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

655 West 12th Avenue
Vancouver, BC V5Z 4R4

Tel 604.707.2400
Fax 604.707.2401

www.bccdc.ca

British Columbia Annual Summary of Reportable Diseases

2013

Prepared by:

Communicable Disease Prevention and Control Services (CDPACS)

September 3, 2014

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

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

Contents Page

2013 Highlights

The year 2013 was characterized by moderate and stable levels of many reportable communicable diseases. However, several outbreaks punctuated the year; most noteworthy were the ongoing Vancouver-based syphilis outbreak and the national *E. coli* O157:H7 outbreak associated with BC-produced unpasteurized cheese.

Vaccine-preventable diseases

The 2013-14 influenza season was moderately severe and characterized by the resurgence of influenza A (H1N1)pdm09 activity. Measles activity was moderate in 2013 with 17 cases reported from the Lower Mainland Health Authorities. The incidence of invasive meningococcal disease continued to decrease largely due to the meningococcal C conjugate vaccination started in 2003. Mumps, with 38 cases reported, remained at endemic levels in BC. Pertussis showed an asynchronous cyclical peak of 316 cases driven primarily by activity in Island Health. Invasive pneumococcal disease has remained constant for the last few years.

Sexually-transmitted and bloodborne pathogens

There was a continued and rapid increase in the number of syphilis cases reported in 2013 (558 cases). The outbreak is mostly affecting males in the Vancouver HSDA. The HIV infection incidence rate increased slightly in 2013, likely due to increased testing with the BC STOP HIV/AIDS Program. The AIDS rate continued its decline. The incidence of *Chlamydia* infection remained stable whereas the gonorrhea infection rate increased. Acute hepatitis B infection rates have remained low and stable. Hepatitis C rates increased slightly, likely due to US testing recommendations.

Enteric, food and waterborne diseases

Two cases of botulism were reported in adults who consumed high risk foods in 2013. *Campylobacter* infection remains the most commonly reported bacterial enteric disease with 1655 cases. An unresolved outbreak of *Cyclospora* infection led to a higher incidence in 2013 than in recent years. The incidence of shigatoxigenic *E. coli* (STEC) infection has been increasing since 2011. In 2013, four STEC outbreaks were reported, including a national outbreak associated with unpasteurized cheese. Hepatitis A infection reached an all-time low with only 21 cases reported, the majority of which were travel-related. The incidence of *Salmonella* infection has fallen to pre-epidemic levels after a *Salmonella* Enteritidis outbreak occurred in 2008-11. Shigellosis rates decreased slightly in 2013; *S.* flexneri remains the most common species and has been related to a sexually transmitted outbreak in Vancouver. The incidence of *Vibrio* infection (mainly *V. parahaemolyticus*) has been increasing since 2008 reaching a high of 64 cases reported in 2013, the majority of which were associated with the consumption of raw oysters.

Vectorborne and zoonotic diseases

Lyme Disease cases continue to be reported at low rates (7 cases in 2013). Rabies exposures have remained constant with 168 reported in 2013, the majority (60.7%) of which occurred outside of Canada. A single human case of West Nile Virus infection was reported from the Okanagan.

