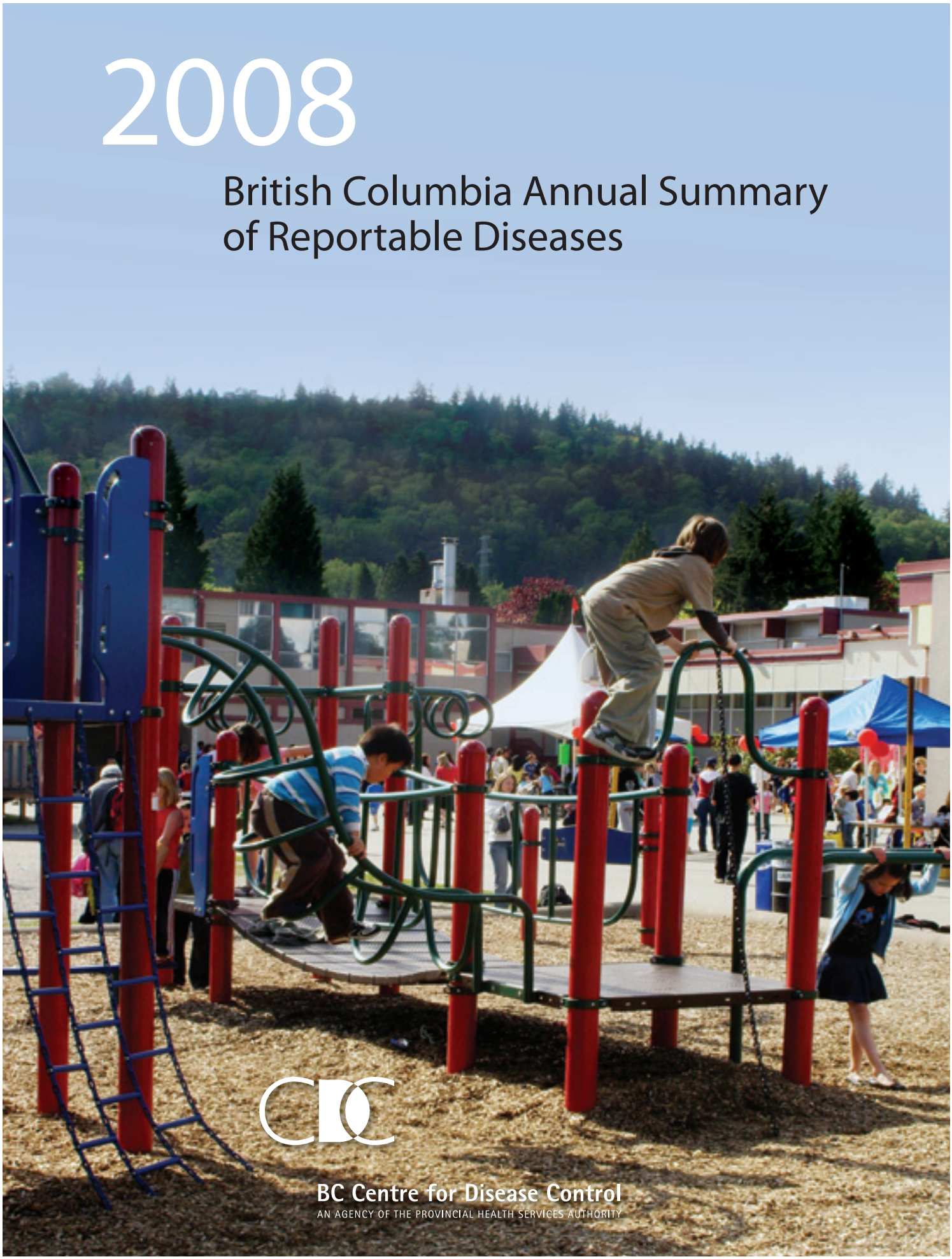
2008

British Columbia Annual Summary of Reportable Diseases



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

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2008 Highlights

Vaccine Preventable Diseases

2008 was marked in BC by a large outbreak of mumps which occurred from February through September, was localized to Fraser Health Authority, originated in a community resistant to vaccination, and resulted in 180 laboratory confirmed and many more clinical, suspect and unreported cases of mumps. This outbreak, reflective of increased mumps activity in other parts of Canada, led to a change in mumps immunization policy to a recommendation for two doses of mumps-containing vaccine for people born in 1970 and later.

The influenza season peaked later than usual in the first week of March and was milder than usual, with A/H1N1 predominating early in the season and A/H3N2 thereafter, although type B accounted for under a quarter of virus confirmations. The circulating A strains were well matched to the 2008-9 vaccine components but the B strain was lineage-level mismatched to the vaccine. All of the tested A/H1N1 isolates from BC and Canada were oseltamivir resistant. At the end of the seasonal influenza season, in April 2009, a novel A/H1N1 swine-origin virus was detected in North America ultimately leading to a pandemic declaration by the World Health Organization in June 2009.

Other than the above, vaccine preventable diseases were at low or declining rates. Three cases of invasive Hib disease were reported in infants and toddlers, one of whom was unimmunized. Eight adult cases were reported, the highest in the past decade; whether this will become a sustained trend is worth watching. Acute hepatitis B incidence continued to decline to an all-time low with cases only among adults aged over 25 and predominantly in males. No measles cases were reported, and only 1 rubella case was reported in a young adult student from SE Asia without a recognized source of infection. No meningococcal group C cases were reported in children or adolescents for the 3rd year in a row, reflective of the routine use of meningococcal C vaccine and high uptake. Pertussis continued at the low rates reported since 2005. Invasive pneumococcal disease declined from the prior year, which had been marked by an outbreak of serotype 5 which spanned 2006–07. Rates declined among children aged 1–4 years and increased from 4 cases in 2007 to 8 cases in 2008 among those under 1; half of these infant cases were due to serotypes in the conjugate 7-valent vaccine. No cases of tetanus were reported, as is expected; the prior year had been marked by an unusual pattern of 4 cases.

Sexually Transmitted and Bloodborne Pathogens

New positive HIV tests have continued to decline from a peak in 2004, with a slight increase observed in 2007 but a decline in 2008 to 350 cases. One perinatally-acquired case of HIV infection was reported. The greatest concentration of newly detected infections continues to be in Vancouver Health Service Delivery Area (HSDA), followed by Northwest HSDA. AIDS rates were reported for 2007 due to the customary lag time in reporting. A decline from 91 to 78 cases was observed, with predominance among males aged 30–59 years. The highest rate continues to be in Vancouver HSDA, but this year Northern Interior takes 2nd place.

Chlamydia has been on the rise since 1997 in BC in keeping with a trend observed nationally. The highest rates are in young women aged 15–24, and geographically in Northern Interior and Northwest HSDAs. A similar pattern of increase was seen in gonorrhea, also reflective of the national situation. Highest rates were in young women aged 15–24 years and men aged 20–29 years. Geographically, the highest rates were reported from Vancouver and Northern Interior HSDAs.

Infectious syphilis has been on the upswing since 1997, with 328 cases reported in 2008, an increase of 28 cases over 2007 but slightly lower than in 2006, indicating that a plateau may have been reached. The majority

of cases are in men aged 25–59 years, with the highest rate in Vancouver HSDA. Hepatitis C newly identified infection rates continued to decline but are still substantially higher than national rates. Female cases predominate at younger ages and males at older. Seven cases were reported in children under 10 and were most likely due to vertical transmission from mother to infant.

Diseases Transmitted by Direct Contact and Respiratory Routes

Invasive GAS reports were slightly higher than the year before, with a total of 260 cases reported, and the case fatality rate increased from 6.5% in 2007 to 8.8% in 2008, still lower than the highest rate reported of 10% in 2005 since this disease became reportable. While only 3.8% of cases were reported as associated with toxic shock-like syndrome, 9.2% were associated with necrotizing fasciitis. Age specific rates were highest in infants and in adults aged 30 years and over.

Tuberculosis increased slightly in 2008, from 290 cases in 2007 to 303 reported in 2008, for a provincial rate of 6.8 per 100,000. The highest rates were reported from Richmond, Vancouver, and Northwest HSDA with all three having rates above 10 per 100,000. Female cases predominated in adults 20–29 years old but thereafter males are overrepresented. The year was marked by an outbreak in Kelowna with cases among homeless people using shelters.

Antimicrobial Resistant Organisms

This summary was based on surveillance using both provincial and national data sources for Gram positive and negative bacterial resistance based on specimens collected in BC, and on rates of antimicrobial use from PharmaNet data. The increasing rate of methicillin resistance among *Staphylococcus aureus* (MRSA) isolates that had been observed in the past decade, and has been largely associated with community-associated isolates, appeared to level off in 2008. The increase in erythromycin resistance among Gram positive organisms including *S. aureus*, *S. pneumoniae* and *S. pyogenes* is associated with increased utilization of new macrolide antibiotics such as azithromycin and clarithromycin. Gram negative urinary tract pathogens including *E. coli*, *Proteus mirabilis* and *Klebsiella pneumoniae* are showing increased resistance against ciprofloxacin and thimethoprim-sulfamethoxazole and variable resistance to nitrofurantoin. Overall antimicrobial utilization seems to be decreasing following an upswing in 2003–05.

Enteric, Food and Waterborne Diseases

There were no consistent trends in this varied group of diseases, many of which predominate in children, show seasonal patterns with increases in the summer months, and are related to travel. Amebiasis, associated with oral-anal sex among men and diagnosis through screening among new immigrants, is highly concentrated in Vancouver HSDA; rates have been stable since 2003. Campylobacteriosis, the most common enteric infection reported, has been declining since 1998 but rates have been stable since 2004. An outbreak occurred in August in Richmond in association with a wedding attended by residents of the Lower Mainland and may have been a factor in the subsequent increase in rates seen in the region. Cryptosporidiosis rates were increased compared to last year but no outbreaks were detected. The highest rates were in male children under 10 years. Cyclosporiasis reports decreased, perhaps due to lack of recognized outbreaks associated with contaminated imported produce, and most cases were associated with travel to endemic countries.

Verotoxigenic *E. coli* infection rates declined from the prior two years with the highest rates in children under 5 years old. No large outbreaks were reported. The typical seasonal trend was observed with a peak in late summer/early fall. Giardiasis rates continued the downward trend observed in the past decade, with the highest rates observed in children aged 1–9 years old. Acute hepatitis A rates have been declining in the past decade, and were unchanged from last year, with only 39 cases reported. Travel to endemic parts of the world by unimmunized travellers continues to be an important risk factor.

Listeriosis case rates were substantially increased from prior years to 23 reports, with 5 cases associated with a national processed meat recall. Additional sporadic cases may have been identified because of increased testing related to awareness of the outbreak. Two of the 23 cases were among neonates who both recovered, and two in pregnant women.

2008 Highlights (continued)

Salmonellosis, the second most common reportable enteric infection, remained similar to last year. The highest rates were reported among children under 5, and a summer peak was observed. A large outbreak of S. Enteritidis occurred with 188 cases investigated starting in June and continuing into 2009. Eggs are deemed the likely source of infection based on analytic studies. S. Enteritidis accounted for 44% of salmonella infections in BC.

Typhoid fever rates were at the highest level in the past decade and twice as high as in 2007. Paratyphoid fever rates were slightly elevated. Both of these infections are acquired during travel to endemic countries and mainly India, and cluster in the first three months of the year because travel patterns.

Shigellosis in BC fluctuates from year to year and was down in 2008. While both sexes were affected, male cases in the 30–59 year age group predominated and are reflective of ongoing high endemicity of *S. sonnei* among homeless people in Vancouver and Fraser South.

Vibrio parahaemolyticus infections were at the typical rate seen in the past decade and all but one case were among adults. This infection is associated with consumption of undercooked shellfish during the summer months, with the highest rate in North Shore/ Coast Garibaldi HSDA. This year the usual male preponderance was not seen.

Yersiniosis, the third most common reportable enteric infection, continued to decline in keeping with the trend in the past decade. No outbreaks were detected. Case reports are from across the age span with highest rates in children under 5 years old.

Outbreaks of gastroenteritis were reported for the first time in this annual report, and reporting is facilitated by a new web-based reporting software which was launched in BC in August 2008. Eighty-six percent of the 28 outbreaks reported between August 1st and December 31st were caused by norovirus and 79% were in long term care facilities.

Vectorborne and Other Zoonotic Diseases

No cases of hantavirus pulmonary syndrome were reported in 2008. Seven cases of Lyme disease were confirmed in 2008, down from 13 in 2007. Half were in those over 60 years old. Malaria rates were stable with 35 cases reported and related to travel to endemic areas of the world.

Potential rabies exposure incidents, including those for which rabies post-exposure prophylaxis was administered, declined from 387 in 2007 to 240 in 2008. Most incidents were in the summer season when bats are active in BC. Bat-related exposures accounted for 60% of incidents, down from 75% in the prior year, and dog-related incidents increased. Six percent of bats submitted to the Canadian Food Inspection Agency for testing were positive, a proportion similar to prior years. Thirty-five percent of exposures occurred outside of Canada, up from 13% the year before.

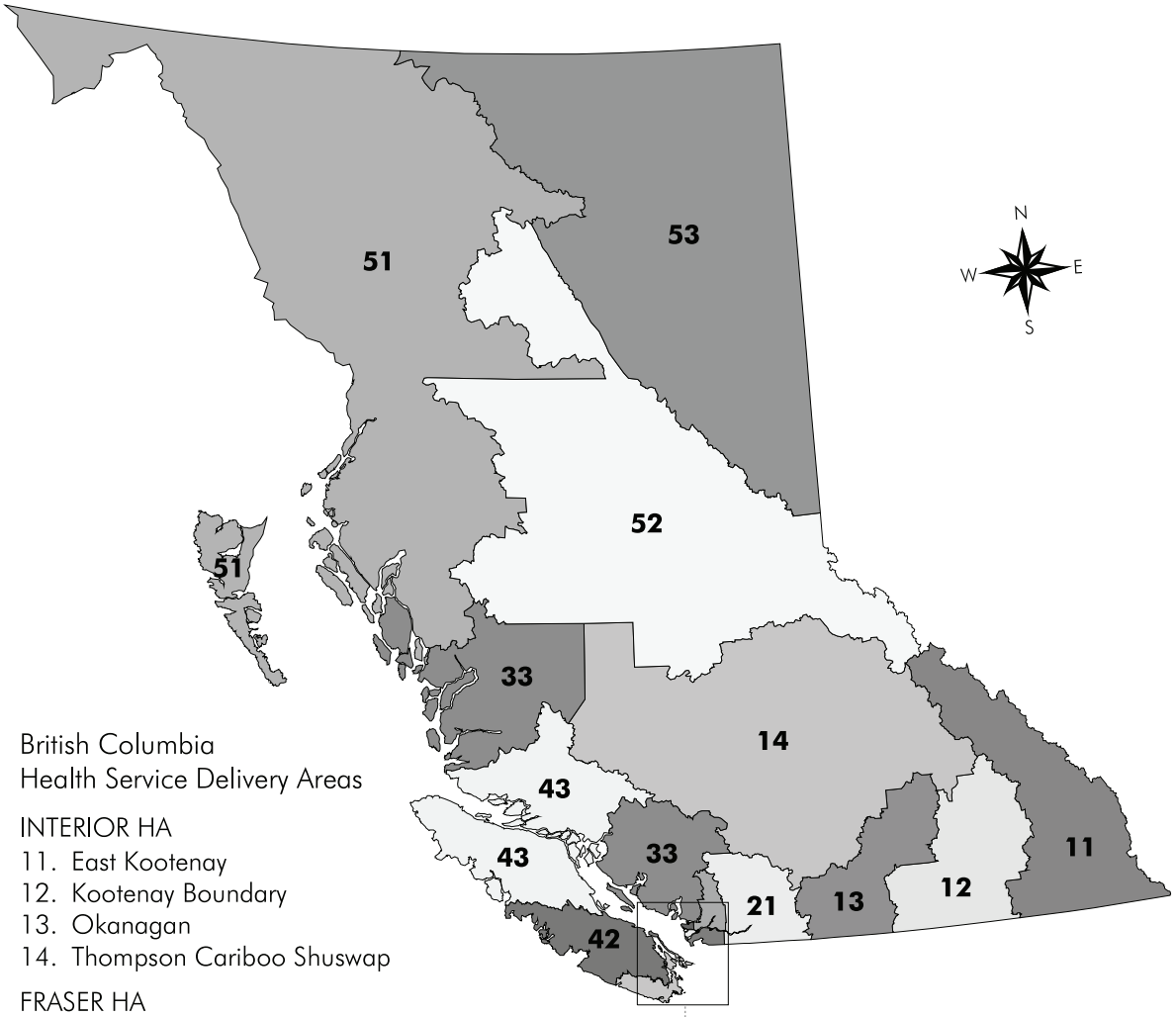
No endemic West Nile virus activity was detected in BC despite multi-source seasonal surveillance. One case in a BC resident who had travelled to Saskatchewan was identified. There was evidence of activity in Washington State with 4 human and 41 equine cases. Surveillance for potential endemic activity in 2009 will be conducted.

Environmental Fungi

Twenty-one cases of *Cryptococcus gattii*, newly emerged as endemic to British Columbia, were identified through enhanced surveillance in 2008, the lowest number since 2001. This infection has expanded its endemicity within BC to the Fraser South area. All cases were 30 years and older.

—Dr. Monika Naus
Medical Director Immunization Programs and
Associate Director, Epidemiology, BCCDC

British Columbia Health Service Delivery Areas



British Columbia
Health Service Delivery Areas

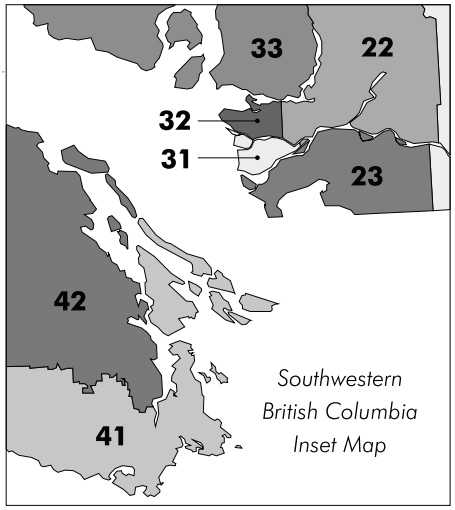
INTERIOR HA
11. East Kootenay
12. Kootenay Boundary
13. Okanagan
14. Thompson Cariboo Shuswap

FRASER HA
21. Fraser East
22. Fraser North
23. Fraser South

VANCOUVER COASTAL HA
31. Richmond
32. Vancouver
33. North Shore/Coast Garibaldi

VANCOUVER ISLAND HA
41. South Vancouver Island
42. Central Vancouver Island
43. North Vancouver Island

NORTHERN HA
51. Northwest
52. Northern Interior
53. Northeast



diseases preventable by vaccination

BRITISH COLUMBIA
The Best Place on Earth

ImmunizeBC

***Haemophilus influenzae* type b (Hib), invasive**

Hepatitis B

Influenza

Measles

Meningococcal Disease, invasive

Mumps

Pertussis

Pneumococcal Disease, invasive

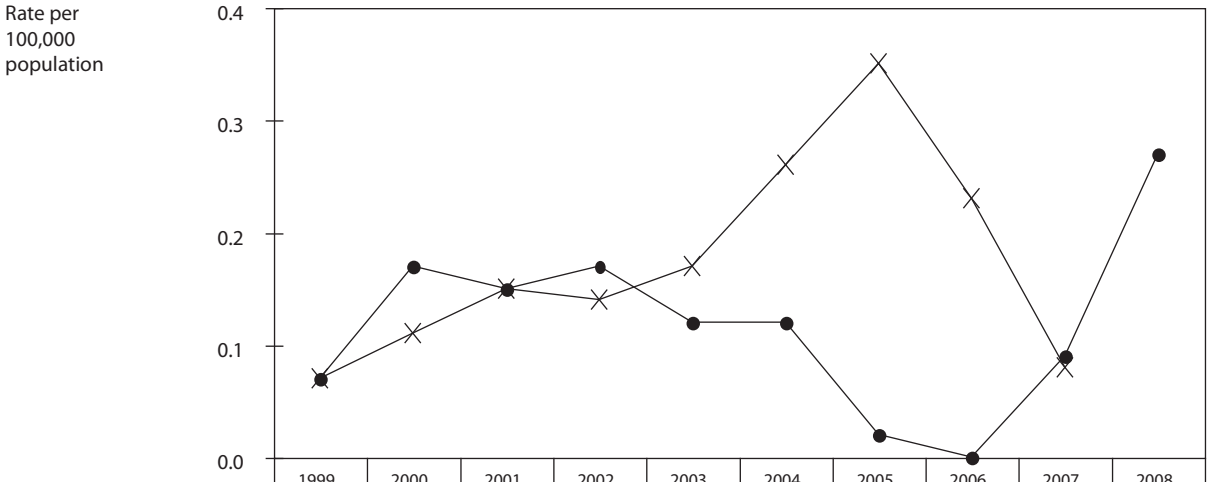
Rubella

Tetanus

Haemophilus influenzae type b (Hib), invasive

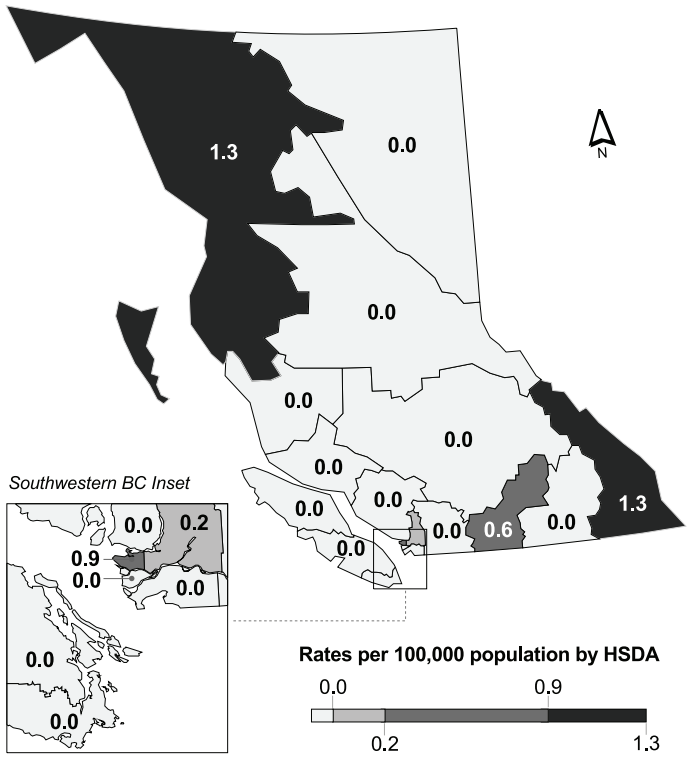
Eleven cases of invasive Hib disease were reported in 2008, the highest number reported in over a decade. Eight were in adults and three in children. One child was aged 16 months and unimmunized due to a conscientious objection. The other two children had both received the three primary doses of Hib vaccine, and were aged 10 and 15 months at the time of onset.

1.1 *Haemophilus influenzae* type b (Hib), invasive Rates by Year, 1999–2008



	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
BC Invasive Hib Reports	3	7	6	7	5	5	1	0	4	11
BC Invasive Hib Rate	0.07	0.17	0.15	0.17	0.12	0.12	0.02	0.00	0.09	0.27
Canadian Hib Rate	0.07	0.11	0.15	0.14	0.17	0.26	0.35	0.23	0.08	

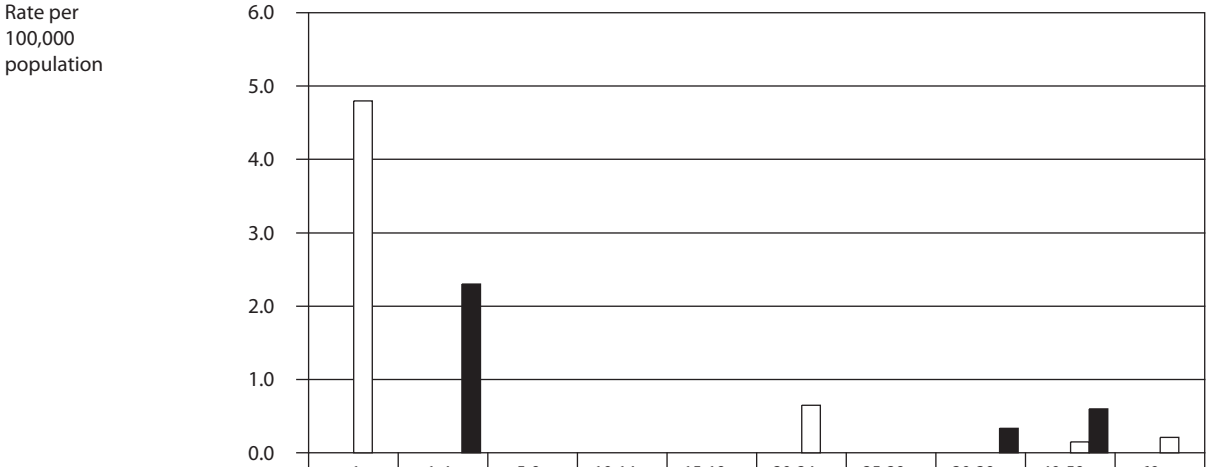
1.2 *Haemophilus influenzae* type b (Hib), invasive Rates by HSDA, 2008



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	1	1.3
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	1	0.2
23	Fraser South	0	0.0
31	Richmond	0	0.0
32	Vancouver	6	0.9
33	North Shore/Coast Garibaldi	0	0.0
41	South Vancouver Island	0	0.0
42	Central Vancouver Island	0	0.0
43	North Vancouver Island	0	0.0
51	Northwest	1	1.3
52	Northern Interior	0	0.0
53	Northeast	0	0.0

Note: Map classification by Jenks natural breaks method.

1.3 *Haemophilus influenzae* type b (Hib), invasive Rates by Age Group and Sex, 2008



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Invasive Hib Reports - Female	1	0	0	0	0	1	0	0	1	1
Invasive Hib Reports - Male	0	2	0	0	0	0	0	1	4	0
Invasive Hib Rate - Female	4.8	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.2	0.2
Invasive Hib Rate - Male	0.0	2.3	0.0	0.0	0.0	0.0	0.0	0.3	0.6	0.0

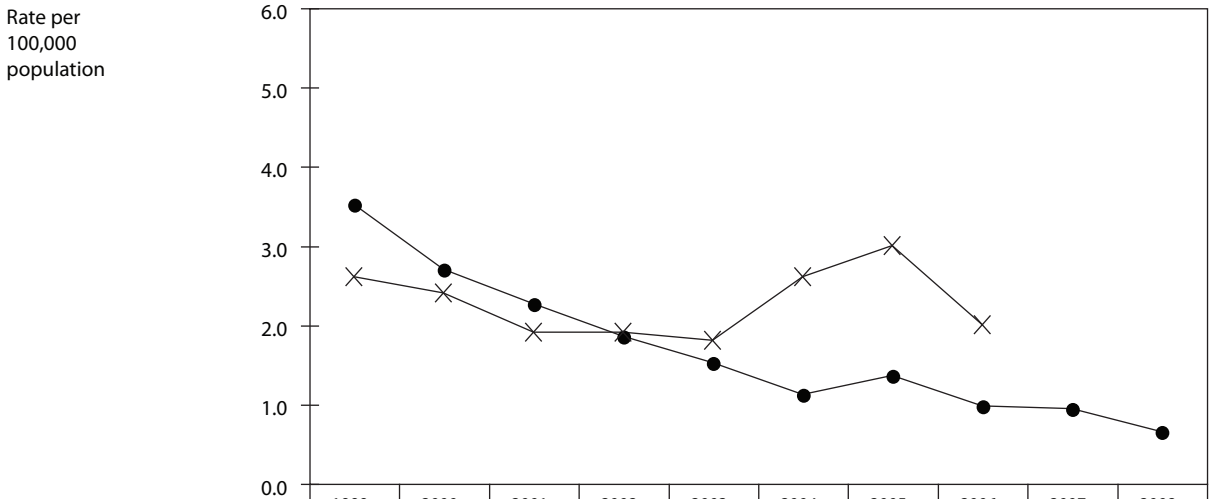
Hepatitis B

The annual number of acute hepatitis B cases identified in BC has continued to decline and has been below the Canadian rate since 2002. Twenty-nine cases of acute hepatitis B have been reported to date for 2008 in BC. However this number must be considered provisional and likely to increase slightly. When hepatitis B is newly identified without symptoms of acute infection or a 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 a few cases currently entered as unknown/undetermined may be changed at a later date. For example in 2007, since the numbers in the annual report were extracted in March 2007, an additional 6 cases of hepatitis B infection were determined as acute infections in 2007.

Publicly funded hepatitis B vaccine programs in BC include the Grade 6 program which began in 1992 and of which the first recipients were aged 27 years in 2008, and the universal infant program introduced province-wide in 2001. 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. In 2008, no cases were reported in persons less than 25 years of age. As in previous years the majority of cases (72%) were male.

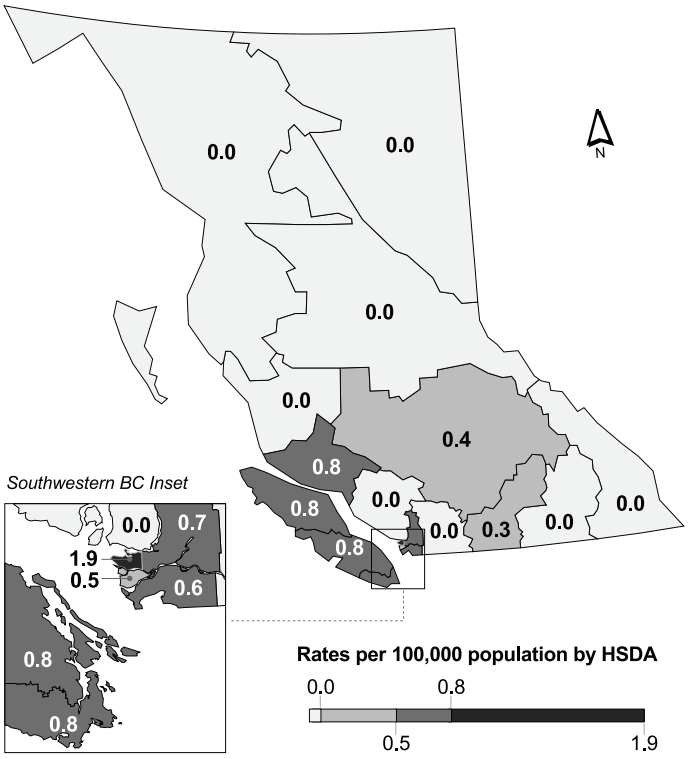
Vancouver was the only area with more than 4 cases of acute hepatitis B and the only area with a rate of acute HBV infection above 1 case per 100,000 population. However due to small numbers the rates in all other Health Service Delivery Areas are likely to be unstable.

2.1 Acute Hepatitis B Rates by Year, 1999–2008



	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
BC Hepatitis B: Acute Reports	141	109	92	76	63	47	58	42	41	29
BC Hepatitis B: Acute Rate	3.5	2.7	2.3	1.9	1.5	1.1	1.4	1.0	0.9	0.7
Canadian Hepatitis B Rate	2.6	2.4	1.9	1.9	1.8	2.6	3.0	2.0		

2.2 Acute Hepatitis B Rates by HSDA, 2008



HSDA	Health Service Delivery Area	Cases	Rate
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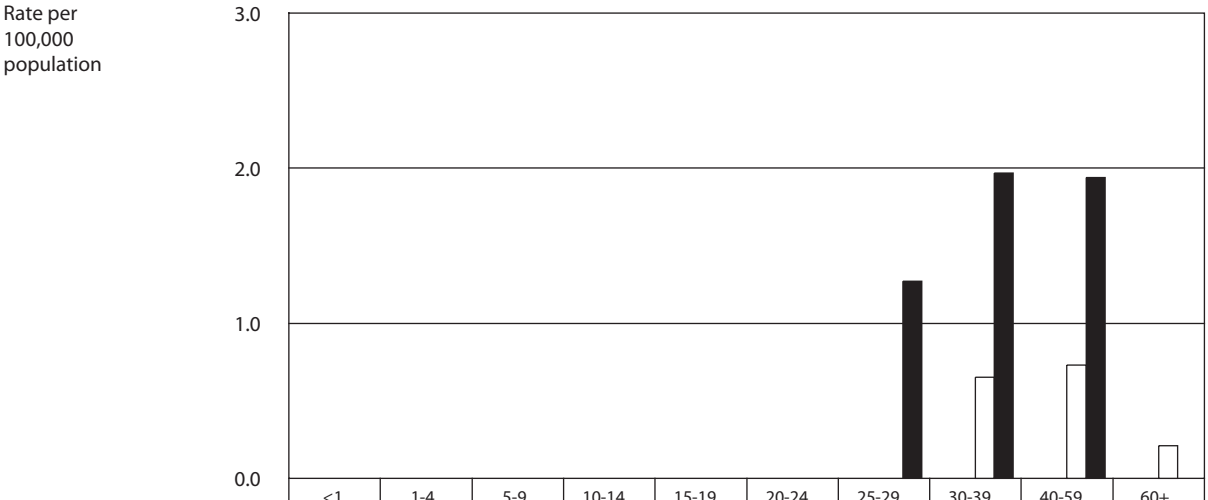
12	Kootenay Boundary	0	0.0
13	Okanagan	1	0.3
14	Thompson Cariboo Shuswap	1	0.4
21	Fraser East	0	0.0
22	Fraser North	4	0.7
23	Fraser South	4	0.6
31	Richmond	1	0.5
32	Vancouver	12	1.9
33	North Shore/Coast Garibaldi	0	0.0
41	South Vancouver Island	3	0.8
42	Central Vancouver Island	2	0.8
43	North Vancouver 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.

2.3 Acute Hepatitis B Rates by Age Group and Sex, 2008



	<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	2	5	1
Hepatitis B: Acute Reports - Male	0	0	0	0	0	0	2	6	13	0
Hepatitis B: Acute Rate - Female	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.7	0.2
Hepatitis B: Acute Rate - Male	0.0	0.0	0.0	0.0	0.0	0.0	1.3	2.0	1.9	0.0

Influenza

Influenza surveillance in British Columbia (BC) consists of collection, analysis and reporting of results from 3 main sources of information: sentinel influenza-like-illness (ILI) tracking; facility and school outbreak notifications; and laboratory diagnosis including detailed subtype and strain characterization.

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 40 in 2008 (September 28, 2008) to week 15 in 2009 (ending April 18, 2009).**

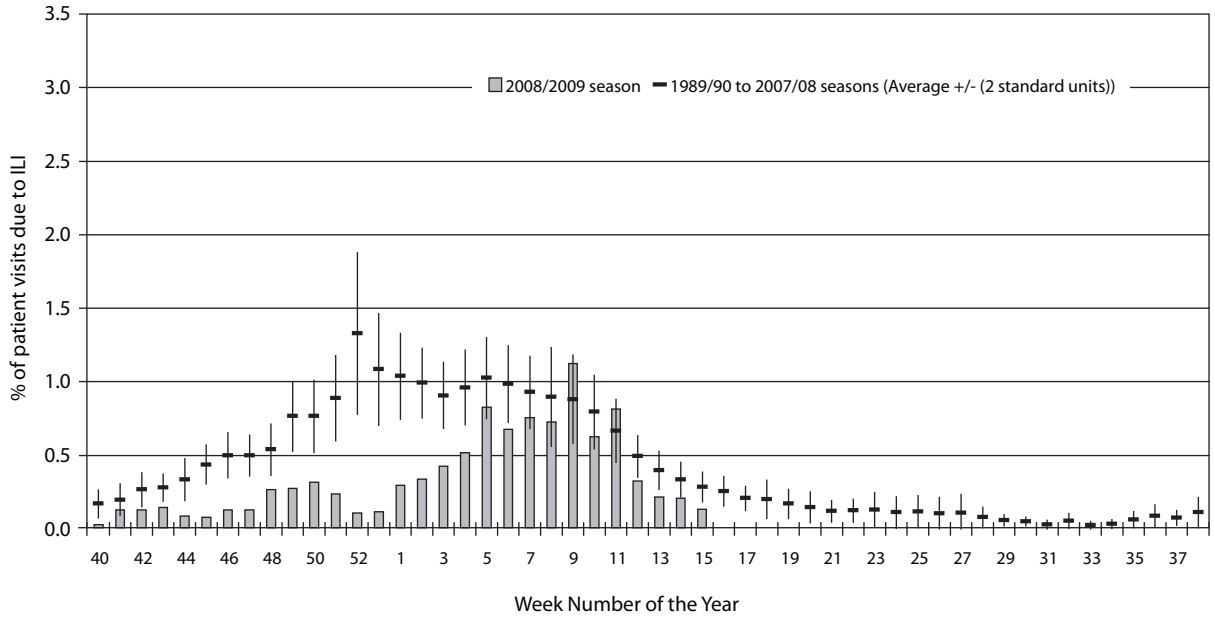
Summary

Overall, the 2008–09 influenza season peaked later than usual. Historically, the peak in influenza activity occurs between late December and early February, while the peak in the 2008–09 season was seen in week 9 (March 1–7, 2009). Influenza A activity dominated throughout the 2008–09 season: influenza A/H1N1 was the predominant subtype early in the season; however, influenza A/H3N2 activity began increasing at the end of January and predominated thereafter. As of mid-April 2009, fewer than one quarter of influenza viruses detected in BC during the 2008–09 season were type B.

Sentinel Physician Surveillance

BC sentinel physician surveillance for the 2008–09 influenza season consisted of 41 active sentinel sites representing all regional health authorities of BC. The proportion of patient visits due to ILI reported by sentinel physicians was below or within the expected range based on historic averages throughout the surveillance

3.1 Proportion of Patient Visits due to Influenza-Like Illness (ILI) per Week Number Compared to Average Proportion of ILI Visits for the Past 18 Seasons Sentinel Physicians, 2008–2009, British Columbia



period. There was an increase in the ILI proportion during weeks 48–50; the proportion then dropped and started increasing again, reaching a peak during week 9 (March 1–7, 2009), in which 1.12% of the total sentinel physician visits were attributed to ILI. The pattern of ILI visits as a proportion of total sentinel visits indicates a milder and later than usual season (see Figure 3.1).

ILI Outbreaks

Between week 40 and week 15 of the 2008–09 season, ILI outbreaks were reported in 71 schools (4 of which were lab-confirmed), and lab-confirmed influenza outbreaks were reported in 38 long-term care facilities and 7 acute care facilities. As shown in Table 3.2, these counts of outbreaks in BC schools and long-term care facilities were generally fewer than those reported during the same period in the 5 previous years. Among the 38 influenza outbreaks in long-term care facilities, 34 (89%) were attributed to influenza A/H3N2, 1 (3%) to influenza A/H1N1, 2 (5%) to influenza A (subtype not available), and 1 (3%) to influenza B. Rhino/enterovirus was furthermore identified in 13 outbreak investigations, RSV in 7, human metapneumovirus in 5, parainfluenza in 3, coronavirus in 2, and adenovirus in 1 (see Table 3.2 and Figure 3.3).

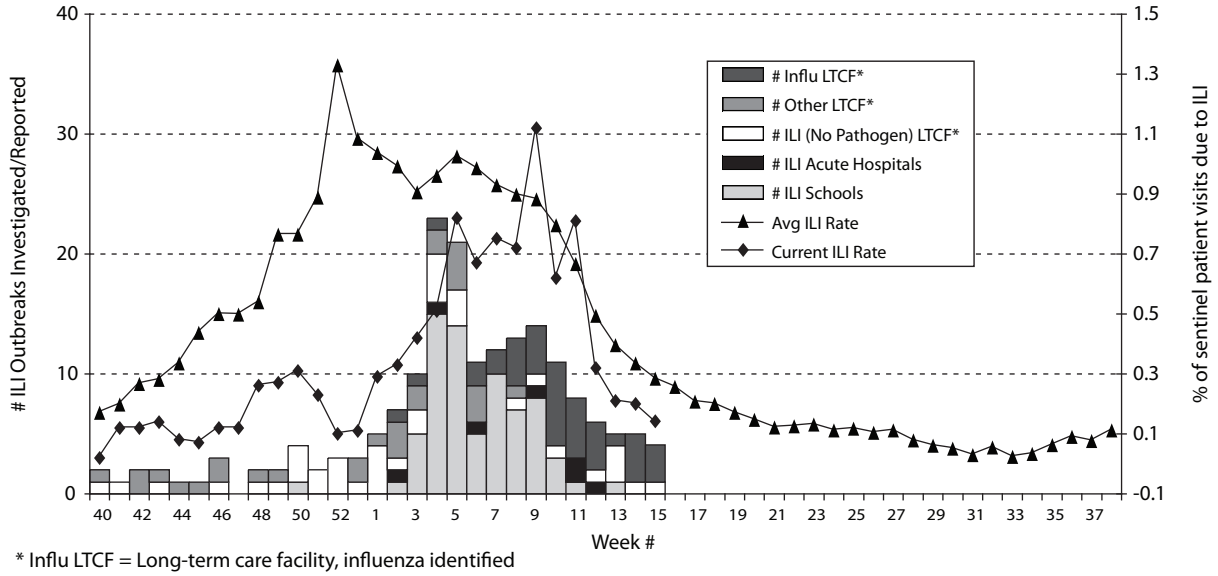
3.2 Number of reported influenza/ILI outbreaks in long-term care facilities and schools between weeks 40 and 15, British Columbia, 2003–04 to 2008–09 seasons

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

† Includes lab-confirmed influenza outbreaks only

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

3.3 Number of Influenza-Like Illness (ILI) Outbreaks Reported, ILI Rates and Average ILI Rate for Past 19 Years, Per Week , 2008–2009, British Columbia



* Influ LTCF = Long-term care facility, influenza identified
* Other LTCF = Long-term care facility, other pathogen identified (including RSV, parainfluenza, adenovirus, and rhino/enterovirus)
* ILI (No Pathogen) LTCF = Long-term care facility, no pathogen identified

Influenza (continued)

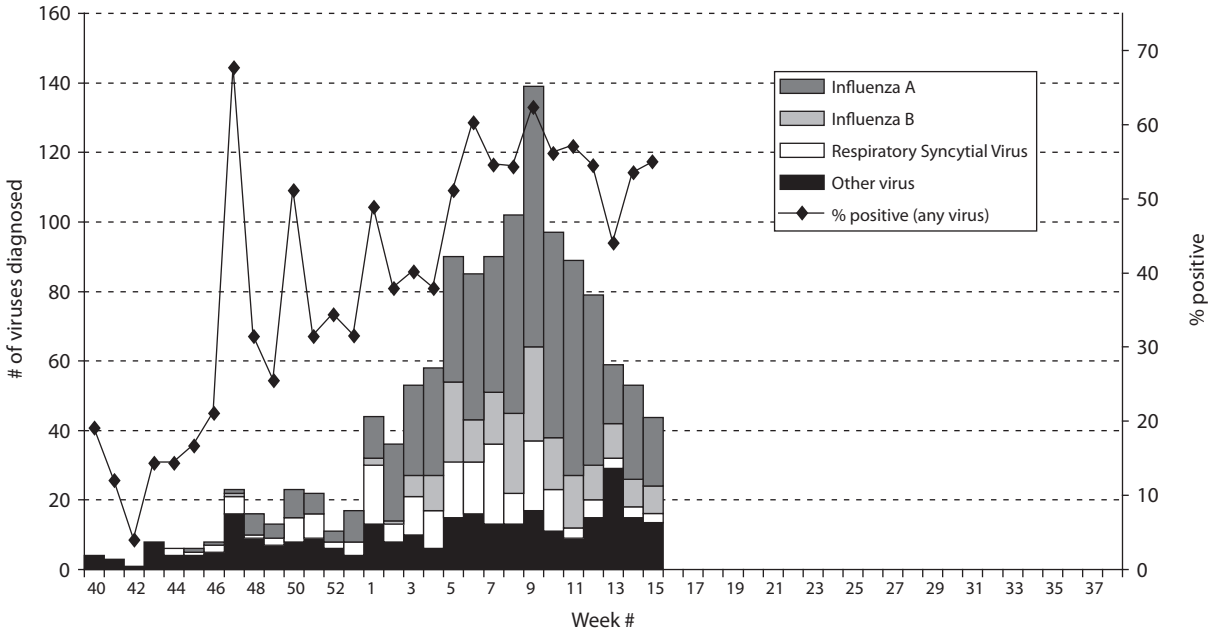
Laboratory Profile of Influenza

The BCCDC Virology Laboratory and the Children's and Women's Health Centre Virology Laboratory conducted 4,884 tests for respiratory viruses between September 28, 2008 and April 18, 2009. Nine-hundred forty-seven (19%) specimens were positive for influenza, of which 718 (76%) were influenza A and 229 (24%) were influenza B. Of the 636 influenza A viruses that were subtyped, 445 (70%) were A/H3N2. Additionally, 742 (15%) specimens were positive for respiratory syncytial virus—the majority of which were reported from Children's and Women's Health Centre Virology Laboratory—and, 387 (8%) were positive for other respiratory viruses (i.e., adenovirus, parainfluenza, entero/rhinovirus, human metapneumovirus, or coronavirus) (see Figures 3.4 and 3.5).

