British Columbia Annual Summary of Reportable Diseases

2010

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

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

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2010 Highlights

Vaccine Preventable Diseases

After the influenza pandemic in 2009, 2010 was a relatively quiet year for influenza. With the peak of the pandemic occurring in October of 2009, there was negligible activity from January to March of 2010 when we normally expect a seasonal peak. This was very good news for the 2010 Olympic and Paralympic Winter Games which were held in Vancouver and Whistler in February through March, 2010. The Olympics did have some influence on vaccine preventable disease rates in the province however, as there was a measles outbreak starting in March of 2010 that likely resulted from imported infections during the Games. This was the first measles outbreak in BC since 2001 when 23 cases were reported. Overall 78 confirmed outbreak-related cases were reported mostly in unimmunized or underimmunized individuals in the lower mainland and North Shore Coast Garibaldi areas.

Other vaccine preventable diseases showed continuing declines. Only 1 case of invasive Hib disease was reported in an adult with no cases in children reported. Acute hepatitis B continued to decline and no cases were identified in persons less than 30 years of age. This reflects the fact a universal hepatitis B immunization program was introduced in BC in Grade 6 students in 1992 and these recipients were now aged 29 years. Invasive meningococcal disease continued to decline with a 10 year low of 12 cases reported in 2010. Mumps occurred at a similarly low rate comparable to rates seen in 2002-2006 and significantly lower than the outbreak year of 2008. Pertussis continued to be reported at its lowest rates in 20 years with a decline in cases of 25% from 2009. Among cases of invasive pneumococcal disease in children under 5 years old, none were due to serotypes covered by PCV-7 vaccine which was in use in BC from 2003 through 2010, and 67% (12/18) were due to the 6 additional serotypes covered by PCV-13 vaccine which was introduced in June 2010. A single case of tetanus was reported in 2010 after a year with no cases in 2009. The exception to the declines seen in most of the vaccine preventable diseases was rubella. Nine cases of rubella were reported in 2010, a substantial increase over the previous 10 years when 0-2 cases have been reported annually. All the cases were adults and related to a single outbreak.

Sexually Transmitted and Bloodborne Pathogens

The rate of new positive HIV tests continued to decrease slightly in 2010 with 301 versus 337 new cases reported and AIDS cases similarly decreased to the lowest levels in 10 years. While this decline is in part attributable to HIV becoming reportable in 2003, these trends likely reflect a true decrease in disease incidence largely driven by a decrease in new positive HIV tests in people who use injection drugs.

Chlamydia rates in British Columbia and Canada continue to increase and 11,838 cases were reported in the province in 2010. This overall trend in Chlamydia infection rates has been increasing since 1999 with the highest reported rates in women 15-24 years of age.

The rates of gonorrhea were stable in 2010 at levels comparable to 2009 with 1321 cases reported in 2010 compared to 1309 in 2009. This reflects an overall increasing trend in gonorrhea rates in BC for reasons that are not clear. Infectious syphilis numbers however, declined in 2010 with 155 cases reported, down from 216 in 2009 and the lowest rates seen in 10 years. A continued modest decline in the rate of hepatitis C was also observed.

2010 Highlights (continued)

Diseases Transmitted by Direct Contact and Respiratory Routes

Invasive group A streptococcal disease reports declined again in 2010 to 142 cases, reversing an upward trend seen from 2001 through 2008. Highest rates were observed in infants less than 1 year of age.

The rate of tuberculosis declined by 23% from 2009 with 240 cases reported in BC in 2010; the lowest number reported in 10 years. Northwest, Fraser South, Richmond and Vancouver health service delivery areas had rates that exceeded the provincial average. As in prior years, rates in men exceed those in women at ages 40 years and older; although the highest rates observed in 2010 were in women aged 25-29 years.

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 2010 were:

- the percent of S. aureus isolates that are MRSA increased to 27.8% largely driven by community-associated strains (CA-MRSA).
- Resistance to erythromycin (and related macrolides) was also increased at about 29.6% of S. pneumoniae isolates.
- Urinary tract pathogens such as E. coli and P.mirabilis are exhibiting increasing resistance toward fluoroquinolones as well as cotrimoxaxole. 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 continued to be stable or decline in 2010. Campylobacter remained the most frequently reported enteric infection with 1556 cases reported; the rate in 2010, however was the lowest ever reported in BC. Rates of Cryptosporidiosis and cyclosporiasis were also at a 10 year low with only 55 and 25 cases, respectively, reported in 2010.

Salmonellosis rates increased again in 2010 for the third year in a row with 1078 cases reported in 2010; this is driven by observed increases in reports of S. Enteriditis. Over 600 cases of S. Enteriditis have been investigated since 2008 with information from these investigations suggesting the most likely source of illness was eggs. Higher rates of V. parahaemolyticus infections were seen again in 2010 with 39 cases reported compared to 34 cases in 2009.The majority of cases were reported during the annual summer peak when ocean temperatures are highest and facilitate bacterial growth.

Rates of listeriosis were stable from 2009 with 15 cases reported in 2010, most in people 60 years of age and older. There were 29 cases of acute hepatitis A reported in 2010 continuing a downward trend observed in the last decade. An outbreak of HAV on Vancouver Island accounted for 12 of the reported cases near the end of 2010. This outbreak continued into 2011.

Vectorborne and Other Zoonotic Diseases

One case of WNV was reported in 2010 with exposure in the Central Okanagan; five positive birds were also reported from the same area, the first time birds have tested positive in BC. This after the first locally acquired human cases were identified in the South Okanagan in 2009.

Lyme disease continues to be reported at consistent low rates in BC with 7 cases reported in 2010.

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. Bonnie Henry

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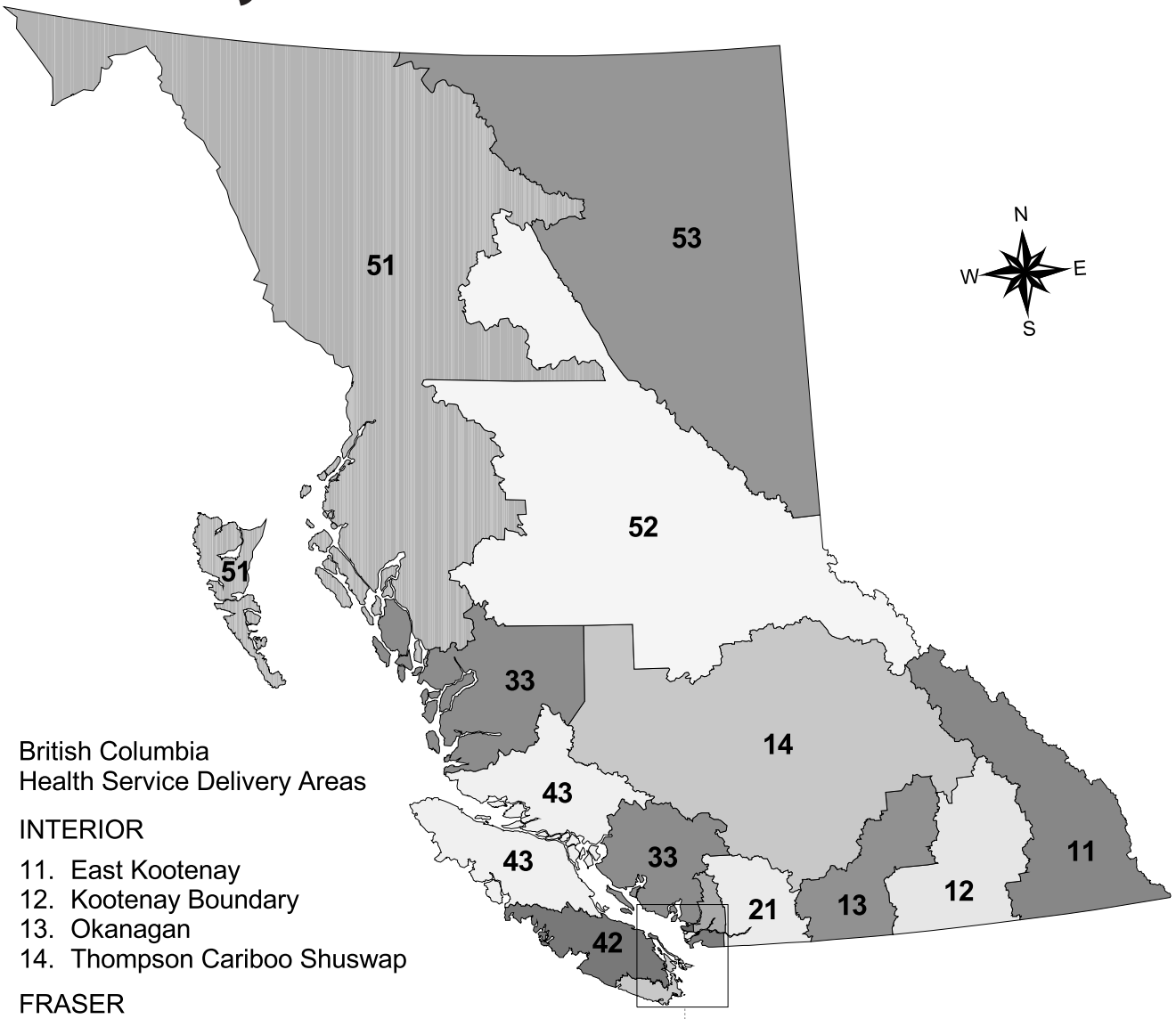
Prevention and Control Service, BCCDC

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

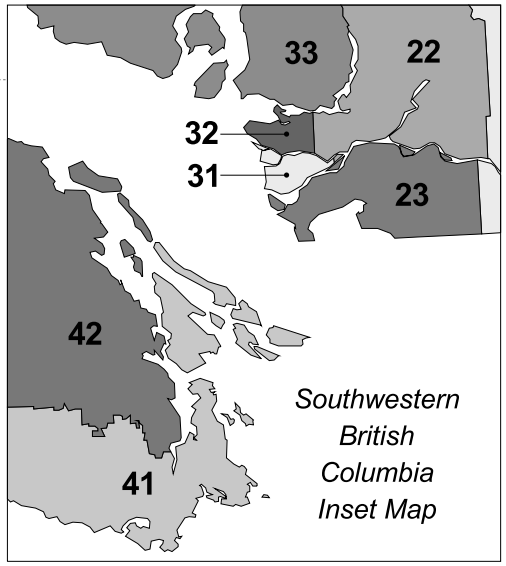
31. Richmond
32. Vancouver
33. North Shore/Coast Garibaldi

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

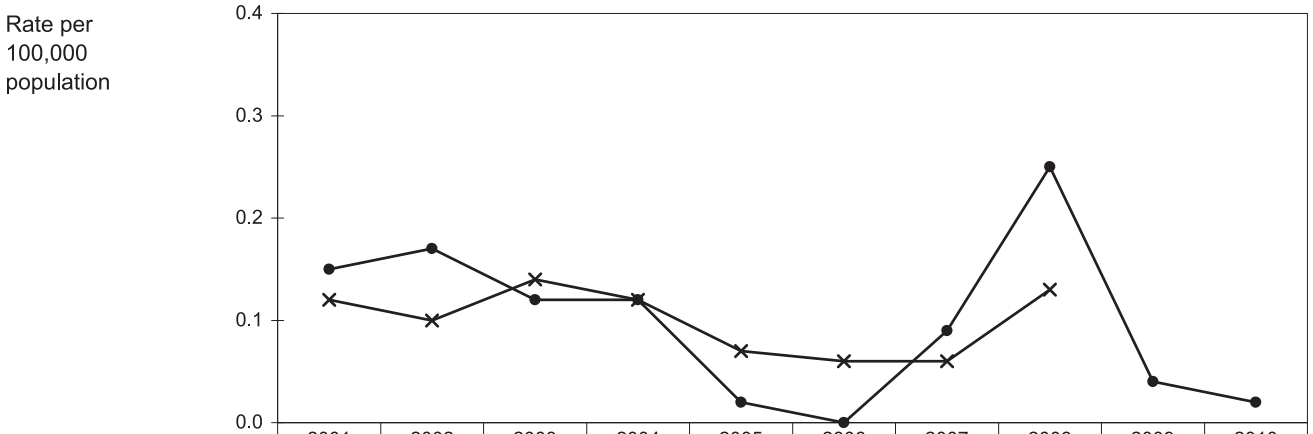
Rubella

Tetanus

Haemophilus influenzae type b (Hib), invasive

One case of invasive Haemophilus influenzae type b (Hib) disease in a 40 year old female was reported in 2010.

1.1 *Haemophilus influenzae* type b (Hib), invasive Rates by Year, 2001-2010



	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
BC Invasive Hib Reports	6	7	5	5	1	0	4	11	2	1
BC Invasive Hib Rate	0.15	0.17	0.12	0.12	0.02	0.00	0.09	0.25	0.04	0.02
Canadian Hib Rate*	0.12	0.10	0.14	0.12	0.07	0.06	0.06	0.13		

*Please see Sources and Explanatory Remarks, Section 11 on page 125 in regard to the national rate

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, prenatal testing or 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. Infants and young children are more likely to be asymptomatic than older children and adults. As the number of acute cases is very small, to interpret hepatitis B 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 2010, 1,329 cases were reported in BC however this information is not collected nationally so BC rates cannot be compared with national rates.

Identification of chronic hepatitis B will depend on testing. Hepatitis B is not tested routinely in persons who immigrate to Canada, even those from a country where hepatitis B infection is endemic. The highest rates of chronic and unknown hepatitis B in BC correspond to areas of high immigration i.e. Richmond, Vancouver and Fraser North at 111.1, 72.9 and 45.4 cases per 100,000 respectively. All other Health service Delivery Areas have rates of less than 25 cases per 100,000.

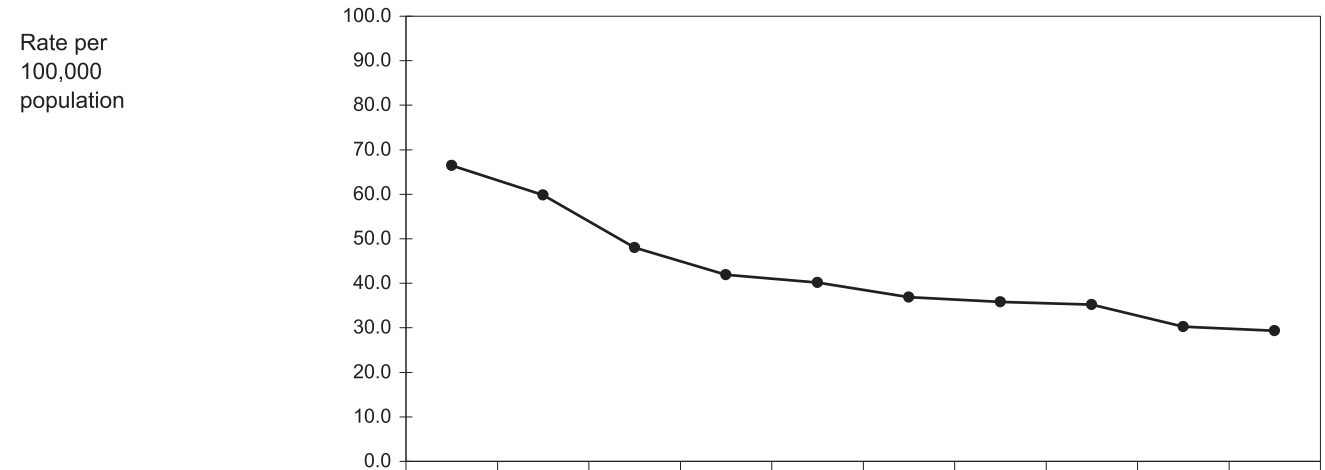
Hepatitis B testing is part of the routine prenatal testing and this may account for the greater number of chronic hepatitis B infections identified in females compared to males in the 15-29 year age groups. Infants born to hepatitis B infected mothers receive hepatitis B immune globulin and vaccine at birth and 3 subsequent vaccine doses at 2, 4 and 6 month 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.

Acute Hepatitis B

The annual number of acute hepatitis B cases reported in BC has continued to decline as seen in figure 2.4.The national acute hepatitis B rate is not available prior to 2005 or after 2008. 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 2010 data (11 cases) should be considered provisional.

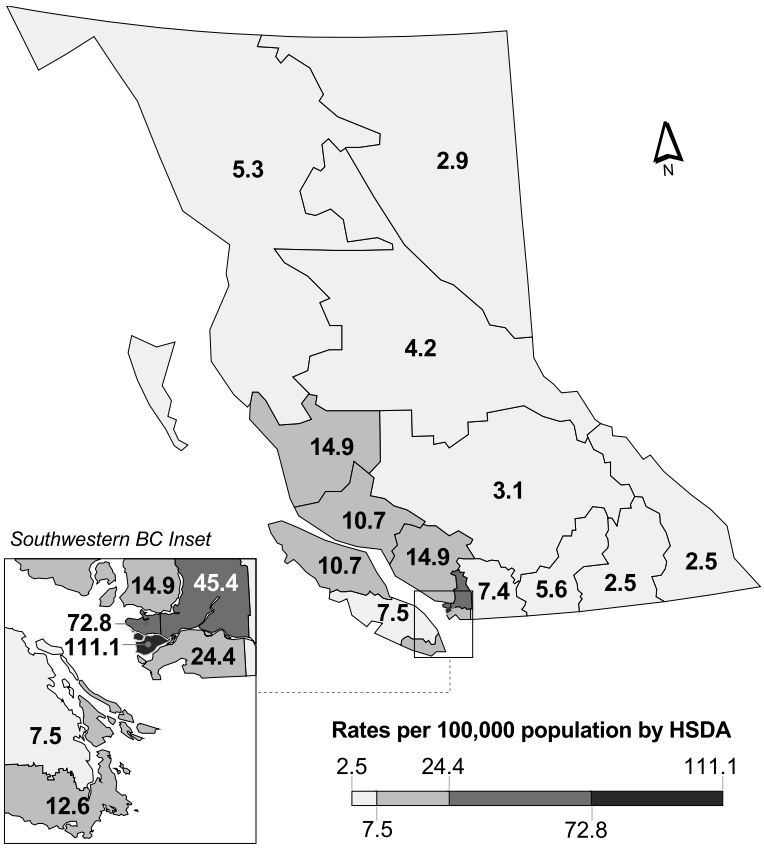
Universal hepatitis B vaccine became available in BC for Grade 6 students in 1992 and the infant program introduced province-wide in 2001. The first recipients of the adolescent school based program were aged 29 years in 2010. No cases were identified in persons less than 30 years of age. The vaccine 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 (82%) were male. Due to small numbers the rates by Health Service Delivery Areas are likely to be unstable.

2.1 Chronic and Unknown Hepatitis B Rates by Year, 2001-2010



	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
BC Hepatitis B: Chronic and Unknown Reports	2710	2451	1980	1742	1685	1566	1543	1543	1349	1329
BC Hepatitis B: Chronic and Unknown Rate	66.5	59.8	48.0	41.9	40.1	36.9	35.8	35.2	30.3	29.4

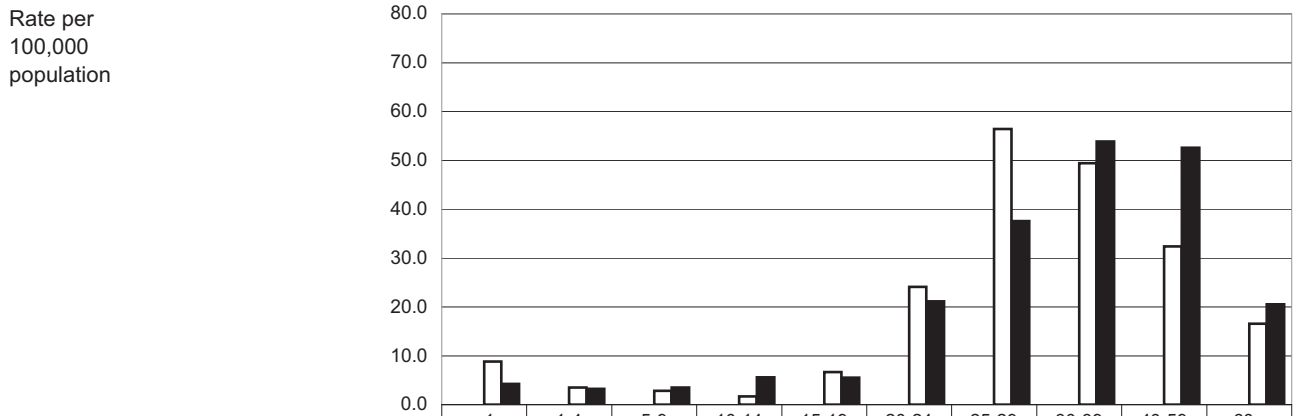
2.2 Chronic and Unknown Hepatitis B Rates by HSDA, 2010



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	2	2.5
12	Kootenay Boundary	2	2.5
13	Okanagan	20	5.6
14	Thompson Cariboo Shuswap	7	3.1
21	Fraser East	21	7.4
22	Fraser North	277	45.4
23	Fraser South	174	24.4
31	Richmond	218	111.1
32	Vancouver	474	72.8
33	North Shore/Coast Garibaldi	42	14.9
41	South Vancouver Island	47	12.6
42	Central Vancouver Island	20	7.5
43	North Vancouver Island	13	10.7
51	Northwest	4	5.3
52	Northern Interior	6	4.2
53	Northeast	2	2.9

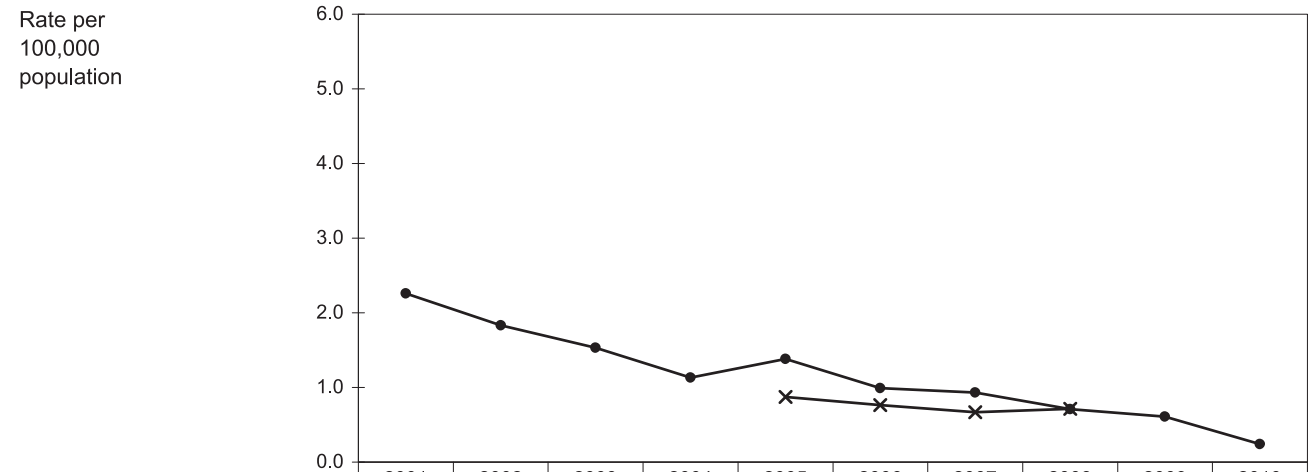
Note: Map classification by Jenks natural breaks method.

2.3 Chronic and Unknown Hepatitis B Rates by Age Group and Sex, 2010



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Hepatitis B: Chronic and Unknown Reports - Female	2	3	3	2	9	37	90	149	224	84
Hepatitis B: Chronic and Unknown Reports - Male	1	3	4	7	8	35	61	159	355	92
Hepatitis B: Chronic and Unknown Rate - Female	8.8	3.5	2.8	1.7	6.6	24.1	56.5	49.4	32.4	16.6
Hepatitis B: Chronic and Unknown Rate - Male	4.2	3.3	3.5	5.6	5.5	21.1	37.6	53.9	52.6	20.6

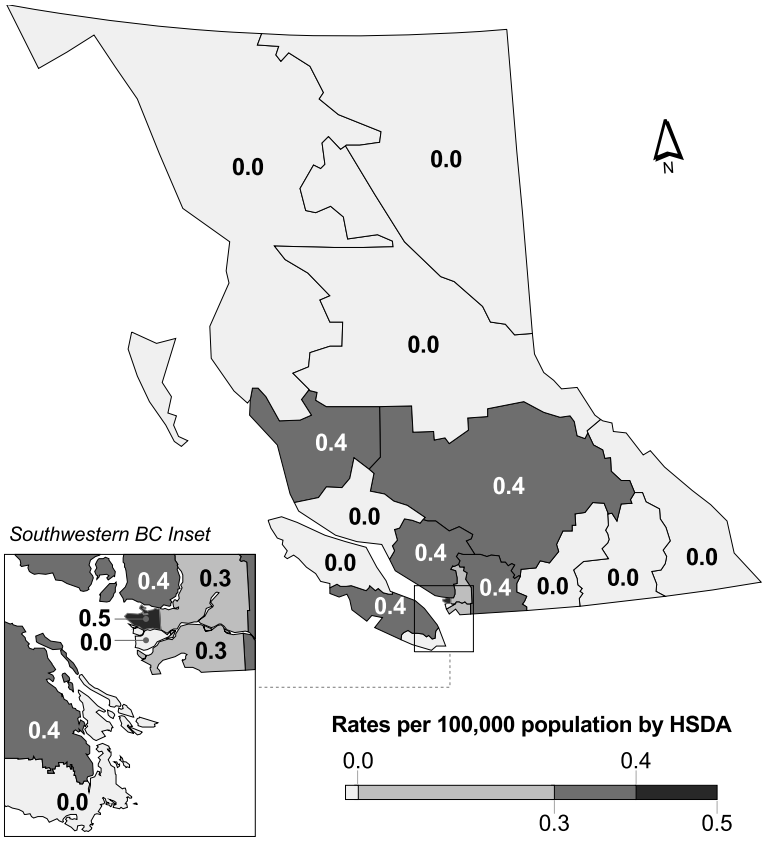
2.4 Acute Hepatitis B Rates by Year, 2001-2010



	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
BC Hepatitis B: Acute Reports	92	75	63	47	58	42	40	31	27	11
BC Hepatitis B: Acute Rate	2.3	1.8	1.5	1.1	1.4	1.0	0.9	0.7	0.6	0.2
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.

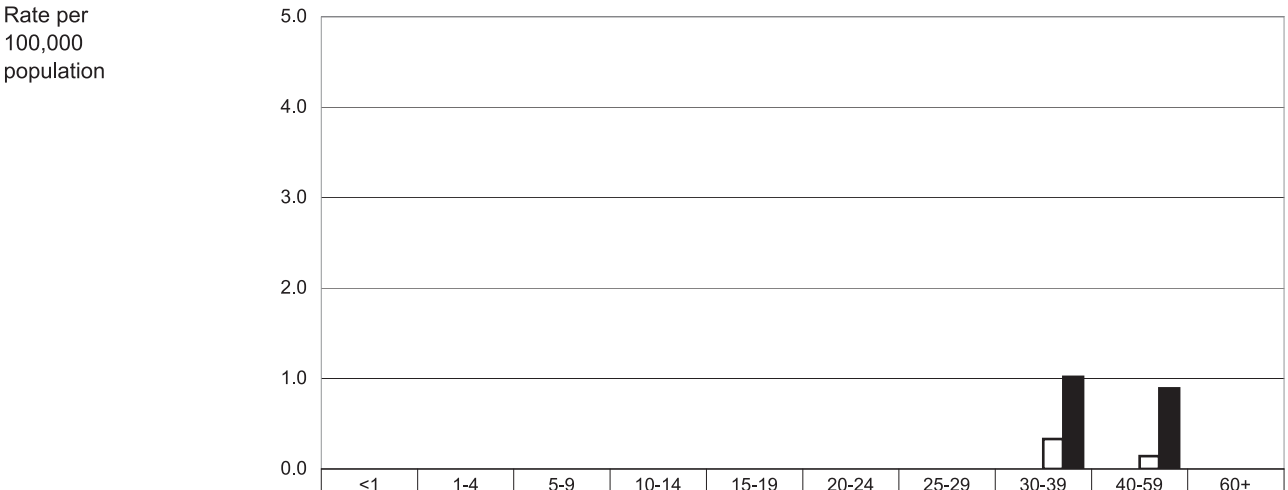
2.5 Acute Hepatitis B Rates by HSDA, 2010



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	1	0.4
21	Fraser East	1	0.4
22	Fraser North	2	0.3
23	Fraser South	2	0.3
31	Richmond	0	0.0
32	Vancouver	3	0.5
33	North Shore/Coast Garibaldi	1	0.4
41	South Vancouver Island	0	0.0
42	Central Vancouver Island	1	0.4
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.

2.6 Acute Hepatitis B Rates by Age Group and Sex, 2010



	<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	0	0	1	1	0
Hepatitis B: Acute Reports - Male	0	0	0	0	0	0	0	3	6	0
Hepatitis B: Acute Rate - Female	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.1	0.0
Hepatitis B: Acute Rate - Male	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.9	0.0

Influenza

Influenza surveillance in BC mainly 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) laboratory diagnoses including subtype and strain characterization; and (4) facility and school outbreak notifications.

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 of the 2009/10 influenza season (March 21, 2010) through week 11 of 2010/11 (ending March 19, 2011).**

Summary

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 the 2010/11 season, overall influenza activity remained below expected levels but increased in the later part of the season (February - April, 2011). Sporadic pandemic influenza A/H1N1 was detected throughout the usual influenza season accompanied by A/H3N2 and influenza B late in the season.

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 from week 12 (March 21, 2010) through week 11 (ending March 19, 2011) remained below the historical average of the past 20 years. The 2010/11 season was also marked by low activity during the early part of the season (December - January) and later increase in February and March that still remained below expected levels (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 in March (week 11) (Figure 3.2).

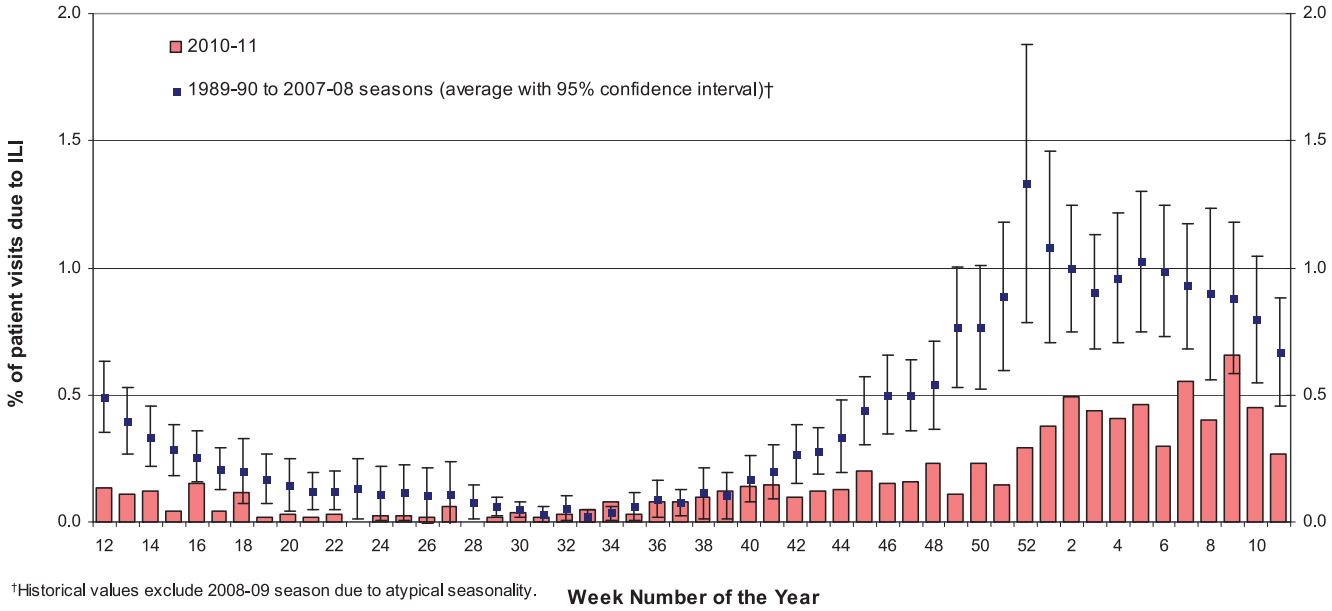
ILI Outbreaks

Between week 12 of the 2009/10 influenza season (March 21, 2010) and week 11 of the 2010/11 influenza season (March 19, 2011), ILI outbreaks were reported in 191 schools, and laboratory-confirmed influenza outbreaks were reported in 14 long-term care facilities (LTCF) and two acute care facilities. The increase in number of school ILI outbreaks coincided with sentinel physician and MSP ILI rates during the later part of the season (January-March 2011). (Figure 3.4)

Laboratory Profile of Influenza

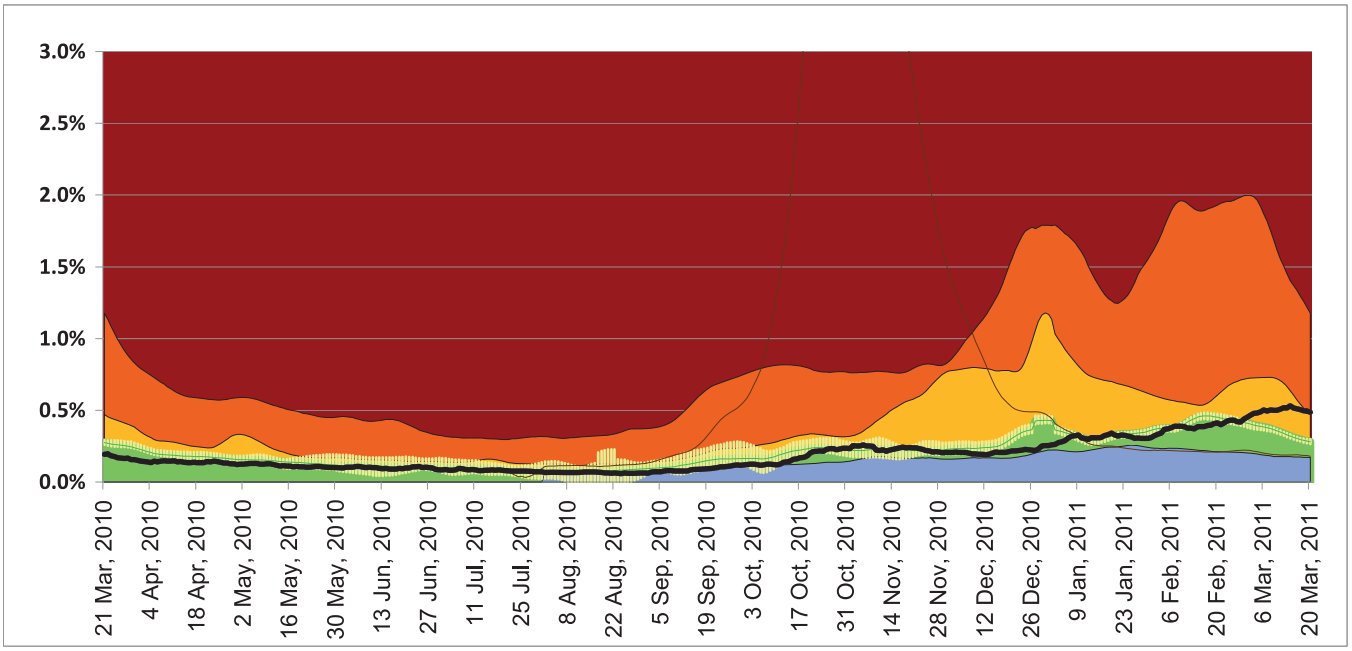
The BCCDC Virology Laboratory and the Children's and Women's Health Centre Virology Laboratory conducted 29,126 tests for respiratory viruses between March 22, 2009 (week 12) and March 20, 2010 (week 11). Eight thousand one-hundred forty one (28%) specimens were positive for influenza, of which 8078 (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).

3.1 Percentage of Patient Visits to Sentinel Physicians due to Influenza Like Illness (ILI) per Week Compared to Average Percentage of ILI Visits for the Past 19 Seasons, 2010-2011, British Columbia



†Historical values exclude 2008-09 season due to atypical seasonality.

3.2 Proportion of Influenza Illness Visits Among Submitted BC Medical Services Plan (MSP) Claims per Week, British Columbia, 2010-11

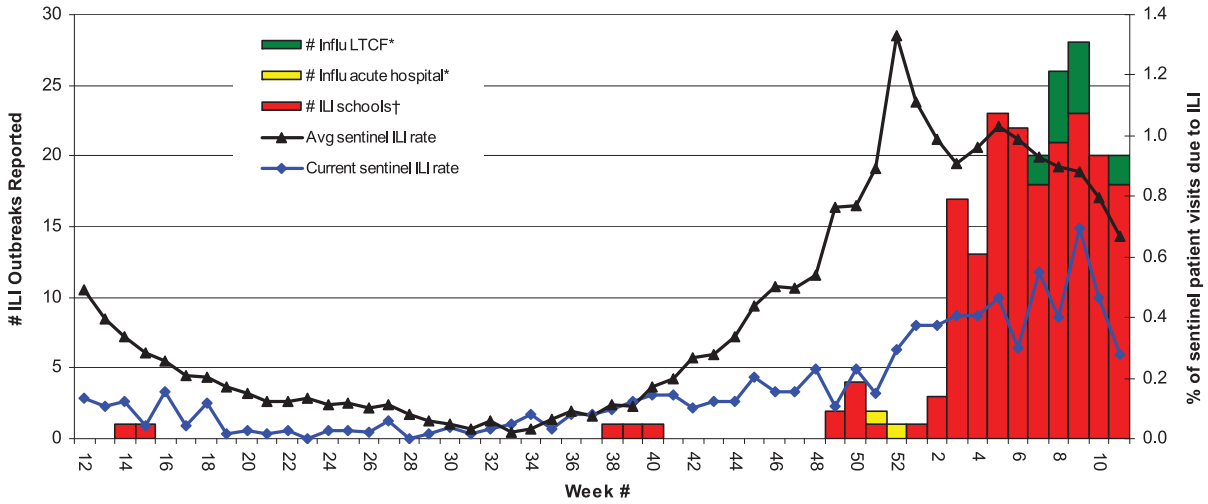


3.3 Number of Reported Influenza/ILI Outbreaks in Long-Term Care Facilities and Schools Between Weeks 40 and 11, British Columbia, 2003-04 to 2010-11 Seasons

	Long-term care facility outbreaks†	Acute care facility outbreaks†	School outbreaks‡
2003-04	57	7	108
2004-05	85	4	24
2005-06	46	2	141
2006-07	45	7	101
2007-08	54	7	97
2008-09	27	6	70
2009-10	13	0	617
2010-11	14	2	187

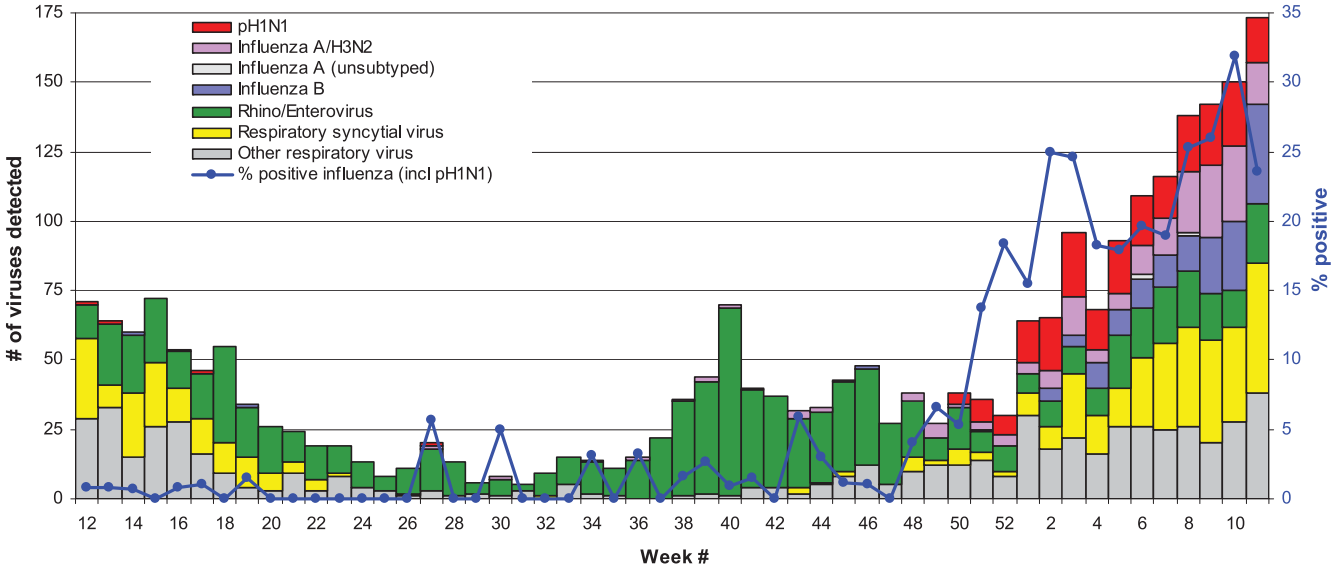
† Includes lab-confirmed influenza outbreaks only
‡ ILI outbreaks in schools defined as > 10% absenteeism, which could be attributed to influenza-like illness

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, 2010-2011

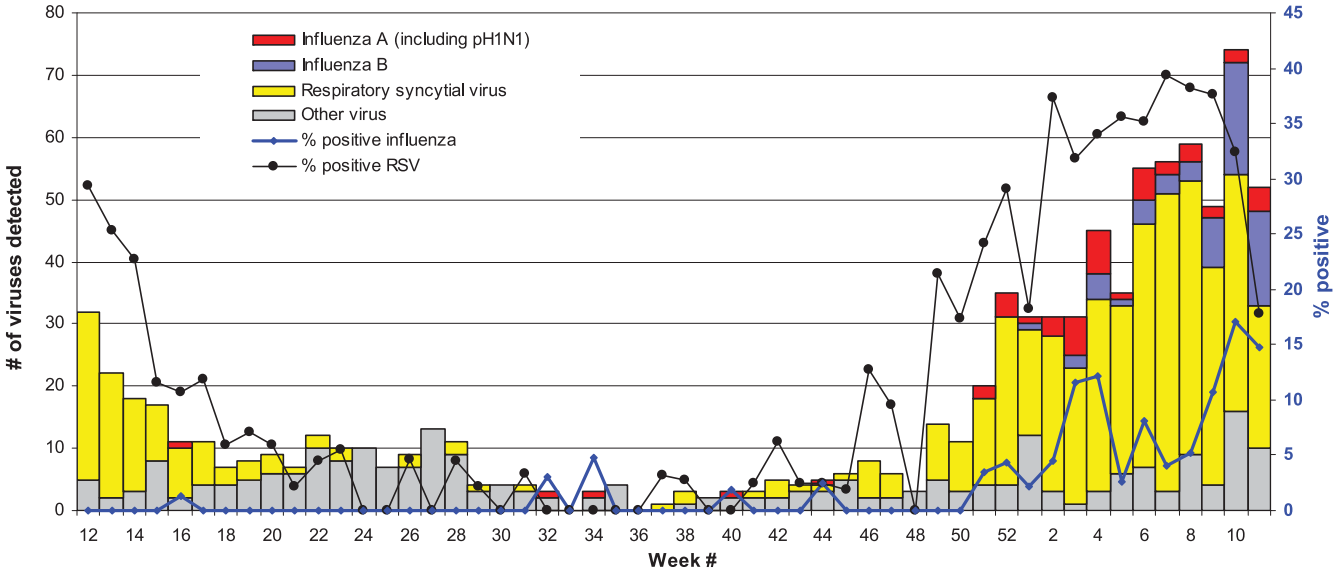


* Facility **influenza** outbreak defined as 2 or more ILI cases within 7-day period, with at least one case **laboratory-confirmed** as influenza.
† School **ILI** outbreak defined as >10% absenteeism on any day, most likely due to ILI.

3.5a Influenza and Other Virus Detection Among Respiratory Specimens Submitted to BC Public Health Microbiology & Reference Laboratory PHSA, 2010-2011



3.5b Influenza and Other Virus Detections Among Respiratory Specimens Submitted to BC Children's and Women's Health Centre Laboratory, 2010-2011



Influenza (continued)

Strain Characterization

BC laboratories routinely send influenza isolates to the National Microbiology Laboratory (NML) for strain characterization. Between September 1, 2010 and March 19, 2011, 435 isolates were sent to NML from BC. Of these, 202 (46.5%) were A/Perth/16/2009(H3N2) –like, 90 (20.7%) were A/California/07/09 (H1N1)-like, 134 (30.9%) were B/Brisbane/60/2008(Victoria)-like, and 9 (2.0%) were B/Wisconsin/01/2010(Yamagata)-like. The WHO-recommended components for the 2010/11 and 2011/12 Northern Hemisphere trivalent influenza vaccines are:

2010-11 and 2011-12 Vaccine Strains

2010/11	2011/12
A/California/07/2009 (H1N1) *	A/California/07/2009 (H1N1) *
A/Perth/16/2009 (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, 2010 and March 24, 2011, the NML reported that 98.9% (87/88) of pH1N1 isolates, all influenza B isolates (n=135) and 99.4%(176/177) influenza A/H3N2 isolates tested were sensitive to oseltamivir. All pH1N1 (n=86), all A/H3N2 (n=174), and all influenza B (n=136) isolates were sensitive to zanamivir. All pH1N1 (n=96) and 99.7% (324/325) A/H3N2 isolates were considered resistant to amantadine.

Measles

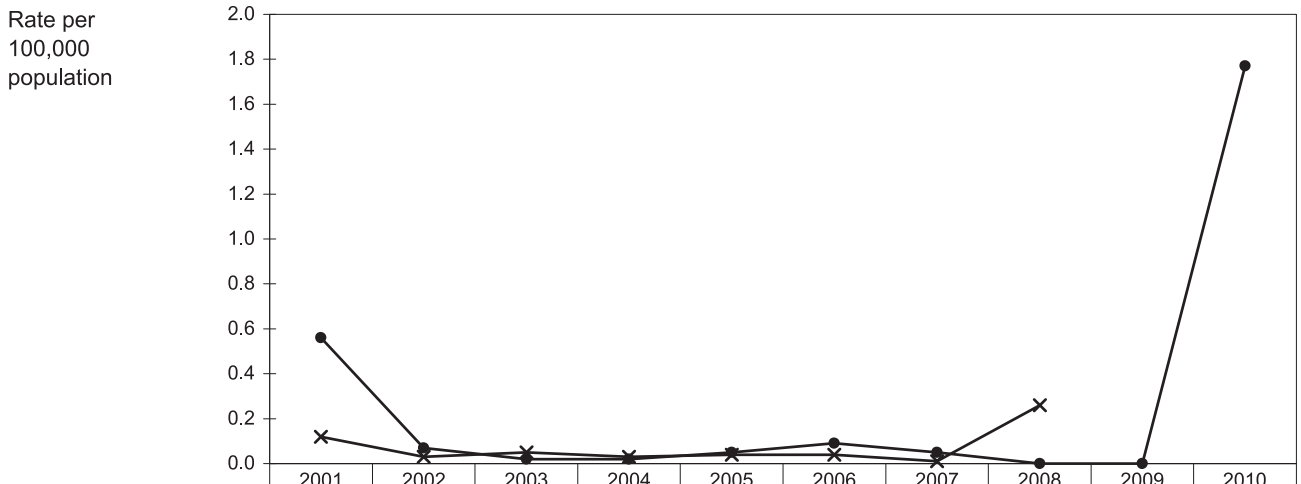
There were 80 confirmed cases of measles reported in BC in 2010.

Most were associated with a large outbreak following the Winter Olympic Games held in February. This was the largest measles outbreak in BC since 1997, during which 247 cases were reported. In the 2010 outbreak, onset dates ranged from March 9 through April 28, peaking April 6th. Ages ranged from 4 months to 64 years with a mean age of 23 years. Thirty-seven percent were unimmunized, 38% had unknown immunization history and 9% had received two prior doses of measles containing vaccine. Initial cases were in the Lower Mainland with spread throughout BC.

Two thirds of cases reported during the outbreak had no recognized source of infection, indicative of unrecognized and/or unreported cases.

Two measles cases were not associated with the outbreak. These cases were associated with travel to areas of known measles activity outside of Canada. No secondary transmissions were associated with these cases.

