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British Columbia Annual Summary of Reportable Diseases

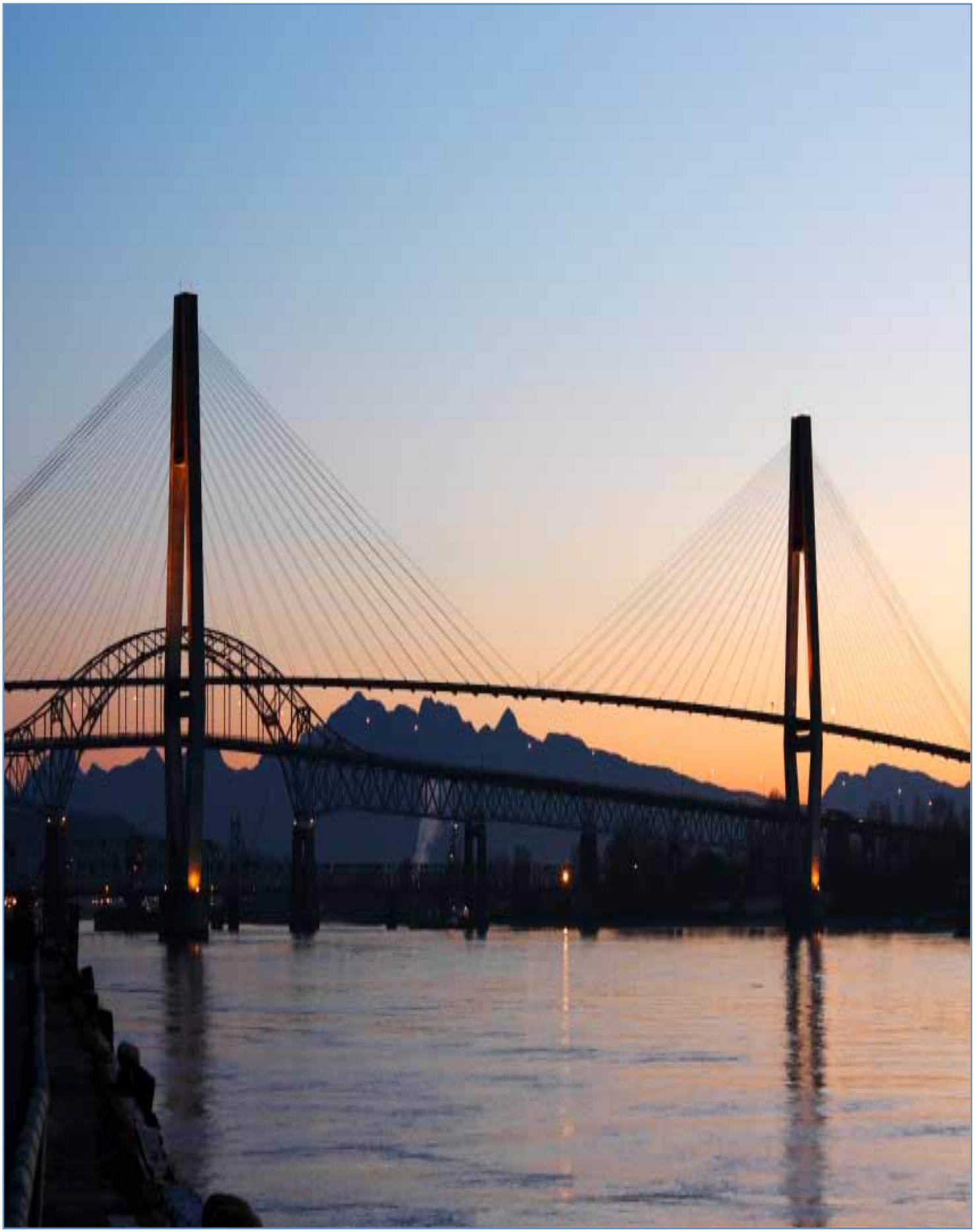
2012

Prepared by:

Communicable Disease Prevention and Control Services (CDPACS)
September 3, 2013

Provincial Health Services Authority
Province-wide solutions. Better health.

Date of publication: September 3, 2013
Report is available at http://www.bccdc.ca
Right photo: A new day dawns over two bridges spanning the Fraser River, BC



Contents

2012 Highlights

Vaccine Preventable Diseases

A localized increase in pertussis activity in the Fraser Health Authority seen at the tail-end of 2011 continued into the first half of 2012 and spread to the Vancouver Coastal Health Authority. The highest rates were seen in the Fraser East and North Shore/Coast Garibaldi areas. Overall 519 cases were reported in BC in 2012; the highest number and rate of pertussis seen since cyclical increases in 2000 and 2003. The highest rates of pertussis were in infants (under 1 year) and adolescents aged 12-13 years.

Only three cases of invasive Hib disease were reported in 2012 compared to five cases in 2011. All three cases were in adults with no cases in children (who are routinely immunized in BC) reported again in 2012. There were two cases of measles reported in BC in 2012; both of them were acquired when traveling outside of Canada. There was a slight increase again in reported cases of invasive meningococcal disease with 16 cases reported in 2012. There was a single case of serogroup C disease in an older adult who would not have been immunized through the infant and school-age catch-up meningococcal C conjugate immunization program which began in BC in 2003. Ten of the 16 cases were serogroup B for which there is not currently a vaccine. There were only eight cases of mumps reported in BC in 2012; substantially lower than in 2011 where an outbreak related 132 cases were reported. Eight cases are similar to the low levels of mumps seen in BC from 2003 to 2006. A single case of tetanus was reported in 2012 in an older woman injured while gardening.

The 2012-2013 influenza season was characterized by an early and more intense peak compared to the previous ten non-pandemic seasons. There were 91 confirmed influenza outbreaks in long-term care homes reported, the highest number since 2003-2004. Increased impact in the elderly likely reflects the predominant circulation of influenza A H3N2 for most of the season which has historically caused more severe illness in the elderly. A low level of influenza B circulated during the tail end of the season. Among other respiratory viruses detected respiratory syncytial virus (RSV) predominated.

The rate of invasive pneumococcal disease (IPD) increased slightly in 2012 with 359 cases reported in BC. This reflects a steady increase in IPD since 2010. Among cases aged less than 5 years where serotyping results were available, 10% were due to serotypes covered by the pneumococcal conjugate 7-valent vaccine (PCV-7) which was in use in BC from 2003 through 2010 and 30% were due to the 6 additional serotypes covered by the pneumococcal conjugate 13-valent vaccine (PCV-13) which was introduced in June 2010. Among cases over 65 years of age where serotyping results were available 60% of cases were due to serotypes covered by the pneumococcal polysaccharide 23-valent vaccine.

Sexually Transmitted and Bloodborne Pathogens

The rate of new positive HIV tests decreased to its lowest point ever in BC with 238 cases reported in 2012. Over 85% of the new cases were in males. AIDS cases similarly decreased to the lowest levels in 10 years with 70 cases reported ion 2011. These trends likely reflect a true decrease in disease incidence largely driven by a decrease in new positive HIV tests in people who use injection drugs. Rates were higher in Vancouver, Northwest and Northern Interior HSDAs reflecting increased testing efforts as part of the Seek and Treat for Optimum Prevention (STOP) pilot project in these health areas.

Chlamydia rates in British Columbia have been increasing steadily since 1998. In 2012 the rate of genital Chlamydia in BC increased to 267.5 per 100,000 population with 12,364 cases reported. The highest reported rates were in young adults 20-24 years of age followed by adolescents aged 15-19 years.

In 2012 the rate of genital gonorrhea in BC decreased to 28 per 100,000 population, with 1295 cases reported compared to 1575 in 2011. The highest rates were in men aged 20-39 and females aged 15-29 years.

Infectious syphilis numbers on the other hand, increased remarkably in 2012 with 372 cases reported up from 193 cases reported in 2011. Over 90% of the cases were in males with the highest rates in men 25-59 years of age. The majority of cases were reported from Vancouver (257 cases) where an investigation is ongoing and awareness and prevention messages have been developed.

There were 13 cases of acute hepatitis B reported in 2012 similar to the number in 2011; however, this is nearly half the number of cases reported in 2009 (27) fitting with a general trend of decline over the past decade. A continued modest decline in the rate of hepatitis C was also observed.

Diseases Transmitted by Respiratory Routes

Invasive group A streptococcal disease reports decreased in 2012 to 143 after an increase to 182 cases in 2011. Highest rates were observed in adults males over 60 years of age.

After having the historic lowest reported rates of tuberculosis in 2010 there was an increase of seven percent (to 268 cases) in 2011 and a further 7% increase in 2012 to 289 cases. This corresponds to a rate of 6.3 per 100,000 population; above the Canadian rate of 4.6 per 100,000 population. As in prior years, rates in men exceed those in women at ages 40 years and older; with the highest rates (18.7 per 100,000 population) in men over 60 years of age.

Antimicrobial Resistant Organisms

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

The main observations of note during 2012 were:

- the percent of *Staphylococcus aureus* isolates that are methicillin resistant (MRSA) decreased to 16.1% down from a high of 30.5% in 2007.
- *Streptococcus pneumoniae* isolates have demonstrated a stable rate of resistance to all antibiotics since 2007; with 33.7% of all tested isolates demonstrating resistance against erythromycin in 2012.
- In 2012 *Escherichia coli* resistance to ciprofloxacin was 25.3% and to TMP-SMX was 25.6%. Nitrofurantoin, however, remains a highly effective empiric treatment for *E. coli* with 97.1% of isolates being sensitive.
- Antimicrobial utilization rates overall have stabilized or declined from a peak in 2005 with clearest reductions in utilization for childhood respiratory infections – the main targets of the Do Bugs Need Drugs? program.

Enteric, Food and Waterborne Diseases

Campylobacter remained the most frequently reported enteric infection with 1853 cases reported in 2012; the rate has been fairly stable since 2004 with a slight increase in the past two years.

Rates of cryptosporidiosis rose slightly from 1.2 to 1.6 cases per 100,000 population; 74 cases were reported in 2012 compared to 53 cases in 2011. Rates of shigella infections also rose slightly with 175 cases reported in 2012; 60.2% were associated with international travel. Cyclosporiasis and Yersiniosis rates however, continued to decrease and remain at a 10 year low with 23 cases of Cyclosporiasis and 393 cases of Yersiniosis reported in 2012.

Salmonellosis continues to be the second most commonly reported enteric infection in BC with 930 cases reported in 2012; however rates decreased in 2012 after four years of increases. Overall, 29.2% of the *Salmonella* infections reported in 2012 were associated with international travel.

S. Enteritidis remained the most common serotype seen at 38.2% of isolates.

In 2012 there were a total of 35 cases of hepatitis A reported in BC. This is less than half the number from 2011 when 80 cases were reported (many related to an outbreak) and in line with previous years. The majority of cases were associated with travel to or visitors from areas of the world where hepatitis A remains endemic and one cluster of six cases was related to consumption of a contaminated frozen fruit blend.

Higher rates of *V. parahaemolyticus* infections were seen again in 2012 with 54 cases reported compared to 42 cases in 2010. The majority of cases were reported during the annual summer peak when ocean temperatures are highest and facilitate bacterial growth. Cases were mostly associated with consumption of raw or undercooked shellfish; 69.2% of cases were related to shellfish consumed in restaurants.

There were 14 cases of listeriosis reported in 2012; down from 19 cases reported in 2011 and similar to numbers seen in 2009 and 2010. Rates continue to be highest among adults over the age of 60.

Vectorborne and Other Zoonotic Diseases

No cases of West Nile Virus were reported in BC in 2012 despite hot summer weather and high mosquito numbers. There were 18 cases of clinical or laboratory confirmed Lyme Disease reported in BC in 2012 with similar rates to 2011 at 0.4 per 100,000 population. Fifty percent of the cases likely acquired their infection while traveling outside of BC. The reported number of rabies exposures has dropped since changes to guidelines in 2009 and remained steady in 2012 with 160 exposures reported. Fifty eight percent of the exposures occurred during international travel with exposure to potentially rabid dogs being most common. For exposures within BC or Canada, the majority (64%) involved exposure to bats.

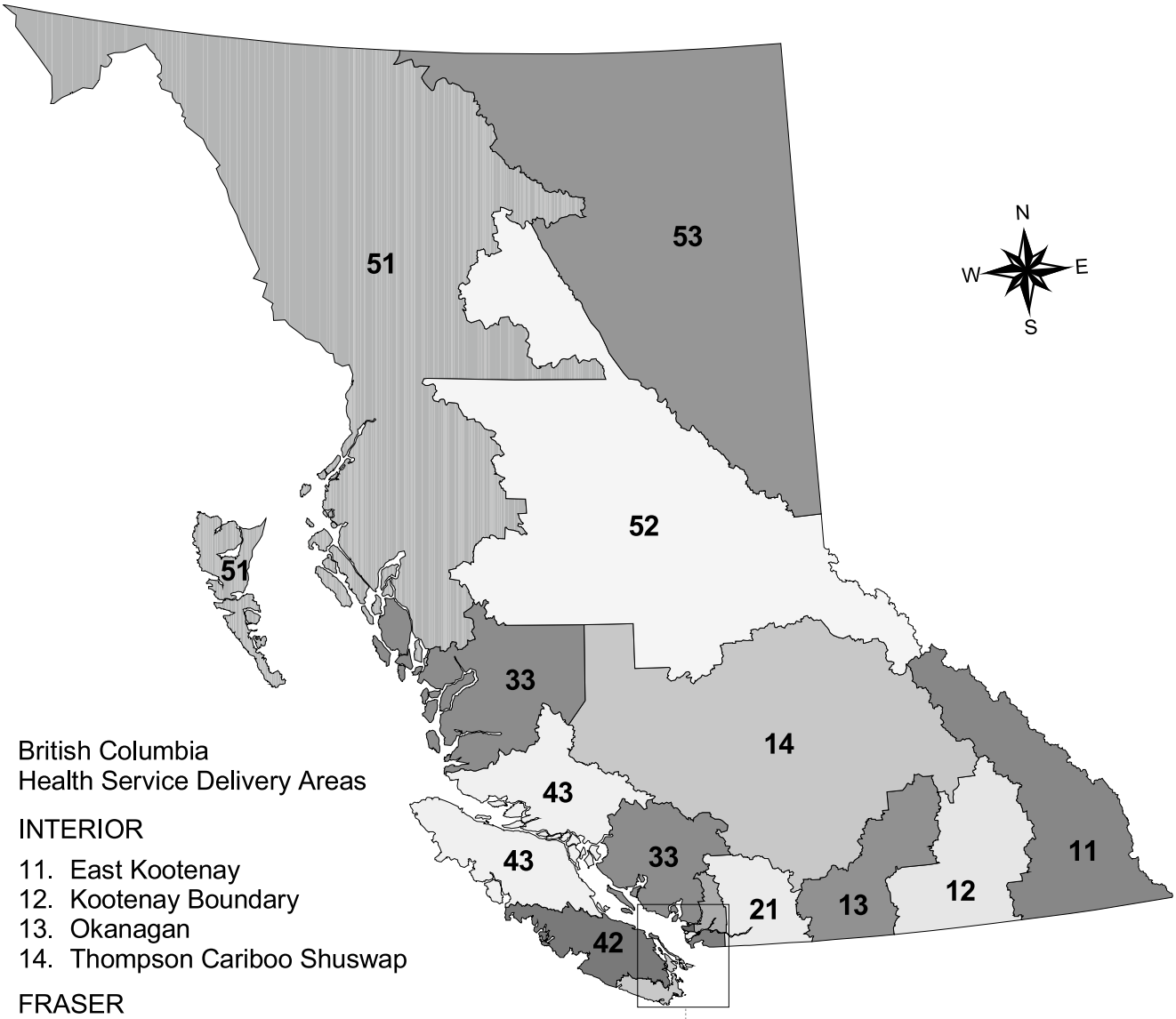
Environmental Fungi

Cryptococcus gattiii infections continue to be observed in British Columbia with an increase in reported infections in 2012 to 34 cases (24 laboratory confirmed cases) from 23 (18 confirmed) in 2011. In 2012 over half the cases (21) were reported from the lower mainland with the highest rates reported from Central Vancouver Island and Fraser East. As in previous years, all cases were in adults. Starting in 2013 only confirmed cases will be reportable and included in our surveillance reports.

In 2012, eleven cases of Legionellosis were reported in BC, the highest number in the last decade. The reasons for the increase are unclear but rates have been rising across Canada. Cases were all in adults (over 40 years of age) in 2012 and were sporadic throughout the year with no outbreaks reported.

Dr. Bonnie Henry
Medical Director,
Communicable Disease Prevention and Control Service, BCCDC

British Columbia Health Services Delivery Areas



British Columbia
Health Service Delivery Areas

INTERIOR

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

FRASER

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

VANCOUVER COASTAL

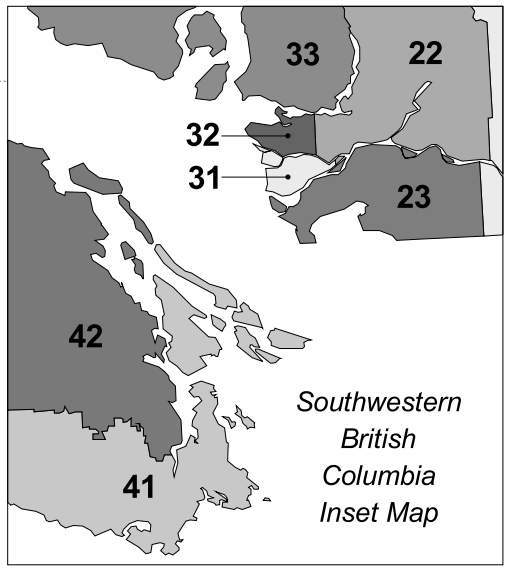
31. Richmond
32. Vancouver
33. North Shore/Coast Garibaldi

VANCOUVER ISLAND

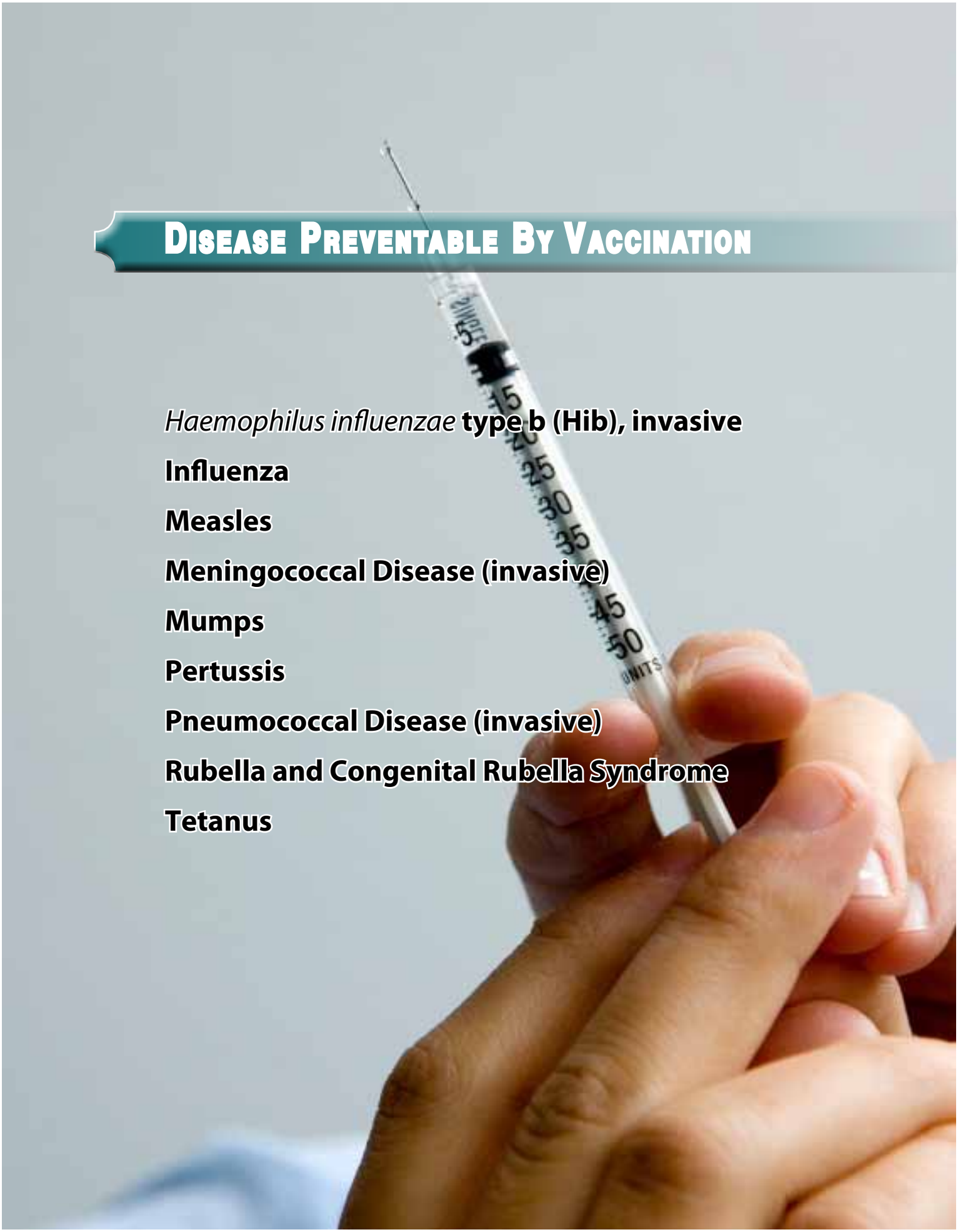
41. South Vancouver Island
42. Central Vancouver Island
43. North Vancouver Island

NORTHERN

51. Northwest
52. Northern Interior
53. Northeast



Disease Preventable By Vaccination



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

Influenza

Measles

Meningococcal Disease (invasive)

Mumps

Pertussis

Pneumococcal Disease (invasive)

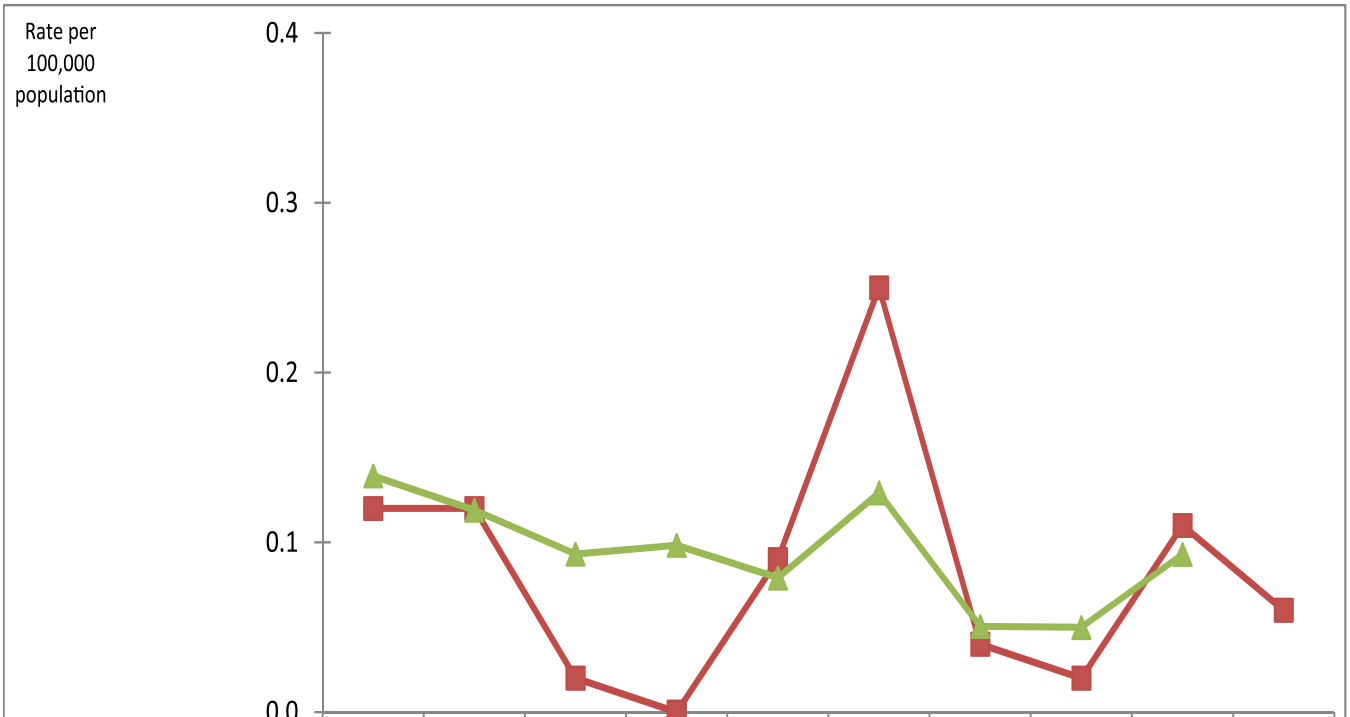
Rubella and Congenital Rubella Syndrome

Tetanus

Haemophilus influenzae type b (Hib), invasive

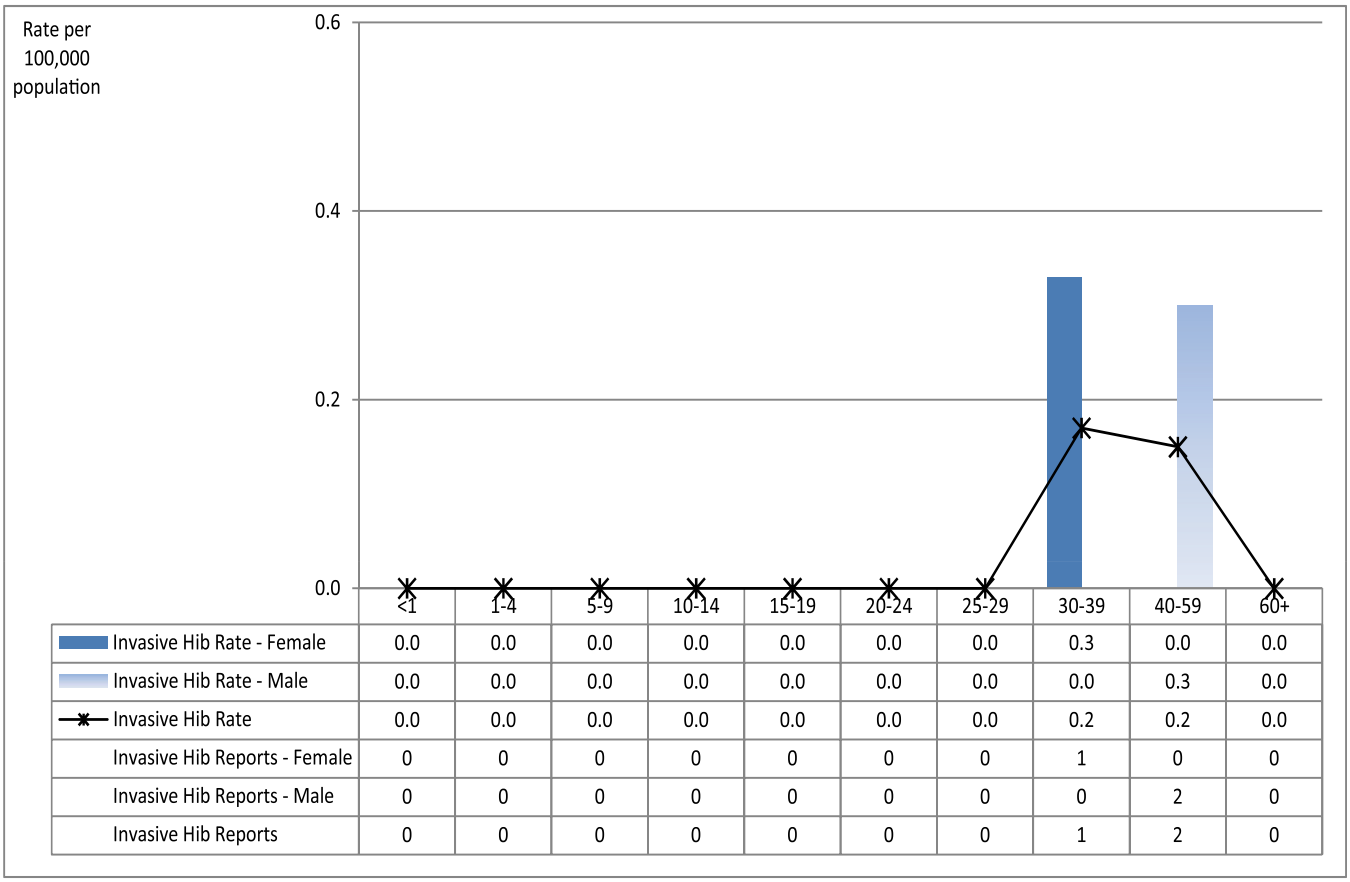
Three cases of invasive *Haemophilus influenzae* type b (Hib) disease were reported in 2012. No cases were reported in children. The 3 cases were in 2 males and 1 female aged 30 to 59 years. Hib vaccine is routinely given in infancy with a booster dose in the 2nd year of life. Its use in adults is limited to those with select high risk medical conditions. Hib disease has declined dramatically since the introduction of Hib vaccines in the early 1990s, with a small residual burden of illness almost exclusively in adults.

1.1 *Haemophilus influenzae* type b (Hib), invasive Rates by Year, 2003-2012



	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
BC Invasive Hib Reports	5	5	1	0	4	11	2	1	5	3
BC Invasive Hib Rate	0.12	0.12	0.02	0.00	0.09	0.25	0.04	0.02	0.11	0.06
Canadian Hib Rate	0.14	0.12	0.09	0.10	0.08	0.13	0.05	0.05	0.09	

1.2 *Haemophilus influenzae* type b (Hib), invasive Rates by Age Group and Sex, 2012



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

Influenza

The goal of influenza surveillance in BC is to identify major trends in influenza activity (arrival, peak and diminution) and to monitor the relative contribution of virus types, subtypes and variants to inform the effectiveness of prevention and control programs, including vaccine and antiviral medication.

As such, influenza surveillance consists of the collection, analysis and reporting of multiple community indicators including: (1) sentinel physician reporting of influenza-like-illness (ILI); (2) Medical Service Plan (MSP) visits with an influenza diagnosis; (3) facility outbreak notifications; and (4) provincial influenza laboratory diagnosis by the BC Public Health Microbiology & Reference Laboratory and BC Children's and Women's Health Centre Laboratory, including strain characterization and antiviral resistance assessment by the National Microbiology Laboratory (NML).

Since 2004, the BC Centre for Disease Control (BCCDC) has also led a national surveillance initiative to monitor the effectiveness of the annually-reformulated influenza vaccine against medically-attended, laboratory-confirmed influenza, using a test-negative case-control design overlaid upon the sentinel physician surveillance network, with additional gene sequencing analysis applied to detected influenza viruses to identify circulating variants that may influence vaccine protection.

Surveillance is year-round in BC with the renewed annual monitoring period typically commencing the first week of October (week 40), regular seasonal activities typically spanning to the end of April (week 17) and surveillance ongoing through the end of September (week 39) the following year.

This report for 2012-2013 summarizes surveillance data spanning week 40 (starting September 30, 2012) through week 17 (ending April 27, 2013). Detailed surveillance bulletins issued through the season, including weekly distribution through periods of heightened activity, are available at the following web link:

http://www.bccdc.ca/dis-cond/DiseaseStatsReports/influSurveillanceReports.htm

SUMMARY

The 2012-2013 influenza season in BC was characterized by an early (mid-January) and more intense peak compared to the prior ten (non-pandemic) seasons, as shown through multiple indicators including sentinel physician, MSP and facility outbreak reporting. Influenza activity was dominated by the influenza A/H3N2 subtype with lesser contribution by influenza B toward the tail end of the season. In mid-season analysis from the BC-led national sentinel surveillance initiative, interim estimates of influenza vaccine effectiveness (VE) published in January 2013 showed suboptimal vaccine protection against the dominant circulating A/H3N2 strain, reducing the risk of medically-attended laboratory confirmed influenza by about half.

1. Sentinel physician reporting of ILI

BC sentinel physician surveillance for the 2012-2013 influenza season consisted of 42 active sentinel sites representing all BC Health Authorities. During the reporting period spanning week 40 to week 17, the proportion of patient visits due to ILI seen by these sentinel sites was within the expected historic range except during consecutive weeks 2-4 (January 6, 2013 to January 26, 2013) during which the sentinel ILI proportion rose steeply beginning from week 1 to levels significantly above the ten-year historic, declining to within expected levels thereafter (Figure 2.2).

2. MSP visits with an influenza diagnosis

Consistent with sentinel surveillance observations, the proportion of all MSP claims submitted by general practitioners and coded as influenza (ICD-9 code 487) showed steep rise beginning in early 2013, peaked mid-January at levels ranging above the ten-year maximum provincially then gradually returned to expected seasonal levels (Figure 2.3).

3. Facility outbreak notifications

For the purpose of early diagnosis and intervention, residential institutions (facilities) are asked to notify their local health unit when two or more cases of ILI occur within their setting within a seven day period. A provincial surveillance form enables tracking of ILI outbreak activity. Where at least one case is laboratory-confirmed as influenza, this may be notified as an influenza outbreak. However, both ILI and laboratory-confirmed influenza outbreak detection and reporting locally and to the provincial level vary regionally, and at the discretion of the local Health Authority. Provincial-level reporting is intended for overall trend tracking rather than absolute quantification.

In that context, facility outbreak reporting mirrored other indicators of early and intense influenza activity for the 2012-2013 season. Laboratory-confirmed influenza outbreaks were reported sporadically in the fall of 2012 from long term care facilities (LTCF), with substantial increase in the weekly number of facility reports beginning over the holiday period, peaking in early-mid January 2013, and declining thereafter.

In total for 2012-2013, there were 222 ILI outbreak reports to BCCDC, including 126 from LTCF, among which 91 (72%) were laboratory-confirmed as influenza. LTCF outbreak reporting was greatest from Fraser Health Authority. The number of LTCF influenza outbreaks in BC in 2012-2013 (representing about one-quarter of LTCFs overall) is the highest recorded provincially since 2003-2004, exceeding the next highest number during the 2004-2005 season (68) by about a third and exceeding several-fold the number recorded during the milder post-pandemic seasons of 2010-2011 (13) and 2011-2012 (30) (Table 2.1). Of interest, the number of LTCF influenza outbreak reports for the 2012-2013 season, during which activity was driven by the influenza A/H3N2 subtype, substantially exceeded the number reported for the 2009-2010 pandemic H1N1 season during which the lowest number of LTCF outbreaks was reported (12) (Figure 2.4). A greater susceptibility to influenza A/H3N2 versus A/H1N1 subtypes among the elderly has been noted elsewhere, and this influence, along with other agent-host-environment factors, must be taken into account in explaining and comparing facility outbreak reporting variation from year to year. In addition to LTCF reports, there were also 95 ILI outbreak reports from schools and 1 from an acute care hospital although detection, diagnosis and surveillance reporting from non-LTCF settings are less consistent provincially.

4. Laboratory diagnosis

a. BC Public Health Microbiology & Reference Laboratory

It should be noted that laboratory surveillance through the BC Public Health Microbiology & Reference Laboratory has been established primarily in support of influenza monitoring, including systematic collection and testing of specimens from community sentinel sites. Other respiratory virus monitoring is less systematically conducted, with multiplex testing for other respiratory viruses limited primarily to pediatric, acute care and/or facility-based specimens unless otherwise clinically indicated or requested. Thus provincial surveillance patterns for other respiratory virus detection may be less reliable or representative of general community experience and should be interpreted cautiously.

The BC Public Health Microbiology & Reference Laboratory tested 6,669 specimens for respiratory viruses, notably influenza, between week 40 and week 17 of 2012-2013. One thousand seven hundred and thirty-eight (26%) specimens were positive for influenza, of which 1411 (81%) were influenza A [1243 A/H3N2, 166 A(H1N1)pdm09, 2 un-subtyped influenza A] and 327 (19%) were influenza B.

Overall, A/H3N2 comprised the vast majority of influenza detections, predominating during the early and middle periods with gradual increase in the proportion of low-level influenza B activity at the tail end of the season. Among other respiratory viruses detected, entero/rhinovirus and RSV predominated with other respiratory viruses also sporadically detected (Figure 2.5a).

b. BC Children's and Women's Health Centre Laboratory

From week 40 to week 17 of 2012-2013, BC Children's and

Women's Health Centre Laboratory reported that it tested 2155 respiratory specimens. Consistent with the BC Public Health Microbiology & Reference Laboratory, influenza A was the predominant influenza virus detected during the early and middle periods followed by a small wave of influenza B during the later part of the 2012-2013 season. Among the 2155 respiratory specimens tested, 186 (9%) were positive for influenza viruses, of which 145 (78%) were influenza A and 41 (22%) influenza B; 497 (23%) were positive for RSV, and 187 (9%) were positive for at least one virus including parainfluenza, adenovirus, human metapneumovirus, entero/rhinovirus, and coronavirus (Figure 2.5b). Overall, RSV was the predominant virus among the non-influenza respiratory viruses detected.

c. Strain characterization by the National Microbiology Laboratory

Select influenza isolates are routinely sent by BC laboratories to the National Microbiology Laboratory (NML) for strain characterization by conventional haemagglutination inhibition (HI) assay. Between September 1, 2012 to April 27, 2013, 143 isolates were sent to NML from BC. Of these, 112 were influenza A including 104 A/Victoria/361/2011-like (H3N2) and 8 A/California/07/2009-like (H1N1), 31 were influenza B including 14 B/Brisbane/60/2008-like (Victoria linkage) and 17 B/Wisconsin/01/2010-like (Yamagata). For context, the WHO-recommended components for the 2012-2013 and upcoming 2013-2014 Northern Hemisphere trivalent influenza vaccines are listed below:

2012-2013	2013-2014
A/California/07/2009 (H1N1) pdm09-like virus	A/California/07/2009 (H1N1) pdm09-like virus
A/Victoria/361/2011 (H3N2)-like virus	A/Victoria/361/2011 (H3N2)-like virus
B/Wisconsin/1/2010 (Yamagata lineage)-like virus	B/Massachusetts/2/2012-like virus

d. Antiviral resistance assessment by the National Microbiology Laboratory

The National Microbiology Laboratory (NML) routinely tests for susceptibility of select influenza isolates to antiviral drugs recommended for treatment of influenza: oseltamivir, zanamivir and amantadine. From across Canada from September 1, 2012 to May 23, 2013, the NML reported that one of 597 influenza A/H3N2, none of 463 influenza B isolates, and one of 201 A(H1N1)pdm09 isolates tested were resistant to oseltamivir. One of 595 influenza A/H3N2, none of 429 influenza B isolates, and none of 197 A(H1N1) pdm09 tested were resistant to zanamivir. One of 985 A/H3N2 isolates and none of 238 A(H1N1)pdm09 tested were sensitive to amantadine.

5. Sentinel influenza vaccine effectiveness (VE) monitoring

The early and substantial 2012-2013 influenza season in BC and elsewhere in Canada enabled mid-season assessment of the protection afforded by that season's influenza vaccine. Sentinel surveillance data collected from the five largest provinces of Canada (BC, Alberta, Manitoba, Ontario and Quebec) participating in annual influenza VE monitoring were rapidly assembled and analyzed, with interim results published in an open-access peer-reviewed journal in January 2013, available at: http://www.eurosurveillance.org/ViewArticle.aspx?ArticleId=20394 .

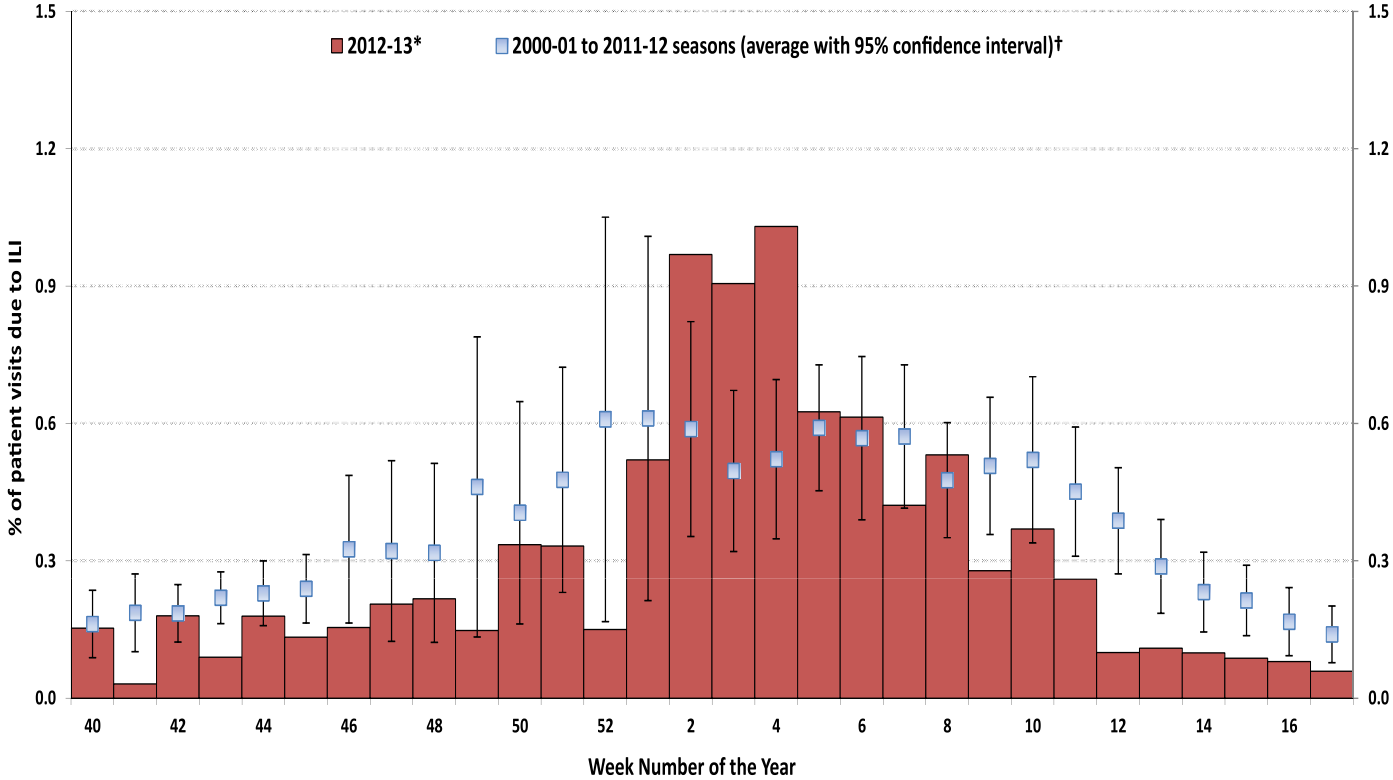
Interim adjusted-VE against medically-attended laboratory-confirmed influenza A/H3N2 infection was found to be 45% (95%CI: 13-66), consistent with interim findings for that strain also reported from the United States and Europe, showing vaccine approximately halved the risk of medically-attended influenza. Detailed virus characterization showed significant antigenic site mutations in the haemagglutinin gene potentially contributing to suboptimal VE estimates although conventional strain characterization based on haemagglutination inhibition assay described circulating strains in Canada as similar to vaccine. Final 2012-2013 season VE estimates, inclusive of protection against tail-end influenza B activity, will be further assessed.

2.1 Number of reported laboratory-confirmed influenza outbreaks in long-term care facility (LTCF) settings between weeks 40 and 17, British Columbia, 2003/04 to 2012/13 seasons

Season	Long-term care facility outbreaks†
2003-04	46
2004-05	68
2005-06	28
2006-07	25
2007-08	53
2008-09	41
2009-10	12
2010-11	13
2011-12	30
2012-13	91

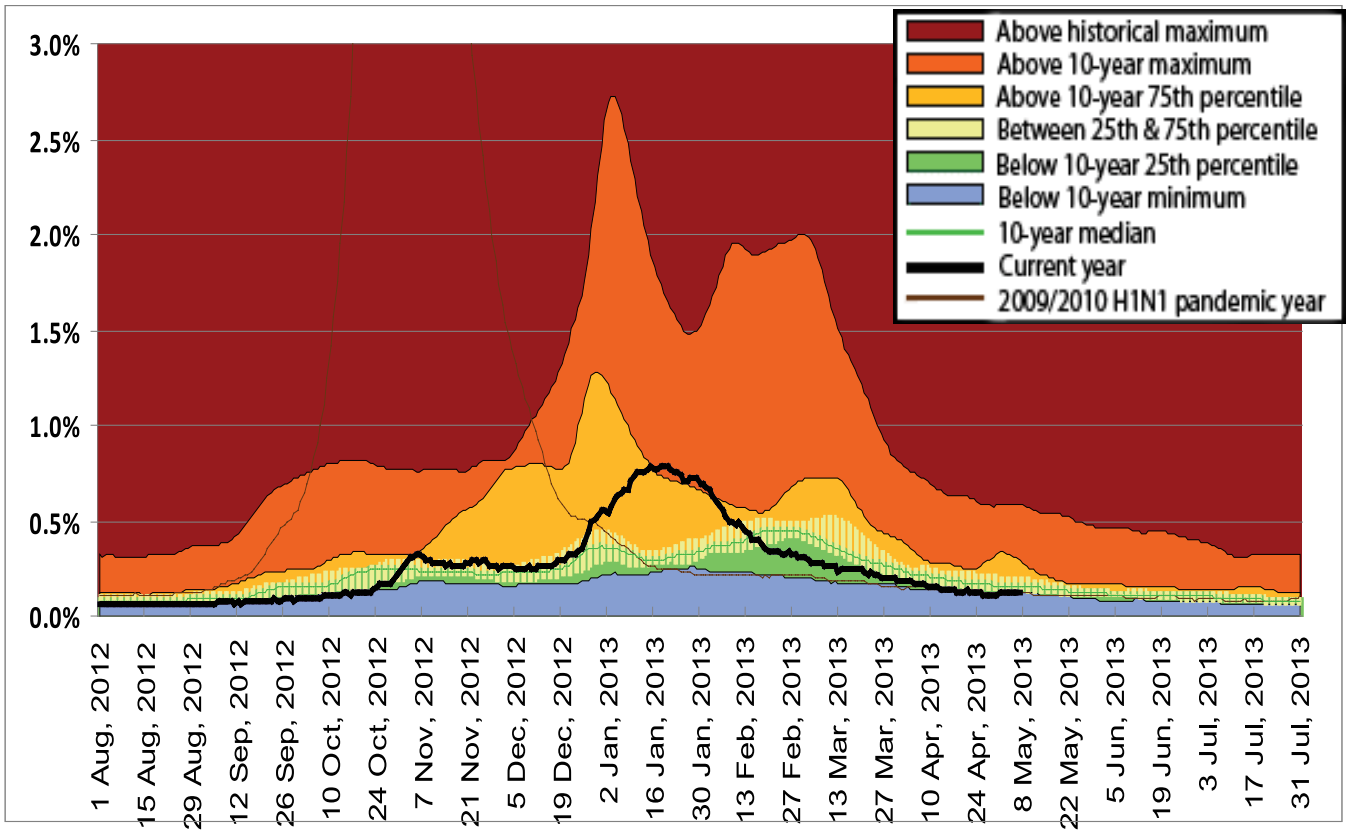
† IIncludes lab-confirmed influenza outbreaks only. Note that historic numbers may differ from previous annual reports owing to restriction to laboratory-confirmed influenza outbreaks for consistency and historic reconciliation to correct for that as well as other data issues such as duplicate reporting etc.

2.2 Sentinel Physicians, British Columbia, 2012-2013 Percentage of Patient Visits due to Influenza-Like Illness (ILI) per Week Compared to Average Percentage of ILI Visits for the Past 10 Seasons

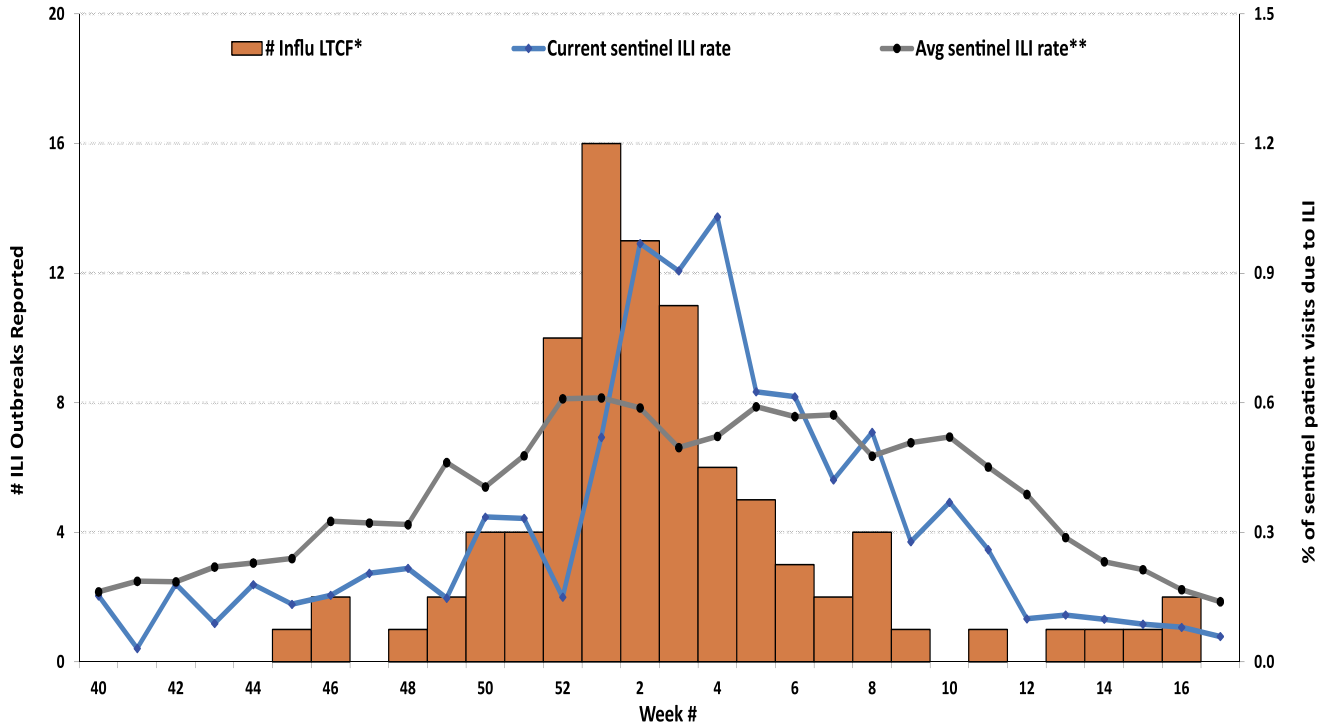


* Week 40 - Week 17 = [30 September 2012 – 27 April 2013]; Week 40 = [30 September 2012 - 6 October 2012]; Week 1 = [30 December 2012 - 5 January 2013]; Week 17 = [21 April 2013 - 27 April 2013]. In the above, the month of March runs from week 9 [24 February 2013 - 2 March 2013] through week 14 [31 March 2013 - 6 April 2013].
† Historical average includes 2000-01 to 2011-12 seasons, excluding 2008-09 and 2009-10 seasons due to atypical seasonality.

2.3 Daily MSP Claims Received for Selected GP Services (7-day Moving Average), British Columbia Influenza Illness (II) as Percentage of All



2.4 Number of Influenza Lab-confirmed Influenza Outbreaks Reported, Compared to Current Sentinel ILI Rate and Average Sentinel ILI Rate since 2000-10 season, per Week, British Columbia, 2012-2013 season



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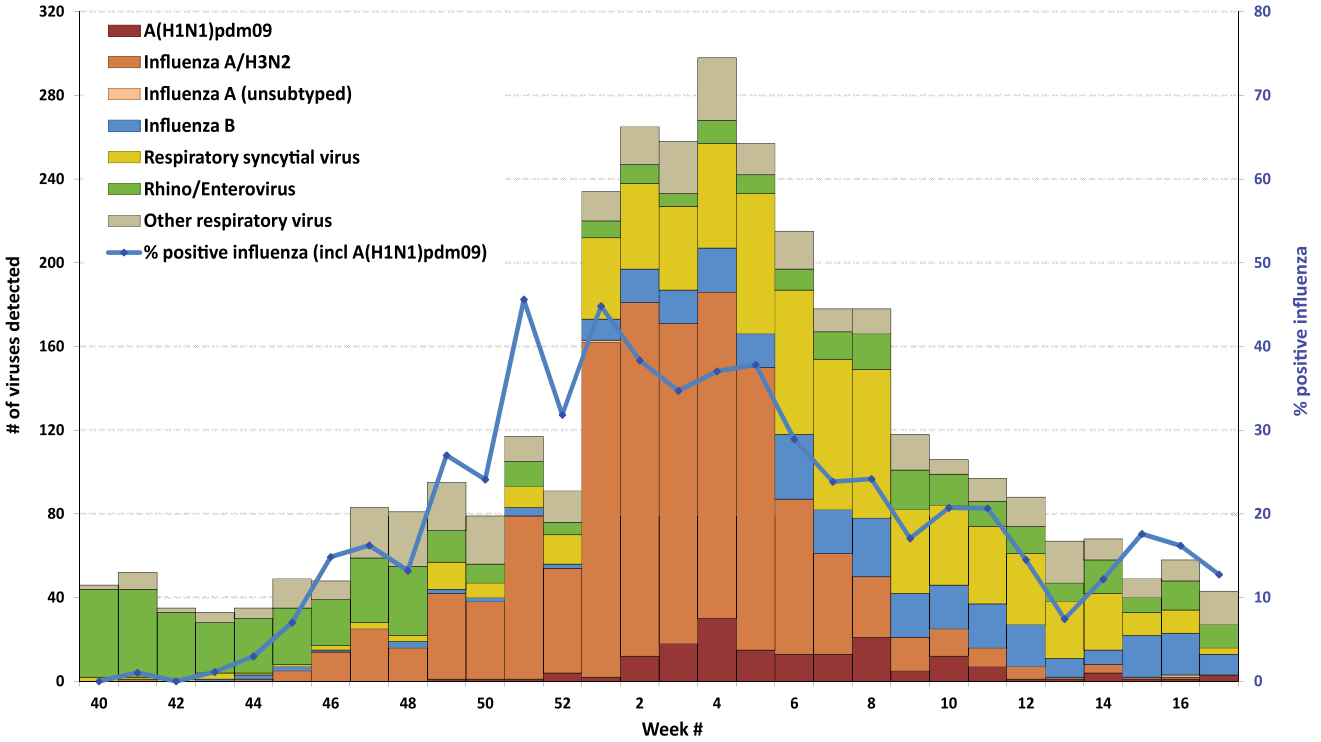
* Facility **influenza** outbreak defined as 2 or more ILI cases within 7-day period, with at least one case laboratory-confirmed as influenza.

** Historical average includes 2000-01 to 2011-12 seasons, excluding 2008-09 and 2009-10 seasons due to atypical seasonality.

2.5a BC Public Health Microbiology & Reference Laboratory, 2012-2013 Influenza and Other Virus Detections among Respiratory Specimens



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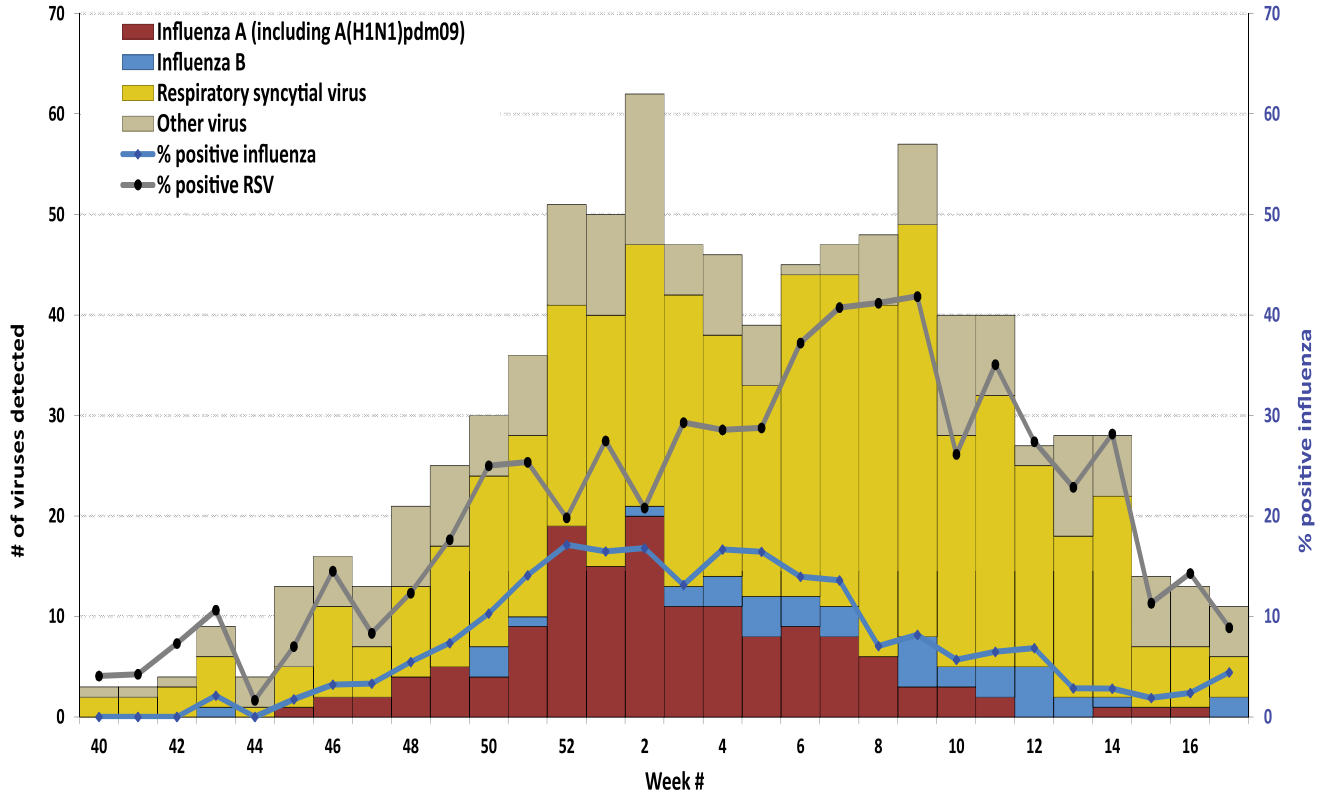
Note 2: Provincial surveillance patterns for other respiratory virus detection may be less reliable or representative of general community experience than influenza and should be interpreted cautiously. See narrative section 4.

2.5b BC Children's and Women's Health Centre Laboratory, 2012-2013 Influenza and Other Virus Detections among Respiratory Specimens



Note: Week 40 - Week 17 = [30 September 2012 – 27 April 2013]; Week 40 = [30 September 2012 - 6 October 2012]; Week 1 = [30 December 2012 - 5 January 2013]; Week 17 = [21 April 2013 - 27 April 2013]. In the above, the month of March runs from week 9 [24 February 2013 - 2 March 2013] through week 14 [31 March 2013 - 6 April 2013].

Measles

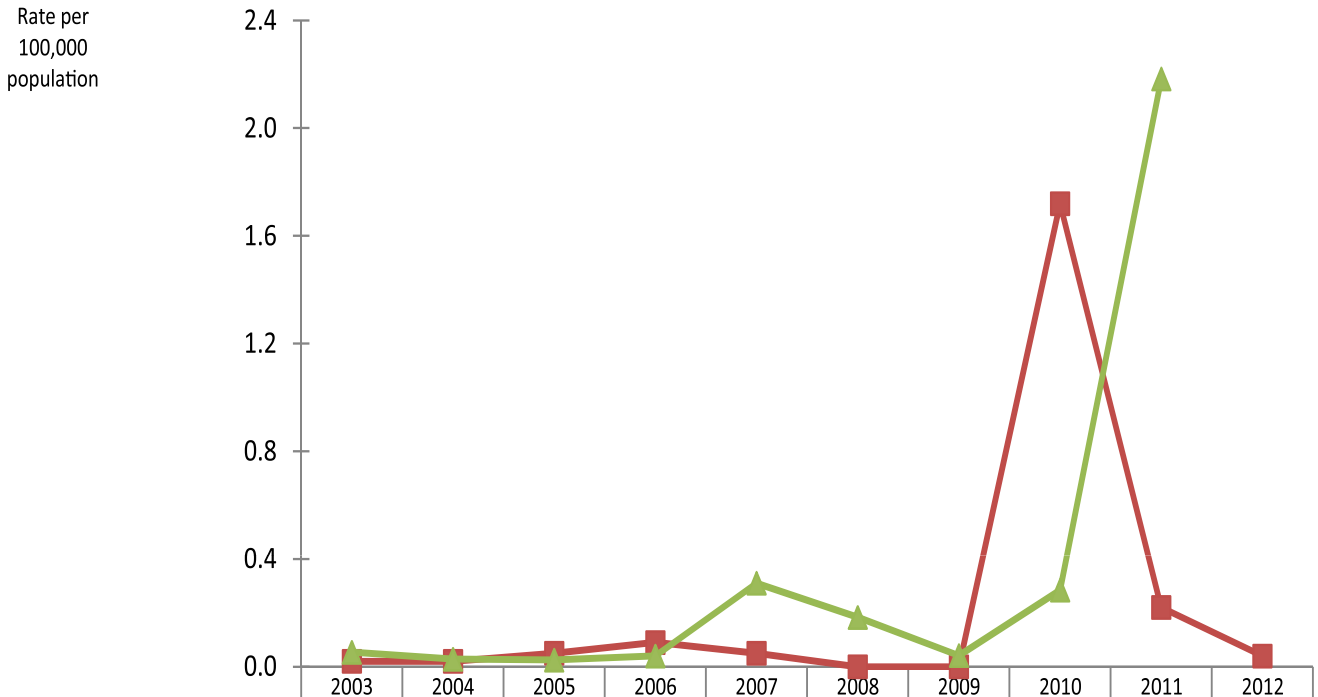
There were two confirmed measles cases among BC residents in 2012 (0.04 per 100,000 population), one in a school aged child and the other in an adult.

Both cases were acquired abroad. Genotyping indicated that both infections were caused by the B3 genotype, consistent with the circulating genotypes in the geographic areas of acquisition which were Africa and the Middle East, respectively. One case was unimmunized, while the other received appropriate immunizations for age by verbal history but only one dose was documented.

Public health followed up 51 identified contacts for these two cases and no secondary transmissions were reported from either case.

Information about measles virus genotypes circulating globally is available from the World Health Organization: http://www.who.int/immunization_monitoring/diseases/measles_monthlydata/en/index1.html

3.1 Measles Rates by Year, 2003-2012



	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
BC Measles Reports	1	1	2	4	2	0	0	78	10	2
BC Measles Rate	0.02	0.02	0.05	0.09	0.05	0.00	0.00	1.72	0.22	0.04
Canadian Measles Rate	0.05	0.03	0.02	0.04	0.31	0.18	0.04	0.28	2.18	

Meningococcal Disease (invasive)

During 2012, 16 invasive meningococcal disease (IMD) cases were reported. The serogroups were: 10 B, 4 Y, 1 C and 1 non-typeable. Three cases were fatal: two serogroup Y and one serogroup B. There was no evidence of geographic clustering of cases and all were sporadic.

The rate of IMD has decreased from 0.7 cases per 100,000 population in 2003 to 0.3 cases per 100,000 population in 2012.

This decline is substantially related to a dramatic downward trend in serogroup C disease. The incidence of serogroup C disease in 2003 was 0.22 per 100,000 population. In 2012 it was 0.02 per 100,000 population; the single serogroup C case was 82 years old. This reflects the impact of the infant and school-age catch-up meningococcal C conjugate immunization program beginning in September 2003.

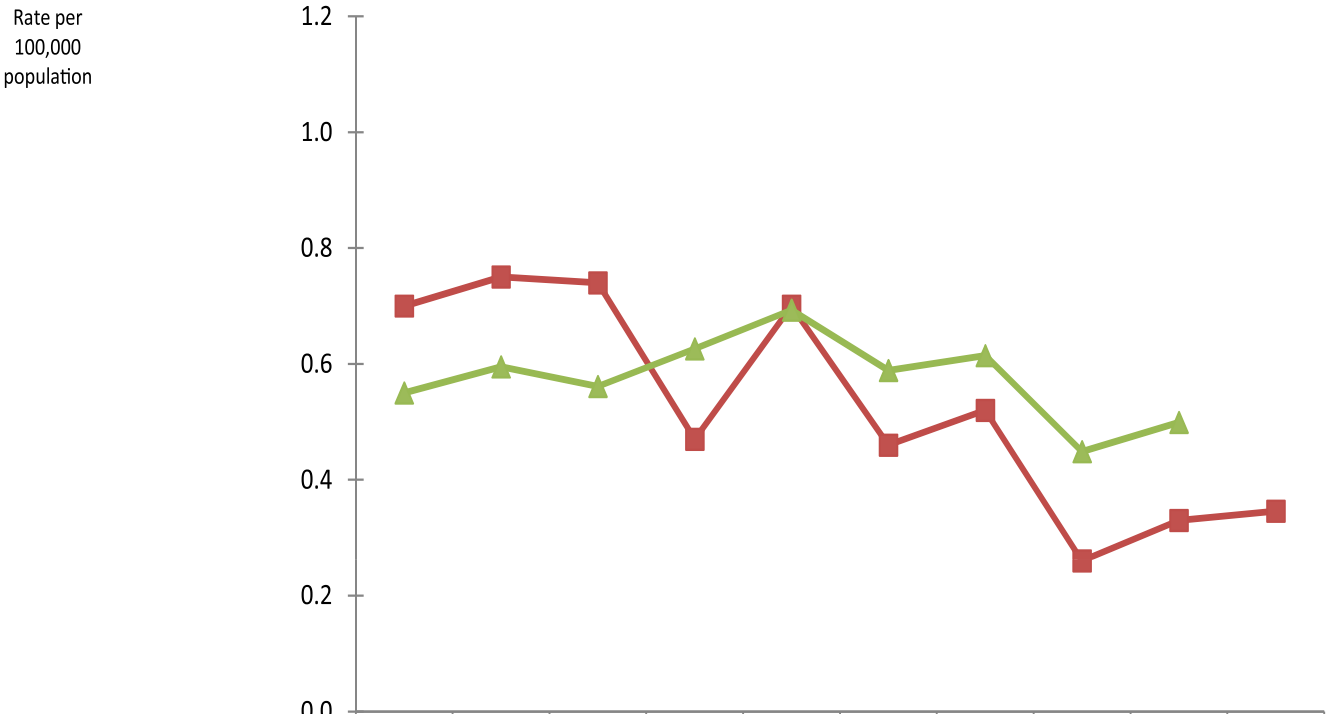
The majority of cases in 2012 were serogroup B. Fluctuations in annual incidence in serogroup B disease have been observed in the last 10 years with rates ranging from 0.09 to 0.36 cases per 100,000 population per year.

Serogroup Y incidence has historically been lower than of either serogroups C or B and rates in the past decade fluctuated from 0.02 to 0.24 cases per 100,000 population per year. The rate of W135 is lower still and ranged from 0.0 to 0.10 cases per 100,000 population per year Figure 4.4. There have only been 2 cases of serogroup A disease in the past decade; both occurred in 2006 and were due to importation from the Indian subcontinent.

Outbreaks of IMD in the past decade in BC were due to serogroup C: one in the Abbotsford area in 2001 and one among men who have sex with men in 2004 (see Annual Summary of Reportable Diseases for these years for additional detail http://www.bccdc.ca/util/about/annreport/default.htm). Since introduction of the serogroup C immunization program, there has not been a recurrence of the historical pattern of periodic outbreaks in school-age children and adolescents.