Strain Characterization

BC laboratories routinely send a sample of influenza isolates to the National Microbiology Laboratory (NML) for further strain characterization. Between September 1, 2008 and April 17, 2009, 95 isolates were sent to NML from BC. Of these, 26 (27%) were A/Brisbane/59/07 (H1N1)-like, 25 (26%) were A/Brisbane/10/2007(H3N2)-like, 21 (22%), were B/Brisbane/60/2008(Victoria lineage)-like, and 23 (24%) were B/Malaysia/2506/04(Victoria lineage)-like. A/Brisbane/59/07(H1N1) and A/Brisbane/10/2007(H3N2) are the influenza A components of the 2008–09 influenza vaccine and the recommended influenza A components of the 2009/10 influenza vaccine. B/Florida/04/2006 is the influenza B component of the 2008–09 vaccine, and B/Brisbane/60/2008 is the recommended component of the 2009/10 influenza vaccine. Thus, for the 2009/10 season, only the B component will be changed from the 2008–09 vaccine. In summary, the predominant influenza A/H1N1 and A/H3N2 strains circulating in BC between weeks 40 and 15 of the 2008–09 season were well-matched to the 2008–09 vaccine components, while the circulating B virus was lineage-level mismatched to the vaccine.

3.4 Virus Isolates and Percentage of Respiratory Specimens Submitted to BC Provincial Laboratory Diagnosed Positive for a Virus, per Week, 2008–2009, British Columbia



Antiviral Resistance

Antiviral resistance testing conducted at the BCCDC Virology Lab and the National Microbiology Lab identified continued and increased rates of oseltamivir resistance among influenza A (H1N1) isolates during the 2008–09 season. This resistance was first recognized internationally during the 2007–08 season. As of April 22, 2009, BCCDC assessed over 140 A/H1N1 isolates for genotypic evidence of oseltamivir resistance during the 2008–09 season; all of these isolates for which oseltamivir sensitivity could be determined were found to be resistant. In Canada, a total of 839 influenza isolates (225 influenza A/H1, 154 influenza A/H3, and 460 influenza B) were tested for oseltamivir resistance between September 1, 2007 and April 15, 2009. All of the A/H1 isolates were resistant, while all of the A/H3 and B isolates were sensitive to oseltamivir. Interim guidelines were developed by BCCDC in response to this trend of resistance to assist clinicians in selecting appropriate treatment options and public health partners in selecting appropriate options for facility outbreak control. The National Microbiology Laboratory also tested 794 influenza isolates (176 A/H1, 152 A/H3, and 466 B) from throughout Canada for zanamivir resistance and found all of these to be sensitive. Finally, of those isolates tested for amantadine resistance, all 242 A/H1 isolates were found to be sensitive, and all 285 A/H3 isolates were found to be resistant, which is consistent with amantadine sensitivity patterns from previous seasons.

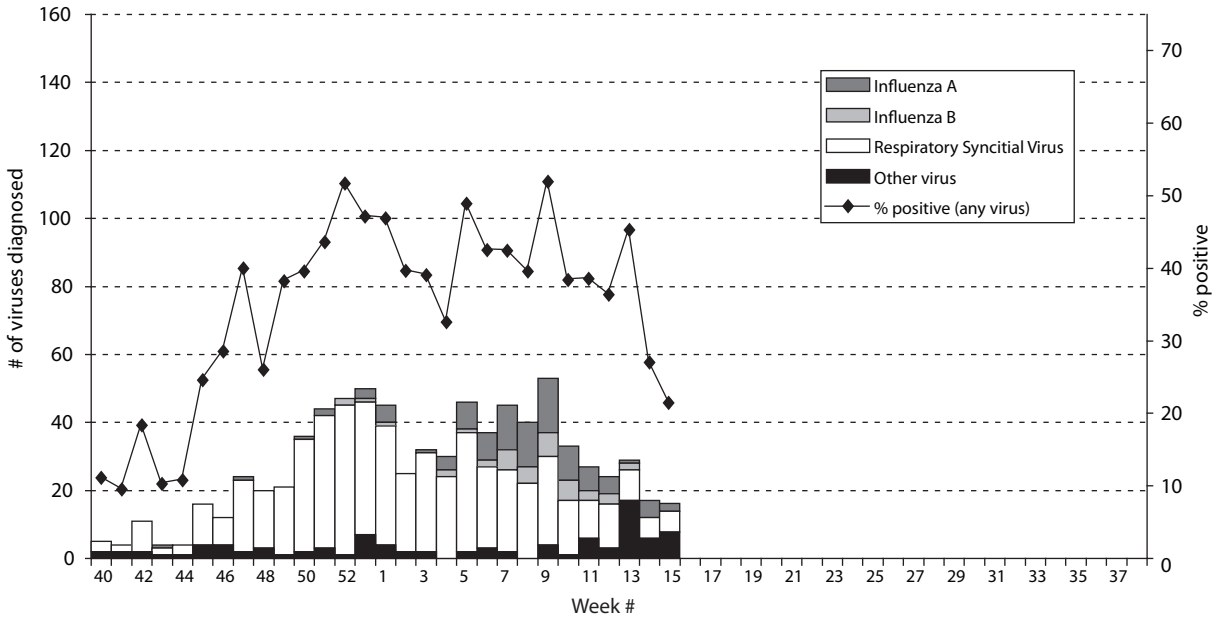
Vaccine Effectiveness Study

A vaccine effectiveness study using an observational design to assess vaccine effectiveness against laboratory-confirmed influenza was conducted for the 2008–09 season in coordination with the sentinel physician networks in Quebec, Ontario, Alberta, and BC. Estimates will be published when available.

Swine-origin influenza A/H1N1

In April 2009, a novel swine-origin influenza A/H1N1 virus was detected in North America. The scope of the outbreak due to this virus in BC—including severity, spread, duration, and attack rate—remains uncertain. BCCDC continues to monitor the situation closely and will provide an epidemiological summary at a later date when data are more complete.

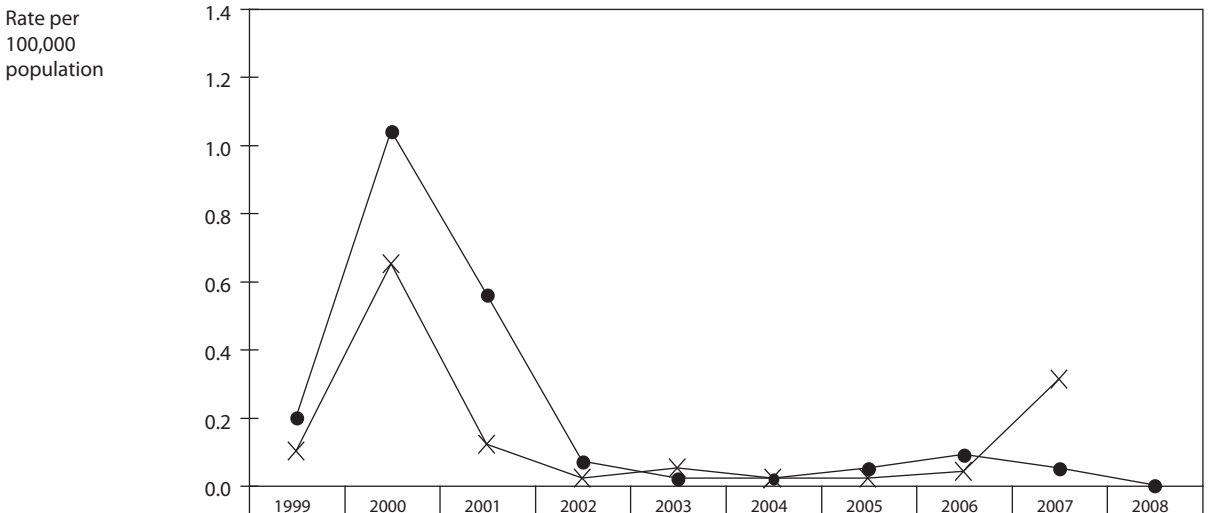
3.5 Virus Isolates and Percentage of Respiratory Specimens Submitted to Children and Women's Health Centre Laboratory Diagnosed Positive for a Virus, per Week, 2008–2009, British Columbia



Measles

There were no cases of measles reported in BC in 2008.
The temporal trend of measles is shown in Figure 4.1.

4.1 Measles Rates by Year, 1999–2008



	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
BC Measles Reports	8	42	23	3	1	1	2	4	2	0
BC Measles Rate	0.20	1.04	0.56	0.07	0.02	0.02	0.05	0.09	0.05	0.00
Canadian Measles Rate	0.10	0.65	0.12	0.02	0.05	0.02	0.02	0.04	0.31	

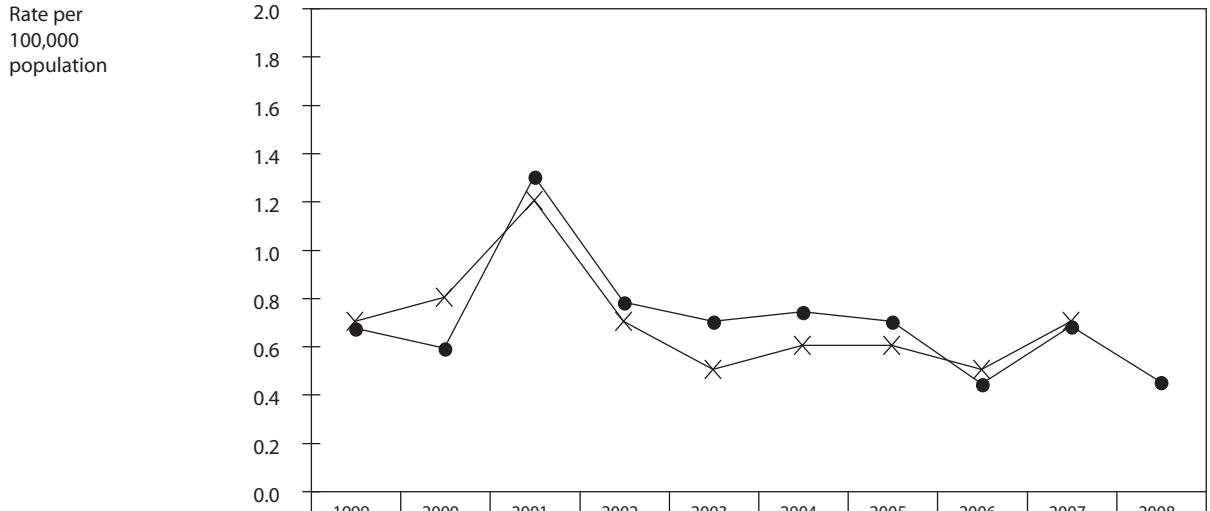
Meningococcal Disease (invasive)

The rate of invasive meningococcal disease was 0.5 per 100,000 population during 2008. Of the 20 reported cases, 3 were reported in children below the age of 18 years.

Overall serogroup breakdown included 10 serogroup C, 5 B, 4 Y and 1 W135.

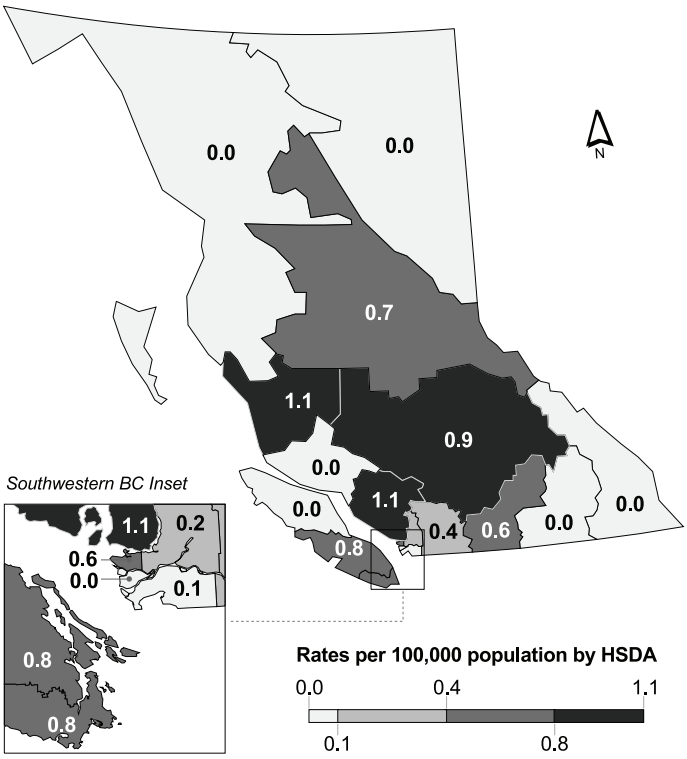
2 serogroup B and one serogroup Y isolates were identified from the three pediatric or adolescent cases. This is the third consecutive year in which no serogroup C disease has been seen in children or adolescents.

5.1 Meningococcal Disease (invasive) Rates by Year, 1999–2008



	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
BC Meningococcal Reports	27	24	53	32	29	31	30	19	30	20
BC Meningococcal Rate	0.7	0.6	1.3	0.8	0.7	0.7	0.7	0.4	0.7	0.5
Canadian Meningococcal Rate	0.7	0.8	1.2	0.7	0.5	0.6	0.6	0.5	0.7	

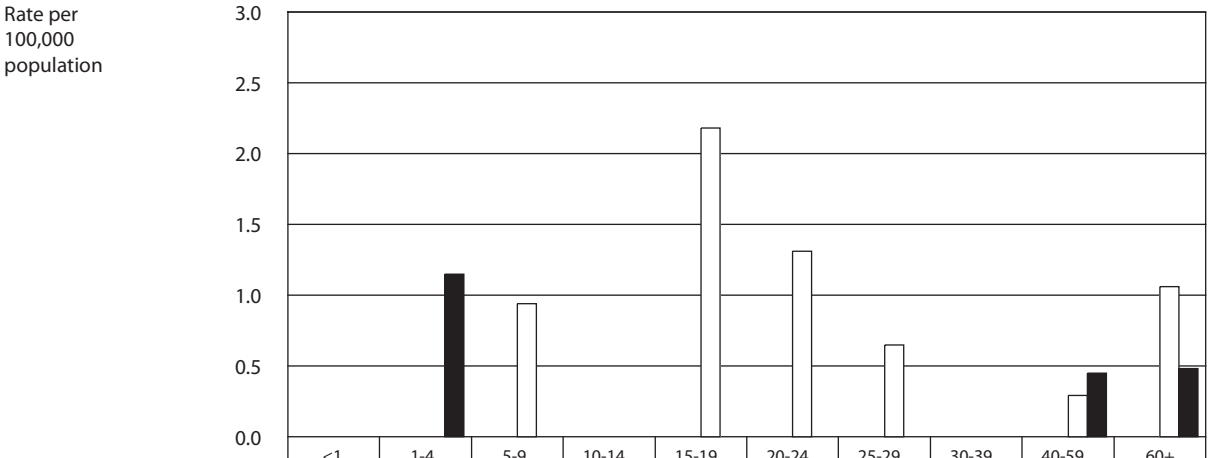
5.2 Meningococcal Disease (invasive) Rates by HSDA, 2008



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	2	0.9
21	Fraser East	1	0.4
22	Fraser North	1	0.2
23	Fraser South	1	0.1
31	Richmond	0	0.0
32	Vancouver	4	0.6
33	North Shore/Coast Garibaldi	3	1.1
41	South Vancouver Island	3	0.8
42	Central Vancouver Island	2	0.8
43	North Vancouver Island	0	0.0
51	Northwest	0	0.0
52	Northern Interior	1	0.7
53	Northeast	0	0.0

Note: Map classification by Jenks natural breaks method.

5.3 Meningococcal Disease (invasive) Rates by Age Group and Sex, 2008



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Meningococcal Reports - Female	0	0	1	0	3	2	1	0	2	5
Meningococcal Reports - Male	0	1	0	0	0	0	0	0	3	2
□ Meningococcal Rate - Female	0.0	0.0	0.9	0.0	2.2	1.3	0.7	0.0	0.3	1.1
■ Meningococcal Rate - Male	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5

Mumps

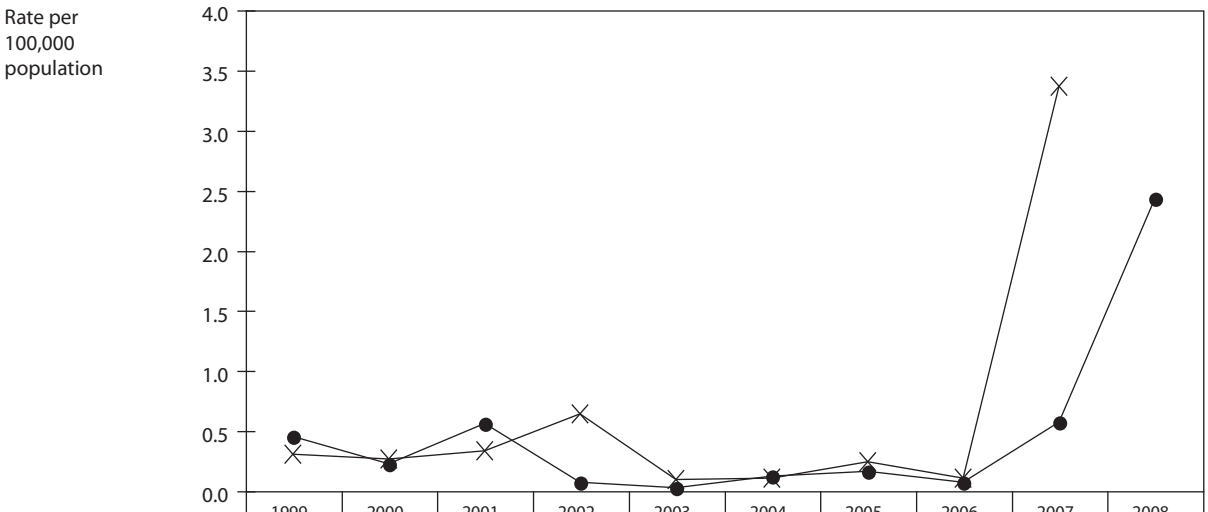
There were 192 cases of mumps reported in BC in 2008. Eighty five were laboratory confirmed, 44 epidemiologically linked, 32 clinical and 19 suspect cases. Most cases (n=180) were associated with an outbreak of mumps in the Fraser Health Authority that occurred from February to September. Enhanced surveillance of outbreak-related cases was conducted to allow for recording of cases and variables not usually reported through iPHIS (Public Health Information System). Four cases occurred among residents of other areas of the province that were related to travel/exposure to the outbreak affected area. The outbreak clustered around the faith-based community in Fraser East which is resistant to vaccination for religious reasons; cases in this community were underreported and it is likely that many more cases occurred than were reported. Nearly half of all reported cases were unimmunized (47%). The majority of cases were male (57%) and the outbreak began in and primarily affected a young school aged population (48% aged 0–19 years; range: 0–54). Complications were reported in approximately 16% of cases and were mainly orchitis; one case of mumps meningitis was confirmed. No deaths occurred.

Twelve sporadic cases of laboratory confirmed mumps occurred in the province unrelated to the outbreak. Of these, 6 (50%) were related to travel to an area of known mumps activity outside of BC, 5 cases had unknown exposure and 1 case had a known link to another sporadic case.

As a result of the outbreak, immunization policy in BC changed to include a recommendation for two doses of mumps-containing vaccine for individuals born on or after January 1, 1970.

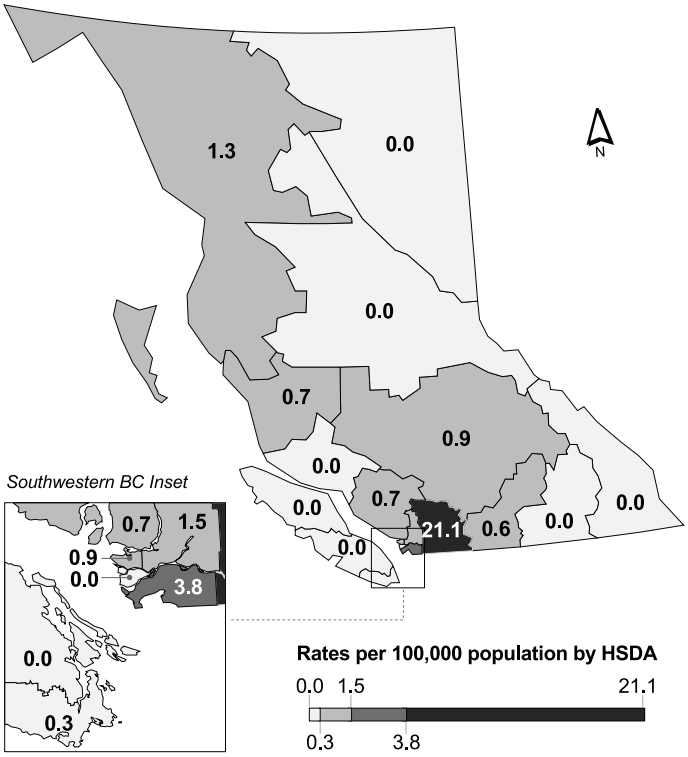
The figures in this report related to mumps in 2008 in BC are based on reported confirmed cases of mumps received through iPHIS (Public Health Information System), and not specific to the outbreak described above.

6.1 Mumps Rates by Year, 1999–2008



	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
BC Mumps Reports	18	9	23	3	1	5	7	3	25	108
BC Mumps Rate	0.45	0.22	0.56	0.07	0.02	0.12	0.16	0.07	0.57	2.43
Canadian Mumps Rate	0.30	0.26	0.33	0.64	0.09	0.10	0.24	0.10	3.36	

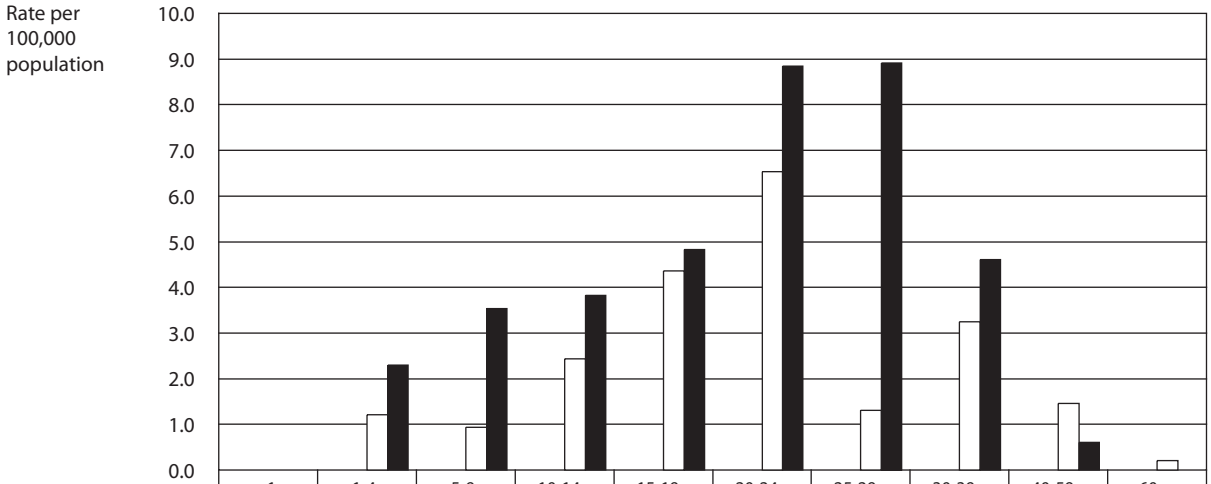
6.2 Mumps Rates by HSDA, 2008



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	2	0.9
21	Fraser East	59	21.1
22	Fraser North	9	1.5
23	Fraser South	26	3.8
31	Richmond	0	0.0
32	Vancouver	6	0.9
33	North Shore/Coast Garibaldi	2	0.7
41	South Vancouver Island	1	0.3
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	0	0.0

Note: Map classification by Jenks natural breaks method.

6.3 Mumps Rates by Age Group and Sex, 2008



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Mumps Reports - Female	0	1	1	3	6	10	2	10	10	1
Mumps Reports - Male	0	2	4	5	7	14	14	14	4	0
□ Mumps Rate - Female	0.0	1.2	0.9	2.4	4.4	6.5	1.3	3.3	1.5	0.2
■ Mumps Rate - Male	0.0	2.3	3.5	3.8	4.8	8.8	8.9	4.6	0.6	0.0

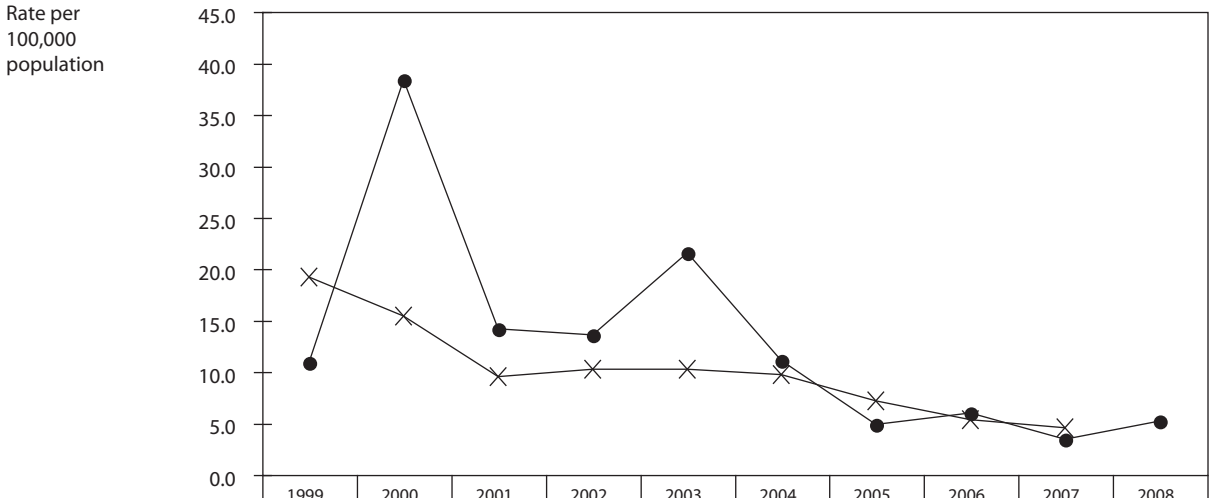
Pertussis

Pertussis demonstrates expected cyclical peaks every three to five years. In the early 1990s, overall rates in BC rose substantially above 5 per 100,000 with significant peaks in 1996 (25 per 100,000), 2000 (38 per 100,000), and 2003 (21.5 per 100,000). The dramatic peaks of 2000 and 2003 were driven primarily by increased rates of pertussis in a cohort of preteen/ teen children previously given the less efficacious whole cell pertussis vaccine. Increases were also seen in infants during these peak years.

Since 2005, pertussis rates have dropped to their lowest levels since the 1980s. In particular, rates among infants have dropped by about 10-fold in 2007 compared to 2000 and earlier. In 2008, there was slight cyclical increase, with some regions in BC experiencing higher rates than others, but rates remain far below historic peaks, including among infants.

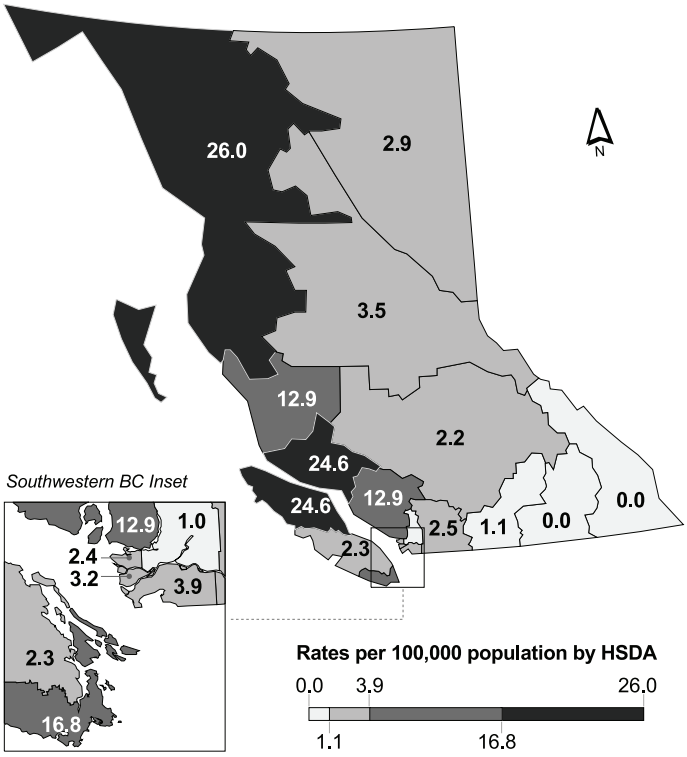
In British Columbia, acellular pertussis vaccine replaced the whole cell vaccine for routine childhood immunization beginning in 1997. Acellular vaccine was also introduced for routine immunization of adolescents 14–15 years of age (Grade 9) beginning in January 2004. Previous outbreaks and immunization program expansions may have contributed to population immunity and recent reduction in pertussis activity levels. 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, 1999–2008



	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
BC Pertussis Reports	435	1549	577	557	895	464	206	258	149	231
BC Pertussis Rate	10.8	38.4	14.2	13.5	21.5	11.0	4.8	6.0	3.4	5.2
Canadian Pertussis Rate	19.2	15.4	9.5	10.2	10.2	9.7	7.1	5.3	4.5	

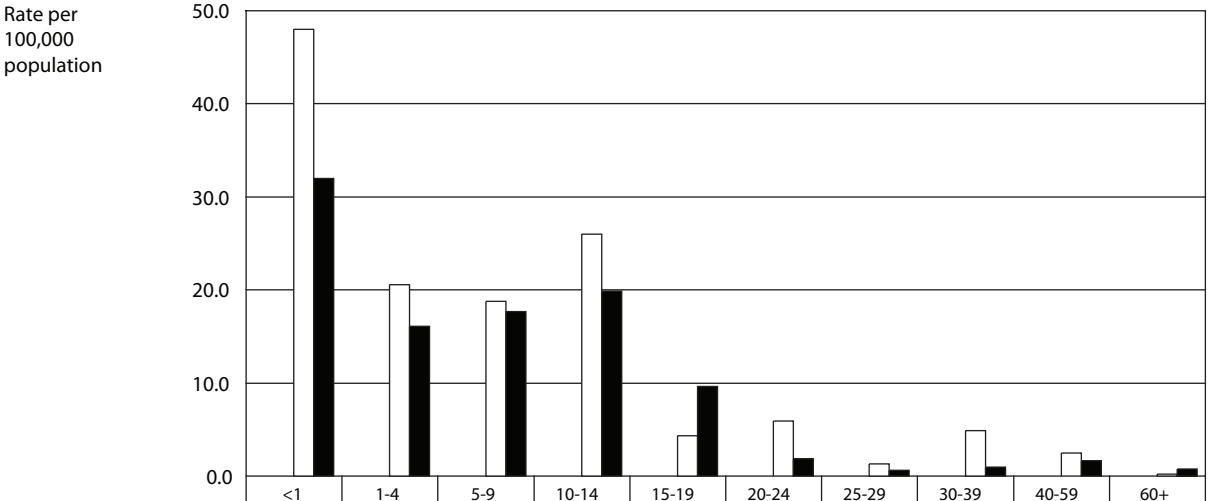
7.2 Pertussis Rates by HSDA, 2008



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	0	0.0
12	Kootenay Boundary	0	0.0
13	Okanagan	4	1.1
14	Thompson Cariboo Shuswap	5	2.2
21	Fraser East	7	2.5
22	Fraser North	6	1.0
23	Fraser South	27	3.9
31	Richmond	6	3.2
32	Vancouver	15	2.4
33	North Shore/Coast Garibaldi	36	12.9
41	South Vancouver Island	62	16.8
42	Central Vancouver Island	6	2.3
43	North Vancouver Island	30	24.6
51	Northwest	20	26.0
52	Northern Interior	5	3.5
53	Northeast	2	2.9

Note: Map classification by Jenks natural breaks method.

7.3 Pertussis Rates by Age Group and Sex, 2008



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Pertussis Reports - Female	10	17	20	32	6	9	2	15	17	1
Pertussis Reports - Male	7	14	20	26	14	3	1	3	11	3
□ Pertussis Rate - Female	48.0	20.6	18.8	26.0	4.4	5.9	1.3	4.9	2.5	0.2
■ Pertussis Rate - Male	32.0	16.1	17.7	19.9	9.7	1.9	0.6	1.0	1.6	0.7

Pneumococcal Disease (invasive)

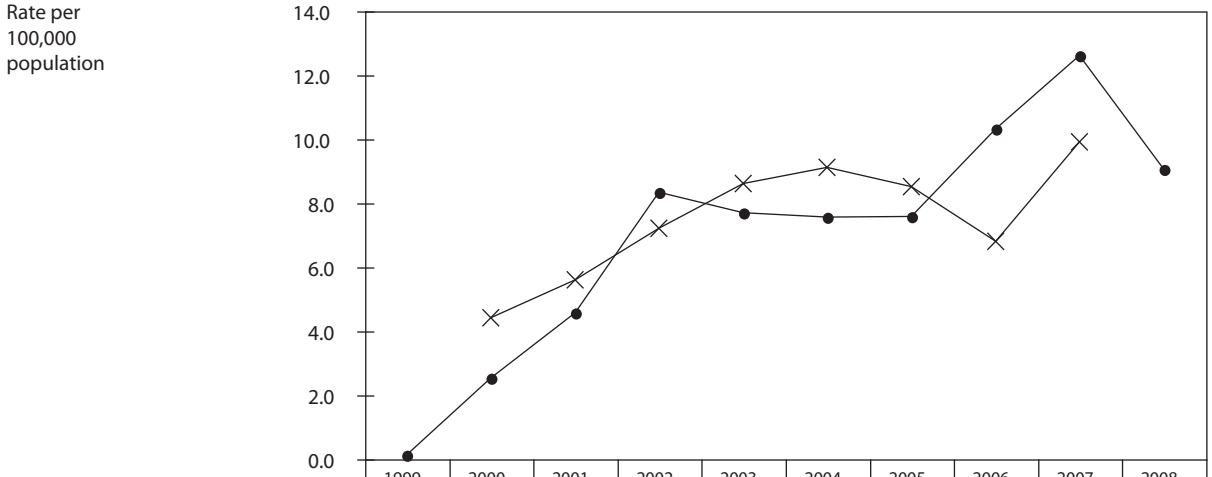
The rate of invasive pneumococcal disease (IPD) decreased in 2008 to 9.1 reports per 100,000 population compared to 12.6 per 100,000 in 2007. The increase in cases in 2006 and 2007 were driven by two outbreaks of IPD. The first was a geographically concentrated outbreak of serotype 5 disease identified by Providence Health Care and Vancouver Coastal Health Authority.[1] The outbreak occurred mainly in the fall of 2006 but continued into the beginning months of 2007. The second outbreak was also serotype 5 disease in the Interior Health Authority of BC occurring mainly in the Kelowna area.[2] Both of these outbreaks were focused among indigent and drug using populations. As a result of these two outbreaks, homelessness and illicit drug use have been added to the indications for publicly funded pneumococcal polysaccharide vaccine in BC.

Rates of IPD among children < 5 years old in British Columbia have fallen by 70% since the introduction of conjugate pneumococcal vaccine (from 54.6 per 100,000 to 16.4 per 100,000 in 2008). Compared to 2007, rates in the 1–4 year old age group have decreased slightly from 16.8 per 100,000 in 2007 to 14.1 per 100,000 in 2008. In 2007, rates were 9.6 per 100,000 in the <1 year age group. In 2008 they rose to 18.8 per 100,000, which represents an increase from 4 cases in 2007 to 8 cases in 2008. Of the 8 cases reported in 2008, 4 were PCV-7 serotypes (three 19F and one 6B). None of the cases were vaccinated prior to infection.

1. Romney M, Hull M, Gustafson R *et al.* Large Community Outbreak of Streptococcus pneumoniae serotype 5 invasive infections in an impoverished urban population. Clinical Infectious Diseases 2008; 47:768-774.

2. Kozoriz K, Fraser J, McKay D, Grunert B, Ferris D, Parker R. Serotype 5 Invasive Pneumococcal Disease Outbreak – Kelowna, British Columbia, Canada. Canada Communicable Disease Report, 4 January 2008; http://www.phac-aspc.gc.ca/ccdrw-rmtch/2008/r0108-eng.php.

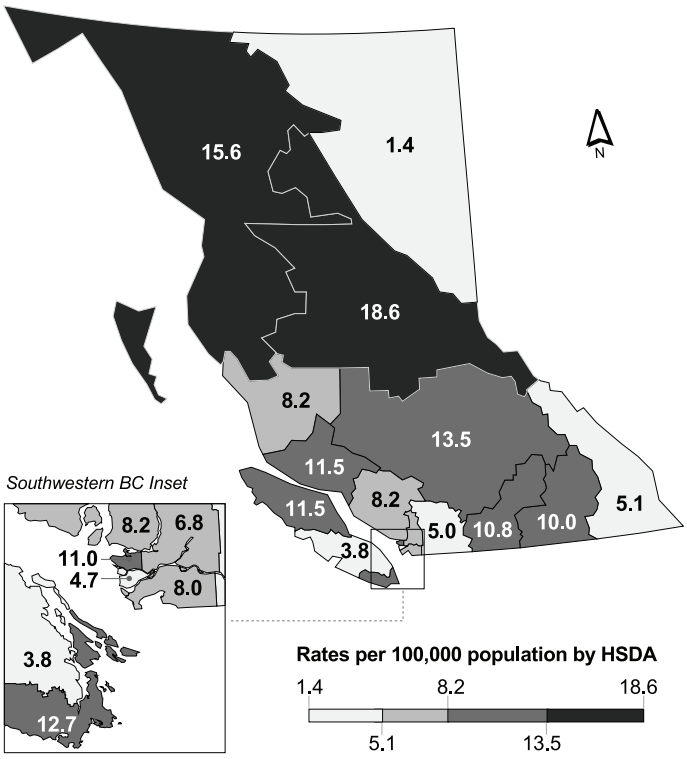
8.1 Pneumococcal Disease (invasive) Rates by Year, 1999–2008



	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
BC Invasive Pneumococcal Reports	5	102	186	343	319	318	323	446	552	402
BC Invasive Pneumococcal Rate	0.1	2.5	4.6	8.3	7.7	7.6	7.6	10.3	12.6	9.1
Canadian Invasive Pneumococcal Rate		4.4	5.6	7.2	8.6	9.1	8.5	6.8	9.9	

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

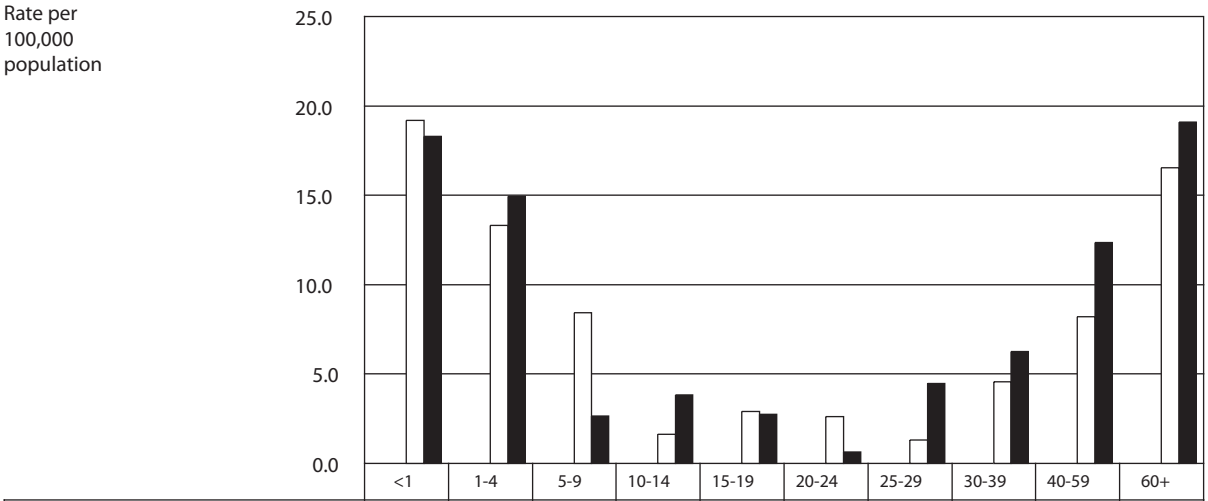
8.2 Pneumococcal Disease (invasive) Rates by HSDA, 2008



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	4	5.1
12	Kootenay Boundary	8	10.0
13	Okanagan	38	10.8
14	Thompson Cariboo Shuswap	30	13.5
21	Fraser East	14	5.0
22	Fraser North	40	6.8
23	Fraser South	55	8.0
31	Richmond	9	4.7
32	Vancouver	70	11.0
33	North Shore/Coast Garibaldi	23	8.2
41	South Vancouver Island	47	12.7
42	Central Vancouver Island	10	3.8
43	North Vancouver Island	14	11.5
51	Northwest	12	15.6
52	Northern Interior	27	18.6
53	Northeast	1	1.4

Note: Map classification by Jenks natural breaks method.

8.3 Pneumococcal Disease (invasive) Rates by Age Group and Sex, 2008



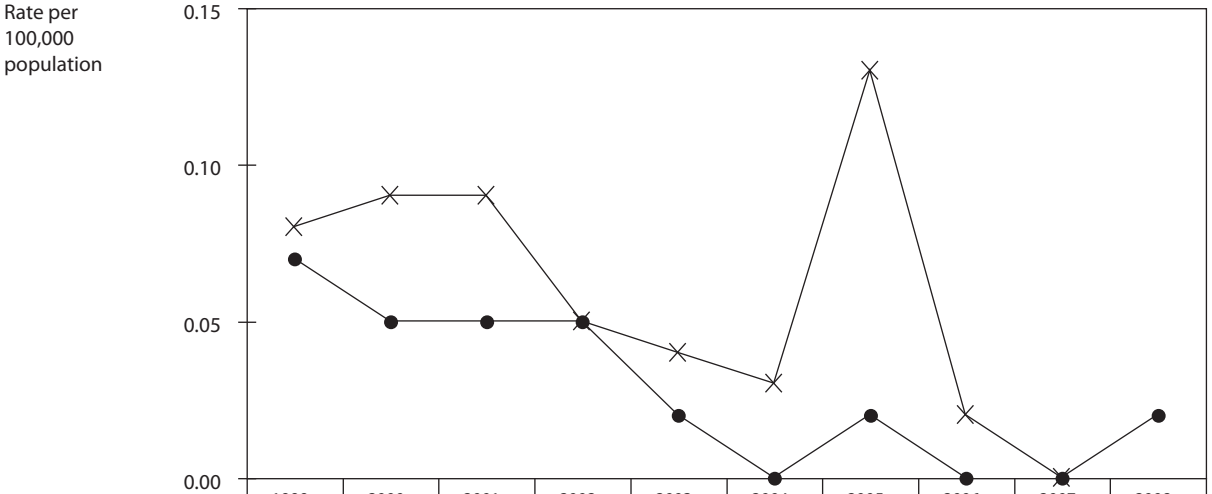
	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Invasive Pneumococcal Reports - Female	4	11	9	2	4	4	2	14	56	78
Invasive Pneumococcal Reports - Male	4	13	3	5	4	1	7	19	83	79
□ Invasive Pneumococcal Rate - Female	19.2	13.3	8.4	1.6	2.9	2.6	1.3	4.6	8.2	16.5
■ Invasive Pneumococcal Rate - Male	18.3	14.9	2.7	3.8	2.8	0.6	4.5	6.3	12.4	19.1

Rubella and Congenital Rubella Syndrome

One case of rubella occurred in a BC resident in 2008. This case resided on a college/ university campus, was a female in her mid-20s, and a student from SE Asia. She had no known rubella exposures, including no known travel during her incubation period. She had classic rubella symptoms, including a maculopapular rash, and was confirmed by serological testing for IgM as well as IgG seroconversion. No other cases of rubella were reported in BC during this time, including among visitors.

There were no reported cases of congenital rubella syndrome.