Others

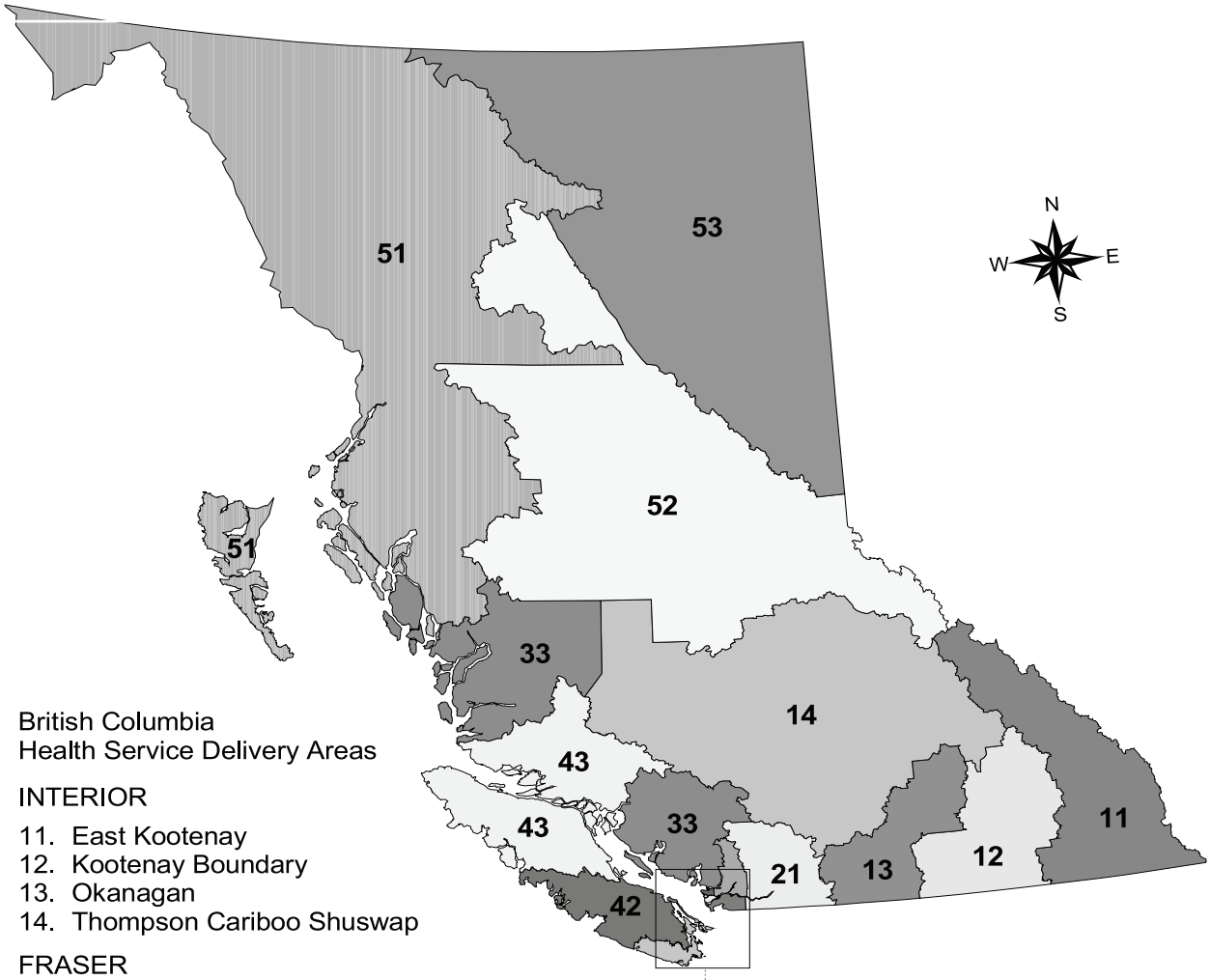
The incidence of tuberculosis has remained stable in the last few years. *E. coli* resistance to ciprofloxacin and vancomycin-resistant enterococci both increased in 2013. The incidence of *Cryptococcus gattii* infection remains low and stable with the majority of cases reported from Central Vancouver Island and Fraser Health Authority. The incidence of legionellosis has been increasing for unknown reasons in the last few years.

Dr. Eleni Galani

Interim 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

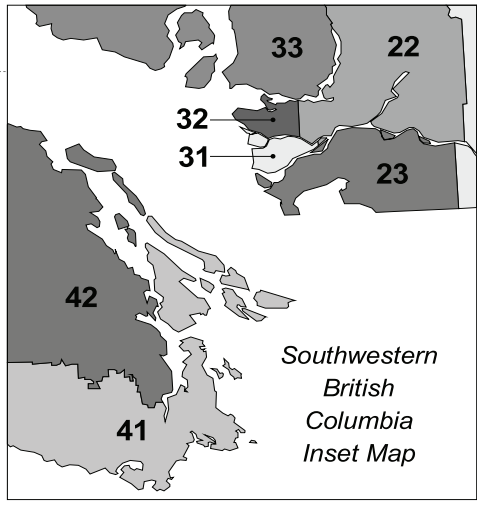
31. Richmond
32. Vancouver
33. North Shore/Coast Garibaldi

