
12	Kootenay Boundary	0	0.0
13	Okanagan	2	0.6
14	Thompson Cariboo Shuswap	0	0.0
21	Fraser East	0	0.0
22	Fraser North	5	0.8
23	Fraser South	4	0.6
31	Richmond	1	0.5
32	Vancouver	11	1.7
33	North Shore/Coast Garibaldi	1	0.4
41	South Vancouver Island	0	0.0
42	Central Vancouver Island	0	0.0
43	North Vancouver Island	2	1.7
51	Northwest	1	1.3
52	Northern Interior	0	0.0
53	Northeast	0	0.0

Note: Map classification by Jenks natural breaks method.

## 2.6 Acute Hepatitis B Rates by Age Group and Sex, 2009

Rate per 100,000 population



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Hepatitis B: Acute Reports - Female	0	0	0	0	0	1	2	0	3	0
Hepatitis B: Acute Reports - Male	0	0	0	0	0	0	0	6	11	4
□ Hepatitis B: Acute Rate - Female	0.0	0.0	0.0	0.0	0.0	0.7	1.3	0.0	0.4	0.0
■ Hepatitis B: Acute Rate - Male	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	1.7	0.9

# Influenza

Influenza surveillance in British Columbia (BC) consists of collection, analysis and reporting of: influenza activity in the community tracked through a composite of (1) sentinel influenza-like-illness (ILI) cases; (2) Medical Service Plan influenza visits; (3) facility and school outbreak notifications; (4) laboratory diagnoses including detailed subtype and strain characterization; and (5) hospitalizations and deaths related to influenza.

Surveillance is year-round in BC with a new monitoring period typically commencing the first week of October (week 40) and continuing through the end of September (week 39) the following year. **This report includes surveillance data from week 12 in 2009 (March 22, 2009) to week 11 in 2010 (ending March 20, 2010).**

## Summary

The hallmark of the 2009/10 influenza season was the World Health Organization's (WHO) declaration of the first influenza pandemic in more than 40 years on June 11, 2009, following the emergence of a novel swine-origin influenza virus of the H1N1 subtype—now called pandemic influenza A/H1N1 (pH1N1). Historically, the peak in influenza activity has occurred between late December and early February, followed by a substantial decline in late March or early April. In 2009, after a decline in activity due to seasonal viruses in late March, there was an increase in activity due to pH1N1 during weeks 17 to 19 in the spring followed by low level activity throughout the summer (first wave). pH1N1 activity started to increase again in week 36, peaked in week 43 (October 25- 31, 2009) and declined thereafter to below historic levels in week 50 (second wave). Since then (to March 20, 2010) sporadic detections of pH1N1 continued with intervening periods of no activity. pH1N1 activity dominated throughout the 2009/10 season with only sporadic detections of influenza A/H3N2 and influenza B.

## Sentinel Physicians Surveillance

BC sentinel physician surveillance for the 2009/10 influenza season consisted of 51 active sentinel sites representing all regional health authorities of BC. The proportion of patient visits due to ILI reported by sentinel physicians increased above the expected level and reached its peak at 1.3% in week 18 (May 2-8, 2009), then started declining again. Low level activity continued during the summer until week 36 (September 6-12, 2009), when activity started to increase again, peaking in week 43 (October 25-31, 2009) during which 6% of the patient visits were attributed to ILI. The proportion of visits attributed to ILI at the week 43 peak was well above the historical maximum of the past 20 years (Figure 3.1).

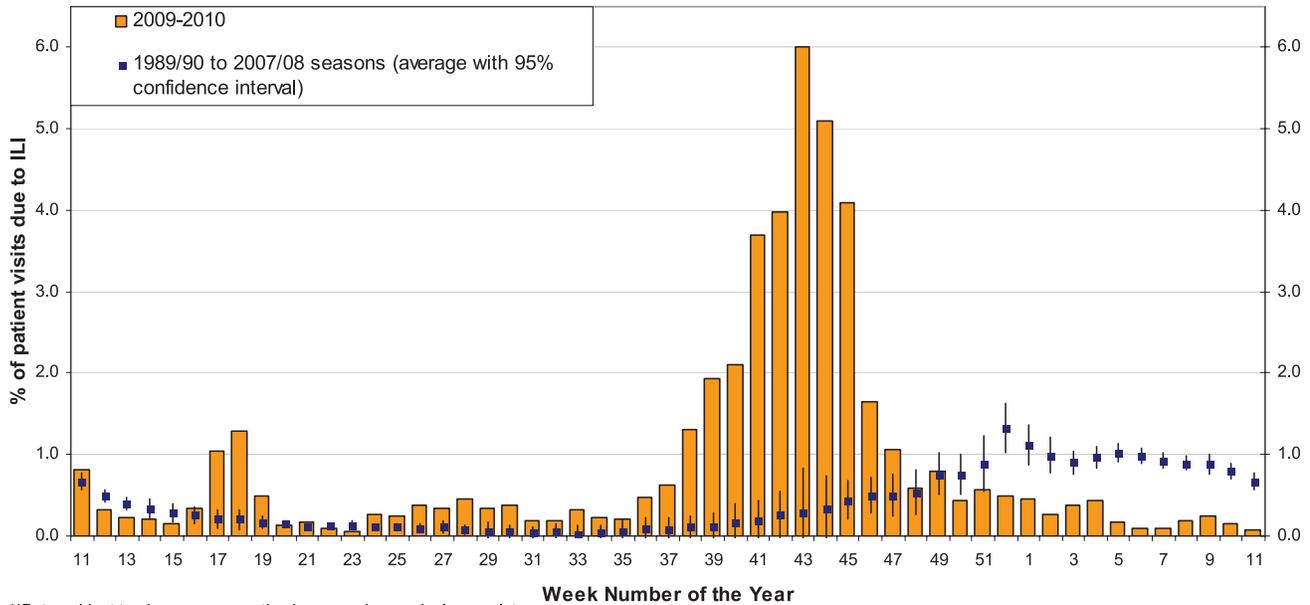
Influenza illness (ICD-9 code 487) as a proportion of all claims submitted by general practitioners to the BC Medical Services Plan (MSP) showed a similar picture with peak at 9.3% on November 7, 2009 (Figure 3.2).

## ILI Outbreaks

Between week 12, 2008/09 and week 11 of the 2009/10 season, ILI outbreaks were reported in 655 schools, and laboratory confirmed influenza outbreaks were reported in 31 long-term care facilities (LTCF) and one acute care facility. For the usual reporting period of previous years (between week 40 and week 12) 13 laboratory confirmed outbreaks were reported from LTCFs, and all were attributed to pH1N1. As shown in Table 3.3, the count of ILI outbreaks in BC schools was much higher than previous years, while influenza outbreaks in long-term care facilities were fewer than those reported during the same period in the 5 previous years (Table 3.3 and Figure 3.4).

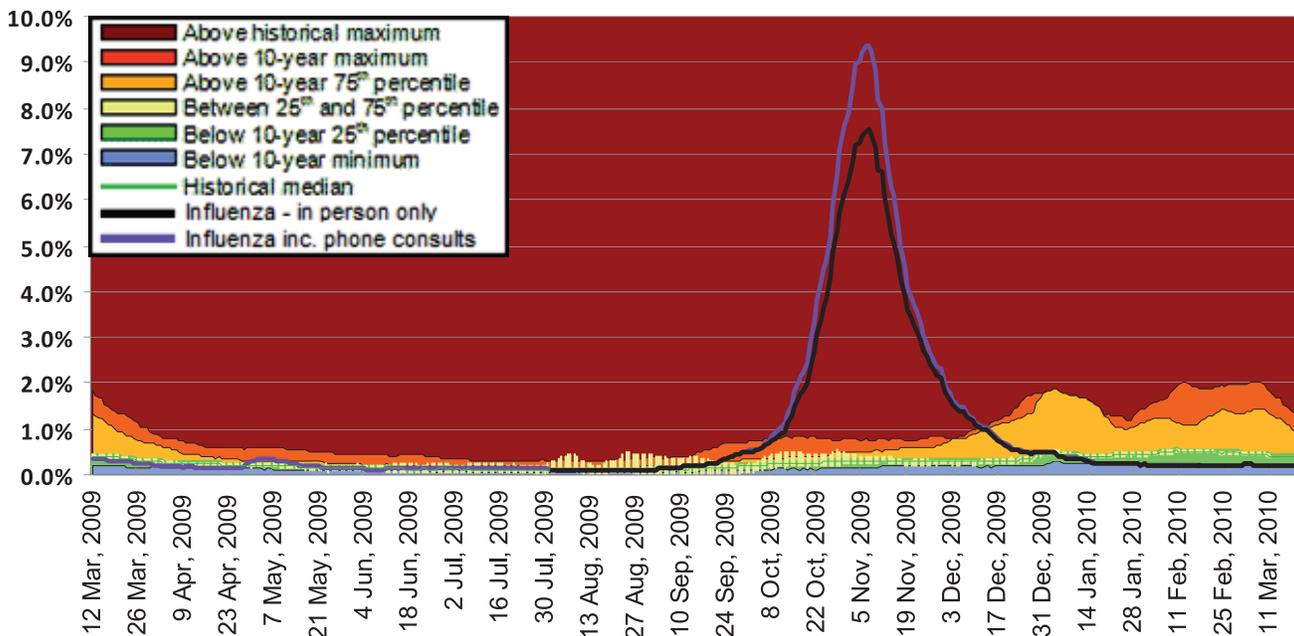
# Influenza (continued)

## 3.1 Proportion of Patient Visits due to Influenza-Like Illness (ILI) per Week Number Compared to Average Sentinel Physicians Proportion of ILI Visits for the Past 19 Seasons, 2009-2010, British Columbia



\*\*Data subject to change as reporting becomes increasingly complete

## 3.2 Proportion of influenza illness visits among submitted BC Medical Services Plan (MSP) claims per week, British Columbia, 2009-10



# Influenza (continued)

### 3.3 Number of reported influenza/ILI outbreaks in long-term care facilities and schools between weeks 40 and 15, British Columbia, 2003-04 to 2009-10 seasons

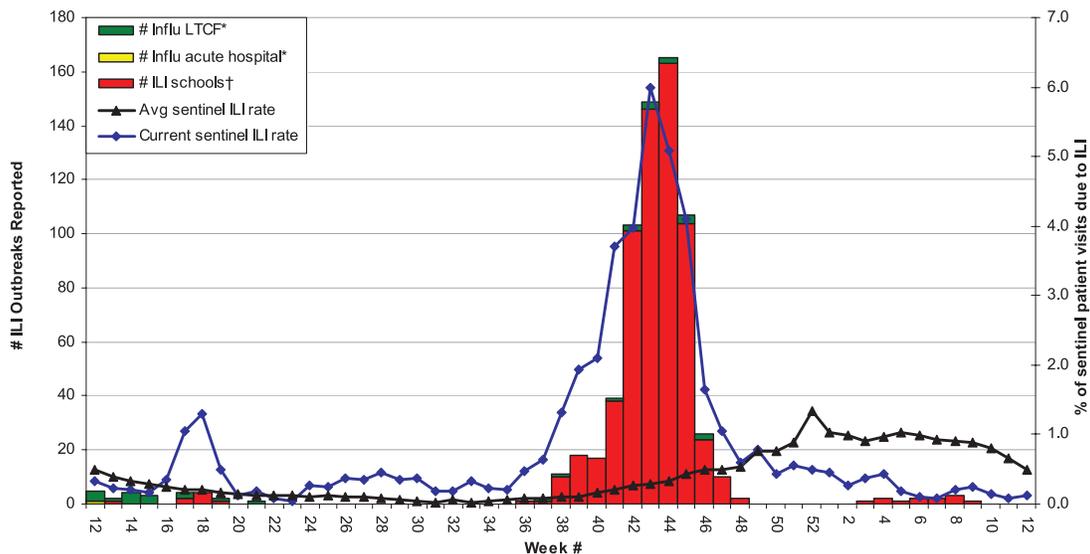
	Long-term care facility outbreak†	School outbreaks‡
2003-04	58	108
2004-05	86	24
2005-06	52	148
2006-07	52	101
2007-08	75	99
2008-09	38	71
2009-10	13	617

† Includes lab-confirmed influenza outbreaks only  
 ‡ ILI outbreaks in schools defined as > 10% absenteeism, which could be attributed to influenza-like illness

### Laboratory Profile of Influenza

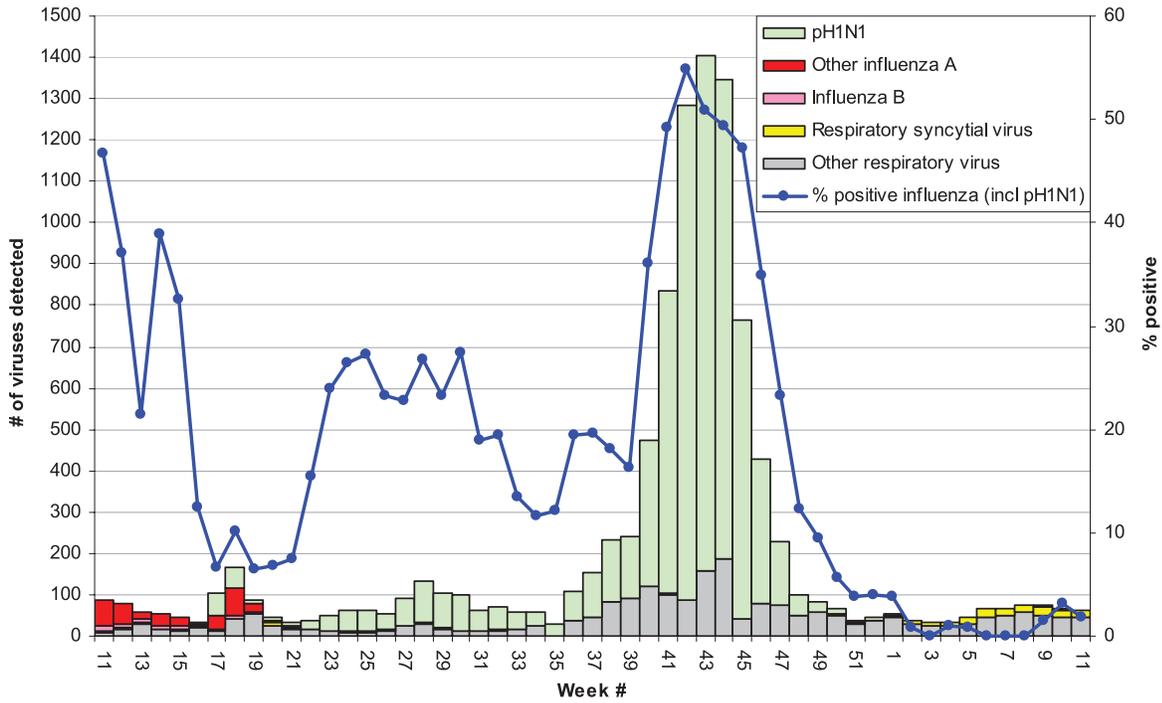
The BCCDC Virology Laboratory and the Children’s and Women’s Health Centre Virology Laboratory conducted 29,126 tests for respiratory viruses between March 22, 2009 (week 12) and March 20, 2010 (week 11). Eight thousand one-hundred forty one (28%) specimens were positive for influenza, of which 8078 (99%) were influenza A and 63 (1%) were influenza B. Of the 7636 influenza A viruses that were subtyped, 7364 (96%) were pH1N1. Of 8781 specimens tested for other respiratory viruses, 2459 (28%) were positive for at least one virus (i.e., respiratory syncytial virus, adenovirus, parainfluenza, entero/rhinovirus, human metapneumovirus, human bocavirus, or coronavirus) (Figures 3.5a and b).

### 3.4 Number of Influenza and Influenza-Like Illness (ILI) Outbreaks Reported, Compared to Current Sentinel ILI Rate and Average Sentinel ILI Rate for past 19 years, per Week, British Columbia, 2009-2010

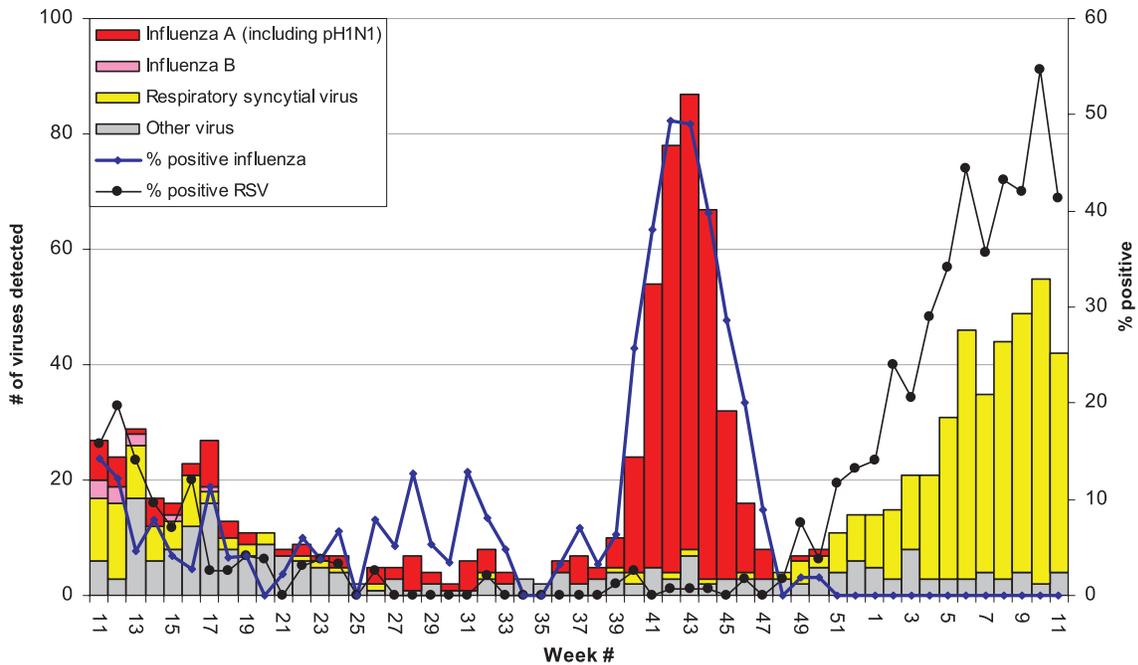


\* Facility influenza outbreak defined as 2 or more ILI cases within 7-day period, with at least one case laboratory-confirmed as influenza.  
 † School ILI outbreak defined as >10% absenteeism on any day, most likely due to ILI.

**3.5a Influenza and Other Virus Detection Among Respiratory Specimens Submitted to BC Provincial Laboratory, 2009-2010**



**3.5b Influenza and Other Virus Detections Among Respiratory Specimens Submitted to BC Children’s and Women’s Health Centre Laboratory, 2009-2010**



## Influenza (continued)

BC laboratories routinely send influenza isolates to the National Microbiology Laboratory (NML) for strain characterization. Between September 1, 2009 and March 11, 2010, 208 isolates were sent to NML from BC. Of these, 205 (99%) were A/California/07/2009-like, 2 (1%) were A/Perth/16/2009 (H3N2)-like and one was A/Brisbane/10/2007(H3N2)-like. The WHO-recommended components of the 2009-10 and 2010-11 Northern Hemisphere trivalent influenza vaccines are:

### 2009-10 and 2010-11 Vaccine Strains

2009-10	2010-11
A/Brisbane/59/2007 (H1N1)	A/California/07/2009 (H1N1) *
A/Brisbane/10/2007 (H3N2)	A/Perth/16/2009 (H3N2)
B/Brisbane/60/2008 (Victoria lineage)	B/Brisbane/60/2008 (Victoria lineage)

\* 2009 pandemic H1N1 vaccine strain

### Antiviral Resistance

The NML routinely tests for susceptibility of selected isolates to antiviral drugs recommended for treatment of influenza: oseltamivir, zanamivir and amantadine. Between September 1, 2009 and March 11, 2010 the NML indicated that 99% (1053/1065) of pH1N1 isolates in Canada were sensitive to oseltamivir. All influenza B isolates (n=3) and influenza A/H3N2 isolates (n=13) tested were sensitive to oseltamivir, and the 6 seasonal A/H1N1 isolates tested were oseltamivir-resistant. All pH1N1 (n=1043), seasonal H1N1 (n=2), A/H3N2 (n=13), and influenza B (n=3) isolates were sensitive to zanamivir. All pH1N1 (n=1121) and A/H3N2 (n=24) isolates were resistant to amantadine. Four seasonal H1N1 isolates were sensitive to amantadine, and one was resistant.

## Influenza (continued)

### **Pandemic H1N1 (pH1N1) Severe Outcomes**

Surveillance of laboratory confirmed severe outcomes (hospitalizations, ICU admission and deaths) related to influenza started in April 2009. 1083 pH1N1 hospitalizations and 57 pH1N1 deaths have been reported in the province between April 17, 2009 and March 20, 2010. Most of these hospitalizations were reported between weeks 39 and 50, corresponding to the fall pH1N1 wave. Sixty-five percent of hospitalized cases had at least one reported underlying medical condition (excluding pregnancy). Twenty-six percent of hospitalized cases were admitted to the ICU, and 8% died. Available data suggest that attack rates of pH1N1 were highest among school age children (5-19 years) while hospitalization rates were highest among very young children (<4 years). Although attack rates and hospitalization rates were relatively low among the elderly ( $\geq 65$  years), the pH1N1 mortality rate in this group was higher in comparison to younger age groups. Thus, the risk of acquiring pH1N1 infection and getting hospitalized was low for the elderly, but if they did get infected, then their risk of mortality was high (Figures 3.6a & b).

### **Rapid Response Evaluations**

During the current seasonal and pandemic reporting period, various rapid response evaluations were undertaken to characterize pH1N1-related illness, its

immuno-epidemiology and interaction with prior seasonal vaccine. Selected abstracts and papers can be accessed at the following links.

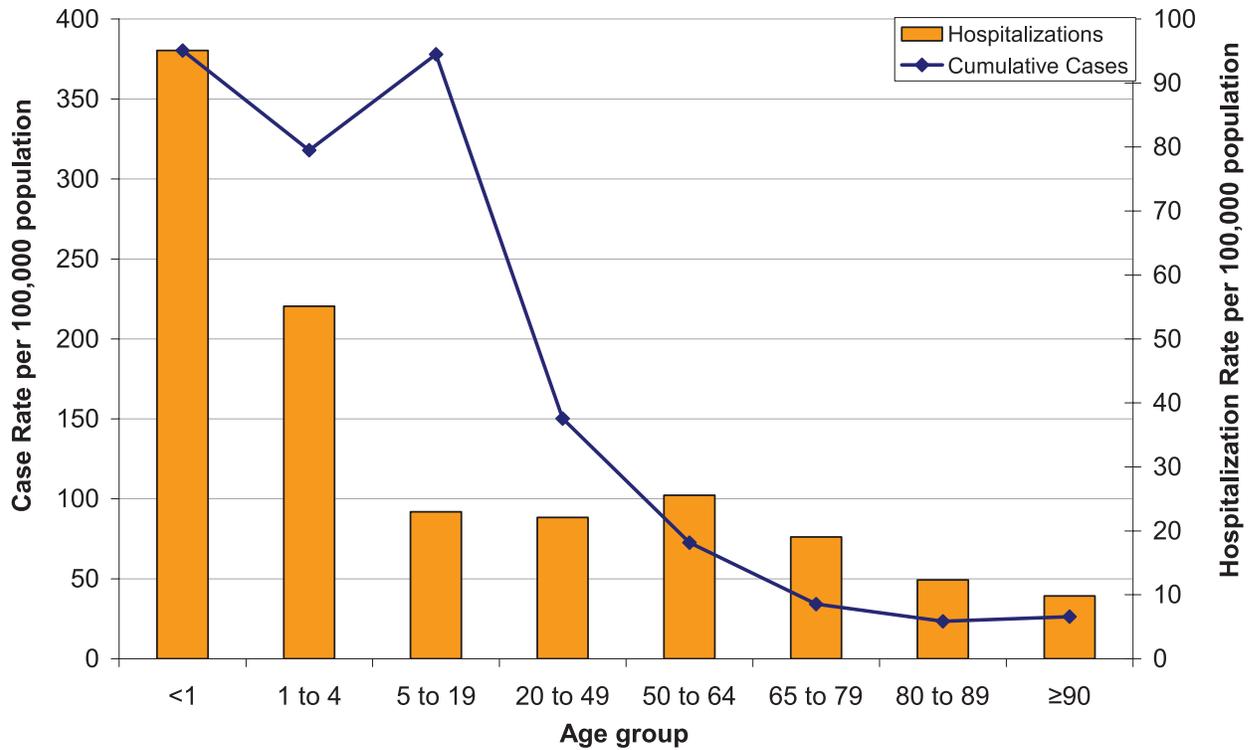
- Association between the 2008–09 Seasonal Influenza Vaccine and Pandemic H1N1 Illness during Spring–Summer 2009: Four Observational Studies from Canada  
<http://www.plosmedicine.org/article/info%3Adoi%2F10.1371%2Fjournal.pmed.1000258>

- Seasonal influenza vaccine and increased risk of pandemic H1N1 illness: first detection of the association during outbreak investigation in British Columbia, Canada  
<http://www.nfid.org/pdf/conferences/vaccine10abstracts.pdf> Page 103

- Immuno-epidemiologic correlates of pandemic H1N1 surveillance observations: higher antibody and lower cell-mediated immune responses with advanced age  
<http://www.nfid.org/pdf/conferences/vaccine10abstracts.pdf> Page 96

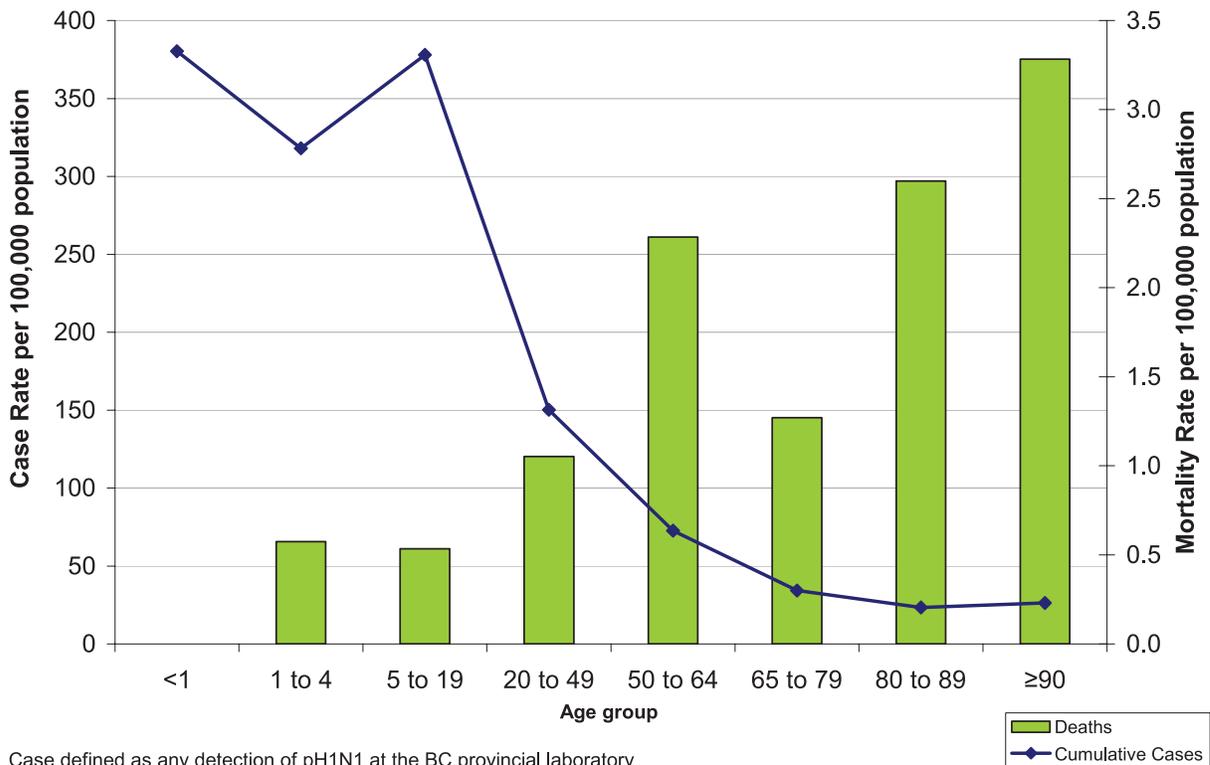
- Product-related differences in cross-reactive non-neutralizing antibody to pandemic H1N1 induced by 2008-09 trivalent influenza vaccine in Canada  
<http://www.nfid.org/pdf/conferences/vaccine10abstracts.pdf> Page 97

**3.6a Cumulative Rate of pH1N1 Cases and Hospitalizations by Age, per 100,000 Population, BC April 17, 2009 - March 22, 2010**



Case defined as any detection of pH1N1 at the BC provincial laboratory.

**3.6b Cumulative Rate of pH1N1 Cases and Deaths by Age, per 100,000 Population, BC April 17, 2009 - March 22, 2010**



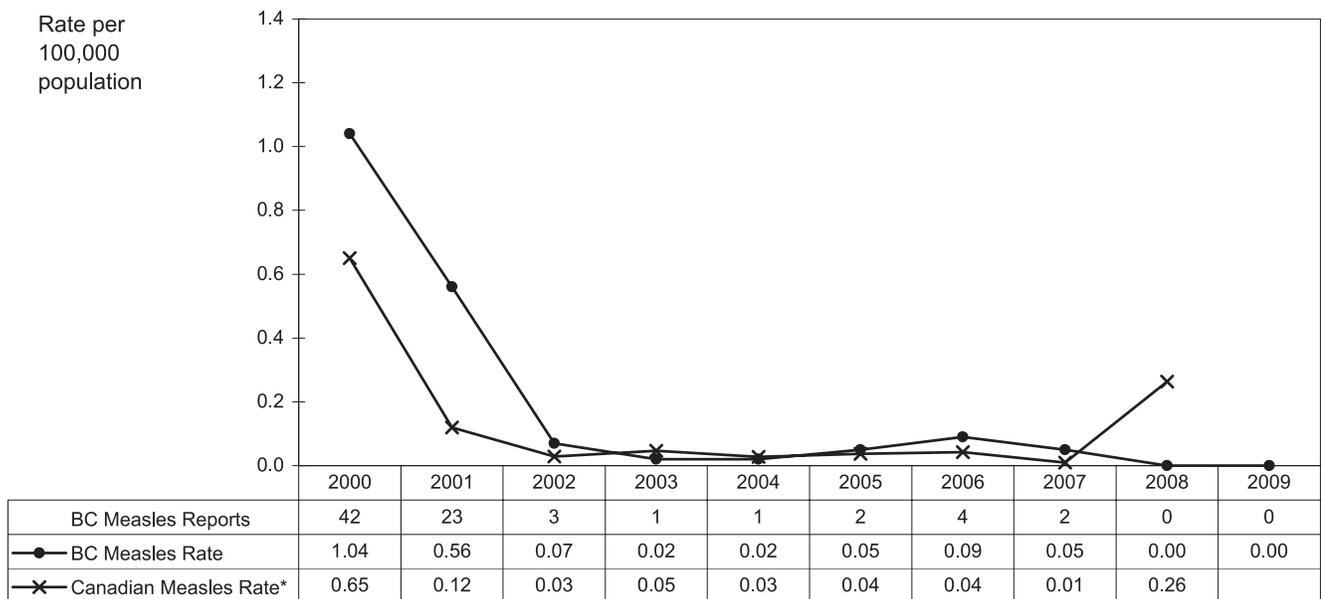
Case defined as any detection of pH1N1 at the BC provincial laboratory.

# Measles

There were no cases of measles reported in BC in 2009. Measles is a disease under elimination in the Americas, and very low rates have been reported in BC in the past decade. This is largely attributable to introduction of a second dose

of measles vaccine in the routine childhood immunization schedule following the catch-up campaign conducted for all children to end of high school in 1996.

## 4.1 Measles Rates by Year, 2000-2009



\*Please see Sources and Explanatory Remarks, Section 11 on Page 123 in regard to the national rate

# Meningococcal Disease (invasive)

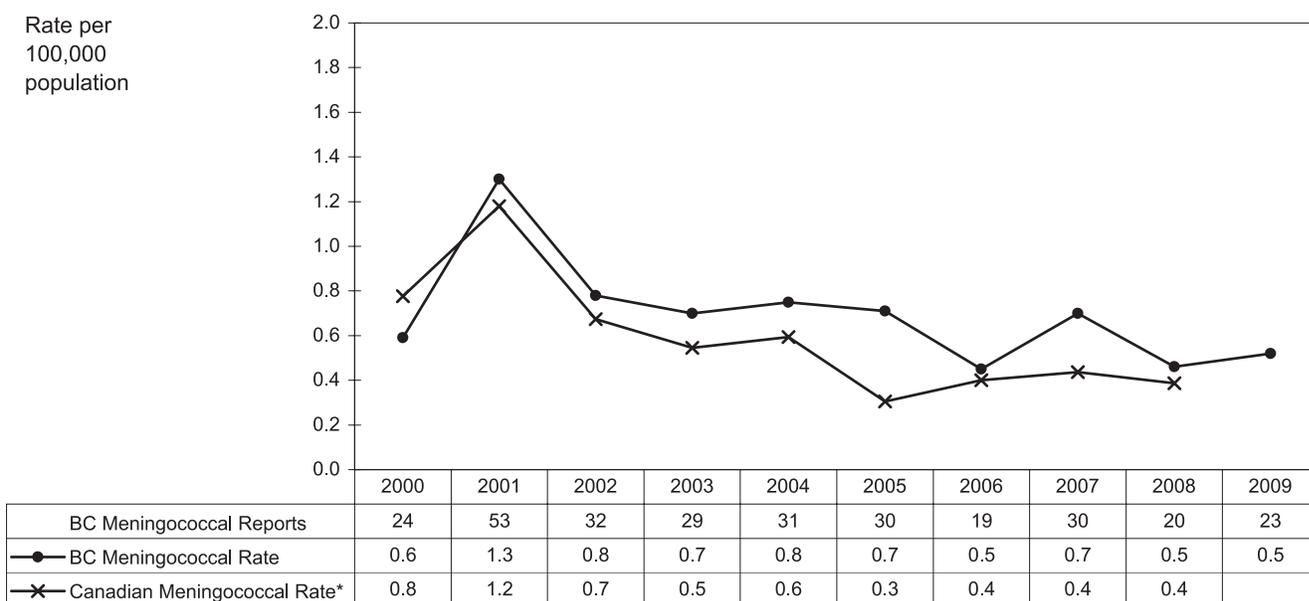
The overall rate of IMD has significantly declined between 2002 and 2009 from 0.78 to 0.52 per 100,000 population ( $p=0.014$ ,  $r=0.76$ ). IMD specific mortality rate has also fallen from 0.073 to 0.045 per 100,000 population ( $p=0.007$ ,  $r=0.81$ ). The rate of serogroup C disease declined (ten-fold) over the same period from 0.22 to 0.022 per 100,000 population with only one case reported (an adult) during 2009.

There has been no recurrence of the historical pattern of

periodic outbreaks in school age children and adolescents. There has been no significant change in the rates of serogroup B, A, Y or W135 disease. Median age of all IMD increased from 23 to 57 years of age between 2002 and 2008 but decreased to 29 in 2009 due to 5 sporadic cases of serogroup B in infants.

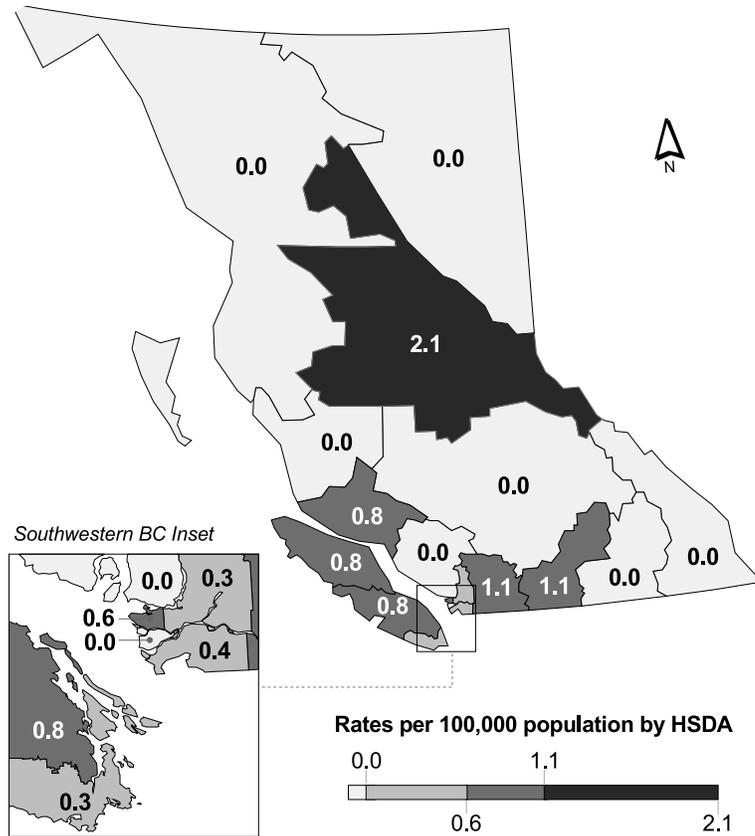
During 2009, 23 cases were reported. 16 were serogroup B, 5 serogroup Y, 1 serogroup C and 1 serogroup 29E.

## 5.1 Meningococcal Disease (invasive) Rates by Year, 2000-2009



\*Please see Sources and Explanatory Remarks, Section 11 on Page 123 in regard to the national rate

## 5.2 Meningococcal Disease (invasive) Rates by HSDA, 2009

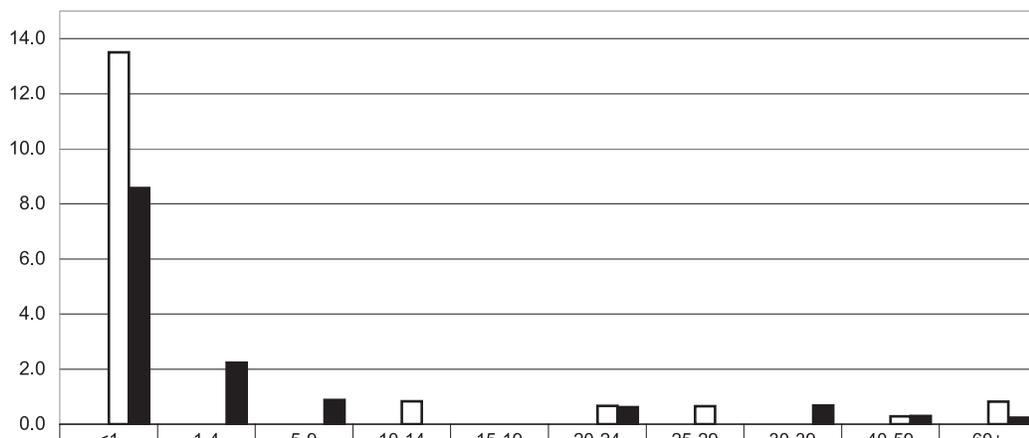


HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	0	0.0
12	Kootenay Boundary	0	0.0
13	Okanagan	4	1.1
14	Thompson Cariboo Shuswap	0	0.0
21	Fraser East	3	1.1
22	Fraser North	2	0.3
23	Fraser South	3	0.4
31	Richmond	0	0.0
32	Vancouver	4	0.6
33	North Shore/Coast Garibaldi	0	0.0
41	South Vancouver Island	1	0.3
42	Central Vancouver Island	2	0.8
43	North Vancouver Island	1	0.8
51	Northwest	0	0.0
52	Northern Interior	3	2.1
53	Northeast	0	0.0

Note: Map classification by Jenks natural breaks method.

## 5.3 Meningococcal Disease (invasive) Rates by Age Group and Sex, 2009

Rate per 100,000 population



Meningococcal Reports - Female	3	0	0	1	0	1	1	0	2	4
Meningococcal Reports - Male	2	2	1	0	0	1	0	2	2	1
□ Meningococcal Rate - Female	13.5	0.0	0.0	0.8	0.0	0.7	0.7	0.0	0.3	0.8
■ Meningococcal Rate - Male	8.6	2.2	0.9	0.0	0.0	0.6	0.0	0.7	0.3	0.2

# Mumps

Twenty-four cases of confirmed mumps were reported in 2009. Sixteen (66%) were among residents of Fraser Health Authority, suggesting low levels of ongoing transmission following the large outbreak in 2008.

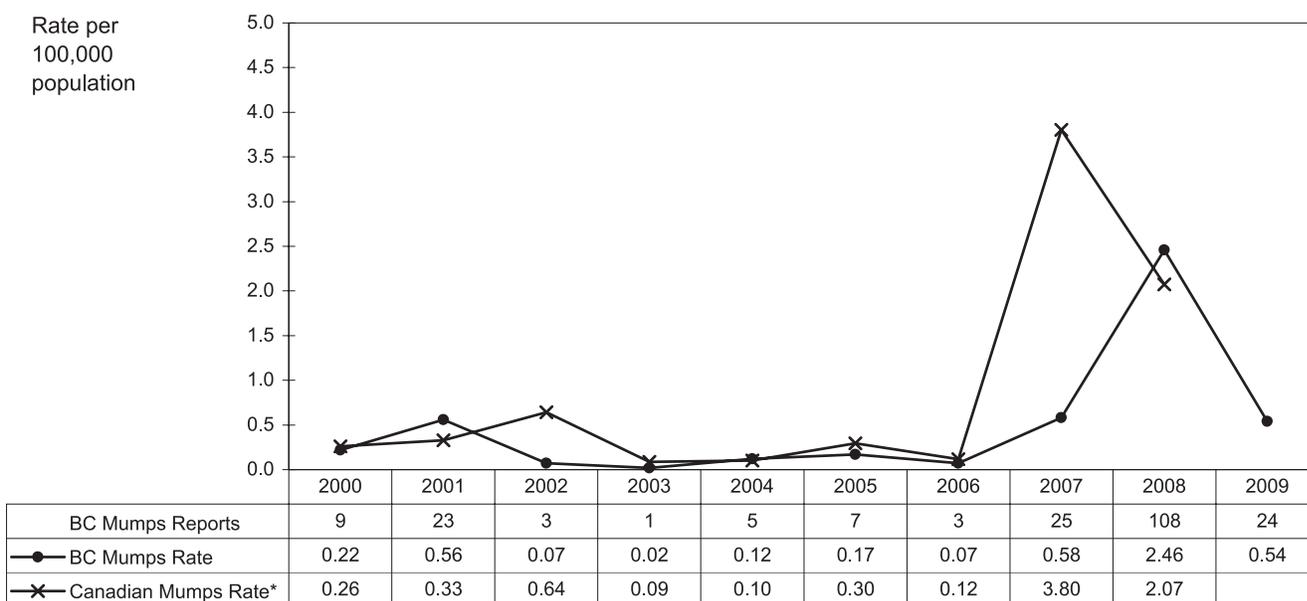
Cases ranged in age from 15 to 61 years. Fifteen (63%) were male. Only one (4%) was hospitalized for dehydration, with illness consisting of parotitis, orchitis and high fever.

Four cases acquired their infection from a BC-based mumps case. Seven (29%) cases had a history of travel during their

likely exposure period. Two traveled to areas of known mumps activity outside of BC and one of these had contact with a confirmed case. Five travelled to areas with no known mumps activity. Thirteen cases did not report travel during their exposure period and had no recognized exposure to a known case of mumps.

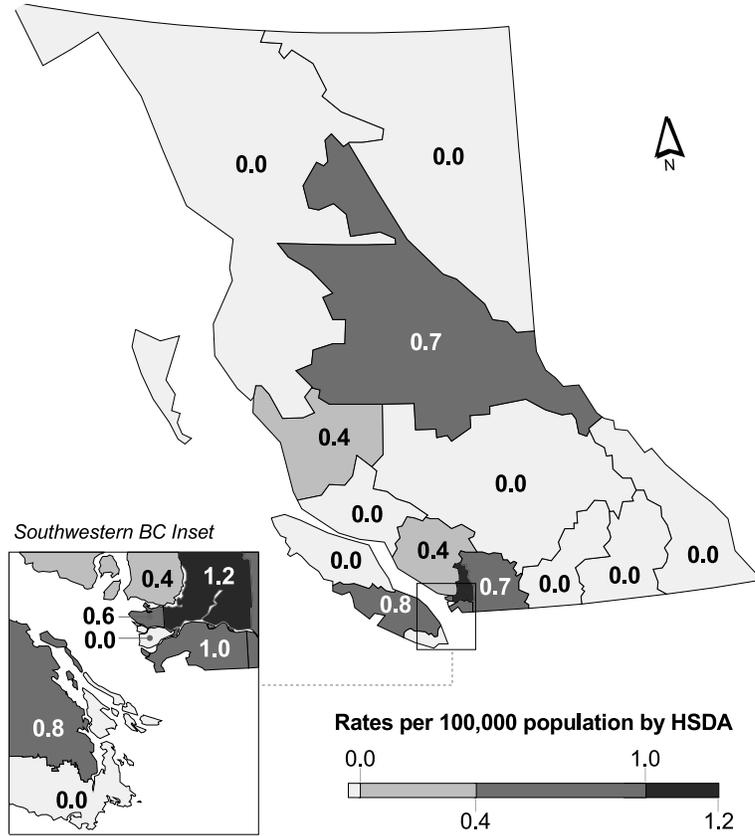
One case had previously received one documented dose of MMR vaccine, two cases were unimmunized and the remainder had unknown or undocumented immunization status.

## 6.1 Mumps Rates by Year, 2000-2009



\*Please see Sources and Explanatory Remarks, Section 11 on Page 123 in regard to the national rate

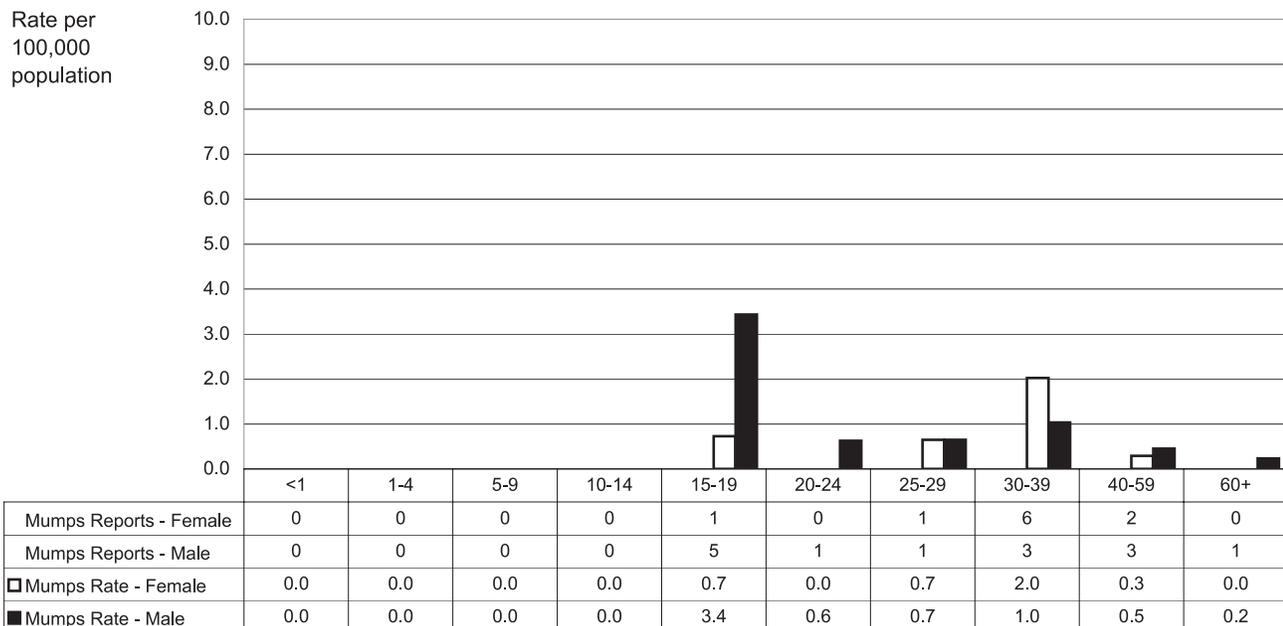
## 6.2 Mumps Rates by HSDA, 2009



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	0	0.0
12	Kootenay Boundary	0	0.0
13	Okanagan	0	0.0
14	Thompson Cariboo Shuswap	0	0.0
21	Fraser East	2	0.7
22	Fraser North	7	1.2
23	Fraser South	7	1.0
31	Richmond	0	0.0
32	Vancouver	4	0.6
33	North Shore/Coast Garibaldi	1	0.4
41	South Vancouver Island	0	0.0
42	Central Vancouver Island	2	0.8
43	North Vancouver Island	0	0.0
51	Northwest	0	0.0
52	Northern Interior	1	0.7
53	Northeast	0	0.0

Note: Map classification by Jenks natural breaks method.