9.1 Rubella Rates by Year, 1999–2008

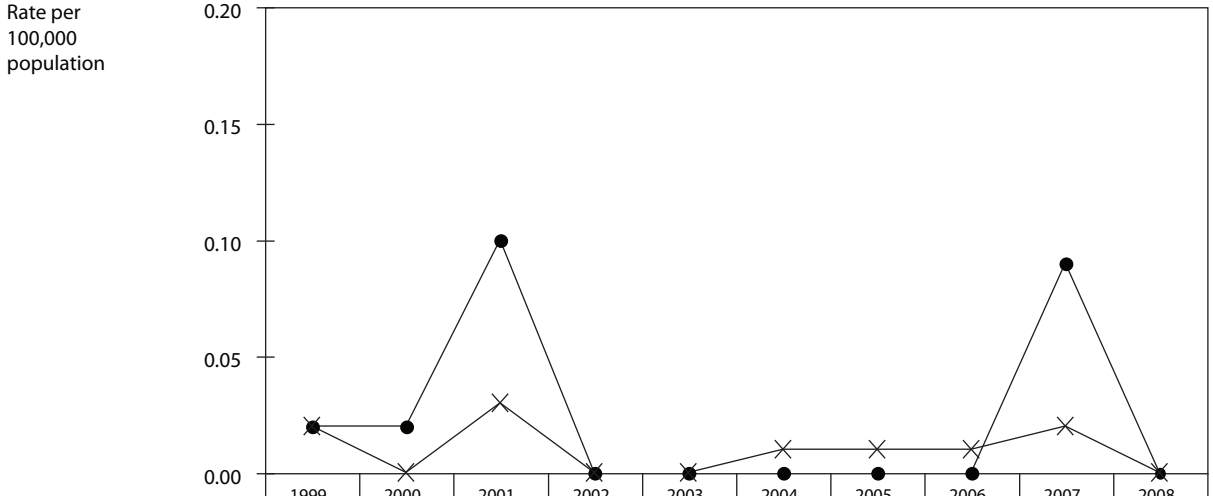


	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
BC Rubella Reports	3	2	2	2	1	0	1	0	0	1
BC Rubella Rate	0.07	0.05	0.05	0.05	0.02	0.00	0.02	0.00	0.00	0.02
Canadian Rubella Rate	0.08	0.09	0.09	0.05	0.04	0.03	0.13	0.02	0.00	

Tetanus

There were no cases of tetanus reported in BC in 2008.
The temporal trend of tetanus is shown in Figure 10.1.

10.1 Tetanus Rates by Year, 1999–2008



	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
BC Tetanus Reports	1	1	4	0	0	0	0	0	4	0
BC Tetanus Rate	0.02	0.02	0.10	0.00	0.00	0.00	0.00	0.00	0.09	0.00
Canadian Tetanus Rate	0.02	0.00	0.03	0.00	0.00	0.01	0.01	0.01	0.02	0.00

sexually transmitted and bloodborne pathogens

HIV

AIDS

Genital Chlamydia

Gonorrhea

Hepatitis C

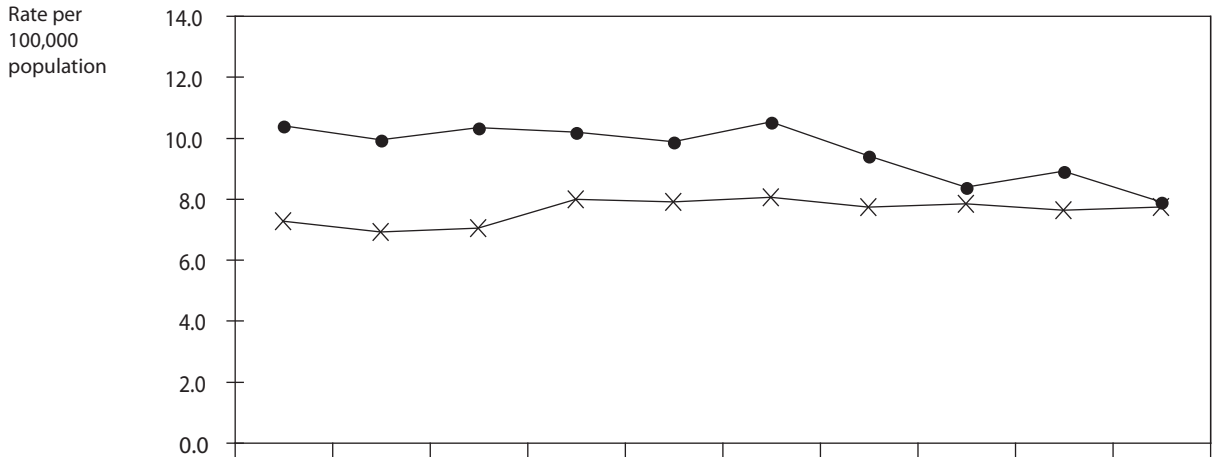
Infectious Syphilis

HIV

The rate of new positive HIV tests decreased in 2008 to 7.9 (350 cases) from 8.9 per 100,000 (389 cases) in 2007, with a decreased number of HIV cases among both males and females. There was one perinatally-acquired case of HIV infection in 2008. Trends are variable by Health Service Delivery Area (HSDA); the highest rate of new positive HIV tests was in Vancouver HSDA (28.0 per 100,000; 178 cases), followed by Northwest HSDA (16.9 per 100,000; 13 cases) and Kootenay Boundary HSDA (8.8 per 100,000; 7 cases). While new positive HIV test rates have declined overall in BC from a peak in 2004, this may in part be attributed to reportability of HIV and enhanced follow-up of all HIV test results starting in 2003.[1]

1. See *2006 British Columbia Annual Summary of Reportable Diseases* (p.31) for further explanation.

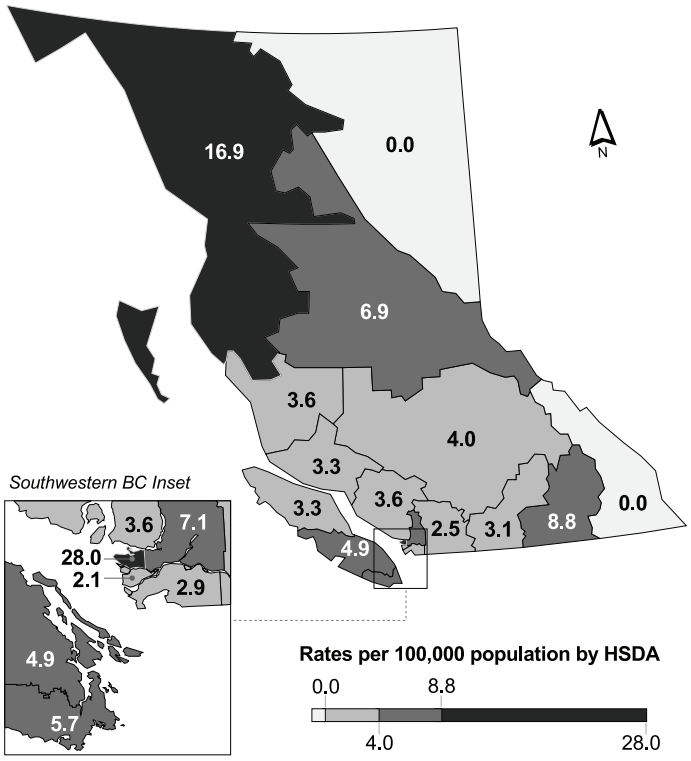
11.1 HIV Rates by Year, 1999–2008



	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008*
BC HIV Reports	416	400	420	418	409	441	400	361	389	350
BC HIV Rate	10.4	9.9	10.3	10.2	9.8	10.5	9.4	8.4	8.9	7.9
Canadian HIV Rate	7.2	6.9	7.1	7.9	7.8	7.9	7.7	7.8	7.6	7.7

*2008 Canadian rates are projected based on positive test reports to June 2008 from the Public Health Agency of Canada (2009) and are subject to change.

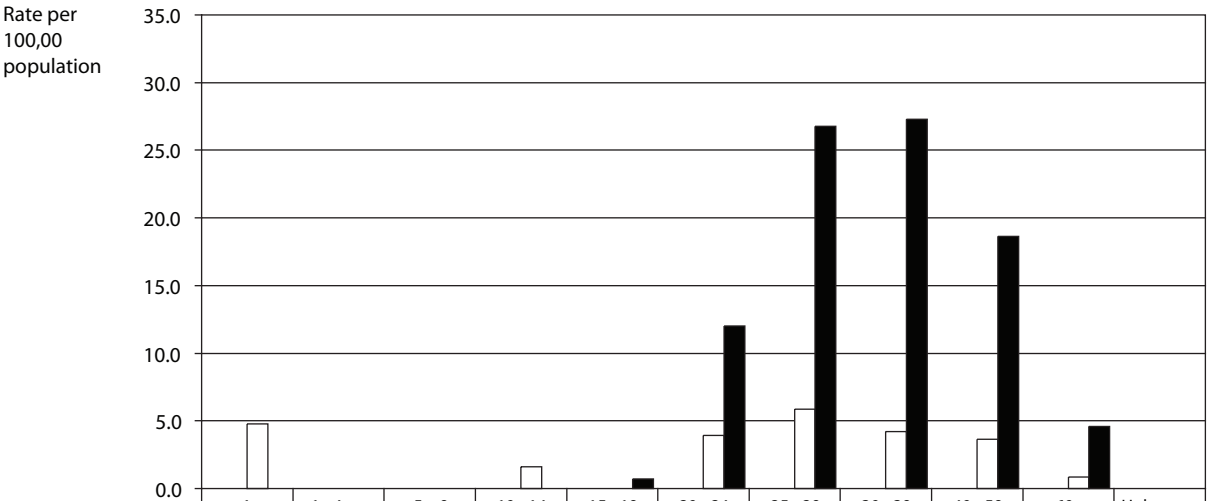
11.2 HIV Rates by HSDA, 2008



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	0	0.0
12	Kootenay Boundary	7	8.8
13	Okanagan	11	3.1
14	Thompson Cariboo Shuswap	9	4.0
21	Fraser East	7	2.5
22	Fraser North	42	7.1
23	Fraser South	20	2.9
31	Richmond	4	2.1
32	Vancouver	178	28.0
33	North Shore/Coast Garibaldi	10	3.6
41	South Vancouver Island	21	5.7
42	Central Vancouver Island	13	4.9
43	North Vancouver Island	4	3.3
51	Northwest	13	16.9
52	Northern Interior	10	6.9
53	Northeast	0	0.0

Note: Map classification by Jenks natural breaks method.

11.3 HIV Rates by Age Group and Sex, 2008

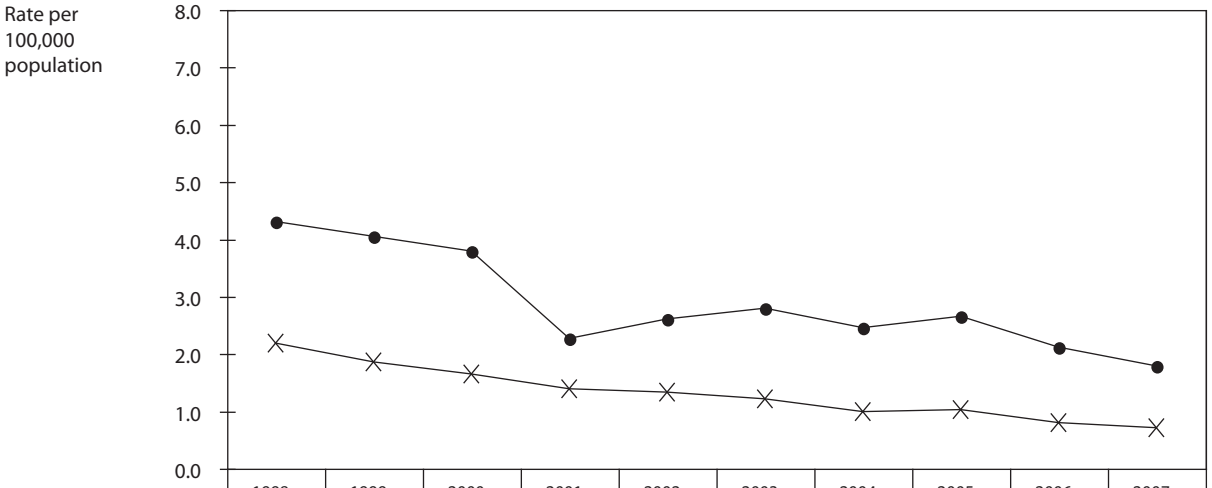


	< 1 yr	1 - 4 yrs	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 39	40 - 59	60+	Unknown
HIV Reports - Female	1	0	0	2	0	6	9	13	25	4	0
HIV Reports - Male	0	0	0	0	1	19	42	83	125	19	0
□ HIV Rate - Female	4.8	0.0	0.0	1.6	0.0	3.9	5.9	4.2	3.7	0.8	
■ HIV Rate - Male	0.0	0.0	0.0	0.0	0.7	12.0	26.8	27.3	18.6	4.6	

AIDS

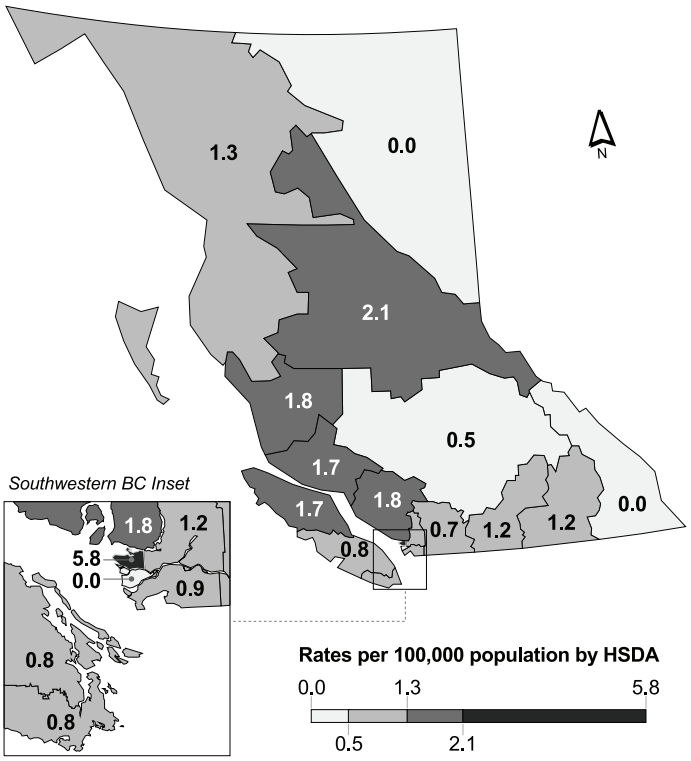
Due to the expected delays associated with AIDS reporting, this 2008 report includes data on AIDS through 2007 only. In 2007, the AIDS rate in BC declined to 1.8 per 100,000 (78 cases) from 2.1 per 100,000 (91 cases) in 2006. The majority of AIDS cases occurred in males, with the greatest concentration in males aged 30–59. The highest rate was recorded in Vancouver HSDA (5.8 per 100,000; 36 cases) followed by Northern Interior HSDA (2.1 per 100,000; 3 cases).

12.1 AIDS Rates by Year, 1998–2007



	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
BC AIDS Reports	171	162	153	92	107	116	103	113	91	78
BC AIDS Rate	4.3	4.0	3.8	2.3	2.6	2.8	2.5	2.7	2.1	1.8
Canadian AIDS Rate	2.1	1.8	1.6	1.4	1.3	1.2	1.0	1.1	0.9	0.8

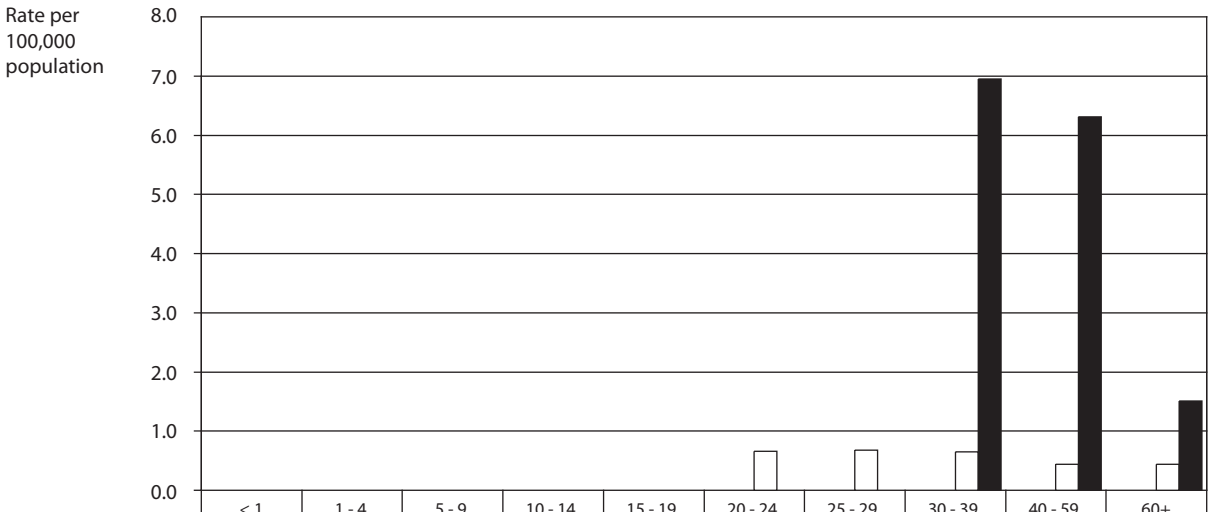
12.2 AIDS Rates by HSDA, 2007



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	0	0.0
12	Kootenay Boundary	1	1.2
13	Okanagan	4	1.2
14	Thompson Cariboo Shuswap	1	0.5
21	Fraser East	2	0.7
22	Fraser North	7	1.2
23	Fraser South	6	0.9
31	Richmond	0	0.0
32	Vancouver	36	5.8
33	North Shore/Coast Garibaldi	5	1.8
41	South Vancouver Island	3	0.8
42	Central Vancouver Island	2	0.8
43	North Vancouver Island	2	1.7
51	Northwest	1	1.3
52	Northern Interior	3	2.1
53	Northeast	0	0.0

Note: Map classification by Jenks natural breaks method.

12.3 AIDS Rates by Age Group and Sex, 2007

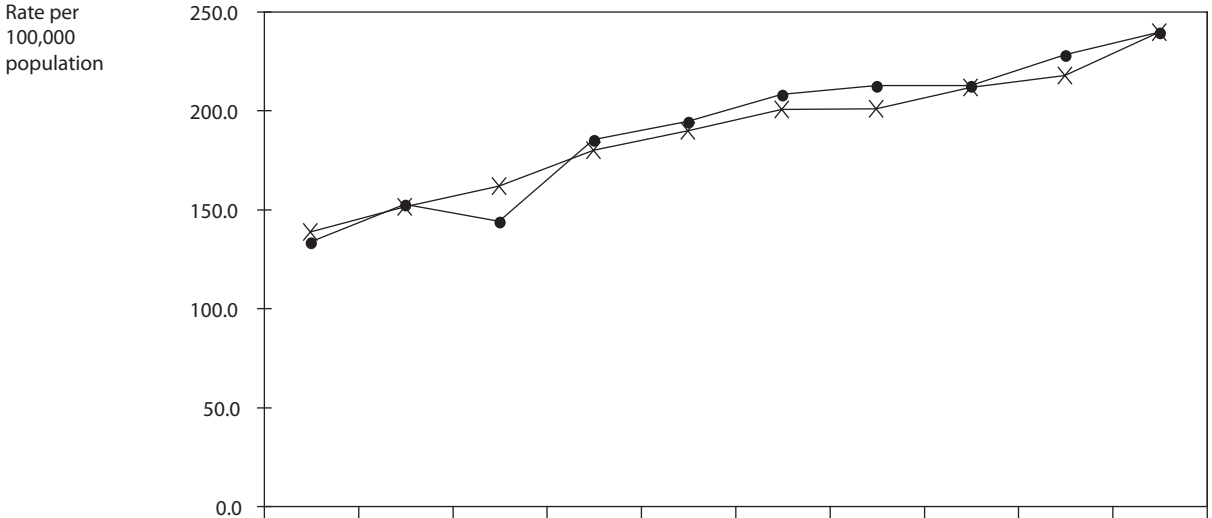


	< 1	1 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 39	40 - 59	60+
AIDS Reports - Female	0	0	0	0	0	1	1	2	3	2
AIDS Reports - Male	0	0	0	0	0	0	0	21	42	6
□ AIDS Rate - Female	0.0	0.0	0.0	0.0	0.0	0.7	0.7	0.7	0.4	0.4
■ AIDS Rate - Male	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.9	6.3	1.5

Chlamydia (anogenital)

Chlamydia rates in BC continue to increase in parallel with Canadian rates, to 239.3 per 100,000 (10,629 cases) in 2008. 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 1475.9 and 1743.3 per 100,000 respectively. Increased rates have been observed in almost all Health Service Delivery Areas (HSDAs), with the greatest rates observed in Northern Interior HSDA (416.5 per 100,000; 603 cases) and Northwest HSDA (328.0 per 100,000; 252 cases).

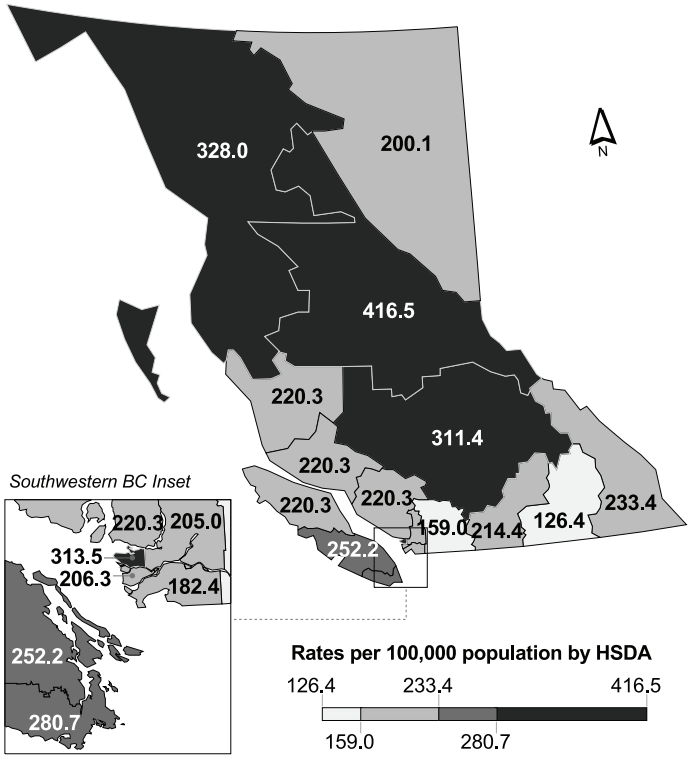
13.1 Genital Chlamydia Rates by Year, 1999–2008



	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008*
BC Chlamydia Reports	5,343	6,150	5,855	7,603	8,071	8,733	9,045	9,172	9,971	10,629
BC Chlamydia Rate	133.2	152.3	143.6	184.7	194.2	207.7	212.3	212.3	227.6	239.3
Canadian Chlamydia Rate	138.2	150.9	161.4	179.4	189.4	200.1	200.4	211.4	217.3	239.3

2008 Canadian rate is projected and is subject to change (Public Health Agency of Canada, 2009).

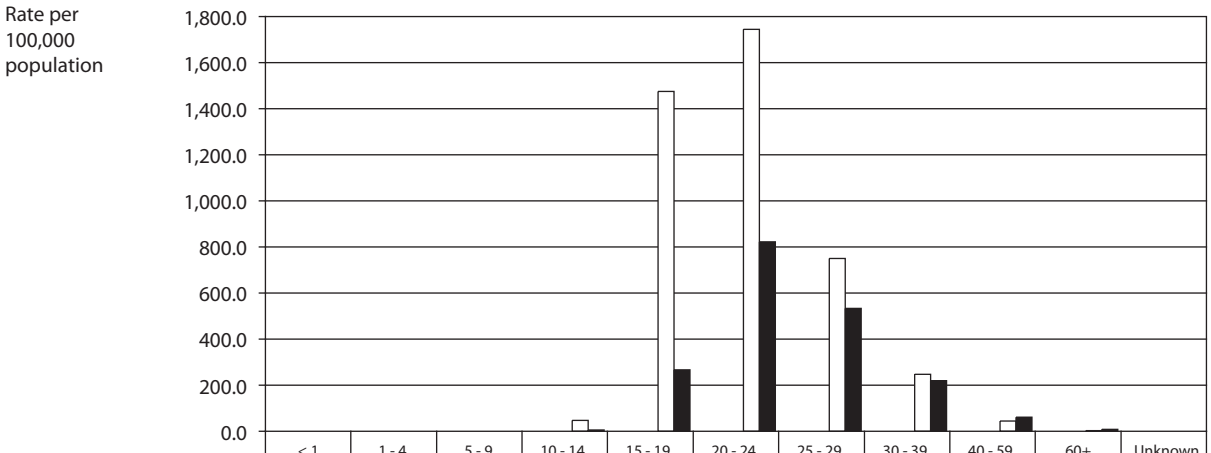
13.2 Genital Chlamydia Rates by HSDA, 2008



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	184	233.4
12	Kootenay Boundary	101	126.4
13	Okanagan	751	214.4
14	Thompson Cariboo Shuswap	694	311.4
21	Fraser East	444	159.0
22	Fraser North	1210	205.0
23	Fraser South	1253	182.4
31	Richmond	391	206.3
32	Vancouver	1996	313.5
33	North Shore/Coast Garibaldi	615	220.3
41	South Vancouver Island	1037	280.7
42	Central Vancouver Island	671	252.2
43	North Vancouver Island	269	220.3
51	Northwest	252	328.0
52	Northern Interior	603	416.5
53	Northeast	138	200.1

Note: Map classification by Jenks natural breaks method.

13.3 Genital Chlamydia Rates by Age Group and Sex, 2008

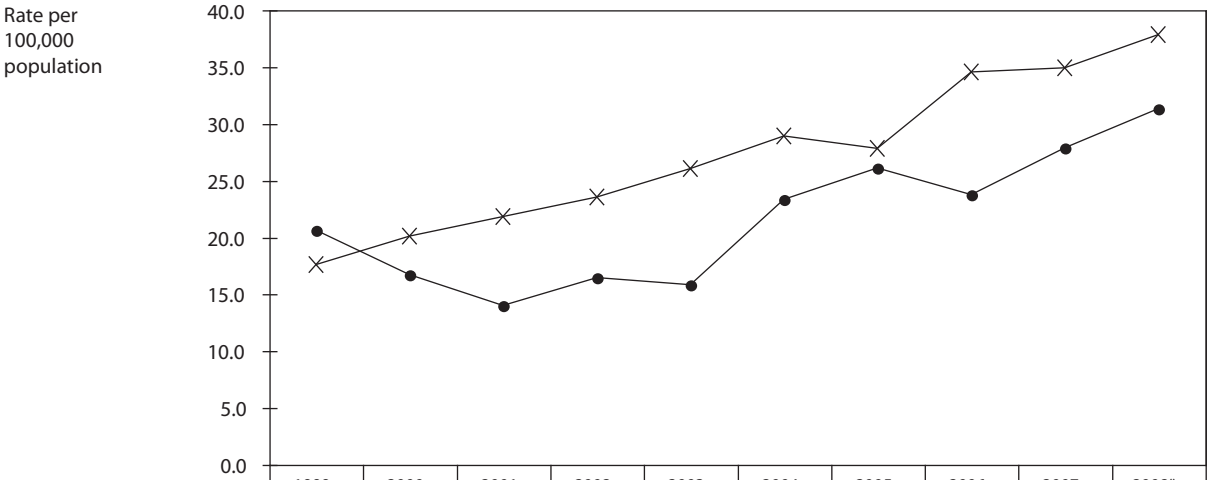


	< 1	1 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 39	40 - 59	60+	Unknown
Chlamydia Reports - Female	0	0	0	58	2,029	2,666	1,147	762	305	7	11
Chlamydia Reports - Male	0	0	0	8	386	1,304	835	668	405	29	2
Chlamydia Reports - Transgender/Unknown	0	0	0	0	2.00	0.00	0	0	0	0	5
Chlamydia Rate - Female	0.0	0.0	0.0	47.1	1475.9	1743.3	749.9	247.5	44.6	1.5	
Chlamydia Rate - Male	0.0	0.0	0.0	6.1	266.3	823.3	532.2	219.7	60.3	7.0	

Gonorrhea (anogenital)

There has been an increasing trend in gonorrhea rates in BC, paralleling Canadian rates. The gonorrhea rate for BC increased in 2008 (31.3 per 100,000) from 2007 (27.9 per 100,000), reflecting an increase in case reports from 1220 to 1391. Increases were observed for both males and females; 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. Trends are variable by Health Service Delivery Area (HSDA); the highest rate was observed in Northern Interior HSDA (69.1 per 100,000; 100 cases) followed by Vancouver HSDA (60.6 per 100,000 HSDA; 386 cases).

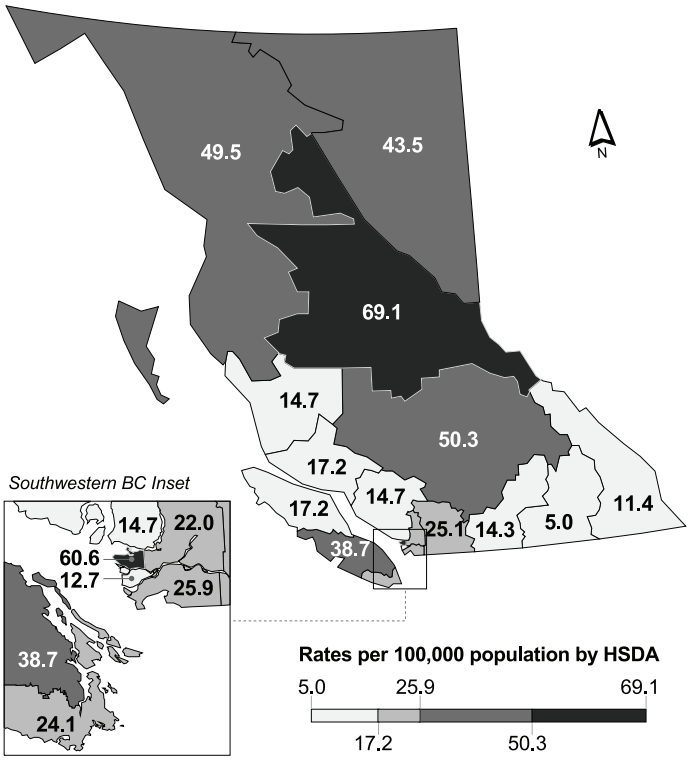
14.1 Gonorrhea Rates in BC by Year, 1999–2008



	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008*
BC Gonorrhea Reports	827	675	571	675	656	979	1,111	1,026	1,220	1,391
BC Gonorrhea Rate	20.6	16.7	14.0	16.4	15.8	23.3	26.1	23.7	27.9	31.3
Canadian Gonorrhea Rate	17.6	20.1	21.8	23.5	26.0	28.9	27.8	34.5	34.9	37.8

*2008 Canadian rate is projected and is subject to change (Public Health Agency of Canada, 2009).

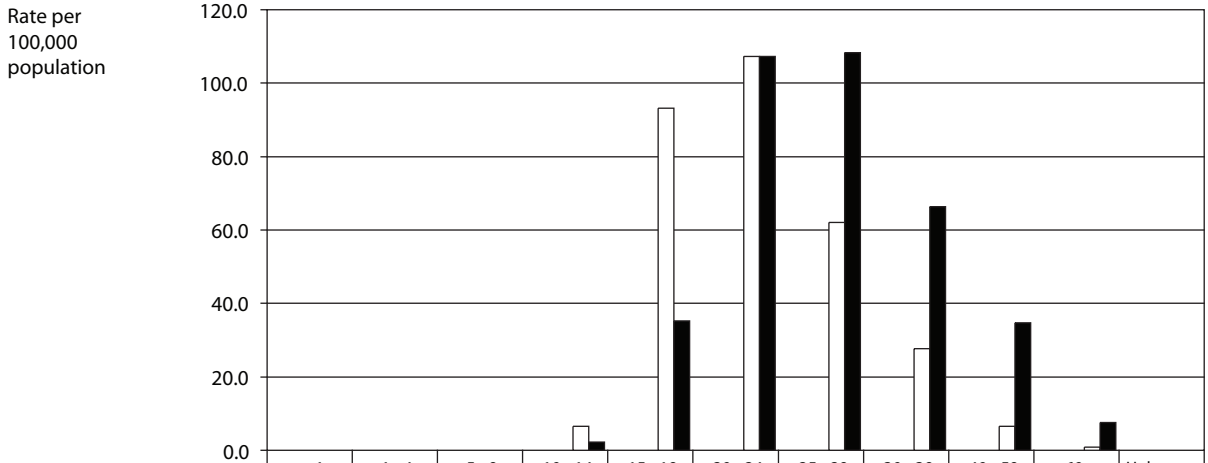
14.2 Gonorrhea Rates by HSDA, 2008



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	9	11.4
12	Kootenay Boundary	4	5.0
13	Okanagan	50	14.3
14	Thompson Cariboo Shuswap	112	50.3
21	Fraser East	70	25.1
22	Fraser North	130	22.0
23	Fraser South	178	25.9
31	Richmond	24	12.7
32	Vancouver	386	60.6
33	North Shore/Coast Garibaldi	41	14.7
41	South Vancouver Island	89	24.1
42	Central Vancouver Island	103	38.7
43	North Vancouver Island	21	17.2
51	Northwest	38	49.5
52	Northern Interior	100	69.1
53	Northeast	30	43.5

Note: Map classification by Jenks natural breaks method.

14.3 Gonorrhea Rates by Age Group and Sex, 2008



	< 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	8	128	164	95	85	45	4	0
Gonorrhea Reports - Male	0	0	0	3	51	170	170	202	233	31	0
Gonorrhea Reports - Transgender/Unknown	0	0	0	0	0	0	0	0	1	0	1
□ Gonorrhea Rate - Female	0.0	0.0	0.0	6.5	93.1	107.2	62.1	27.6	6.6	0.8	
■ Gonorrhea Rate - Male	0.0	0.0	0.0	2.3	35.2	107.3	108.4	66.4	34.7	7.5	

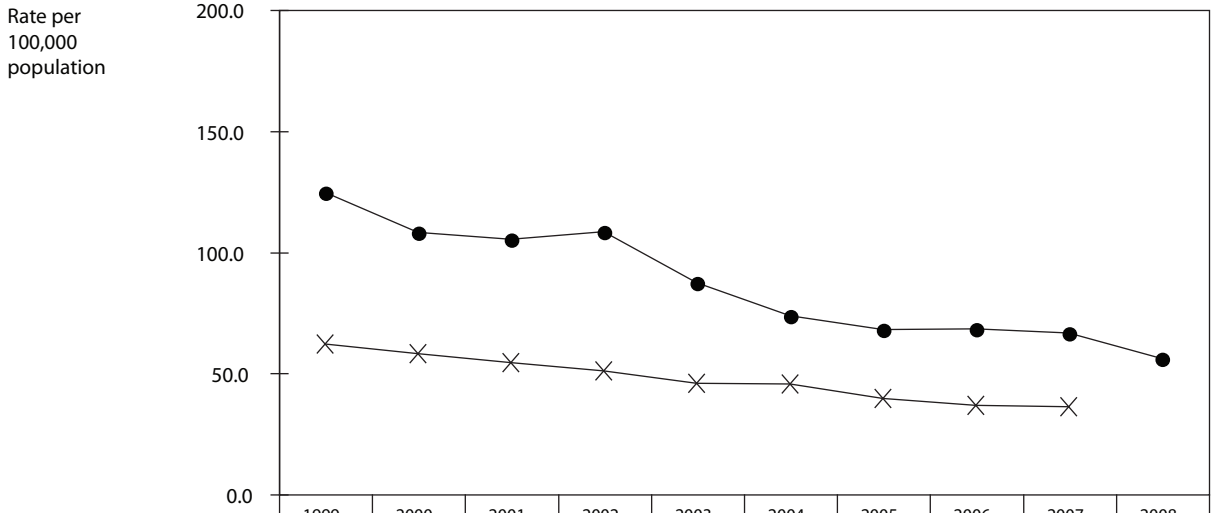
Hepatitis C

The annual number of cases of hepatitis C reported in BC continued to decline in 2008. Newly identified cases of hepatitis C infection may be persons who have been recently infected, persons with chronic hepatitis C infection who are tested due to symptoms of liver disease or persons tested due to past or ongoing risk factors. In 2008, a total of 2,479 cases were reported for a rate of 55.8 per 100,000 population. Although declining, this rate remains considerably above the Canadian rate.

Seven cases were reported in children aged less than 10 years; these infections were likely to have been transmitted vertically from mother to infant during pregnancy and delivery. Although overall more cases were reported in males (64%), cases and rates in females in the 15–19 and 20–24 year age groups exceeded their male counterparts. This may indicate a higher rate of hepatitis C in females in these age groups, but may in part reflect testing patterns.

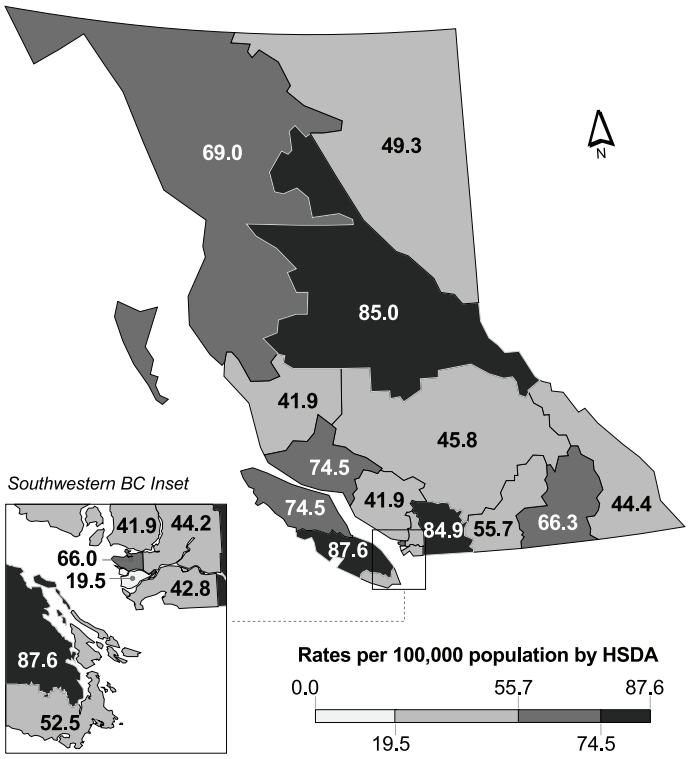
Vancouver Health Service Delivery Area (HSDA) had the largest number of cases (420) of hepatitis C reported in 2008. Richmond HSDA had the lowest rate at 19.5 cases per 100,000. All other HSDAs had rates above 40 cases per 100,000. Three HSDAs (Fraser East, Northern Interior and Central Vancouver Island) had rates between 80 and 90 cases 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.

15.1 Hepatitis C Rates by Year, 1999–2008



	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
BC Hepatitis C Reports	4984	4359	4282	4446	3617	3086	2879	2935	2898	2479
BC Hepatitis C Rate	124.3	107.9	105.0	108.0	87.0	73.4	67.6	67.9	66.2	55.8
Canadian Hepatitis C Rate	61.7	57.8	54.1	50.7	45.5	45.1	39.3	36.5	35.8	

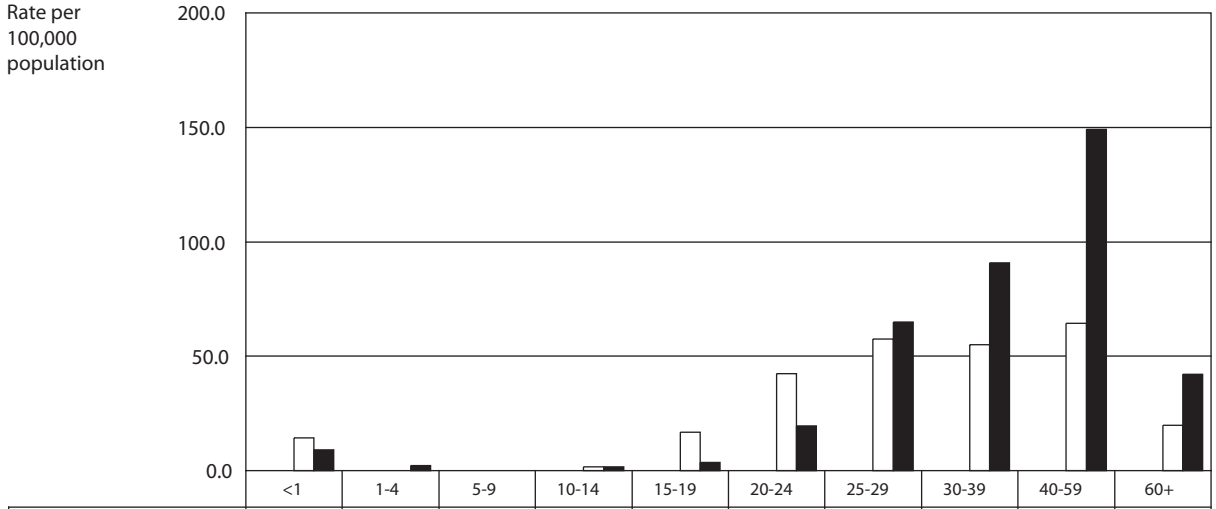
15.2 Hepatitis C Rates by HSDA, 2008



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	35	44.4
12	Kootenay Boundary	53	66.3
13	Okanagan	195	55.7
14	Thompson Cariboo Shuswap	102	45.8
21	Fraser East	237	84.9
22	Fraser North	261	44.2
23	Fraser South	294	42.8
31	Richmond	37	19.5
32	Vancouver	420	66.0
33	North Shore/Coast Garibaldi	117	41.9
41	South Vancouver Island	194	52.5
42	Central Vancouver Island	233	87.6
43	North Vancouver Island	91	74.5
51	Northwest	53	69.0
52	Northern Interior	123	85.0
53	Northeast	34	49.3

Note: Map classification by Jenks natural breaks method.

15.3 Hepatitis C Rates by Age Group and Sex, 2008



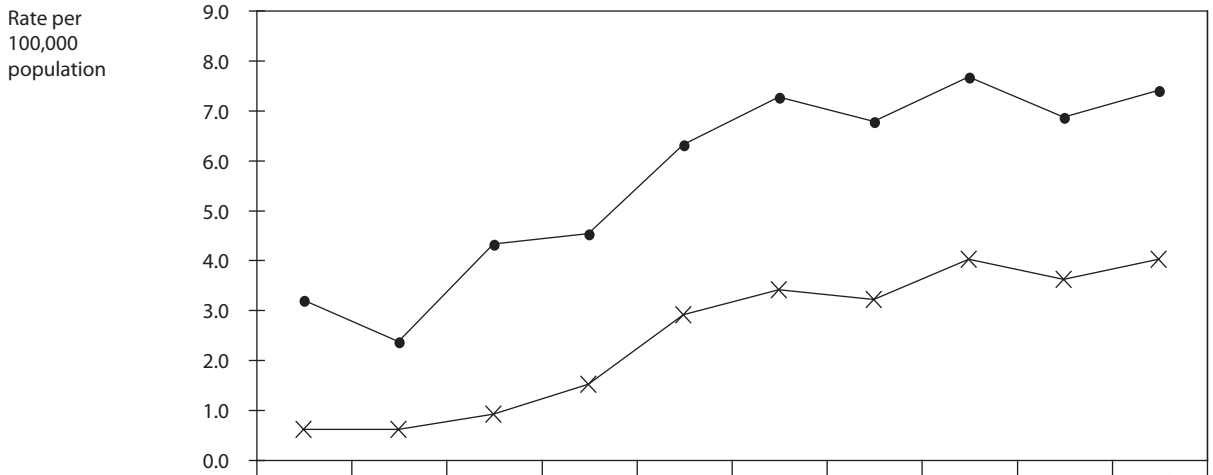
	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Hepatitis C Reports - Female	3	0	0	2	23	65	88	169	440	94
Hepatitis C Reports - Male	2	2	0	2	5	31	102	276	1001	174
□ Hepatitis C Rate - Female	14.4	0.0	0.0	1.6	16.7	42.5	57.5	54.9	64.4	19.9
■ Hepatitis C Rate - Male	9.1	2.3	0.0	1.5	3.5	19.6	65.0	90.8	149.1	42.1

Infectious Syphilis

The rate of infectious syphilis increased from 6.8 in 2007 to 7.4 per 100,000 population in 2008 reflecting an increase from 300 to 328 cases. Overall provincial rates of syphilis may be stabilizing following steady increases since 1997.

The majority of cases occurred among men, with the greatest concentration in men aged 25–59 years. Trends are variable by HSDA; the highest rate was observed in Vancouver HSDA (32.4 per 100,000; 206 cases).