VANCOUVER ISLAND

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

NORTHERN

51. Northwest
52. Northern Interior
53. Northeast



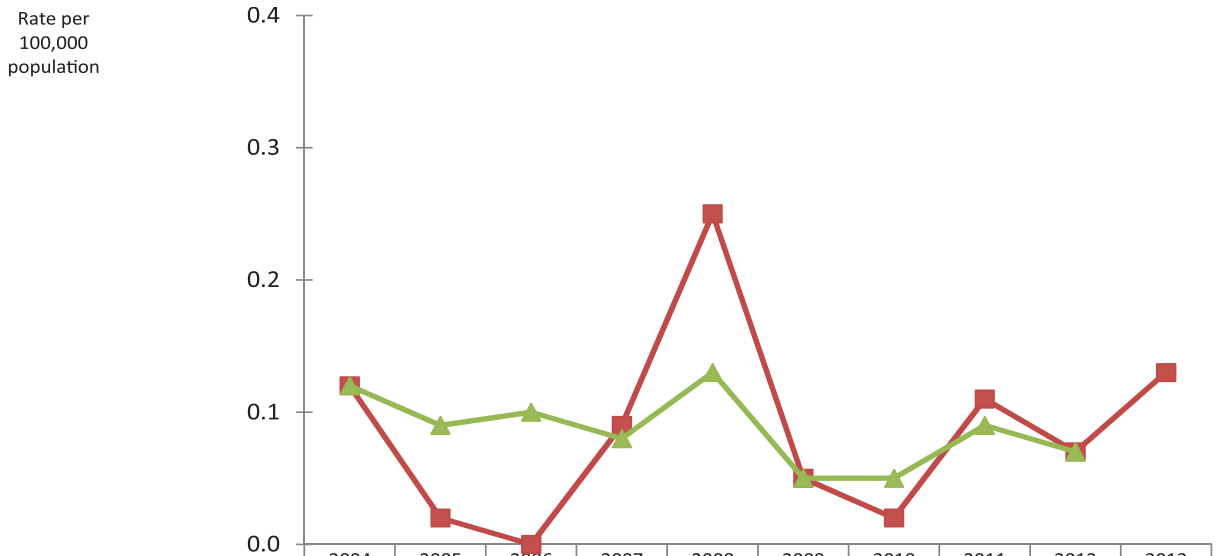
Diseases Preventable by Vaccination

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

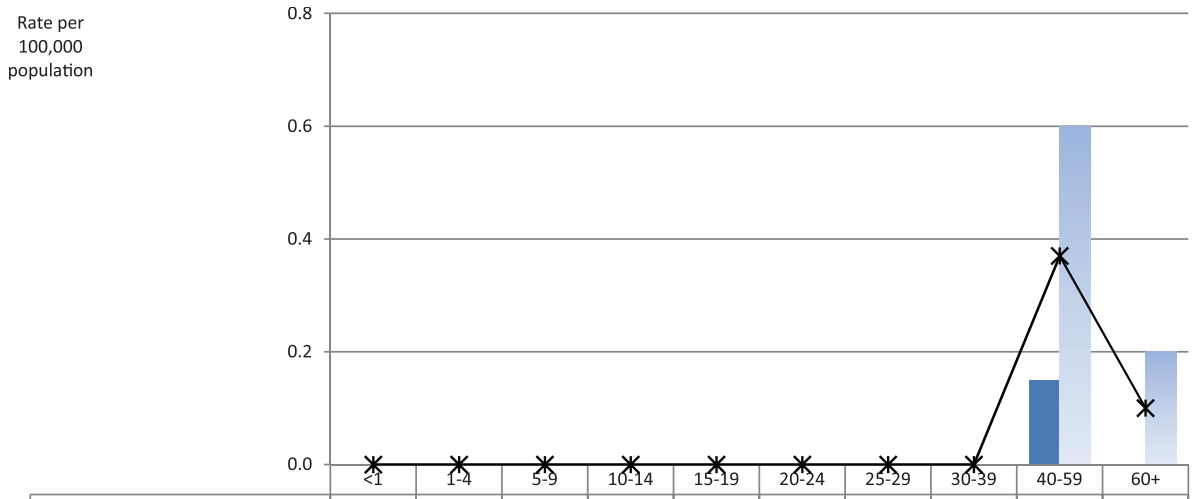
Six cases of invasive Haemophilus influenzae type b (Hib) disease were reported in 2013. No cases were reported in children. All cases were aged ≥ 40 years; five were male and one female. Hib vaccine is routinely given in infancy with a booster dose in the 2nd year of life. Its use in adults is limited 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, 2004-2013



	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
BC Invasive Hib Reports	5	1	0	4	11	2	1	5	3	6
BC Invasive Hib Rate	0.12	0.02	0.00	0.09	0.25	0.05	0.02	0.11	0.07	0.13
Canadian Hib Rate	0.12	0.09	0.10	0.08	0.13	0.05	0.05	0.09	0.07	

1.2 *Haemophilus influenzae type b (Hib), invasive Rates by Age Group and Sex, 2013*