## 6.3 Mumps Rates by Age Group and Sex, 2009



# Pertussis

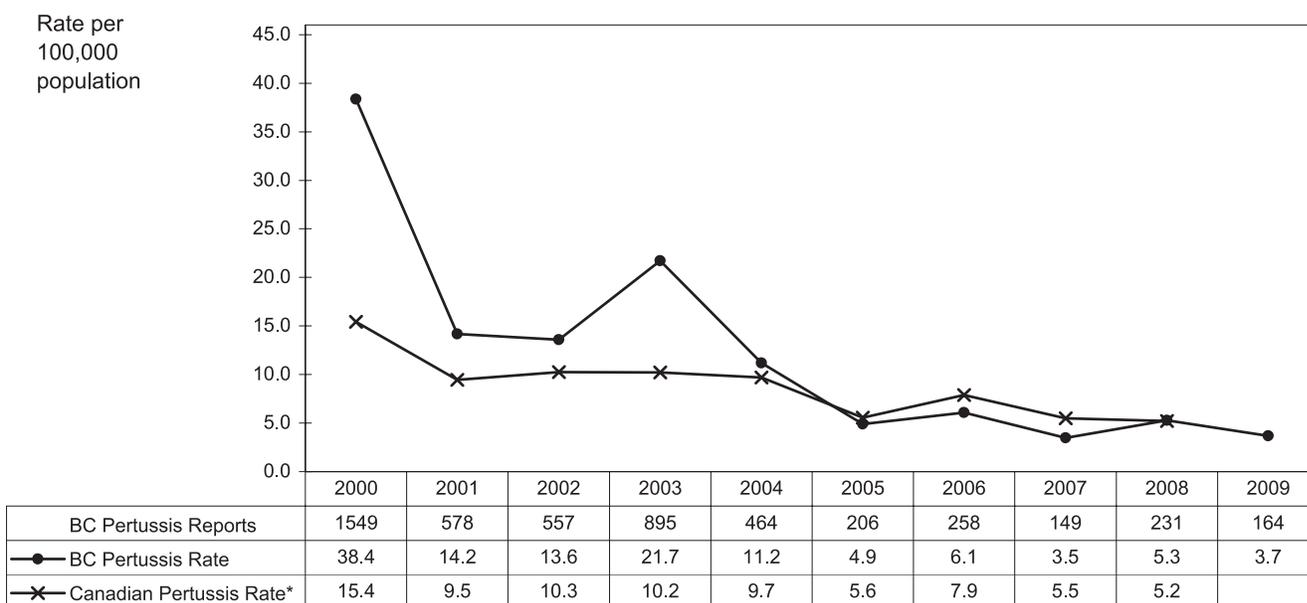
Pertussis generally demonstrates cyclical peaks every three to five years. British Columbia has not experienced a significant provincial peak since 2003 (21.5 per 100,000), and rates have since dropped to their lowest levels in approximately 20 years (3-5 per 100,000 in 2007-2009), including among infants.

The peaks of 2000 and 2003 were driven primarily by a preteen/teen reservoir reflecting a moving (aging) birth cohort effect among children previously given the less efficacious whole cell pertussis vaccine. Infants were also substantially affected during these peaks. In British Columbia, acellular pertussis vaccine replaced whole cell vaccine for routine childhood immunization in 1997 and was introduced for routine immunization of adolescents 14-15 years of age (Grade 9) in January 2004. More recent

change to the routine infant immunization program (2, 4, and 6 month doses) in February 2009 included replacement of the pentavalent vaccine (with five acellular pertussis [aP] antigens in addition to tetanus [T], diphtheria [D], polio [P], and *Haemophilus influenzae* b [Hib]) with a hexavalent combination including hepatitis B plus D,T,P,aP,Hib but with fewer (three) pertussis antigens.

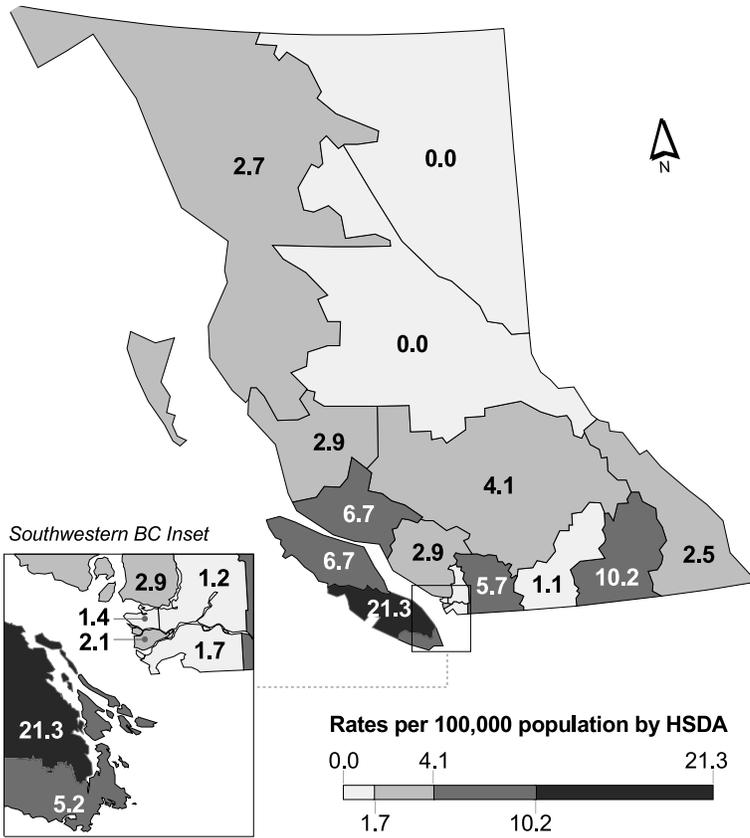
Previous outbreaks and immunization program expansions may have contributed to population immunity and recent decrease in provincial pertussis rates. In recent years, pertussis rates in preteens/teens have diminished, with no apparent remaining birth cohort effects. Continued monitoring is required to assess further changes in pertussis activity and to inform modifications to the pertussis immunization program.

## 7.1 Pertussis Rates by Year, 2000-2009



\*Please see Sources and Explanatory Remarks, Section 11 on Page 123 in regard to the national rate

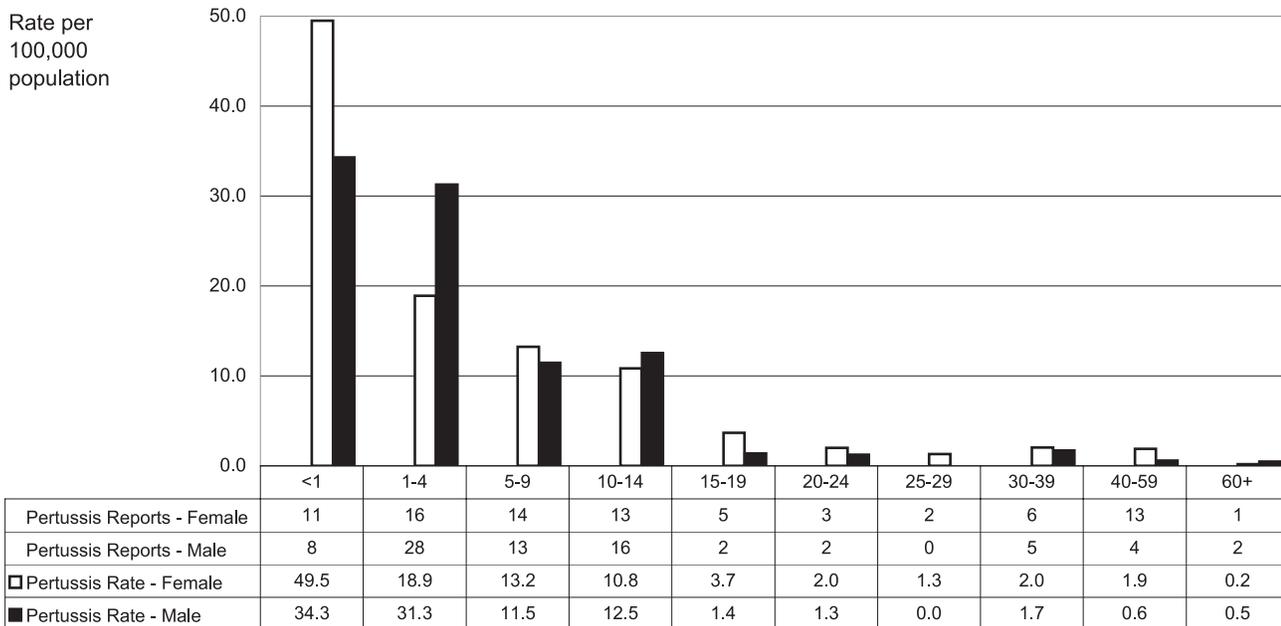
### 7.2 Pertussis Rates by HSDA, 2009



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	2	2.5
12	Kootenay Boundary	8	10.2
13	Okanagan	4	1.1
14	Thompson Cariboo Shuswap	9	4.1
21	Fraser East	16	5.7
22	Fraser North	7	1.2
23	Fraser South	12	1.7
31	Richmond	4	2.1
32	Vancouver	9	1.4
33	North Shore/Coast Garibaldi	8	2.9
41	South Vancouver Island	19	5.2
42	Central Vancouver Island	56	21.3
43	North Vancouver Island	8	6.7
51	Northwest	2	2.7
52	Northern Interior	0	0.0
53	Northeast	0	0.0

Note: Map classification by Jenks natural breaks method.

### 7.3 Pertussis Rates by Age Group and Sex, 2009



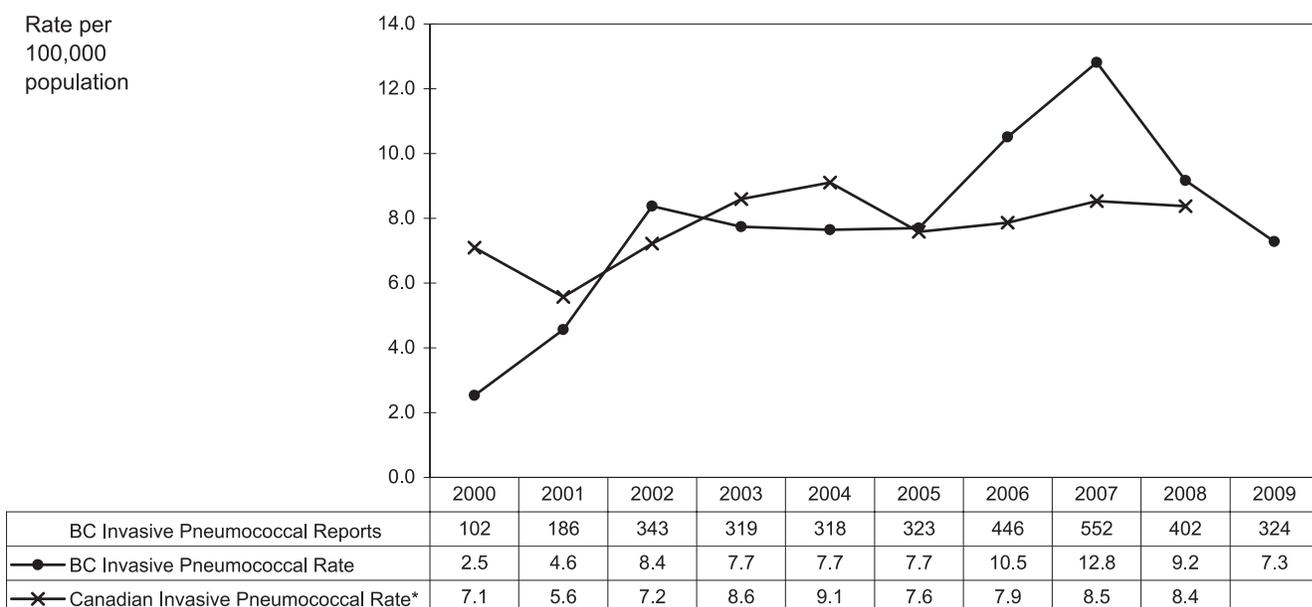
# Pneumococcal Disease (invasive)

The rate of invasive pneumococcal disease (IPD) decreased in 2009 to 7.3 reports per 100,000 residents (compared to 9.2 per 100,000 in 2008).

Rates of IPD among children < 5 years old in British Columbia have decreased by 79% since the introduction of pneumococcal conjugate vaccine from 54.4 per 100,000 (114 cases) in 2002 to 11.4 per 100,000 (25 cases) in 2009. Compared to 2008, rates in the 1 – 4 year old age group have

decreased from 14.1 per 100,000 in 2008 to 9.8 per 100,000 in 2009. In 2008, rates were 18.8 per 100,000 in the under one year age group. In 2009 the rate decreased slightly to 17.6 per 100,000; but the case total remained at 8 cases for both 2008 and 2009. Of the 8 cases reported in 2009, none were PCV-7 serotypes. Five cases were serotype 19A (included in PCV-13), one case was 6A, another case was 35B and the last case is unknown. Four cases had received one or two doses of PCV-7 vaccine prior to infection.

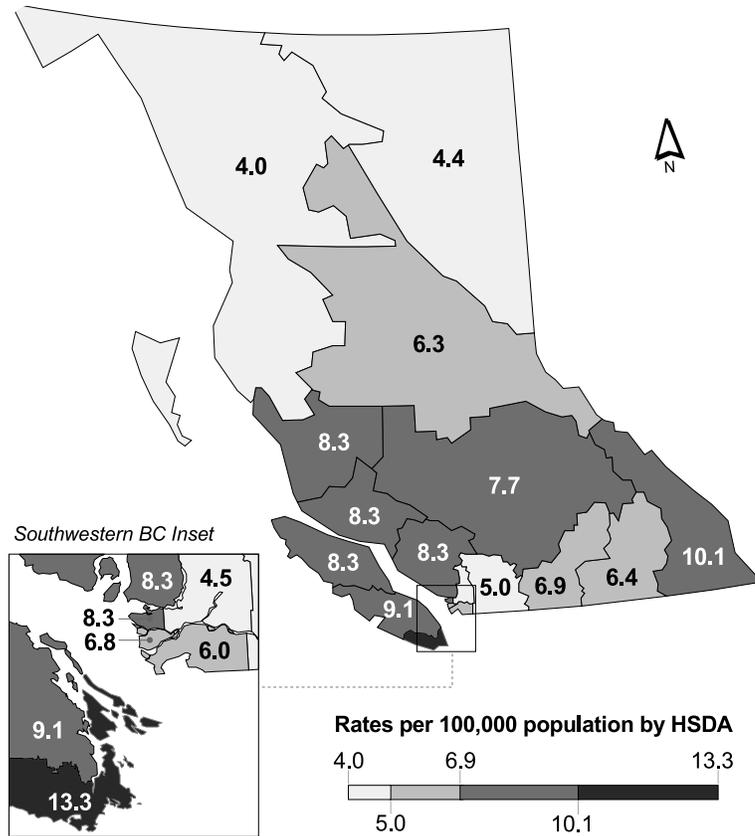
## 8.1 Pneumococcal Disease (invasive) Rates by Year, 2000-2009



Note: Reporting of pneumococcal meningitis under regulations under the Health Act was replaced with Invasive Pneumococcal Disease in Jan 2000

\*Please see Sources and Explanatory Remarks, Section 11 on Page 123 in regard to the national rate

## 8.2 Pneumococcal Disease (invasive) Rates by HSDA, 2009

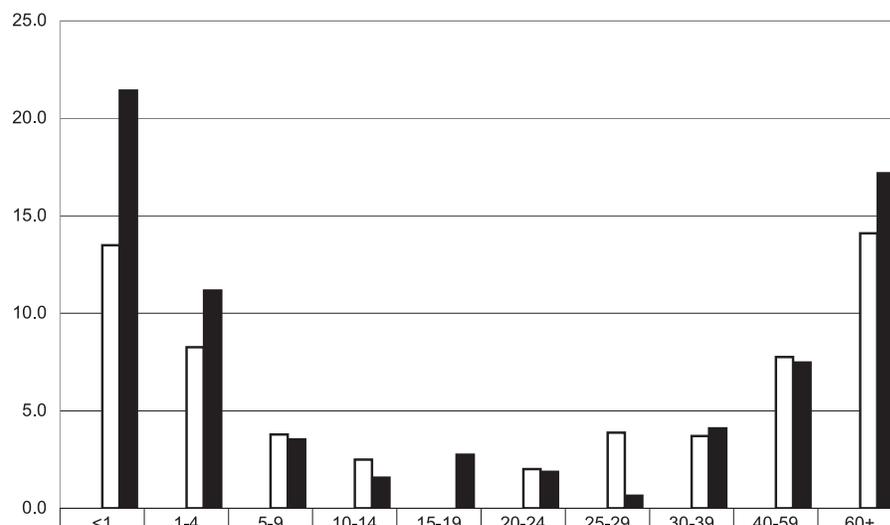


HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	8	10.1
12	Kootenay Boundary	5	6.4
13	Okanagan	24	6.9
14	Thompson Cariboo Shuswap	17	7.7
21	Fraser East	14	5.0
22	Fraser North	27	4.5
23	Fraser South	42	6.0
31	Richmond	13	6.8
32	Vancouver	53	8.3
33	North Shore/Coast Garibaldi	23	8.3
41	South Vancouver Island	49	13.3
42	Central Vancouver Island	24	9.1
43	North Vancouver Island	10	8.3
51	Northwest	3	4.0
52	Northern Interior	9	6.3
53	Northeast	3	4.4

Note: Map classification by Jenks natural breaks method.

## 8.3 Pneumococcal Disease (invasive) Rates by Age Group and Sex, 2009

Rate per  
100,000  
population



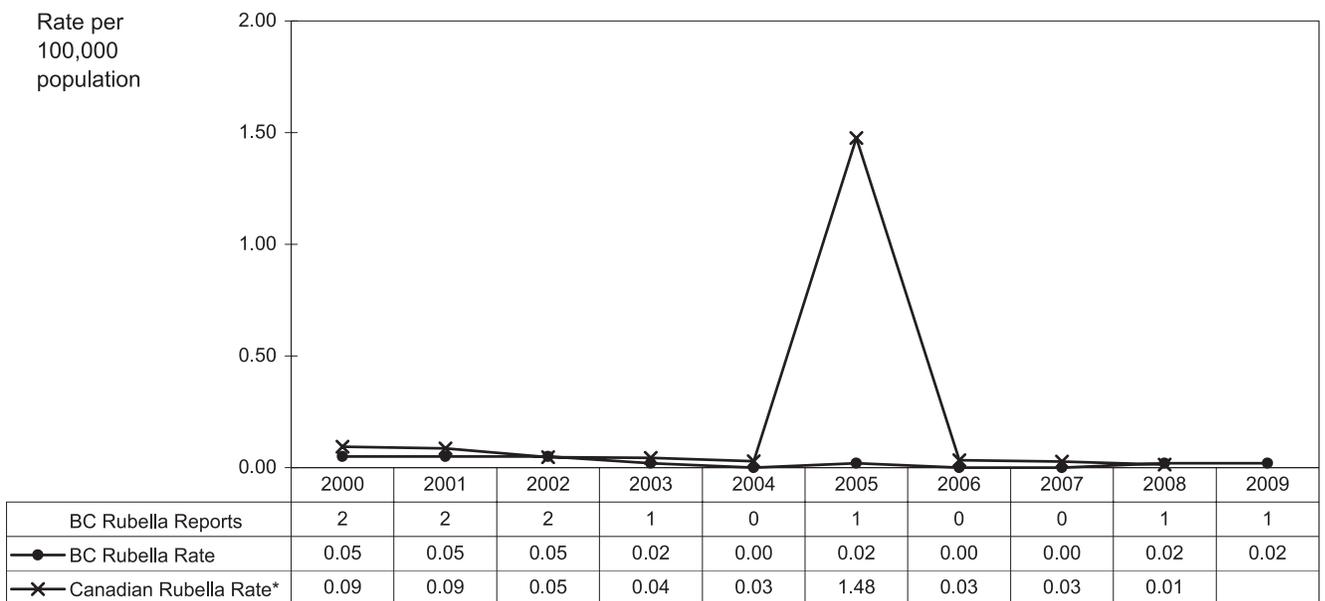
Invasive Pneumococcal Reports - Female	3	7	4	3	0	3	6	11	53	69
Invasive Pneumococcal Reports - Male	5	10	4	2	4	3	1	12	50	74
□ Invasive Pneumococcal Rate - Female	13.5	8.3	3.8	2.5	0.0	2.0	3.9	3.7	7.8	14.1
■ Invasive Pneumococcal Rate - Male	21.4	11.2	3.5	1.6	2.7	1.9	0.6	4.1	7.5	17.2

# Rubella and Congenital Rubella Syndrome

One case of rubella was reported in a BC resident in 2009. This case was an unimmunized 10 year old male with contact during his exposure period with a suspect rubella case who had in turn likely acquired his infection in Europe. Symptoms were typical of rubella including a low grade fever, sore throat, myalgia, lymphadenopathy and maculopapular rash;

the diagnosis was confirmed by IgM serology and RT-PCR. There have been no reported cases of congenital rubella syndrome in BC since a single case was reported in each of 2002 and 2004.

## 9.1 Rubella Rates by Year, 2000-2009

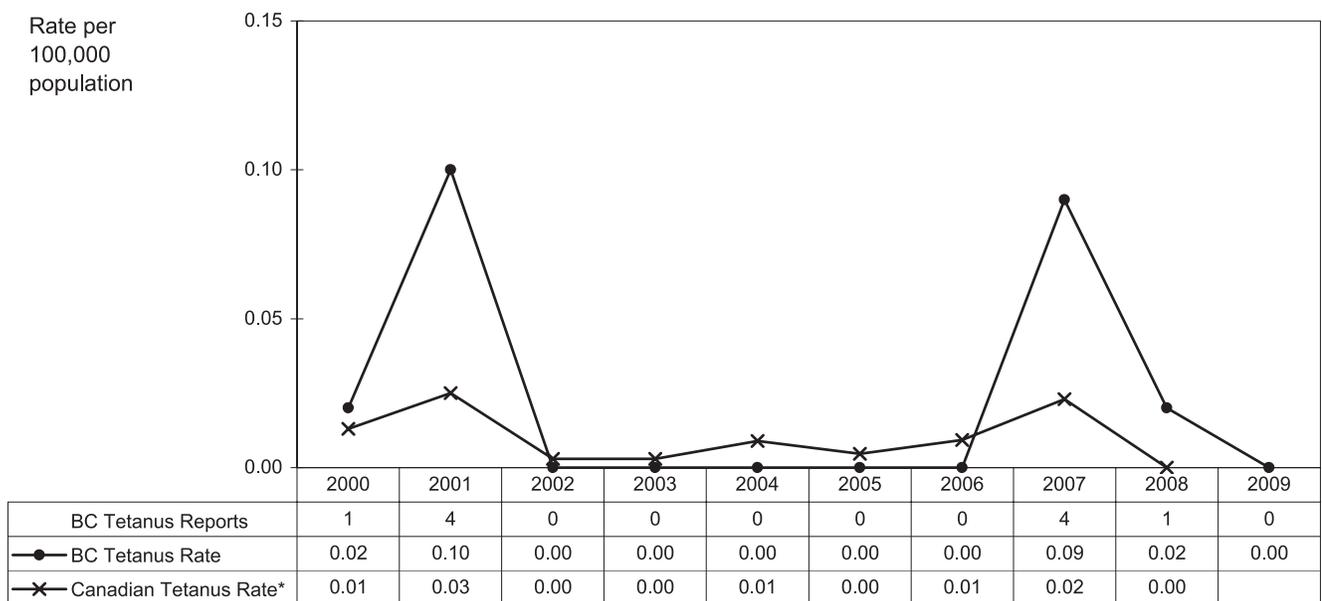


\*Please see Sources and Explanatory Remarks, Section 11 on Page 123 in regard to the national rate

# Tetanus

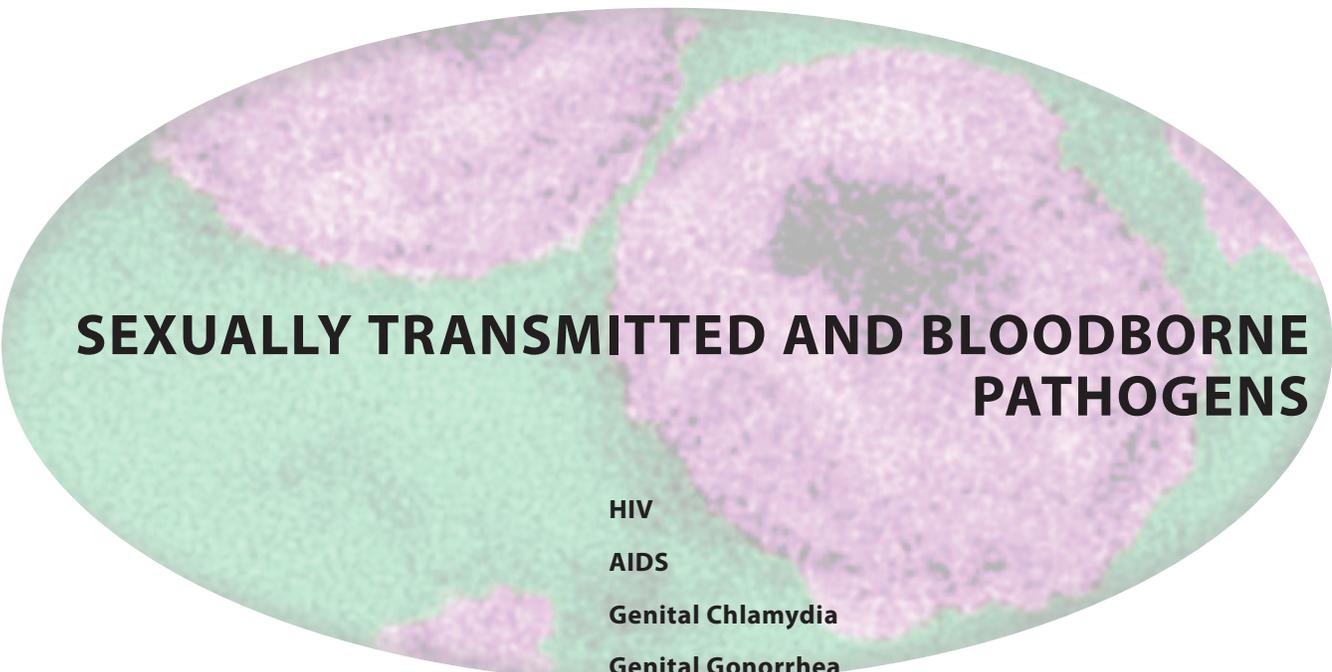
There were no cases of tetanus reported in BC in 2009.

## 10.1 Tetanus Rates by Year, 2000-2009



\*Please see Sources and Explanatory Remarks, Section 11 on Page 123 in regard to the national rate





# **SEXUALLY TRANSMITTED AND BLOODBORNE PATHOGENS**

**HIV**

**AIDS**

**Genital Chlamydia**

**Genital Gonorrhea**

**Hepatitis C**

**Infectious Syphilis**

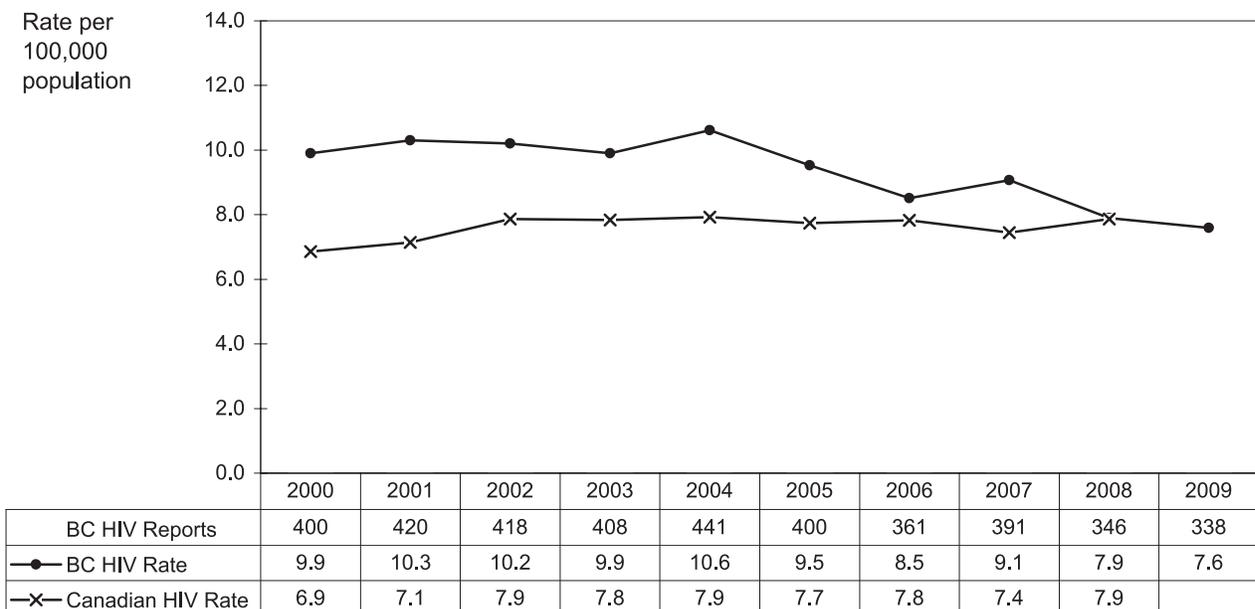
# HIV

The rate of new positive HIV tests decreased slightly in 2009 to 7.6 (338 cases) from 7.9 per 100,000 (346 cases) in 2008. The majority of new positive HIV tests were identified in males, with the highest rate among males aged 25-29 years (23.3 per 100,000). Trends are variable by HSDA; the highest rate of new positive HIV tests was in Vancouver HSDA (23.6 per 100,000; 151 cases), followed by Northwest HSDA (12.0 per 100,000; 9 cases) and Northern Interior HSDA (11.2 per

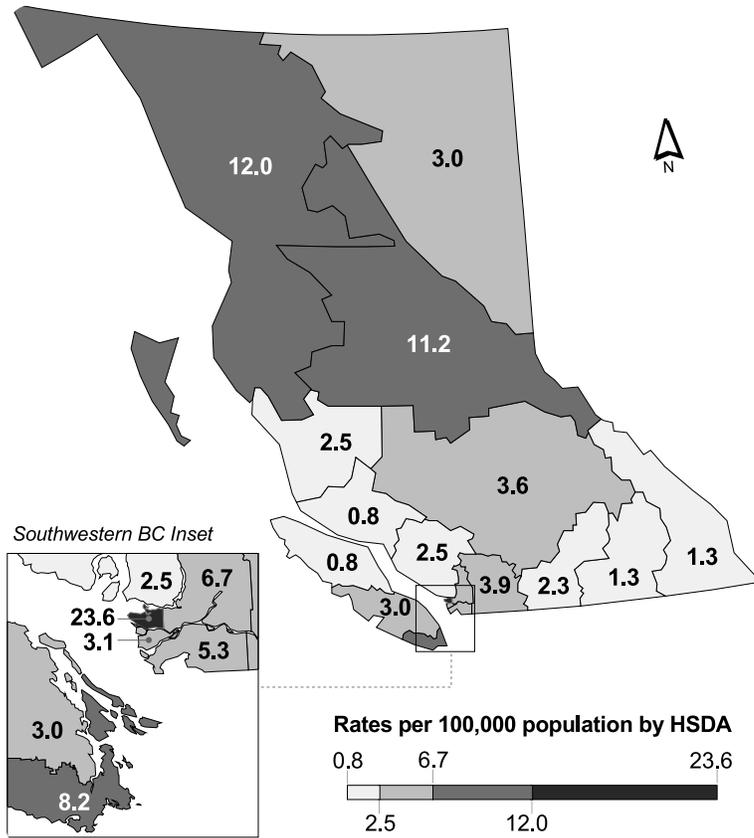
100,000; 16 cases). While new positive HIV test rates have declined overall in BC from a peak in 2004, this may in part be attributed to reportability of HIV and enhanced follow-up of all HIV test results starting in 2003.<sup>1</sup>

<sup>1</sup>, See *2008 Annual Surveillance Report: HIV and Sexually Transmitted Infections* (p.41) for further explanation.

## 11.1 HIV Rates by Year, 2000-2009



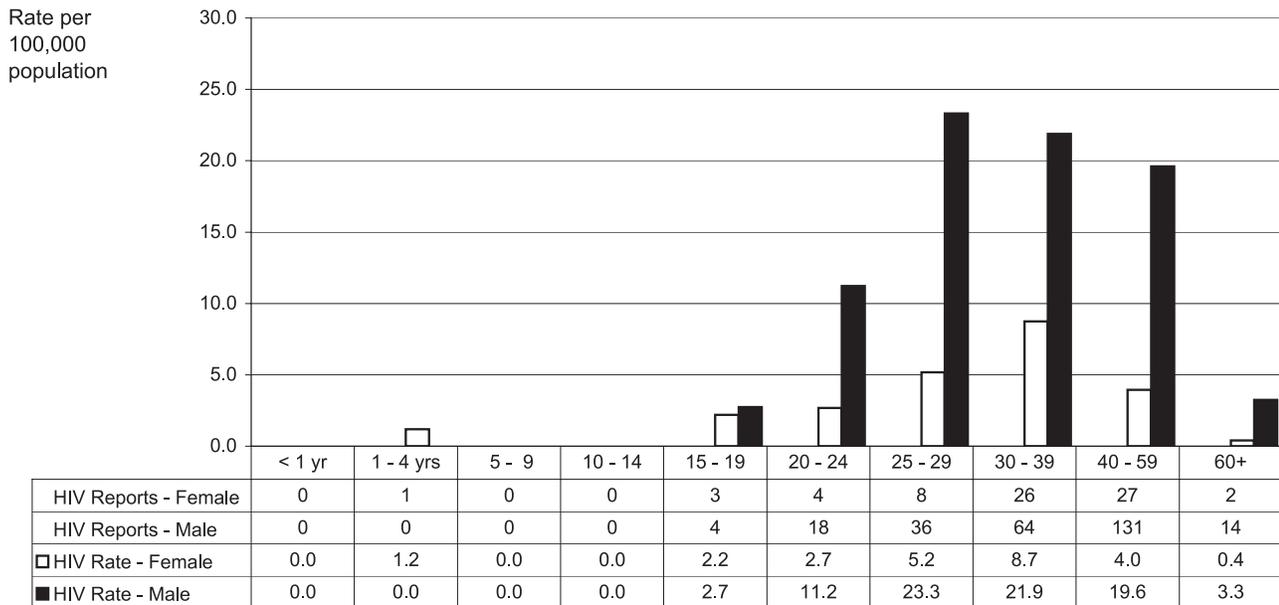
### 11.2 HIV Rates by HSDA, 2009



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	1	1.3
12	Kootenay Boundary	1	1.3
13	Okanagan	8	2.3
14	Thompson Cariboo Shuswap	8	3.6
21	Fraser East	11	3.9
22	Fraser North	40	6.7
23	Fraser South	37	5.3
31	Richmond	6	3.1
32	Vancouver	151	23.6
33	North Shore/Coast Garibaldi	7	2.5
41	South Vancouver Island	30	8.2
42	Central Vancouver Island	8	3.0
43	North Vancouver Island	1	0.8
51	Northwest	9	12.0
52	Northern Interior	16	11.2
53	Northeast	2	3.0

Note: Map classification by Jenks natural breaks method.

### 11.3 HIV Rates by Age Group and Sex, 2009

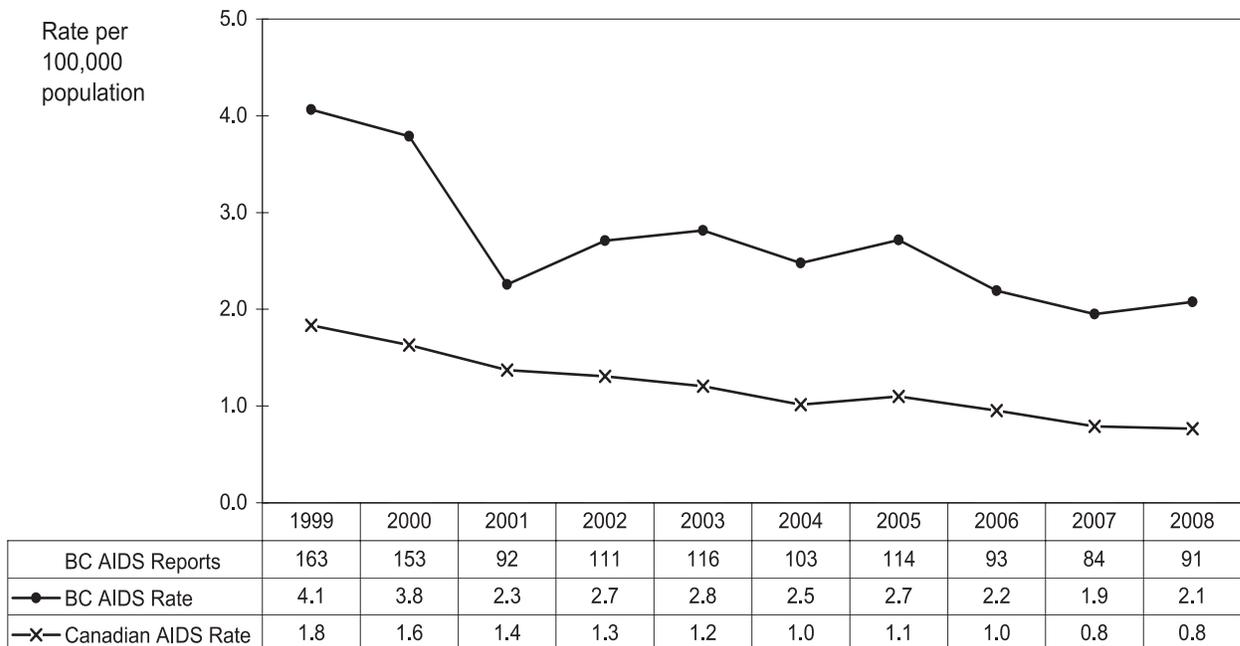


# AIDS

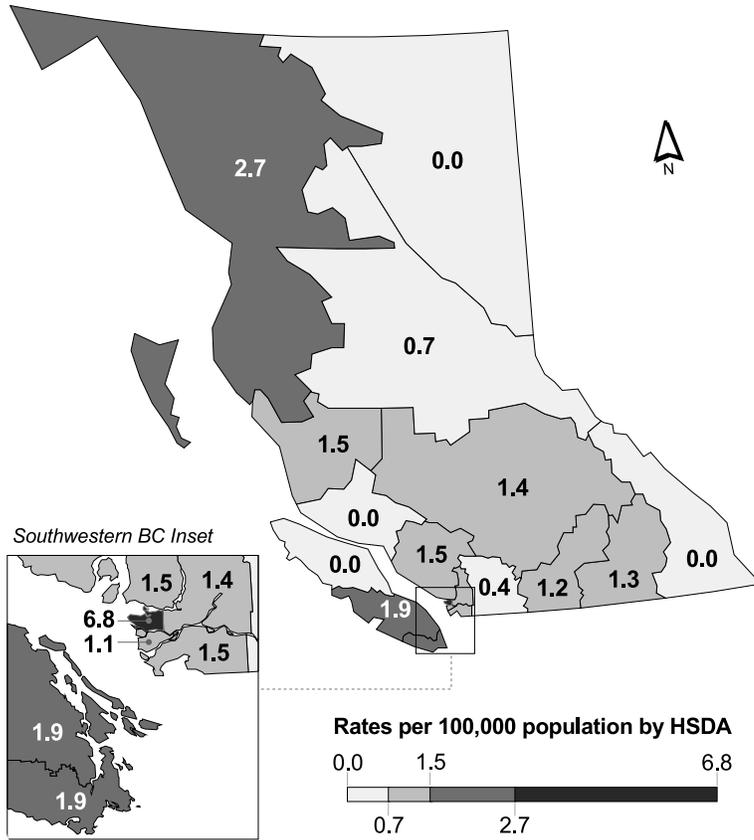
Due to the expected delays associated with AIDS reporting, this 2009 report includes data on AIDS through 2008 only. In 2008, the AIDS rate in BC increased slightly to 2.1 per 100,000 (91 cases) from 1.9 per 100,000 (84 cases) in 2007. The

majority of AIDS cases occurred in males, with the greatest concentration in males aged 30-59. The highest rate was recorded in Vancouver HSDA (6.8 per 100,000; 43 cases) followed by Northwest HSDA (2.7 per 100,000; 2 cases).

## 12.1 AIDS Rates by Year, 1999-2008



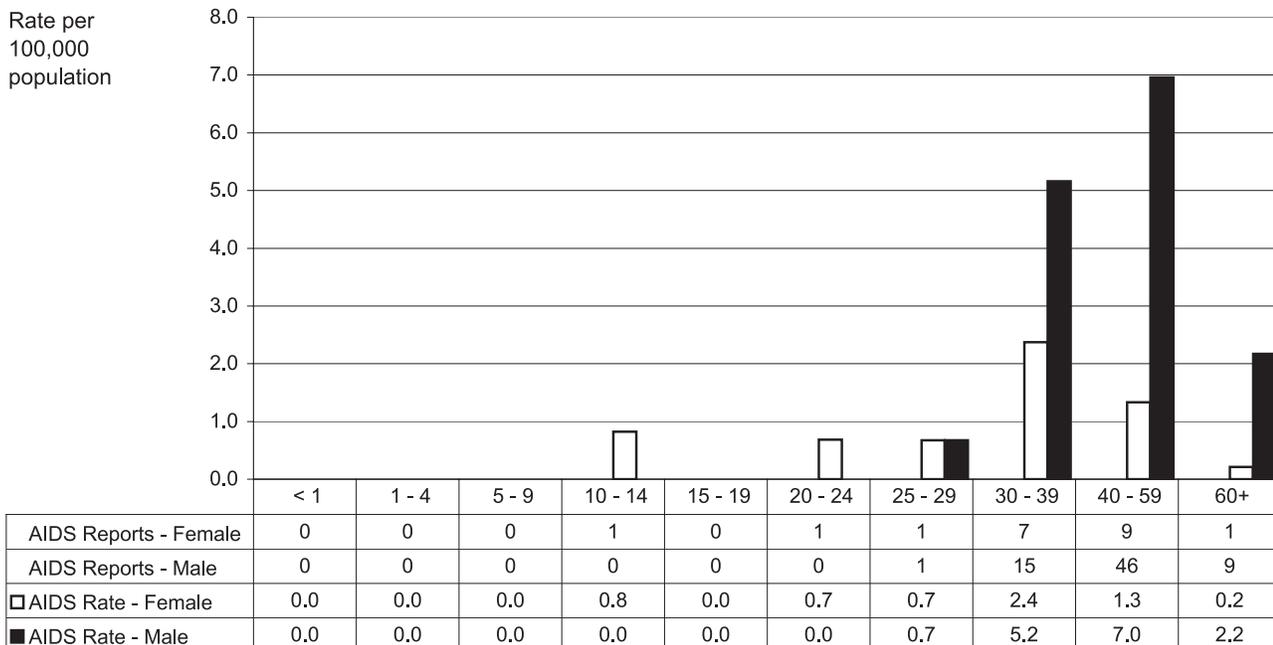
### 12.2 AIDS Rates by HSDA, 2008



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	0	0.0
12	Kootenay Boundary	1	1.3
13	Okanagan	4	1.2
14	Thompson Cariboo Shuswap	3	1.4
21	Fraser East	1	0.4
22	Fraser North	8	1.4
23	Fraser South	10	1.5
31	Richmond	2	1.1
32	Vancouver	43	6.8
33	North Shore/Coast Garibaldi	4	1.5
41	South Vancouver Island	7	1.9
42	Central Vancouver Island	5	1.9
43	North Vancouver Island	0	0.0
51	Northwest	2	2.7
52	Northern Interior	1	0.7
53	Northeast	0	0.0

Note: Map classification by Jenks natural breaks method.

### 12.3 AIDS Rates by Age Group and Sex, 2008

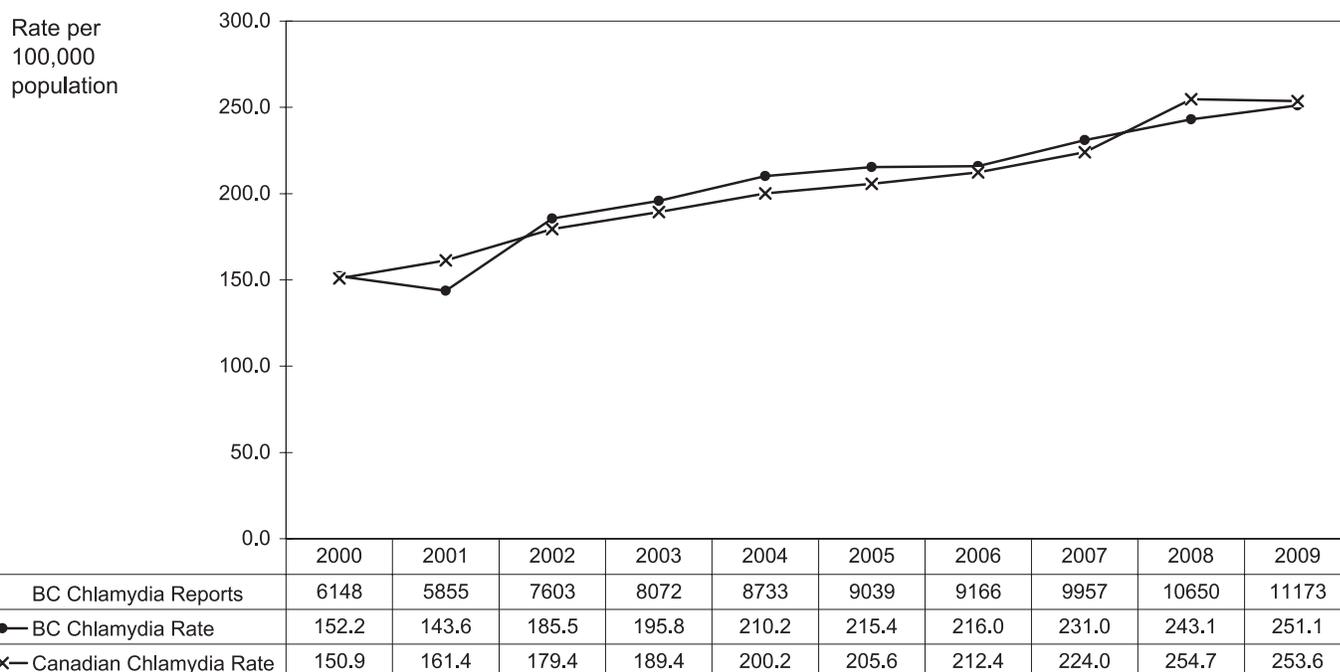


# Chlamydia (anogenital)

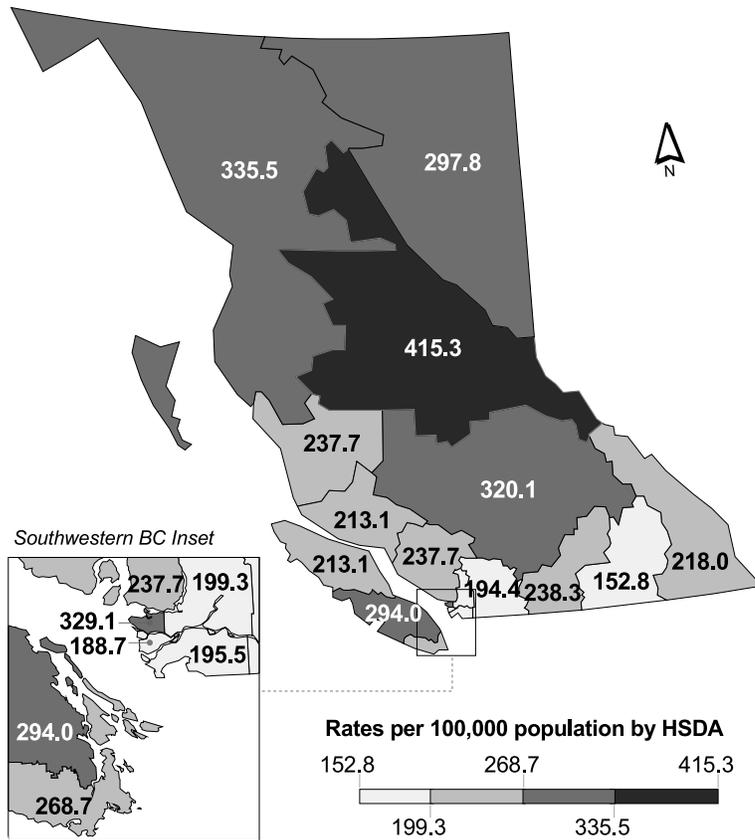
Chlamydia rates in BC continue to increase in parallel with Canadian rates, to 251.1 per 100,000 (11,173 cases) in 2009. The overall trend in chlamydia infection rates has been increasing since 1999. By age, women aged 15-19 and 20-24 continue to have the highest chlamydia rates at 1669.4

and 1701.5 per 100,000 respectively. The greatest rates of infection are observed in Northern Interior HSDA (415.3 per 100,000; 591 cases), Northwest HSDA (335.5 per 100,000; 251 cases), and Vancouver HSDA (329.1 per 100,000; 2109 cases).