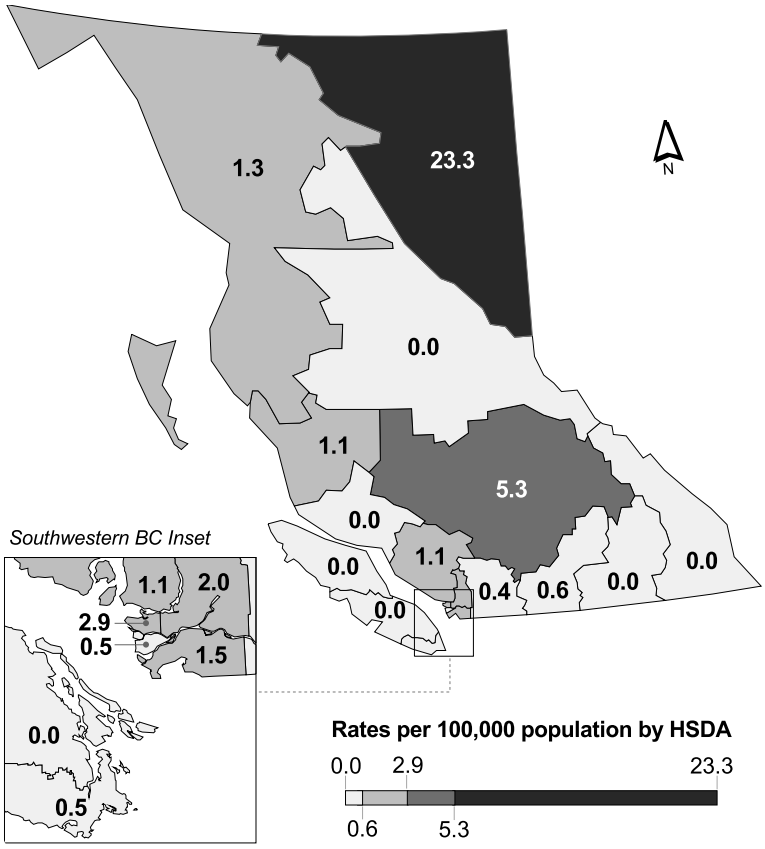
4.1 Measles Rates by Year, 2001-2010



	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
BC Measles Reports	23	3	1	1	2	4	2	0	0	80
BC Measles Rate	0.56	0.07	0.02	0.02	0.05	0.09	0.05	0.00	0.00	1.77
Canadian Measles Rate*	0.12	0.03	0.05	0.03	0.04	0.04	0.01	0.26		

*Please see Sources and Explanatory Remarks, Section 11 on page 125 in regard to the national rate

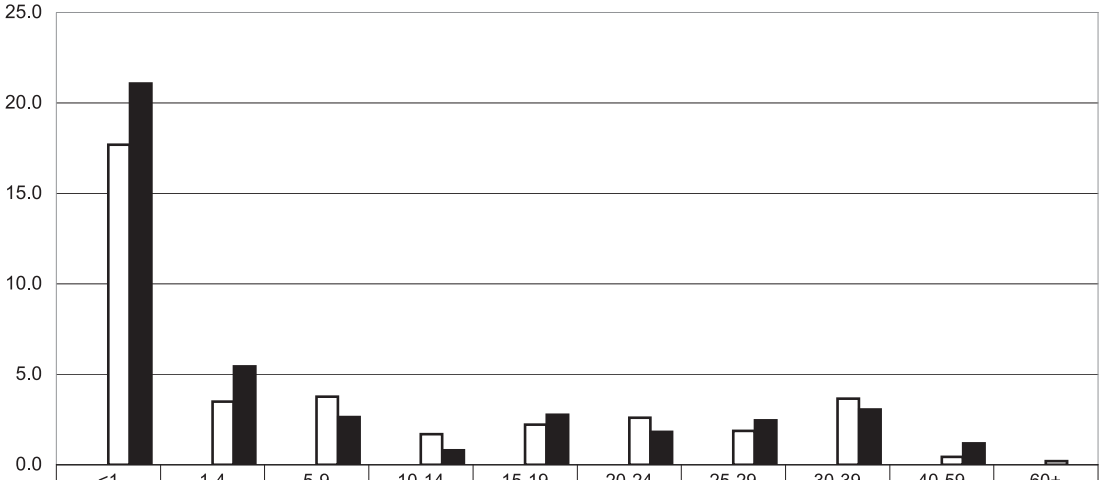
4.2 Measles Rates by HSDA, 2010



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	12	5.3
21	Fraser East	1	0.4
22	Fraser North	12	2.0
23	Fraser South	11	1.5
31	Richmond	1	0.5
32	Vancouver	19	2.9
33	North Shore/Coast Garibaldi	3	1.1
41	South Vancouver Island	2	0.5
42	Central Vancouver Island	0	0.0
43	North Vancouver Island	0	0.0
51	Northwest	1	1.3
52	Northern Interior	0	0.0
53	Northeast	16	23.3

Note: Map classification by Jenks natural breaks method.

4.3 Measles Rates by Age Group and Sex, 2010



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Measles Reports - Female	4	3	4	2	3	4	3	11	3	1
Measles Reports - Male	5	5	3	1	4	3	4	9	8	0
□ Measles Rate - Female	17.7	3.5	3.8	1.7	2.2	2.6	1.9	3.7	0.4	0.2
■ Measles Rate - Male	21.1	5.4	2.6	0.8	2.8	1.8	2.5	3.1	1.2	0.0

Meningococcal Disease (invasive)

The rate of invasive meningococcal disease (IMD) has decreased from 0.78 cases per 100,000 population in 2002 to 0.27 cases per 100,000 population in 2010.

The rate of serogroup C disease declined over the same period from 0.22 to 0.02 cases per 100,000 population, with only one case reported (an adult) during 2010. This downward trend reflects the positive impact of the infant and school-age catch-up meningococcal C immunization programs that started in September 2003.

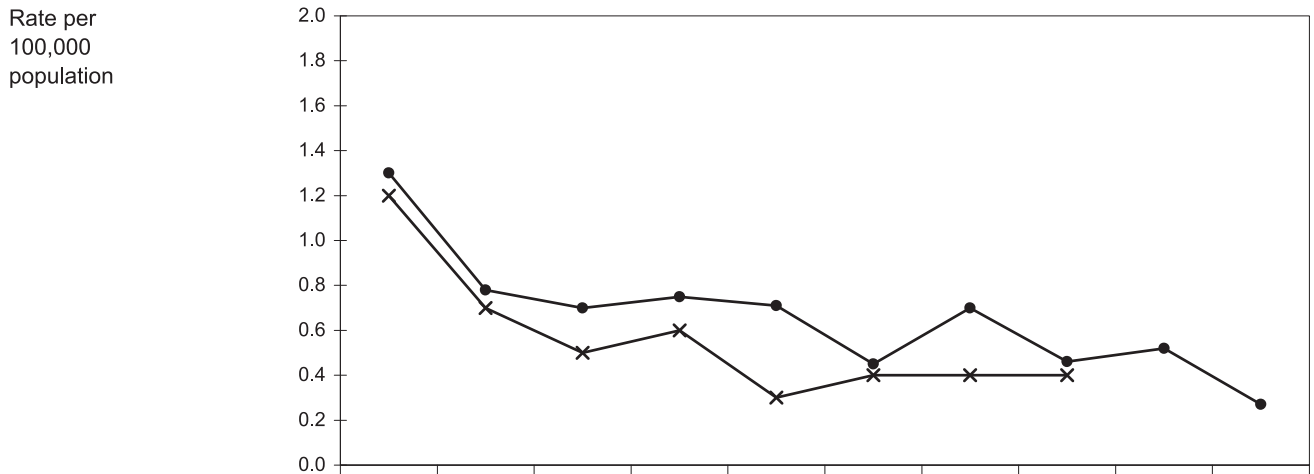
Since 2001, there has been no observable trend in the rates of serogroup B (range: 0.09-0.41 cases/100,000 per year), Y (range: 0.02-0.24 cases/100,000 per year) or W135 (range: 0.0-0.10 cases/100,000 per year) disease (Figure 5.2). There have only been 2 cases of serogroup A disease in this time period; both occurred in 2006 and were due to importation from the Indian subcontinent.

The most recent IMD outbreaks were both serogroup C: one in the Abbotsford area in 2001 and one among men who have sex with men in 2004 (see Annual Summary of Reportable Diseases for these years for additional detail).

Since introduction of the serogroup C immunization program, there has not been a recurrence of the historical pattern of periodic outbreaks in school-age children and adolescents. The median age of all IMD increased from 23 years to 57 years between 2002 and 2008, but decreased to 29 in 2009 due to 5 sporadic cases of serogroup B in infants. In 2010, the median age of IMD cases increased to 45.5 years.

During 2010, 12 cases were reported. Serogroups were: 4 B, 2 Y, 2 W135, 1 C, 1 29E and 2 untypable/unknown. One case was fatal. There was no evidence of geographic clustering of cases.

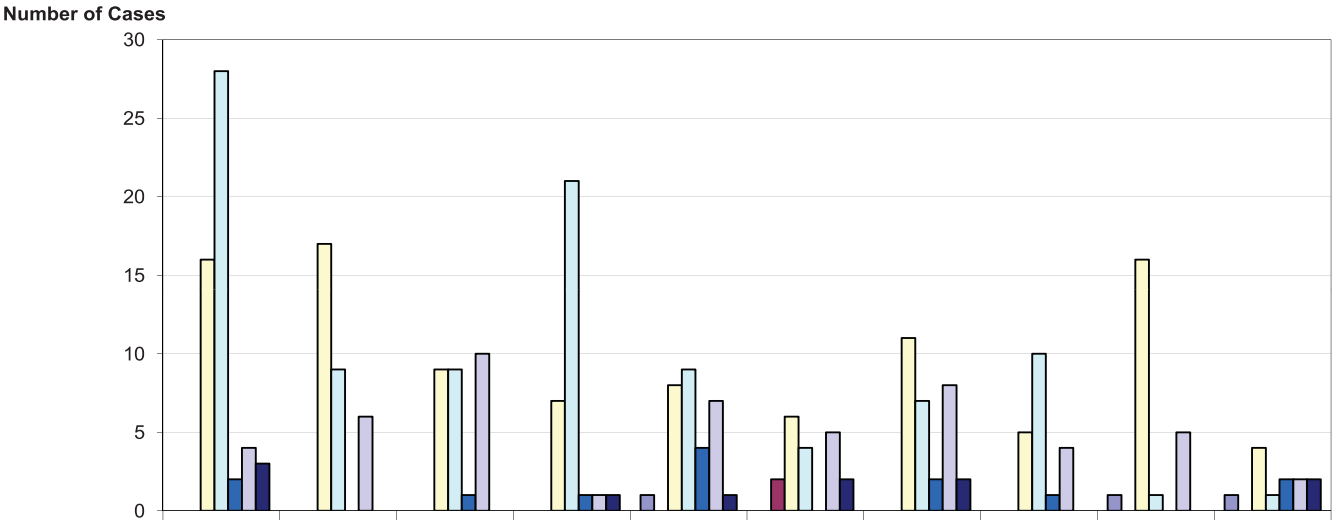
5.1 Meningococcal Disease (invasive) Rates by Year, 2001-2010



	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
BC Meningococcal Reports	53	32	29	31	30	19	30	20	23	12
BC Meningococcal Rate	1.3	0.8	0.7	0.8	0.7	0.5	0.7	0.5	0.5	0.3
Canadian Meningococcal Rate*	1.2	0.7	0.5	0.6	0.3	0.4	0.4	0.4		

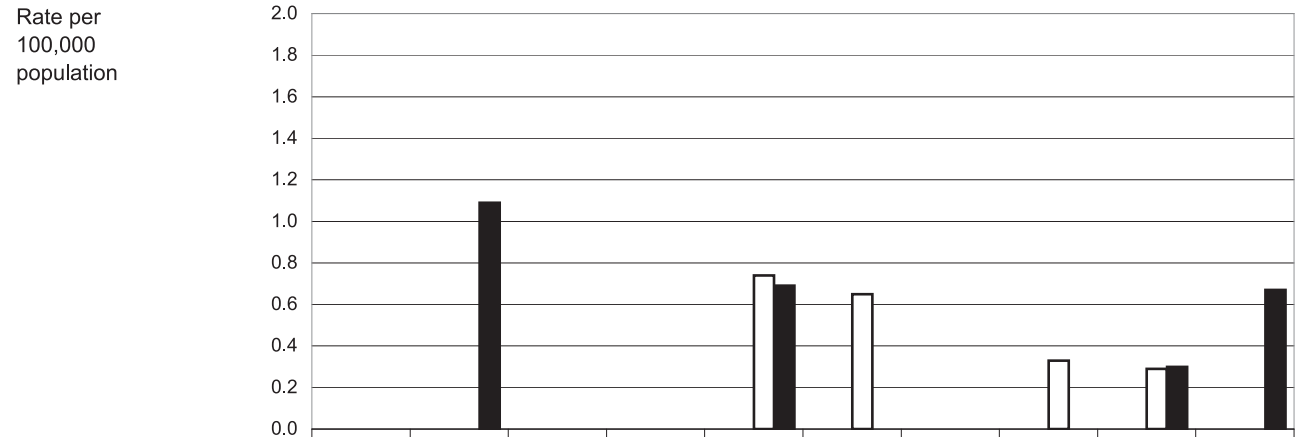
*Please see Sources and Explanatory Remarks, Section 11 on page 125 in regard to the national rate

5.2 Meningococcal Disease (invasive) Cases by Serogroup and Year, 2001-2010



	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
29E	0	0	0	0	1	0	0	0	1	1
A	0	0	0	0	0	2	0	0	0	0
B	16	17	9	7	8	6	11	5	16	4
C	28	9	9	21	9	4	7	10	1	1
W135	2	0	1	1	4	0	2	1	0	2
Y	4	6	10	1	7	5	8	4	5	2
Unknown	3	0	0	1	1	2	2	0	0	2

5.3 Meningococcal Disease (invasive) Rates by Age Group and Sex, 2010



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Meningococcal Reports - Female	0	0	0	0	1	1	0	1	2	0
Meningococcal Reports - Male	0	1	0	0	1	0	0	0	2	3
Meningococcal Rate - Female	0.0	0.0	0.0	0.0	0.7	0.7	0.0	0.3	0.3	0.0
Meningococcal Rate - Male	0.0	1.1	0.0	0.0	0.7	0.0	0.0	0.0	0.3	0.7

Mumps

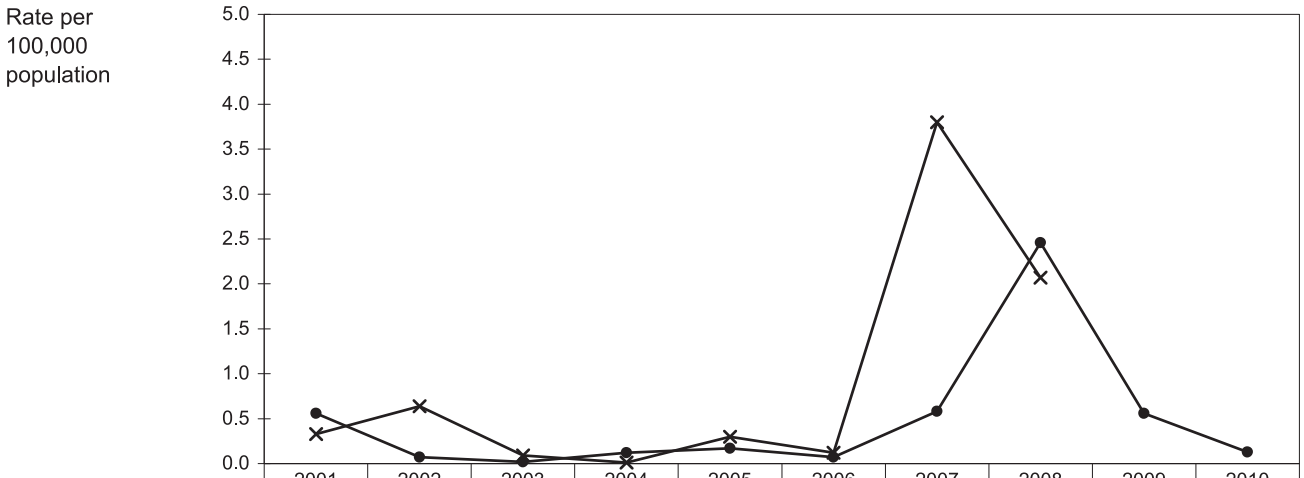
Six confirmed cases and ten clinical cases of mumps were reported in 2010.

Confirmed cases ranged in age from 23 to 40 years. In 4 cases, prior mumps vaccine history was reported as unknown, 1 had received one dose of mumps containing vaccine and 1 was unimmunized. None were hospitalized.

Three had traveled internationally to regions of known mumps activity. One was a contact of a confirmed case in Ontario.

A cluster of three linked clinical cases was reported from Vancouver Island Health Authority.

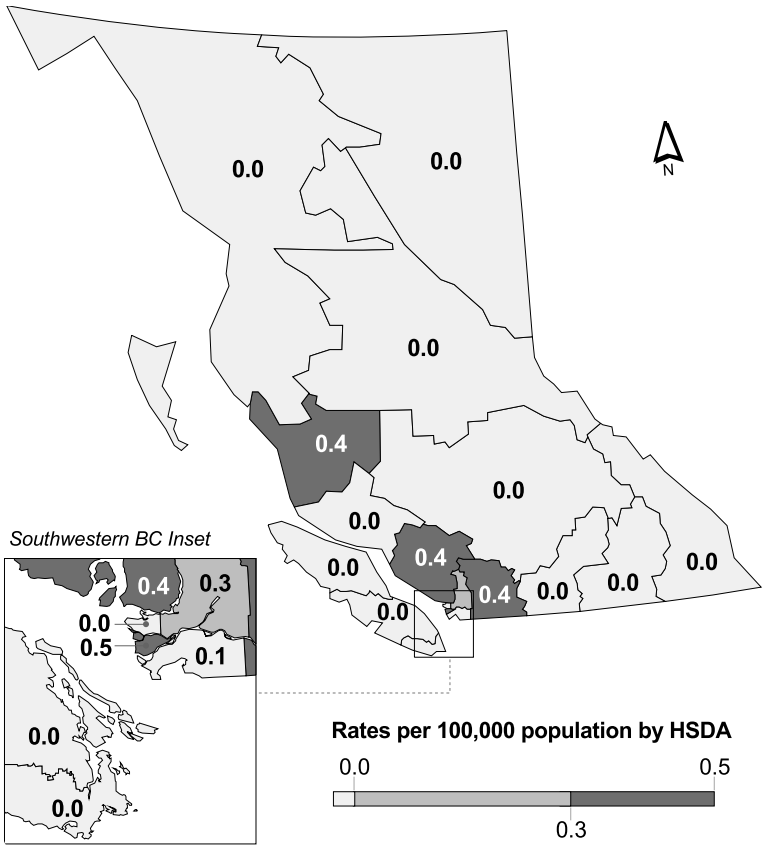
6.1 Mumps Rates by Year, 2001-2010



	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
BC Mumps Reports	23	3	1	5	7	3	25	108	25	6
BC Mumps Rate	0.56	0.07	0.02	0.12	0.17	0.07	0.58	2.46	0.56	0.13
Canadian Mumps Rate*	0.33	0.64	0.09	0.01	0.30	0.12	3.80	2.07		

*Please see Sources and Explanatory Remarks, Section 11 on page 125 in regard to the national rate

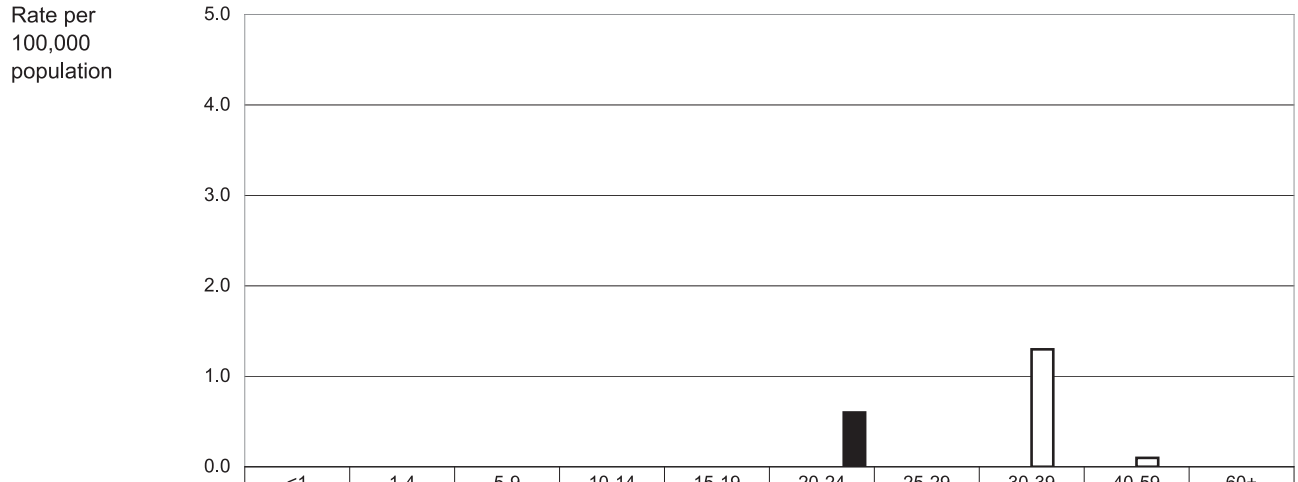
6.2 Mumps Rates by HSDA, 2010



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	1	0.4
22	Fraser North	2	0.3
23	Fraser South	1	0.1
31	Richmond	1	0.5
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.

6.3 Mumps Rates by Age Group and Sex, 2010



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Mumps Reports - Female	0	0	0	0	0	0	0	4	1	0
Mumps Reports - Male	0	0	0	0	0	1	0	0	0	0
Mumps Rate - Female	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	0.1	0.0
Mumps Rate - Male	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0

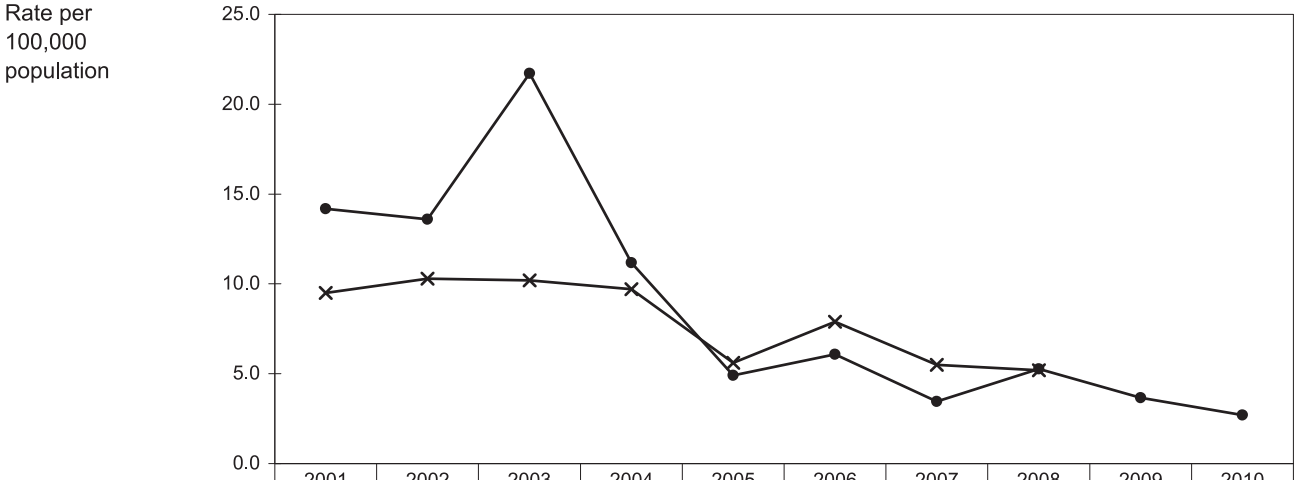
Pertussis

Pertussis generally demonstrates cyclical peaks every three to five years in BC. Following the detection of dramatic epidemics in 1996, 2000 and 2003, BC has not experienced a significant provincial peak since 2003 (21.5 per 100,000), following which rates have dropped to their lowest levels in ~20 years (<10 per 100,000 from 2005) despite ongoing surveillance and testing through sensitive PCR. The cumulative incidence rate in 2010 was 2.8 per 100,000, which is the lowest recorded since 1990.

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 and some shift in predominance back toward infants and pre-school children. Continued monitoring is required to assess further changes in pertussis activity and to inform modifications to the pertussis immunization program.

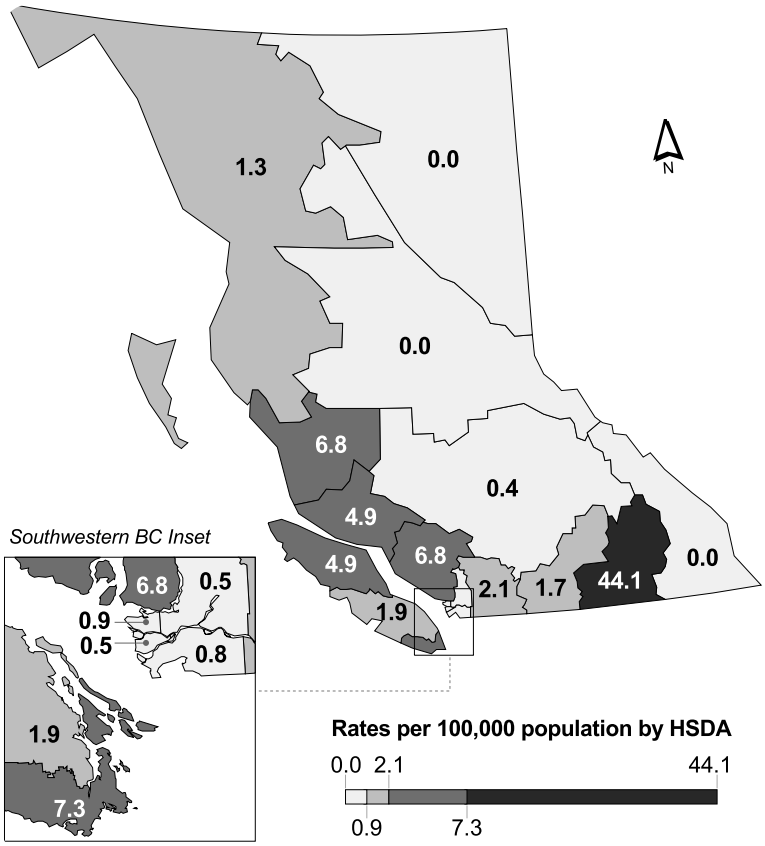
7.1 Pertussis Rates by Year, 2001-2010



	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
BC Pertussis Reports	578	557	895	464	206	258	149	231	163	122
BC Pertussis Rate	14.2	13.6	21.7	11.2	4.9	6.1	3.5	5.3	3.7	2.7
Canadian Pertussis Rate*	9.5	10.3	10.2	9.7	5.6	7.9	5.5	5.2		

*Please see Sources and Explanatory Remarks, Section 11 on page 125 in regard to the national rate

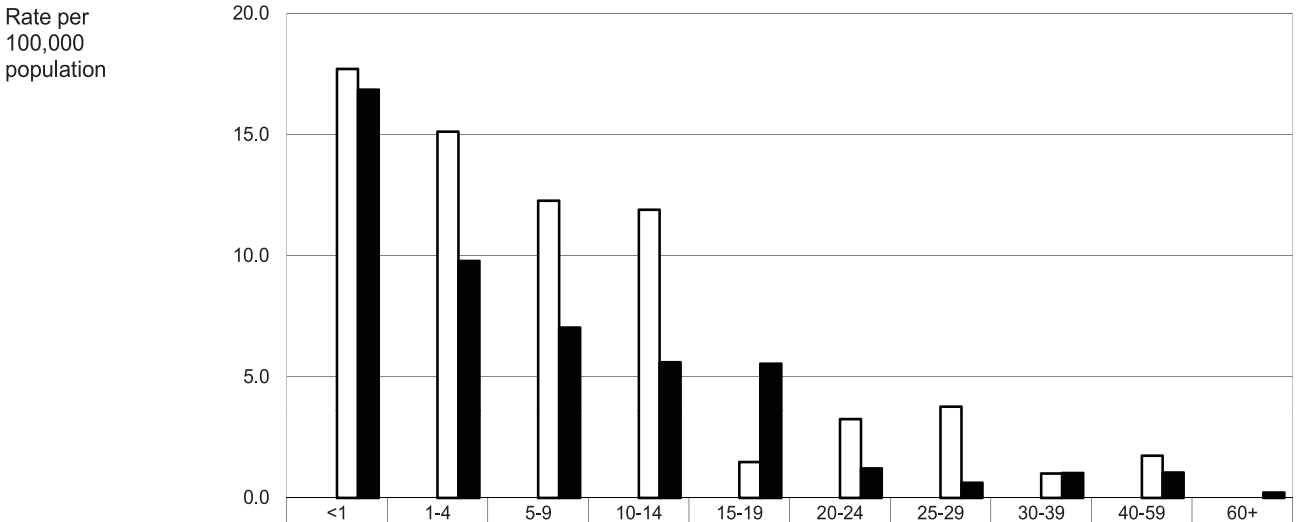
7.2 Pertussis Rates by HSDA, 2010



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	0	0.0
12	Kootenay Boundary	35	44.1
13	Okanagan	6	1.7
14	Thompson Cariboo Shuswap	1	0.4
21	Fraser East	6	2.1
22	Fraser North	3	0.5
23	Fraser South	6	0.8
31	Richmond	1	0.5
32	Vancouver	6	0.9
33	North Shore/Coast Garibaldi	19	6.8
41	South Vancouver Island	27	7.3
42	Central Vancouver Island	5	1.9
43	North Vancouver Island	6	4.9
51	Northwest	1	1.3
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, 2010



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Pertussis Reports - Female	4	13	13	14	2	5	6	3	12	0
Pertussis Reports - Male	4	9	8	7	8	2	1	3	7	1
Pertussis Rate - Female	17.7	15.1	12.3	11.9	1.5	3.3	3.8	1.0	1.7	0.0
Pertussis Rate - Male	16.9	9.8	7.0	5.6	5.5	1.2	0.6	1.0	1.0	0.2

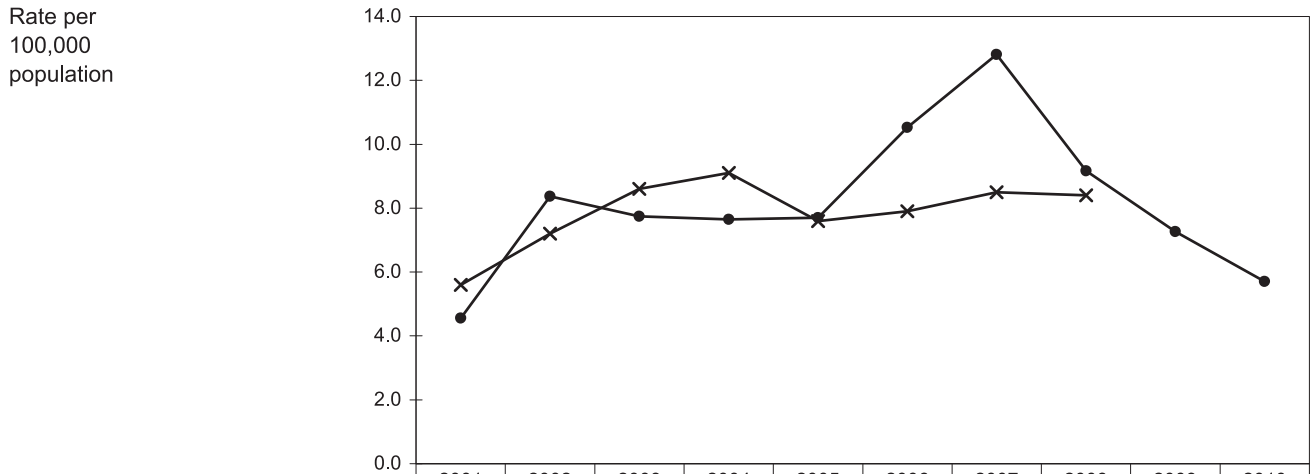
Pneumococcal Disease (invasive)

The rate of invasive pneumococcal disease (IPD) decreased in 2010 to 5.7 reports per 100,000 population compared to 7.3 per 100,000 in 2009.

Rates of IPD among children < 5 years old in British Columbia have decreased 79% since the introduction of pneumococcal conjugate vaccine from 54.4 per 100,000 (114 cases) in 2002 to 10.7 per 100,000 (24 cases) in 2010.

Serotyping results were available for 77% (198/258) of cases in 2010. Among these cases aged less than 5 years, none were due to serotypes covered by PCV-7 vaccine and 67% (12/18) were due to the 6 additional serotypes covered by PCV-13 vaccine. Among cases over 65 years of age where serotyping results were available, 78% (49/63) of cases were due to serotypes covered by the PPV-23 vaccine.

8.1 Pneumococcal Disease (invasive) Rates by Year, 2001-2010

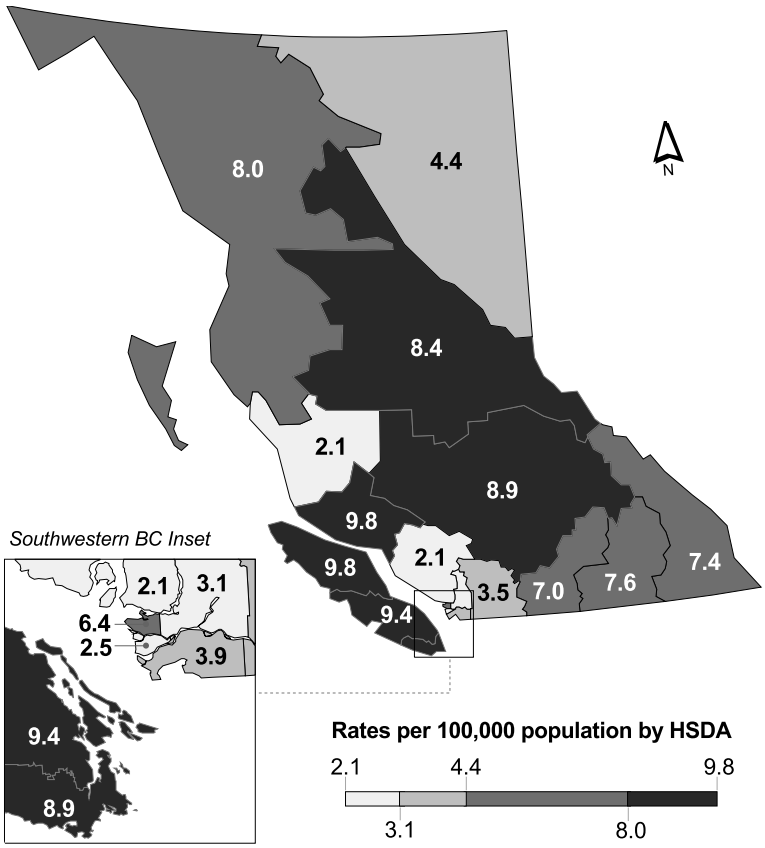


	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
BC Invasive Pneumococcal Reports	186	343	319	318	323	447	552	402	324	258
BC Invasive Pneumococcal Rate	4.6	8.4	7.7	7.7	7.7	10.5	12.8	9.2	7.3	5.7
Canadian Invasive Pneumococcal Rate*	5.6	7.2	8.6	9.1	7.6	7.9	8.5	8.4		

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 125 in regard to the national rate

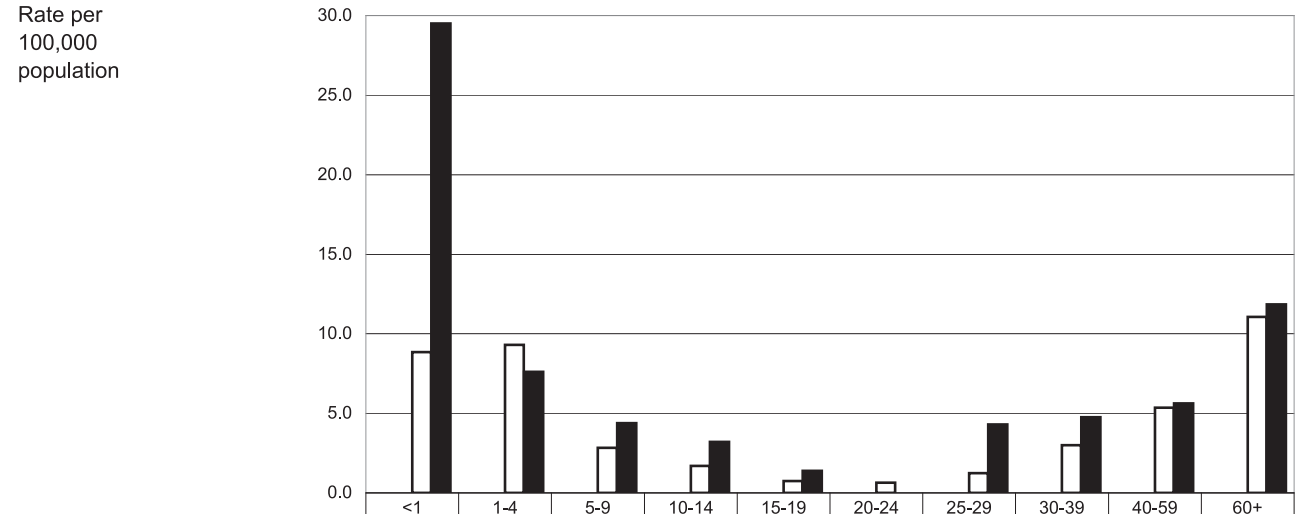
8.2 Pneumococcal Disease (invasive) Rates by HSDA, 2010



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	6	7.4
12	Kootenay Boundary	6	7.6
13	Okanagan	25	7.0
14	Thompson Cariboo Shuswap	20	8.9
21	Fraser East	10	3.5
22	Fraser North	19	3.1
23	Fraser South	28	3.9
31	Richmond	5	2.5
32	Vancouver	42	6.4
33	North Shore/Coast Garibaldi	6	2.1
41	South Vancouver Island	33	8.9
42	Central Vancouver Island	25	9.4
43	North Vancouver Island	12	9.8
51	Northwest	6	8.0
52	Northern Interior	12	8.4
53	Northeast	3	4.4

Note: Map classification by Jenks natural breaks method.

8.3 Pneumococcal Disease (invasive) Rates by Age Group and Sex, 2010



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Invasive Pneumococcal Reports - Female	2	8	3	2	1	1	2	9	37	56
Invasive Pneumococcal Reports - Male	7	7	5	4	2	0	7	14	38	53
Invasive Pneumococcal Rate - Female	8.9	9.3	2.8	1.7	0.7	0.7	1.3	3.0	5.4	11.1
Invasive Pneumococcal Rate - Male	29.5	7.6	4.4	3.2	1.4	0.0	4.3	4.8	5.6	11.9

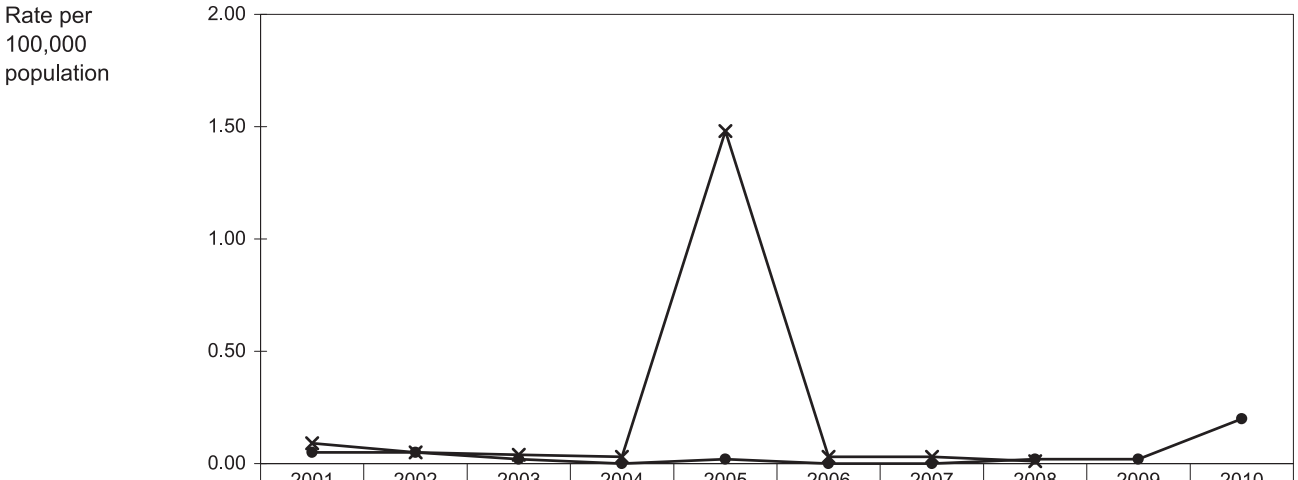
Rubella and Congenital Rubella Syndrome

Nine cases of rubella occurred in BC residents in 2010. All cases were associated with a workplace located in the Lower Mainland area. The index case was a male in his 40s with an unknown immunization history whose infection was compatible with acquisition during travel to the Philippines. Cases ranged in age from 39 to 60 years and 5 were female. Two cases were unimmunized and seven had unknown immunization status. None were hospitalized. No recognized infections occurred among pregnant women.

This was the largest outbreak of rubella reported in BC in the past decade.

There were no reported cases of congenital rubella syndrome in 2010.

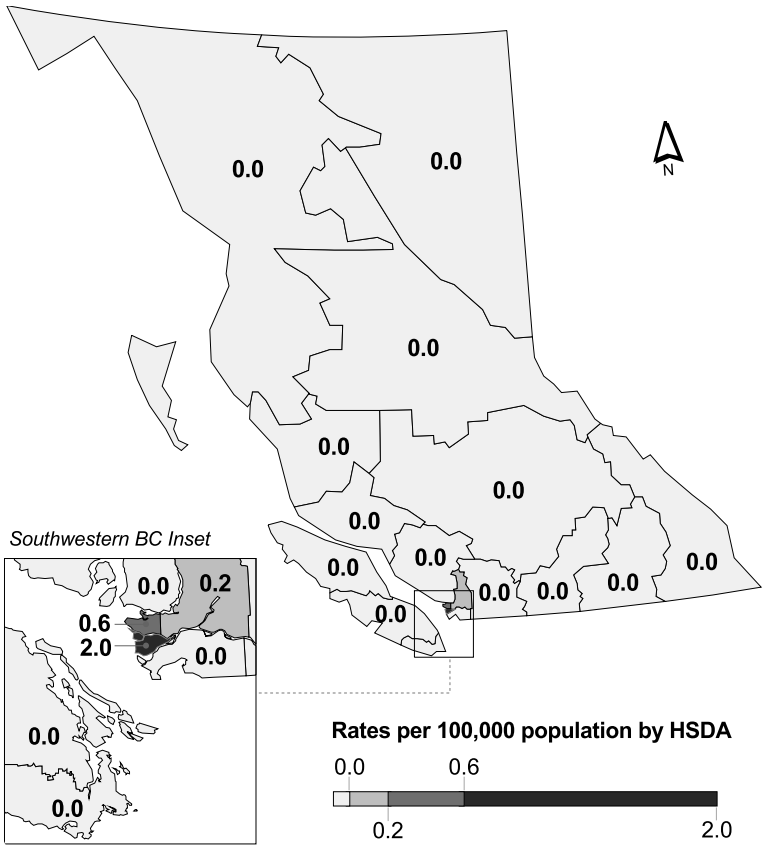
9.1 Rubella Rates by Year, 2001-2010



	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
BC Rubella Reports	2	2	1	0	1	0	0	1	1	9
BC Rubella Rate	0.05	0.05	0.02	0.00	0.02	0.00	0.00	0.02	0.02	0.20
Canadian Rubella Rate*	0.09	0.05	0.04	0.03	1.48	0.03	0.03	0.01		

*Please see Sources and Explanatory Remarks, Section 11 on page 125 in regard to the national rate

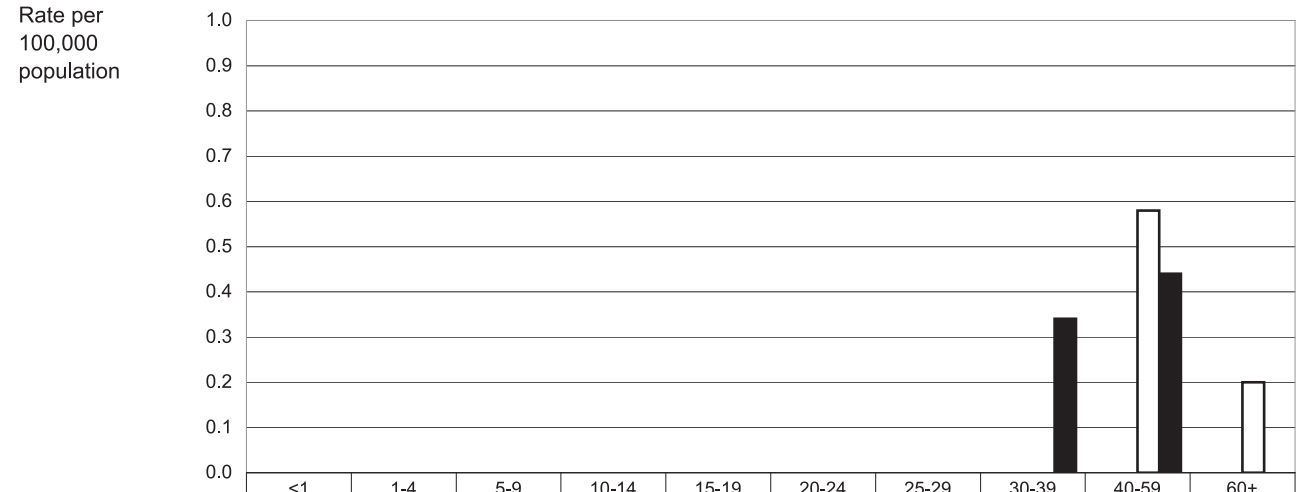
9.2 Rubella Rates by HSDA, 2010



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	4	2.0
32	Vancouver	4	0.6
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.

9.3 Rubella Rates by Age Group and Sex, 2010

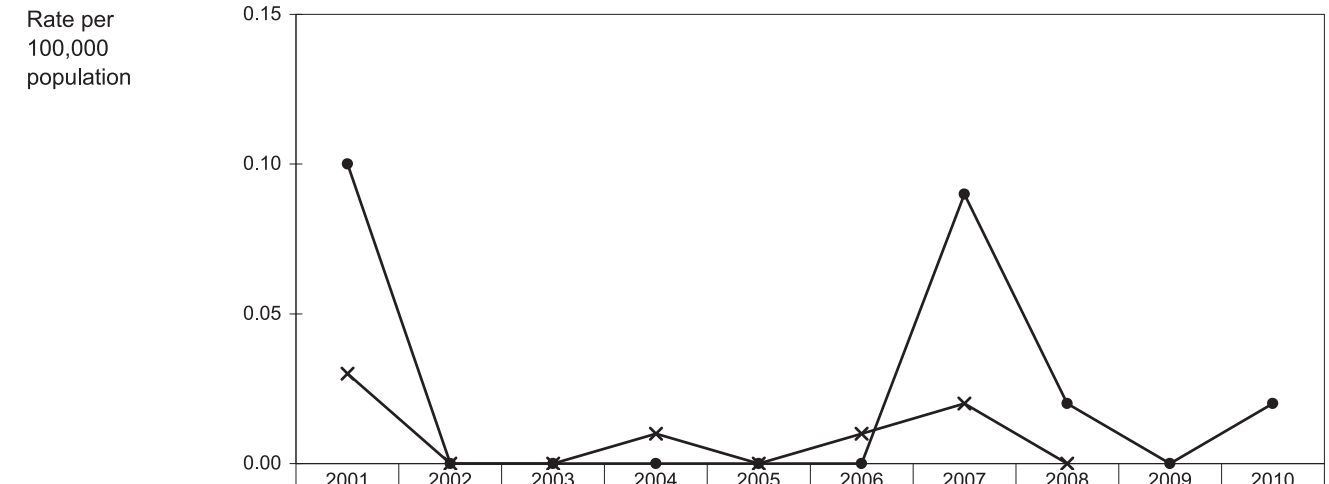


	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Rubella Reports - Female	0	0	0	0	0	0	0	0	4	1
Rubella Reports - Male	0	0	0	0	0	0	0	1	3	0
Rubella Rate - Female	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.2
Rubella Rate - Male	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.4	0.0

Tetanus

A case of tetanus was reported in an elderly male with an unknown tetanus immunization history.