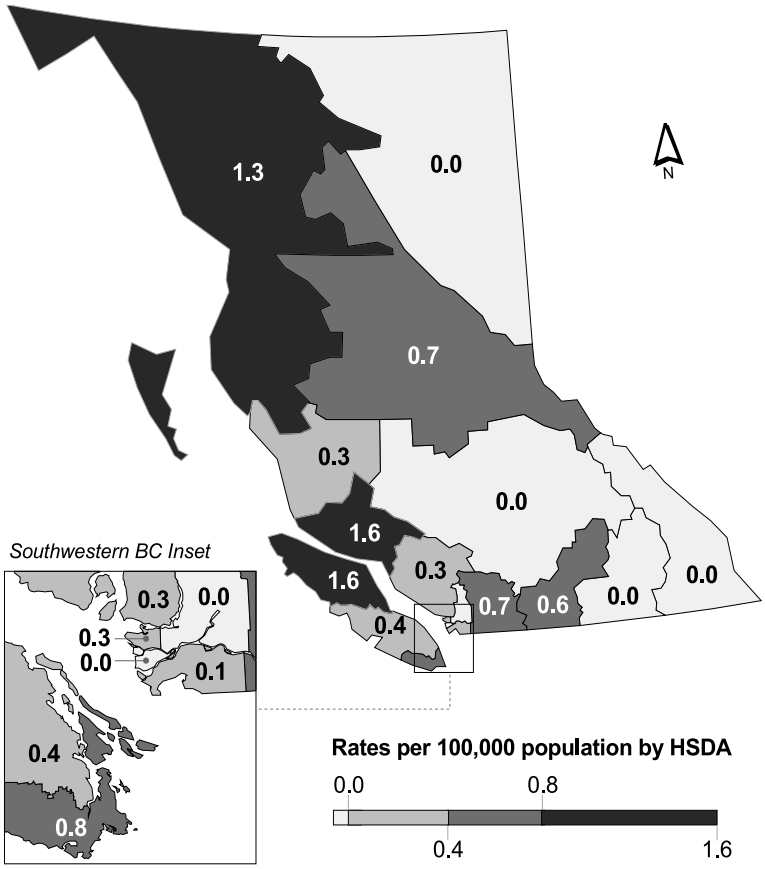
The annual median age of all IMD ranged from 19 years to 57 years in 2003-2011. In 2012, the median age of IMD cases was 20 years with nine cases aged < 21 years (7 serogroup B and 2 serogroup Y).

4.1 Meningococcal Disease (invasive) Rates by Year, 2003-2012



	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
BC Meningococcal Reports	29	31	31	20	30	20	23	12	15	16
BC Meningococcal Rate	0.7	0.8	0.7	0.5	0.7	0.5	0.5	0.3	0.3	0.3
Canadian Meningococcal Rate	0.5	0.6	0.6	0.6	0.7	0.6	0.6	0.4	0.5	

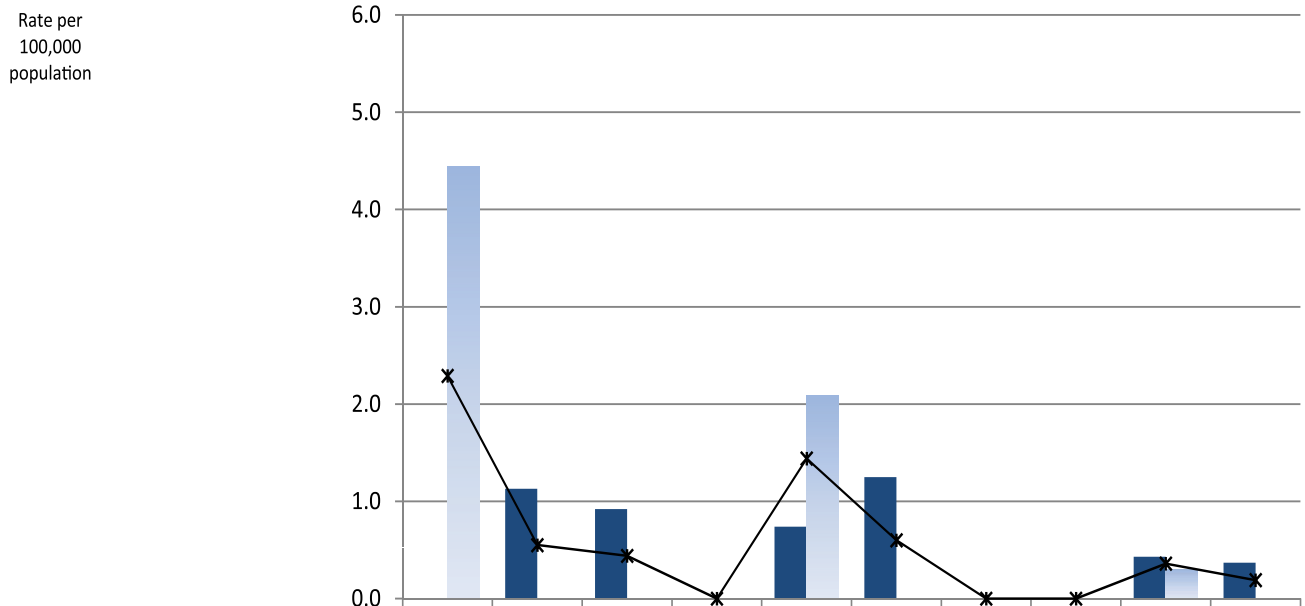
4.2 Meningococcal Disease (invasive) Rates by HSDA, 2012



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	0	0.0
12	Kootenay Boundary	0	0.0
13	Okanagan	2	0.6
14	Thompson Cariboo Shuswap	0	0.0
21	Fraser East	2	0.7
22	Fraser North	0	0.0
23	Fraser South	1	0.1
31	Richmond	0	0.0
32	Vancouver	2	0.3
33	North Shore/Coast Garibaldi	1	0.3
41	South Vancouver Island	3	0.8
42	Central Vancouver Island	1	0.4
43	North Vancouver Island	2	1.6
51	Northwest	1	1.3
52	Northern Interior	1	0.7
53	Northeast	0	0.0

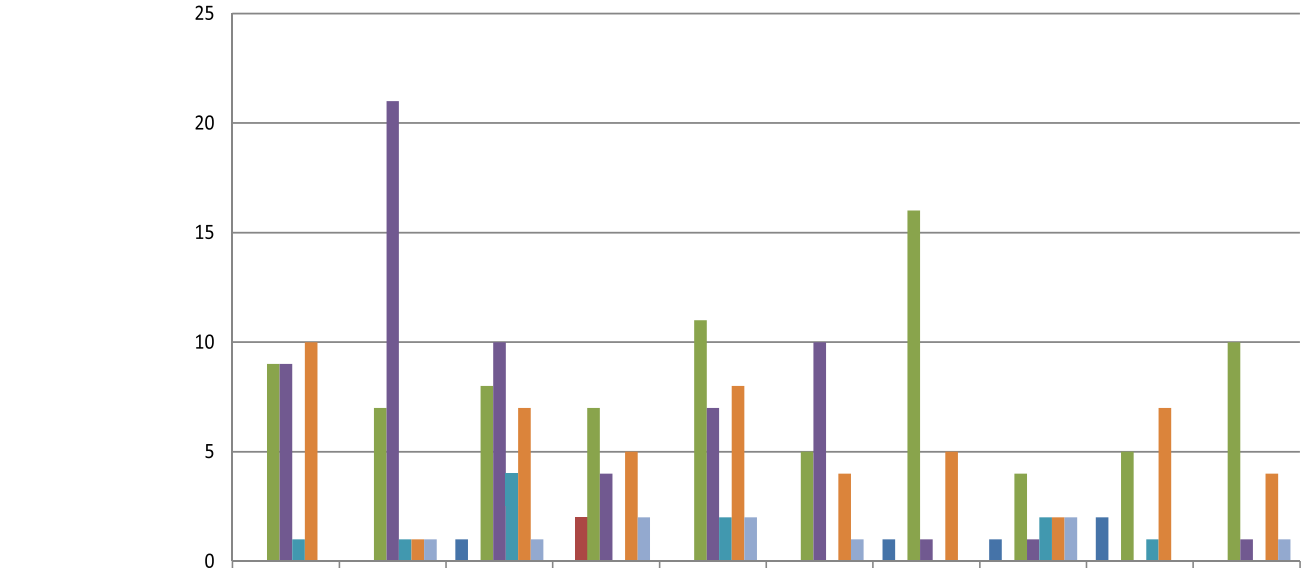
Note: Map classification by Jenks natural breaks method.

4.3 Meningococcal Disease (invasive) Rates by Age Group and Sex, 2012



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Meningococcal Rate - Female	0.0	1.1	0.9	0.0	0.7	1.3	0.0	0.0	0.4	0.4
Meningococcal Rate - Male	4.4	0.0	0.0	0.0	2.1	0.0	0.0	0.0	0.3	0.0
Meningococcal Disease (invasive) Rate	2.3	0.6	0.4	0.0	1.4	0.6	0.0	0.0	0.4	0.2
Meningococcal Reports - Female	0	1	1	0	1	2	0	0	3	2
Meningococcal Reports - Male	1	0	0	0	3	0	0	0	2	0
Meningococcal Disease (invasive) Reports	1	1	1	0	4	2	0	0	5	2

4.4 Meningococcal Disease (invasive) Cases by Serotype and Year, 2003-2012



	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
29E	0	0	1	0	0	0	1	1	2	0
A	0	0	0	2	0	0	0	0	0	0
B	9	7	8	7	11	5	16	4	5	10
C	9	21	10	4	7	10	1	1	0	1
W-135	1	1	4	0	2	0	0	2	1	0
Y	10	1	7	5	8	4	5	2	7	4
Nontypable/Unknown	0	1	1	2	2	1	0	2	0	1

Mumps

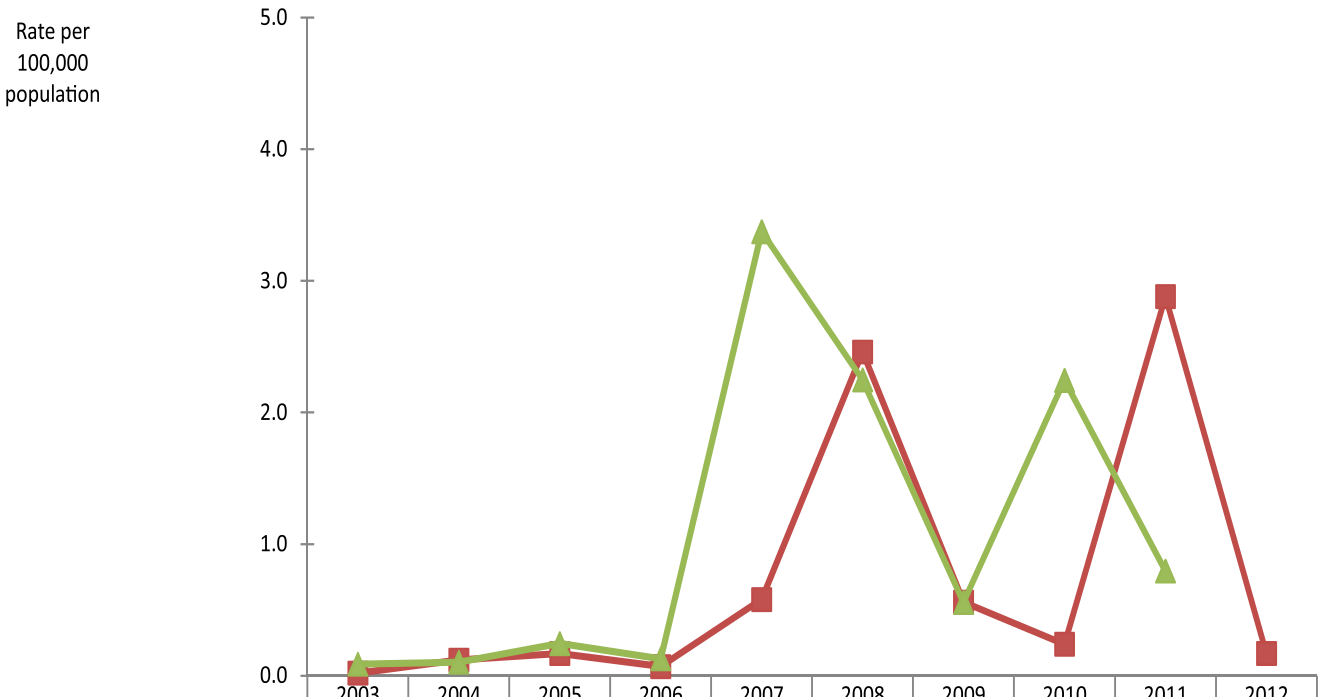
There were eight confirmed mumps cases among BC residents in 2012 (0.17 per 100,000 population), substantially less than the 132 cases reported in 2011 and similar to several low incidence years prior to 2007.

The eight confirmed mumps cases in 2012 showed no seasonality. Four cases were reported by Vancouver Coastal Health Authority, three cases were reported by Vancouver Island Health Authority, and one case was reported by Northern Health Authority. The cases occurred in unvaccinated and under-vaccinated adults. The median age of the cases was 35 years (range 19 to 57 years). Four were male. Three cases were unvaccinated, two cases had received one dose of MMR vaccine, and three cases had unknown mumps vaccination status. Only one of the cases reported visiting an emergency room and none of the cases were hospitalized. Three of the cases were consistent with acquisition outside of Canada in Mexico, the Philippines, and the United Kingdom, respectively. The case imported from the United Kingdom was genotype G, which is the most common genotype in the United Kingdom, and resulted in one secondary case.

BC introduced a 2nd dose of mumps vaccine into the routine childhood immunization schedule in 1996. Future low level endemic mumps activity as well as importations are likely to continue, especially among under-vaccinated adults.

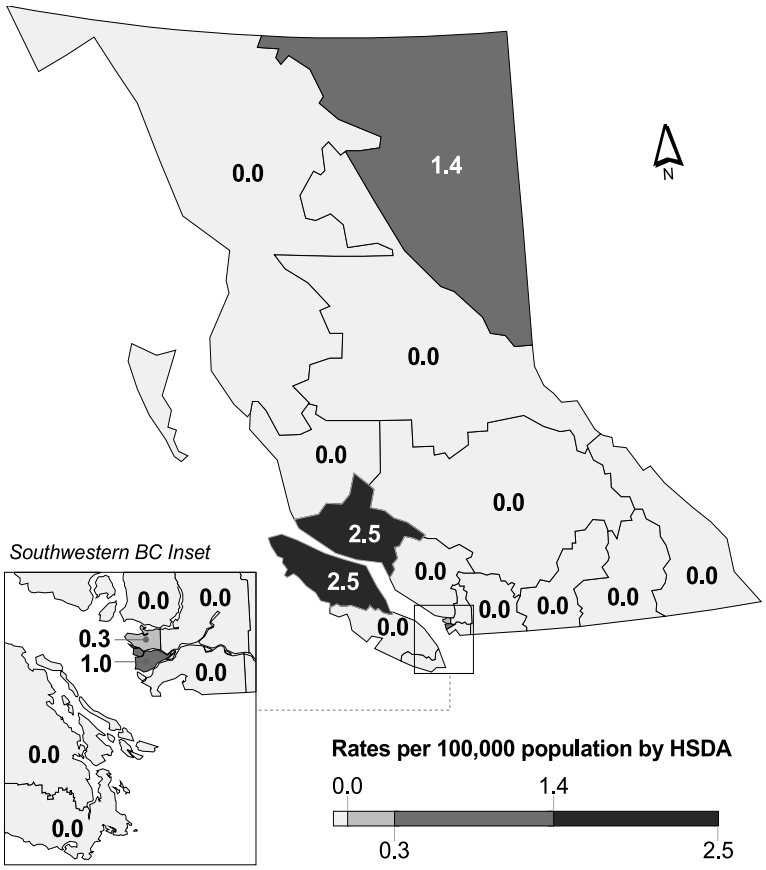
Information about mumps virus genotypes circulating globally is available from the World Health Organization: http://www.who.int/immunization_monitoring/diseases/mumps/en/index.html

5.1 Mumps Rates by Year, 2003-2012



	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
BC Mumps Reports	1	5	7	3	25	108	25	11	132	8
BC Mumps Rate	0.02	0.12	0.17	0.07	0.58	2.46	0.56	0.24	2.88	0.17
Canadian Mumps Rate	0.09	0.10	0.24	0.13	3.37	2.25	0.56	2.24	0.80	

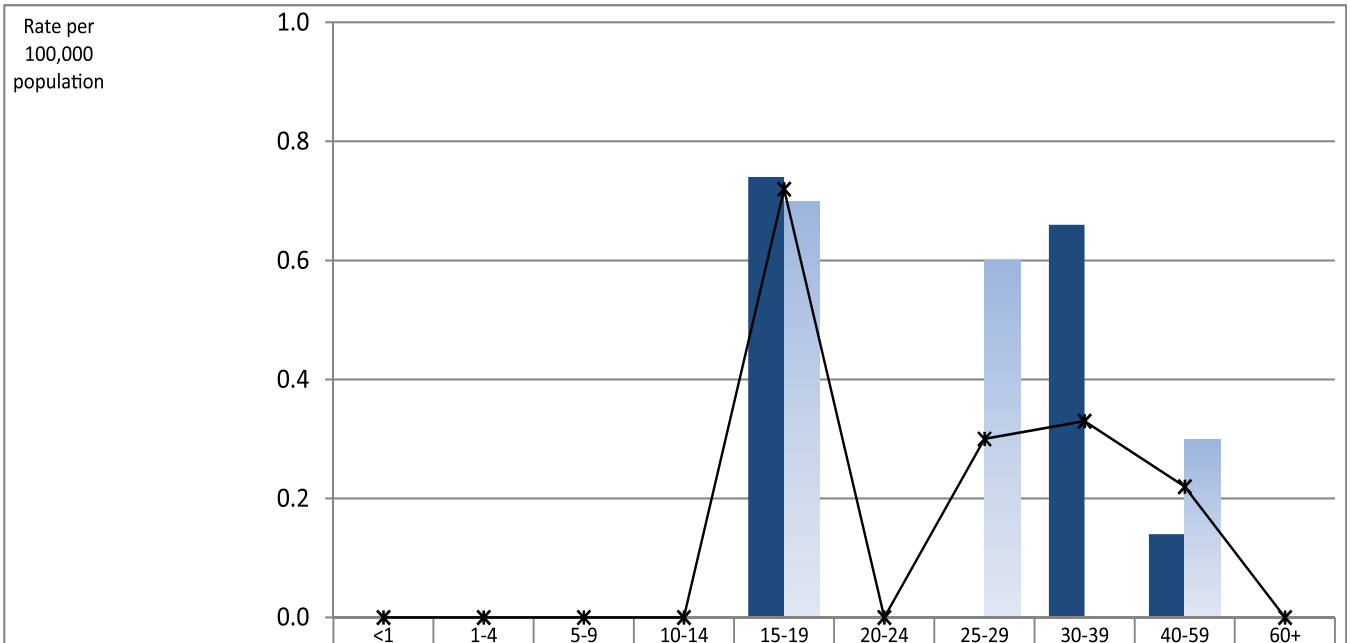
5.2 Mumps Rates by HSDA, 2012



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	0	0.0
12	Kootenay Boundary	0	0.0
13	Okanagan	0	0.0
14	Thompson Cariboo Shuswap	0	0.0
21	Fraser East	0	0.0
22	Fraser North	0	0.0
23	Fraser South	0	0.0
31	Richmond	2	1.0
32	Vancouver	2	0.3
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	3	2.5
51	Northwest	0	0.0
52	Northern Interior	0	0.0
53	Northeast	1	1.4

Note: Map classification by Jenks natural breaks method.

5.3 Mumps Rates by Age Group and Sex, 2012



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Mumps Rate - Female	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.7	0.1	0.0
Mumps Rate - Male	0.0	0.0	0.0	0.0	0.7	0.0	0.6	0.0	0.3	0.0
Mumps Rate	0.0	0.0	0.0	0.0	0.7	0.0	0.3	0.3	0.2	0.0
Mumps Reports - Female	0	0	0	0	1	0	0	2	1	0
Mumps Reports - Male	0	0	0	0	1	0	1	0	2	0
Mumps Reports	0	0	0	0	2	0	1	2	3	0

Pertussis

As elsewhere, pertussis remains endemic in BC, with recurring cyclical peaks typically showing a 3-5 year periodicity.

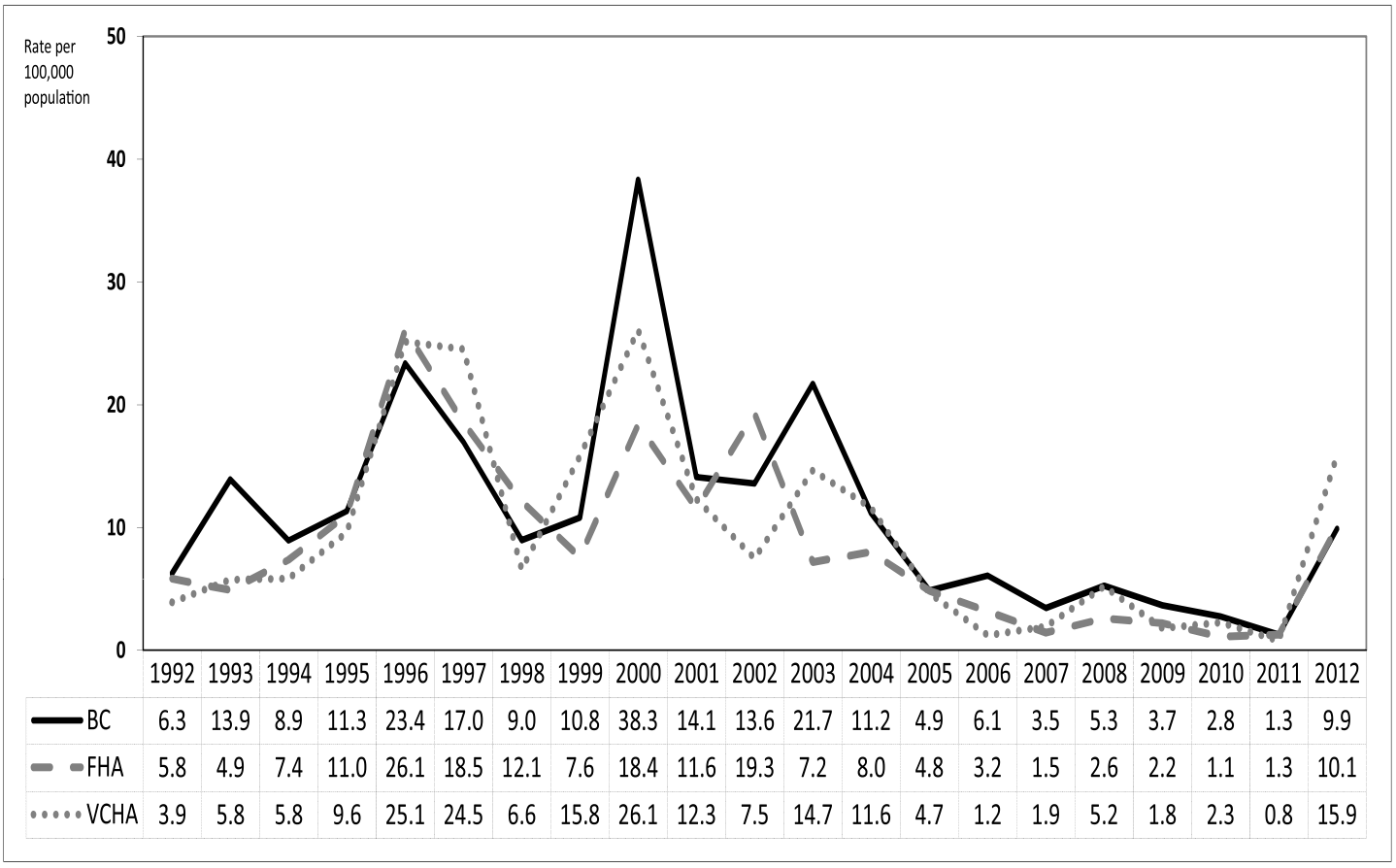
As shown in Figure 6.1, BC has experienced trough levels of pertussis in recent years with only minor cyclical peaks (last evident in 2008) and a 20-year historic low in 2011. BC experienced a cyclical resurgence in 2012 driven primarily by reports from the Lower Mainland of BC (Vancouver Coastal [VCHA] and Fraser Health [FHA] Authorities) (Figure 6.2). Overall, however, the 2012 cyclical peak with an incidence of 10 per 100,000 was less substantial than previous peaks in BC exceeding 20 per 100,000 population in 1996 and 2003 and approaching 40 per 100,000 population provincially in 2000. Similarly, 2012 incidence in the predominantly affected regions of VCHA and FHA was higher relative to the most recent trough years since 2005, but was still below historic cyclical peaks in those regions (Figure 6.1).

As shown in Figure 6.3, peak pertussis incidence in 2012 occurred in infants less than one year of age and in pre-teens/teens. Pre-school children and adults showed the lowest incidence with gradual increase among school age children peaking at 12-13 years of age and declining thereafter. A similar age-related pattern was observed in the predominantly affected regions of VCHA and FHA (Figure 6.4).

The age-related pattern of pertussis activity in BC in 2012 is consistent with previous peaks emphasizing risk in young infants (Figures 6.3, 6.4). The shift in age distribution toward pre-teens and teens previously emphasized in comparing activity during the 1990s to that of the early 2000s is further demonstrated in the 2012 peak. Previous peaks involving that age band were postulated to have been due to an accumulated birth cohort effect among prior recipients of a less efficacious whole cell pertussis vaccine earlier used in Canada. In 2012, peak incidence is again observed in pre-teens/teens but overall activity in that age group is substantially lower than observed during prior cyclical peaks. This may reflect overall improved protection from the acellular pertussis vaccine introduced for the routine pediatric program in 1997 in BC but with waning of that immunity since the last booster dose (4-6 years of age), next administered in BC at 14-15 years of age (since 2004).

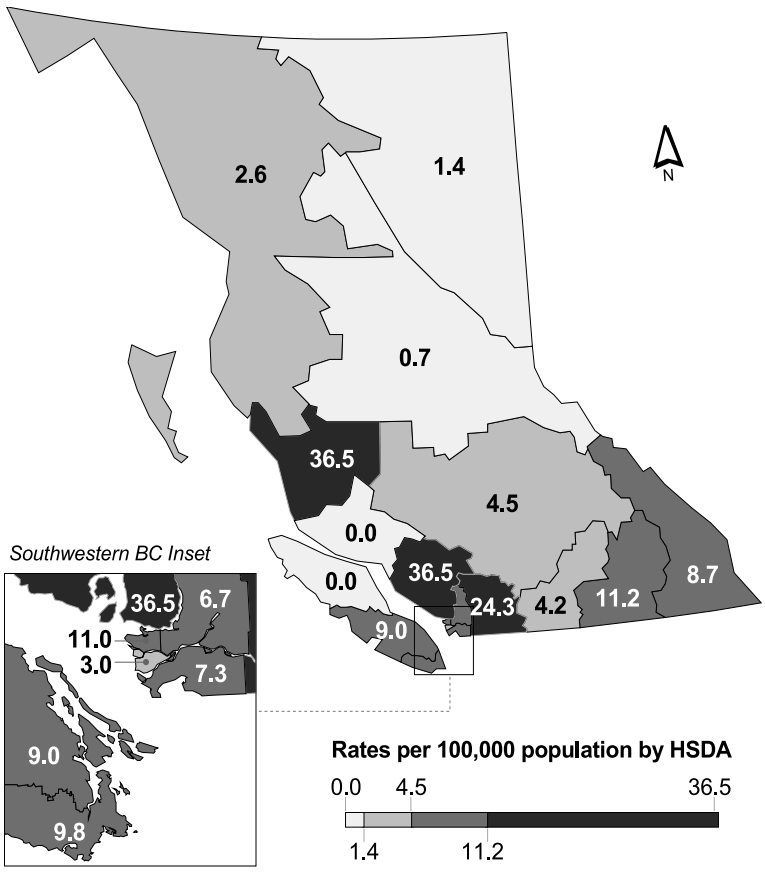
However, other agent-host-environment factors to explain variation in pertussis peaks and age-related patterns must be considered including the influence of prior outbreaks on population immunity, social mixing patterns and differential testing, reporting and other surveillance practices. Awareness was substantially increased during the 2012 pertussis peak so that ongoing monitoring is required to interpret surveillance signals and their implications for proposed adjustment to the prevention and control program.

6.1 Pertussis Rates by Year for BC, FHA, and VCHA, 1992-2012



	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
BC	6.3	13.9	8.9	11.3	23.4	17.0	9.0	10.8	38.3	14.1	13.6	21.7	11.2	4.9	6.1	3.5	5.3	3.7	2.8	1.3	9.9
FHA	5.8	4.9	7.4	11.0	26.1	18.5	12.1	7.6	18.4	11.6	19.3	7.2	8.0	4.8	3.2	1.5	2.6	2.2	1.1	1.3	10.1
VCHA	3.9	5.8	5.8	9.6	25.1	24.5	6.6	15.8	26.1	12.3	7.5	14.7	11.6	4.7	1.2	1.9	5.2	1.8	2.3	0.8	15.9

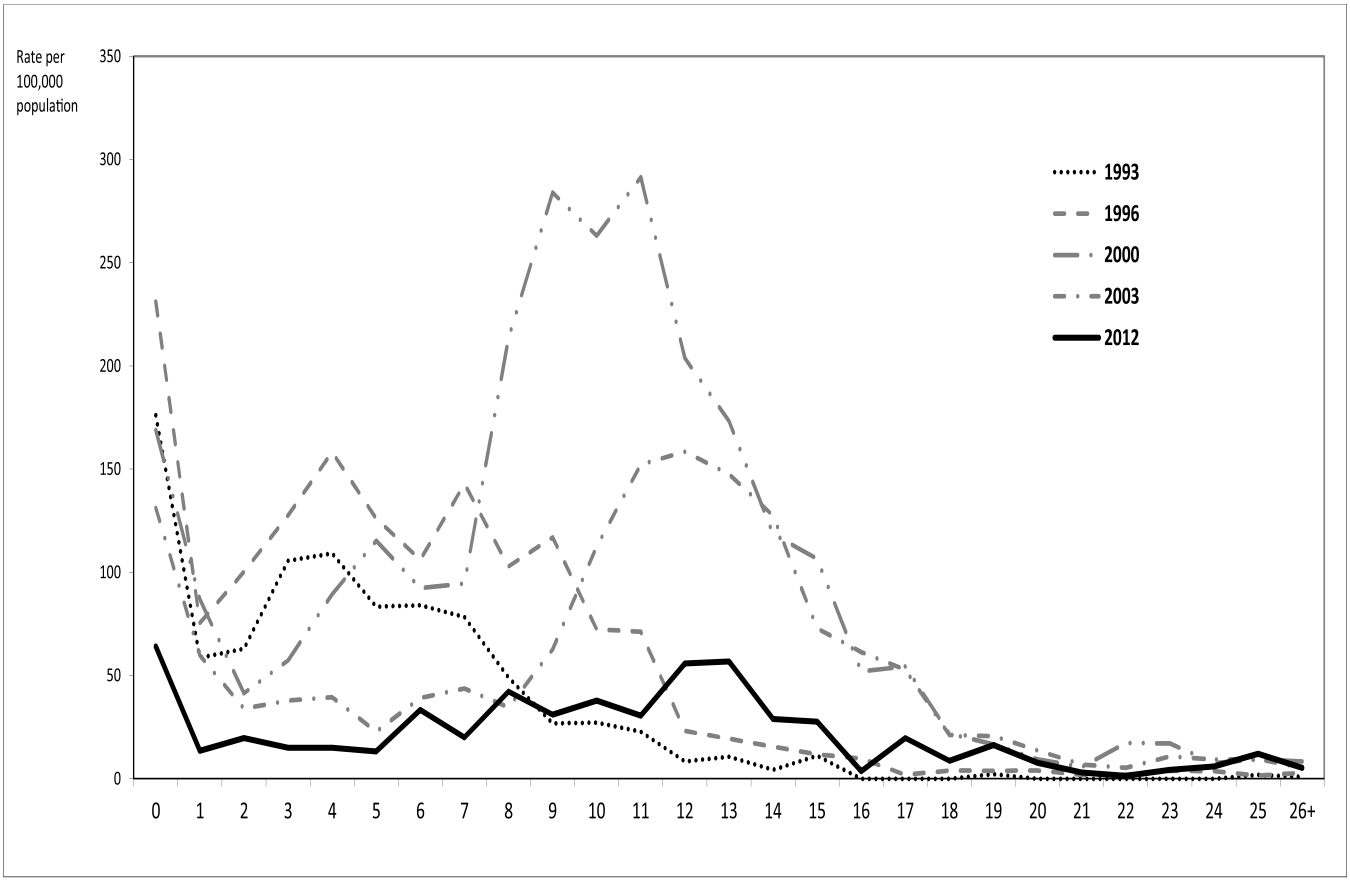
6.2 Pertussis Rates by HSDA, 2012



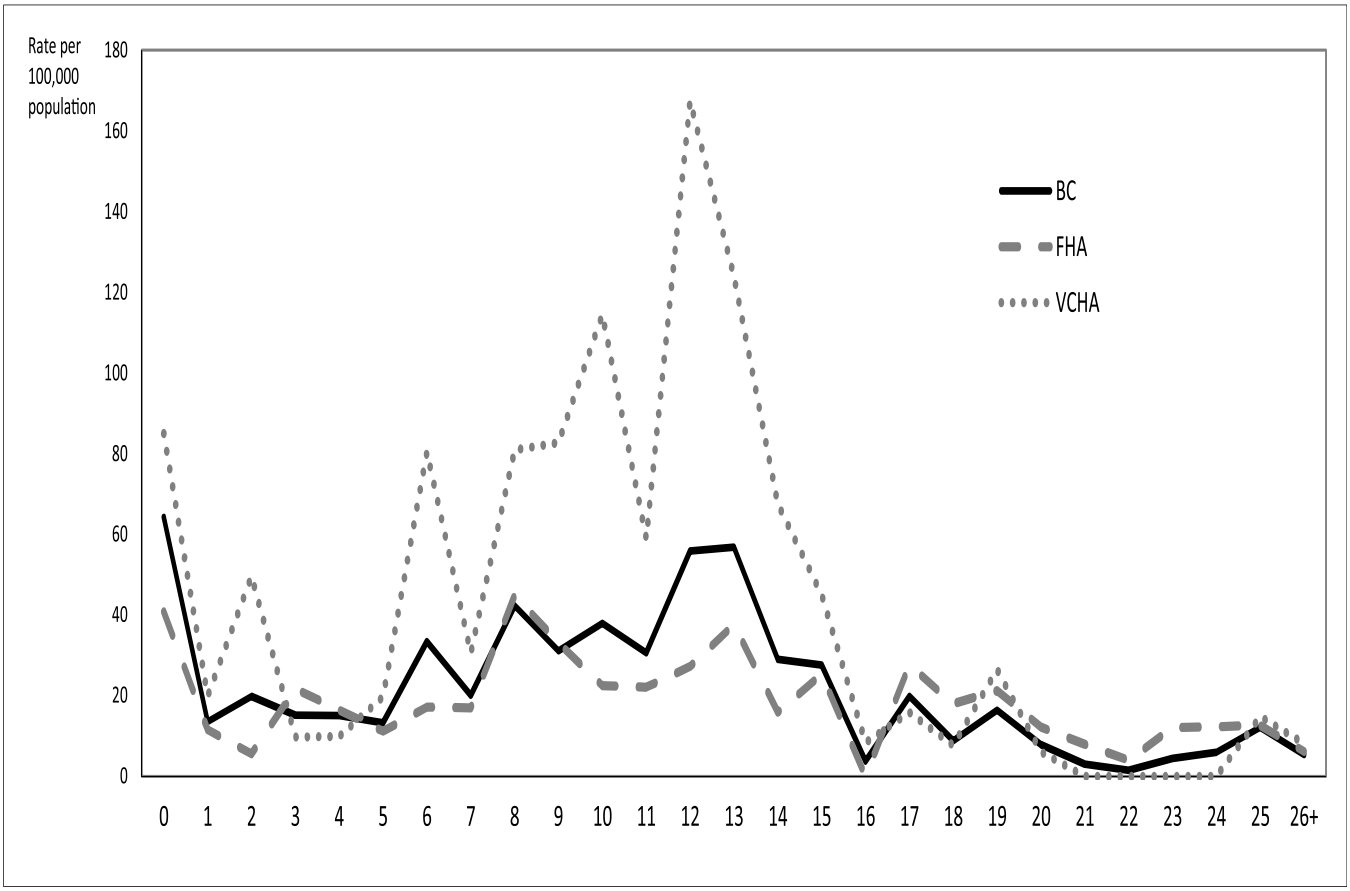
HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	7	8.7
12	Kootenay Boundary	9	11.2
13	Okanagan	15	4.2
14	Thompson Cariboo Shuswap	10	4.5
21	Fraser East	70	24.3
22	Fraser North	42	6.7
23	Fraser South	54	7.3
31	Richmond	6	3.0
32	Vancouver	75	11.0
33	North Shore/Coast Garibaldi	106	36.5
41	South Vancouver Island	37	9.8
42	Central Vancouver Island	24	9.0
43	North Vancouver Island	0	0.0
51	Northwest	2	2.6
52	Northern Interior	1	0.7
53	Northeast	1	1.4

Note: Map classification by Jenks natural breaks method.

6.3 Pertussis Rates by Age (one year intervals), BC 2012 and select comparator years



6.4 Pertussis Rates by Age (one year intervals) for BC, FHA and VCHA 2012



Pneumococcal Disease

There were 359 cases of invasive pneumococcal disease (IPD) among BC residents in 2012 (7.8 per 100,000 population), slightly higher than 326 cases reported in 2011 (7.1 per 100,000 population) and 271 cases reported in 2010 (6.0 per 100,000 population). The rate of IPD in BC has been steadily increasing since 2010.

The highest rates of IPD occurred among infants (11.5 per 100,000 population), those 1-4 years old (10.4 per 100,000 population) and those 60 years of age and older (17 per 100,000 population).

Regions with the highest rates of disease were Vancouver Island Health Authority (9.7 cases per 100,000 population) and Northern Health Authority (8.9 per 100,000 population), both higher than the overall provincial rate for 2012.

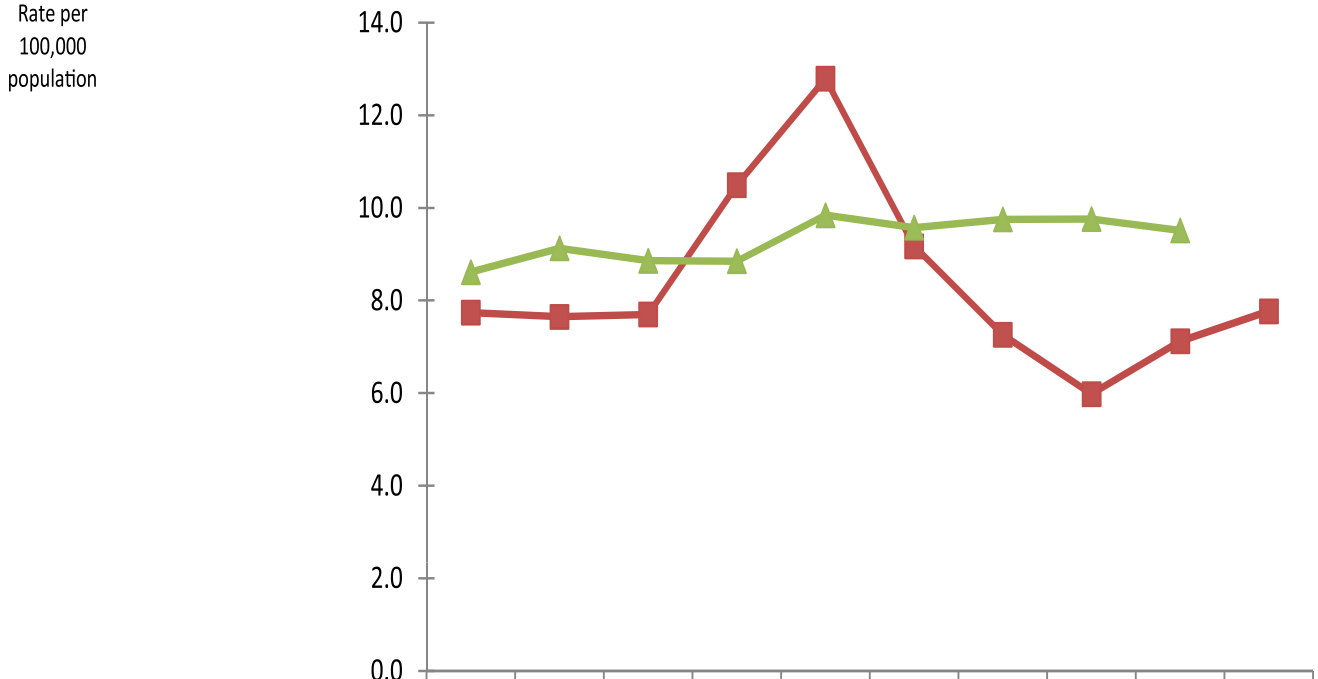
Serotyping results were available for 84% (302/359) of cases in 2012. Among cases under 5 years of age, 83% had serotyping results available (20/24), of which 10% (n=2) were due to serotypes covered by the 7-valent pneumoccocal conjugate vaccine (PCV-7) and 30% (n=6) were due to additional serotypes in the pneumococcal conjugate 13-valent vaccine (PCV-13). The remaining 16 cases (60%) were due to serotypes not found in a conjugate vaccine.

Two of the cases due to vaccine preventable serotypes in children under 5 were due to serotype 19F, contained in both PCV-7 and PCV-13. Both children were fully immunized prior to disease onset but one had underlying immunocompromise.

Of the six children with disease due to one of the six additional serotypes covered by PCV-13, three were due to serotype 19A. Two were fully immunized with PCV-7 but had not received a dose of PCV-13; one had received only 1 dose of PCV-13 and was delayed for additional doses. The fourth was serotype 7F, with onset at 2 ½ months of age and prior to receipt of the first dose of PCV-13. The other two were both serotype 3; both had been in infancy in 2008 when PCV-7, which does not cover serotype 3, was in use, and were reported as immunized.

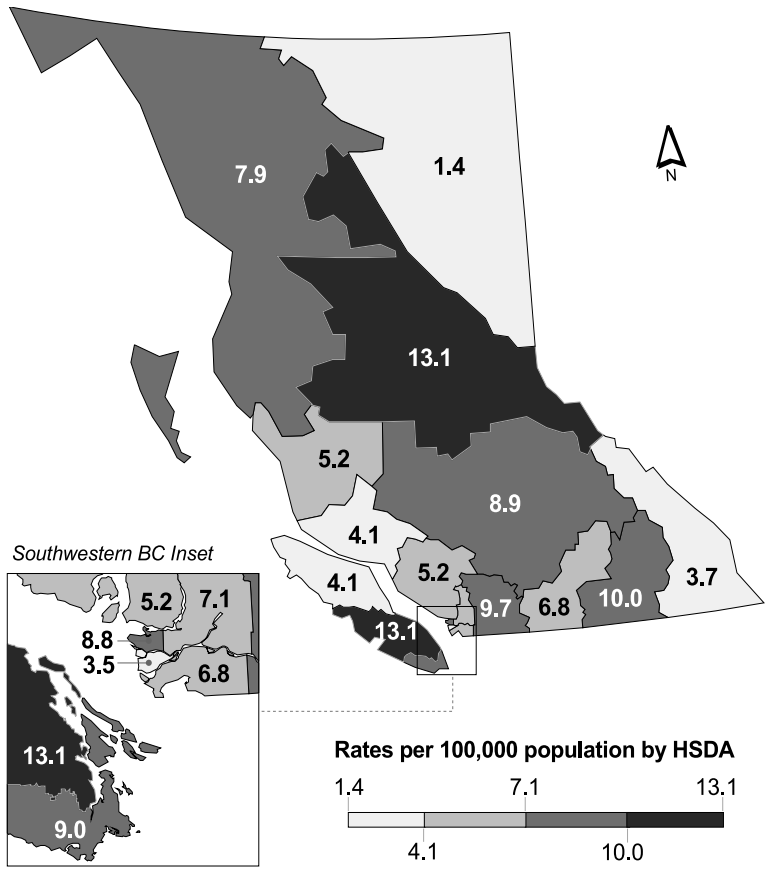
Among cases over 65 years of age, serotyping results were available for 81% (102/126) of cases, and 60% (61/102) were due to serotypes covered by the pneumococcal polysaccharide 23-valent (PPV-23) vaccine.

7.1 Pneumococcal Disease (invasive) Rates by Year, 2003-2012



	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
BC Invasive Pneumococcal Reports	319	318	323	445	551	402	324	271	326	359
BC Invasive Pneumococcal Rate	7.7	7.7	7.7	10.5	12.8	9.2	7.3	6.0	7.1	7.8
Canadian Invasive Pneumococcal Rate	8.6	9.1	8.9	8.9	9.8	9.6	9.8	9.8	9.5	

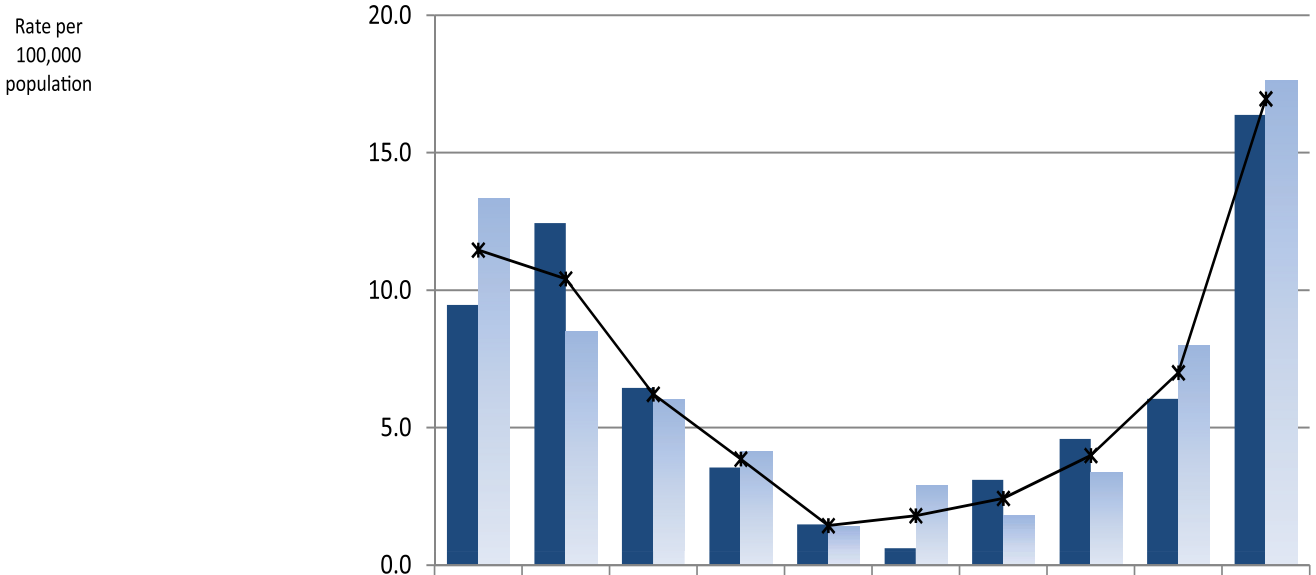
7.2 Pneumococcal Disease (invasive) Rates by HSDA, 2012



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	3	3.7
12	Kootenay Boundary	8	10.0
13	Okanagan	24	6.8
14	Thompson Cariboo Shuswap	20	8.9
21	Fraser East	28	9.7
22	Fraser North	44	7.1
23	Fraser South	50	6.8
31	Richmond	7	3.5
32	Vancouver	60	8.8
33	North Shore/Coast Garibaldi	15	5.2
41	South Vancouver Island	34	9.0
42	Central Vancouver Island	35	13.1
43	North Vancouver Island	5	4.1
51	Northwest	6	7.9
52	Northern Interior	19	13.1
53	Northeast	1	1.4

Note: Map classification by Jenks natural breaks method.

7.3 Pneumococcal Disease (invasive) Rates by Age Group and Sex, 2012



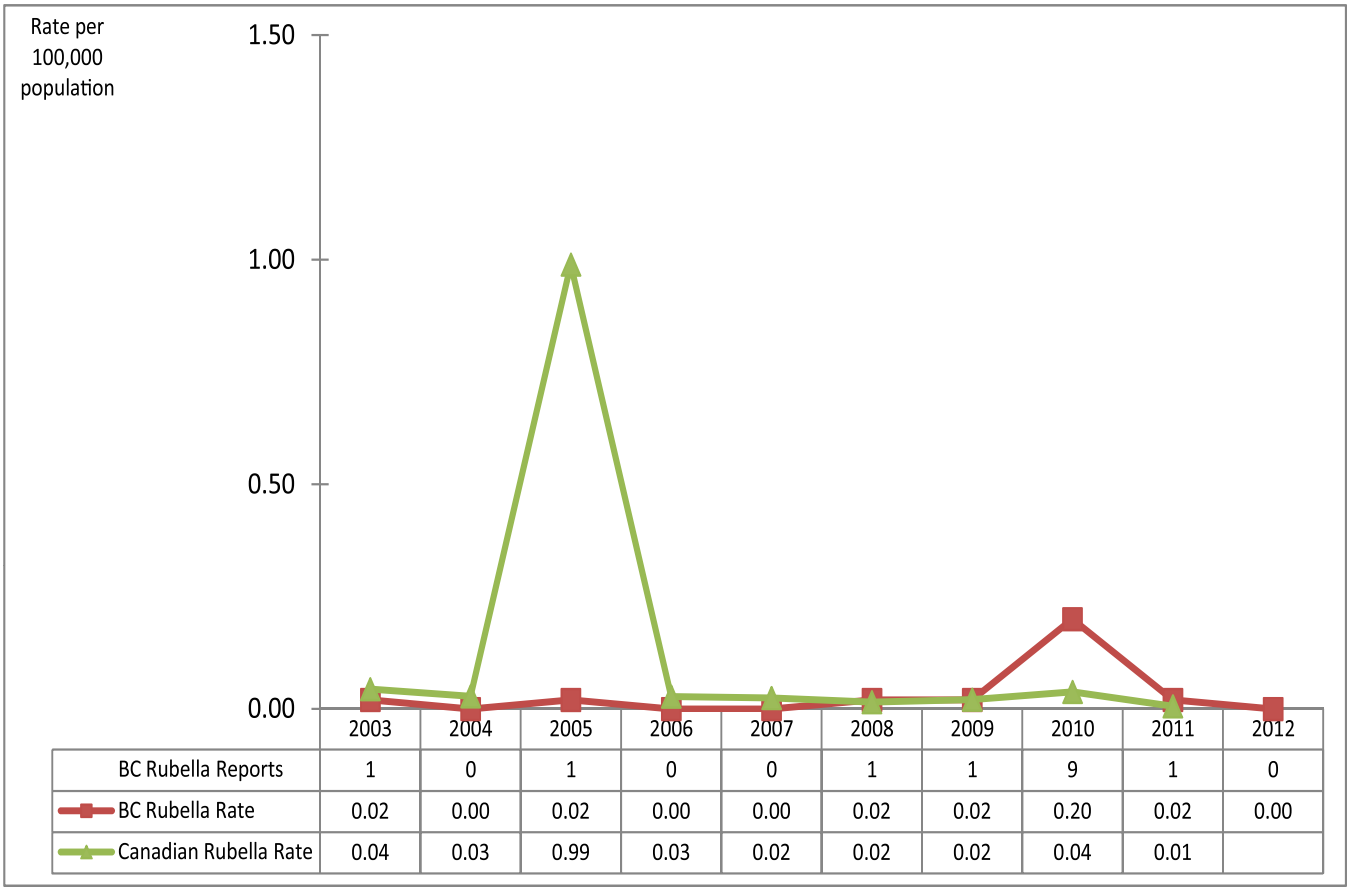
	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Invasive Pneumococcal Rate - Female	9.5	12.4	6.5	3.6	1.5	0.6	3.1	4.6	6.1	16.4
Invasive Pneumococcal Rate - Male	13.3	8.5	6.0	4.2	1.4	2.9	1.8	3.4	8.0	17.6
Pneumococcal Disease (invasive) Rate	11.5	10.4	6.2	3.9	1.4	1.8	2.4	4.0	7.0	17.0
Invasive Pneumococcal Reports - Female	2	11	7	4	2	1	5	14	42	89
Invasive Pneumococcal Reports - Male	3	8	7	5	2	5	3	10	54	85
Pneumococcal Disease (invasive) Reports	5	19	14	9	4	6	8	24	96	174

Rubella and Congenital Rubella Syndrome

There were no cases of rubella reported in BC in 2012.

No cases of congenital rubella syndrome have been reported in BC since a single case was reported in each of 2002 and 2004.

8.1 Rubella Rates by Year, 2003-2012



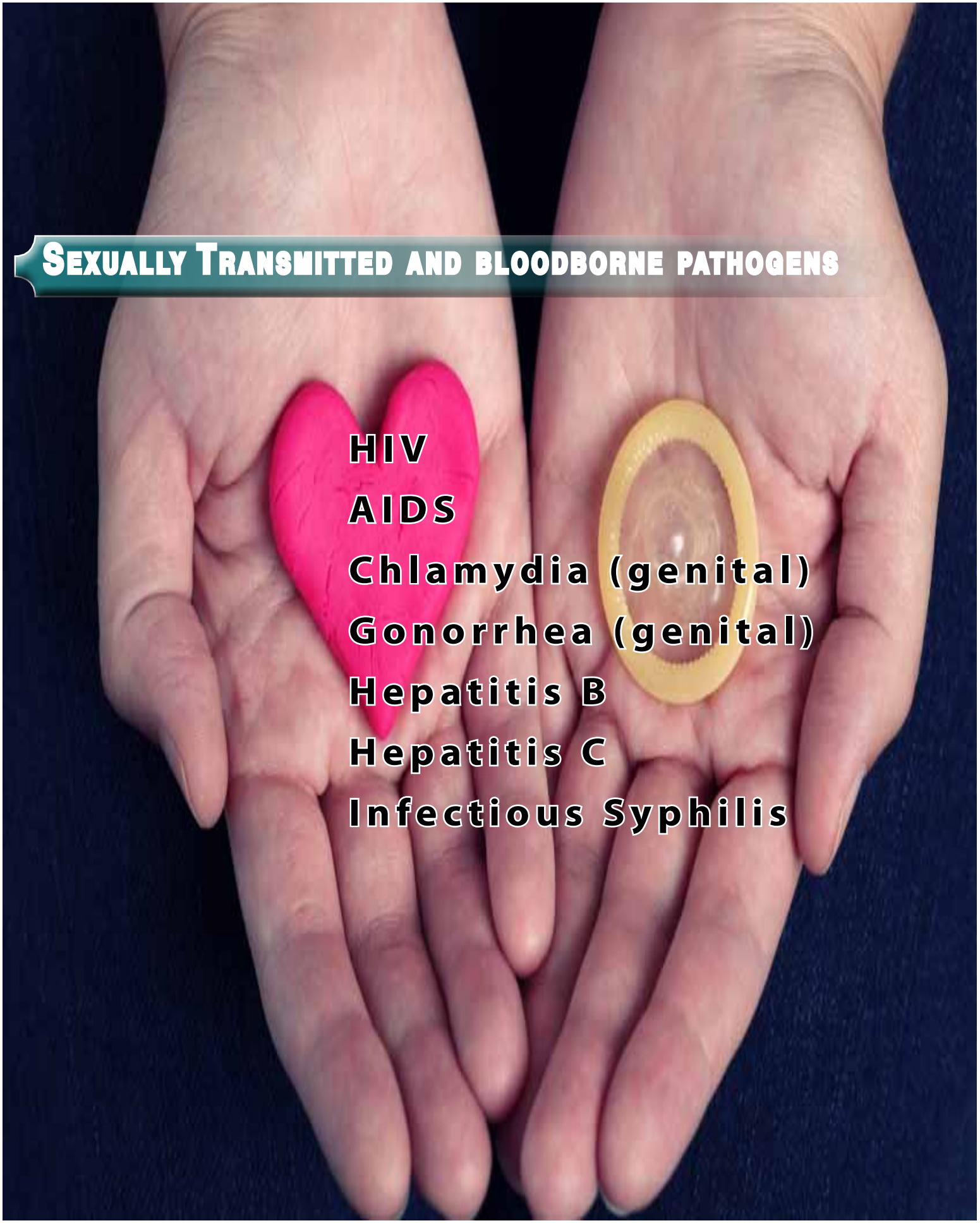
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
BC Rubella Reports	1	0	1	0	0	1	1	9	1	0
BC Rubella Rate	0.02	0.00	0.02	0.00	0.00	0.02	0.02	0.20	0.02	0.00
Canadian Rubella Rate	0.04	0.03	0.99	0.03	0.02	0.02	0.02	0.04	0.01	

Tetanus

There was one confirmed case of tetanus reported in BC in 2012. The diagnosis in a woman in her 70s was based on clinical criteria, with isolation of several Clostridium species but not *C. tetani*, in a wound sustained while gardening. Prior tetanus toxoid receipt was incomplete. She was hospitalized for over a month and survived.

From 2003 to 2011 there were six tetanus cases reported in BC: four cases in 2007, one case in 2008, and one case in 2010. Readers are referred to the relevant year's Annual Summary of Reportable Diseases for additional detail http://www.bccdc.ca/util/about/annreport/default.htm

In adults who have completed a primary series of tetanus toxoid in childhood, a booster dose of tetanus toxoid is recommended every 10 years to maintain protection against tetanus, which is ubiquitous in the environment.



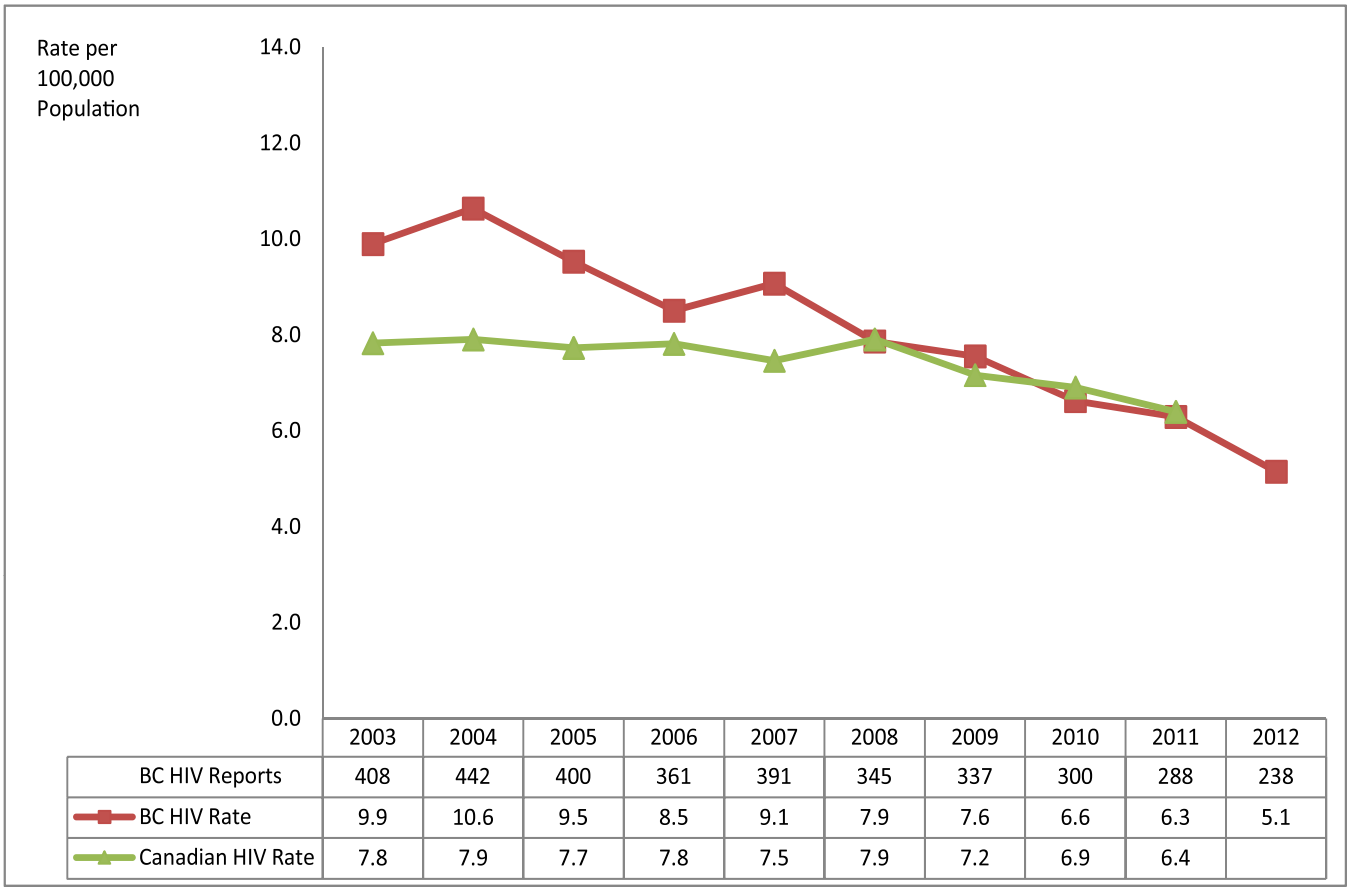
Sexually Transmitted and bloodborne pathogens

HIV
AIDS
Chlamydia (genital)
Gonorrhea (genital)
Hepatitis B
Hepatitis C
Infectious Syphilis

HIV

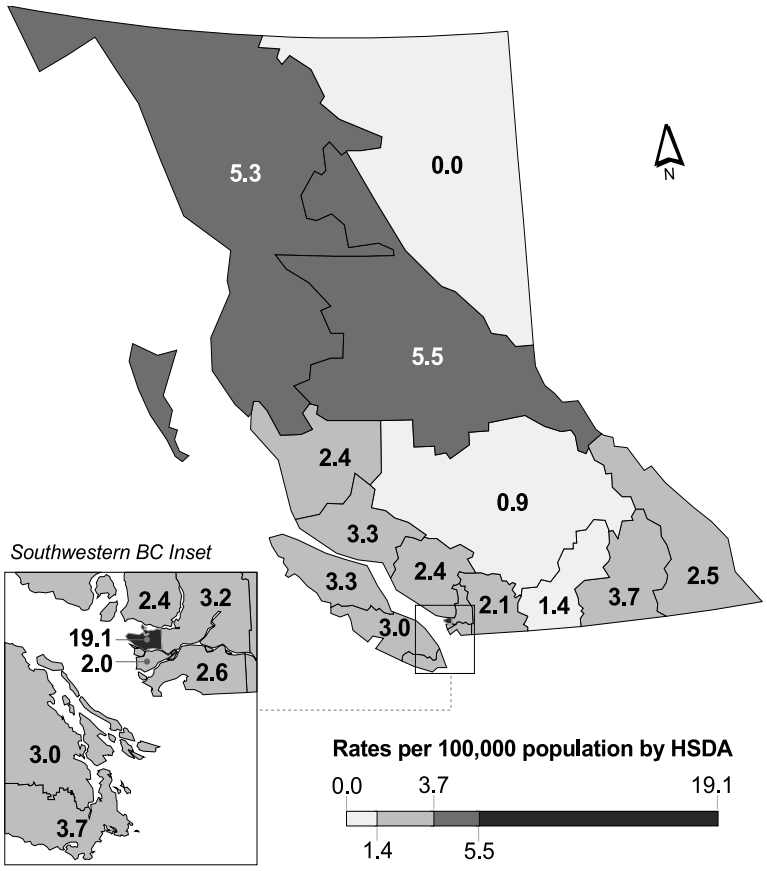
In 2012, the rate of new HIV diagnoses decreased to its lowest point ever in BC to 5.1 (238 cases) from 6.3 (288 cases) per 100,000 population in 2011. Over 85% (209 cases) of new HIV diagnoses in 2012 were male, with the highest rates observed in males between 25-59 years of age. Across HSDAs, Vancouver (19.1 per 100,000 population; 131 cases), Northern Interior (5.5 per 100,000 population; 8 cases) and Northwest (5.3 per 100,000 population; 4 cases) had the highest rates of new HIV diagnoses. Recent trends in these regions have been influenced by increased testing efforts related to the provincial Seek and Treat for Optimal Prevention of HIV/AIDS (STOP HIV/AIDS) Pilot Project launched in 2010.

10.1 HIV Rates by Year, 2003-2012



	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
BC HIV Reports	408	442	400	361	391	345	337	300	288	238
BC HIV Rate	9.9	10.6	9.5	8.5	9.1	7.9	7.6	6.6	6.3	5.1
Canadian HIV Rate	7.8	7.9	7.7	7.8	7.5	7.9	7.2	6.9	6.4	

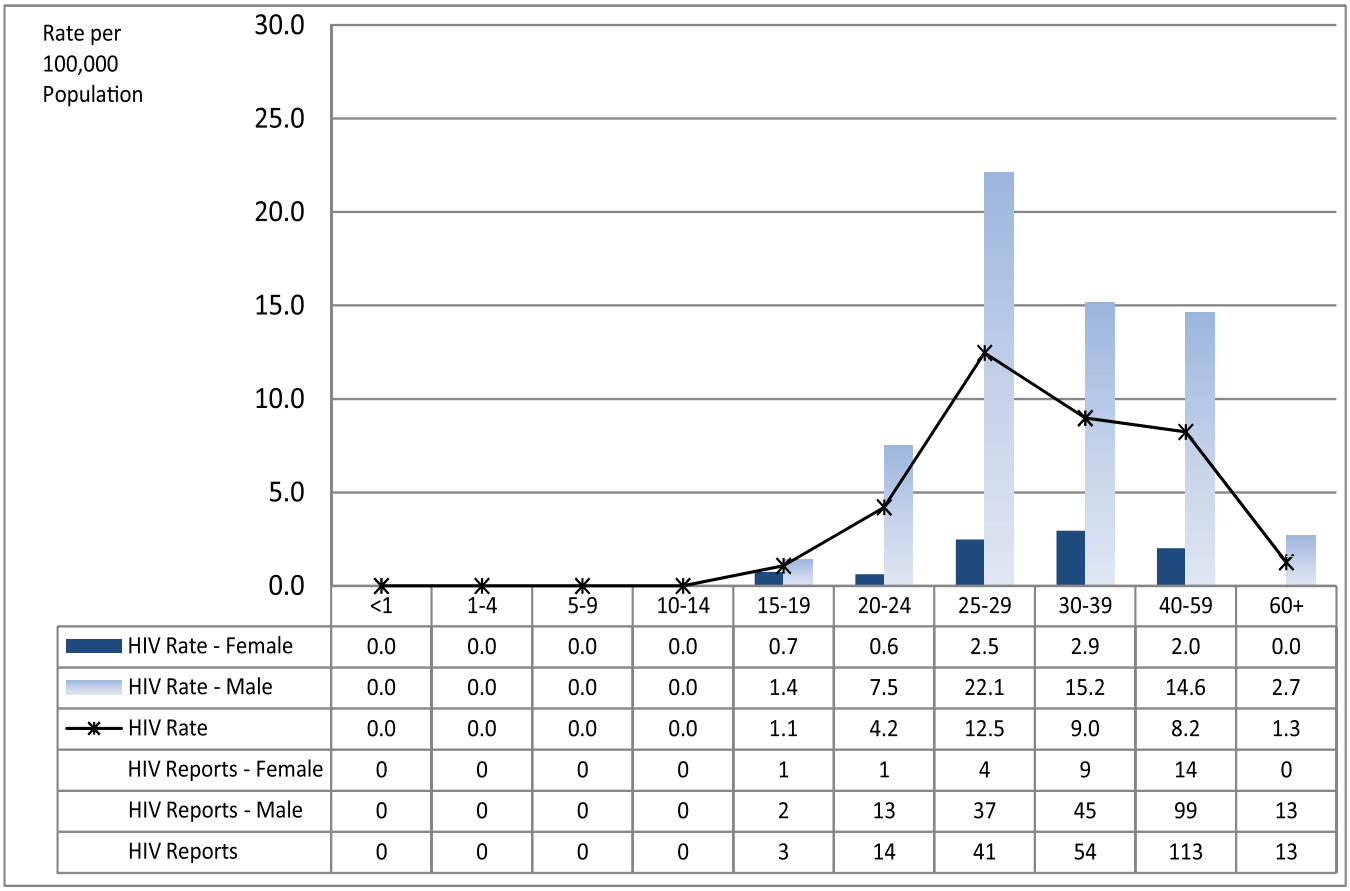
10.2 HIV Rates by HSDA, 2012



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	2	2.5
12	Kootenay Boundary	3	3.7
13	Okanagan	5	1.4
14	Thompson Cariboo Shuswap	2	0.9
21	Fraser East	6	2.1
22	Fraser North	20	3.2
23	Fraser South	19	2.6
31	Richmond	4	2.0
32	Vancouver	131	19.1
33	North Shore/Coast Garibaldi	7	2.4
41	South Vancouver Island	14	3.7
42	Central Vancouver Island	8	3.0
43	North Vancouver Island	4	3.3
51	Northwest	4	5.3
52	Northern Interior	8	5.5
53	Northeast	0	0.0

Note: Map classification by Jenks natural breaks method.