## 13.1 Genital Chlamydia Rates by Year, 2000-2009



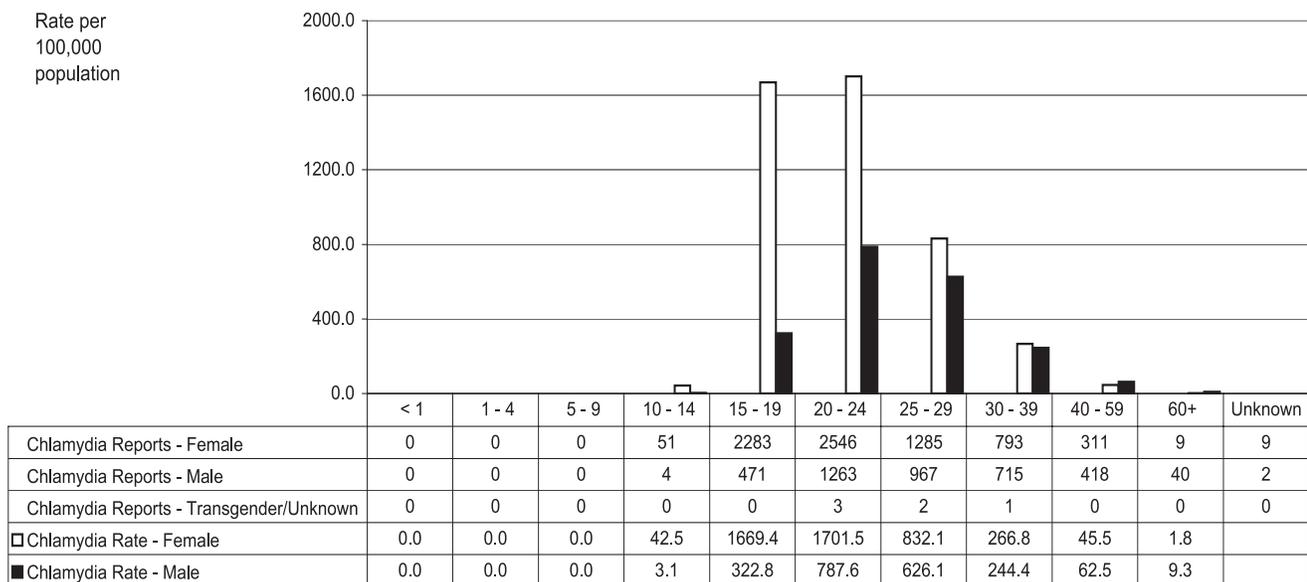
### 13.2 Genital Chlamydia Rates by HSDA, 2009



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	173	218.0
12	Kootenay Boundary	120	152.8
13	Okanagan	834	238.3
14	Thompson Cariboo Shuswap	710	320.1
21	Fraser East	547	194.4
22	Fraser North	1191	199.3
23	Fraser South	1359	195.5
31	Richmond	363	188.7
32	Vancouver	2109	329.1
33	North Shore/Coast Garibaldi	658	237.7
41	South Vancouver Island	989	268.7
42	Central Vancouver Island	772	294.0
43	North Vancouver Island	256	213.1
51	Northwest	251	335.5
52	Northern Interior	591	415.3
53	Northeast	201	297.8

Note: Map classification by Jenks natural breaks method.

### 13.3 Genital Chlamydia Rates by Age Group and Sex, 2009

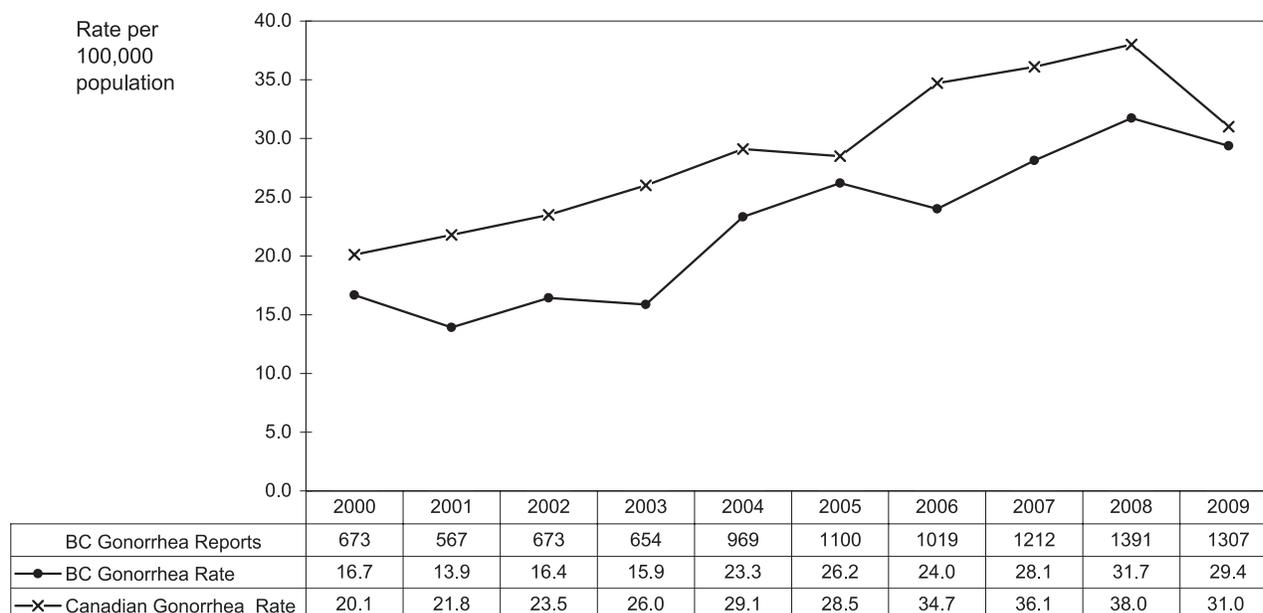


## Gonorrhea (anogenital)

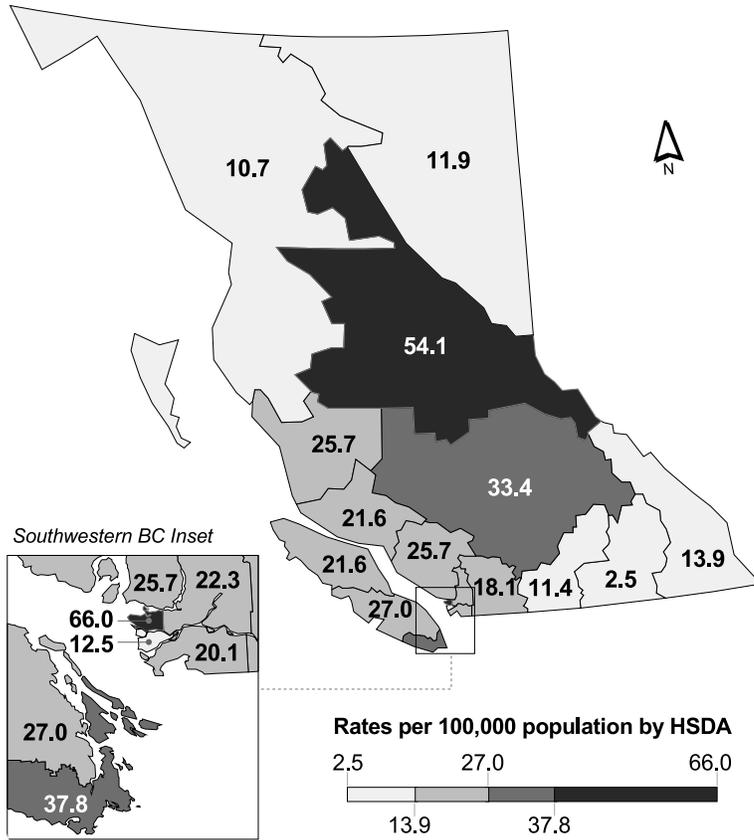
There has been an overall increasing trend in gonorrhea rates in BC, paralleling Canadian rates. The gonorrhea rate for BC decreased in 2009 (29.4 per 100,000) from 2008 (31.7 per 100,000), reflecting a decrease in case reports from 1,391 to 1,307. Similar to previous years, the highest rates

of gonorrhea were for females between the ages of 15-24 years, and for males between 20-29 years. The highest rate was observed in Vancouver HSDA (66.0 per 100,000; 423 cases) followed by Northern Interior HSDA (54.1 per 100,000; 77 cases).

### 14.1 Genital Gonorrhea Rates by Year, 2000-2009



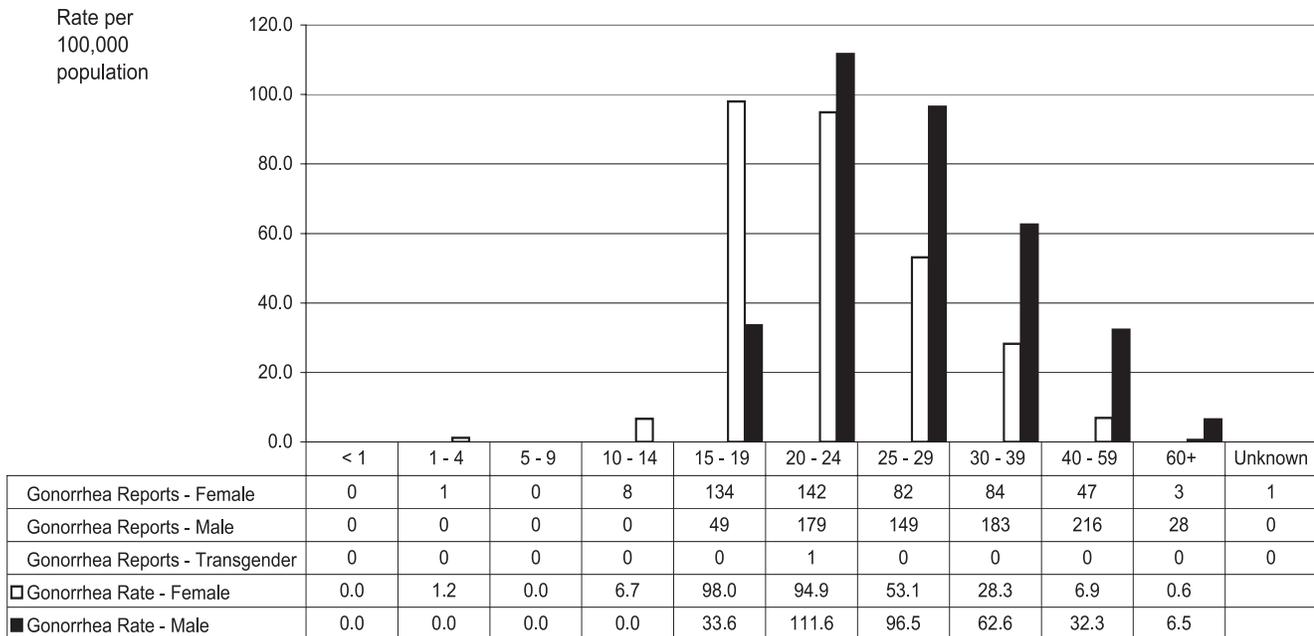
### 14.2 Genital Gonorrhea Rates by HSDA, 2009



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	11	13.9
12	Kootenay Boundary	2	2.5
13	Okanagan	40	11.4
14	Thompson Cariboo Shuswap	74	33.4
21	Fraser East	51	18.1
22	Fraser North	133	22.3
23	Fraser South	140	20.1
31	Richmond	24	12.5
32	Vancouver	423	66.0
33	North Shore/Coast Garibaldi	71	25.7
41	South Vancouver Island	139	37.8
42	Central Vancouver Island	71	27.0
43	North Vancouver Island	26	21.6
51	Northwest	8	10.7
52	Northern Interior	77	54.1
53	Northeast	8	11.9

Note: Map classification by Jenks natural breaks method.

### 14.3 Genital Gonorrhea Rates by Age Group and Sex, 2009



# Hepatitis C

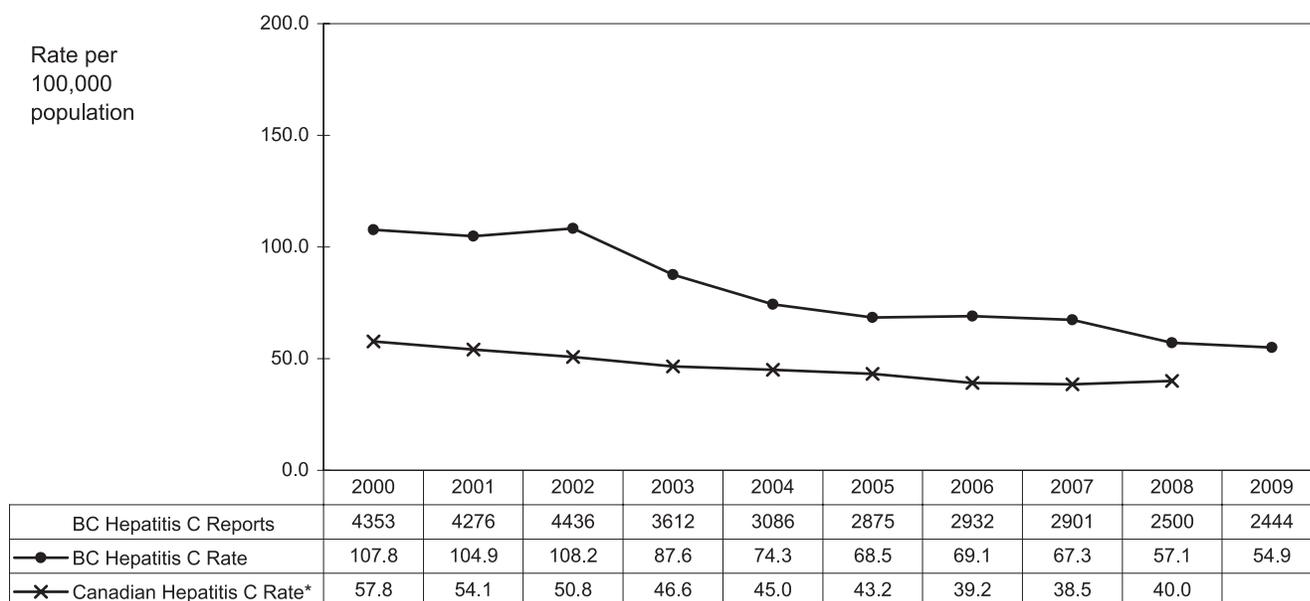
The annual number of cases of hepatitis C reported in BC continued a modest decline in 2009 compared to 2008. Newly identified cases of hepatitis C infection may be persons who have been recently or remotely infected. Persons may be tested for hepatitis C due to ongoing or past risk factors, for insurance purposes or due to symptoms of liver disease. In 2009, a total of 2,444 cases were reported for a rate of 54.9 per 100,000 population. Although declining, this rate remains considerably above the Canadian rate; however, diagnosis of hepatitis C depends on availability and accessibility of testing.

Eighteen cases were reported in children aged less than 10 years, and sixteen of these were children less than a year old; these infections were likely to have been transmitted vertically from mother to infant during pregnancy and delivery. Although females are tested more frequently than

males, overall more cases were reported in males (66.1%). However cases and rates in females in the 15–19 and 20–24 year age groups exceeded their male counterparts. This may indicate a true higher rate of hepatitis C in females in these age groups, but it may in part reflect testing patterns.

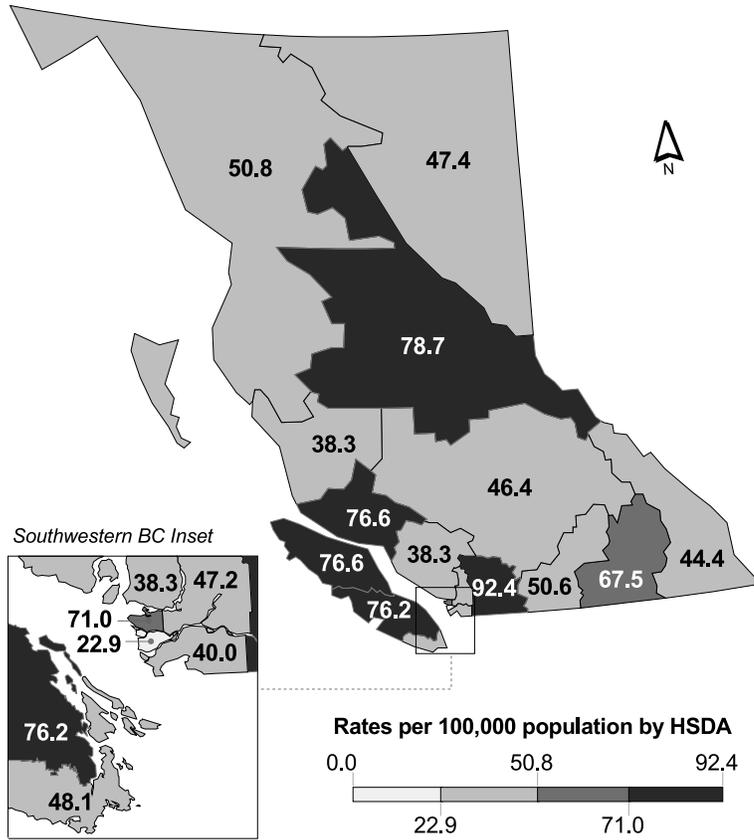
Vancouver Health Service Delivery Area (HSDA) had the largest number of cases (455) of hepatitis C reported in 2009. Richmond HSDA had the lowest rate at 22.9 cases per 100,000; all other HSDAs had rates above 40 cases per 100,000. Fraser East HSDA had the highest rate at 92.4 per 100,000; Fraser East is the location of several federal correctional institutions where inmates may be tested and hepatitis C identified for the first time. Four other HSDAs (Vancouver, Central Vancouver Island, North Vancouver Island, and Northern Interior) had rates above 70 per 100,000.

## 15.1 Hepatitis C Rates by Year, 2000-2009



\*Please see Sources and Explanatory Remarks, Section 11 on Page 123 in regard to the national rate

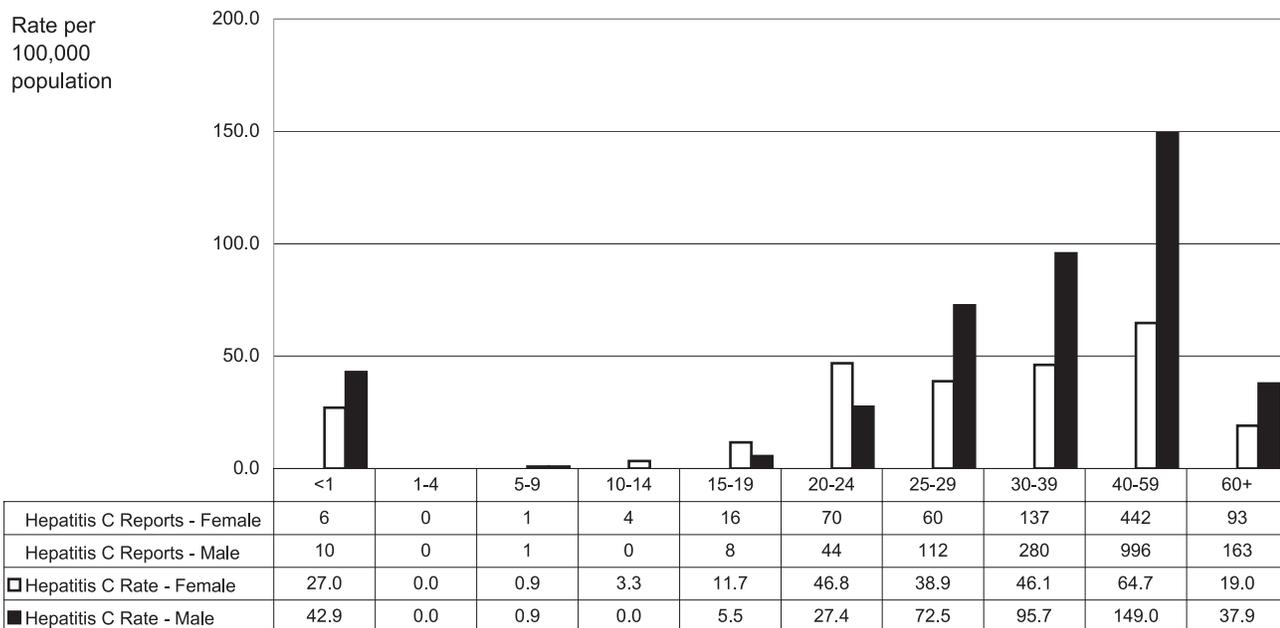
### 15.2 Hepatitis C Rates by HSDA, 2009



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	35	44.4
12	Kootenay Boundary	53	67.5
13	Okanagan	177	50.6
14	Thompson Cariboo Shuswap	103	46.4
21	Fraser East	260	92.4
22	Fraser North	282	47.2
23	Fraser South	278	40.0
31	Richmond	44	22.9
32	Vancouver	455	71.0
33	North Shore/Coast Garibaldi	106	38.3
41	South Vancouver Island	177	48.1
42	Central Vancouver Island	200	76.2
43	North Vancouver Island	92	76.6
51	Northwest	38	50.8
52	Northern Interior	112	78.7
53	Northeast	32	47.4

Note: Map classification by Jenks natural breaks method.

### 15.3 Hepatitis Rates by Age Group and Sex, 2009

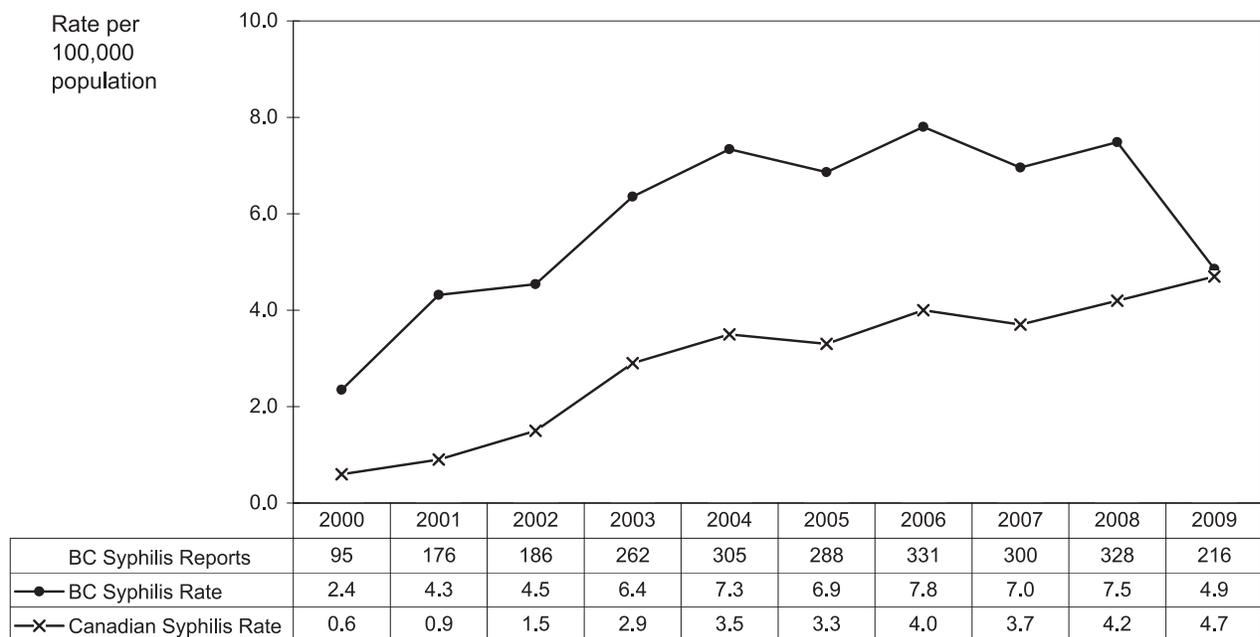


# Infectious Syphilis

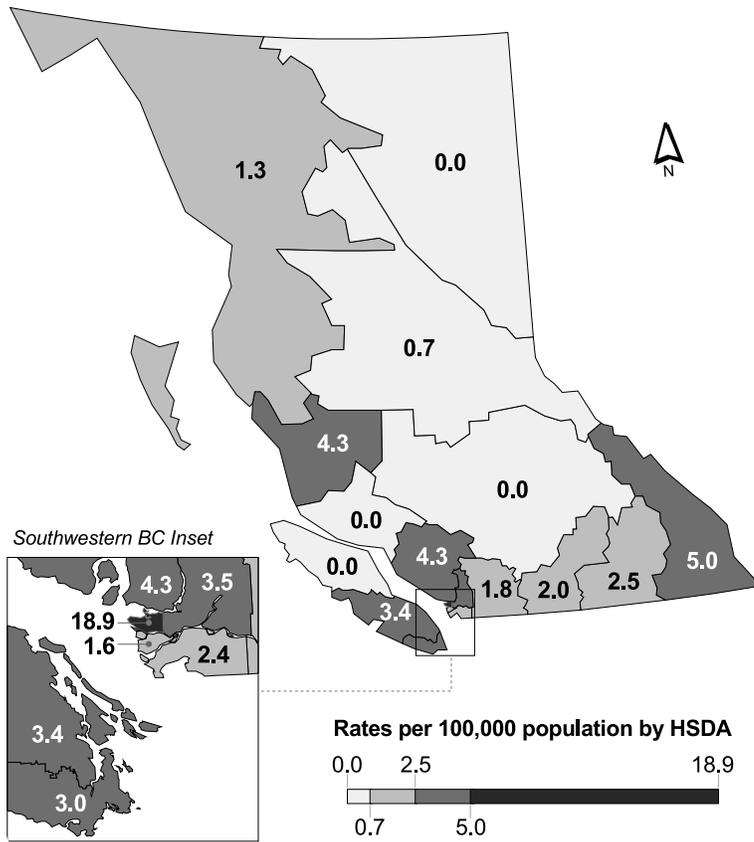
The rate of infectious syphilis decreased from 7.5 in 2008 to 4.9 per 100,000 population in 2009 reflecting a decrease from 328 to 216 cases. The majority of cases occurred

among men, with the greatest rates among men aged 25-39. The highest rate was observed in Vancouver HSDA (18.9 per 100,000; 121 cases).

## 16.1 Infectious Syphilis Rates by Year, 2000-2009



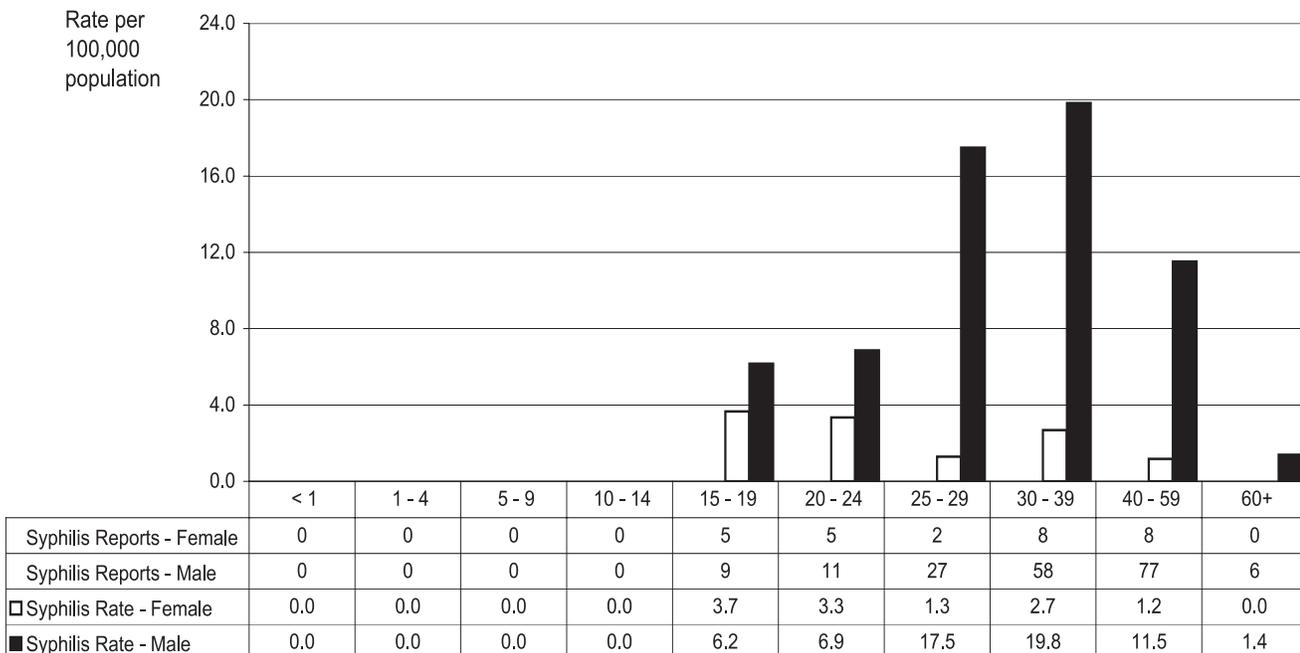
### 16.2 Infectious Syphilis Rates by HSDA, 2009



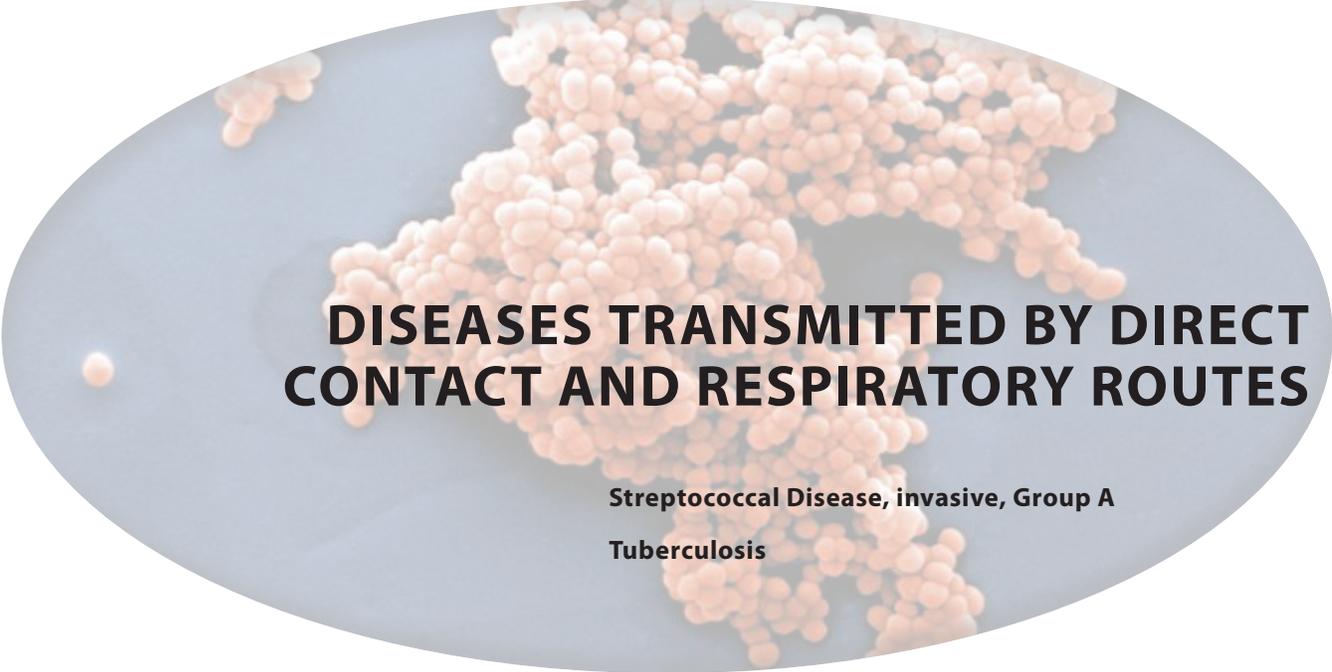
HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	4	5.0
12	Kootenay Boundary	2	2.5
13	Okanagan	7	2.0
14	Thompson Cariboo Shuswap	0	0.0
21	Fraser East	5	1.8
22	Fraser North	21	3.5
23	Fraser South	17	2.4
31	Richmond	3	1.6
32	Vancouver	121	18.9
33	North Shore/Coast Garibaldi	12	4.3
41	South Vancouver Island	11	3.0
42	Central Vancouver Island	9	3.4
43	North Vancouver Island	0	0.0
51	Northwest	1	1.3
52	Northern Interior	1	0.7
53	Northeast	0	0.0

Note: Map classification by Jenks natural breaks method.

### 16.3 Infectious Syphilis Rates by Age Group and Sex, 2009







**DISEASES TRANSMITTED BY DIRECT  
CONTACT AND RESPIRATORY ROUTES**

**Streptococcal Disease, invasive, Group A**

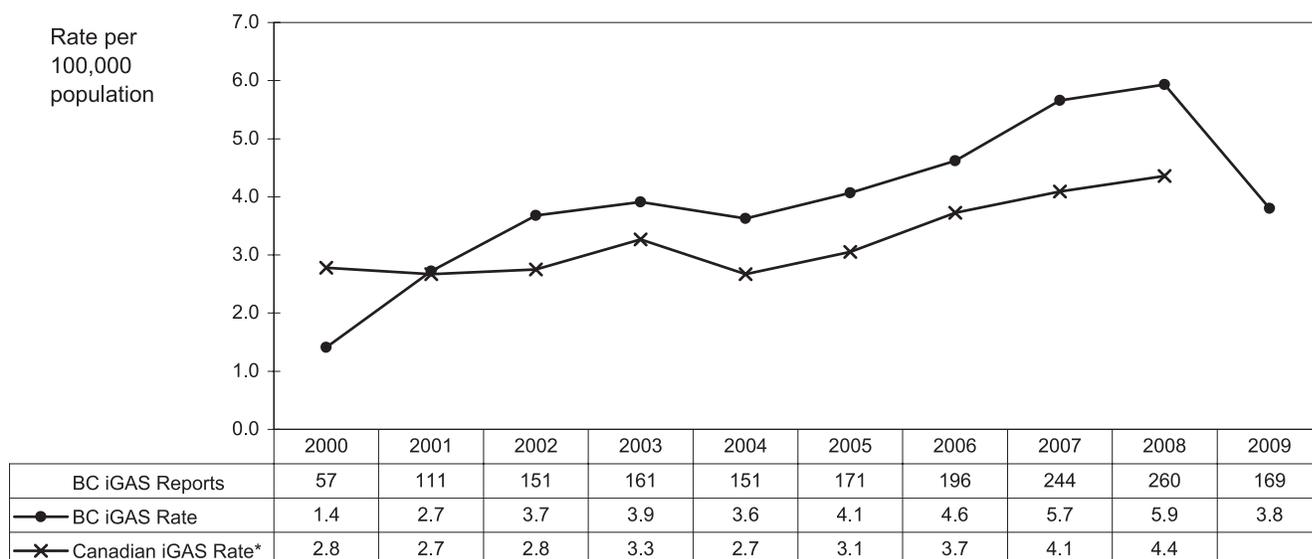
**Tuberculosis**

# Streptococcal Disease (invasive) Group A

The rate of reported cases of invasive group A Streptococcal (iGAS) disease decreased from 5.9 to 3.8 per 100,000 from 2008 to 2009. This is the lowest rate reported since 2004, when the rate was 3.6 per 100,000. The age group of 30 – 39 years had the highest rate per 100,000 (males, 6.5 and females, 5.1), followed by the age group of 40-59 years (males 5.7/100,000, females 3.1 /100,000). Thompson Cariboo Shuswap and South Vancouver Island Health Service Delivery Areas (HSDA) reported the highest rate of 5.4 per 100,000 followed by Central Vancouver Island HSDA

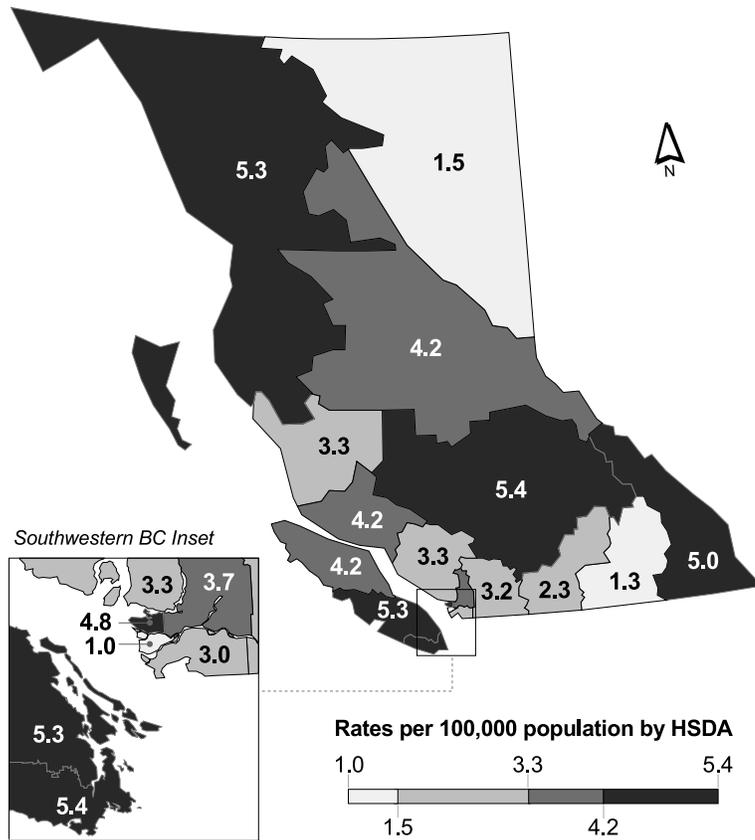
with a rate of 5.3 per 100,000. Twelve or 7.1% of cases were associated with toxic shock-like syndrome, as compared to 3.8% in 2008. Twelve cases (7.1%) were associated with necrotizing fasciitis (NF). NF-associated cases had accounted for 31% of iGAS in 2000 with subsequent declines to lows of 7% in 2007 and 9.2% in 2008. This likely reflects better reporting of less severe cases over time. In 2009, the case fatality among the 169 confirmed cases was 6.5% compared to 8.8% in 2008.

## 17.1 Streptococcal Disease (invasive) Group A Rates by Year, 2000-2009



\*Please see Sources and Explanatory Remarks, Section 11 on Page 123 in regard to the national rate

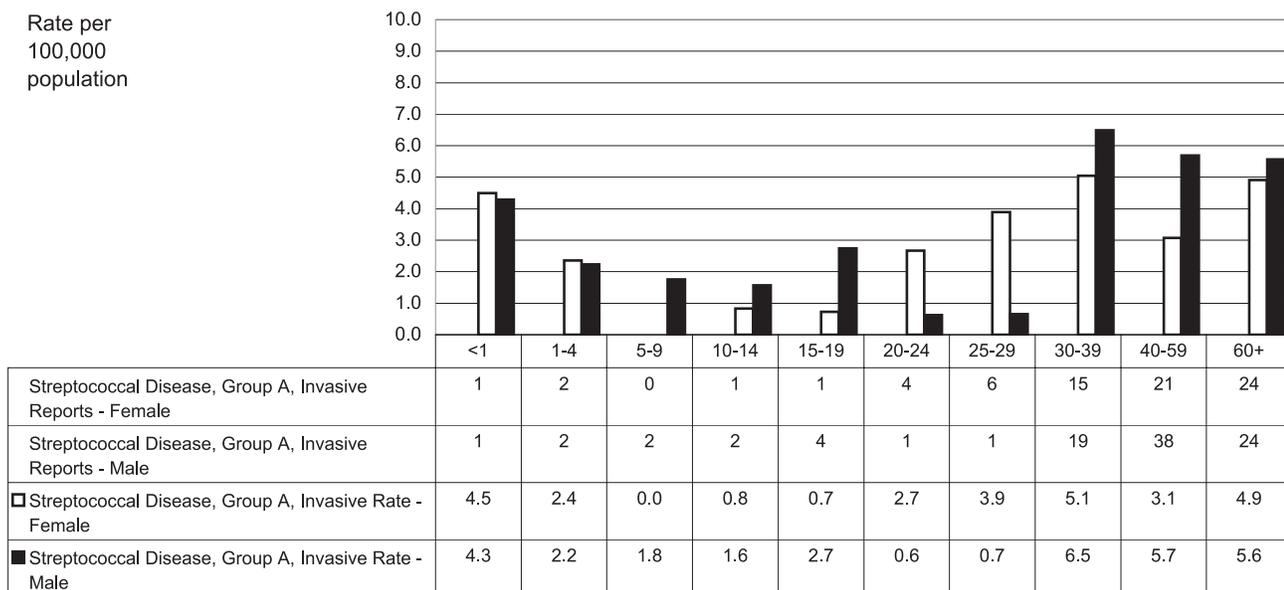
### 17.2 Streptococcal Disease (invasive) Group A Rates by HSDA, 2009



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	4	5.0
12	Kootenay Boundary	1	1.3
13	Okanagan	8	2.3
14	Thompson Cariboo Shuswap	12	5.4
21	Fraser East	9	3.2
22	Fraser North	22	3.7
23	Fraser South	21	3.0
31	Richmond	2	1.0
32	Vancouver	31	4.8
33	North Shore/Coast Garibaldi	9	3.3
41	South Vancouver Island	20	5.4
42	Central Vancouver Island	14	5.3
43	North Vancouver Island	5	4.2
51	Northwest	4	5.3
52	Northern Interior	6	4.2
53	Northeast	1	1.5

Note: Map classification by Jenks natural breaks method.

### 17.3 Streptococcal Disease (invasive) Group A Rates by Age Group and Sex, 2009



# Tuberculosis

In 2009 there were 293 cases of reported tuberculosis in British Columbia, for a rate of 6.6 per 100,000, a 7% decrease in the number and 8% decrease in the rate of reported cases compared to 2008.

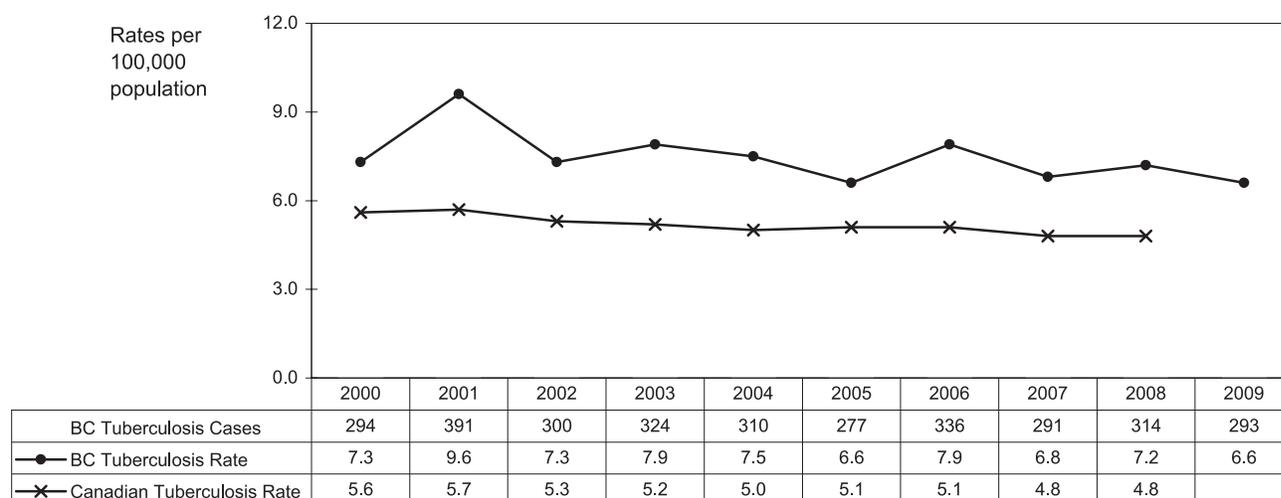
Rates for Health Regions vary across the province. The Northwest, Richmond, Vancouver, Fraser South, Fraser North, Northern Interior, and North Vancouver Island health service delivery areas have rates exceeding the provincial rate (6.6/ 100,000 population). The highest incidence was reported from Northwest and Richmond (13.4 and 12.5/ 100,000 population respectively) while the lowest was in East Kootenay and Northeast (both no cases/ 100,000 population).

Compared to 2008, the rate of tuberculosis decreased

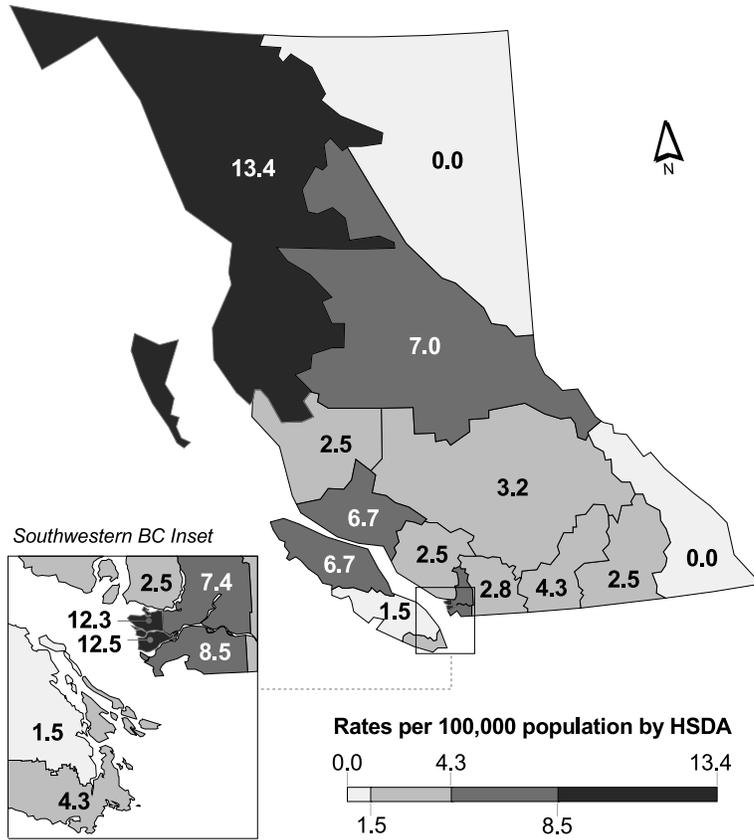
in Northeast, East Kootenay, Central Vancouver Island, Richmond, North Shore/Coast Garibaldi, Vancouver, Fraser East, Thompson Cariboo Shuswap, Fraser North, remained the same in South Vancouver Island, and in all other health regions the rate of tuberculosis increased with North Vancouver Island showing the largest increase in rate of tuberculosis (from 1.6 to 6.7/ 100,000 population).

The age specific rates are shown in figure 18.3. Overall, the tuberculosis rate was higher in men than in women (7.6 vs 5.6 per 100,000). For the age group < 40 years the rate of tuberculosis was higher in men than women (7.6 vs 4.8 per 100,000). Also in those >= 40 years old, the rate of tuberculosis in men was higher than in women (13.5 vs 8.4 per 100,000).

## 18.1 Tuberculosis Rates by Year, 2000-2009



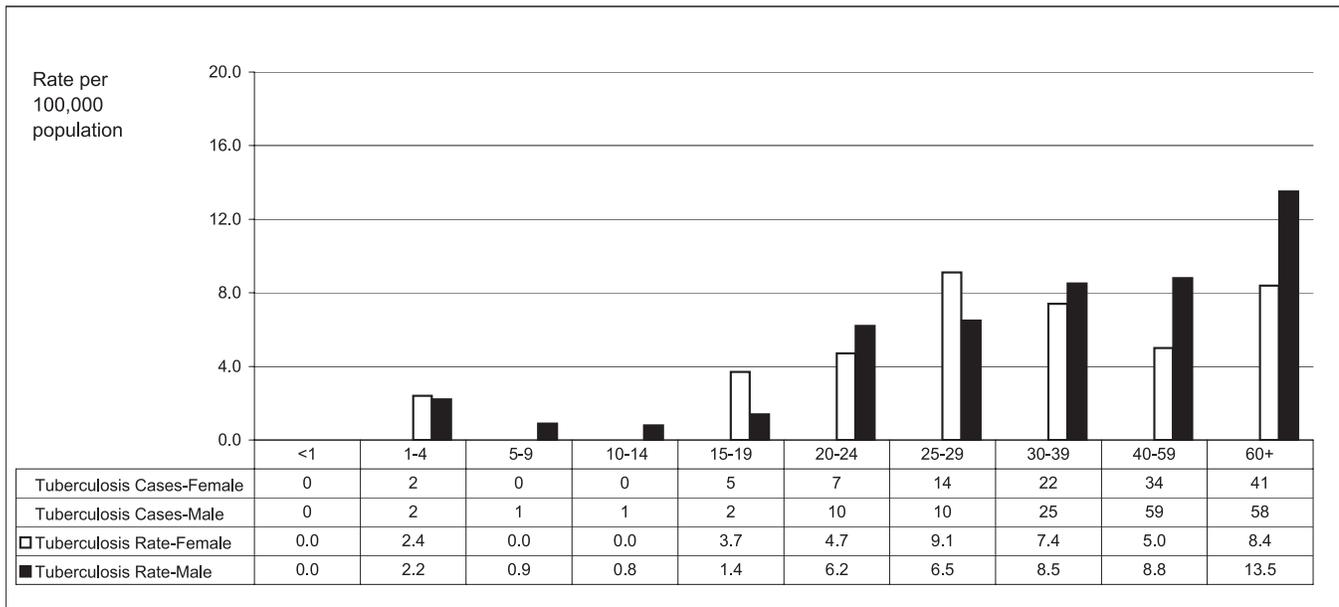
### 18.2 Tuberculosis Rates by HSDA, 2009



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	0	0.0
12	Kootenay Boundary	2	2.5
13	Okanagan	15	4.3
14	Thompson Cariboo Shuswap	7	3.2
21	Fraser East	8	2.8
22	Fraser North	44	7.4
23	Fraser South	59	8.5
31	Richmond	24	12.5
32	Vancouver	79	12.3
33	North Shore/Coast Garibaldi	7	2.5
41	South Vancouver Island	16	4.3
42	Central Vancouver Island	4	1.5
43	North Vancouver Island	8	6.7
51	Northwest	10	13.4
52	Northern Interior	10	7.0
53	Northeast	0	0.0

Note: Map classification by Jenks natural breaks method.