10.1 Tetanus Rates by Year, 2001-2010



	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
BC Tetanus Reports	4	0	0	0	0	0	4	1	0	1
BC Tetanus Rate	0.10	0.00	0.00	0.00	0.00	0.00	0.09	0.02	0.00	0.02
Canadian Tetanus Rate*	0.03	0.00	0.00	0.01	0.00	0.01	0.02	0.00		

*Please see Sources and Explanatory Remarks, Section 11 on page 125 in regard to the national rate

SEXUALLY TRANSMITTED AND BLOODBORNE PATHOGENS

HIV

AIDS

Genital Chlamydia

Genital Gonorrhea

Hepatitis C

Infectious Syphilis

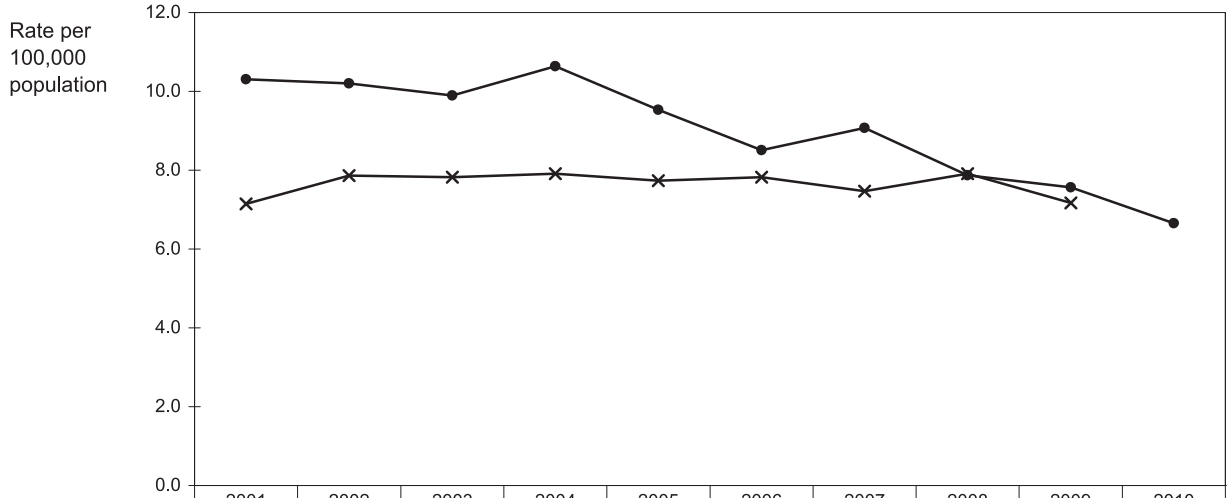
HIV

The rate of new positive HIV tests decreased slightly in 2010 to 6.7 (301 cases) from 7.6 per 100,000 (337 cases) in 2009. The majority of new positive HIV tests were identified in males, with the highest rate among males aged 30-39 years (24.1 per 100,000). Trends are variable by HSDA; the highest rate of new positive HIV tests was in Vancouver HSDA (22.7 per 100,000; 148 cases), followed by Northwest HSDA (8.0 per 100,000; 6 cases). While the decline in new positive HIV test rates since 2004 is in part attributed to HIV becoming reportable and enhanced follow-up of all HIV test results starting in 2003, these trends likely reflect a true decrease in HIV incidence, driven by a decrease in new positive HIV tests among people who use injection drugs. [1,2]

1, See 2009 Annual Surveillance Report: HIV and Sexually Transmitted Infections (p.36) for further explanation of this ascertainment bias.

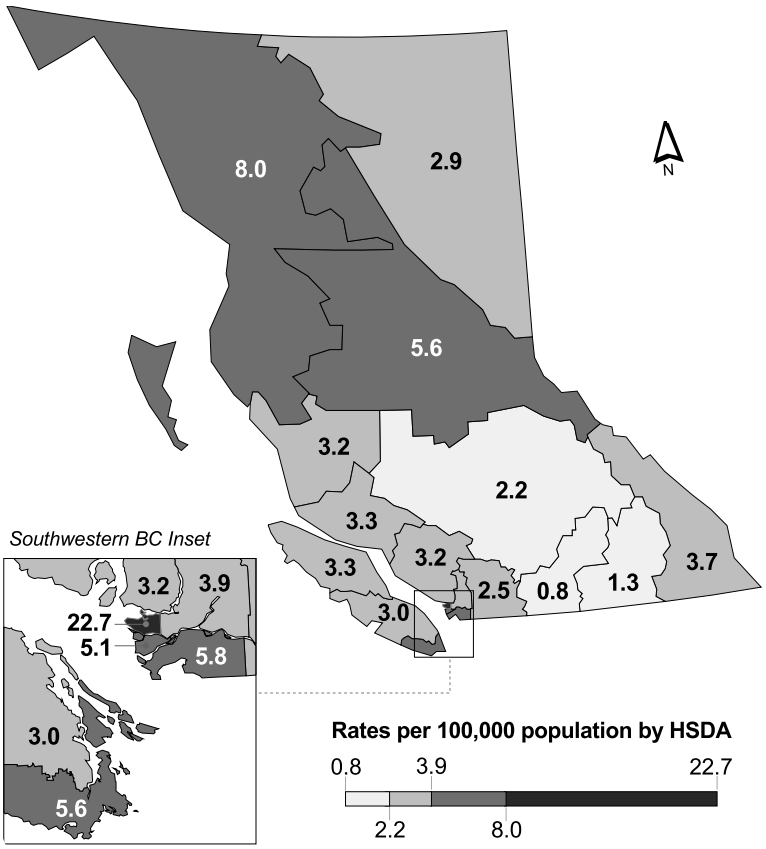
2, Kendall P. Decreasing HIV infections among people who use drugs by injection in British Columbia: Potential Explanations and recommendations for further action. Report from the Office of the Provincial Health Officer, March 2011.

11.1 HIV Rates by Year, 2001-2010



	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
BC HIV Reports	420	418	408	442	400	361	391	345	337	301
BC HIV Rate	10.3	10.2	9.9	10.6	9.5	8.5	9.1	7.9	7.6	6.7
Canadian HIV Rate	7.1	7.9	7.8	7.9	7.7	7.8	7.5	7.9	7.2	

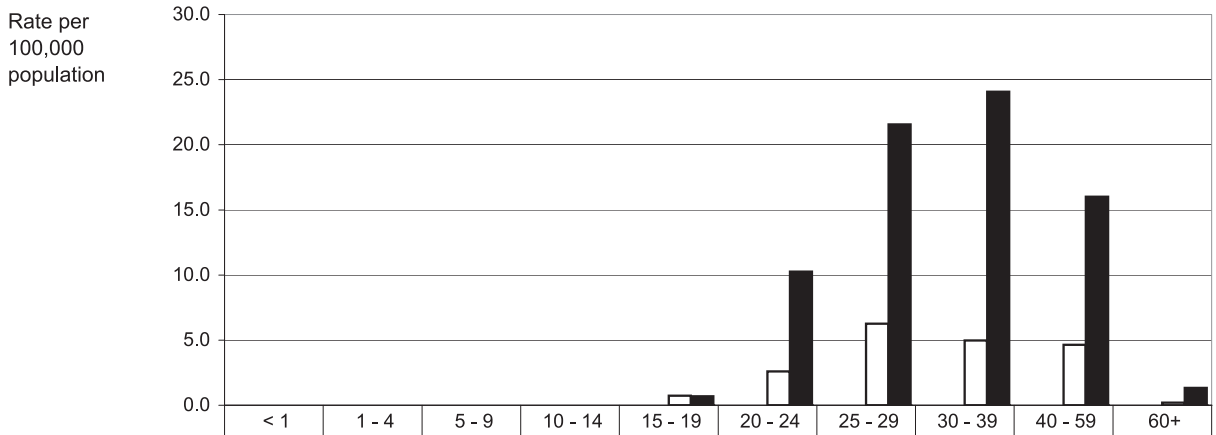
11.2 HIV Rates by HSDA, 2010



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	3	3.7
12	Kootenay Boundary	1	1.3
13	Okanagan	3	0.8
14	Thompson Cariboo Shuswap	5	2.2
21	Fraser East	7	2.5
22	Fraser North	24	3.9
23	Fraser South	41	5.8
31	Richmond	10	5.1
32	Vancouver	148	22.7
33	North Shore/Coast Garibaldi	9	3.2
41	South Vancouver Island	21	5.6
42	Central Vancouver Island	8	3.0
43	North Vancouver Island	4	3.3
51	Northwest	6	8.0
52	Northern Interior	8	5.6
53	Northeast	2	2.9

Note: Map classification by Jenks natural breaks method.

11.3 HIV Rates by Age Group and Sex, 2010

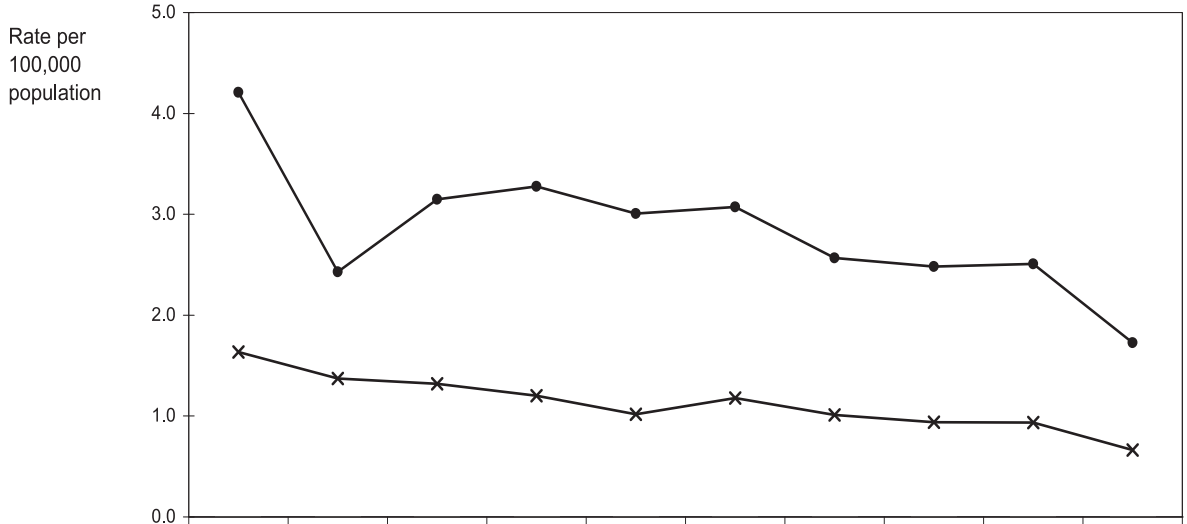


	< 1	1 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 39	40 - 59	60+
HIV Reports - Female	0	0	0	0	1	4	10	15	32	1
HIV Reports - Male	0	0	0	0	1	17	35	71	108	6
HIV Rate - Female	0.0	0.0	0.0	0.0	0.7	2.6	6.3	5.0	4.6	0.2
HIV Rate - Male	0.0	0.0	0.0	0.0	0.7	10.3	21.6	24.1	16.0	1.3

AIDS

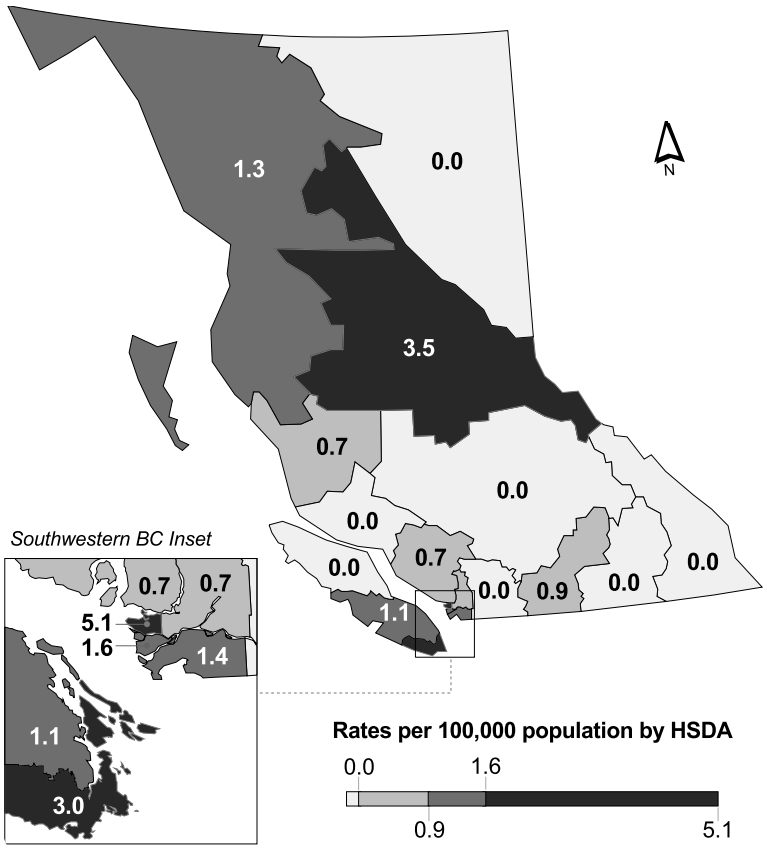
Due to the expected delays associated with AIDS reporting, this report includes data on AIDS through 2009 only. In 2009, the AIDS rate in BC decreased to 1.7 per 100,000 (77 cases) from 2.5 per 100,000 (110 cases) in 2008. The majority of AIDS cases occurred in males, with the greatest concentration in males aged 40-59 years (6.0 per 100,000). The highest rate was recorded in Vancouver HSDA (5.1 per 100,000; 33 cases) followed by Northern Interior HSDA (3.5 per 100,000; 5 cases) and South Vancouver Island HSDA (3.0 per 100,000; 11 cases).

12.1 AIDS Rates by Year, 2000-2009



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
BC AIDS Reports	170	99	129	135	125	129	109	107	110	77
BC AIDS Rate	4.2	2.4	3.1	3.3	3.0	3.1	2.6	2.5	2.5	1.7
Canadian AIDS Rate	1.6	1.4	1.3	1.2	1.0	1.2	1.0	0.9	0.9	0.7

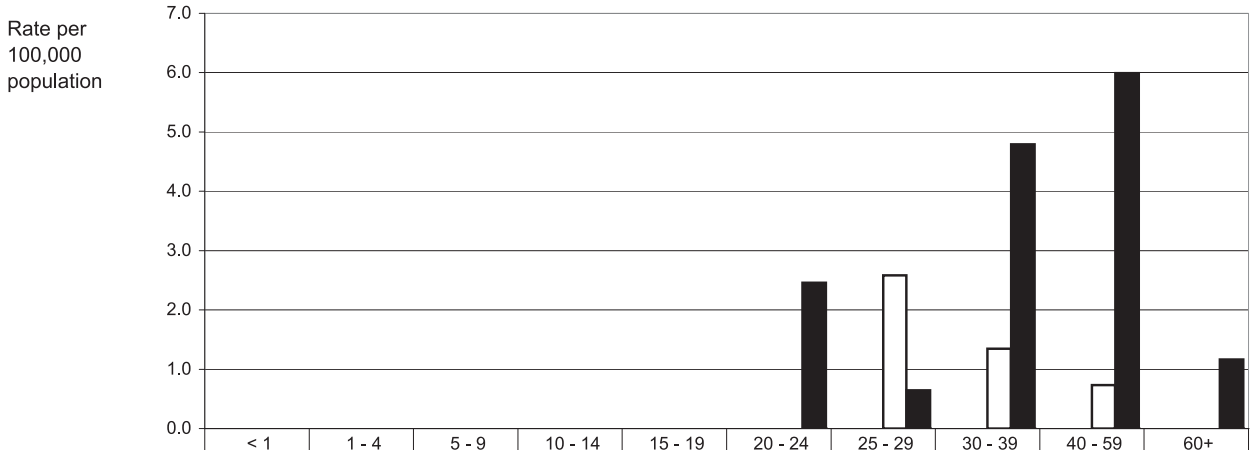
12.2 AIDS Rates by HSDA, 2009



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	0	0.0
12	Kootenay Boundary	0	0.0
13	Okanagan	3	0.9
14	Thompson Cariboo Shuswap	0	0.0
21	Fraser East	0	0.0
22	Fraser North	4	0.7
23	Fraser South	10	1.4
31	Richmond	3	1.6
32	Vancouver	33	5.1
33	North Shore/Coast Garibaldi	2	0.7
41	South Vancouver Island	11	3.0
42	Central Vancouver Island	3	1.1
43	North Vancouver Island	0	0.0
51	Northwest	1	1.3
52	Northern Interior	5	3.5
53	Northeast	0	0.0

Note: Map classification by Jenks natural breaks method.

12.3 AIDS Rates by Age Group and Sex, 2009

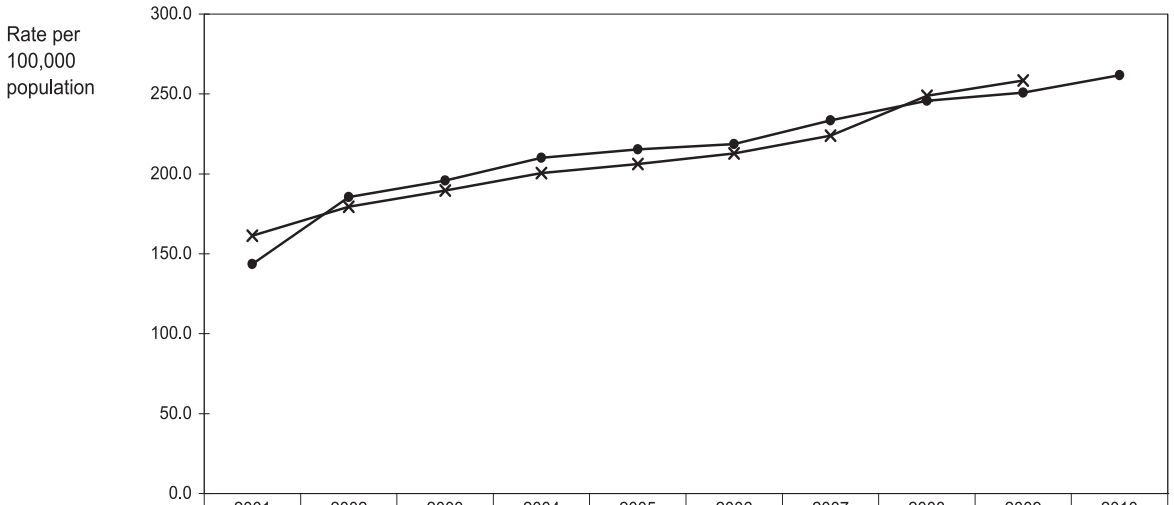


	< 1	1 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 39	40 - 59	60+
AIDS Reports - Female	0	0	0	0	0	0	4	4	5	0
AIDS Reports - Male	0	0	0	0	0	4	1	14	40	5
AIDS Rate - Female	0.0	0.0	0.0	0.0	0.0	0.0	2.6	1.3	0.7	0.0
AIDS Rate - Male	0.0	0.0	0.0	0.0	0.0	2.5	0.6	4.8	6.0	1.2

Chlamydia (anogenital)

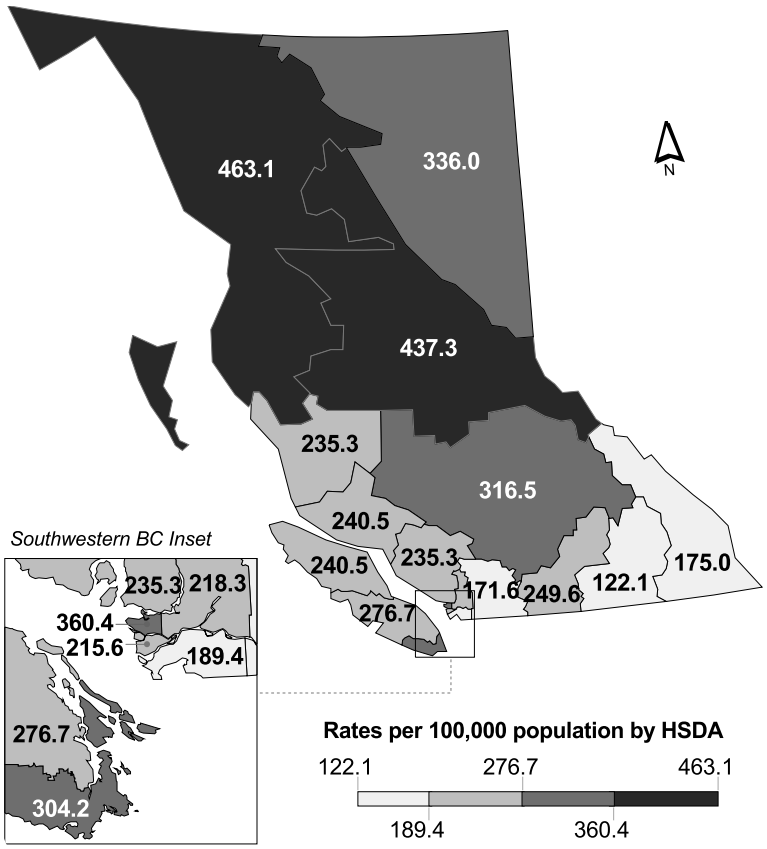
Chlamydia rates in BC continue to increase, to 261.7 per 100,000 (11,838 cases) in 2010. The overall trend in Chlamydia infection rates has been increasing since 1999. By age, women aged 15-19 and 20-24 continue to have the highest chlamydia rates at 1586.2 and 1850.7 per 100,000 respectively. The greatest rates of infection are observed in Northwest HSDA (463.1 per 100,000; 348 cases), Northern Interior HSDA (437.3 per 100,000; 625 cases), and Vancouver HSDA (360.4 per 100,000; 2347 cases).

13.1 Genital Chlamydia Rates by Year, 2001-2010



	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
BC Chlamydia Reports	5,855	7,601	8,072	8,733	9,040	9,275	10,063	10,776	11,177	11,838
BC Chlamydia Rate	143.6	185.5	195.8	210.2	215.4	218.6	233.5	245.8	250.9	261.7
Canadian Chlamydia Rate	161.4	179.5	189.6	200.5	206.1	212.9	224.0	248.8	258.5	

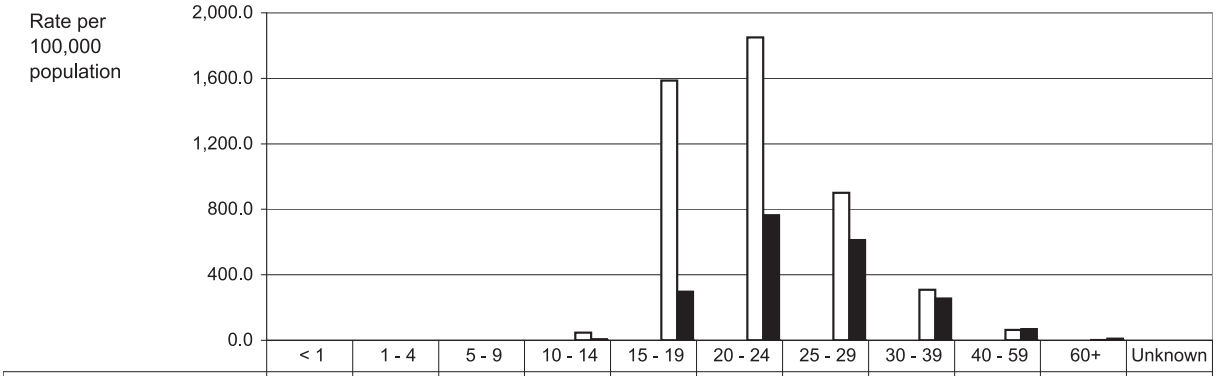
13.2 Genital Chlamydia Rates by HSDA, 2010



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	142	175.0
12	Kootenay Boundary	97	122.1
13	Okanagan	890	249.6
14	Thompson Cariboo Shuswap	711	316.5
21	Fraser East	490	171.6
22	Fraser North	1331	218.3
23	Fraser South	1349	189.4
31	Richmond	423	215.6
32	Vancouver	2347	360.4
33	North Shore/Coast Garibaldi	662	235.3
41	South Vancouver Island	1131	304.2
42	Central Vancouver Island	735	276.7
43	North Vancouver Island	293	240.5
51	Northwest	348	463.1
52	Northern Interior	625	437.3
53	Northeast	231	336.0

Note: Map classification by Jenks natural breaks method.

13.3 Genital Chlamydia Rates by Age Group and Sex, 2010

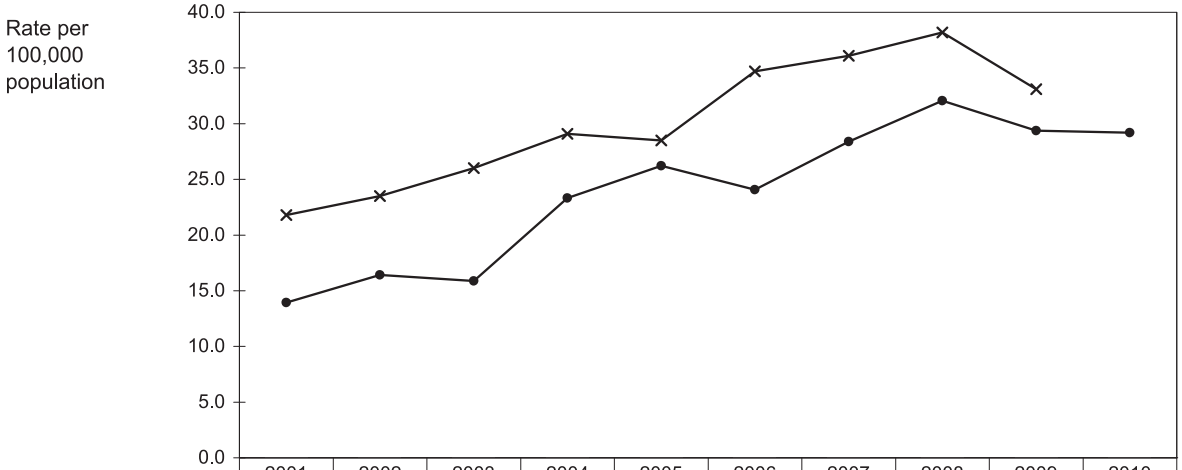


	< 1	1 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 39	40 - 59	60+	Unknown
Chlamydia Reports - Female	0	0	0	55	2,150	2,843	1,435	929	442	8	6
Chlamydia Reports - Male	0	0	0	9	429	1,265	993	755	462	46	5
Chlamydia Reports - Transgender/Unknown	0	0	0	0	1	3	1	0	0	0	1
□ Chlamydia Rate - Female	0.0	0.0	0.0	46.7	1,586.2	1,850.7	900.1	308.2	64.0	1.6	
■ Chlamydia Rate - Male	0.0	0.0	0.0	7.2	297.0	763.4	611.8	255.9	68.5	10.3	

Gonorrhea (anogenital)

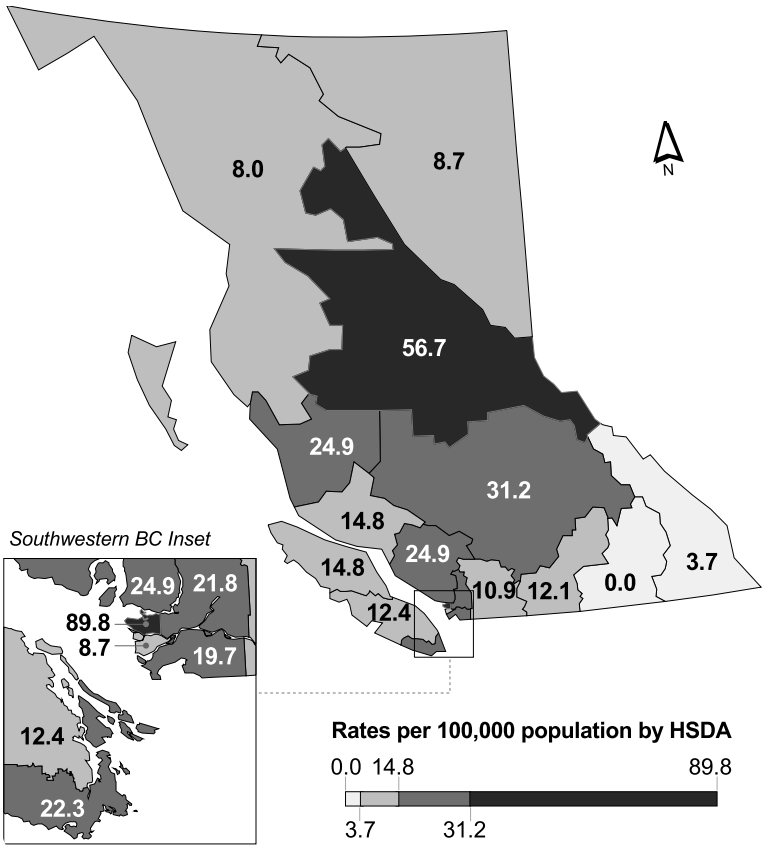
There has been an overall increasing trend in gonorrhea rates in BC, although trends for the past two years have been stable at 29.2 per 100,000 (1,321 cases) in 2010 compared to 29.4 per 100,000 (1,309 cases) in 2009. Similar to previous years, the highest rates of gonorrhea were for females between the ages of 15-24 years, and for males between 20-29 years. The highest rate was observed in Vancouver HSDA (89.8 per 100,000; 585 cases) followed by Northern Interior HSDA (56.7 per 100,000; 81 cases).

14.1 Genital Gonorrhea Rates by Year, 2001-2010



	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
BC Gonorrhea Reports	568	673	654	969	1,100	1,022	1,224	1,405	1,309	1,321
BC Gonorrhea Rate	13.9	16.4	15.9	23.3	26.2	24.1	28.4	32.0	29.4	29.2
Canadian Gonorrhea Rate	21.8	23.5	26.0	29.1	28.5	34.7	36.1	38.2	33.1	

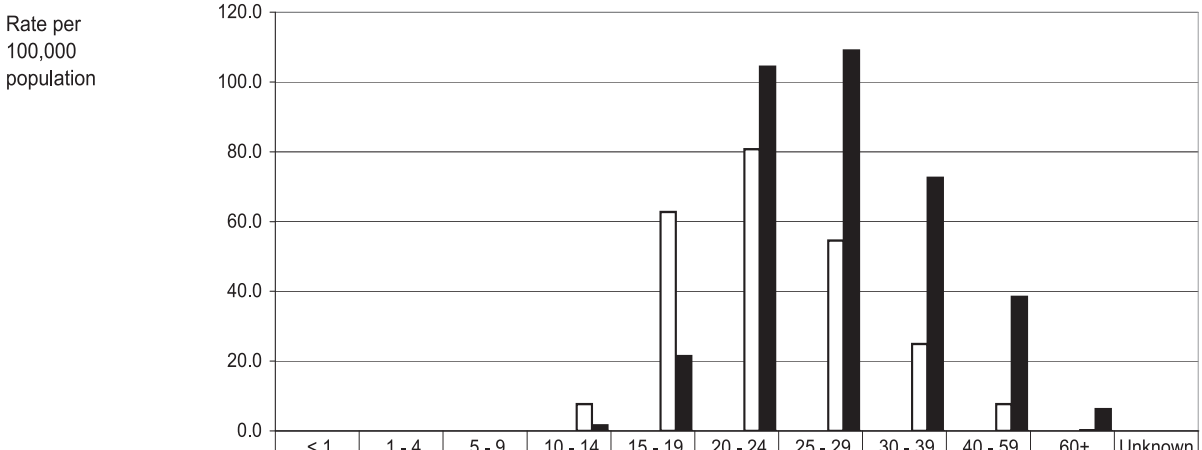
14.2 Genital Gonorrhea Rates by HSDA, 2010



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	3	3.7
12	Kootenay Boundary	0	0.0
13	Okanagan	43	12.1
14	Thompson Cariboo Shuswap	70	31.2
21	Fraser East	31	10.9
22	Fraser North	133	21.8
23	Fraser South	140	19.7
31	Richmond	17	8.7
32	Vancouver	585	89.8
33	North Shore/Coast Garibaldi	70	24.9
41	South Vancouver Island	83	22.3
42	Central Vancouver Island	33	12.4
43	North Vancouver Island	18	14.8
51	Northwest	6	8.0
52	Northern Interior	81	56.7
53	Northeast	6	8.7

Note: Map classification by Jenks natural breaks method.

14.3 Genital Gonorrhea Rates by Age Group and Sex, 2010



	< 1	1 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 39	40 - 59	60+	Unknown
Gonorrhea Reports - Female	0	0	0	9	85	124	87	75	53	1	1
Gonorrhea Reports - Male	0	0	0	2	31	173	177	214	259	28	0
Gonorrhea Reports - Transgender	0	0	0	0	0	1	1	0	0	0	0
Gonorrhea Rate - Female	0.0	0.0	0.0	7.6	62.7	80.7	54.6	24.9	7.7	0.2	
Gonorrhea Rate - Male	0.0	0.0	0.0	1.6	21.5	104.4	109.1	72.5	38.4	6.3	

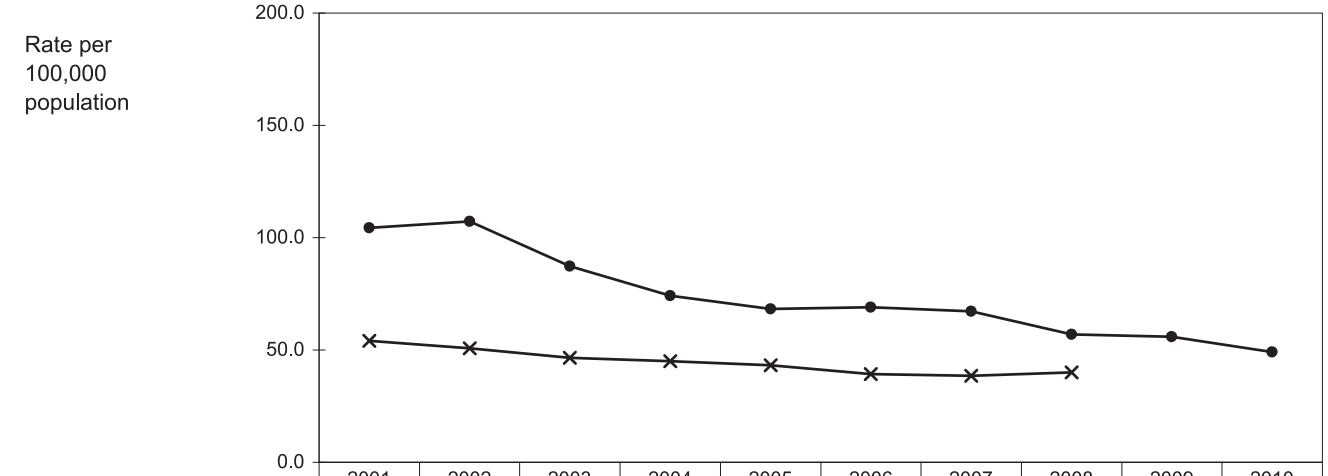
Hepatitis C

Since 2002, the number of cases of hepatitis C reported in BC has declined annually. Newly identified cases of hepatitis C infection may be due to recent or remote infection. Persons may be tested for hepatitis C because of ongoing or past risk factors, for insurance purposes or symptoms of liver disease due to long term chronic infection. In 2010, a total of 2,223 cases were reported for a rate of 49.1 per 100,000 population; this is the first time since 1995 that the rate has been below 50 cases per 100,000. Diagnosis of hepatitis C depends on availability and acceptability of testing; overall testing for hepatitis C has continued to increase over time.

Vancouver Health Service Delivery Area (HSDA) had the largest number of cases of hepatitis C (371) reported in 2010. Richmond HSDA had the lowest rate at 13.3 cases per 100,000; all other HSDAs had rates above 30 cases per 100,000. The highest rate of hepatitis C is Fraser East HSDA at 77.1 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. Rates above 70 per 100,000 were noted in all three HSDA in Vancouver Island Health Authority, Vancouver, Thompson Cariboo Shuswap and Northern Interior.

Eight cases were reported in children aged less than 10 years, and six 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 (66.8%). However cases and rates in females in the 15–19 year age groups exceeded their male counterparts. This may indicate a true higher rate of hepatitis C in females in these age groups, but may in part reflect testing patterns.

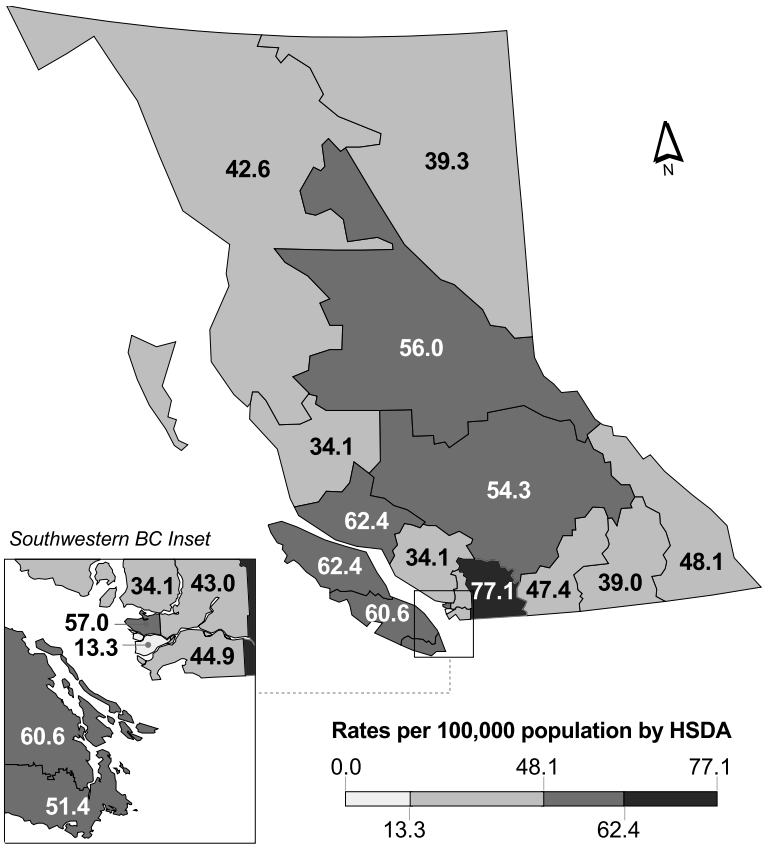
15.1 Hepatitis C Rates by Year, 2001-2010



	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
BC Hepatitis C Reports	4257	4396	3598	3080	2866	2928	2897	2496	2490	2223
BC Hepatitis C Rate	104.4	107.3	87.3	74.1	68.3	69.0	67.2	56.9	55.9	49.1
Canadian Hepatitis C Rate*	54.1	50.8	46.6	45.0	43.2	39.2	38.5	40.0		

*Please see Sources and Explanatory Remarks, Section 11 on page 125 in regard to the national rate

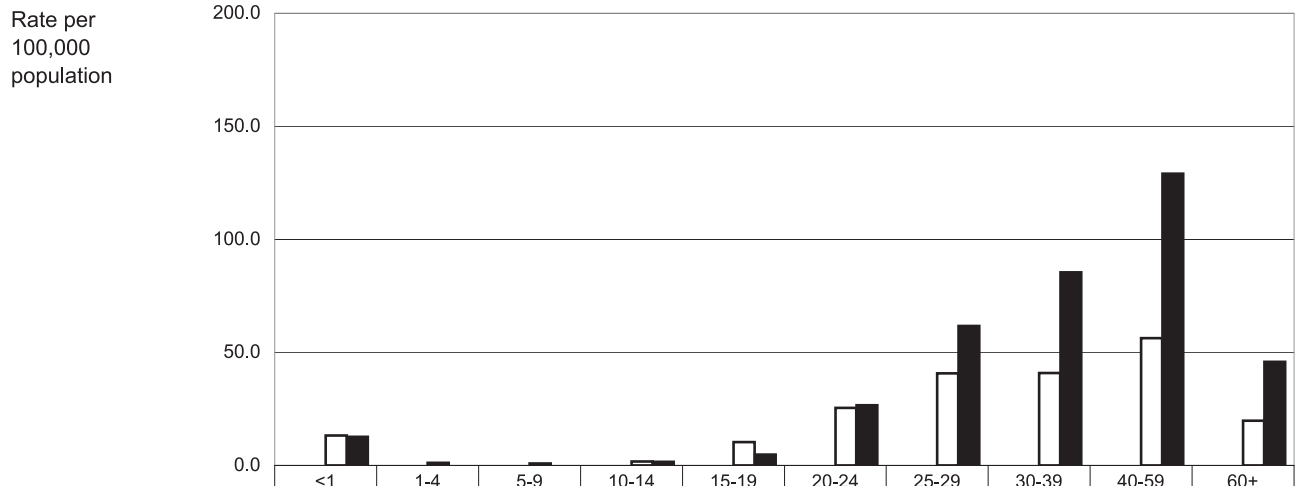
15.2 Hepatitis C Rates by HSDA, 2010



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	39	48.1
12	Kootenay Boundary	31	39.0
13	Okanagan	169	47.4
14	Thompson Cariboo Shuswap	122	54.3
21	Fraser East	220	77.1
22	Fraser North	262	43.0
23	Fraser South	320	44.9
31	Richmond	26	13.3
32	Vancouver	371	57.0
33	North Shore/Coast Garibaldi	96	34.1
41	South Vancouver Island	191	51.4
42	Central Vancouver Island	161	60.6
43	North Vancouver Island	76	62.4
51	Northwest	32	42.6
52	Northern Interior	80	56.0
53	Northeast	27	39.3

Note: Map classification by Jenks natural breaks method.

15.3 Hepatitis C Rates by Age Group and Sex, 2010

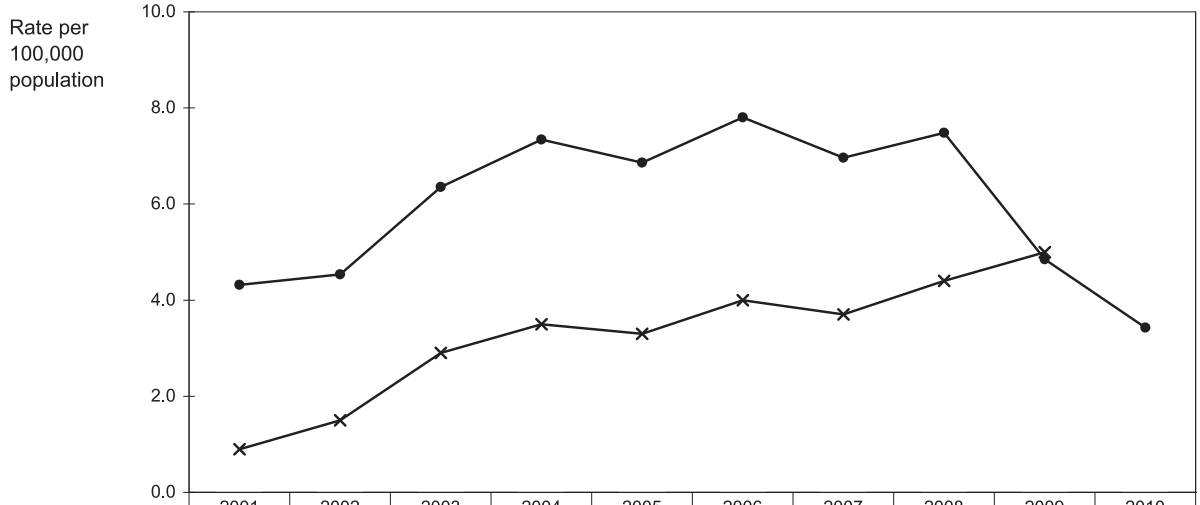


	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Hepatitis C Reports - Female	3	1	1	2	14	39	65	123	389	100
Hepatitis C Reports - Male	3	0	0	2	7	44	100	252	871	205
Hepatitis C Rate - Female	13.3	1.2	0.9	1.7	10.3	25.4	40.8	40.8	56.3	19.8
Hepatitis C Rate - Male	12.6	0.0	0.0	1.6	4.9	26.6	61.6	85.4	129.1	45.8

Infectious Syphilis

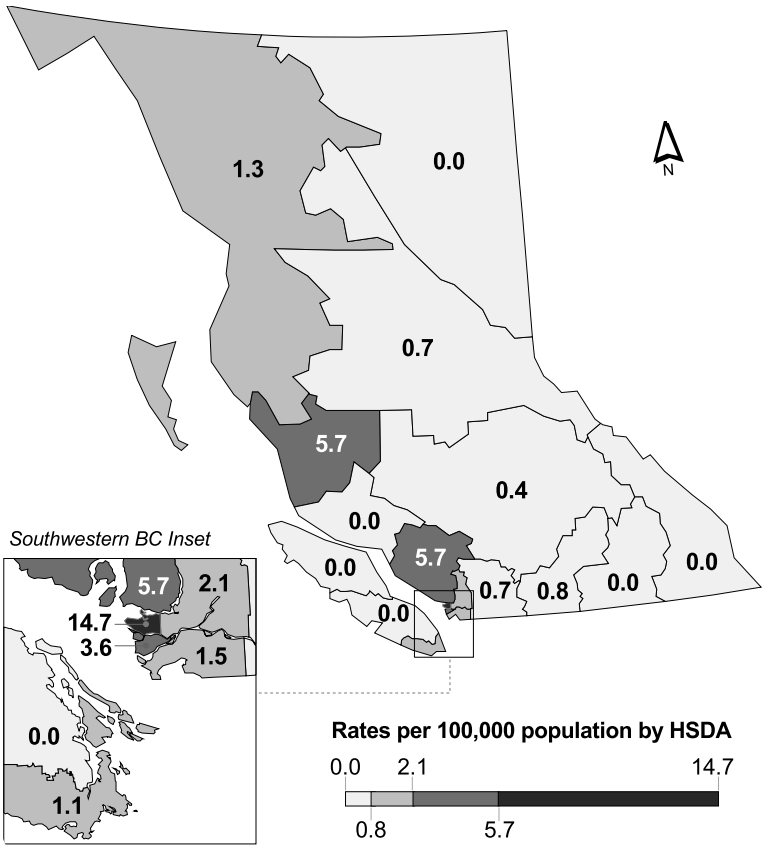
The rate of infectious syphilis decreased from 4.8 in 2009 to 3.4 per 100,000 population in 2010 reflecting a decrease from 216 to 155 cases. The majority of cases occurred among men, with the greatest rates among men aged 40-59 years. The highest rate was observed in Vancouver HSDA (14.7 per 100,000; 96 cases).

16.1 Infectious Syphilis Rates by Year, 2001-2010



	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
BC Syphilis Reports	176	186	262	305	288	331	300	328	216	155
BC Syphilis Rate	4.3	4.5	6.4	7.3	6.9	7.8	7.0	7.5	4.8	3.4
Canadian Syphilis Rate	0.9	1.5	2.9	3.5	3.3	4.0	3.7	4.4	5.0	

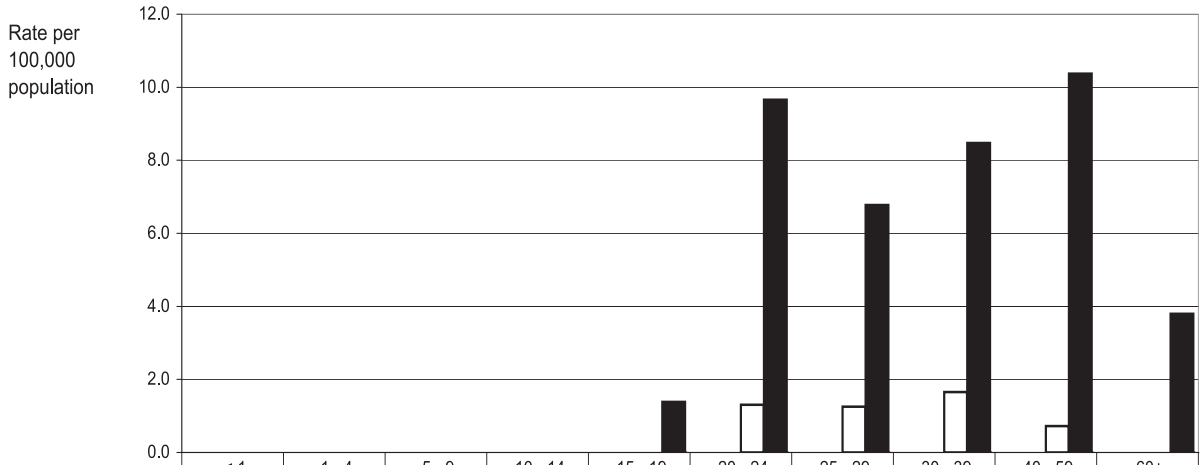
16.2 Infectious Syphilis Rates by HSDA, 2010



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	0	0.0
12	Kootenay Boundary	0	0.0
13	Okanagan	3	0.8
14	Thompson Cariboo Shuswap	1	0.4
21	Fraser East	2	0.7
22	Fraser North	13	2.1
23	Fraser South	11	1.5
31	Richmond	7	3.6
32	Vancouver	96	14.7
33	North Shore/Coast Garibaldi	16	5.7
41	South Vancouver Island	4	1.1
42	Central Vancouver Island	0	0.0
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, 2010



	< 1	1 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 39	40 - 59	60+
Syphilis Reports - Female	0	0	0	0	0	2	2	5	5	0
Syphilis Reports - Male	0	0	0	0	2	16	11	25	70	17
Syphilis Rate - Female	0.0	0.0	0.0	0.0	0.0	1.3	1.3	1.7	0.7	0.0
Syphilis Rate - Male	0.0	0.0	0.0	0.0	1.4	9.7	6.8	8.5	10.4	3.8

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 disease (iGAS) was 3.1 per 100,000 in 2010. This is reflective of a declining trend in incidence since a peak at 5.9 per 100,000 reported in 2008.

Infants are at greatest risk of iGAS with rates of 8.6 per 100,000. Rates of cases among adults are comparable to those reported among the elderly; this is in contrast to other published reports of iGAS epidemiology in North America (Davies 1996; O'Brien 2002) in which rates are highest in those aged 65 and older.

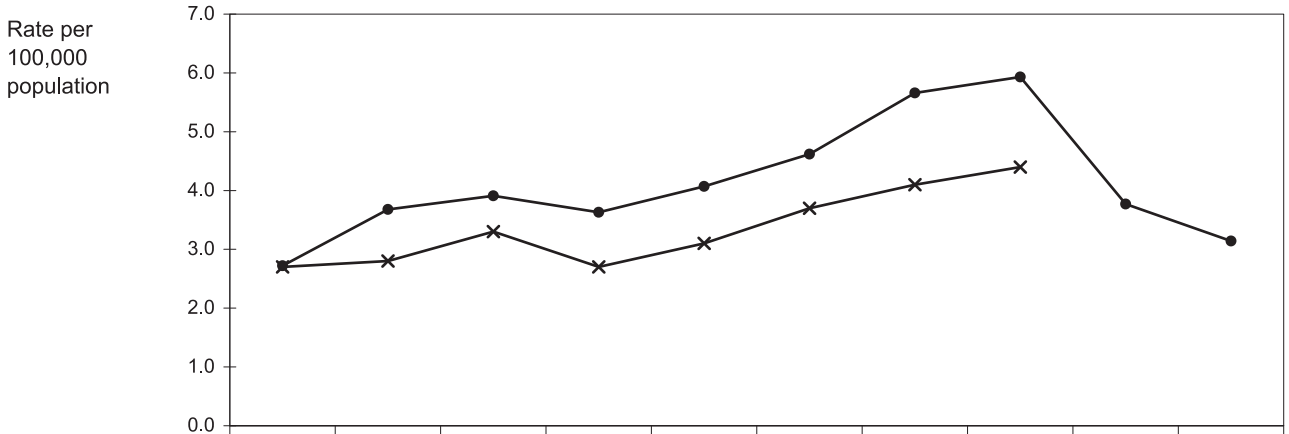
The case fatality was 7.8% and within the range observed over the last decade (3.7 to 13.2%). One death was in a child and was associated with extensive dental surgery.