10.3 HIV Rates by Age Group and Sex, 2012

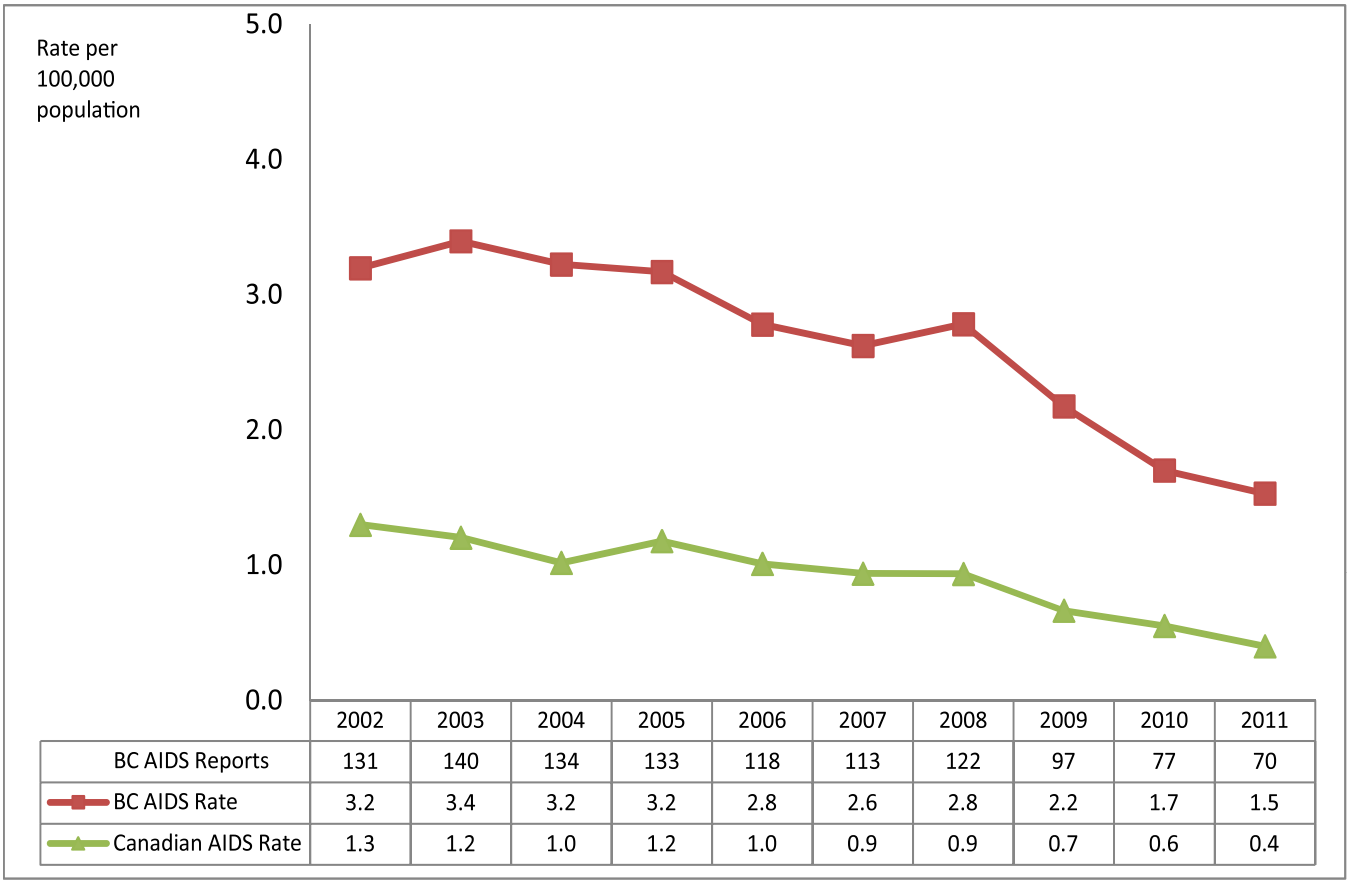


	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
HIV Rate - Female	0.0	0.0	0.0	0.0	0.7	0.6	2.5	2.9	2.0	0.0
HIV Rate - Male	0.0	0.0	0.0	0.0	1.4	7.5	22.1	15.2	14.6	2.7
HIV Rate	0.0	0.0	0.0	0.0	1.1	4.2	12.5	9.0	8.2	1.3
HIV Reports - Female	0	0	0	0	1	1	4	9	14	0
HIV Reports - Male	0	0	0	0	2	13	37	45	99	13
HIV Reports	0	0	0	0	3	14	41	54	113	13

AIDS

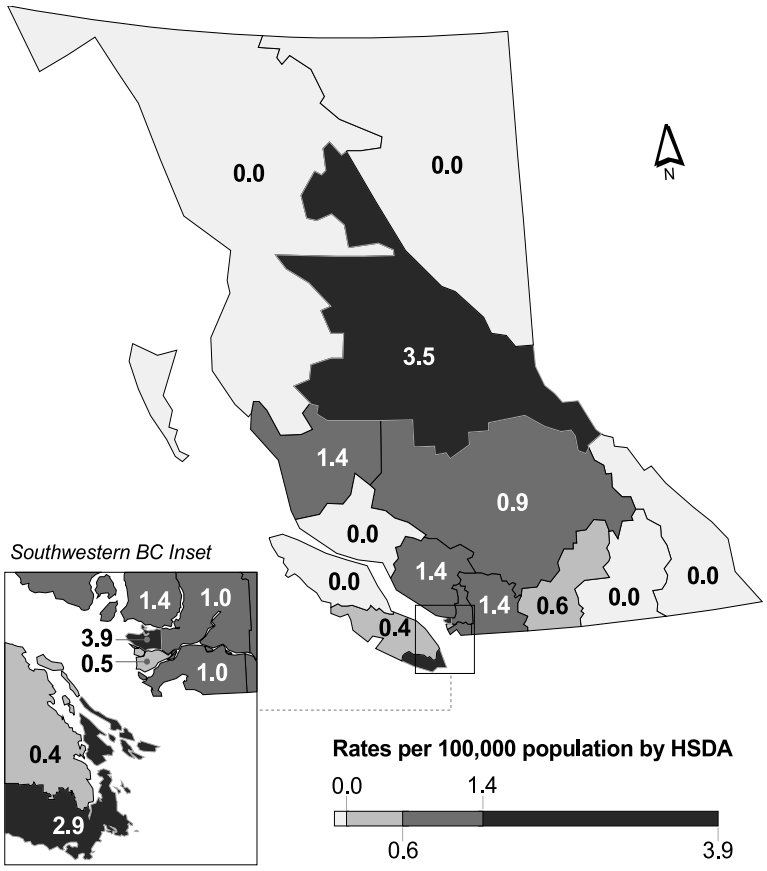
Due to the expected delays associated with AIDS reporting, this report only includes AIDS cases to 2011. In 2011, the rate of AIDS case reports in BC continued to decrease to 1.5 (70 cases) from 1.7 (77 cases) per 100,000 population in 2010. Over 80% (59 cases) of AIDS cases in 2011 were male, with the highest rates observed in males between 30-59 years of age. Across HSDAs, Vancouver (3.9 per 100,000 population; 26 cases) and Northern Interior (3.5 per 100,000 population; 5 cases) had the highest rates of AIDS cases.

11.1 AIDS Rates by Year, 2002-2011



	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
BC AIDS Reports	131	140	134	133	118	113	122	97	77	70
BC AIDS Rate	3.2	3.4	3.2	3.2	2.8	2.6	2.8	2.2	1.7	1.5
Canadian AIDS Rate	1.3	1.2	1.0	1.2	1.0	0.9	0.9	0.7	0.6	0.4

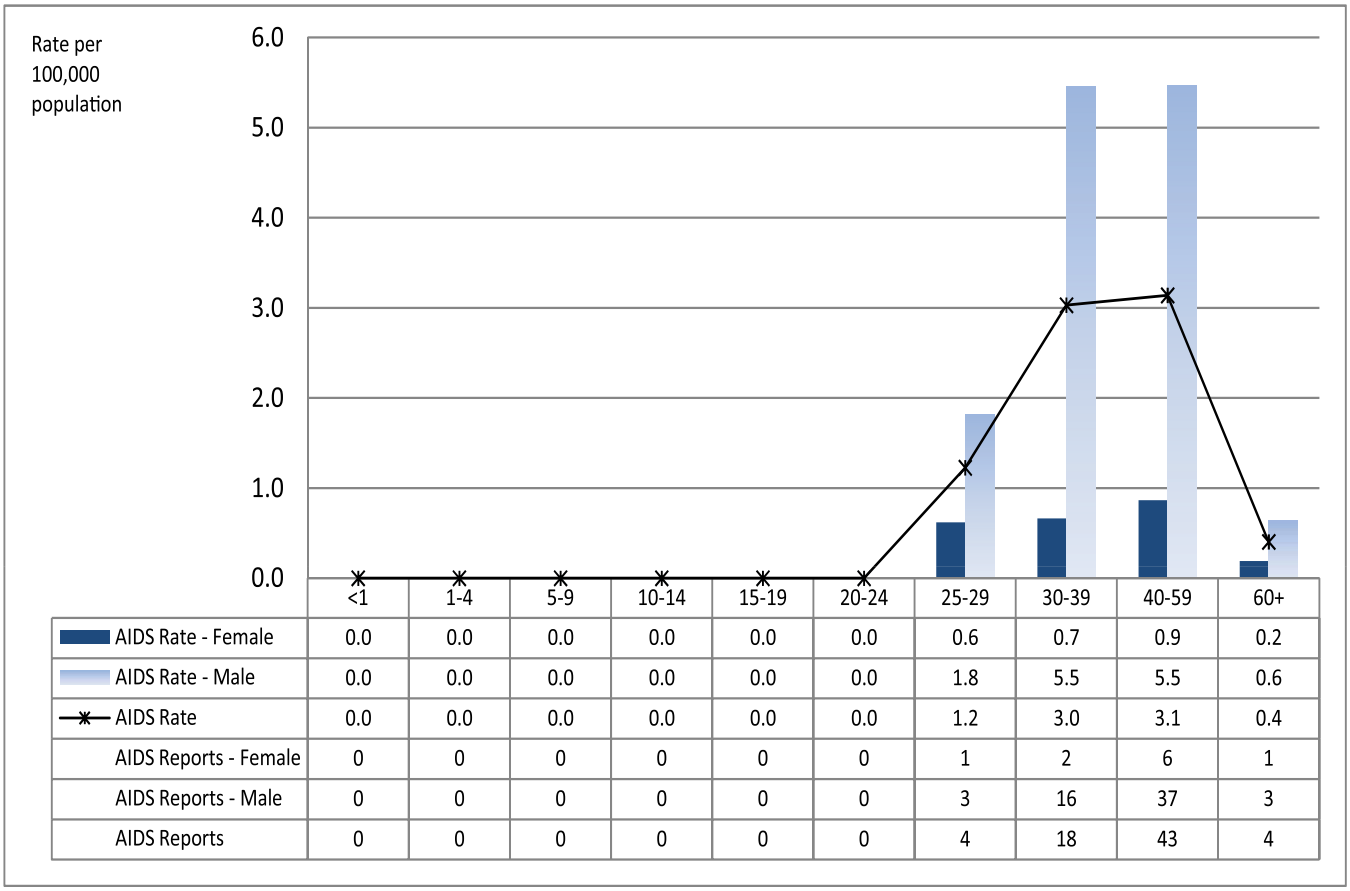
11.2 AIDS Rates by HSDA, 2011



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	4	1.4
22	Fraser North	6	1.0
23	Fraser South	7	1.0
31	Richmond	1	0.5
32	Vancouver	26	3.9
33	North Shore/Coast Garibaldi	4	1.4
41	South Vancouver Island	11	2.9
42	Central Vancouver Island	1	0.4
43	North Vancouver Island	0	0.0
51	Northwest	0	0.0
52	Northern Interior	5	3.5
53	Northeast	0	0.0

Note: Map classification by Jenks natural breaks method.

11.3 AIDS Rates by Age Group and Sex, 2011

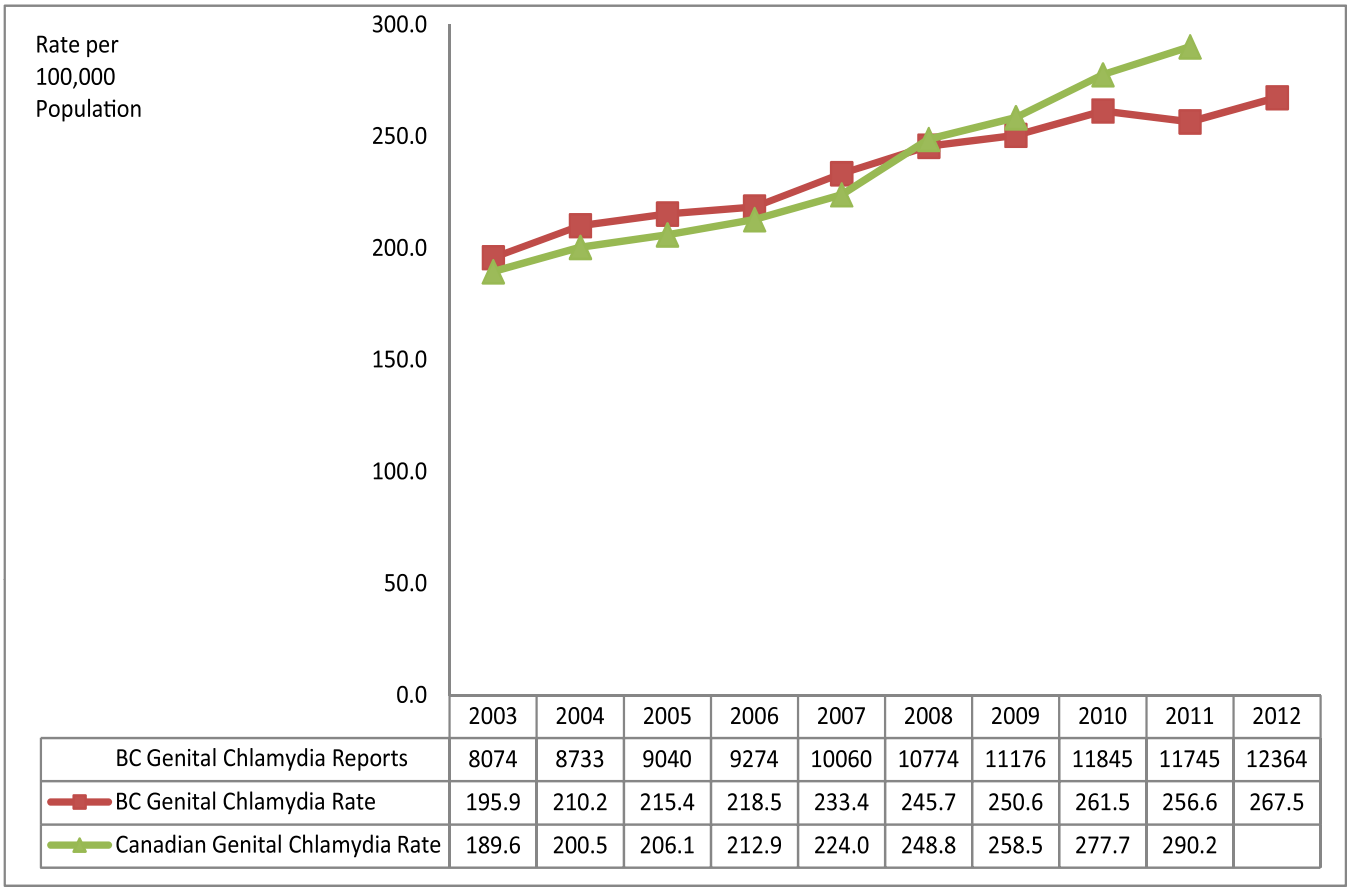


	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
AIDS Rate - Female	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.7	0.9	0.2
AIDS Rate - Male	0.0	0.0	0.0	0.0	0.0	0.0	1.8	5.5	5.5	0.6
AIDS Rate	0.0	0.0	0.0	0.0	0.0	0.0	1.2	3.0	3.1	0.4
AIDS Reports - Female	0	0	0	0	0	0	1	2	6	1
AIDS Reports - Male	0	0	0	0	0	0	3	16	37	3
AIDS Reports	0	0	0	0	0	0	4	18	43	4

Chlamydia (genital)

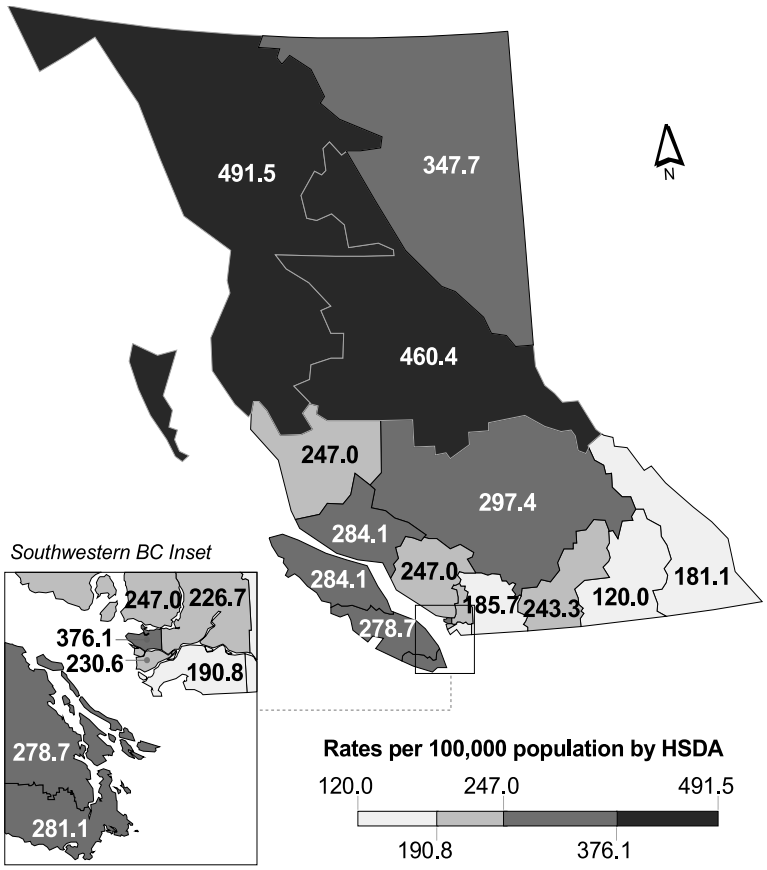
Genital Chlamydia rates have steadily been increasing since 1998. In 2012, the rate of genital Chlamydia in BC increased to 267.5 (12,364 cases) from 256.6 (11,745 cases) per 100,000 population in 2011. The highest rates of Chlamydia in 2012 were among young adults aged 20-24 years followed by adolescents aged 15-19 years, influenced primarily by trends among females. In 2012, rates among HSDAs varied with the highest rates in Northwest (491.5 per 100,000 population; 371 cases), Northern Interior (460.4 per 100,000 population; 668 cases) and Vancouver (376.1 per 100,000 population; 2,575 cases), and the lowest rates in Kootenay Boundary (120.0 per 100,000 population; 96 cases), East Kootenay (181.1 per 100,000 population; 146 cases) and Fraser East (185.7 per 100,000 population; 536 cases).

12.1 Genital Chlamydia Rates by Year, 2003-2012



	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
BC Genital Chlamydia Reports	8074	8733	9040	9274	10060	10774	11176	11845	11745	12364
BC Genital Chlamydia Rate	195.9	210.2	215.4	218.5	233.4	245.7	250.6	261.5	256.6	267.5
Canadian Genital Chlamydia Rate	189.6	200.5	206.1	212.9	224.0	248.8	258.5	277.7	290.2	

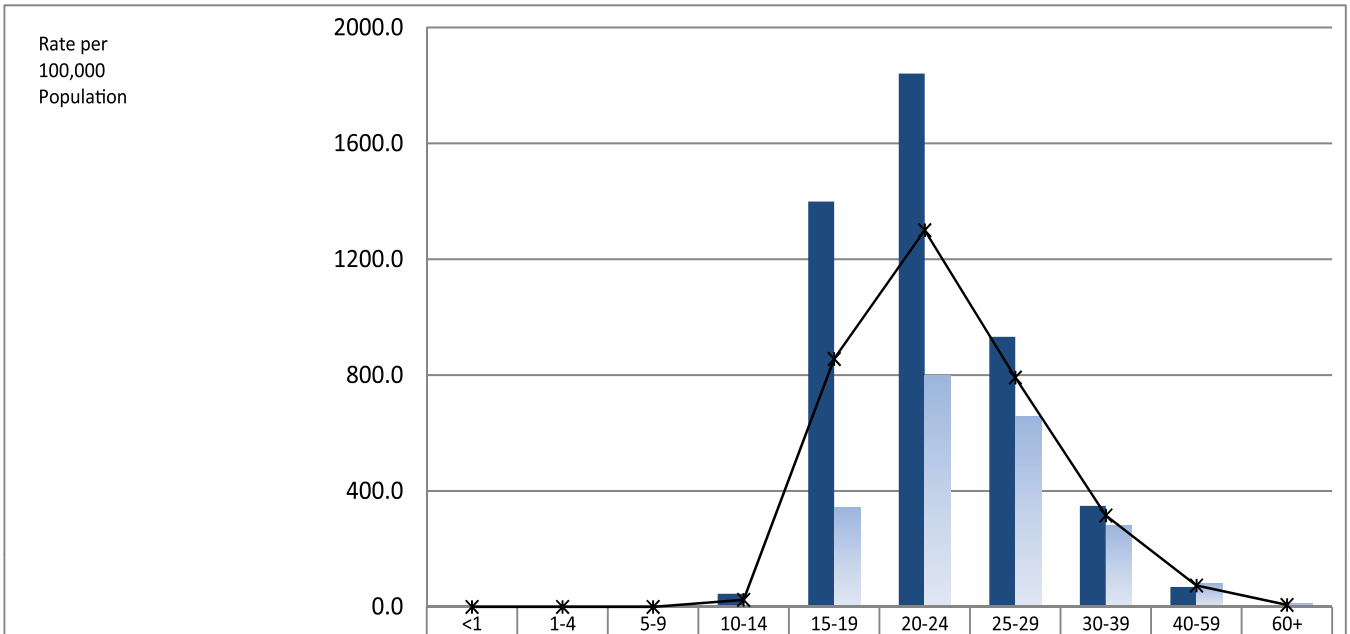
12.2 Genital Chlamydia Rates by HSDA, 2012



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	146	181.1
12	Kootenay Boundary	96	120.0
13	Okanagan	863	243.3
14	Thompson Cariboo Shuswap	667	297.4
21	Fraser East	536	185.7
22	Fraser North	1413	226.7
23	Fraser South	1408	190.8
31	Richmond	461	230.6
32	Vancouver	2575	376.1
33	North Shore/Coast Garibaldi	718	247.0
41	South Vancouver Island	1058	281.1
42	Central Vancouver Island	744	278.7
43	North Vancouver Island	345	284.1
51	Northwest	371	491.5
52	Northern Interior	668	460.4
53	Northeast	251	347.7

Note: Map classification by Jenks natural breaks method.

12.3 Genital Chlamydia Rates by Age Group and Sex, 2012



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Genital Chlamydia Rate - Female	0.0	0.0	0.0	45.3	1399.2	1840.8	932.4	348.8	68.2	3.5
Genital Chlamydia Rate - Male	0.0	0.0	0.0	5.0	344.2	797.4	656.0	281.5	79.8	10.8
Genital Chlamydia Rate	0.0	0.0	0.0	24.5	856.0	1300.1	791.7	315.7	73.9	6.9
Genital Chlamydia Reports - Female	0	0	0	51	1888	2949	1506	1065	474	19
Genital Chlamydia Reports - Male	0	0	0	6	493	1374	1098	834	540	52
Genital Chlamydia Reports	0	0	0	57	2381	4323	2604	1899	1014	71

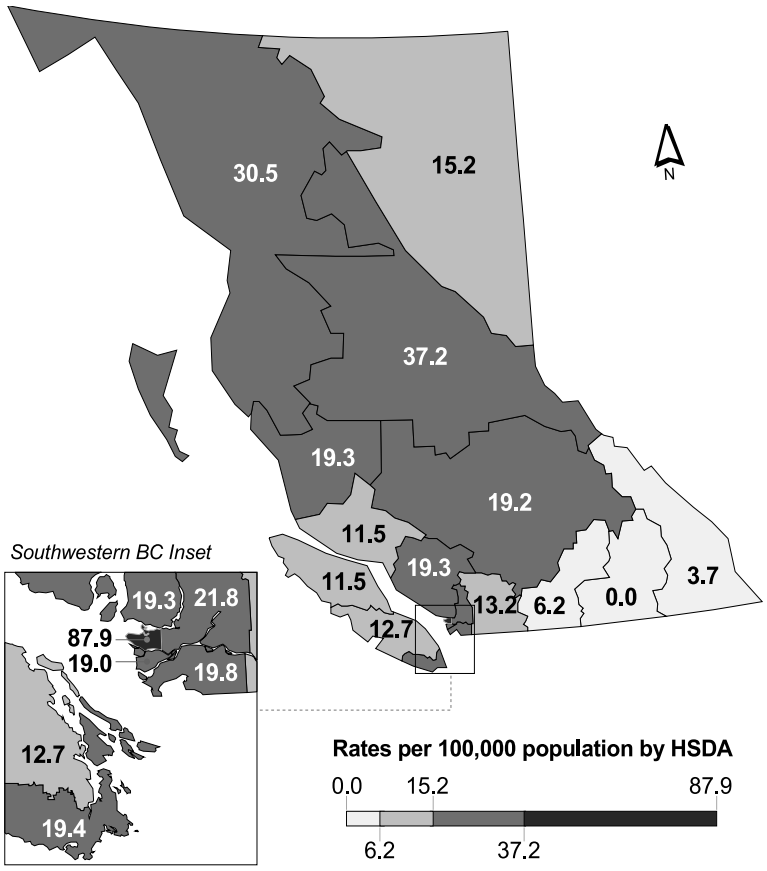
Gonorrhea (genital)

In 2012, the rate of genital gonorrhea in BC decreased to 28.0 (1,295 cases) from 34.4 (1,574 cases) per 100,000 population in 2011. The highest rates in 2012 were among males aged 20-39 years and, for females the highest rates were among those aged 15-29 years. In 2012, rates among HSDAs vary with the highest rates in Vancouver (87.9 per 100,000 population; 602 cases), Northern Interior (37.2 per 100,000 population; 54 cases) and Northwest (30.5 per 100,000 population; 23 cases), and the lowest rates in Kootenay Boundary (0.0 per 100,000 population; 0 cases), East Kootenay (3.7 per 100,000 population; 3 cases) and Okanagan (6.2 per 100,000 population; 22 cases).

13.1 Genital Gonorrhea Rates by Year, 2003-2012

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
BC Genital Gonorrhea Reports	654	969	1100	1022	1224	1405	1309	1321	1574	1295
BC Genital Gonorrhea Rate	15.9	23.3	26.2	24.1	28.4	32.0	29.4	29.2	34.4	28.0
Canadian Genital Gonorrhea Rate	26.0	29.1	28.5	34.7	36.1	38.2	33.1	33.4	33.1	

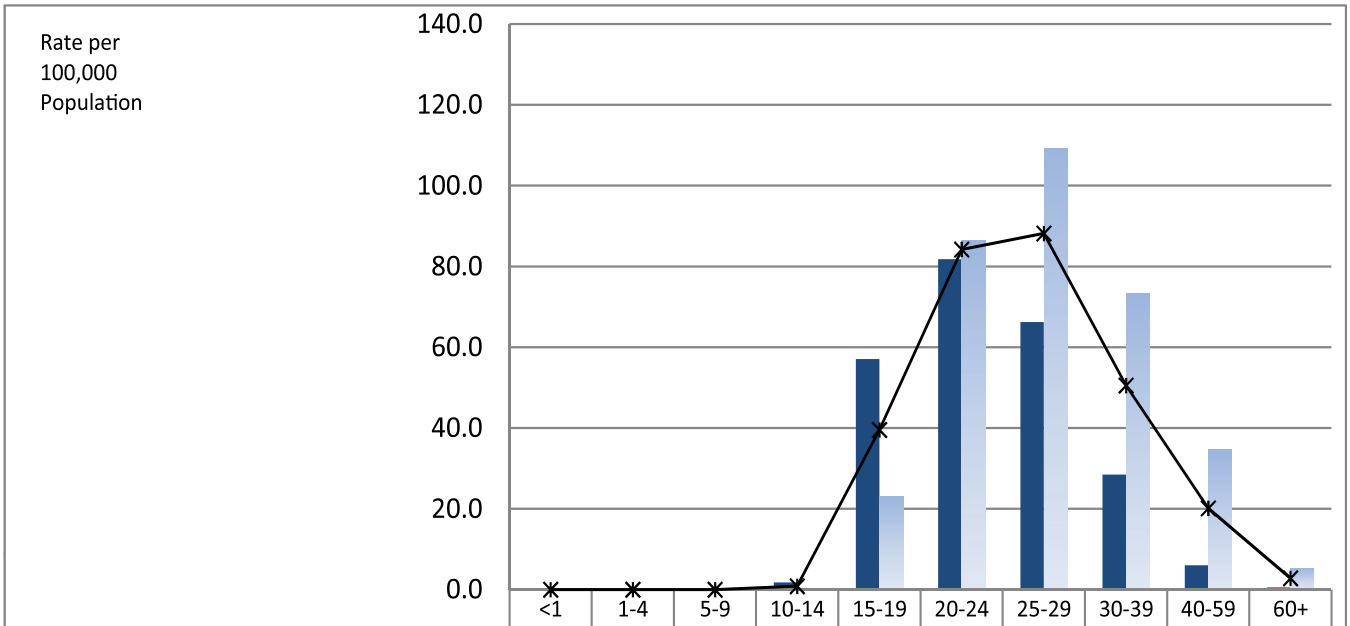
13.2 Genital Gonorrhea Rates by HSDA, 2012



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	3	3.7
12	Kootenay Boundary	0	0.0
13	Okanagan	22	6.2
14	Thompson Cariboo Shuswap	43	19.2
21	Fraser East	38	13.2
22	Fraser North	136	21.8
23	Fraser South	146	19.8
31	Richmond	38	19.0
32	Vancouver	602	87.9
33	North Shore/Coast Garibaldi	56	19.3
41	South Vancouver Island	73	19.4
42	Central Vancouver Island	34	12.7
43	North Vancouver Island	14	11.5
51	Northwest	23	30.5
52	Northern Interior	54	37.2
53	Northeast	11	15.2

Note: Map classification by Jenks natural breaks method.

13.3 Genital Gonorrhea Rates by Age Group and Sex, 2012



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Genital Gonorrhea Rate - Female	0.0	0.0	0.0	1.8	57.1	81.8	66.2	28.5	6.0	0.6
Genital Gonorrhea Rate - Male	0.0	0.0	0.0	0.0	23.0	86.5	109.3	73.2	34.6	5.4
Genital Gonorrhea Rate	0.0	0.0	0.0	0.9	39.5	84.2	88.2	50.5	20.1	2.8
Genital Gonorrhea Reports - Female	0	0	0	2	77	131	107	87	42	3
Genital Gonorrhea Reports - Male	0	0	0	0	33	149	183	217	234	26
Genital Gonorrhea Reports	0	0	0	2	110	280	290	304	276	29

Hepatitis B

Most cases of hepatitis B reported each year in BC are chronic infections; i.e. an infection which has persisted for more than six months. The majority of chronic infections are identified in persons who have emigrated from a country where hepatitis B infection is endemic and they were possibly infected at birth. Infants infected through vetical (mother-to-child) transmission have a high likelihood of developing chronic hepatitis B infection. Timely post exposure prophylaxis (hepatitis B immunoglobulin at birth and hepatitis B vaccine at birth, 2, 4, and 6 months of age), can reduce the risk of transmission to the infant. However, there is still a small risk of hepatitis B transmission to the infant. People with chronic hepatitis B may be asymptomatic and the virus detected through routine prenatal screening, testing for insurance purposes; or testing may be performed due to symptoms of chronic hepatitis B infection such as cirrhosis. Acute hepatitis B is suspected when a person has symptoms (e.g. jaundice) and is confirmed by hepatitis B surface antigen and anti-hepatitis B core IgM. Infants and young children are more likely to be asymptomatic with acute infection than older children and adults.

As the number of acute cases reported in BC is very small, to interpret hepatitis B trends meaningfully it is important to determine which cases are acute and which are chronic. Some cases are reported as unknown, but as these are asymptomatic they are usually chronic infections.

Hepatitis B - Chronic and Unknown

The rates of chronic and unknown hepatitis B has continued to decline in BC, with 1071 cases identified in 2012. The rate in 2012 was 23.2 per 100,000 population, almost half the rate in 2003 46.1 per 100,000 population. Inconsistencies in provincial reporting of hepatitis B make comparison to national trends impossible.

Demographic data show the highest rates of reported cases are in 25-29; 30-39 and 40-59 age groups all with a rate >40 per 100,000 population with the highest rate in the 30-39 age group. Chronic Hepatitis B cases were distributed fairly evenly between sexes, (47% female); however, females have a higher rate than males in 20-24, 25-29 and 30-39 year age groups. This is likely due in part to females being tested during routine prenatal screening. Infants born to mothers who have hepatitis B and receive post-exposure prophylaxis are recommended to be tested for hepatitis B one to six months after receiving last vaccine dose; this may account for the slightly increased rate in the <1 year age group.

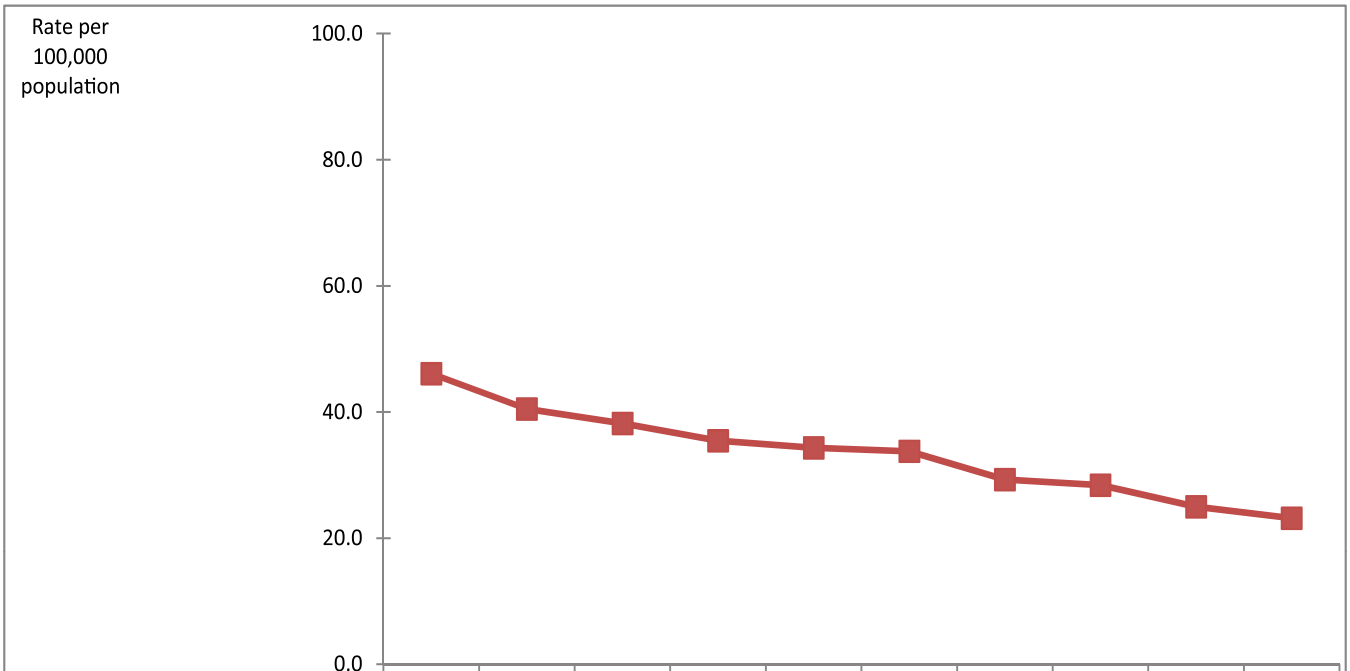
As in previous years, Richmond, Vancouver and Fraser North, regions of high immigration from endemic regions, demonstrate chronic hepatitis B one to six months after receiving last vaccine dose; rates well above all other areas (88.52, 56.08, 39.95 per 100,000 popoulation respectively) and above the overall provincial rate of 23.17

Hepatitis B - Acute

The number of acute hepatitis B cases reported in 2012 was 13, the same number as reported in 2011, yielding a rate of 0.3 per 100,000 population which is half the rate of 2009. The number of cases is provisional and may change with follow-up testing at 6 months. In BC high risk individuals are eligible for publicly funded hepatitis B vaccine. A publicly funded hepatitis B vaccination program was introduced for students in grade 6 in 1992, and an infant program began in 2001. In 2012, no cases were identified in individuals less than 20 years of age.

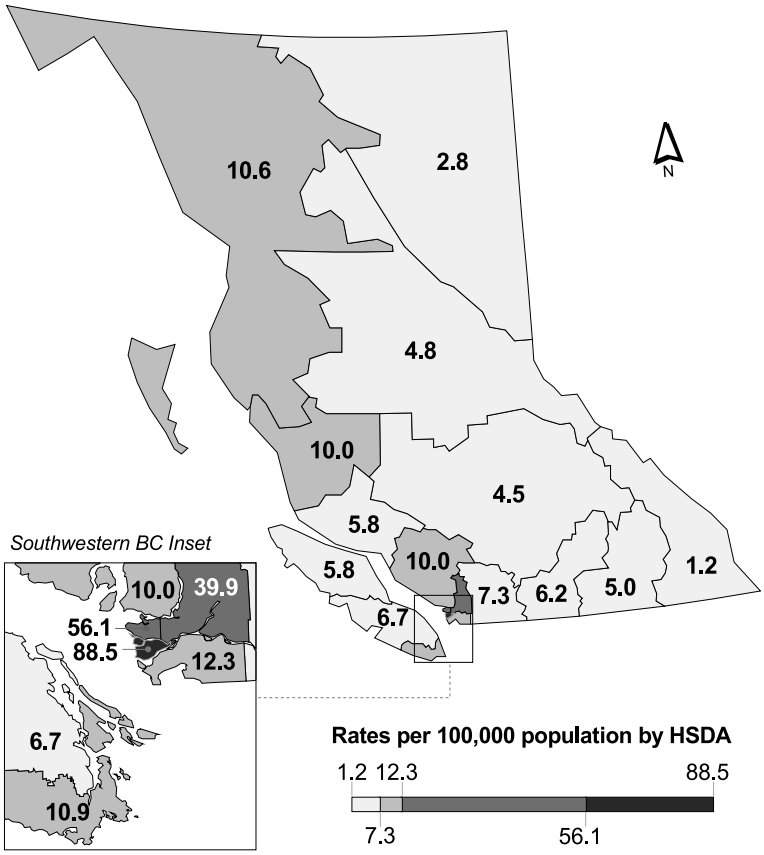
Cases were evenly distributed by sex (6 females, 7 males). Vancouver Health Service Delivery Area (HSDA) reported 8 of the 13 cases. The remaining 5 cases were distributed through out other HSDAs.

14.1 Chronic and Unknown Hepatitis B Rates by Year, 2003-2012



	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
BC Hepatitis B: Chronic and Unknown Reports	1900	1682	1603	1504	1479	1481	1306	1287	1143	1071
BC Hepatitis B: Chronic and Unknown Rate	46.1	40.5	38.2	35.4	34.3	33.8	29.3	28.4	25.0	23.2

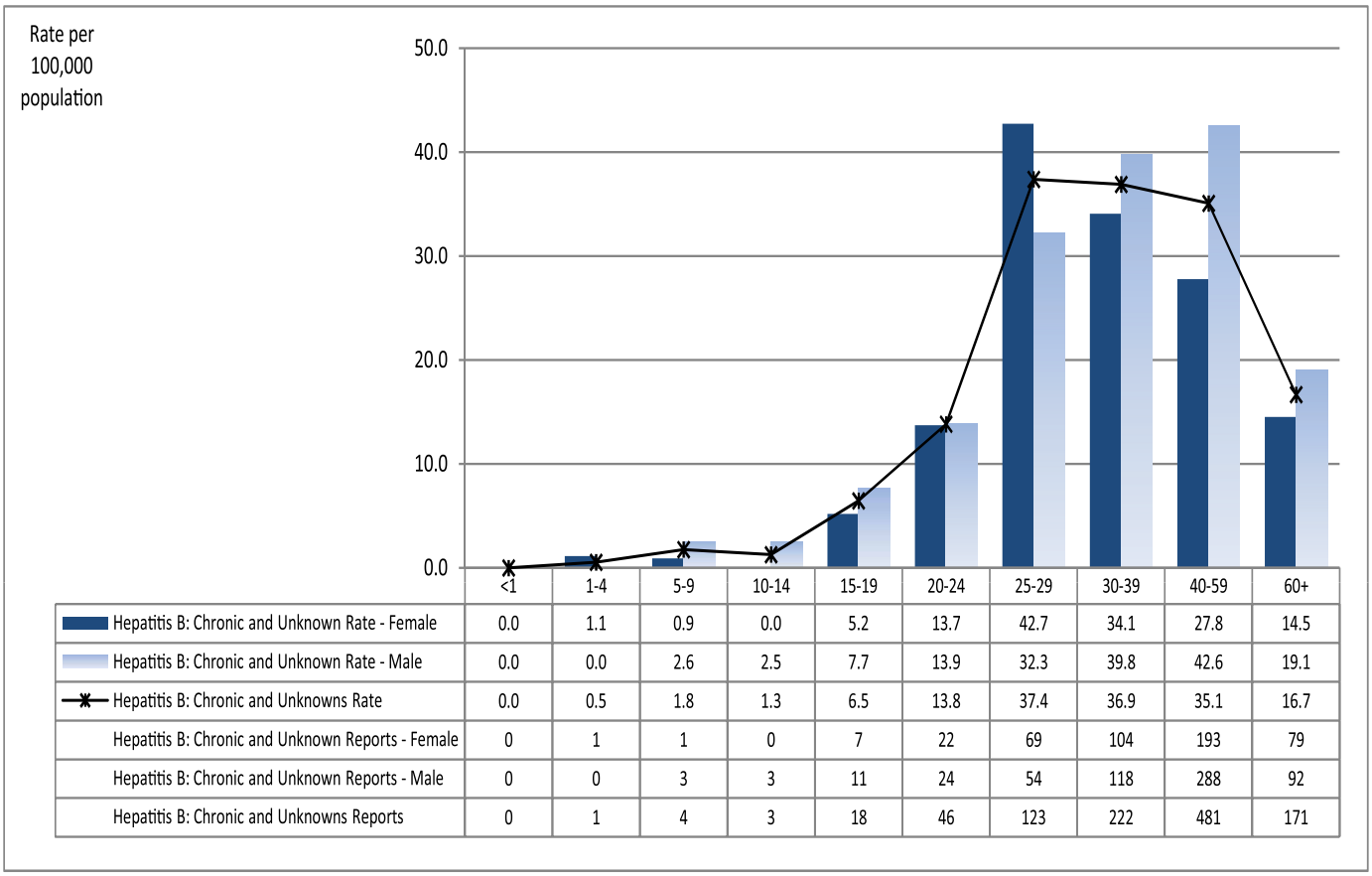
14.2 Chronic and Unknown Hepatitis B Rates by HSDA, 2012



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	1	1.2
12	Kootenay Boundary	4	5.0
13	Okanagan	22	6.2
14	Thompson Cariboo Shuswap	10	4.5
21	Fraser East	21	7.3
22	Fraser North	249	39.9
23	Fraser South	91	12.3
31	Richmond	177	88.5
32	Vancouver	384	56.1
33	North Shore/Coast Garibaldi	29	10.0
41	South Vancouver Island	41	10.9
42	Central Vancouver Island	18	6.7
43	North Vancouver Island	7	5.8
51	Northwest	8	10.6
52	Northern Interior	7	4.8
53	Northeast	2	2.8

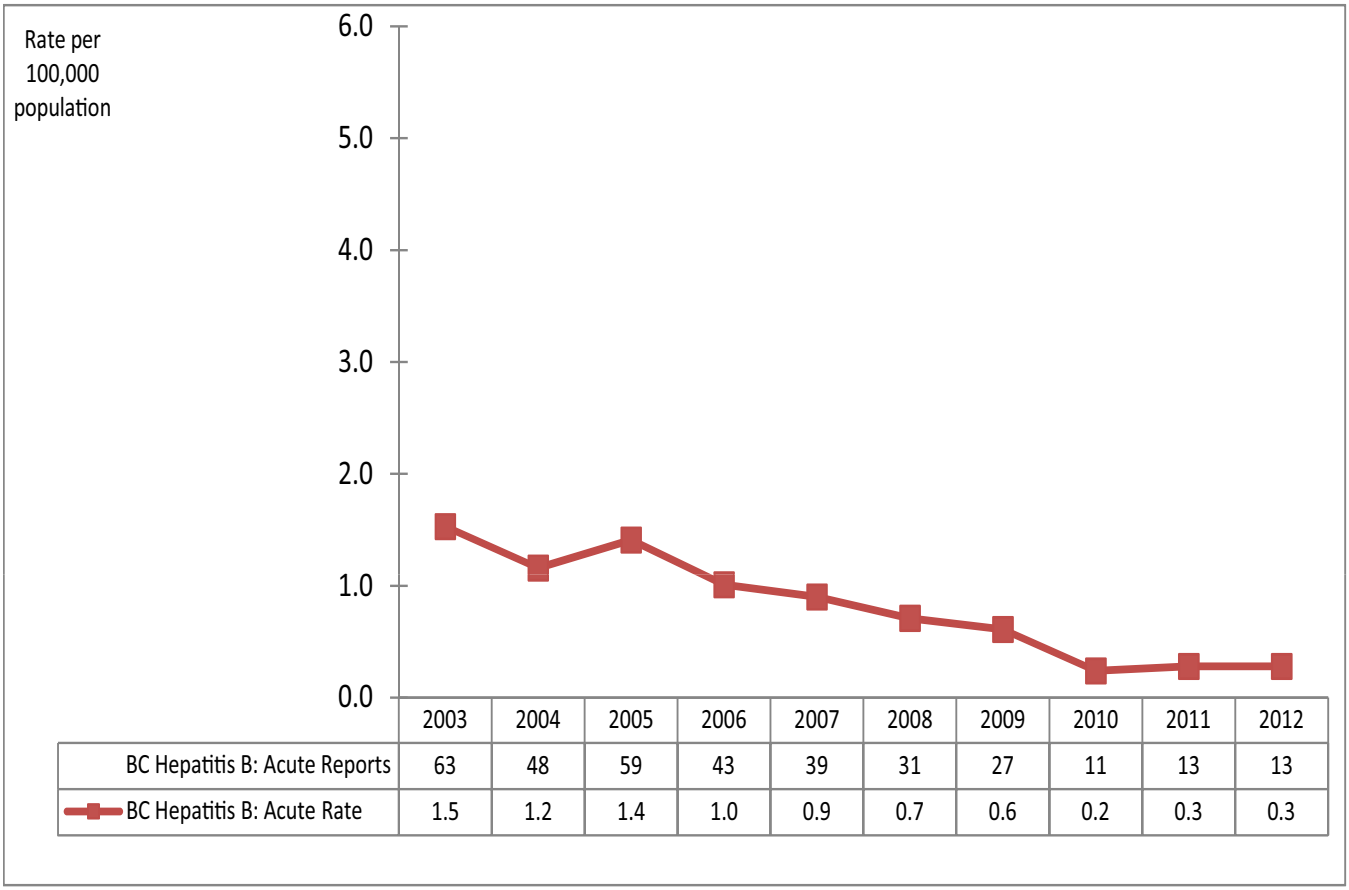
Note: Map classification by Jenks natural breaks method.

14.3 Chronic and Unknown Hepatitis B Rates by Age Group and Sex, 2012



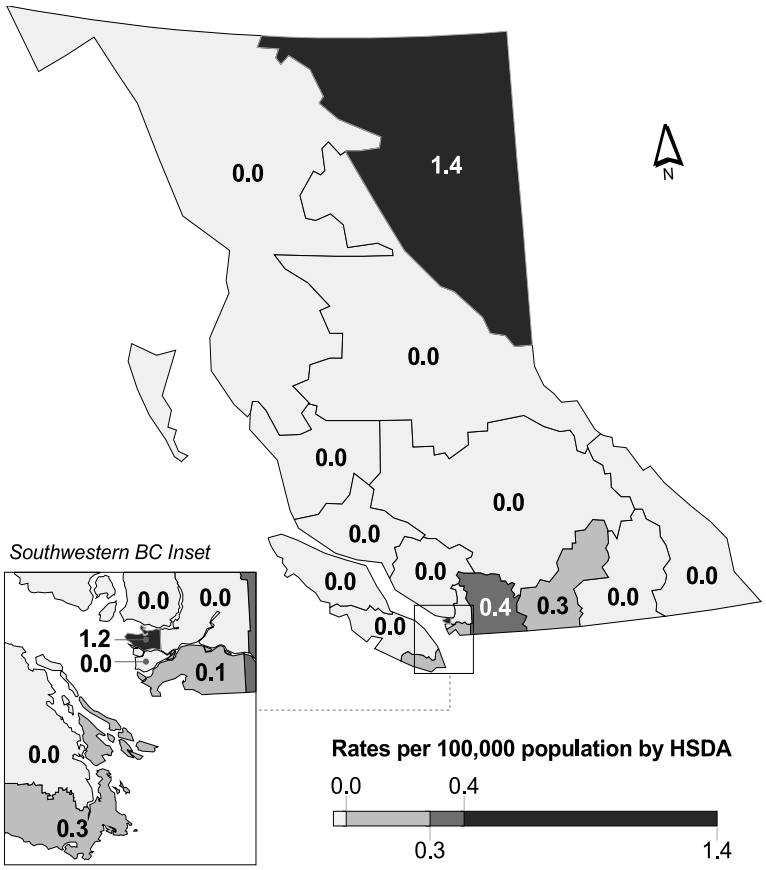
	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Hepatitis B: Chronic and Unknown Rate - Female	0.0	1.1	0.9	0.0	5.2	13.7	42.7	34.1	27.8	14.5
Hepatitis B: Chronic and Unknown Rate - Male	0.0	0.0	2.6	2.5	7.7	13.9	32.3	39.8	42.6	19.1
Hepatitis B: Chronic and Unknowns Rate	0.0	0.5	1.8	1.3	6.5	13.8	37.4	36.9	35.1	16.7
Hepatitis B: Chronic and Unknown Reports - Female	0	1	1	0	7	22	69	104	193	79
Hepatitis B: Chronic and Unknown Reports - Male	0	0	3	3	11	24	54	118	288	92
Hepatitis B: Chronic and Unknowns Reports	0	1	4	3	18	46	123	222	481	171

14.4 Acute Hepatitis B Rates by Year, 2003-2012



	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
BC Hepatitis B: Acute Reports	63	48	59	43	39	31	27	11	13	13
BC Hepatitis B: Acute Rate	1.5	1.2	1.4	1.0	0.9	0.7	0.6	0.2	0.3	0.3

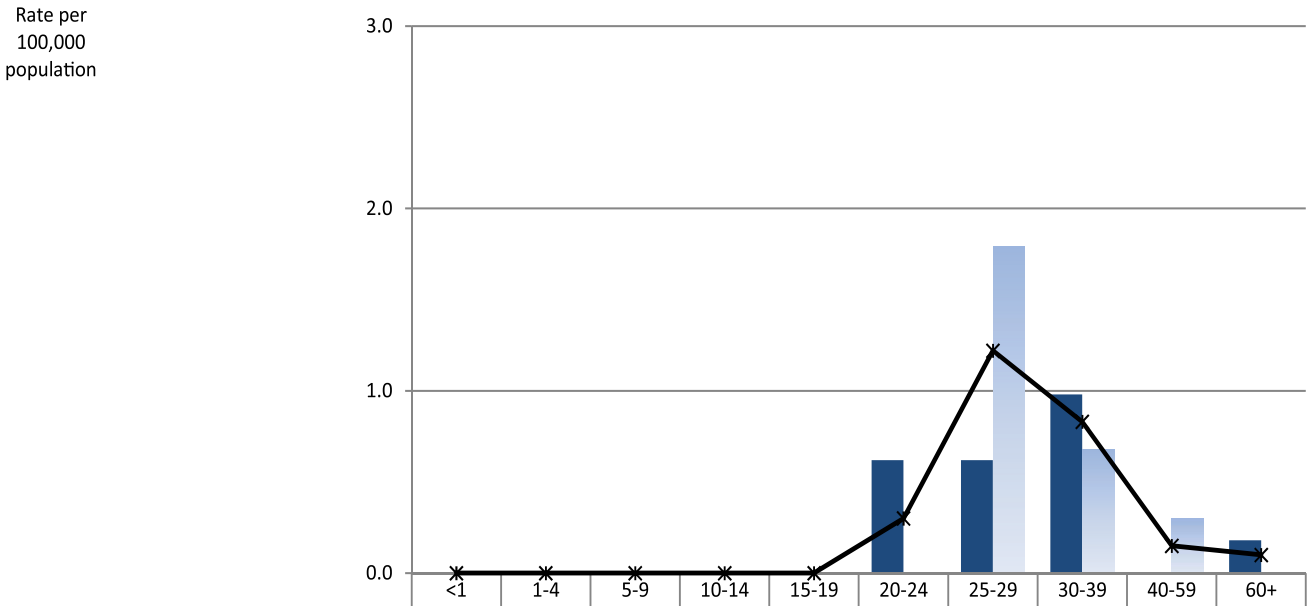
14.5 Acute Hepatitis B Rates by HSDA, 2012



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	0	0.0
12	Kootenay Boundary	0	0.0
13	Okanagan	1	0.3
14	Thompson Cariboo Shuswap	0	0.0
21	Fraser East	1	0.4
22	Fraser North	0	0.0
23	Fraser South	1	0.1
31	Richmond	0	0.0
32	Vancouver	8	1.2
33	North Shore/Coast Garibaldi	0	0.0
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	0	0.0
53	Northeast	1	1.4

Note: Map classification by Jenks natural breaks method.

14.6 Acute Hepatitis B Rates by Age Group and Sex, 2012



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Hepatitis B: Acute Rate - Female	0.0	0.0	0.0	0.0	0.0	0.6	0.6	1.0	0.0	0.2
Hepatitis B: Acute Rate - Male	0.0	0.0	0.0	0.0	0.0	0.0	1.8	0.7	0.3	0.0
Acute Hepatitis B Rate	0.0	0.0	0.0	0.0	0.0	0.3	1.2	0.8	0.2	0.1
Hepatitis B: Acute Reports - Female	0	0	0	0	0	1	1	3	0	1
Hepatitis B: Acute Reports - Male	0	0	0	0	0	0	3	2	2	0
Acute Hepatitis B Reports	0	0	0	0	0	1	4	5	2	1

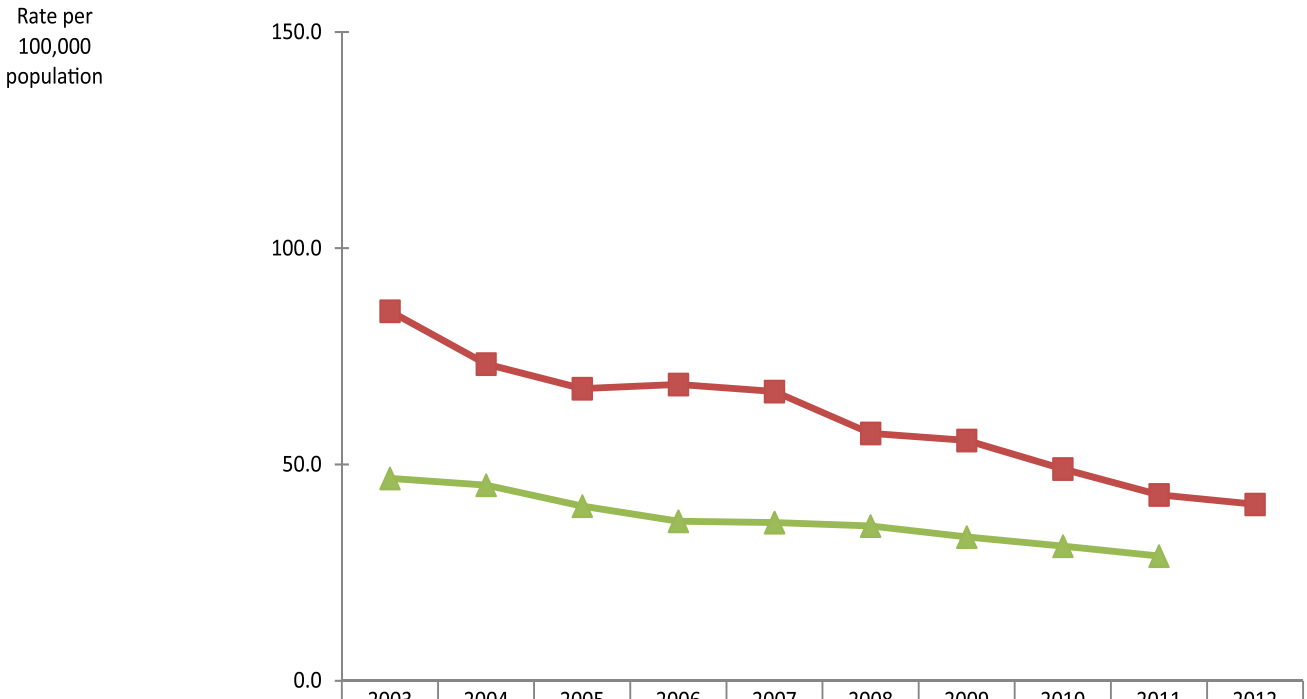
Hepatitis C

Hepatitis C case reports continued to decline in BC in 2012. Individuals are tested for HCV for many reasons, including current or past risk factors, symptoms of liver disease or for routine insurance purposes. Therefore newly identified HCV cases may represent either a recent or a remote infection. Overall, the rate of hepatitis C testing is increasing annually. In 2012, 1885 cases of HCV were reported, for a rate of 40.8 per 100,000.

Overall, males are overrepresented, with a rate almost twice that of females (53.1 per 100,000 popoulaton and 28.6 per 100,000 population respectively), The rate in males peaked at 100 per 100,000 population in 40-59 year age group. While cases reported in childhood was low, five cases occurred in children less than 1 year of age, likely representing vertical (mother-to-child) transmission.

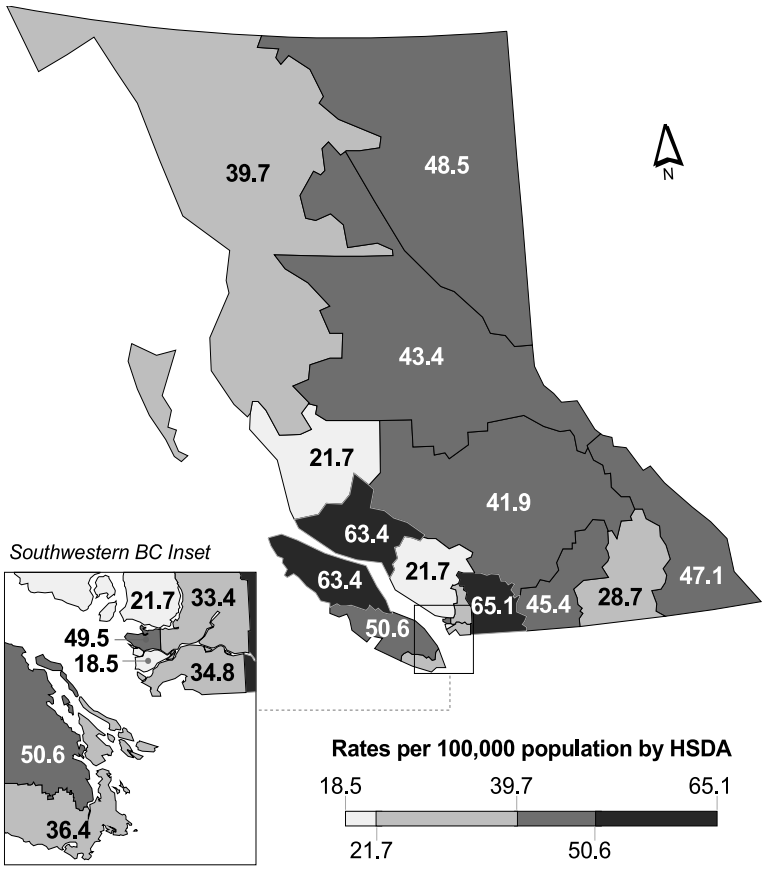
With respect to Health Service Delivery Areas (HSDA), the highest rate was found in Fraser East (65.1 per 100,000 population), followed by Northern Vancouver Island (63.4 per 100,000 population); and Central Vancouver Island (50.6 per 100,000 population). The lowest rate was in North Shore/Coast Garibaldi (21.7 per 100,000 population) and Kootenay Boundary (28.7 per 100,000 population).

15.1 Hepatitis C Rates by Year, 2003-2012



	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
BC Hepatitis C Reports	3523	3043	2834	2907	2882	2508	2479	2218	1968	1885
BC Hepatitis C Rate	85.5	73.2	67.5	68.5	66.9	57.2	55.6	49.0	43.0	40.8
Canadian Hepatitis C Rate	46.8	45.2	40.4	36.9	36.6	35.8	33.2	31.1	28.8	

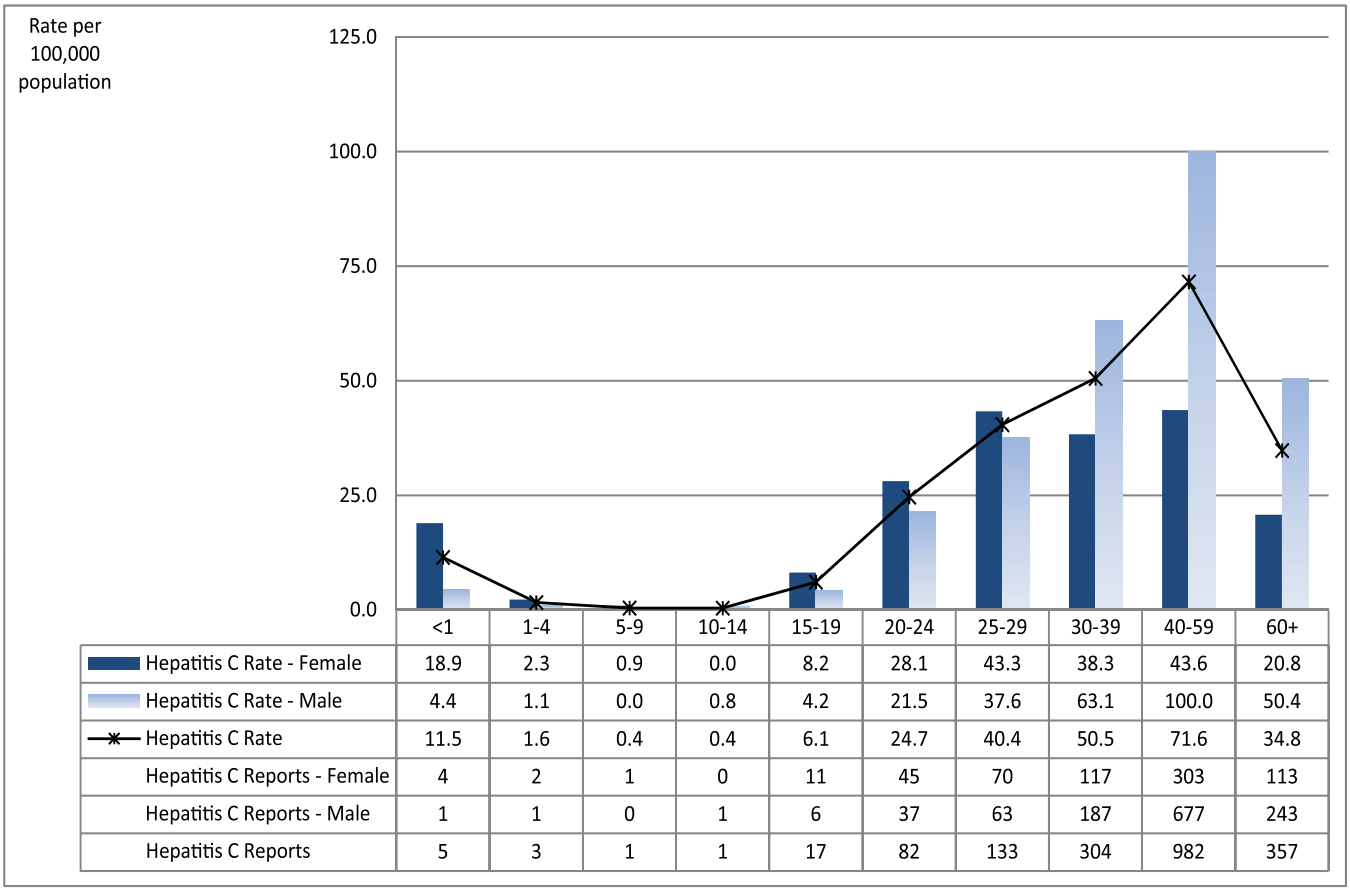
15.2 Hepatitis C Rates by HSDA, 2012



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	38	47.1
12	Kootenay Boundary	23	28.7
13	Okanagan	161	45.4
14	Thompson Cariboo Shuswap	94	41.9
21	Fraser East	188	65.1
22	Fraser North	208	33.4
23	Fraser South	257	34.8
31	Richmond	37	18.5
32	Vancouver	339	49.5
33	North Shore/Coast Garibaldi	63	21.7
41	South Vancouver Island	137	36.4
42	Central Vancouver Island	135	50.6
43	North Vancouver Island	77	63.4
51	Northwest	30	39.7
52	Northern Interior	63	43.4
53	Northeast	35	48.5

Note: Map classification by Jenks natural breaks method.