### 18.3 Tuberculosis Rates by Age Group and Sex, 2009



# Antimicrobial Resistant Organism Surveillance in BC

## Executive Summary

### Objective

The purpose of this report is to provide a comprehensive overview of antimicrobial resistance (AMR) trends in the province of British Columbia (BC) and to correlate these trends with antibiotic utilization.

### Methods

Data were obtained from various provincial and national sources for a broad-spectrum view of clinically relevant Gram-positive and Gram-negative bacteria. Rates of antimicrobial utilization were available from the Pharmanet database. Data were analyzed in Microsoft Excel and SPSS using a two-sided Spearman Rank test.

### Results

- The percent of *Staphylococcus aureus* isolates that were methicillin-resistant (MRSA) represent a fourth of all tested isolates (23.9%). MRSA resistance towards erythromycin, clindamycin and trimethoprim-sulfamethoxazole (TMP-SMX) has seen a steady decline; this can likely be attributed to the increased prevalence of community-associated (CA) MRSA strains.
- *Streptococcus pneumoniae* isolates have demonstrated increasing resistance against erythromycin (currently above 20%). These trends are correlated with utilization of new macrolides such as azithromycin and clarithromycin. Clindamycin resistance rates are also increasing among *Streptococcus pneumoniae* from 1999 (2.0%) to 2009 (18.9%).
- In the past 3 years, resistance rates towards erythromycin and clindamycin have steadily decreased

in *Streptococcus pyogenes* isolates. All isolates remain highly susceptible towards penicillin and vancomycin (>99%).

- *Enterococcus spp.* isolates remain highly susceptible to vancomycin, ampicillin and nitrofurantoin (>98%). A fourth (25.2%) of all isolates remained resistant towards ciprofloxacin although significant decreases in resistance have occurred since 2002. The percent of *Enterococcus spp.* isolates demonstrating resistance against vancomycin has remained under 1% in BC for years 1999 to 2009.
- Urinary tract pathogens such as *Escherichia coli*, *Klebsiella pneumoniae* and *Proteus mirabilis* have demonstrated increasing resistance against ciprofloxacin while only *E. coli* and *P. mirabilis* isolates has seen increasing resistance to TMP-SMX. Nitrofurantoin remains highly effective for *Escherichia coli* with over 96% of isolates showing susceptibility. This is reassuring as 85% to 90% of all uncomplicated UTI infections are caused by this organism.
- *Pseudomonas aeruginosa* isolates non-susceptibility rates remains steady towards ciprofloxacin (~11%) and continue to be highly susceptible (>95%) to tobramycin, piperacillin, ceftazidime and gentamicin.
- Of all tested antimicrobials, *Salmonella Enteritidis* resistance towards nalidixic acid remains highest at 10.8% but has decreased from a high of 24.2%. After peaking in 2006 at 15.5%, a dramatic decrease to 1.4% in resistance towards tetracycline has been observed in 2008.

For the full report, please refer to the following report: *Antimicrobial Resistance Trends in the Province of British Columbia - 2009. Epidemiology Services, British Columbia Centre for Disease Control. URL: <http://www.bccdc.ca/NR/rdonlyres/88FFDDA4-1D33-4123-98A9-613F916A0F56/0/AntimicrobialResistanceTrendsInBC2009.pdf>*

# Antimicrobial Resistant Organism Surveillance in BC

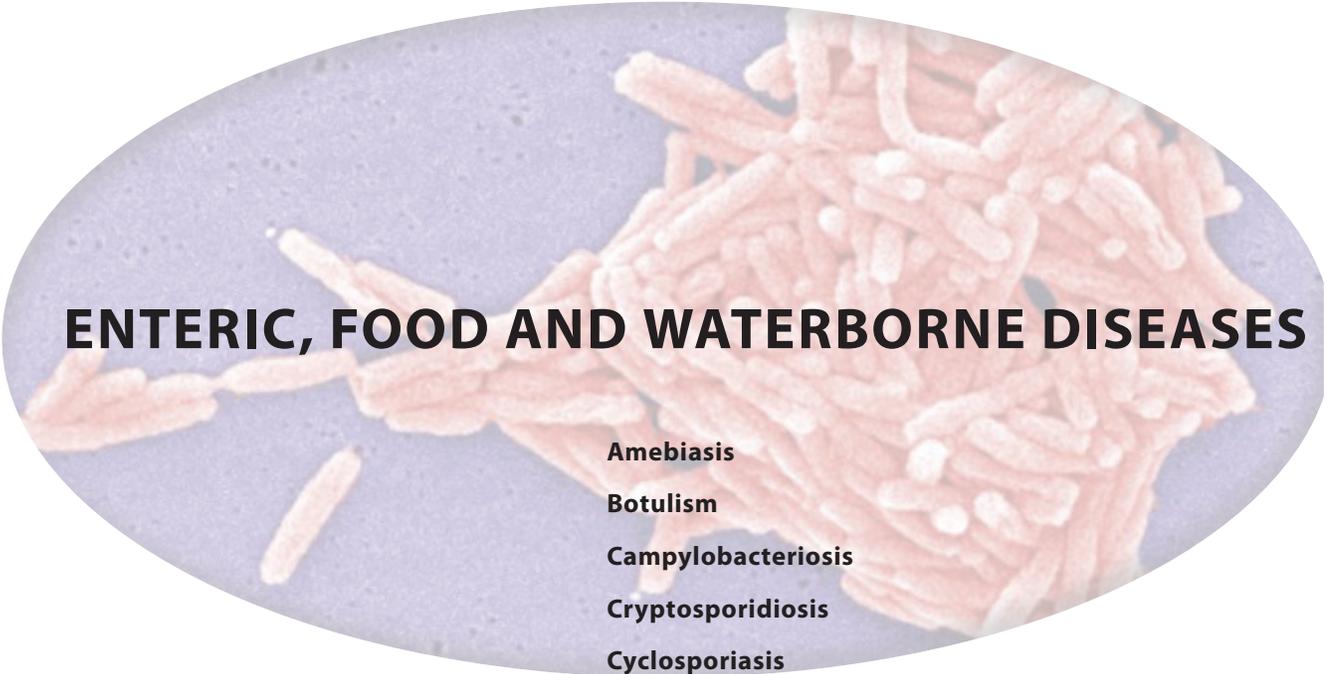
## Executive Summary (continued)

- Antimicrobial utilization rates have remained stable from 2007 to 2008. Overall antimicrobial utilization decreased over the available time period, 1996 to 2008, but an upward rebound was observed from 2002 to 2005, which appears to have ended.
- $\beta$ -lactam antimicrobials constitute the majority of antimicrobial prescriptions with a rate of 5.3 defined daily does (DDD)/1000 inhabitant days in 2008.  $\beta$ -lactams are followed by macrolides, tetracyclines, quinolones and trimethoprim/sulfa combinations.
- Macrolide and quinolone utilization rates considerably increased between years 1996 to 2008, while  $\beta$ -lactam, tetracycline, and trimethoprim/sulfa utilization significantly decreased during the same time period.

## Conclusion

Continued surveillance of AMR trends is necessary to ascertain the prevalence of AMR pathogens in BC and to guide control efforts. The compilation of this report would not be possible without the provision of data from both provincial and national collaborators. Continued collaboration with these and additional data providers will be necessary to monitor changes in AMR trends in subsequent years.





# ENTERIC, FOOD AND WATERBORNE DISEASES

**Amebiasis**

**Botulism**

**Campylobacteriosis**

**Cryptosporidiosis**

**Cyclosporiasis**

**Shigatoxigenic *E. coli* (STEC) Infection**

**Giardiasis**

**Hepatitis A**

**Legionellosis**

**Listeriosis**

**Salmonellosis**

- **Typhoid Fever**
- **Paratyphoid Fever**

**Shigellosis**

***Vibrio parahaemolyticus***

**Yersiniosis**

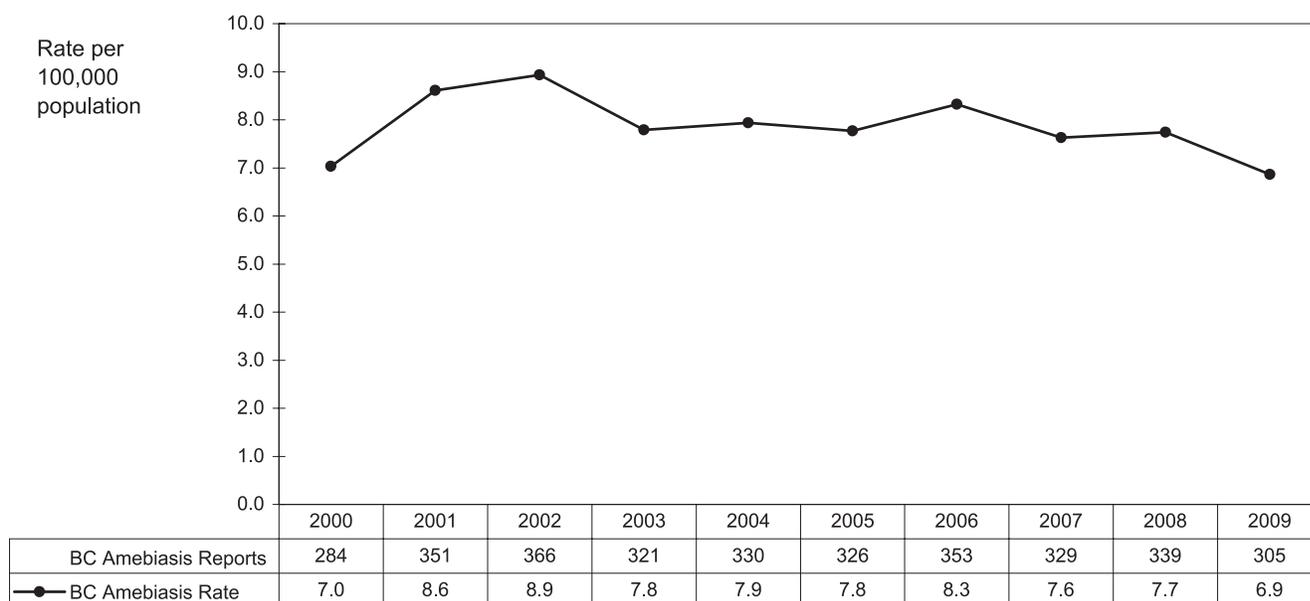
**Outbreaks of Gastroenteritis**

# Amebiasis

Throughout the last ten years, the rate of amebiasis in British Columbia has remained fairly constant. The overall provincial rate for 2009 was 6.9 cases per 100,000. In 2009, no outbreaks were identified and no seasonal pattern was evident. The reporting rate was highest in males in the 40-59 year old group at 15.3 cases per 100,000, followed by 30-39 year old males at 15.0 cases per 100,000. Men who have sex with men may be at increased risk of infection as

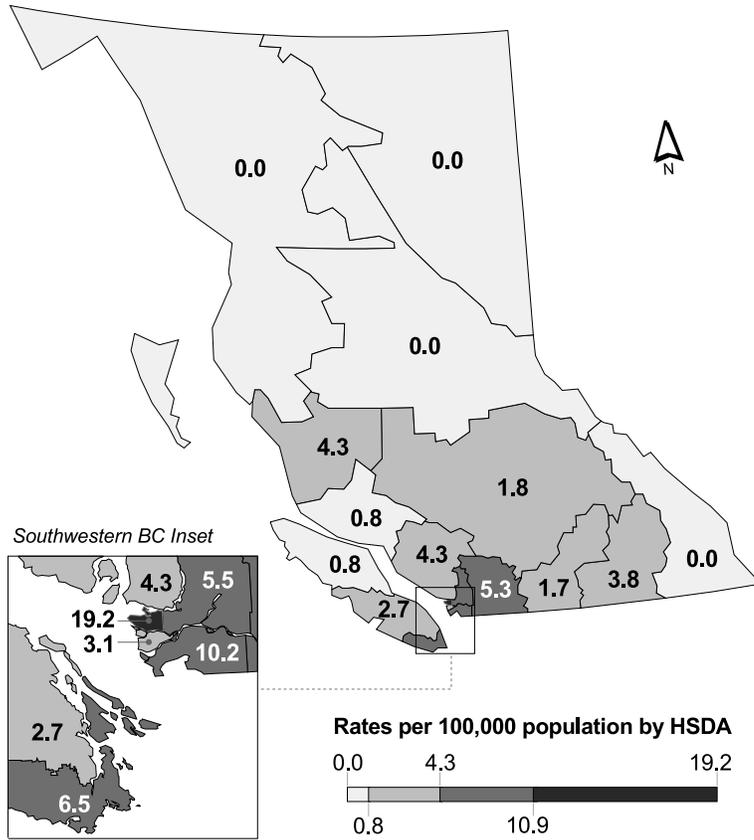
amebiasis is known to be transmitted sexually through oral-anal contact. The highest rate for females was in the 30-39 year old age group, at 8.8 cases per 100,000, followed by the 25-29 year old age group at 5.8. Vancouver, as in previous years, reported the highest rate of illness (19.2 cases per 100,000). The screening program for refugees in Vancouver may partially account for this.

## 19.1 Amebiasis Rates by Year, 2000-2009



Note: Amebiasis was removed from national surveillance in January 2000

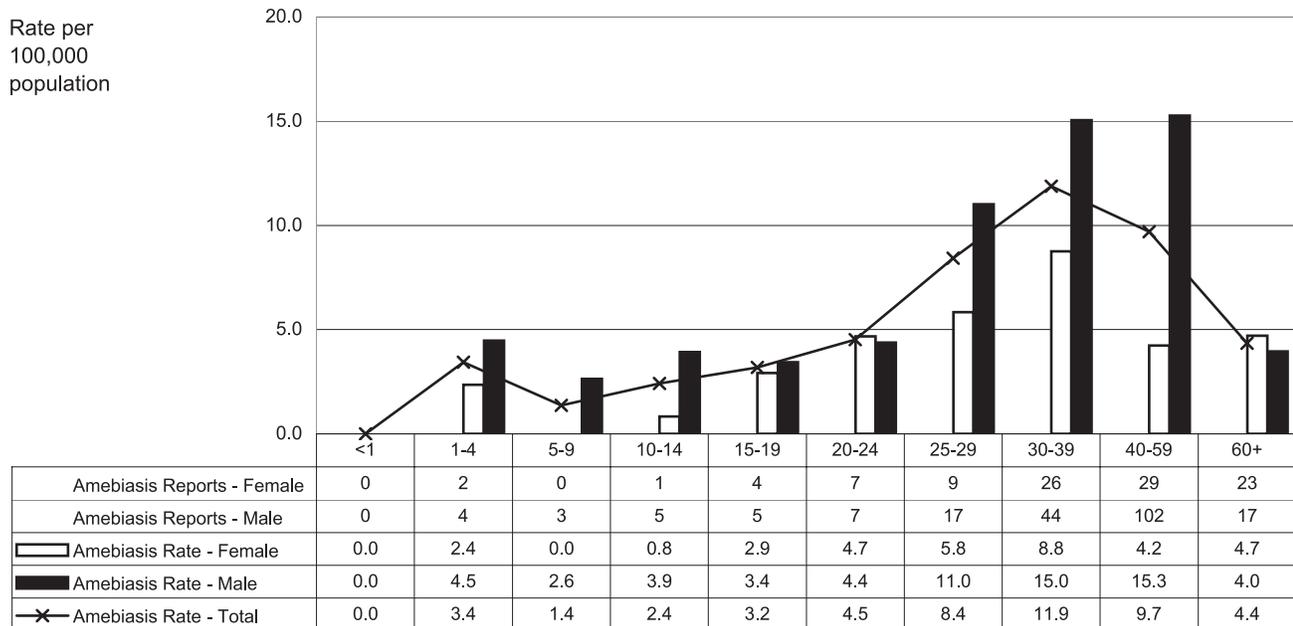
### 19.2 Amebiasis Rates by HSDA, 2009



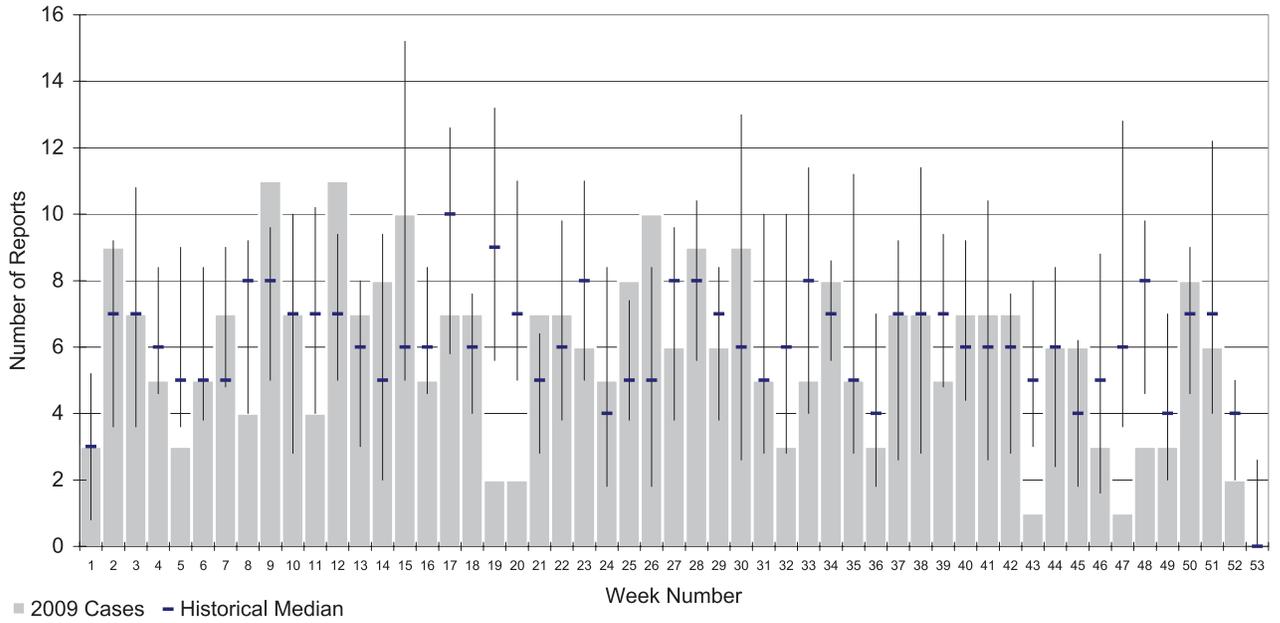
HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	0	0.0
12	Kootenay Boundary	3	3.8
13	Okanagan	6	1.7
14	Thompson Cariboo Shuswap	4	1.8
21	Fraser East	15	5.3
22	Fraser North	33	5.5
23	Fraser South	71	10.2
31	Richmond	6	3.1
32	Vancouver	123	19.2
33	North Shore/Coast Garibaldi	12	4.3
41	South Vancouver Island	24	6.5
42	Central Vancouver Island	7	2.7
43	North Vancouver Island	1	0.8
51	Northwest	0	0.0
52	Northern Interior	0	0.0
53	Northeast	0	0.0

Note: Map classification by Jenks natural breaks method.

### 19.3 Amebiasis Rates by Age Group and Sex, 2009



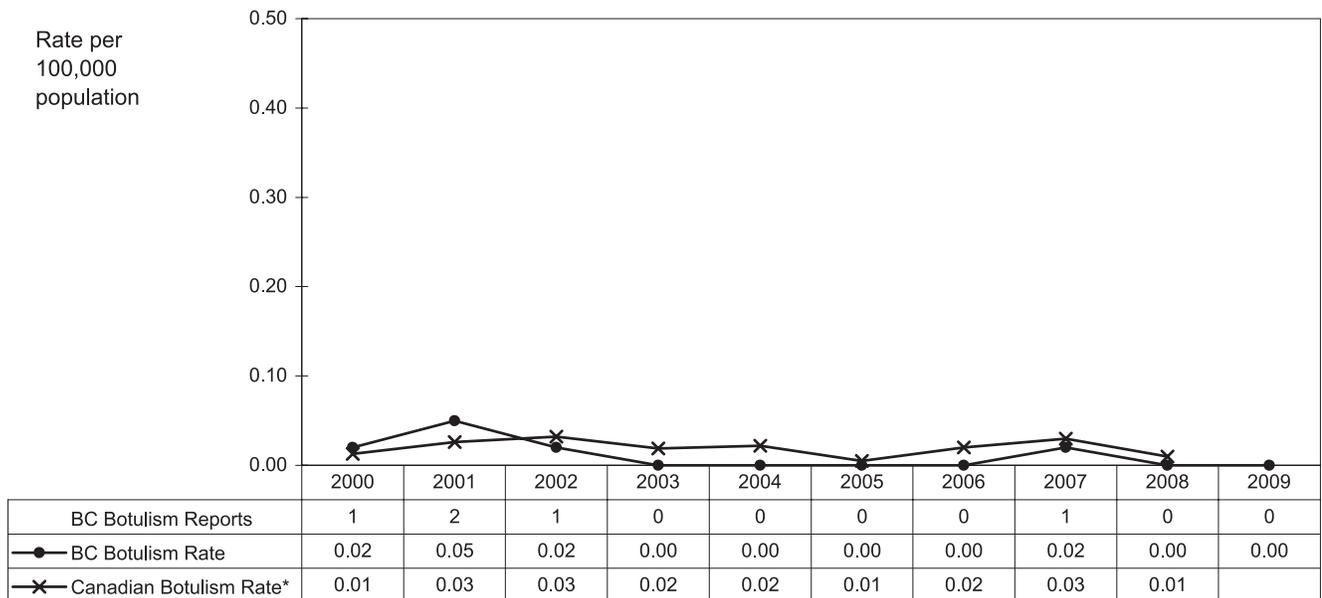
**19.4 2009 Amebiasis Reports Compared to Historical Median and the 10th and 90th Percentiles Around the Median (2000 to 2008)**



# Botulism

There were no cases of botulism reported in 2009. In the last 10 years, a total of 5 cases was reported.

## 20.1 Botulism Rates by Year, 2000-2009



\*Please see Sources and Explanatory Remarks, Section 11 on Page 123 in regard to the national rate

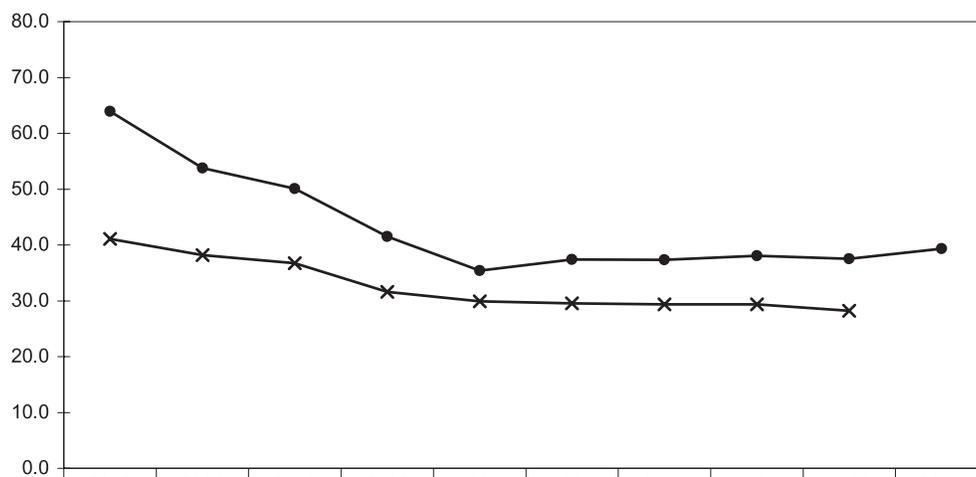
# Campylobacteriosis

Campylobacteriosis was the most commonly reported enteric disease with a total of 1750 cases reported in 2009. The incidence has been stable since 2004. Similar to past years, rates were highest among children aged 1 to 4 years, particularly among males and adults between the ages of 20 to 29 years. The highest rate was reported from North Shore/

Coast Garibaldi (60.0/100,000). This was followed by other HSDAs in the lower mainland, Vancouver Island HSDAs and Kootenay Boundary. The geographic distribution is similar to that seen in previous years. As in most years, the number of cases reported was higher during the summer months, between weeks 22 and 39. No outbreaks were reported.

## 21.1 Campylobacteriosis Rates by Year, 2000-2009

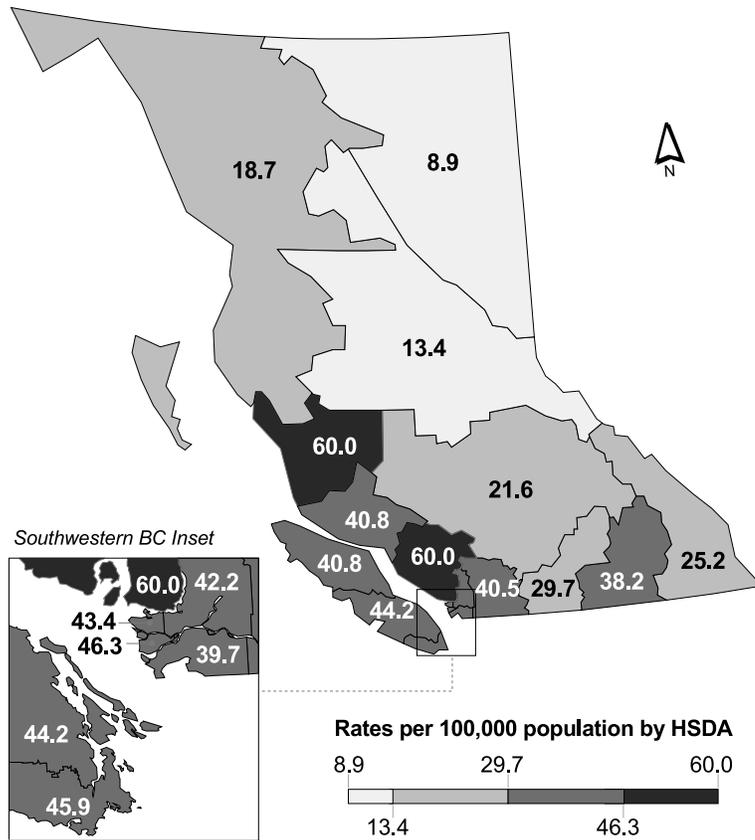
Rate per  
100,000  
population



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
BC Campylobacteriosis Reports	2583	2193	2052	1712	1471	1569	1586	1640	1645	1750
● BC Campylobacteriosis Rate	64.0	53.8	50.1	41.5	35.4	37.4	37.4	38.1	37.5	39.3
✕ Canadian Campylobacteriosis Rate*	41.1	38.2	36.7	31.6	29.9	29.6	29.4	29.4	28.2	

\*Please see Sources and Explanatory Remarks, Section 11 on Page 123 in regard to the national rate

## 21.2 Campylobacteriosis Rates by HSDA, 2009

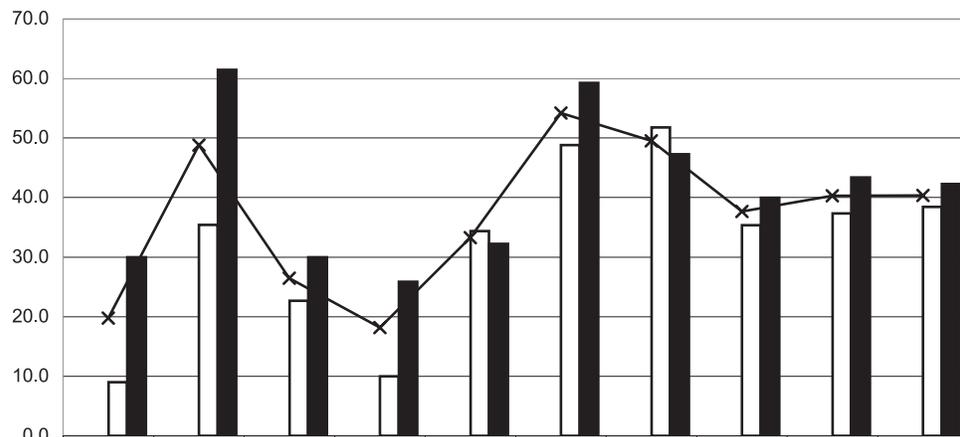


HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	20	25.2
12	Kootenay Boundary	30	38.2
13	Okanagan	104	29.7
14	Thompson Cariboo Shuswap	48	21.6
21	Fraser East	114	40.5
22	Fraser North	252	42.2
23	Fraser South	276	39.7
31	Richmond	89	46.3
32	Vancouver	278	43.4
33	North Shore/Coast Garibaldi	166	60.0
41	South Vancouver Island	169	45.9
42	Central Vancouver Island	116	44.2
43	North Vancouver Island	49	40.8
51	Northwest	14	18.7
52	Northern Interior	19	13.4
53	Northeast	6	8.9

Note: Map classification by Jenks natural breaks method.

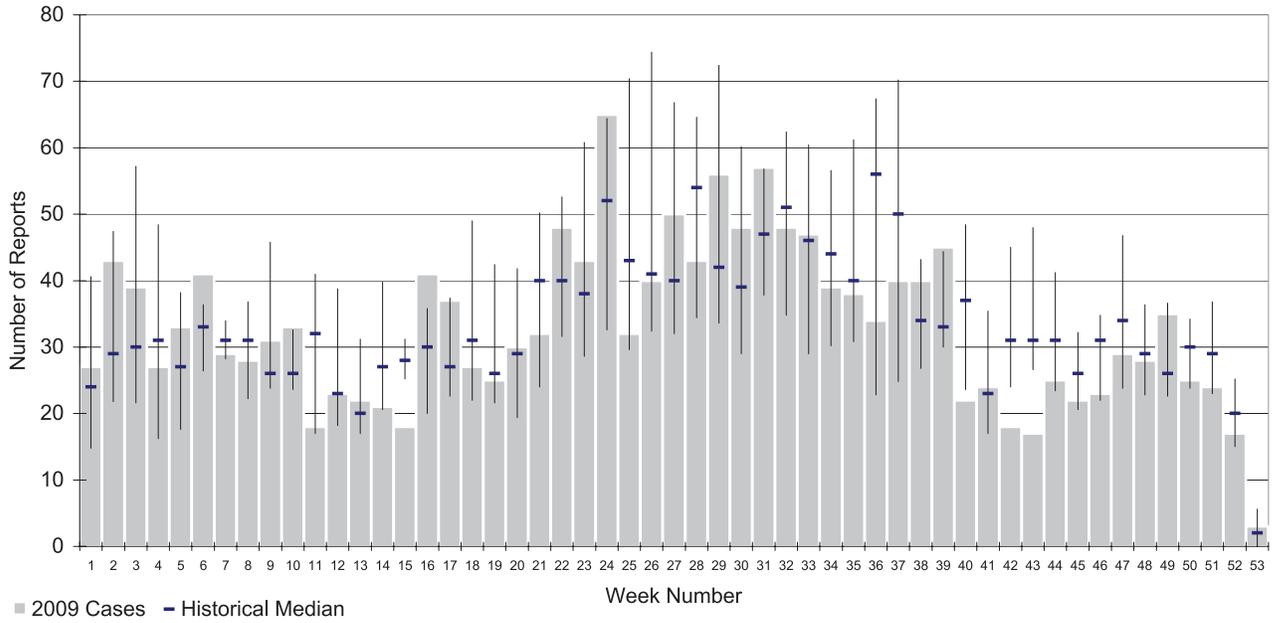
## 21.3 Campylobacteriosis Rates by Age Group and Sex, 2009

Rate per  
100,000  
population



Campylobacteriosis Reports - Female	2	30	24	12	47	73	80	105	255	188
Campylobacteriosis Reports - Male	7	55	34	33	47	95	73	117	290	182
□ Campylobacteriosis Rate - Female	9.0	35.4	22.7	10.0	34.4	48.8	51.8	35.3	37.3	38.4
■ Campylobacteriosis Rate - Male	30.0	61.5	30.0	25.9	32.2	59.2	47.3	40.0	43.4	42.3
✕ Campylobacteriosis Rate - Total	19.8	48.8	26.5	18.2	33.3	54.2	49.5	37.6	40.3	40.3

**21.4 2009 Campylobacteriosis Reports Compared to Historical Median and the 10th and 90th Percentiles Around the Median (2000 to 2008)**

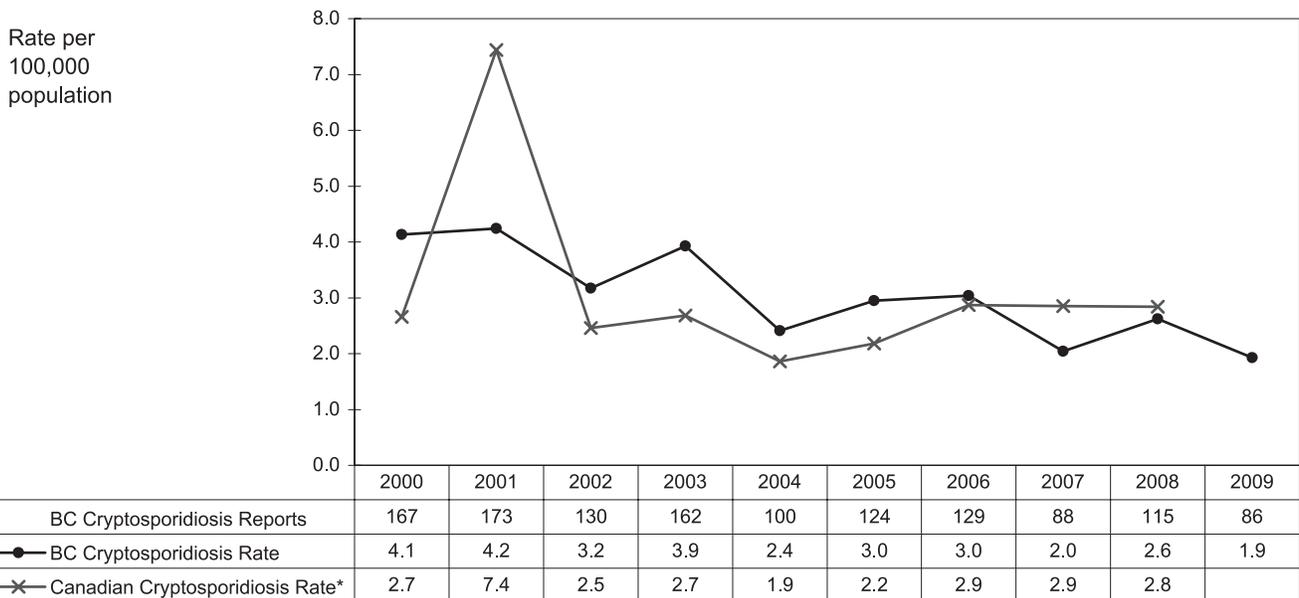


# Cryptosporidiosis

In 2009, 86 cases of cryptosporidiosis were reported (1.9 cases per 100,000), a slightly lower rate than in 2008. The highest rate was reported from Fraser East, followed by Vancouver and North Shore-Coast Garibaldi. Incidence of

infection was highest in males in the 5-9 year age group (7.9 per 100,000) followed by females in the 1-4 year age group (7.1 per 100,000). No outbreaks were reported, and no seasonal trends were evident in 2009.

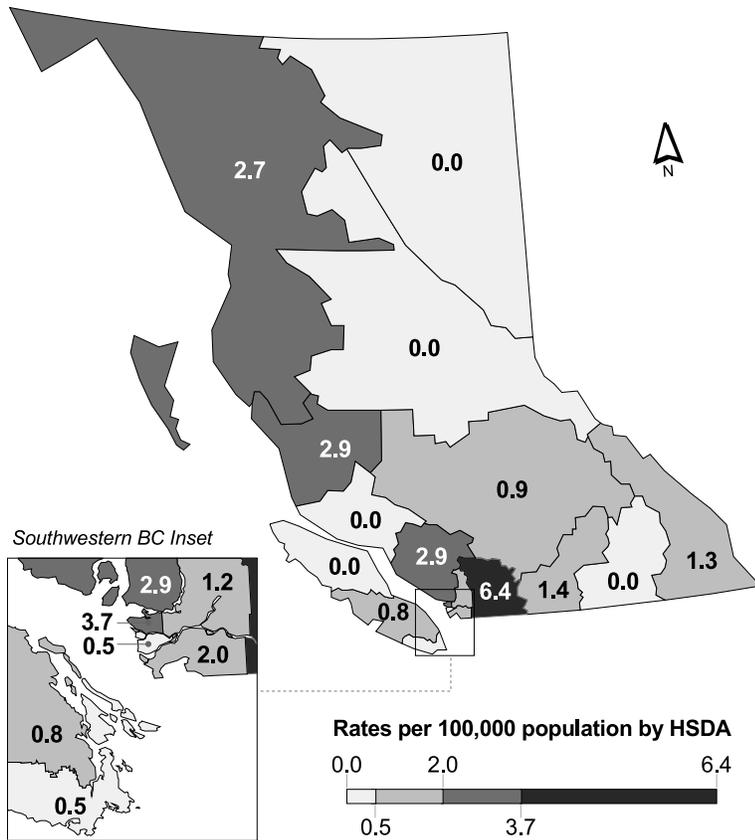
## 22.1 Cryptosporidiosis Rates by Year, 2000-2009



Note: Cryptosporidiosis became nationally notifiable in January 2000

\*Please see Sources and Explanatory Remarks, Section 11 on Page 123 in regard to the national rate

## 22.2 Cryptosporidiosis Rates by HSDA, 2009

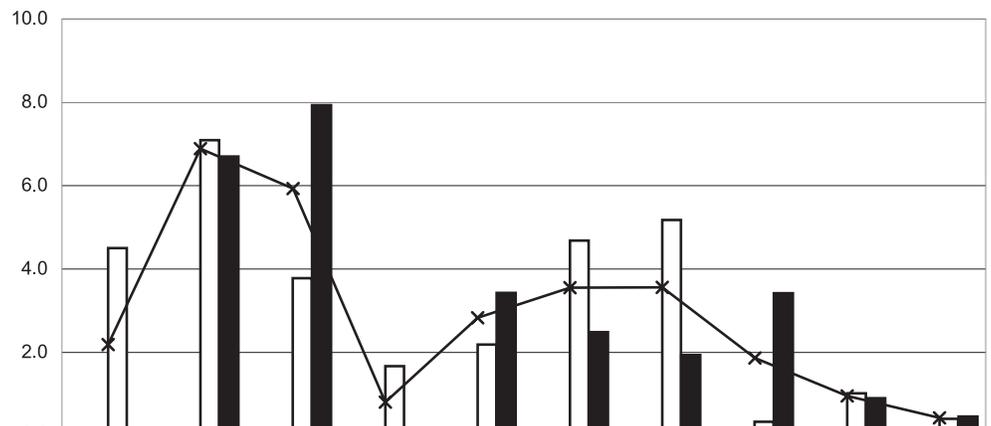


HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	1	1.3
12	Kootenay Boundary	0	0.0
13	Okanagan	5	1.4
14	Thompson Cariboo Shuswap	2	0.9
21	Fraser East	18	6.4
22	Fraser North	7	1.2
23	Fraser South	14	2.0
31	Richmond	1	0.5
32	Vancouver	24	3.7
33	North Shore/Coast Garibaldi	8	2.9
41	South Vancouver Island	2	0.5
42	Central Vancouver Island	2	0.8
43	North Vancouver Island	0	0.0
51	Northwest	2	2.7
52	Northern Interior	0	0.0
53	Northeast	0	0.0

Note: Map classification by Jenks natural breaks method.

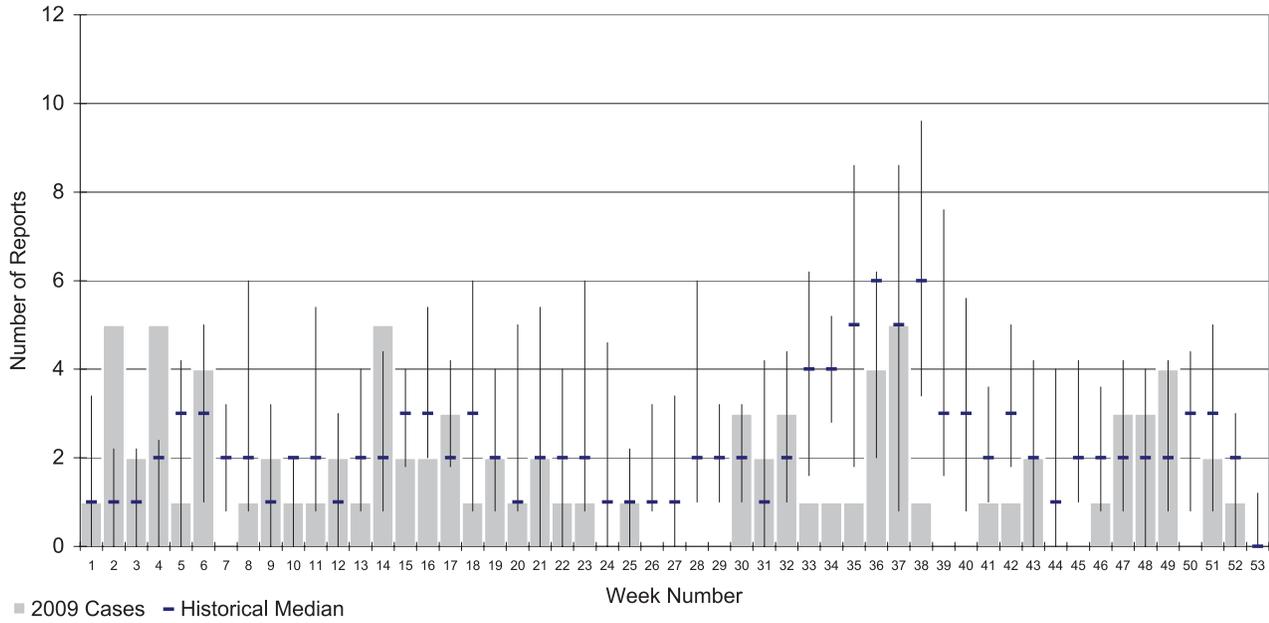
## 22.3 Cryptosporidiosis Rates by Age Group and Sex, 2009

Rate per  
100,000  
population



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Cryptosporidiosis Reports - Female	1	6	4	2	3	7	8	1	7	2
Cryptosporidiosis Reports - Male	0	6	9	0	5	4	3	10	6	2
Cryptosporidiosis Rate - Female	4.5	7.1	3.8	1.7	2.2	4.7	5.2	0.3	1.0	0.4
Cryptosporidiosis Rate - Male	0.0	6.7	7.9	0.0	3.4	2.5	1.9	3.4	0.9	0.5
Cryptosporidiosis Rate - Total	2.2	6.9	5.9	0.8	2.8	3.6	3.6	1.9	1.0	0.4

**21.4 2009 Cryptosporidiosis Reports Compared to Historical Median and the 10th and 90th Percentiles Around the Median (2000 to 2008)**

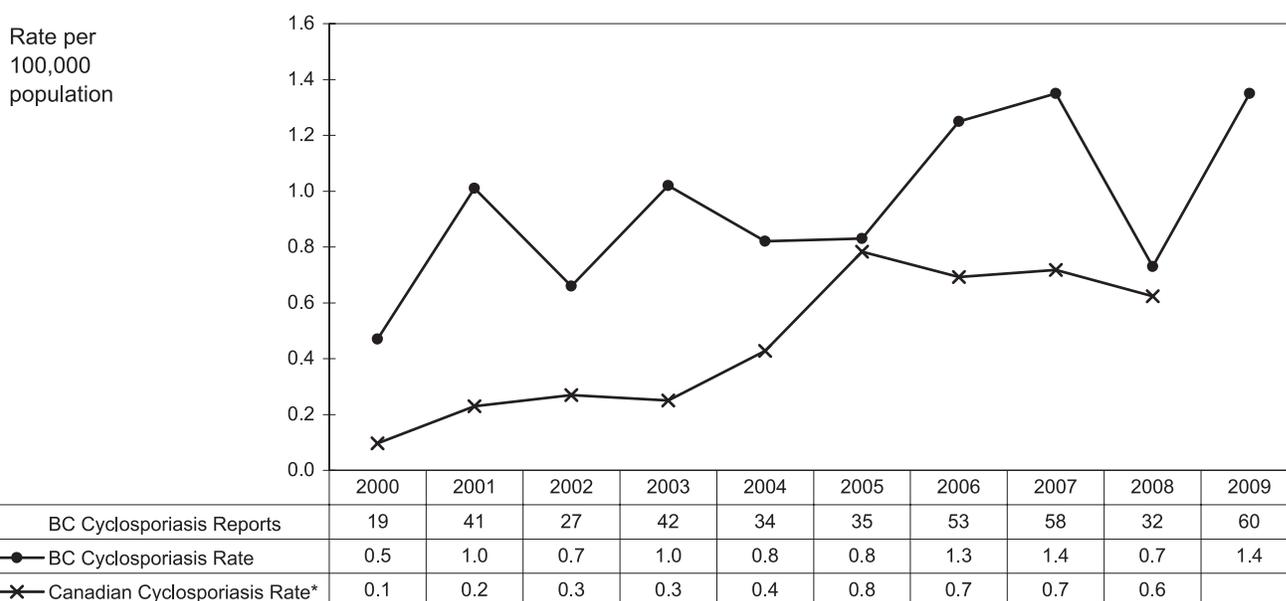


# Cyclosporiasis

In 2009 there was an increase in the number of infections and incidence of *Cyclospora* infections. In previous years high incidence rates were associated with outbreaks of locally-acquired infections due to contaminated, imported produce. In 2009, there were no locally-acquired outbreaks. In May, 14 cases acquired their infection during travel on a cruise through South and Central America, accounting for the peak starting in week 18. The majority of the remaining

infections were also a result of travel to endemic areas such as South and Central America (80%). There were three cases reported with no history of travel but no local source identified. Incidence rates were higher in adults and was highest among males aged 25 to 29 years. This increased incidence may be due to the fact that adults are travelling to *cyclospora* endemic areas and those aged 25-29 may participate in higher risk activities while travelling.

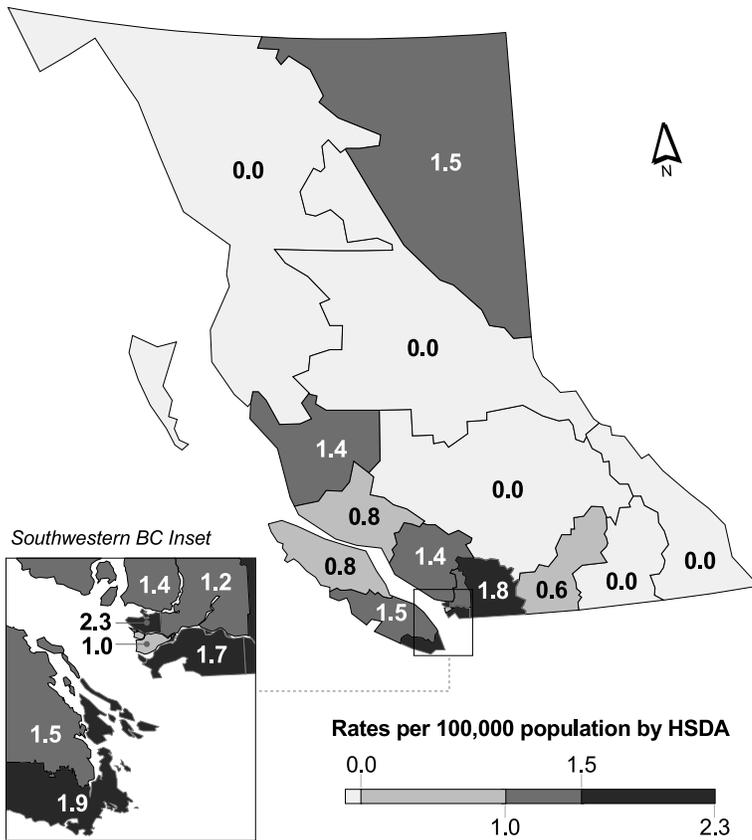
## 23.1 Cyclosporiasis Rates by Year, 2000-2009



Note: Cyclosporiasis became nationally notifiable in January 2000

\*Please see Sources and Explanatory Remarks, Section 11 on Page 123 in regard to the national rate

### 23.2 Cyclosporiasis Rates by HSDA, 2009

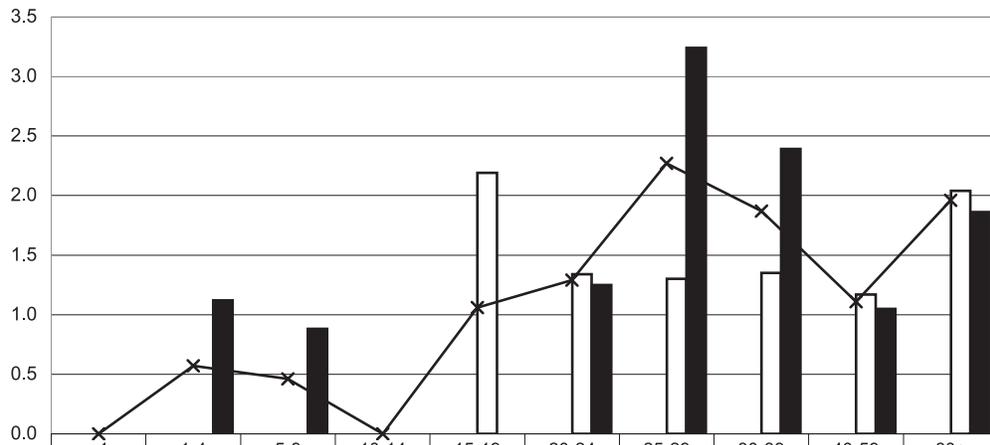


HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	0	0.0
12	Kootenay Boundary	0	0.0
13	Okanagan	2	0.6
14	Thompson Cariboo Shuswap	0	0.0
21	Fraser East	5	1.8
22	Fraser North	7	1.2
23	Fraser South	12	1.7
31	Richmond	2	1.0
32	Vancouver	15	2.3
33	North Shore/Coast Garibaldi	4	1.4
41	South Vancouver Island	7	1.9
42	Central Vancouver Island	4	1.5
43	North Vancouver Island	1	0.8
51	Northwest	0	0.0
52	Northern Interior	0	0.0
53	Northeast	1	1.5

Note: Map classification by Jenks natural breaks method.