A cluster of 3 cases of puerperal fever occurred among women admitted to a labour and delivery unit; all recovered with treatment. Infants were unaffected. The same strain of iGAS was identified in all 3 cases, consistent with nosocomial transmission.

Davies HD, McGeer A, Schwartz B, Green K, Cann D, Simor AE, Low DE and the Ontario Group A Streptococcal Study Group. Invasive Group A Streptococcal Infections in Ontario, Canada. The New England Journal of Medicine 1996; 335(8): 547-554.

O'Brien KL, Beall B, Barrett NL, Cieslak PR, Reingold A, Farley MM, Danila R, Zell ER, Facklam R, Schwartz B, Schuchat A. Epidemiology of Invasive Group A Streptococcus Disease in the United States, 1995-1999. Clinical Infectious Diseases 2002; 35:268-76.

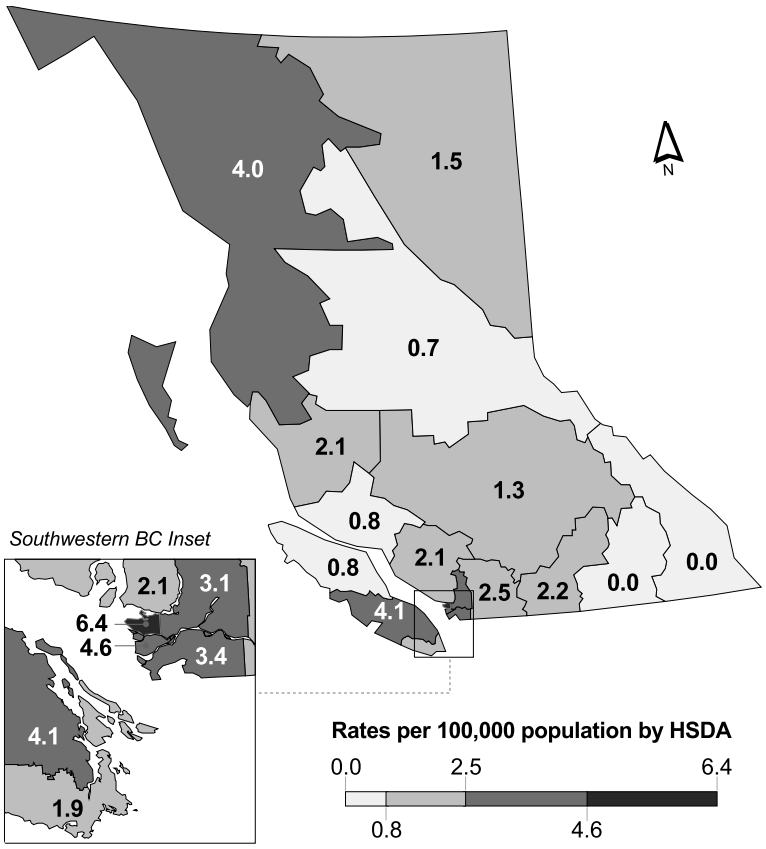
17.1 Streptococcal Disease (invasive) Group A Rates by Year, 2001-2010



	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
BC iGAS Reports	111	151	161	151	171	196	244	260	168	142
BC iGAS Rate	2.7	3.7	3.9	3.6	4.1	4.6	5.7	5.9	3.8	3.1
Canadian iGAS Rate*	2.7	2.8	3.3	2.7	3.1	3.7	4.1	4.4		

*Please see Sources and Explanatory Remarks, Section 11 on page 125 in regard to the national rate

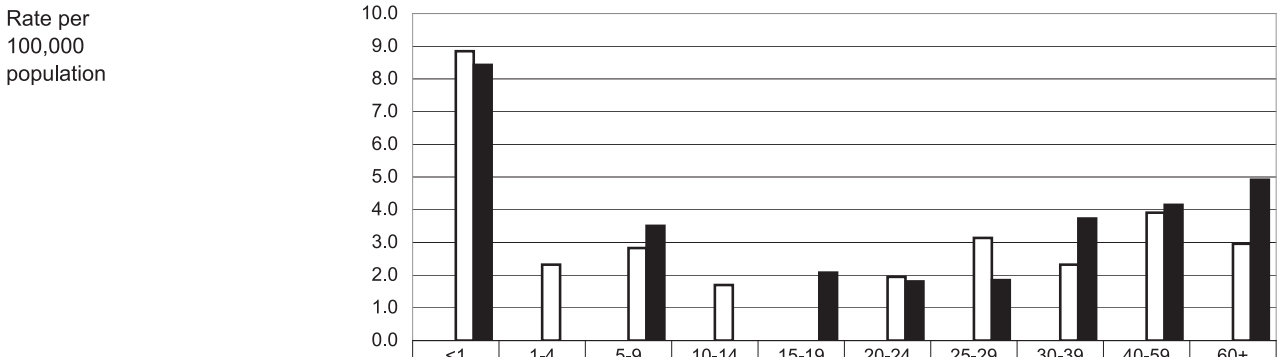
17.2 Streptococcal Disease (invasive) Group A Rates by HSDA, 2010



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	0	0.0
12	Kootenay Boundary	0	0.0
13	Okanagan	8	2.2
14	Thompson Cariboo Shuswap	3	1.3
21	Fraser East	7	2.5
22	Fraser North	19	3.1
23	Fraser South	24	3.4
31	Richmond	9	4.6
32	Vancouver	42	6.4
33	North Shore/Coast Garibaldi	6	2.1
41	South Vancouver Island	7	1.9
42	Central Vancouver Island	11	4.1
43	North Vancouver Island	1	0.8
51	Northwest	3	4.0
52	Northern Interior	1	0.7
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, 2010



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Streptococcal Disease, Group A, Invasive Reports - Female	2	2	3	2	0	3	5	7	27	15
Streptococcal Disease, Group A, Invasive Reports - Male	2	0	4	0	3	3	3	11	28	22
□ Streptococcal Disease, Group A, Invasive Rate - Female	8.9	2.3	2.8	1.7	0.0	2.0	3.1	2.3	3.9	3.0
■ Streptococcal Disease, Group A, Invasive Rate - Male	8.4	0.0	3.5	0.0	2.1	1.8	1.9	3.7	4.2	4.9

Tuberculosis

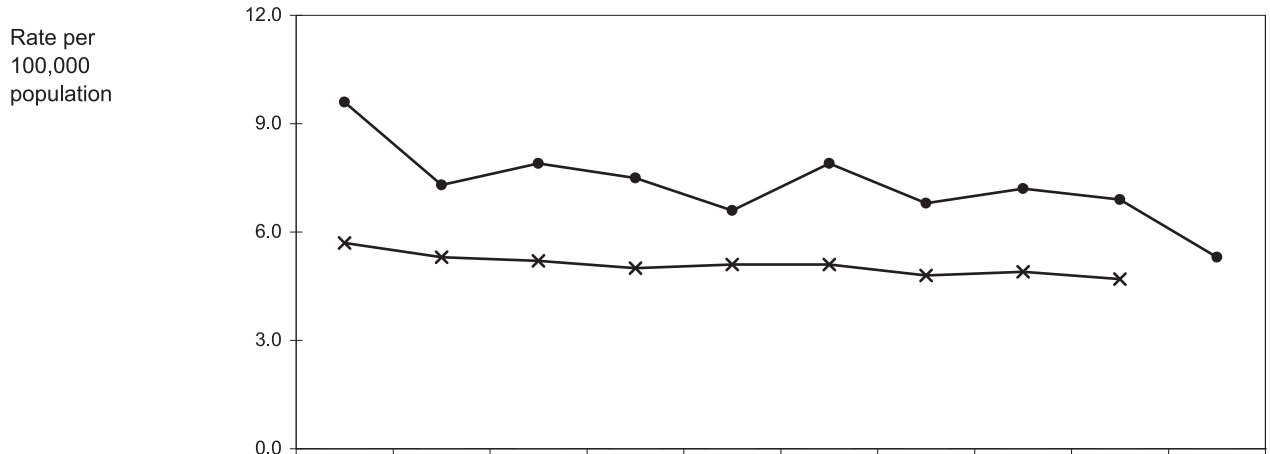
In 2010 there were 240 cases of reported tuberculosis in British Columbia, for a rate of 5.3 per 100,000, a 22% decrease in the number and 23% decrease in the rate of reported cases compared to 2009.

Rates for Health Regions vary across the province. The Richmond, Vancouver, Fraser South and Northwest health service delivery areas have rates exceeding the provincial rate (5.3/ 100,000 population). The highest incidence was reported from Richmond and Vancouver (10.2 and 9.2/ 100,000 population respectively) while the lowest was in Kootenay Boundary, North Vancouver Island and Northeast (no cases, no cases and 1.5/ 100,000 population respectively).

Compared to 2009, the rate of tuberculosis increased in East Kootenay, Central Vancouver Island, Northeast, Fraser East and Fraser South with East Kootenay showing the largest increase in rate of tuberculosis (from 0 to 2.5/ 100,000 population). In all other health regions the rate of tuberculosis decreased with North Vancouver Island and Northwest both showing the largest decrease in rate of tuberculosis (from 6.7 to 0 and from 13.4 to 6.7/ 100,000 population respectively).

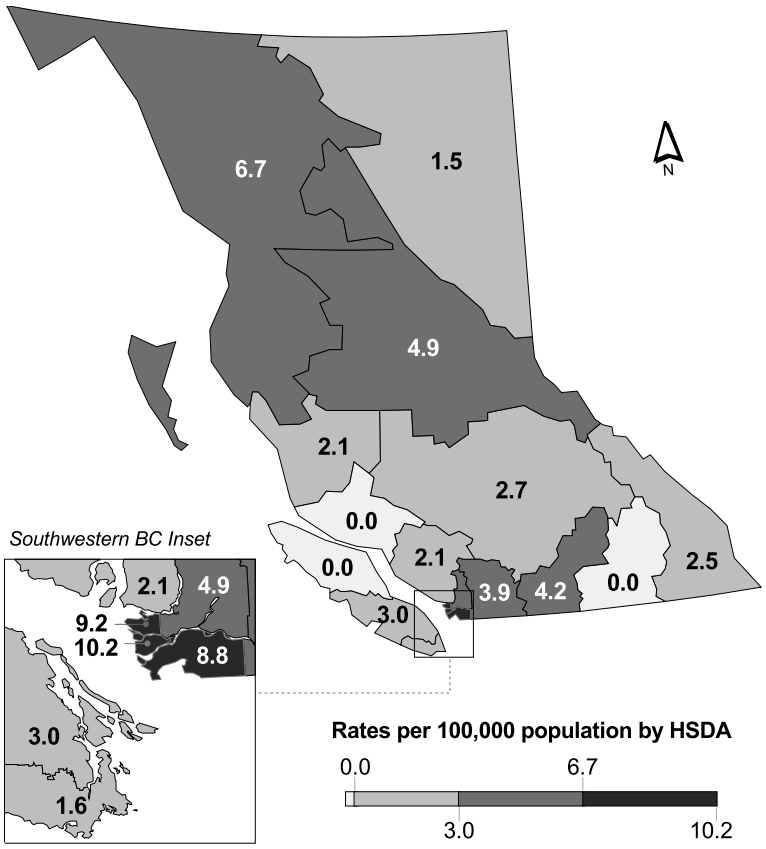
The age specific rates are shown in figure. Overall, the tuberculosis rate was higher in men than in women (5.7 vs 4.9 per 100,000). For the age group < 40 years the rate of tuberculosis was higher in women than in men (3.7 vs 2.6 per 100,000). In those >= 40 years old, the rate of tuberculosis in men was higher than in women (8.8 vs 6.0 per 100,000).

18.1 Tuberculosis Rates by Year, 2001-2010



	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
BC Tuberculosis Cases	391	300	324	310	277	336	292	314	307	240
BC Tuberculosis Rate	9.6	7.3	7.9	7.5	6.6	7.9	6.8	7.2	6.9	5.3
Canadian Tuberculosis Rate	5.7	5.3	5.2	5.0	5.1	5.1	4.8	4.9	4.7	

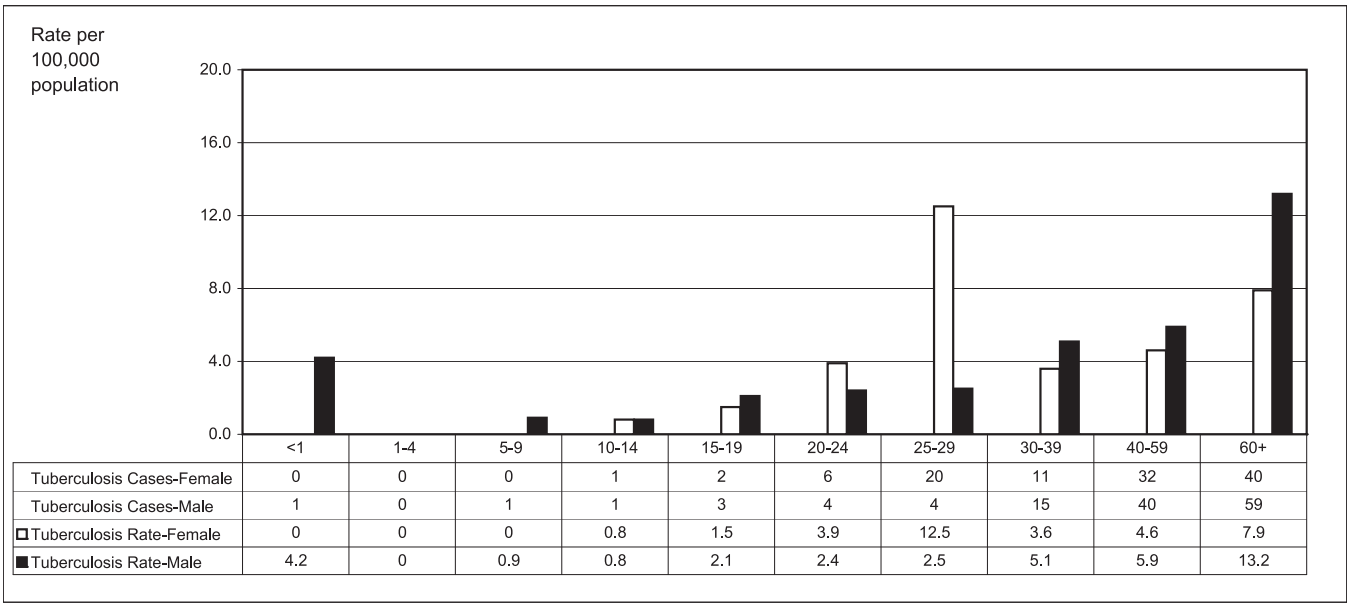
18.2 Tuberculosis Rates by HSDA, 2010



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	2	2.5
12	Kootenay Boundary	0	0.0
13	Okanagan	15	4.2
14	Thompson Cariboo Shuswap	6	2.7
21	Fraser East	11	3.9
22	Fraser North	30	4.9
23	Fraser South	63	8.8
31	Richmond	20	10.2
32	Vancouver	60	9.2
33	North Shore/Coast Garibaldi	6	2.1
41	South Vancouver Island	6	1.6
42	Central Vancouver Island	8	3.0
43	North Vancouver Island	0	0.0
51	Northwest	5	6.7
52	Northern Interior	7	4.9
53	Northeast	1	1.5

Note: Map classification by Jenks natural breaks method.

18.3 Tuberculosis Rates by Age Group and Sex, 2010



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Tuberculosis Cases-Female	0	0	0	1	2	6	20	11	32	40
Tuberculosis Cases-Male	1	0	1	1	3	4	4	15	40	59
Tuberculosis Rate-Female	0	0	0	0.8	1.5	3.9	12.5	3.6	4.6	7.9
Tuberculosis Rate-Male	4.2	0	0.9	0.8	2.1	2.4	2.5	5.1	5.9	13.2

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, Gram-negative and other bacteria. Rates of antimicrobial utilization were available through analysis of BC PharmaNet data. Data were analyzed in Microsoft Excel and SPSS using a two-sided Spearman Rank test.

Results

- The percent of *Staphylococcus aureus* isolates that are methicillin-resistant (MRSA) has increased since 2008; MRSA represents more than a fourth of all tested *Staphylococcus aureus* isolates (27.8%) in 2010. The overall decrease in non-susceptibility rate for clindamycin, erythromycin and trimethoprim-sulfamethoxazole (TMP-SMX) reflects an increase in community-associated (CA) MRSA strains.
- *Streptococcus pneumoniae* isolates have demonstrated a stable rate of non-susceptibility against erythromycin since 2007, with 29.6% of all tested isolates demonstrating resistance against erythromycin in 2010. The percent of *Streptococcus pneumoniae* isolates non-susceptible to erythromycin is significantly correlated with the utilization of new macrolides such as azithromycin and clarithromycin. Approximately a fifth of *Streptococcus pneumoniae* isolates have also demonstrated non-susceptibility against penicillin (21.6%), trimethoprim-sulfamethoxazole (TMP-SMX) (21.4%), and clindamycin (18.3%).
- In the past 3 years, resistance rates to erythromycin and clindamycin have steadily decreased in *Streptococcus pyogenes* isolates. All isolates remain highly susceptible to penicillin and vancomycin (>99%).
- *Enterococcus* spp. isolates remain highly susceptible to vancomycin, ampicillin, nitrofurantoin and trimethoprim-sulfamethoxazole (TMP-SMX) (>98%). Approximately a fourth of all isolates tested are resistant to ciprofloxacin (24.6%). The percent of *Enterococcus* spp. isolates demonstrating resistance against vancomycin (VRE) has remained negligible in BC for all available years.
- Urinary tract pathogens such as *Escherichia coli* and *Klebsiella pneumoniae* isolates have demonstrated increasing resistance against ciprofloxacin while *Proteus mirabilis* isolates demonstrated high but decreasing resistance against ciprofloxacin after a peak in 2008. *E. coli* and *P. mirabilis* isolates demonstrate high level of resistance against trimethoprim-sulfamethoxazole (TMP-SMX) for all years available, including 25.5% in 2010 for *E. coli* and 28.1% for *P. mirabilis,* while relatively lower resistance rate was found for *K. pneumoniae* (8.6%). Nitrofurantoin remains highly effective for *E. coli* isolates with over 96% of isolates showing susceptibility. This is reassuring as 85% to 90% of all uncomplicated UTI infections are caused by *E. coli.*
- The percent of extended spectrum β-lactamase (ESBL) producing Enterobacteriaceae spp. remained low for BC in 2009 for *Escherichia coli* (1% -1.7%) and *Klebsiella pneumoniae* (0.3% - 1%) according to data from the BCAMM 2009 report.

For the full report, please refer to: *Antimicrobial Resistance Trends in the Province of British Columbia - 2009. Epidemiology Services, British Columbia Centre for Disease Control. Available at www.bccdc.ca/prevention/AntibioticResistance*

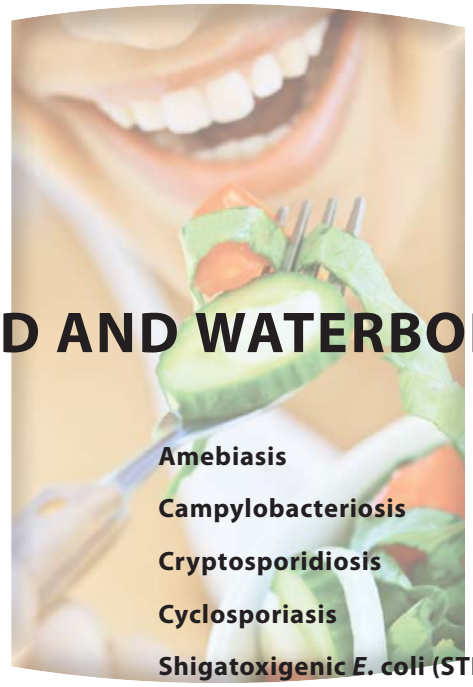
Antimicrobial Resistant Organism Surveillance in BC

Executive Summary (continued)

- Non-susceptibility rate for *Pseudomonas aeruginosa* isolates to ciprofloxacin remains steady (~11%). *P. aeruginosa* isolates continues to be highly susceptible (>95%) to tobramycin, pipercillin, ceftazidime and gentamicin.
- Of all tested antimicrobials, *Salmonella* Enteriditis resistance towards nalidixic acid remains the highest with approximately a tenth of all tested isolates demonstrating non-susceptibility (9.8%) in 2010. Resistance to ampicillin, tetracycline, and chloramphenicol remains low (<3%) but a surge of streptomycin resistance occurred in 2009; 4.2% of *Salmonella* Enteriditis isolates demonstrated resistance to streptomycin in 2009.
- The percent of β-lactamase producing *Haemophilus influenzae* isolates have shown a significant increase in 2008, with approximately 60% of isolates testing positive. The percent of *H. influenzae* isolates resistant to ampicillin decreased only in 2009 for all years available, before increasing in 2010.
- *Mycobacterium tuberculosis* isolates that demonstrate multiple-drug resistance (MDR; resistance to both isoniazid and rifampin) found in 9 cases over 4 years, representing <1% of cases. Mono-resistance occurred in 7.7% of cases while poly-resistance was noted in 1.7% of cases over all years. There are no cases of extensively drug resistant TB (XDR) in BC from 2005 to 2008.
- Overall antibiotic utilization rate remained stable from 2006 to 2008, and dropped significantly in 2009, arresting an upward trend seen between 2002 and 2005.
- β-lactam antimicrobials constitute the majority of antimicrobial prescriptions with a rate of 5.1 defined daily does (DDD)/1000 inhabitant days in 2009. β-lactams are followed by macrolides, tetracyclines, quinolones and trimethoprim/sulfonamides combinations.
- Within the β-lactams class, there is a significant increase in the use of penicillins including β-lactamase inhibitors but a decrease in the use of β-lactamase sensitive and resistant penicillins. Cephalosporin utilization rate remains high, with 1st generation cephalosporins utilization rate surpassing that of 2nd generation cephalosporins as the most used cephalosporin since 2000.
- New macrolide (clarithromycin, azithromycin, telithromycin and spiramycin) utilization rate continues to increase while erythromycin utilization rate significantly decreased since 2000.
- Fluoroquinolones continues to be the major contributor to the increase observed in the utilization of quinolones. Ciprofloxacin remains the most used antibiotic within the fluoroquinolones subclass. Utilization rate for fluoroquinolone has stabilized since 2005. However, of particular concern within the fluoroquinolone subclass is the escalating utilization rate of moxifloxacin since its introduction in 2000.
- Combinations of sulfonamides and trimethoprim, including derivatives saw a 50% decrease in utilization rate since 2000.

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

Campylobacteriosis

Cryptosporidiosis

Cyclosporiasis

Shigatoxigenic *E.* coli (STEC) Infection

Giardiasis

Hepatitis A

Legionellosis

Listeriosis

Salmonellosis

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

Shigellosis

Vibrio parahaemolyticus

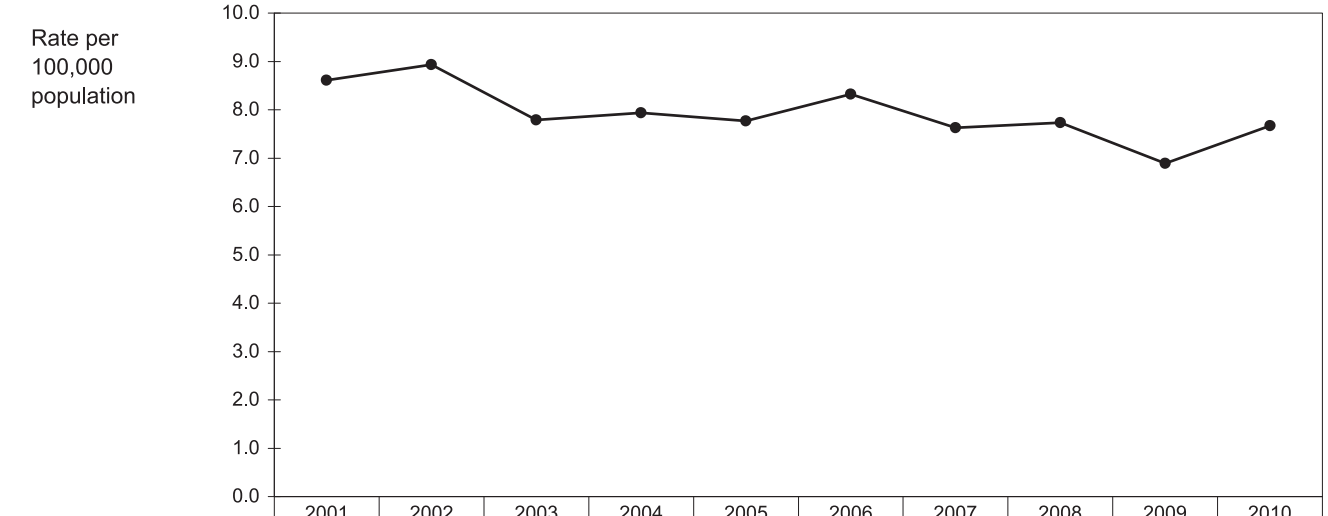
Yersiniosis

Outbreaks of Gastroenteritis

Amebiasis

Throughout the last ten years, the rate of amebiasis in BC has remained fairly constant. The overall provincial rate for 2010 was 7.7 cases per 100,000. In 2010, no outbreaks were identified and no seasonal pattern was evident. The reporting rate was highest in males in the 25-59 year old group. 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. Vancouver, as in previous years, reported the highest rate of illness (24.1 cases per 100,000). The screening program for refugees in Vancouver may partially account for this.

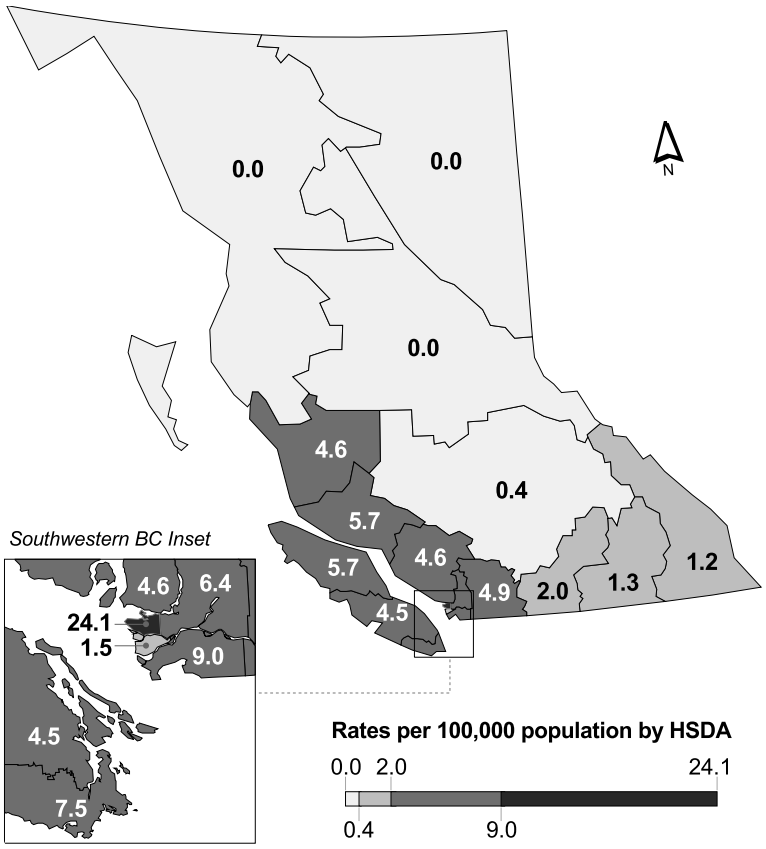
19.1 Amebiasis Rates by Year, 2001-2010



	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
BC Amebiasis Reports	351	366	321	330	326	353	329	339	307	347
BC Amebiasis Rate	8.6	8.9	7.8	7.9	7.8	8.3	7.6	7.7	6.9	7.7

Note: Amebiasis was removed from national surveillance in January 2000

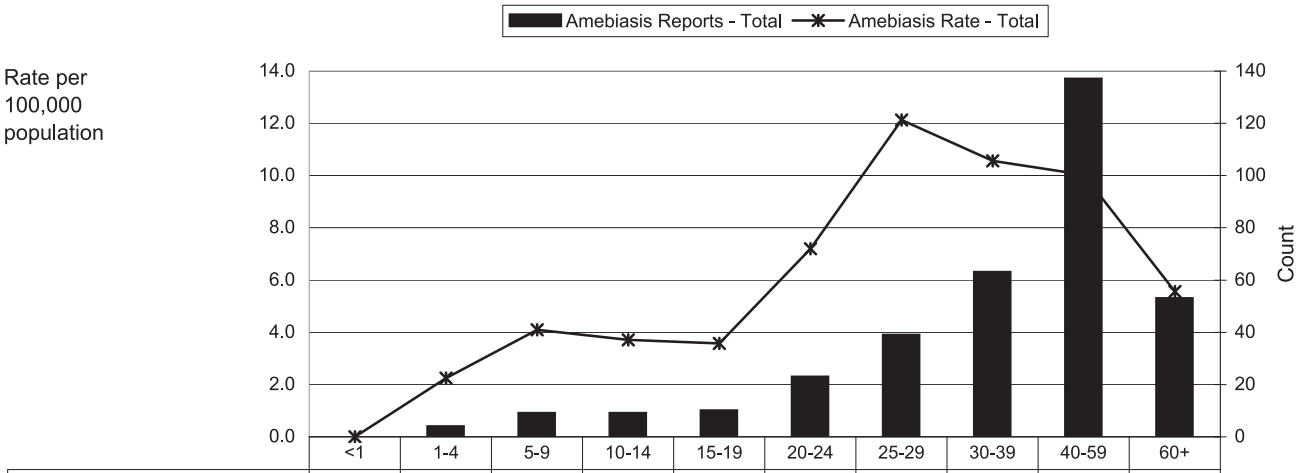
19.2 Amebiasis Rates by HSDA, 2010



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	1	1.2
12	Kootenay Boundary	1	1.3
13	Okanagan	7	2.0
14	Thompson Cariboo Shuswap	1	0.4
21	Fraser East	14	4.9
22	Fraser North	39	6.4
23	Fraser South	64	9.0
31	Richmond	3	1.5
32	Vancouver	157	24.1
33	North Shore/Coast Garibaldi	13	4.6
41	South Vancouver Island	28	7.5
42	Central Vancouver Island	12	4.5
43	North Vancouver Island	7	5.7
51	Northwest	0	0.0
52	Northern Interior	0	0.0
53	Northeast	0	0.0

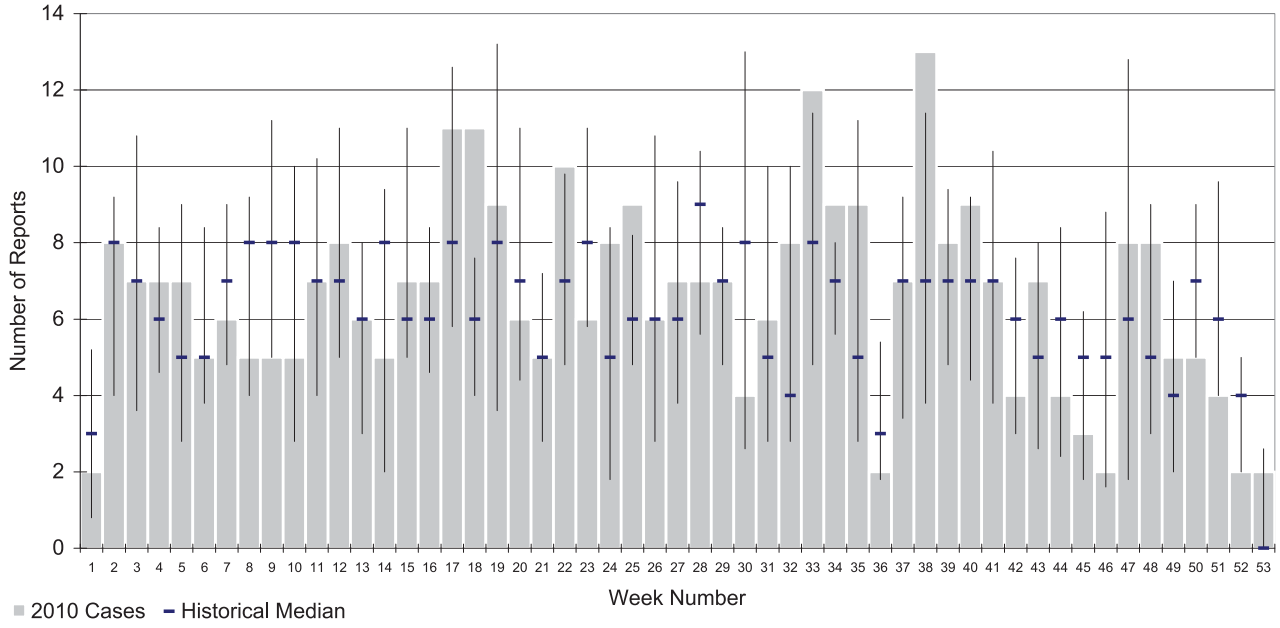
Note: Map classification by Jenks natural breaks method.

19.3 Amebiasis Rates by Age Group and Sex, 2010



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Amebiasis Reports - Female	0	0	3	3	3	10	11	15	25	19
Amebiasis Reports - Male	0	4	6	6	7	13	28	48	112	34
Amebiasis Reports - Total	0	4	9	9	10	23	39	63	137	53
Amebiasis Rate - Female	0.0	0.0	2.8	2.6	2.2	6.5	6.9	5.0	3.6	3.8
Amebiasis Rate - Male	0.0	4.4	5.3	4.8	4.9	7.9	17.3	16.3	16.6	7.6
Amebiasis Rate - Total	0.0	2.3	4.1	3.7	3.6	7.2	12.1	10.6	10.0	5.6

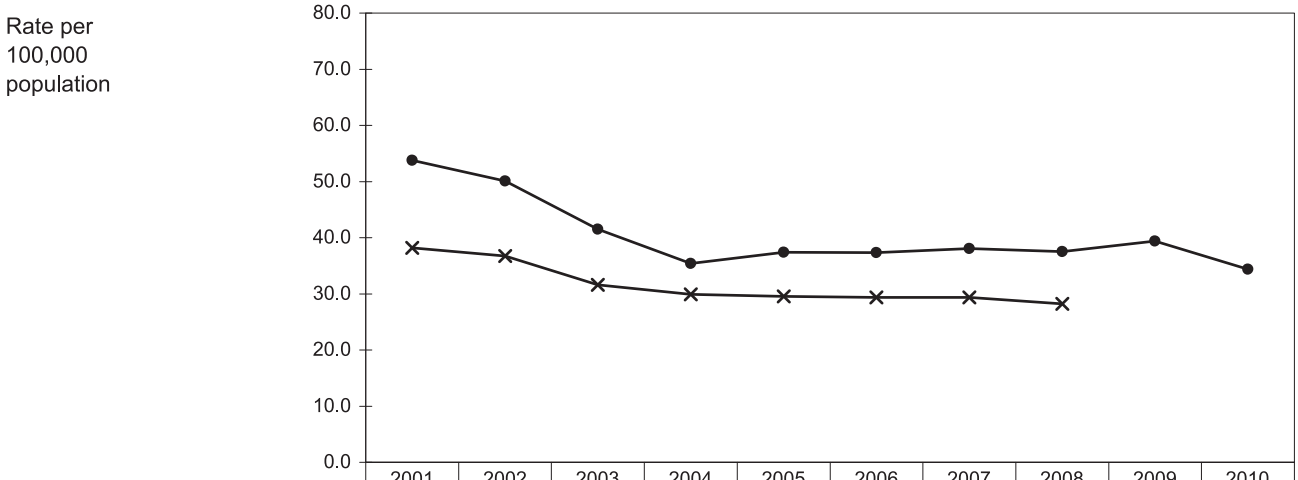
19.4 2010 Amebiasis Reports Compared to Historical Median and the 10th and 90th Percentiles Around the Median (2001 to 2009)



Campylobacteriosis

Campylobacteriosis was the most commonly reported enteric disease with a total of 1556 cases reported in 2010. The rate in 2010 is the lowest ever reported in BC but the incidence has been fairly 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 once again reported from North Shore/Coast Garibaldi (61.5/100,000). 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 slightly higher during the summer months, between weeks 25 and 36. One outbreak associated with an event was reported in North Shore/Coast Garibaldi in early August.

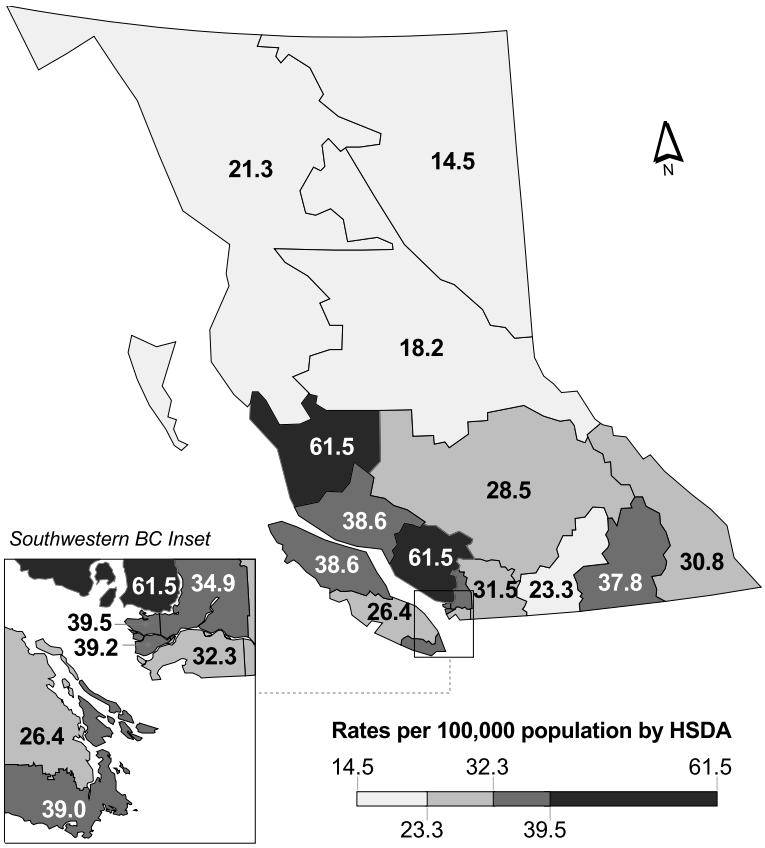
20.1 Campylobacteriosis Rates by Year, 2001-2010



	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
BC Campylobacteriosis Reports	2193	2052	1712	1471	1569	1586	1640	1644	1755	1556
BC Campylobacteriosis Rate	53.8	50.1	41.5	35.4	37.4	37.4	38.1	37.5	39.4	34.4
Canadian Campylobacteriosis Rate*	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 125 in regard to the national rate

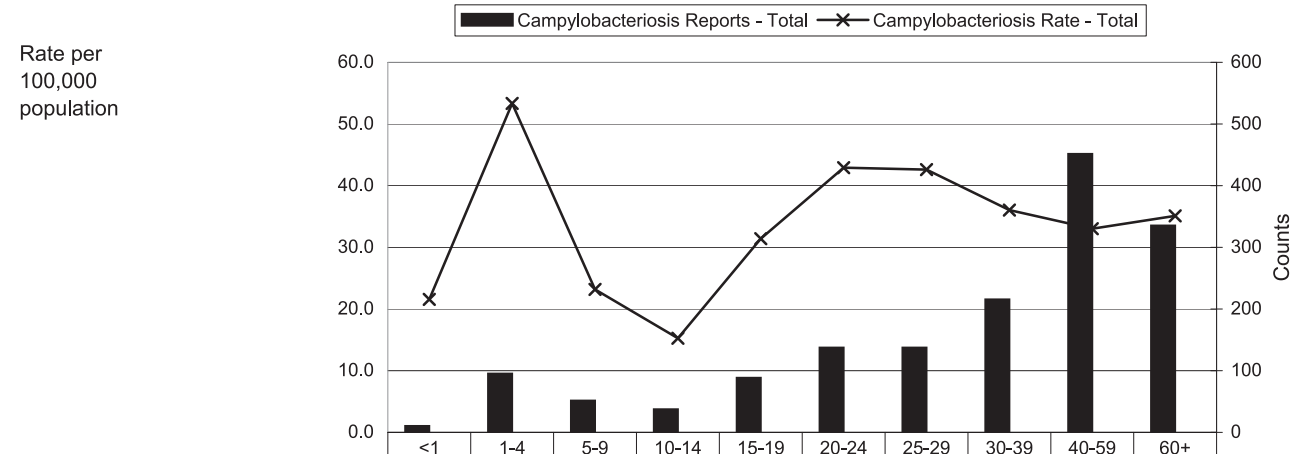
20.2 Campylobacteriosis Rates by HSDA, 2010



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	25	30.8
12	Kootenay Boundary	30	37.8
13	Okanagan	83	23.3
14	Thompson Cariboo Shuswap	64	28.5
21	Fraser East	90	31.5
22	Fraser North	213	34.9
23	Fraser South	230	32.3
31	Richmond	77	39.2
32	Vancouver	257	39.5
33	North Shore/Coast Garibaldi	173	61.5
41	South Vancouver Island	145	39.0
42	Central Vancouver Island	70	26.4
43	North Vancouver Island	47	38.6
51	Northwest	16	21.3
52	Northern Interior	26	18.2
53	Northeast	10	14.5

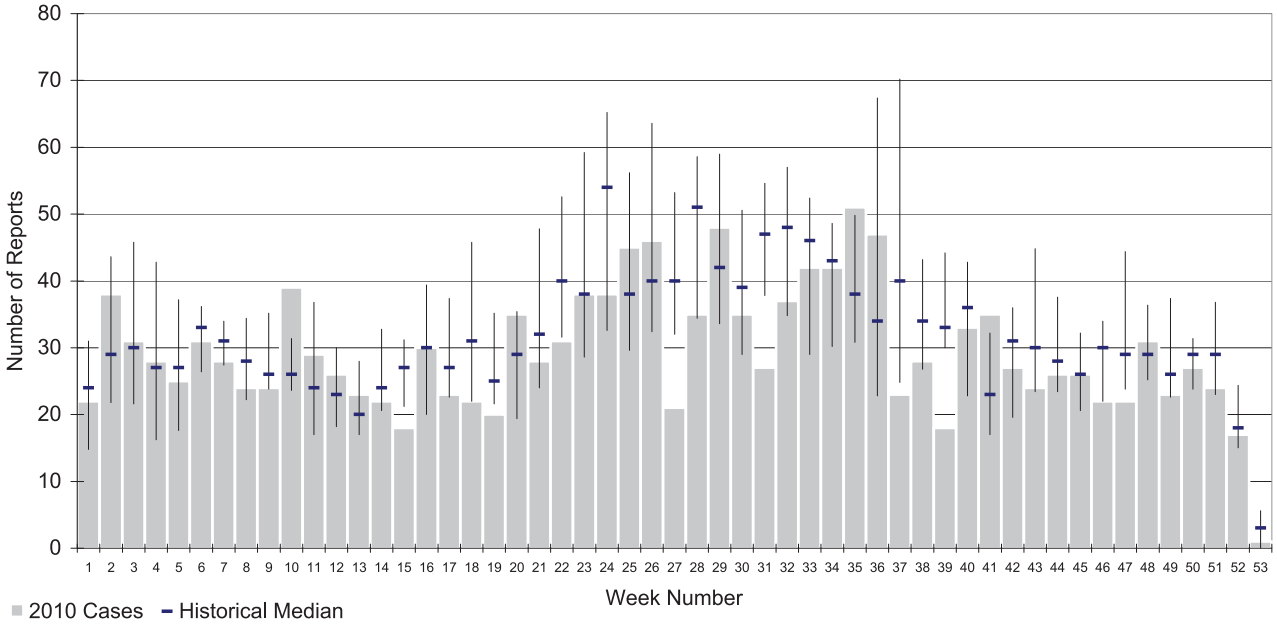
Note: Map classification by Jenks natural breaks method.

20.3 Campylobacteriosis Rates by Age Group and Sex, 2010



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Campylobacteriosis Reports - Female	4	41	23	15	28	66	61	85	205	186
Campylobacteriosis Reports - Male	6	54	28	22	60	71	76	130	246	149
Campylobacteriosis Reports - Total	10	95	51	37	88	137	137	215	451	335
Campylobacteriosis Rate - Female	17.7	47.7	21.7	12.7	20.7	43.0	38.3	28.2	29.7	36.7
Campylobacteriosis Rate - Male	25.3	58.7	24.6	17.6	41.5	42.9	46.8	44.1	36.5	33.3
Campylobacteriosis Rate - Total	21.6	53.4	23.2	15.2	31.4	42.9	42.6	36.1	33.0	35.1

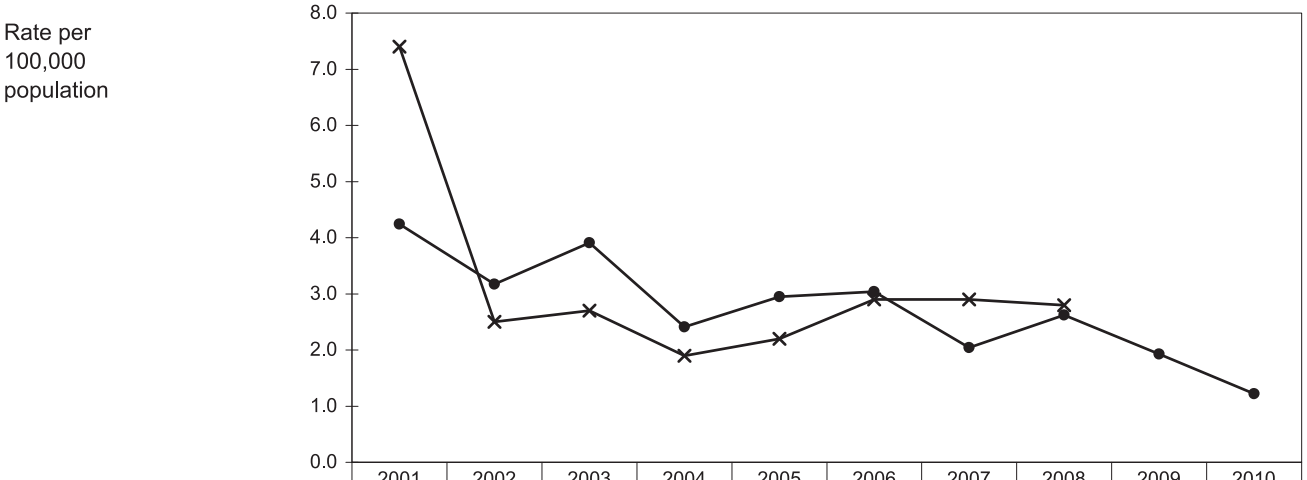
20.4 2010 Campylobacteriosis Reports Compared to Historical Median and the 10th and 90th Percentiles Around the Median (2001 to 2009)



Cryptosporidiosis

In 2010, 55 cases of cryptosporidiosis were reported leading to the lowest rate (1.2 cases per 100,000) in the last decade, 34% of cases reported in 2010 were associated with international travel. The highest rate was reported from East Kootenay (with only 3 cases), followed by Fraser East. Incidence of infection was highest in children aged 1-4 years (9.0 per 100,000). No outbreaks were reported, but a slight peak was evident in the late summer-early fall (weeks 33-41).