15.3 Hepatitis C Rates by Age Group and Sex, 2012

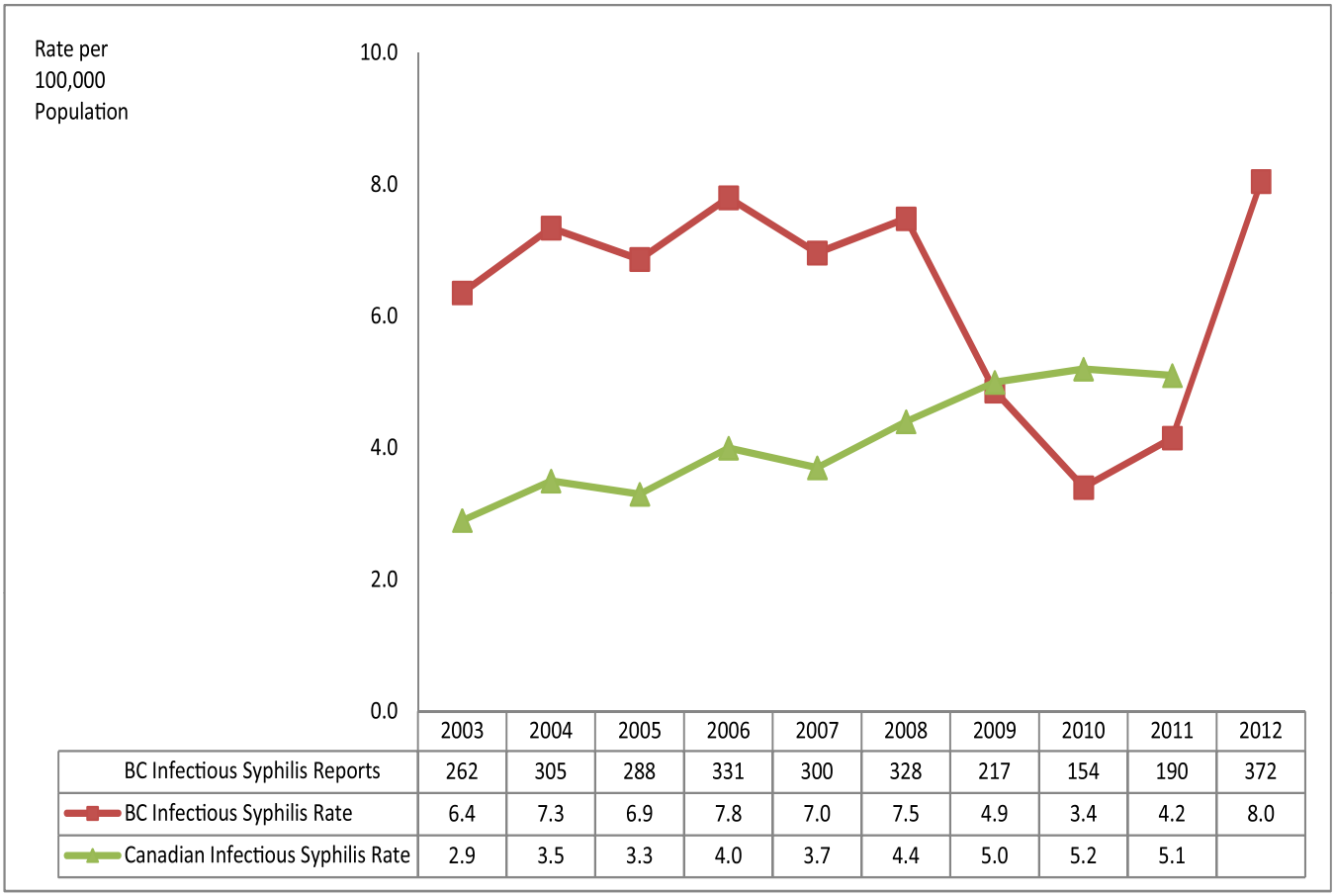


	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Hepatitis C Rate - Female	18.9	2.3	0.9	0.0	8.2	28.1	43.3	38.3	43.6	20.8
Hepatitis C Rate - Male	4.4	1.1	0.0	0.8	4.2	21.5	37.6	63.1	100.0	50.4
Hepatitis C Rate	11.5	1.6	0.4	0.4	6.1	24.7	40.4	50.5	71.6	34.8
Hepatitis C Reports - Female	4	2	1	0	11	45	70	117	303	113
Hepatitis C Reports - Male	1	1	0	1	6	37	63	187	677	243
Hepatitis C Reports	5	3	1	1	17	82	133	304	982	357

Infectious Syphilis

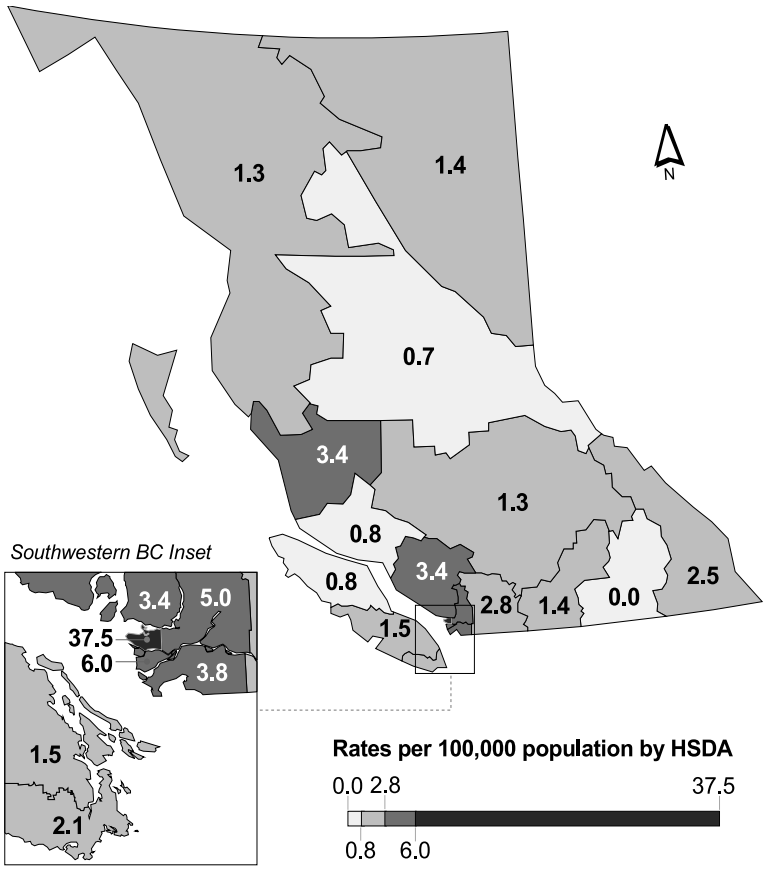
In 2012, the rate of infectious syphilis (i.e., primary, secondary and early latent) in BC increased to 8.0 (372 cases) from 4.2 (190 cases) per 100,000 populaton, reversing a downward trend between 2008 and 2010. Over 90% (346 cases) of infectious syphilis cases in 2012 were male, with the highest rates observed in males between 25-59 years of age. Across HSDAs, Vancouver (37.5 per 100,000 populaton; 257 cases), Richmond (6.0 per 100,000 populaton; 12 cases) and Fraser North (5.0 per 100,000 populaton; 31 cases) had the highest rates of infectious syphilis in 2012.

16.1 Infectious Syphilis Rates by Year, 2003-2012



	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
BC Infectious Syphilis Reports	262	305	288	331	300	328	217	154	190	372
BC Infectious Syphilis Rate	6.4	7.3	6.9	7.8	7.0	7.5	4.9	3.4	4.2	8.0
Canadian Infectious Syphilis Rate	2.9	3.5	3.3	4.0	3.7	4.4	5.0	5.2	5.1	

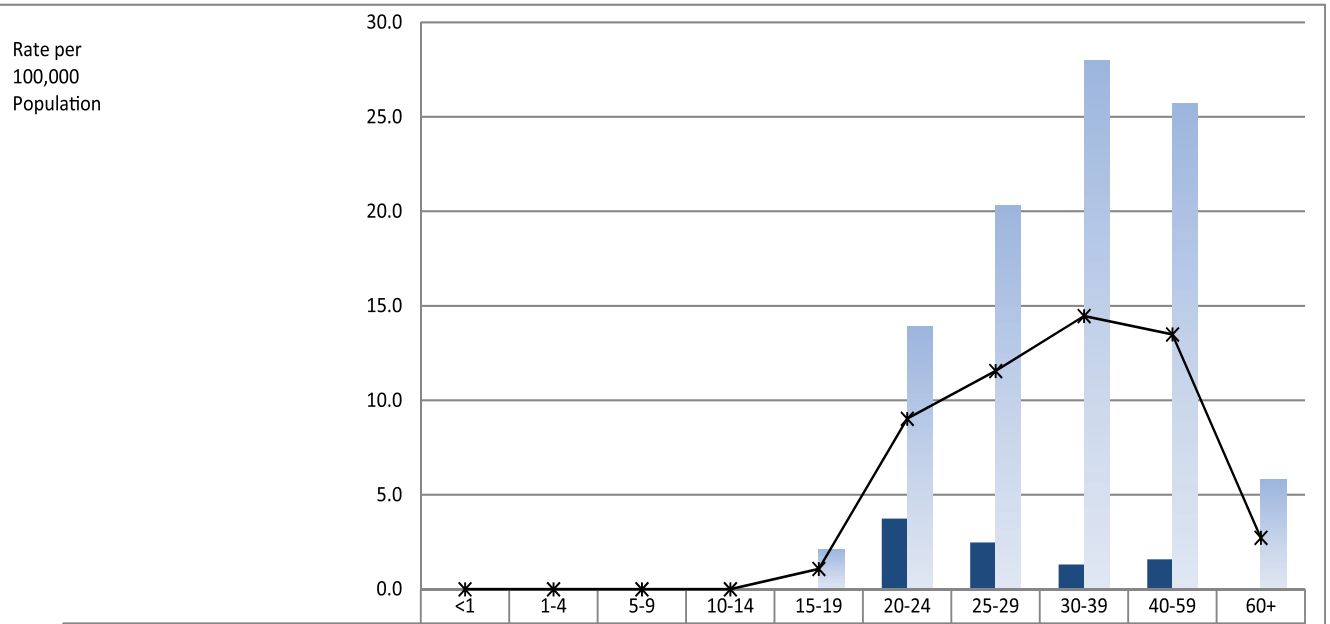
16.2 Infectious Syphilis Rates by HSDA, 2012



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	2	2.5
12	Kootenay Boundary	0	0.0
13	Okanagan	5	1.4
14	Thompson Cariboo Shuswap	3	1.3
21	Fraser East	8	2.8
22	Fraser North	31	5.0
23	Fraser South	28	3.8
31	Richmond	12	6.0
32	Vancouver	257	37.5
33	North Shore/Coast Garibaldi	10	3.4
41	South Vancouver Island	8	2.1
42	Central Vancouver Island	4	1.5
43	North Vancouver Island	1	0.8
51	Northwest	1	1.3
52	Northern Interior	1	0.7
53	Northeast	1	1.4

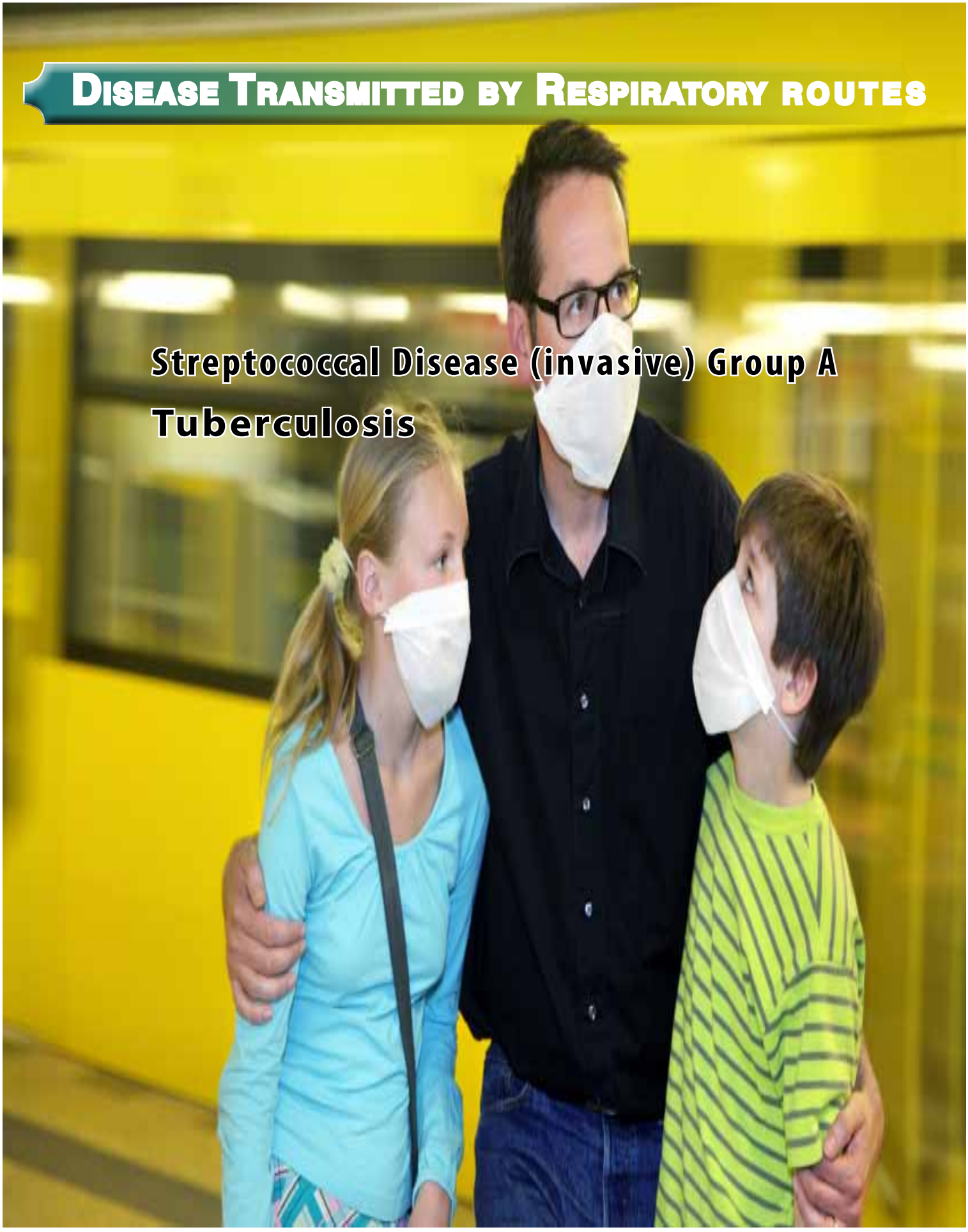
Note: Map classification by Jenks natural breaks method.

16.3 Infectious Syphilis Rates by Age Group and Sex, 2012



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Infectious Syphilis Rate - Female	0.0	0.0	0.0	0.0	0.0	3.7	2.5	1.3	1.6	0.0
Infectious Syphilis Rate - Male	0.0	0.0	0.0	0.0	2.1	13.9	20.3	28.0	25.7	5.8
Infectious Syphilis Rate	0.0	0.0	0.0	0.0	1.1	9.0	11.6	14.5	13.5	2.7
Infectious Syphilis Reports - Female	0	0	0	0	0	6	4	4	11	0
Infectious Syphilis Reports - Male	0	0	0	0	3	24	34	83	174	28
Infectious Syphilis Reports	0	0	0	0	3	30	38	87	185	28

Disease Transmitted by Respiratory routes



Streptococcal Disease (invasive) Group A

Tuberculosis

Streptococcal Disease (invasive) Group A

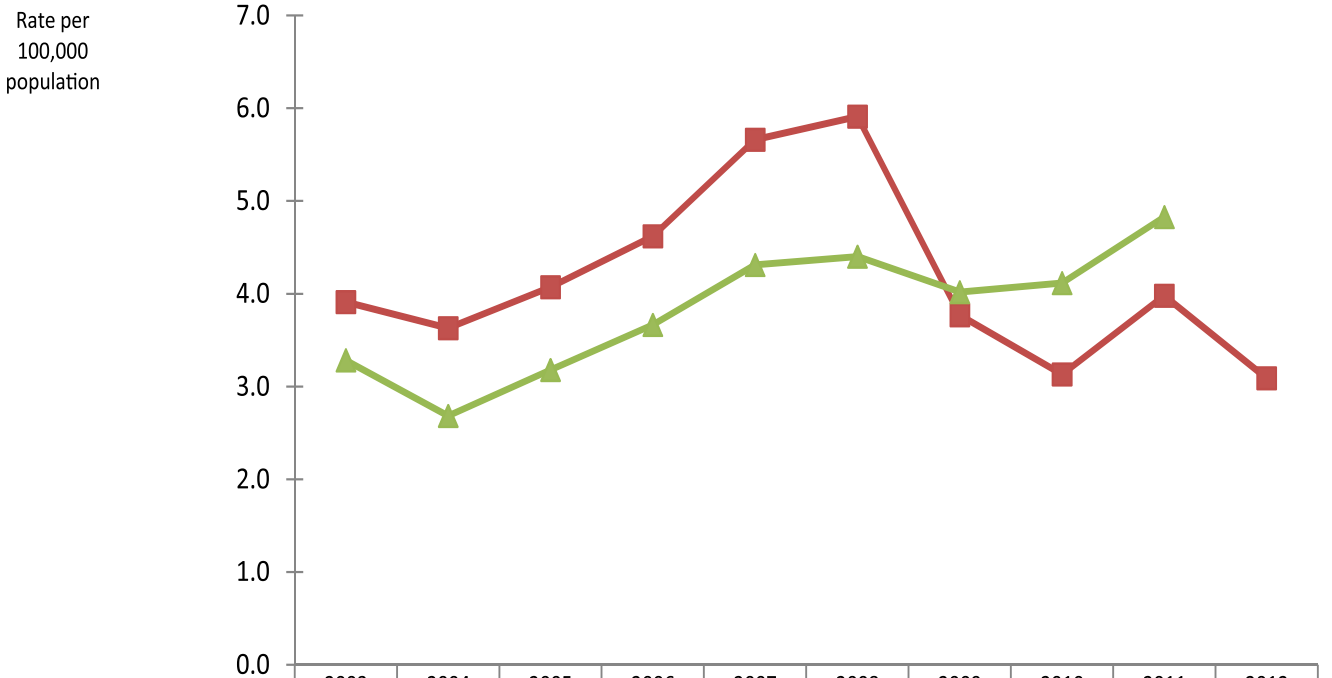
The rate of reported confirmed cases of invasive Group A streptococcal disease (iGAS) was 3.1 per 100,000 population in 2012. This is similar to the reported iGAS rates prior to the peak rates in 2007-2008.

The highest incidence was in males aged ≥60 years with a rate of 6.6 cases per 100,000 population.

Of the 143 confirmed cases in 2012, nine (6.3%) had toxic shock syndrome and fourteen (9.8%) had necrotizing fasciitis.

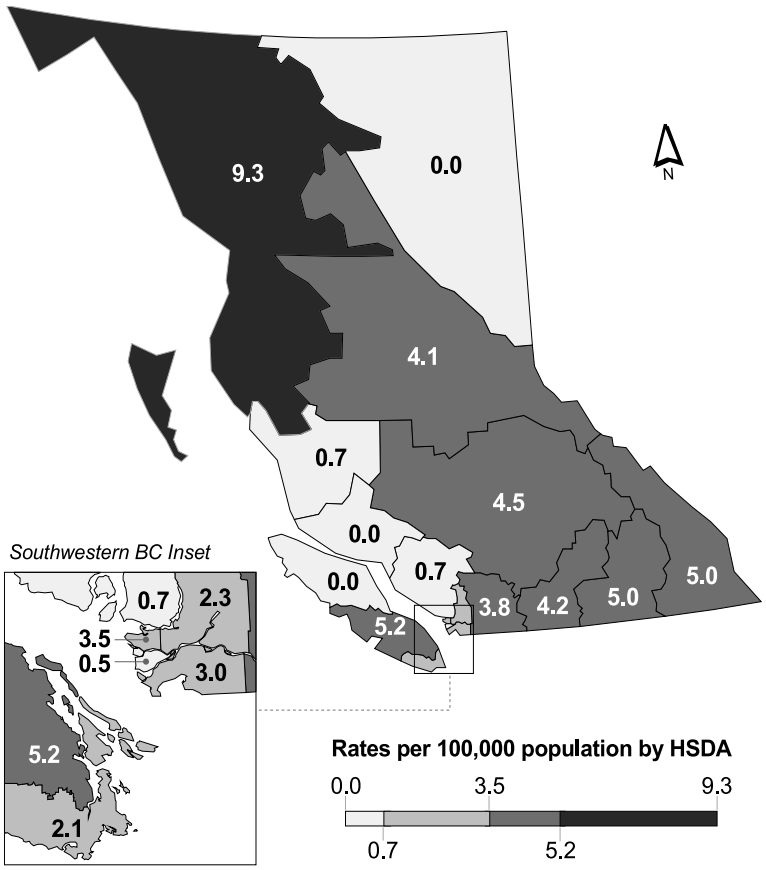
The case fatality rate was 7.0%. Between 2003 and 2012, annual case fatality rates ranged from 3.7% to 13.2%. Of the 10 deaths in 2012, only one was a child; an infant associated with a maternal case of puerperal fever. The other nine deaths were in adults over the age of 35. Isolates from 55 (38%) confirmed cases were typed by the National Microbiology Laboratory. Of these, the most common emm types were 1 (33%), 12 (9%), 4 (9%) and 89 (7%). In 2002 through 2011 the most common emm types among cases with typing results were types 1 (17%), 59 (13%) and 12 (5%).

17.1 Streptococcal Disease (invasive) Group A Rates by Year, 2003-2012



	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
BC iGAS Reports	161	151	171	196	244	259	168	142	182	143
BC iGAS Rate	3.9	3.6	4.1	4.6	5.7	5.9	3.8	3.1	4.0	3.1
Canadian iGAS Rate	3.3	2.7	3.2	3.7	4.3	4.4	4.0	4.1	4.8	

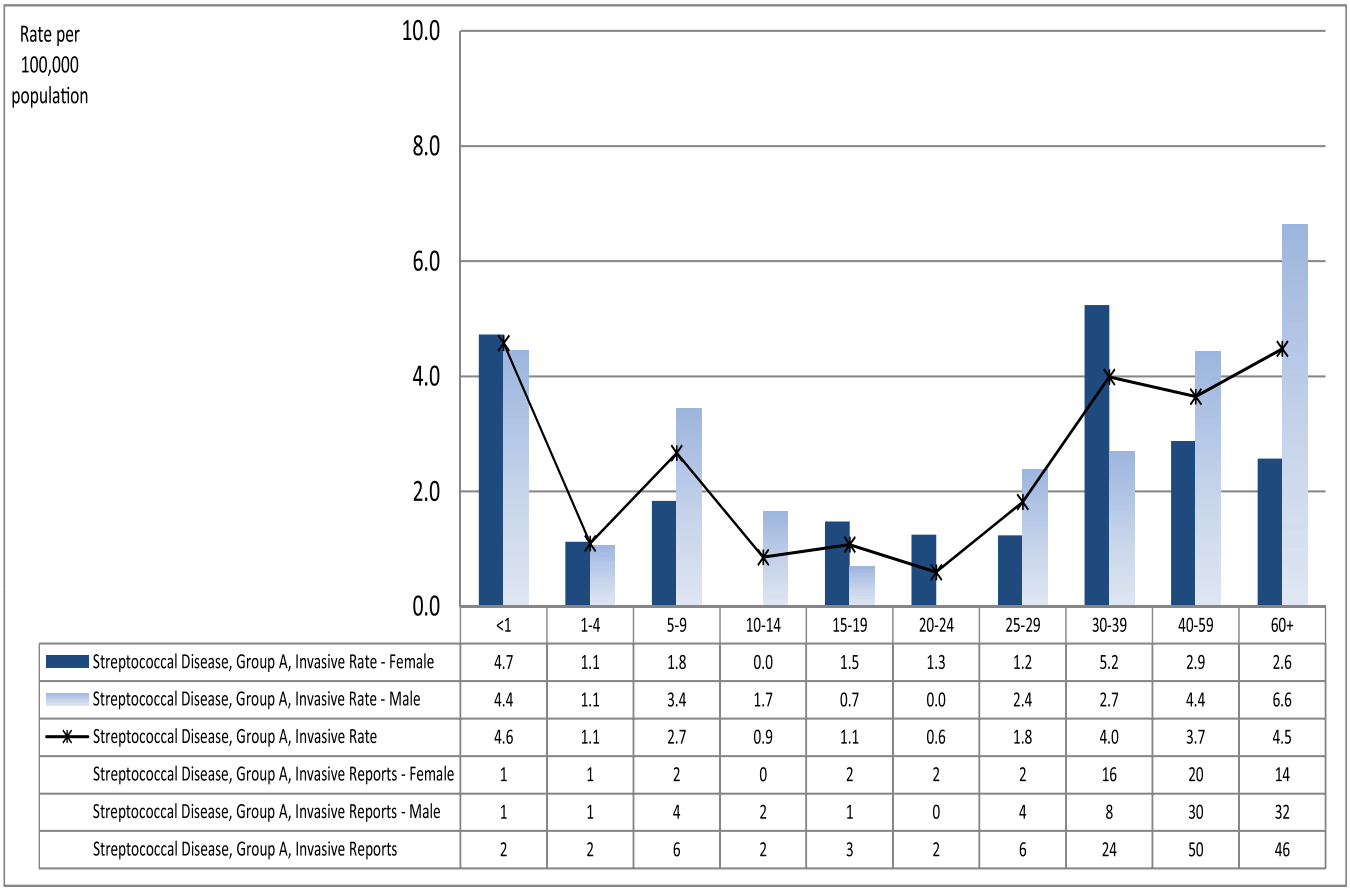
17.2 Streptococcal Disease (invasive) Group A Rates by HSDA, 2012



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	4	5.0
12	Kootenay Boundary	4	5.0
13	Okanagan	15	4.2
14	Thompson Cariboo Shuswap	10	4.5
21	Fraser East	11	3.8
22	Fraser North	14	2.3
23	Fraser South	22	3.0
31	Richmond	1	0.5
32	Vancouver	24	3.5
33	North Shore/Coast Garibaldi	2	0.7
41	South Vancouver Island	8	2.1
42	Central Vancouver Island	14	5.2
43	North Vancouver Island	0	0.0
51	Northwest	7	9.3
52	Northern Interior	6	4.1
53	Northeast	0	0.0

Note: Map classification by Jenks natural breaks method.

17.3 Streptococcal Disease (invasive) Group A Rates by Age Group and Sex, 2012



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Streptococcal Disease, Group A, Invasive Rate - Female	4.7	1.1	1.8	0.0	1.5	1.3	1.2	5.2	2.9	2.6
Streptococcal Disease, Group A, Invasive Rate - Male	4.4	1.1	3.4	1.7	0.7	0.0	2.4	2.7	4.4	6.6
Streptococcal Disease, Group A, Invasive Rate	4.6	1.1	2.7	0.9	1.1	0.6	1.8	4.0	3.7	4.5
Streptococcal Disease, Group A, Invasive Reports - Female	1	1	2	0	2	2	2	16	20	14
Streptococcal Disease, Group A, Invasive Reports - Male	1	1	4	2	1	0	4	8	30	32
Streptococcal Disease, Group A, Invasive Reports	2	2	6	2	3	2	6	24	50	46

Tuberculosis

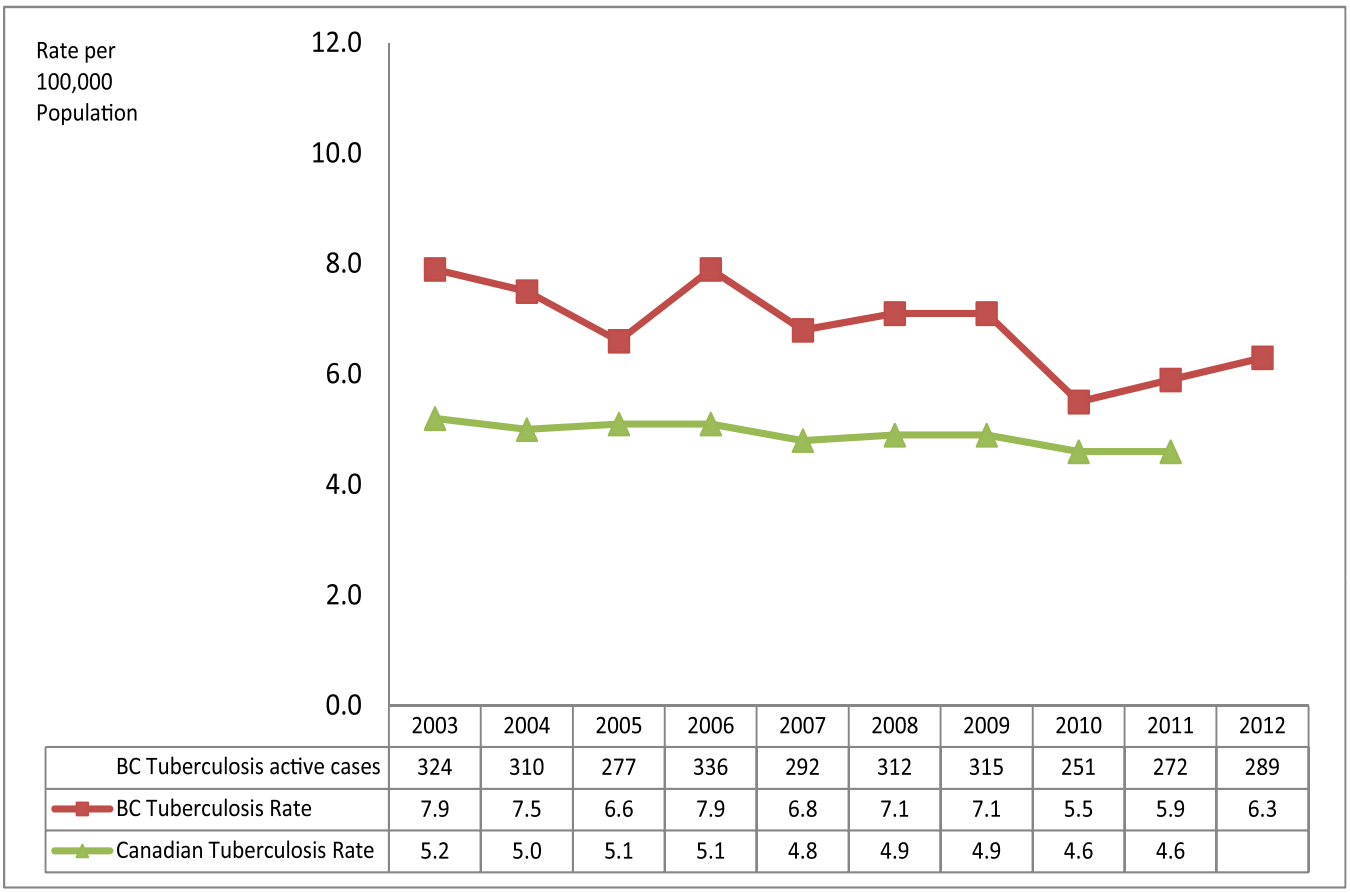
In 2012 there were 289 cases of reported tuberculosis in British Columbia, for a rate of 6.3 per 100,000 population, a 7% increase in the number and 6% increase in the rate of reported cases compared to 2011.

Rates for Health Regions vary across the province. The Richmond, Vancouver, Fraser South and Northern Interior health service delivery areas have rates exceeding the provincial rate (6.3 per 100,000 population). The highest incidence was reported from Richmond and Vancouver (12.5 and 10.7 per 100,000 population respectively) while the lowest was in East Kootenay, Kootenay Boundary and Northwest (1.2, 1.2 and 1.4 per 100,000 population respectively).

Compared to 2011, the rate of tuberculosis increased in Richmond, North Vancouver Island, Okanagan, Thompson Cariboo Shuswap, Central Vancouver Island, Kootenay Boundary, Fraser East, South Vancouver Island and Fraser North with Richmond showing the largest increase in rate of tuberculosis (from 8.1 to 12.5 per 100,000 population). In East Kootenay, North Shore/Coast Garibaldi and Northern Interior the rate remained the same. In all other health regions the rate of tuberculosis decreased with Northwest and Northeast showing the largest decrease in rate of tuberculosis (from 4.0 to 1.3 and from 4.2 to 1.4 per 100,000 population respectively). However, the rate decrease observed in both the Northwest and Northeast represent a drop from 3 to 1 case, and hence are primarily a result of small numbers.

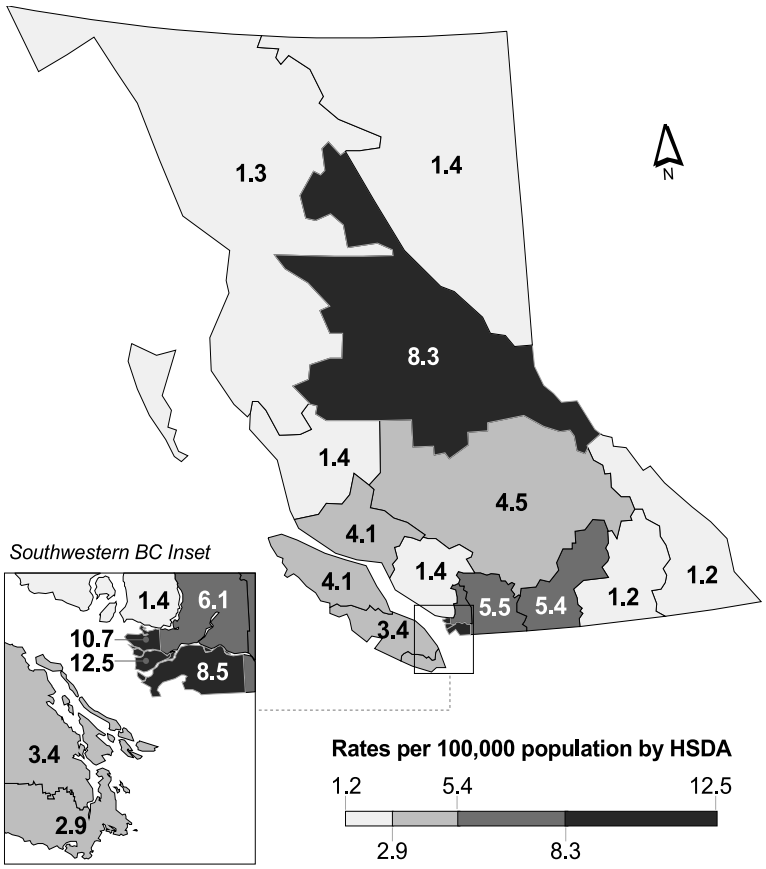
The age specific rates are shown in figure 18.3. Overall, the tuberculosis rate was higher in men than in women (8.0 vs 4.5 per 100,000 population). For the age group 0-14 years the rate of tuberculosis was higher in women than in men (1.2 vs 0.8 per 100,000 population). In those >= 40 years old, the rate of tuberculosis in men was higher than in women (12.7 vs 5.7 per 100,000 population).

18.1 Tuberculosis Rates by Year, 2003-2012



	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
BC Tuberculosis active cases	324	310	277	336	292	312	315	251	272	289
BC Tuberculosis Rate	7.9	7.5	6.6	7.9	6.8	7.1	7.1	5.5	5.9	6.3
Canadian Tuberculosis Rate	5.2	5.0	5.1	5.1	4.8	4.9	4.9	4.6	4.6	

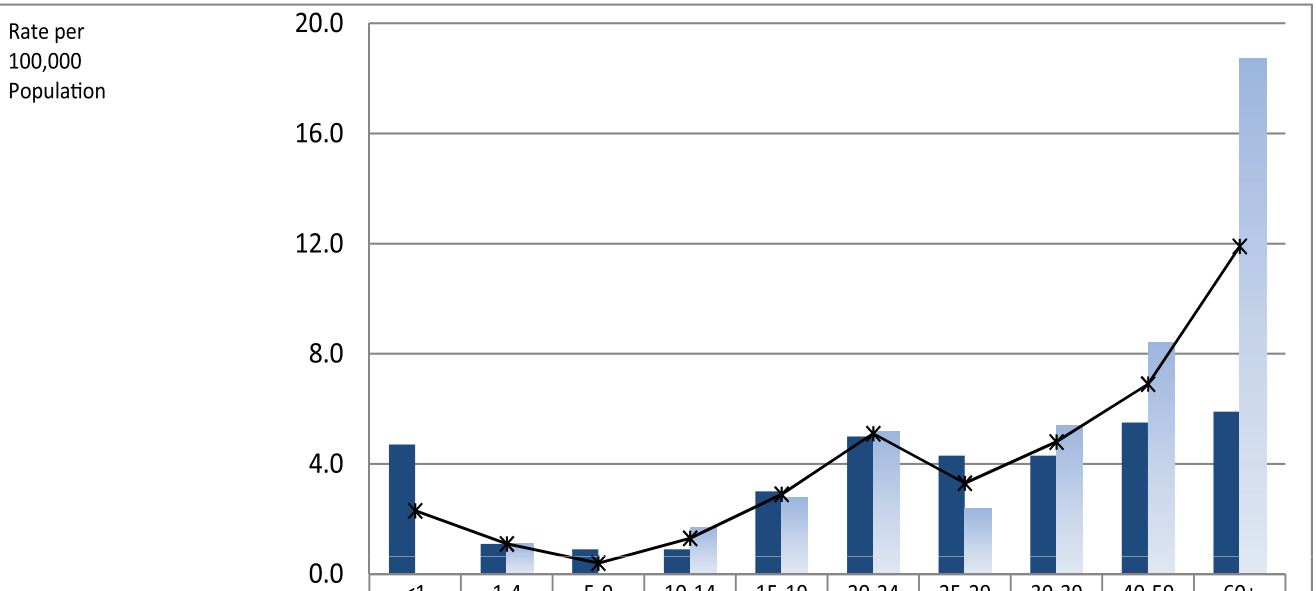
18.2 Tuberculosis Rates by HSDA, 2012



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	1	1.2
12	Kootenay Boundary	1	1.2
13	Okanagan	19	5.4
14	Thompson Cariboo Shuswap	10	4.5
21	Fraser East	16	5.5
22	Fraser North	38	6.1
23	Fraser South	63	8.5
31	Richmond	25	12.5
32	Vancouver	73	10.7
33	North Shore/Coast Garibaldi	4	1.4
41	South Vancouver Island	11	2.9
42	Central Vancouver Island	9	3.4
43	North Vancouver Island	5	4.1
51	Northwest	1	1.3
52	Northern Interior	12	8.3
53	Northeast	1	1.4

Note: Map classification by Jenks natural breaks method.

18.3 Tuberculosis Rates by Age Group and Sex, 2012



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Tuberculosis Rate - Female	4.7	1.1	0.9	0.9	3.0	5.0	4.3	4.3	5.5	5.9
Tuberculosis Rate - Male	0.0	1.1	0.0	1.7	2.8	5.2	2.4	5.4	8.4	18.7
Tuberculosis Rate	2.3	1.1	0.4	1.3	2.9	5.1	3.3	4.8	6.9	11.9
Tuberculosis Reports - Female	1	1	1	1	4	8	7	13	38	32
Tuberculosis Reports - Male	0	1	0	2	4	9	4	16	57	90
Tuberculosis Reports	1	2	1	3	8	17	11	29	95	122

Antimicrobial resistant Organism Surveillance in BC

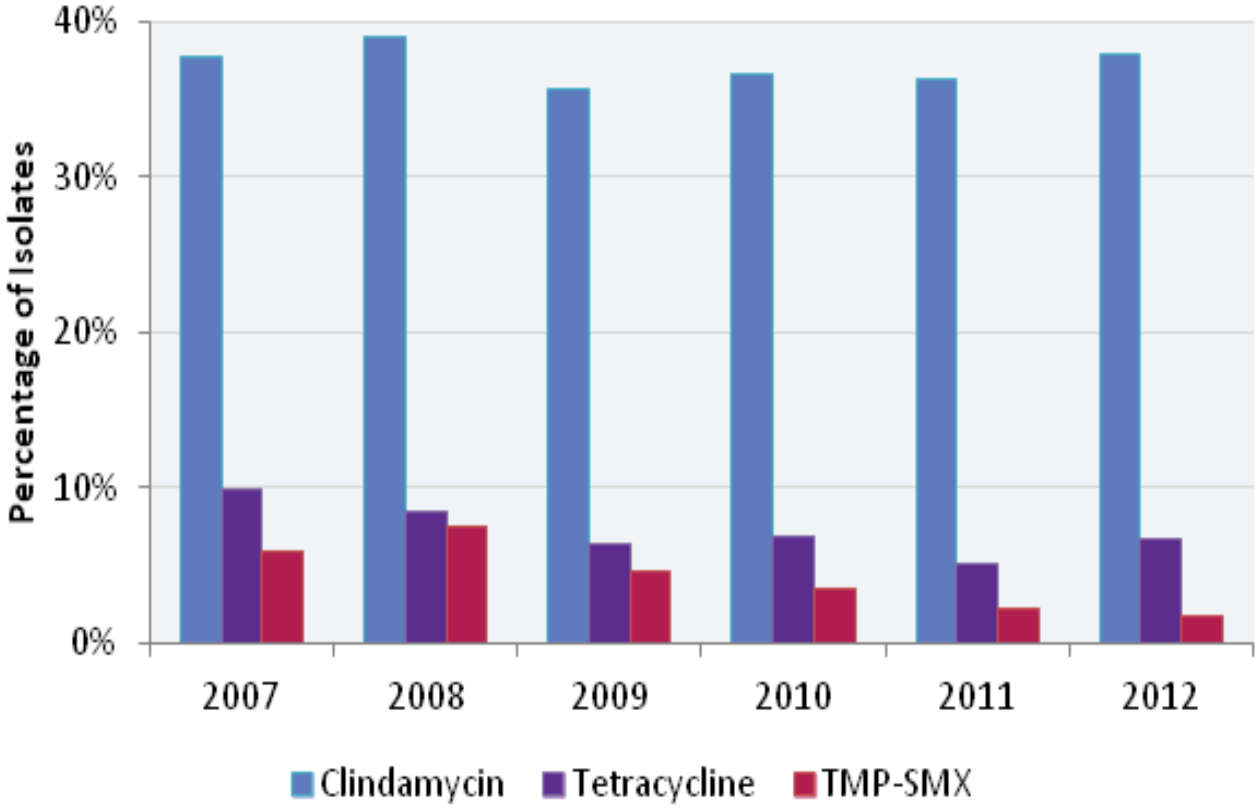
Highlights of Trends in Antibiotic Resistance

- The proportion of *Staphylococcus aureus* isolates that were methicillin resistant (MRSA) ranged from 16.1 % to 23.9% from 2008 to 2012, but remained below the peak rate observed in 2007 (30.5%). In 2012, MRSA isolates were resistant to clindamycin, doxycycline (tetracyclines) and trimethoprim-sulfamethoxazole (TMP-SMX) at rates of 38.0%, 6.7% and 1.8%, respectively (Figure 19.1). This implies that clindamycin may not be an optimal choice for empirical treatment of suspected community-acquired MRSA when antibiotics are needed to treat complicated infections.
- *Streptococcus pneumoniae* isolates have demonstrated a stable rate of resistance to all antibiotics tested since 2007, with the exception of levofloxacin, which demonstrated decreasing trend ($p<0.01$). In 2012, 33.7% of all tested isolates demonstrated non-susceptibility against erythromycin. *S. pneumoniae* isolates were also non-susceptible to penicillin and TMP-SMX at rates of 17.2% and 21.9%, respectively.
- From 2007 to 2010, non-susceptibility rates to erythromycin and clindamycin decreased in *Streptococcus pyogenes* isolates. However, as of 2012, non-susceptibility rates had significantly increased to 22.7% ($p<0.01$) and 22.3% ($p=0.03$), respectively. *S. pyogenes* isolates remain highly susceptible to penicillin, cephalothin and vancomycin, but fully resistant to TMP-SMX and ciprofloxacin.
- In 2012, *Enterococcus spp.* isolates remained highly susceptible to ampicillin (98.6%) and nitrofurantoin (98.8%). However, one quarter of all isolates tested were non-susceptible to ciprofloxacin (24.7%), largely due to increased resistance in individuals older than 70 years of age ($p<0.01$). Less than 1% of all *Enterococcus* spp. isolates were identified as vancomycin resistant *Enterococcus* (VRE).
- In 2012, *Escherichia coli* resistance to ciprofloxacin was 25.3%. These resistance rates increase with age, being highest in those aged 70 years or more ($p<0.001$). *E. coli* isolates have demonstrated moderate levels of resistance to TMP-SMX with 25.6% of isolates being resistant in 2012. Nitrofurantoin remains a highly effective empiric treatment for *E. coli* isolates with approximately 97.1% of isolates exhibiting susceptibility (Figure 19.2). This trend is reassuring as the majority of uncomplicated UTI infections are caused by *E. coli*.
- Data from 2012 suggest that ciprofloxacin resistance in *Klebsiella pneumoniae* remains low at 3.9%. Additionally, resistance to TMP-SMX for *K. pneumoniae* appears to be decreasing from 10.8% in 2007 to 8.2% in 2012 ($p<0.01$).
- In 2012, 20.5% of *Proteus mirabilis* isolates were non-susceptible to ciprofloxacin. Additionally, isolates demonstrated moderate levels (31.3%) of resistance to TMP-SMX.
- Despite a slight increase in non-susceptibility to ciprofloxacin from 10.1% in 2011 to 11.7% in 2012 for *Pseudomonas aeruginosa* isolates, the non-susceptibility trend appears to relatively stable ($p=0.09$). Isolates remain highly susceptible (>95%) to tobramycin, piperacillin, ceftazidime, meorpenem and gentamicin.
- The percent of *Haemophilus influenzae* isolates resistant to ampicillin has remained between 15-20% since 2007 ($p=0.70$), with the lowest resistance reported in 2011 (14.3%). Resistance to ampicillin peaked in 2012 at 19.4%.

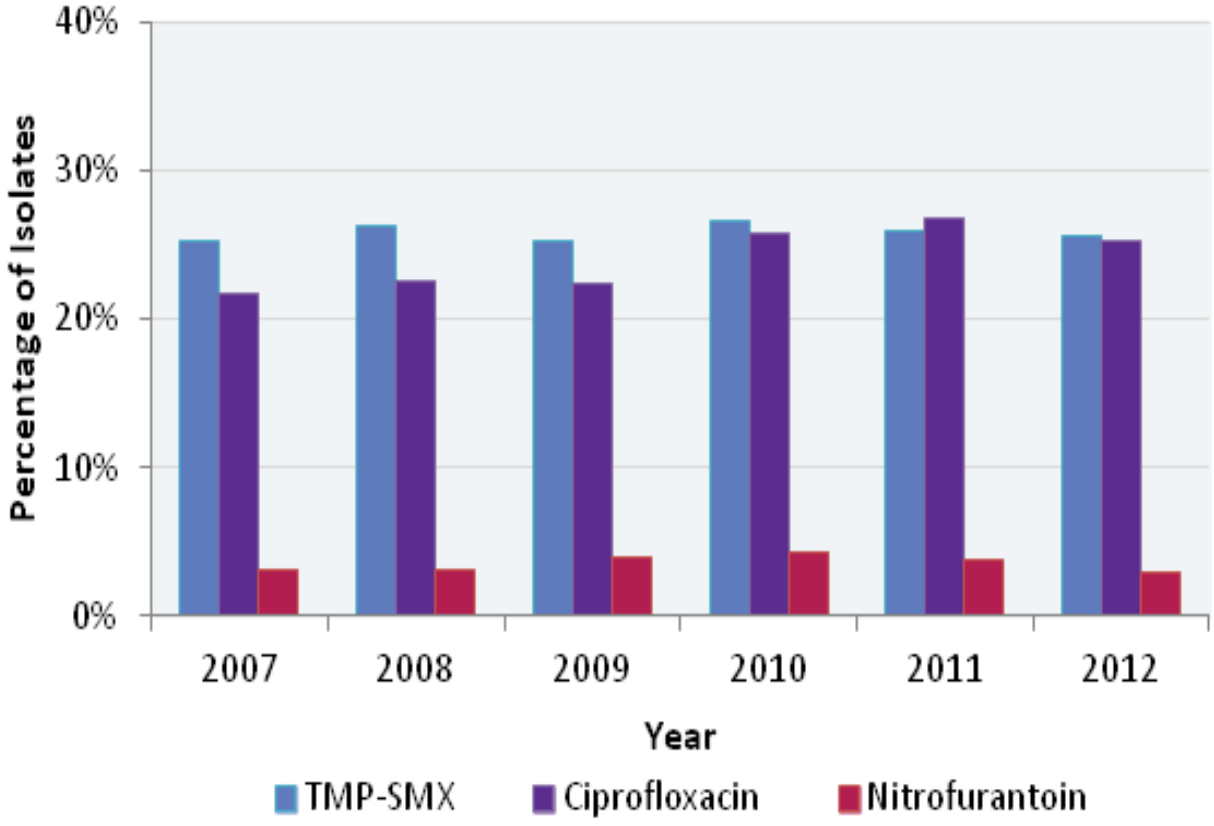
Full length report:

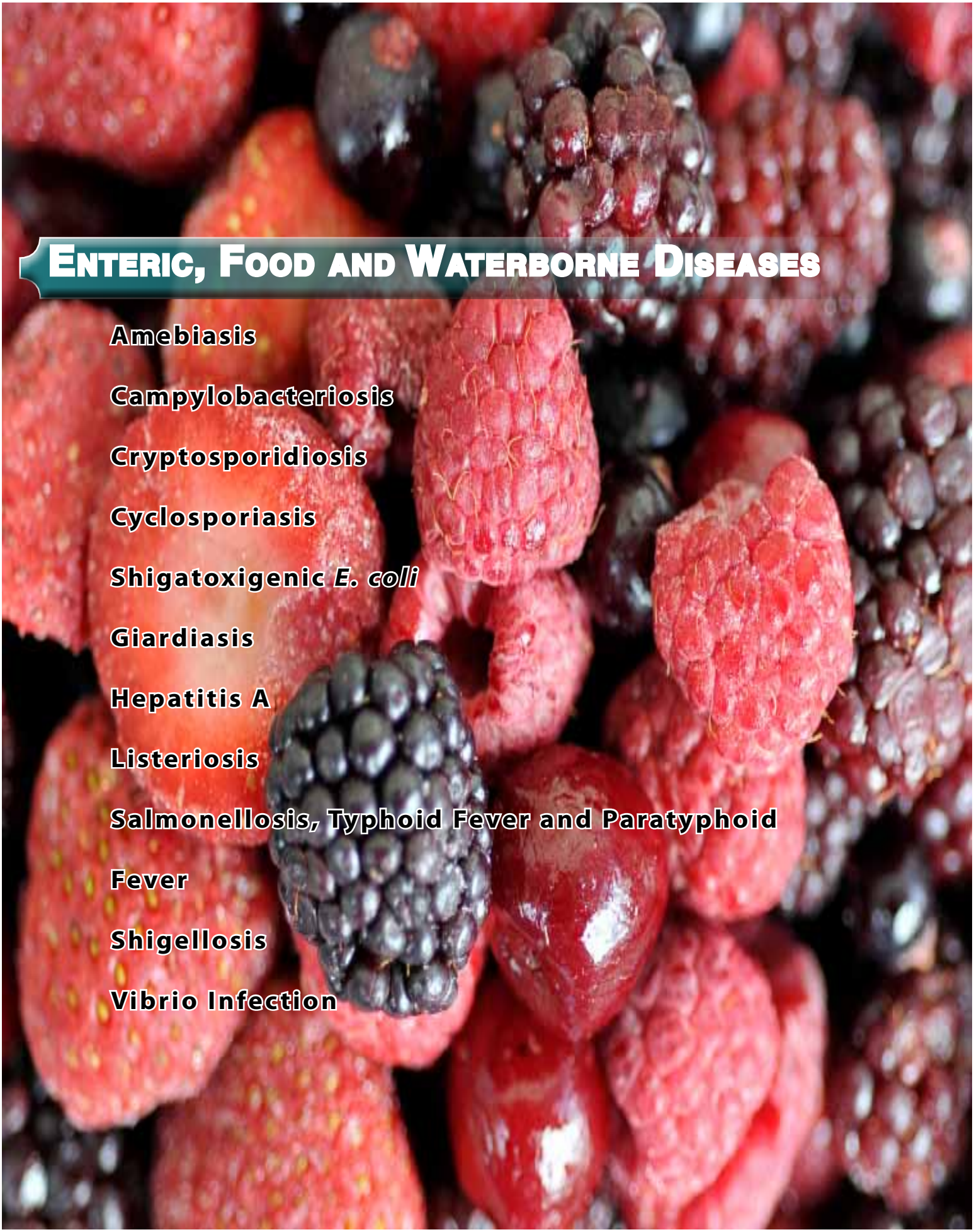
An update on antimicrobial resistance within British Columbia is compiled in a separate report entitled "Antimicrobial Resistance Trends in the Province of British Columbia." Data are obtained through collaborations with provincial and national partners who provide de-identified or aggregate data. As part of the Do Bugs Need Drugs? program, the focus of this surveillance activity is primarily on community resistance patterns. This executive summary provides the findings from an analysis of data from BC Biomedical Laboratories, a outpatient laboratory practice serving the Fraser and Vancouver Coastal Health Authorities in BC, from 2007 to 2012. As these data primarily represent isolates collected in the community, the trends reported here may differ from those reported for institutions. The Spearman rank correlation test was used to test the significance of changes in resistance over time (2007-2012). Non-susceptible rates include both full resistance and intermediate resistance. The most recent update of this report will be published online at www.bccdc.ca/dbnd.

19.1 MRSA Resistance to Clindamycin, Tetracycline and TMP-SMX (2007-2012)
Source: BC Biomedical Laboratories



19.2 *E. coli* Resistance to TMP-SMX, Ciprofloxacin and Nitrofurantoin (2007-2012)
Source: BC Biomedical Laboratories





Enteric, Food and Waterborne Diseases

Amebiasis

Campylobacteriosis

Cryptosporidiosis

Cyclosporiasis

Shigatoxigenic *E. coli*

Giardiasis

Hepatitis A

Listeriosis

Salmonellosis, Typhoid Fever and Paratyphoid Fever

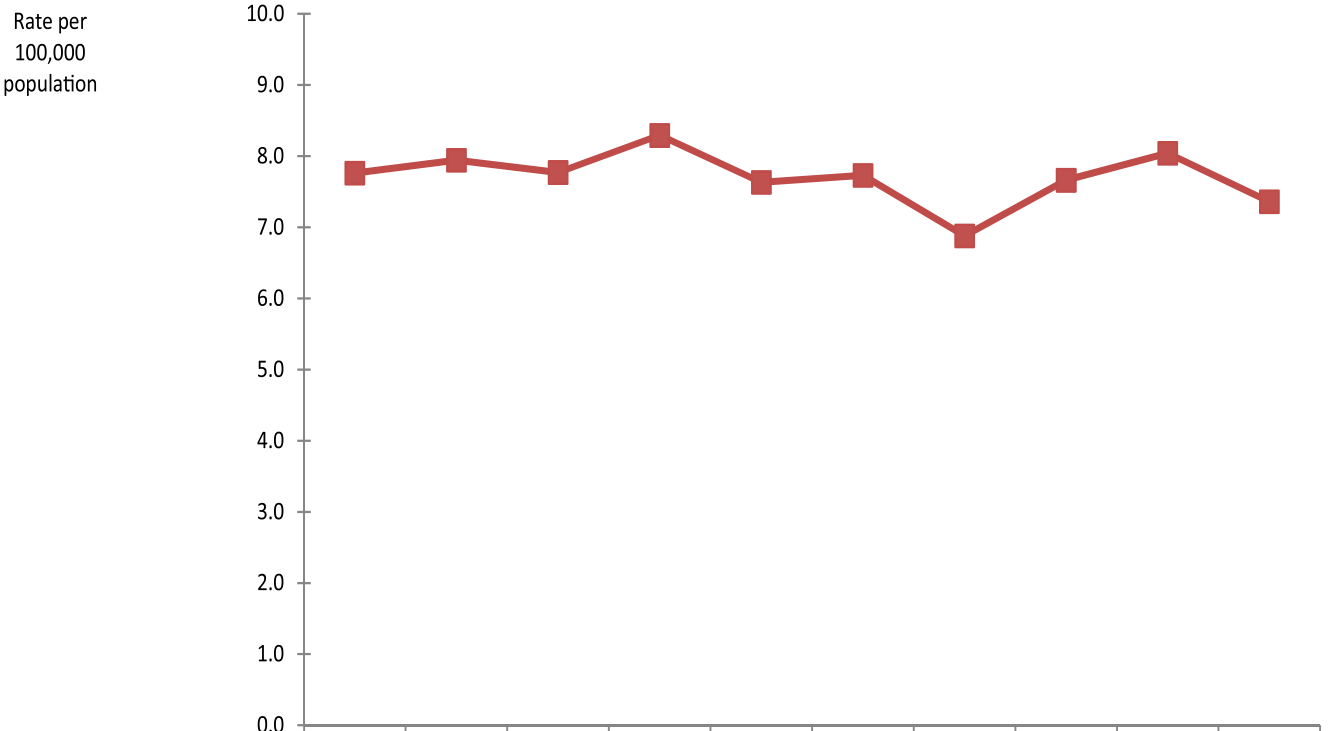
Shigellosis

Vibrio Infection

Amebiasis

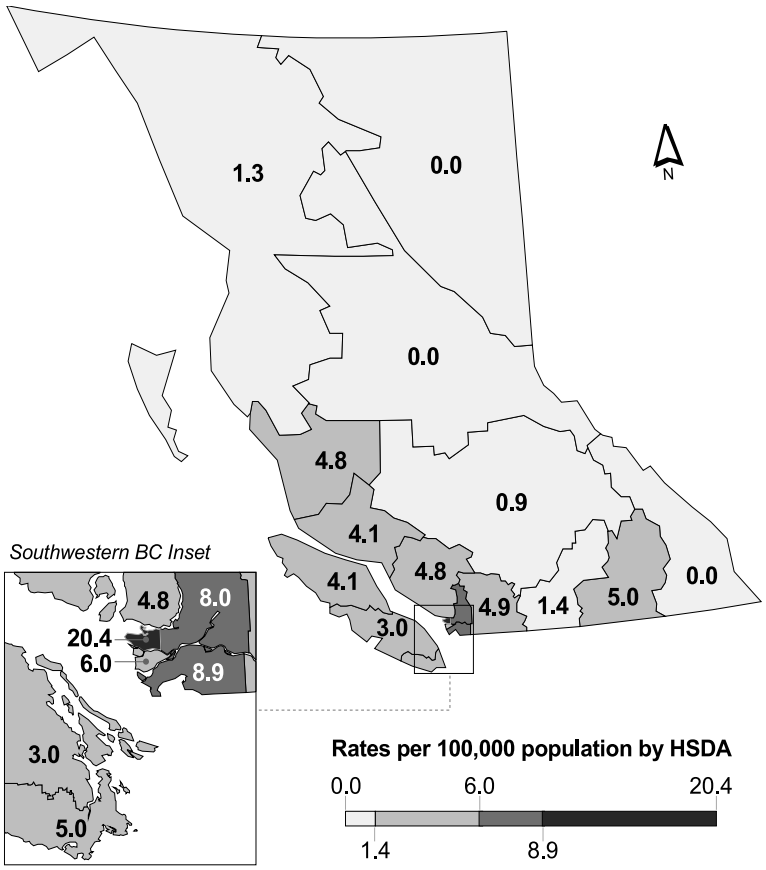
Throughout the last ten years, the rate of amebiasis in BC has remained fairly constant. The 2012 provincial rate was 7.4 per 100,000 population. No outbreaks were reported in 2012 and no seasonal pattern was evident. The reporting rate remained highest in males aged 25-59 years. Vancouver, as in previous years, reported the highest number of cases (140) and the highest rate of illness (20.4 per 100,000 population).

19.1 Amebiasis Rates by Year, 2003-2012



	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
BC Amebiasis Reports	320	330	326	352	329	339	307	347	368	340
BC Amebiasis Rate	7.8	7.9	7.8	8.3	7.6	7.7	6.9	7.7	8.0	7.4

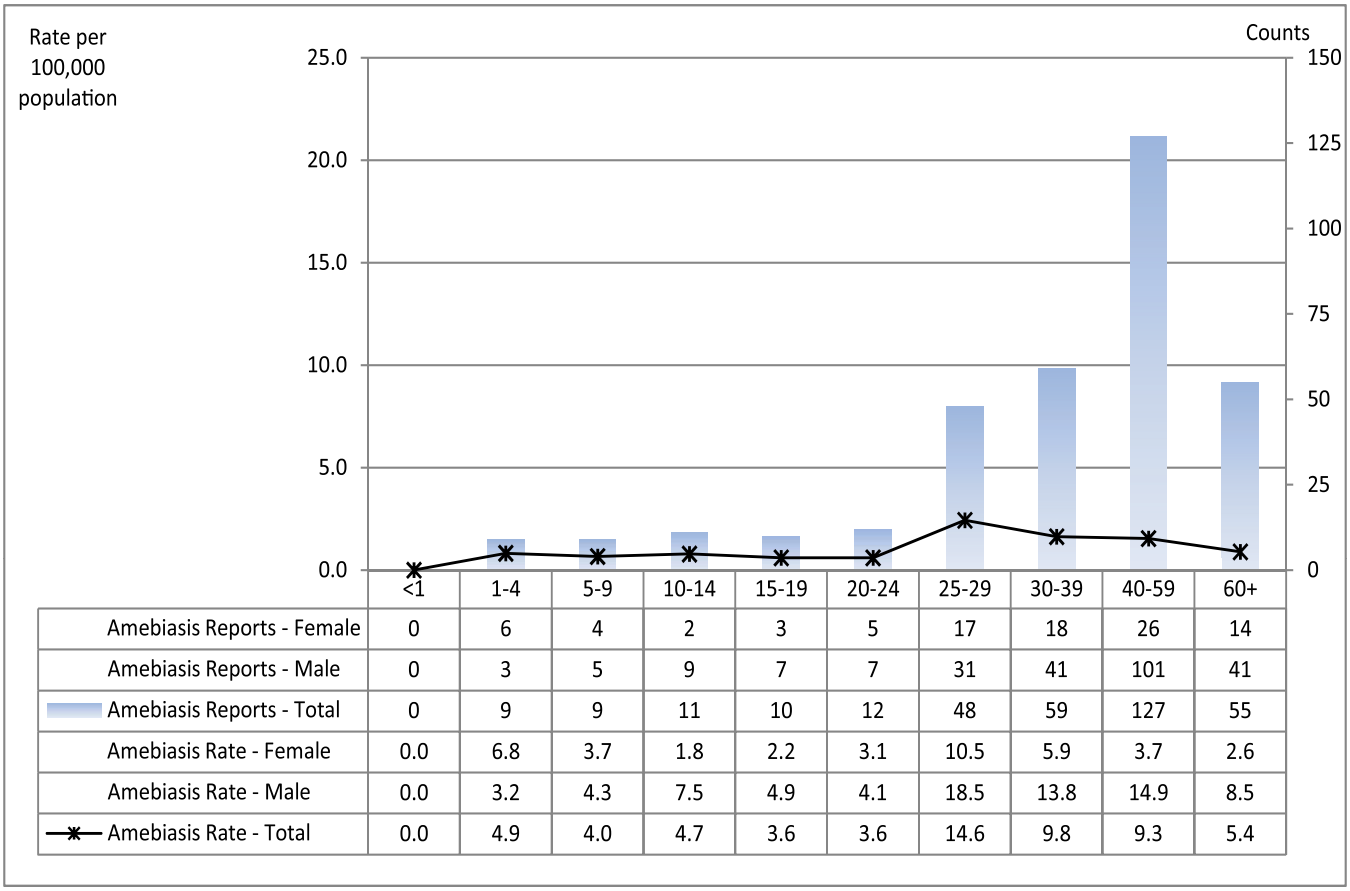
19.2 Amebiasis Rates by HSDA, 2012



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	0	0.0
12	Kootenay Boundary	4	5.0
13	Okanagan	5	1.4
14	Thompson Cariboo Shuswap	2	0.9
21	Fraser East	14	4.9
22	Fraser North	50	8.0
23	Fraser South	66	8.9
31	Richmond	12	6.0
32	Vancouver	140	20.4
33	North Shore/Coast Garibaldi	14	4.8
41	South Vancouver Island	19	5.0
42	Central Vancouver Island	8	3.0
43	North Vancouver Island	5	4.1
51	Northwest	1	1.3
52	Northern Interior	0	0.0
53	Northeast	0	0.0

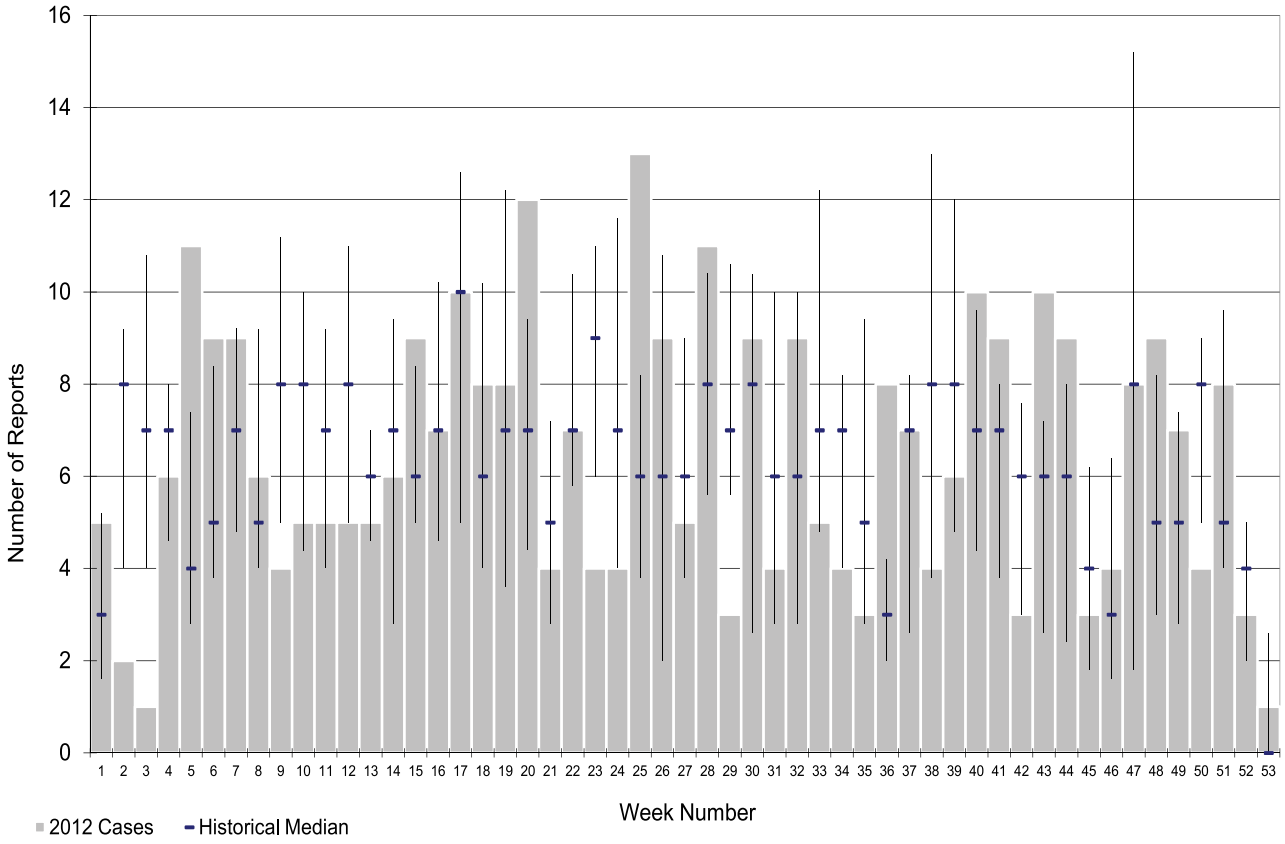
Note: Map classification by Jenks natural breaks method.