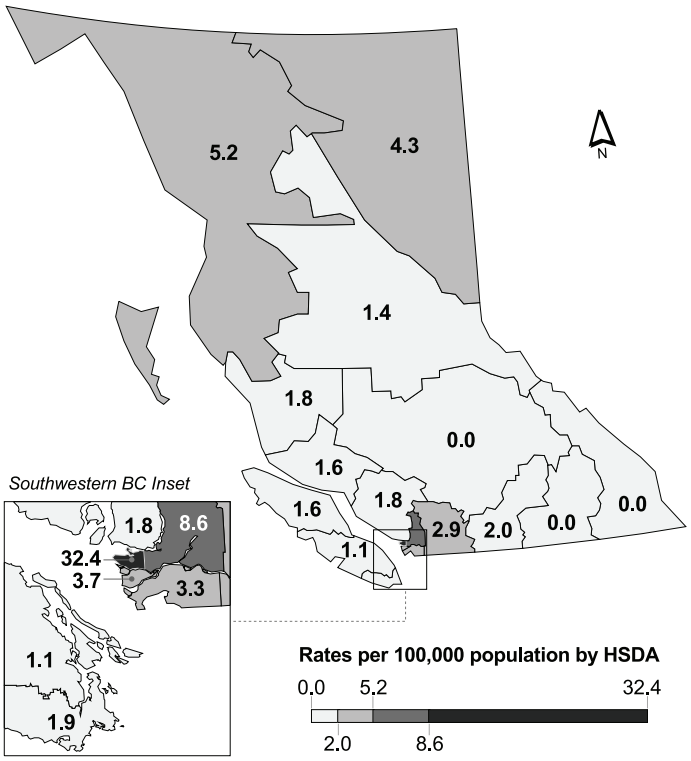
16.1 Infectious Syphilis Rates by Year, 1999–2008



	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008*
BC Syphilis Reports	128	95	176	186	262	305	288	331	300	328
BC Syphilis Rate	3.2	2.4	4.3	4.5	6.3	7.3	6.8	7.7	6.8	7.4
Canadian Syphilis Rate	0.6	0.6	0.9	1.5	2.9	3.4	3.2	4.0	3.6	4.0

*2008 Canadian rate is projected and is subject to change (Public Health Agency of Canada, 2009).

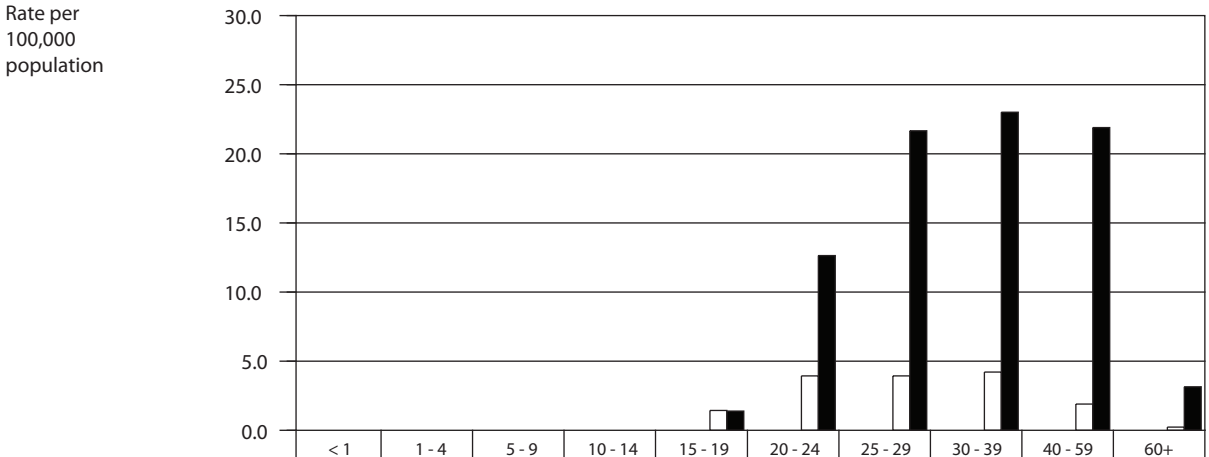
16.2 Infectious Syphilis Rates by HSDA, 2008



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	0	0.0
12	Kootenay Boundary	0	0.0
13	Okanagan	7	2.0
14	Thompson Cariboo Shuswap	0	0.0
21	Fraser East	8	2.9
22	Fraser North	51	8.6
23	Fraser South	23	3.3
31	Richmond	7	3.7
32	Vancouver	206	32.4
33	North Shore/Coast Garibaldi	5	1.8
41	South Vancouver Island	7	1.9
42	Central Vancouver Island	3	1.1
43	North Vancouver Island	2	1.6
51	Northwest	4	5.2
52	Northern Interior	2	1.4
53	Northeast	3	4.3

Note: Map classification by Jenks natural breaks method.

16.3 Infectious Syphilis Rates by Age Group and Sex, 2008



	< 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	2	6	6	13	13	1
Syphilis Reports - Male	0	0	0	0	2	20	34	70	147	13
Syphilis Reports - Transgender/Unknown	0	0	0	0	0	0	0	1	0	0
☐ Syphilis Rate - Female	0.0	0.0	0.0	0.0	1.5	3.9	3.9	4.2	1.9	0.2
■ Syphilis Rate - Male	0.0	0.0	0.0	0.0	1.4	12.6	21.7	23.0	21.9	3.1

Streptococcal Disease, invasive, Group A

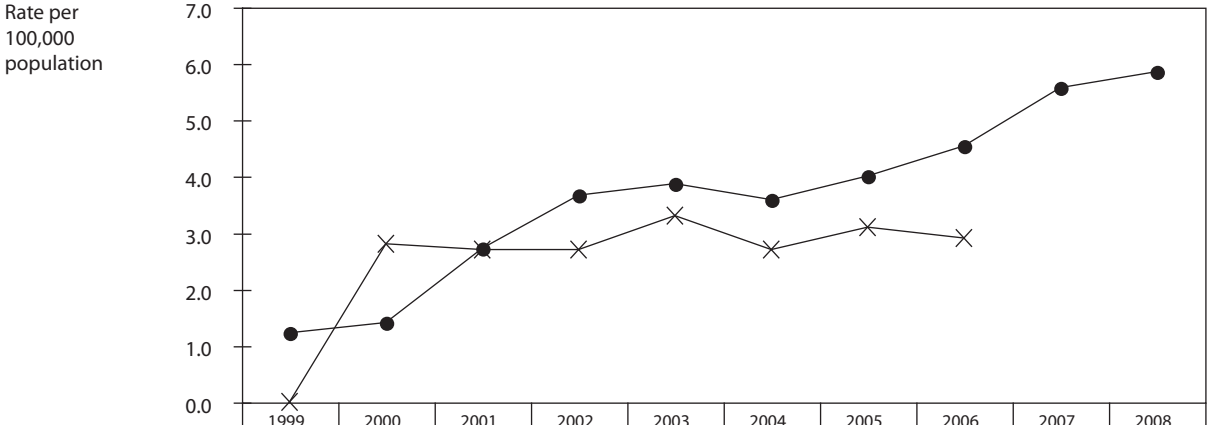
Tuberculosis

diseases transmitted by direct contact and respiratory routes

Streptococcal Disease (invasive) Group A

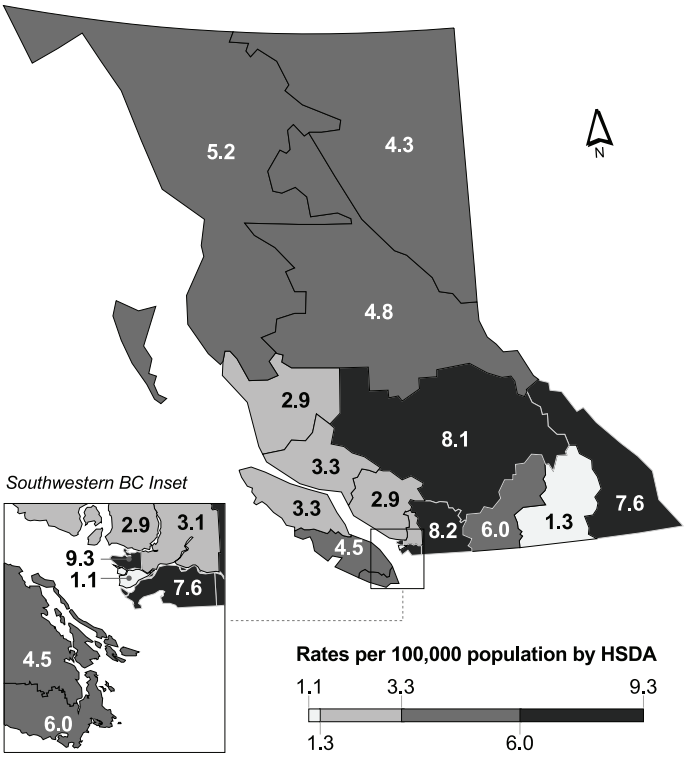
The rate of reported cases of invasive group A Streptococcal (iGAS) disease increased from 5.6 to 5.9 per 100, 000 from 2007 to 2008. This is the highest rate reported since the beginning of the enhanced surveillance program in 1998. Infants < 1 year of age had the highest rate per 100,000 (males, 22.9 and females, 4.8), followed by the age group of 40–59 years (males 10.0 per 100, 000, females 4.7 per 100, 000). Vancouver Health Service Delivery Area (HSDA) reported the highest rate of 9.3 per 100,000, followed by Fraser East HSDA with a rate of 8.2 per 100,000. Ten or 3.8% of cases were associated with toxic shock-like syndrome, lower than in prior years, and 24 cases (9.2%) were associated with necrotizing fasciitis (NF). NF-associated cases had accounted for 31% of iGAS in 2000 with subsequent declines to a low of 7% in 2007. This is suggestive of increased reporting of less severe cases over time. The case fatality among the 260 confirmed cases was 8.8% compared to 6.5% in 2007.

17.1 Streptococcal Disease (invasive) Group A Rates by Year, 1999–2008



	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
BC iGAS Reports	49	57	111	151	161	151	171	196	244	260
BC iGAS Rate	1.2	1.4	2.7	3.7	3.9	3.6	4.0	4.5	5.6	5.9
Canadian iGAS Rate	0.0	2.8	2.7	2.7	3.3	2.7	3.1	2.9		

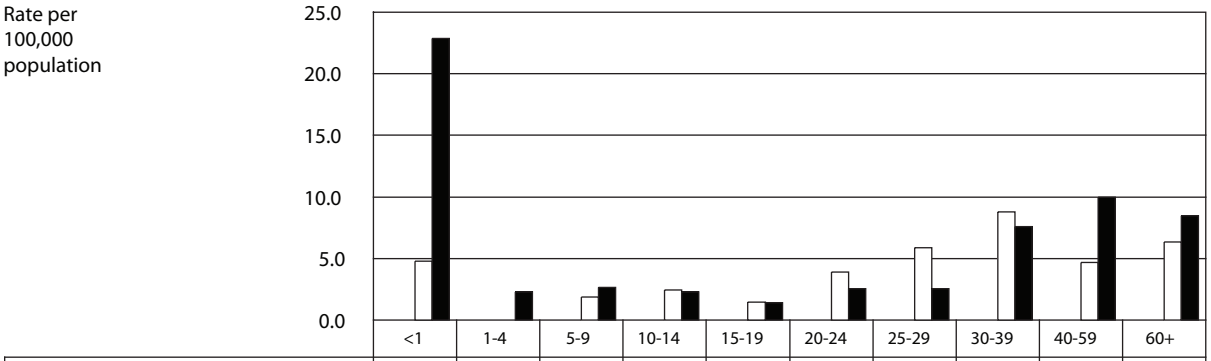
17.2 Streptococcal Disease (invasive) Group A Rates by HSDA, 2008



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	6	7.6
12	Kootenay Boundary	1	1.3
13	Okanagan	21	6.0
14	Thompson Cariboo Shuswap	18	8.1
21	Fraser East	23	8.2
22	Fraser North	18	3.1
23	Fraser South	52	7.6
31	Richmond	2	1.1
32	Vancouver	59	9.3
33	North Shore/Coast Garibaldi	8	2.9
41	South Vancouver Island	22	6.0
42	Central Vancouver Island	12	4.5
43	North Vancouver Island	4	3.3
51	Northwest	4	5.2
52	Northern Interior	7	4.8
53	Northeast	3	4.3

Note: Map classification by Jenks natural breaks method.

17.3 Streptococcal Disease (invasive) Group A Rates by Age Group and Sex, 2008



	<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	1	0	2	3	2	6	9	27	32	30
Streptococcal Disease, Group A, Invasive Reports - Male	5	2	3	3	2	4	4	23	67	35
Streptococcal Disease, Group A, Invasive Rate- Female	4.8	0.0	1.9	2.4	1.5	3.9	5.9	8.8	4.7	6.4
Streptococcal Disease, Group A, Invasive Rate- Male	22.9	2.3	2.7	2.3	1.4	2.5	2.6	7.6	10.0	8.5

Tuberculosis

In 2008 there were 303 cases of reported tuberculosis in British Columbia, for a rate of 6.8 per 100,000, a 3% increase in the number and 4% increase in the rate of reported cases compared to 2007.

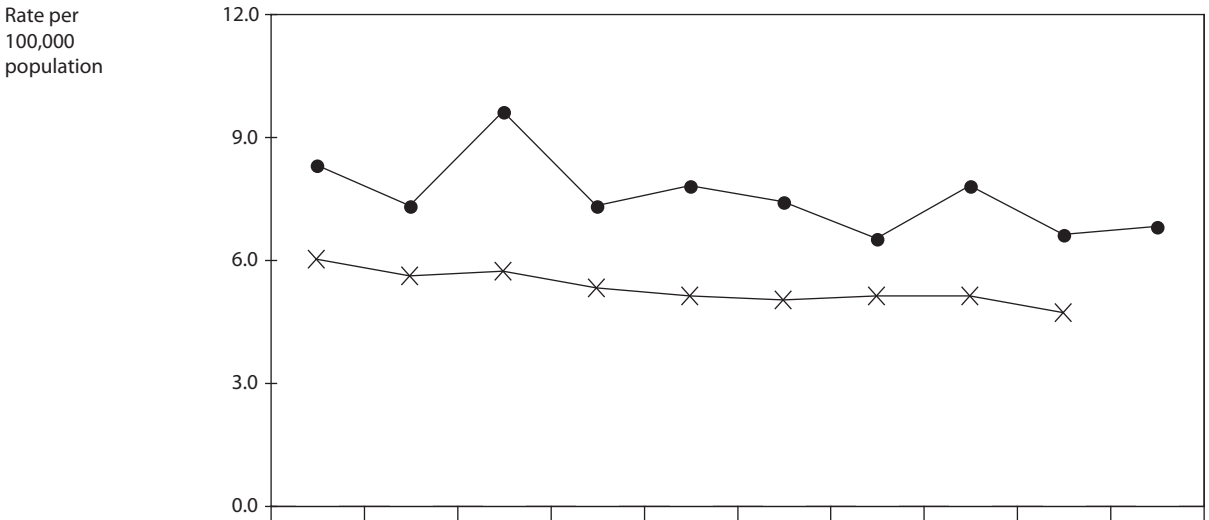
Rates for Health Regions vary across the province. The Richmond, Vancouver, Northwest, Northeast, Fraser South, Fraser North, and East Kootenay Health Service Delivery Areas have rates exceeding the provincial rate (6.8 per 100,000 population). The highest incidence was reported from Richmond and Vancouver (13.7 and 12.9 per 100,000 population respectively) while the lowest was in Kootenay Boundary and North Vancouver (1.3 and 1.6 per 100,000 population respectively).

Compared to 2007, the rate of tuberculosis decreased in Northern Interior, Vancouver, Central Vancouver Island, Fraser North, South Vancouver Island and North Shore/Coast Garibaldi and in all other health regions the rate of tuberculosis increased with East Kootenay showing the largest increase in the rate of tuberculosis (from 0 to 7.6 per 100,000 population).

The age specific rates are shown in Figure 18.3. Overall, the tuberculosis rate was higher in men than in women (7.4 versus 6.3 per 100,000). For the age group < 60 years the rate of tuberculosis was higher in women than in men (4.9 versus 4.0 per 100,000). In those 60 years and older, the rate of tuberculosis in men was higher than in women (10.8 versus 7.5 per 100,000).

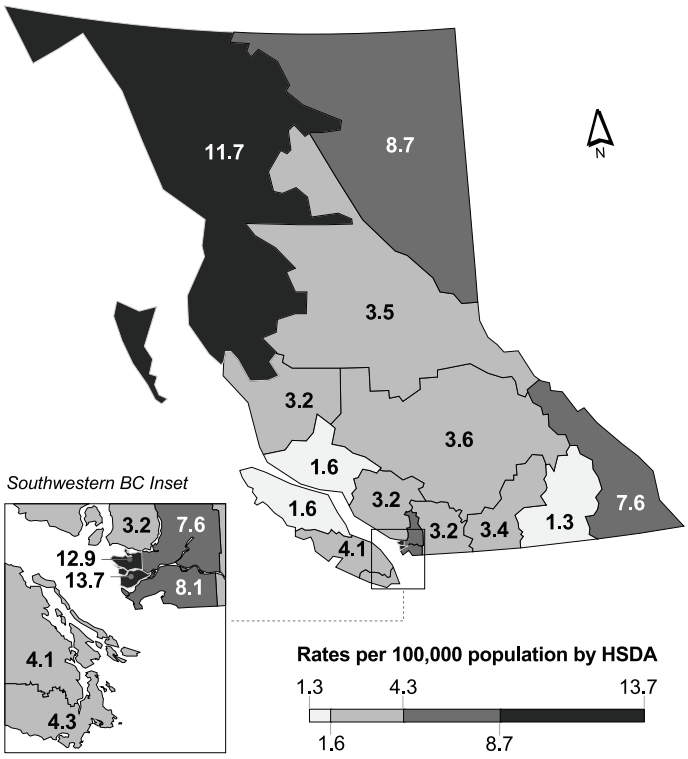
There is currently an outbreak of TB occurring in Kelowna involving predominately homeless people who use shelters. To date 12 active cases have been identified. Isolates from several have shown low levels of isoniazid resistance. Molecular epidemiologic techniques have confirmed that the cases tested to date are related.

18.1 Tuberculosis Rates by Year, 1999–2008



	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
BC Tuberculosis Cases	332	294	391	300	324	310	277	336	290	303
BC Tuberculosis Rate	8.3	7.3	9.6	7.3	7.8	7.4	6.5	7.8	6.6	6.8
Canadian Tuberculosis Rate	6.0	5.6	5.7	5.3	5.1	5.0	5.1	5.1	4.7	

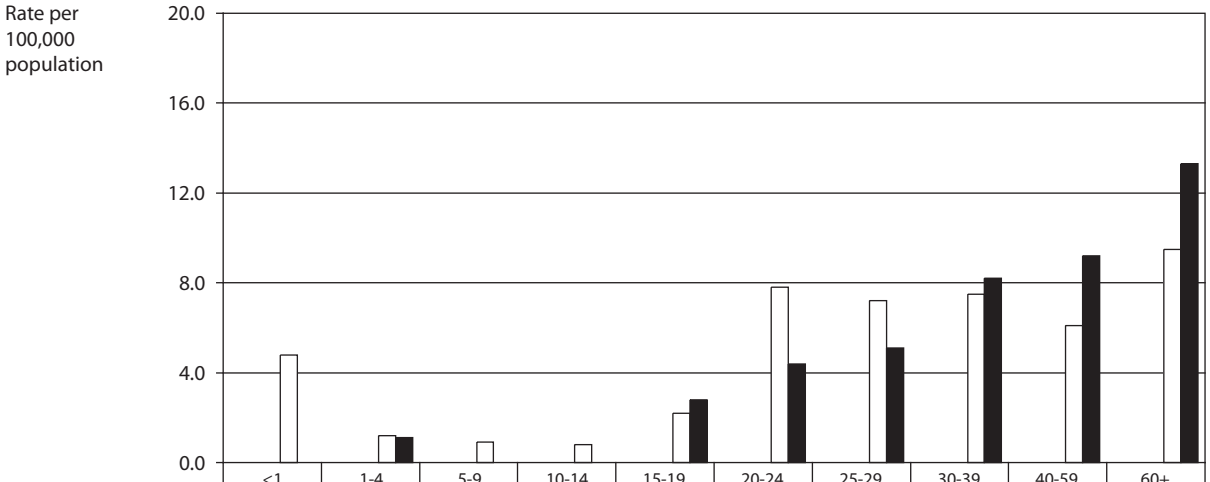
18.2 Tuberculosis Rates by HSDA, 2008



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	6	7.6
12	Kootenay Boundary	1	1.3
13	Okanagan	12	3.4
14	Thompson Cariboo Shuswap	8	3.6
21	Fraser East	9	3.2
22	Fraser North	45	7.6
23	Fraser South	56	8.1
31	Richmond	26	13.7
32	Vancouver	82	12.9
33	North Shore/Coast Garibaldi	9	3.2
41	South Vancouver Island	16	4.3
42	Central Vancouver Island	11	4.1
43	North Vancouver Island	2	1.6
51	Northwest	9	11.7
52	Northern Interior	5	3.5
53	Northeast	6	8.7

Note: Map classification by Jenks natural breaks method.

18.3 Tuberculosis Rates by Age Group and Sex, 2008



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Tuberculosis Cases-Female	1	1	1	1	3	12	11	23	42	45
Tuberculosis Cases-Male	0	1	0	0	4	7	8	25	62	55
Tuberculosis Cases-Transgender	0	0	0	0	0	0	0	1	0	0
□ Tuberculosis Rate-Female	4.8	1.2	0.9	0.8	2.2	7.8	7.2	7.5	6.1	9.5
■ Tuberculosis Rate-Male	0	1.1	0	0	2.8	4.4	5.1	8.2	9.2	13.3

Antimicrobial Resistant Organism Surveillance in BC, 2008

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 AMR trends with antibiotic utilization.

Methods

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

Results

- The percent of *Staphylococcus aureus* isolates that were methicillin-resistant (MRSA) has significantly increased between the years 1998 to 2007, with the rates stabilizing in 2008. This increase is primarily due to the prevalence of community-associated (CA) isolates. The percent of *Enterococcus spp*. isolates demonstrating resistance against vancomycin has remained under 1% in BC for years 1999 to 2008.
- Gram-positive organisms such as *Staphylococcus aureus*, *Streptococcus pneumoniae*, and *Streptococcus pyogenes* have demonstrated an increasing resistance against erythromycin. These trends are correlated with utilization of new macrolides such as azithromycin and clarithromycin.
- Urinary tract pathogens such as *Escherichia coli, Proteus mirabilis* and *Klebsiella pneumoniae*, have demonstrated an increasing resistance against both ciprofloxacin and trimethoprim-sulfamethoxazole (TMP-SMX) as well as variable resistance against nitrofurantoin. These trends are concerning as all three of these drugs are currently considered first line agents for urinary tract infections.
- Overall antimicrobial utilization decreased over the available time period, 1996 to 2007 but an upward rebound was observed from 2003 to 2005 which appears to have ended. β-lactam antimicrobials constitute the majority of antimicrobial prescriptions with a rate of 5.2 defined daily doses per 1000 inhabitant days in 2007. β-lactams are followed by macrolides, tetracyclines, quinolones and trimethoprim/sulfa combinations.
- Macrolide and quinolone utilization rates significantly increased between years 1996 to 2007, while β-lactam, tetracycline, and trimethoprim/sulfa utilization significantly decreased.

Conclusion

Continued reporting and 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 sources. Continued collaboration with these and additional data sources will be necessary to monitor changes in AMR trends in subsequent years.

For the full report, please refer to the below: *Antimicrobial Resistance Trends in the Province of British Columbia – August 2008. Epidemiology Services, British Columbia Centre for Disease Control.* URL: http://www.bccdc.ca/NR/rdonlyres/E7AA8E38-8517-4743-ABDC-FAAC4EA0B96A/0/AntimicrobialResistanceTrendsinBC_2008.pdf

enteric, food and waterborne diseases

Amebiasis

Botulism

Campylobacteriosis

Cryptosporidiosis

Cyclosporiasis

Verotoxigenic *E. coli* (VTEC) Infection

Giardiasis

Hepatitis A

Listeriosis

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

Shigellosis

Vibrio parahaemolyticus

Yersiniosis

Outbreaks of Gastroenteritis

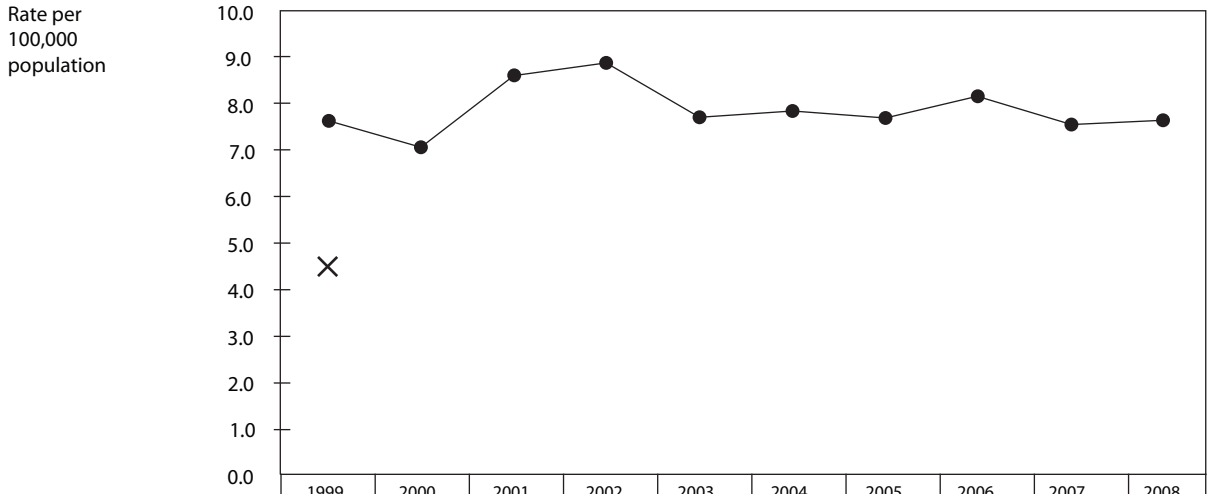
Amebiasis

Throughout the last ten years, the rate of amebiasis in British Columbia has remained fairly constant. In 2008, the overall provincial rate was 7.6 cases per 100,000, no outbreaks were identified and no seasonal pattern was evident.

As in previous years, reporting rates were highest in adult males in the 25–59 year old age groups, peaking in the 40–59 year old group at 16.2 cases per 100,000.

The highest rate for females was in the 1–4 year old age group, at 8.5 cases per 100,000. The high rates in males may be due to men who have sex with men who 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 (21.2 cases per 100,000). The screening program for refugees in Vancouver may partially account for this.

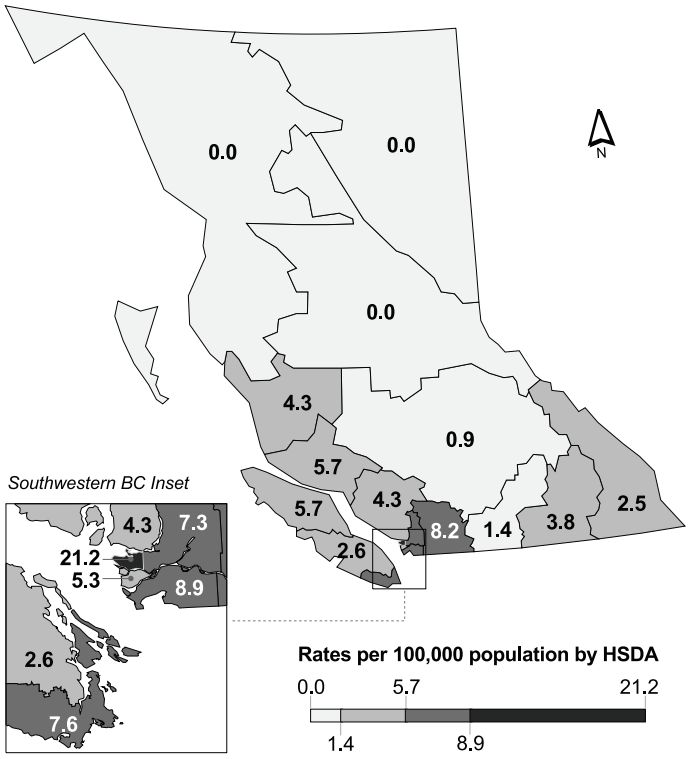
19.1 Amebiasis Rates by Year, 1999–2008



	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
BC Amebiasis Reports	306	284	351	366	321	330	326	353	329	338
BC Amebiasis Rate	7.6	7.0	8.6	8.9	7.7	7.9	7.7	8.2	7.5	7.6
Canadian Amebiasis Rate	4.5									

Note: Amebiasis was removed from national surveillance in January 2000

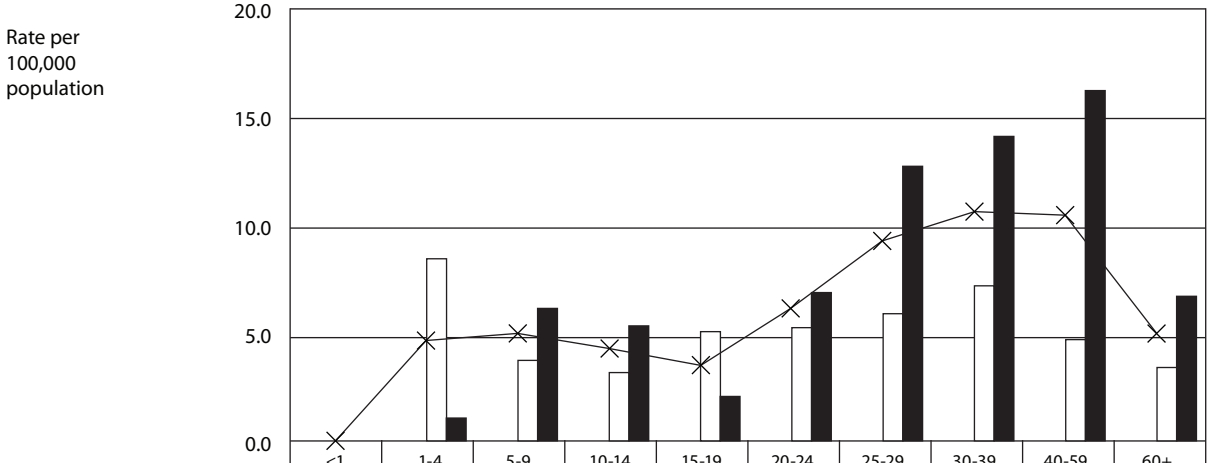
19.2 Amebiasis Rates by HSDA, 2008



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	2	2.5
12	Kootenay Boundary	3	3.8
13	Okanagan	5	1.4
14	Thompson Cariboo Shuswap	2	0.9
21	Fraser East	23	8.2
22	Fraser North	43	7.3
23	Fraser South	61	8.9
31	Richmond	10	5.3
32	Vancouver	135	21.2
33	North Shore/Coast Garibaldi	12	4.3
41	South Vancouver Island	28	7.6
42	Central Vancouver Island	7	2.6
43	North Vancouver Island	7	5.7
51	Northwest	0	0.0
52	Northern Interior	0	0.0
53	Northeast	0	0.0

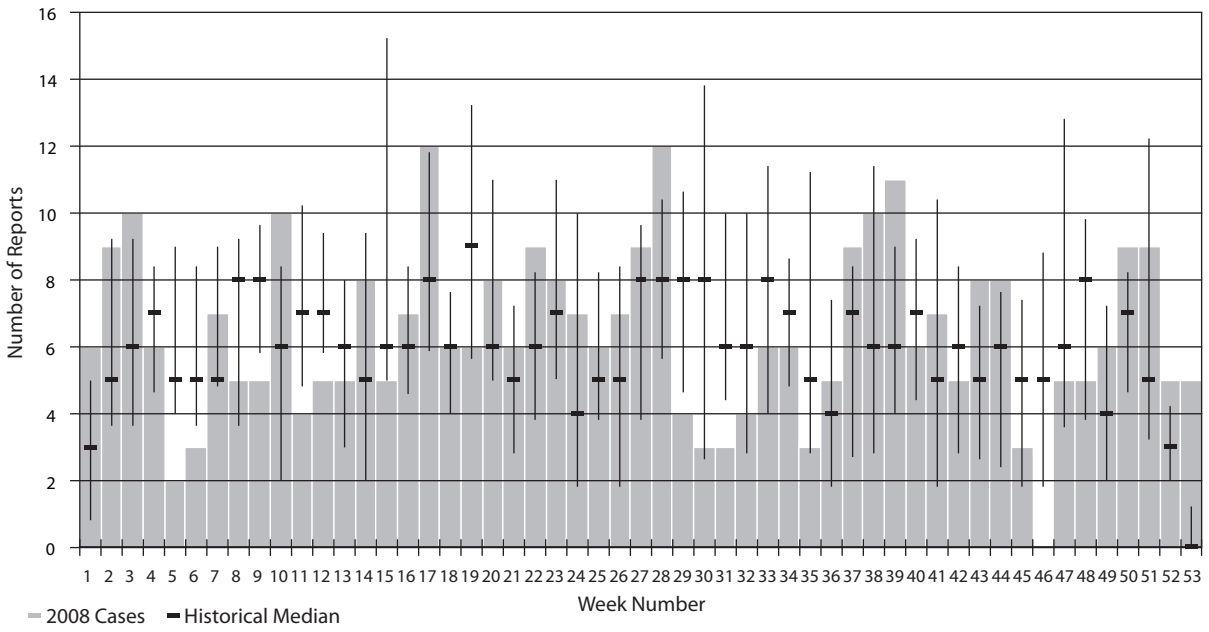
Note: Map classification by Jenks natural breaks method.

19.3 Amebiasis Rates by Age Group and Sex, 2008



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Amebiasis Reports - Female	0	7	4	4	7	8	9	22	32	16
Amebiasis Reports - Male	0	1	7	7	3	11	20	43	109	28
Amebiasis Rate - Female	0.0	8.5	3.8	3.3	5.1	5.2	5.9	7.2	4.7	3.4
Amebiasis Rate - Male	0.0	1.2	6.2	5.4	2.1	6.9	12.8	14.1	16.2	6.8
Amebiasis Rate - Total	0.0	4.7	5.0	4.3	3.5	6.1	9.4	10.6	10.4	5.0

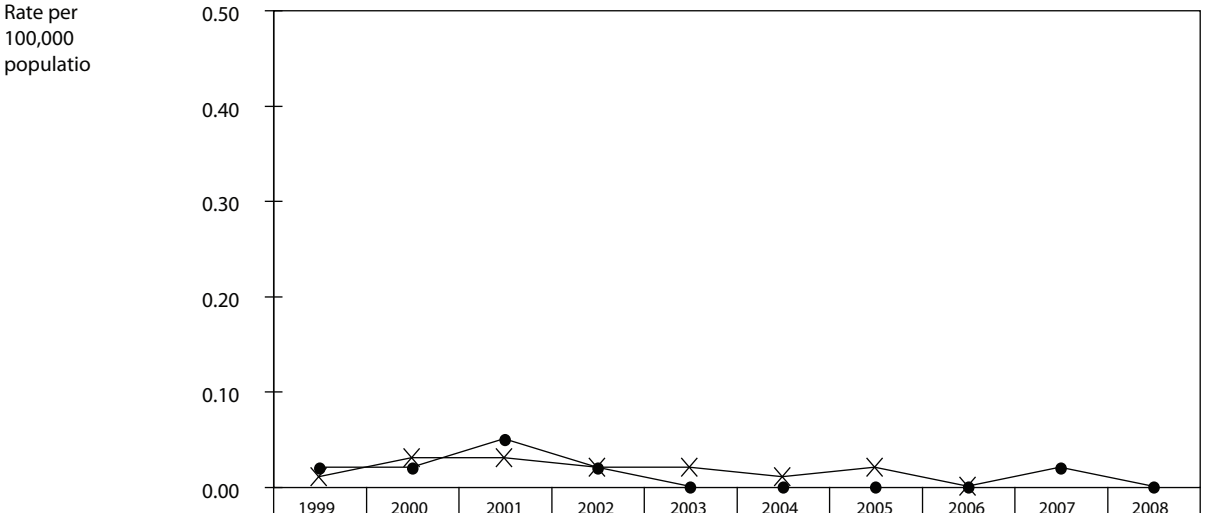
19.4 2008 Amebiasis Reports Compared to Historical Median and the 10th and 90th Percentiles Around the Median (1999 to 2007)



Botulism

There were no cases of botulism reported in 2008. In the last 10 years, a total of 6 cases were reported.

20.1 Botulism Rates by Year, 1999–2008



	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
BC Botulism Reports	1	1	2	1	0	0	0	0	1	0
BC Botulism Rate	0.02	0.02	0.05	0.02	0.00	0.00	0.00	0.00	0.02	0.00
Canadian Botulism Rate	0.01	0.03	0.03	0.02	0.02	0.01	0.02	0.00		

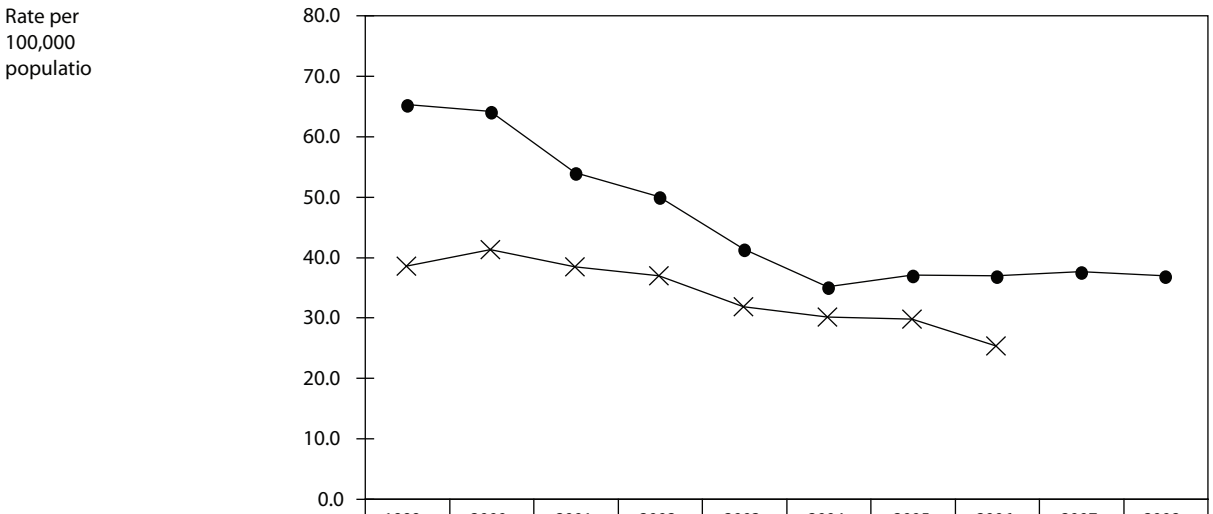
Campylobacteriosis

Campylobacteriosis was the most commonly reported enteric disease with a total of 1635 cases reported in 2008. The incidence has been stable since 2004. Rates were highest among children aged 5 to 9 years, particularly among males and adults between the ages of 25 to 39 years. In previous years the peak was seen at slightly younger ages in children aged 1 to 4 years and adults aged 20 to 29 years.

The highest rates were reported in Vancouver Coastal, Vancouver Island and Fraser Health Authorities. The highest rate was identified in the North Shore/Coast Garibaldi Health Service Delivery Area (HSDA) of Vancouver Coastal Health Authority (61.6 per 100,000 population). An increase in rates was observed in Central and North Vancouver Island and Northeast HSDAs compared to 2007.

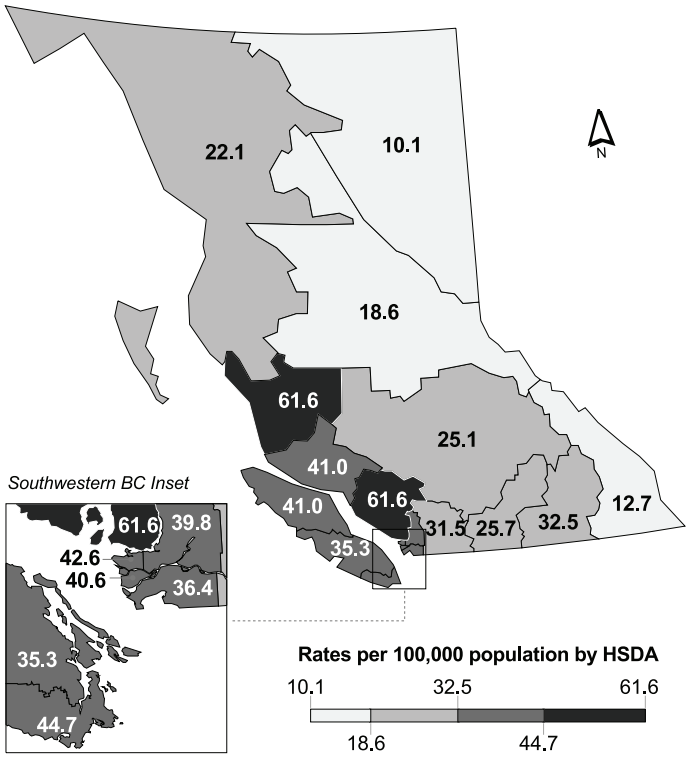
The number of cases reported was higher through the summer months, between weeks 21 and 37. An outbreak in Richmond HSDA occurred in August associated with a wedding attended by residents of the lower mainland. This outbreak may have led to the increased number of cases reported during weeks 36 and 37.

21.1 Campylobacteriosis Rates by Year, 1999–2008



	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
BC Campylobacteriosis Reports	2612	2583	2193	2052	1712	1471	1569	1586	1639	1635
BC Campylobacteriosis Rate	65.1	64.0	53.8	49.9	41.2	35.0	36.8	36.7	37.4	36.8
Canadian Campylobacteriosis Rate	38.3	41.1	38.2	36.7	31.6	29.9	29.6	25.2		

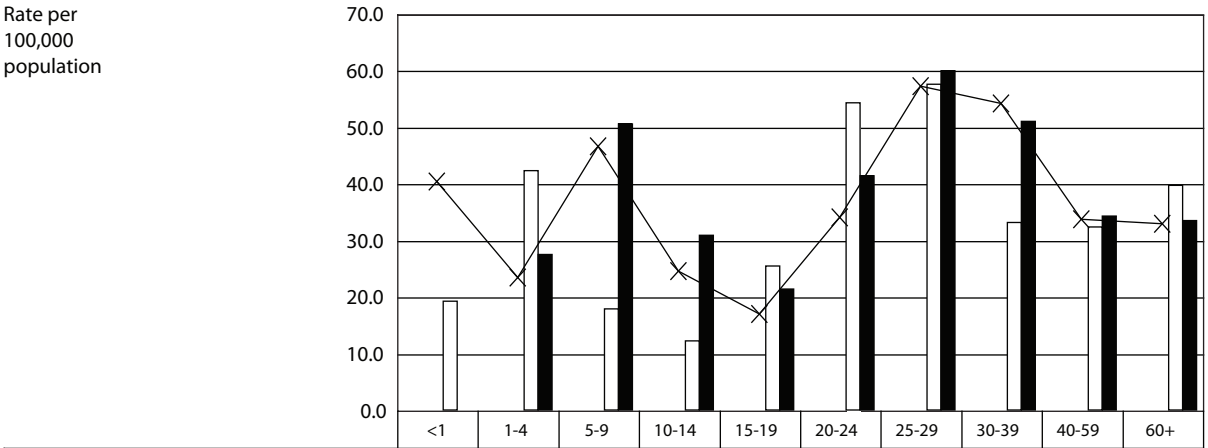
21.2 Campylobacteriosis Rates by HSDA, 2008



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	10	12.7
12	Kootenay Boundary	26	32.5
13	Okanagan	90	25.7
14	Thompson Cariboo Shuswap	56	25.1
21	Fraser East	88	31.5
22	Fraser North	235	39.8
23	Fraser South	250	36.4
31	Richmond	77	40.6
32	Vancouver	271	42.6
33	North Shore/Coast Garibaldi	172	61.6
41	South Vancouver Island	165	44.7
42	Central Vancouver Island	94	35.3
43	North Vancouver Island	50	41.0
51	Northwest	17	22.1
52	Northern Interior	27	18.6
53	Northeast	7	10.1

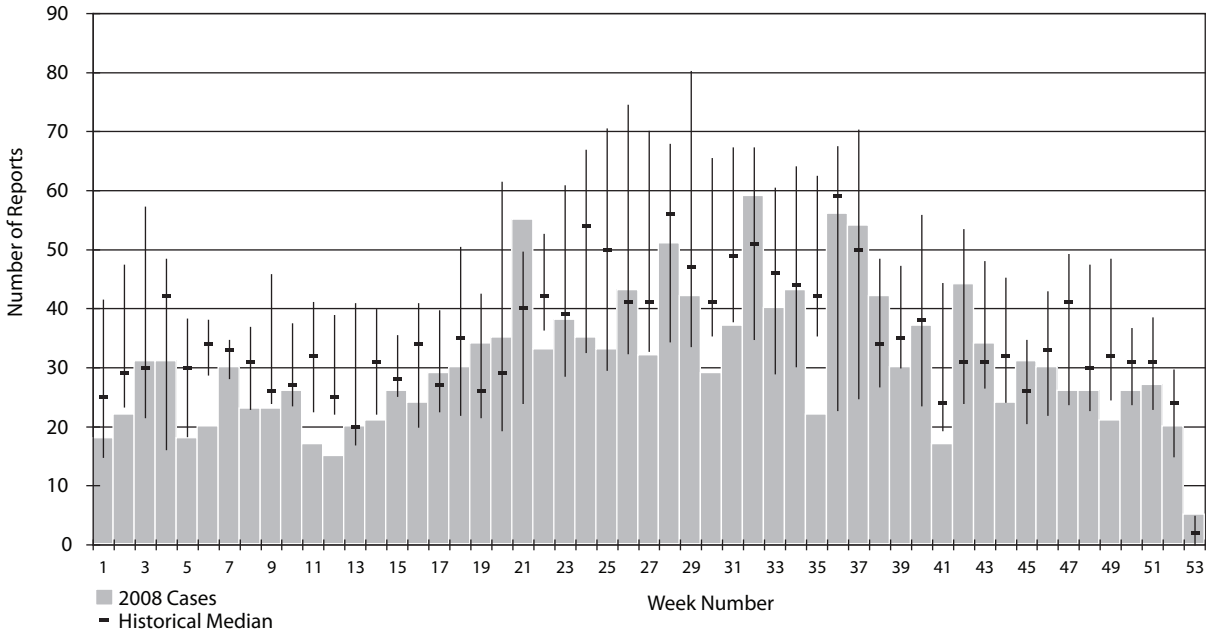
Note: Map classification by Jenks natural breaks method.