21.1 Cryptosporidiosis Rates by Year, 2001-2010

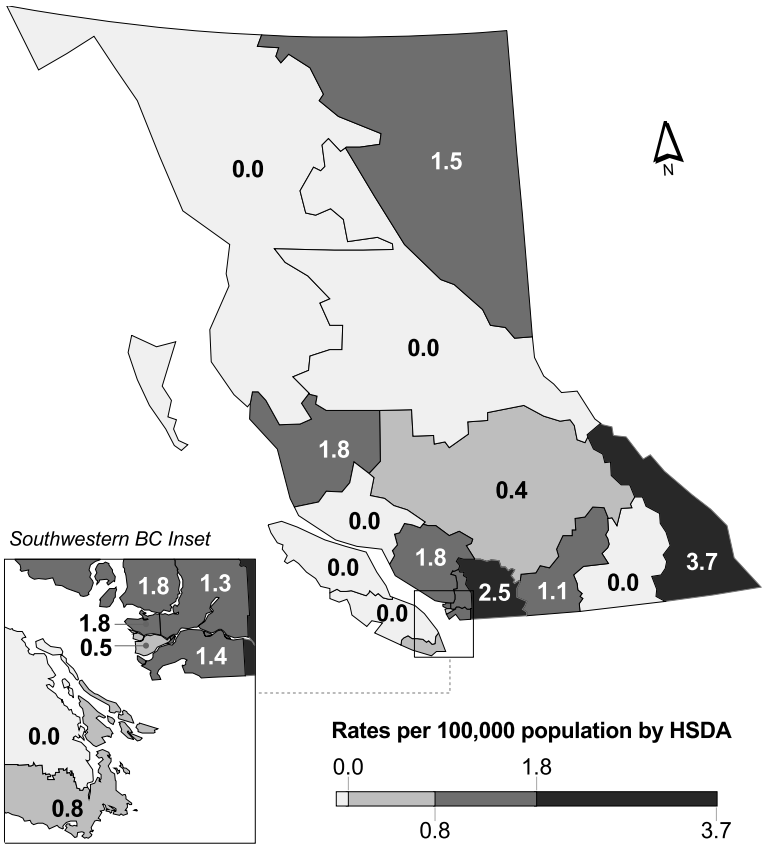


	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
BC Cryptosporidiosis Reports	173	130	161	100	124	129	88	115	86	55
BC Cryptosporidiosis Rate	4.2	3.2	3.9	2.4	3.0	3.0	2.0	2.6	1.9	1.2
Canadian Cryptosporidiosis Rate*	7.4	2.5	2.7	1.9	2.2	2.9	2.9	2.8		

Note: Cryptosporidiosis became nationally notifiable in January 2000

*Please see Sources and Explanatory Remarks, Section 11 on page 125 in regard to the national rate

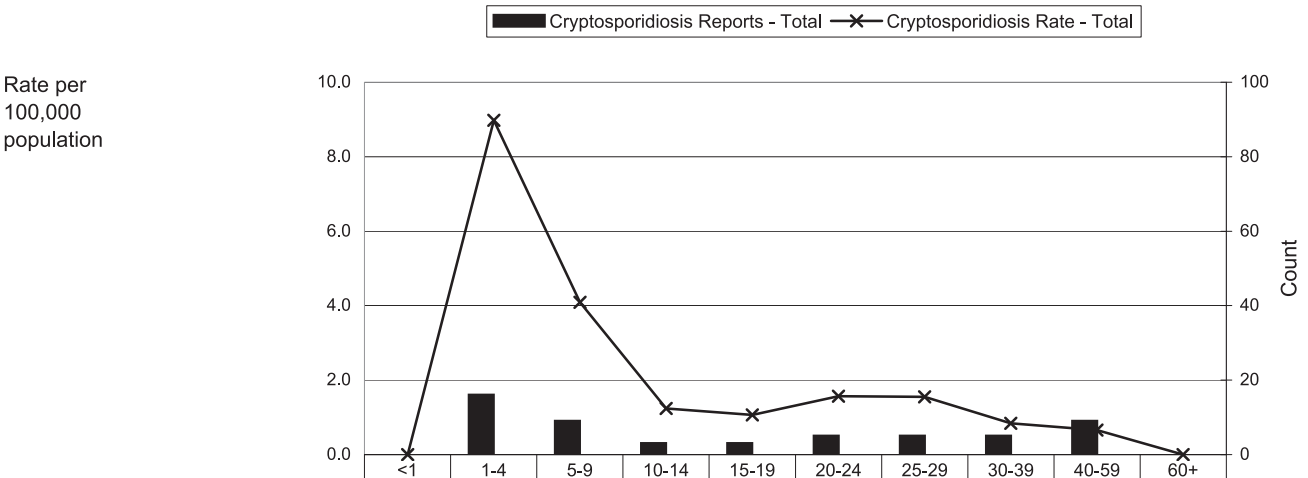
21.2 Cryptosporidiosis Rates by HSDA, 2010



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	3	3.7
12	Kootenay Boundary	0	0.0
13	Okanagan	4	1.1
14	Thompson Cariboo Shuswap	1	0.4
21	Fraser East	7	2.5
22	Fraser North	8	1.3
23	Fraser South	10	1.4
31	Richmond	1	0.5
32	Vancouver	12	1.8
33	North Shore/Coast Garibaldi	5	1.8
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	1	1.5

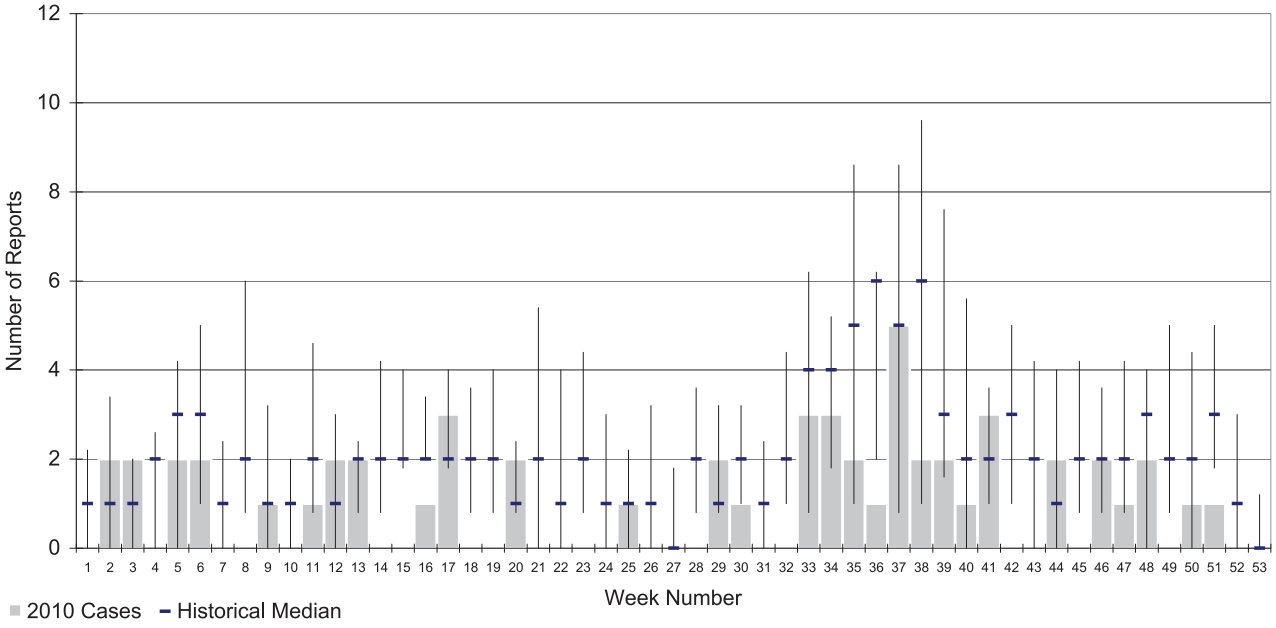
Note: Map classification by Jenks natural breaks method.

21.3 Cryptosporidiosis Rates by Age Group and Sex, 2010



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Cryptosporidiosis Reports - Female	0	9	3	1	0	5	1	1	5	0
Cryptosporidiosis Reports - Male	0	7	6	2	3	0	4	4	4	0
Cryptosporidiosis Reports - Total	0	16	9	3	3	5	5	5	9	0
Cryptosporidiosis Rate - Female	0.0	10.5	2.8	0.9	0.0	3.3	0.6	0.3	0.7	0.0
Cryptosporidiosis Rate - Male	0.0	7.6	5.3	1.6	2.1	0.0	2.5	1.4	0.6	0.0
Cryptosporidiosis Rate - Total	0.0	9.0	4.1	1.2	1.1	1.6	1.6	0.8	0.7	0.0

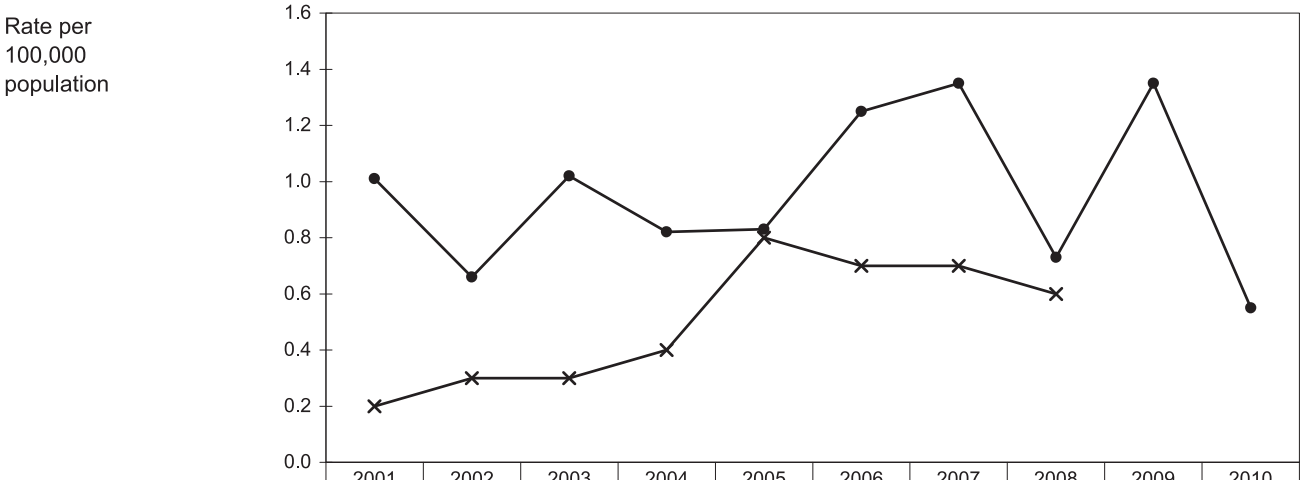
21.4 2010 Crytosporidiosis Reports Compared to Historical Median and the 10th and 90th Percentiles Around the Median (2001 to 2009)



Cyclosporiasis

The number of cyclosporiasis infections decreased in 2010 to 25 cases (0.6 per 100,000), the lowest rate in 10 years. Previous peaks have been associated with locally-acquired outbreaks associated with fresh produce (2006, 2007) or travel to endemic areas (2009). The majority of the infections in 2010 were also a result of travel to endemic areas such as South and Central America (60%). Incidence rates were higher in adults and were highest among females aged 30 to 39 years. This may be due to the fact that adults are travelling to *Cyclospora* endemic areas.

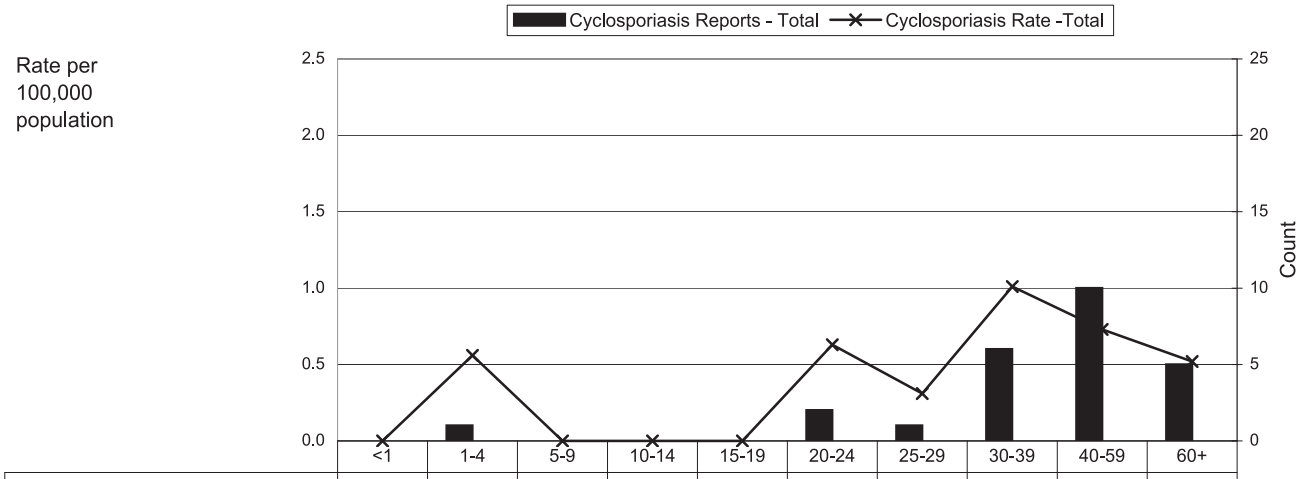
22.1 Cyclosporiasis Rates by Year, 2001-2010



	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
BC Cyclosporiasis Reports	41	27	42	34	35	53	58	32	60	25
BC Cyclosporiasis Rate	1.0	0.7	1.0	0.8	0.8	1.3	1.4	0.7	1.4	0.6
Canadian Cyclosporiasis Rate*	0.2	0.3	0.3	0.4	0.8	0.7	0.7	0.6		

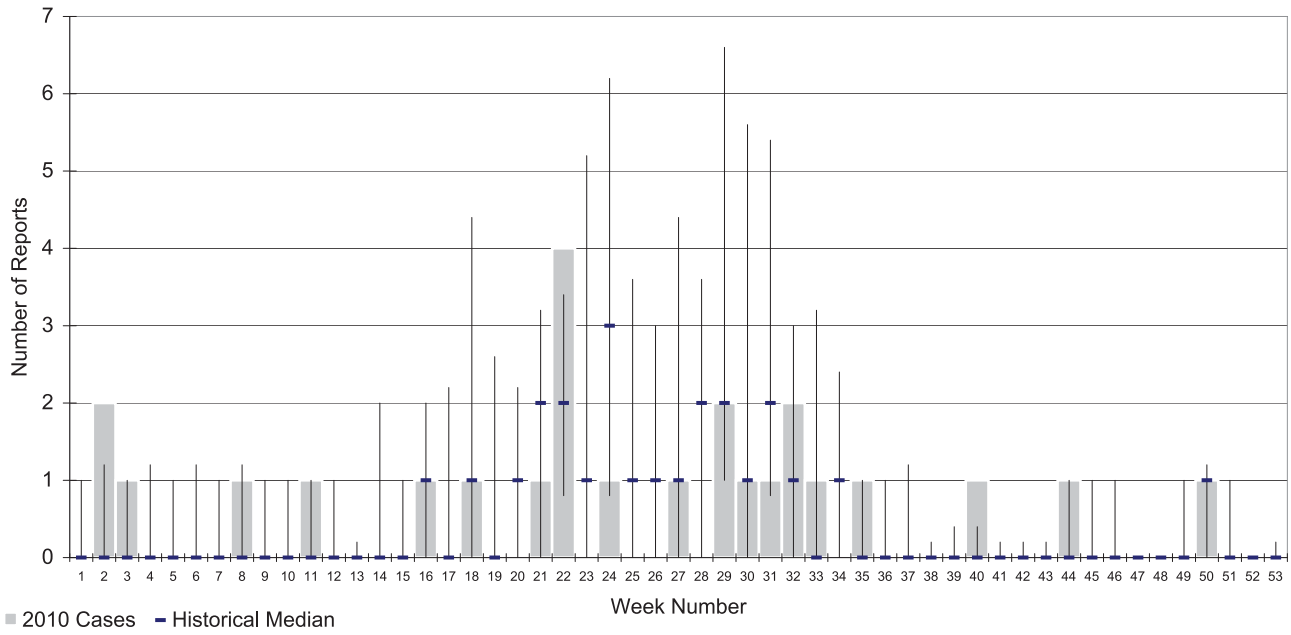
*Please see Sources and Explanatory Remarks, Section 11 on page 125 in regard to the national rate

22.2 Cyclosporiasis Rates by Age Group and Sex, 2010



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Cyclosporiasis Reports - Female	0	1	0	0	0	1	0	4	4	2
Cyclosporiasis Reports - Male	0	0	0	0	0	1	1	2	6	3
Cyclosporiasis Reports - Total	0	1	0	0	0	2	1	6	10	5
Cyclosporiasis Rate - Female	0.0	1.2	0.0	0.0	0.0	0.7	0.0	1.3	0.6	0.4
Cyclosporiasis Rate - Male	0.0	0.0	0.0	0.0	0.0	0.6	0.6	0.7	0.9	0.7
Cyclosporiasis Rate -Total	0.0	0.6	0.0	0.0	0.0	0.6	0.3	1.0	0.7	0.5

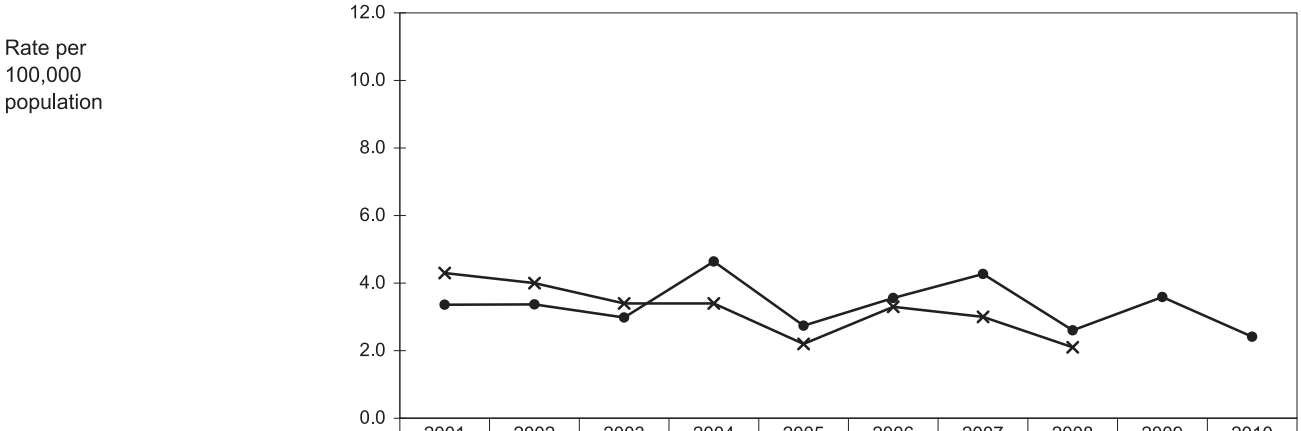
22.3 2010 Cyclosporiasis Reports Compared to Historical Median and the 10th and 90th Percentiles Around the Median (2001 to 2009)



Shigatoxigenic *E. coli*

There were 109 cases of shigatoxigenic *E. coli* infection reported in BC in 2010, 28% of which were associated with international travel. This represents the lowest rate in the last decade. The highest rates of infection were observed in East Kootenay and Thompson Cariboo Shuswap, but the number of cases was small. Incidence was highest in children aged 1-4 years and 15-19 years. The number of reported cases was highest in the spring and summer, which is earlier than the usual late summer peak. A small outbreak occurred among youth in a Thompson Cariboo Shuswap community which accounts for the increase in week 19.

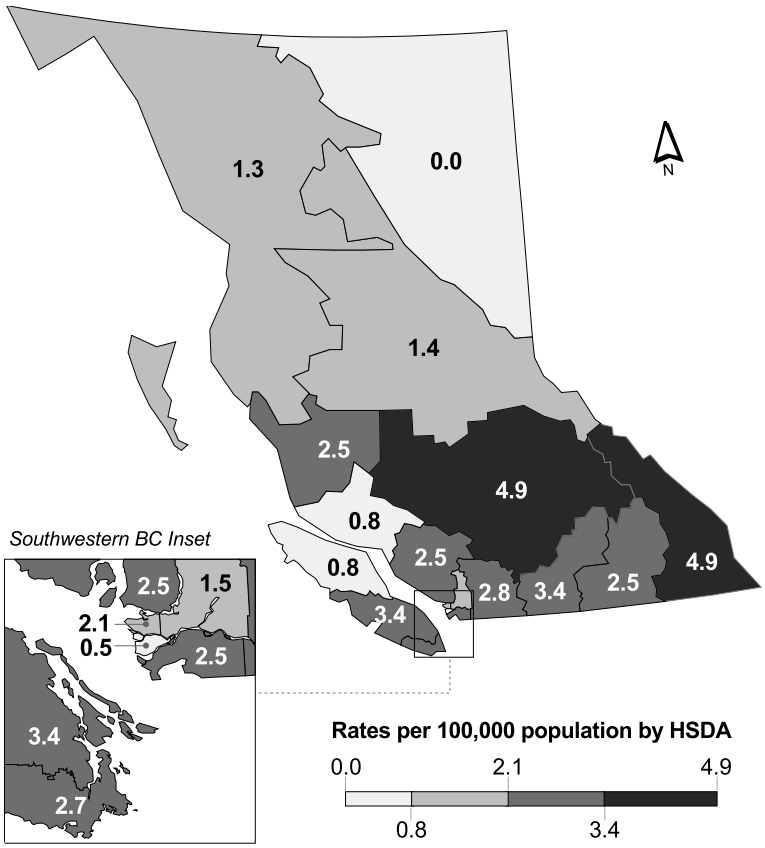
23.1 Shigatoxigenic *E. coli* Rates by Year, 2001-2010



	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
BC Shigatoxigenic E.coli Infection Reports	137	138	123	193	115	151	184	114	160	109
BC Shigatoxigenic E.coli Infection Rate	3.4	3.4	3.0	4.6	2.7	3.6	4.3	2.6	3.6	2.4
Canadian Shigatoxigenic E.coli Infection Rate*	4.3	4.0	3.4	3.4	2.2	3.3	3.0	2.1		

*Please see Sources and Explanatory Remarks, Section 11 on page 125 in regard to the national rate

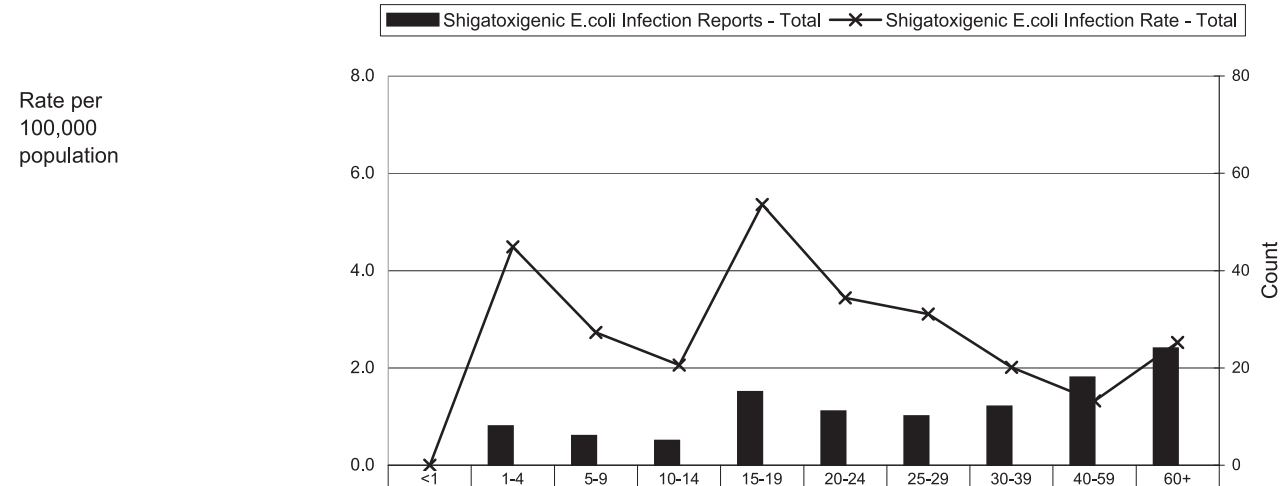
23.2 Shigatoxigenic *E. coli* Rates by HSDA, 2010



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	4	4.9
12	Kootenay Boundary	2	2.5
13	Okanagan	12	3.4
14	Thompson Cariboo Shuswap	11	4.9
21	Fraser East	8	2.8
22	Fraser North	9	1.5
23	Fraser South	18	2.5
31	Richmond	1	0.5
32	Vancouver	14	2.1
33	North Shore/Coast Garibaldi	7	2.5
41	South Vancouver Island	10	2.7
42	Central Vancouver Island	9	3.4
43	North Vancouver Island	1	0.8
51	Northwest	1	1.3
52	Northern Interior	2	1.4
53	Northeast	0	0.0

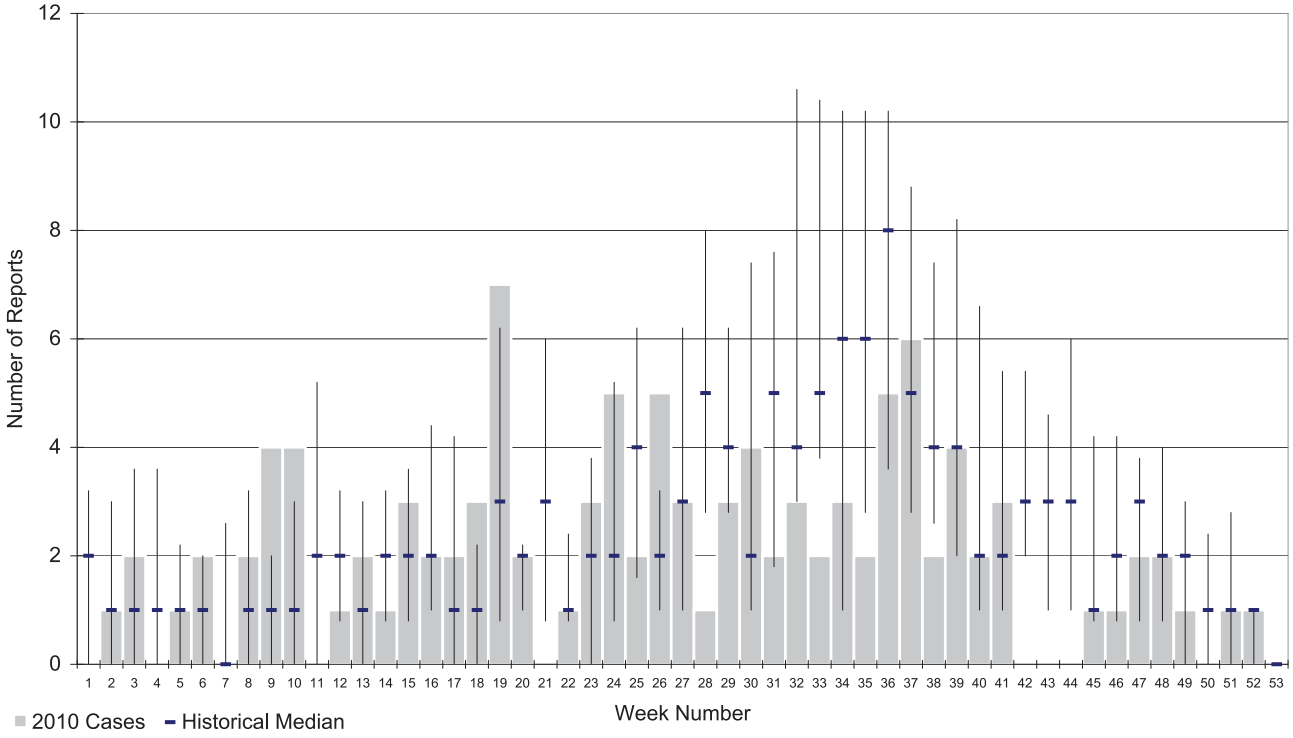
Note: Map classification by Jenks natural breaks method.

23.3 Shigatoxigenic *E. coli* Rates by Age Group and Sex, 2010



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Shigatoxigenic E.coli Infection Reports - Female	0	5	3	3	7	4	5	8	9	17
Shigatoxigenic E.coli Infection Reports - Male	0	3	3	2	8	7	5	4	9	7
Shigatoxigenic E.coli Infection Reports - Total	0	8	6	5	15	11	10	12	18	24
Shigatoxigenic E.coli Infection Rate - Female	0.0	5.8	2.8	2.6	5.2	2.6	3.1	2.7	1.3	3.4
Shigatoxigenic E.coli Infection Rate - Male	0.0	3.3	2.6	1.6	5.5	4.2	3.1	1.4	1.3	1.6
Shigatoxigenic E.coli Infection Rate - Total	0.0	4.5	2.7	2.1	5.4	3.4	3.1	2.0	1.3	2.5

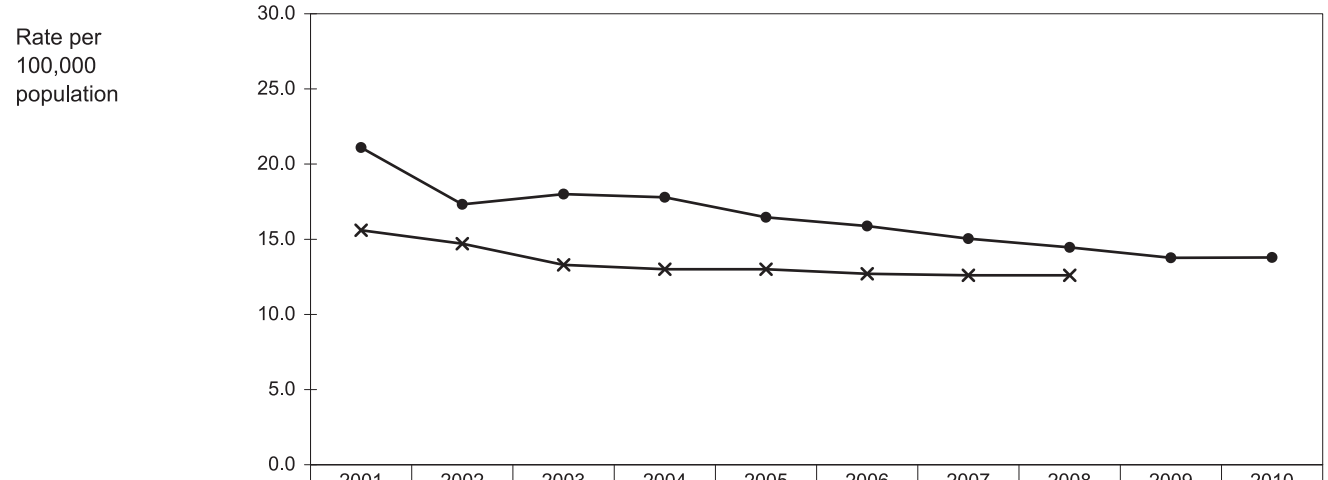
23.4 2010 Shigatoxigenic *E. Coli* Reports Compared to Historical Median and the 10th and 90th Percentiles Around the Median (2001 to 2009)



Giardiasis

Annual rates of giardiasis in BC remained constant in 2010 with 624 cases reported. Rates were highest in Kootenay Boundary, the Northwest, North Shore/Coast Garibaldi and Vancouver. Rates were higher in males than females in most age groups, with the highest rates reported in children 1-9 years and adult males 30-59 years. The latter may in part be due to transmission between men who have sex with men. There were slightly more cases reported during the spring and summer but no outbreaks were reported.

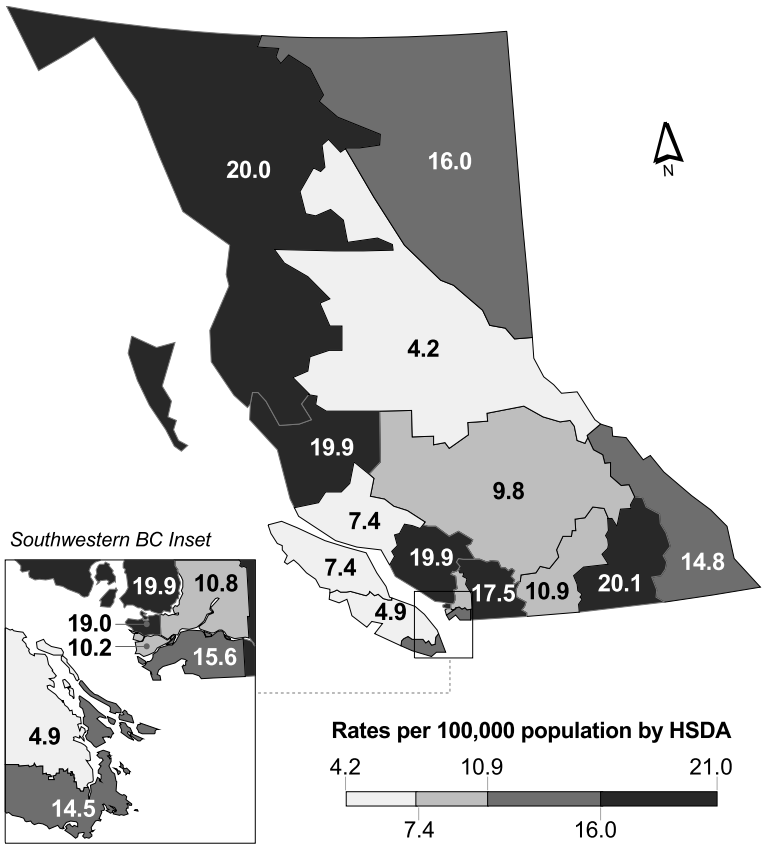
24.1 Giardiasis Rates by Year, 2001-2010



	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
BC Giardiasis Reports	860	710	742	739	691	674	648	634	613	624
BC Giardiasis Rate	21.1	17.3	18.0	17.8	16.5	15.9	15.0	14.5	13.8	13.8
Canadian Giardiasis Rate*	15.6	14.7	13.3	13.0	13.0	12.7	12.6	12.6		

*Please see Sources and Explanatory Remarks, Section 11 on page 125 in regard to the national rate

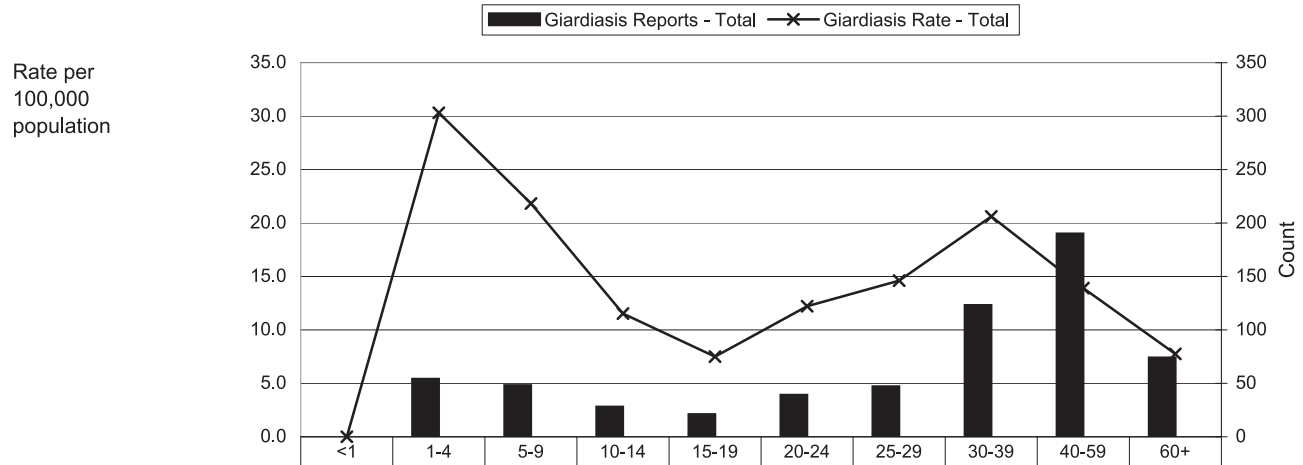
24.2 Giardiasis Rates by HSDA, 2010



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	12	14.8
12	Kootenay Boundary	16	20.1
13	Okanagan	39	10.9
14	Thompson Cariboo Shuswap	22	9.8
21	Fraser East	50	17.5
22	Fraser North	66	10.8
23	Fraser South	111	15.6
31	Richmond	20	10.2
32	Vancouver	124	19.0
33	North Shore/Coast Garibaldi	56	19.9
41	South Vancouver Island	54	14.5
42	Central Vancouver Island	13	4.9
43	North Vancouver Island	9	7.4
51	Northwest	15	20.0
52	Northern Interior	6	4.2
53	Northeast	11	16.0

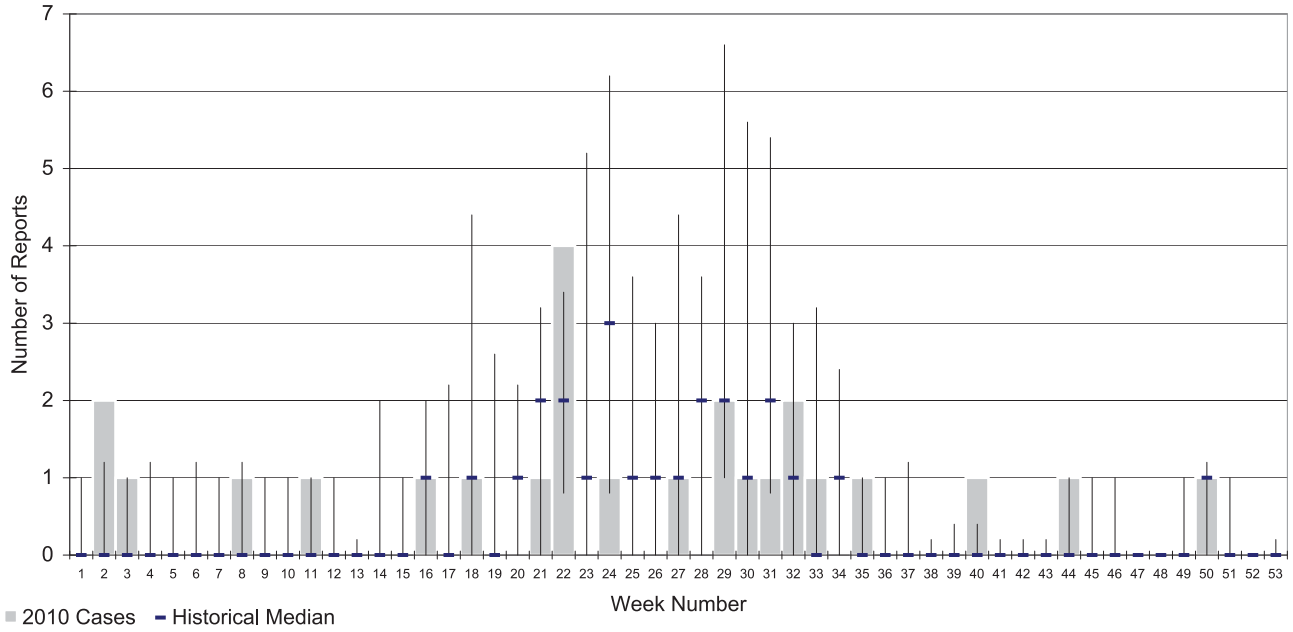
Note: Map classification by Jenks natural breaks method.

24.3 Giardiasis Rates by Age Group and Sex, 2010



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Giardiasis Reports - Female	0	27	21	7	10	18	21	51	56	32
Giardiasis Reports - Male	0	27	27	21	11	21	26	72	134	42
Giardiasis Reports - Total	0	54	48	28	21	39	47	123	190	74
Giardiasis Rate - Female	0.0	31.4	19.8	6.0	7.4	11.7	13.2	16.9	8.1	6.3
Giardiasis Rate - Male	0.0	29.3	23.7	16.8	7.6	12.7	16.0	24.4	19.9	9.4
Giardiasis Rate - Total	0.0	30.3	21.8	11.5	7.5	12.2	14.6	20.6	13.9	7.8

24.4 2010 Giardiasis Reports Compared to Historical Median and the 10th and 90th Percentiles Around the Median (2001 to 2009)



Hepatitis A

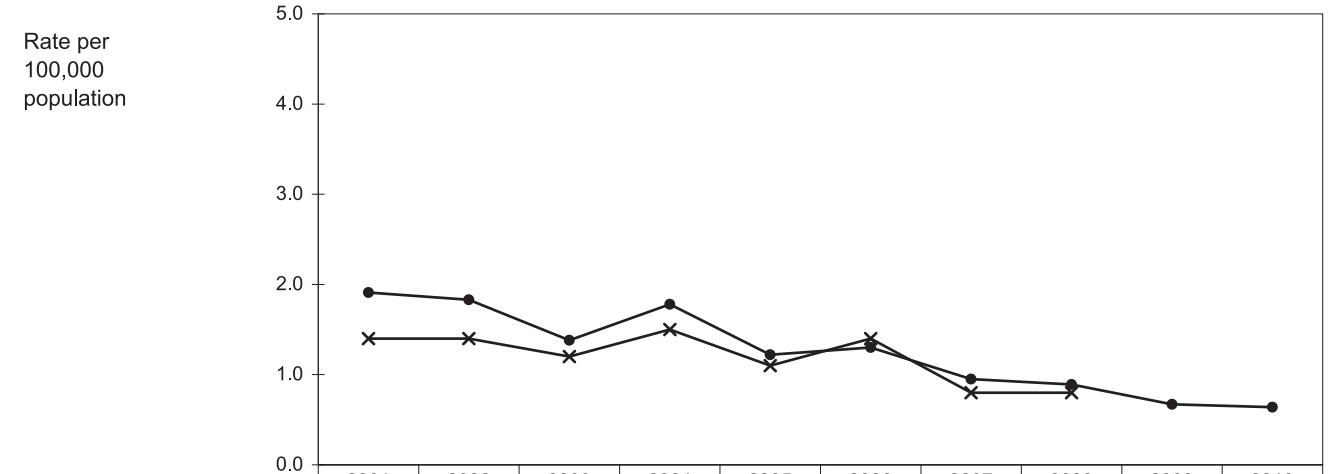
There were 29 cases of hepatitis A reported in BC in 2010 for a rate of 0.6 per 100,000 population, continuing the downward trend observed over the past decade. However, the actual number of cases of hepatitis A is estimated to be more than five times the reported number. Young children may be asymptomatic making underreporting more likely in this age group. 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 people who use illicit drugs and men who have sex with men; and post exposure prophylaxis of contacts of cases of hepatitis A to prevent transmission and also improved hygiene.

Hepatitis A samples are sent to the National Microbial Laboratory for genotyping (RNA fingerprinting). This can identify samples with identical fingerprinting and therefore identify clusters and cases related to a local or National outbreak.

The largest number of hepatitis cases identified in a Health service Delivery Area in 2010 was 12 in Central Vancouver Island (CVI). An increase in hepatitis A cases was identified in CVI the latter part of the year and the cases were determined to have identical genotypes. This outbreak has continued into 2011. The median age of the outbreak-related cases was younger when compared to the non-outbreak cases (15 vs. 36 years).

A large proportion of hepatitis A cases, (excluding the outbreak-related cases) continue to be identified in persons who have travelled to countries where hepatitis A is endemic, but were not immunized prior to travel or their contacts after returning to BC. Previous analyses identified travel to an endemic country was responsible for 90% of hepatitis A cases (data not shown). Although hepatitis A vaccine is recommended to these travelers it is not publicly funded for this group.

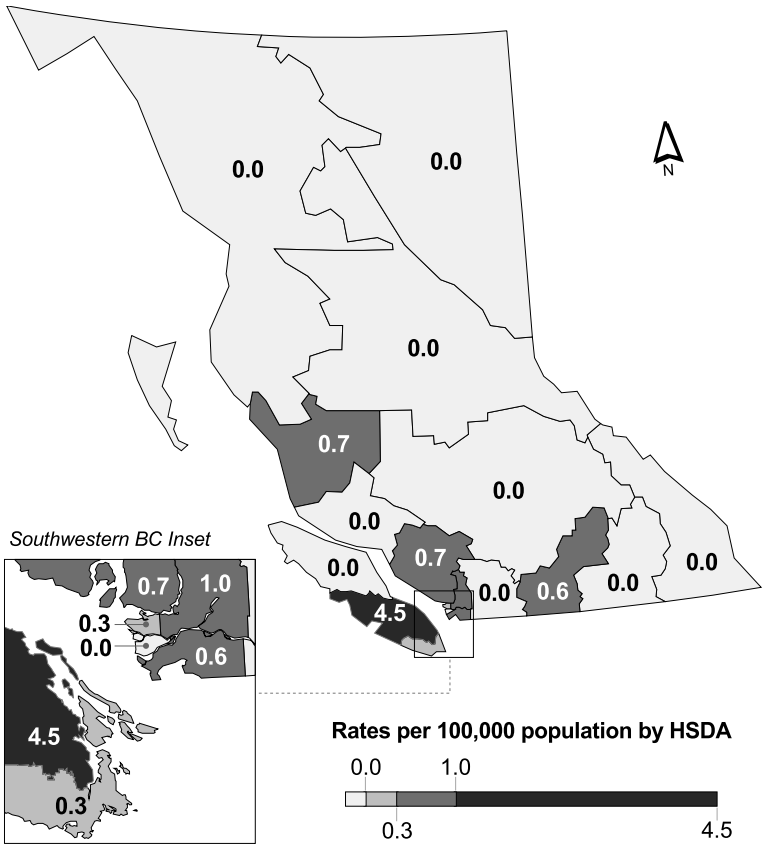
25.1 Hepatitis A Rates by Year, 2001-2010



	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
BC Hepatitis A Reports	78	75	57	74	51	55	41	39	30	29
BC Hepatitis A Rate	1.9	1.8	1.4	1.8	1.2	1.3	1.0	0.9	0.7	0.6
Canadian Hepatitis A Rate*	1.4	1.4	1.2	1.5	1.1	1.4	0.8	0.8		

*Please see Sources and Explanatory Remarks, Section 11 on page 125 in regard to the national rate

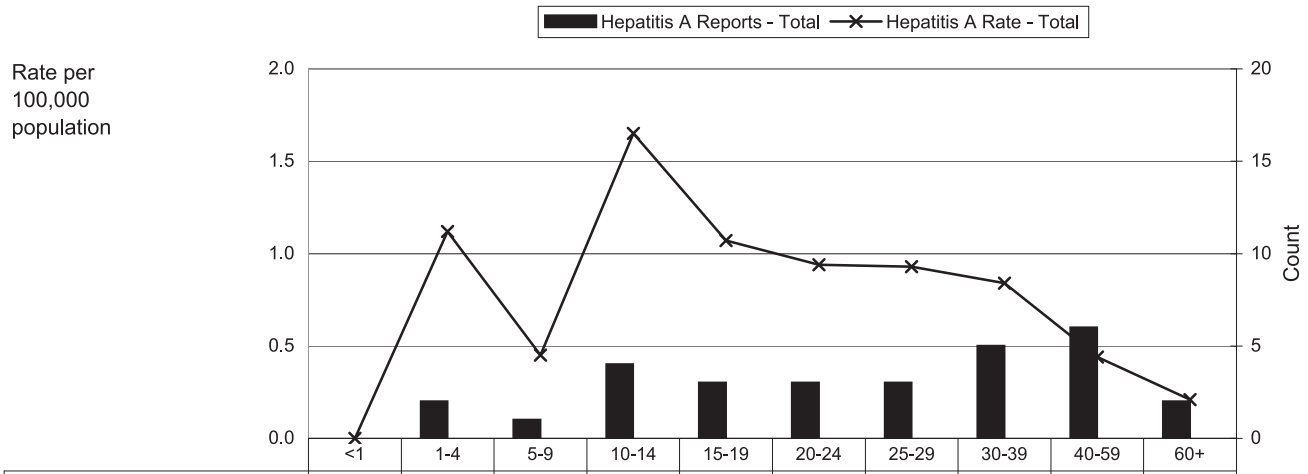
25.2 Hepatitis A Rates by HSDA, 2010



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	6	1.0
23	Fraser South	4	0.6
31	Richmond	0	0.0
32	Vancouver	2	0.3
33	North Shore/Coast Garibaldi	2	0.7
41	South Vancouver Island	1	0.3
42	Central Vancouver Island	12	4.5
43	North Vancouver Island	0	0.0
51	Northwest	0	0.0
52	Northern Interior	0	0.0
53	Northeast	0	0.0

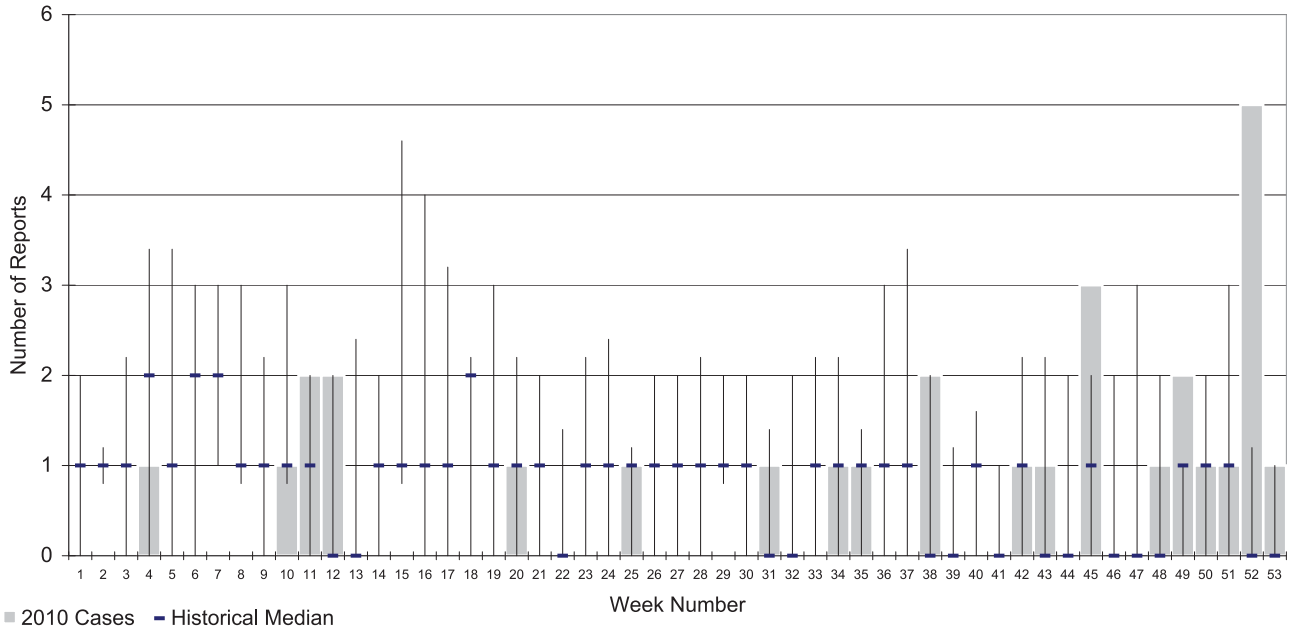
Note: Map classification by Jenks natural breaks method.