19.3 Amebiasis Rates by Age Group and Sex, 2012



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Amebiasis Reports - Female	0	6	4	2	3	5	17	18	26	14
Amebiasis Reports - Male	0	3	5	9	7	7	31	41	101	41
Amebiasis Reports - Total	0	9	9	11	10	12	48	59	127	55
Amebiasis Rate - Female	0.0	6.8	3.7	1.8	2.2	3.1	10.5	5.9	3.7	2.6
Amebiasis Rate - Male	0.0	3.2	4.3	7.5	4.9	4.1	18.5	13.8	14.9	8.5
Amebiasis Rate - Total	0.0	4.9	4.0	4.7	3.6	3.6	14.6	9.8	9.3	5.4

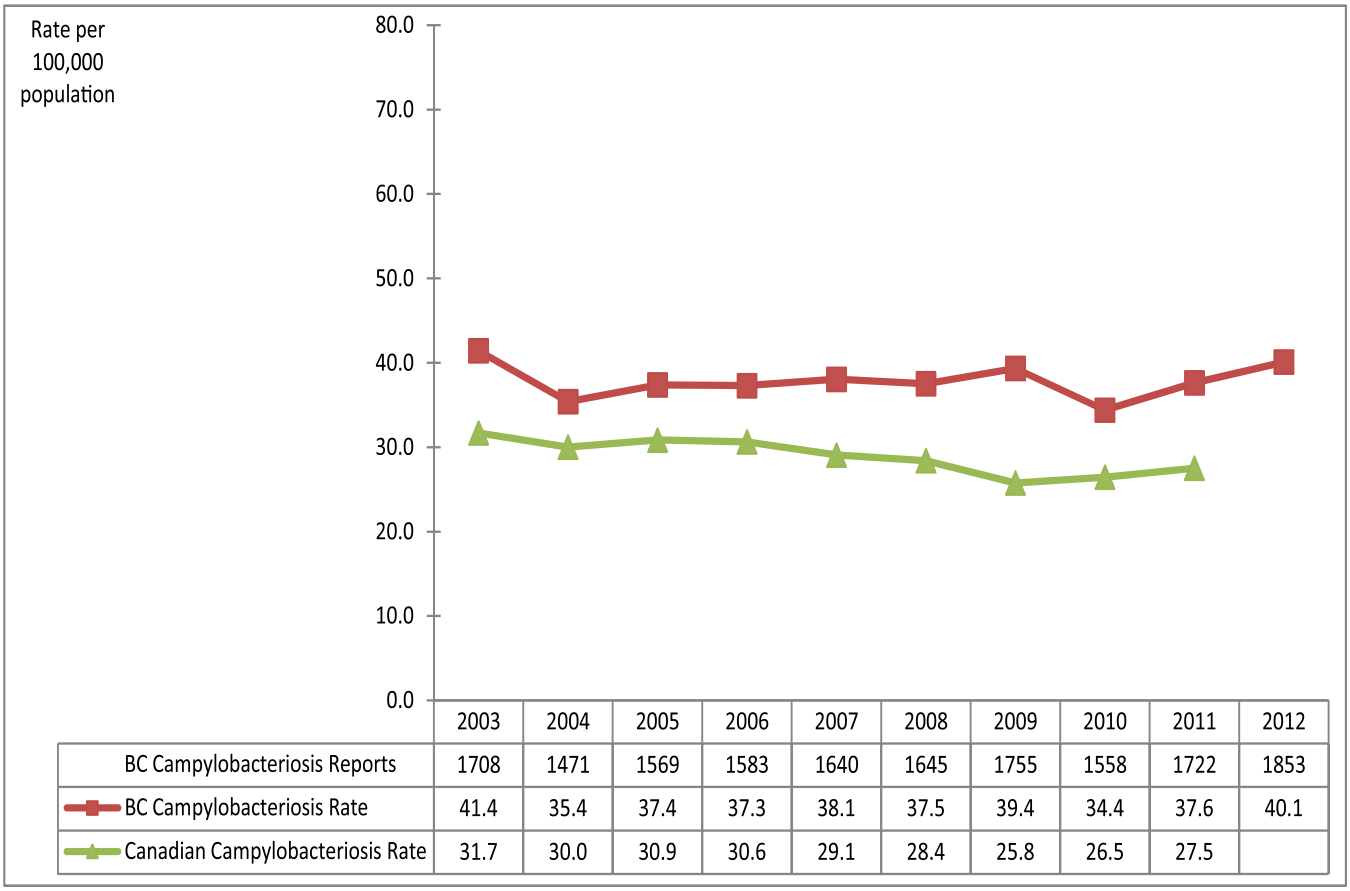
19.4 2012 Amebiasis Reports Compared to Historical Median and the 10th and 90th Percentiles Around the Median (2003 to 2011)



Campylobacteriosis

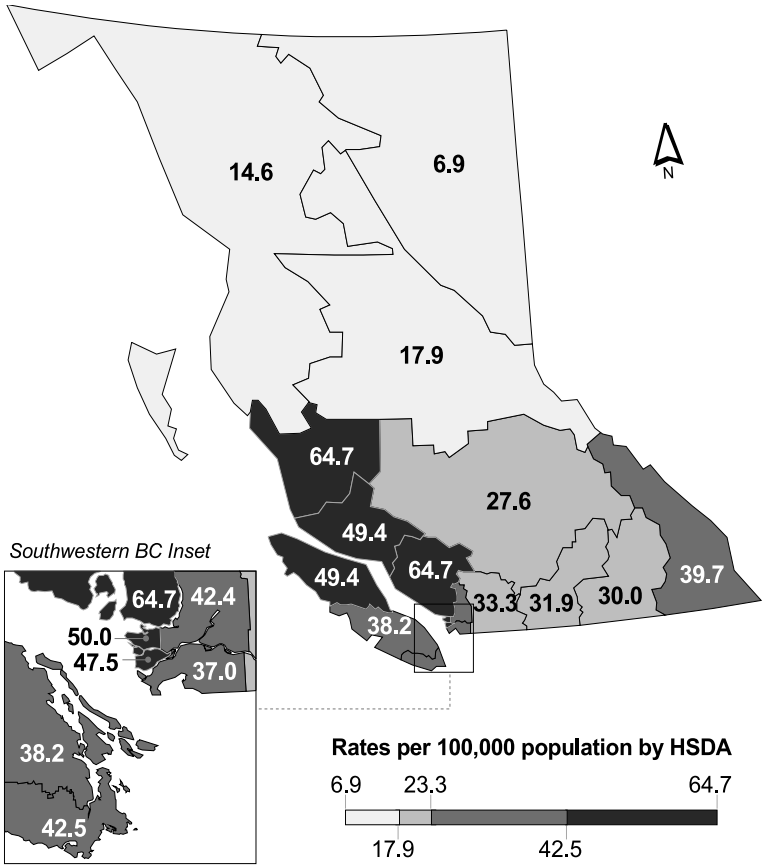
Campylobacteriosis was the most commonly reported enteric disease with a total of 1853 cases reported in 2012. The rate has been fairly stable since 2004, although there has been a slow increase in the last two years. Similar to past years, rates were highest among children aged 1 to 4 years, particularly among males, and adults between 15 and 29 years. The highest rate was once again reported from North Shore/Coast Garibaldi (64.7 per 100,000 population). This was followed by other HSDAs in the lower mainland, Vancouver Island and East Kootenay. The geographic distribution is similar to that seen in previous years. As in most years, the number of cases reported was higher during the summer months, between weeks 24 and 37. No outbreaks were reported.

20.1 Campylobacteriosis Rates by Year, 2003-2012



	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
BC Campylobacteriosis Reports	1708	1471	1569	1583	1640	1645	1755	1558	1722	1853
BC Campylobacteriosis Rate	41.4	35.4	37.4	37.3	38.1	37.5	39.4	34.4	37.6	40.1
Canadian Campylobacteriosis Rate	31.7	30.0	30.9	30.6	29.1	28.4	25.8	26.5	27.5	

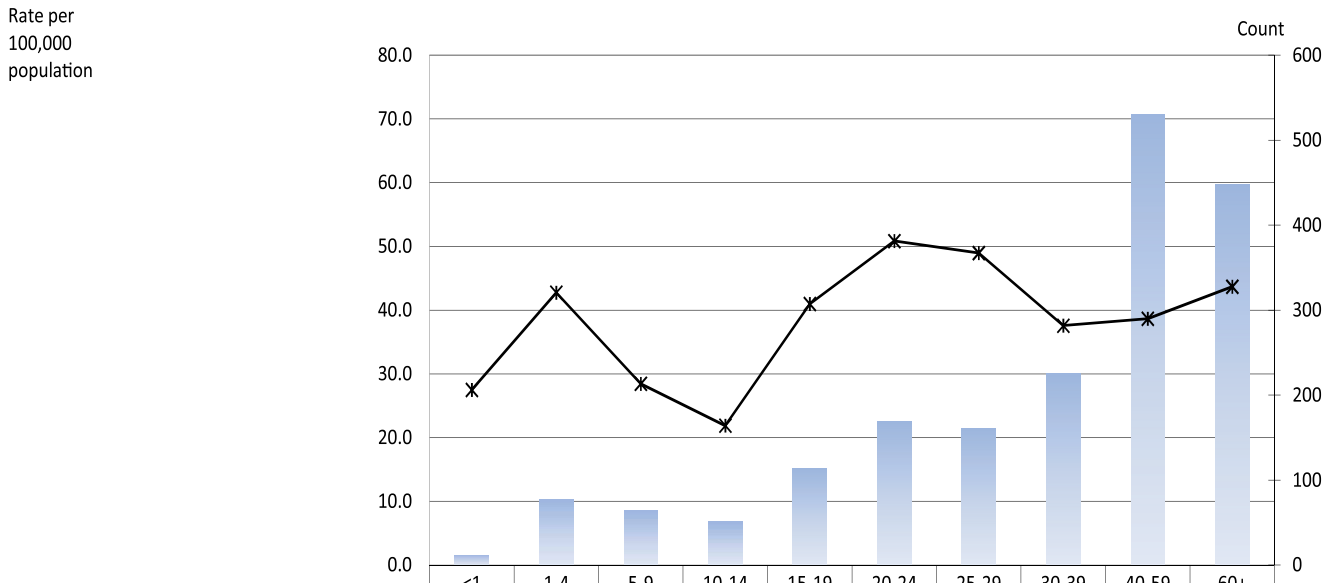
20.2 Campylobacteriosis Rates by HSDA, 2012



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	32	39.7
12	Kootenay Boundary	24	30.0
13	Okanagan	113	31.9
14	Thompson Cariboo Shuswap	62	27.6
21	Fraser East	96	33.3
22	Fraser North	264	42.4
23	Fraser South	273	37.0
31	Richmond	95	47.5
32	Vancouver	342	50.0
33	North Shore/Coast Garibaldi	188	64.7
41	South Vancouver Island	160	42.5
42	Central Vancouver Island	102	38.2
43	North Vancouver Island	60	49.4
51	Northwest	11	14.6
52	Northern Interior	26	17.9
53	Northeast	5	6.9

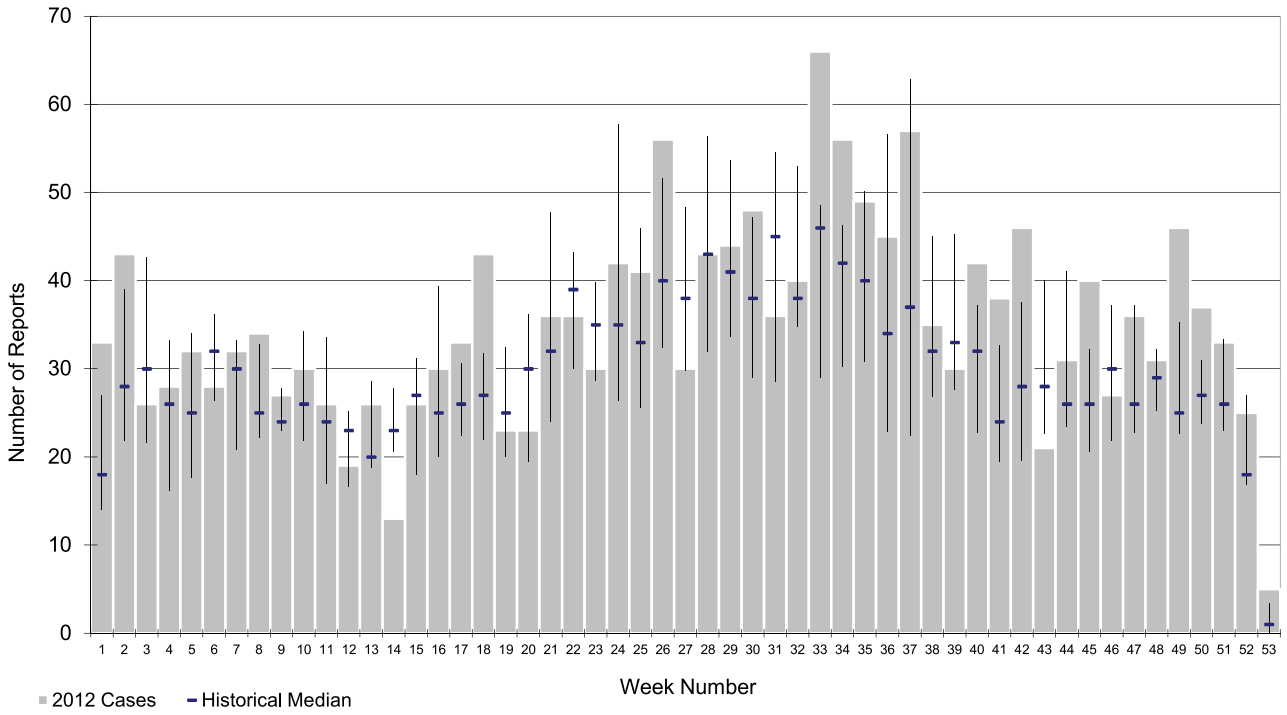
Note: Map classification by Jenks natural breaks method.

20.3 Campylobacteriosis Rates by Age Group and Sex, 2012



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Campylobacteriosis Reports - Female	4	30	24	14	35	76	78	111	254	222
Campylobacteriosis Reports - Male	8	48	40	37	79	93	83	114	276	226
Campylobacteriosis Reports - Total	12	78	64	51	114	169	161	226	530	448
Campylobacteriosis Rate - Female	18.9	33.9	22.1	12.4	25.9	47.4	48.3	36.4	36.6	40.8
Campylobacteriosis Rate - Male	35.6	51.0	34.4	30.8	55.2	54.0	49.6	38.5	40.8	46.9
Campylobacteriosis Rate - Total	27.5	42.8	28.5	21.9	41.0	50.8	49.0	37.6	38.7	43.7

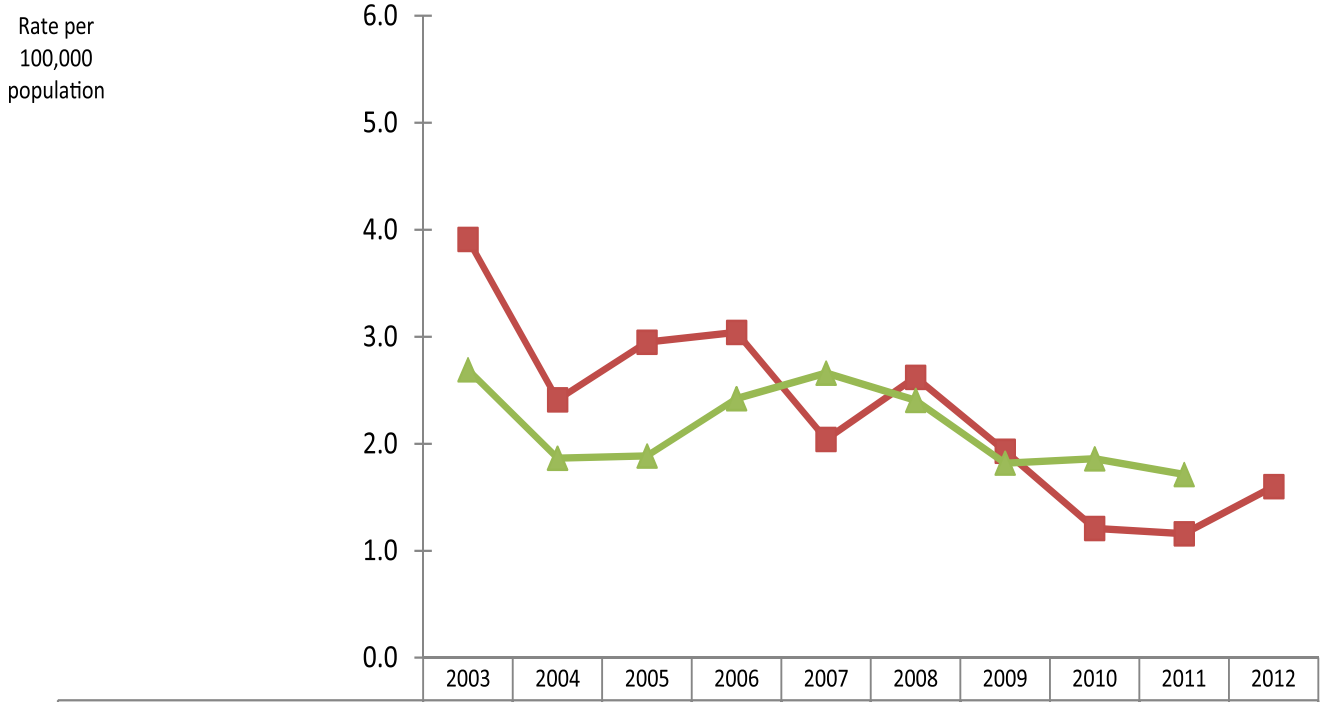
20.4 2012 Campylobacteriosis Reports Compared to Historical Median and the 10th and 90th Percentiles Around the Median (2003 to 2011)



Cryptosporidiosis

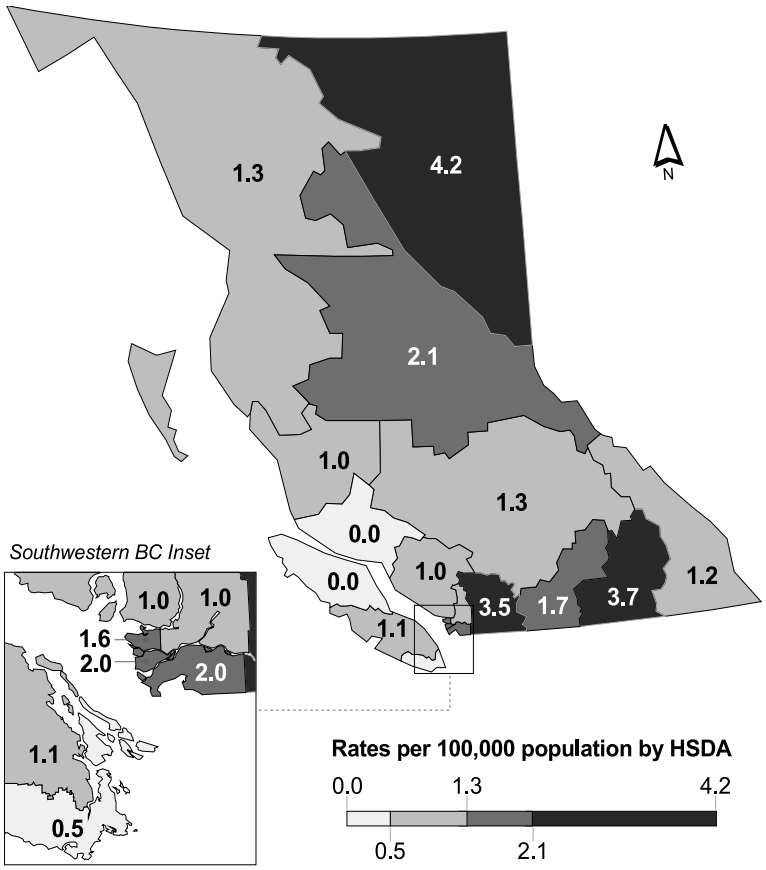
In 2012, 74 cases (1.6 per 100,000 population) of cryptosporidiosis were reported, a slight increase as compared to the previous two years. The highest rate was reported from Northeast (with only 3 cases), followed by Kootenay Boundary (3 cases) and Fraser East (10 cases). As in previous years, the incidence was highest in children aged 1-9 years. No outbreaks were reported, but as expected, a slight peak was evident in the late summer-early fall (weeks 28-40).

21.1 Cryptosporidiosis Rates by Year, 2003-2012



	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
BC Cryptosporidiosis Reports	161	100	124	129	88	115	86	55	53	74
BC Cryptosporidiosis Rate	3.9	2.4	3.0	3.0	2.0	2.6	1.9	1.2	1.2	1.6
Canadian Cryptosporidiosis Rate	2.7	1.9	1.9	2.4	2.7	2.4	1.8	1.9	1.7	

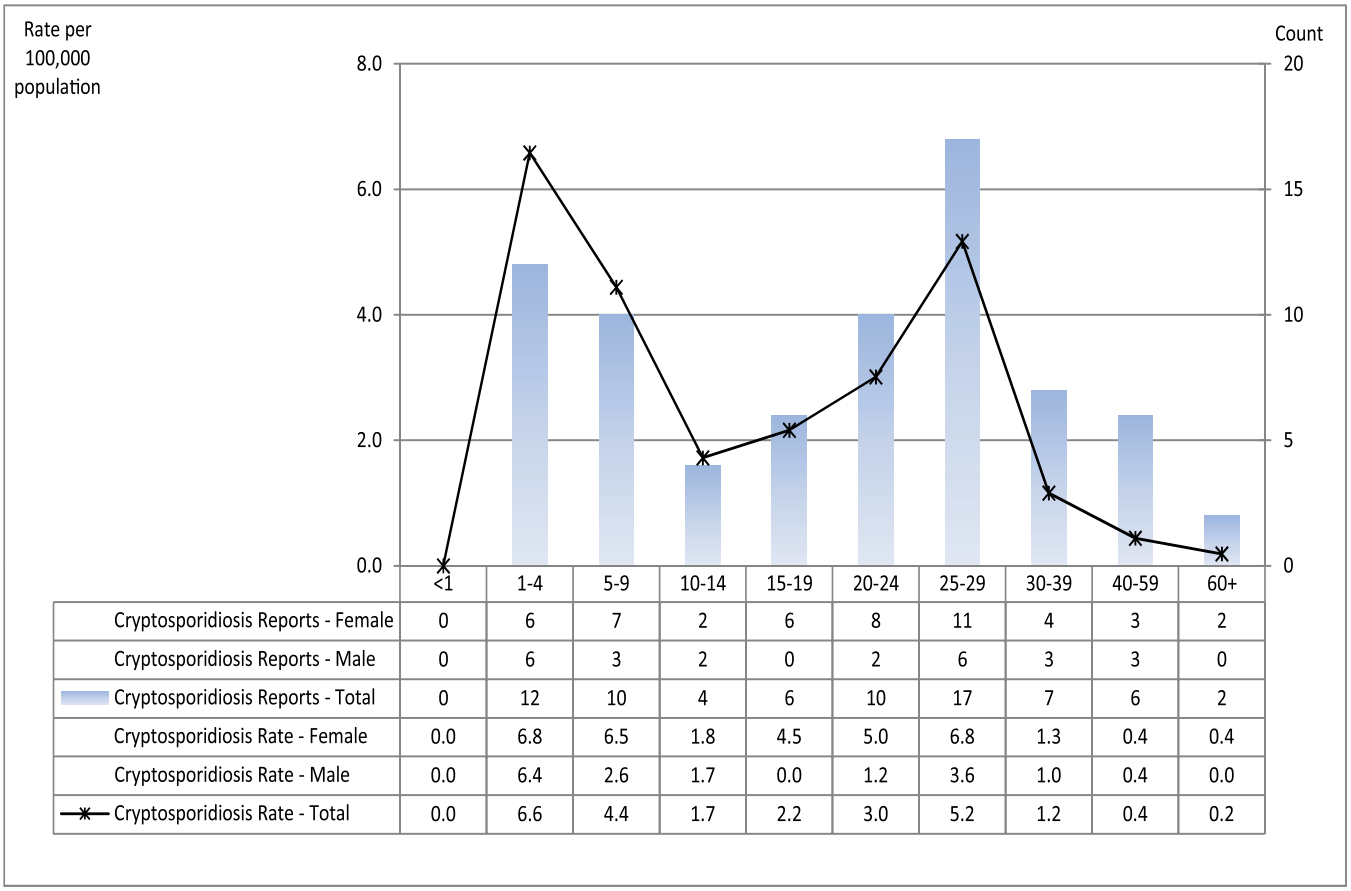
21.2 Cryptosporidiosis Rates by HSDA, 2012



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	1	1.2
12	Kootenay Boundary	3	3.7
13	Okanagan	6	1.7
14	Thompson Cariboo Shuswap	3	1.3
21	Fraser East	10	3.5
22	Fraser North	6	1.0
23	Fraser South	15	2.0
31	Richmond	4	2.0
32	Vancouver	11	1.6
33	North Shore/Coast Garibaldi	3	1.0
41	South Vancouver Island	2	0.5
42	Central Vancouver Island	3	1.1
43	North Vancouver Island	0	0.0
51	Northwest	1	1.3
52	Northern Interior	3	2.1
53	Northeast	3	4.2

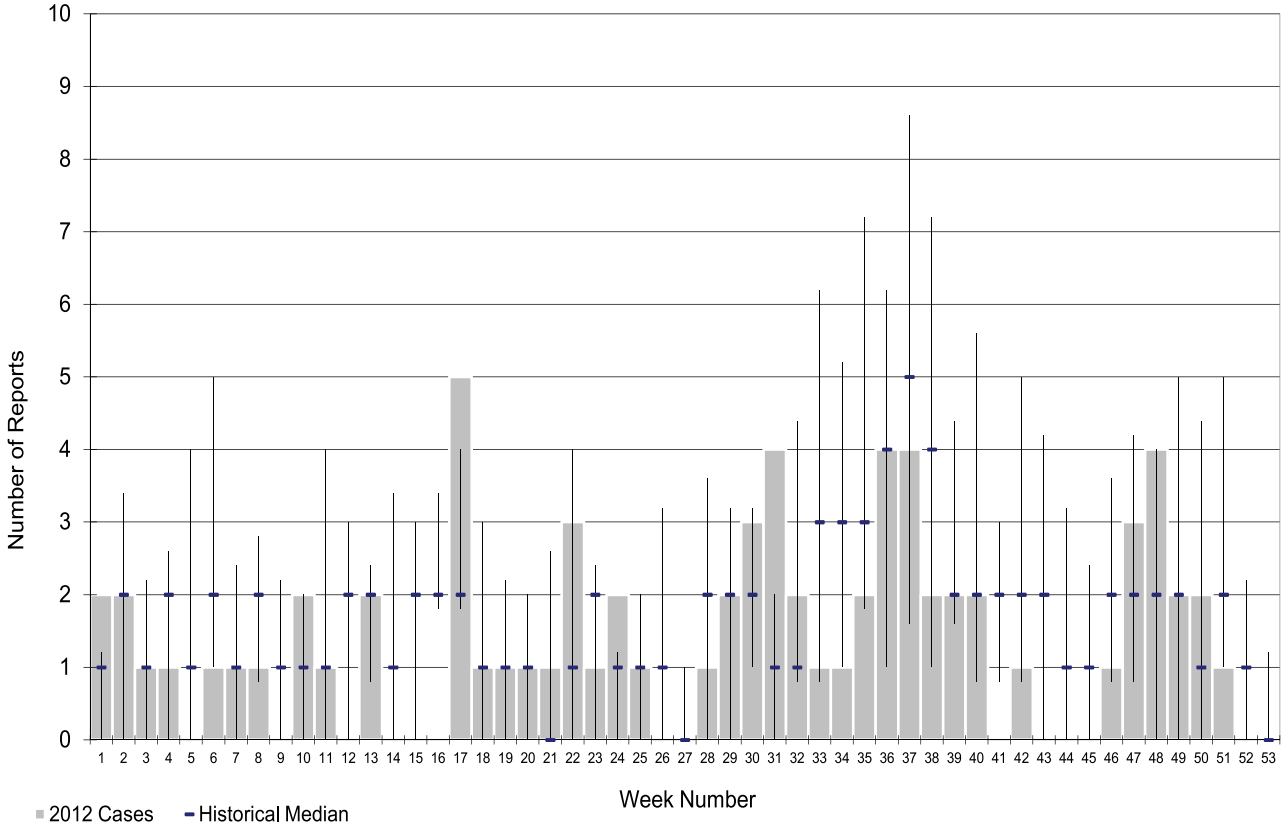
Note: Map classification by Jenks natural breaks method.

21.3 Cryptosporidiosis Rates by Age Group and Sex, 2012



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Cryptosporidiosis Reports - Female	0	6	7	2	6	8	11	4	3	2
Cryptosporidiosis Reports - Male	0	6	3	2	0	2	6	3	3	0
Cryptosporidiosis Reports - Total	0	12	10	4	6	10	17	7	6	2
Cryptosporidiosis Rate - Female	0.0	6.8	6.5	1.8	4.5	5.0	6.8	1.3	0.4	0.4
Cryptosporidiosis Rate - Male	0.0	6.4	2.6	1.7	0.0	1.2	3.6	1.0	0.4	0.0
Cryptosporidiosis Rate - Total	0.0	6.6	4.4	1.7	2.2	3.0	5.2	1.2	0.4	0.2

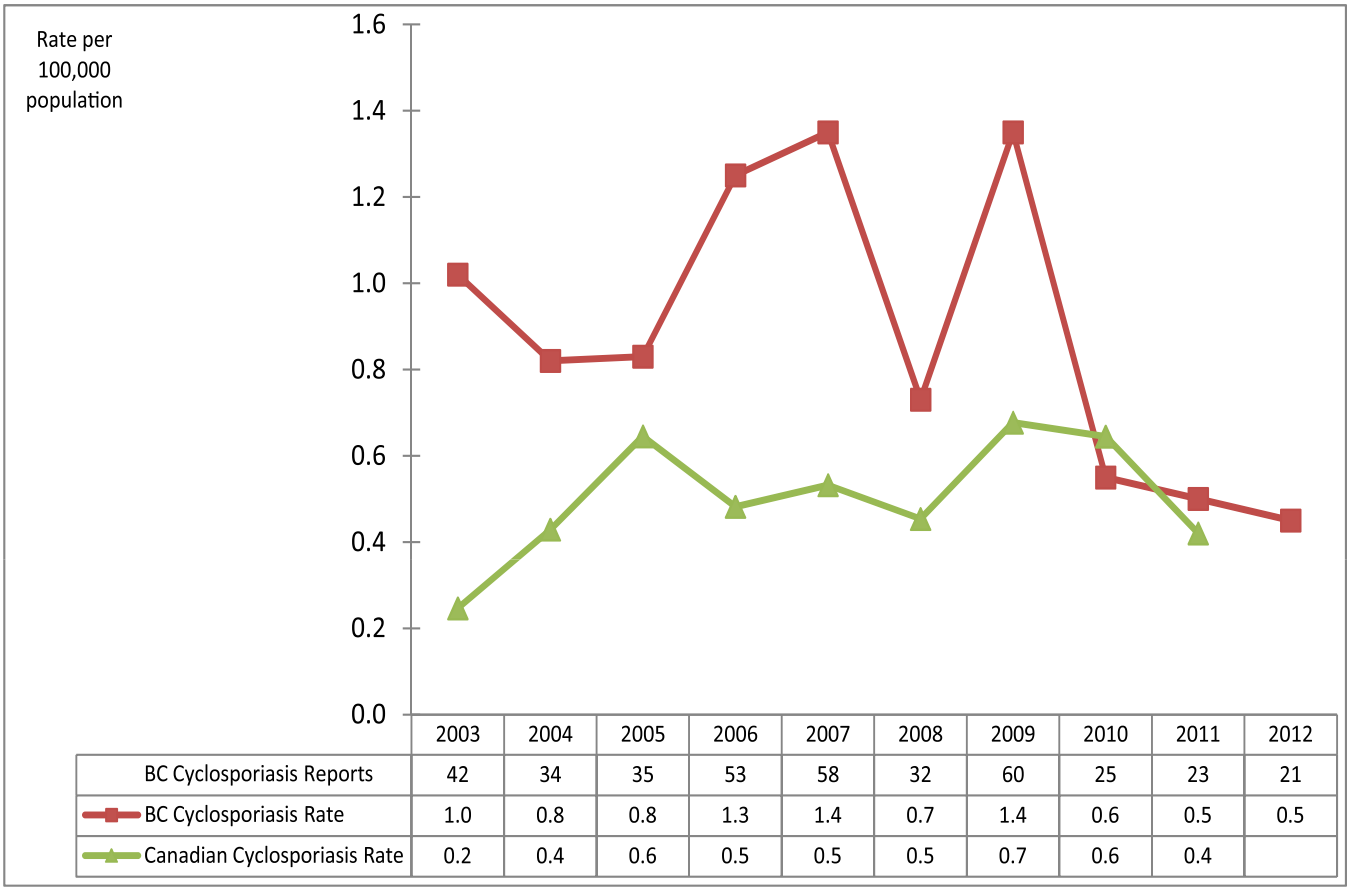
21.4 2012 Cryptosporidiosis Reports Compared to Historical Median and the 10th and 90th Percentiles Around the Median (2003 to 2011)



Cyclosporiasis

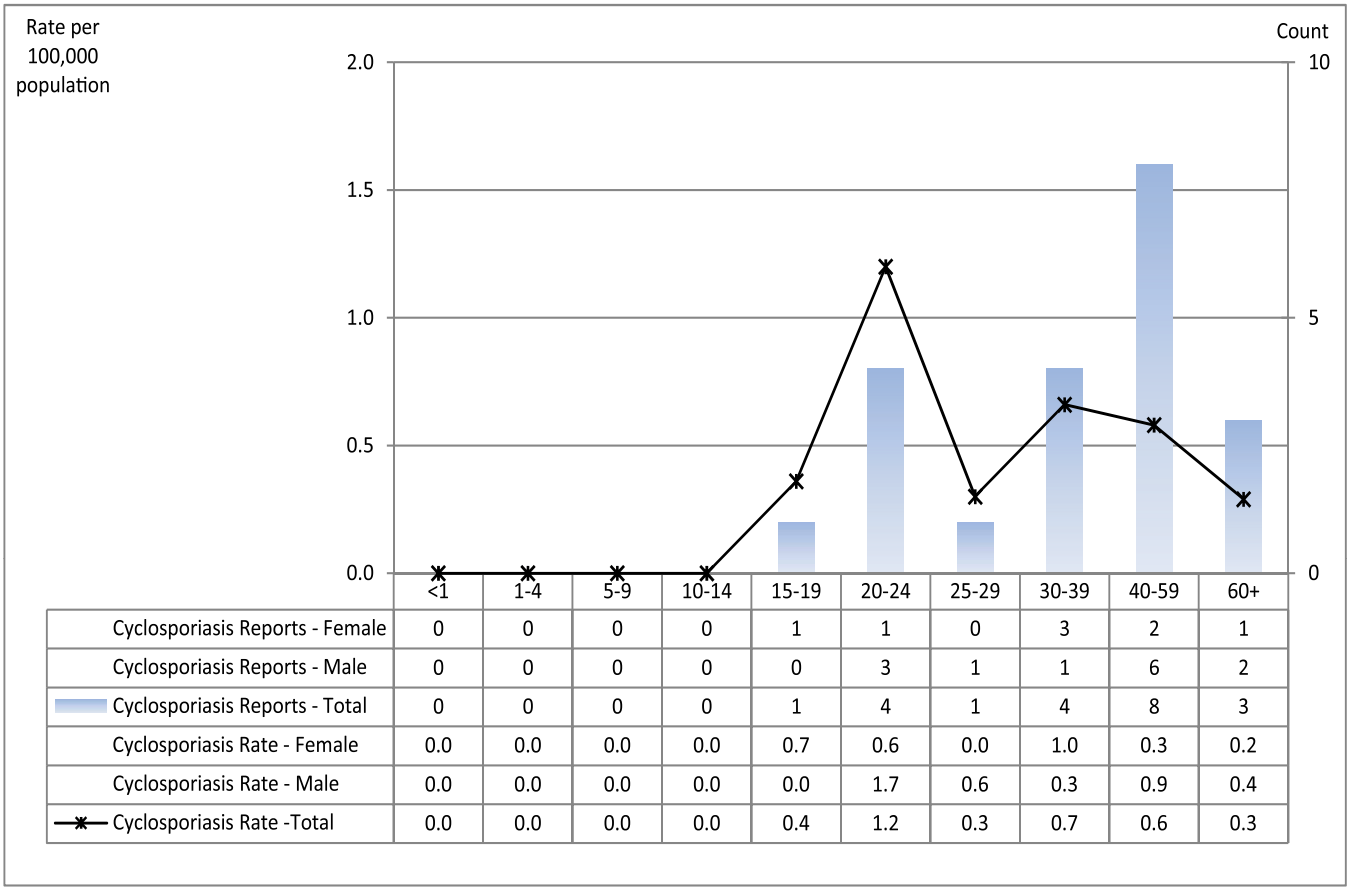
The number of cyclosporiasis infections decreased slightly in 2012 to 21 cases (0.5 per 100,000 population). The rate of disease has decreased for the past 3 years and is the lowest rate in 10 years. Previous peaks have been due to locally-acquired outbreaks associated with fresh produce (2006, 2007) or travel to endemic areas (2009). The majority of the infections in 2012 were also a result of travel (85.0%). Most cases traveled to endemic areas such as South and Central America. Incidence rates were higher in adults and were highest among males aged 20 to 24 years. The majority of cases were reported between June and August (weeks 23-34). This may be due to the fact that adults are most often travelling to *Cyclospora* endemic areas and are diagnosed after travel which occurs in the spring and summer.

22.1 Cyclosporiasis Rates by Year, 2003-2012



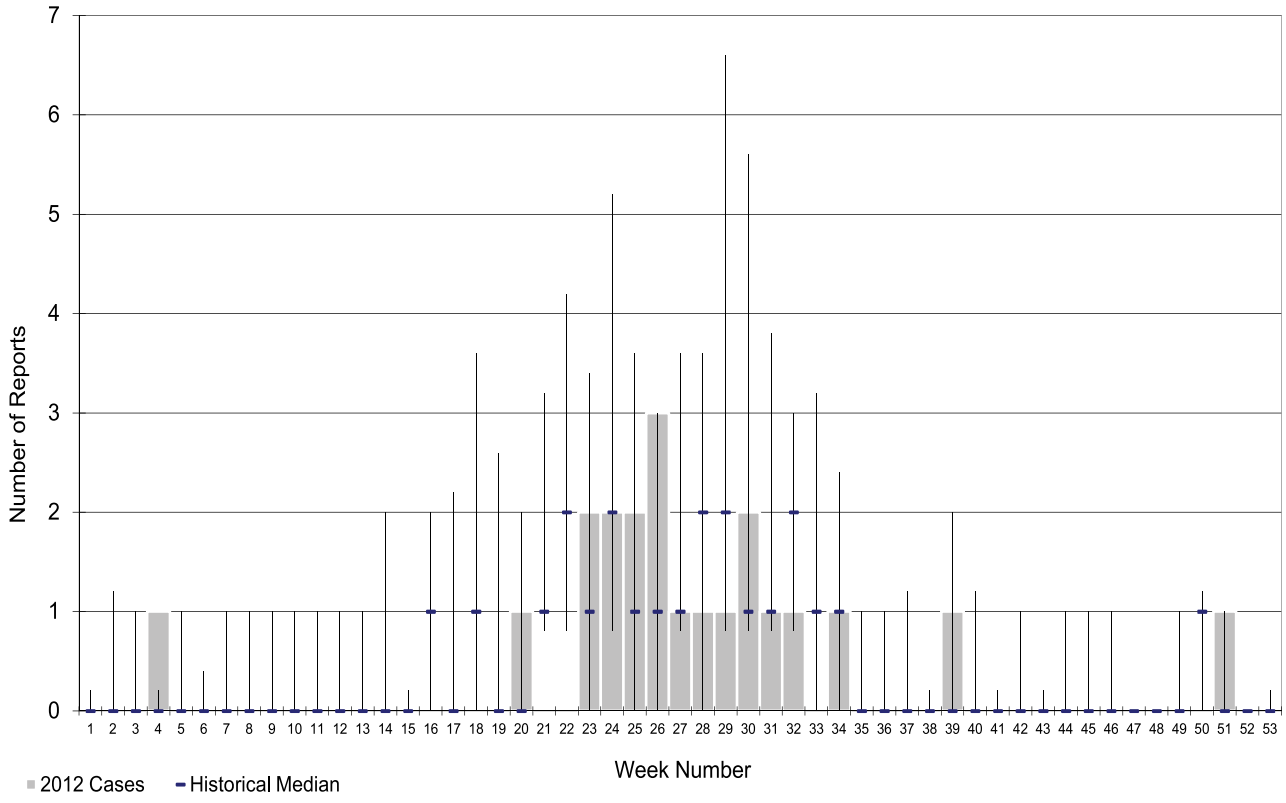
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
BC Cyclosporiasis Reports	42	34	35	53	58	32	60	25	23	21
BC Cyclosporiasis Rate	1.0	0.8	0.8	1.3	1.4	0.7	1.4	0.6	0.5	0.5
Canadian Cyclosporiasis Rate	0.2	0.4	0.6	0.5	0.5	0.5	0.7	0.6	0.4	

22.2 Cyclosporiasis Rates by Age Group and Sex, 2012



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Cyclosporiasis Reports - Female	0	0	0	0	1	1	0	3	2	1
Cyclosporiasis Reports - Male	0	0	0	0	0	3	1	1	6	2
Cyclosporiasis Reports - Total	0	0	0	0	1	4	1	4	8	3
Cyclosporiasis Rate - Female	0.0	0.0	0.0	0.0	0.7	0.6	0.0	1.0	0.3	0.2
Cyclosporiasis Rate - Male	0.0	0.0	0.0	0.0	0.0	1.7	0.6	0.3	0.9	0.4
Cyclosporiasis Rate -Total	0.0	0.0	0.0	0.0	0.4	1.2	0.3	0.7	0.6	0.3

22.3 2012 Cyclosporiasis Reports Compared to Historical Median and the 10th and 90th Percentiles Around the Median (2003 to 2011)

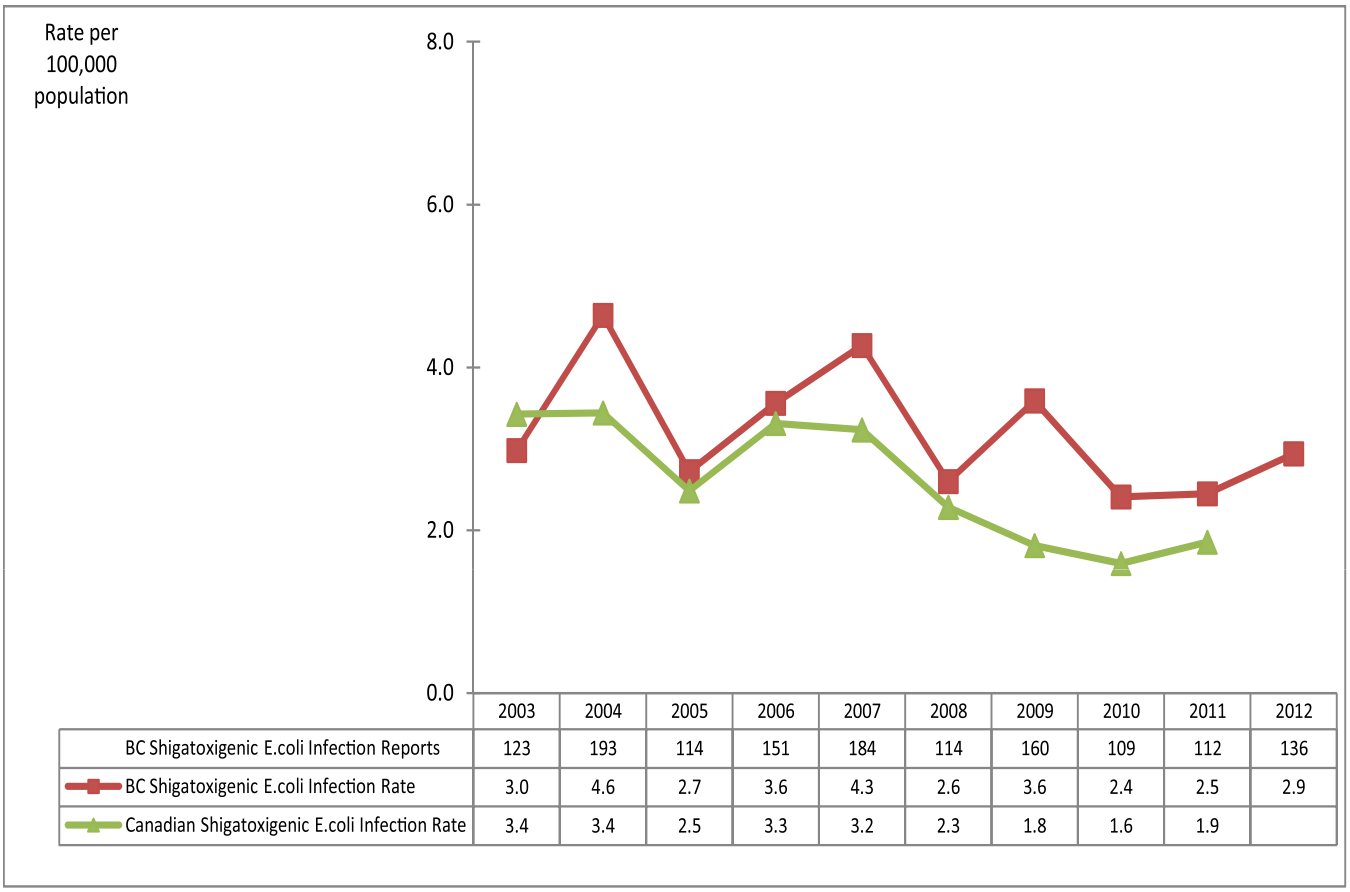


Shigatoxigenic *E. coli*

There were 136 cases of shigatoxigenic *E. coli* infection reported in BC in 2012, 18.8% of which were associated with international travel. After decreasing for a few years, the rate is now somewhat more stable. The highest number of cases and rate of infection were reported from South Vancouver Island; this was likely due to an outbreak which occurred during the summer. Incidence was highest in children aged 1-4 years and adults 20-24 years. The number of reported cases was highest in the summer and fall, as expected. There was a peak of cases reported in week 41. This was during the time of a national *E. coli* O157:H7 outbreak associated with beef products; BC had three cases associated with this outbreak.

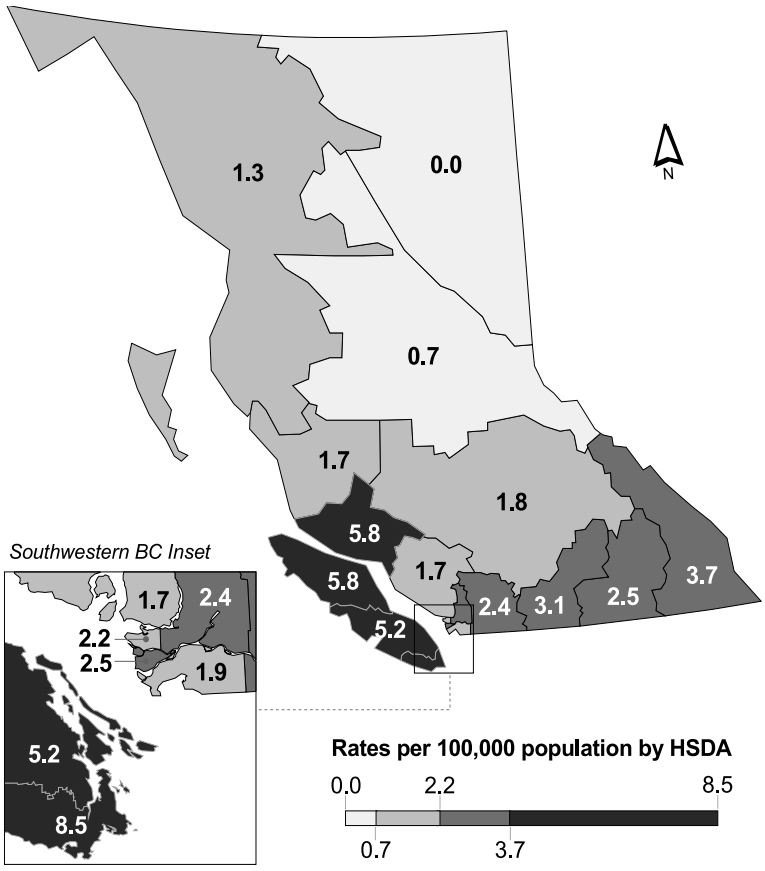
O157 continues to be the most common serogroup in BC. A large increase in O121 was seen in 2012 compared to 2011 (21.6% compared to 5.2%). Most of these cases were reported from VIHA and associated with an outbreak.

23.1 Shigatoxigenic *E. coli* Rates by Year, 2003-2012



	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
BC Shigatoxigenic E.coli Infection Reports	123	193	114	151	184	114	160	109	112	136
BC Shigatoxigenic E.coli Infection Rate	3.0	4.6	2.7	3.6	4.3	2.6	3.6	2.4	2.5	2.9
Canadian Shigatoxigenic E.coli Infection Rate	3.4	3.4	2.5	3.3	3.2	2.3	1.8	1.6	1.9	

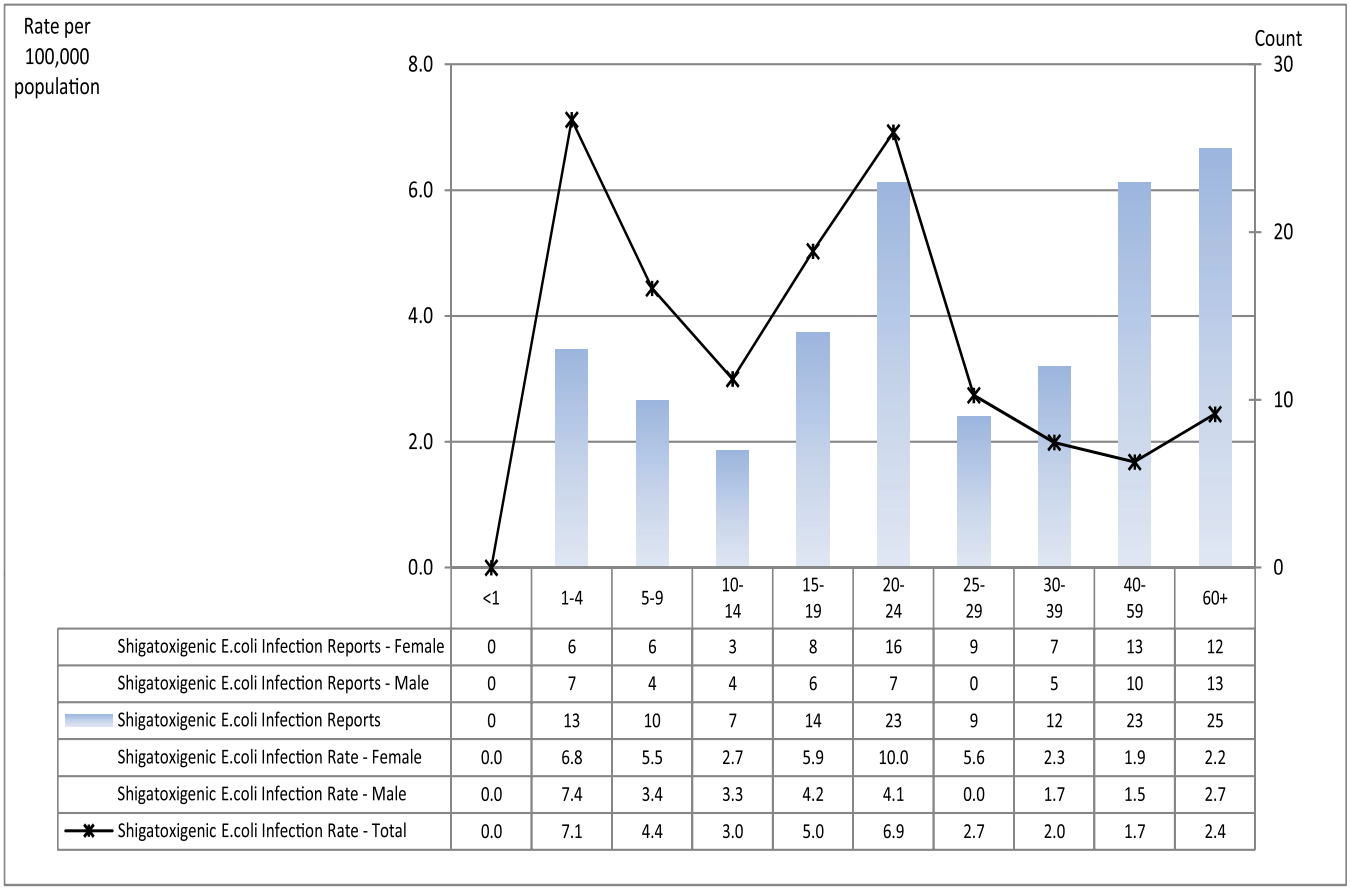
23.2 Shigatoxigenic *E. coli* Rates by HSDA, 2012



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	3	3.7
12	Kootenay Boundary	2	2.5
13	Okanagan	11	3.1
14	Thompson Cariboo Shuswap	4	1.8
21	Fraser East	7	2.4
22	Fraser North	15	2.4
23	Fraser South	14	1.9
31	Richmond	5	2.5
32	Vancouver	15	2.2
33	North Shore/Coast Garibaldi	5	1.7
41	South Vancouver Island	32	8.5
42	Central Vancouver Island	14	5.2
43	North Vancouver Island	7	5.8
51	Northwest	1	1.3
52	Northern Interior	1	0.7
53	Northeast	0	0.0

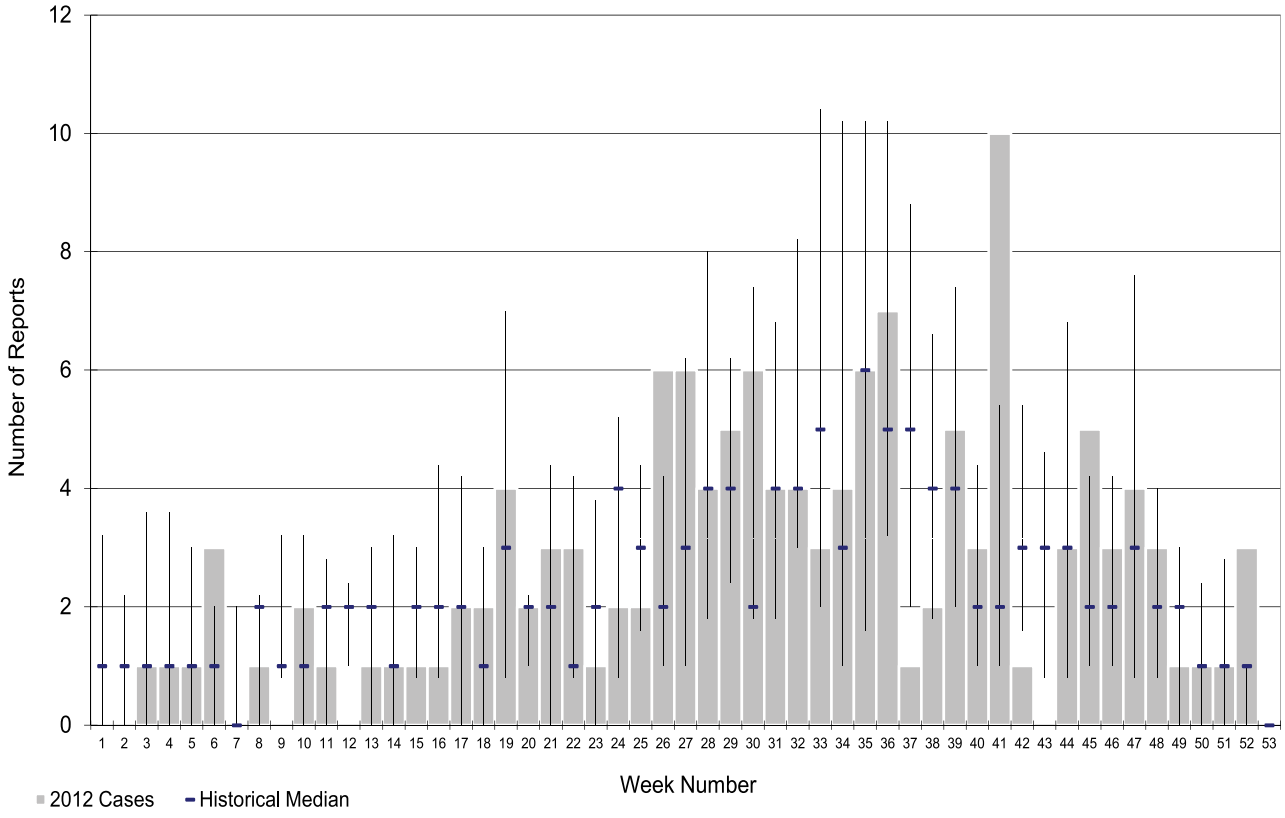
Note: Map classification by Jenks natural breaks method.

23.3 Shigatoxigenic *E. coli* Rates by Age Group and Sex, 2012



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Shigatoxigenic E.coli Infection Reports - Female	0	6	6	3	8	16	9	7	13	12
Shigatoxigenic E.coli Infection Reports - Male	0	7	4	4	6	7	0	5	10	13
Shigatoxigenic E.coli Infection Reports	0	13	10	7	14	23	9	12	23	25
Shigatoxigenic E.coli Infection Rate - Female	0.0	6.8	5.5	2.7	5.9	10.0	5.6	2.3	1.9	2.2
Shigatoxigenic E.coli Infection Rate - Male	0.0	7.4	3.4	3.3	4.2	4.1	0.0	1.7	1.5	2.7
Shigatoxigenic E.coli Infection Rate - Total	0.0	7.1	4.4	3.0	5.0	6.9	2.7	2.0	1.7	2.4

23.4 2012 Shigatoxigenic *E. coli* Reports Compared to Historical Median and the 10th and 90th Percentiles Around the Median (2003 to 2011)



23.5 Shigatoxigenic *E. coli* serogroup distribution, 2012

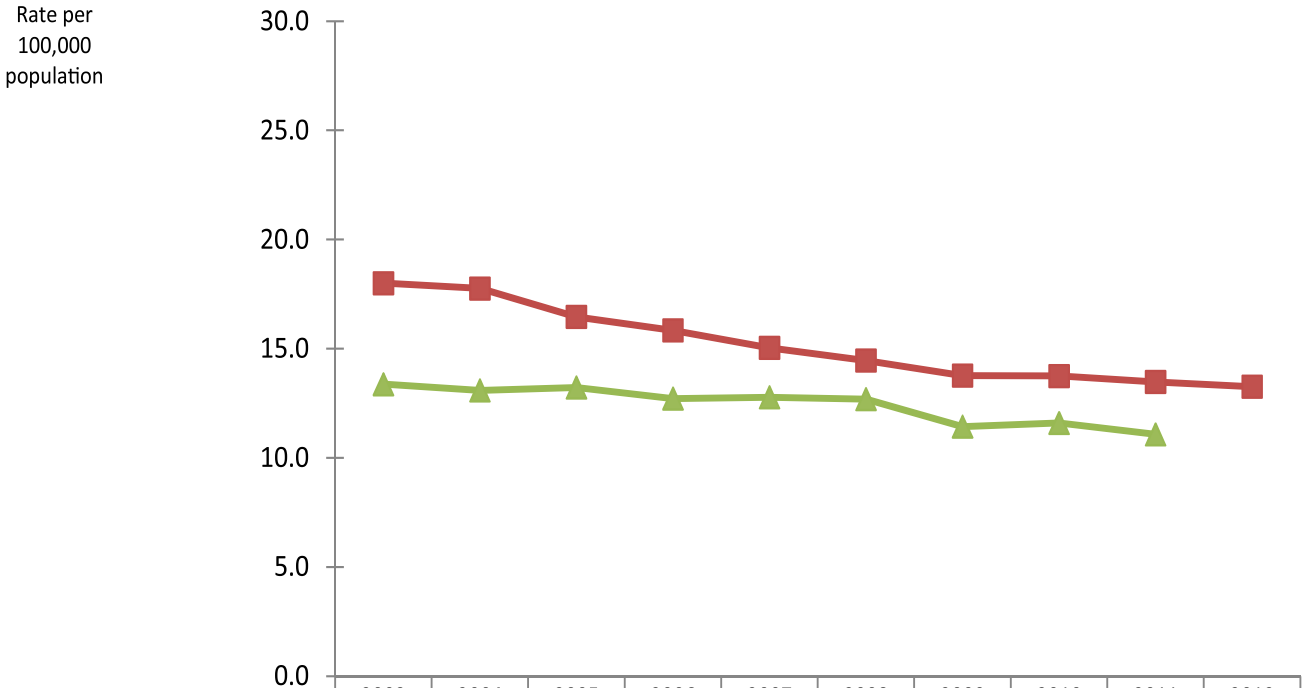
Rank	Serogroup	Number of Isolates	Proportion
1	O157	59	57.8%
2	O121	22	21.6%
3	O26	8	7.8%
4	O103	6	5.9%
	Other	4	3.9%
	Unknown/Unspecified	3	2.9%
	Total	102	100.0%

Note: Serogroup distribution is based on BCCDC PHMRL data. Numbers may vary from those reported in iPHIS.

Giardiasis

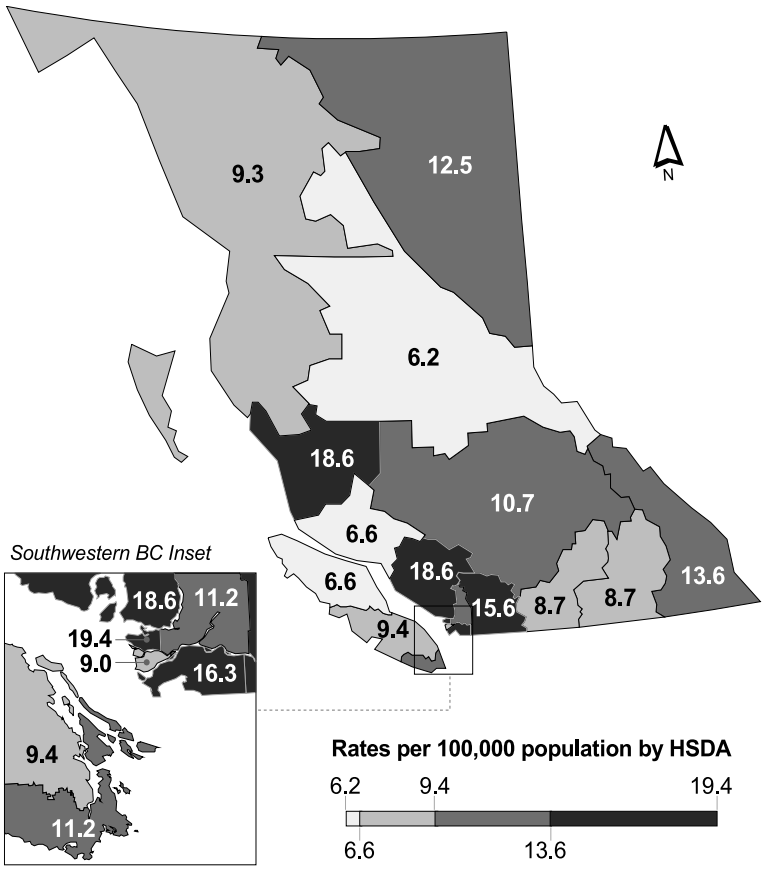
Annual rates of giardiasis in BC remained constant in 2012 with 613 cases reported (13.3 per 100,000 population). Rates were higher in males than females in all age groups except 0-1 years, with the highest rates reported in children 1-9 years and adult males 20-59 years. The latter may in part be due to transmission between men who have sex with men. There was no seasonal pattern and no outbreaks were detected. Rates were highest in Vancouver, North Shore/ Coast Garibaldi and Fraser South.

24.1 Giardiasis Rates by Year, 2003-2012



	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
BC Giardiasis Reports	742	738	691	672	648	634	614	623	617	613
BC Giardiasis Rate	18.0	17.8	16.5	15.8	15.0	14.5	13.8	13.8	13.5	13.3
Canadian Giardiasis Rate	13.4	13.1	13.2	12.7	12.8	12.7	11.4	11.6	11.1	

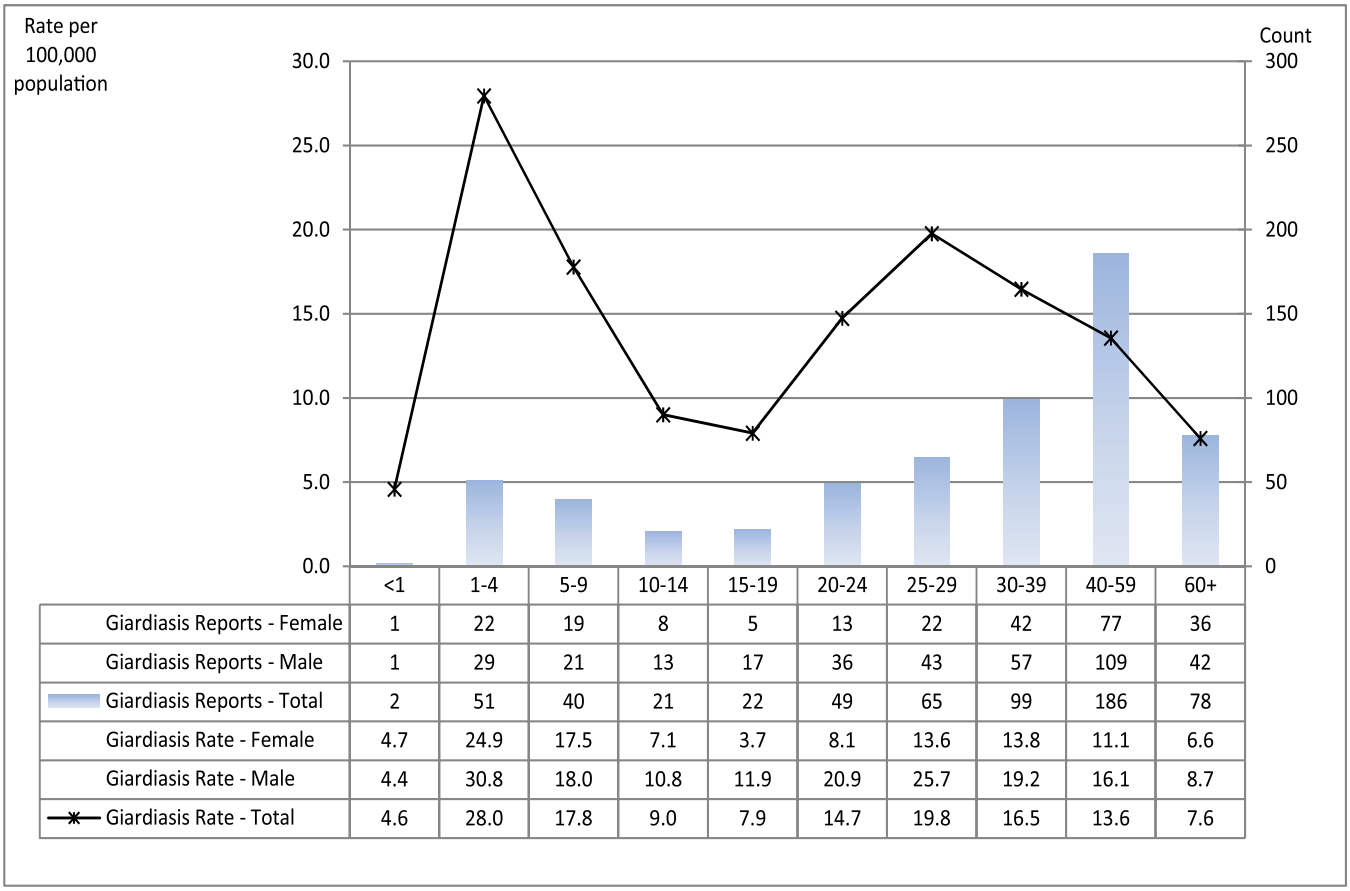
24.2 Giardiasis by HSDA, 2012



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	11	13.6
12	Kootenay Boundary	7	8.7
13	Okanagan	31	8.7
14	Thompson Cariboo Shuswap	24	10.7
21	Fraser East	45	15.6
22	Fraser North	70	11.2
23	Fraser South	120	16.3
31	Richmond	18	9.0
32	Vancouver	133	19.4
33	North Shore/Coast Garibaldi	54	18.6
41	South Vancouver Island	42	11.2
42	Central Vancouver Island	25	9.4
43	North Vancouver Island	8	6.6
51	Northwest	7	9.3
52	Northern Interior	9	6.2
53	Northeast	9	12.5

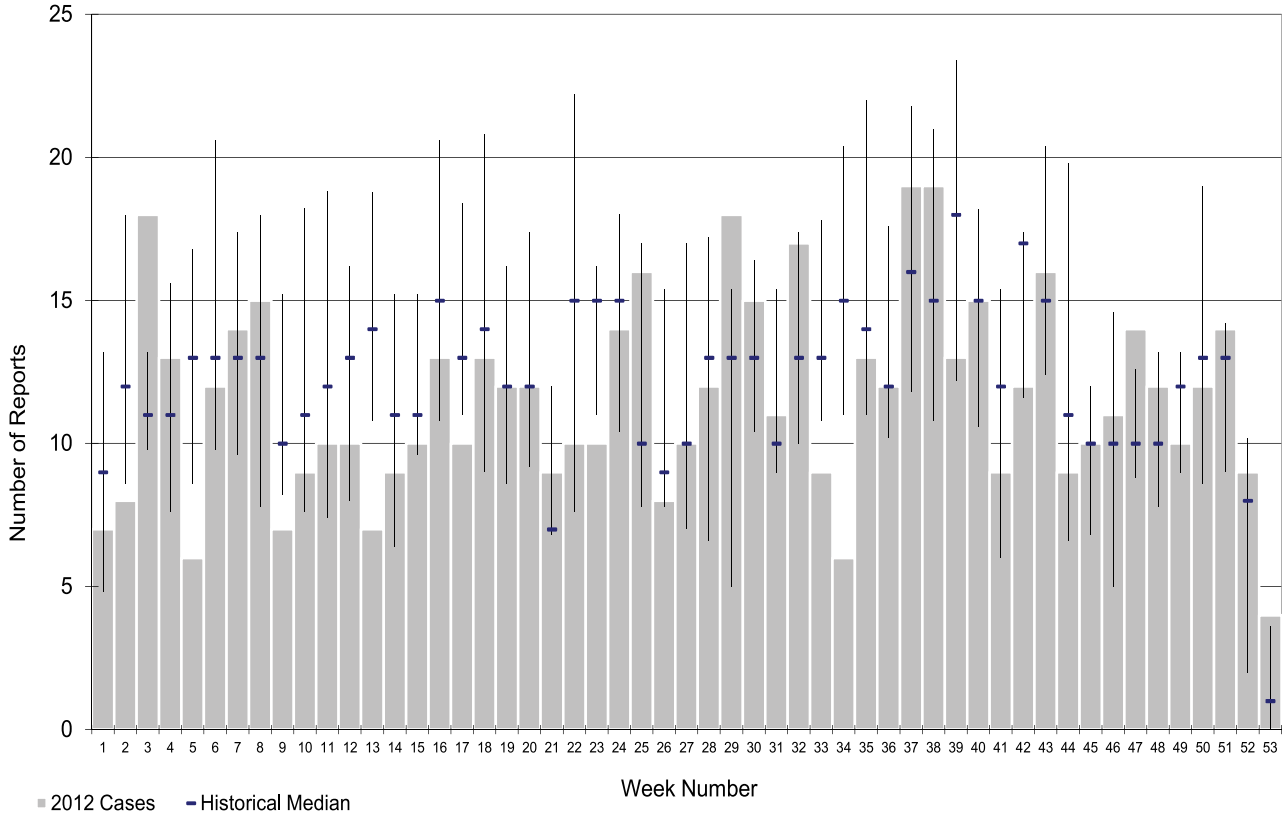
Note: Map classification by Jenks natural breaks method.