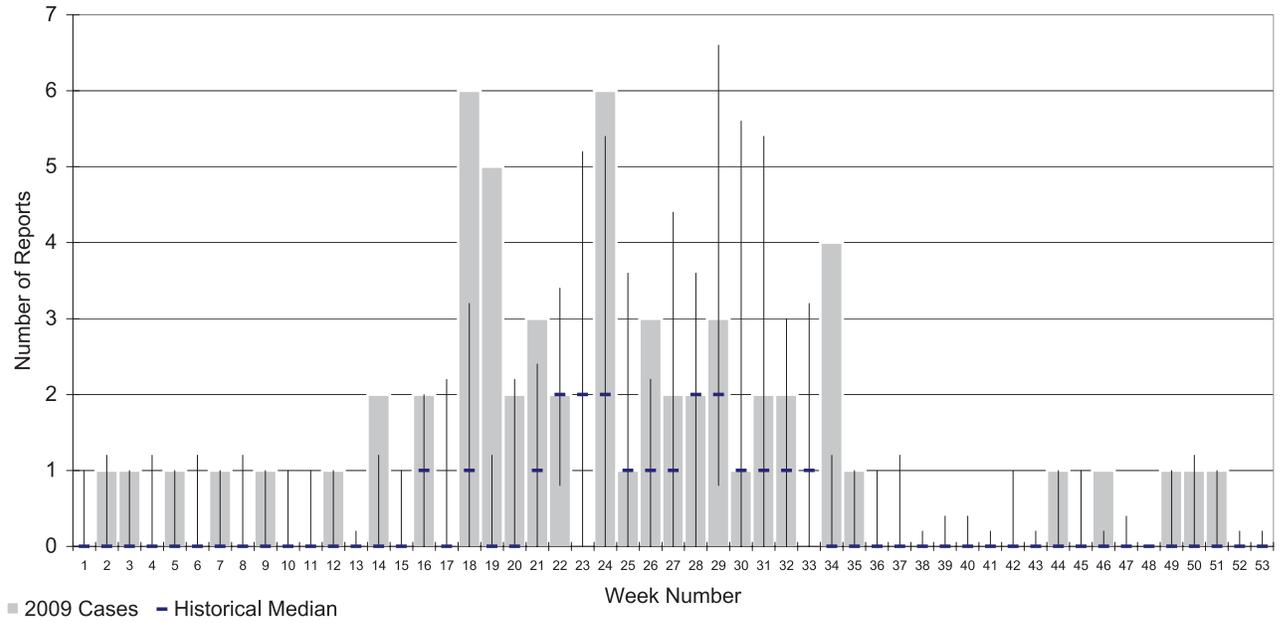
### 23.3 Cyclosporiasis Rates by Age Group and Sex, 2009

Rate per 100,000 population



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Cyclosporiasis Reports - Female	0	0	0	0	3	2	2	4	8	10
Cyclosporiasis Reports - Male	0	1	1	0	0	2	5	7	7	8
Cyclosporiasis Rate - Female	0.0	0.0	0.0	0.0	2.2	1.3	1.3	1.4	1.2	2.0
Cyclosporiasis Rate - Male	0.0	1.1	0.9	0.0	0.0	1.3	3.2	2.4	1.1	1.9
Cyclosporiasis Rate - Total	0.0	0.6	0.5	0.0	1.1	1.3	2.3	1.9	1.1	2.0

**23.4 2009 Cyclosporiasis Reports Compared to Historical Median and the 10th and 90th Percentiles Around the Median (2000 to 2008)**

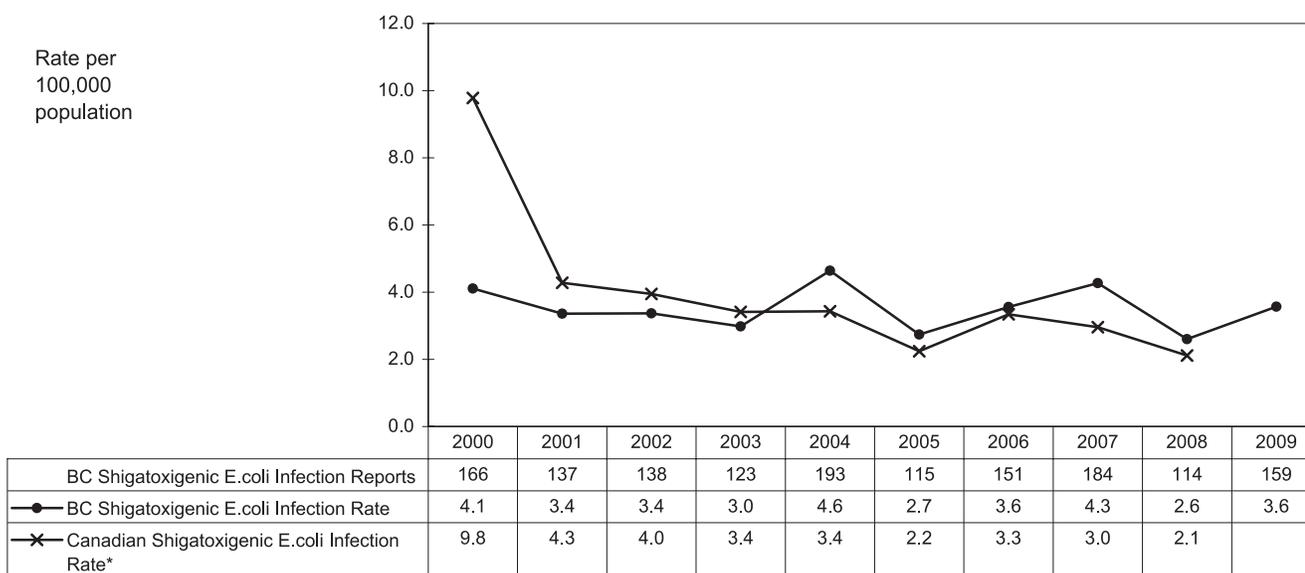


# Shigatoxigenic *E. coli*

There were 159 cases of shigatoxigenic *E. coli* infection reported in BC in 2009; 9% were associated with international travel. An outbreak associated with a petting zoo facility occurred in September (peak seen in week 37). Incidence was highest in children under age 5 in 2009. Compared to 2008, the incidence rate among those aged 1 to 4 years increased almost three times and among those aged 5 to 9 years increased almost four times. This increased

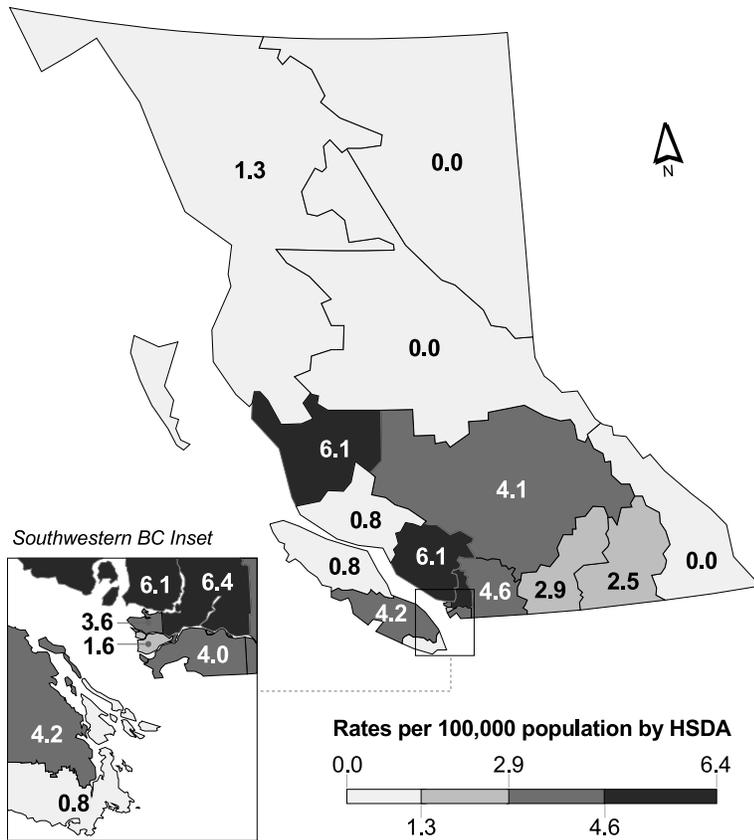
incidence in children was likely due to the outbreak. The highest rates of infection were found in Fraser North and North Shore/Coast Garibaldi, however most health service delivery areas in the lower mainland saw increased incidence rates likely due to the outbreak in September. Incidence rates in Northern Health Authority and South Vancouver Island decreased in 2009 compared to 2008.

## 24.1 Shigatoxigenic *E. coli* Rates by Year, 2000-2009



\*Please see Sources and Explanatory Remarks, Section 11 on Page 123 in regard to the national rate

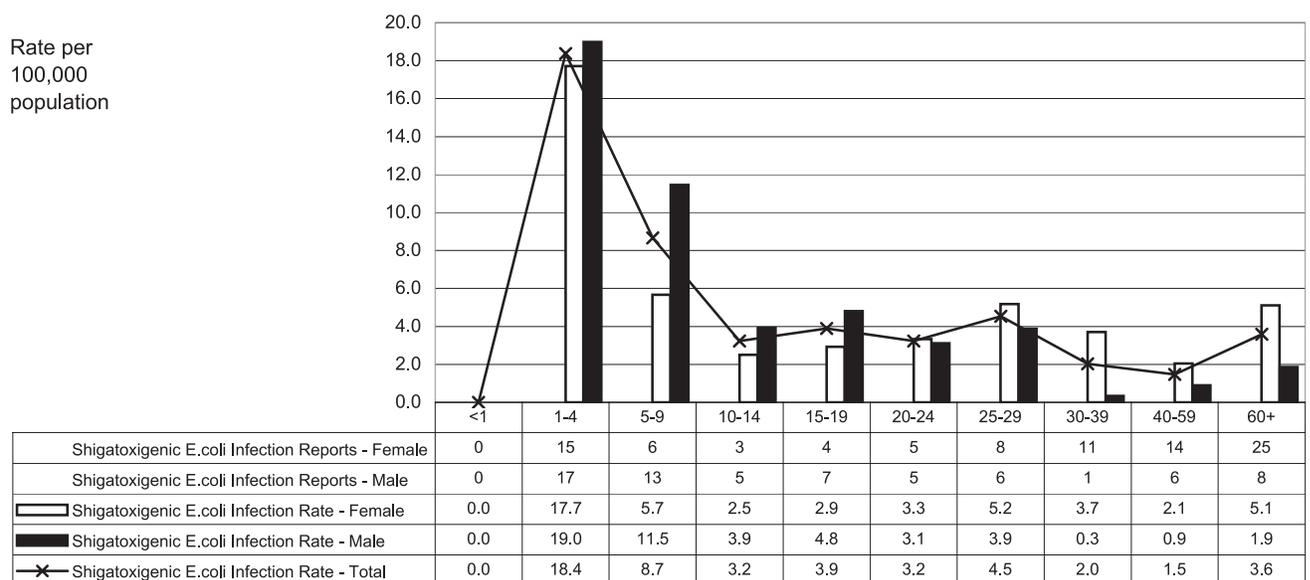
## 24.2 Shigatoxigenic *E. coli* Rates by HSDA, 2009



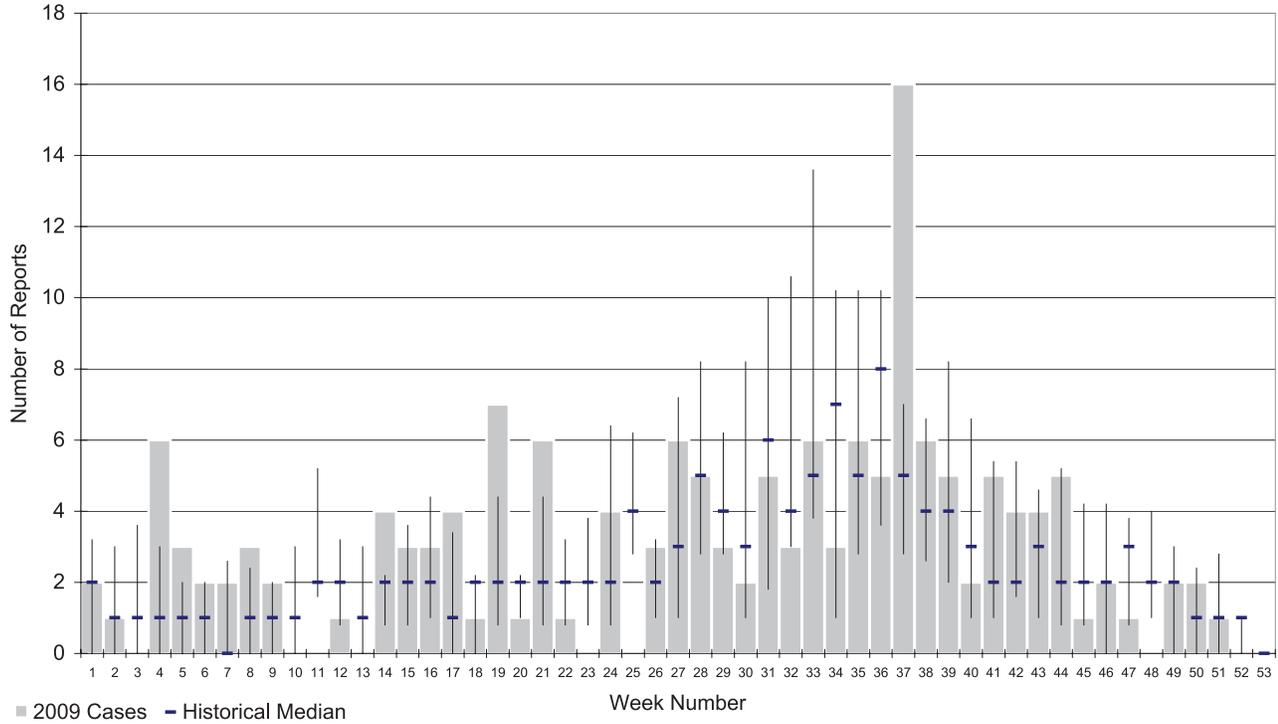
HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	0	0.0
12	Kootenay Boundary	2	2.5
13	Okanagan	10	2.9
14	Thompson Cariboo Shuswap	9	4.1
21	Fraser East	13	4.6
22	Fraser North	38	6.4
23	Fraser South	28	4.0
31	Richmond	3	1.6
32	Vancouver	23	3.6
33	North Shore/Coast Garibaldi	17	6.1
41	South Vancouver Island	3	0.8
42	Central Vancouver Island	11	4.2
43	North Vancouver Island	1	0.8
51	Northwest	1	1.3
52	Northern Interior	0	0.0
53	Northeast	0	0.0

Note: Map classification by Jenks natural breaks method.

## 24.3 Shigatoxigenic *E. coli* Rates by Age Group and Sex, 2009



**21.4 2009 Shigatoxigenic *E. Coli* Reports Compared to Historical Median and the 10th and 90th Percentiles Around the Median (2000 to 2008)**

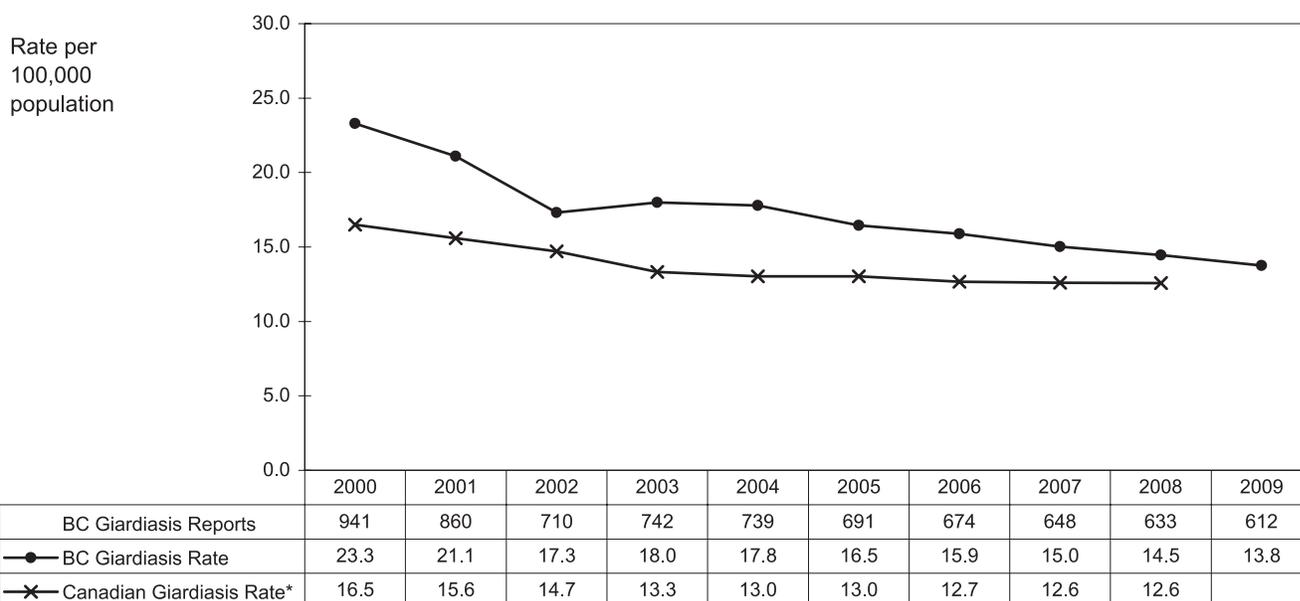


# Giardiasis

Annual rates of giardiasis in BC continued to decline in 2009 with 612 cases reported. No seasonal peaks and no outbreaks were detected. Rates were higher in males than females in all age groups except for the 20-24 year old age group, where the incidence for females was slightly higher

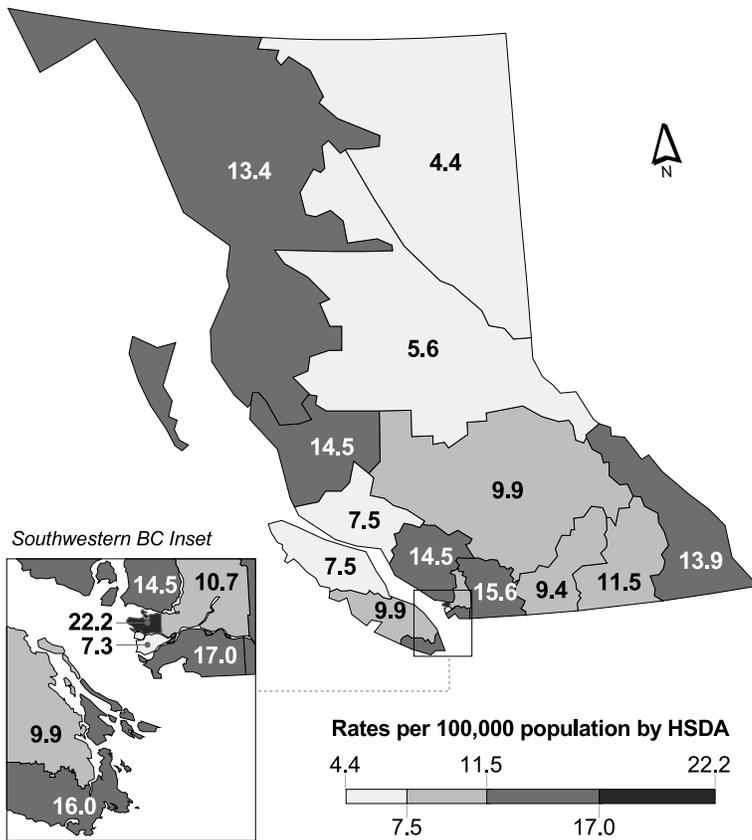
at 18.7 per 100,000 vs. 18.1 per 100,000 for males. Vancouver experienced the highest rate of infection at 22.2 cases per 100,000 population.

## 25.1 Giardiasis Rates by Year, 2000-2009



\*Please see Sources and Explanatory Remarks, Section 11 on Page 123 in regard to the national rate

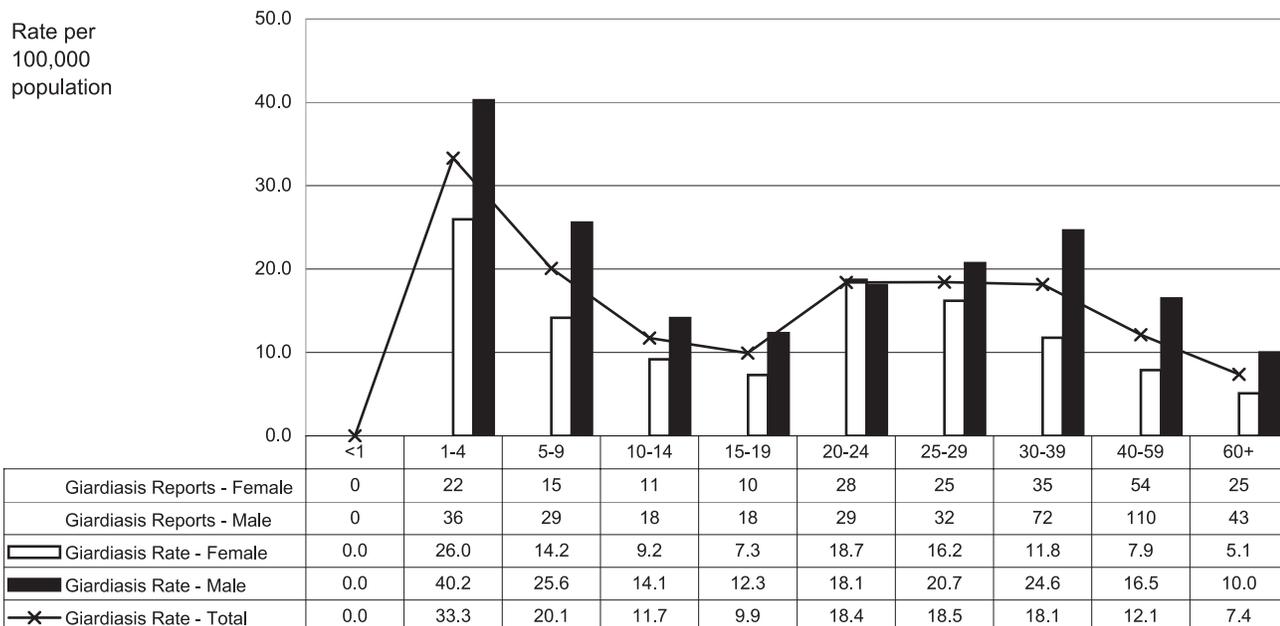
## 25.2 Giardiasis Rates by HSDA, 2009



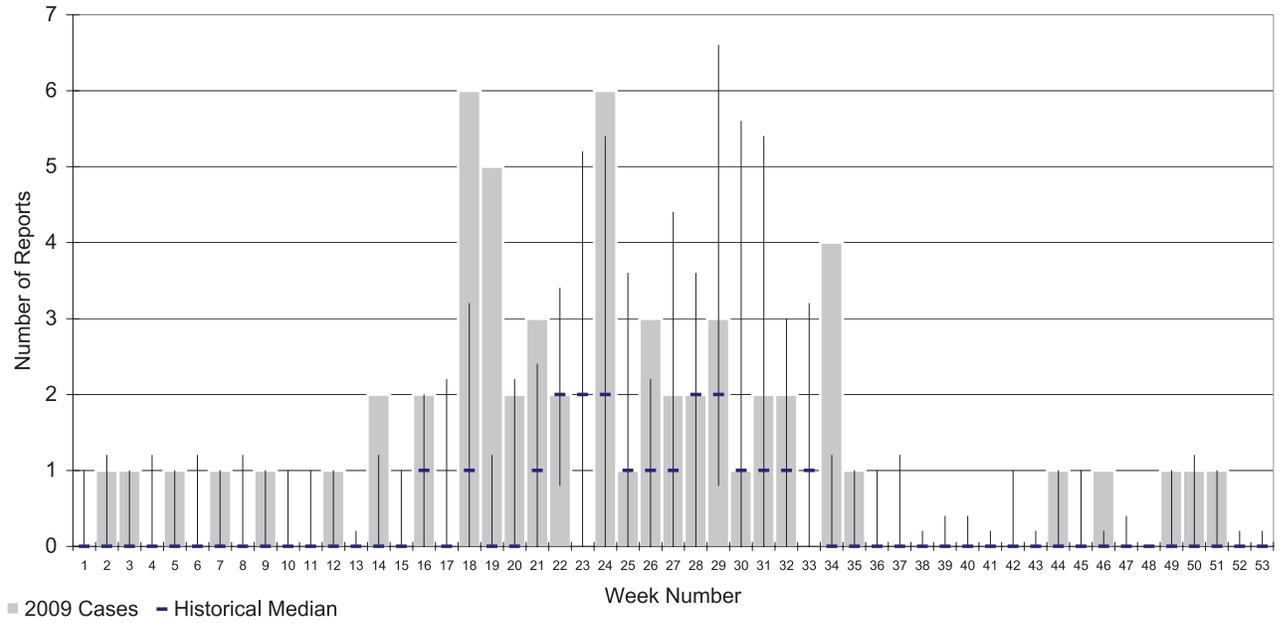
HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	11	13.9
12	Kootenay Boundary	9	11.5
13	Okanagan	33	9.4
14	Thompson Cariboo Shuswap	22	9.9
21	Fraser East	44	15.6
22	Fraser North	64	10.7
23	Fraser South	118	17.0
31	Richmond	14	7.3
32	Vancouver	142	22.2
33	North Shore/Coast Garibaldi	40	14.5
41	South Vancouver Island	59	16.0
42	Central Vancouver Island	26	9.9
43	North Vancouver Island	9	7.5
51	Northwest	10	13.4
52	Northern Interior	8	5.6
53	Northeast	3	4.4

Note: Map classification by Jenks natural breaks method.

## 25.3 Giardiasis Rates by Age Group and Sex, 2009



**25.4 2009 Giardiasis Reports Compared to Historical Median and the 10th and 90th Percentiles Around the Median (2000 to 2008)**



# Hepatitis A

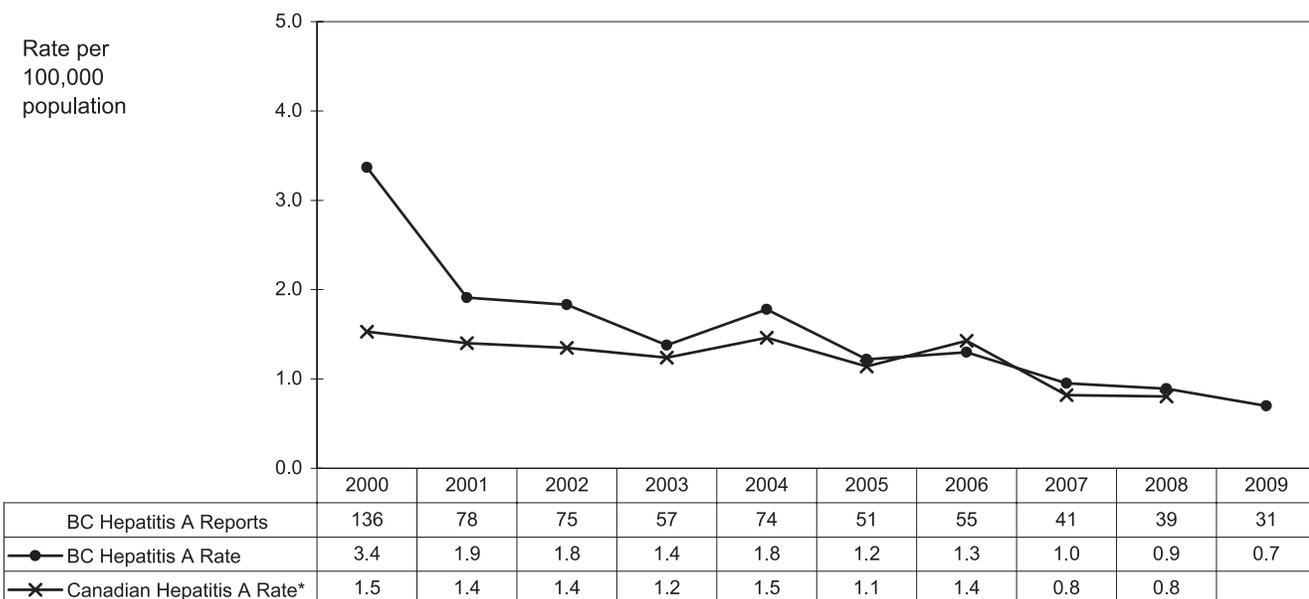
There were 31 reported cases of hepatitis A in BC in 2009 for a rate of 0.7 per 100,000 population. This continued downward trend observed over the past decade mirrors the national rates. However, the actual number of cases of hepatitis A is estimated to be 5 or more times the reported number. The declining numbers of hepatitis A in BC can be attributed to the availability of a publicly funded hepatitis A vaccine in BC for high-risk populations such as illicit drug users and men who have sex with men, post exposure prophylaxis of contacts of cases of hepatitis A to prevent transmission, and improved hygiene.

The majority of cases in 2009 (74.1%) were in the 20-59 year age groups with only one reported case under 5 years of age. However, young children may be asymptomatic making underreporting more likely in this age group. Cases

were evenly distributed between males and females (16 and 15, respectively). Two Health Service Delivery Areas, Fraser North and Fraser South, had seven reported cases of hepatitis A, each. Temporally, cases are a little more likely to occur in the first half of the year (61.3%) than the latter half (38.7%).

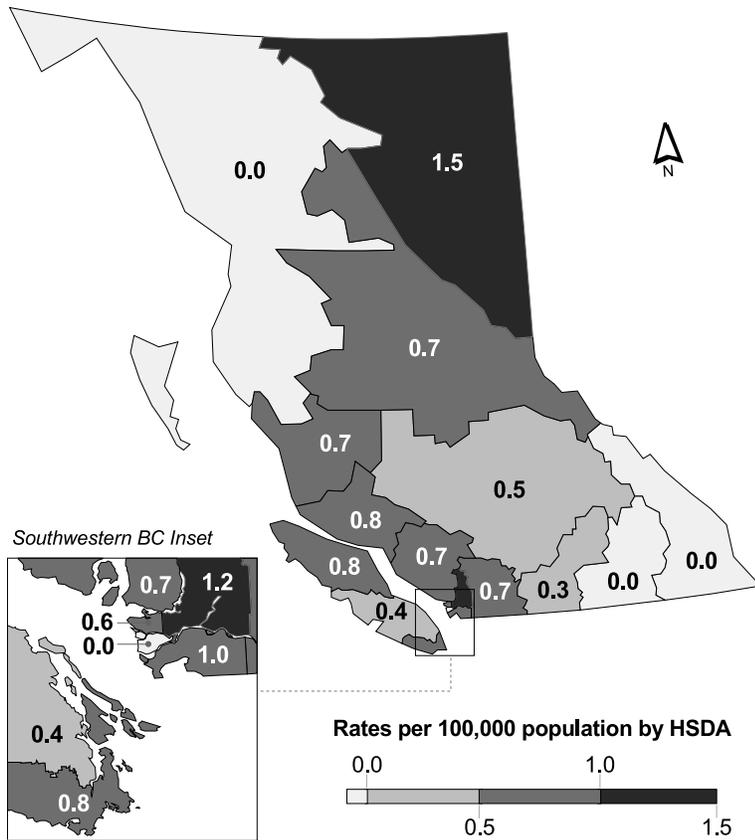
A large proportion of hepatitis A cases continue to be identified in persons who have travelled to countries where hepatitis A is endemic, but were not immunized prior to travel. Previous analyses identified travel to an endemic country was responsible for 90% of hepatitis A cases in January 2009 (data not shown). Although hepatitis A vaccine is recommended to these travelers it is not publicly funded for this group.

## 26.1 Hepatitis A Rates by Year, 2000-2009



\*Please see Sources and Explanatory Remarks, Section 11 on Page 123 in regard to the national rate

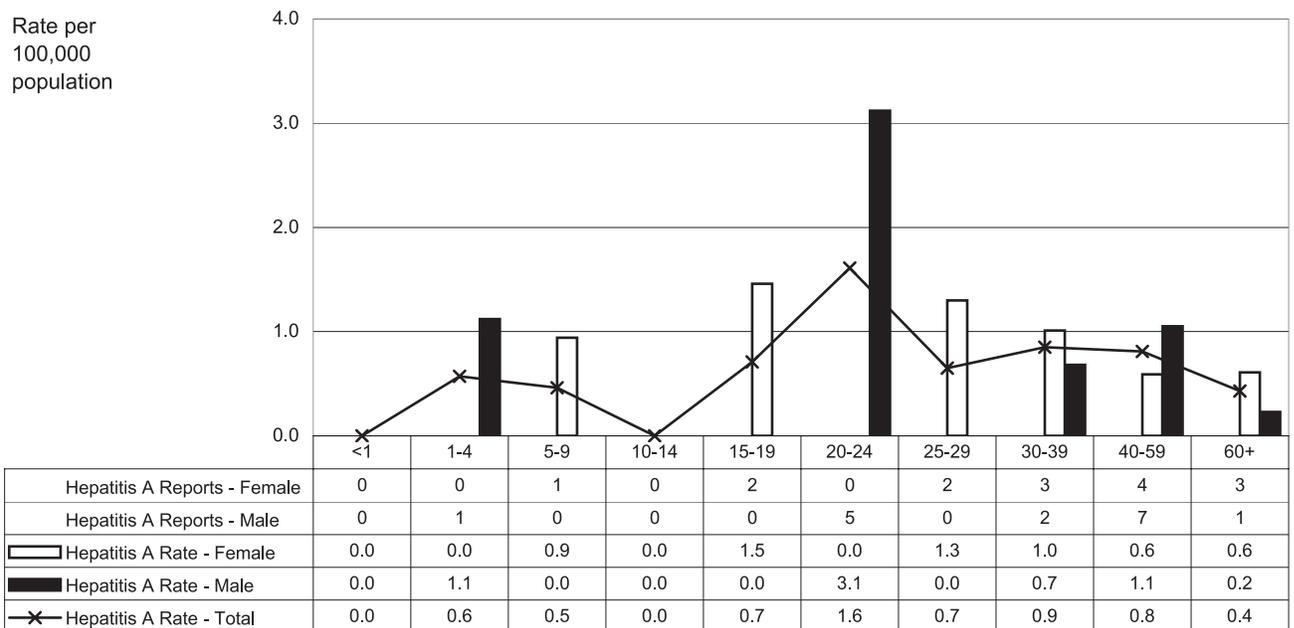
## 26.2 Hepatitis A Rates by HSDA, 2009



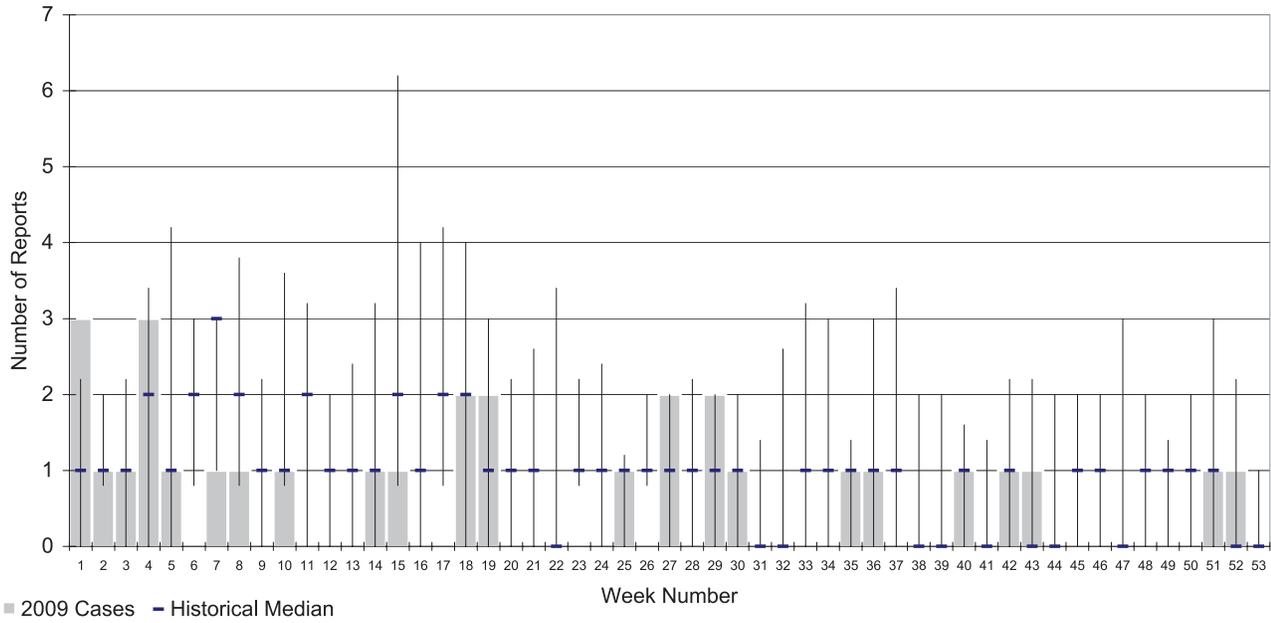
HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	0	0.0
12	Kootenay Boundary	0	0.0
13	Okanagan	1	0.3
14	Thompson Cariboo Shuswap	1	0.5
21	Fraser East	2	0.7
22	Fraser North	7	1.2
23	Fraser South	7	1.0
31	Richmond	0	0.0
32	Vancouver	4	0.6
33	North Shore/Coast Garibaldi	2	0.7
41	South Vancouver Island	3	0.8
42	Central Vancouver Island	1	0.4
43	North Vancouver Island	1	0.8
51	Northwest	0	0.0
52	Northern Interior	1	0.7
53	Northeast	1	1.5

Note: Map classification by Jenks natural breaks method.

## 26.3 Hepatitis A Rates by Age Group and Sex, 2009



**26.4 2009 Hepatitis A Reports Compared to Historical Median and the 10th and 90th Percentiles Around the Median (2000 to 2008)**

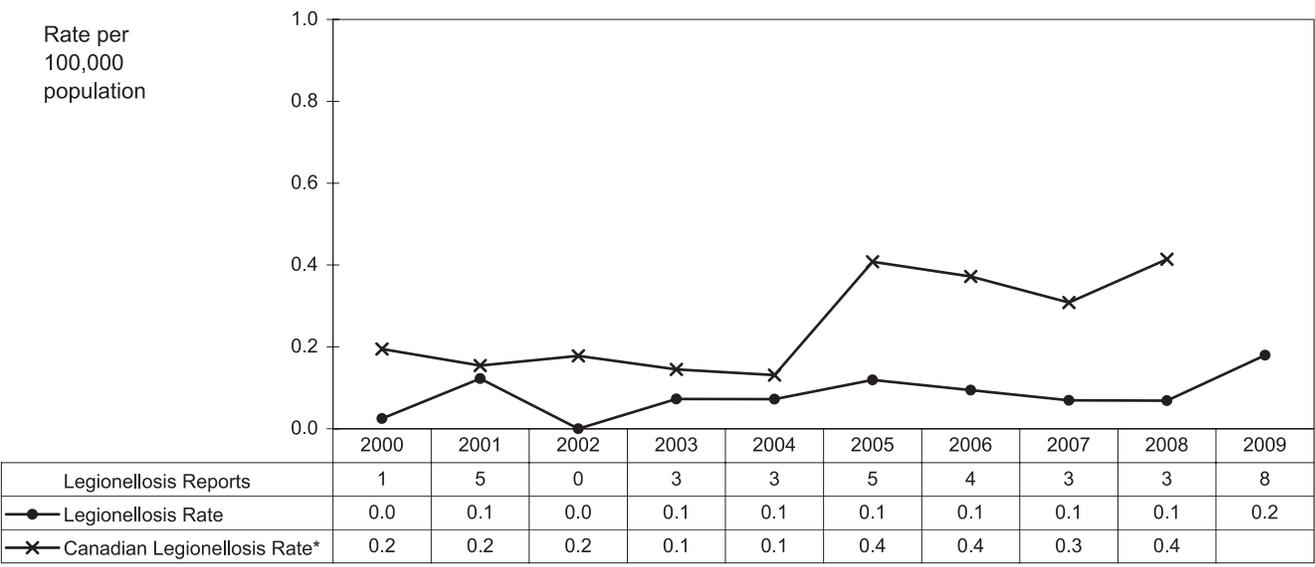


# Legionellosis

In 2009, eight cases of legionellosis were reported, a higher number than in any given year in the last decade. All occurred in adult males in Fraser, Vancouver Island and

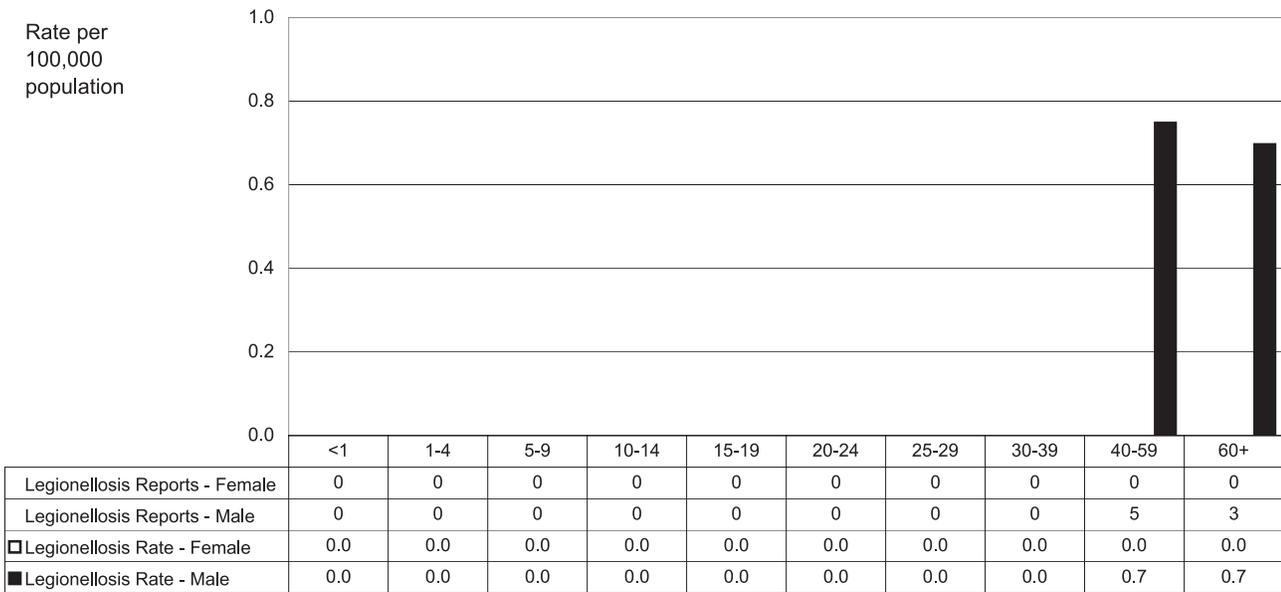
Interior Health Authorities. Cases occurred throughout the year. There was no common exposure between cases.

## 27.1 Legionellosis Rates by Year, 2000-2009

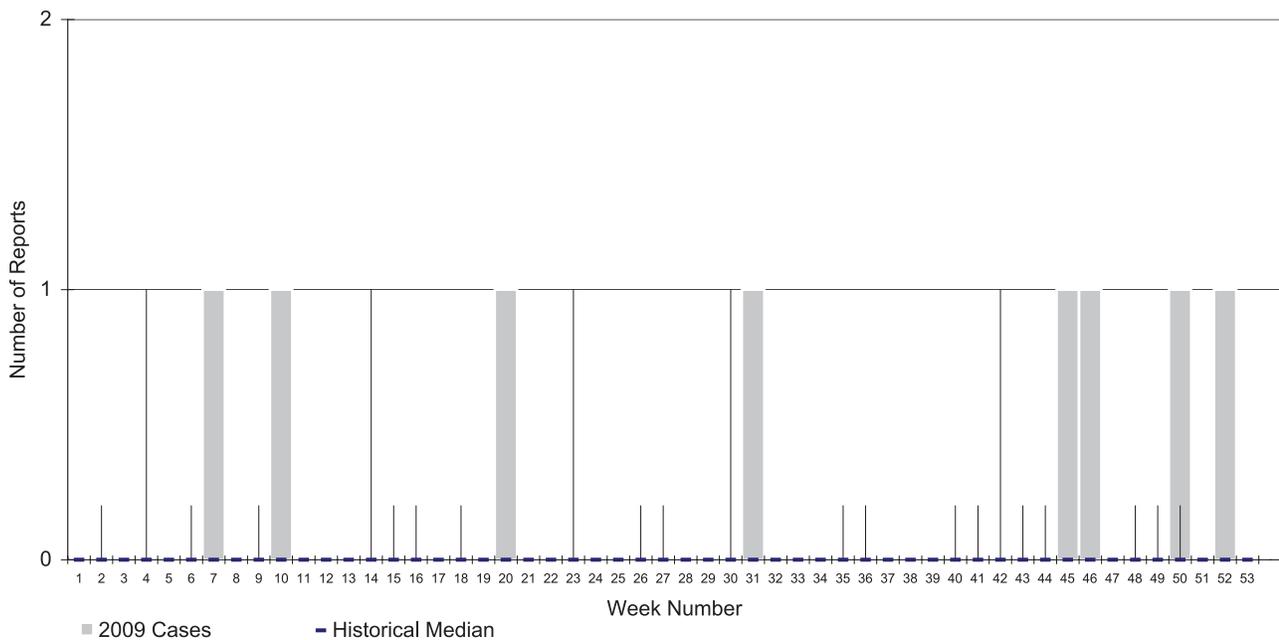


\*Please see Sources and Explanatory Remarks, Section 11 on Page 123 in regard to the national rate

### 27.2 Legionellosis Rates by Age Group and Sex, 2009



### 27.3 2009 Legionellosis Reports Compared to Historical Median and the 10th and 90th Percentiles Around the Median (2000 to 2008)

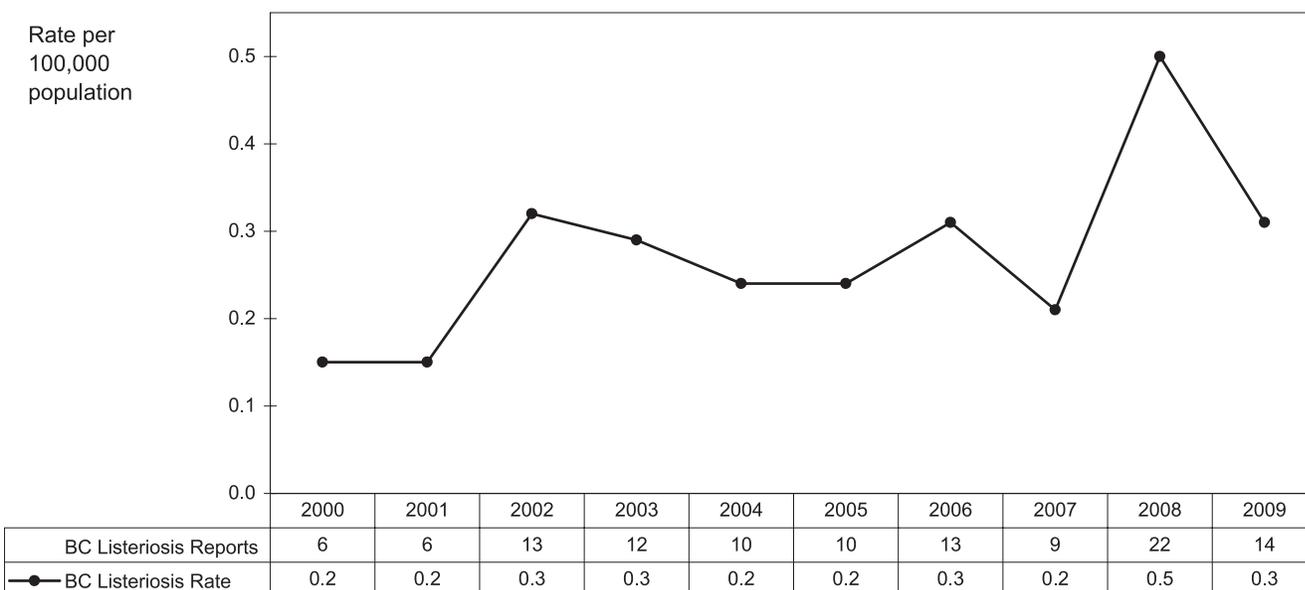


# Listeriosis

Fourteen cases of invasive listeriosis were reported in 2009; 9% were associated with international travel. The incidence in 2009 was similar to years prior to 2008 when a large national outbreak occurred.