25.3 Hepatitis A Rates by Age Group and Sex, 2010



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Hepatitis A Reports - Female	0	0	1	2	2	2	2	3	3	2
Hepatitis A Reports - Male	0	2	0	2	1	1	1	2	3	0
Hepatitis A Reports - Total	0	2	1	4	3	3	3	5	6	2
Hepatitis A Rate - Female	0.0	0.0	0.9	1.7	1.5	1.3	1.3	1.0	0.4	0.4
Hepatitis A Rate - Male	0.0	2.2	0.0	1.6	0.7	0.6	0.6	0.7	0.4	0.0
Hepatitis A Rate - Total	0.0	1.1	0.5	1.7	1.1	0.9	0.9	0.8	0.4	0.2

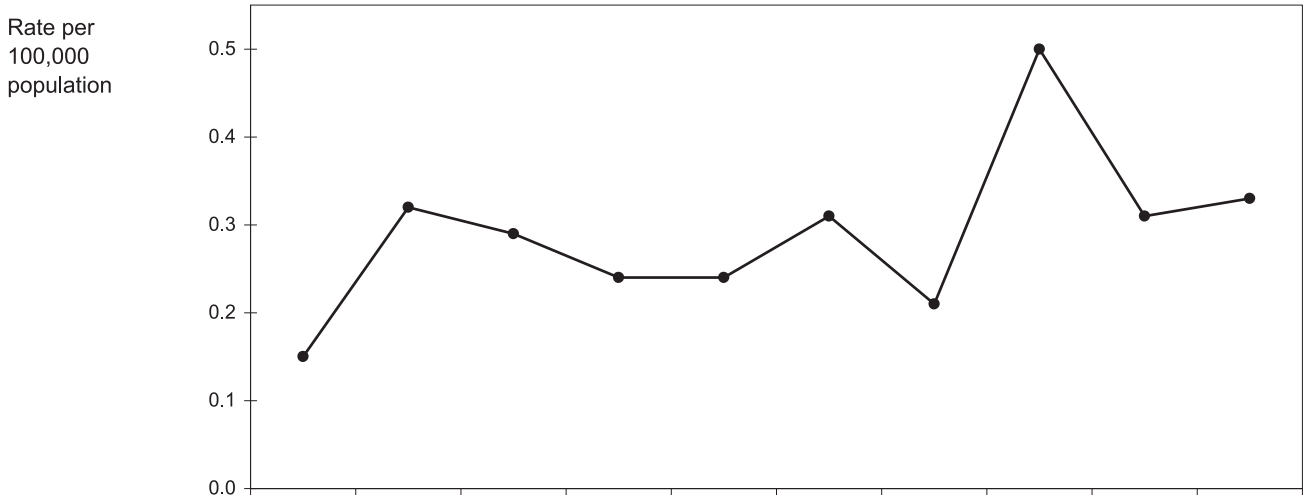
25.4 2010 Hepatitis A Reports Compared to Historical Median and the 10th and 90th Percentiles Around the Median (2001 to 2009)



Listeriosis

Fifteen cases of invasive listeriosis were reported in 2010, no infections were associated with international travel. The incidence in 2010 was similar to 2009 and years prior to 2008. Rates were highest among adults aged 60 years and older. There was no regional clustering and cases occurred throughout the year. No outbreaks were reported.

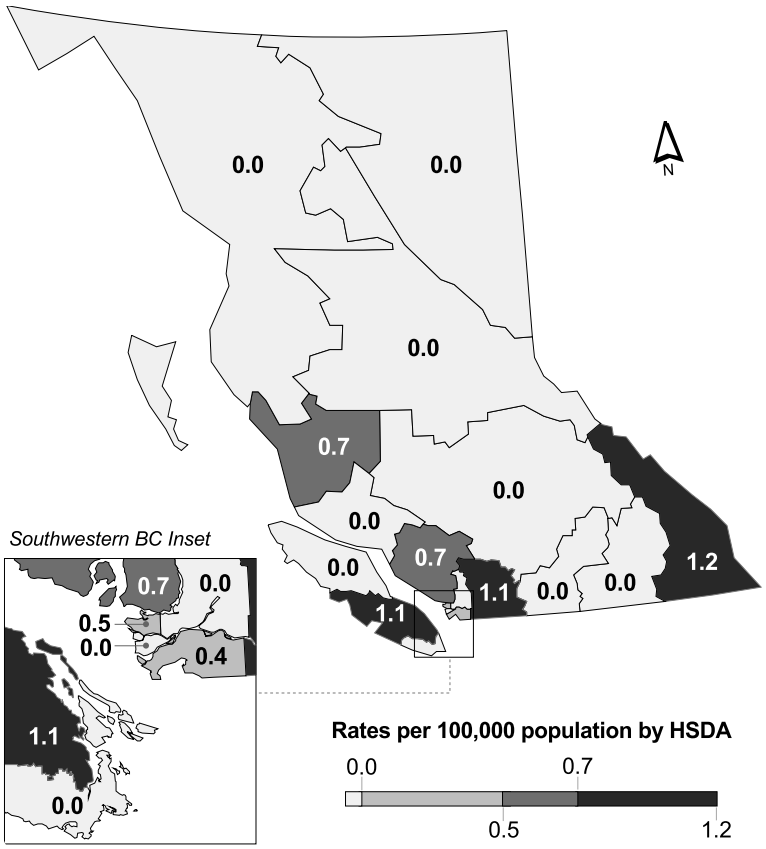
26.1 Listeriosis Rates by Year, 2001-2010



	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
BC Listeriosis Reports	6	13	12	10	10	13	9	22	14	15
BC Listeriosis Rate	0.2	0.3	0.3	0.2	0.2	0.3	0.2	0.5	0.3	0.3

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

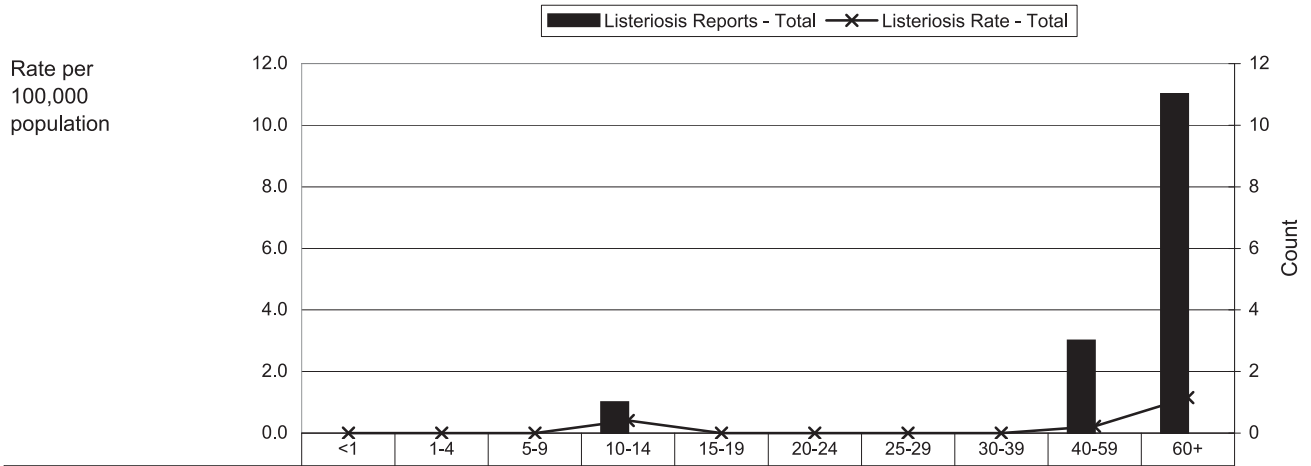
26.2 Listeriosis Rates by HSDA, 2010



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	1	1.2
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	0	0.0
23	Fraser South	3	0.4
31	Richmond	0	0.0
32	Vancouver	3	0.5
33	North Shore/Coast Garibaldi	2	0.7
41	South Vancouver Island	0	0.0
42	Central Vancouver Island	3	1.1
43	North Vancouver Island	0	0.0
51	Northwest	0	0.0
52	Northern Interior	0	0.0
53	Northeast	0	0.0

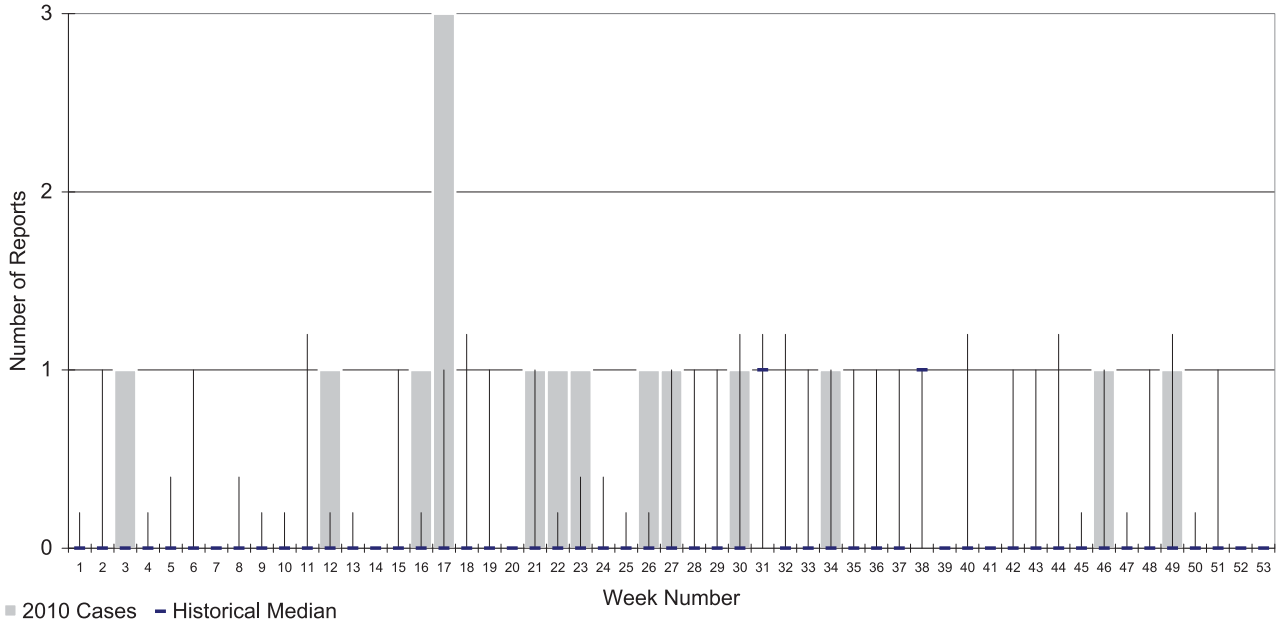
Note: Map classification by Jenks natural breaks method.

26.3 Listeriosis Rates by Age Group and Sex, 2010



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Listeriosis Reports - Female	0	0	0	1	0	0	0	0	2	2
Listeriosis Reports - Male	0	0	0	0	0	0	0	0	1	9
Listeriosis Reports - Total	0	0	0	1	0	0	0	0	3	11
Listeriosis Rate - Female	0.0	0.0	0.0	0.9	0.0	0.0	0.0	0.0	0.3	0.4
Listeriosis Rate - Male	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	2.0
Listeriosis Rate - Total	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.2	1.2

26.4 2010 Listeriosis Reports Compared to Historical Median and the 10th and 90th Percentiles Around the Median (2001 to 2009)



Salmonellosis, Typhoid Fever and Paratyphoid Fever*

In 2010, 1078 cases of salmonellosis were reported for a rate of 23.8 per 100,000. *Salmonella* infection continues to be the second most commonly reported enteric disease in BC. Overall, 21% of *Salmonella* infections were associated with international travel. The rate in 2010 increased slightly compared to 2008 and 2009 and continues to be notably higher when compared to the previously stable rate reported between 2001 and 2007 (1.4 times higher compared to the rate in 2006). Rates were highest in children under 5 years of age and among residents of Fraser Health and Vancouver Coastal Health Authority. Outside of the lower mainland, Northwest and Thompson Cariboo Shuswap reported the highest incidence of infections. Compared to 2009 East Kootenay (5.0 compared to 14.8), Thompson Cariboo Shuswap (15.4 compared to 22.3), Richmond (18.7 compared to 28.5) and Northeast (5.9 compared to 11.6) show the largest increases in incidence. Three peaks were seen in 2010; early spring (week 16-17), summer (weeks 30-37) and winter (weeks 49-51). The summer peak was associated with clusters of cases associated with common food establishments and the winter peak was associated with international travel.

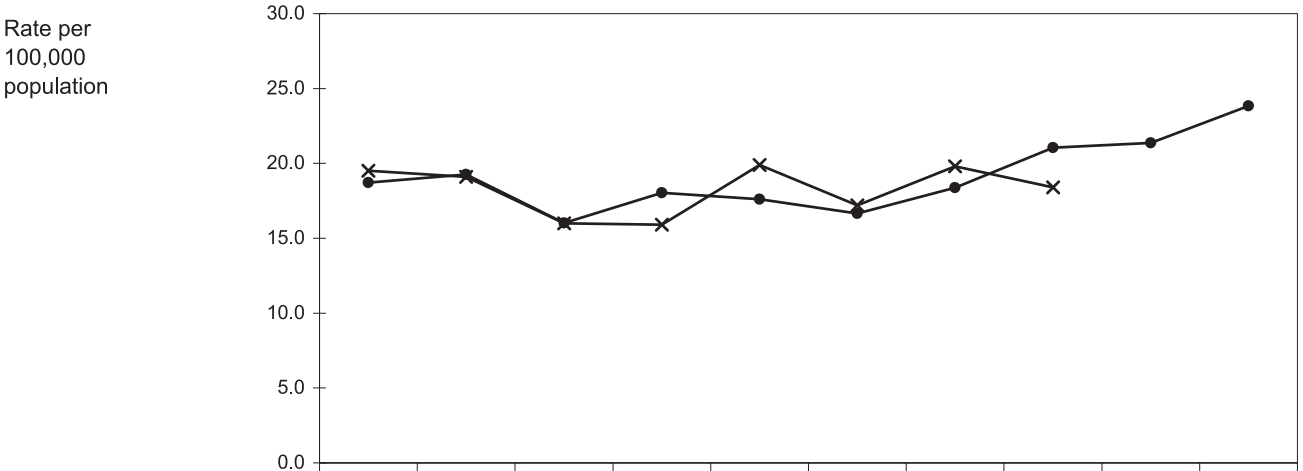
An ongoing investigation into an *S*. Enteritidis PFGE pattern SENXAI.0003 outbreak continued in 2010. Over 200 cases were investigated in 2010 and over 600 cases have been investigated since May 2008. The majority of cases resided in the lower mainland which likely explains the higher rates in these geographic areas. The largest number of cases was reported in summer months reflected by the summer peak. Based on information collected during investigations the most likely source of illness was eggs.

Typhoid fever rates in British Columbia decreased in 2010 for the second consecutive year. 28 cases were reported for a rate of 0.6 cases per 100,000. Seventy-three percent were associated with international travel. Paratyphoid fever incidence was similar to previous years at 0.6 cases per 100,000. Seventy percent of cases 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.

Enteritidis and Typhimurium remained the top two serotypes isolated in 2010; however the proportion of Enteritidis continues to increase compared to previous years whereas the proportion of Typhimurium continues to decrease. *S*. Heidelberg which had been reported less frequently in recent years (fourth in 2008 and fifth in 2009) returned to the top three serotypes in 2010. *S*. Chester was reported for the first time in the top ten serotypes in 2010 due to an outbreak associated with headcheese which occurred in July 2010. *S*. Hadar and *S*. Stanley returned to the top 10 serotypes in 2010 after not being reported 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.*

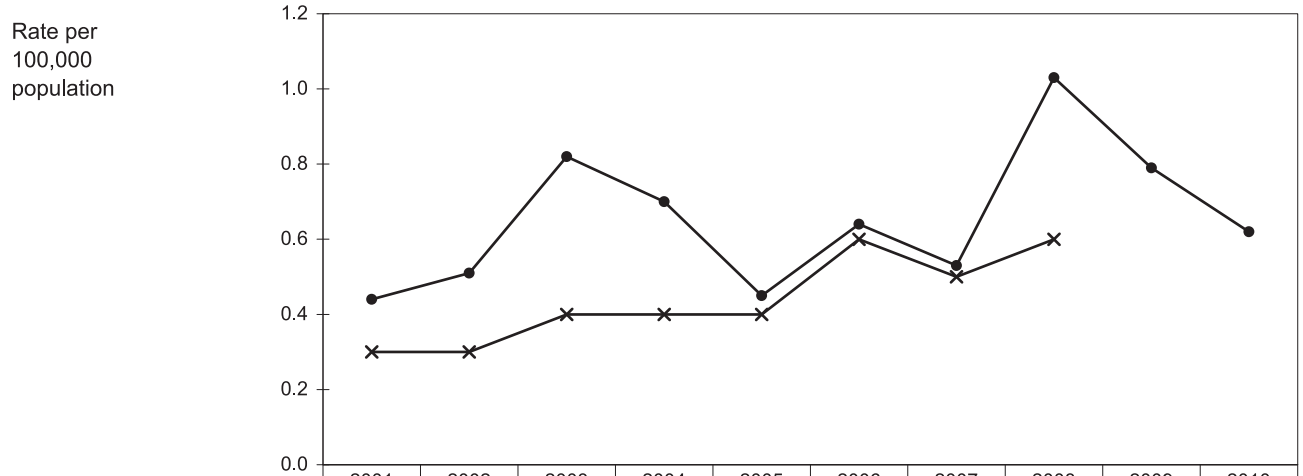
27.1 Salmonellosis Rates by Year, 2001-2010



	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
BC Salmonellosis Reports	763	789	660	749	739	707	792	923	952	1078
BC Salmonellosis Rate	18.7	19.3	16.0	18.0	17.6	16.7	18.4	21.1	21.4	23.8
Canadian Salmonellosis Rate*	19.5	19.1	16.0	15.9	19.9	17.2	19.8	18.4		

*Please see Sources and Explanatory Remarks, Section 11 on page 125 in regard to the national rate

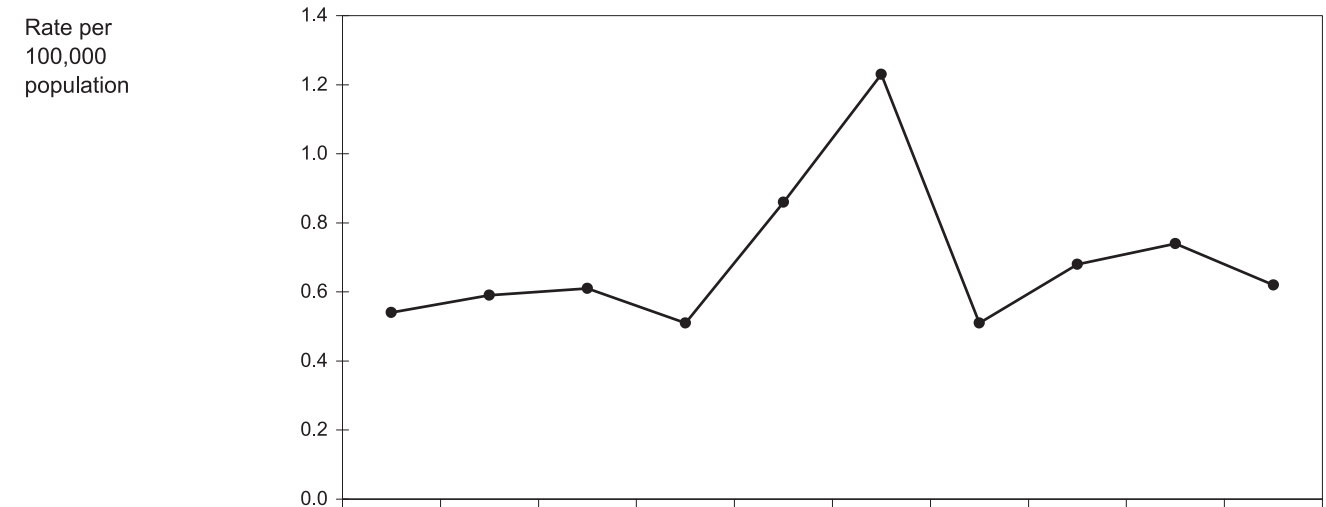
27.2 Typhoid Rates by Year, 2001-2010



	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
BC Typhoid Fever Reports	18	21	34	29	19	27	23	45	35	28
BC Typhoid Fever Rate	0.4	0.5	0.8	0.7	0.5	0.6	0.5	1.0	0.8	0.6
Canadian Typhoid Fever Rate*	0.3	0.3	0.4	0.4	0.4	0.6	0.5	0.6		

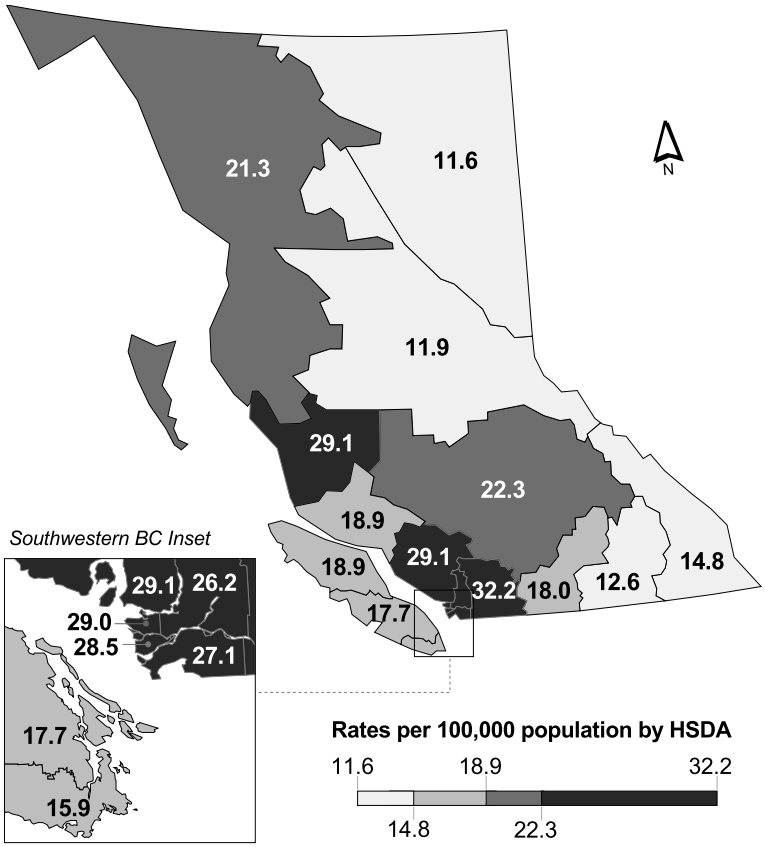
*Please see Sources and Explanatory Remarks, Section 11 on page 125 in regard to the national rate

27.3 Paratyphoid Fever Rates by Year, 2001-2010



	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
BC Paratyphoid Fever Reports	22	24	25	21	36	52	22	30	33	28
BC Paratyphoid Fever Rate	0.5	0.6	0.6	0.5	0.9	1.2	0.5	0.7	0.7	0.6

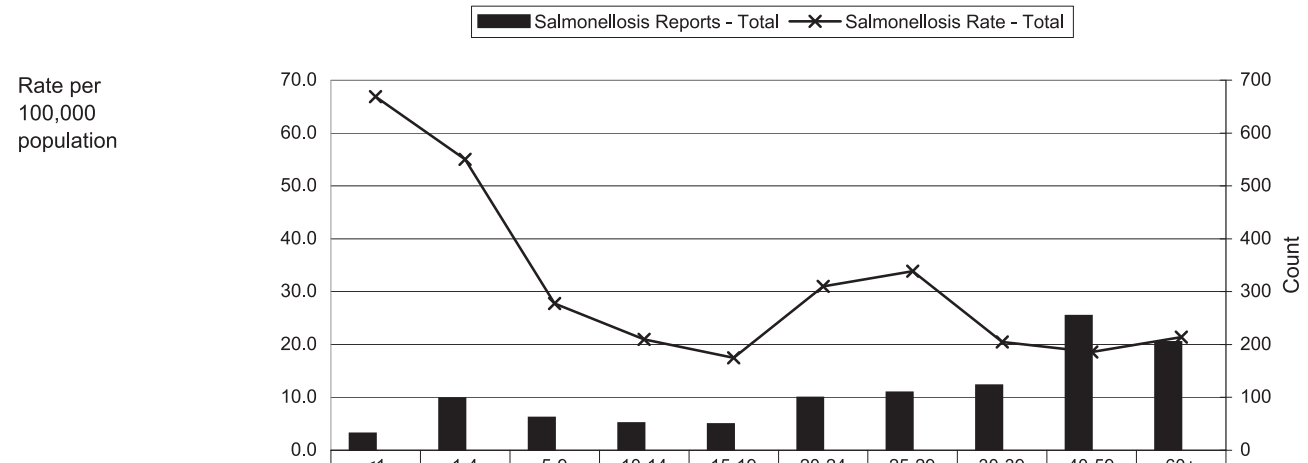
27.4 Salmonellosis Rates by HSDA, 2010



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	12	14.8
12	Kootenay Boundary	10	12.6
13	Okanagan	64	18.0
14	Thompson Cariboo Shuswap	50	22.3
21	Fraser East	92	32.2
22	Fraser North	160	26.2
23	Fraser South	193	27.1
31	Richmond	56	28.5
32	Vancouver	189	29.0
33	North Shore/Coast Garibaldi	82	29.1
41	South Vancouver Island	59	15.9
42	Central Vancouver Island	47	17.7
43	North Vancouver Island	23	18.9
51	Northwest	16	21.3
52	Northern Interior	17	11.9
53	Northeast	8	11.6

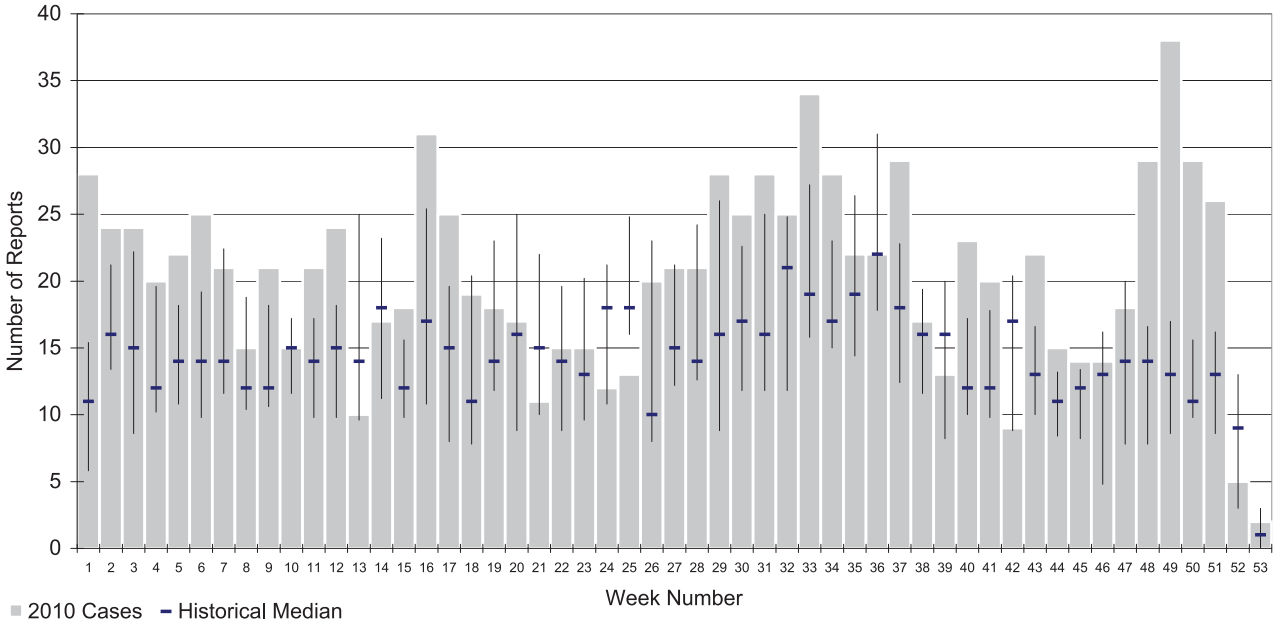
Note: Map classification by Jenks natural breaks method.

27.5 Salmonellosis Rates by Age Group and Sex, 2010



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Salmonellosis Reports - Female	14	31	28	17	30	50	52	52	133	98
Salmonellosis Reports - Male	17	67	33	34	19	49	57	70	121	106
Salmonellosis Reports - Total	31	98	61	51	49	99	109	122	254	204
Salmonellosis Rate - Female	61.9	36.0	26.4	14.4	22.1	32.6	32.6	17.3	19.3	19.4
Salmonellosis Rate - Male	71.6	72.8	29.0	27.2	13.2	29.6	35.1	23.7	17.9	23.7
Salmonellosis Rate - Total	66.9	55.0	27.7	21.0	17.5	31.0	33.9	20.5	18.6	21.4

27.6 2010 Salmonellosis Reports Compared to Historical Median and the 10th and 90th Percentiles Around the Median (2001-2009)



27.7 *Salmonella* serotype distribution, 2010

Rank	Species	Number of Cases	Proportion
1	Enteritidis	556	48.6%
2	Typhimurium	100	8.7%
3	Heidelberg	64	5.6%
4	*Salmonella* ssp I 4,5,12:i-	46	4.0%
5	Typhi	34	3.0%
6	Chester	34	3.0
7	Paratyphi A	20	1.7%
8	Newport	19	1.7%
9	Stanley	15	1.3%
10	Hadar	15	1.3%
	Others	241	21.1%
	Total	1144	100.0%

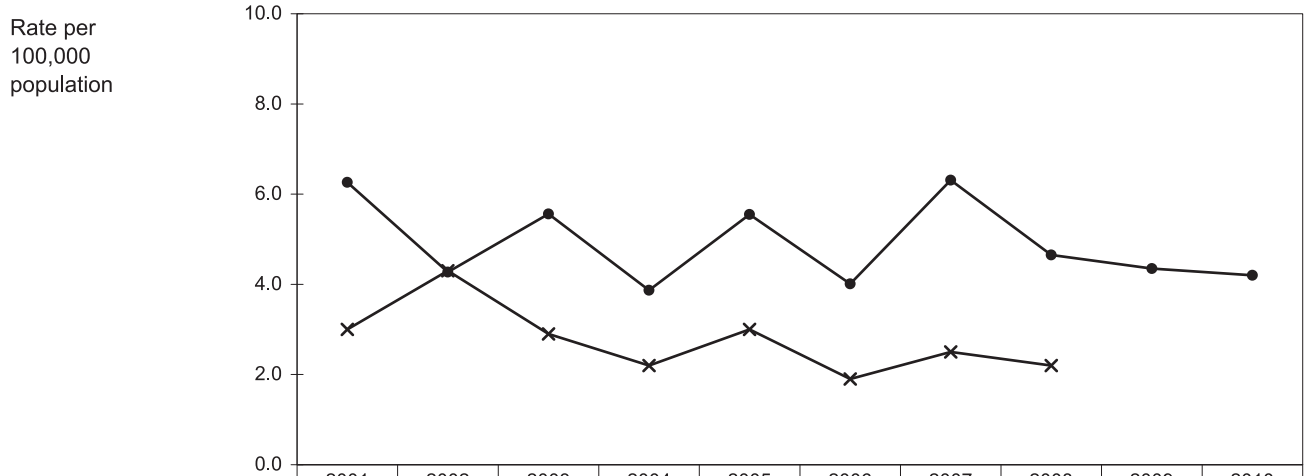
Note: Species distribution is based on the BCCDC Public Health and Microbiology Reference Laboratory data. Numbers may vary from those reported in iPHIS.

Shigellosis

In 2010, the annual incidence (4.2/100,000) remained similar to the previous 2 years. Fifty-five percent were associated with international travel. Rates continue to be highest in Vancouver. Incidence rates were highest among males aged 1-4 years, females aged 20-24 and males aged 30-39 years. A *S. sonnei* outbreak associated with a food service establishment in the Okanagan was reported in February, which is reflected in the increase reported in week 5 and the higher incidence for the Okanagan.

S. flexneri was the most common species reported in 2010 for the second year in a row. This is a change from previous years when *S. sonnei* accounted for the majority of isolates reported. This change may in part be due to ongoing transmission among MSM and/or acquisition during travel.

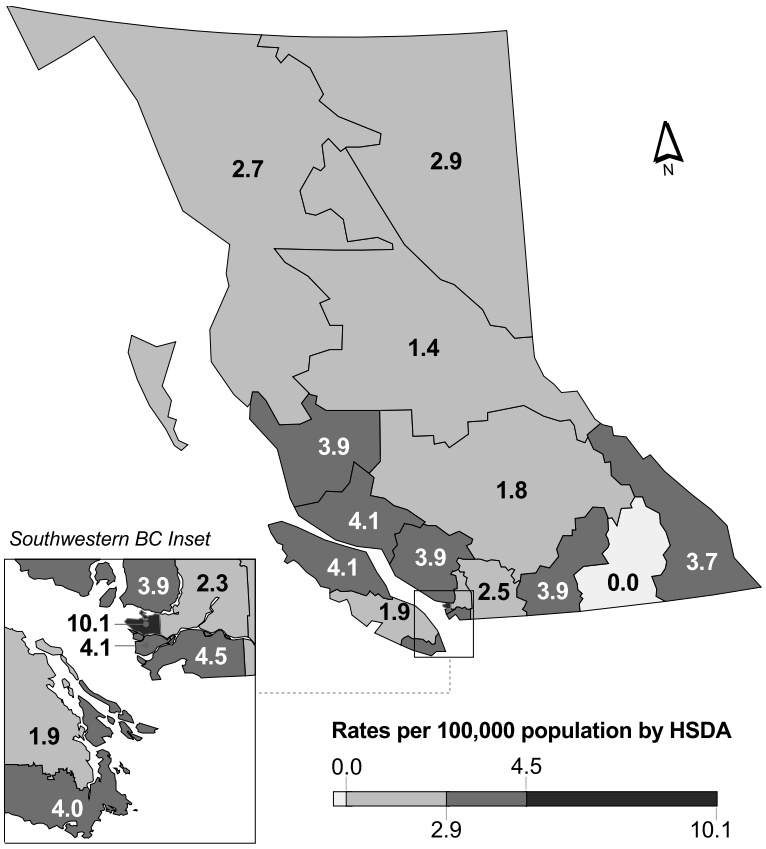
28.1 Shigellosis Rates by Year, 2001-2010



	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
BC Shigellosis Reports	255	175	229	161	233	170	272	204	194	190
BC Shigellosis Rate	6.3	4.3	5.6	3.9	5.6	4.0	6.3	4.7	4.4	4.2
Canadian Shigellosis Rate*	3.0	4.3	2.9	2.2	3.0	1.9	2.5	2.2		

*Please see Sources and Explanatory Remarks, Section 11 on page 125 in regard to the national rate

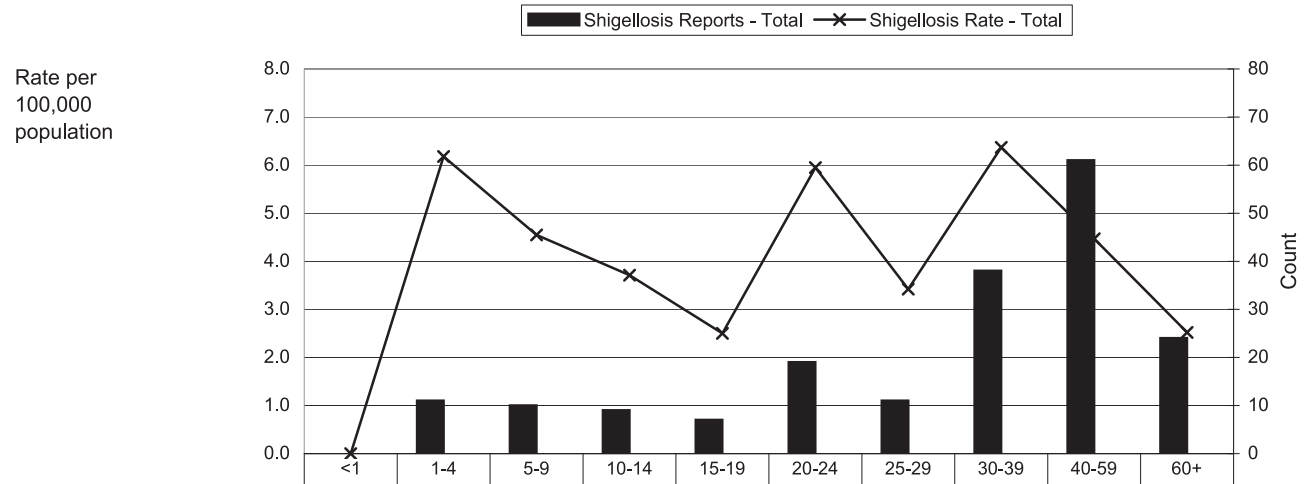
28.2 Shigellosis Rates by HSDA, 2010



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	3	3.7
12	Kootenay Boundary	0	0.0
13	Okanagan	14	3.9
14	Thompson Cariboo Shuswap	4	1.8
21	Fraser East	7	2.5
22	Fraser North	14	2.3
23	Fraser South	32	4.5
31	Richmond	8	4.1
32	Vancouver	66	10.1
33	North Shore/Coast Garibaldi	11	3.9
41	South Vancouver Island	15	4.0
42	Central Vancouver Island	5	1.9
43	North Vancouver Island	5	4.1
51	Northwest	2	2.7
52	Northern Interior	2	1.4
53	Northeast	2	2.9

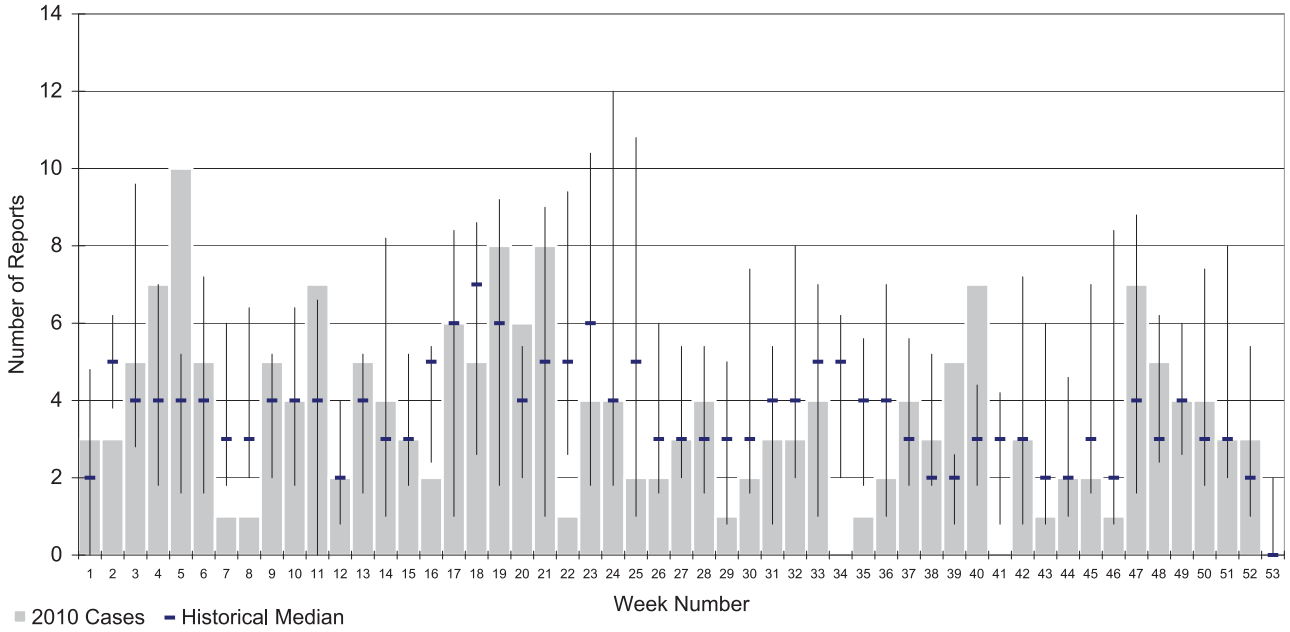
Note: Map classification by Jenks natural breaks method.

28.3 Shigellosis Rates by Age Group and Sex, 2010



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Shigellosis Reports - Female	0	4	5	4	3	11	2	14	16	10
Shigellosis Reports - Male	0	7	5	5	4	8	9	24	45	14
Shigellosis Reports - Total	0	11	10	9	7	19	11	38	61	24
Shigellosis Rate - Female	0.0	4.7	4.7	3.4	2.2	7.2	1.3	4.6	2.3	2.0
Shigellosis Rate - Male	0.0	7.6	4.4	4.0	2.8	4.8	5.6	8.1	6.7	3.1
Shigellosis Rate - Total	0.0	6.2	4.6	3.7	2.5	6.0	3.4	6.4	4.5	2.5

28.4 2010 Shigellosis Reports Compared to Historical Median and the 10th and 90th Percentiles Around the Median (2001 to 2009)



28.5 *Shigella* species distribution, 2010

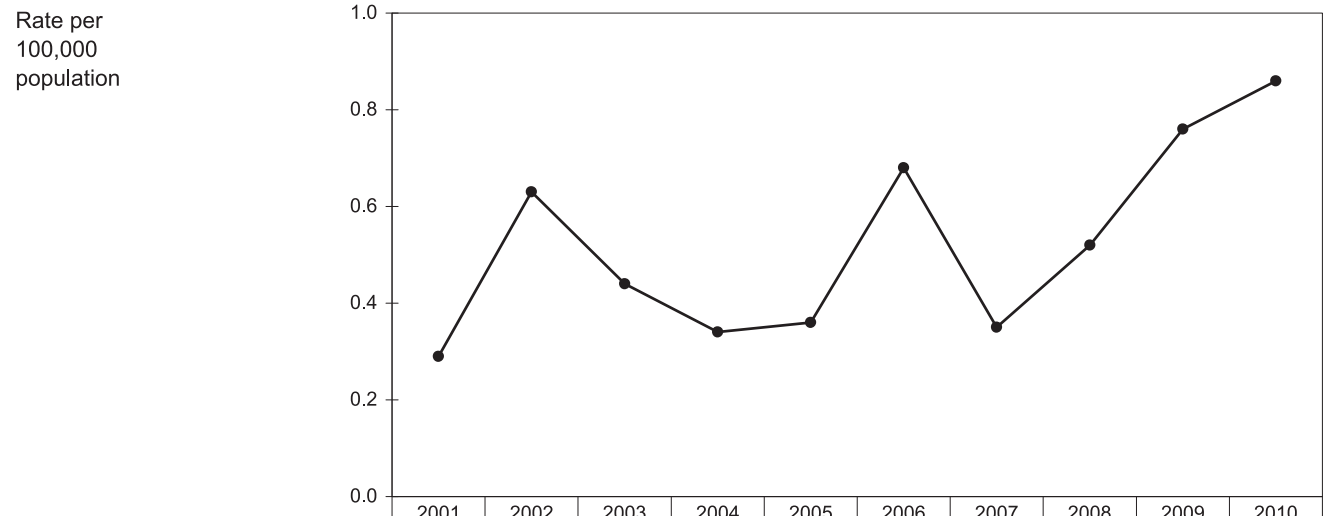
Rank	Species	Number of Cases	Proportion
1	*flexneri*	95	50.8%
2	*sonnei*	80	42.8%
3	*boydii*	8	4.3%
4	*dysenteriae*	3	1.6%
	Other/unknown	1	0.5%
	Total	187	100.0%

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

Vibrio parahaemolyticus

Thirty-nine cases were reported in 2010, 3% was associated with international travel. The incidence of *Vibrio parahaemolyticus* infections has been increasing steadily since 2007 in BC and the highest rate in the last 10 years was reported in 2010 (0.9/100,000). As per usual, cases occurred mostly in adult males, incidence was highest in males aged 30-39 years (2.7/100,000). Typically cases are reported mostly from coastal regions; however in 2010 cases were more widely distributed with the highest incidence rates reported from Northwest, Thompson Cariboo Shuswap and South Vancouver Island. Lower incidence rates were reported from Central and North Vancouver Island as well as North Shore/Coast Garibaldi compared to 2009. The majority of cases were reported from weeks 27 to 37, consistent with the annual summer peak. *V. parahaemolyticus* infections in BC are mostly associated with consumption of raw or undercooked shellfish.

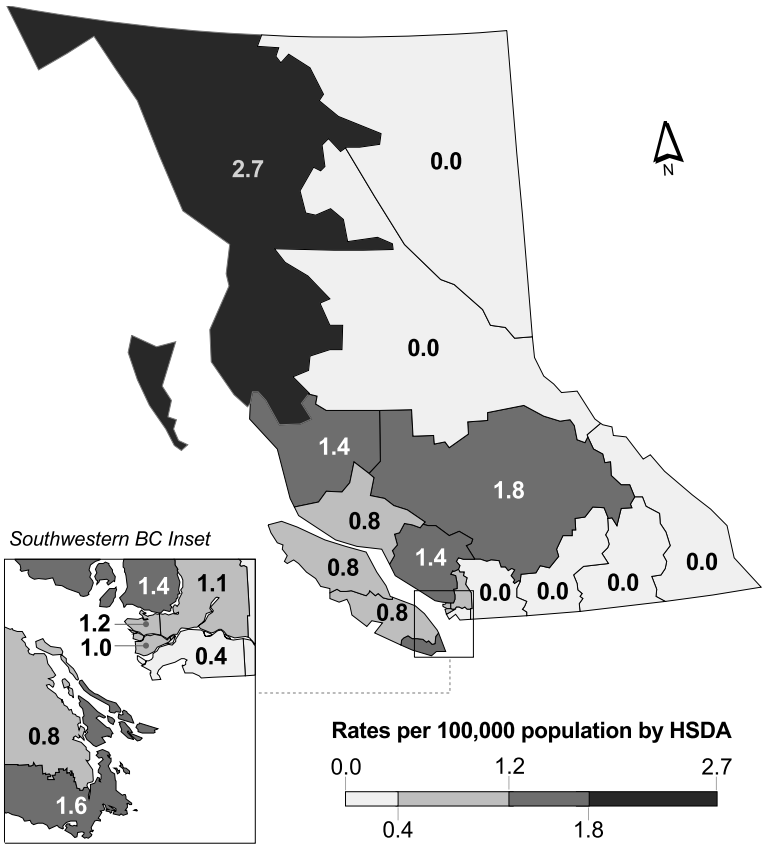
29.1 *Vibrio parahaemolyticus* Rates by Year, 2001-2010



	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
BC Vibrio parahaemolyticus Reports	12	26	18	14	15	29	15	23	34	39
BC Vibrio parahaemolyticus Rate	0.3	0.6	0.4	0.3	0.4	0.7	0.4	0.5	0.8	0.9

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

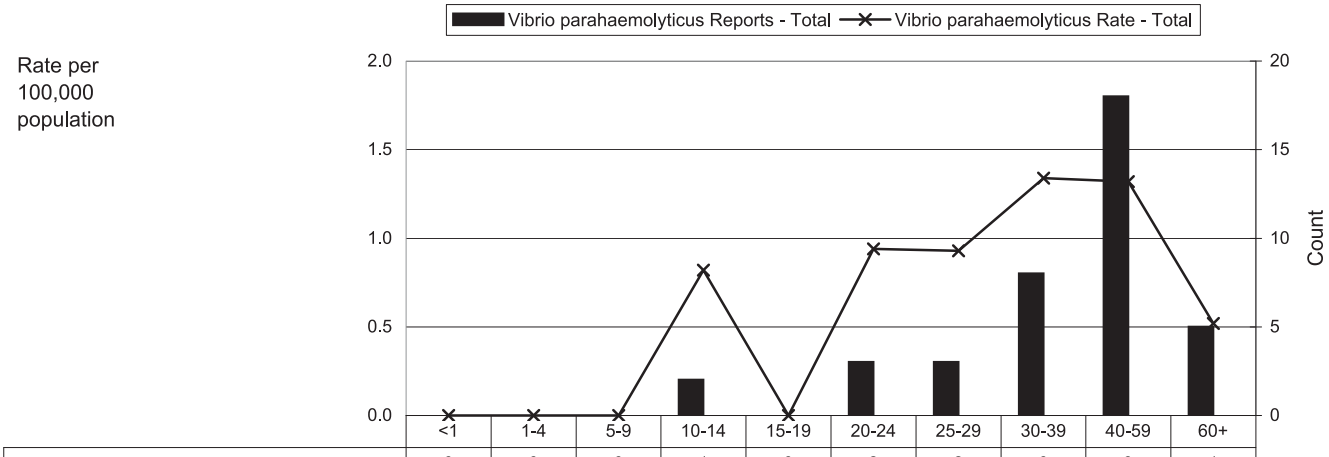
29.2 *Vibrio parahaemolyticus* Rates by HSDA, 2010



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	4	1.8
21	Fraser East	0	0.0
22	Fraser North	7	1.1
23	Fraser South	3	0.4
31	Richmond	2	1.0
32	Vancouver	8	1.2
33	North Shore/Coast Garibaldi	4	1.4
41	South Vancouver Island	6	1.6
42	Central Vancouver Island	2	0.8
43	North Vancouver Island	1	0.8
51	Northwest	2	2.7
52	Northern Interior	0	0.0
53	Northeast	0	0.0

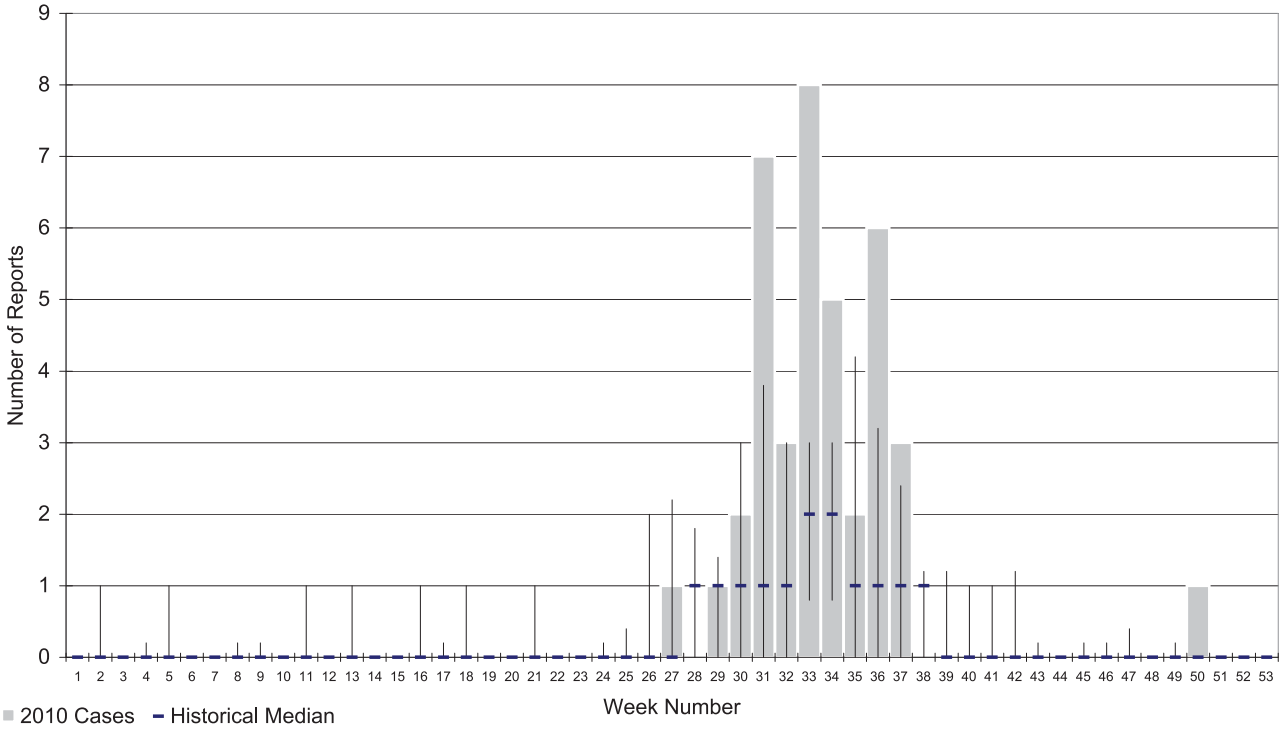
Note: Map classification by Jenks natural breaks method.