24.3 Giardiasis Rates by Age Group and Sex, 2012



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Giardiasis Reports - Female	1	22	19	8	5	13	22	42	77	36
Giardiasis Reports - Male	1	29	21	13	17	36	43	57	109	42
Giardiasis Reports - Total	2	51	40	21	22	49	65	99	186	78
Giardiasis Rate - Female	4.7	24.9	17.5	7.1	3.7	8.1	13.6	13.8	11.1	6.6
Giardiasis Rate - Male	4.4	30.8	18.0	10.8	11.9	20.9	25.7	19.2	16.1	8.7
Giardiasis Rate - Total	4.6	28.0	17.8	9.0	7.9	14.7	19.8	16.5	13.6	7.6

24.4 2012 Giardiasis Reports Compared to Historical Median and the 10th and 90th Percentiles Around the Median (2003 to 2011)



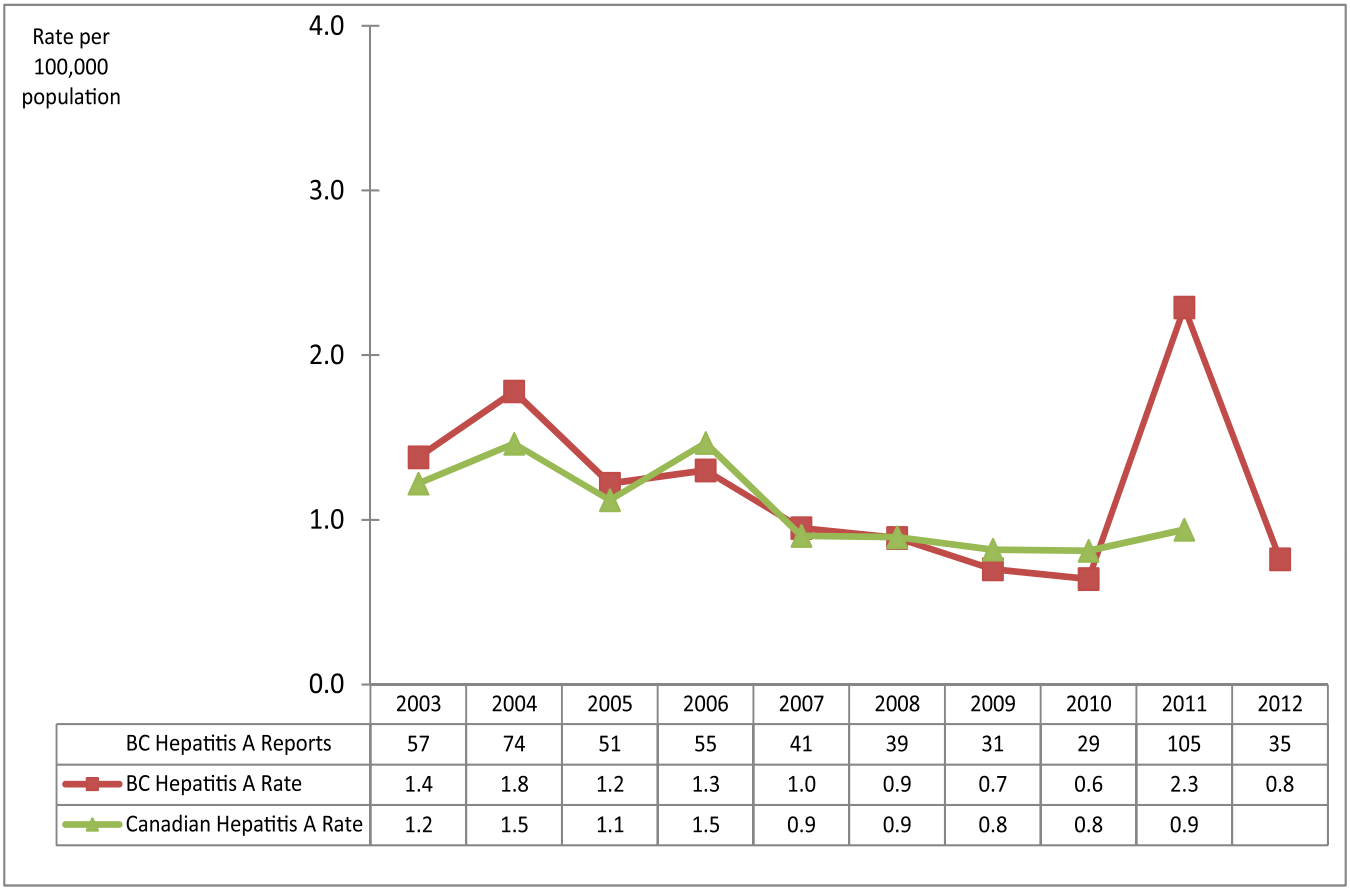
Hepatitis A

In 2012, there were a total of 35 cases of hepatitis A reported in British Columbia. This yielded a rate of 0.8 per 100,000 population which is consistent with the rate <1 per 100,000 population observed in 2008, 2009 and 2010. In 2011, an increase of hepatitis A cases reported was largely due to an outbreak in Central Vancouver Island of about 80 cases.[1]

In 2012, hepatitis A was reported roughly equally in both sexes (16 females, 19 males) and in all age groups with 15-19 year olds having largest number of cases (n=7). Fraser Health Authority reported 17 cases, Vancouver Coastal Health reported 10 and Vancouver Island Health Authority reported six cases. The majority of cases of hepatitis A in BC in 2012 were associated with travel to, or visitors from endemic regions. However, six cases of hepatitis A in 2012; were associated with the consumption of a contaminated frozen fruit blend.

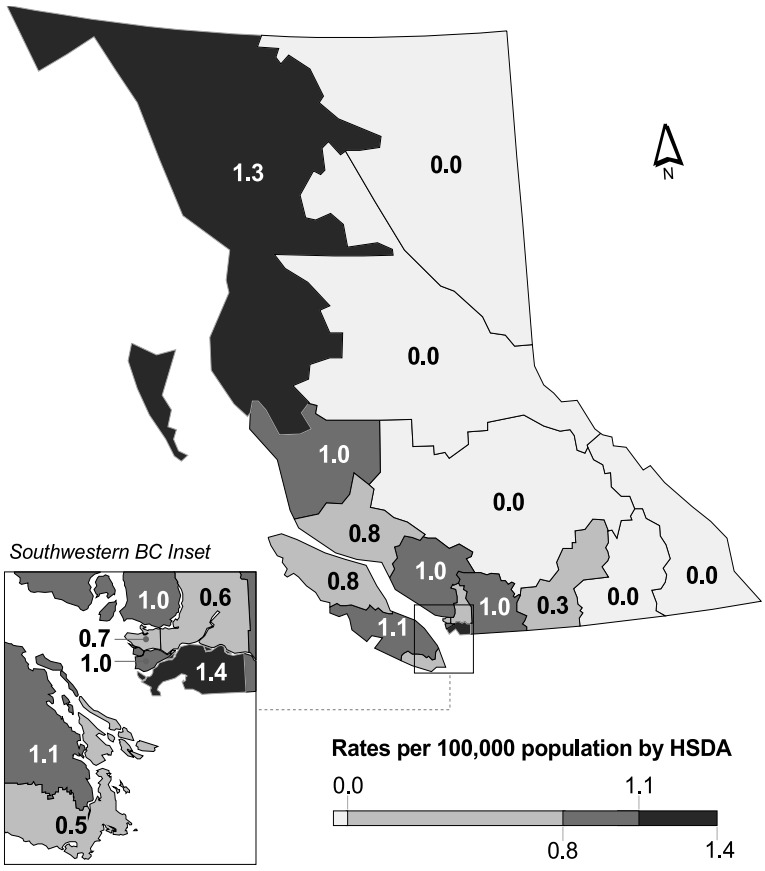
[1]Kuo M, Buxton J. Hepatitis A in British Columbia, 2010-2011. http://www.bccdc.ca/NR/rdonlyres/BAFDED8C-77EA-4493-A3A9-6AD7483A65D6/0/HepatitisAUpdateBC20102011.pdf

25.1 Hepatitis A Rates by Year, 2003-2012



	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
BC Hepatitis A Reports	57	74	51	55	41	39	31	29	105	35
BC Hepatitis A Rate	1.4	1.8	1.2	1.3	1.0	0.9	0.7	0.6	2.3	0.8
Canadian Hepatitis A Rate	1.2	1.5	1.1	1.5	0.9	0.9	0.8	0.8	0.9	

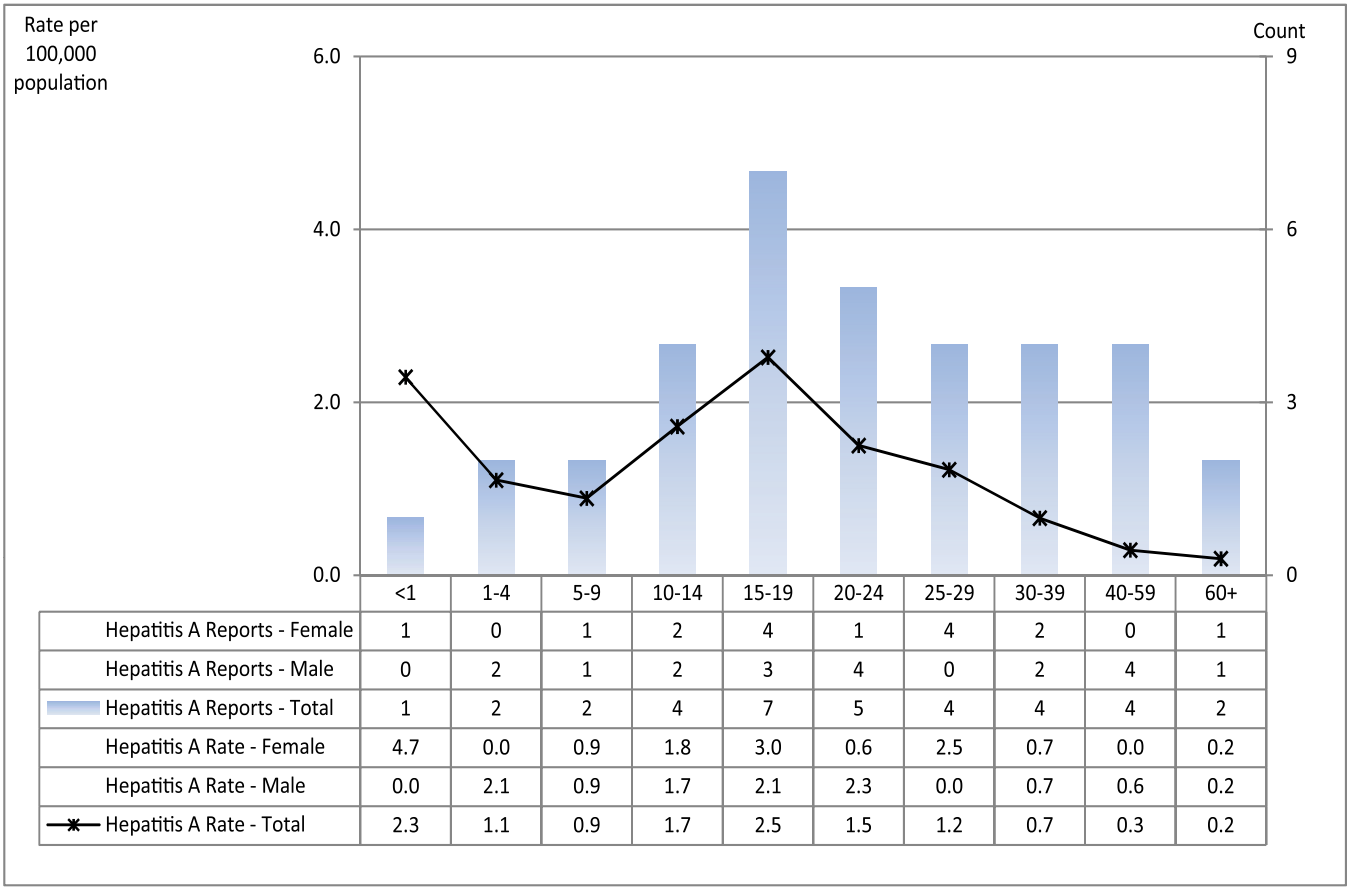
25.2 Hepatitis A Rates by HSDA, 2012



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	3	1.0
22	Fraser North	4	0.6
23	Fraser South	10	1.4
31	Richmond	2	1.0
32	Vancouver	5	0.7
33	North Shore/Coast Garibaldi	3	1.0
41	South Vancouver Island	2	0.5
42	Central Vancouver Island	3	1.1
43	North Vancouver Island	1	0.8
51	Northwest	1	1.3
52	Northern Interior	0	0.0
53	Northeast	0	0.0

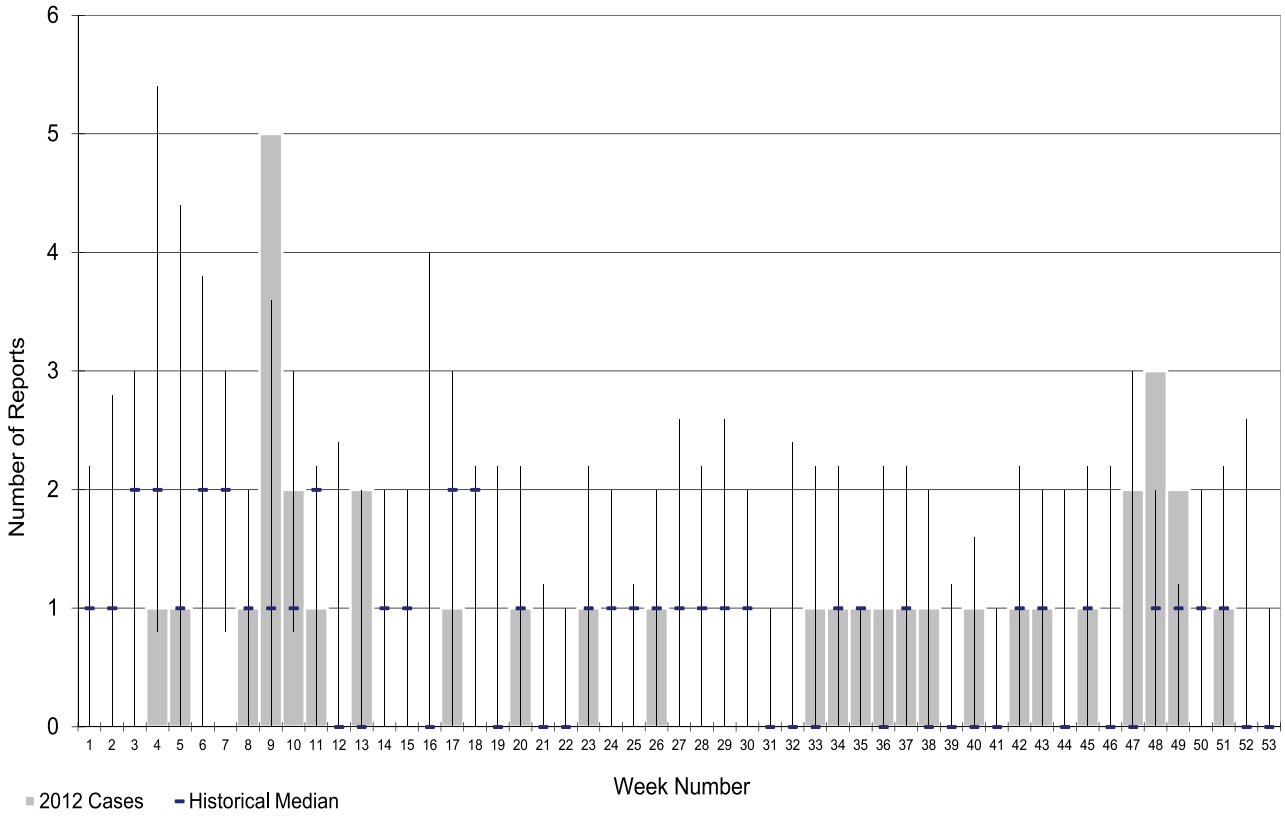
Note: Map classification by Jenks natural breaks method.

25.3 Hepatitis A Rates by Age Group and Sex, 2012



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Hepatitis A Reports - Female	1	0	1	2	4	1	4	2	0	1
Hepatitis A Reports - Male	0	2	1	2	3	4	0	2	4	1
Hepatitis A Reports - Total	1	2	2	4	7	5	4	4	4	2
Hepatitis A Rate - Female	4.7	0.0	0.9	1.8	3.0	0.6	2.5	0.7	0.0	0.2
Hepatitis A Rate - Male	0.0	2.1	0.9	1.7	2.1	2.3	0.0	0.7	0.6	0.2
Hepatitis A Rate - Total	2.3	1.1	0.9	1.7	2.5	1.5	1.2	0.7	0.3	0.2

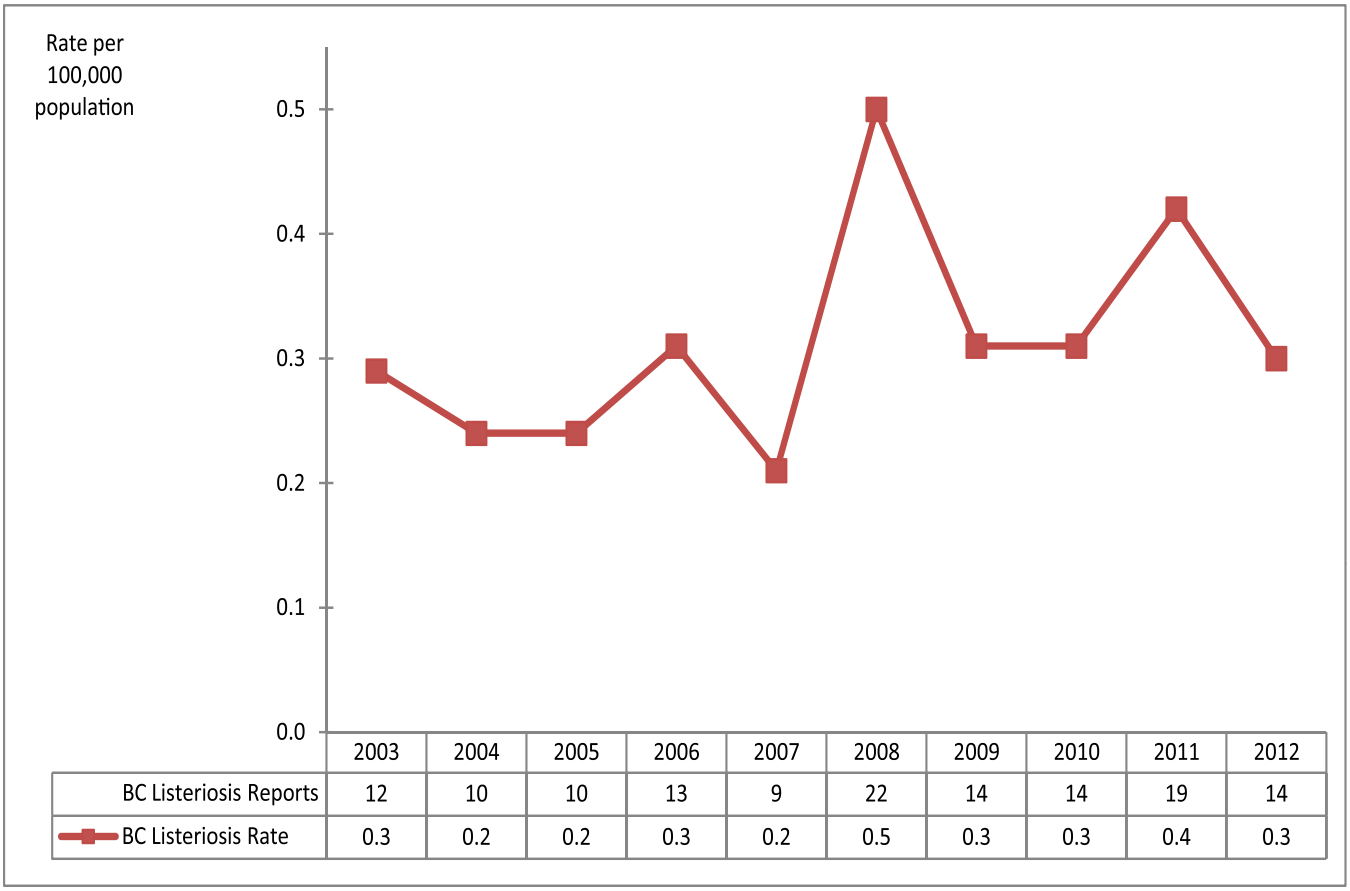
25.4 2012 Hepatitis A Reports Compared to Historical Median and the 10th and 90th Percentiles Around the Median (2003 to 2011)



Listeriosis

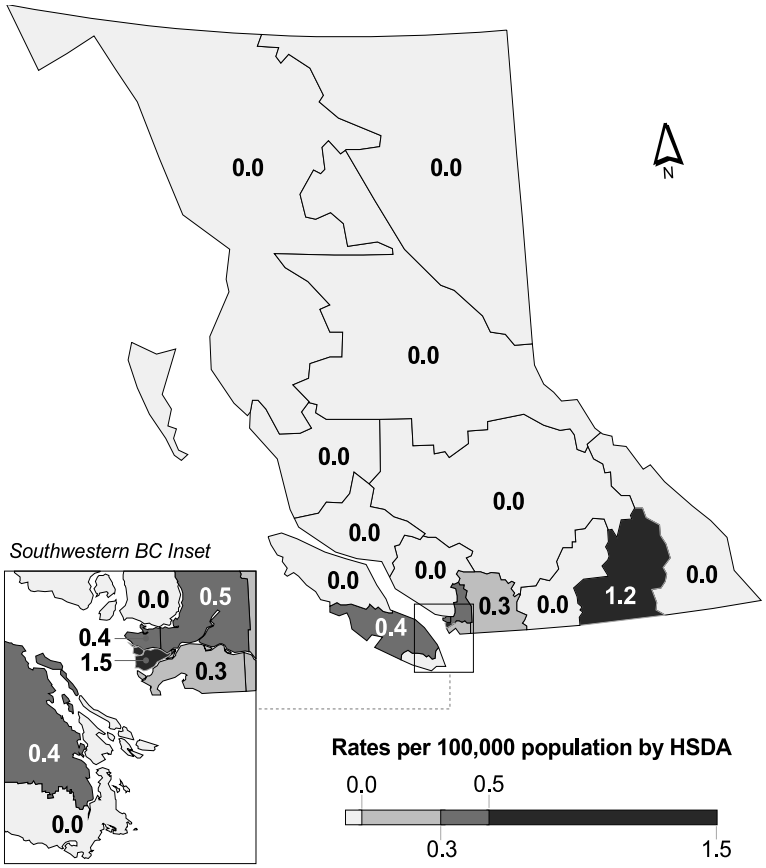
Fourteen cases of invasive listeriosis were reported in 2012; no infections were associated with international travel. The incidence (0.3 per 100,000 population) in 2012 was similar to 2009-2011. Rates were highest among adults sixty years and older. Cases occurred throughout the year, although there was some clustering of cases in the early fall (weeks 34-40) which were unrelated. No outbreaks were reported. Rates were highest in Richmond and Kootenay Boundary, but this represented a small number of cases (3 and 1, respectively).

26.1 Listeriosis Rates by Year, 2003-2012



	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
BC Listeriosis Reports	12	10	10	13	9	22	14	14	19	14
BC Listeriosis Rate	0.3	0.2	0.2	0.3	0.2	0.5	0.3	0.3	0.4	0.3

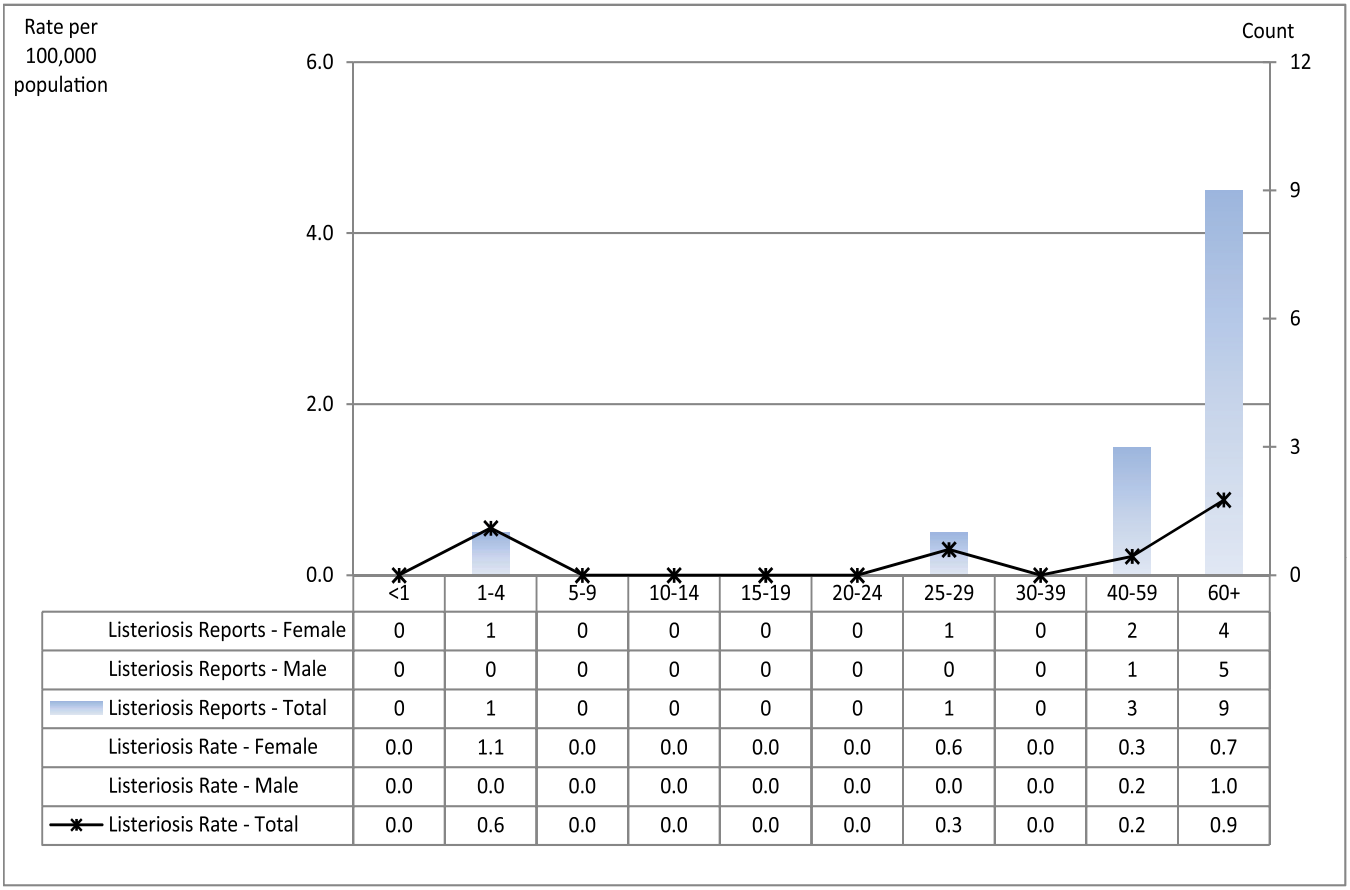
26.2 Listeriosis Rates by HSDA, 2012



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

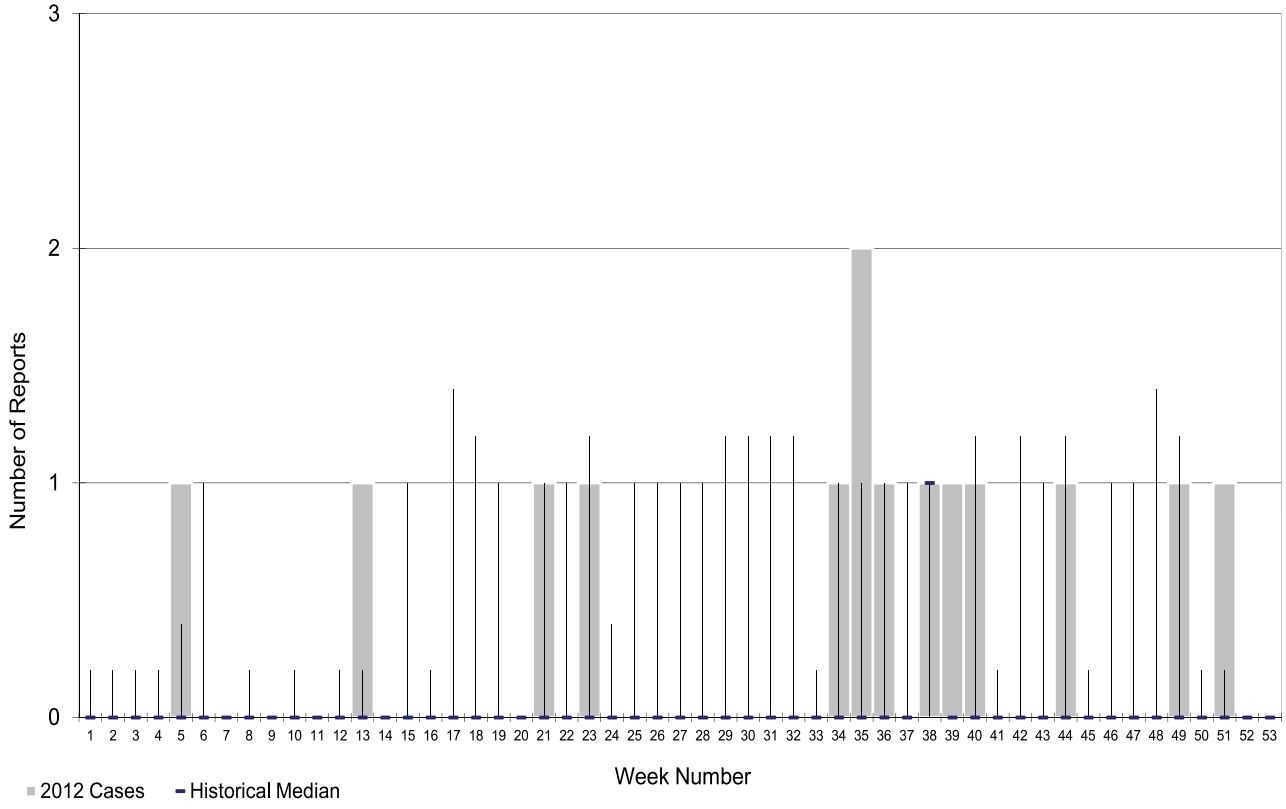
Note: Map classification by Jenks natural breaks method.

26.3 Listeriosis Rates by Age Group and Sex, 2012



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Listeriosis Reports - Female	0	1	0	0	0	0	1	0	2	4
Listeriosis Reports - Male	0	0	0	0	0	0	0	0	1	5
Listeriosis Reports - Total	0	1	0	0	0	0	1	0	3	9
Listeriosis Rate - Female	0.0	1.1	0.0	0.0	0.0	0.0	0.6	0.0	0.3	0.7
Listeriosis Rate - Male	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.0
Listeriosis Rate - Total	0.0	0.6	0.0	0.0	0.0	0.0	0.3	0.0	0.2	0.9

26.4 2012 Listeriosis Reports Compared to Historical Median and the 10th and 90th Percentiles Around the Median (2003 to 2011)



Salmonellosis, Typhoid Fever and Paratyphoid Fever*

In 2012, 930 cases of salmonellosis were reported for a rate of 20.1 per 100,000. *Salmonella* infection continues to be the second most commonly reported enteric disease in BC. Overall, 29.2% of *Salmonella* infections were associated with international travel. The rate in 2012 decreased for the first time after an ongoing increase in rate of illness since 2007. The rate in 2012 was comparable with 2008 but was still increased compared to the stable incidence seen between 2003 and 2006.

Rates were highest in children under 5 years of age and among residents of Fraser South, Richmond, Fraser North and the Northeast. The increase in the Northeast was considerable (22.2 compared to 10.0 per 100,000 population in 2011). Unlike in previous years a summer peak was not as evident in 2012. Cases were reported throughout the year with a slight peak in the winter (weeks 2-6) which was most likely associated with travel.

Typhoid fever rates in British Columbia decreased slightly in 2012. Twenty-six cases were reported for a rate of 0.6 cases per 100,000 population; 69.2% were associated with international travel. Twenty-four cases of paratyphoid fever were reported. The incidence was similar to previous years at 0.5 cases per 100,000 population. International travel was associated with 71.4% of cases. The highest incidence of paratyphoid fever cases was in children aged 10-14 years and for typhoid fever was in adults aged 20-24 years. Cases of typhoid and paratyphoid fever were acquired during travel to endemic countries and 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 South Asia (data not shown).

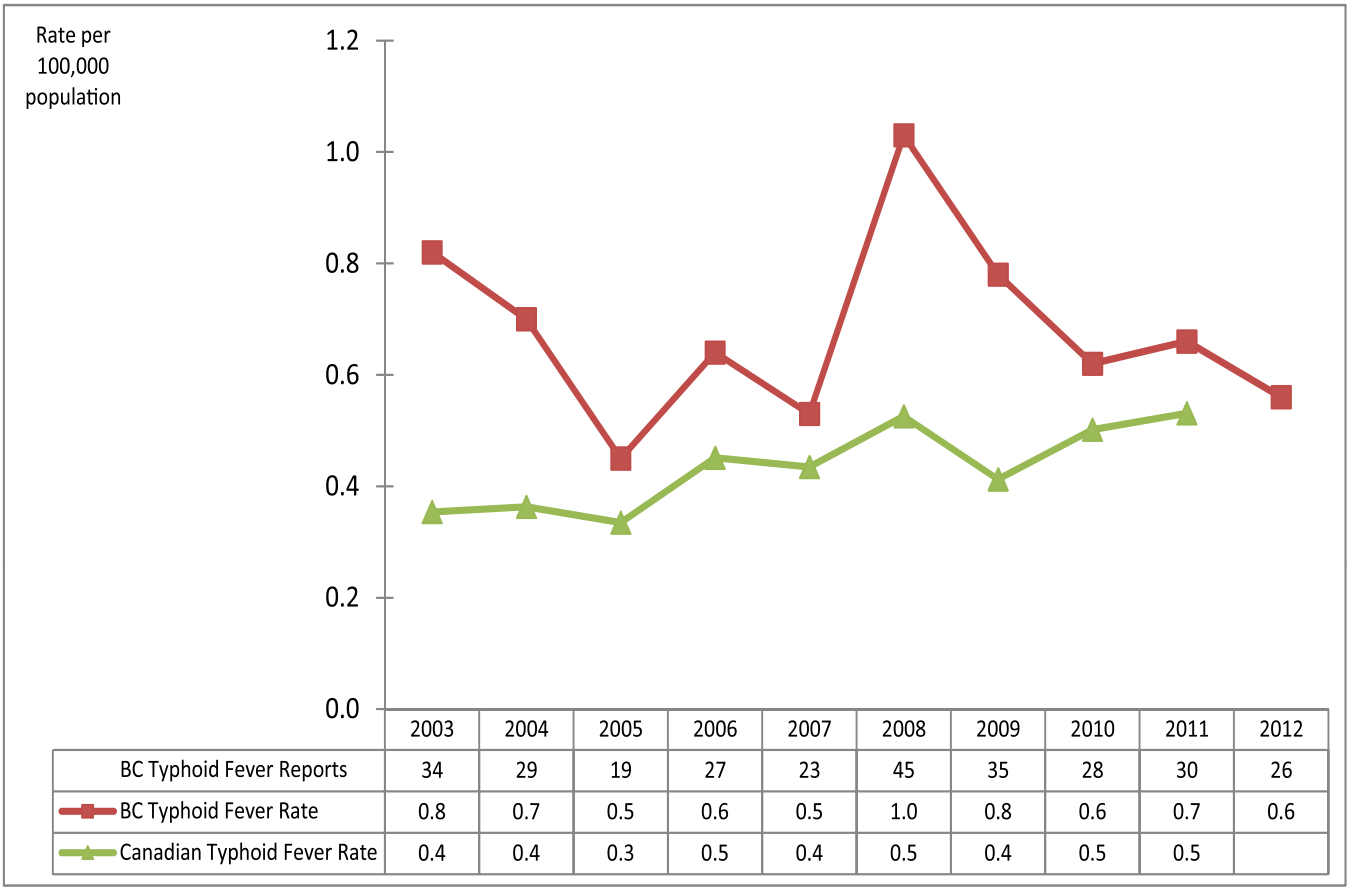
S. Enteritidis, *S.* Heidelberg and *S.* Typhimurium were the most commonly reported serotypes in 2012. However the proportion of *S.* Enteritidis decreased from 50.8% in 2011 to 38.2% in 2012. Since 2008, BC has been investigating an SE outbreak caused by a common strain. In 2012, the decrease in *S.* Enteritidis and *Salmonella* overall may be due to the decrease of this particular strain. *S.* Heidelberg increased to become the second most common serotype. The number of isolates and the proportion doubled in 2012 compared to 2011. There was no change in *S.* Typhimurium compared to 2011. *S.* Braenderup was reported in the top 10 serotypes in 2012 due to a large outbreak associated with fresh mangoes in August.

**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 (yphoid fever) and S. Paratyphi (paratyphoid fever) cases and rates by year have also been presented separately.*

27.1 Salmonellosis Rates by Year, 2003-2012

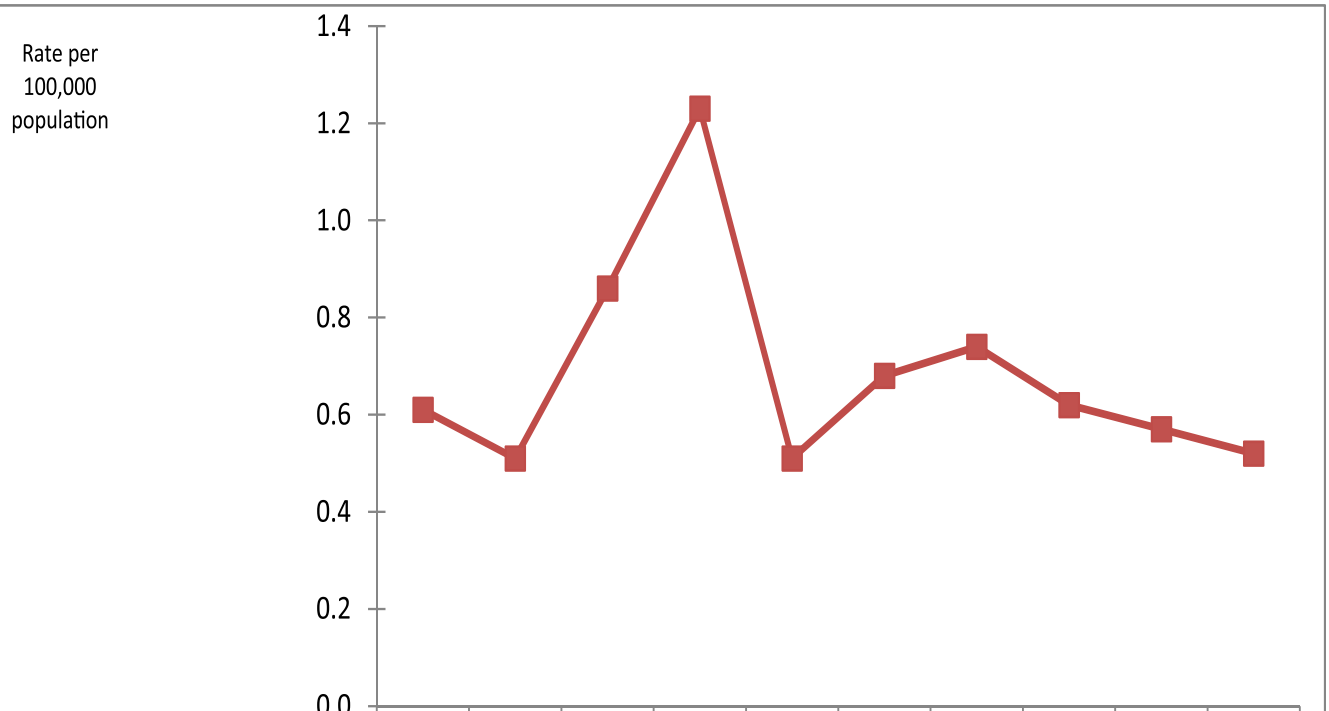
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
BC Salmonellosis Reports	659	747	739	704	792	922	952	1078	1104	930
BC Salmonellosis Rate	16.0	18.0	17.6	16.6	18.4	21.0	21.4	23.8	24.1	20.1
Canadian Salmonellosis Rate	16.0	16.0	18.6	16.8	18.7	18.2	17.4	20.5	19.1	

27.2 Typhoid Fever Rates by Year, 2003-2012



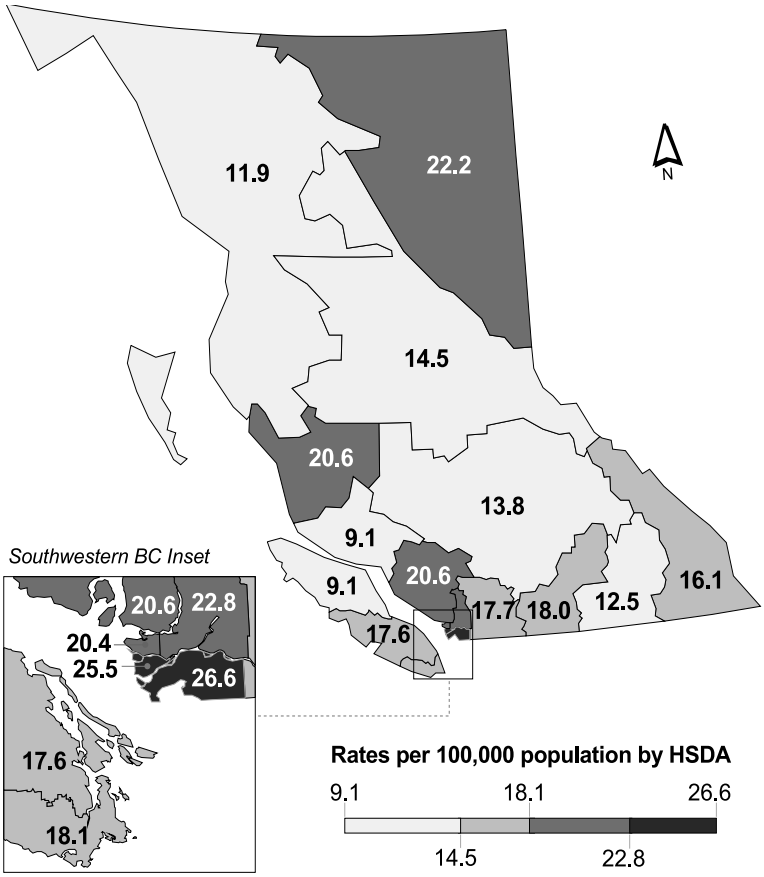
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
BC Typhoid Fever Reports	34	29	19	27	23	45	35	28	30	26
BC Typhoid Fever Rate	0.8	0.7	0.5	0.6	0.5	1.0	0.8	0.6	0.7	0.6
Canadian Typhoid Fever Rate	0.4	0.4	0.3	0.5	0.4	0.5	0.4	0.5	0.5	

27.3 Paratyphoid Fever Rates by Year, 2003-2012



	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
BC Paratyphoid Fever Reports	25	21	36	52	22	30	33	28	26	24
BC Paratyphoid Fever Rate	0.6	0.5	0.9	1.2	0.5	0.7	0.7	0.6	0.6	0.5

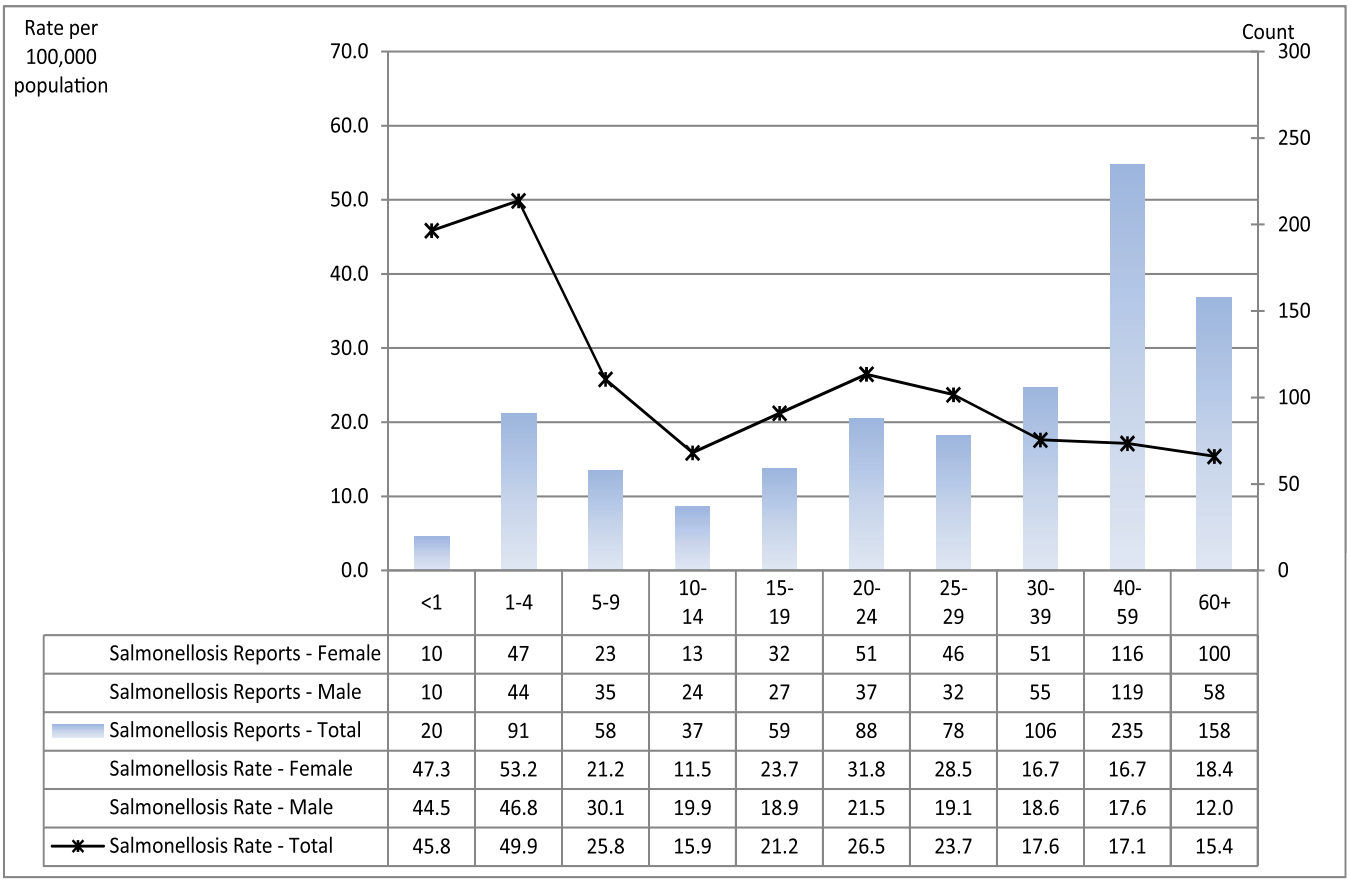
27.4 Salmonellosis Rates by HSDA, 2012



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	13	16.1
12	Kootenay Boundary	10	12.5
13	Okanagan	64	18.0
14	Thompson Cariboo Shuswap	31	13.8
21	Fraser East	51	17.7
22	Fraser North	142	22.8
23	Fraser South	196	26.6
31	Richmond	51	25.5
32	Vancouver	140	20.4
33	North Shore/Coast Garibaldi	60	20.6
41	South Vancouver Island	68	18.1
42	Central Vancouver Island	47	17.6
43	North Vancouver Island	11	9.1
51	Northwest	9	11.9
52	Northern Interior	21	14.5
53	Northeast	16	22.2

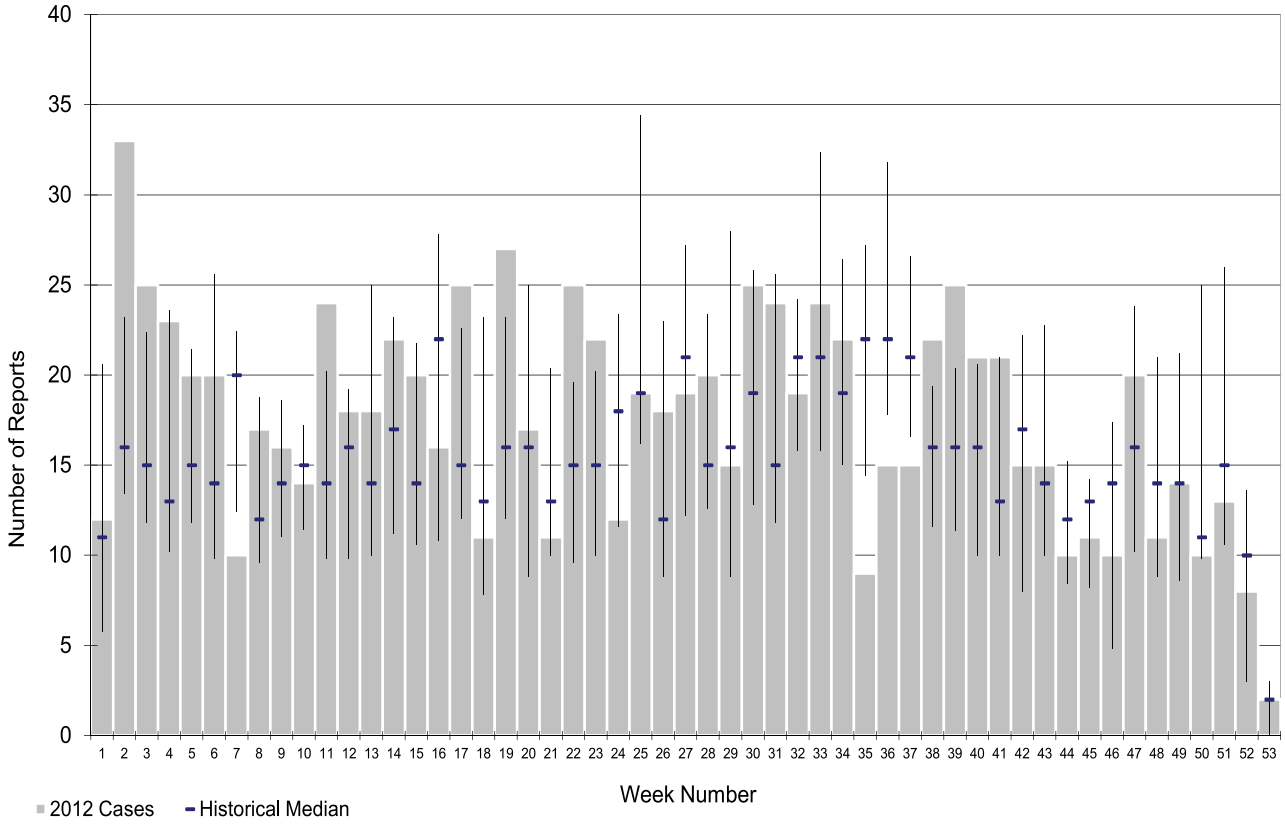
Note: Map classification by Jenks natural breaks method.

27.5 Salmonellosis Rates by Age Group and Sex, 2012



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Salmonellosis Reports - Female	10	47	23	13	32	51	46	51	116	100
Salmonellosis Reports - Male	10	44	35	24	27	37	32	55	119	58
Salmonellosis Reports - Total	20	91	58	37	59	88	78	106	235	158
Salmonellosis Rate - Female	47.3	53.2	21.2	11.5	23.7	31.8	28.5	16.7	16.7	18.4
Salmonellosis Rate - Male	44.5	46.8	30.1	19.9	18.9	21.5	19.1	18.6	17.6	12.0
Salmonellosis Rate - Total	45.8	49.9	25.8	15.9	21.2	26.5	23.7	17.6	17.1	15.4

27.6 2012 Salmonellosis Reports Compared to Historical Median and the 10th and 90th Percentiles Around the Median (2003 to 2011)



27.7 *Salmonella* serotype distribution, 2012

Rank	Species	Number of Cases	Proportion
1	Enteritidis	384	38.2%
2	Heidelberg	95	9.5%
3	Typhimurium	72	7.2%
4	Typhi	33	3.3%
5	Braenderup	28	2.8%
6	Paratyphi A	27	2.7%
7	Newport	24	2.4%
8	Infantis	23	2.3%
9	Salmonella ssp I 4,5,12:i:-	23	2.3%
10	Salmonella ssp I	21	2.1%
	Others	274	27.3%
	Total	1004	100.0%

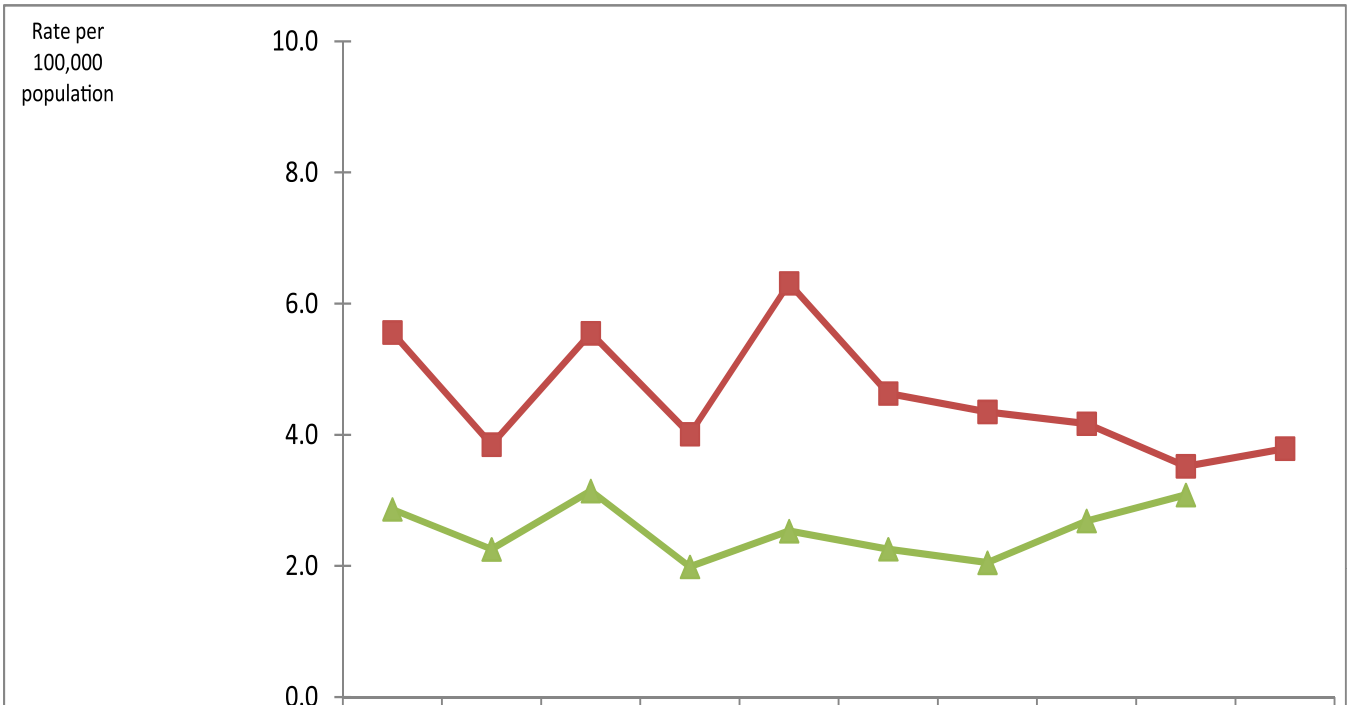
Note: Species distribution is based on the BCCDC Public Health and Microbiology Reference Laboratory data. Numbers may vary from those reported in iPHIS.

Shigellosis

In 2012, 175 cases were reported and the annual incidence (3.8 per 100,000 population) remained similar to the previous year. Of the reported cases, 60.2% were associated with international travel. Incidence rates were highest among male children aged <1 and 5-9 years, females aged 20-29, males aged 20-29 and males aged 40-59 years. Cases were reported throughout the year. Rates continue to be highest in Vancouver.

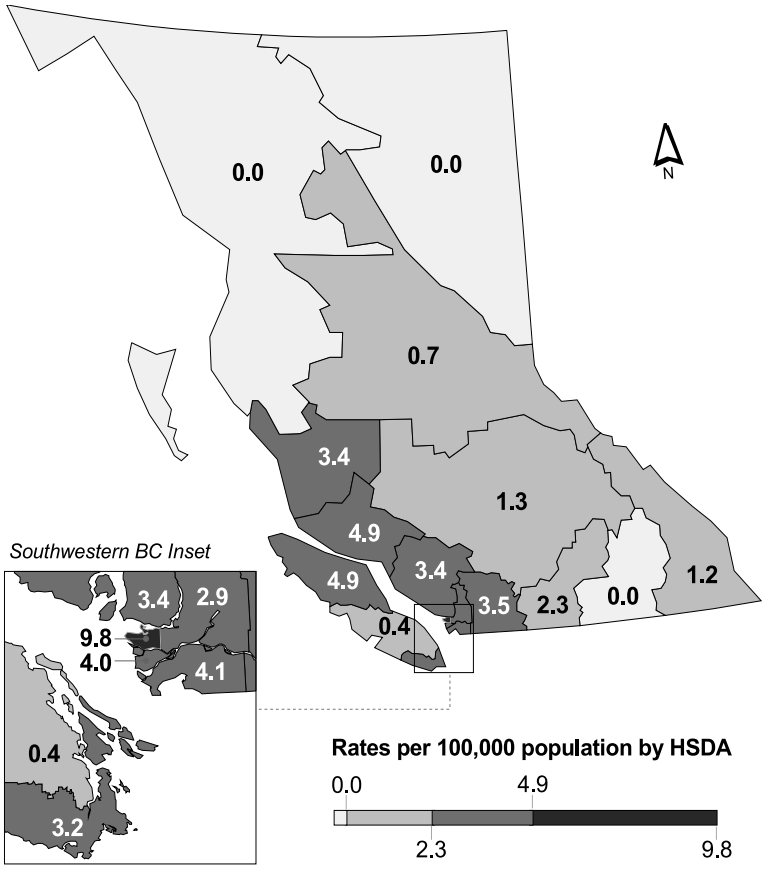
S. flexneri was the most common species reported in 2012 for the fourth year in a row. Prior to 2009, *S. sonnei* accounted for the majority of isolates reported. This change may be due to ongoing transmission of a particular strain of *S. flexneri* among men who have sex with men and infection during travel.

28.1 Shigellosis Rates by Year, 2003-2012



	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
BC Shigellosis Reports	229	160	233	170	272	203	194	189	161	175
BC Shigellosis Rate	5.6	3.9	5.6	4.0	6.3	4.6	4.4	4.2	3.5	3.8
Canadian Shigellosis Rate	2.9	2.3	3.1	2.0	2.5	2.3	2.1	2.7	3.1	

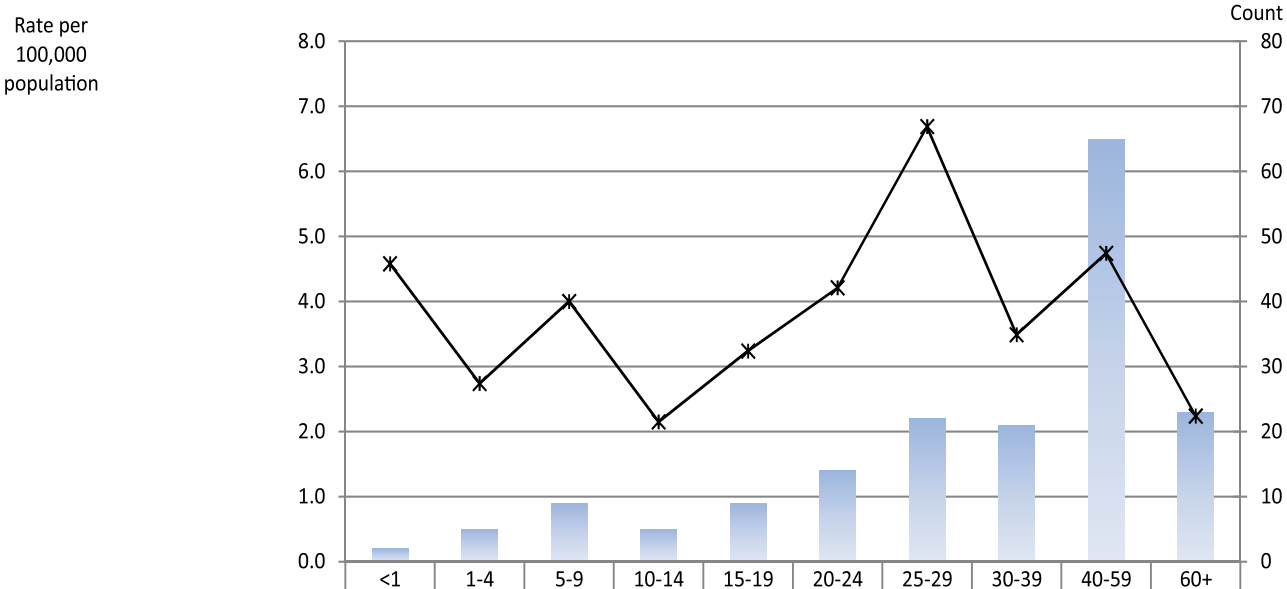
28.2 Shigellosis Rates by HSDA, 2012



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	1	1.2
12	Kootenay Boundary	0	0.0
13	Okanagan	8	2.3
14	Thompson Cariboo Shuswap	3	1.3
21	Fraser East	10	3.5
22	Fraser North	18	2.9
23	Fraser South	30	4.1
31	Richmond	8	4.0
32	Vancouver	67	9.8
33	North Shore/Coast Garibaldi	10	3.4
41	South Vancouver Island	12	3.2
42	Central Vancouver Island	1	0.4
43	North Vancouver Island	6	4.9
51	Northwest	0	0.0
52	Northern Interior	1	0.7
53	Northeast	0	0.0

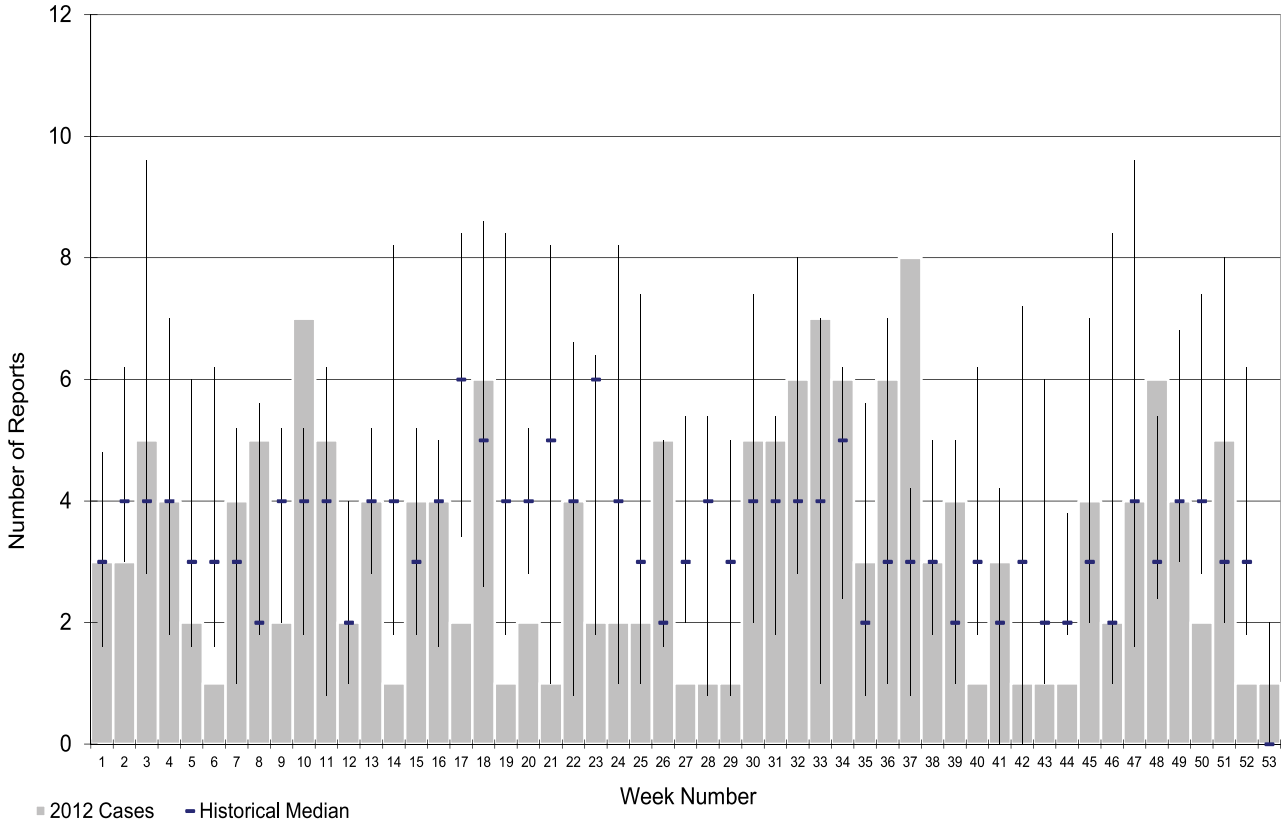
Note: Map classification by Jenks natural breaks method.