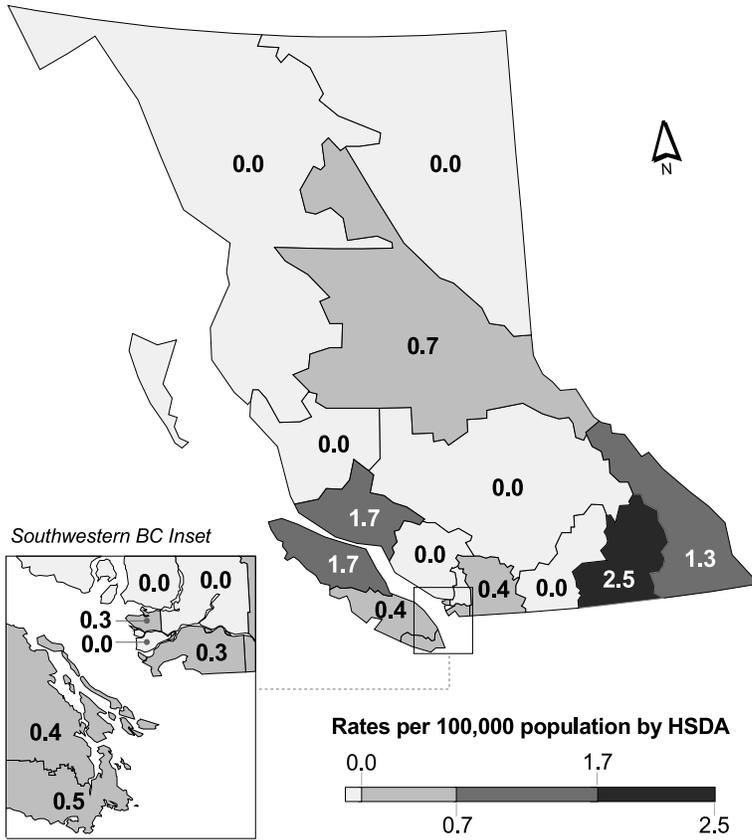
Apart from 1 case reported among <1 year olds, rates were highest among adults over the age of sixty. There was no regional clustering. Temporal clustering can be seen between weeks 15 and 18, however these cases were not related.

## 28.1 Listeriosis Rates by Year, 2000-2009



Note: Listeriosis was removed from national surveillance in January 2000, but has recently been added again as of 2008.

### 28.2 Listeriosis Rates by HSDA, 2009

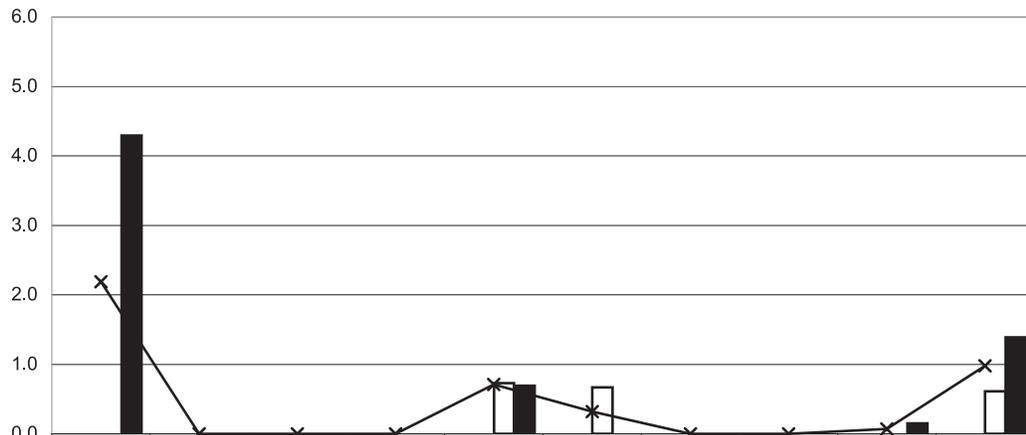


HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	1	1.3
12	Kootenay Boundary	2	2.5
13	Okanagan	0	0.0
14	Thompson Cariboo Shuswap	0	0.0
21	Fraser East	1	0.4
22	Fraser North	0	0.0
23	Fraser South	2	0.3
31	Richmond	0	0.0
32	Vancouver	2	0.3
33	North Shore/Coast Garibaldi	0	0.0
41	South Vancouver Island	2	0.5
42	Central Vancouver Island	1	0.4
43	North Vancouver Island	2	1.7
51	Northwest	0	0.0
52	Northern Interior	1	0.7
53	Northeast	0	0.0

Note: Map classification by Jenks natural breaks method.

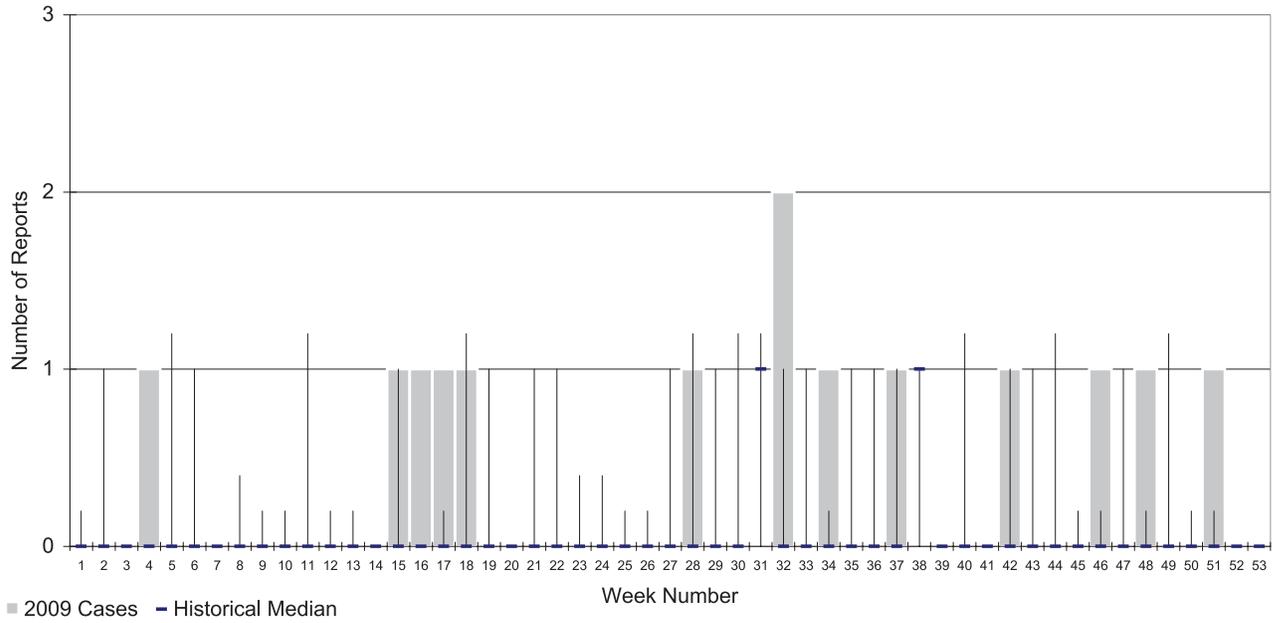
### 28.3 Listeriosis Rates by Age Group and Sex, 2009

Rate per 100,000 population



Listeriosis Reports - Female	0	0	0	0	1	1	0	0	0	3
Listeriosis Reports - Male	1	0	0	0	1	0	0	0	1	6
Listeriosis Rate - Female	0.0	0.0	0.0	0.0	0.7	0.7	0.0	0.0	0.0	0.6
Listeriosis Rate - Male	4.3	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.2	1.4
Listeriosis Rate - Total	2.2	0.0	0.0	0.0	0.7	0.3	0.0	0.0	0.1	1.0

**29.4 2009 Listeriosis Reports Compared to Historical Median and the 10th and 90th Percentiles Around the Median (2000 to 2008)**



## Salmonellosis, Typhoid Fever and Paratyphoid Fever\*

In 2009, 952 cases of salmonellosis were reported for a rate of 21.4 per 100,000, making *Salmonella* infections the second most commonly reported enteric disease in BC. Overall, 23% of *Salmonella* infections were associated with international travel. The rate in 2009 was similar to 2008 which was a notable increase over the previously stable rate. Rates were highest in children under 5 years of age and among residents of Fraser Health Authority. Northwest reported a significant increase in incidence (24.1/100,000 in 2009 compared to 11.7/100,000 in 2008). The number of cases reported peaked in the spring and late summer.

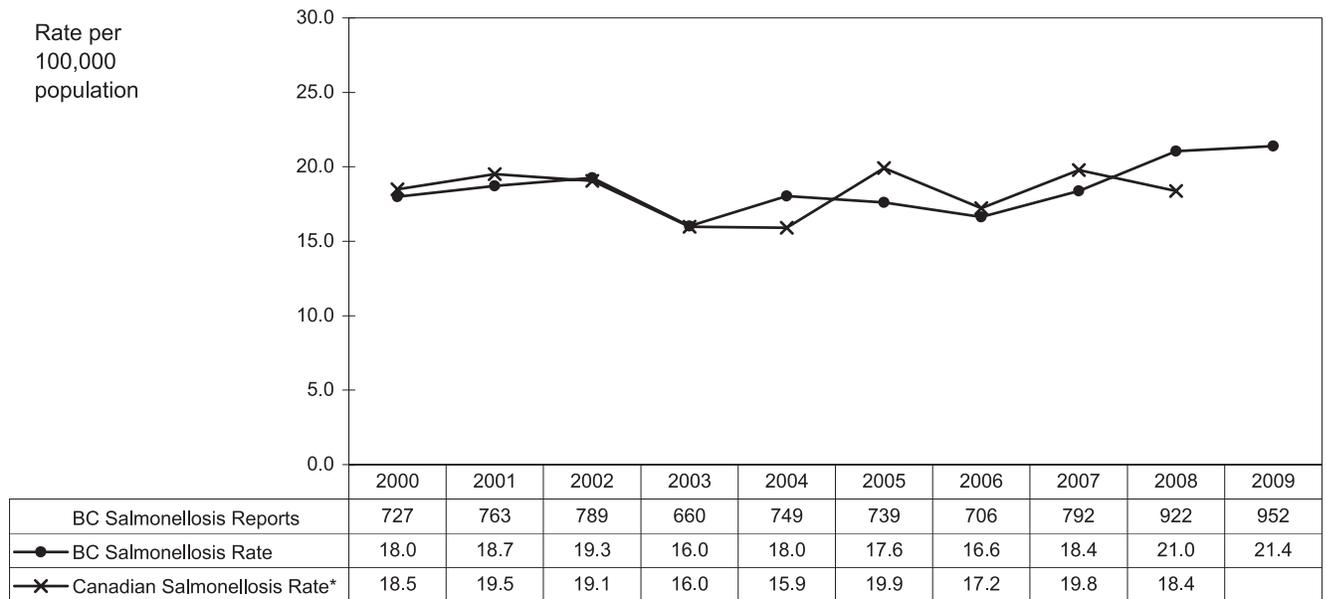
An ongoing investigation into an *S. Enteritidis* outbreak continued in 2009. Over 200 cases were investigated in 2009. The majority of cases resided in the lower mainland which likely explains the higher rates in these geographic areas. The largest number of cases was reported in May and June which is seen by the large peak between week 16 to 22. The most likely source of illness was eggs. Collaborative work with the Ministry of Agriculture and Lands and industry is ongoing in an attempt to control this outbreak.

Typhoid fever rates in British Columbia decreased in 2009. Thirty-five cases were reported for a rate of 0.8 cases per 100,000. Sixty-nine per cent were associated with international travel. Paratyphoid fever incidence was similar to 2008 at 0.7 cases per 100,000 in 2009. Sixty-one per cent were associated with international travel. Cases of Typhoid and Paratyphoid Fever are acquired during travel to endemic countries and are clustered in the first quarter of the year, a temporal reflection of the travel patterns of BC residents. Most cases were reported from Fraser Health Authority and were associated with travel to India.

*S. Enteritidis*, Typhimurium and Typhi remained the top three serotypes isolated in 2009. *S. Heidelberg* had been reported in the top three since 2004, but was the fourth most common serotype in 2008 and fifth most common in 2009. The proportion of *Salmonella ssp* I 4,5,12:i- increased in 2009. *S. Hadar* and *S. Stanley*, reported in the top 10 serotypes in 2008 were not reported in the top 10 serotypes in 2009. *S. Paratyphi B* var. java, *S. Saintpaul* and *S. Weltevreden* were all new to the top 10 serotypes in 2009.

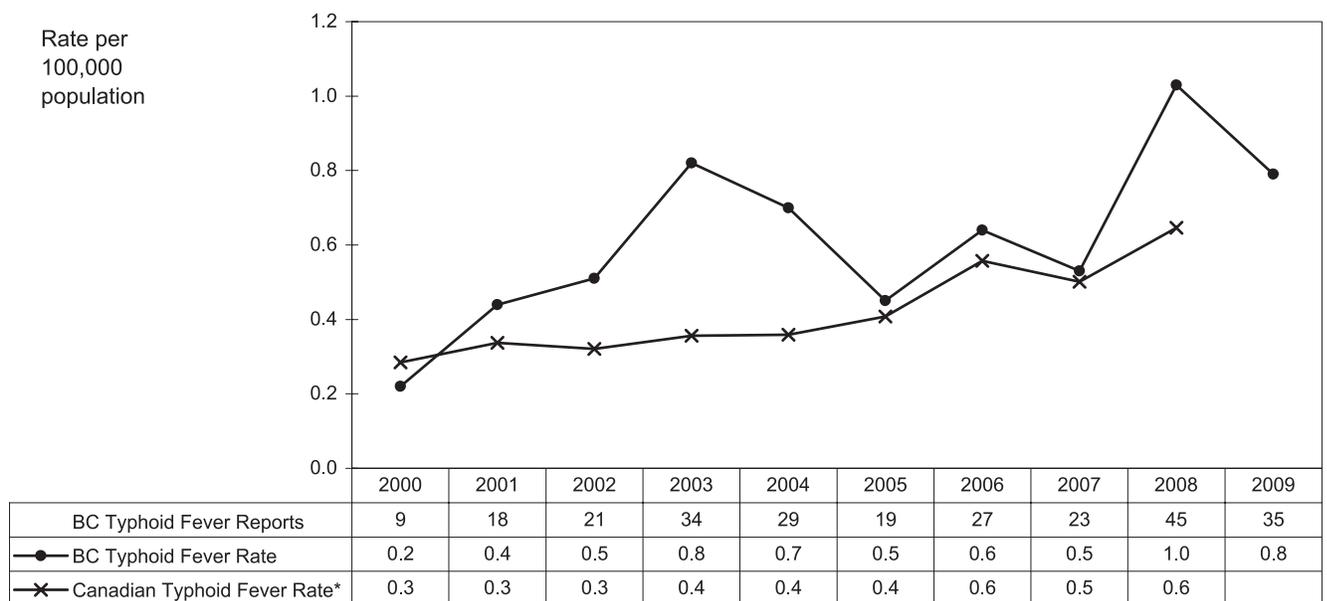
\*All cases of *Salmonella* infection reported through iPHIS, including *S. Typhi* and *S. Paratyphi*, have been included in the overall numbers and rates by year, the rates by age and sex, the geographical distribution of cases and the cases reported by week. *S. Typhi* (Typhoid fever) and *S. Paratyphi* (Paratyphoid fever) cases and rates by year have also been presented separately.

## 29.1 Salmonellosis Rates by Year, 2000-2009



\*Please see Sources and Explanatory Remarks, Section 11 on Page 123 in regard to the national rate

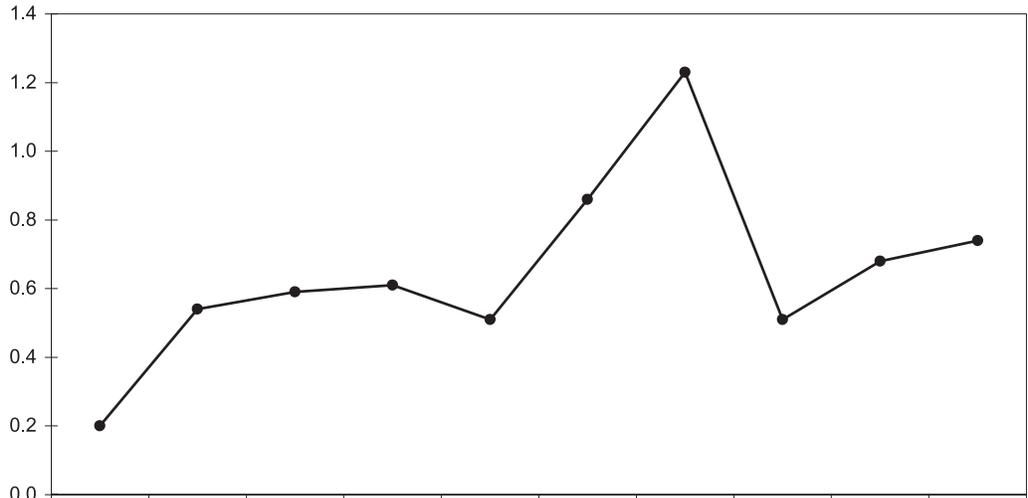
## 29.2 Typhoid Rates by Year, 2000-2009



\*Please see Sources and Explanatory Remarks, Section 11 on Page 123 in regard to the national rate

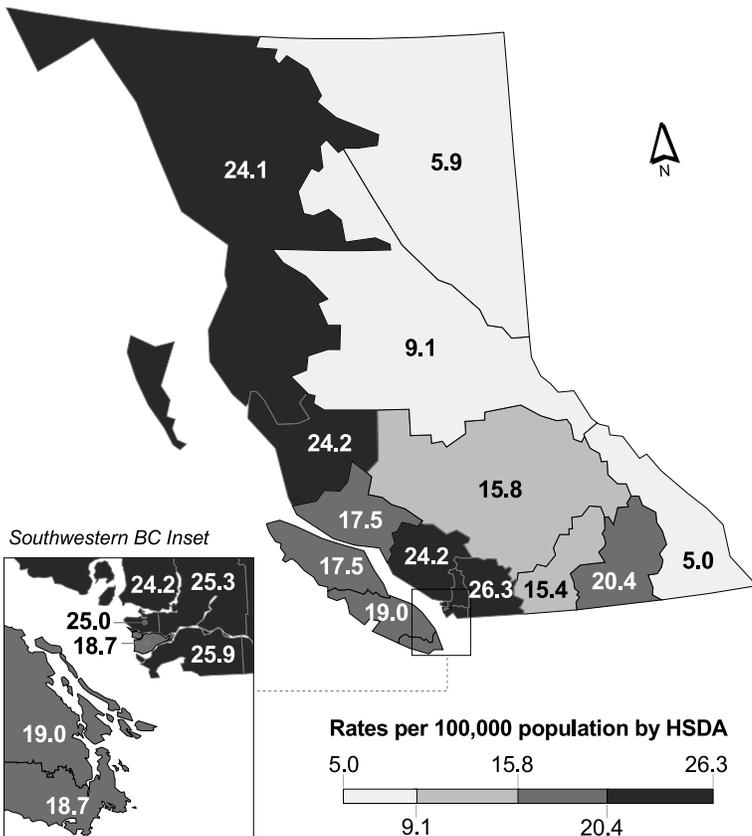
### 29.3 Paratyphoid Fever Rates by Year, 2000-2009

Rate per 100,000 population



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
BC Paratyphoid Fever Reports	8	22	24	25	21	36	52	22	30	33
BC Paratyphoid Fever Rate	0.2	0.5	0.6	0.6	0.5	0.9	1.2	0.5	0.7	0.7

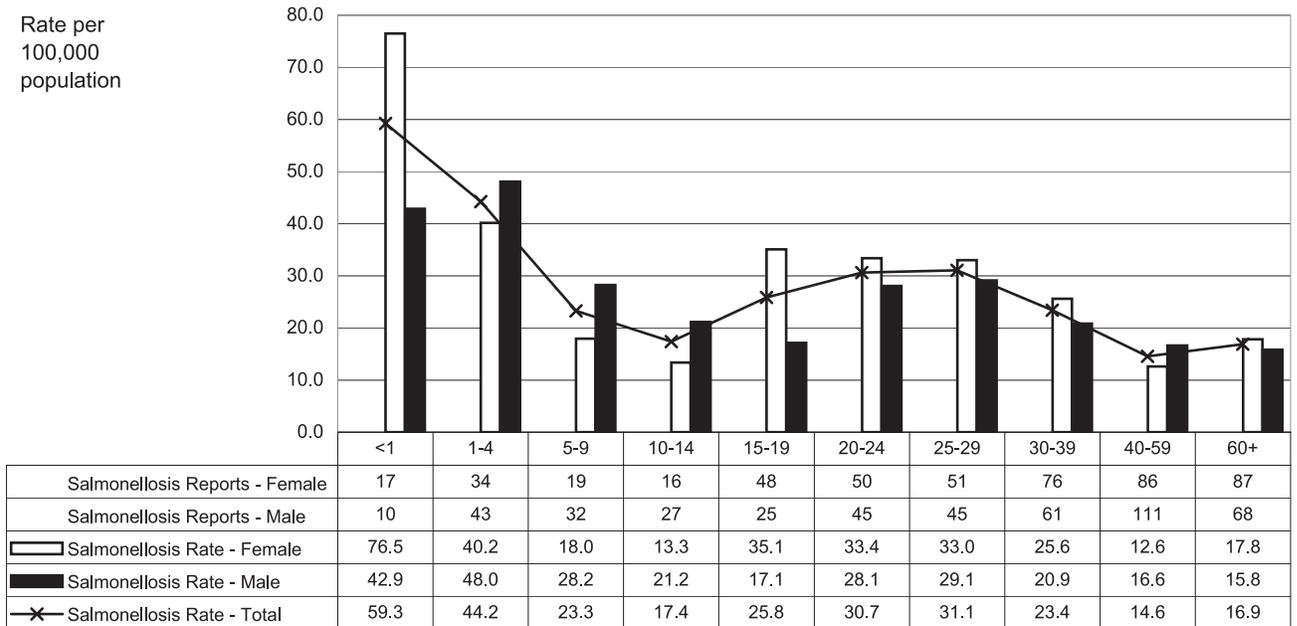
### 29.4 Salmonellosis Rates by HSDA, 2009



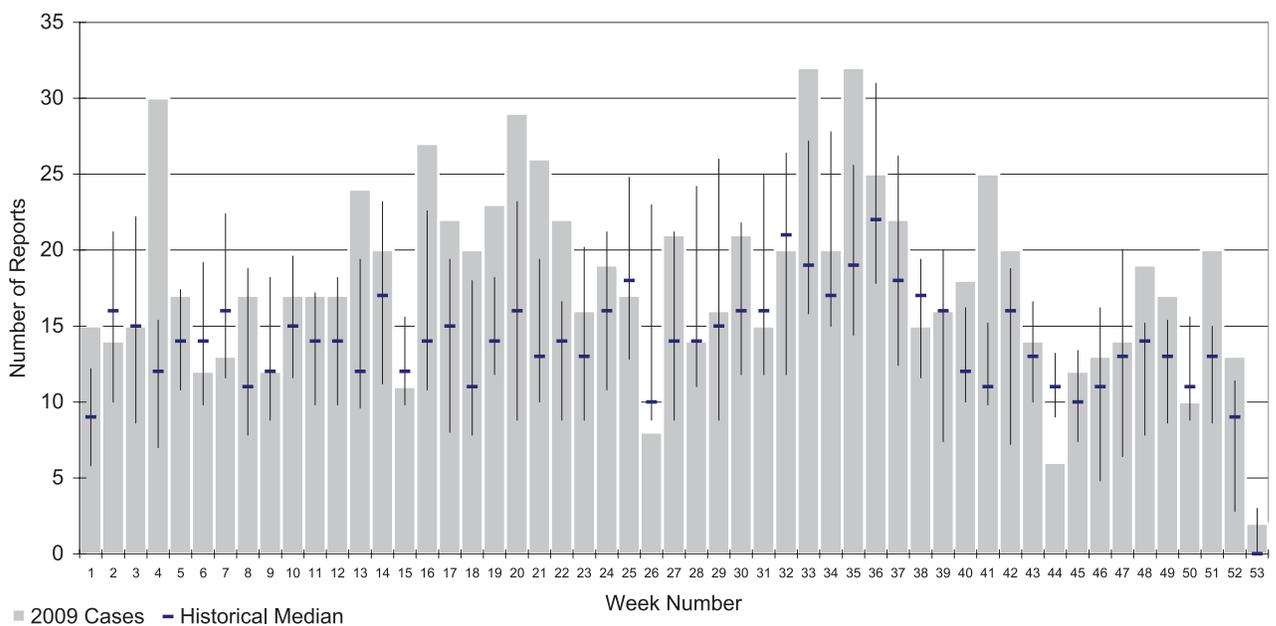
HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	4	5.0
12	Kootenay Boundary	16	20.4
13	Okanagan	54	15.4
14	Thompson Cariboo Shuswap	35	15.8
21	Fraser East	74	26.3
22	Fraser North	151	25.3
23	Fraser South	180	25.9
31	Richmond	36	18.7
32	Vancouver	160	25.0
33	North Shore/Coast Garibaldi	67	24.2
41	South Vancouver Island	69	18.7
42	Central Vancouver Island	50	19.0
43	North Vancouver Island	21	17.5
51	Northwest	18	24.1
52	Northern Interior	13	9.1
53	Northeast	4	5.9

Note: Map classification by Jenks natural breaks method.

## 29.5 Salmonellosis Rates by Age Group and Sex, 2009



## 29.6 2009 Salmonellosis Reports Compared to Historical Median and the 10th and 90th Percentiles Around the Median (2000-2008)



## 29.7 *Salmonella* serotype distribution, 2009

Rank	Species	Number of Cases	Proportion
1	Enteritidis	456	45.0%
2	Typhimurium	96	9.5%
3	Typhi	41	4.0%
4	<i>Salmonella</i> ssp   4,5,12:i-	41	4.0%
5	Heidelberg	39	3.8%
6	Paratyphi A	32	3.2%
7	Paratyphi B var. Java	23	2.3%
8	Saintpaul	20	2.0%
8	Newport	17	1.7%
10	Weltevreden	15	1.5%
	Others	234	23.0%
	Total	1014	100.0%

Note: Species distribution is based on the BCCDC Public Health and Microbiology Reference Laboratory data. Numbers may vary from those reported in iPHIS.

# Shigellosis

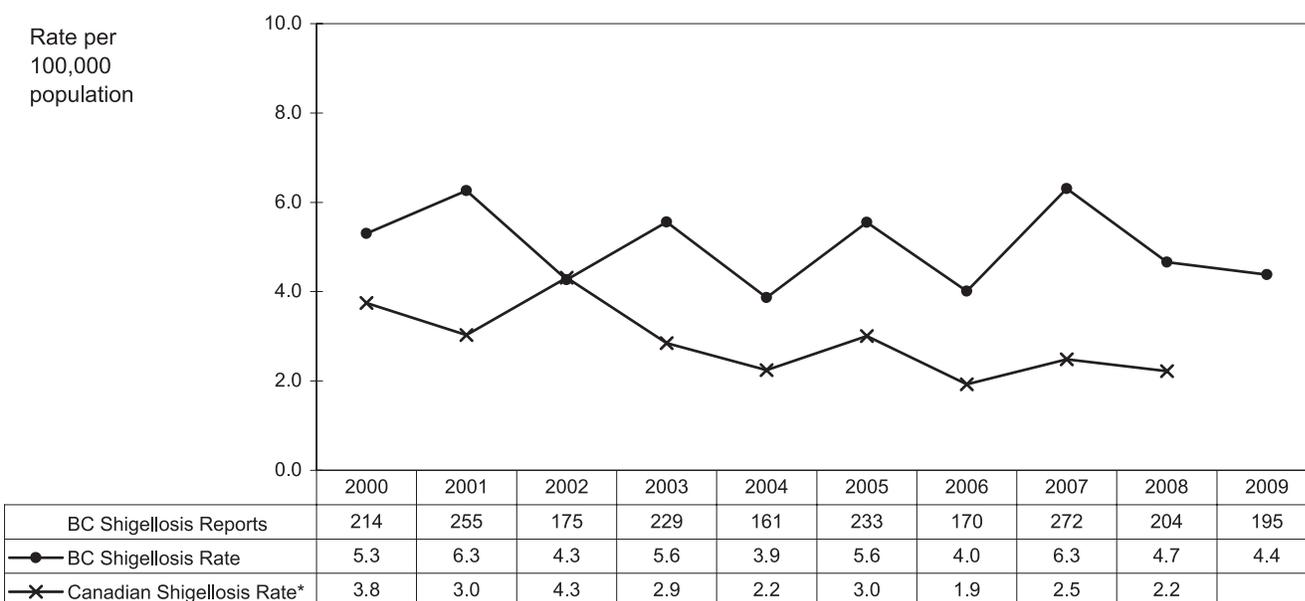
In 2009, the annual incidence (4.4/100,000) remained similar to 2008. Annual shigellosis incidence in the province has fluctuated between 4-6 cases/100,000 population over the last ten years. Fifty-four per cent were associated with international travel. The highest incidence rate was among females between 25 and 29 years of age (9.1/100,000).

Among males, the incidence rate was highest among those aged less than 1 year and 40-59 years. An outbreak of *S. flexneri* var. 1 infection among the MSM population occurred in Vancouver Coastal Health Authority and Fraser Health Authority in the spring of 2009. This likely explains the

higher rates in adult males and the Vancouver HSDA. These cluster and travel-related cases explain the above expected number of cases reported between weeks 13 and 18. The reason for the high incidence in females aged 25 to 29 years is unknown.

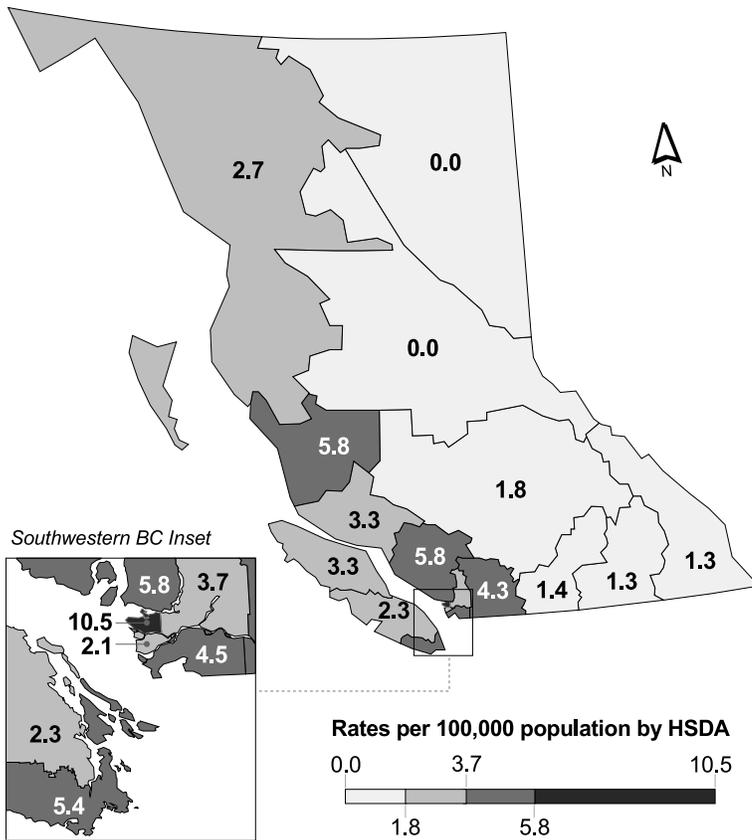
*S. flexneri* was the most common species reported in 2009. This is a change from previous years when *S. sonnei* accounted for the majority of isolates reported. This change is likely due to the cluster of cases among MSM.

## 30.1 Shigellosis Rates by Year, 2000-2009



\*Please see Sources and Explanatory Remarks, Section 11 on Page 123 in regard to the national rate

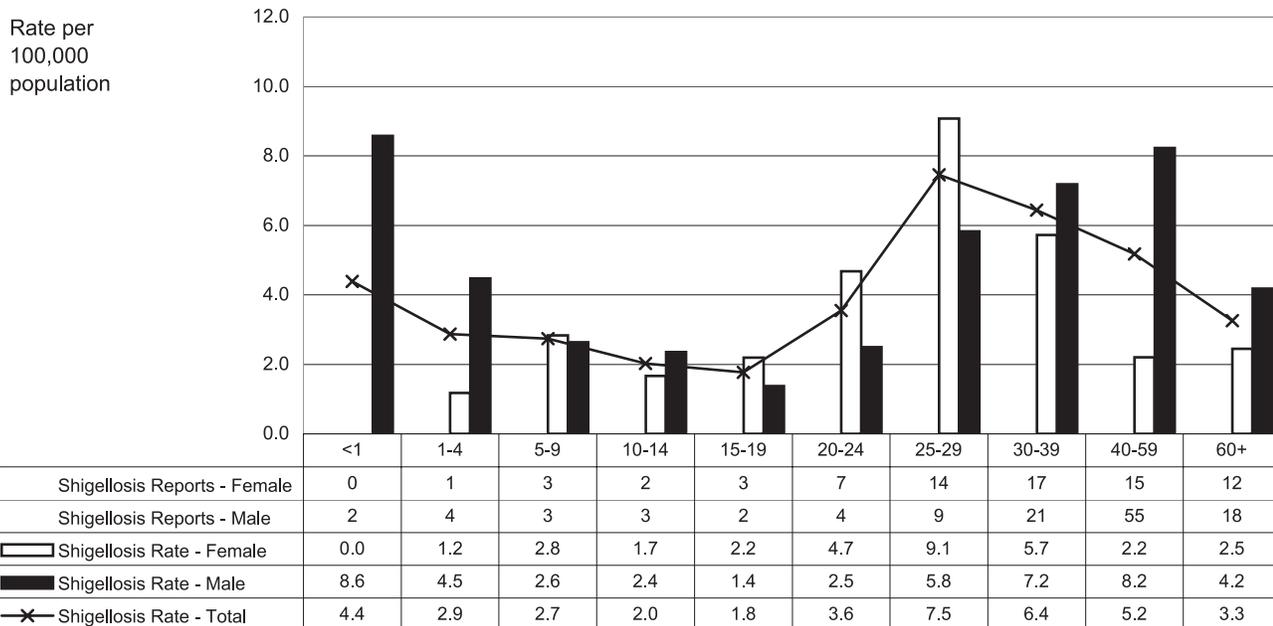
### 30.2 Shigellosis Rates by HSDA, 2009



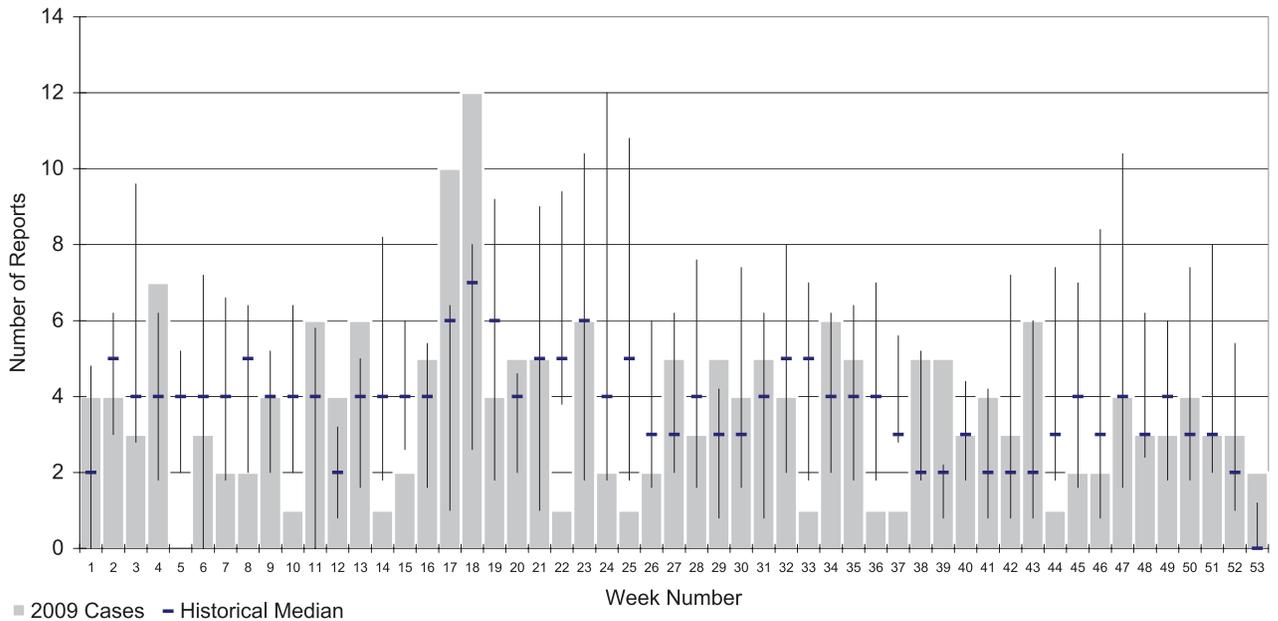
HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	1	1.3
12	Kootenay Boundary	1	1.3
13	Okanagan	5	1.4
14	Thompson Cariboo Shuswap	4	1.8
21	Fraser East	12	4.3
22	Fraser North	22	3.7
23	Fraser South	31	4.5
31	Richmond	4	2.1
32	Vancouver	67	10.5
33	North Shore/Coast Garibaldi	16	5.8
41	South Vancouver Island	20	5.4
42	Central Vancouver Island	6	2.3
43	North Vancouver Island	4	3.3
51	Northwest	2	2.7
52	Northern Interior	0	0.0
53	Northeast	0	0.0

Note: Map classification by Jenks natural breaks method.

### 30.3 Shigellosis Rates by Age Group and Sex, 2009



### 30.4 2009 Shigellosis Reports Compared to Historical Median and the 10th and 90th Percentiles Around the Median (2000 to 2008)



### 30.5 *Shigella* species distribution, 2009

Rank	Species	Number of Cases	Proportion
1	<i>flexneri</i>	95	55.6%
2	<i>sonnei</i>	67	39.2%
3	<i>dysenteriae</i>	5	2.9%
4	<i>boydii</i>	3	1.7%
	Other/unknown	1	0.6%
	Total	171	100.0%

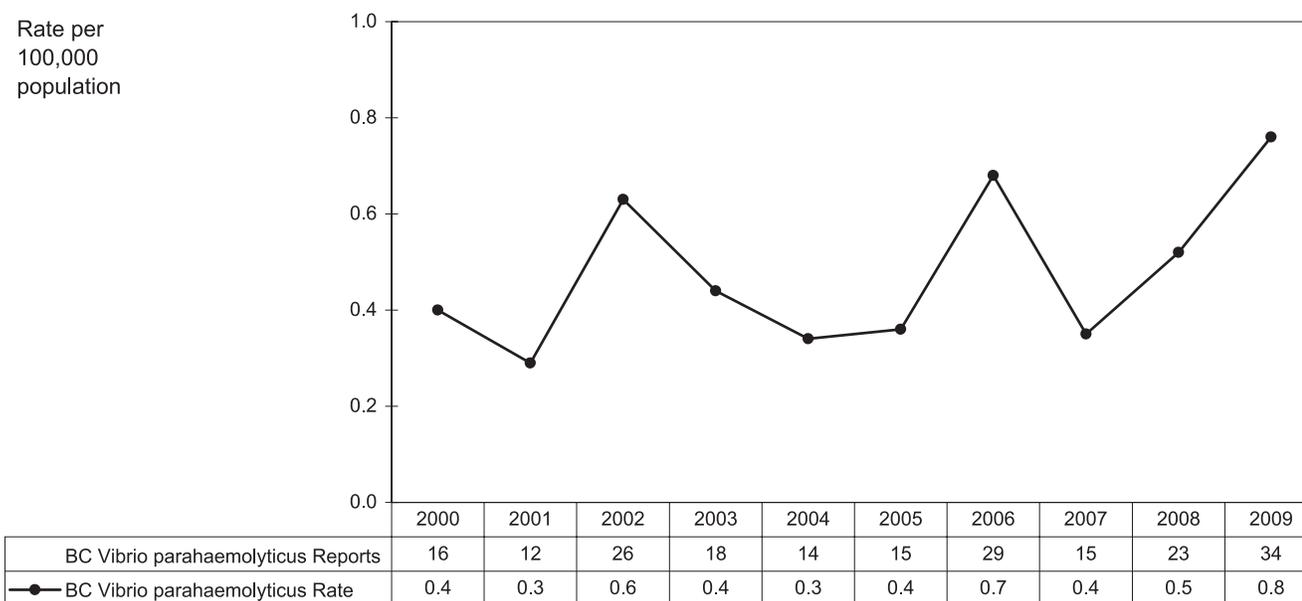
Note: Species distribution is based on BCCDC Public Health and Microbiology Reference Laboratory data. Numbers may vary from those reported in iPHIS.

# Vibrio parahaemolyticus

With 34 cases reported, 2009 had the highest incidence (0.8/100,000) of *V. parahaemolyticus* infection in the last 10 years. This was likely due to a particularly warm summer. Fourteen per cent of infections were associated with international travel. As per usual, cases occurred mostly in adult males. Cases were reported mostly from coastal

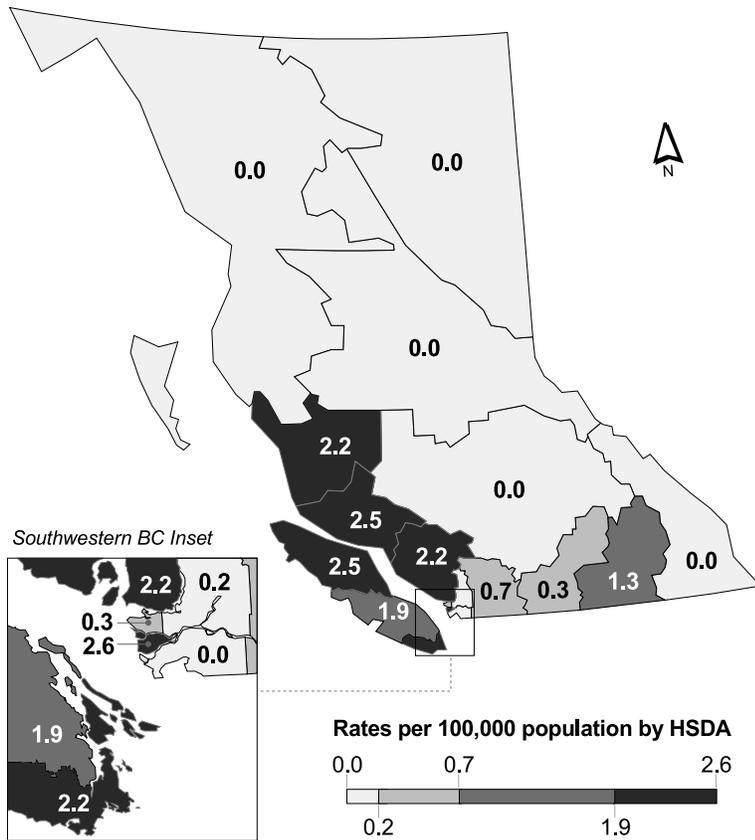
regions with the highest number of cases reported from Vancouver Island. Unusually low numbers were reported from Vancouver. The majority of cases were reported from weeks 24 to 36, consistent with the annual summer peak. *V. parahaemolyticus* infections in BC are mostly associated with consumption of raw or undercooked shellfish.

## 31.1 *Vibrio parahaemolyticus* Rates by Year, 2000-2009



Note: *Vibrio parahaemolyticus* has been notifiable nationally as of 2008.

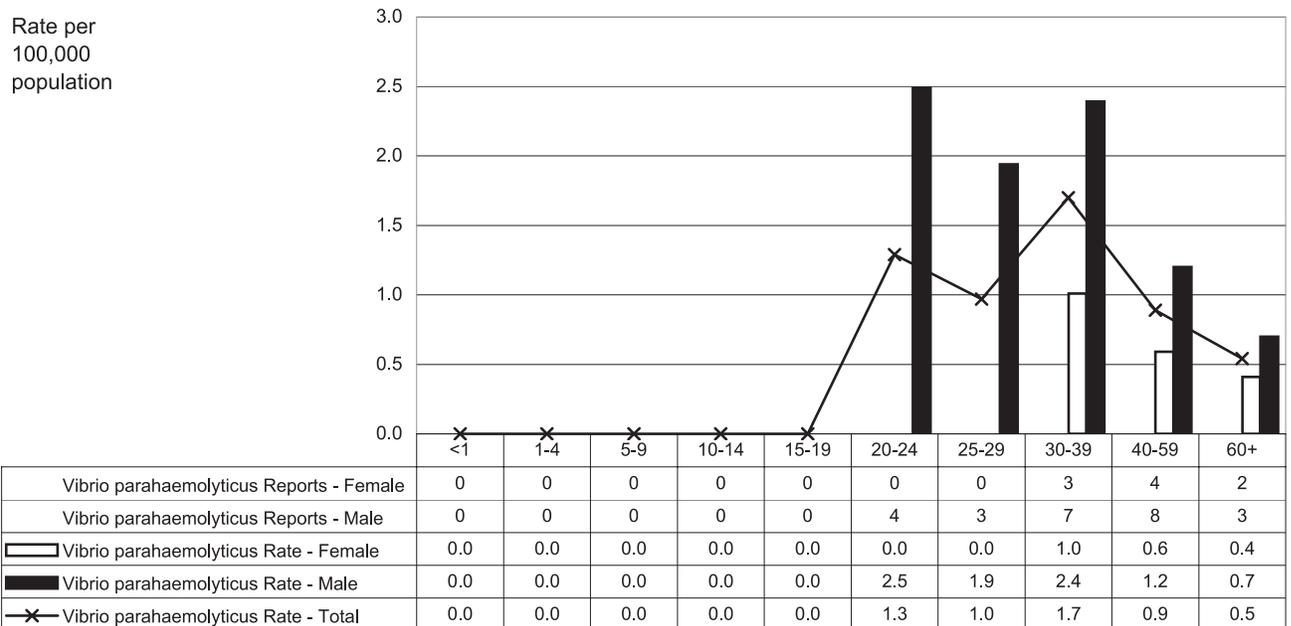
### 31.2 *Vibrio parahaemolyticus* Rates by HSDA, 2009



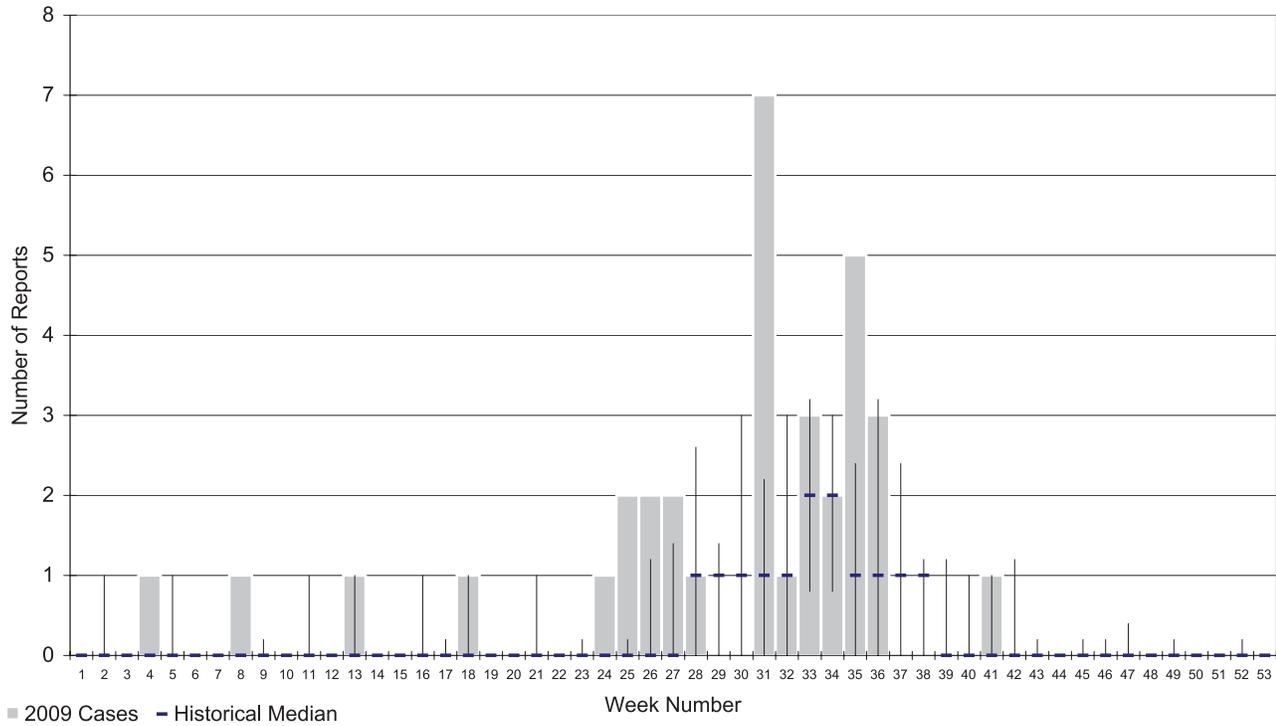
HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	0	0.0
12	Kootenay Boundary	1	1.3
13	Okanagan	1	0.3
14	Thompson Cariboo Shuswap	0	0.0
21	Fraser East	2	0.7
22	Fraser North	1	0.2
23	Fraser South	0	0.0
31	Richmond	5	2.6
32	Vancouver	2	0.3
33	North Shore/Coast Garibaldi	6	2.2
41	South Vancouver Island	8	2.2
42	Central Vancouver Island	5	1.9
43	North Vancouver Island	3	2.5
51	Northwest	0	0.0
52	Northern Interior	0	0.0
53	Northeast	0	0.0

Note: Map classification by Jenks natural breaks method.