21.3 Campylobacteriosis Rates by Age Group and Sex, 2008



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Campylobacteriosis Reports - Female	4	35	19	15	35	83	88	102	221	187
Campylobacteriosis Reports - Male	6	44	35	28	60	95	80	104	225	167
Campylobacteriosis Reports - Unknown	0	0	0	0	1	0	0	0	0	0
Campylobacteriosis Rate - Female	19.2	42.3	17.8	12.2	25.5	54.3	57.5	33.1	32.3	39.6
Campylobacteriosis Rate - Male	0.0	27.4	50.6	30.9	21.4	41.4	60.0	51.0	34.2	33.5
Campylobacteriosis Rate - Total	40.4	23.4	46.6	24.6	16.9	34.0	57.2	54.2	33.7	32.9

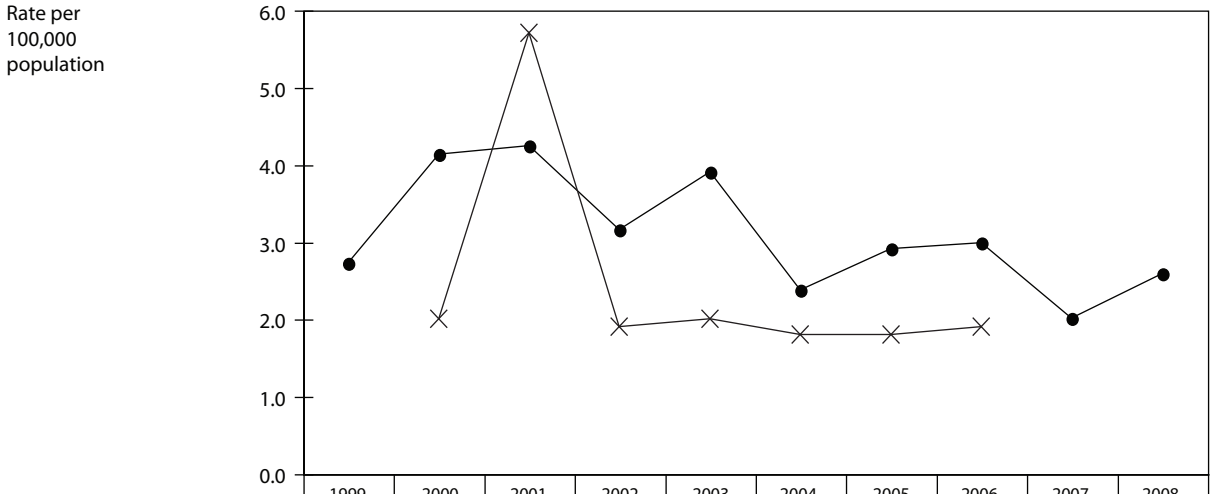
21.4 2008 Campylobacteriosis Reports Compared to Historical Median and the 10th and 90th Percentiles Around the Median (1999 to 2007)



Cryptosporidiosis

In 2008, 115 cases of cryptosporidiosis were reported (2.6 cases per 100,000), a slightly higher rate than in 2007. The highest rate was reported from Vancouver, followed by Northwest and Fraser South. Infections were most common in males in the 1–4 year age group (8.0 per 100,000) followed by females in the 25–29 year age group (5.9 per 100,000). No outbreaks were reported in 2008.

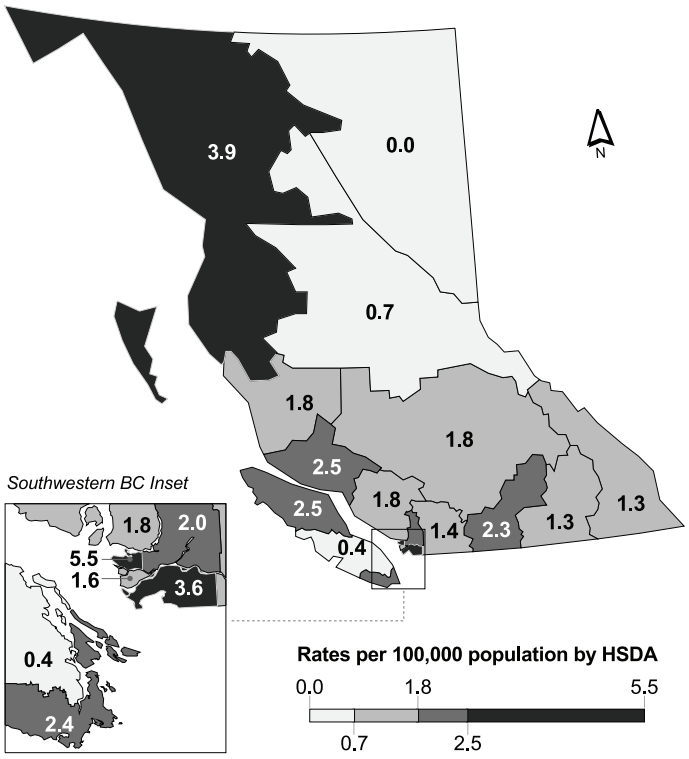
22.1 Cryptosporidiosis Rates by Year, 1999–2008



	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
BC Cryptosporidiosis Reports	109	167	173	130	162	100	124	129	88	115
BC Cryptosporidiosis Rate	2.7	4.1	4.2	3.2	3.9	2.4	2.9	3.0	2.0	2.6
Canadian Cryptosporidiosis Rate		2.0	5.7	1.9	2.0	1.8	1.8	1.9		

Note: Cryptosporidiosis became nationally notifiable in January 2000

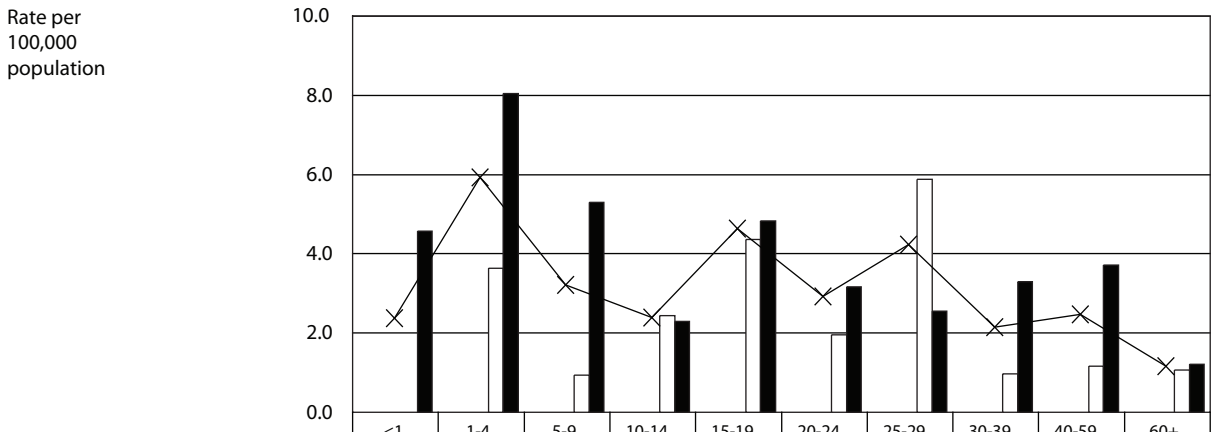
22.2 Cryptosporidiosis Rates by HSDA, 2008



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	1	1.3
12	Kootenay Boundary	1	1.3
13	Okanagan	8	2.3
14	Thompson Cariboo Shuswap	4	1.8
21	Fraser East	4	1.4
22	Fraser North	12	2.0
23	Fraser South	25	3.6
31	Richmond	3	1.6
32	Vancouver	35	5.5
33	North Shore/Coast Garibaldi	5	1.8
41	South Vancouver Island	9	2.4
42	Central Vancouver Island	1	0.4
43	North Vancouver Island	3	2.5
51	Northwest	3	3.9
52	Northern Interior	1	0.7
53	Northeast	0	0.0

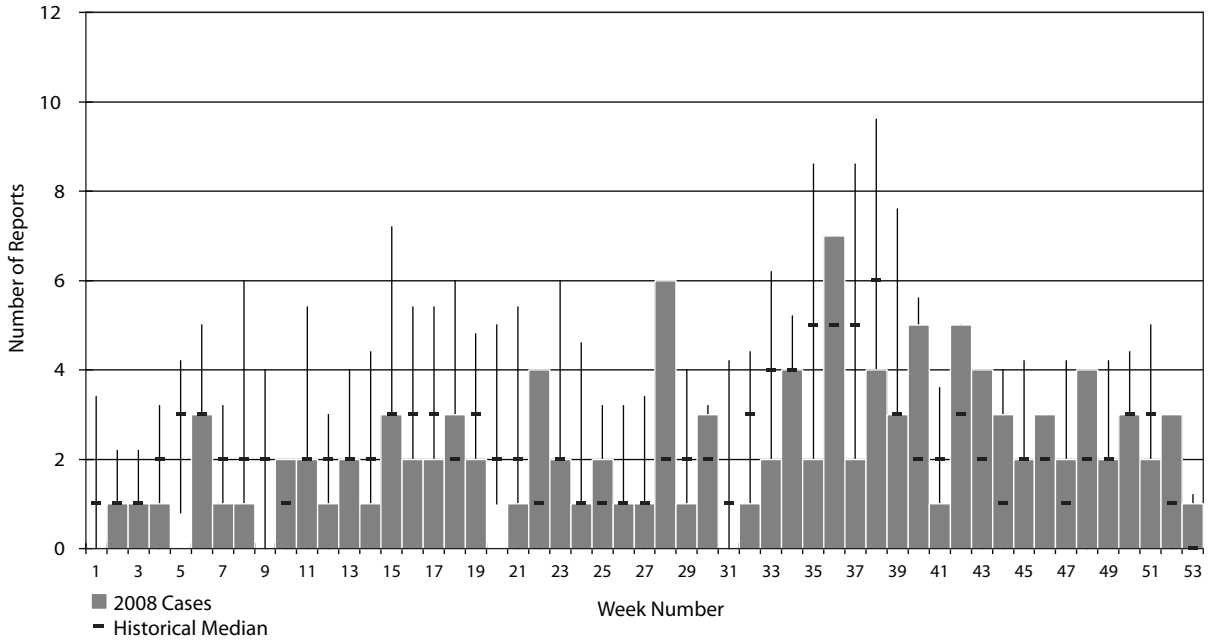
Note: Map classification by Jenks natural breaks method.

22.3 Cryptosporidiosis Rates by Age Group and Sex, 2008



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Cryptosporidiosis Reports - Female	0	3	1	3	6	3	9	3	8	5
Cryptosporidiosis Reports - Male	1	7	6	3	7	5	4	10	25	5
Cryptosporidiosis Reports - Unknown	0	0	0	0	0	1	0	0	0	0
Cryptosporidiosis Rate - Female	0.0	3.6	0.9	2.4	4.4	2.0	5.9	1.0	1.2	1.1
Cryptosporidiosis Rate - Male	4.6	8.0	5.3	2.3	4.8	3.2	2.6	3.3	3.7	1.2
Cryptosporidiosis Rate - Total	2.3	5.9	3.2	2.4	4.6	2.9	4.2	2.1	2.4	1.1

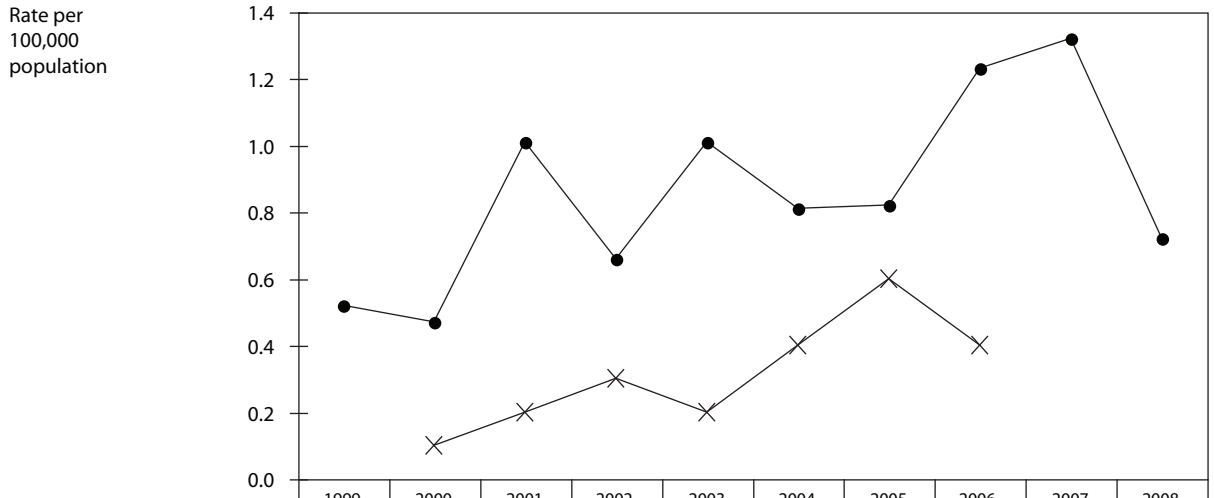
22.4 2008 Cryptosporidiosis Reports Compared to Historical Median and the 10th and 90th Percentiles Around the Median (1999 to 2007)



Cyclosporiasis

In 2008 there was a decrease in the incidence of *Cyclospora* infections. There were no outbreaks of locally acquired infections associated with contaminated, imported produce as had occurred in the years 2001, 2003, 2004, 2006, and 2007 which may have led to this decrease. One case of locally-acquired infection was reported in November at the same time that locally-acquired cases were also identified in Ontario. However a coordinated investigation did not identify a common source and no other cases were identified in BC. Two confirmed cases of infection in BC were associated to an outbreak in the US among conference attendees. Other cases in BC are a result of acquiring infection during travel to endemic areas such as South and Central America.

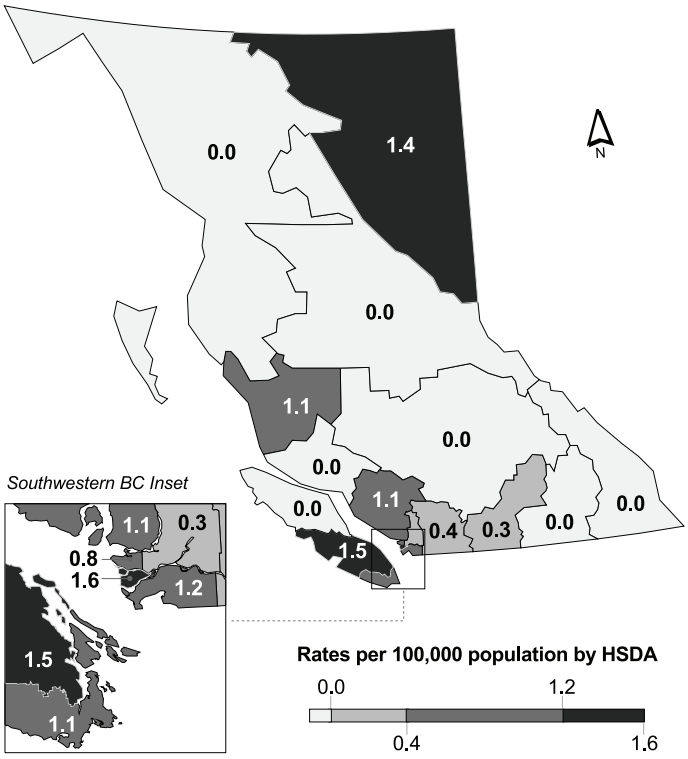
23.1 Cyclosporiasis Rates by Year, 1999–2008



	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
BC Cyclosporiasis Reports	21	19	41	27	42	34	35	53	58	32
BC Cyclosporiasis Rate	0.5	0.5	1.0	0.7	1.0	0.8	0.8	1.2	1.3	0.7
Canadian Cyclosporiasis Rate		0.1	0.2	0.3	0.2	0.4	0.6	0.4		

Note: Cyclosporiasis became nationally notifiable in January 2000

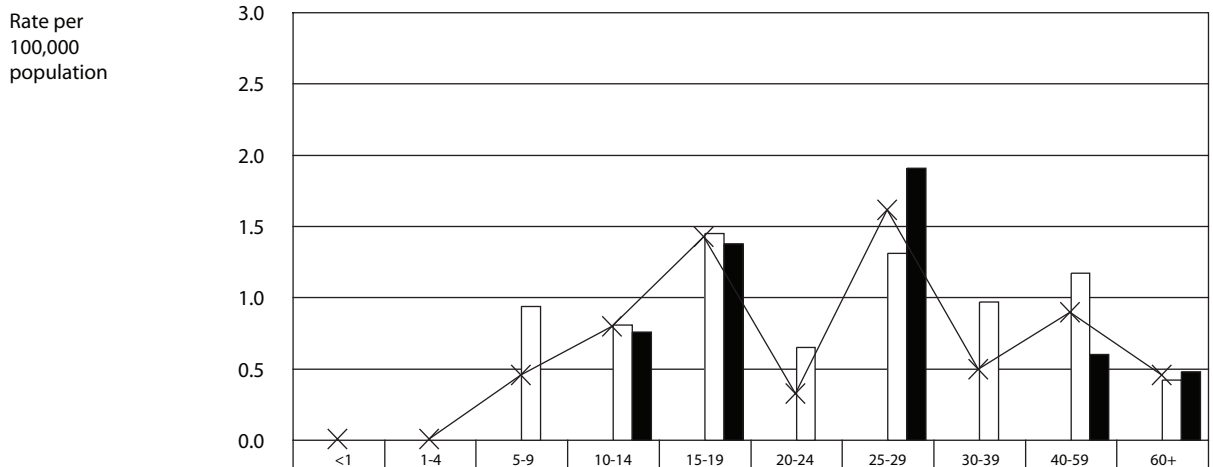
23.2 Cyclosporiasis Rates by HSDA, 2008



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	0	0.0
12	Kootenay Boundary	0	0.0
13	Okanagan	1	0.3
14	Thompson Cariboo Shuswap	0	0.0
21	Fraser East	1	0.4
22	Fraser North	2	0.3
23	Fraser South	8	1.2
31	Richmond	3	1.6
32	Vancouver	5	0.8
33	North Shore/Coast Garibaldi	3	1.1
41	South Vancouver Island	4	1.1
42	Central Vancouver Island	4	1.5
43	North Vancouver Island	0	0.0
51	Northwest	0	0.0
52	Northern Interior	0	0.0
53	Northeast	1	1.4

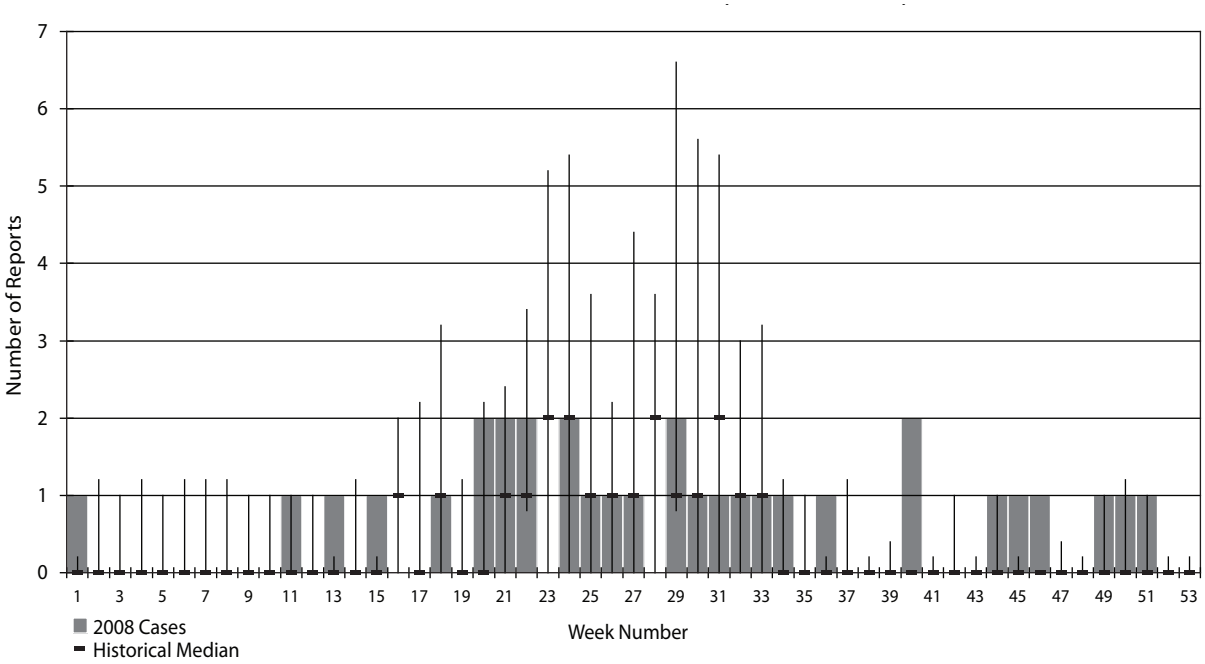
Note: Map classification by Jenks natural breaks method.

23.3 Cyclosporiasis Rates by Age Group and Sex, 2008



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Cyclosporiasis Reports - Female	0	0	1	1	2	1	2	3	8	2
Cyclosporiasis Reports - Male	0	0	0	1	2	0	3	0	4	2
Cyclosporiasis Rate - Female	0.0	0.0	0.9	0.8	1.5	0.7	1.3	1.0	1.2	0.4
Cyclosporiasis Rate - Male	0.0	0.0	0.0	0.8	1.4	0.0	1.9	0.0	0.6	0.5
Cyclosporiasis Rate - Total	0.0	0.0	0.5	0.8	1.4	0.3	1.6	0.5	0.9	0.5

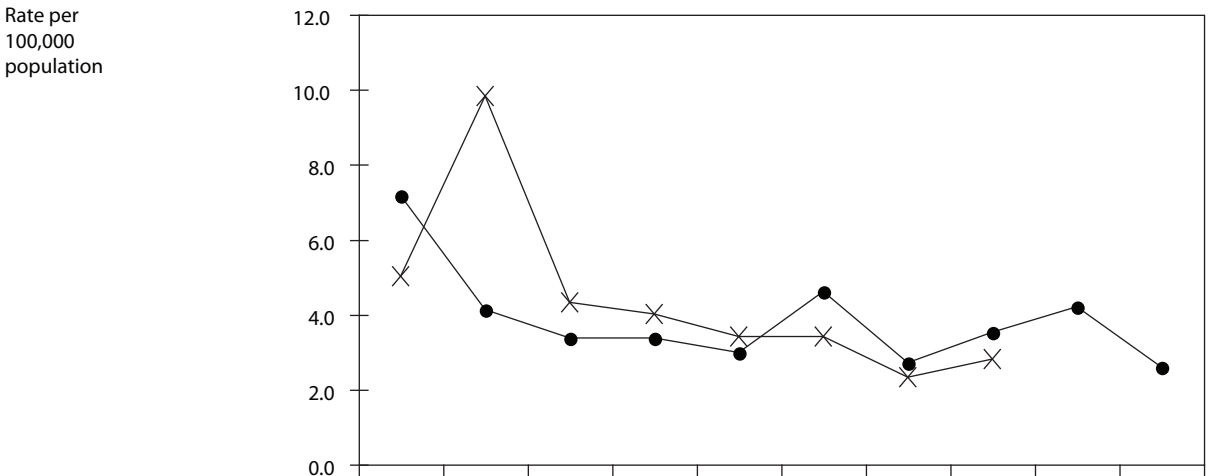
23.4 2008 Cyclosporiasis Reports Compared to Historical Median and the 10th and 90th Percentiles Around the Median (1999 to 2007)



Verotoxigenic *E. coli*

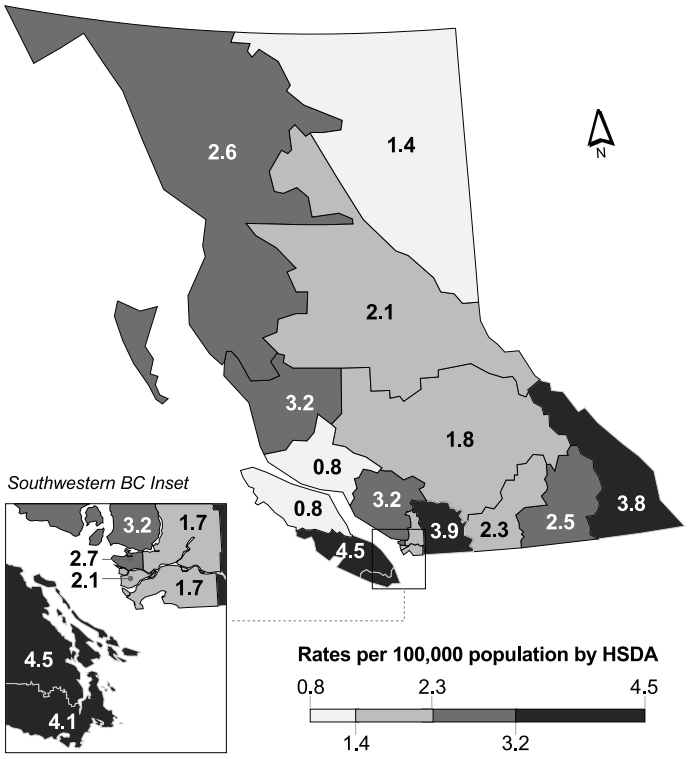
There were 114 cases of verotoxigenic *E. coli* infection reported in BC in 2008, corresponding to a slight decrease in incidence to 2.6 cases per 100,000 population, after three years of gradual increase. No large outbreaks were reported in BC associated with verotoxigenic *E. coli*. Incidence was highest in those under age 5. *E. coli* exhibited expected seasonality, with peak incidence occurring between late summer and early fall. Similar to 2007, the highest rates of infection were found in Fraser East, South Vancouver Island, and Central Vancouver Island Health Service Delivery Areas (HSDA) (range of 3.9 to 4.5 cases per 100,000 population). Previously high rates identified in Thompson Cariboo Shuswap HSDA decreased in 2008 from 7.3 per 100,000 population in 2007 to 1.8 per 100,000 population in 2008.

24.1 Verotoxigenic *E. coli* Rates by Year, 1999–2008



	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
BC Verotoxigenic E.coli Infection Reports	287	166	137	138	123	193	115	151	183	114
BC Verotoxigenic E.coli Infection Rate	7.2	4.1	3.4	3.4	3.0	4.6	2.7	3.5	4.2	2.6
Canadian Verotoxigenic E.coli Infection Rate	5.0	9.8	4.3	4.0	3.4	3.4	2.3	2.8		

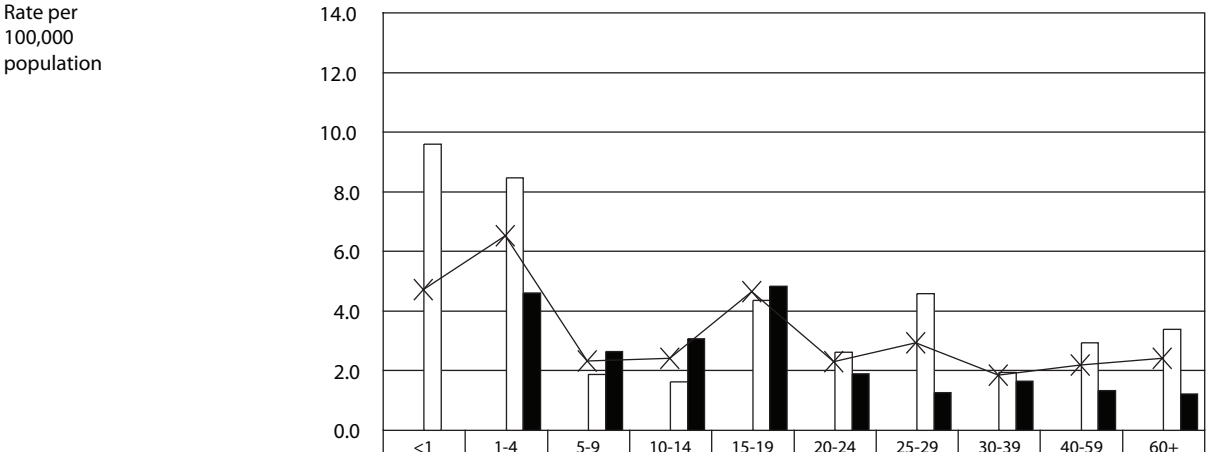
24.2 Verotoxigenic *E. coli* Rates by HSDA, 2008



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	3	3.8
12	Kootenay Boundary	2	2.5
13	Okanagan	8	2.3
14	Thompson Cariboo Shuswap	4	1.8
21	Fraser East	11	3.9
22	Fraser North	10	1.7
23	Fraser South	12	1.7
31	Richmond	4	2.1
32	Vancouver	17	2.7
33	North Shore/Coast Garibaldi	9	3.2
41	South Vancouver Island	15	4.1
42	Central Vancouver Island	12	4.5
43	North Vancouver Island	1	0.8
51	Northwest	2	2.6
52	Northern Interior	3	2.1
53	Northeast	1	1.4

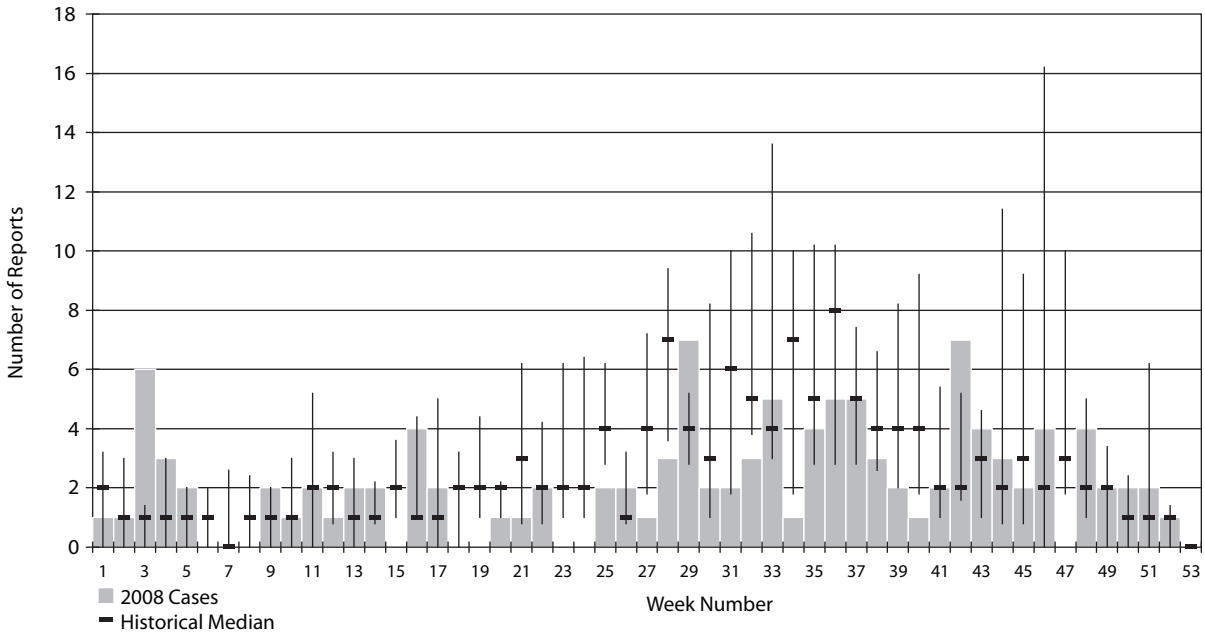
Note: Map classification by Jenks natural breaks method.

24.3 Verotoxigenic *E. coli* Rates by Age Group and Sex, 2008



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Verotoxigenic E.coli Infection Reports - Female	2	7	2	2	6	4	7	6	20	16
Verotoxigenic E.coli Infection Reports - Male	0	4	3	4	7	3	2	5	9	5
Verotoxigenic E.coli Infection Rate - Female	9.6	8.5	1.9	1.6	4.4	2.6	4.6	2.0	2.9	3.4
Verotoxigenic E.coli Infection Rate - Male	0.0	4.6	2.7	3.1	4.8	1.9	1.3	1.6	1.3	1.2
Verotoxigenic E.coli Infection Rate - Total	4.7	6.5	2.3	2.4	4.6	2.3	2.9	1.8	2.1	2.4

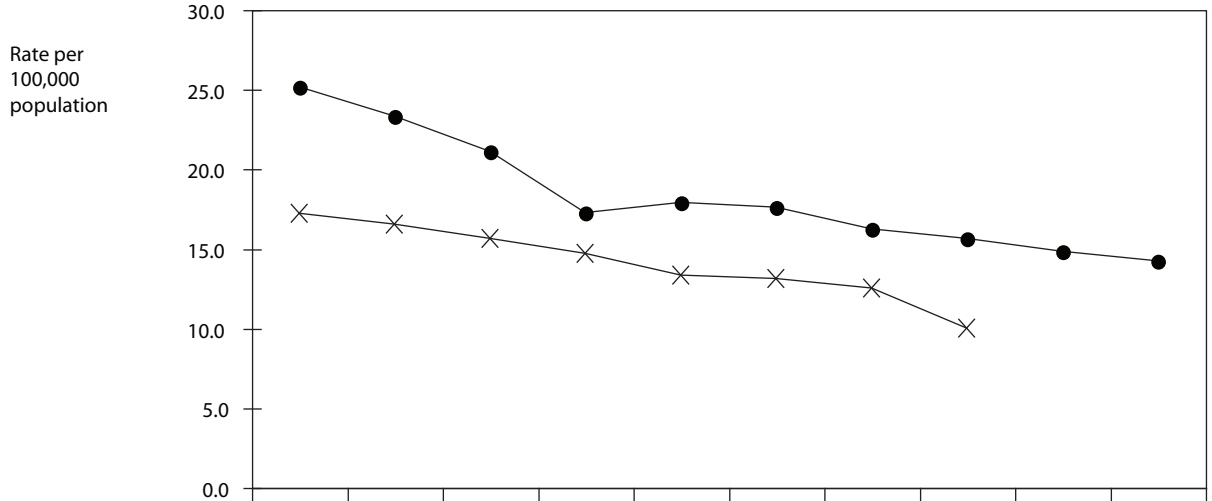
24.4 2008 Verotoxigenic *E. coli* Reports Compared to Historical Median and the 10th and 90th Percentiles Around the Median (1999 to 2007)



Giardiasis

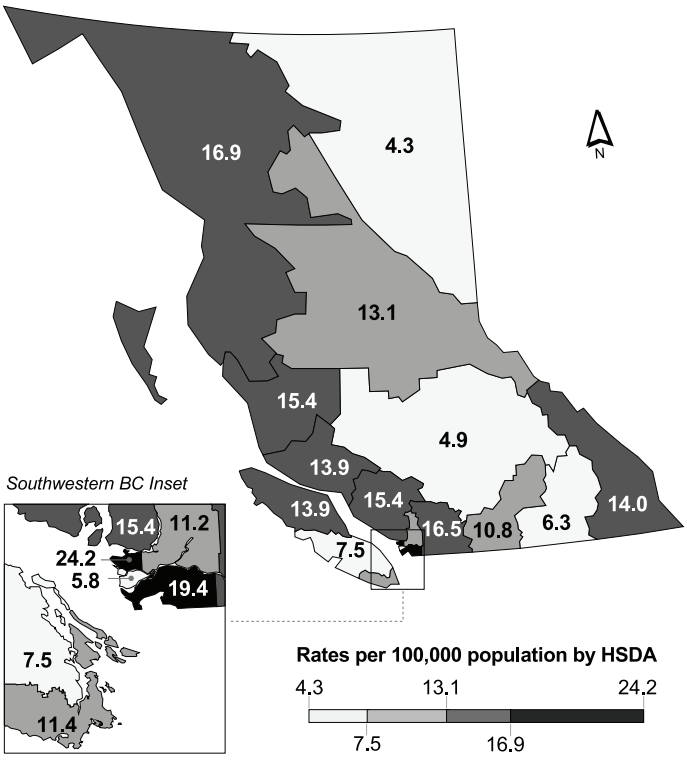
Annual rates of giardiasis in BC continued to decline in 2008 with 632 cases reported. No seasonal peak and no outbreaks were detected. As in previous years, rates were higher in males than females in most age groups except among those under 5 years old. Vancouver and Fraser South experienced the highest rates of infection at 24.2 and 19.4 per 100,000 population, respectively.

25.1 Giardiasis Rates by Year, 1999–2008



	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
BC Giardiasis Reports	1009	941	860	710	742	739	691	674	649	632
BC Giardiasis Rate	25.2	23.3	21.1	17.3	17.9	17.6	16.2	15.6	14.8	14.2
Canadian Giardiasis Rate	17.2	16.5	15.6	14.7	13.3	13.1	12.5	10.0		

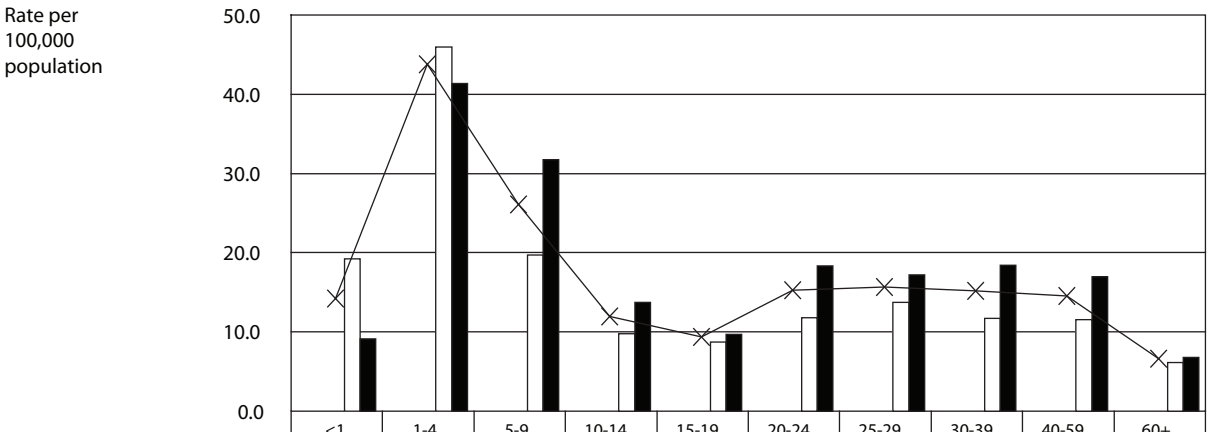
25.2 Giardiasis Rates by HSDA, 2008



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	11	14.0
12	Kootenay Boundary	5	6.3
13	Okanagan	38	10.8
14	Thompson Cariboo Shuswap	11	4.9
21	Fraser East	46	16.5
22	Fraser North	66	11.2
23	Fraser South	133	19.4
31	Richmond	11	5.8
32	Vancouver	154	24.2
33	North Shore/Coast Garibaldi	43	15.4
41	South Vancouver Island	42	11.4
42	Central Vancouver Island	20	7.5
43	North Vancouver Island	17	13.9
51	Northwest	13	16.9
52	Northern Interior	19	13.1
53	Northeast	3	4.3

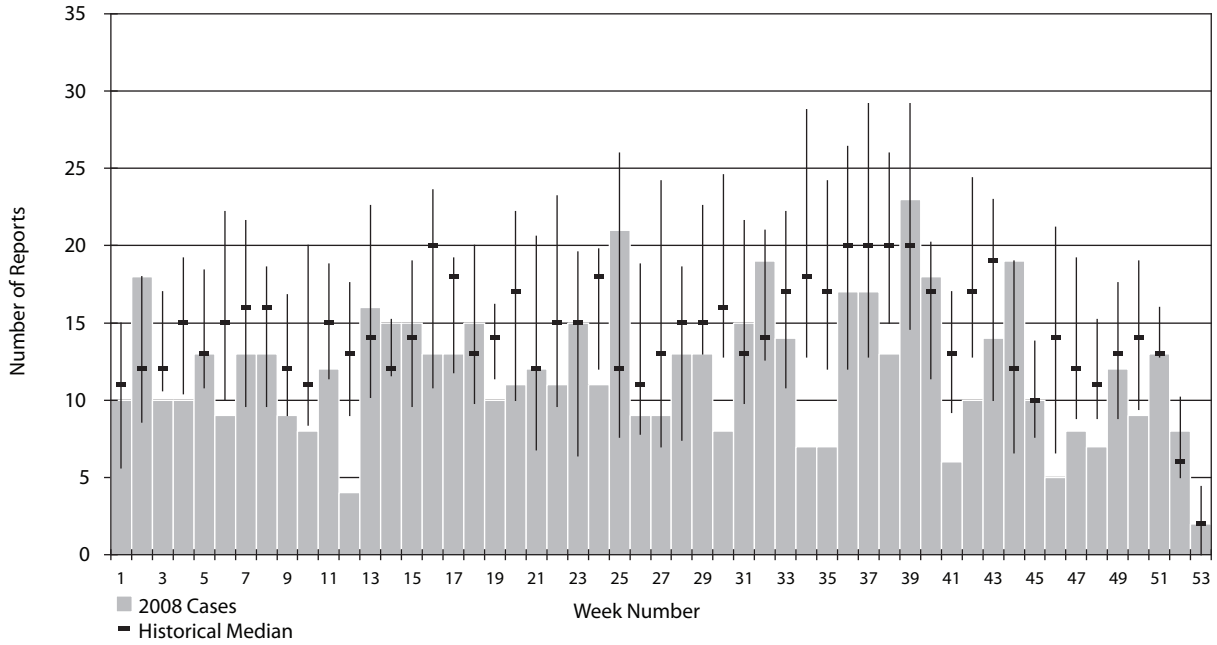
Note: Map classification by Jenks natural breaks method.