29.3 *Vibrio parahaemolyticus* Rates by Age Group and Sex, 2010



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Vibrio parahaemolyticus Reports - Female	0	0	0	1	0	2	2	0	3	1
Vibrio parahaemolyticus Reports - Male	0	0	0	1	0	1	1	8	15	4
Vibrio parahaemolyticus Reports - Total	0	0	0	2	0	3	3	8	18	5
Vibrio parahaemolyticus Rate - Female	0.0	0.0	0.0	0.9	0.0	1.3	1.3	0.0	0.4	0.2
Vibrio parahaemolyticus Rate - Male	0.0	0.0	0.0	0.8	0.0	0.6	0.6	2.7	2.2	0.9
Vibrio parahaemolyticus Rate - Total	0.0	0.0	0.0	0.8	0.0	0.9	0.9	1.3	1.3	0.5

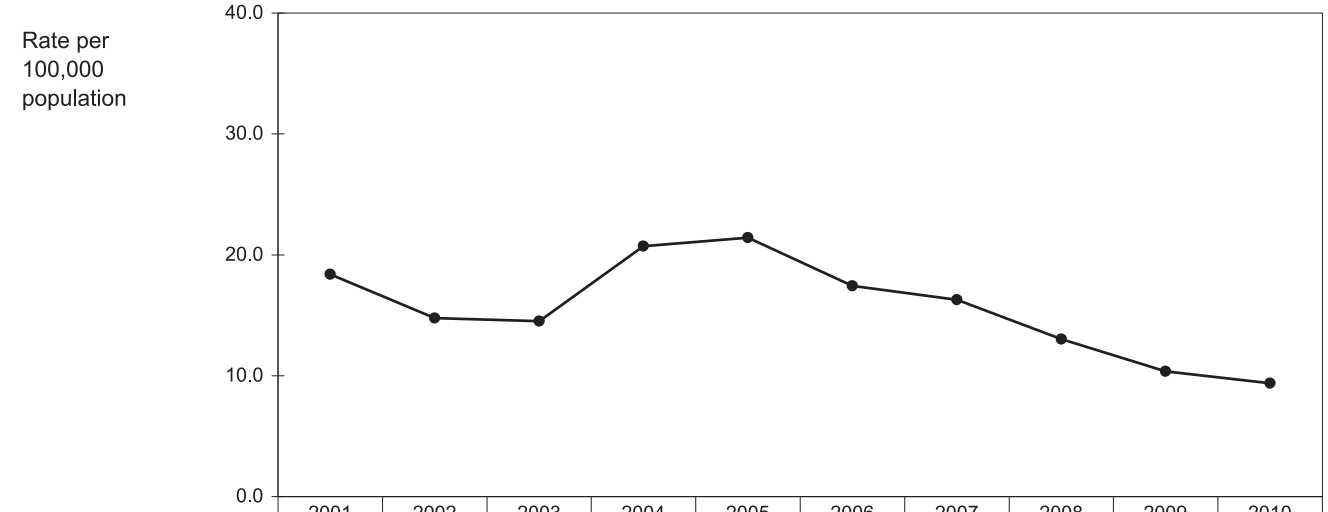
29.4 2010 *Vibrio parahaemolyticus* Reports Compared to Historical Median and the 10th and 90th Percentiles Around the Median (2001 to 2009)



Yersiniosis

In 2010, 424 cases of yersiniosis were reported. There has been a decreasing trend in incidence over the past five years. Incidence was highest in children less than five years and adults 25 years and older. A slight peak was identified in the spring and summer months (week 17 to 39). 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.

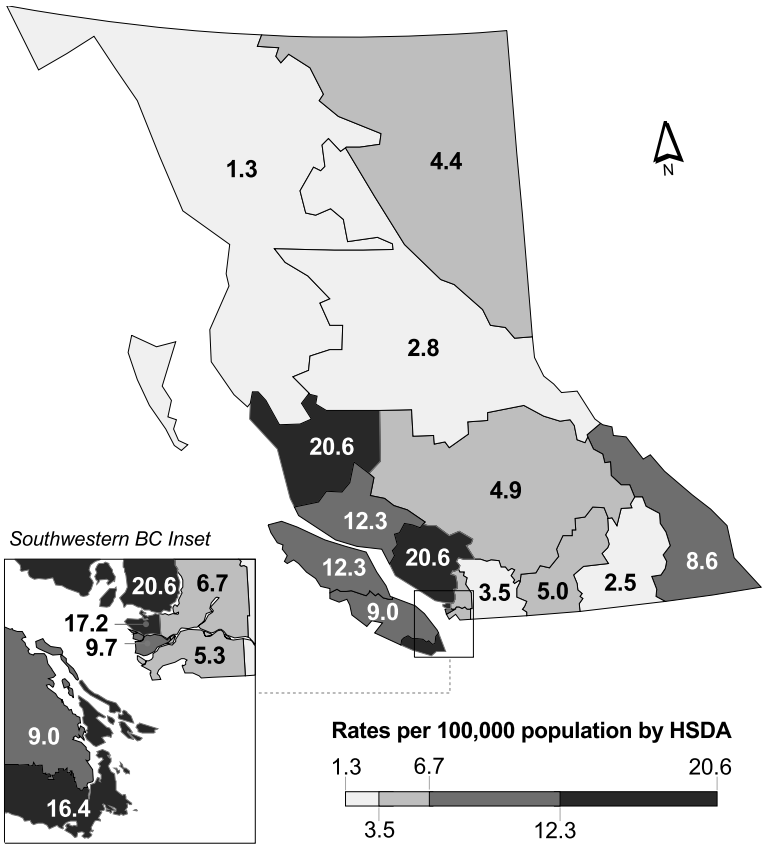
30.1 Yersiniosis Rates by Year, 2001-2010



	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
BC Yersiniosis Reports	750	605	598	861	899	740	702	571	462	424
BC Yersiniosis Rate	18.4	14.8	14.5	20.7	21.4	17.4	16.3	13.0	10.4	9.4

Note: Yersiniosis is not notifable nationally

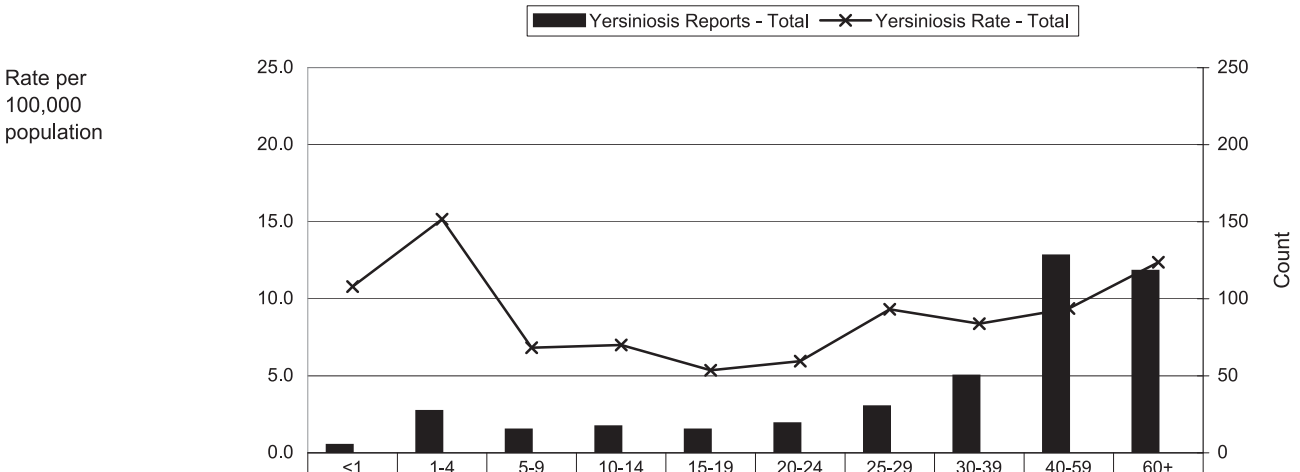
30.2 Yersiniosis Rates by HSDA, 2010



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	7	8.6
12	Kootenay Boundary	2	2.5
13	Okanagan	18	5.0
14	Thompson Cariboo Shuswap	11	4.9
21	Fraser East	10	3.5
22	Fraser North	41	6.7
23	Fraser South	38	5.3
31	Richmond	19	9.7
32	Vancouver	112	17.2
33	North Shore/Coast Garibaldi	58	20.6
41	South Vancouver Island	61	16.4
42	Central Vancouver Island	24	9.0
43	North Vancouver Island	15	12.3
51	Northwest	1	1.3
52	Northern Interior	4	2.8
53	Northeast	3	4.4

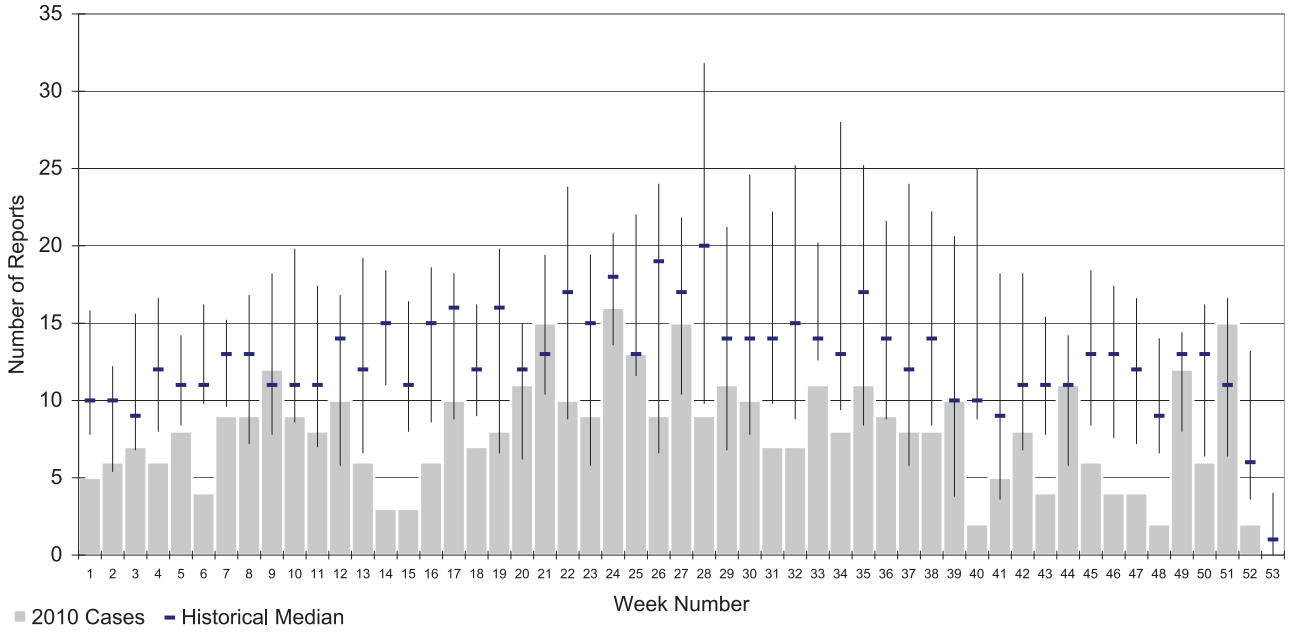
Note: Map classification by Jenks natural breaks method.

30.3 Yersiniosis Rates by Age Group and Sex, 2010



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Yersiniosis Reports - Female	1	15	9	8	8	8	17	29	63	72
Yersiniosis Reports - Male	4	12	6	9	7	11	13	21	65	46
Yersiniosis Reports - Total	5	27	15	17	15	19	30	50	128	118
Yersiniosis Rate - Female	4.4	17.4	8.5	6.8	5.9	5.2	10.7	9.6	9.1	14.2
Yersiniosis Rate - Male	16.9	13.0	5.3	7.2	4.9	6.6	8.0	7.1	9.6	10.3
Yersiniosis Rate - Total	10.8	15.2	6.8	7.0	5.4	6.0	9.3	8.4	9.4	12.4

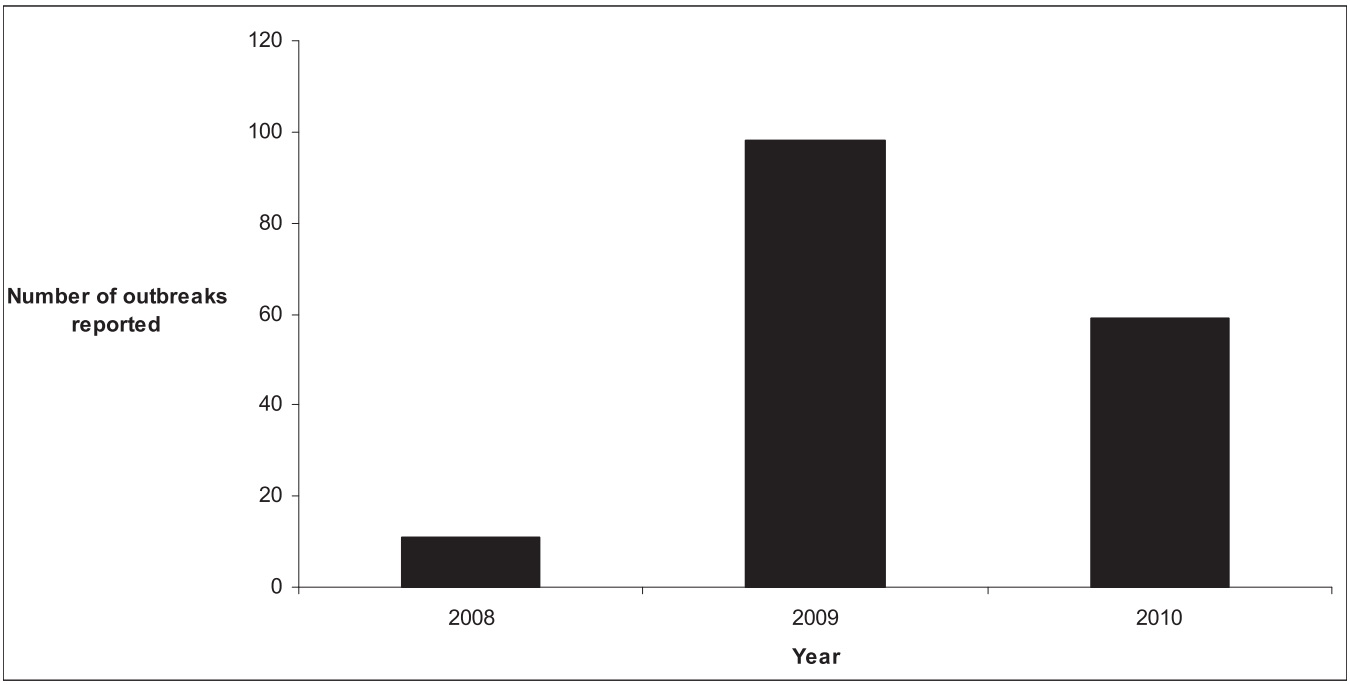
30.4 2010 Yersiniosis Reports Compared to Historical Median and the 10th and 90th Percentiles Around the Median (2001 to 2009)

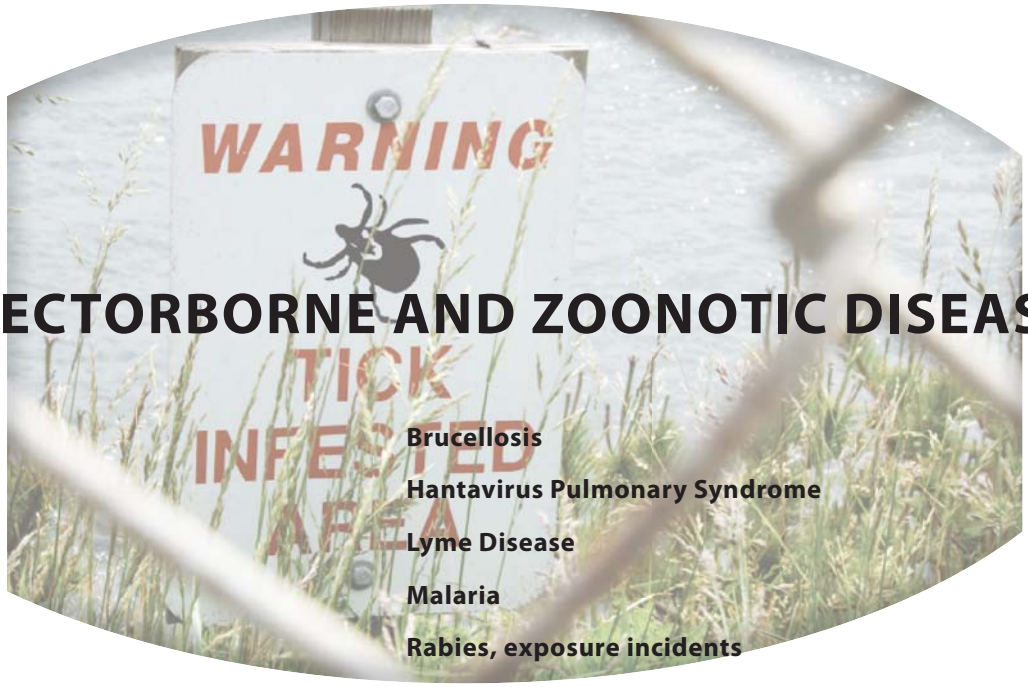


Outbreaks of Gastroenteritis

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, 2010, 60 enteric outbreaks were reported. 43 were reported from IHA, 12 from VIHA, 1 from FHA, 1 from NHA and 3 from BCCDC. 39 (65%) were caused by a viral pathogen. 53 (88%) occurred in residential institutional facilities and two in food service establishments. 52 (87%) were transmitted through person to person contact, five through food (1 seafood, 1 meat, one mixed food and 2 unknown).

The number of outbreaks reported peaked in 2009; however changes in HA reporting processes and the severity of the norovirus season have impact on the number of outbreaks reported over time. There remains important underreporting of enteric outbreaks through this system and work is ongoing to improve this.





VECTORBORNE AND ZOONOTIC DISEASES

Brucellosis

Hantavirus Pulmonary Syndrome

Lyme Disease

Malaria

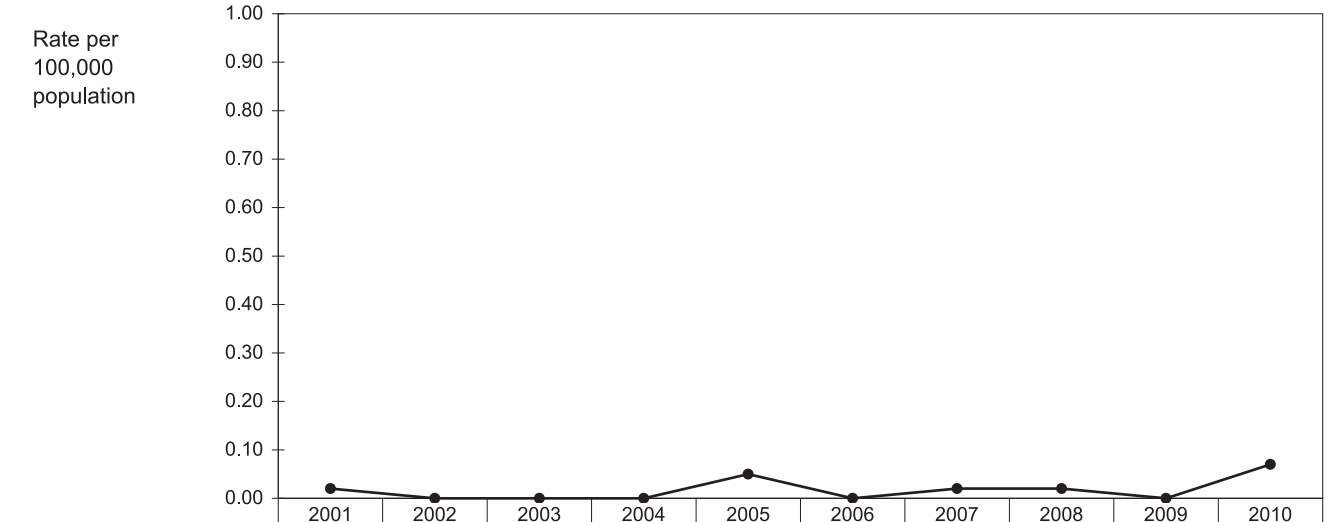
Rabies, exposure incidents

West Nile Virus

Brucellosis

In 2010, three cases of brucellosis were reported. Each of the three cases had reported international travel to an endemic area during their incubation period.

31.1 Brucellosis Rates by Year, 2001-2010



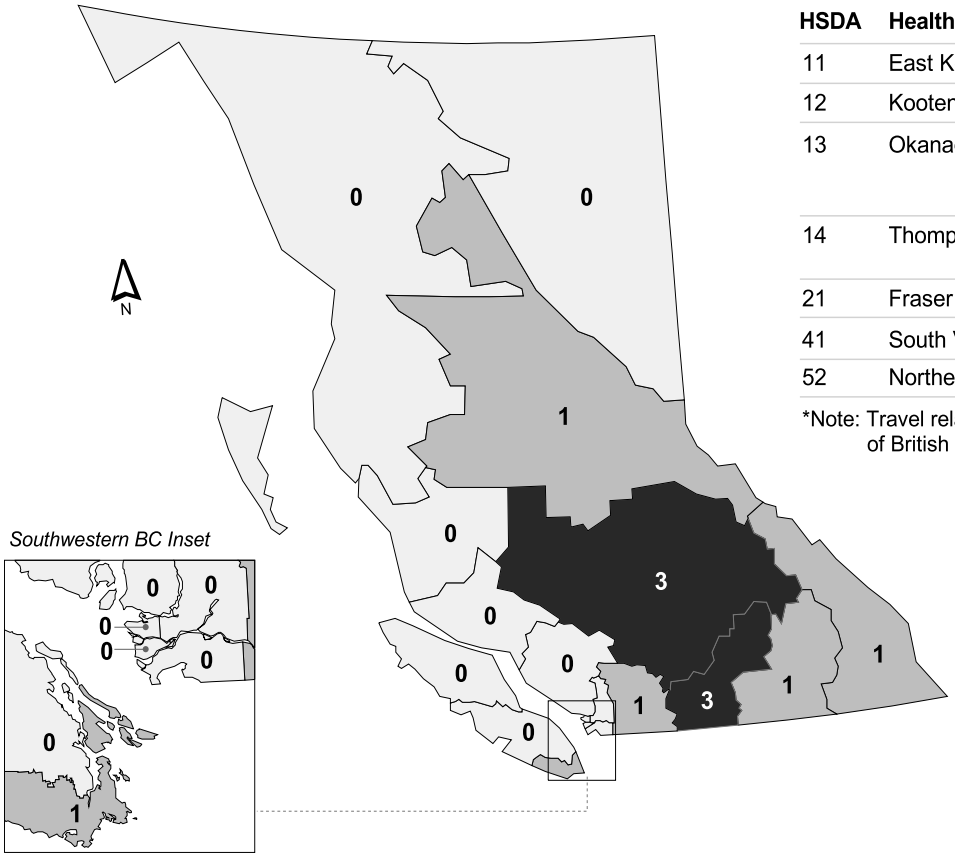
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
BC Brucellosis Reports	1	0	0	0	2	0	1	1	0	3
BC Brucellosis Rate	0.02	0.00	0.00	0.00	0.05	0.00	0.02	0.02	0.00	0.07

*Please see Sources and Explanatory Remarks, Section 11 on page 125 in regard to the national rate

Hantavirus pulmonary syndrome

There were no cases of hantavirus pulmonary syndrome reported in 2010.

32.1 Hantavirus pulmonary syndrome, cumulative number of cases by HSDA, 1994-2010



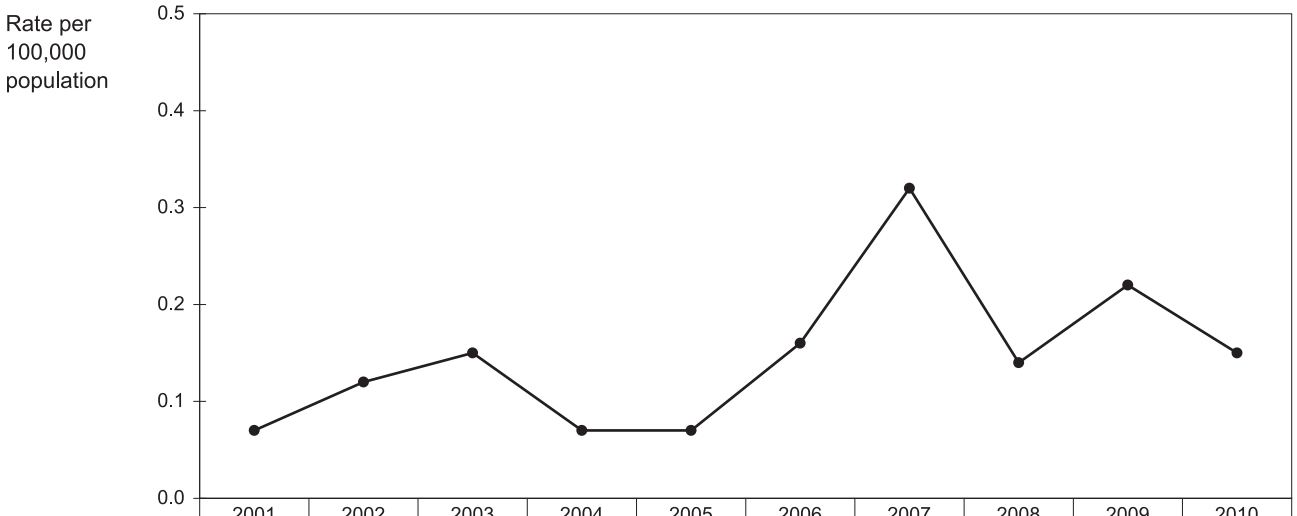
HSDA	Health Service Delivery Area	Cases	Year
11	East Kootenay	1	2007
12	Kootenay Boundary	1	2005
13	Okanagan	1	1994
		1	2002
		1	2006
14	Thompson Cariboo Shuswap	2	1994
		1	1995
21	Fraser East	1	1994
41	South Vancouver Island	1	1996
52	Northern Interior	*1	2006

*Note: Travel related case with exposure occurring outside of British Columbia.

Lyme Disease

BC continues to have a low endemic risk of Lyme Disease (LD). There were seven cases of clinical or laboratory confirmed LD reported in BC in 2010; this is similar to previous years. Three of these cases likely acquired their infection outside of BC.

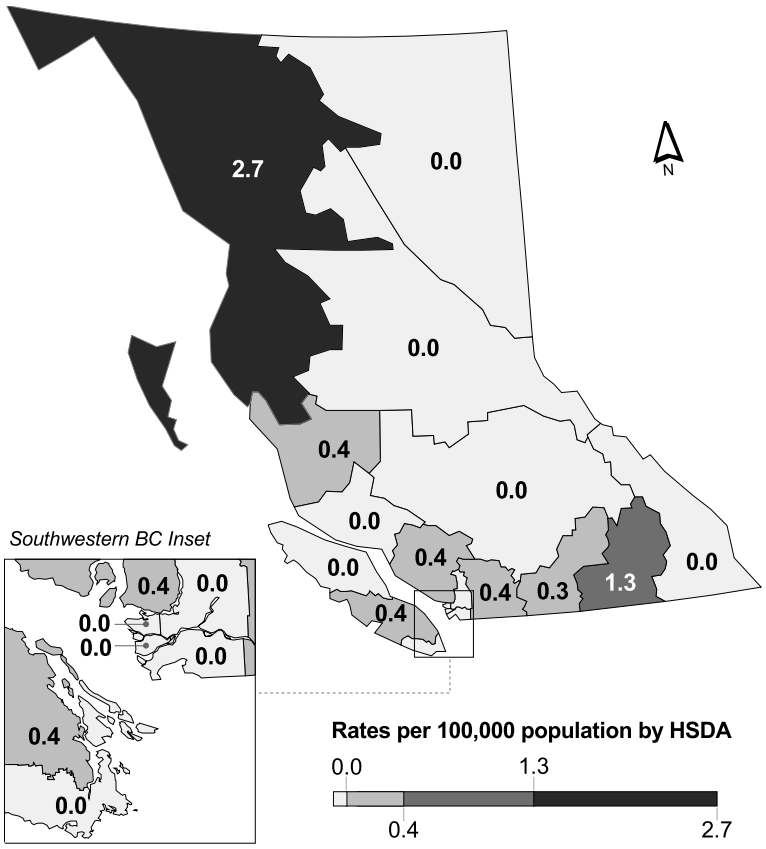
33.1 Lyme Disease Rates by Year, 2001-2010



	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
BC Lyme Reports	3	5	6	3	3	7	14	6	10	7
BC Lyme Rate	0.1	0.1	0.2	0.1	0.1	0.2	0.3	0.1	0.2	0.2

Note: Lyme Disease became nationally notifiable in 2009

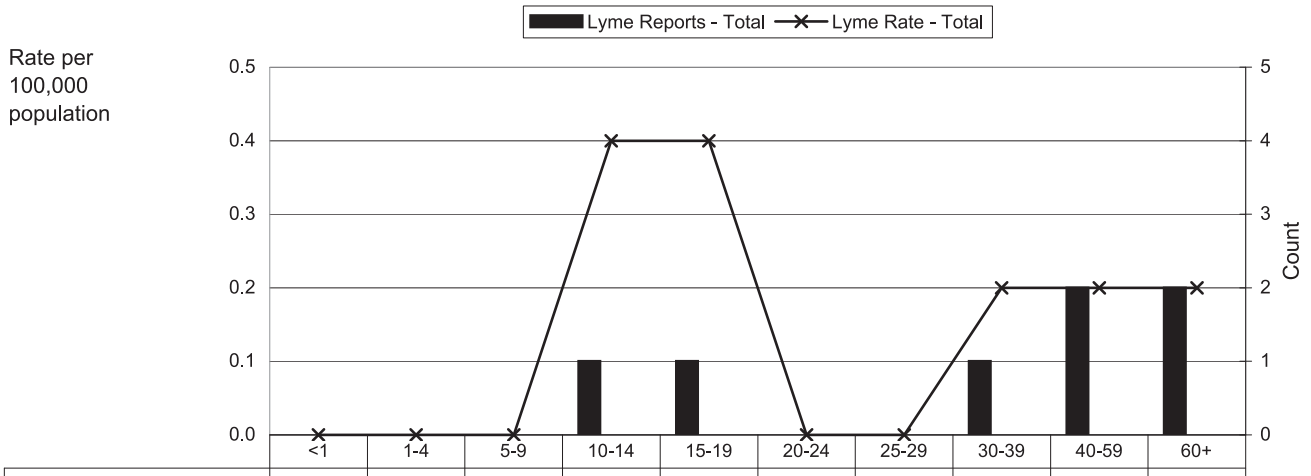
33.2 Lyme Disease Rates by HSDA, 2010



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	1	0.4
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	1	0.4
41	South Vancouver Island	0	0.0
42	Central Vancouver Island	1	0.4
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.

33.3 Lyme Disease Rates by Age Group and Sex, 2010

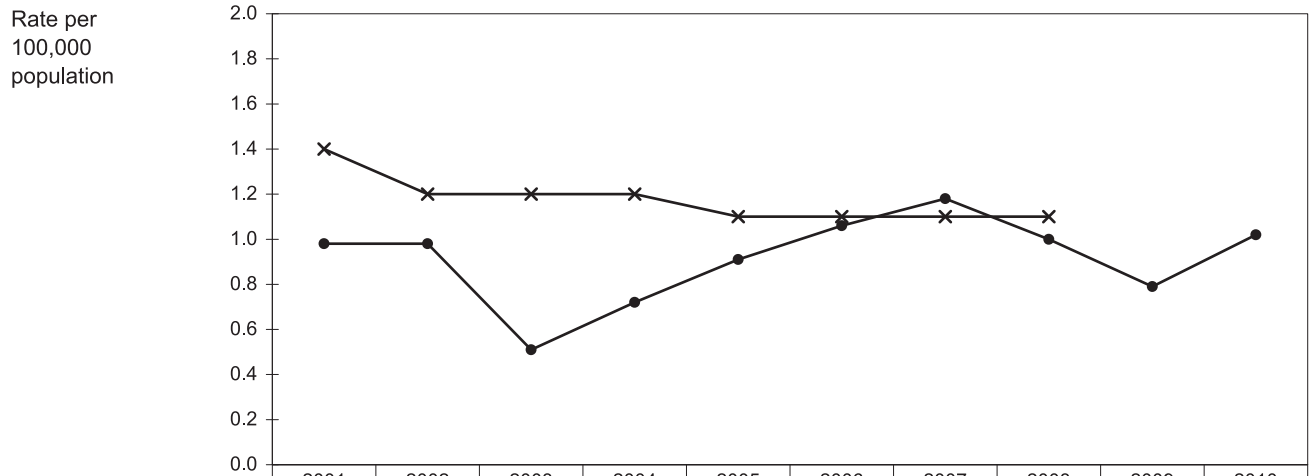


	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Lyme Reports - Female	0	0	0	1	0	0	0	1	0	0
Lyme Reports - Male	0	0	0	0	1	0	0	0	2	2
Lyme Reports - Total	0	0	0	1	1	0	0	1	2	2
Lyme Rate - Female	0.0	0.0	0.0	0.9	0.0	0.0	0.0	0.3	0.0	0.0
Lyme Rate - Male	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.3	0.5
Lyme Rate - Total	0.0	0.0	0.0	0.4	0.4	0.0	0.0	0.2	0.2	0.2

Malaria

Malaria is not endemic in British Columbia. During 2010, we had 46 cases reported in BC for a rate of 1.0 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.

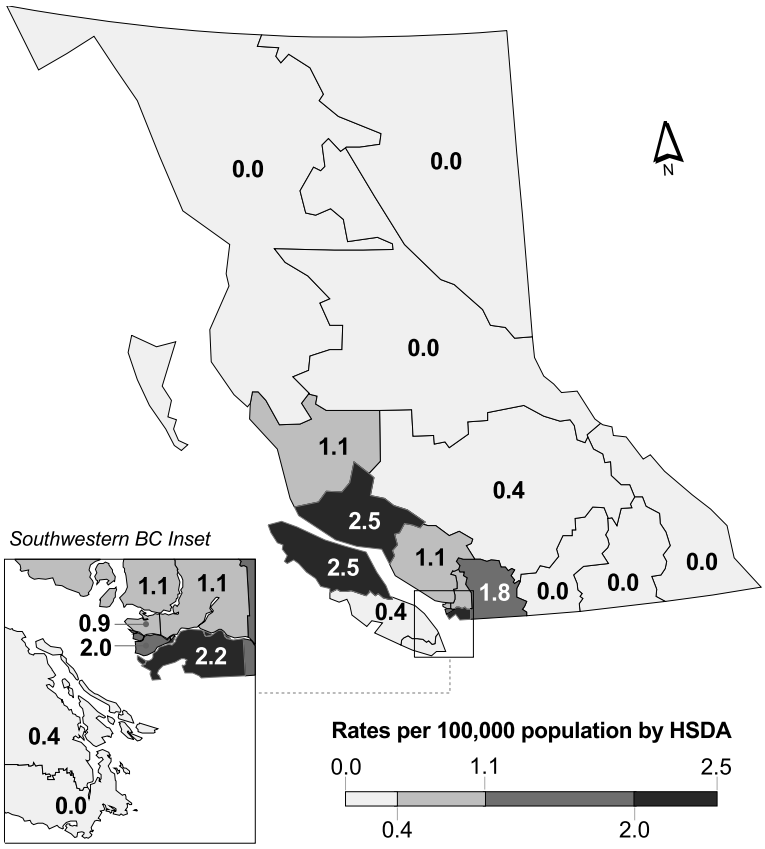
34.1 Malaria Rates by Year, 2001-2010



	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
BC Malaria Reports	40	40	21	30	38	45	51	44	35	46
BC Malaria Rate	1.0	1.0	0.5	0.7	0.9	1.1	1.2	1.0	0.8	1.0
Canadian Malaria Rate*	1.4	1.2	1.2	1.2	1.1	1.1	1.1	1.1		

*Please see Sources and Explanatory Remarks, Section 11 on page 125 in regard to the national rate

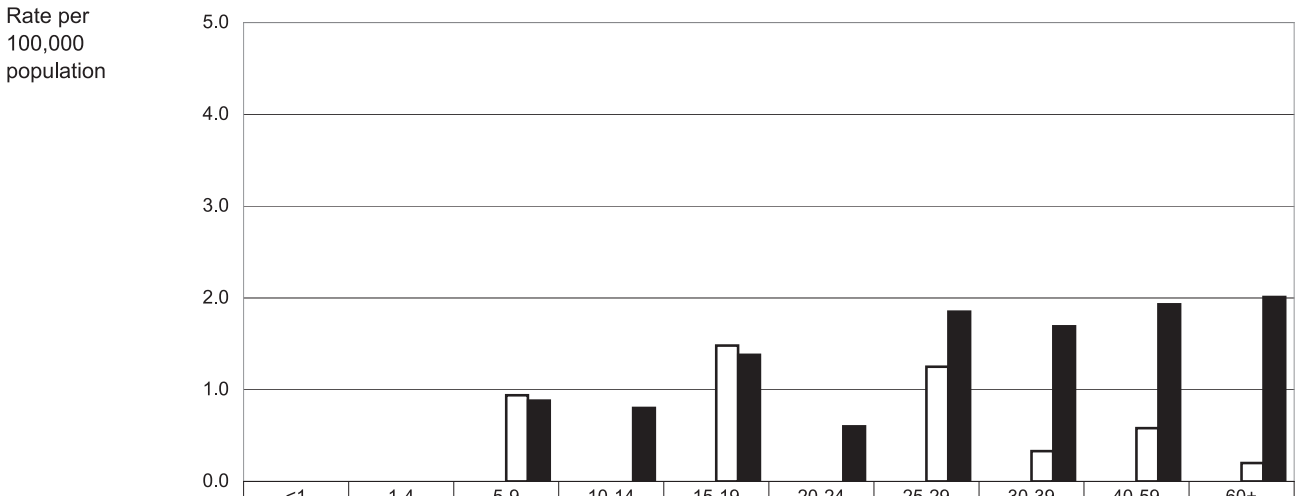
34.2 Malaria Rates by HSDA, 2010



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	1	0.4
21	Fraser East	5	1.8
22	Fraser North	7	1.1
23	Fraser South	16	2.2
31	Richmond	4	2.0
32	Vancouver	6	0.9
33	North Shore/Coast Garibaldi	3	1.1
41	South Vancouver Island	0	0.0
42	Central Vancouver Island	1	0.4
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.

34.3 Malaria Rates by Age Group and Sex, 2010



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Malaria Reports - Female	0	0	1	0	2	0	2	1	4	1
Malaria Reports - Male	0	0	1	1	2	1	3	5	13	9
Malaria Rate - Female	0.0	0.0	0.9	0.0	1.5	0.0	1.3	0.3	0.6	0.2
Malaria Rate - Male	0.0	0.0	0.9	0.8	1.4	0.6	1.9	1.7	1.9	2.0

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.

The rate of reported rabies exposures in BC has been decreasing since 2008 and has reached an all-time low of 122 exposures or 2.7/100,000 in 2010. Overall, 55% (68) of exposures occurred during international travel. The incidence of exposure in nearly all age groups continued to decrease from 2009 to 2010. For the first time, the highest rate was observed in young adults as opposed to teenagers. The reasons for this are not clear.

Vancouver Coastal Health reported the greatest number of exposures at 38. However, the highest rates of exposure were reported from Kootenay Boundary (7.6/100,000) and Thompson Cariboo Shuswap (6.2/100,000) which have traditionally been considered the highest risk areas in BC for bat contact.

Most exposures are reported over the summer months when bats are active. Exposures investigated during the winter are often related to travel. The fraction of exposures involving bats dropped from 60% in 2008 to 39% in 2010. Of the bats submitted for testing, 5 (4.9%) were positive for rabies (CFIA, 2011). Dogs are accounting for an ever increasing proportion of exposures at 34% in 2010; 93% (40) of these exposures occurred in other countries.

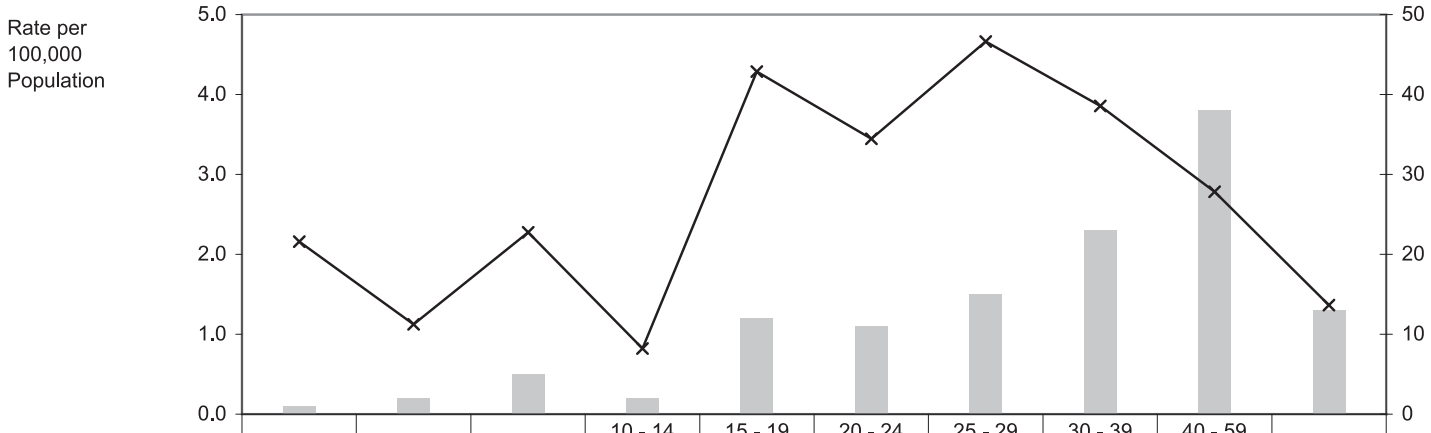
In 2010, the vast majority of exposures continued to be due to bites. Fewer were due to handling of an animal but a greater number than in the past few years were due to scratches. For the second year in a row, no exposures occurred due to a bat found in the bedroom or found nearby.

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).