### 31.3 *Vibrio parahaemolyticus* Rates by Age Group and Sex, 2009



**31.4 2009 *Vibrio parahaemolyticus* Reports Compared to Historical Median and the 10th and 90th Percentiles Around the Median (2000 to 2008)**

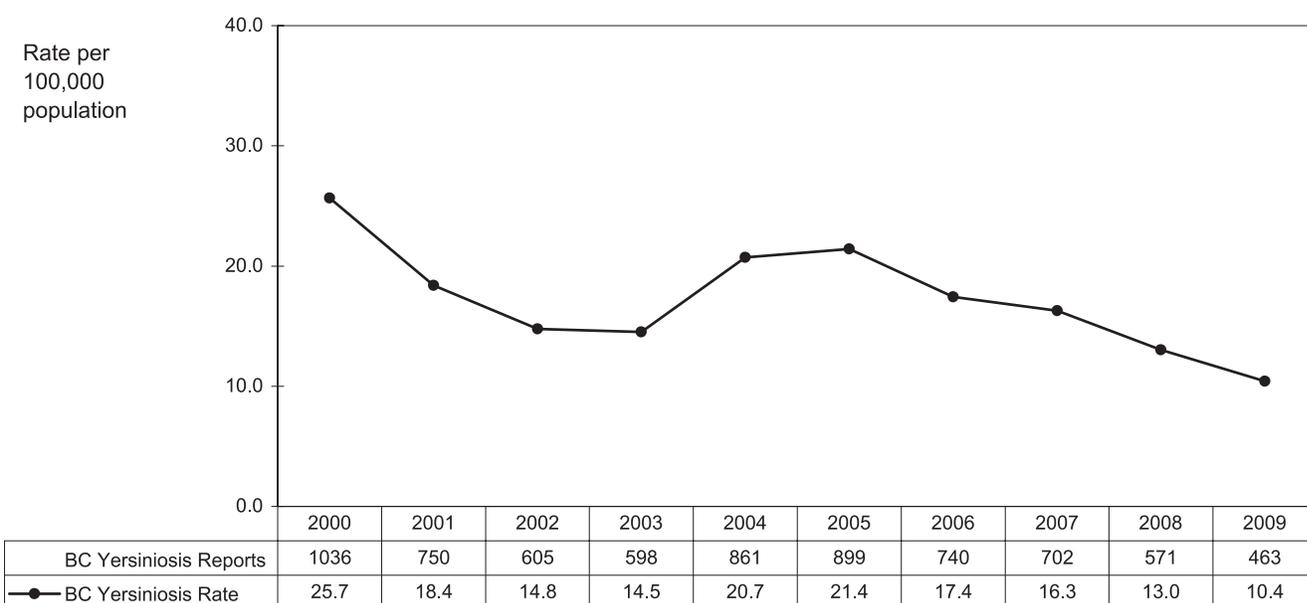


# Yersiniosis

In 2009, 463 cases of yersiniosis were reported. There has been a decreasing trend in incidence over the past four years. Incidence was highest in children less than five years and adults 25 years and older. The typical summer peak was

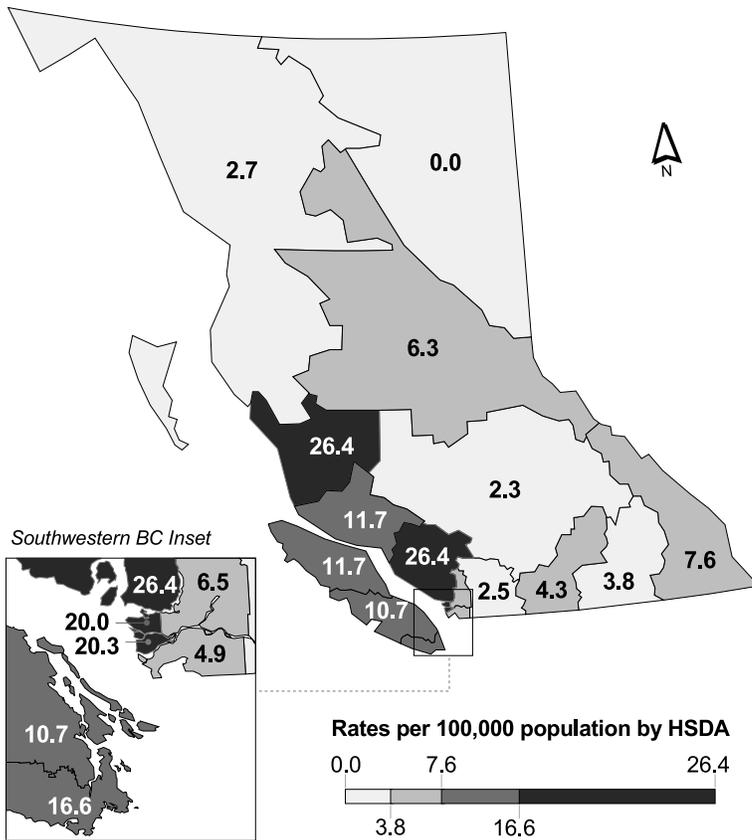
not observed in 2009. No outbreaks were reported. Like previous years, there was significant geographic variation with the highest rates reported from Vancouver Coastal and Vancouver Island Health Authorities.

## 32.1 Yersiniosis Rates by Year, 2000-2009



Note: Yersiniosis is not notifiable nationally

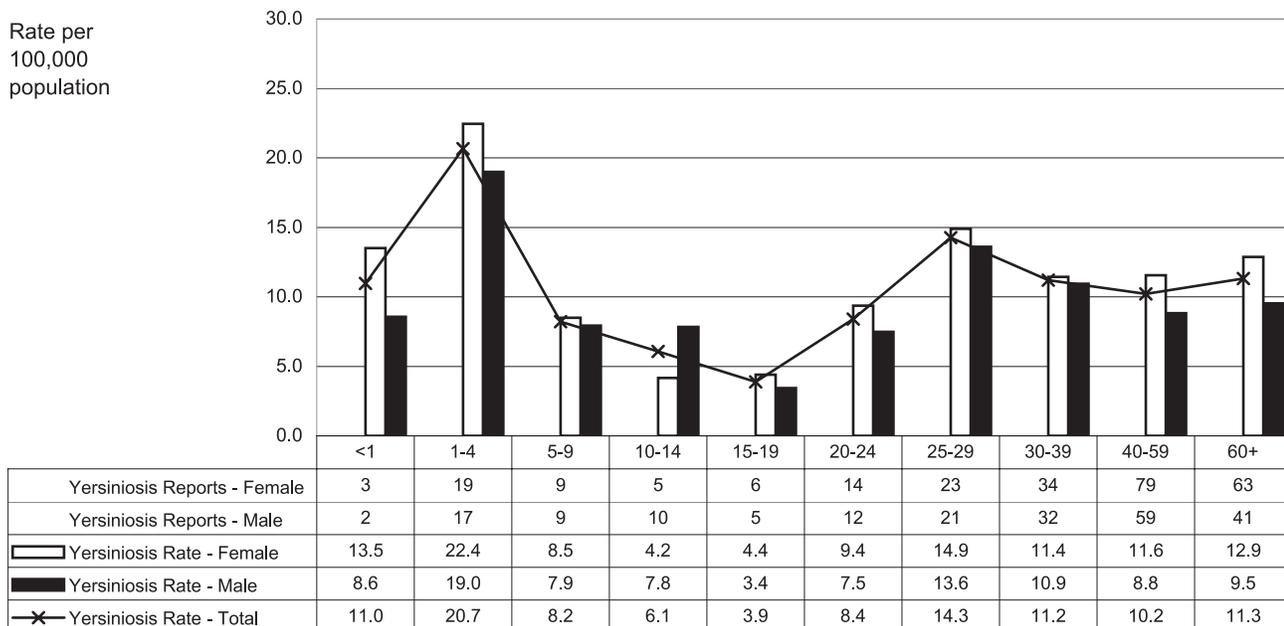
### 32.2 Yersiniosis Rates by HSDA, 2009



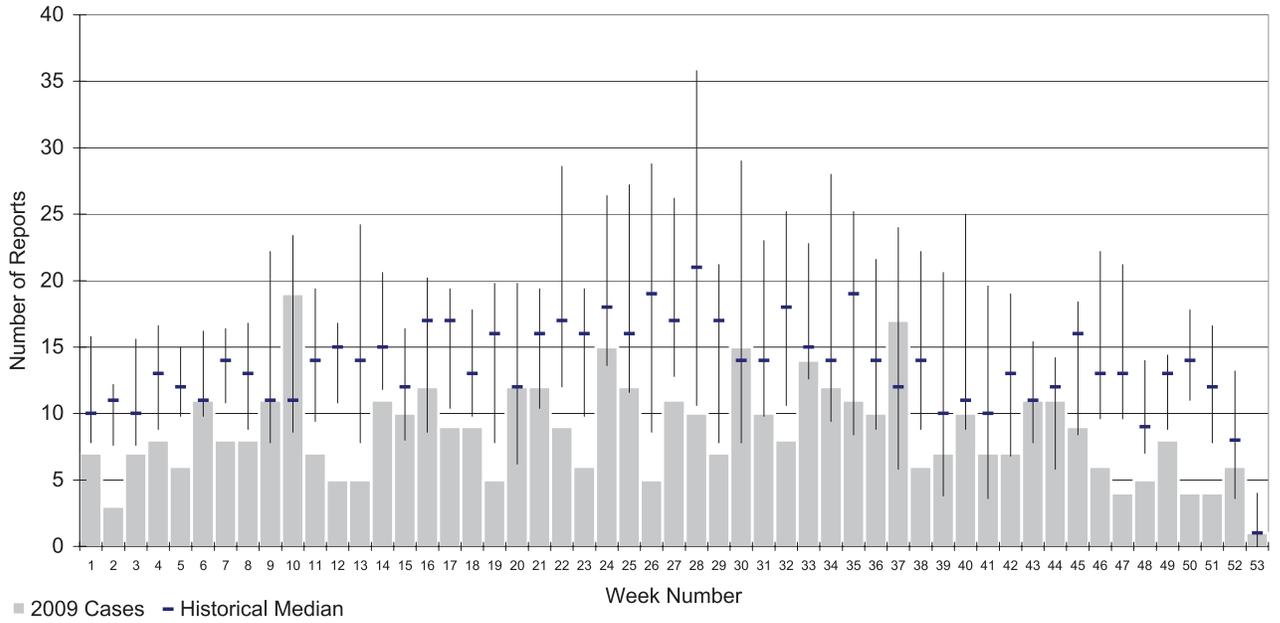
HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	6	7.6
12	Kootenay Boundary	3	3.8
13	Okanagan	15	4.3
14	Thompson Cariboo Shuswap	5	2.3
21	Fraser East	7	2.5
22	Fraser North	39	6.5
23	Fraser South	34	4.9
31	Richmond	39	20.3
32	Vancouver	128	20.0
33	North Shore/Coast Garibaldi	73	26.4
41	South Vancouver Island	61	16.6
42	Central Vancouver Island	28	10.7
43	North Vancouver Island	14	11.7
51	Northwest	2	2.7
52	Northern Interior	9	6.3
53	Northeast	0	0.0

Note: Map classification by Jenks natural breaks method.

### 32.3 Yersiniosis Rates by Age Group and Sex, 2009



**32.4 2009 Yersiniosis Reports Compared to Historical Median and the 10th and 90th Percentiles Around the Median (2000 to 2008)**

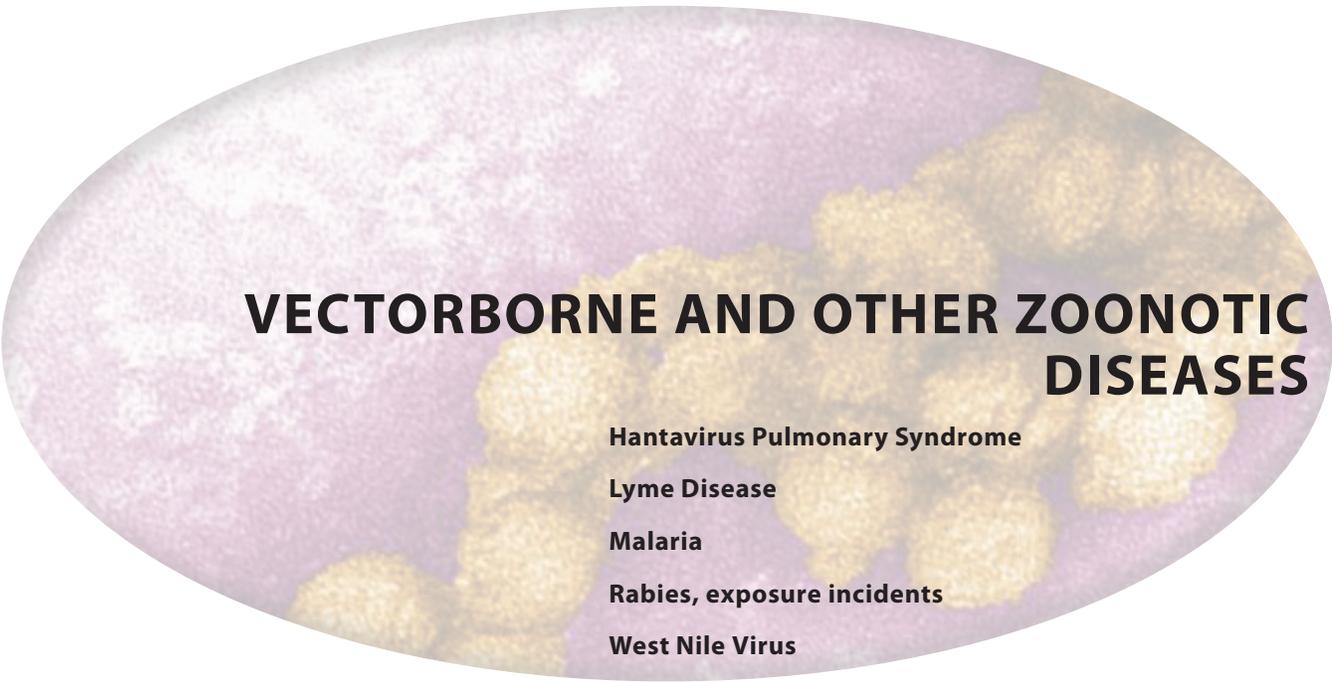


## Outbreaks of Gastroenteritis

In August 2008 a national web-enabled outbreak reporting tool was launched in BC. The objective of surveillance of enteric outbreaks in BC is to describe and understand trends in outbreaks (e.g. organism, setting, route of transmission, source), and to evaluate effectiveness of outbreak control measures. Between January 1 and December 31, 2009, 80 enteric outbreaks were reported. Thirty-five were reported from IHA, 30 from VIHA, 10 from FHA, and 5 from NHA. Sixty-eight (85%) were caused by a viral pathogen. Seventy-

one (89%) occurred in residential institutional facilities and five in food service establishments. Sixty-seven (84%) were transmitted through person to person contact. Contact with cases and infected food handlers were the most common factors contributing to an outbreak. Sanitizing the facility, cohorting cases, excluding ill staff and restricting admissions and transfers were the most common interventions used. There remains important underreporting of enteric outbreaks through this system in these early stages.





# **VECTORBORNE AND OTHER ZOOONOTIC DISEASES**

**Hantavirus Pulmonary Syndrome**

**Lyme Disease**

**Malaria**

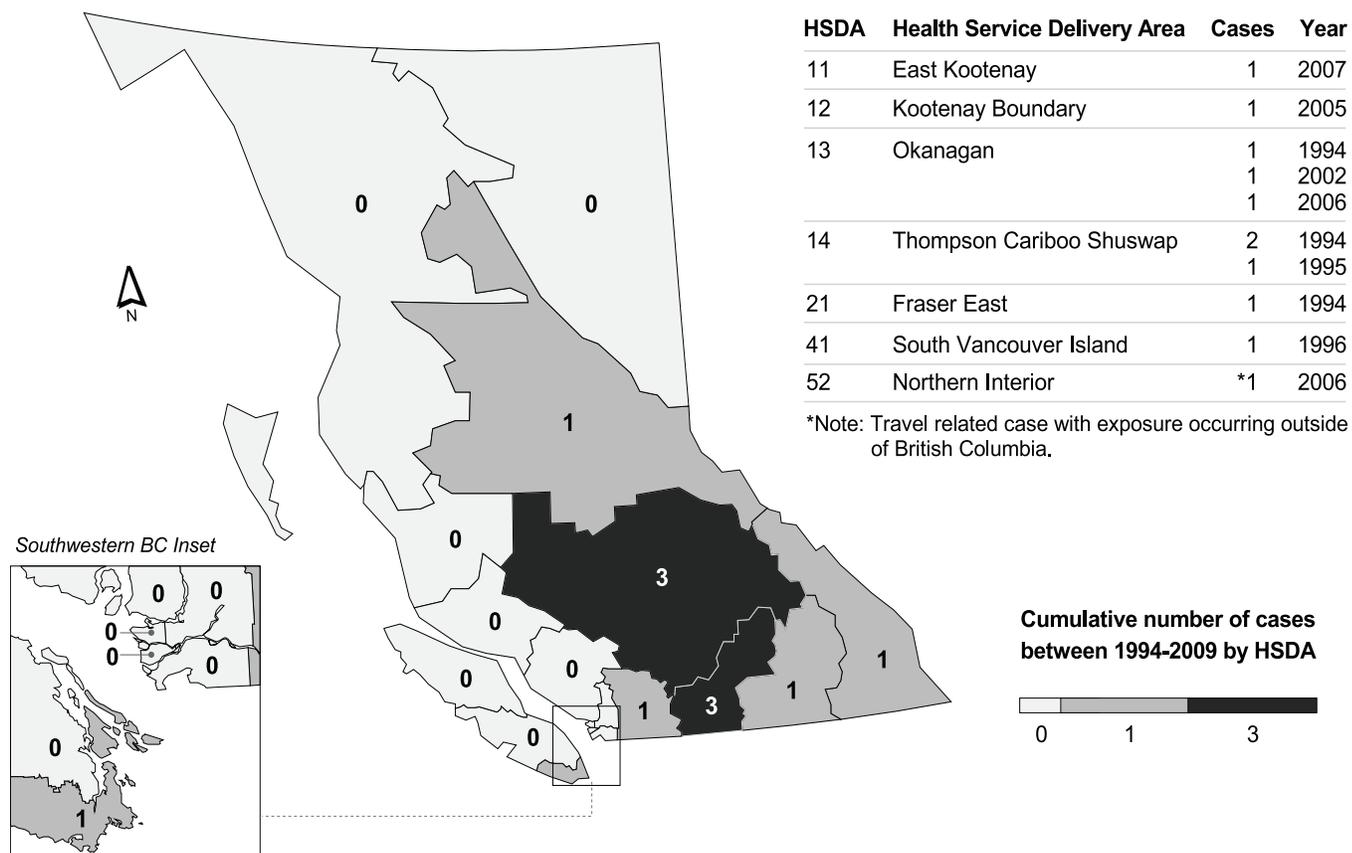
**Rabies, exposure incidents**

**West Nile Virus**

# Hantavirus pulmonary syndrome

There were no cases of hantavirus pulmonary syndrome reported in 2009.

## 33.1 Hantavirus pulmonary syndrome, cumulative number of cases by HSDA, 1994-2009

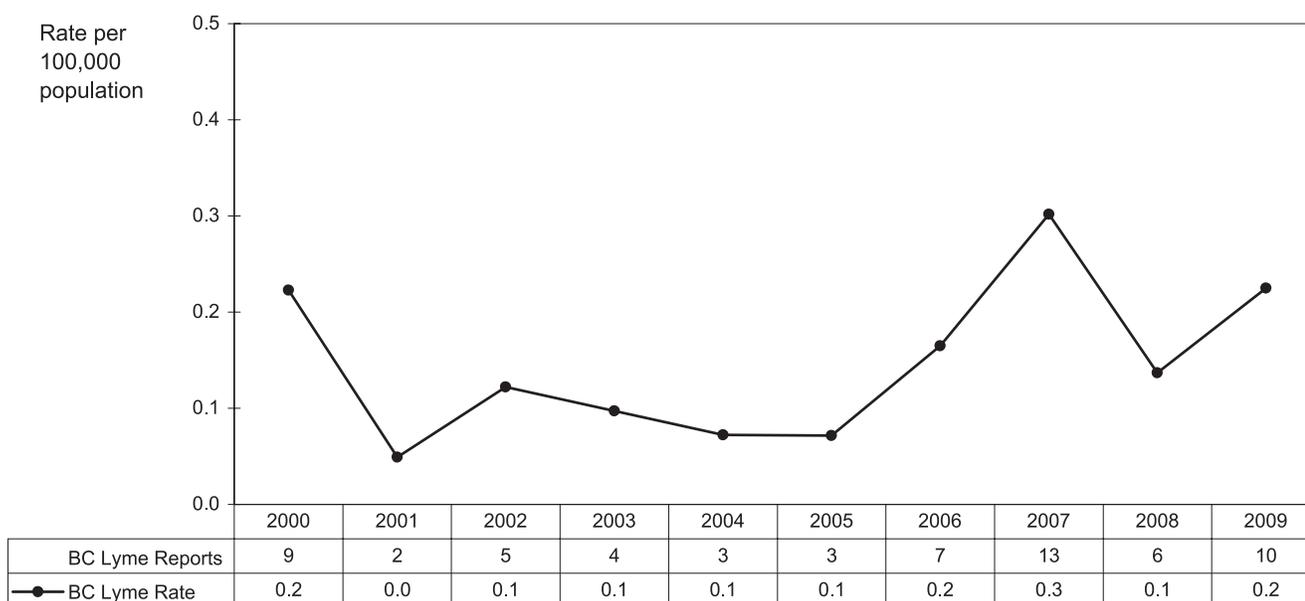


# Lyme Disease

BC continues to have a low endemic risk of Lyme Disease (LD). There were 10 cases of clinical or laboratory confirmed LD reported in BC in 2009. Four of these cases acquired their

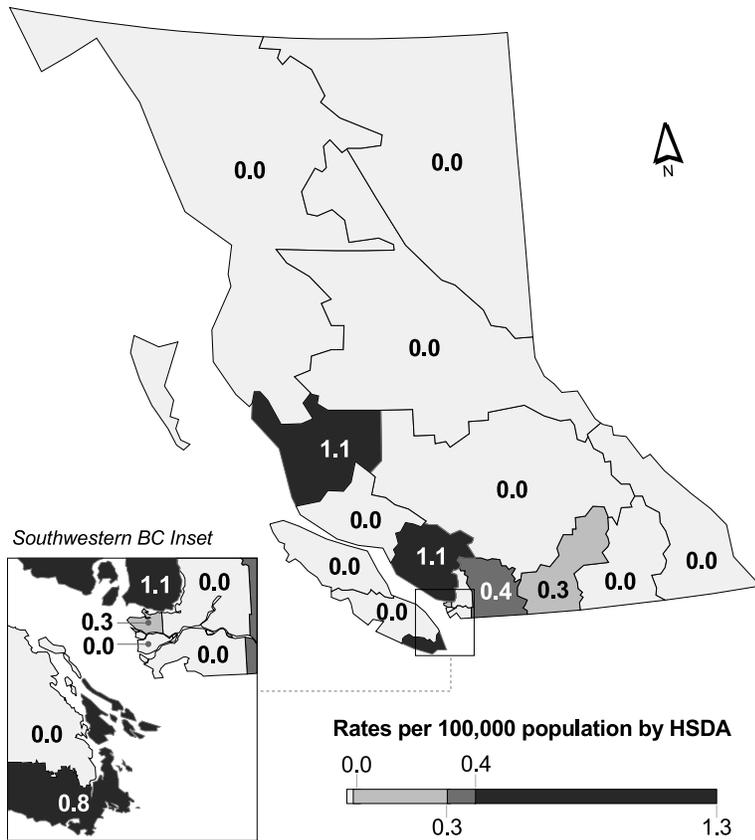
infection while travelling outside of BC to high endemic areas in the US and Europe.

## 34.1 Lyme Disease Rates by Year, 2000-2009



Note: Lyme Disease became nationally notifiable in 2009

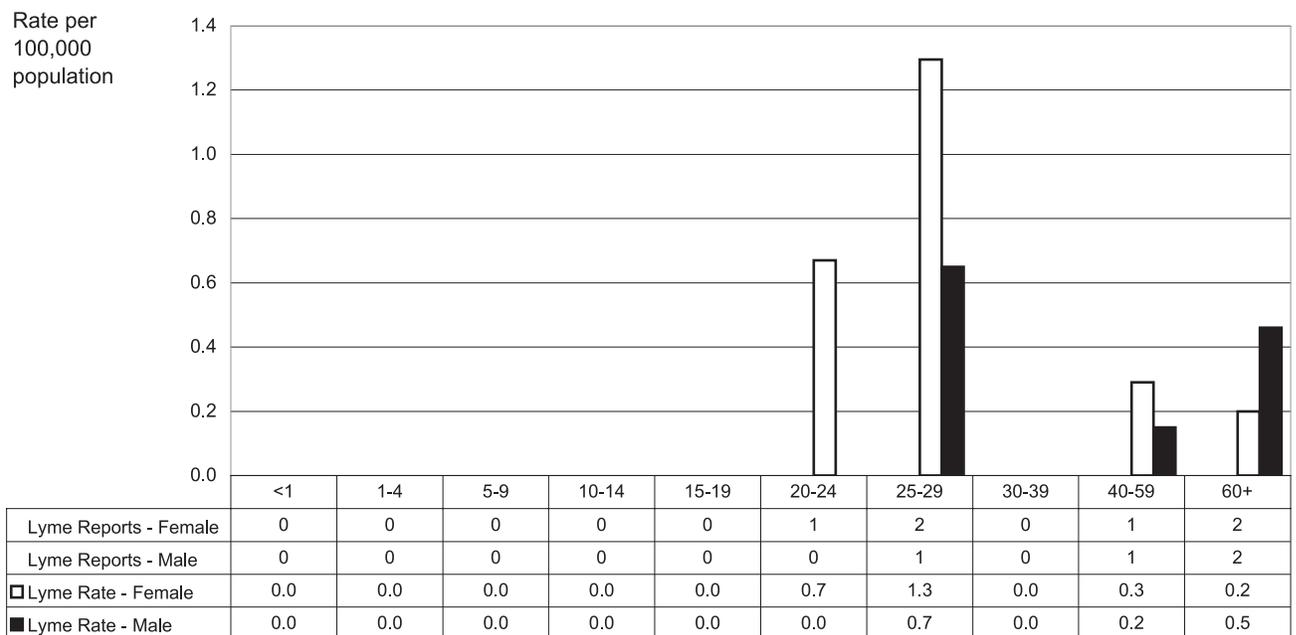
### 34.2 Lyme Disease Rates by HSDA, 2009



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	0	0.0
12	Kootenay Boundary	0	0.0
13	Okanagan	1	0.3
14	Thompson Cariboo Shuswap	0	0.0
21	Fraser East	1	0.4
22	Fraser North	0	0.0
23	Fraser South	0	0.0
31	Richmond	0	0.0
32	Vancouver	2	0.3
33	North Shore/Coast Garibaldi	3	1.1
41	South Vancouver Island	3	0.8
42	Central Vancouver Island	0	0.0
43	North Vancouver Island	0	0.0
51	Northwest	0	0.0
52	Northern Interior	0	0.0
53	Northeast	0	0.0

Note: Map classification by Jenks natural breaks method.

### 34.3 Lyme Disease Rates by Age Group and Sex, 2009

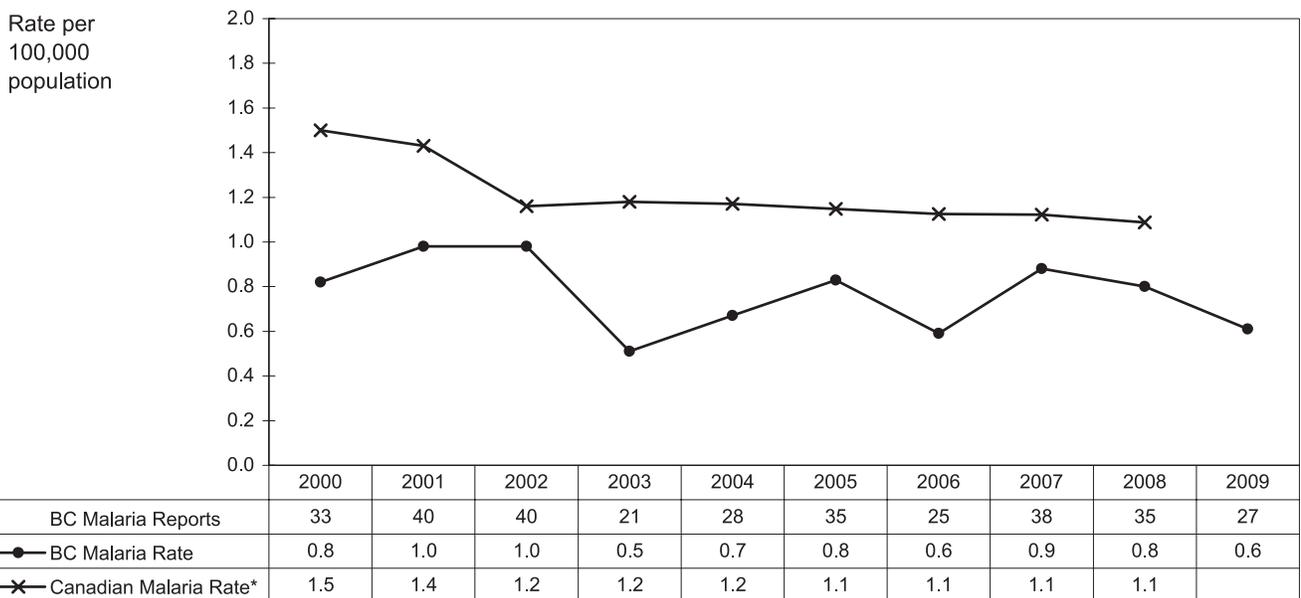


# Malaria

Malaria is not endemic in British Columbia. During 2009, we had 27 cases reported in BC for a rate of 0.6 per 100,000 population. Over the past few years, somewhat higher rates

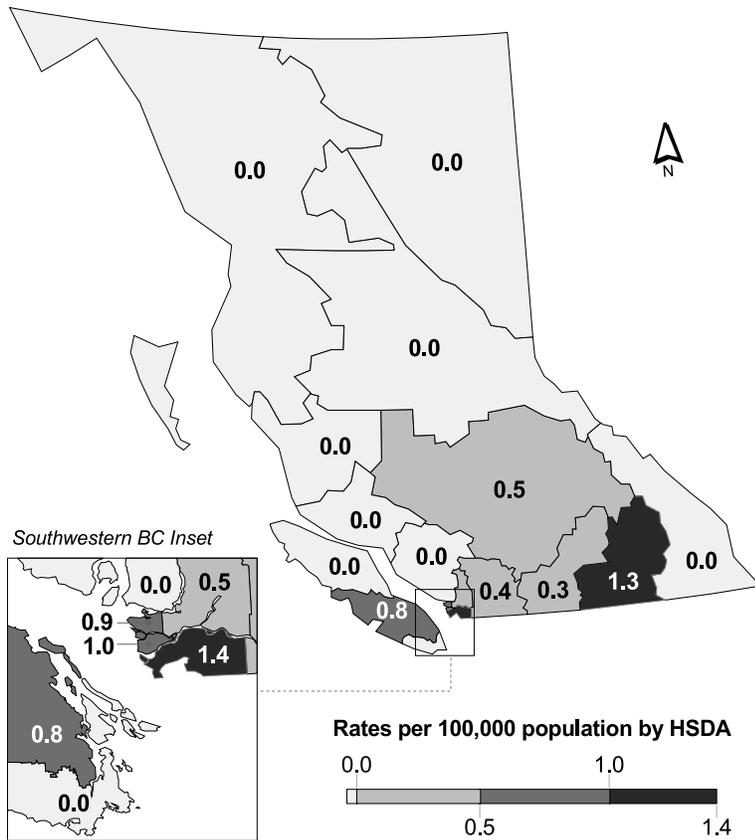
have been reported from Fraser South in keeping with a known pattern of frequent family visits to endemic areas.

## 35.1 Malaria Rates by Year, 2000-2009



\*Please see Sources and Explanatory Remarks, Section 11 on Page 123 in regard to the national rate

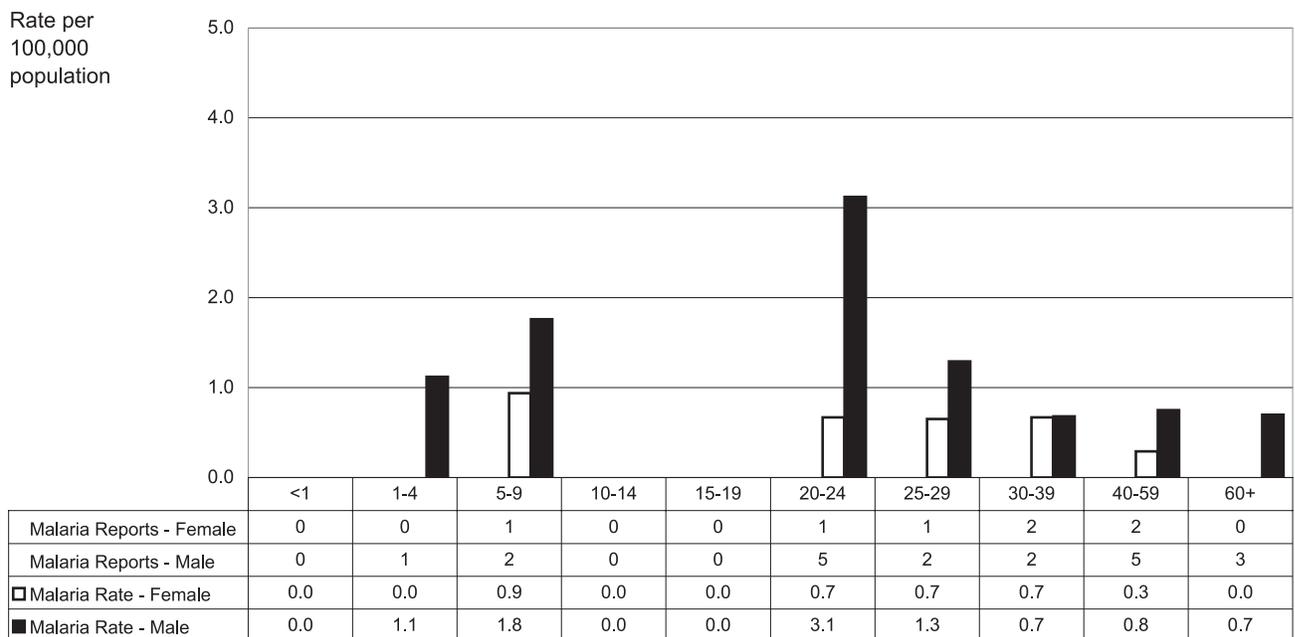
### 35.2 Malaria Rates by HSDA, 2009



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	0	0.0
12	Kootenay Boundary	1	1.3
13	Okanagan	1	0.3
14	Thompson Cariboo Shuswap	1	0.5
21	Fraser East	1	0.4
22	Fraser North	3	0.5
23	Fraser South	10	1.4
31	Richmond	2	1.0
32	Vancouver	6	0.9
33	North Shore/Coast Garibaldi	0	0.0
41	South Vancouver Island	0	0.0
42	Central Vancouver Island	2	0.8
43	North Vancouver Island	0	0.0
51	Northwest	0	0.0
52	Northern Interior	0	0.0
53	Northeast	0	0.0

Note: Map classification by Jenks natural breaks method.

### 35.3 Malaria Rates by Age Group and Sex, 2009



# Rabies

The term “exposure” denotes a report of an animal exposure which presents a risk of rabies infection. One report represents an individual incident that was reported to a BC Health Authority. Several individuals exposed to one animal would result in several incident reports.

From 2008 to 2009, the rate of reported rabies exposures decreased from 5.5 to 3.8 per 100,000 (from 240 exposures to 167 exposures). One hundred forty-three of the exposures in 2009 required rabies post-exposure prophylaxis [RPEP]. The incidence of exposure in both sexes and nearly all age groups decreased significantly from 2008 to 2009. The exposure rate for the 15-19 year old age group continued to be the highest, at 6.0 per 100,000. There was a significant drop in the exposure rate for the 10-14 year old age group, from 6.4 per 100,000 in 2008 to 3.2 per 100,000 in 2009. Fraser Health Authority had the greatest number of exposure reports at 52. Although a relatively high number of exposures were recorded for the Okanagan area, this includes some exposures that occurred in other parts of Interior Health.

Most animal exposures occur over the warmer months when bats are active, but the fraction involving bats dropped

from 60% in 2008 to 46% in 2009. Of the bats submitted for testing, 9 were positive for rabies (CFIA, 2010). Dogs accounted for the second largest proportion at 31% of exposures; all but 2 of these exposures occurred in other countries.

In 2009, the majority of exposures was due to bites or handling of potentially rabid animals. No exposures requiring RPEP occurred due to a bat found in the bedroom or found nearby.

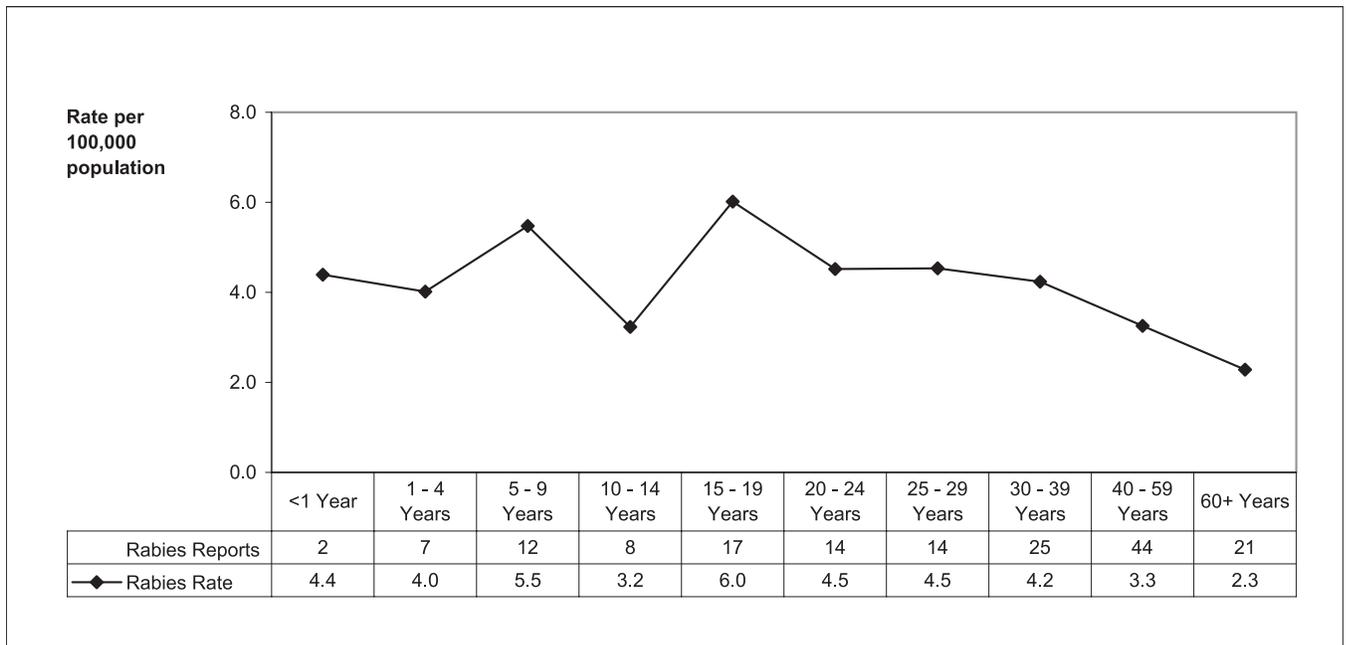
The decrease in incidence of exposure and the proportion associated with bats as well as the shift in types of exposures reported are probably due in large part to a change in RPEP policy. Effective August 2008, RPEP is no longer recommended in BC if a bat is found in a bedroom and there is no evidence of direct contact with the bat.

See the BC guidelines at <http://www.bccdc.ca/dis-cond/comm-manual/CDManualChap1.htm> and the National Advisory Committee on Immunization statement at <http://www.phac-aspc.gc.ca/publicat/ccdr-rmtc/09vol35/acs-dcc-7/index-eng.php>

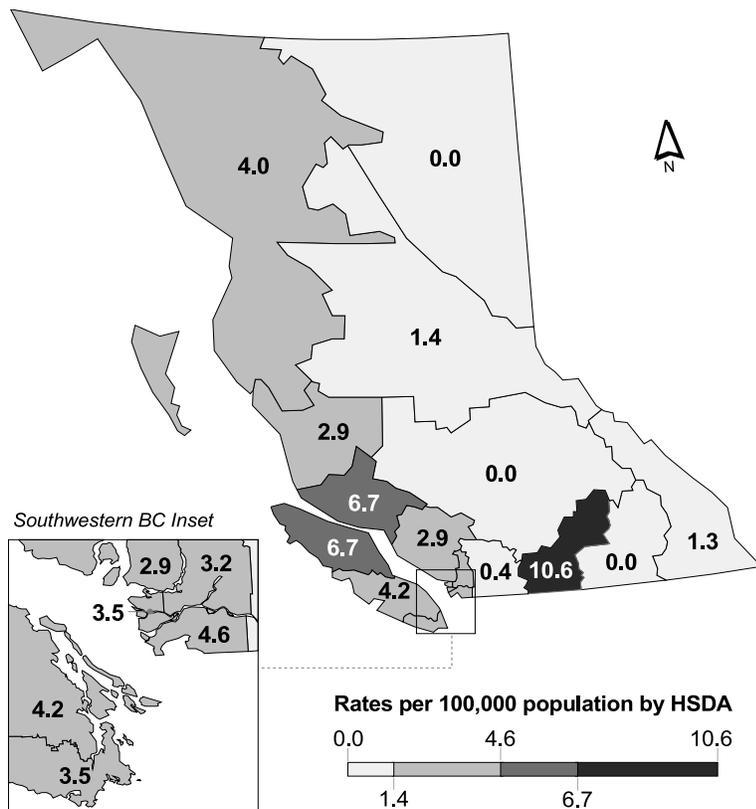
## 36.1 Rabies Exposure Incidents Reported to BC Health Authorities, 2008-2009

	# Exposures	Rate per 100,000
2007	387	9.0
2008	240	5.5
2009	167	3.8
TOTAL	794	6.1

### 36.2 Rabies Exposure Rates by Age Group, 2009



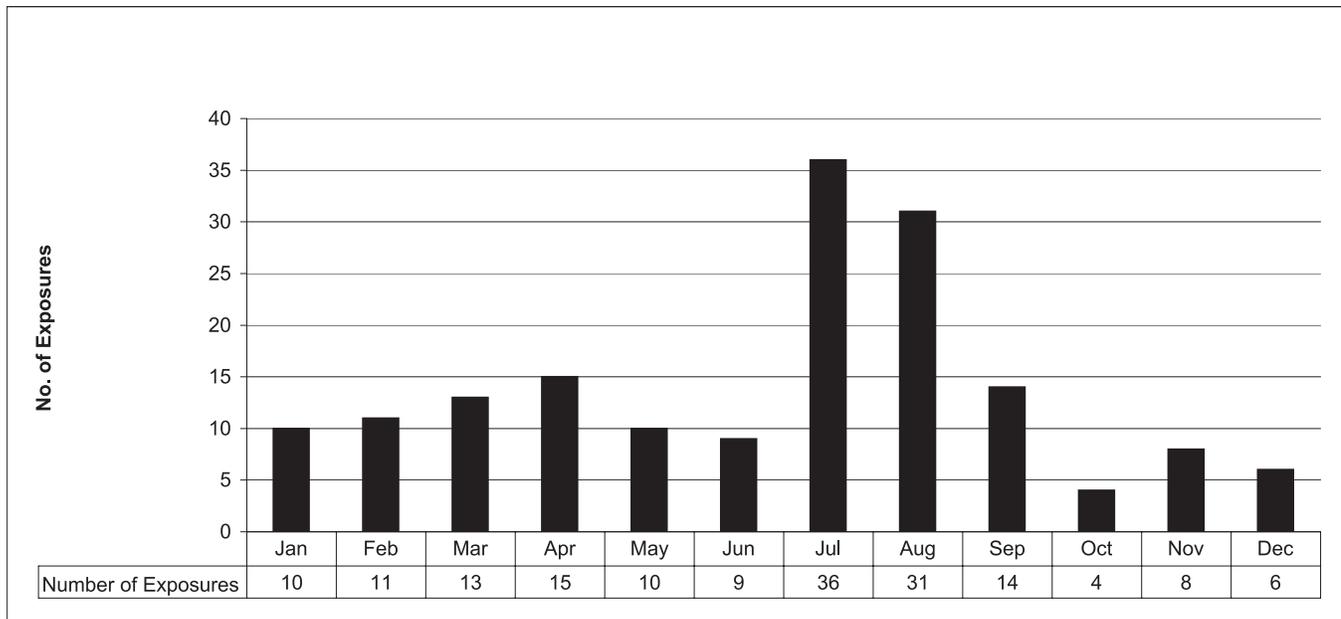
### 36.3 Rabies Exposure Rates by HSDA, 2009



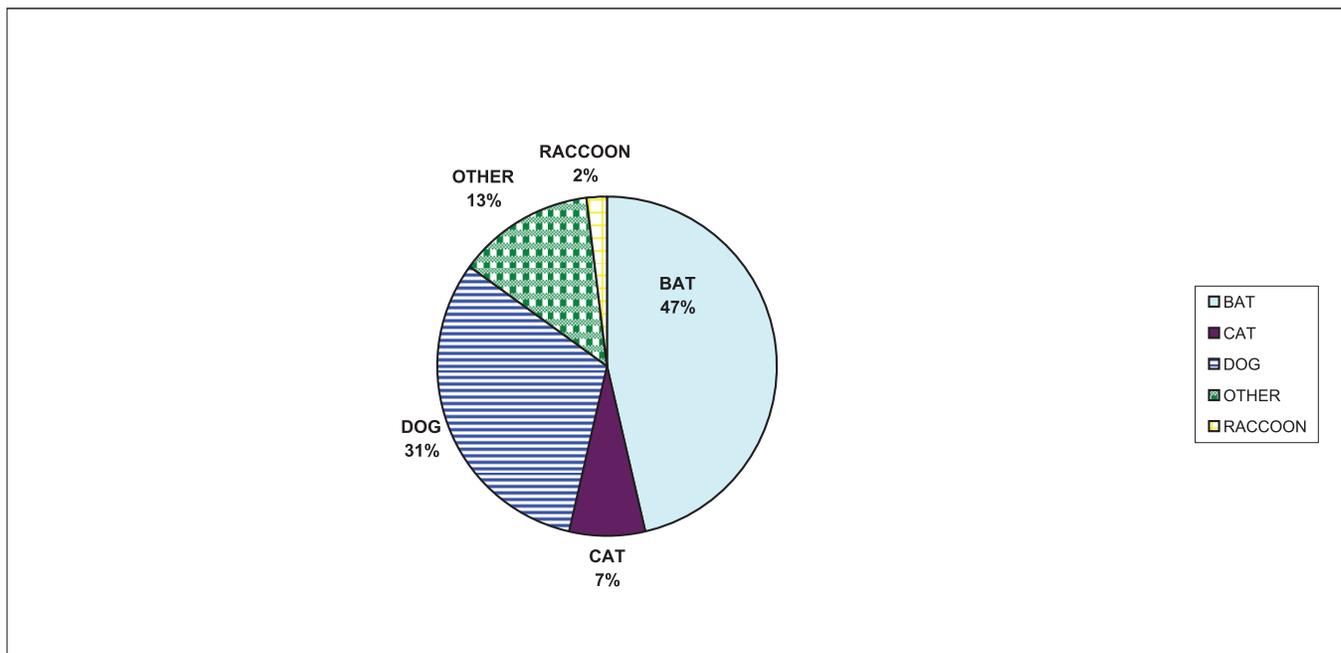
HSDA	Health Service Delivery Area	Exps.	Rate
11	East Kootenay	1	1.3
12	Kootenay Boundary	0	0.0
13	Okanagan	37	10.6
14	Thompson Cariboo Shuswap	0	0.0
21	Fraser East	1	0.4
22	Fraser North	19	3.2
23	Fraser South	32	4.6
31/32	Richmond/Vancouver	29	3.5
33	North Shore/Coast Garibaldi	8	2.9
41	South Vancouver Island	13	3.5
42	Central Vancouver Island	11	4.2
43	North Vancouver Island	8	6.7
51	Northwest	3	4.0
52	Northern Interior	2	1.4
53	Northeast	0	0.0

Note: Map classification by Jenks natural breaks method.