28.3 Shigellosis Rates by Age Group and Sex, 2012



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Shigellosis Reports - Female	0	1	1	1	5	10	11	7	22	8
Shigellosis Reports - Male	2	4	8	4	4	4	11	14	43	15
Shigellosis Reports - Total	2	5	9	5	9	14	22	21	65	23
Shigellosis Rate - Female	0.0	1.1	0.9	0.9	3.7	6.2	6.8	2.3	3.2	1.5
Shigellosis Rate - Male	8.9	4.3	6.9	3.3	2.8	2.3	6.6	4.7	6.4	3.1
Shigellosis Rate - Total	4.6	2.7	4.0	2.2	3.2	4.2	6.7	3.5	4.7	2.2

28.4 2012 Shigellosis Reports Compared to Historical Median and the 10th and 90th Percentiles Around the Median (2003 to 2011)



28.5 *Shigella* species distribution, 2012

Rank	Species	Number of Cases	Proportion
1	*flexneri*	76	50.3%
2	*sonnei*	65	43.0%
3	*boydii*	7	4.6%
4	*dysenteriae*	3	2.0%
	Total	151	100.0%

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

Vibrio Infection

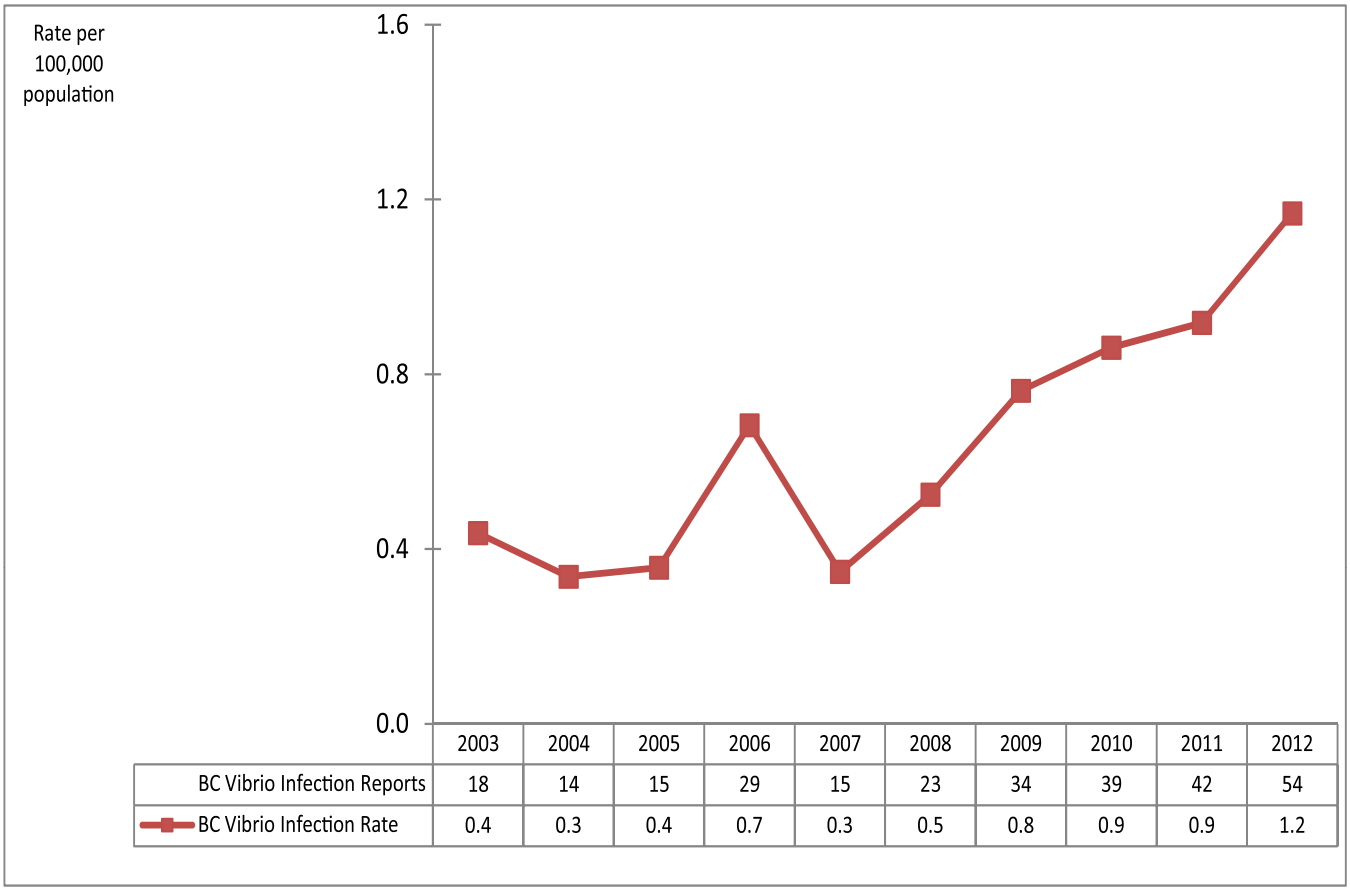
Fifty-four cases were reported in 2012; 12.2% were associated with international travel. The incidence of *Vibrio* infections has been increasing steadily since 2007 and the highest rate in the last 10 years was reported in 2012 (1.2 per 100,000 population). The reason for this increase in incidence is unknown. Typically cases are reported mostly from coastal regions; in 2012 the highest incidence rates were reported from Vancouver, North Shore/ Coast Garibaldi, Fraser East and South Vancouver Island. Vancouver experienced a notable increase in cases in 2012 (20 compared to 7 in 2011).

As per usual, cases occurred mostly in adult males; incidence was highest in males aged 25-29 years. The majority of cases were reported from weeks 28 to 42, with a peak in week 35. This time period is consistent with the annual summer peak.

V. parahaemolyticus is the most common species which causes infections in BC. These infections are mostly associated with consumption of raw or undercooked shellfish during the summer months. In 2012, surveillance for shellfish-related illness identified that 18/26 (69.2%) of laboratory-confirmed *Vibrio parahaemolyticus* events were related to shellfish consumed in restaurants.

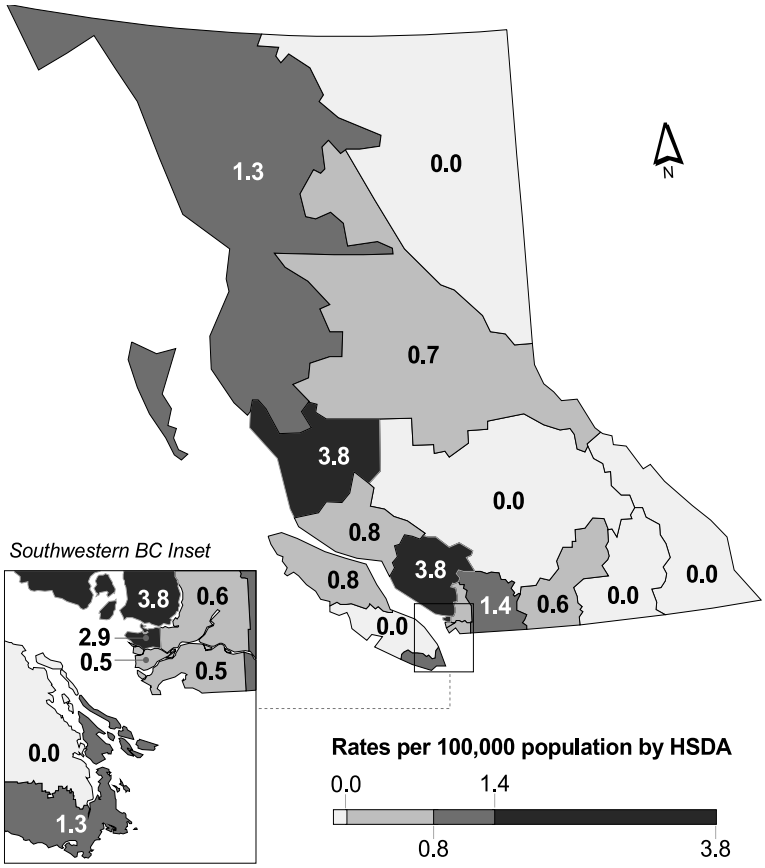
Note: Previously this section was titled *Vibrio parahaemolyticus*. The title has been updated to reflect that the data represent all *Vibrio* infections. The data have not changed.

29.1 *Vibrio* Infection Rates by Year, 2003-2012



	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
BC Vibrio Infection Reports	18	14	15	29	15	23	34	39	42	54
BC Vibrio Infection Rate	0.4	0.3	0.4	0.7	0.3	0.5	0.8	0.9	0.9	1.2

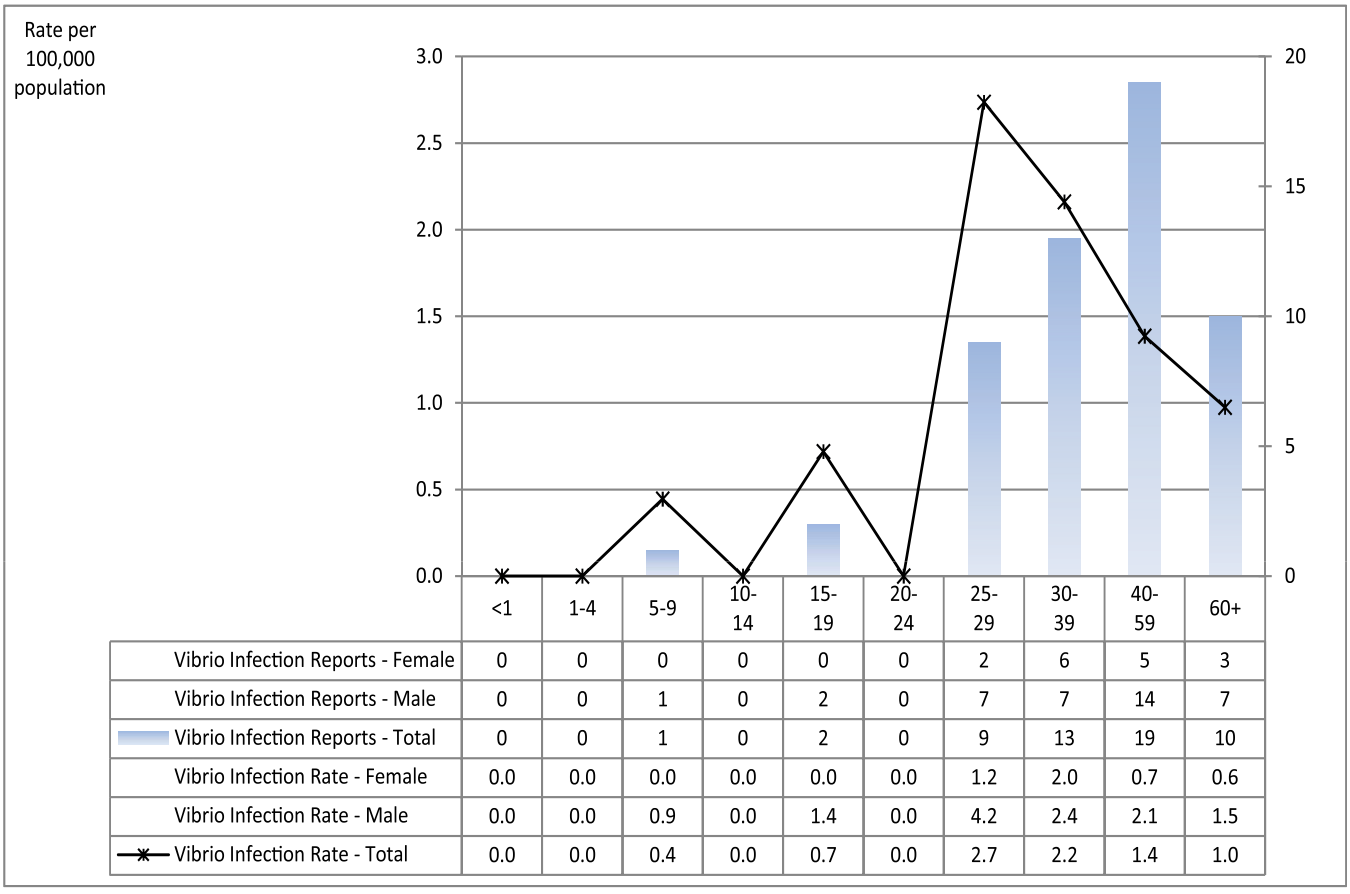
29.2 *Vibrio* Infection Rates by HSDA, 2012



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	0	0.0
12	Kootenay Boundary	0	0.0
13	Okanagan	2	0.6
14	Thompson Cariboo Shuswap	0	0.0
21	Fraser East	4	1.4
22	Fraser North	4	0.6
23	Fraser South	4	0.5
31	Richmond	1	0.5
32	Vancouver	20	2.9
33	North Shore/Coast Garibaldi	11	3.8
41	South Vancouver Island	5	1.3
42	Central Vancouver Island	0	0.0
43	North Vancouver Island	1	0.8
51	Northwest	1	1.3
52	Northern Interior	1	0.7
53	Northeast	0	0.0

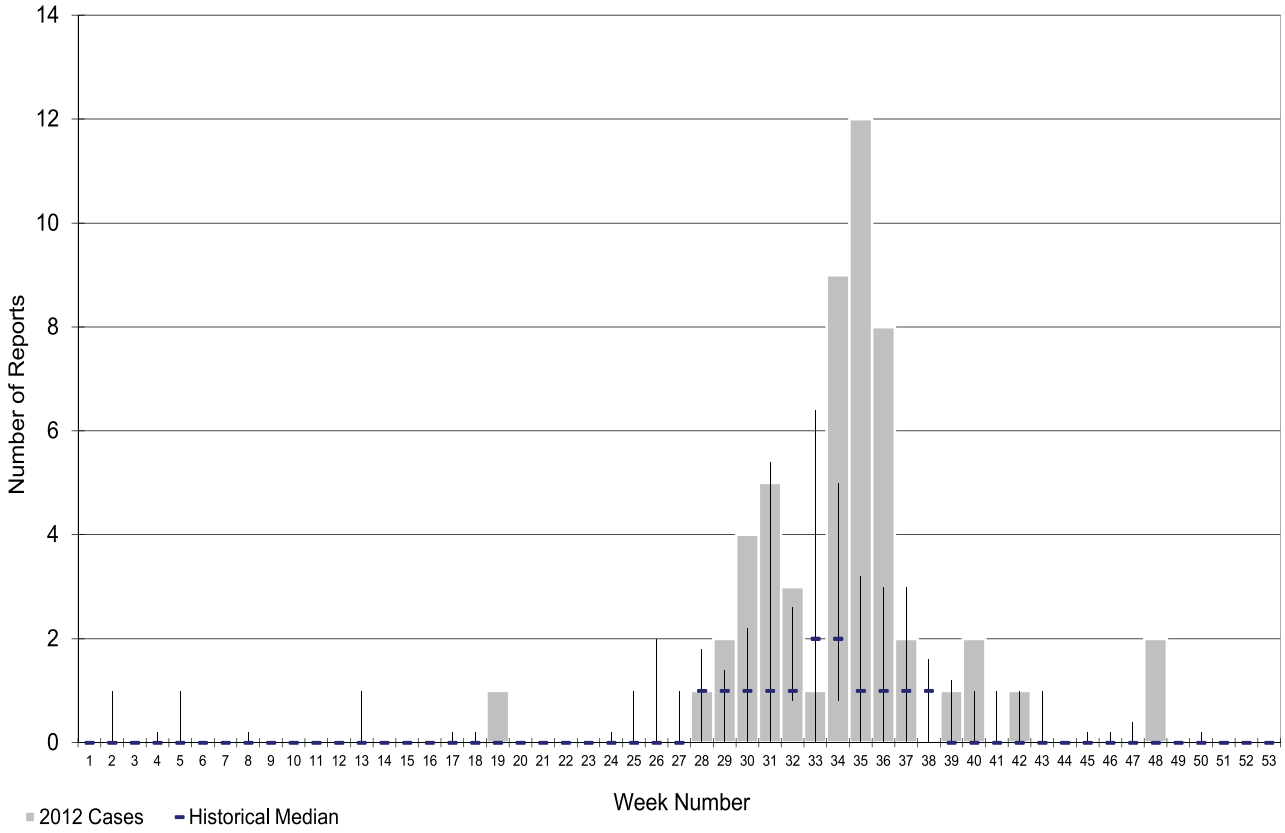
Note: Map classification by Jenks natural breaks method.

29.3 *Vibrio* Infection Rates by Age Group and Sex, 2012



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Vibrio Infection Reports - Female	0	0	0	0	0	0	2	6	5	3
Vibrio Infection Reports - Male	0	0	1	0	2	0	7	7	14	7
Vibrio Infection Reports - Total	0	0	1	0	2	0	9	13	19	10
Vibrio Infection Rate - Female	0.0	0.0	0.0	0.0	0.0	0.0	1.2	2.0	0.7	0.6
Vibrio Infection Rate - Male	0.0	0.0	0.9	0.0	1.4	0.0	4.2	2.4	2.1	1.5
Vibrio Infection Rate - Total	0.0	0.0	0.4	0.0	0.7	0.0	2.7	2.2	1.4	1.0

29.4 2012 *Vibrio* Infection Reports Compared to Historical Median and the 10th and 90th Percentiles Around the Median (2003 to 2011)



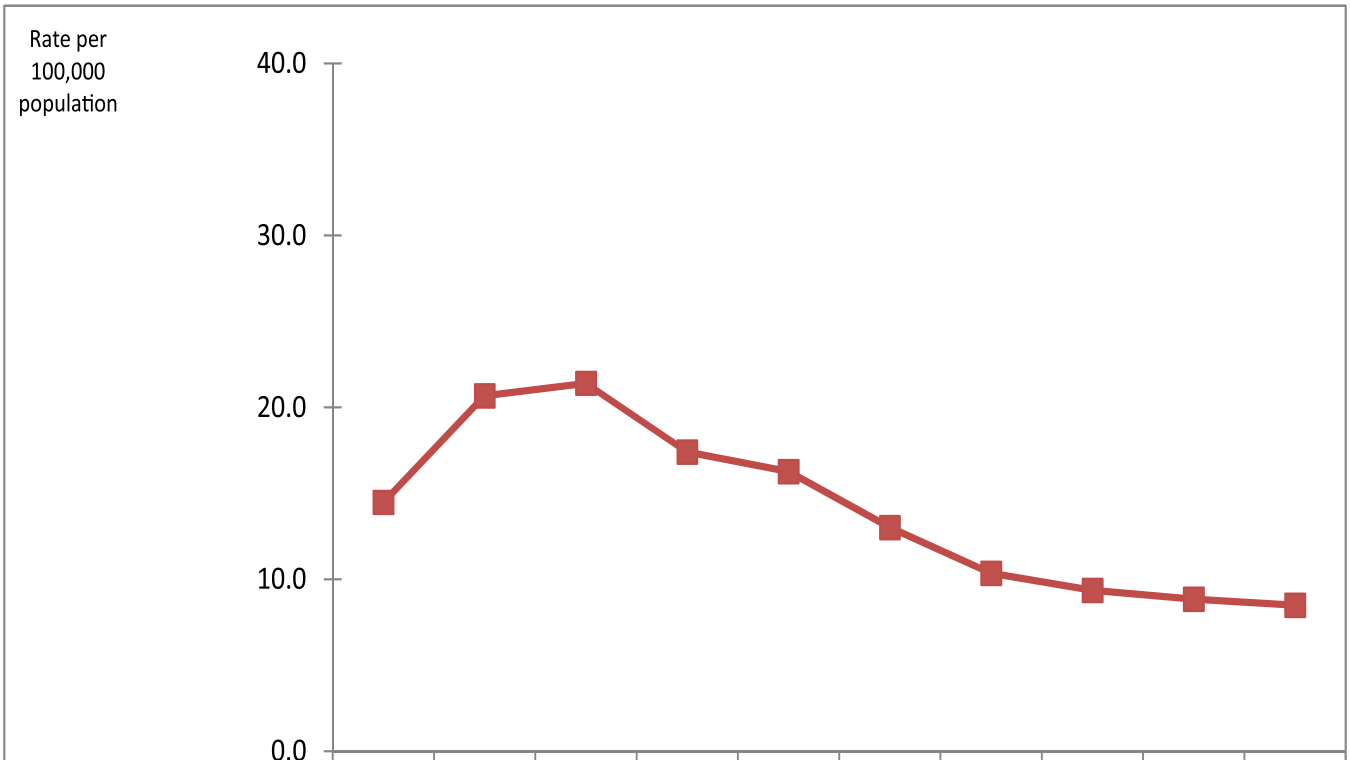
29.5 *Vibrio* species distribution, 2012

Rank	Species	Number of Cases	Proportion
1	*Parahaemolyticus*	46	85.2%
2	*Alginolyticus*	3	5.6%
3	*Fluvalis*	3	5.6%
4	*Metschnikovii*	1	1.9%
	Unknown	1	1.9%
	Total	54	100.0%

Yersiniosis

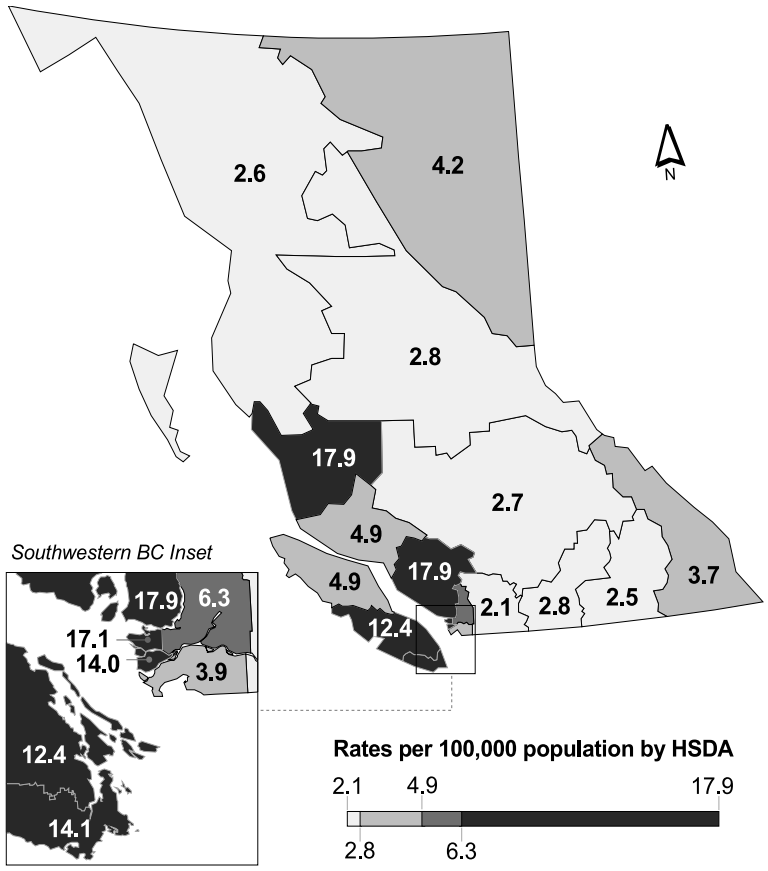
In 2012, 393 cases of yersiniosis were reported. The incidence has been decreasing since 2005; the reasons for this are not clear. Incidence remains highest in children aged 1-4 years and adults aged 20-29 years. Like previous years, there was significant geographic variation with the highest rates reported from Vancouver Coastal and Vancouver Island Health Authorities. There were no seasonal trend and no outbreaks were reported.

30.1 Yersiniosis Rates by Year, 2003-2012



	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
BC Yersiniosis Reports	597	859	898	739	701	571	462	424	405	393
BC Yersiniosis Rate	14.5	20.7	21.4	17.4	16.3	13.0	10.4	9.4	8.9	8.5

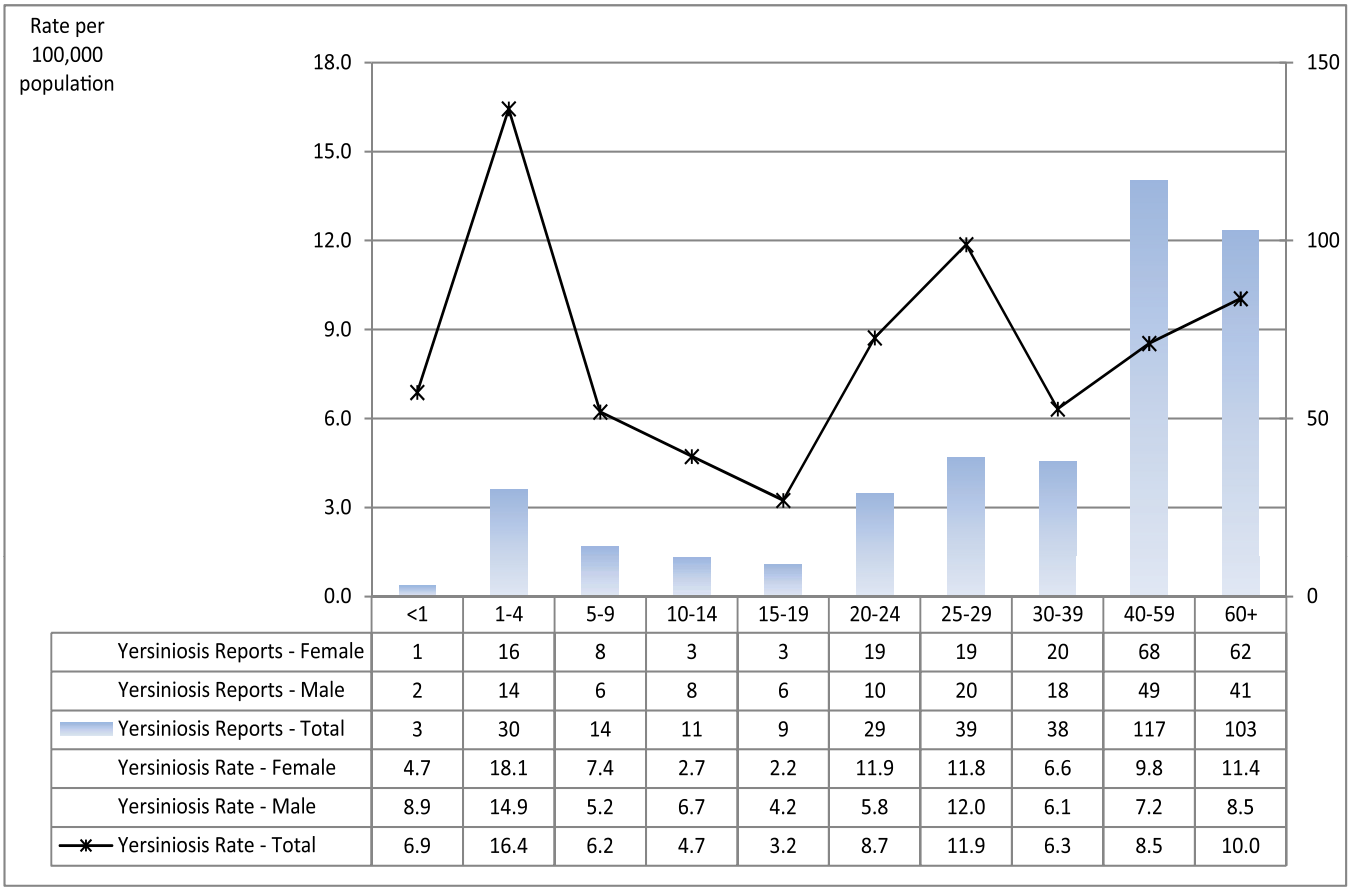
30.2 Yersiniosis Rates by HSDA, 2012



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	3	3.7
12	Kootenay Boundary	2	2.5
13	Okanagan	10	2.8
14	Thompson Cariboo Shuswap	6	2.7
21	Fraser East	6	2.1
22	Fraser North	39	6.3
23	Fraser South	29	3.9
31	Richmond	28	14.0
32	Vancouver	117	17.1
33	North Shore/Coast Garibaldi	52	17.9
41	South Vancouver Island	53	14.1
42	Central Vancouver Island	33	12.4
43	North Vancouver Island	6	4.9
51	Northwest	2	2.6
52	Northern Interior	4	2.8
53	Northeast	3	4.2

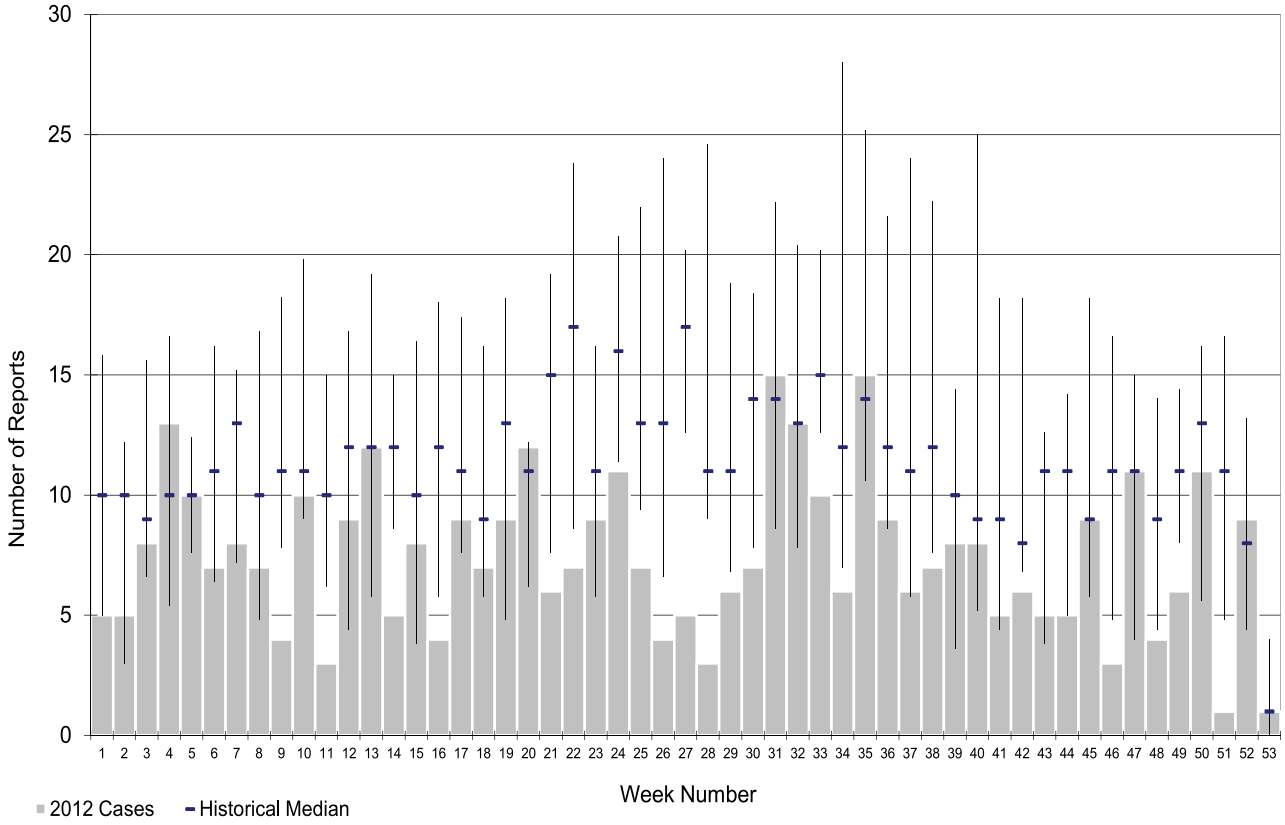
Note: Map classification by Jenks natural breaks method.

30.3 Yersiniosis Rates by Age Group and Sex, 2012



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Yersiniosis Reports - Female	1	16	8	3	3	19	19	20	68	62
Yersiniosis Reports - Male	2	14	6	8	6	10	20	18	49	41
Yersiniosis Reports - Total	3	30	14	11	9	29	39	38	117	103
Yersiniosis Rate - Female	4.7	18.1	7.4	2.7	2.2	11.9	11.8	6.6	9.8	11.4
Yersiniosis Rate - Male	8.9	14.9	5.2	6.7	4.2	5.8	12.0	6.1	7.2	8.5
Yersiniosis Rate - Total	6.9	16.4	6.2	4.7	3.2	8.7	11.9	6.3	8.5	10.0

30.4 2012 Yersiniosis Reports Compared to Historical Median and the 10th and 90th Percentiles Around the Median (2003 to 2011)



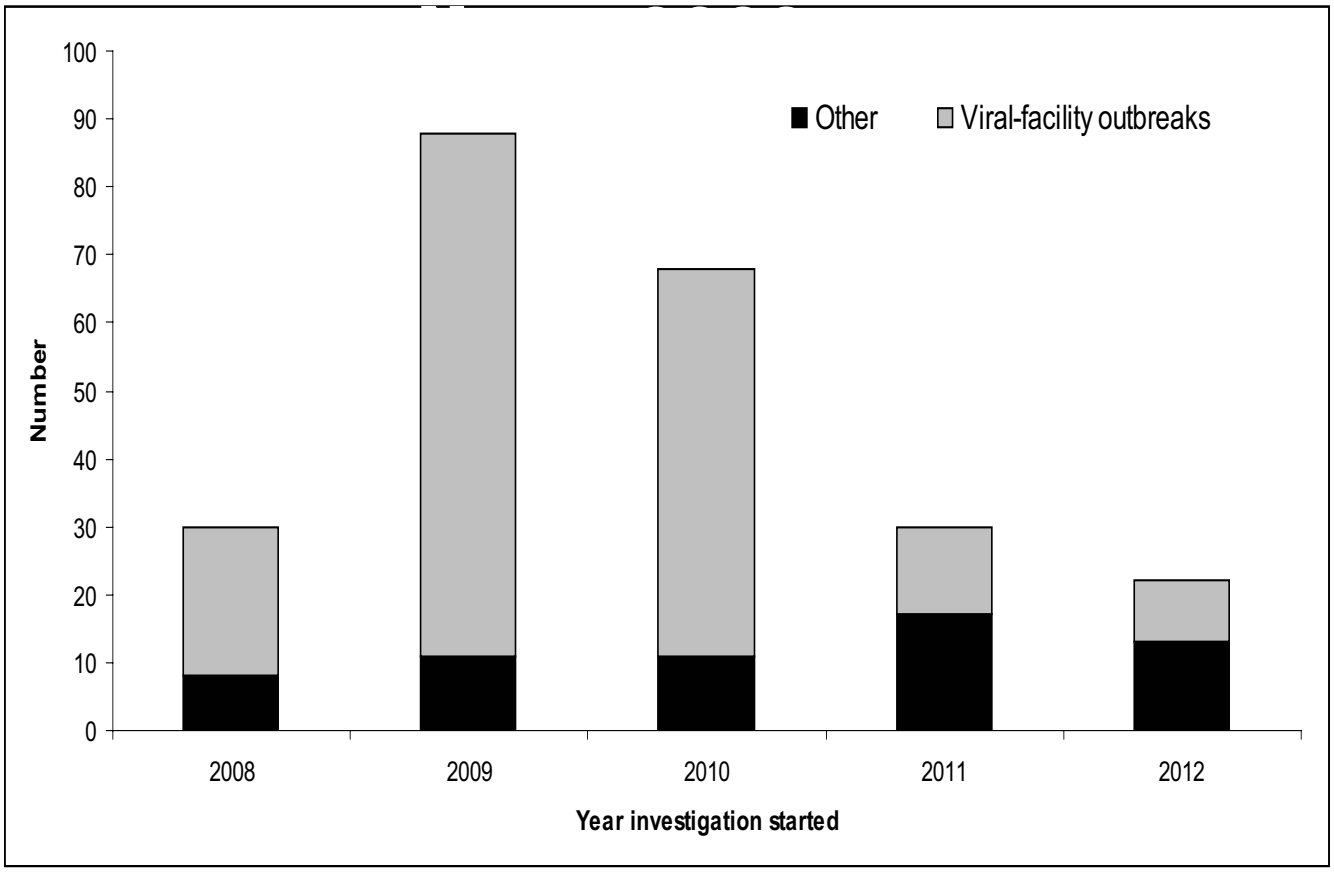
Outbreaks of Gastroenteritis

In August 2008 a national web-enabled outbreak reporting tool was launched in BC. The objective of surveillance of enteric outbreaks in BC is to describe and understand trends in outbreaks (e.g. organism, setting, route of transmission, source), and to evaluate effectiveness of outbreak control measures.

In 2012 there was a total of 22 outbreaks investigated and reported provincially; 8 of these were viral outbreaks in long-term care facilities. There were 14 additional outbreaks of which 4 were reported by VCH, 4 by FHA, 3 by BCCDC, 2 from IHA and 1 from NHA. Seven (50.0%) were caused by norovirus, 2 by *Salmonella*, 1 by hepatitis A, 1 by shellfish toxin, 1 by histamine, 1 by *Aeromonas* and 1 had an unknown etiology. Six (42.9%) occurred in food service establishments and 5 in the community and 3 occurred in other settings. Nine (64.3%) were transmitted through food (3 fruit, 2 seafood, 1 mixed and 3 unknown sources).

In 2011 and 2012 four of the five health authorities discontinued reporting of viral outbreaks in long-term care facilities which has had an impact on the overall number of outbreaks reported.

Reported enteric outbreaks investigated by year, British Columbia, 2008-2012



Note: 2008 is a partial year of reporting

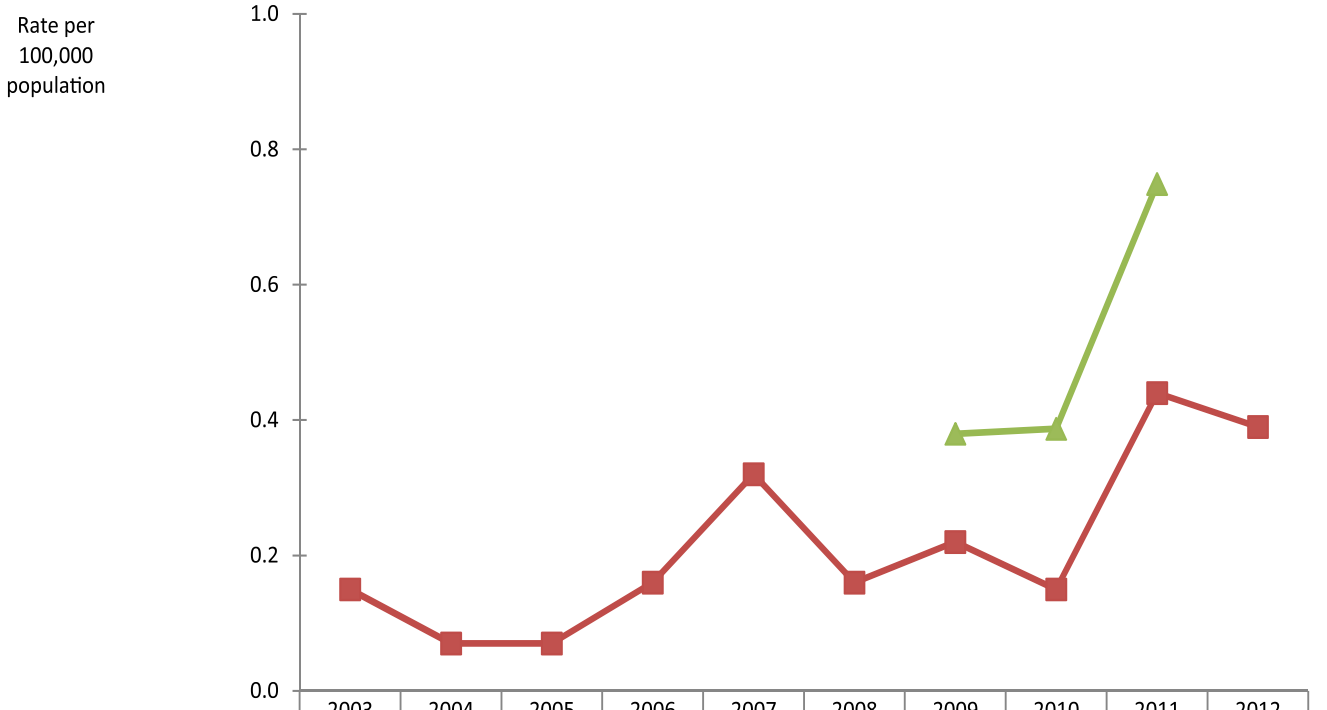
Vectorborne and Zoonotic Diseases

Lyme Disease
Malaria
Rabies Exposures
West Nile Virus

Lyme Disease

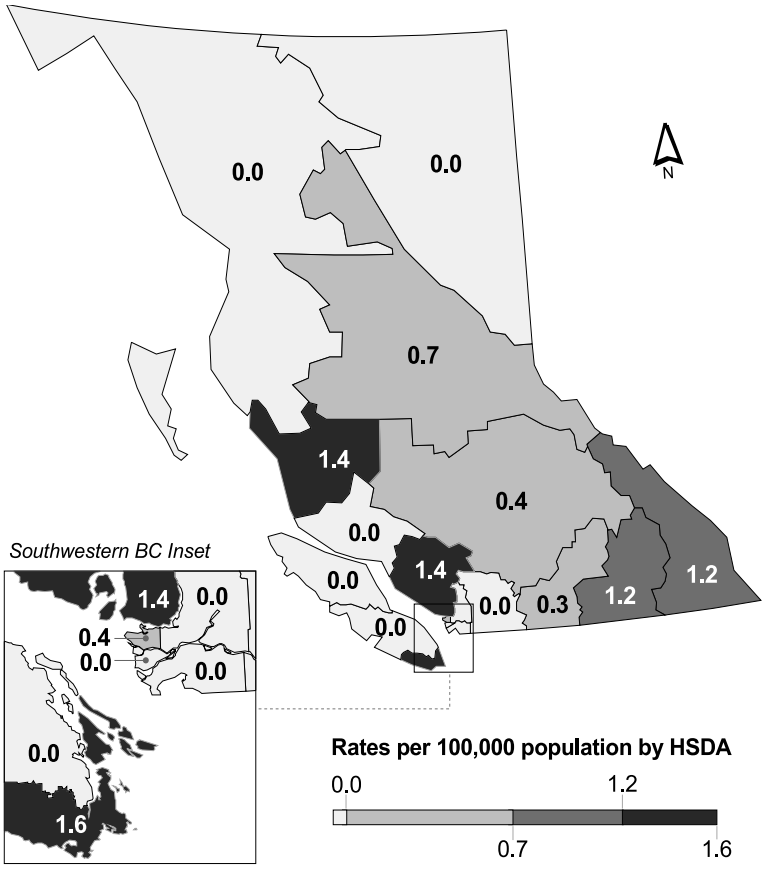
There continues to be a low endemic risk of Lyme Disease in BC. There were 18 cases of clinical or laboratory confirmed disease (0.4 per 100,000 population) reported in 2012. The incidence in 2012 is similar to 2011. The increased incidence over the past 2 years is likely related to ongoing communication and increased awareness of health care providers and reporting. Nine (50%) of cases reported travel and likely acquired their infection outside of BC. Incidence is highest in males between the ages of 25-29 years (1.2 per 100,000 population) although cases are reported throughout a variety of age groups. The highest incidence was reported in South Vancouver Island and North Shore/ Coast Garabaldi.

31.1 Lyme Disease by Year, 2003-2012



	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
BC Lyme Reports	6	3	3	7	14	7	10	7	20	18
BC Lyme Rate	0.2	0.1	0.1	0.2	0.3	0.2	0.2	0.2	0.4	0.4
Canadian Lyme Rate							0.4	0.4	0.7	

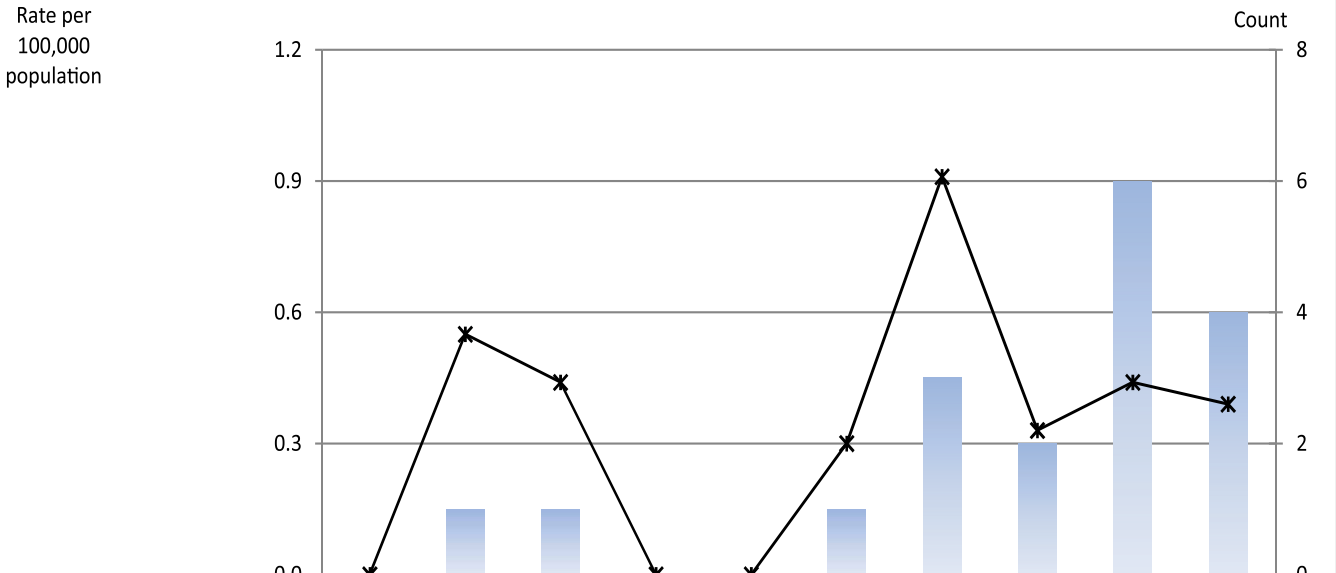
31.2 Lyme Disease Rates by HSDA, 2012



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	1	1.2
12	Kootenay Boundary	1	1.2
13	Okanagan	1	0.3
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	3	0.4
33	North Shore/Coast Garibaldi	4	1.4
41	South Vancouver Island	6	1.6
42	Central Vancouver Island	0	0.0
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.

31.3 Lyme Disease Rates by Age Group and Sex, 2012

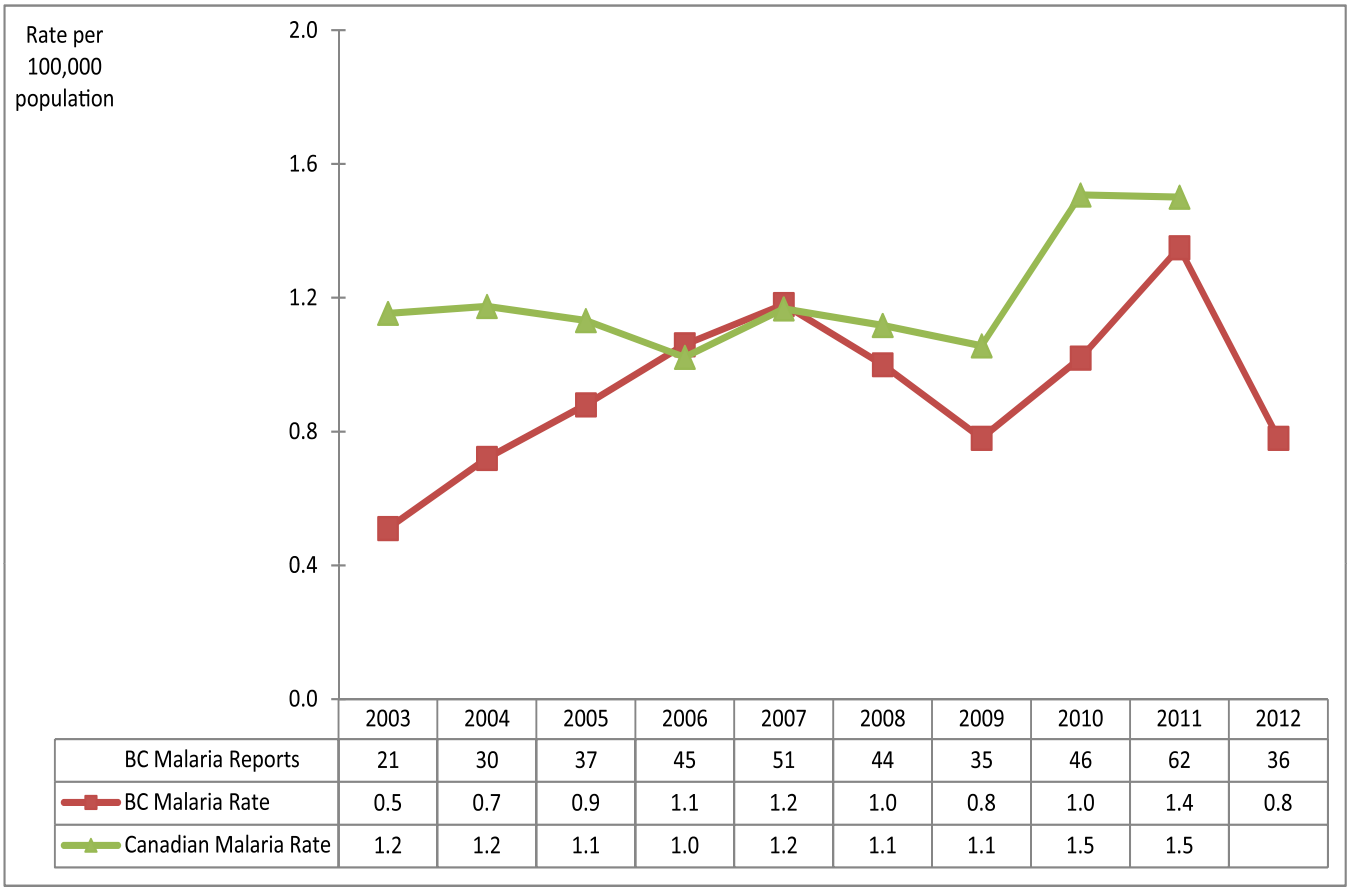


	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Lyme Reports - Female	0	1	1	0	0	0	1	1	6	1
Lyme Reports - Male	0	0	0	0	0	1	2	1	0	3
Lyme Reports - Total	0	1	1	0	0	1	3	2	6	4
Lyme Rate - Female	0.0	1.1	0.9	0.0	0.0	0.0	0.6	0.3	0.9	0.2
Lyme Rate - Male	0.0	0.0	0.0	0.0	0.0	0.6	1.2	0.3	0.0	0.6
Lyme Rate - Total	0.0	0.6	0.4	0.0	0.0	0.3	0.9	0.3	0.4	0.4

Malaria

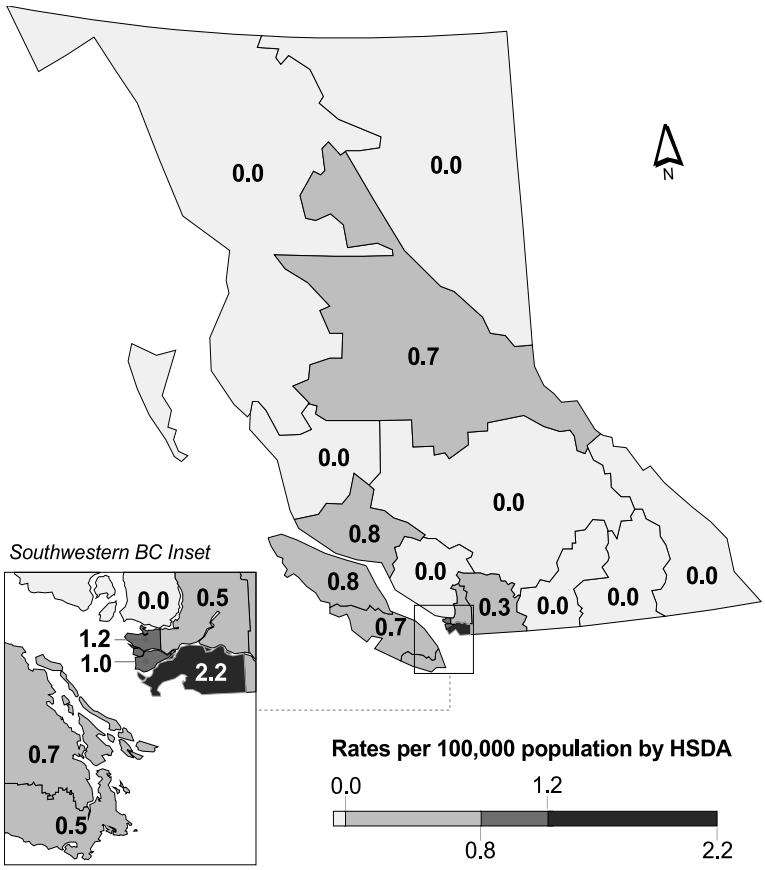
Malaria is not endemic in BC as we do not have the mosquito species that can carry malaria in the province. There were 36 cases of malaria reported in BC in 2012 for a rate of 0.8 per 100,000 population; this is lower than numbers seen in 2011 but in keeping with the numbers seen from 2003 to 2010. The highest rates are seen in males aged 25-29 years at 4.2 per 100,000 population. The largest proportion of cases continues to be from the Fraser South HSDA which reflects frequent travel to malaria endemic countries by residents of Fraser South.

32.1 Malaria Rates by Year, 2003-2012



	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
BC Malaria Reports	21	30	37	45	51	44	35	46	62	36
BC Malaria Rate	0.5	0.7	0.9	1.1	1.2	1.0	0.8	1.0	1.4	0.8
Canadian Malaria Rate	1.2	1.2	1.1	1.0	1.2	1.1	1.1	1.5	1.5	

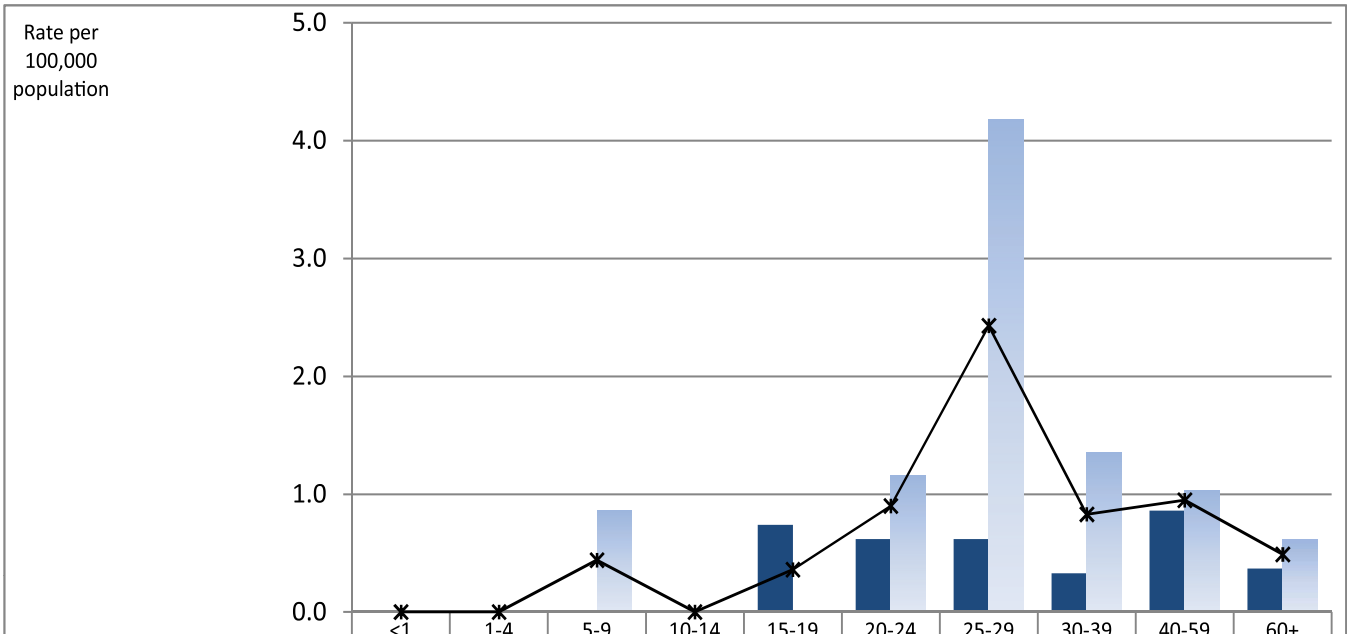
32.2 Malaria Rates by HSDA, 2012



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	0	0.0
12	Kootenay Boundary	0	0.0
13	Okanagan	0	0.0
14	Thompson Cariboo Shuswap	0	0.0
21	Fraser East	1	0.3
22	Fraser North	3	0.5
23	Fraser South	16	2.2
31	Richmond	2	1.0
32	Vancouver	8	1.2
33	North Shore/Coast Garibaldi	0	0.0
41	South Vancouver Island	2	0.5
42	Central Vancouver Island	2	0.7
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.

32.3 Malaria Rates by Age Group and Sex, 2012



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Malaria Rate - Female	0.0	0.0	0.0	0.0	0.7	0.6	0.6	0.3	0.9	0.4
Malaria Rate - Male	0.0	0.0	0.9	0.0	0.0	1.2	4.2	1.4	1.0	0.6
Malaria Rate	0.0	0.0	0.4	0.0	0.4	0.9	2.4	0.8	1.0	0.5
Malaria Reports - Female	0	0	0	0	1	1	1	1	6	2
Malaria Reports - Male	0	0	1	0	0	2	7	4	7	3
Malaria Reports	0	0	1	0	1	3	8	5	13	5

Rabies Exposures

The rate of reported rabies exposures[1] in BC dropped in 2009 following a change in the provincial recommendations whereby individuals finding a bat in their bedroom or nearby no longer receive post exposure prophylaxis. It has been relatively stable since then, with 160 exposures or 3.5 per 100,000 population in 2012 (Figure 33.1). Overall, 58% (92) of exposures occurred during international travel. The highest rates are again reported from individuals aged 15-19 years and 25-29 years (Figure 33.3). The 10-14 year age group is the only one for which there are many more exposures within BC/Canada than outside BC/Canada.

Vancouver/Richmond reported the greatest number of exposures at 40 (Figure 33.2). However, the highest rate of exposure by far was reported from Kootenay Boundary (12.5 per 100,000 population) which is one of the highest risk areas in BC for bat contact. The greatest number of exposures occurring within BC in 2012 was reported from Kootenay Boundary (9), Thompson Cariboo Shushwap (7) and Central Vancouver Island (7). Only 2 exposures were reported as occurring in other Canadian jurisdictions.

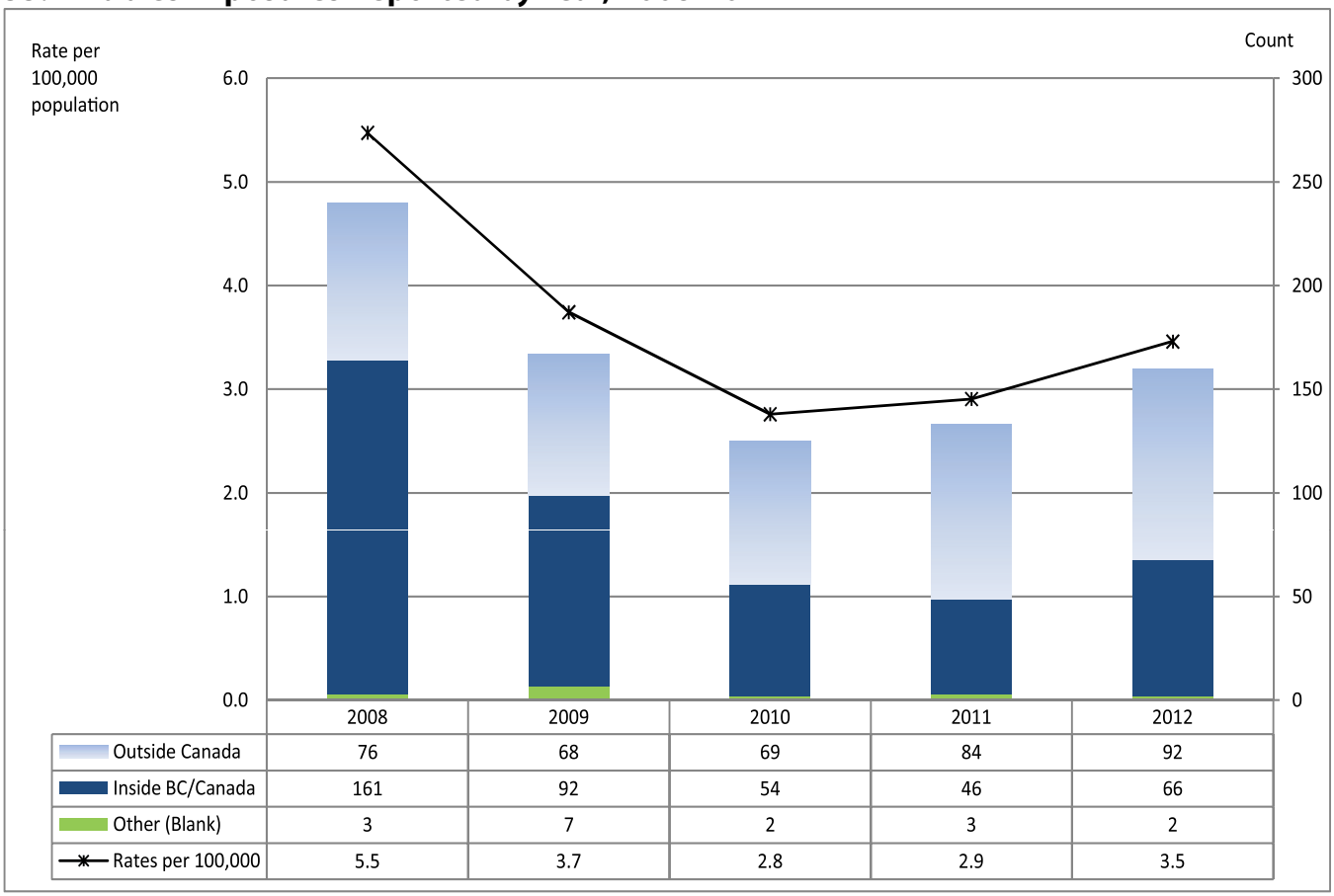
Most BC/Canada exposures were reported between July and September when bats are active (Figure 33.4). International exposures occurred throughout the year with a high number in the fall months.

The majority (64%) of exposures occurring in BC/Canada in 2012 involved bats, the only rabies reservoir in BC (Figure 33.5). Dogs accounted for 50% of international exposures. Several people were exposed to the same presumptive human case of rabies while on a medical mission overseas.

In 2012 as in recent years, the majority (59%) of exposures were due to bites (Figure 33.6). Fewer were due to handling of an animal, scratches and contact with saliva. For the fourth year in a row, no exposures due to a bat found in the same room or nearby were reported.

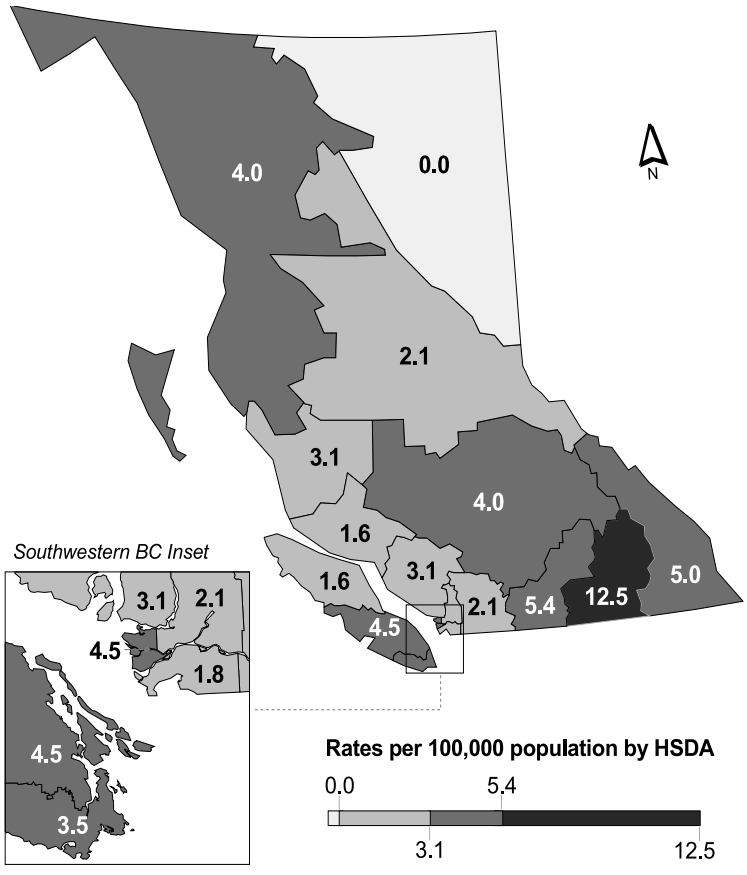
[1]The terms "exposure" denotes a report of an individual exposed to an animal of human which presents a risk of rabies infection. Several individuals exposed to one animal/human would result in several exposures.