25.3 Giardiasis Rates by Age Group and Sex, 2008



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Giardiasis Reports - Female	4	38	21	12	12	18	21	36	79	29
Giardiasis Reports - Male	2	36	36	18	14	29	27	56	114	28
Giardiasis Reports - Unknown	0	0	0	0	0	0	0	0	2	0
Giardiasis Rate - Female	19.2	46.0	19.7	9.8	8.7	11.8	13.7	11.7	11.6	6.2
Giardiasis Rate - Male	9.1	41.4	31.8	13.8	9.7	18.3	17.2	18.4	17.0	6.8
Giardiasis Rate - Total	14.1	43.6	25.9	11.8	9.2	15.1	15.5	15.0	14.4	6.4

25.4 2008 Giardiasis Reports Compared to Historical Median and the 10th and 90th Percentiles Around the Median (1999 to 2007)



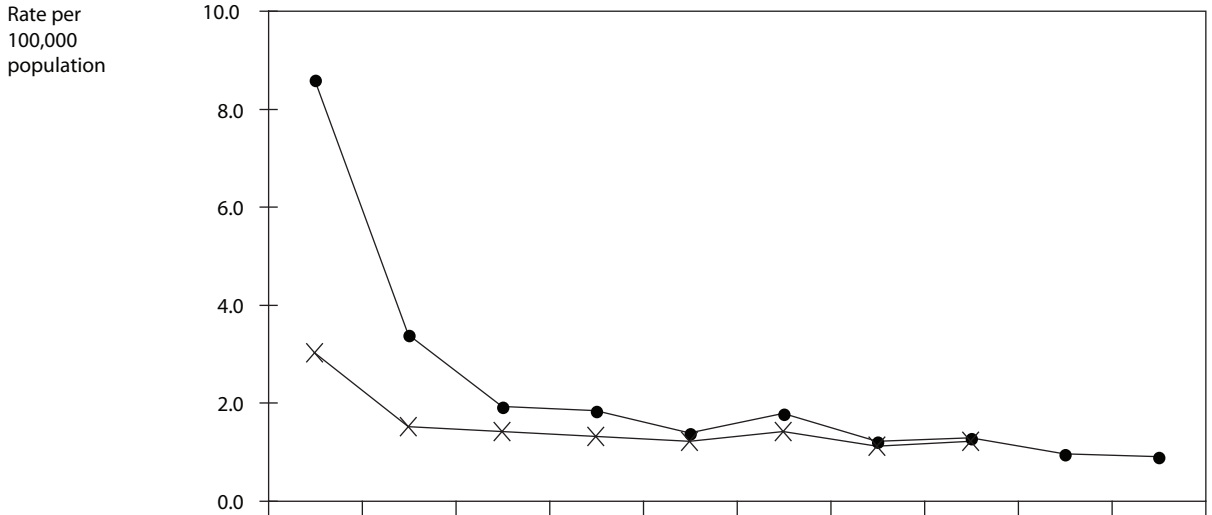
Hepatitis A

The annual number of cases of hepatitis A reported in BC has continued to decline. In 2008 there were 39 cases reported for a rate of 0.9 cases per 100,000 population, which is similar to the Canadian rate. However, for this disease the actual number of hepatitis A cases may be more than 5 times that reported. Publicly funded hepatitis A vaccine is available in BC for individuals at high risk of infection; these include groups in which previous outbreaks have occurred, such as men who have sex with men and illicit drug users.

No cases were reported in persons less than 5 years of age, but young children may have asymptomatic infection and thus not be identified. In 2008, 62% of reported cases were male. Due to small numbers the rates by Health Service Delivery Area (HSDA) were unstable. Only two HSDAs (Vancouver and Fraser North) had more than 4 cases at 8 and 6 respectively.

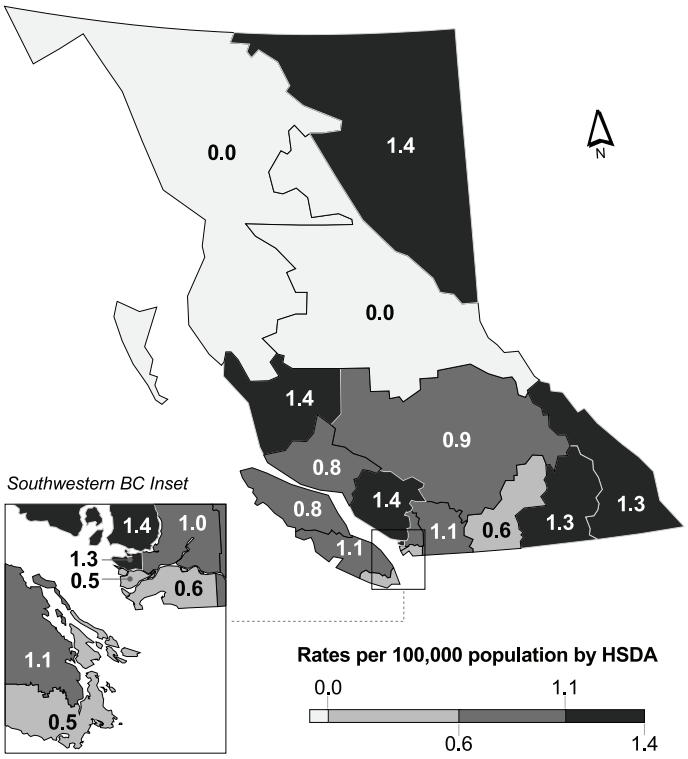
A significant proportion of hepatitis A cases continue to be identified in persons who have travelled to countries where hepatitis A is endemic, but were not immunized prior to travel. Although hepatitis A vaccine is recommended to these travelers it is not publicly funded for this group. Interestingly 44% of the cases in 2008 occurred in the first 10 weeks of the year.

26.1 Hepatitis A Rates by Year, 1999–2008



	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
BC Hepatitis A Reports	344	136	78	75	57	74	51	55	41	39
BC Hepatitis A Rate	8.6	3.4	1.9	1.8	1.4	1.8	1.2	1.3	0.9	0.9
Canadian Hepatitis A Rate	3.0	1.5	1.4	1.3	1.2	1.4	1.1	1.2		

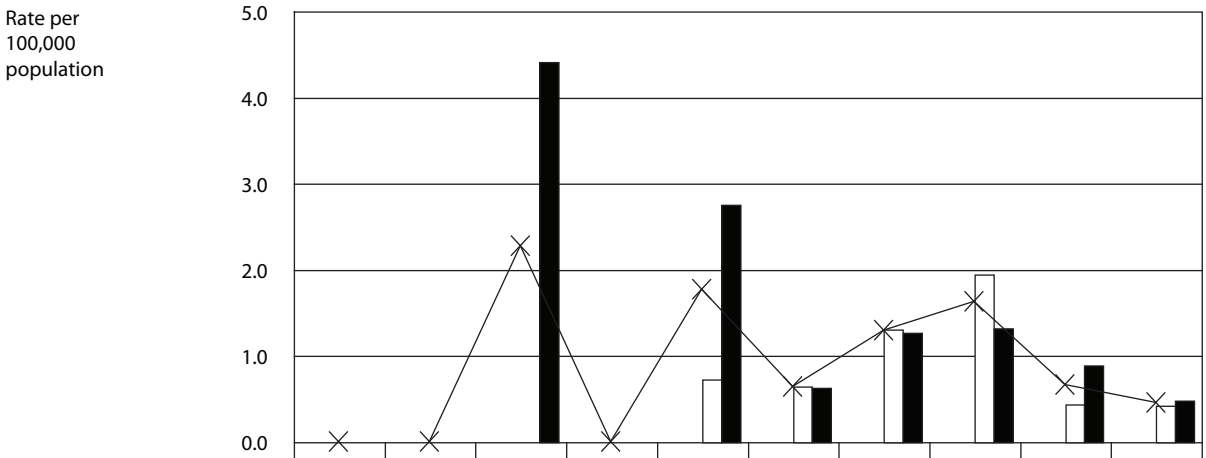
26.2 Hepatitis A Rates by HSDA, 2008



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	1	1.3
12	Kootenay Boundary	1	1.3
13	Okanagan	2	0.6
14	Thompson Cariboo Shuswap	2	0.9
21	Fraser East	3	1.1
22	Fraser North	6	1.0
23	Fraser South	4	0.6
31	Richmond	1	0.5
32	Vancouver	8	1.3
33	North Shore/Coast Garibaldi	4	1.4
41	South Vancouver Island	2	0.5
42	Central Vancouver Island	3	1.1
43	North Vancouver Island	1	0.8
51	Northwest	0	0.0
52	Northern Interior	0	0.0
53	Northeast	1	1.4

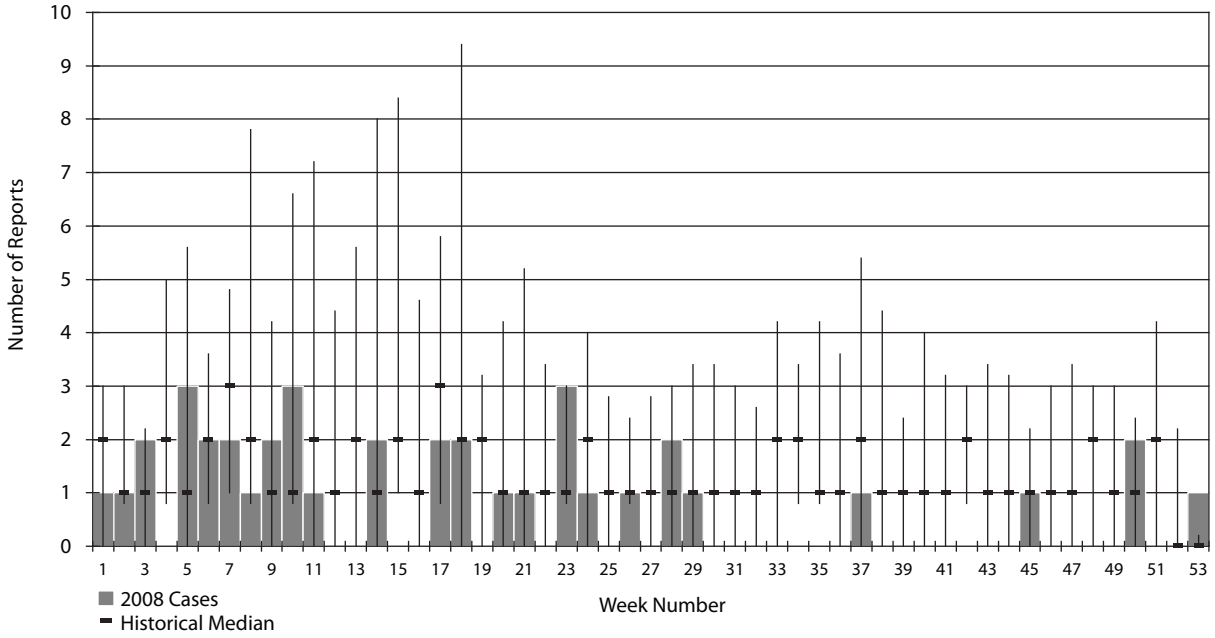
Note: Map classification by Jenks natural breaks method.

26.3 Hepatitis A Rates by Age Group and Sex, 2008



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Hepatitis A Reports - Female	0	0	0	0	1	1	2	6	3	2
Hepatitis A Reports - Male	0	0	5	0	4	1	2	4	6	2
Hepatitis A Rate - Female	0.0	0.0	0.0	0.0	0.7	0.7	1.3	2.0	0.4	0.4
Hepatitis A Rate - Male	0.0	0.0	4.4	0.0	2.8	0.6	1.3	1.3	0.9	0.5
Hepatitis A Rate - Total	0.0	0.0	2.3	0.0	1.8	0.6	1.3	1.6	0.7	0.5

26.4 2008 Hepatitis A Reports Compared to Historical Median and the 10th and 90th Percentiles Around the Median (1999 to 2007)

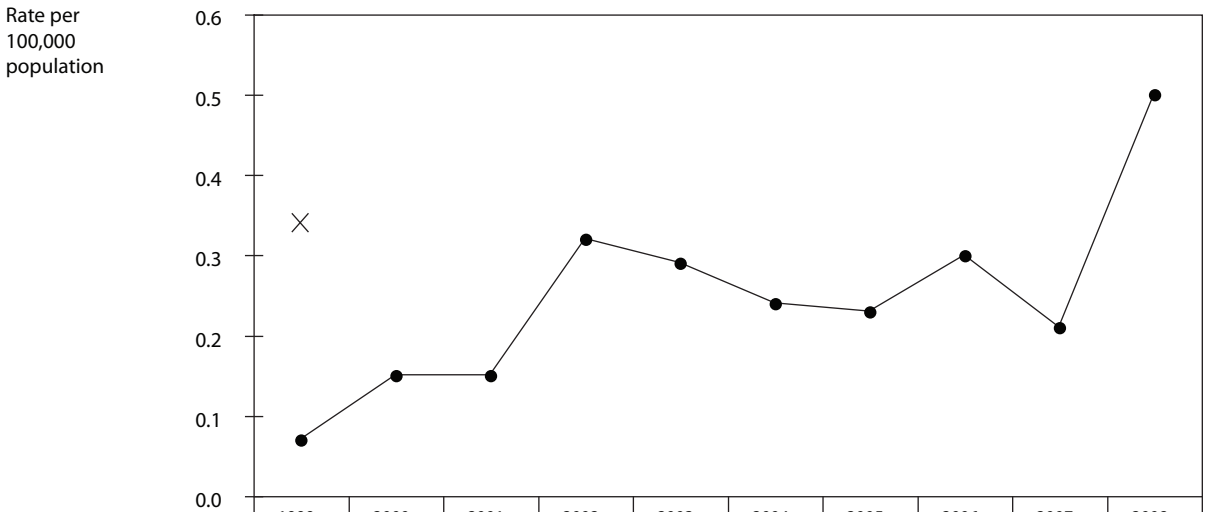


Listeriosis

Twenty-three cases of invasive listeriosis were reported in 2008. Five of these cases were associated with the large national outbreak investigation and recall associated with Maple Leaf processed meat products. The increased incidence in 2008 may have been due to this outbreak and testing of high risk individuals during this time period.

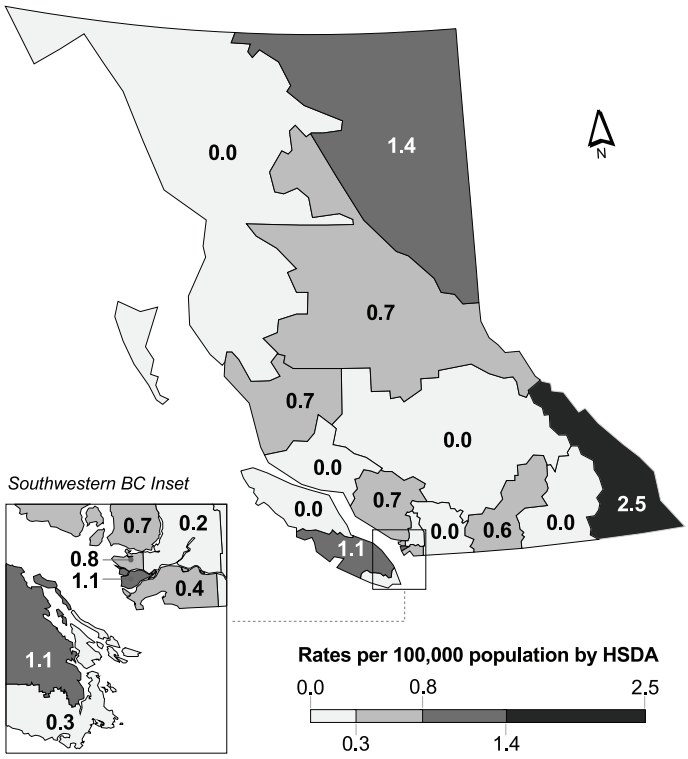
Rates were highest among children less than one year of age and adults over the age of sixty. The two cases among infants were neonates who recovered from infection. Two cases were reported in pregnant women. There was no regional clustering. Temporal clustering can be seen between weeks 27 and 49, peaking at week 40. The temporal clustering coincides with the identification of the outbreak and numerous recall alerts.

27.1 Listeriosis Rates by Year, 1999–2008



	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
BC Listeriosis Reports	3	6	6	13	12	10	10	13	9	23
BC Listeriosis Rate	0.1	0.2	0.2	0.3	0.3	0.2	0.2	0.3	0.2	0.5
Canadian Listeriosis Rate	0.3									

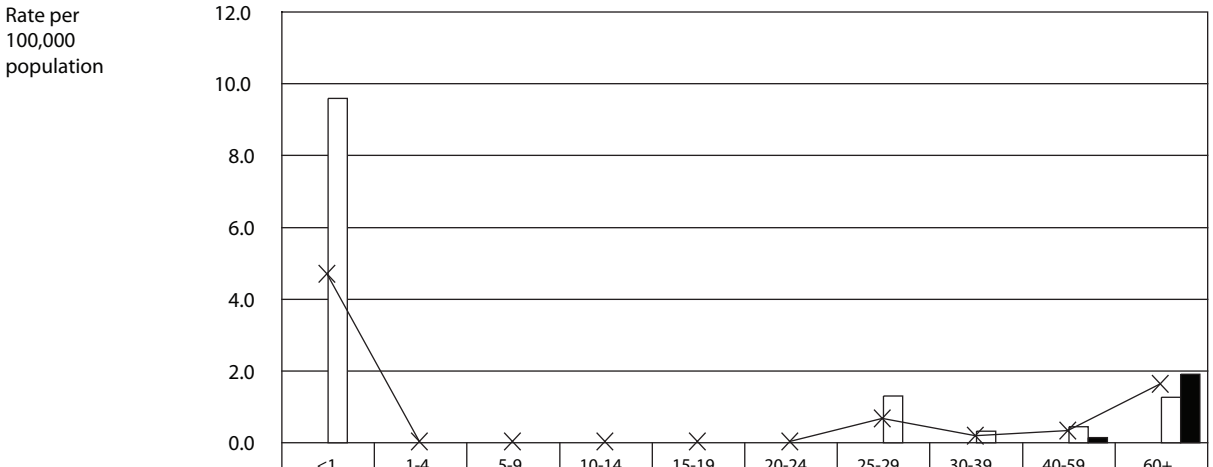
27.2 Listeriosis Rates by HSDA, 2008



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	2	2.5
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	1	0.2
23	Fraser South	3	0.4
31	Richmond	2	1.1
32	Vancouver	5	0.8
33	North Shore/Coast Garibaldi	2	0.7
41	South Vancouver Island	1	0.3
42	Central Vancouver Island	3	1.1
43	North Vancouver Island	0	0.0
51	Northwest	0	0.0
52	Northern Interior	1	0.7
53	Northeast	1	1.4

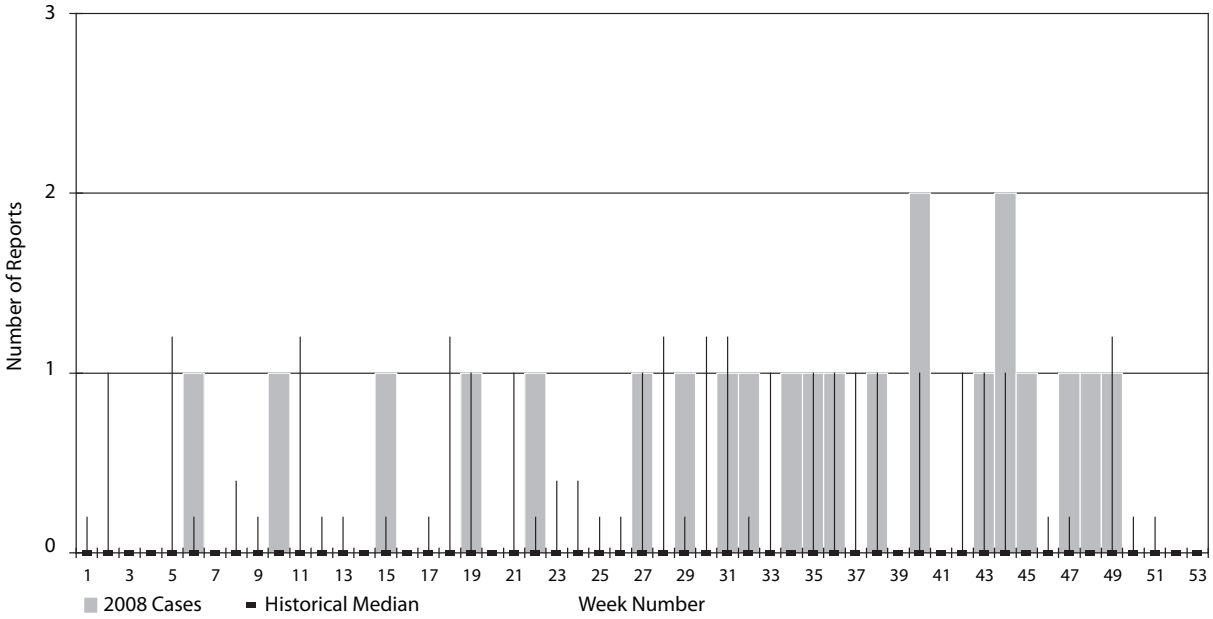
Note: Map classification by Jenks natural breaks method.

27.3 Listeriosis Rates by Age Group and Sex, 2008



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Listeriosis Reports - Female	2	0	0	0	0	0	2	1	3	6
Listeriosis Reports - Male	0	0	0	0	0	0	0	0	1	8
Listeriosis Rate - Female	9.6	0.0	0.0	0.0	0.0	0.0	1.3	0.3	0.4	1.3
Listeriosis Rate - Male	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.9
Listeriosis Rate - Total	4.7	0.0	0.0	0.0	0.0	0.0	0.7	0.2	0.3	1.6

27.4 2008 Listeriosis Reports Compared to Historical Median and the 10th and 90th Percentiles Around the Median (1999 to 2007)



*Based on 22 cases, as date for 23rd case was not available

Salmonellosis, Typhoid Fever and Paratyphoid Fever*

In 2008, 922 cases of salmonellosis were reported for a rate of 20.8 per 100,000 population, making *Salmonella* infection the second most commonly reported enteric disease in BC. Provincial rates of salmonellosis have remained relatively stable over the last 10 years, with a slight increase in the past two years. Rates were highest in children under 5 years of age and among residents of Fraser South, Kootenay Boundary and Vancouver (28.4 to 25.4 cases per 100,000 population). The number of cases reported peaked in the summer months.

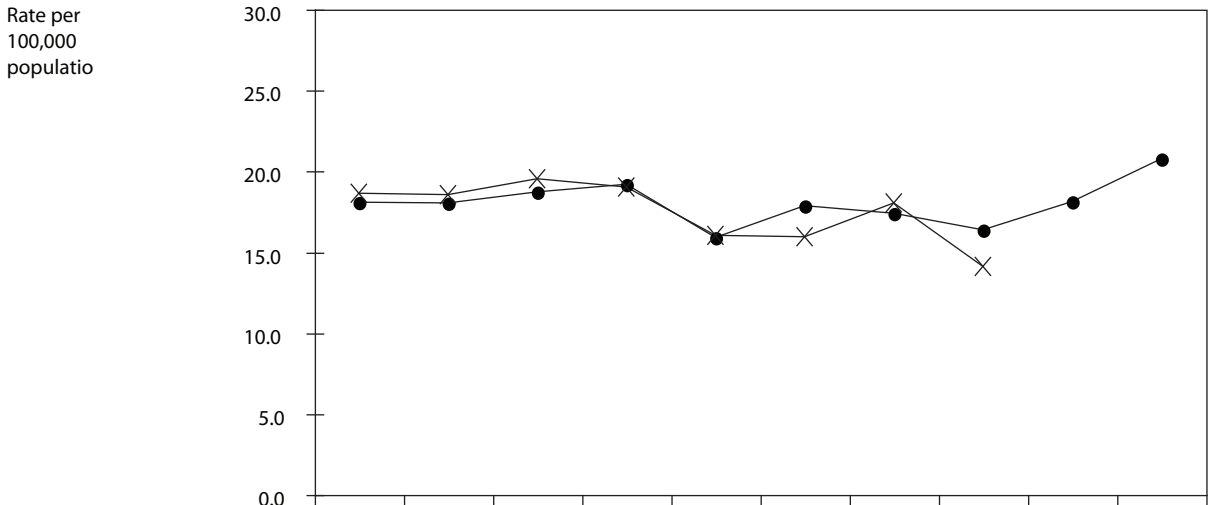
A large outbreak of *S*. Enteritidis occurred in 2008. 188 cases were investigated as part of this outbreak which began in June and was ongoing into 2009. The investigation in BC involved all five health authorities. The majority of cases were from the lower mainland as well as a large cluster in Kootenay Boundary which likely explains the higher rates in these geographic areas. The largest numbers of cases were reported in June and August which is shown by the large peaks during weeks 25 and 36. The most likely source of illness based on case investigation and a case-control study was eggs.

Typhoid fever rates in British Columbia have increased since 2000 and were higher again in 2008. Forty-five cases were reported in 2008 for a rate of 1.0 case per 100,000, double that of 2007. Paratyphoid fever incidence was similar to 2007 at 0.7 cases per 100,000 population in 2008. 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.

For the first time since 2004, there was a change in the top three serotypes. *S*. Heidelberg had been reported in the top three since 2004, but was the fourth most common serotype in 2008. *S*. Typhi increased and was included in the top 3 reported serotypes in 2008. The proportion of infections caused by *S*. Enteritidis increased in 2008 to 44% of infections compared to 36% in 2007 and 20% in 2006. This increase is due to the large outbreak caused by *S*. Enteritidis in 2008. The proportion of *S*. Heidelberg and *Salmonella* ssp I 4,5,12:i- decreased from 2007 to 2008. *S*. Saintpaul, reported in the top 10 serotypes in 2007 was not reported in the top 10 serotypes in 2008.

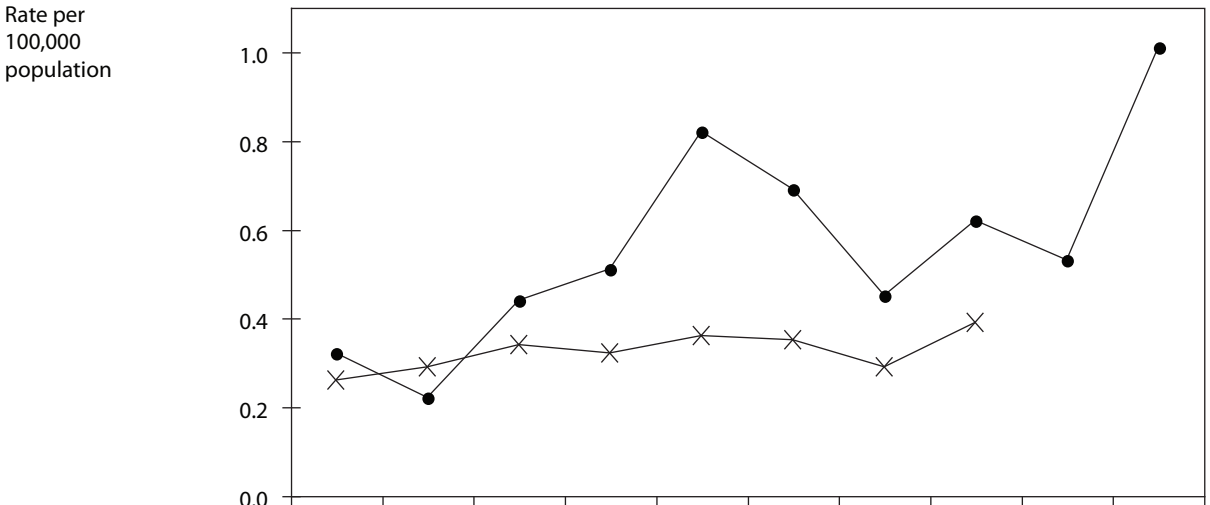
**All cases of Salmonella infection reported through iPHIS, including S. Typhi and S. Paratyphi, have been included in the overall numbers and rates by year, the rates by age and sex, the geographical distribution of cases and the cases reported by week. S. Typhi (Typhoid fever) and S. Paratyphi (Paratyphoid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

28.1 Salmonellosis Rates by Year, 1999–2008



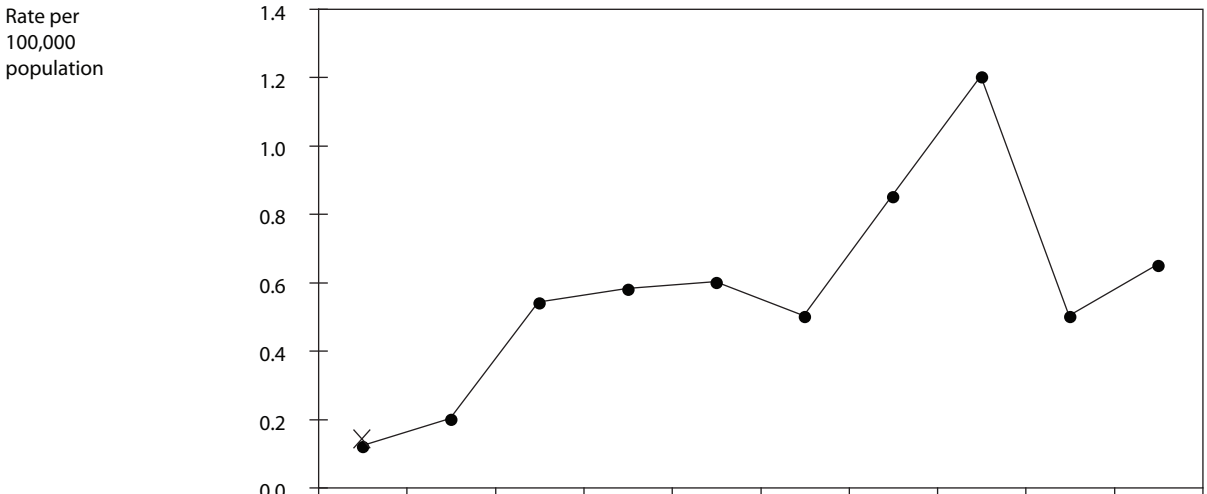
	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
BC Salmonellosis Reports	725	727	763	789	660	749	739	706	792	922
BC Salmonellosis Rate	18.1	18.0	18.7	19.2	15.9	17.8	17.4	16.3	18.1	20.8
Canadian Salmonellosis Rate	18.6	18.5	19.5	19.0	16.0	15.9	18.0	14.1		

28.2 Typhoid Fever Rates by Year, 1999–2008



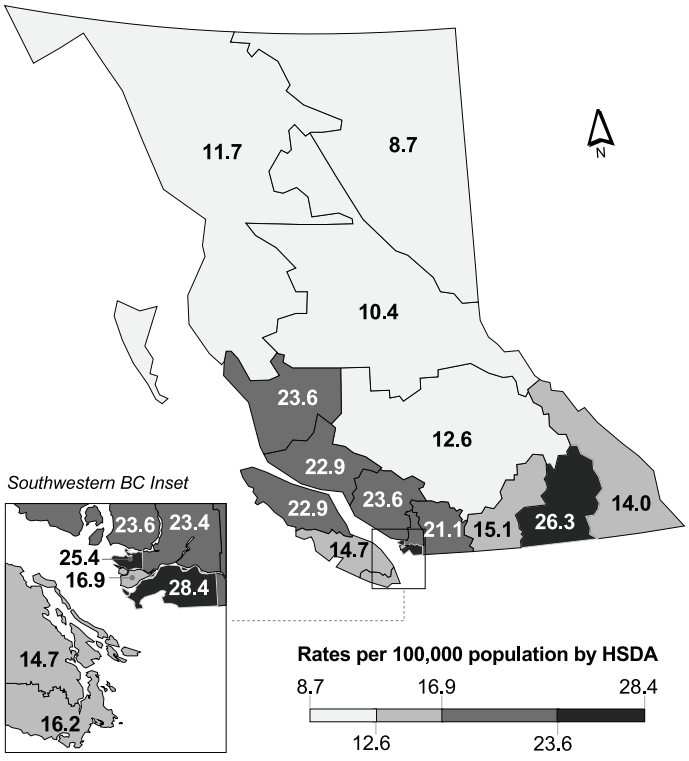
	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
BC Typhoid Fever Reports	13	9	18	21	34	29	19	27	23	45
BC Typhoid Fever Rate	0.3	0.2	0.4	0.5	0.8	0.7	0.5	0.6	0.5	1.0
Canadian Typhoid Fever Rate	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.4		

28.3 Paratyphoid Fever Rates by Year, 1999–2008



	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
BC Paratyphoid Fever Reports	5	8	22	24	25	21	36	52	22	29
BC Paratyphoid Fever Rate	0.1	0.2	0.5	0.6	0.6	0.5	0.9	1.2	0.5	0.7
Canadian Paratyphoid Fever Rate	0.1									

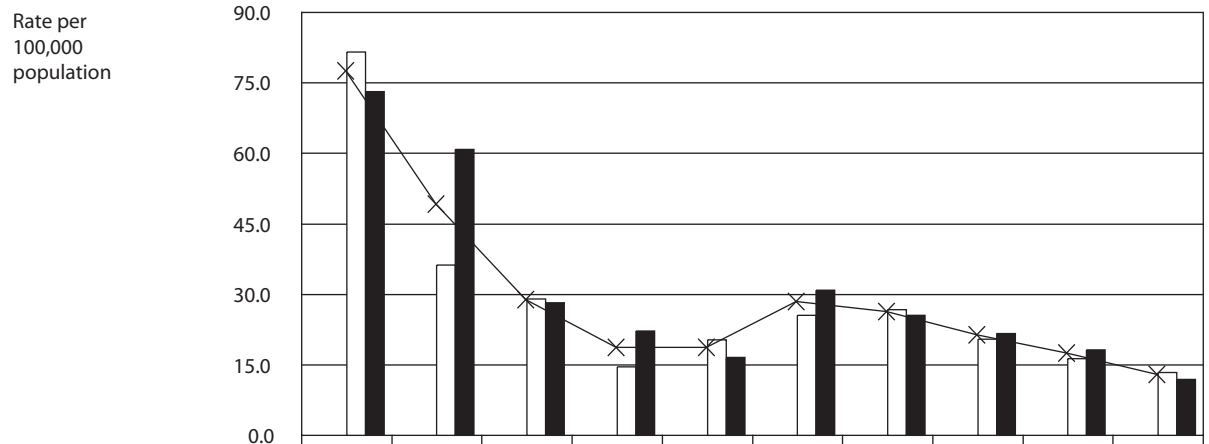
28.4 Salmonellosis Rates by HSDA, 2008



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	11	14.0
12	Kootenay Boundary	21	26.3
13	Okanagan	53	15.1
14	Thompson Cariboo Shuswap	28	12.6
21	Fraser East	59	21.1
22	Fraser North	138	23.4
23	Fraser South	195	28.4
31	Richmond	32	16.9
32	Vancouver	162	25.4
33	North Shore/Coast Garibaldi	66	23.6
41	South Vancouver Island	60	16.2
42	Central Vancouver Island	39	14.7
43	North Vancouver Island	28	22.9
51	Northwest	9	11.7
52	Northern Interior	15	10.4
53	Northeast	6	8.7

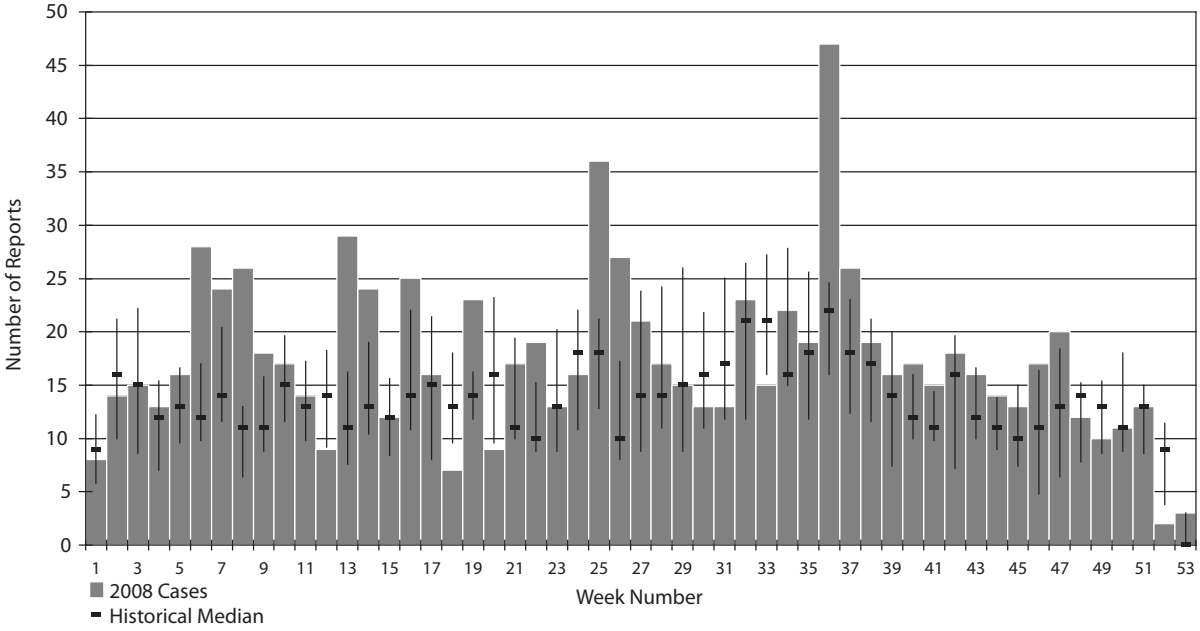
Note: Map classification by Jenks natural breaks method.

28.5 Salmonellosis Rates by Age Group and Sex, 2008



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Salmonellosis Reports - Female	17	30	31	18	28	39	41	63	112	63
Salmonellosis Reports - Male	16	53	32	29	24	49	40	66	122	49
Salmonellosis Rate - Female	81.6	36.3	29.1	14.6	20.4	25.5	26.8	20.5	16.4	13.4
Salmonellosis Rate - Male	73.2	60.9	28.2	22.2	16.6	30.9	25.5	21.7	18.2	11.8
Salmonellosis Rate - Total	77.3	48.9	28.7	18.5	18.4	28.3	26.1	21.1	17.3	12.7

28.6 2008 Salmonellosis Reports Compared to Historical Median and the 10th and 90th Percentiles Around the Median (1999 to 2007)



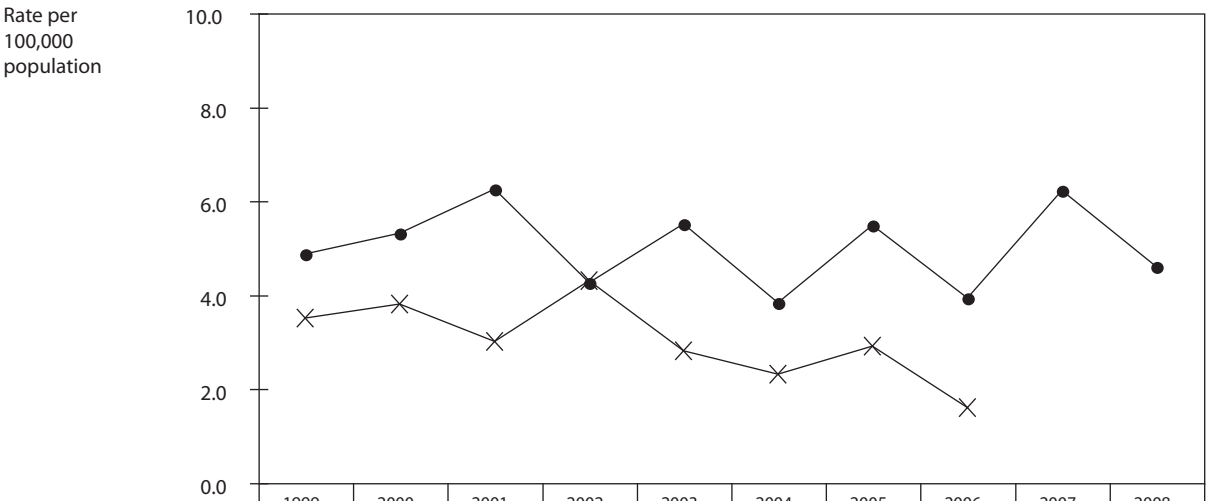
28.7 *Salmonella* serotype distribution, 2008

Rank	Species	Number of Cases	Proportion
1	Enteritidis	414	43.8%
2	Typhimurium	102	10.8%
3	Typhi	49	5.2%
4	Heidelberg	34	3.6%
5	Paratyphi A	32	3.4%
6	Salmonella ssp I 4,5,12:i-	28	2.9%
7	Stanley	20	2.1%
8	Newport	18	1.9%
8	Hadar	18	1.9%
10	Salmonella spp 1	14	1.4%
Others	Others	217	22.9%
	Total	185	100.0%

Shigellosis

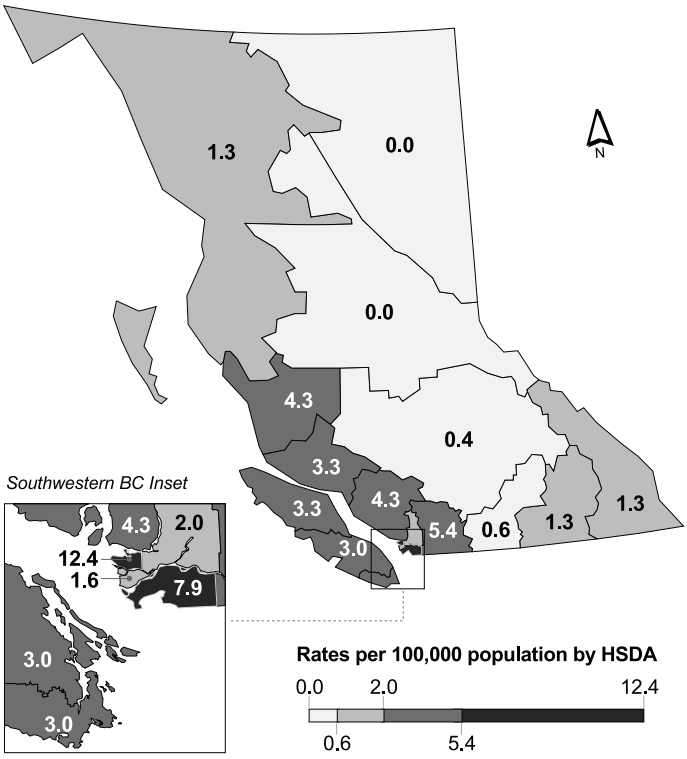
Annual shigellosis incidence in the province has fluctuated between 4–6 cases per 100,000 population over the last ten years. In 2008, there was a slight decrease in cases compared to 2007. A large outbreak of *S. sonnei* infection among the homeless populations in Vancouver and Surrey began in the fall of 2007 and continued into the winter of 2008. This explains the higher rates in adult males and in Vancouver and Fraser South as well as the above expected number of cases reported in the first few weeks of 2008. Typical peaks were also observed in children aged 1 to 4 years and among adults aged 20–29 years. *S. sonnei* remains the most common species and accounted for two-thirds of the isolates in 2008.

29.1 Shigellosis Rates by Year, 1999–2008



	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
BC Shigellosis Reports	195	214	255	175	229	161	233	170	272	204
BC Shigellosis Rate	4.9	5.3	6.3	4.3	5.5	3.8	5.5	3.9	6.2	4.6
Canadian Shigellosis Rate	3.5	3.8	3.0	4.3	2.8	2.3	2.9	1.6		

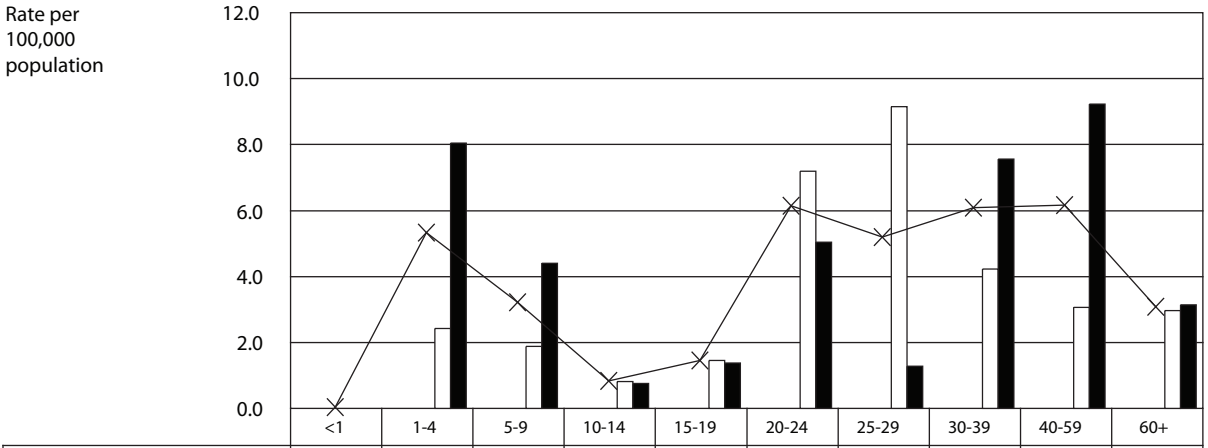
29.2 Shigellosis Rates by HSDA, 2008



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	1	1.3
12	Kootenay Boundary	1	1.3
13	Okanagan	2	0.6
14	Thompson Cariboo Shuswap	1	0.4
21	Fraser East	15	5.4
22	Fraser North	12	2.0
23	Fraser South	54	7.9
31	Richmond	3	1.6
32	Vancouver	79	12.4
33	North Shore/Coast Garibaldi	12	4.3
41	South Vancouver Island	11	3.0
42	Central Vancouver Island	8	3.0
43	North Vancouver Island	4	3.3
51	Northwest	1	1.3
52	Northern Interior	0	0.0
53	Northeast	0	0.0

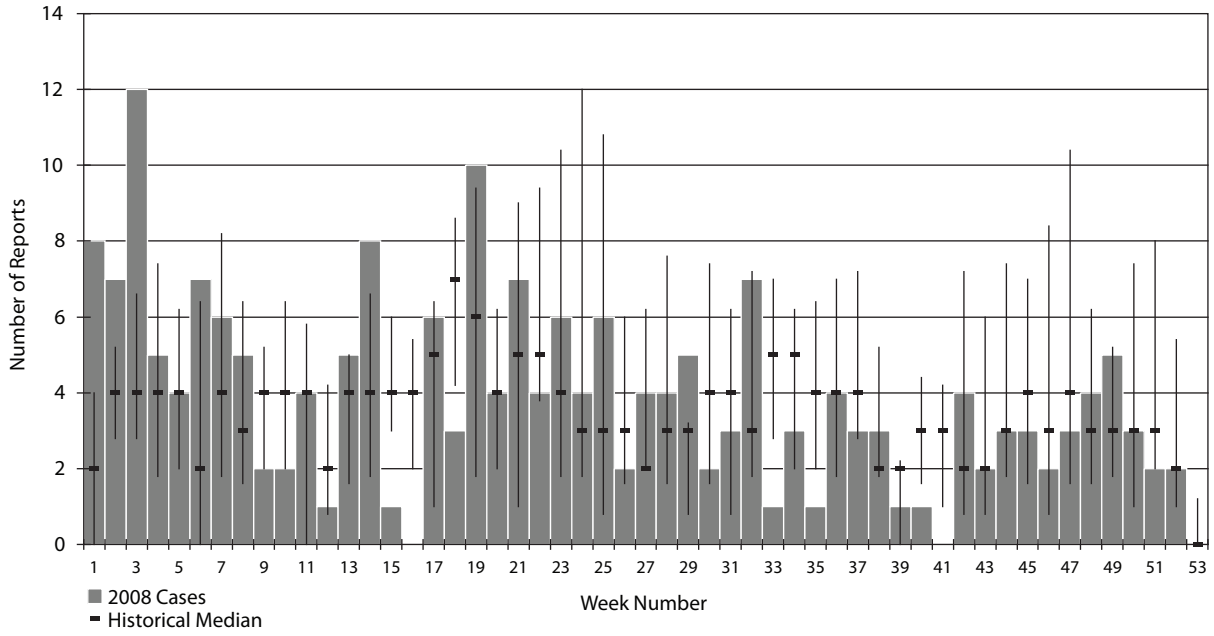
Note: Map classification by Jenks natural breaks method.