35.1 Rabies Exposure Incidents Reported to BC Health Authorities, 2007-2010

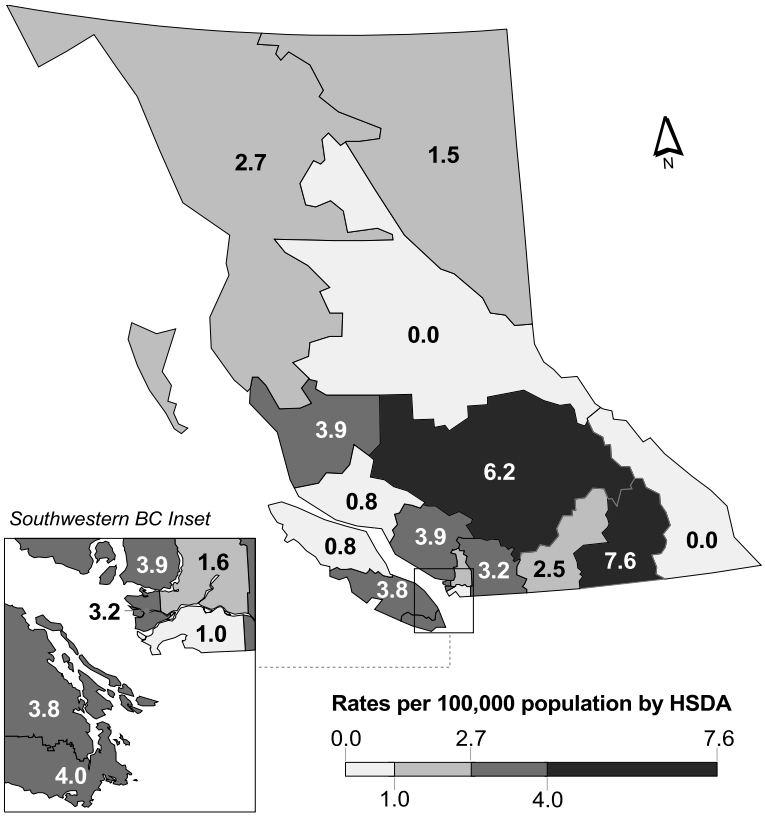
Year	# Exposures	Rate per 100,000
2007	387	9.0
2008	240	5.5
2009	167	3.8
2010	122	2.7
TOTAL	916	5.2

35.2 Rabies Exposure Rates by Age Group, 2010



	<1 Year	1 - 4 Years	5 - 9 Years	10 - 14 Years	15 - 19 Years	20 - 24 Years	25 - 29 Years	30 - 39 Years	40 - 59 Years	60+ Years
Rabies Exposures	1	2	5	2	12	11	15	23	38	13
Rabies Rate	2.2	1.1	2.3	0.8	4.3	3.4	4.7	3.9	2.8	1.4

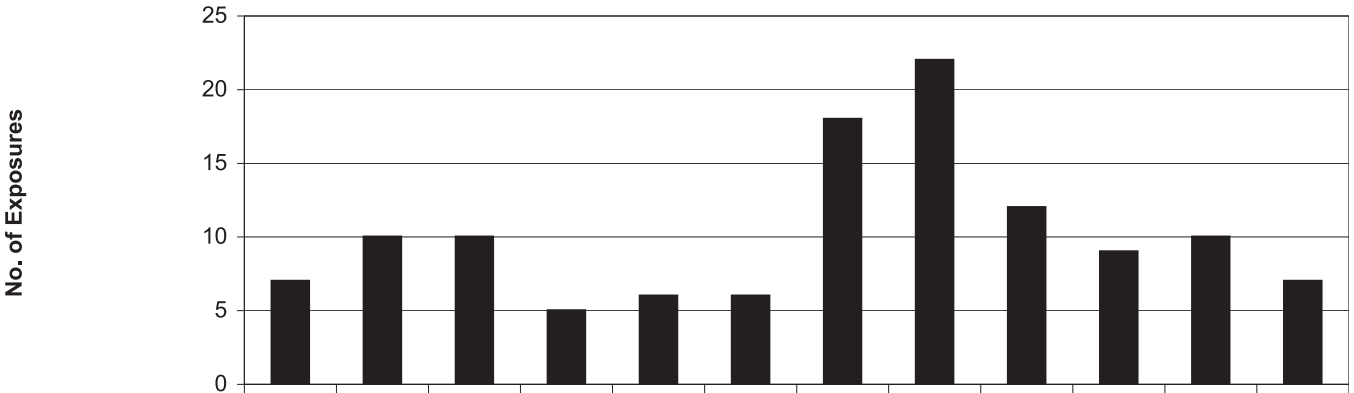
35.3 Rabies Exposure Rates by HSDA, 2010



HSDA	Health Service Delivery Area	Exps.	Rate
11	East Kootenay	0	0.0
12	Kootenay Boundary	6	7.6
13	Okanagan	9	2.5
14	Thompson Cariboo Shuswap	14	6.2
21	Fraser East	9	3.2
22	Fraser North	10	1.6
23	Fraser South	7	1.0
31/32	Richmond/Vancouver	27	3.2
33	North Shore/Coast Garibaldi	11	3.9
41	South Vancouver Island	15	4.0
42	Central Vancouver Island	10	3.8
43	North Vancouver Island	1	0.8
51	Northwest	2	2.7
52	Northern Interior	0	0.0
53	Northeast	1	1.5

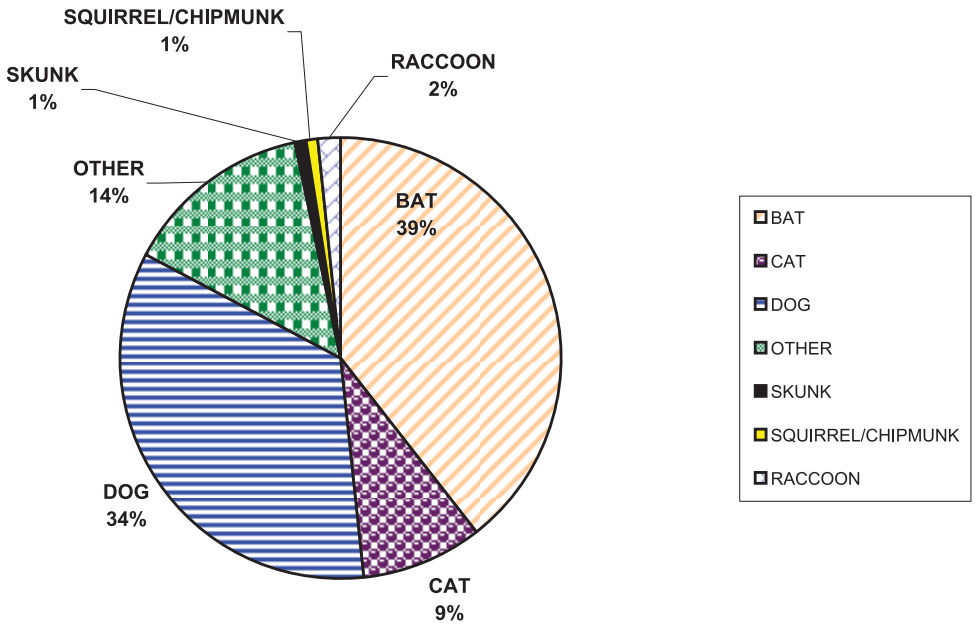
Note: Map classification by Jenks natural breaks method.

35.4 Rabies Exposure Incident by Month, 2010

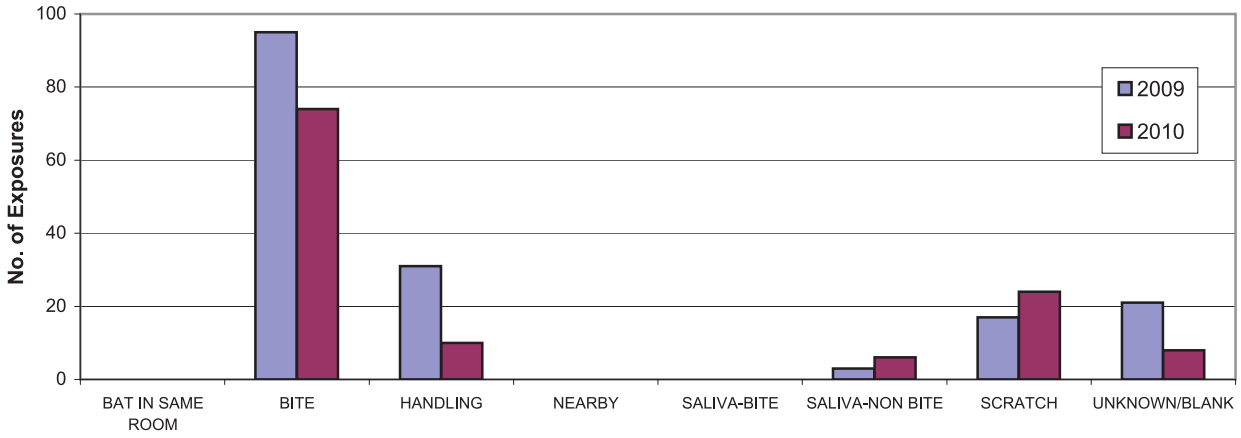


	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Number of Exposures	7	10	10	5	6	6	18	22	12	9	10	7

35.5 Rabies Exposure Incidents by Percentage of Animal Species Involved, 2010



35.6 Rabies Exposure by Type of Exposure and Year, 2009-2010



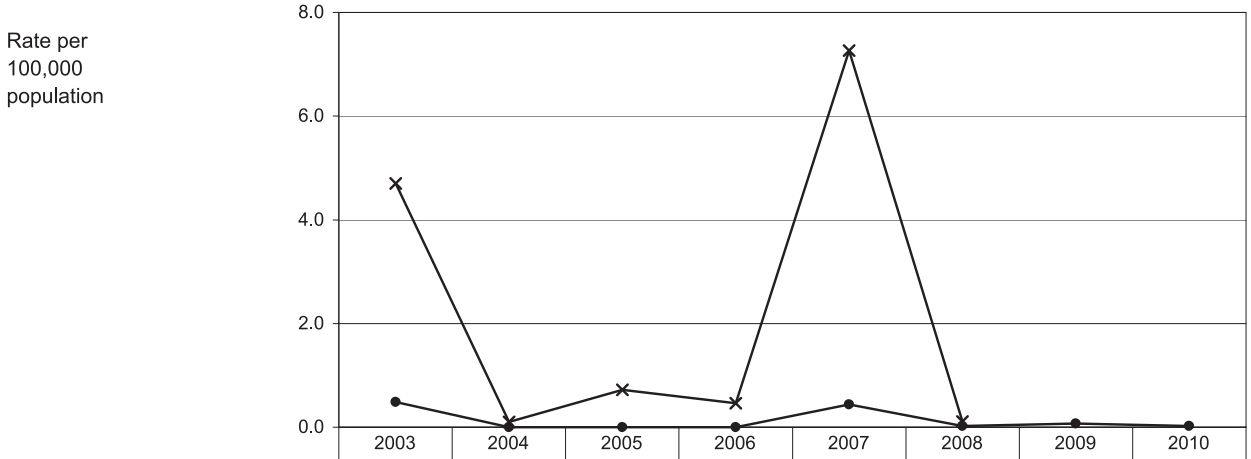
West Nile Virus

Locally acquired WNV was detected again in BC in 2010. One human case with non-neurological symptoms was reported. The case had exposure in the Central Okanagan area. Five positive birds all collected in the Central Okanagan were also reported in 2010. This is the first time positive birds have been reported in BC. No positive mosquito or horse samples were reported in 2010.

There were only five cases of WNV reported in Canada in 2010 (from AB, SK, ON and BC), and 981 cases reported in the US (two from Washington State).

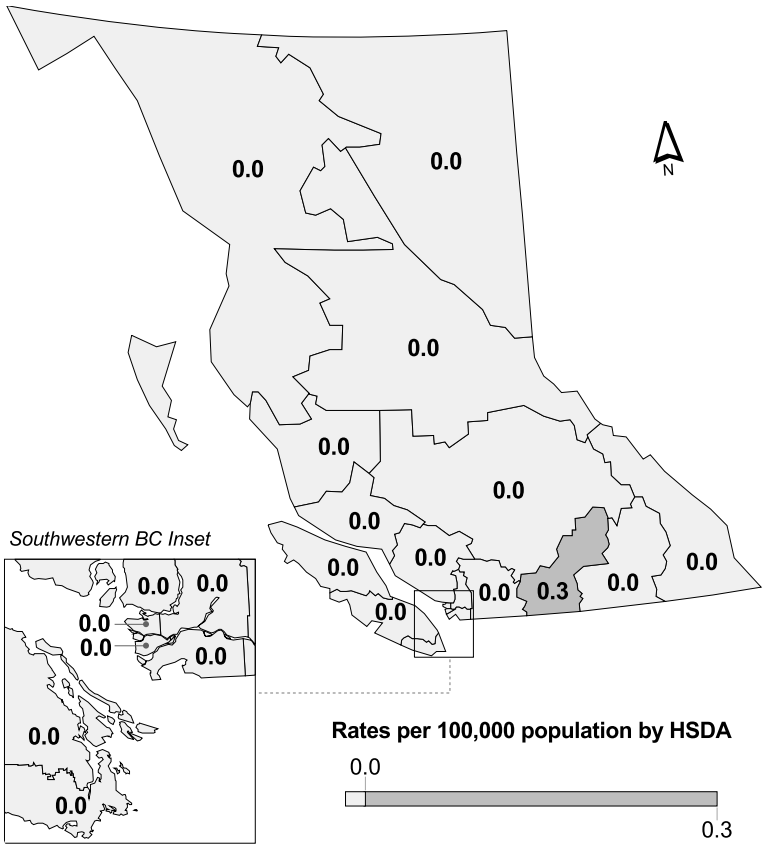
The 2010 BC West Nile Virus Surveillance Program Report is available at http://www.bccdc.ca/dis-cond/a-z/_w/WestNileVirus/Surveillance/WNV2010Surveillance.htm.

36.1 West Nile Virus Infection Rates by Year, 2003-2010



	2003	2004	2005	2006	2007	2008	2009	2010
BC West Nile Virus Infection Reports	20	0	0	0	19	1	3	1
BC West Nile Virus Infection Rate	0.5	0.0	0.0	0.0	0.4	0.0	0.1	0.0
Canadian West Nile Virus Rate	4.7	0.1	0.7	0.5	7.3	0.1		

36.2 West Nile Virus Infection Rates by HSDA, 2010



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	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.

ENVIRONMENTAL PATHOGENS

Cryptococcus gattii

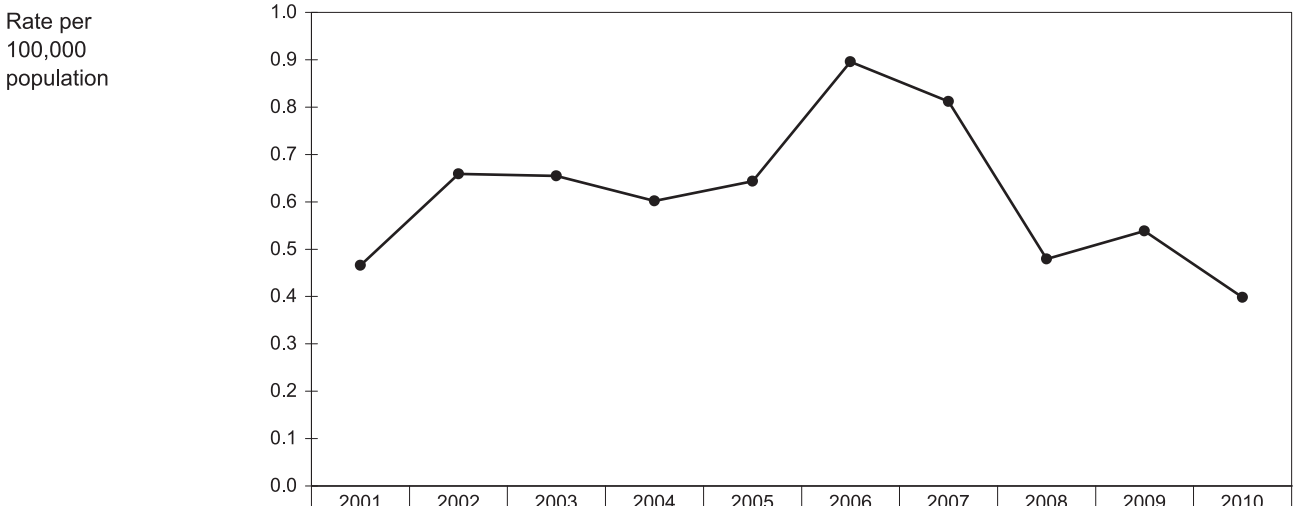
Legionellosis

Cryptococcus gattii

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

In 2010, 18 cases (0.4/100,000) of *C. gattii* infection were reported. The reason for the drop in incidence in the last three years is unclear and is being investigated. As seen in previous years, most cases occurred in older adults. The highest rates were reported from South and Central Vancouver Island. Only three cases were reported from the mainland, whereas in recent years about half of the cases were mainland residents.

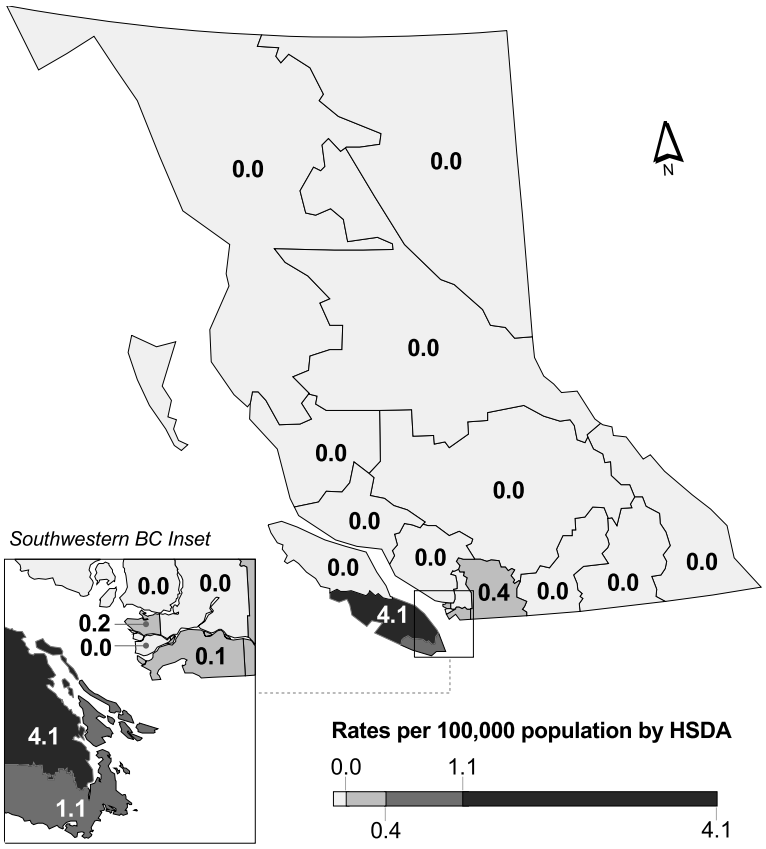
37.1 *Cryptococcus gattii* Infection Rates by Year, 2001-2010



	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
BC Cryptococcus gattii Reports	19	27	27	25	27	38	35	21	24	18
BC Cryptococcus gattii Rate	0.5	0.7	0.7	0.6	0.6	0.9	0.8	0.5	0.5	0.4

Note: Cryptococcus Infection became notifiable in BC in 2003

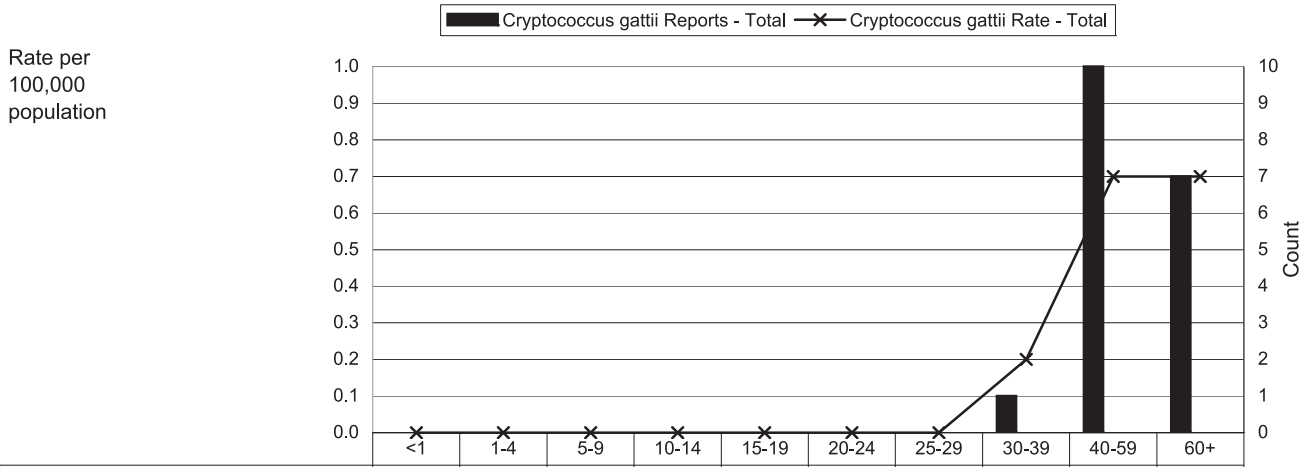
37.2 *Cryptococcus gattii* Infection Rates by HSDA, 2010



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	1	0.4
22	Fraser North	0	0.0
23	Fraser South	1	0.1
31	Richmond	0	0.0
32	Vancouver	1	0.2
33	North Shore/Coast Garibaldi	0	0.0
41	South Vancouver Island	4	1.1
42	Central Vancouver Island	11	4.1
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.

37.3 *Cryptococcus gattii* Infection Rates by Age Group and Sex, 2010

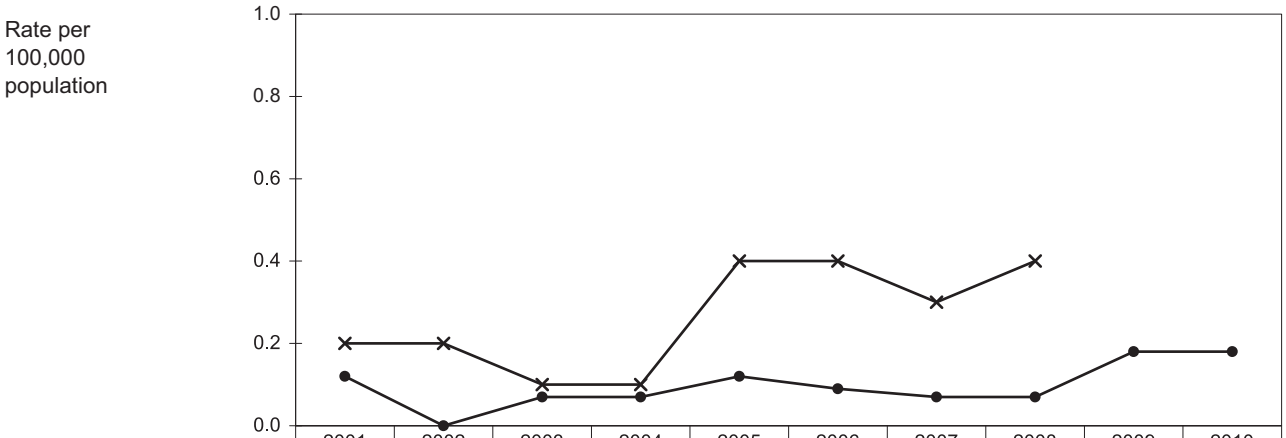


	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Cryptococcus gattii Reports - Female	0	0	0	0	0	0	0	1	8	2
Cryptococcus gattii Reports - Male	0	0	0	0	0	0	0	0	2	5
Cryptococcus gattii Reports - Total	0	0	0	0	0	0	0	1	10	7
Cryptococcus gattii Rate - Female	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.2	0.4
Cryptococcus gattii Rate - Male	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.1
Cryptococcus gattii Rate - Total	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.7	0.7

Legionellosis

In 2010, eight cases of legionellosis were reported. All occurred in adult males in various health authorities. Cases occurred throughout the year. There was no common exposure identified between cases.

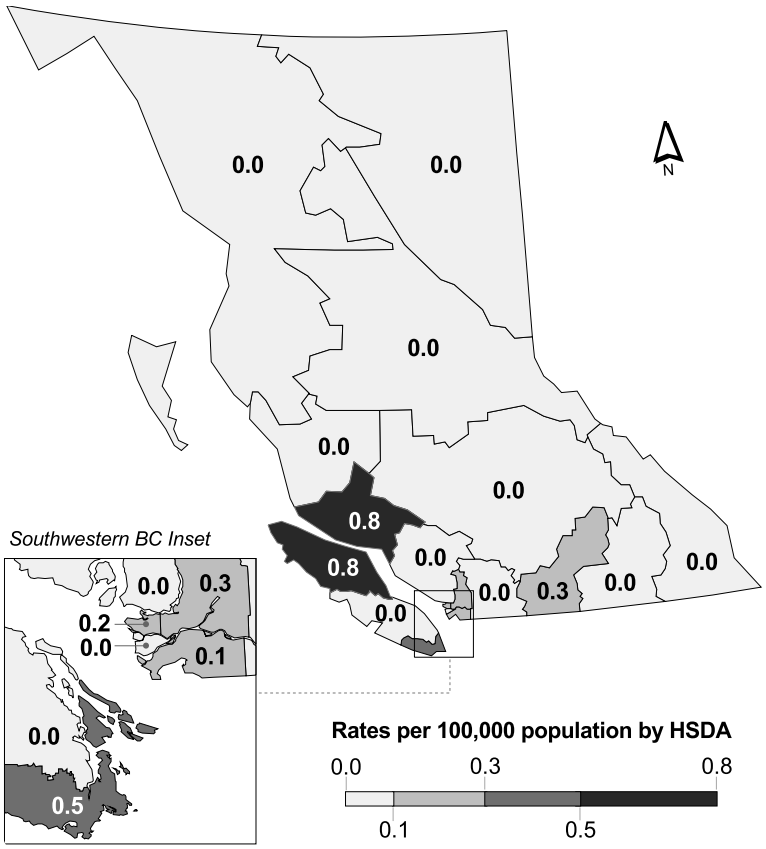
38.1 Legionellosis Rates by Year, 2001-2010



	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Legionellosis Reports	5	0	3	3	5	4	3	3	8	8
Legionellosis Rate	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2
Canadian Legionellosis Rate*	0.2	0.2	0.1	0.1	0.4	0.4	0.3	0.4		

*Please see Sources and Explanatory Remarks, Section 11 on page 125 in regard to the national rate

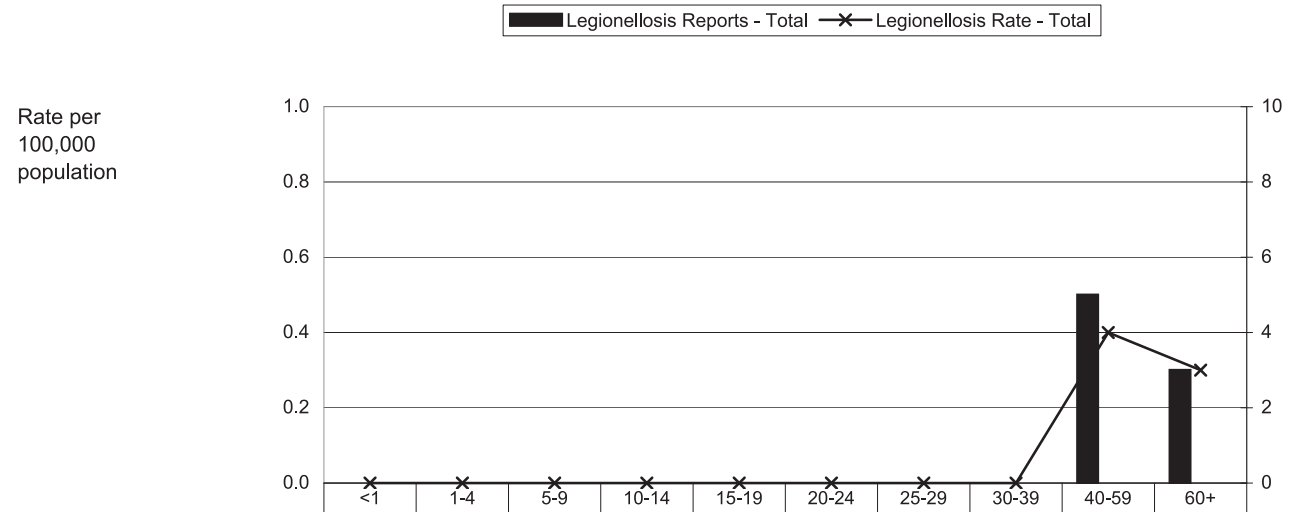
38.2 Legionellosis Rates by HSDA, 2010



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	0	0.0
22	Fraser North	2	0.3
23	Fraser South	1	0.1
31	Richmond	0	0.0
32	Vancouver	1	0.2
33	North Shore/Coast Garibaldi	0	0.0
41	South Vancouver Island	2	0.5
42	Central Vancouver Island	0	0.0
43	North Vancouver Island	1	0.8
51	Northwest	0	0.0
52	Northern Interior	0	0.0
53	Northeast	0	0.0

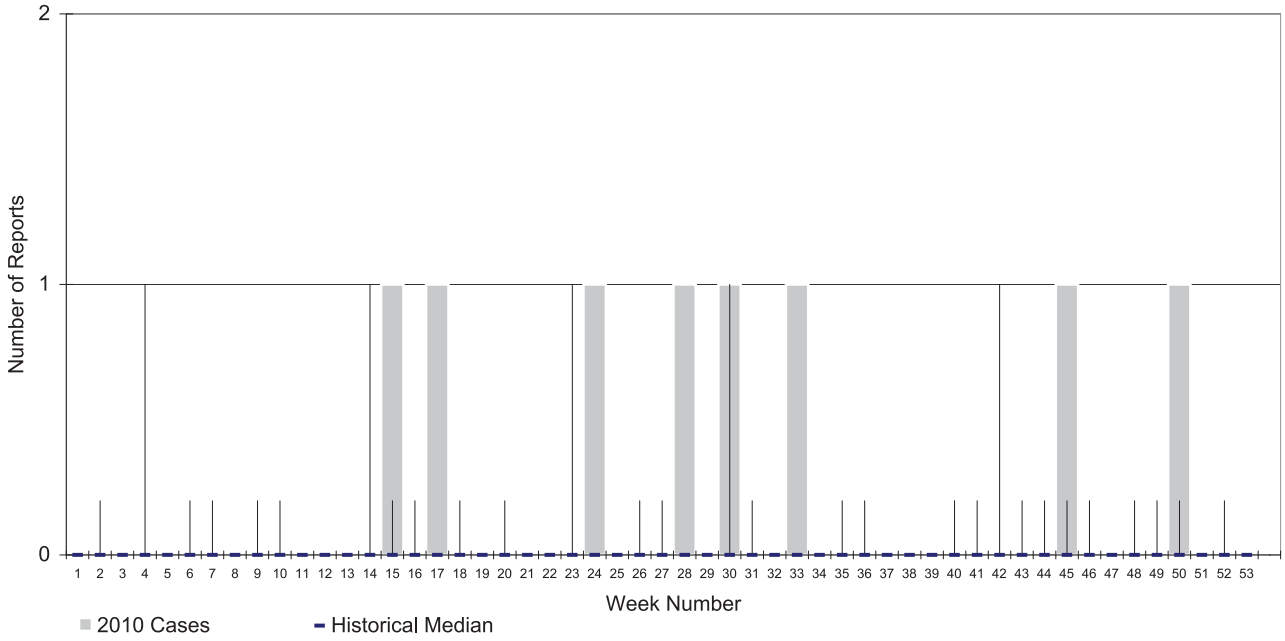
Note: Map classification by Jenks natural breaks method.

38.3 Legionellosis Rates by Age Group and Sex, 2010



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Legionellosis Reports - Female	0	0	0	0	0	0	0	0	0	0
Legionellosis Reports - Male	0	0	0	0	0	0	0	0	5	3
Legionellosis Reports - Total	0	0	0	0	0	0	0	0	5	3
Legionellosis Rate - Female	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Legionellosis Rate - Male	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.7
Legionellosis Rate - Total	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.3

27.4 2010 Legionellosis Reports Compared to Historical Median and the 10th and 90th Percentiles Around the Median (2001 to 2009)



Reportable Communicable Diseases in BC, June 2011

Schedule A: Reportable by all sources, including Laboratories

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

As per Health Act Communicable Disease Regulation B.C. Reg. 4/83 O.C. 6/83 includes amendments up to B.C. Reg. 330/2010, November 19, 2010 http://www.bclaws.ca/EPLibraries/bclaws_new/document/ID/freeside/12_4_83#section2

2010 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**
2010 Population (PEOPLE 35 Estimate)	**4523995**	81141	79432	356523	224613	**741709**	285509	609660	712225	**1607394**
AIDS (2009)*	**77**	0	0	3	0	**3**	0	4	10	**14**
Amebiasis	**347**	1	1	7	1	**10**	14	39	64	**117**
Campylobacteriosis	**1556**	25	30	83	64	**202**	90	213	230	**533**
Chlamydia^	**11838**	142	97	890	711	**1840**	490	1331	1349	**3170**
Congenital Rubella Syndrome	**0**	0	0	0	0	**0**	0	0	0	**0**
Cryptococcus gattii	**18**	0	0	0	0	**0**	1	0	1	**2**
Cryptosporidiosis	**55**	3	0	4	1	**8**	7	8	10	**25**
Cyclosporiasis	**25**	0	0	3	1	**4**	2	5	3	**10**
E. coli, Shigatoxigenic	**109**	4	2	12	11	**29**	8	9	18	**35**
Giardiasis	**624**	12	16	39	22	**89**	50	66	111	**227**
Gonorrhea^	**1321**	3	0	43	70	**116**	31	133	140	**304**
Hepatitis A	**29**	0	0	2	0	**2**	0	6	4	**10**
Hepatitis B Acute	**11**	0	0	0	1	**1**	1	2	2	**5**
Hepatitis B Chronic and Unknown	**1329**	2	2	20	7	**31**	21	277	174	**472**
Hepatitis C	**2223**	39	31	169	122	**361**	220	262	320	**802**
Haemophilus influenzae b, invasive	**1**	0	0	0	0	**0**	0	0	0	**0**
HIV^	**301**	3	1	3	5	**12**	7	24	41	**72**
Listeriosis	**15**	1	0	0	0	**1**	3	0	3	**6**
Lyme	**7**	0	1	1	0	**2**	1	0	0	**1**
Malaria	**46**	0	0	0	1	**1**	5	7	16	**28**
Measles	**80**	0	0	2	12	**14**	1	12	11	**24**
Meningococcal Disease, invasive	**12**	0	0	2	1	**3**	0	1	0	**1**
Mumps	**6**	0	0	0	0	**0**	1	2	1	**4**
Paratyphoid Fever	**28**	1	0	0	1	**2**	5	1	15	**21**
Pertussis	**122**	0	35	6	1	**42**	6	3	6	**15**
Pneumococcal Disease, invasive	**258**	6	6	25	20	**57**	10	19	28	**57**
Rubella	**9**	0	0	0	0	**0**	0	1	0	**1**
Salmonellosis	**1078**	12	10	64	50	**136**	92	160	193	**445**
Shigellosis	**190**	3	0	14	4	**21**	7	14	32	**53**
Streptococcal Group A invasive	**142**	0	0	8	3	**11**	7	19	24	**50**
Syphilis (infectious)^	**155**	0	0	3	1	**4**	2	13	11	**26**
Tetanus	**1**	0	0	1	0	**1**	0	0	0	**0**
Tuberculosis	**240**	2	0	15	6	**23**	11	30	63	**104**
Typhoid Fever	**28**	0	0	0	0	**0**	3	1	17	**21**
Vibrio parahaemolyticus	**39**	0	0	0	4	**4**	0	7	3	**10**
Yersiniosis	**424**	7	2	18	11	**38**	10	41	38	**89**
West Nile	**1**	0	0	1	0	**1**	0	0	0	**0**
LESS COMMON DISEASES										
Brucellosis	**3**	0	0	0	0	**0**	0	0	3	**3**
Cholera: Serogroup non-O1/O139	**0**	0	0	0	0	**0**	0	0	0	**0**
Cholera: Serogroup O1/O139	**1**	0	0	0	0	**0**	0	0	0	**0**
Creutzfeldt-Jacob Disease	**3**	0	0	1	0	**1**	0	0	1	**1**
Legionellosis	**8**	0	0	1	0	**1**	0	2	1	**3**
Leprosy (Hansen's Disease)	**1**	0	0	0	0	**0**	0	0	0	**0**
Leptospirosis	**1**	0	0	0	0	**0**	0	0	0	**0**
Neonatal Group B Streptococcal Infection	**13**	0	0	2	1	**3**	0	1	0	**1**

*AIDS case reports are for 2009. The 2010 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 2010 of Anthrax, Botulism, Cholera: Serogroup non-O1/O139, Congenital Rubella Syndrome, Diphtheria, Hantavirus, Hemorrhagic Viral Fevers, Plague, Poliomyelitis, Rabies, Severe Acute Respiratory Syndrome, 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**
196217	651276	281361	**1128854**	371748	265623	121848	**759219**	75144	142930	68745	**286819**
3	33	2	**38**	11	3	0	**14**	1	5	0	**6**
3	157	13	**173**	28	12	7	**47**	0	0	0	**0**
77	257	173	**507**	145	70	47	**262**	16	26	10	**52**
423	2347	662	**3432**	1131	735	293	**2159**	348	625	231	**1204**
0	0	0	**0**	0	0	0	**0**	0	0	0	**0**
0	1	0	**1**	4	11	0	**15**	0	0	0	**0**
1	12	5	**18**	3	0	0	**3**	0	0	1	**1**
2	6	0	**8**	2	1	0	**3**	0	0	0	**0**
1	14	7	**22**	10	9	1	**20**	1	2	0	**3**
20	124	56	**200**	54	13	9	**76**	15	6	11	**32**
17	585	70	**672**	83	33	18	**134**	6	81	6	**93**
0	2	2	**4**	1	12	0	**13**	0	0	0	**0**
0	3	1	**4**	0	1	0	**1**	0	0	0	**0**
218	474	42	**734**	47	20	13	**80**	4	6	2	**12**
26	371	96	**493**	191	161	76	**428**	32	80	27	**139**
0	0	1	**1**	0	0	0	**0**	0	0	0	**0**
10	148	9	**167**	21	8	4	**33**	6	8	2	**16**
0	3	2	**5**	0	3	0	**3**	0	0	0	**0**
0	0	1	**1**	0	1	0	**1**	2	0	0	**2**
4	6	3	**13**	0	1	3	**4**	0	0	0	**0**
1	19	3	**23**	2	0	0	**2**	1	0	16	**17**
1	1	2	**4**	3	1	0	**4**	0	0	0	**0**
1	0	1	**2**	0	0	0	**0**	0	0	0	**0**
2	2	1	**5**	0	0	0	**0**	0	0	0	**0**
1	6	19	**26**	27	5	6	**38**	1	0	0	**1**
5	42	6	**53**	33	25	12	**70**	6	12	3	**21**
4	4	0	**8**	0	0	0	**0**	0	0	0	**0**
56	189	82	**327**	59	47	23	**129**	16	17	8	**41**
8	66	11	**85**	15	5	5	**25**	2	2	2	**6**
9	42	6	**57**	7	11	1	**19**	3	1	1	**5**
7	96	16	**119**	4	0	0	**4**	1	1	0	**2**
0	0	0	**0**	0	0	0	**0**	0	0	0	**0**
20	60	6	**86**	6	8	0	**14**	5	7	1	**13**
1	3	2	**6**	0	0	0	**0**	0	1	0	**1**
2	8	4	**14**	6	2	1	**9**	2	0	0	**2**
19	112	58	**189**	61	24	15	**100**	1	4	3	**8**
0	0	0	**0**	0	0	0	**0**	0	0	0	**0**
0	0	0	**0**	0	0	0	**0**	0	0	0	**0**
0	0	0	**0**	0	0	0	**0**	0	0	0	**0**
0	1	0	**1**	0	0	0	**0**	0	0	0	**0**
0	1	0	**1**	0	0	0	**0**	0	0	0	**0**
0	1	0	**1**	2	0	1	**3**	0	0	0	**0**
1	0	0	**1**	0	0	0	**0**	0	0	0	**0**
0	0	1	**1**	0	0	0	**0**	0	0	0	**0**
0	2	1	**3**	3	1	0	**4**	0	2	0	**2**

2010 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**
2010 Population (PEOPLE 35 Estimate)	**4523995**	81141	79432	356523	224613	**741709**	285509	609660	712225	**1607394**
AIDS (2009)*	**1.7**	0.0	0.9	0.0	0.4	**0.0**	0.7	1.4	0.9	**1.6**
Amebiasis	**7.7**	1.2	1.3	2.0	0.5	**1.4**	4.9	6.4	9.0	**7.3**
Campylobacteriosis	**34.4**	30.8	37.8	23.3	28.5	**27.2**	31.5	34.9	32.3	**33.2**
Chlamydia^	**261.7**	175.0	122.1	249.6	316.5	**248.1**	171.6	218.3	189.4	**197.2**
Congenital Rubella Syndrome	**0.0**	0.0	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**
Cryptococcus gattii	**0.4**	0.0	0.0	0.0	0.0	**0.0**	0.4	0.0	0.1	**0.1**
Cryptosporidiosis	**1.2**	3.7	0.0	1.1	0.5	**1.1**	2.5	1.3	1.4	**1.6**
Cyclosporiasis	**0.6**	0.0	0.0	0.8	0.5	**0.5**	0.7	0.8	0.4	**0.6**
E. coli, Shigatoxigenic	**2.4**	4.9	2.5	3.4	4.9	**3.9**	2.8	1.5	2.5	**2.2**
Giardiasis	**13.8**	14.8	20.1	10.9	9.8	**12.0**	17.5	10.8	15.6	**14.1**
Gonorrhea^	**29.2**	3.7	0.0	12.1	31.2	**15.6**	10.9	21.8	19.7	**18.9**
Hepatitis A	**0.6**	0.0	0.0	0.6	0.0	**0.3**	0.0	1.0	0.6	**0.6**
Hepatitis B Acute	**0.2**	0.0	0.0	0.0	0.5	**0.1**	0.4	0.3	0.3	**0.3**
Hepatitis B Chronic and Unknown	**29.4**	2.5	2.5	5.6	3.1	**4.2**	7.4	45.4	24.4	**29.4**
Hepatitis C	**49.1**	48.1	39.0	47.4	54.3	**48.7**	77.1	43.0	44.9	**49.9**
Haemophilus influenzae b, invasive	**0.02**	0.0	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**
HIV^	**6.7**	3.7	1.3	0.8	2.2	**1.6**	2.5	3.9	5.8	**4.5**
Listeriosis	**0.3**	1.2	0.0	0.0	0.0	**0.1**	1.1	0.0	0.4	**0.4**
Lyme	**0.2**	0.0	1.3	0.3	0.0	**0.3**	0.4	0.0	0.0	**0.1**
Malaria	**1.0**	0.0	0.0	0.0	0.5	**0.1**	1.8	1.2	2.3	**1.7**
Measles	**1.8**	0.0	0.0	0.6	5.3	**1.9**	0.4	2.0	1.5	**1.5**
Meningococcal Disease, invasive	**0.3**	0.0	0.0	0.6	0.5	**0.4**	0.0	0.2	0.0	**0.1**
Mumps	**0.1**	0.0	0.0	0.0	0.0	**0.0**	0.4	0.3	0.1	**0.2**
Paratyphoid Fever	**0.6**	1.2	0.0	0.0	0.5	**0.3**	1.8	0.2	2.1	**1.3**
Pertussis	**2.7**	0.0	44.1	1.7	0.5	**5.7**	2.1	0.5	0.8	**0.9**
Pneumococcal Disease, invasive	**5.7**	7.4	7.6	7.0	8.9	**7.7**	3.5	3.1	3.9	**3.6**
Rubella	**0.2**	0.0	0.0	0.0	0.0	**0.0**	0.0	0.2	0.0	**0.1**
Salmonellosis	**23.8**	14.8	12.6	18.0	22.3	**18.3**	32.2	26.2	27.1	**27.7**
Shigellosis	**4.2**	3.7	0.0	3.9	1.8	**2.8**	2.5	2.3	4.5	**3.3**
Streptococcal Group A invasive	**3.1**	0.0	0.0	2.2	1.3	**1.5**	2.5	3.1	3.4	**3.1**
Syphilis (infectious)^	**3.4**	0.0	0.0	0.8	0.4	**0.5**	0.7	2.1	1.5	**1.6**
Tetanus	**0.02**	0.0	0.0	0.3	0.0	**0.1**	0.0	0.0	0.0	**0.0**
Tuberculosis	**5.3**	2.5	0.0	4.2	2.7	**3.1**	3.9	4.9	8.8	**6.5**
Typhoid Fever	**0.6**	0.0	0.0	0.0	0.0	**0.0**	1.1	0.2	2.4	**1.3**
Vibrio parahaemolyticus	**0.9**	0.0	0.0	0.0	1.8	**0.5**	0.0	1.2	0.4	**0.6**
Yersiniosis	**9.4**	8.6	2.5	5.1	4.9	**5.1**	3.5	6.7	5.3	**5.5**
West Nile	**0.02**	0.0	0.0	0.3	0.0	**0.1**	0.0	0.0	0.0	**0.0**
LESS COMMON DISEASES										
Brucellosis	**0.1**	0.0	0.0	0.0	0.0	**0.0**	0.0	0.0	0.4	**0.2**
Cholera: Serogroup non-O1/O139	**0.0**	0.0	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**
Cholera: Serogroup O1/O139	**0.02**	0.0	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**
Creutzfeldt-Jacob Disease	**0.1**	0.0	0.0	0.3	0.0	**0.1**	0.0	0.0	0.1	**0.1**
Legionellosis	**0.2**	0.0	0.0	0.3	0.0	**0.1**	0.0	0.3	0.1	**0.2**
Leprosy (Hansen's Disease)	**0.02**	0.0	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**
Leptospirosis	**0.02**	0.0	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**
Neonatal Group B Streptococcal Infection	**0.3**	0.0	0.0	0.6	0.5	**0.4**	0.0	0.2	0.0	**0.1**

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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 2010 of Anthrax, Botulism, Cholera: Serogroup non-O1/O139, Congenital Rubella Syndrome, Diphtheria, Hantavirus, Hemorrhagic Viral Fevers, Plague, Poliomyelitis, Rabies, Severe Acute Respiratory Syndrome, 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**
196217	651276	281361	**1128854**	371748	265623	121848	**759219**	75144	142930	68745	**286819**
5.1	0.7	3.4	**3.0**	1.1	0.0	1.9	**1.3**	3.5	0.0	2.1	**1.7**
1.5	24.1	4.6	**15.3**	7.5	4.5	5.7	**6.2**	0.0	0.0	0.0	**0.0**
39.2	39.5	61.5	**44.9**	39.0	26.4	38.6	**34.5**	21.3	18.2	14.6	**18.1**
215.6	360.4	235.3	**304.0**	304.2	276.7	240.5	**284.4**	463.1	437.3	336.0	**419.8**
0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**
0.0	0.2	0.0	**0.1**	1.1	4.1	0.0	**2.0**	0.0	0.0	0.0	**0.0**
0.5	1.8	1.8	**1.6**	0.8	0.0	0.0	**0.4**	0.0	0.0	1.5	**0.4**
1.0	0.9	0.0	**0.7**	0.5	0.4	0.0	**0.4**	0.0	0.0	0.0	**0.0**
0.5	2.2	2.5	**2.0**	2.7	3.4	0.8	**2.6**	1.3	1.4	0.0	**1.1**
10.2	19.0	19.9	**17.7**	14.5	4.9	7.4	**10.0**	20.0	4.2	16.0	**11.2**
8.7	89.8	24.9	**59.5**	22.3	12.4	14.8	**17.6**	8.0	56.7	8.7	**32.4**
0.0	0.3	0.7	**0.4**	0.3	4.5	0.0	**1.7**	0.0	0.0	0.0	**0.0**
0.0	0.5	0.4	**0.4**	0.0	0.4	0.0	**0.1**	0.0	0.0	0.0	**0.0**
111.1	72.8	14.9	**65.0**	12.6	7.5	10.7	**10.5**	5.3	4.2	2.9	**4.2**
13.3	57.0	34.1	**43.7**	51.4	60.6	62.4	**56.4**	42.6	56.0	39.3	**48.5**
0.0	0.0	0.4	**0.1**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**
5.1	22.7	3.2	**14.8**	5.6	3.0	3.3	**4.3**	8.0	5.6	2.9	**5.6**
0.0	0.5	0.7	**0.4**	0.0	1.1	0.0	**0.4**	0.0	0.0	0.0	**0.0**
0.0	0.0	0.4	**0.1**	0.0	0.4	0.0	**0.1**	2.7	0.0	0.0	**0.7**
2.0	0.9	1.1	**1.2**	0.0	0.4	2.5	**0.5**	0.0	0.0	0.0	**0.0**
0.5	2.9	1.1	**2.0**	0.5	0.0	0.0	**0.3**	1.3	0.0	23.3	**5.9**
0.5	0.2	0.7	**0.4**	0.8	0.4	0.0	**0.5**	0.0	0.0	0.0	**0.0**
0.5	0.0	0.4	**0.2**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**
1.0	0.3	0.4	**0.4**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**
0.5	0.9	6.8	**2.3**	7.3	1.9	4.9	**5.0**	1.3	0.0	0.0	**0.4**
2.6	6.5	2.1	**4.7**	8.9	9.4	9.9	**9.2**	8.0	8.4	4.4	**7.3**
2.0	0.6	0.0	**0.7**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**
28.5	29.0	29.1	**29.0**	15.9	17.7	18.9	**17.0**	21.3	11.9	11.6	**14.3**
4.1	10.1	3.9	**7.5**	4.0	1.9	4.1	**3.3**	2.7	1.4	2.9	**2.1**
4.6	6.5	2.1	**5.1**	1.9	4.1	0.8	**2.5**	4.0	0.7	1.5	**1.7**
3.6	14.7	5.7	**10.5**	1.1	0.0	0.0	**0.5**	1.3	0.7	0.0	**0.7**
0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**
10.2	9.2	2.1	**7.6**	1.6	3.0	0.0	**1.8**	6.7	4.9	1.5	**4.5**
0.5	0.5	0.7	**0.5**	0.0	0.0	0.0	**0.0**	0.0	0.7	0.0	**0.4**
1.0	1.2	1.4	**1.2**	1.6	0.8	0.8	**1.2**	2.7	0.0	0.0	**0.7**
9.7	17.2	20.6	**16.7**	16.4	9.0	12.3	**13.2**	1.3	2.8	4.4	**2.8**
0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**
0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**
0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**
0.0	0.2	0.0	**0.1**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**
0.0	0.2	0.0	**0.1**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**
0.0	0.2	0.0	**0.1**	0.5	0.0	0.8	**0.4**	0.0	0.0	0.0	**0.0**
0.5	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**
0.0	0.0	0.4	**0.1**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**
0.0	0.3	0.4	**0.3**	0.8	0.4	0.0	**0.5**	0.0	1.4	0.0	**0.7**

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. 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 March 2011 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. Summary reports contained herein for some diseases are based on enhanced surveillance data bases maintained at BCCDC which are sourced from reporting by BC Health Authorities using forms specifically designed for that disease, and reconciliation of laboratory data. These may not always correspond to iPHIS reports, including by case classification (i.e., confirmed and clinical status).

4. 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.

5. 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 2009. The 2010 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.

6. Statistics on tuberculosis are based on the analysis of the data extracted in March 2011. For more updated statistics on tuberculosis, please contact the Division of Tuberculosis Control.

7. For information on Antimicrobial Resistant Organism (ARO) Surveillance in BC, please refer to: *Antimicrobial Resistance Trends in the Province of British Columbia - 2009. Epidemiology Services, British Columbia Centre for Disease Control.* Available at www.bccdc.ca/prevention/AntibioticResistance

8. 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 2001 through 2010.
9. Salmonellosis reports include Paratyphoid (*S*. Paratyphi) and Typhoid Fever (*S*. Typhi).

10. 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).

11. Health Service Delivery Area boundaries are taken from BC STATS; BC STATS is the central statistical agency of the Province of British Columbia.

12. 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. 2009 and 2010 national rates are unavailable currently until data updates are finalized.

13. Population estimates and projections are taken from P.E.O.P.L.E. Projection 35 (Population Extrapolation for Organizational Planning with Less Error). Health Data Warehouse Release Date: Totals: August 2010; Age/Sex Estimates: August 2010.

14. 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 2010 in British Columbia, please contact epidserv@bccdc.ca.

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