33.1 Rabies Exposures Reported by Year, 2008-2012



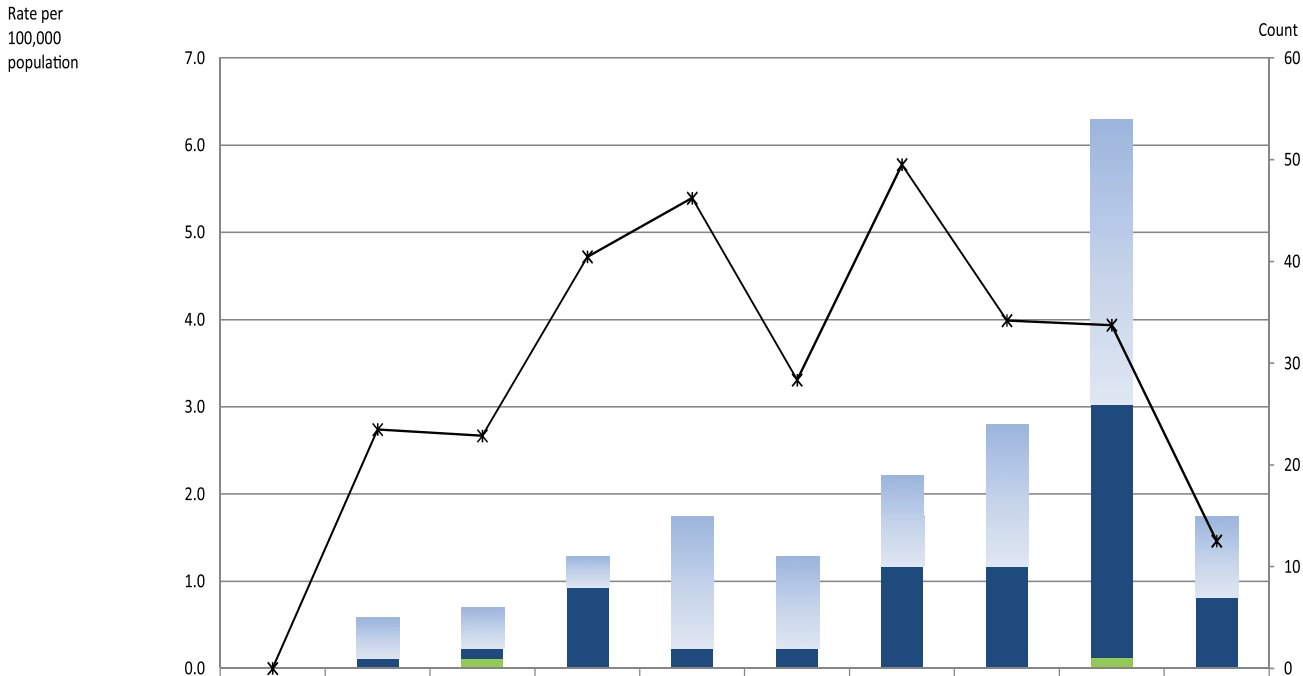
	2008	2009	2010	2011	2012
Outside Canada	76	68	69	84	92
Inside BC/Canada	161	92	54	46	66
Other (Blank)	3	7	2	3	2
Rates per 100,000	5.5	3.7	2.8	2.9	3.5

33.2 Rabies Exposures Rates by HSDA, 2012



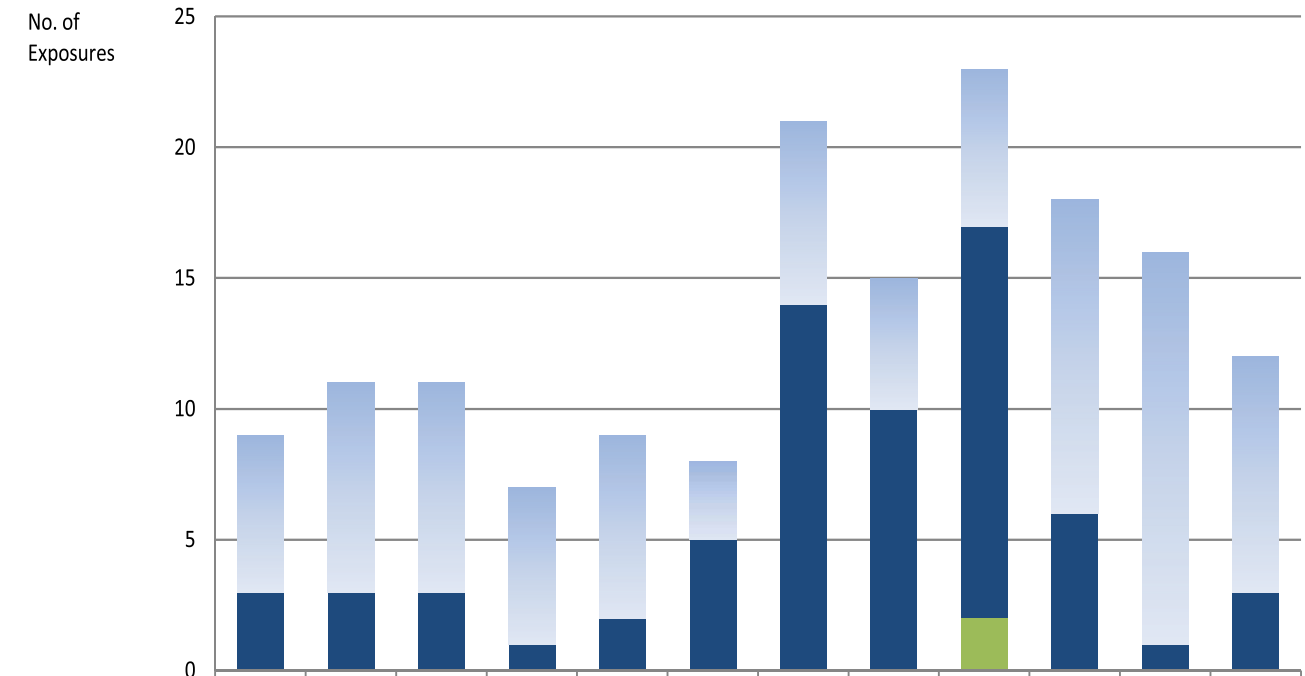
HSDA	Health Service Delivery Area	Exps.	Rate	BC/Can. Exps.	Int'l Exps.
11	East Kootenay	4	5.0	3	1
12	Kootenay Boundary	10	12.5	9	1
13	Okanagan	19	5.4	10	9
14	Thompson Cariboo Shuswap	9	4.0	7	2
21	Fraser East	6	2.1	4	2
22	Fraser North	13	2.1	3	10
23	Fraser South	13	1.8	1	12
31/32	Richmond/Vancouver	40	4.5	10	30
33	North Shore/Coast Garibaldi	9	3.1	2	7
41	South Vancouver Island	13	3.5	2	11
42	Central Vancouver Island	12	4.5	7	5
43	North Vancouver Island	2	1.6	1	1
51	Northwest	3	4.0	3	0
52	Northern Interior	3	2.1	2	1
53	Northeast	0	0.0	0	0

33.3 Rabies Exposures by Age Group, 2012



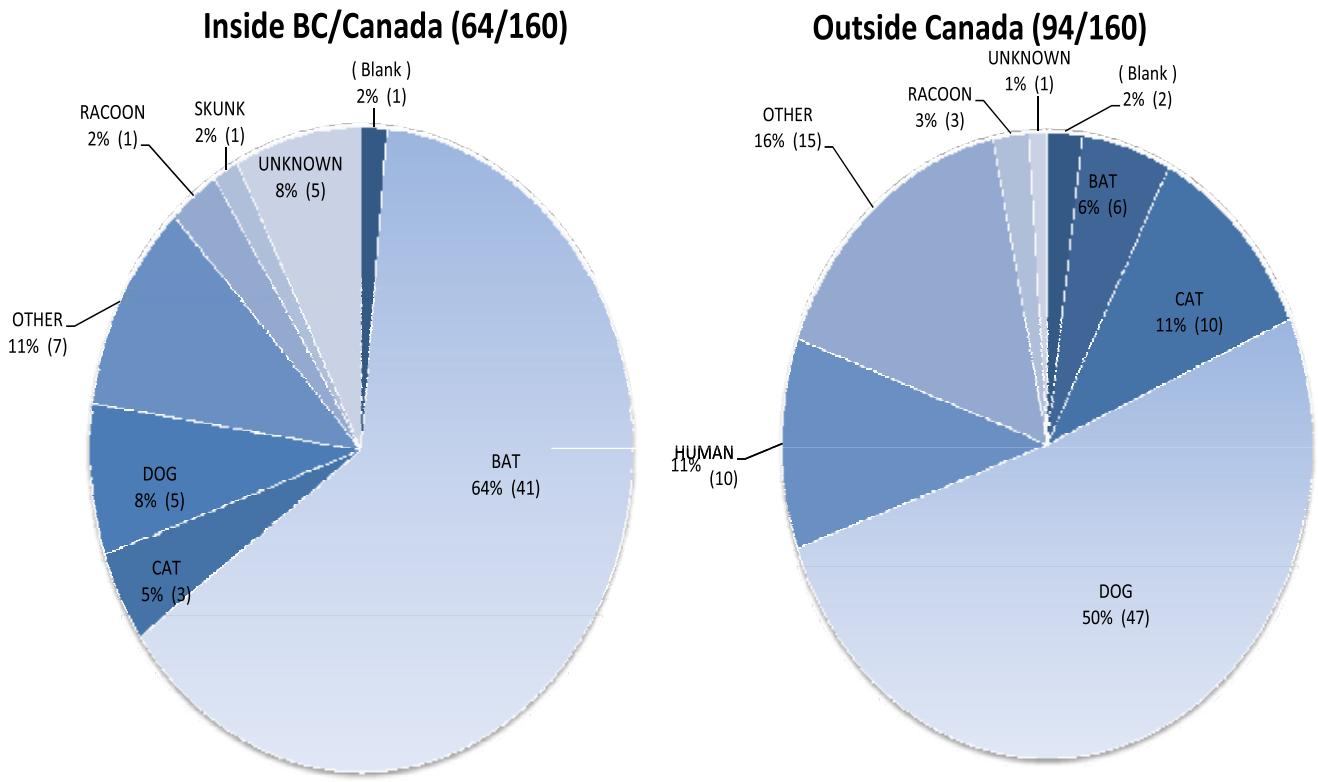
	<1 Year	1 - 4 Years	5 - 9 Years	10 - 14 Years	15 - 19 Years	20 - 24 Years	25 - 29 Years	30 - 39 Years	40 - 59 Years	60+ Years
Outside Canada	0	4	4	3	13	9	9	14	28	8
Inside BC/Canada	0	1	1	8	2	2	10	10	25	7
Other (Blank)	0	0	1	0	0	0	0	0	1	0
Rate per 100,000	0.0	2.7	2.7	4.7	5.4	3.3	5.8	4.0	3.9	1.5

33.4 Rabies Exposures by Month, 2012

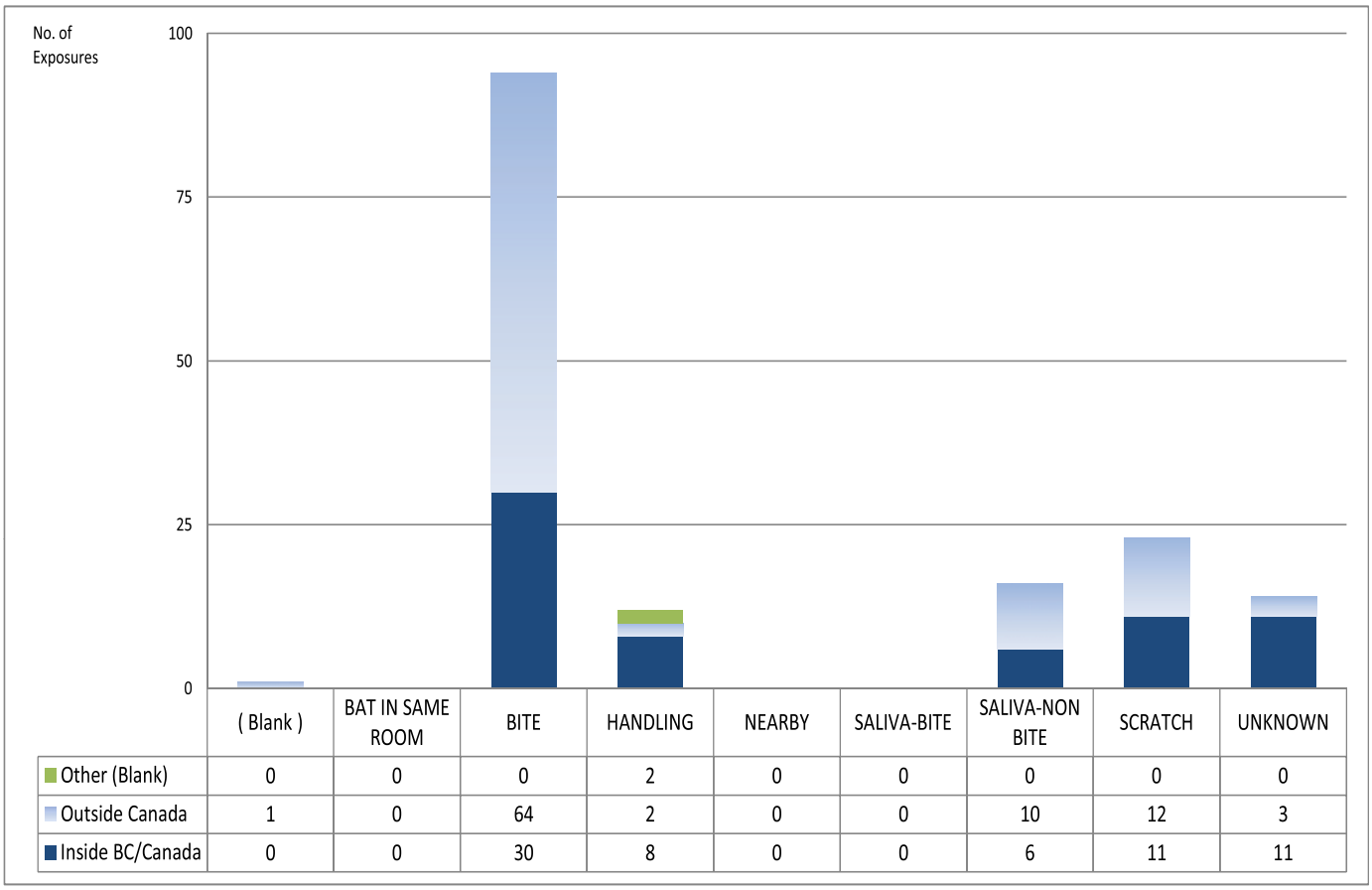


	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Outside Canada	6	8	8	6	7	3	7	5	6	12	15	9
Inside BC/Canada	3	3	3	1	2	5	14	10	15	6	1	3
Other (Blank)	0	0	0	0	0	0	0	0	2	0	0	0

33.5 Rabies Exposures by Percentage of Animal Species Involved, 2012



33.6 Rabies Exposures by Type of Exposure, 2012



	(Blank)	BAT IN SAME ROOM	BITE	HANDLING	NEARBY	SALIVA-BITE	SALIVA-NON BITE	SCRATCH	UNKNOWN
Other (Blank)	0	0	0	2	0	0	0	0	0
Outside Canada	1	0	64	2	0	0	10	12	3
Inside BC/Canada	0	0	30	8	0	0	6	11	11

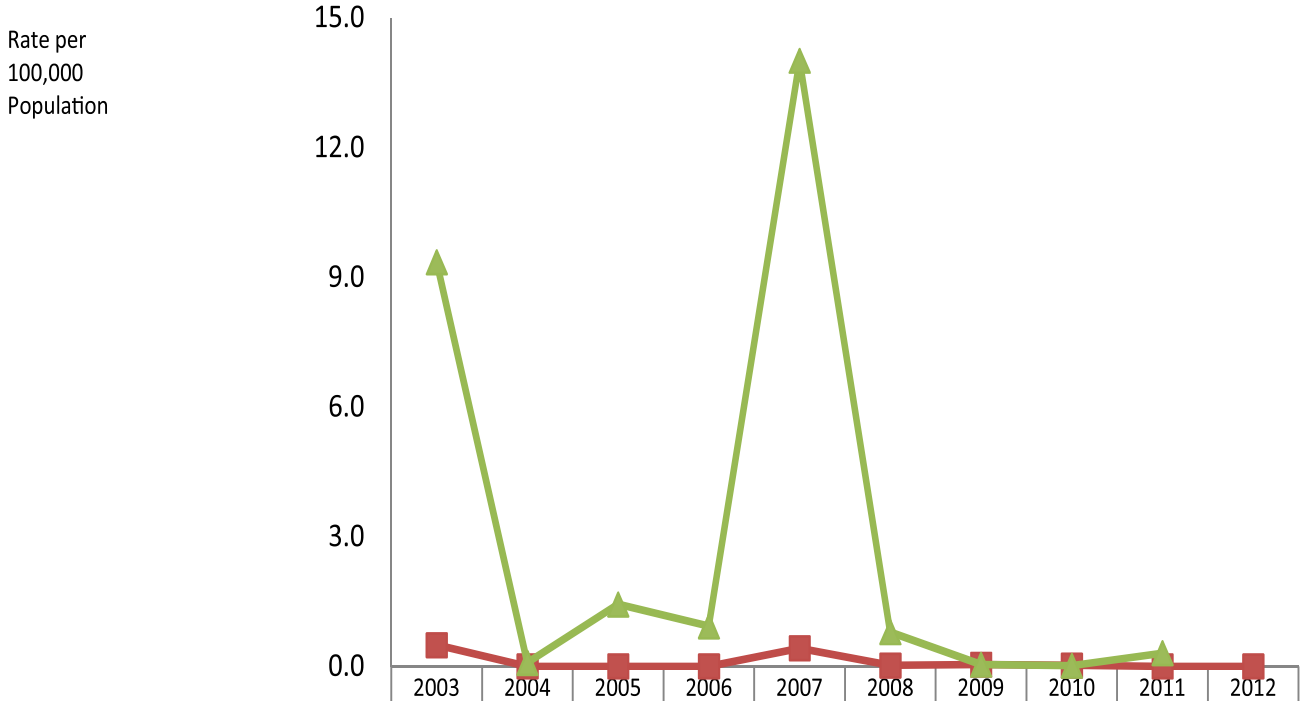
West Nile Virus

No positive human cases, birds, mosquito samples or horses were reported in 2012.

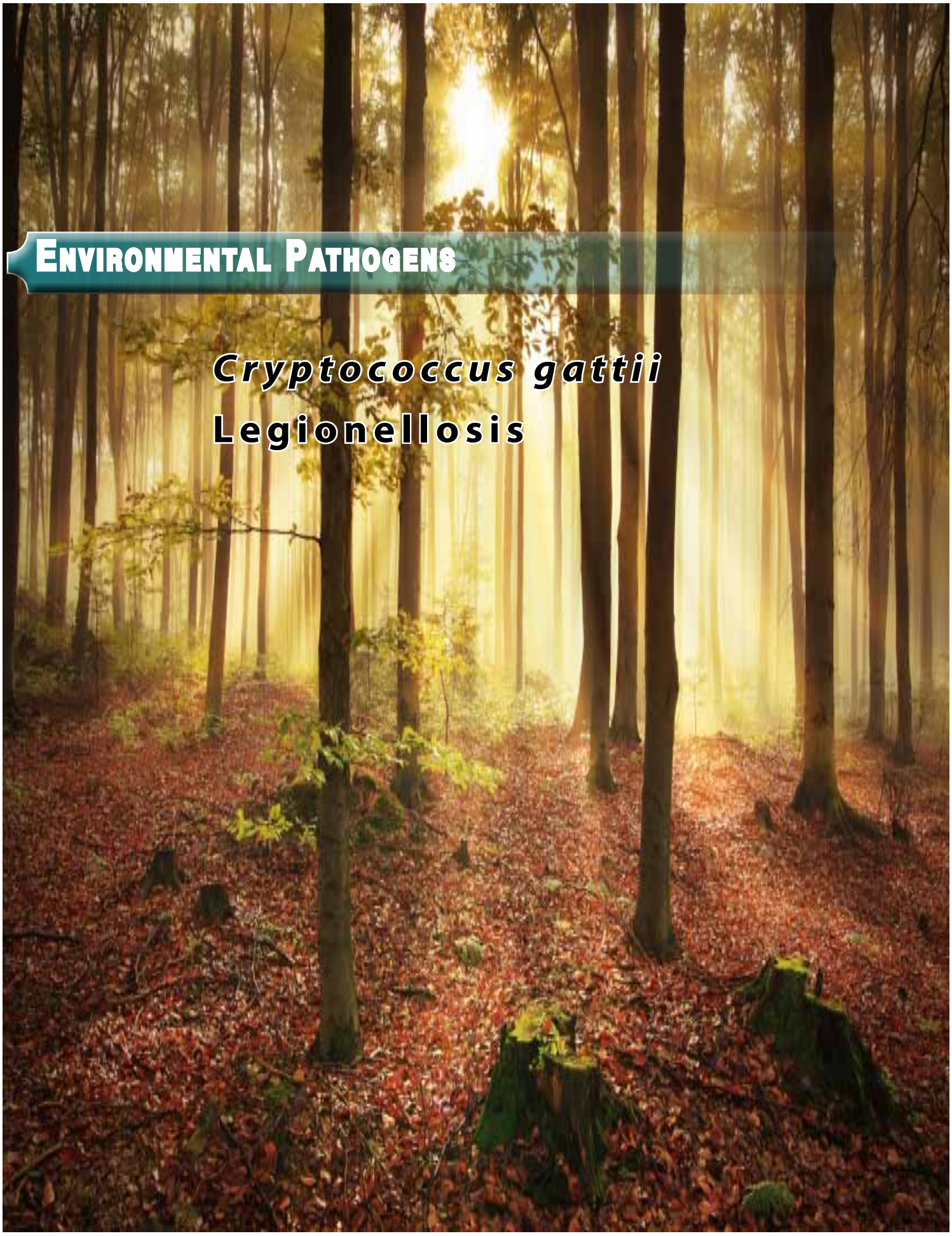
In 2012, 433 human cases were reported in Canada which is the highest number since 2007 and in the US, over 5,000 cases were reported which is highest number of cases since 2003.

The 2012 BC West Nile Virus Surveillance Program Report is available at http://www.bccdc.ca/dis-cond/a-z/_w/WestNileVirus/Surveillance/wnv_2012_surveillance.htm

34.1 West Nile Virus Infection Rates by Year, 2003-2012



	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
BC West Nile Virus Reports	20	0	0	0	18	1	2	1	0	0
BC West Nile Virus Rate	0.5	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0
Canadian West Nile Virus Rate	9.3	0.1	1.4	0.9	14.0	0.8	0.0	0.0	0.3	



Environmental Pathogens

Cryptococcus gattii

Legionellosis

Cryptococcus gattii

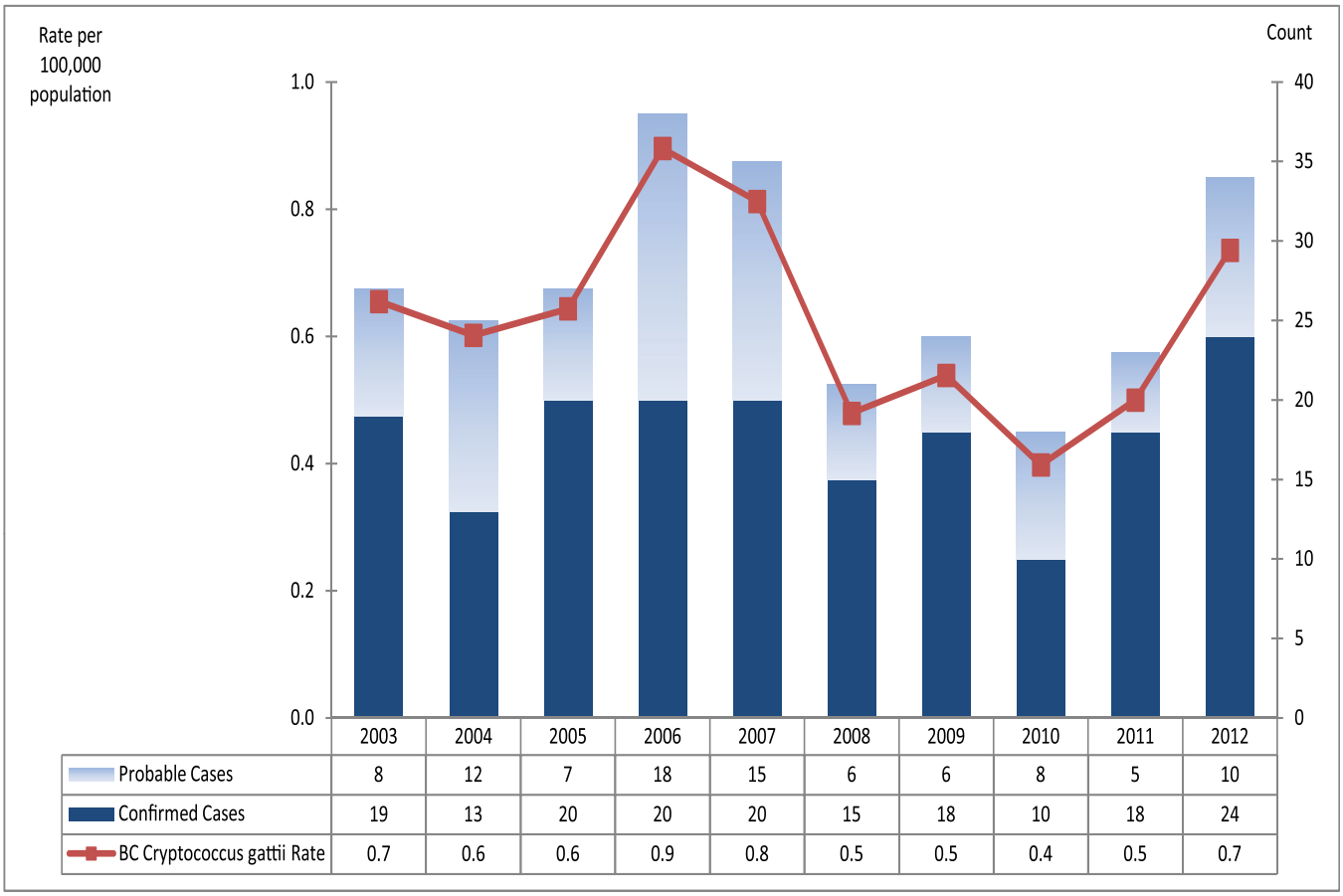
The numbers presented in this section are based on information generated through enhanced surveillance for *C. gattii* infection. In this report, *C. gattii* cases by year are presented by probable and confirmed case categories. [1] Starting in 2013, only confirmed cases will be reportable and presented in this report.

In 2012, 34 cases (0.7 per 100,000 population) of *C. gattii* infection were reported. Twenty-four (70.6%) cases were culture-confirmed. The overall incidence has increased again slightly for unclear reasons.

As seen in previous years, all cases occurred in adults. More than half the cases (21) were reported from the lower mainland. The highest rates were reported from Central Vancouver Island and the Fraser East.

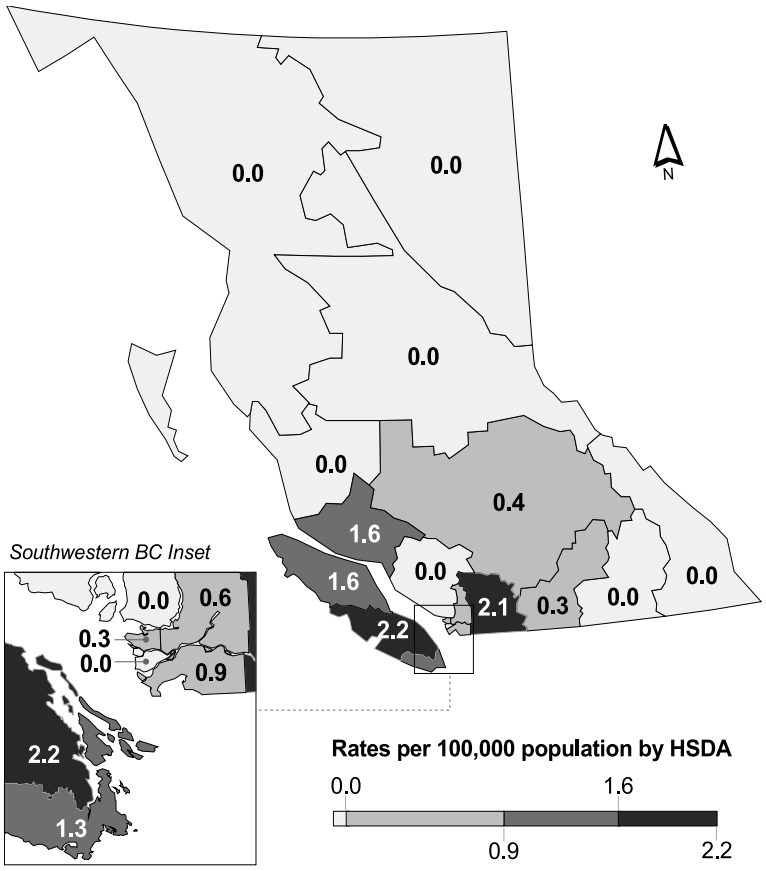
[1] A confirmed case is a person with culture-confirmed *C. gattii* infection. A probable case is a person who is HIV-negative AND lives in or visited a local or international endemic area in the year prior to onset/diagnosis AND has laboratory evidence of infection (positive latex agglutination test (≥ 1:8) AND symptoms compatible with *C. gattii* infection OR positive histopathology OR positive microscopy OR culture-confirmed *Cryptococcus* without information on species).

35.1 *Cryptococcus gattii* Rates by Year, 2003-2012



	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Probable Cases	8	12	7	18	15	6	6	8	5	10
Confirmed Cases	19	13	20	20	20	15	18	10	18	24
BC Cryptococcus gattii Rate	0.7	0.6	0.6	0.9	0.8	0.5	0.5	0.4	0.5	0.7

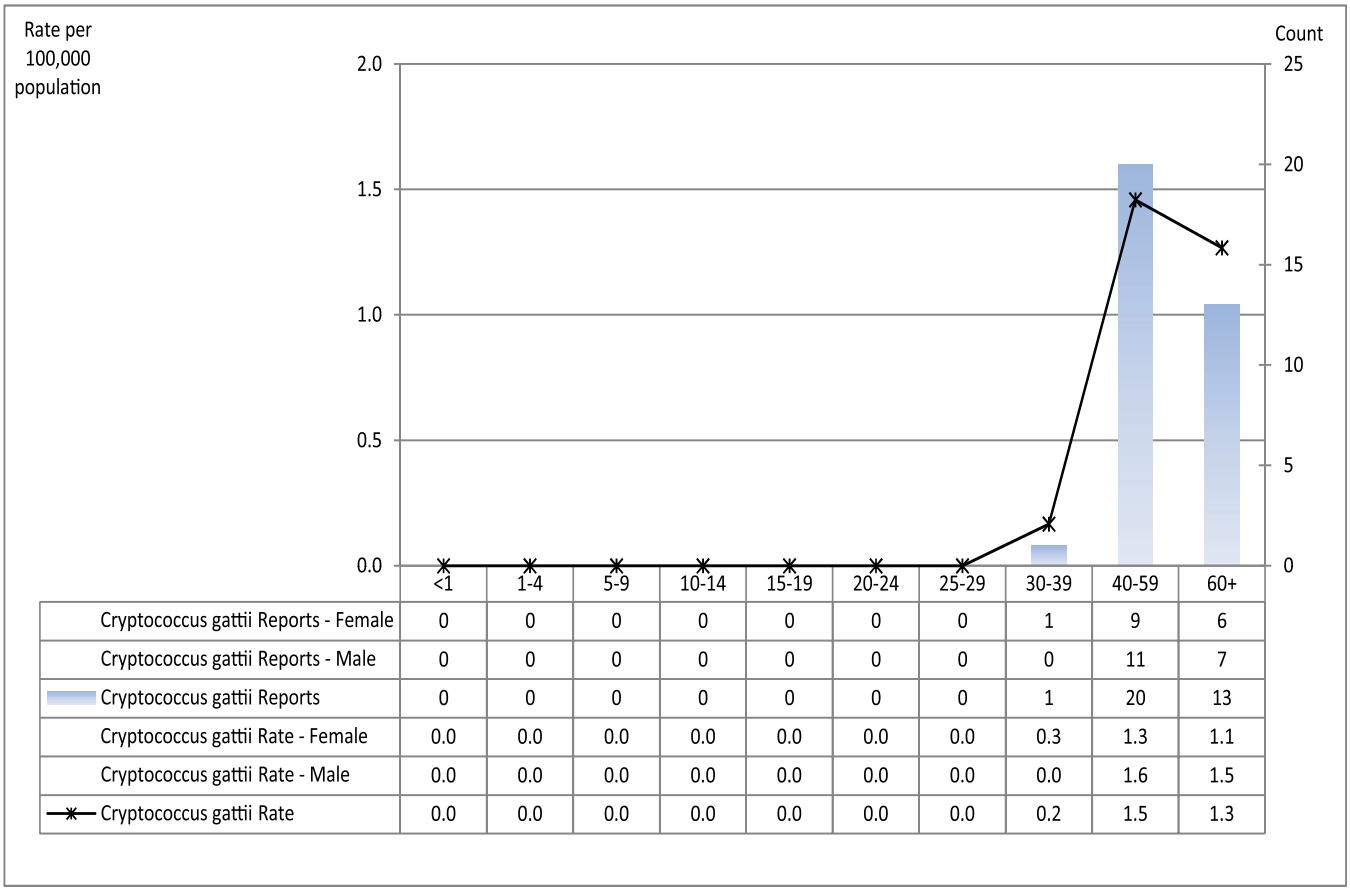
35.2 *Cryptococcus gattii* Rates by HSDA, 2012



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	6	2.1
22	Fraser North	4	0.6
23	Fraser South	7	0.9
31	Richmond	0	0.0
32	Vancouver	2	0.3
33	North Shore/Coast Garibaldi	0	0.0
41	South Vancouver Island	5	1.3
42	Central Vancouver Island	6	2.2
43	North Vancouver Island	2	1.6
51	Northwest	0	0.0
52	Northern Interior	0	0.0
53	Northeast	0	0.0

Note: Map classification by Jenks natural breaks method.

35.3 *Cryptococcus gattii* Rates by Age Group and Sex, 2012

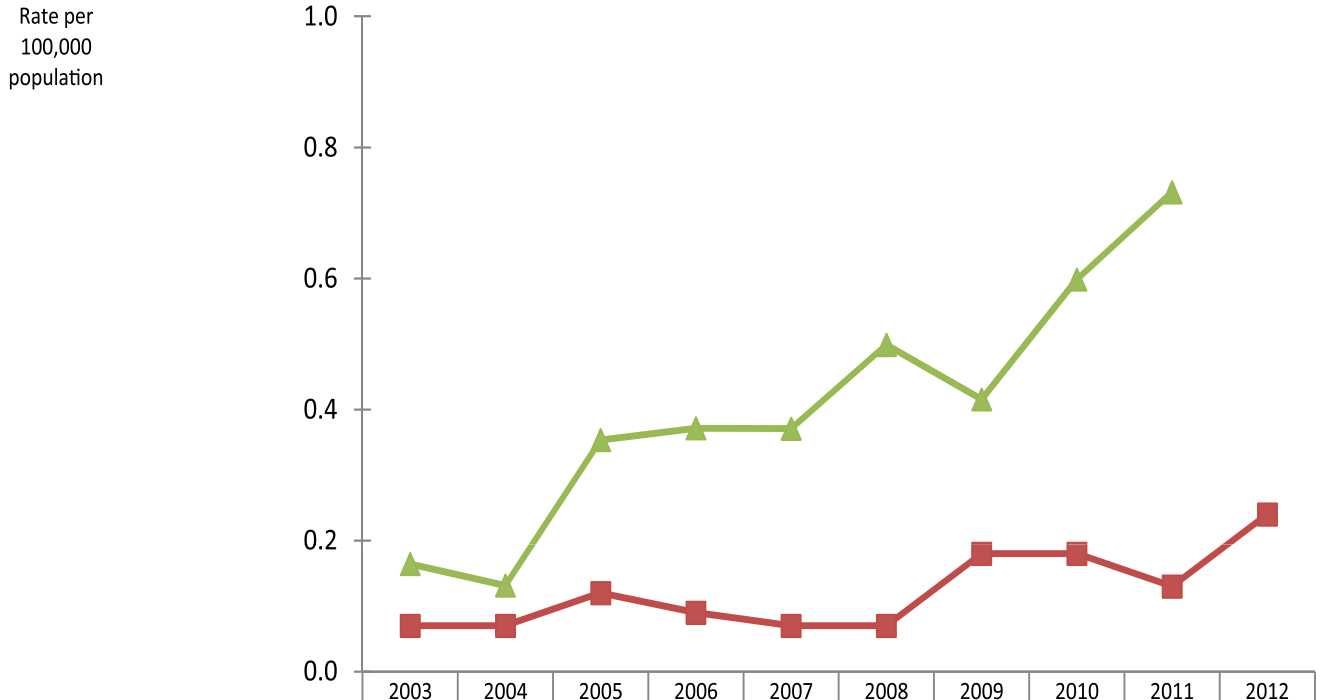


	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Cryptococcus gattii Reports - Female	0	0	0	0	0	0	0	1	9	6
Cryptococcus gattii Reports - Male	0	0	0	0	0	0	0	0	11	7
Cryptococcus gattii Reports	0	0	0	0	0	0	0	1	20	13
Cryptococcus gattii Rate - Female	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.3	1.1
Cryptococcus gattii Rate - Male	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	1.5
Cryptococcus gattii Rate	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.5	1.3

Legionellosis

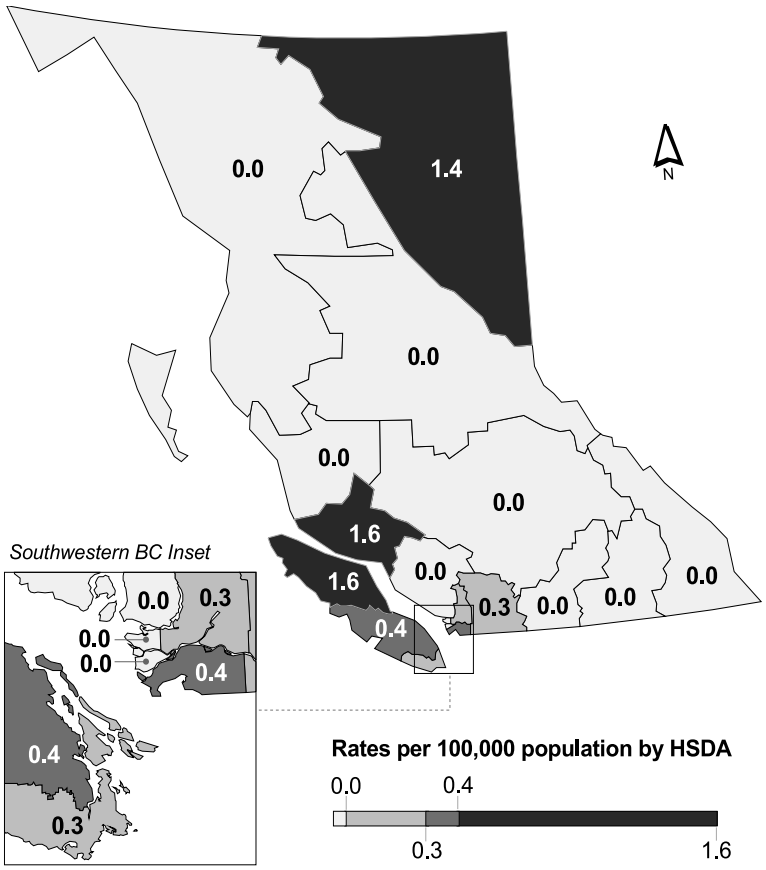
In 2012, eleven cases of legionellosis were reported, the highest number in the last decade. The rates have also been increasing nationally. Reasons for this increase are not clear. Over half the cases were reported from Fraser Health Authority. All cases occurred in adults aged 40 years and older. Cases occurred throughout the year and no outbreaks were reported.

36.1 Legionellosis Rates by Year, 2003-2012



	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Legionellosis Reports	3	3	5	4	3	3	8	8	6	11
Legionellosis Rate	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.2
Canadian Legionellosis Rate	0.2	0.1	0.4	0.4	0.4	0.5	0.4	0.6	0.7	

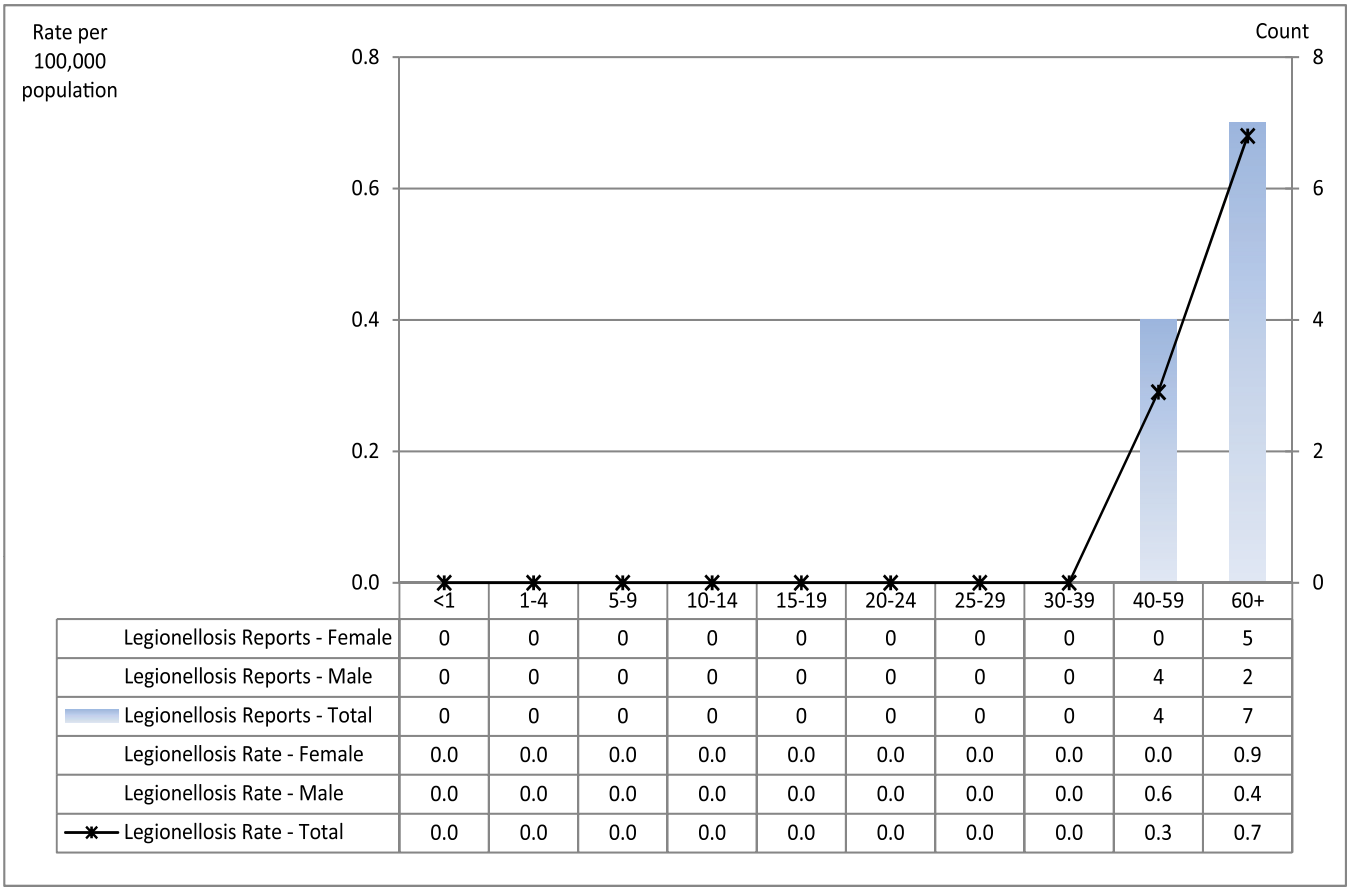
36.2 Legionellosis Rates by HSDA, 2012



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

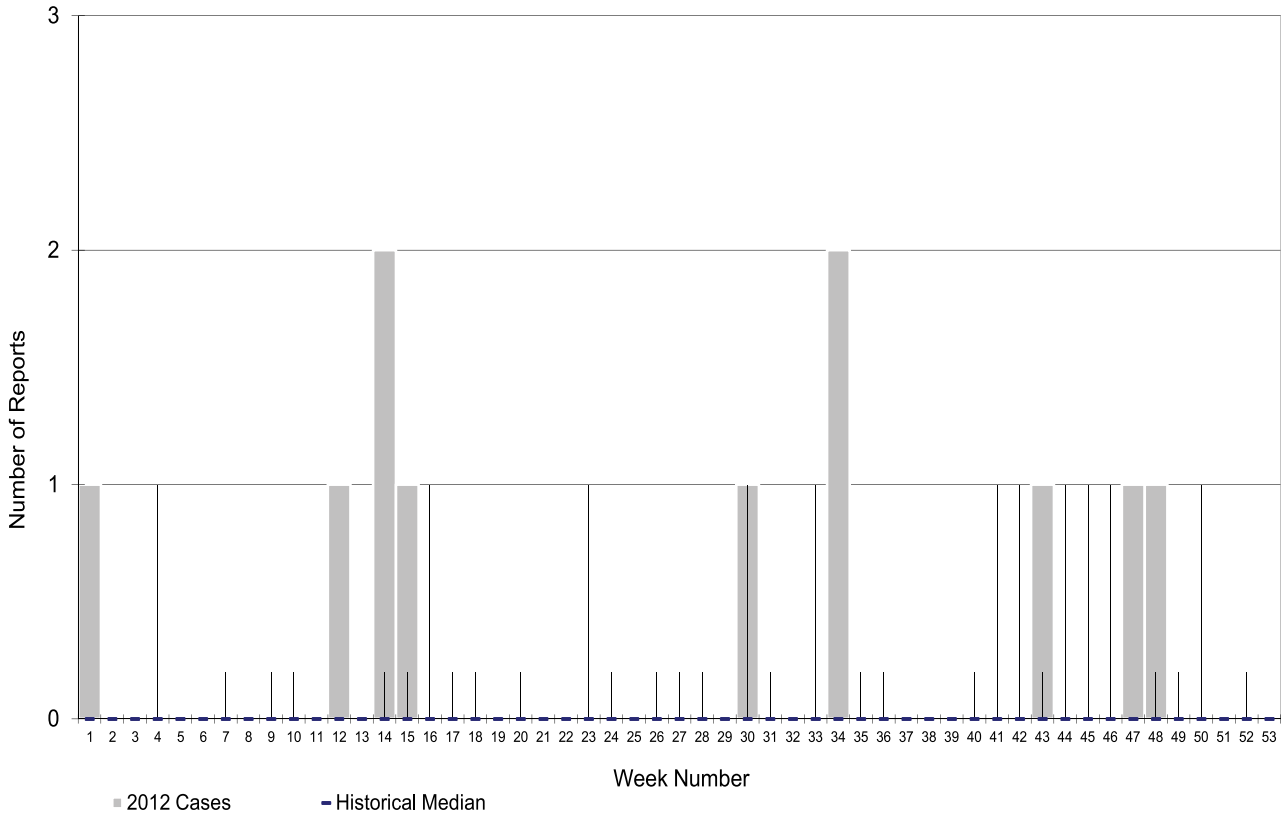
Note: Map classification by Jenks natural breaks method.

36.3 Legionellosis Rates by Age Group and Sex, 2012



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Legionellosis Reports - Female	0	0	0	0	0	0	0	0	0	5
Legionellosis Reports - Male	0	0	0	0	0	0	0	0	4	2
Legionellosis Reports - Total	0	0	0	0	0	0	0	0	4	7
Legionellosis Rate - Female	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9
Legionellosis Rate - Male	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.4
Legionellosis Rate - Total	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.7

36.4 2012 Legionellosis Reports Compared to Historical Median and the 10th and 90th Percentiles Around the Median (2003 to 2011)



Reportable Communicable Diseases in BC, December 2011

Schedule A: Reportable by all sources, including Laboratories

- Acquired Immune Deficiency Syndrome
- Anthrax
- Botulism
- Brucellosis
- Chancroid
- Cholera
- Congenital Infections:
  - Toxoplasmosis
  - Rubella
  - Cytomegalovirus
  - Herpes Simplex
  - Varicella-Zoster
  - Hepatitis B Virus
  - Listeriosis and any other congenital infection
- Creutzfeldt-Jacob Disease
- Cryptococcal infection
- Cryptosporidiosis
- Cyclospora infection
- Diffuse Lamellar Keratitis
- Diphtheria:
  - Cases
  - Carriers
- Encephalitis:
  - Post-infectious
  - Subacute sclerosing panencephalitis
  - Vaccine-related
  - Viral
- Foodborne illness:
  - All causes
- Gastroenteritis epidemic:
  - Bacterial
  - Parasitic
  - Viral
- Genital Chlamydia Infection
- Giardiasis
- Gonorrhea - all sites
- Group A Streptococcal Disease, Invasive
- H5 and H7 strains of the Influenza virus
- *Haemophilus influenzae* Disease,
  - All Invasive, by Type
- Hantavirus Pulmonary Syndrome
- Hemolytic Uremic Syndrome (HUS)
- Hemorrhagic Viral Fevers
- Hepatitis Viral:
  - Hepatitis A
  - Hepatitis B
  - Hepatitis C
  - Hepatitis E
  - Other Viral Hepatitis
- Human Immunodeficiency Virus Infection
- Leprosy
- Lyme Disease
- Measles
- Meningitis: All causes
  - (i) Bacterial:
    - Haemophilus
    - Pneumococcal
    - Other
  - (ii) Viral
- Meningococcal Disease, All Invasive
  - including "Primary Meningococcal Pneumonia" and "Primary Meningococcal Conjunctivitis"
- Mumps
- Neonatal Group B Streptococcal Infection
- Paralytic Shellfish Poisoning (PSP)
- Pertussis (Whooping Cough)
- Plague
- Poliomyelitis
- Rabies
- Reye Syndrome
- Rubella
- Severe Acute Respiratory Syndrome (SARS)
- Smallpox
- Streptococcus pneumoniae Infection, Invasive
- Syphilis
- Tetanus
- Transfusion Transmitted Infection
- Tuberculosis
- Tularemia
- Typhoid Fever and Paratyphoid Fever
- Venereal Disease:
  - Chancroid
  - Gonorrhea - all sites
  - Syphilis
- 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. 216/2011, December 2, 2011
http://www.bclaws.ca/EPLibraries/bclaws_new/document/ID/freeside/12_4_83#section2

	BC TOTAL	INTERIOR					FRASER			
	Provincial Total	East Kootenay	Kootenay Boundary	Okanagan	Thompson Cariboo	**Interior Total**	Fraser East	Fraser North	Fraser South	**Fraser Total**
2012 Population Estimate	**4622573**	80617	80003	354746	224274	**739640**	288598	623357	738107	**1650062**
AIDS (2011)*	**69**	0	0	2	2	**4**	4	6	7	**17**
Amebiasis	**340**	0	4	5	2	**11**	14	50	66	**130**
Campylobacteriosis	**1853**	32	24	113	62	**231**	96	264	273	**633**
Chlamydia^	**12320**	146	96	863	667	**1772**	536	1413	1408	**3357**
Cryptococcus gattii	**34**	0	0	1	1	**2**	6	4	7	**17**
Cryptosporidiosis	**74**	1	3	6	3	**13**	10	6	15	**31**
Cyclosporiasis	**21**	0	0	0	1	**1**	0	2	4	**6**
E. coli, Shigatoxigenic	**136**	3	2	11	4	**20**	7	15	14	**36**
Giardiasis	**613**	11	7	31	24	**73**	45	70	120	**235**
Gonorrhea^	**1293**	3	0	22	43	**68**	38	136	146	**320**
Hepatitis A	**35**	0	0	1	0	**1**	3	4	10	**17**
Hepatitis B Acute	**13**	0	0	1	0	**1**	1	0	1	**2**
Hepatitis B Chronic and Unknown	**1071**	1	4	22	10	**37**	21	249	91	**361**
Hepatitis C	**1885**	38	23	161	94	**316**	188	208	257	**653**
Haemophilus influenzae b, invasive	**3**	0	0	1	0	**1**	0	0	0	**0**
HIV^	**237**	2	3	5	2	**12**	6	20	19	**45**
Listeriosis	**14**	0	1	0	0	**1**	1	3	2	**6**
Lyme	**18**	1	1	1	1	**4**	0	0	0	**0**
Malaria	**36**	0	0	0	0	**0**	1	3	16	**20**
Measles	**2**	0	0	0	0	**0**	0	1	0	**1**
Meningococcal Disease, invasive	**16**	0	0	2	0	**2**	2	0	1	**3**
Mumps	**8**	0	0	0	0	**0**	0	0	0	**0**
Paratyphoid Fever	**24**	0	0	4	0	**4**	2	2	14	**18**
Pertussis	**459**	7	9	15	10	**41**	70	42	54	**166**
Pneumococcal Disease, invasive	**359**	3	8	24	20	**55**	28	44	50	**122**
Rubella	**0**	0	0	0	0	**0**	0	0	0	**0**
Salmonellosis	**930**	13	10	64	31	**118**	51	142	196	**389**
Shigellosis	**175**	1	0	8	3	**12**	10	18	30	**58**
Streptococcus Group A invasive	**143**	4	4	15	10	**33**	11	14	22	**47**
Syphilis (infectious)^	**372**	2	0	5	3	**10**	8	31	28	**67**
Tuberculosis	**289**	1	1	19	10	**31**	16	38	63	**117**
Typhoid Fever	**26**	0	0	1	0	**1**	2	4	17	**23**
Vibrio Infections	**54**	0	0	2	0	**2**	4	4	4	**12**
Yersinlosis	**393**	3	2	10	6	**21**	6	39	29	**74**
LESS COMMON DISEASES										
Brucellosis	**1**	0	0	1	0	**1**	0	0	0	**0**
Creutzfeldt-Jacob Disease	**3**	0	0	0	0	**0**	1	0	0	**1**
Diphtheria	**1**	0	0	0	0	**0**	0	0	1	**1**
Legionellosis	**11**	0	0	0	0	**0**	1	2	3	**6**
Leprosy	**2**	0	0	0	0	**0**	1	1	0	**2**
Neonatal Group B Streptococcal Infection	**5**	0	0	0	0	**0**	0	1	0	**1**
Tetanus	**1**	0	0	0	0	**0**	0	0	1	**1**

*AIDS case reports are for 2011. The 2012 AIDS statistics will be available in our next report due to a delay associated with AIDS data colletion.
^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: In 2012, there were no reported cases of Anthrax, Botulism, Cholera, Congenital Rubella Syndrome, Hantavirus, Viral Hemorrhagic Fevers, Leptospirosis, Plague, Poliomyelitis, Rabies, Severe Acute Respiratory Syndrome, Trichinosis, Tularemia, West Nile or Yellow Fever.

VANCOUVER COASTAL				VANCOUVER ISLAND				NORTHERN			
Richmond	Vancouver	North Shore Coast Garibaldi	**Vancouver Coastal Total**	South Vancouver Island	Central Vancouver Island	North Vancouver Island	**Vancouver Island Total**	Northwest	Northern Interior	Northeast	**Northern Total**
199949	684681	290653	**1175283**	376423	266984	121417	**764824**	75486	145087	72191	**292764**
1	26	4	**31**	11	1	0	**12**	0	5	0	**5**
12	140	14	**166**	19	8	5	**32**	1	0	0	**1**
95	342	188	**625**	160	102	60	**322**	11	26	5	**42**
461	2575	718	**3754**	1058	744	345	**2147**	371	668	251	**1290**
0	2	0	**2**	5	6	2	**13**	0	0	0	**0**
4	11	3	**18**	2	3	0	**5**	1	3	3	**7**
0	7	3	**10**	2	2	0	**4**	0	0	0	**0**
5	15	5	**25**	32	14	7	**53**	1	1	0	**2**
18	133	54	**205**	42	25	8	**75**	7	9	9	**25**
38	602	56	**696**	73	34	14	**121**	23	54	11	**88**
2	5	3	**10**	2	3	1	**6**	1	0	0	**1**
0	8	0	**8**	1	0	0	**1**	0	0	1	**1**
177	384	29	**590**	41	18	7	**66**	8	7	2	**17**
37	339	63	**439**	137	135	77	**349**	30	63	35	**128**
0	2	0	**2**	0	0	0	**0**	0	0	0	**0**
4	131	7	**142**	14	8	4	**26**	4	8	0	**12**
3	3	0	**6**	0	1	0	**1**	0	0	0	**0**
0	3	4	**7**	6	0	0	**6**	0	1	0	**1**
2	8	0	**10**	2	2	1	**5**	0	1	0	**1**
0	0	1	**1**	0	0	0	**0**	0	0	0	**0**
0	2	1	**3**	3	1	2	**6**	1	1	0	**2**
2	2	0	**4**	0	0	3	**3**	0	0	1	**1**
1	1	0	**2**	0	0	0	**0**	0	0	0	**0**
6	75	106	**187**	37	24	0	**61**	2	1	1	**4**
7	60	15	**82**	34	35	5	**74**	6	19	1	**26**
0	0	0	**0**	0	0	0	**0**	0	0	0	**0**
51	140	60	**251**	68	47	11	**126**	9	21	16	**46**
8	67	10	**85**	12	1	6	**19**	0	1	0	**1**
1	24	2	**27**	8	14	0	**22**	7	6	0	**13**
12	257	10	**279**	8	4	1	**13**	1	1	1	**3**
25	73	4	**102**	11	9	5	**25**	1	12	1	**14**
0	2	0	**2**	0	0	0	**0**	0	0	0	**0**
1	20	11	**32**	5	0	1	**6**	1	1	0	**2**
28	117	52	**197**	53	33	6	**92**	2	4	3	**9**
0	0	0	**0**	0	0	0	**0**	0	0	0	**0**
0	1	0	**1**	0	1	0	**1**	0	0	0	**0**
0	0	0	**0**	0	0	0	**0**	0	0	0	**0**
0	0	0	**0**	1	1	2	**4**	0	0	1	**1**
0	0	0	**0**	0	0	0	**0**	0	0	0	**0**
1	0	0	**1**	1	1	0	**2**	0	0	1	**1**
0	0	0	**0**	0	0	0	**0**	0	0	0	**0**

	BC TOTAL	INTERIOR					FRASER			
	Provincial Total	East Kootenay	Kootenay Boundary	Okanagan	Thompson Cariboo	**Interior Total**	Fraser East	Fraser North	Fraser South	**Fraser Total**
2012 Population Estimate	**4622573**	80617	80003	354746	224274	**739640**	288598	623357	738107	**1650062**
AIDS (2011)*	**1.5**	0.0	0.0	0.6	0.9	**0.5**	1.4	1.0	1.0	**1.0**
Amebiasis	**7.4**	0.0	5.0	1.4	0.9	**1.5**	4.9	8.0	8.9	**7.9**
Campylobacteriosis	**40.1**	39.7	30.0	31.9	27.6	**31.2**	33.3	42.4	37.0	**38.4**
Chlamydia^	**266.5**	181.1	120.0	243.3	297.4	**239.6**	185.7	226.7	190.8	**203.4**
Cryptococcus gattii	**0.7**	0.0	0.0	0.3	0.4	**0.3**	2.1	0.6	0.9	**1.0**
Cryptosporidiosis	**1.6**	1.2	3.7	1.7	1.3	**1.8**	3.5	1.0	2.0	**1.9**
Cyclosporiasis	**0.5**	0.0	0.0	0.0	0.4	**0.1**	0.0	0.3	0.5	**0.4**
E. coli, Shigatoxigenic	**2.9**	3.7	2.5	3.1	1.8	**2.7**	2.4	2.4	1.9	**2.2**
Giardiasis	**13.3**	13.6	8.7	8.7	10.7	**9.9**	15.6	11.2	16.3	**14.2**
Gonorrhea^	**28.0**	3.7	0.0	6.2	19.2	**9.2**	13.2	21.8	19.8	**19.4**
Hepatitis A	**0.8**	0.0	0.0	0.3	0.0	**0.1**	1.0	0.6	1.4	**1.0**
Hepatitis B Acute	**0.3**	0.0	0.0	0.3	0.0	**0.1**	0.3	0.0	0.1	**0.1**
Hepatitis B Chronic and Unknown	**23.2**	1.2	5.0	6.2	4.5	**5.0**	7.3	39.9	12.3	**21.9**
Hepatitis C	**40.8**	47.1	28.7	45.4	41.9	**42.7**	65.1	33.4	34.8	**39.6**
Haemophilus influenzae b, invasive	**0.1**	0.0	0.0	0.3	0.0	**0.1**	0.0	0.0	0.0	**0.0**
HIV^	**5.1**	2.5	3.7	1.4	0.9	**1.6**	2.1	3.2	2.6	**2.7**
Listeriosis	**0.3**	0.0	1.2	0.0	0.0	**0.1**	0.3	0.5	0.3	**0.4**
Lyme	**0.4**	1.2	1.2	0.3	0.4	**0.5**	0.0	0.0	0.0	**0.0**
Malaria	**0.8**	0.0	0.0	0.0	0.0	**0.0**	0.3	0.5	2.2	**1.2**
Measles	**0.0**	0.0	0.0	0.0	0.0	**0.0**	0.0	0.2	0.0	**0.1**
Meningococcal Disease, invasive	**0.3**	0.0	0.0	0.6	0.0	**0.3**	0.7	0.0	0.1	**0.2**
Mumps	**0.2**	0.0	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**
Paratyphoid Fever	**0.5**	0.0	0.0	1.1	0.0	**0.5**	0.7	0.3	1.9	**1.1**
Pertussis	**9.9**	8.7	11.2	4.2	4.5	**5.5**	24.3	6.7	7.3	**10.1**
Pneumococcal Disease, invasive	**7.8**	3.7	10.0	6.8	8.9	**7.4**	9.7	7.1	6.8	**7.4**
Rubella	**0.0**	0.0	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**
Salmonellosis	**20.1**	16.1	12.5	18.0	13.8	**16.0**	17.7	22.8	26.6	**23.6**
Shigellosis	**3.8**	1.2	0.0	2.3	1.3	**1.6**	3.5	2.9	4.1	**3.5**
Streptococcus Group A invasive	**3.1**	5.0	5.0	4.2	4.5	**4.5**	3.8	2.2	3.0	**2.8**
Syphilis (infectious)^	**8.0**	2.5	0.0	1.4	1.3	**1.4**	2.8	5.0	3.8	**4.1**
Tuberculosis	**6.3**	1.2	1.2	5.4	4.5	**4.2**	5.5	6.1	8.5	**7.1**
Typhoid Fever	**0.6**	0.0	0.0	0.3	0.0	**0.1**	0.7	0.6	2.3	**1.4**
Vibrio Infections	**1.2**	0.0	0.0	0.6	0.0	**0.3**	1.4	0.6	0.5	**0.7**
Yersinlosis	**8.5**	3.7	2.5	2.8	2.7	**2.8**	2.1	6.3	3.9	**4.5**
LESS COMMON DISEASES										
Brucellosis	**0.02**	0.00	0.00	0.28	0.00	**0.14**	0.00	0.00	0.00	**0.00**
Creutzfeldt-Jacob Disease	**0.06**	0.00	0.00	0.00	0.00	**0.00**	0.35	0.00	0.00	**0.06**
Diphtheria	**0.02**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.14	**0.06**
Legionellosis	**0.24**	0.00	0.00	0.00	0.00	**0.00**	0.35	0.32	0.41	**0.36**
Leprosy	**0.04**	0.00	0.00	0.00	0.00	**0.00**	0.35	0.16	0.00	**0.12**
Neonatal Group B Streptococcal Infection	**0.11**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.16	0.00	**0.06**
Tetanus	**0.02**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.14	**0.06**

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

Note: In 2012, there were no reported cases of Anthrax, Botulism, Cholera, Congenital Rubella Syndrome, Hantavirus, Viral Hemorrhagic Fevers, Leptospirosis, Plague, Poliomyelitis, Rabies, Severe Acute Respiratory Syndrome, Trichinosis, Tularemia, West Nile or Yellow Fever.

VANCOUVER COASTAL				VANCOUVER ISLAND				NORTHERN			
Richmond	Vancouver	North Shore Coast Garibaldi	**Vancouver Coastal Total**	South Vancouver Island	Central Vancouver Island	North Vancouver Island	**Vancouver Island Total**	Northwest	Northern Interior	Northeast	**Northern Total**
199949	684681	290653	**1175283**	376423	266984	121417	**764824**	75486	145087	72191	**292764**
0.5	3.9	1.4	**2.7**	2.9	0.4	0.0	**1.6**	0.0	3.5	0.0	**1.7**
6.0	20.4	4.8	**14.1**	5.0	3.0	4.1	**4.2**	1.3	0.0	0.0	**0.3**
47.5	50.0	64.7	**53.2**	42.5	38.2	49.4	**42.1**	14.6	17.9	6.9	**14.3**
230.6	376.1	247.0	**319.4**	281.1	278.7	284.1	**280.7**	491.5	460.4	347.7	**440.6**
0.0	0.3	0.0	**0.2**	1.3	2.2	1.6	**1.7**	0.0	0.0	0.0	**0.0**
2.0	1.6	1.0	**1.5**	0.5	1.1	0.0	**0.7**	1.3	2.1	4.2	**2.4**
0.0	1.0	1.0	**0.9**	0.5	0.7	0.0	**0.5**	0.0	0.0	0.0	**0.0**
2.5	2.2	1.7	**2.1**	8.5	5.2	5.8	**6.9**	1.3	0.7	0.0	**0.7**
9.0	19.4	18.6	**17.4**	11.2	9.4	6.6	**9.8**	9.3	6.2	12.5	**8.5**
19.0	87.9	19.3	**59.2**	19.4	12.7	11.5	**15.8**	30.5	37.2	15.2	**30.1**
1.0	0.7	1.0	**0.9**	0.5	1.1	0.8	**0.8**	1.3	0.0	0.0	**0.3**
0.0	1.2	0.0	**0.7**	0.3	0.0	0.0	**0.1**	0.0	0.0	1.4	**0.3**
88.5	56.1	10.0	**50.2**	10.9	6.7	5.8	**8.6**	10.6	4.8	2.8	**5.8**
18.5	49.5	21.7	**37.4**	36.4	50.6	63.4	**45.6**	39.7	43.4	48.5	**43.7**
0.0	0.3	0.0	**0.2**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**
2.0	19.1	2.4	**12.1**	3.7	3.0	3.3	**3.4**	5.3	5.5	0.0	**4.1**
1.5	0.4	0.0	**0.5**	0.0	0.4	0.0	**0.1**	0.0	0.0	0.0	**0.0**
0.0	0.4	1.4	**0.6**	1.6	0.0	0.0	**0.8**	0.0	0.7	0.0	**0.3**
1.0	1.2	0.0	**0.9**	0.5	0.7	0.8	**0.7**	0.0	0.7	0.0	**0.3**
0.0	0.0	0.3	**0.1**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**
0.0	0.3	0.3	**0.3**	0.8	0.4	1.6	**0.8**	1.3	0.7	0.0	**0.7**
1.0	0.3	0.0	**0.3**	0.0	0.0	2.5	**0.4**	0.0	0.0	1.4	**0.3**
0.5	0.1	0.0	**0.2**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**
3.0	11.0	36.5	**15.9**	9.8	9.0	0.0	**8.0**	2.6	0.7	1.4	**1.4**
3.5	8.8	5.2	**7.0**	9.0	13.1	4.1	**9.7**	7.9	13.1	1.4	**8.9**
0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**
25.5	20.4	20.6	**21.4**	18.1	17.6	9.1	**16.5**	11.9	14.5	22.2	**15.7**
4.0	9.8	3.4	**7.2**	3.2	0.4	4.9	**2.5**	0.0	0.7	0.0	**0.3**
0.5	3.5	0.7	**2.3**	2.1	5.2	0.0	**2.9**	9.3	4.1	0.0	**4.4**
6.0	37.5	3.4	**23.7**	2.1	1.5	0.8	**1.7**	1.3	0.7	1.4	**1.0**
12.5	10.7	1.4	**8.7**	2.9	3.4	4.1	**3.3**	1.3	8.3	1.4	**4.8**
0.0	0.3	0.0	**0.2**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**
0.5	2.9	3.8	**2.7**	1.3	0.0	0.8	**0.8**	1.3	0.7	0.0	**0.7**
14.0	17.1	17.9	**16.8**	14.1	12.4	4.9	**12.0**	2.6	2.8	4.2	**3.1**
0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**
0.00	0.15	0.00	**0.09**	0.00	0.37	0.00	**0.13**	0.00	0.00	0.00	**0.00**
0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**
0.00	0.00	0.00	**0.00**	0.27	0.37	1.65	**0.52**	0.00	0.00	1.39	**0.34**
0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**
0.50	0.00	0.00	**0.09**	0.27	0.37	0.00	**0.26**	0.00	0.00	1.39	**0.34**
0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**

Sources and Explanatory Remarks

1. Clinical and confirmed case reports are collected from the health regions in British Columbia through the integrated Public Health Information System (iPHIS). Starting in 2005, only confirmed cases are described in the main report, in keeping with BC reporting to the Public Health Agency of Canada. For the breakdown of cases by their confirmed or clinical case status for 2005 and previous years, see the 2005 BC Annual Summary of Reportable Diseases posted on www.bccdc.ca. The exceptions are Lyme Disease, and Tetanus for which clinical cases are included in reporting. For *Cryptococcus gattii* probable cases are included in reporting.

2. Numbers in this report were generated in April 2013 and are subject to change due to possible late reporting and/or data clean up in the regions. This may also explain changes in the number of reported cases in previous years for some diseases.

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

4. Data for influenza, invasive meningococcal and pneumococcal disease and invasive group A streptococcal disease, measles, mumps, and rubella, *Cryptococcus gattii* infection, 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. *Cryptococcus gattii* infections are reported using the date the diagnosis is reported by the laboratory. Other diseases are classified by the reported date which is the date reported to the health authority.

5. Data for HIV and AIDS are collected through HAISYS, the HIV/AIDS Information System. Data for other sexually transmitted infections (STIs) are collected through the STI Information System. AIDS case reports are for 2011. The 2012 AIDS statistics will be available in our next report due to a delay associated with AIDS data collection. The BC total numbers for AIDS, chlamydia (genital), gonorrhea (genital), HIV and syphilis (infectious) include cases of non-BC residents and cases of unknown residency and thus may exceed the sum of cases in the five health authorities.

6. Statistics on tuberculosis are based on the analysis of the data extracted in April 2013. For more updated statistics on tuberculosis, please contact the Division of Tuberculosis Control.

7. For information on Antimicrobial Resistant Organism (ARO) Surveillance in BC, please refer to: Antimicrobial Resistance Trends in the Province of British Columbia - 2012. Epidemiology Services, British Columbia Centre for Disease Control. Available at www.bccdc.ca/prevention/AntibioticResistance

8. Amebiasis, cryptosporidiosis and listeriosis were removed from national surveillance in January 2000. Listeriosis was made reportable nationally again in 2007. Lyme disease became

nationally notifiable in 2009; methicillin resistant *Staphylococcus aureus*, vancomycin resistant enterococci, *Vibrio parahaemolyticus* and yersiniosis have not been nationally notifiable diseases in the period 2003 through 2012.

9. Salmonellosis reports include Paratyphoid (*S.* Paratyphi) and Typhoid Fever (*S.* Typhi).

10. The Jenks Natural Breaks Classification method was used for defining different classifications of disease rates in the maps. This classification method identifies gaps or depressions within the data distribution and creates the categories based on the best fit of the data (i.e., groups based on similarities).

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

12. National rates are provided by the Public Health Agency of Canada -Division of Surveillance and Risk Assessment. The 2011 and 2012 national rates are preliminary. In 2011, New Brunswick and Prince Edward Island did not report cyclosporiasis hence the population of that Provinces have been removed for rate calculation. The resulting national rates are therefore based only on the data and populations for the remaining participating jurisdictions, and the national rates may change once reporting is complete. 2012 national rates are unavailable currently until data updates are finalized.

13. Population estimates are taken from BC Stats, Ministry of Labour, Citizens' Services and Open Government July 1. Please note for the 2010 BC Annual Summary of Reportable Diseases and previous years reports, population estimates were taken from P.E.O.P.L.E. Projection (Population Extrapolation for Organizational Planning with Less Error) .

14. While we endeavour to include data on the majority of reportable diseases in this publication, data on some are not included. For information on the incidence of these diseases in 2012 in British Columbia, please contact epidserv@bccdc.ca.

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