29.3 Shigellosis Rates by Age Group and Sex, 2008



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Shigellosis Reports - Female	0	2	2	1	2	11	14	13	21	14
Shigellosis Reports - Male	0	7	5	1	2	8	2	23	62	13
Shigellosis Reports - Unknown	0	0	0	0	0	0	0	1	0	0
Shigellosis Rate - Female	0.0	2.4	1.9	0.8	1.5	7.2	9.2	4.2	3.1	3.0
Shigellosis Rate - Male	0.0	8.0	4.4	0.8	1.4	5.1	1.3	7.6	9.2	3.1
Shigellosis Rate - Total	0.0	5.3	3.2	0.8	1.4	6.1	5.2	6.1	6.1	3.1

29.4 2008 Shigellosis Reports Compared to Historical Median and the 10th and 90th Percentiles Around the Median (1999 to 2007)



29.5 *Shigella* species distribution, 2008

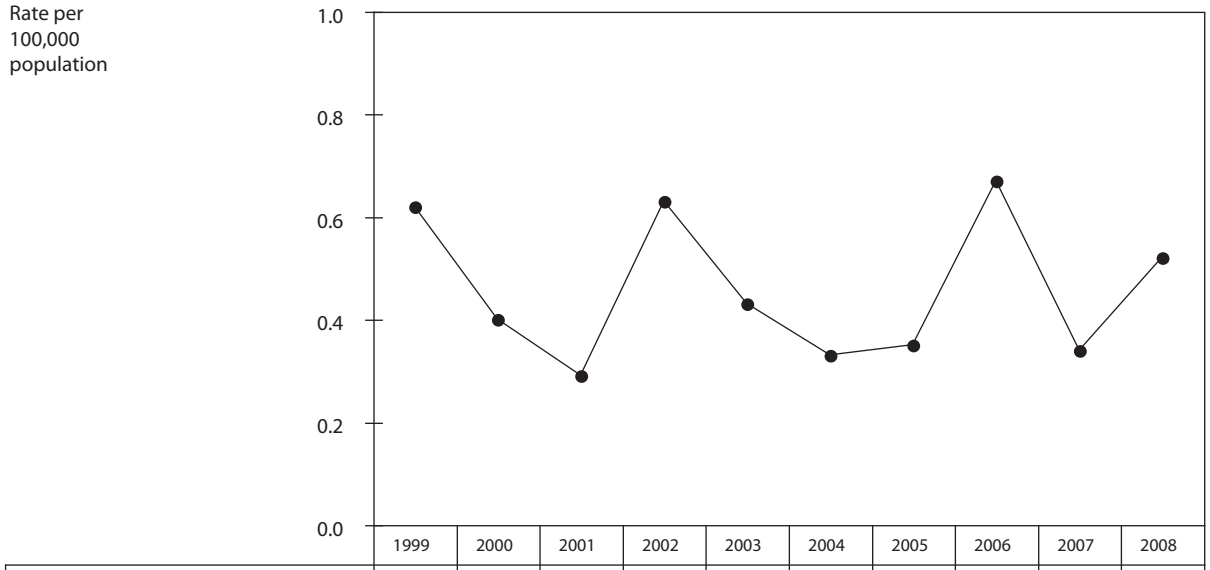
Rank	Species	Number of Cases	Proportion
1	sonnei	110	59.4%
2	flexneri	60	32.4%
3	boydii	8	4.3%
4	dysenteriae	3	1.6%
	Other/unknown	4	2.2%
	Total	185	100.0%

Note: Species distribution is based on BCCDC Laboratory Services data. Numbers may vary from those reported in iPHIS.

Vibrio parahaemolyticus

In 2008, twenty-three cases of *V. parahaemolyticus* infection were reported, a slight increase in incidence compared to 2007 but within the typical rate per 100,000 population which has ranged from 0.3 to 0.7 rate per 100,000 population over the past ten years. Cases were reported mostly from coastal regions with the highest number of cases reported from North Shore/Coast Garibaldi. Twenty-two cases were reported in adults, and one case was reported in an individual aged 10 to 14 years. In previous years the majority of cases have been reported in males, but in 2008 only 52% of cases were male. The majority of cases were reported from weeks 28 to 41, which is consistent with the annual summer peak. *V. parahaemolyticus* infections in BC are mostly associated with consumption of raw or undercooked shellfish during the summer months.

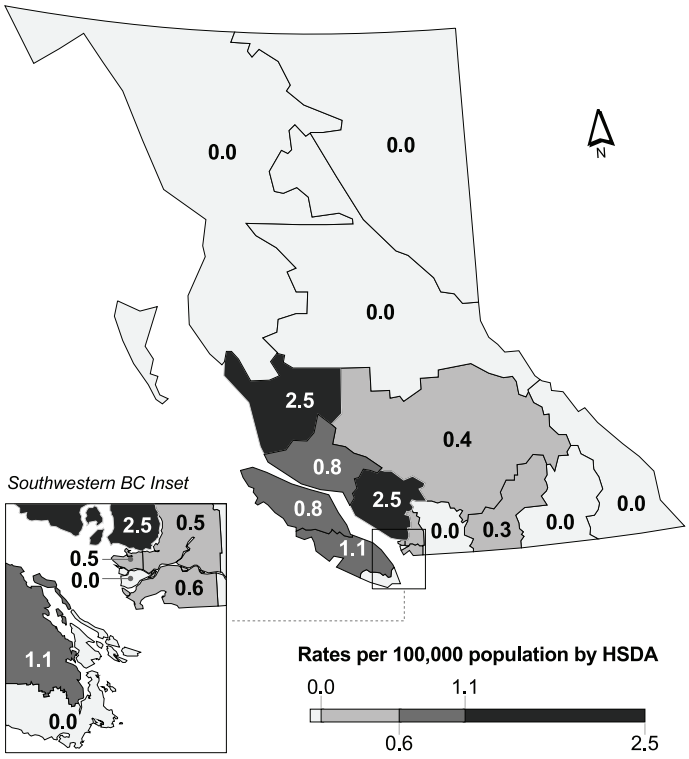
30.1 *Vibrio parahaemolyticus* Rates by Year, 1999–2008



	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
BC Vibrio parahaemolyticus Reports	25	16	12	26	18	14	15	29	15	23
BC Vibrio parahaemolyticus Rate	0.6	0.4	0.3	0.6	0.4	0.3	0.4	0.7	0.3	0.5

Note: Vibrio parahaemolyticus is not notifiable nationally

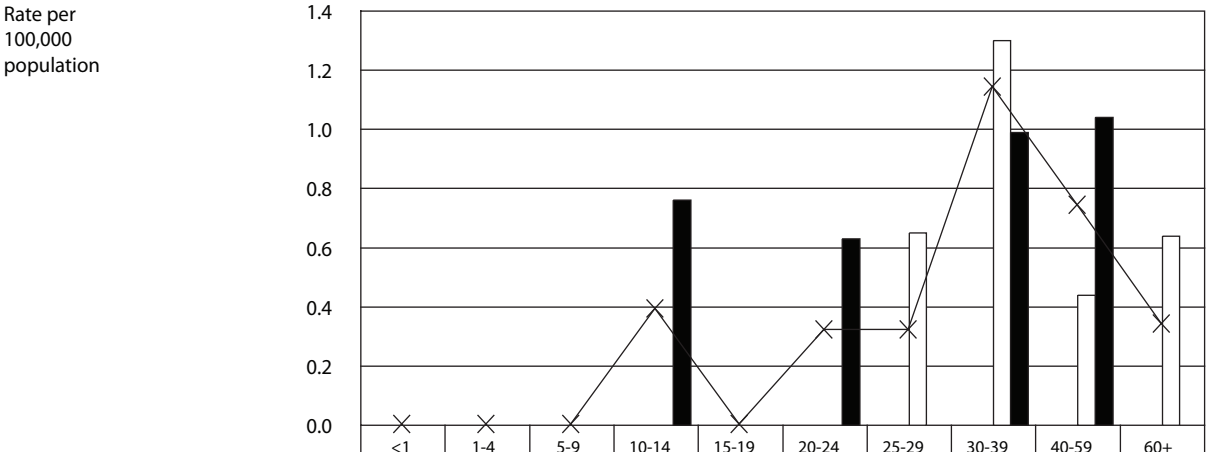
30.2 *Vibrio parahaemolyticus* Rates by HSDA, 2008



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	0	0.0
12	Kootenay Boundary	0	0.0
13	Okanagan	1	0.3
14	Thompson Cariboo Shuswap	1	0.4
21	Fraser East	0	0.0
22	Fraser North	3	0.5
23	Fraser South	4	0.6
31	Richmond	0	0.0
32	Vancouver	3	0.5
33	North Shore/Coast Garibaldi	7	2.5
41	South Vancouver Island	0	0.0
42	Central Vancouver Island	3	1.1
43	North Vancouver Island	1	0.8
51	Northwest	0	0.0
52	Northern Interior	0	0.0
53	Northeast	0	0.0

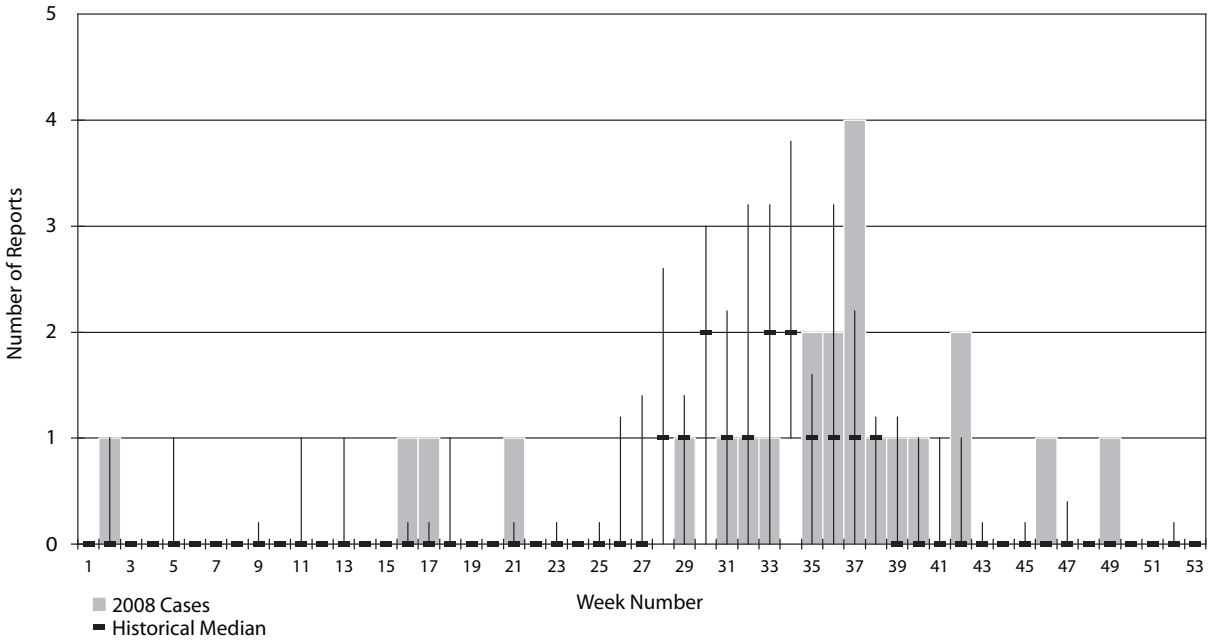
Note: Map classification by Jenks natural breaks method.

30.3 *Vibrio parahaemolyticus* Rates by Age Group and Sex, 2008



	<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	0	0	0	1	4	3	3
Vibrio parahaemolyticus Reports - Male	0	0	0	1	0	1	0	3	7	0
Vibrio parahaemolyticus Rate - Female	0.0	0.0	0.0	0.0	0.0	0.0	0.7	1.3	0.4	0.6
Vibrio parahaemolyticus Rate - Male	0.0	0.0	0.0	0.8	0.0	0.6	0.0	1.0	1.0	0.0
Vibrio parahaemolyticus Rate - Total	0.0	0.0	0.0	0.4	0.0	0.3	0.3	1.1	0.7	0.3

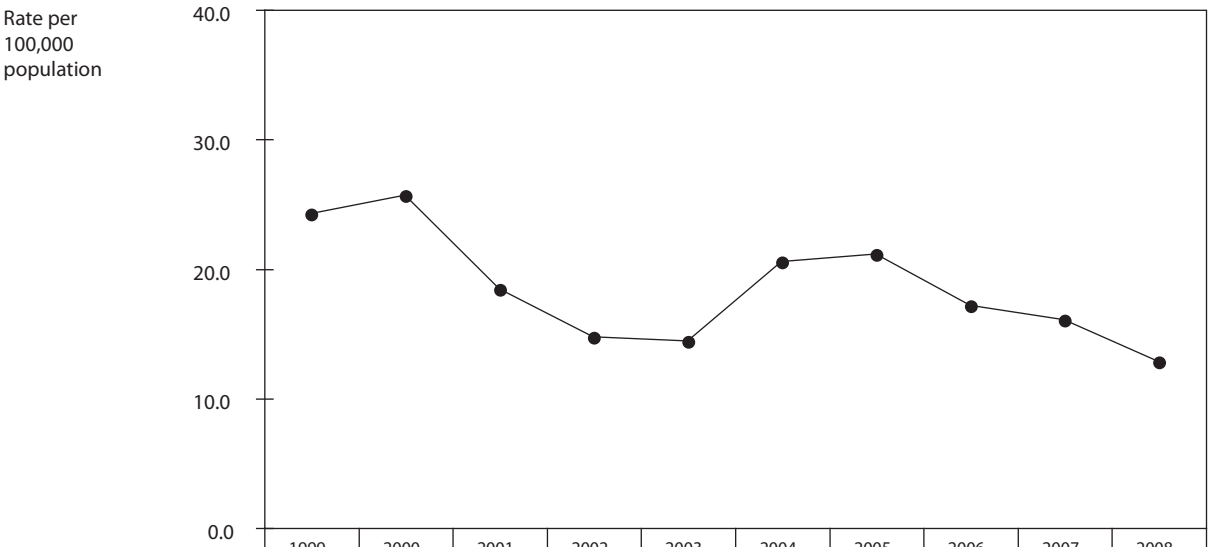
30.4 2008 *Vibrio parahaemolyticus* Reports Compared to Historical Median and the 10th and 90th Percentiles Around the Median (1999 to 2007)



Yersiniosis

Yersiniosis was the third most common enteric infection reported and in 2008, 569 cases were reported. There has been a decreasing trend in incidence over the past four years. Incidence was highest in children less than five years of age and those individuals over 60 years of age. The number of cases reported was highest during weeks 1 (January) and 28 (July). The typical mid-summer seasonal peak was less evident in 2008 with cases occurring throughout the year; no outbreaks were reported. Like previous years, there was significant geographic variation in rates. This is likely related to differences in isolation techniques used at clinical laboratories; cold enrichment, which promotes the growth of *Yersinia* is used by some laboratories servicing the lower mainland and Vancouver Island. The highest rates of infection were reported in residents of North Shore/Coast Garibaldi at 28.7/100,000 followed by Richmond, South Vancouver Island and Vancouver.

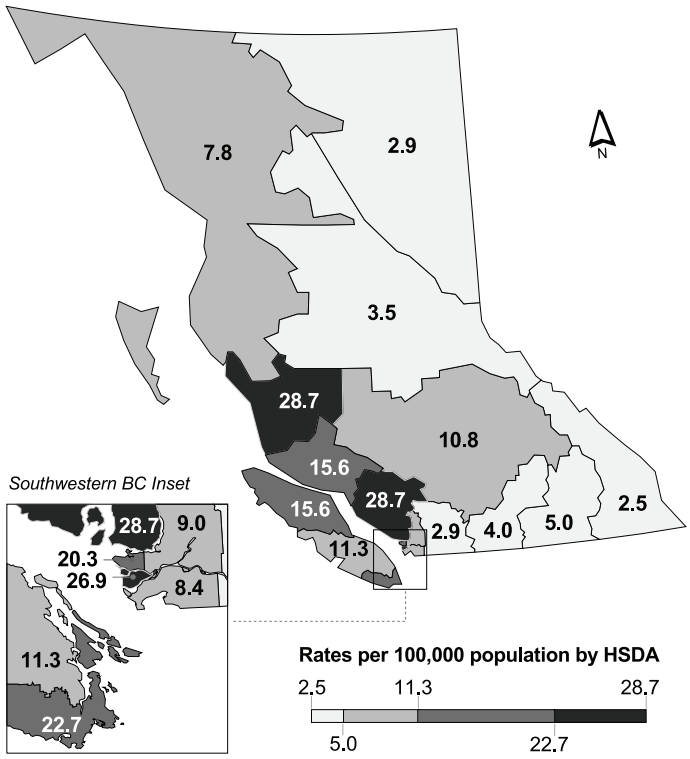
31.1 Yersiniosis Rates by Year, 1999–2008



	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
BC Yersiniosis Reports	970	1036	750	605	598	861	899	740	702	569
BC Yersiniosis Rate	24.2	25.7	18.4	14.7	14.4	20.5	21.1	17.1	16.0	12.8

Note: Yersiniosis is not notifiable nationally

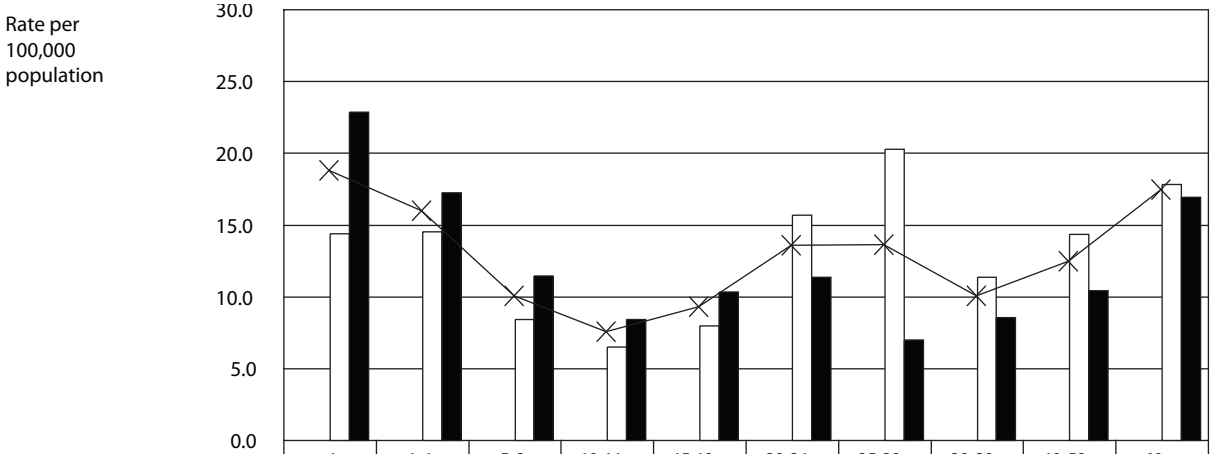
31.2 Yersiniosis Rates by HSDA, 2008



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	2	2.5
12	Kootenay Boundary	4	5.0
13	Okanagan	14	4.0
14	Thompson Cariboo Shuswap	24	10.8
21	Fraser East	8	2.9
22	Fraser North	53	9.0
23	Fraser South	58	8.4
31	Richmond	51	26.9
32	Vancouver	129	20.3
33	North Shore/Coast Garibaldi	80	28.7
41	South Vancouver Island	84	22.7
42	Central Vancouver Island	30	11.3
43	North Vancouver Island	19	15.6
51	Northwest	6	7.8
52	Northern Interior	5	3.5
53	Northeast	2	2.9

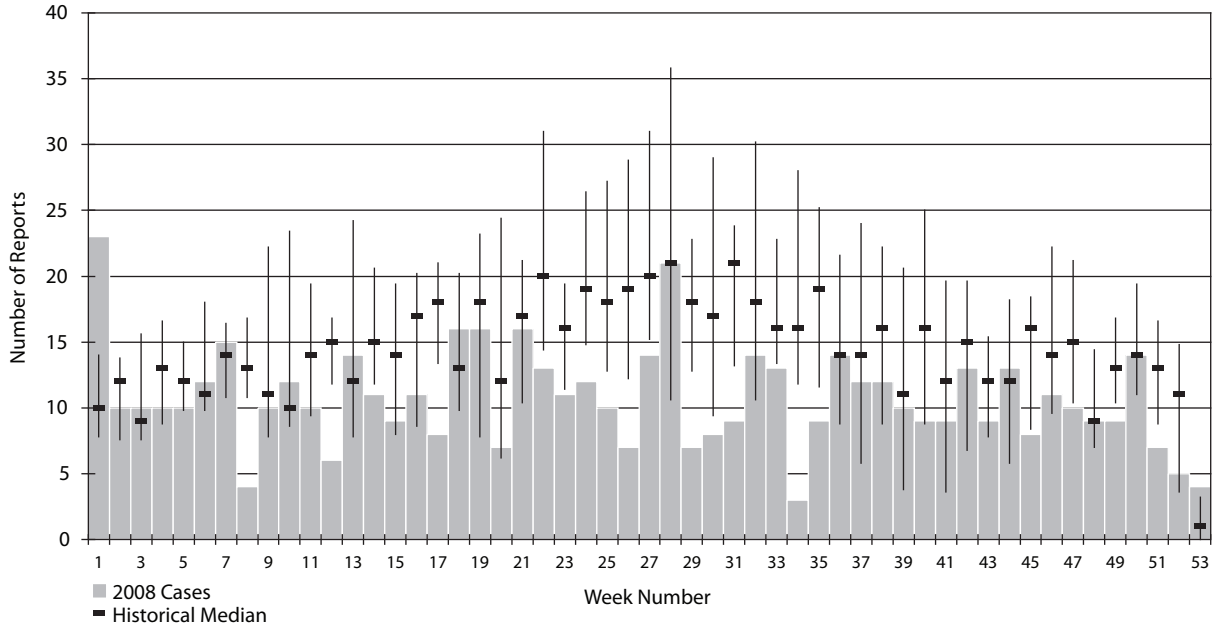
Note: Map classification by Jenks natural breaks method.

31.3 Yersiniosis Rates by Age Group and Sex, 2008



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Yersiniosis Reports - Female	3	12	9	8	11	24	31	35	98	84
Yersiniosis Reports - Male	5	15	13	11	15	18	11	26	70	70
Yersiniosis Rate - Female	14.4	14.5	8.4	6.5	8.0	15.7	20.3	11.4	14.3	17.8
Yersiniosis Rate - Male	22.9	17.2	11.5	8.4	10.4	11.4	7.0	8.6	10.4	16.9
Yersiniosis Rate - Total	18.7	15.9	10.0	7.5	9.2	13.5	13.6	10.0	12.4	17.4

31.4 2008 Yersiniosis Reports Compared to Historical Median and the 10th and 90th Percentiles Around the Median (1999 to 2007)



Outbreaks of Gastroenteritis

In August 2008 a web-enabled outbreak reporting tool for enteric outbreaks was launched in BC. The objective of conducting 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 August 1 and December 31, 2008, 28 enteric outbreaks were reported. Thirteen were reported from Interior Health, 7 from Vancouver Island, 4 from Fraser, 3 from BCCDC and 1 from Vancouver Coastal. The use of this tool is ongoing throughout BC.

vectorborne and other zoonotic diseases

Hantavirus Pulmonary Syndrome

Lyme Disease

Malaria

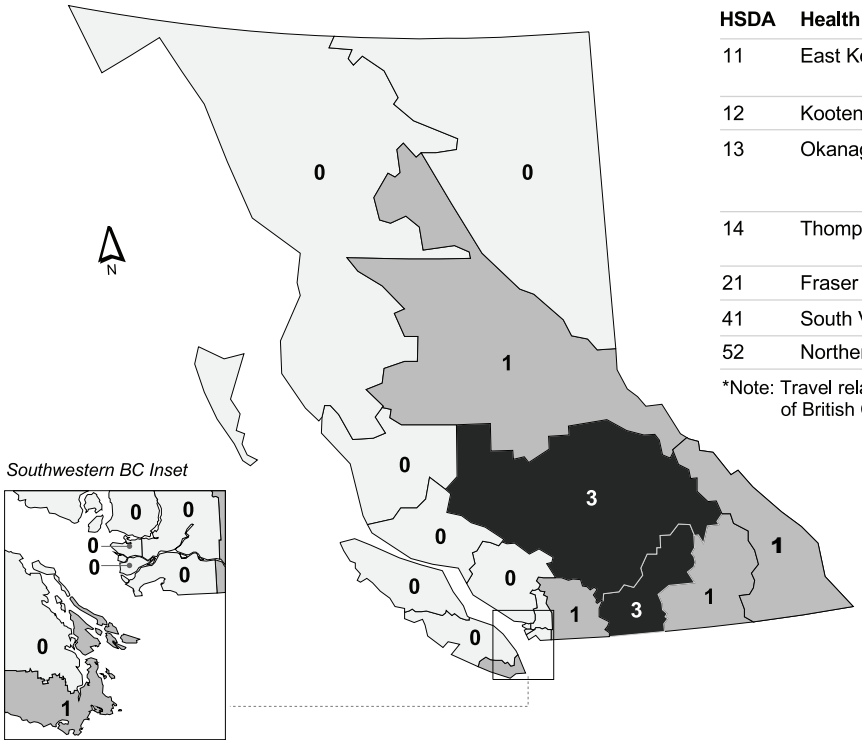
Rabies, exposure incidents

West Nile Virus

Hantavirus pulmonary syndrome

There were no cases of hantavirus pulmonary syndrome reported in 2008. Since 1994 eleven cases have been reported of which 10 were locally-acquired. All cases have been related to contact with rodent excreta through recreational, peri-domestic, occupational or farming activities.

32.1 Hantavirus plumonary syndrome, cumulative number of cases by HSDA, 1994–2008



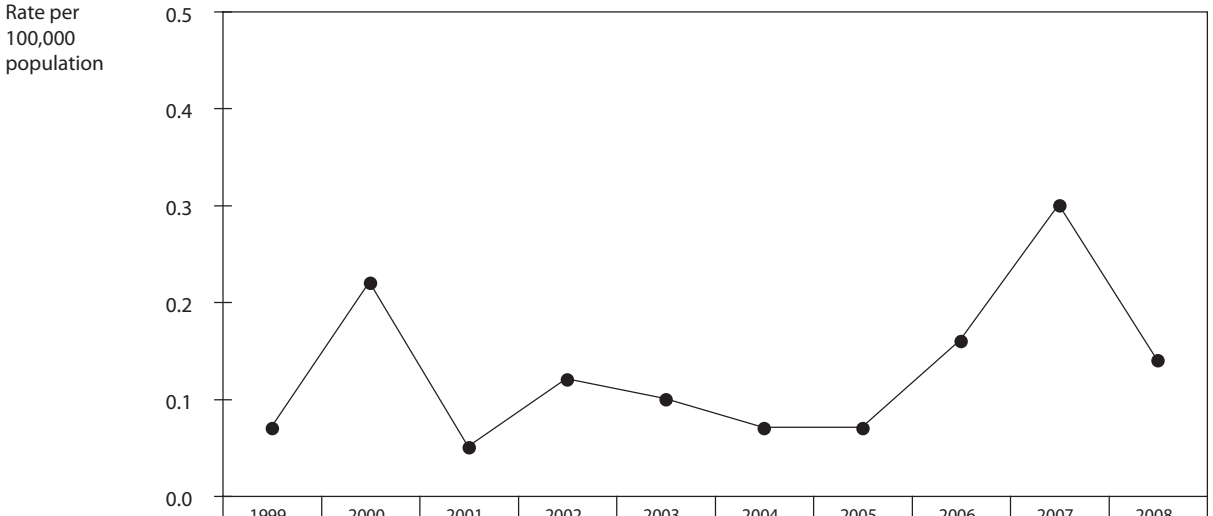
HSDA	Health Service Delivery Area	Cases	Year
11	East Kootenay	1	2007
12	Kootenay Boundary	1	2005
13	Okanagan	1 1 1	1994 2002 2006
14	Thompson Cariboo Shuswap	2 1	1994 1995
21	Fraser East	1	1994
41	South Vancouver Island	1	1996
52	Northern Interior	*1	2006

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

Lyme Disease

BC continues to have a low endemic rate of Lyme Disease. There were 6 confirmed cases of Lyme Disease reported in BC in 2008 (4 male, 2 female), down from 13 in 2007. Half of the cases were in the 60+ age group with 2 of those in males. The provincial rate was 0.1 per 100,000.

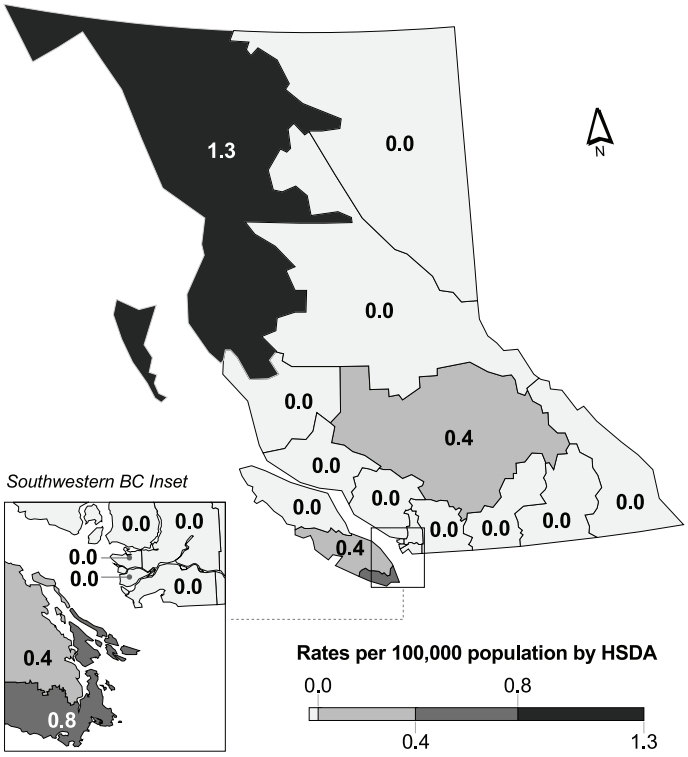
33.1 Lyme Disease Rates by Year, 1999–2008



	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
BC Lyme Reports	3	9	2	5	4	3	3	7	13	6
BC Lyme Rate	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.1

Note: Lyme Disease is not notifiable nationally

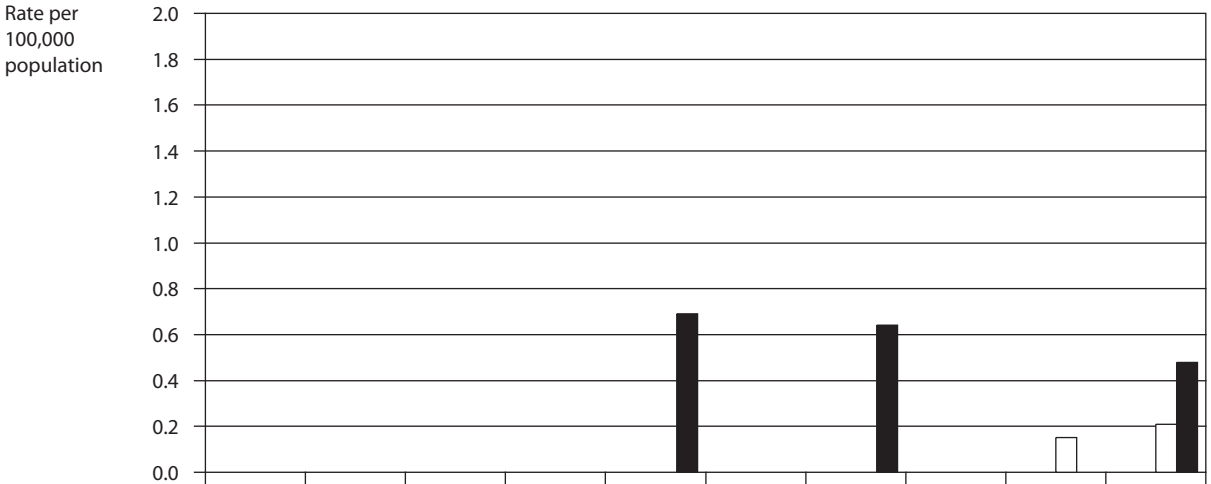
33.2 Lyme Disease Rates by HSDA, 2008



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	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	3	0.8
42	Central Vancouver Island	1	0.4
43	North Vancouver Island	0	0.0
51	Northwest	1	1.3
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, 2008

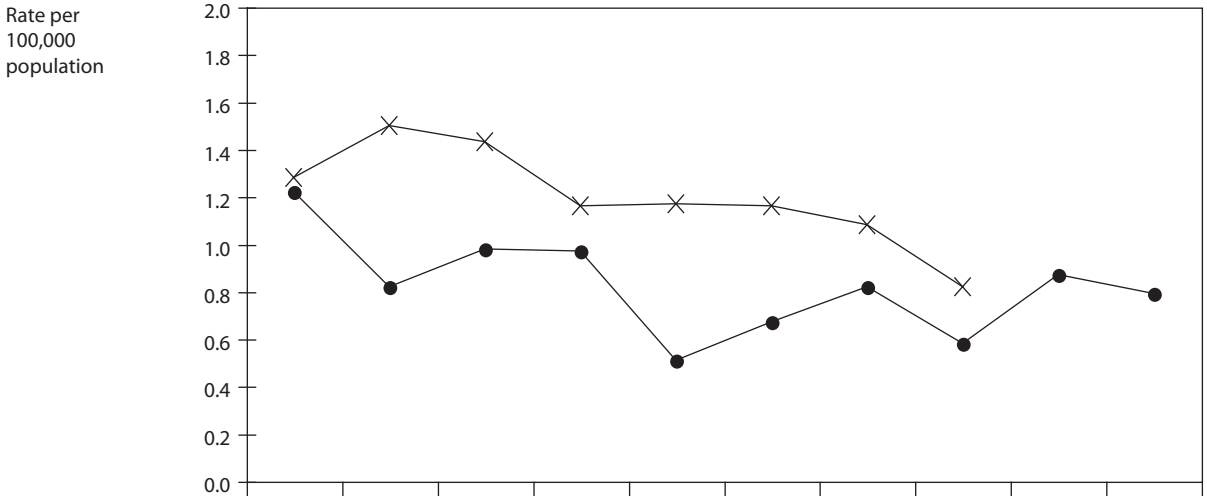


	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Lyme Reports - Female	0	0	0	0	0	0	0	0	1	1
Lyme Reports - Male	0	0	0	0	1	0	1	0	0	2
☐ Lyme Rate - Female	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2
■ Lyme Rate - Male	0.0	0.0	0.0	0.0	0.7	0.0	0.6	0.0	0.0	0.5

Malaria

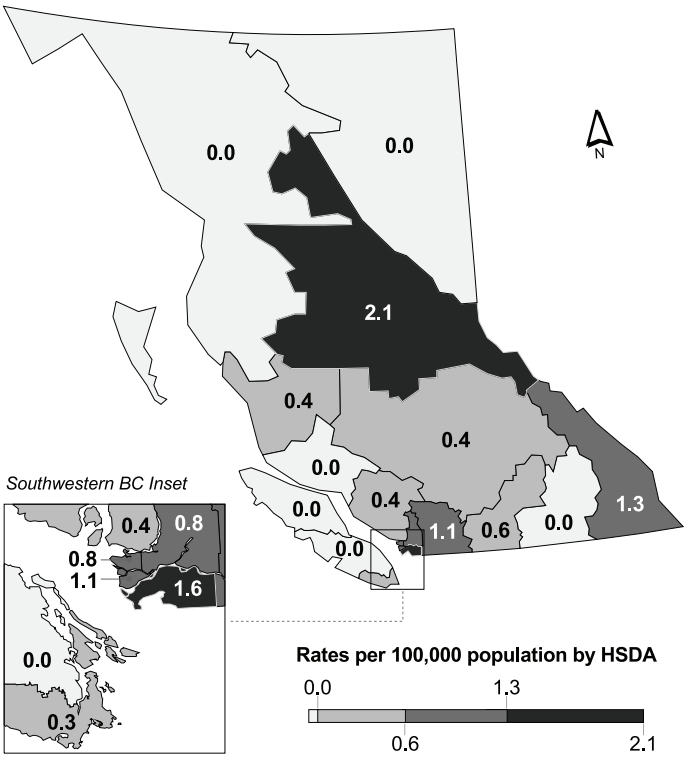
There were 35 reported cases of malaria in BC during 2008 for a rate of 0.8 per 100,000 population. Malaria is not endemic in BC. Antimalarials for prophylaxis and treatment are broadly effective in most parts of the globe but there is some evidence of emerging resistance in pockets of South-East Asia.

34.1 Malaria Rates by Year, 1999–2008



	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
BC Malaria Reports	49	33	40	40	21	28	35	25	38	35
BC Malaria Rate	1.2	0.8	1.0	1.0	0.5	0.7	0.8	0.6	0.9	0.8
Canadian Malaria Rate	1.3	1.5	1.4	1.2	1.2	1.2	1.1	0.8		

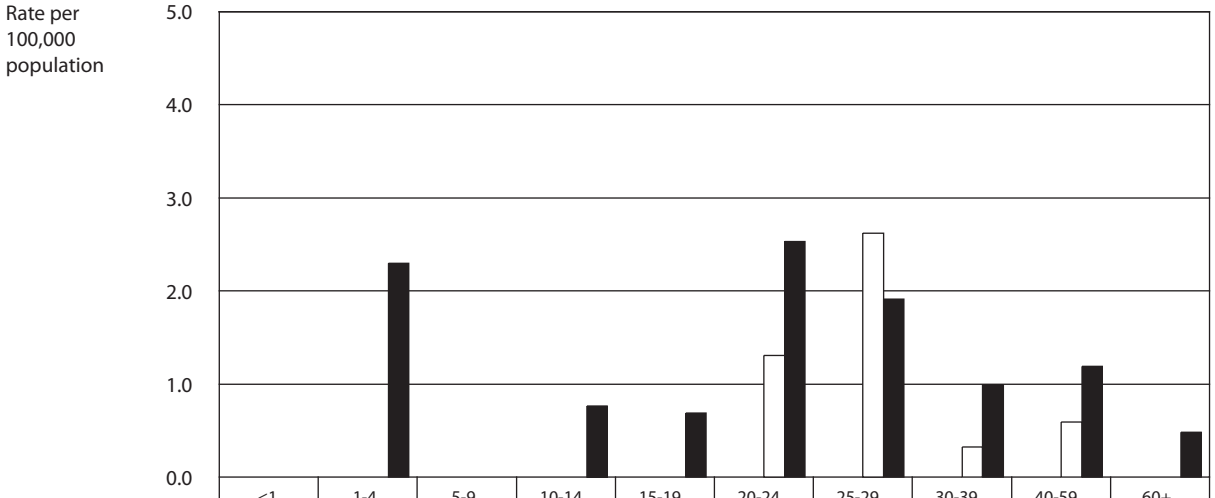
34.2 Malaria Rates by HSDA, 2008



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	1	1.3
12	Kootenay Boundary	0	0.0
13	Okanagan	2	0.6
14	Thompson Cariboo Shuswap	1	0.4
21	Fraser East	3	1.1
22	Fraser North	5	0.8
23	Fraser South	11	1.6
31	Richmond	2	1.1
32	Vancouver	5	0.8
33	North Shore/Coast Garibaldi	1	0.4
41	South Vancouver Island	1	0.3
42	Central Vancouver Island	0	0.0
43	North Vancouver Island	0	0.0
51	Northwest	0	0.0
52	Northern Interior	3	2.1
53	Northeast	0	0.0

Note: Map classification by Jenks natural breaks method.

34.3 Malaria Rates by Age Group and Sex, 2008



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Malaria Reports - Female	0	0	0	0	0	2	4	1	4	0
Malaria Reports - Male	0	2	0	1	1	4	3	3	8	2
Malaria Rate - Female	0.0	0.0	0.0	0.0	0.0	1.3	2.6	0.3	0.6	0.0
Malaria Rate - Male	0.0	2.3	0.0	0.8	0.7	2.5	1.9	1.0	1.2	0.5

Rabies

The term "exposure" denotes a report of a possible rabies exposure risk with one report representing an individual incident that was reported to a Health Authority for the purpose of rabies investigation. For these exposures, rabies post exposure prophylaxis (RPEP) may or may not have been given.

From 2007 to 2008, the rate of reported rabies exposures decreased from 9.0 to 5.5 per 100,000 (387 exposures vs. 240 exposures). Interior Health Authority continues to report the highest number of rabies exposures. The incidence rate for the Thompson Cariboo Shuswap Health Service Delivery Area saw a tenfold decrease from 27.3 per 100,000 in 2007 to 2.7 per 100,000 in 2008. Kootenay Boundary decreased from 16.8 to 5.1, whereas the Okanagan increased from 14.2 to 18.3. North Shore/Coast Garibaldi decreased from 11.9 to 2.2 exposures per 100,000 and Vancouver/ Richmond increased from 5.9 to 14.6.

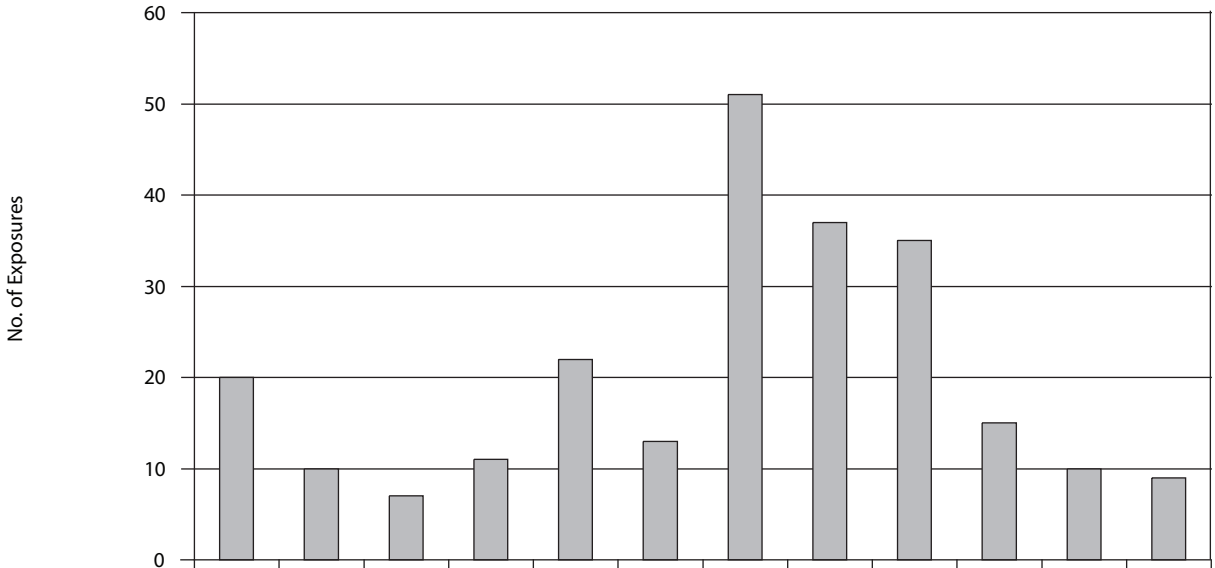
Most animal exposures continue to occur over the warmer months when bats are active, but the fraction involving bats dropped from 75% in 2007 to 60% in 2008. The largest portion of the difference was taken up by dogs (13% to 22%). Of the 224 bats submitted for testing from BC in 2008, there were 14 (6.3%) positive specimens (CFIA 2009).