	<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	0.0	0.2	0.0
Invasive Hib Rate - Male	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.2
Invasive Hib Rate	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.1
Invasive Hib Reports - Female	0	0	0	0	0	0	0	0	1	0
Invasive Hib Reports - Male	0	0	0	0	0	0	0	0	4	1
Invasive Hib Reports	0	0	0	0	0	0	0	0	5	1

Influenza

Influenza surveillance is conducted year-round in BC, with renewed annual monitoring typically commencing the first week of October (week 40) and ongoing through the end of September (week 39). This report summarizes surveillance data for the 2013-14 influenza season, spanning week 40 (starting September 29, 2013) through week 17 (ending April 26, 2014).

Influenza surveillance in BC consists of monitoring major trends in influenza activity and circulating viruses to inform prevention and control programs, including vaccine effectiveness and antiviral use. Community indicators for influenza surveillance include: (1) sentinel physician reporting of influenza-like illness (ILI); (2) Medical Service Plan (MSP) visits with an influenza diagnosis; (3) facility outbreak notifications; (4) provincial influenza laboratory diagnosis by the BC Public Health Microbiology and Reference Laboratory and BC Children's and Women's Health Centre Laboratory; and (5) strain characterization and antiviral resistance testing by the National Microbiology Laboratory (NML), Public Health Agency of Canada.

Since 2004, the BCCDC has also led a national surveillance initiative to monitor annual vaccine effectiveness (VE) against medically-attended, lab-confirmed influenza, using a test-negative case-control design overlaid upon the sentinel physician surveillance network, with additional phenotypic and genetic characterization of circulating viruses to inform VE analysis and interpretation.

Detailed surveillance bulletins are issued throughout the season, distributed weekly during the influenza season and periodically during inter-seasonal months, and are available from: http://www.bccdc.ca/dis-cond/DiseaseStatsReports/influSurveillanceReports.htm.

SUMMARY

The 2013-14 influenza season in BC was moderately severe, characterized by resurgent and dominant influenza A(H1N1)pdm09 activity, with some late-season but less substantial influenza B circulation. Influenza activity during the 2013-14 season started in late November (weeks 47-48) and peaked in early-to-mid January (weeks 2-3), with multiple community indicators (e.g. sentinel physician reporting and MSP visits) suggesting higher than expected activity during this peak period. However, compared to the previous A(H3N2)-dominant 2012-13 season, fewer lab-confirmed influenza outbreaks were reported from long-term care facilities, likely due in part to pre-existing protective immunity to A(H1N1)pdm09 documented among elderly adults. In mid-season analysis from the BC-led national sentinel physician surveillance network, interim estimates of influenza VE published in February 2014 showed moderate vaccine protection of 74% against the dominant circulating A(H1N1)pdm09 strain which remained antigenically well-conserved since 2009.

1. Sentinel physician reporting of ILI

During the 2013-14 influenza season, 39 active sentinel sites representing all regional health authorities in BC contributed to sentinel physician ILI surveillance. The proportion of patient visits due to ILI seen by these sentinel sites was lower than or within expected historical ranges throughout the influenza season, spanning week 40 to week 17, with the exception of 3 consecutive weeks in mid-January (weeks 2-4) during which sentinel ILI consultation rates were significantly above 10-year historical averages (Figure 2.2).

2. MSP visits with an influenza diagnosis

BC MSP general practitioner service claims with a diagnosis of influenza (ICD-9 code 487), as a proportion of all submitted MSP claims, showed a steep rise beginning in late December 2013, exceeding the 10-year maximums in January 2014 (weeks 2-4) and then gradually returned to expected seasonal levels thereafter (Figure 2.3).

3. Facility outbreak notifications

Residential facilities, such as long-term care facilities (LTCFs), are asked to notify their local health unit when 2 or more cases of ILI occur within their setting within a 7-day period. Schools are asked to report when absenteeism, mostly likely due to ILI, is greater than 10% on any one day. Provincial reporting of ILI outbreaks to BCCDC is at the discretion of the local health authority and varies regionally, with less consistent reporting for school outbreaks.

During the 2013-14 influenza season (week 40 to week 17), 94 ILI outbreaks were reported to BCCDC, including 48 from LTCFs, of which 13 (27%) were lab-confirmed as influenza (Figure 2.4). By subtype, lab-confirmed influenza outbreaks in LTCFs included: 6 due to A(H1N1)pdm09 [2 in FHA, 3 in IHA, and 1 in VCH], 3 due to A(H3N2) [2 in FHA and 1 in VIHA]; 1 due to influenza A with subtype unknown due to insufficient viral copies in IHA; and 3 due to influenza

B (all in FHA).