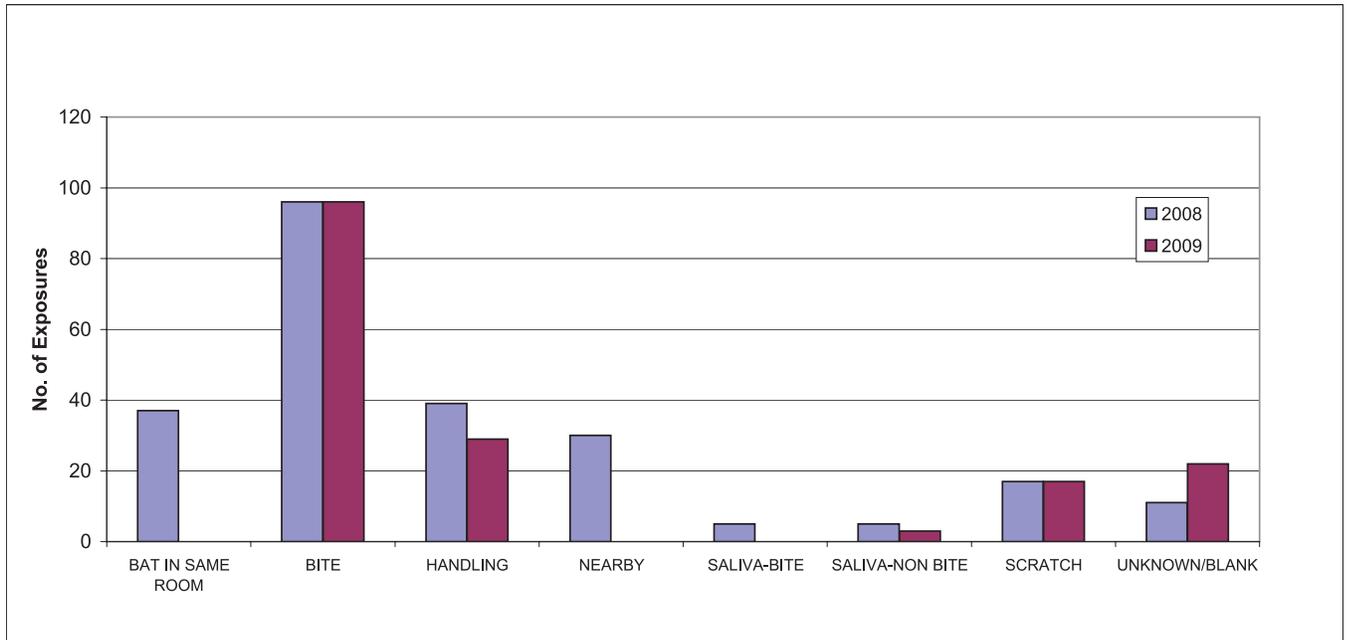
### 36.4 Rabies Exposure Incident by Month, 2009



### 36.5 Rabies Exposure Incidents by Percentage of Animal Species Involved, 2008



### 36.6 Rabies Exposure by Type of Exposure and Year, 2008-2009



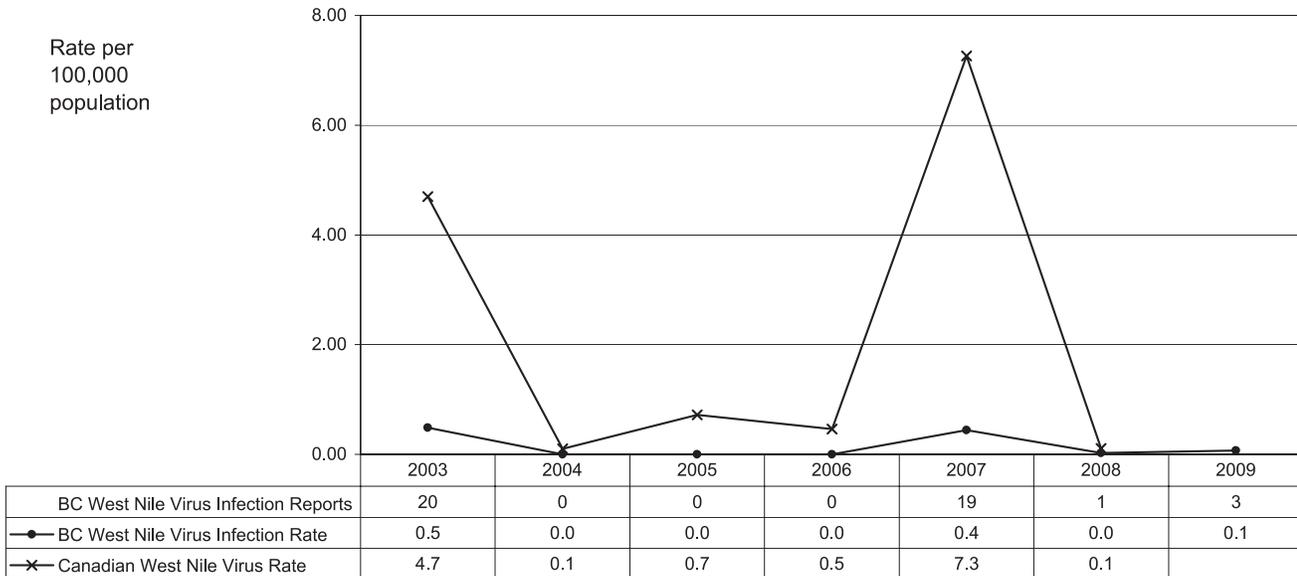
# West Nile Virus

Locally acquired WNV was detected for the first time in BC in 2009. Two cases reported non-neurological symptoms and acquired their infection in the South Okanagan. A third case of non-neurological syndrome was related to travel outside of BC. Ten mosquito pools of *Culex tarsalis* from traps placed in the South Okanagan tested positive for WNV. Three horses – 2 from the South Okanagan and 1 from the Fraser Valley also tested positive.

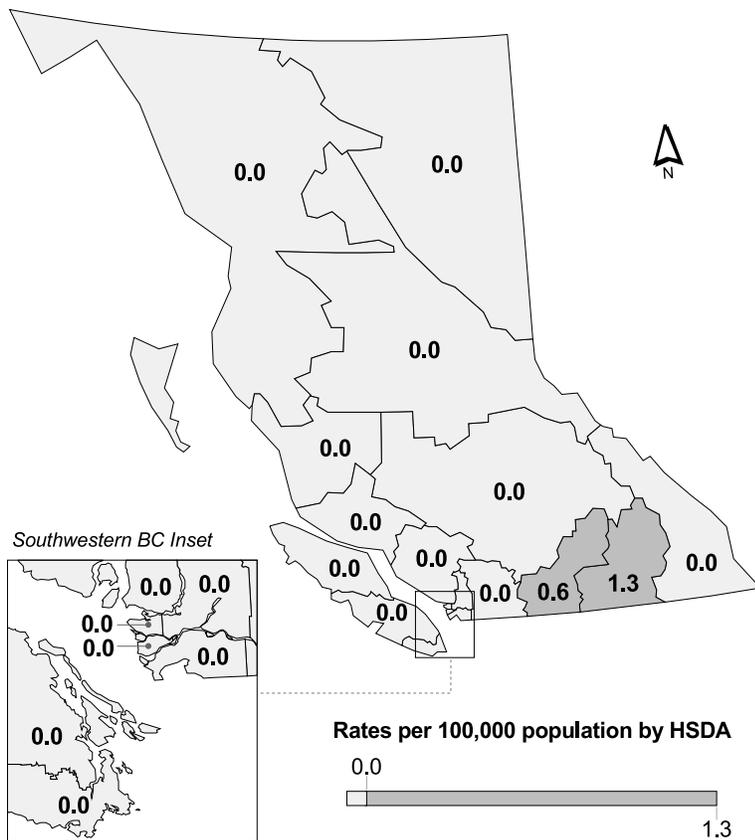
There were only 8 cases of WNV reported in Canada in 2009, and 515 cases reported in the US – 36 of those were in Washington State.

The 2009 BC West Nile Virus Surveillance Program Report is available at <http://www.bccdc.ca/resources/stats-res/default.htm#Stats>

### 37.1 West Nile Virus Infection Rates by Year, 2003-2009



### 37.2 West Nile Virus Infection Rates by HSDA, 2009



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	0	0.0
12	Kootenay Boundary	1	1.3
13	Okanagan	2	0.6
14	Thompson Cariboo Shuswap	0	0.0
21	Fraser East	0	0.0
22	Fraser North	0	0.0
23	Fraser South	0	0.0
31	Richmond	0	0.0
32	Vancouver	0	0.0
33	North Shore/Coast Garibaldi	0	0.0
41	South Vancouver Island	0	0.0
42	Central Vancouver Island	0	0.0
43	North Vancouver Island	0	0.0
51	Northwest	0	0.0
52	Northern Interior	0	0.0
53	Northeast	0	0.0

Note: Map classification by Jenks natural breaks method.

A microscopic image of Cryptococcus gattii, showing numerous small, round, pinkish-purple yeast cells with a distinct outer capsule. The cells are densely packed and scattered throughout the field of view. The background is a light, slightly granular texture.

# ENVIRONMENTAL FUNGI

*Cryptococcus gattii*

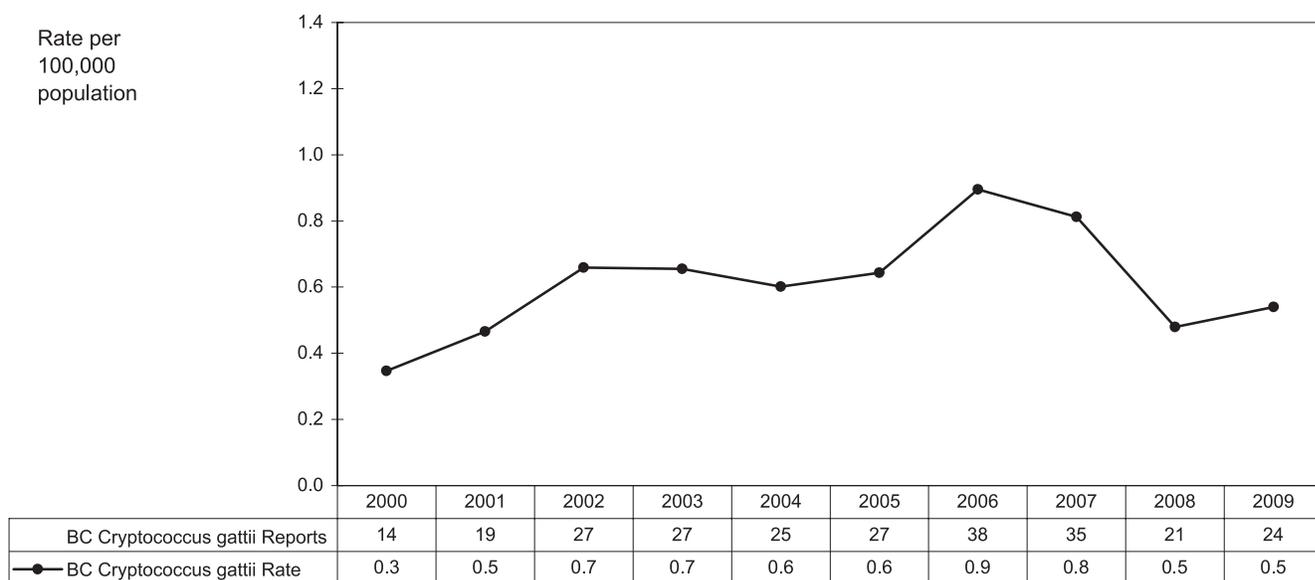
# Cryptococcus gattii

The numbers presented in this section are based on information generated through enhanced surveillance for *Cryptococcus gattii* infection.

In 2009, 24 cases of *C. gattii* infection were reported. The reason for the drop in incidence since 2008 is unclear but

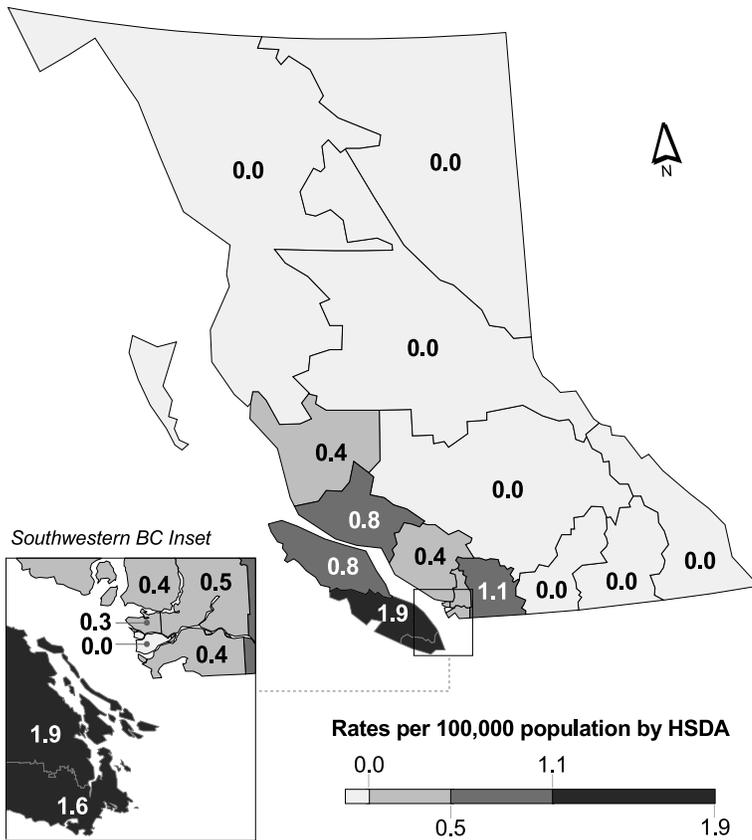
it may be associated with a change in diagnostic practices. As seen in previous years, all cases occurred in adults. The highest rates were reported from South and Central Vancouver Island. The number of cases and rates reported in Fraser Health Authority has been increasing over time, particularly in Fraser East.

## 38.1 *Cryptococcus gattii* Infection Rates by Year, 2000-2009



Note: Cryptococcal Infection became notifiable in BC in 2003

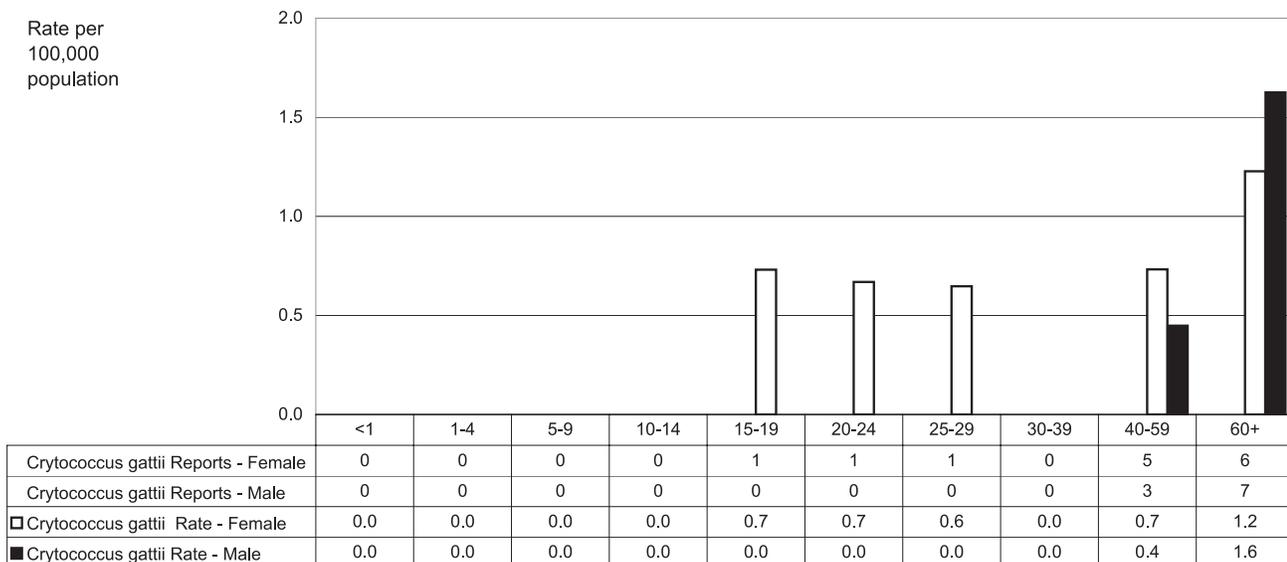
### 38.2 *Cryptococcus gattii* Infection Rates by HSDA, 2009



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	0	0.0
12	Kootenay Boundary	0	0.0
13	Okanagan	0	0.0
14	Thompson Cariboo Shuswap	0	0.0
21	Fraser East	3	1.1
22	Fraser North	3	0.5
23	Fraser South	3	0.4
31	Richmond	0	0.0
32	Vancouver	2	0.3
33	North Shore/Coast Garibaldi	1	0.4
41	South Vancouver Island	6	1.6
42	Central Vancouver Island	5	1.9
43	North Vancouver Island	1	0.8
51	Northwest	0	0.0
52	Northern Interior	0	0.0
53	Northeast	0	0.0

Note: Map classification by Jenks natural breaks method.

### 38.3 *Cryptococcus gattii* Infection Rates by Age Group and Sex, 2009



# Reportable Communicable Diseases in BC, July 2010

## Schedule A: Reportable by all sources, including Laboratories

Acquired Immune Deficiency Syndrome	Hemorrhagic Viral Fevers
Anthrax	Hepatitis Viral:
Botulism	Hepatitis A
Brucellosis	Hepatitis B
Chancroid	Hepatitis C
Cholera	Hepatitis E
Congenital Infections:	Other Viral Hepatitis
Toxoplasmosis	Human Immunodeficiency Virus Infection
Rubella	Leprosy
Cytomegalovirus	Lyme Disease
Herpes Simplex	Measles
Varicella-Zoster	Meningitis: All causes
Hepatitis B Virus	(i) Bacterial:
Listeriosis and any other congenital infection	Haemophilus
Creutzfeldt-Jacob Disease	Pneumococcal
Cryptococcal infection	Other
Cryptosporidiosis	(ii) Viral
Cyclospora infection	Meningococcal Disease, All Invasive
Diffuse Lamellar Keratitis	including "Primary Meningococcal Pneumonia" and
Diphtheria:	"Primary Meningococcal Conjunctivitis"
Cases	Mumps
Carriers	Neonatal Group B Streptococcal Infection
Encephalitis:	Paralytic Shellfish Poisoning (PSP)
Post-infectious	Pertussis (Whooping Cough)
Subacute sclerosing panencephalitis	Plague
Vaccine-related	Poliomyelitis
Viral	Rabies
Foodborne illness:	Reye Syndrome
All causes	Rubella
Gastroenteritis epidemic:	Severe Acute Respiratory Syndrome (SARS)
Bacterial	Smallpox
Parasitic	<i>Streptococcus pneumoniae</i> Infection, Invasive
Viral	Syphilis
Genital Chlamydia Infection	Tetanus
Giardiasis	Transfusion Transmitted Infection
Gonorrhoea - all sites	Tuberculosis
Group A Streptococcal Disease, Invasive	Tularemia
H5 and H7 strains of the Influenza virus	Typhoid Fever and Paratyphoid Fever
<i>Haemophilus influenzae</i> Disease,	Waterborne Illness
All Invasive, by Type	All causes
Hantavirus Pulmonary Syndrome	West Nile Virus Infection
Hemolytic Uremic Syndrome (HUS)	Yellow Fever

## Schedule B: Reportable by Laboratories only

All specific bacterial and viral stool pathogens:

(i) Bacterial:

*Campylobacter*

*Salmonella*

*Shigella*

*Yersinia*

(ii) Viral

Amoebiasis

*Borrelia burgdorferi* infection

Cerebrospinal Fluid Micro-organisms

Chlamydial Diseases, including Psittacosis

Creutzfeldt-Jacob Disease

Cryptococcal Infection

Herpes Genitalis

Human Immunodeficiency Virus Infection

Influenza virus, including the H5 and H7 strains

Legionellosis

Leptospirosis

Listeriosis

Malaria

Q Fever

Rickettsial Diseases

Severe Acute Respiratory Syndrome (SARS)

Smallpox

Tularemia

West Nile Virus Infection

## 2009 BC SELECTED REPORTABLE DISEASE CASE REPORTS BY HEALTH SERVICE DELIVERY AREA

	BC TOTAL	INTERIOR					FRASER			
	Provincial Total	East Kootenay	Kootenay Boundary	Okanagan	Thompson Cariboo	Interior Total	Fraser East	Fraser North	Fraser South	Fraser Total
2009 Population (PEOPLE 34 Estimate)	<b>4449289</b>	79372	78512	350039	221790	<b>729713</b>	281309	597659	695245	<b>1574213</b>
AIDS (2008)*	<b>91</b>	0	1	4	3	<b>8</b>	1	8	10	<b>19</b>
Amebiasis	<b>305</b>	0	3	6	4	<b>13</b>	15	33	71	<b>119</b>
Campylobacteriosis	<b>1750</b>	20	30	104	48	<b>202</b>	114	252	276	<b>642</b>
Chlamydia^	<b>11173</b>	173	120	834	710	<b>1837</b>	547	1191	1359	<b>3097</b>
Congenital Rubella Syndrome	<b>0</b>	0	0	0	0	<b>0</b>	0	0	0	<b>0</b>
<i>Cryptococcus gattii</i>	<b>24</b>	0	0	0	0	<b>0</b>	3	3	3	<b>9</b>
Cryptosporidiosis	<b>86</b>	1	0	5	2	<b>8</b>	18	7	14	<b>39</b>
Cyclosporiasis	<b>60</b>	0	0	2	0	<b>2</b>	5	7	12	<b>24</b>
<i>E. coli</i> , Shigatoxigenic	<b>159</b>	0	2	10	9	<b>21</b>	13	38	28	<b>79</b>
Giardiasis	<b>612</b>	11	9	33	22	<b>75</b>	44	64	118	<b>226</b>
Gonorrhoea^	<b>1307</b>	11	2	40	74	<b>127</b>	51	133	140	<b>324</b>
Hepatitis A	<b>31</b>	0	0	1	1	<b>2</b>	2	7	7	<b>16</b>
Hepatitis B Acute	<b>27</b>	0	0	2	0	<b>2</b>	0	5	4	<b>9</b>
Hepatitis B Chronic and Unknown	<b>1311</b>	4	3	17	9	<b>33</b>	13	216	164	<b>393</b>
Hepatitis C	<b>2444</b>	35	53	177	103	<b>368</b>	260	282	278	<b>820</b>
<i>Haemophilus influenzae</i> b, invasive	<b>2</b>	0	0	0	0	<b>0</b>	0	1	0	<b>1</b>
HIV^	<b>338</b>	1	1	8	8	<b>18</b>	11	40	37	<b>88</b>
Listeriosis	<b>14</b>	1	2	0	0	<b>3</b>	1	0	2	<b>3</b>
Lyme	<b>10</b>	0	0	1	0	<b>1</b>	1	0	0	<b>1</b>
Malaria	<b>27</b>	0	1	1	1	<b>3</b>	1	3	10	<b>14</b>
Measles	<b>0</b>	0	0	0	0	<b>0</b>	0	0	0	<b>0</b>
Meningococcal Disease, invasive	<b>23</b>	0	0	4	0	<b>4</b>	3	2	3	<b>8</b>
Mumps	<b>24</b>	0	0	0	0	<b>0</b>	2	7	7	<b>16</b>
Paratyphoid Fever	<b>33</b>	0	1	4	1	<b>6</b>	3	3	15	<b>21</b>
Pertussis	<b>164</b>	2	8	4	9	<b>23</b>	16	7	12	<b>35</b>
Pneumococcal Disease, invasive	<b>324</b>	8	5	24	17	<b>54</b>	14	27	42	<b>83</b>
Rubella	<b>1</b>	0	0	0	0	<b>0</b>	0	0	0	<b>0</b>
Salmonellosis	<b>952</b>	4	16	54	35	<b>109</b>	74	151	180	<b>405</b>
Shigellosis	<b>195</b>	1	1	5	4	<b>11</b>	12	22	31	<b>65</b>
Streptococcal Group A invasive	<b>169</b>	4	1	8	12	<b>25</b>	9	22	21	<b>52</b>
Syphilis (infectious)^	<b>216</b>	4	2	7	0	<b>13</b>	5	21	17	<b>43</b>
Tuberculosis	<b>293</b>	0	2	15	7	<b>24</b>	8	44	59	<b>111</b>
Typhoid Fever	<b>35</b>	0	0	0	1	<b>1</b>	7	4	16	<b>27</b>
<i>Vibrio parahaemolyticus</i>	<b>34</b>	0	1	1	0	<b>2</b>	2	1	0	<b>3</b>
Yersiniosis	<b>463</b>	6	3	15	5	<b>29</b>	7	39	34	<b>80</b>
West Nile	<b>3</b>	0	1	2	0	<b>3</b>	0	0	0	<b>0</b>
LESS COMMON DISEASES										
Cholera: Serogroup non-O1/O139	<b>2</b>	0	0	0	0	<b>0</b>	0	1	0	<b>1</b>
Cholera: Serogroup O1/O139	<b>1</b>	0	0	0	0	<b>0</b>	0	1	0	<b>1</b>
Creutzfeldt-Jacob Disease	<b>3</b>	0	0	0	0	<b>0</b>	0	0	1	<b>1</b>
Legionellosis	<b>8</b>	0	0	0	1	<b>1</b>	0	3	1	<b>4</b>
Leptospirosis	<b>2</b>	0	0	0	0	<b>0</b>	0	0	0	<b>0</b>
Neonatal Group B Streptococcal Infection	<b>11</b>	0	0	0	2	<b>2</b>	0	1	0	<b>1</b>

\*AIDS case reports are for 2008. The 2009 AIDS statistics will be available in our next report due to a delay associated with AIDS data collection.

^BC total includes cases of non-BC residents and cases of unspecified residency and thus may exceed the sum of cases of the five health authorities.

Note: No cases reported in 2009 of Anthrax, Botulism, Brucellosis, Diphtheria, Hantavirus, Hemorrhagic Viral Fevers, Leprosy (Hansen's Disease), Measles, Plague, Poliomyelitis, Rabies, Severe Acute Respiratory Syndrome, Tetanus, Trichinosis, Tularemia, and Yellow Fever.

VANCOUVER COASTAL				VANCOUVER ISLAND				NORTHERN			
Richmond	Vancouver	North Shore Coast Garibaldi	Vancouver Coastal Total	South Vancouver Island	Central Vancouver Island	North Vancouver Island	Vancouver Island Total	Northwest	Northern Interior	Northeast	Northern Total
192372	640780	276780	<b>1109932</b>	368029	262628	120150	<b>750807</b>	74822	142300	67502	<b>284624</b>
2	43	4	<b>49</b>	7	5	0	<b>12</b>	2	1	0	<b>3</b>
6	123	12	<b>141</b>	24	7	1	<b>32</b>	0	0	0	<b>0</b>
89	278	166	<b>533</b>	169	116	49	<b>334</b>	14	19	6	<b>39</b>
363	2109	658	<b>3130</b>	989	772	256	<b>2017</b>	251	591	201	<b>1043</b>
0	0	0	<b>0</b>	0	0	0	<b>0</b>	0	0	0	<b>0</b>
0	2	1	<b>3</b>	6	5	1	<b>12</b>	0	0	0	<b>0</b>
1	24	8	<b>33</b>	2	2	0	<b>4</b>	2	0	0	<b>2</b>
2	15	4	<b>21</b>	7	4	1	<b>12</b>	0	0	1	<b>1</b>
3	23	17	<b>43</b>	3	11	1	<b>15</b>	1	0	0	<b>1</b>
14	142	40	<b>196</b>	59	26	9	<b>94</b>	10	8	3	<b>21</b>
24	423	71	<b>518</b>	139	71	26	<b>236</b>	8	77	8	<b>93</b>
0	4	2	<b>6</b>	3	1	1	<b>5</b>	0	1	1	<b>2</b>
1	11	1	<b>13</b>	0	0	2	<b>2</b>	1	0	0	<b>1</b>
208	535	46	<b>789</b>	56	26	4	<b>86</b>	4	5	1	<b>10</b>
44	455	106	<b>605</b>	177	200	92	<b>469</b>	38	112	32	<b>182</b>
0	0	1	<b>1</b>	0	0	0	<b>0</b>	0	0	0	<b>0</b>
6	151	7	<b>164</b>	30	8	1	<b>39</b>	9	16	2	<b>27</b>
0	2	0	<b>2</b>	2	1	2	<b>5</b>	0	1	0	<b>1</b>
0	2	3	<b>5</b>	3	0	0	<b>3</b>	0	0	0	<b>0</b>
2	6	0	<b>8</b>	0	2	0	<b>2</b>	0	0	0	<b>0</b>
0	0	0	<b>0</b>	0	0	0	<b>0</b>	0	0	0	<b>0</b>
0	4	0	<b>4</b>	1	2	1	<b>4</b>	0	3	0	<b>3</b>
0	4	1	<b>5</b>	0	2	0	<b>2</b>	0	1	0	<b>1</b>
0	5	1	<b>6</b>	0	0	0	<b>0</b>	0	0	0	<b>0</b>
4	9	8	<b>21</b>	19	56	8	<b>83</b>	2	0	0	<b>2</b>
13	53	23	<b>89</b>	49	24	10	<b>83</b>	3	9	3	<b>15</b>
0	0	0	<b>0</b>	0	1	0	<b>1</b>	0	0	0	<b>0</b>
36	160	67	<b>263</b>	69	50	21	<b>140</b>	18	13	4	<b>35</b>
4	67	16	<b>87</b>	20	6	4	<b>30</b>	2	0	0	<b>2</b>
2	31	9	<b>42</b>	20	14	5	<b>39</b>	4	6	1	<b>11</b>
3	121	12	<b>136</b>	11	9	0	<b>20</b>	1	1	0	<b>2</b>
24	79	7	<b>110</b>	16	4	8	<b>28</b>	10	10	0	<b>20</b>
4	2	1	<b>7</b>	0	0	0	<b>0</b>	0	0	0	<b>0</b>
5	2	6	<b>13</b>	8	5	3	<b>16</b>	0	0	0	<b>0</b>
39	128	73	<b>240</b>	61	28	14	<b>103</b>	2	9	0	<b>11</b>
0	0	0	<b>0</b>	0	0	0	<b>0</b>	0	0	0	<b>0</b>
0	0	0	<b>0</b>	0	1	0	<b>1</b>	0	0	0	<b>0</b>
0	0	0	<b>0</b>	0	0	0	<b>0</b>	0	0	0	<b>0</b>
0	0	0	<b>0</b>	1	1	0	<b>2</b>	0	0	0	<b>0</b>
0	0	0	<b>0</b>	2	1	0	<b>3</b>	0	0	0	<b>0</b>
0	0	0	<b>0</b>	1	1	0	<b>2</b>	0	0	0	<b>0</b>
0	4	0	<b>4</b>	0	2	0	<b>2</b>	0	2	0	<b>2</b>

## 2009 BC SELECTED REPORTABLE DISEASE CASE RATES BY HEALTH SERVICE DELIVERY AREA

	BC TOTAL	INTERIOR					FRASER			
	Provincial Total	East Kootenay	Kootenay Boundary	Okanagan	Thompson Cariboo	Interior Total	Fraser East	Fraser North	Fraser South	Fraser Total
2009 Population (PEOPLE 34 Estimate)	<b>4449289</b>	79372	78512	350039	221790	<b>729713</b>	281309	597659	695245	<b>1574213</b>
AIDS (2008)*	<b>2.1</b>	0.0	1.3	1.2	1.4	<b>1.1</b>	0.4	1.4	1.5	<b>1.2</b>
Amebiasis	<b>6.9</b>	0.0	3.8	1.7	1.8	<b>1.8</b>	5.3	5.5	10.2	<b>7.6</b>
Campylobacteriosis	<b>39.3</b>	25.2	38.2	29.7	21.6	<b>27.7</b>	40.5	42.2	39.7	<b>40.8</b>
Chlamydia^	<b>251.1</b>	218.0	152.8	238.3	320.1	<b>251.7</b>	194.4	199.3	195.5	<b>196.7</b>
Congenital Rubella Syndrome	<b>0.0</b>	0.0	0.0	0.0	0.0	<b>0.0</b>	0.0	0.0	0.0	<b>0.0</b>
<i>Cryptococcus gattii</i>	<b>0.5</b>	0.0	0.0	0.0	0.0	<b>0.0</b>	1.1	0.5	0.4	<b>0.6</b>
Cryptosporidiosis	<b>1.9</b>	1.3	0.0	1.4	0.9	<b>1.1</b>	6.4	1.2	2.0	<b>2.5</b>
Cyclosporiasis	<b>1.4</b>	0.0	0.0	0.6	0.0	<b>0.3</b>	1.8	1.2	1.7	<b>1.5</b>
<i>E. coli</i> , Shigatoxigenic	<b>3.6</b>	0.0	2.5	2.9	4.1	<b>2.9</b>	4.6	6.4	4.0	<b>5.0</b>
Giardiasis	<b>13.8</b>	13.9	11.5	9.4	9.9	<b>10.3</b>	15.6	10.7	17.0	<b>14.4</b>
Gonorrhoea^	<b>29.4</b>	13.9	2.5	11.4	33.4	<b>17.4</b>	18.1	22.3	20.1	<b>20.6</b>
Hepatitis A	<b>0.7</b>	0.0	0.0	0.3	0.5	<b>0.3</b>	0.7	1.2	1.0	<b>1.0</b>
Hepatitis B Acute	<b>0.6</b>	0.0	0.0	0.6	0.0	<b>0.3</b>	0.0	0.8	0.6	<b>0.6</b>
Hepatitis B Chronic and Unknown	<b>29.5</b>	5.0	3.8	4.9	4.1	<b>4.5</b>	4.6	36.1	23.6	<b>25.0</b>
Hepatitis C	<b>54.9</b>	44.4	67.5	50.6	46.4	<b>50.4</b>	92.4	47.2	40.0	<b>52.1</b>
<i>Haemophilus influenzae b</i> , invasive	<b>0.0</b>	0.0	0.0	0.0	0.0	<b>0.0</b>	0.0	0.2	0.0	<b>0.1</b>
HIV^	<b>7.6</b>	1.3	1.3	2.3	3.6	<b>2.5</b>	3.9	6.7	5.3	<b>5.6</b>
Listeriosis	<b>0.3</b>	1.3	2.5	0.0	0.0	<b>0.4</b>	0.4	0.0	0.3	<b>0.2</b>
Lyme	<b>0.2</b>	0.0	0.0	0.3	0.0	<b>0.1</b>	0.4	0.0	0.0	<b>0.1</b>
Malaria	<b>0.6</b>	0.0	1.3	0.3	0.5	<b>0.4</b>	0.4	0.5	1.4	<b>0.9</b>
Measles	<b>0.0</b>	0.0	0.0	0.0	0.0	<b>0.0</b>	0.0	0.0	0.0	<b>0.0</b>
Meningococcal Disease, invasive	<b>0.5</b>	0.0	0.0	1.1	0.0	<b>0.6</b>	1.1	0.3	0.4	<b>0.5</b>
Mumps	<b>0.6</b>	0.0	0.0	0.0	0.0	<b>0.0</b>	0.7	1.2	1.0	<b>1.0</b>
Paratyphoid Fever	<b>0.7</b>	0.0	1.3	1.1	0.5	<b>0.8</b>	1.1	0.5	2.2	<b>1.3</b>
Pertussis	<b>3.7</b>	2.5	10.2	1.1	4.1	<b>3.2</b>	5.7	1.2	1.7	<b>2.2</b>
Pneumococcal Disease, invasive	<b>7.3</b>	10.1	6.4	6.9	7.7	<b>7.4</b>	5.0	4.5	6.0	<b>5.3</b>
Rubella	<b>0.0</b>	0.0	0.0	0.0	0.0	<b>0.0</b>	0.0	0.0	0.0	<b>0.0</b>
Salmonellosis	<b>21.4</b>	5.0	20.4	15.4	15.8	<b>14.9</b>	26.3	25.3	25.9	<b>25.7</b>
Shigellosis	<b>4.4</b>	1.3	1.3	1.4	1.8	<b>1.5</b>	4.3	3.7	4.5	<b>4.1</b>
Streptococcal Group A invasive	<b>3.8</b>	5.0	1.3	2.3	5.4	<b>3.4</b>	3.2	3.7	3.0	<b>3.3</b>
Syphilis (infectious)^	<b>4.9</b>	5.0	2.5	2.0	0.0	<b>1.8</b>	1.8	3.5	2.4	<b>2.7</b>
Tuberculosis	<b>6.6</b>	0.0	2.5	4.3	3.2	<b>3.3</b>	2.8	7.4	8.5	<b>7.1</b>
Typhoid Fever	<b>0.8</b>	0.0	0.0	0.0	0.5	<b>0.1</b>	2.5	0.7	2.3	<b>1.7</b>
<i>Vibrio parahaemolyticus</i>	<b>0.8</b>	0.0	1.3	0.3	0.0	<b>0.3</b>	0.7	0.2	0.0	<b>0.2</b>
Yersiniosis	<b>10.4</b>	7.6	3.8	4.3	2.3	<b>4.0</b>	2.5	6.5	4.9	<b>5.1</b>
West Nile	<b>0.1</b>	0.0	1.3	0.6	0.0	<b>0.4</b>	0.0	0.0	0.0	<b>0.0</b>
LESS COMMON DISEASES										
Cholera: Serogroup non-O1/O139	<b>0.0</b>	0.0	0.0	0.0	0.0	<b>0.0</b>	0.0	0.2	0.0	<b>0.1</b>
Cholera: Serogroup O1/O139	<b>0.0</b>	0.0	0.0	0.0	0.0	<b>0.0</b>	0.0	0.2	0.0	<b>0.1</b>
Creutzfeldt-Jacob Disease	<b>0.1</b>	0.0	0.0	0.0	0.0	<b>0.0</b>	0.0	0.0	0.1	<b>0.1</b>
Legionellosis	<b>0.2</b>	0.0	0.0	0.0	0.5	<b>0.1</b>	0.0	0.5	0.1	<b>0.3</b>
Leptospirosis	<b>0.0</b>	0.0	0.0	0.0	0.0	<b>0.0</b>	0.0	0.0	0.0	<b>0.0</b>
Neonatal Group B Streptococcal Infection	<b>0.2</b>	0.0	0.0	0.0	0.9	<b>0.3</b>	0.0	0.2	0.0	<b>0.1</b>

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^BC total includes cases of non-BC residents and cases of unspecified residency and thus may exceed the sum of cases of the five health authorities.

Note: No cases reported in 2009 of Anthrax, Botulism, Brucellosis, Diphtheria, Hantavirus, Hemorrhagic Viral Fevers, Leprosy (Hansen's Disease), Measles, Plague, Poliomyelitis, Rabies, Severe Acute Respiratory Syndrome, Tetanus, Trichinosis, Tularemia, and Yellow Fever.

VANCOUVER COASTAL				VANCOUVER ISLAND				NORTHERN			
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192372	640780	276780	<b>1109932</b>	368029	262628	120150	<b>750807</b>	74822	142300	67502	<b>284624</b>
1.1	6.8	1.5	<b>4.4</b>	1.9	1.9	0.0	<b>1.6</b>	2.7	0.7	0.0	<b>1.1</b>
3.1	19.2	4.3	<b>12.7</b>	6.5	2.7	0.8	<b>4.3</b>	0.0	0.0	0.0	<b>0.0</b>
46.3	43.4	60.0	<b>48.0</b>	45.9	44.2	40.8	<b>44.5</b>	18.7	13.4	8.9	<b>13.7</b>
188.7	329.1	237.7	<b>282.0</b>	268.7	294.0	213.1	<b>268.6</b>	335.5	415.3	297.8	<b>366.4</b>
0.0	0.0	0.0	<b>0.0</b>	0.0	0.0	0.0	<b>0.0</b>	0.0	0.0	0.0	<b>0.0</b>
0.0	0.3	0.4	<b>0.3</b>	1.6	1.9	0.8	<b>1.6</b>	0.0	0.0	0.0	<b>0.0</b>
0.5	3.7	2.9	<b>3.0</b>	0.5	0.8	0.0	<b>0.5</b>	2.7	0.0	0.0	<b>0.7</b>
1.0	2.3	1.4	<b>1.9</b>	1.9	1.5	0.8	<b>1.6</b>	0.0	0.0	1.5	<b>0.4</b>
1.6	3.6	6.1	<b>3.9</b>	0.8	4.2	0.8	<b>2.0</b>	1.3	0.0	0.0	<b>0.4</b>
7.3	22.2	14.5	<b>17.7</b>	16.0	9.9	7.5	<b>12.5</b>	13.4	5.6	4.4	<b>7.4</b>
12.5	66.0	25.7	<b>46.7</b>	37.8	27.0	21.6	<b>31.4</b>	10.7	54.1	11.9	<b>32.7</b>
0.0	0.6	0.7	<b>0.5</b>	0.8	0.4	0.8	<b>0.7</b>	0.0	0.7	1.5	<b>0.7</b>
0.5	1.7	0.4	<b>1.2</b>	0.0	0.0	1.7	<b>0.3</b>	1.3	0.0	0.0	<b>0.4</b>
108.1	83.5	16.6	<b>71.1</b>	15.2	9.9	3.3	<b>11.5</b>	5.3	3.5	1.5	<b>3.5</b>
22.9	71.0	38.3	<b>54.5</b>	48.1	76.2	76.6	<b>62.5</b>	50.8	78.7	47.4	<b>63.9</b>
0.0	0.0	0.4	<b>0.1</b>	0.0	0.0	0.0	<b>0.0</b>	0.0	0.0	0.0	<b>0.0</b>
3.1	23.6	2.5	<b>14.8</b>	8.2	3.0	0.8	<b>5.2</b>	12.0	11.2	3.0	<b>9.5</b>
0.0	0.3	0.0	<b>0.2</b>	0.5	0.4	1.7	<b>0.7</b>	0.0	0.7	0.0	<b>0.4</b>
0.0	0.3	1.1	<b>0.5</b>	0.8	0.0	0.0	<b>0.4</b>	0.0	0.0	0.0	<b>0.0</b>
1.0	0.9	0.0	<b>0.7</b>	0.0	0.8	0.0	<b>0.3</b>	0.0	0.0	0.0	<b>0.0</b>
0.0	0.0	0.0	<b>0.0</b>	0.0	0.0	0.0	<b>0.0</b>	0.0	0.0	0.0	<b>0.0</b>
0.0	0.6	0.0	<b>0.4</b>	0.3	0.8	0.8	<b>0.5</b>	0.0	2.1	0.0	<b>1.1</b>
0.0	0.6	0.4	<b>0.5</b>	0.0	0.8	0.0	<b>0.3</b>	0.0	0.7	0.0	<b>0.4</b>
0.0	0.8	0.4	<b>0.5</b>	0.0	0.0	0.0	<b>0.0</b>	0.0	0.0	0.0	<b>0.0</b>
2.1	1.4	2.9	<b>1.9</b>	5.2	21.3	6.7	<b>11.1</b>	2.7	0.0	0.0	<b>0.7</b>
6.8	8.3	8.3	<b>8.0</b>	13.3	9.1	8.3	<b>11.1</b>	4.0	6.3	4.4	<b>5.3</b>
0.0	0.0	0.0	<b>0.0</b>	0.0	0.4	0.0	<b>0.1</b>	0.0	0.0	0.0	<b>0.0</b>
18.7	25.0	24.2	<b>23.7</b>	18.7	19.0	17.5	<b>18.7</b>	24.1	9.1	5.9	<b>12.3</b>
2.1	10.5	5.8	<b>7.8</b>	5.4	2.3	3.3	<b>4.0</b>	2.7	0.0	0.0	<b>0.7</b>
1.0	4.8	3.3	<b>3.8</b>	5.4	5.3	4.2	<b>5.2</b>	5.3	4.2	1.5	<b>3.9</b>
1.6	18.9	4.3	<b>12.3</b>	3.0	3.4	0.0	<b>2.7</b>	1.3	0.7	0.0	<b>0.7</b>
12.5	12.3	2.5	<b>9.9</b>	4.3	1.5	6.7	<b>3.7</b>	13.4	7.0	0.0	<b>7.0</b>
2.1	0.3	0.4	<b>0.6</b>	0.0	0.0	0.0	<b>0.0</b>	0.0	0.0	0.0	<b>0.0</b>
2.6	0.3	2.2	<b>1.2</b>	2.2	1.9	2.5	<b>2.1</b>	0.0	0.0	0.0	<b>0.0</b>
20.3	20.0	26.4	<b>21.6</b>	16.6	10.7	11.7	<b>13.7</b>	2.7	6.3	0.0	<b>3.9</b>
0.0	0.0	0.0	<b>0.0</b>	0.0	0.0	0.0	<b>0.0</b>	0.0	0.0	0.0	<b>0.0</b>
0.0	0.0	0.0	<b>0.0</b>	0.0	0.4	0.0	<b>0.1</b>	0.0	0.0	0.0	<b>0.0</b>
0.0	0.0	0.0	<b>0.0</b>	0.0	0.0	0.0	<b>0.0</b>	0.0	0.0	0.0	<b>0.0</b>
0.0	0.0	0.0	<b>0.0</b>	0.3	0.4	0.0	<b>0.3</b>	0.0	0.0	0.0	<b>0.0</b>
0.0	0.0	0.0	<b>0.0</b>	0.5	0.4	0.0	<b>0.4</b>	0.0	0.0	0.0	<b>0.0</b>
0.0	0.0	0.0	<b>0.0</b>	0.3	0.4	0.0	<b>0.3</b>	0.0	0.0	0.0	<b>0.0</b>
0.0	0.6	0.0	<b>0.4</b>	0.0	0.8	0.0	<b>0.3</b>	0.0	1.4	0.0	<b>0.7</b>

## Sources and Explanatory Remarks

1. Clinical and confirmed case reports are collected from the health regions in British Columbia through the integrated Public Health Information System (iPHIS). Starting in 2005, only confirmed cases are described in the main report, in keeping with BC reporting to the Public Health Agency of Canada. For the breakdown of cases by their confirmed or clinical case status for 2005 and previous years, see the 2005 BC Annual Summary of Reportable Diseases posted on [www.bccdc.ca](http://www.bccdc.ca). The exceptions are *Cryptococcus gattii*, Lyme Disease, and Tetanus for which clinical cases are included in reporting.
2. Numbers in this report were generated in February 2010 and are subject to change due to possible late reporting and/or data clean up in the regions. This may also explain changes in the number of reported cases in previous years for some diseases.
3. Data for influenza, invasive meningococcal and pneumococcal disease and invasive group A streptococcal disease, measles, mumps, and rubella, *Cryptococcus gattii* infection, Lyme Disease, West Nile virus, MRSA and VRE are collected through enhanced surveillance systems. Invasive meningococcal disease, invasive group A streptococcal disease, and *Cryptococcus gattii* infection are reported using episode date. Episode date is the onset date if reported. Other diseases are classified by the reported date which is the date reported to the health authority.
4. Data for HIV and AIDS are collected through HAISYS, the HIV/AIDS Information System. Data for other sexually transmitted infections (STIs) are collected through the STI Information System. AIDS case reports are for 2008. The 2009 AIDS statistics will be available in our next report due to a delay associated with AIDS data collection. The BC total numbers for AIDS, chlamydia (genital), gonorrhea (genital), HIV and syphilis (infectious) include cases of non-BC residents and cases of unknown residency and thus may exceed the sum of cases in the five health authorities.
5. Statistics on tuberculosis are based on the analysis of the data extracted in March 2009. For more updated statistics on tuberculosis, please contact the Division of Tuberculosis Control.
6. For information on Antimicrobial Resistant Organism (ARO) Surveillance in BC, please refer to Antimicrobial Resistance Trends in the Province of British Columbia. <http://www.bccdc.ca/NR/rdonlyres/88FFDDA4-1D33-4123-98A9-613F916A0F56/0/AntimicrobialResistanceTrendsInBC2009.pdf>
7. Amebiasis, cryptosporidiosis and listeriosis were removed from national surveillance in January 2000. Lyme disease became nationally notifiable in 2009; methicillin resistant *Staphylococcus aureus*, vancomycin resistant *enterococci*, *Vibrio parahaemolyticus* and yersiniosis have not been nationally notifiable diseases in the period 2000 through 2009.

8. Salmonellosis reports include Paratyphoid (*S. Paratyphi*) and Typhoid Fever (*S. Typhi*).
9. The Jenks Natural Breaks Classification method was used for defining different classifications of disease rates in the maps. This classification method identifies gaps or depressions within the data distribution and creates the categories based on the best fit of the data (i.e., groups based on similarities).
10. Health Service Delivery Area boundaries are taken from BC STATS; BC STATS is the central statistical agency of the Province of British Columbia.
11. National rates are provided by the Public Health Agency of Canada -Division of Surveillance and Risk Assessment. The 2005-2008 national rates do not include data from Quebec, Alberta, Northwest Territories, and Nunavut. The resulting national rates are therefore based only on the data and populations for the remaining participating jurisdictions, and the national rates may change once reporting is complete.
12. Population estimates and projections are taken from P.E.O.P.L.E. Projection 34 (Population Extrapolation for Organizational Planning with Less Error). Health Data Warehouse Release Date: Totals: February 2009; Age/Sex Estimates: February 2009.
13. While we endeavour to include data on the majority of reportable diseases in this publication, data on some are not included. For information on the incidence of these diseases in 2009 in British Columbia, please contact [epidserv@bccdc.ca](mailto:epidserv@bccdc.ca).

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