Higher rates of exposures occurred in children in the 5 to 19 year age group. However, the range of incidence was narrower than in 2007, from a low of 4.0 to a high of 6.6 across all age groups. In 2007, slightly higher rates of exposure were reported for females (9.5) than males (8.4), but in 2008, the rates were almost identical at 5.4 for females and 5.5 per 100,000 for males. The type of exposure most often reported in 2008 was a bite (96 bites, all species); in 2007 the most commonly reported exposure was a bat in the same room (176 exposures). Eighty-three exposures happened outside Canada in 2008 (35% of the total), whereas 51 such exposures were reported in 2007 (13%). Bats accounted for 146 exposures in 2008 compared to 288 exposures in 2007.

35.1 Rabies Exposure Incidents Reported to BC Health Authorities, 2007–2008

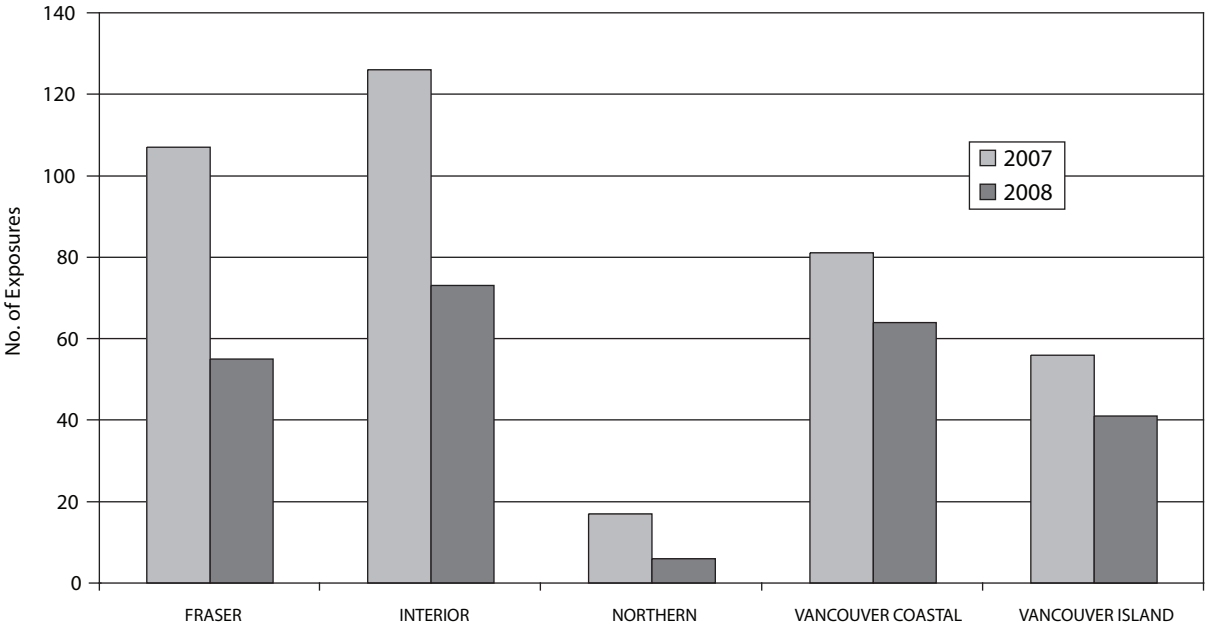
Year	# Exposure	Rate per 100,000
2007	387	9.0
2008	240	5.5
TOTAL	627	7.2

35.2 Rabies Exposure Incident by Month, 2008

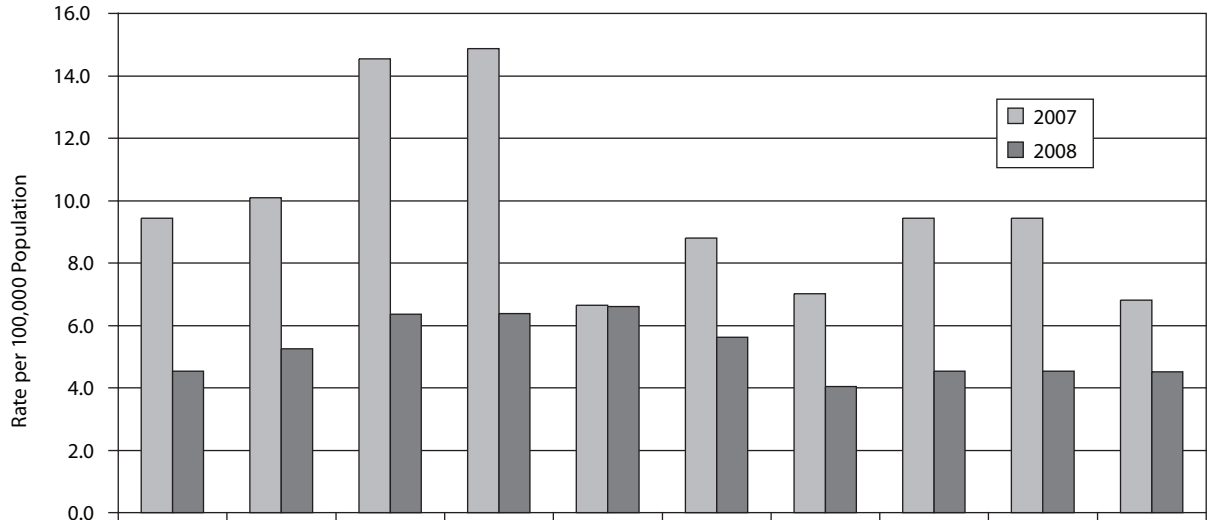


	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Number of Exposures	20	10	7	11	22	13	51	37	35	15	10	9

35.3 Rabies Exposure Incident by Health Authority of Residence, 2007–2008

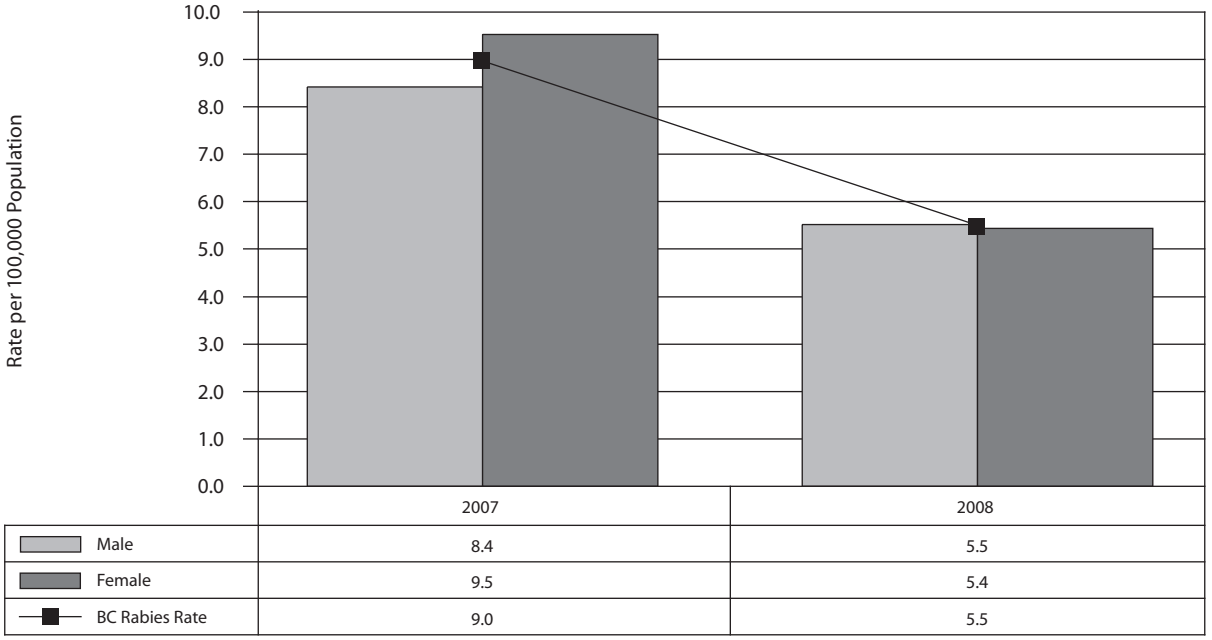


35.4 Rabies Exposure Incident Rates by Age Group, 2007–2008



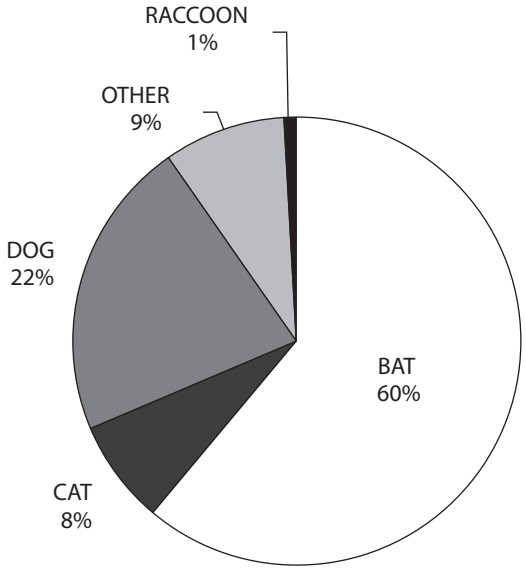
	<1 Year	1 - 4 Years	5 - 9 Years	10 - 14 Years	15 - 19 Years	20 - 24 Years	25 - 29 Years	30 - 39 Years	40 - 59 Years	60+ Years
2007	9.4	10.1	14.5	14.9	6.6	8.8	7.0	9.4	9.4	6.8
2008	4.5	5.3	6.4	6.4	6.6	5.6	4.0	4.5	4.5	4.5

35.5 Rabies Exposure Incident Rates by Sex, 2007–2008

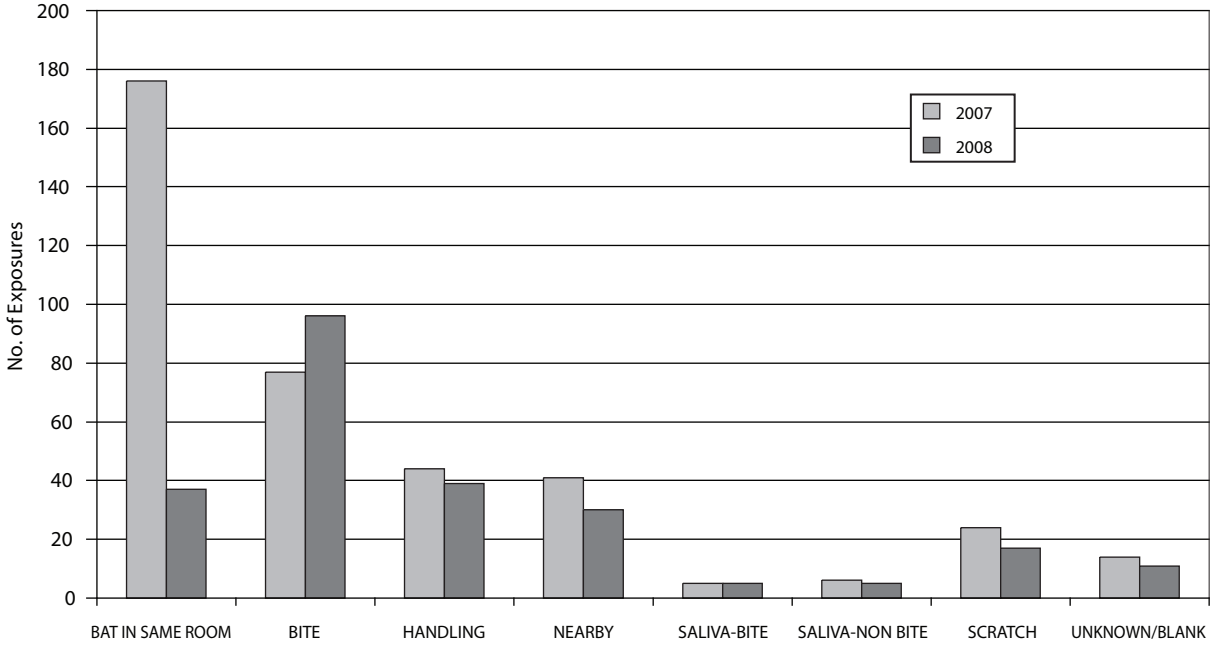


	2007	2008
Male	8.4	5.5
Female	9.5	5.4
BC Rabies Rate	9.0	5.5

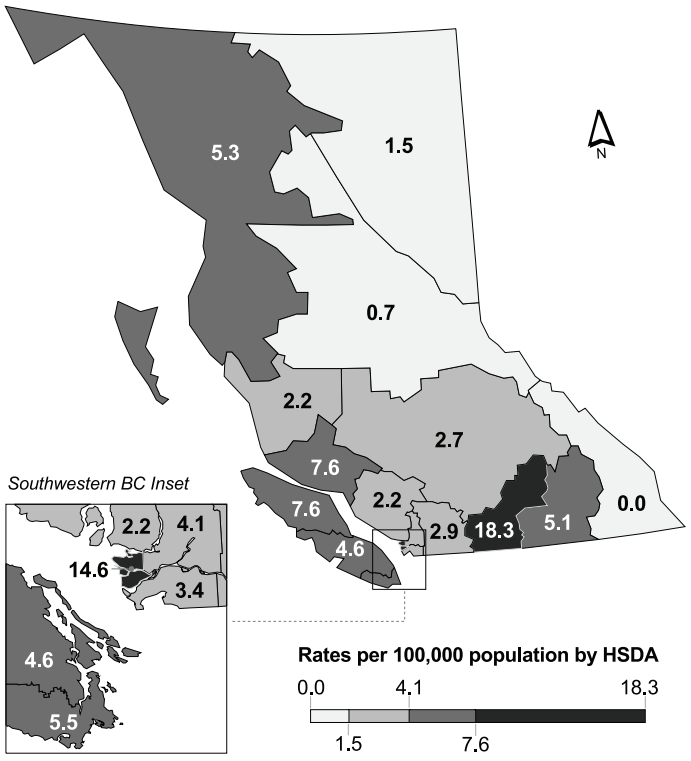
35.6 Rabies Exposure Incidents by Percentage of Animal Species Involved, 2008



35.7 Rabies Exposure by Type of Exposure and Year, 2007–2008



35.8 Rabies Exposure Rates by HSDA, 2008



HSDA	Health Service Delivery Area	Exps.	Rate
11	East Kootenay	0	0.0
12	Kootenay Boundary	4	5.1
13	Okanagan	63	18.3
14	Thompson Cariboo Shuswap	6	2.7
21	Fraser East	8	2.9
22	Fraser North	24	4.1
23	Fraser South	23	3.4
31/32	Richmond/Vancouver	40	14.6
33	North Shore/Coast Garibaldi	24	2.2
41	South Vancouver Island	20	5.5
42	Central Vancouver Island	12	4.6
43	North Vancouver Island	9	7.6
51	Northwest	4	5.3
52	Northern Interior	1	0.7
53	Northeast	1	1.5

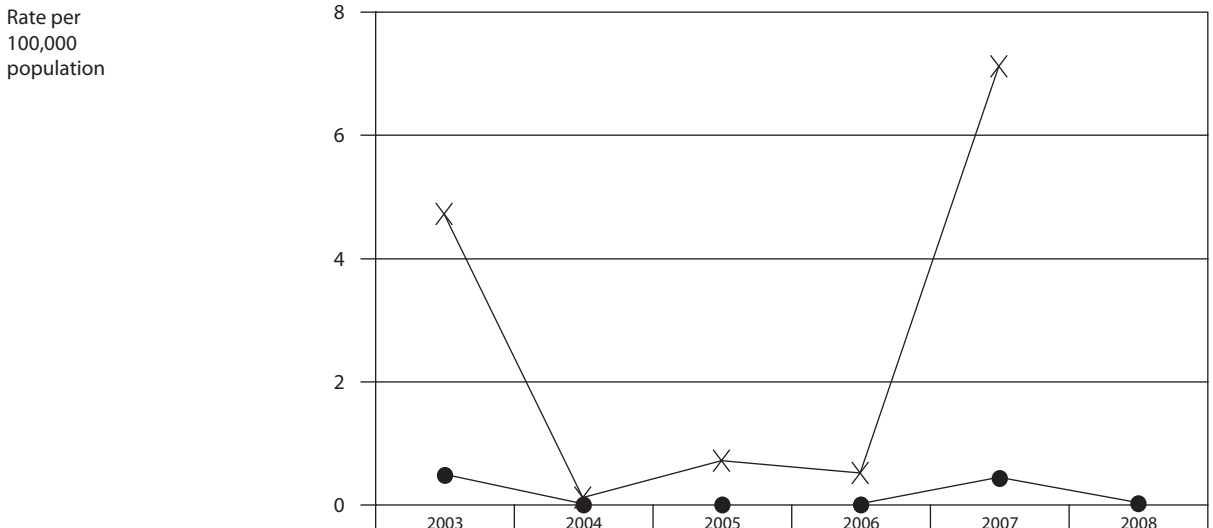
Note: Map classification by Jenks natural breaks method.

West Nile Virus

There was 1 case of West Nile Virus (WNV) infection reported in a BC resident in 2008, contracted through travel to Saskatchewan. No endemic WNV activity was detected in BC in 2008. Canada experienced only 36 cases of WNV in 2008, probably due in part to a cooler spring and summer.

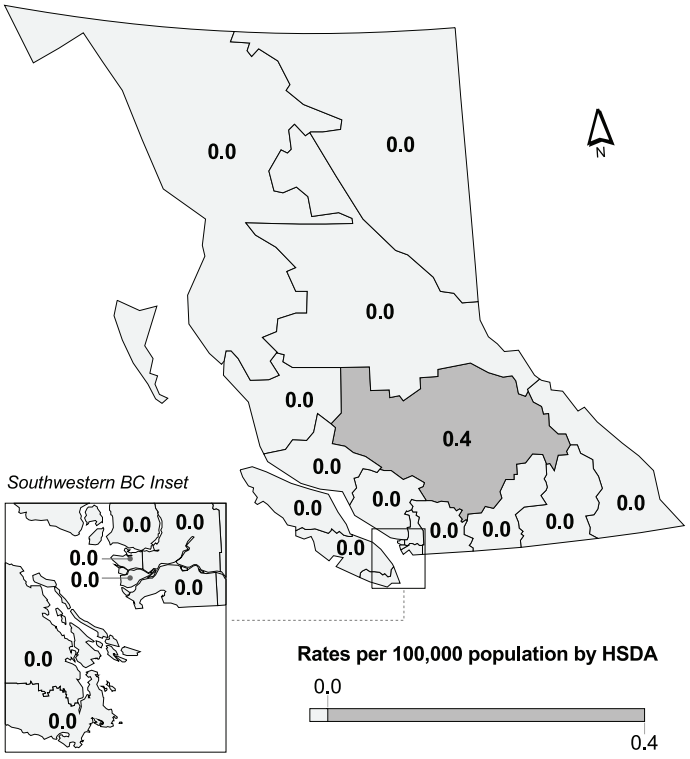
In the US, WNV activity in 2008 was moderate, with 1356 human cases and 43 deaths reported. The states with the highest numbers of human cases included California (445) and Arizona (114). While BC remained free of local viral activity in 2008, there was increased activity in Washington with 3 human, 41 horse, and 22 bird cases of WNV and 57 mosquito pools testing positive, the most in that state to date, and cause for continued concern about possible endemic WNV in BC in future summer seasons.

36.1 West Nile Virus Infection Rates by Year, 2003–2008



	2003	2004	2005	2006	2007	2008
BC West Nile Virus Infection Reports	20	0	0	0	19	1
BC West Nile Virus Infection Rate	0.5	0.0	0.0	0.0	0.4	0.0
Canadian West Nile Virus Rate	4.7	0.1	0.7	0.5	7.1	

36.2 West Nile Virus Infection Rates by HSDA, 2008



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	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 fungi

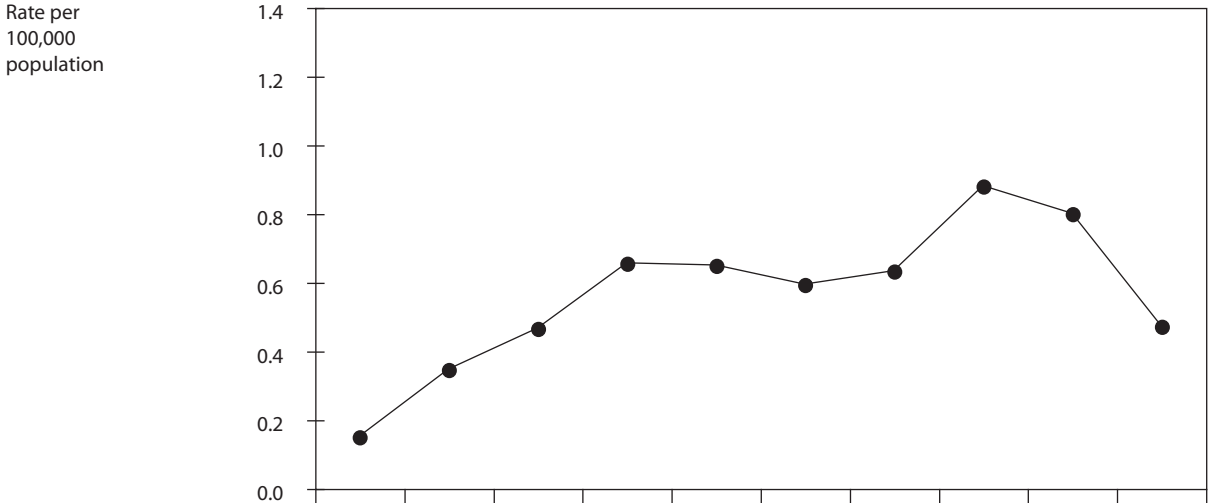
Cryptococcus gattii

Cryptococcus gattii

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

In 2008, 21 cases of *C. gattii* infection were reported for a provincial rate of 0.5 per 100,000. The rate of *C. gattii* infection has decreased for two years in a row. *C. gattii* appears to be expanding its range to the Lower Mainland in Fraser South. In 2008, all cases occurred in adults 30 years of age and older.

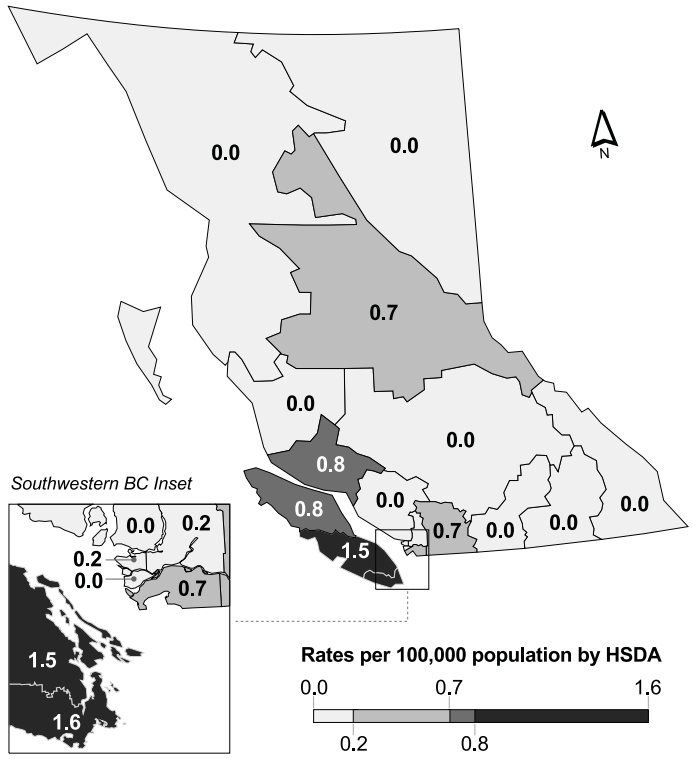
37.1 *Cryptococcus gattii* Infection Rates by Year, 1999–2008



	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
BC Cryptococcus gattii Reports	6	14	19	27	27	25	27	38	35	21
BC Cryptococcus gattii Rate	0.1	0.3	0.5	0.7	0.6	0.6	0.6	0.9	0.8	0.5

Note: Cryptococcal Infection became notifiable in BC in 2003

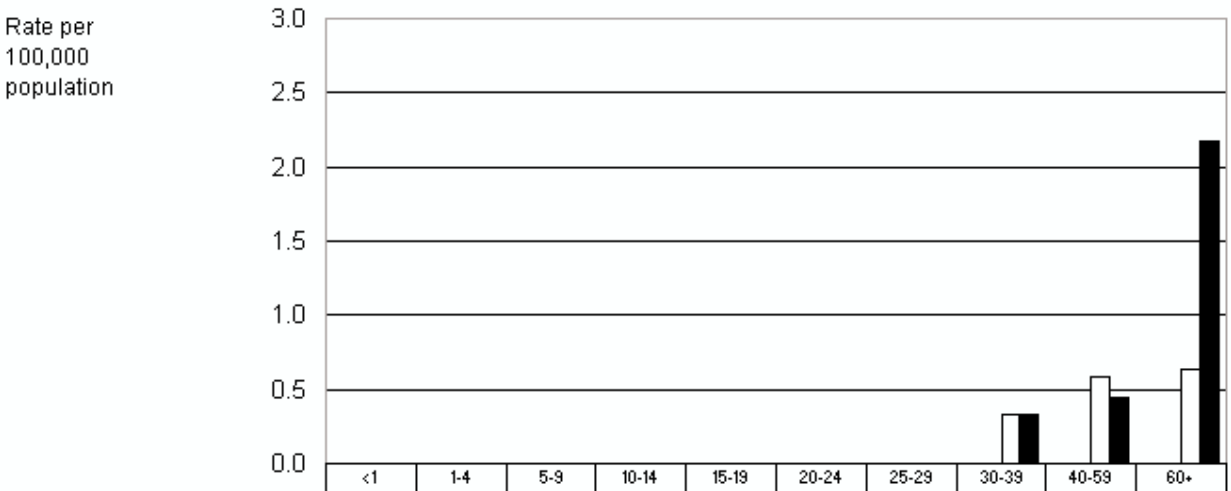
37.2 *Cryptococcus gattii* Infection Rates by HSDA, 2008



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	0	0.0
12	Kootenay Boundary	0	0.0
13	Okanagan	0	0.0
14	Thompson Cariboo Shuswap	0	0.0
21	Fraser East	2	0.7
22	Fraser North	1	0.2
23	Fraser South	5	0.7
31	Richmond	0	0.0
32	Vancouver	1	0.2
33	North Shore/Coast Garibaldi	0	0.0
41	South Vancouver Island	6	1.6
42	Central Vancouver Island	4	1.5
43	North Vancouver Island	1	0.8
51	Northwest	0	0.0
52	Northern Interior	1	0.7
53	Northeast	0	0.0

Note: Map classification by Jenks natural breaks method.

37.3 *Cryptococcus gattii* Infection Rates by Age Group and Sex, 2008



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Crytococcus gattii Reports - Female	0	0	0	0	0	0	0	1	4	3
Crytococcus gattii Reports - Male	0	0	0	0	0	0	0	1	3	9
□ Crytococcus gattii Rate - Female	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.6	0.6
■ Crytococcus gattii Rate - Male	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.4	2.2

Reportable Communicable Diseases in BC, July 2009

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. 70/2008, April 10, 2008
http://www.qp.gov.bc.ca/statreg/reg/H/Health/4_83.htm

2008 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**
2008 Population (PEOPLE 33 Estimate)	4 442 050	78 844	79 927	350 354	222 872	731 997	279 269	590 110	687 128	1 556 507
AIDS (2007)*	78	0	1	4	1	6	2	7	6	15
Amebiasis	338	2	3	5	2	12	23	43	61	127
Botulism	0	0	0	0	0	0	0	0	0	0
Campylobacteriosis	1635	10	26	90	56	182	88	235	250	573
Chlamydia^	10629	184	101	751	694	1730	444	1210	1253	2907
Congenital Rubella Syndrome	0	0	0	0	0	0	0	0	0	0
Cryptosporidiosis	115	1	1	8	4	14	4	12	25	41
Cyclosporiasis	32	0	0	1	0	1	1	2	8	11
E. coli, Verotoxigenic	114	3	2	8	4	17	11	10	12	33
Giardiasis	632	11	5	38	11	65	46	66	133	245
Gonorrhea^	1391	9	4	50	112	175	70	130	178	378
Hantavirus	0	0	0	0	0	0	0	0	0	0
Hepatitis A	39	1	1	2	2	6	3	6	4	13
Hepatitis B: Acute	29	0	0	1	1	2	0	4	4	8
Hepatitis C	2479	35	53	195	102	385	237	261	294	792
Haemophilus influenzae b, invasive	12	1	0	2	0	3	0	2	0	2
HIV^	350	0	7	11	9	27	7	42	20	69
Listeriosis	23	2	0	2	0	4	0	1	3	4
Lyme	6	0	0	0	1	1	0	0	0	0
Malaria	35	1	0	2	1	4	3	5	11	19
Measles	0	0	0	0	0	0	0	0	0	0
Meningococcal Disease, invasive	20	0	0	2	2	4	1	1	1	3
Mumps	108	0	0	2	2	4	59	9	26	94
Paratyphoid Fever	29	0	0	1	0	1	8	5	14	27
Pertussis	231	0	0	4	5	9	7	6	27	40
Pneumococcal Disease, invasive	402	4	8	38	30	80	14	40	55	109
Rubella	1	0	0	0	0	0	0	0	0	0
Salmonellosis	922	11	21	53	28	113	59	138	195	392
Shigellosis	204	1	1	2	1	5	15	12	54	81
Streptococcal Group A invasive	260	6	1	21	18	46	23	18	52	93
Syphilis (infectious)^	328	0	0	7	0	7	8	51	23	82
Tetanus	0	0	0	0	0	0	0	0	0	0
Tuberculosis	303	6	1	12	8	27	9	45	56	110
Typhoid Fever	45	0	0	0	0	0	6	5	29	40
Vibrio parahaemolyticus	23	0	0	1	1	2	0	3	4	7
Yersiniosis	569	2	4	14	24	44	8	53	58	119
West Nile	1	0	0	0	1	0	0	0	0	0
LESS COMMON DISEASES										
Brucellosis	1	0	0	0	0	0	0	0	1	1
Cholera: Serogroup non-O1/O139	2	0	0	0	0	0	0	1	0	1
Creutzfeldt-Jacob Disease	2	0	0	0	0	0	0	0	0	0
Legionellosis	3	1	0	0	0	1	0	0	1	1
Leprosy (Hansen's Disease)	1	0	0	0	0	0	0	0	1	1
Neonatal Group B Streptococcal Infection	8	0	0	1	0	1	0	2	0	2
Tularemia	1	0	0	0	0	0	0	1	0	1
Yellow Fever	1	0	0	0	0	0	0	0	0	0

*AIDS rates are for 2007 and are based on 2007 population numbers. The 2008 AIDS rates 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 2008 of Anthrax, Botulism, Diphtheria, Hantavirus, Hemorrhagic Viral Fevers, Measles, Plague, Poliomyelitis, Rabies, Severe Acute Respiratory Syndrome, Tetanus, Trichinosis, and Smallpox.

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**
189 511	636 752	279 218	1 105 481	369 391	266 006	122 083	757 480	76 820	144 788	68 977	290 585
0	36	5	41	3	2	2	7	1	3	0	4
10	135	12	157	28	7	7	42	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0
77	271	172	520	165	94	50	309	17	27	7	51
391	1996	615	3002	1037	671	269	1977	252	603	138	993
0	0	0	0	0	0	0	0	0	0	0	0
3	35	5	43	9	1	3	13	3	1	0	4
3	5	3	11	4	4	0	8	0	0	1	1
4	17	9	30	15	12	1	28	2	3	1	6
11	154	43	208	42	20	17	79	13	19	3	35
24	386	41	451	89	103	21	213	38	100	30	168
0	0	0	0	0	0	0	0	0	0	0	0
1	8	4	13	2	3	1	6	0	0	1	1
1	12	0	13	3	2	1	6	0	0	0	0
37	420	117	574	194	233	91	518	53	123	34	210
0	6	0	6	0	0	0	0	1	0	0	1
4	178	10	192	21	13	4	38	13	10	0	23
2	5	2	8	1	3	0	4	0	1	1	2
0	0	0	0	3	1	0	4	1	0	0	1
2	5	1	8	1	0	0	1	0	3	0	3
0	0	0	0	0	0	0	0	0	0	0	0
0	4	3	7	3	2	0	5	0	1	0	1
0	6	2	8	1	0	0	1	1	0	0	1
0	1	0	1	0	0	0	0	0	0	0	0
6	15	36	57	62	6	30	98	20	5	2	27
9	70	23	102	47	10	14	71	12	27	1	40
0	1	0	1	0	0	0	0	0	0	0	0
32	162	66	260	60	39	28	127	9	15	6	30
3	79	12	94	11	8	4	23	1	0	0	1
2	59	8	69	22	12	4	38	4	7	3	14
7	206	5	218	7	3	2	12	4	2	3	9
0	0	0	0	0	0	0	0	0	0	0	0
26	82	9	117	16	11	2	29	9	5	6	20
0	5	0	5	0	0	0	0	0	0	0	0
0	3	7	10	0	3	1	4	0	0	0	0
51	129	80	260	84	30	19	133	6	5	2	13
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	0	1	0	0	0	0
1	0	1	2	0	0	0	0	0	0	0	0
0	0	0	0	1	0	0	1	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0
0	1	2	3	1	1	0	2	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0
0	0	1	1	0	0	0	0	0	0	0	0

2008 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**
2008 Population (PEOPLE 33 Estimate)	4 442 050	78 844	79 927	350 354	222 872	731 997	279 269	590 110	687 128	1 556 507
AIDS (2007)*	1.8	0.0	1.2	1.2	0.5	0.8	0.7	1.2	0.9	1.0
Amebiasis	7.6	2.5	3.8	1.4	0.9	1.6	8.2	7.3	8.9	8.2
Botulism	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Campylobacteriosis	36.8	12.7	32.5	25.7	25.1	24.9	31.5	39.8	36.4	36.8
Chlamydia^	239.3	233.4	126.4	214.4	311.4	236.3	159.0	205.0	182.4	186.8
Congenital Rubella Syndrome	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cryptosporidiosis	2.6	1.3	1.3	2.3	1.8	1.9	1.4	2.0	3.6	2.6
Cyclosporiasis	0.7	0.0	0.0	0.3	0.0	0.1	0.4	0.3	1.2	0.7
E. coli, Verotoxigenic	2.6	3.8	2.5	2.3	1.8	2.3	3.9	1.7	1.8	2.1
Giardiasis	14.2	14.0	6.3	10.9	4.9	8.9	16.5	11.2	19.4	15.7
Gonorrhea^	31.3	11.4	5.0	14.3	50.3	23.9	25.1	22.0	25.9	24.3
Hantavirus	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hepatitis A	0.9	1.3	1.3	0.6	0.9	0.8	1.1	1.0	0.6	0.8
Hepatitis B: Acute	0.7	0.0	0.0	0.3	0.5	0.3	0.0	0.7	0.6	0.5
Hepatitis C	55.8	44.4	66.3	55.7	45.8	52.6	84.9	44.2	42.8	50.9
Haemophilus influenzae b, invasive	0.3	1.3	0.0	0.6	0.0	0.4	0.0	0.3	0.0	0.1
HIV^	7.9	0.0	8.8	3.1	4.0	3.7	2.5	7.1	2.9	4.4
Listeriosis	0.5	2.5	0.0	0.6	0.0	0.6	0.0	0.2	0.4	0.3
Lyme	0.1	0.0	0.0	0.0	0.5	0.1	0.0	0.0	0.0	0.0
Malaria	0.8	1.3	0.0	0.6	0.5	0.6	1.1	0.9	1.6	1.2
Measles	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Meningococcal Disease, invasive	0.5	0.0	0.0	0.6	0.9	0.6	0.4	0.2	0.2	0.2
Mumps	2.4	0.0	0.0	0.6	0.9	0.6	21.1	1.5	3.8	6.0
Paratyphoid Fever	0.7	0.0	0.0	0.3	0.0	0.1	2.9	0.9	2.0	1.7
Pertussis	5.2	0.0	0.0	1.1	2.2	1.2	2.5	1.0	3.9	2.6
Pneumococcal Disease, invasive	9.1	5.1	10.0	10.9	13.5	10.9	5.0	6.8	8.0	7.0
Rubella	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Salmonellosis	20.8	14.0	26.3	15.1	12.6	15.4	21.1	23.4	28.4	25.2
Shigellosis	4.6	1.3	1.3	0.6	0.5	0.7	5.4	2.0	7.9	5.2
Streptococcal Group A invasive	5.9	7.6	1.3	6.0	8.1	6.3	8.2	3.1	7.6	6.0
Syphilis (infectious)^	7.4	0.0	0.0	2.0	0.0	1.0	2.9	8.6	3.3	5.3
Tetanus	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tuberculosis	6.8	7.6	1.3	3.4	3.6	3.7	3.2	7.6	8.1	7.1
Typhoid Fever	1.0	0.0	0.0	0.0	0.0	0.0	2.2	0.9	4.2	2.6
Vibrio parahaemolyticus	0.5	0.0	0.0	0.3	0.5	0.3	0.0	0.5	0.6	0.5
Yersiniosis	12.8	2.5	5.0	4.0	10.8	6.0	2.9	9.0	8.4	7.7
West Nile	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0
LESS COMMON DISEASES										
Brucellosis	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
Cholera: Serogroup non-O1/O139	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.1
Creutzfeldt-Jacob Disease	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Legionellosis	0.1	1.3	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1
Leprosy (Hansen's Disease)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
Neonatal Group B Streptococcal Infection	0.2	0.0	0.0	0.3	0.0	0.1	0.0	0.3	0.0	0.1
Tularemia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.1
Yellow Fever	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

*AIDS rates are for 2007 and are based on 2007 population numbers. The 2008 AIDS rates 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 2008 of Anthrax, Botulism, Diphtheria, Hantavirus, Hemorrhagic Viral Fevers, Measles, Plague, Poliomyelitis, Rabies, Severe Acute Respiratory Syndrome, Tetanus, Trichinosis, and Smallpox.

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**
189 511	636 752	279 218	1 105 481	369 391	266 006	122 083	757 480	76 820	144 788	68 977	290 585
0.0	5.8	1.8	3.8	0.8	0.8	1.7	0.9	1.3	2.1	0.0	1.4
5.3	21.2	4.3	14.2	7.6	2.6	5.7	5.5	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
40.6	42.6	61.6	47.0	44.7	35.3	41.0	40.8	22.1	18.7	10.2	17.6
206.3	313.5	220.3	271.6	280.7	252.2	220.3	261.0	328.0	416.5	200.1	341.7
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.6	5.5	1.8	3.9	2.4	0.4	2.5	1.7	3.9	0.7	0.0	1.4
1.6	0.8	1.1	1.0	1.1	1.5	0.0	1.1	0.0	0.0	1.5	0.3
2.1	2.7	3.2	2.7	4.1	4.5	0.8	3.7	2.6	2.1	1.5	2.1
5.8	24.2	15.4	18.8	11.4	7.5	13.9	10.4	16.9	13.1	4.4	12.0
12.7	60.6	14.7	40.8	24.1	38.7	17.2	28.1	49.5	69.1	43.5	57.8
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.5	1.3	1.4	1.2	0.5	1.1	0.8	0.8	0.0	0.0	1.5	0.3
0.5	1.9	0.0	1.2	0.8	0.8	0.8	0.8	0.0	0.0	0.0	0.0
19.5	66.0	41.9	51.9	52.5	87.6	74.5	68.4	69.0	85.0	49.3	72.3
0.0	0.9	0.0	0.5	0.0	0.0	0.0	0.0	1.3	0.0	0.0	0.3
2.1	28.0	3.6	17.4	5.7	4.9	3.3	5.0	16.9	6.9	0.0	7.9
1.1	0.8	0.7	0.7	0.3	1.1	0.0	0.5	0.0	0.7	1.5	0.7
0.0	0.0	0.0	0.0	0.8	0.4	0.0	0.5	1.3	0.0	0.0	0.3
1.1	0.8	0.4	0.7	0.3	0.0	0.0	0.1	0.0	2.1	0.0	1.0
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	0.6	1.1	0.6	0.8	0.8	0.0	0.7	0.0	0.7	0.0	0.3
0.0	0.9	0.7	0.7	0.3	0.0	0.0	0.1	1.3	0.0	0.0	0.3
0.0	0.2	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3.2	2.4	12.9	5.2	16.8	2.3	24.6	12.9	26.0	3.5	2.9	9.3
4.8	11.0	8.2	9.2	12.7	3.8	11.5	9.4	15.6	18.7	1.5	13.8
0.0	0.2	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
16.9	25.4	23.6	23.5	16.2	14.7	22.9	16.8	11.7	10.4	8.7	10.3
1.6	12.4	4.3	8.5	3.0	3.0	3.3	3.0	1.3	0.0	0.0	0.3
1.1	9.3	2.9	6.2	6.0	4.5	3.3	5.0	5.2	4.8	4.4	4.8
3.7	32.4	1.8	19.7	1.9	1.1	1.6	1.6	5.2	1.4	4.3	3.1
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13.7	12.9	3.2	10.6	4.3	4.1	1.6	3.8	11.7	3.5	8.7	6.9
0.0	0.8	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.5	2.5	0.9	0.0	1.1	0.8	0.5	0.0	0.0	0.0	0.0
26.9	20.3	28.7	23.5	22.7	11.3	15.6	17.6	7.8	3.5	2.9	4.5
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	0.3	0.0	0.0	0.1	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
0.0	0.0	0.0	0.0	0.3	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	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.2	0.7	0.3	0.3	0.4	0.0	0.3	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	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

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 page 96. The exception is *Cryptococcus gattii* and *Tetanus* for which clinical cases are included in reporting.

2. Numbers in this report were generated in March 2009 and are subject to change due to possible late reporting and/or data clean up in the regions. This may also explain changes in the number of reported cases in previous years for some diseases.

3. Data for influenza, invasive meningococcal disease and invasive group A streptococcal disease, *Cryptococcus gattii* infection, West Nile virus, MRSA and VRE are collected through enhanced surveillance systems. Invasive meningococcal disease, invasive group A streptococcal disease, and *Cryptococcus gattii* infection are reported using episode date. Episode date is the onset date if reported. Other diseases are classified by the reported date which is the date reported to the health authority.

4. Data for HIV and AIDS are collected through HAISYS, the HIV/AIDS Information System. Data for other sexually transmitted infections (STIs) are collected through the STI Information System. AIDS case reports are for 2007. The 2008 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 of the five health authorities.

5. Statistics on tuberculosis are based on the analysis on the data extracted in March 2009. For more updated statistics on tuberculosis please contact the Division of Tuberculosis Control.

6. For information on Antimicrobial Resistant Organism (ARO) Surveillance in BC, please refer to Antimicrobial Resistance Trends in the Province of British Columbia. http://www.bccdc.ca/NR/rdonlyres/E7AA8E38-8517-4743-ABDC-FAAC4EA0B96A/0/AntimicrobialResistanceTrendsinBC_2008.pdf

7. Amebiasis, cryptosporidiosis and listeriosis were removed from national surveillance in January 2000. Lyme disease, HIV, methicillin resistant *Staphylococcus aureus*, vancomycin resistant enterococci, *Vibrio parahaemolyticus* and yersiniosis were not nationally notifiable diseases in 2008.

8. Data for invasive pneumococcal disease (IPD) 1992–1999 had previously been limited to pneumococcal meningitis. Since July 2000, reporting includes all invasive cases.

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, Ministry of Management Services.

12. National rates are provided by the Public Health Agency of Canada – Division of Surveillance and Risk Assessment. 2006, 2007, and 2008 numbers are preliminary and are subject to change.

13. Population estimates and projections are taken from P.E.O.P.L.E. Projection 33 (Population Extrapolation for Organizational Planning with Less Error). Health Data Warehouse Release Date: Totals: December 2007; Age/Sex Estimates: January 2008.

14. 2007 and 2008 National Rates for Communicable Diseases were not ready for most reportable diseases at the time of the compilation of this report.

15. 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 2008 in British Columbia, please contact epidserv@bccdc.ca.

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