Compared to the previous seasons, fewer lab-confirmed influenza outbreaks in LTCFs were reported during the 2013-14 season. However, the absolute number of LTCF outbreaks reported this season was comparable to the 2009-10 pandemic A(H1N1) pdm09 season during which a historical low number of LTCF outbreaks was reported (Figure 2.1). Prior serological studies have demonstrated that elderly adults possess some degree of pre-existing protective immunity to A(H1N1)pdm09 due to childhood exposures to antigenically related viruses, which likely contributed to the lack of influenza outbreaks at LTCF during A(H1N1)pdm09-dominant seasons. In contrast, a record number of LTCF outbreaks were reported during the A(H3N2)-dominant 2012-13 season, likely due a combination of increased susceptibility among elderly adults to A(H3) subtypes, low vaccine effectiveness against the A(H3N2) component, and other agent-host-environment factors. These factors should be taken into account in explaining and comparing facility outbreak reporting variations from year to year.

In addition to LTCF reports, 46 ILI outbreaks were reported from schools during the 2013-14 influenza season, including 5 lab-confirmed influenza outbreaks [1 influenza A(H1N1)pdm09 in week 47 and 4 influenza B in weeks 11, 15 and 16].

4. Laboratory diagnosis

a. BC Public Health Microbiology & Reference Laboratory

The BC Public Health Microbiology & Reference Laboratory (PHMRL) receives respiratory specimens for influenza and other virus testing primarily from pediatric and acute care hospitals, residential facilities, and community sentinel sites unless otherwise clinically indicated or required. All submitted specimens are routinely tested for influenza and respiratory syncytial virus (RSV), while testing for other respiratory viruses is conducted less systematically and only on a subset of influenza and RSV negative specimens during peak influenza season.

During the 2013-14 influenza season (week 40 to week 17), the BC PHMRL tested 8,203 specimens for respiratory viruses. Of these, 1,798 (22%) specimens overall were positive for influenza, including 1,518 (84%) influenza A [1,356 A(H1N1)pdm09, 137 A(H3N2), and 25 influenza A un-subtyped] and 280 (16%) influenza B. Of these, one patient was co-infected with influenza A(H3N2), influenza B, and RSV. One other patient had 2 influenza infections during the course of the 2013/14 influenza season, one due to influenza A(H1N1)pdm09 and one due to influenza B.

The proportion of laboratory tests positive for influenza at the BC PHMRL exceeded 40% during week 52 of 2013 and week 1 of 2014. The percent of tests positive for any influenza peaked at 45% in week 1, while the absolute number of influenza positive tests peaked in week 2. Overall, the 2013-14 influenza season was characterized by predominant influenza A(H1N1) pdm09 activity, with some late-season but less substantial influenza B circulation (Figure 2.5). During heightened influenza activity in late December and early-to-mid January (week 51 to week 3), A(H1N1) pdm09 viruses comprised over 90% of all influenza detections. Influenza B viruses comprised over 50% of all influenza detections from early March (week 10) until the end of season. Among other respiratory viruses detected, entero/rhinoviruses were commonly detected during the first half of season, while RSV predominated during the second half of the season. Other respiratory viruses were also sporadically detected.

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

During the 2013-14 influenza season (week 40 to week 17), the BC Children's and Women's Health Centre Laboratory conducted 2,919 tests for influenza A and 2,258 tests for influenza B. Of these, 116 (4%) tests were positive for influenza A and 37 (2%) tests were positive for influenza B. As with laboratory surveillance at the BC PHMRL, influenza A was the predominant influenza virus detected, peaking at 15% in weeks 1-2, followed by a smaller late-season wave of influenza B (Figure 2.6). RSV was the most commonly detected virus among the non-influenza respiratory viruses. Other respiratory viruses, including parainfluenza, adenovirus, human metapneumovirus, entero/rhinovirus, and coronavirus were also detected sporadically.

c. Strain characterization by the National Microbiology Laboratory

Select influenza isolates are routinely sent by BC laboratories to the NML for strain characterization by conventional haemagglutination inhibition (HI) assay. From September 1, 2013 to April 24, 2014, 90 BC isolates were sent to NML for strain characterization. Of these, 71 were characterized as influenza A, including 65 A/California/07/09(H1N1)pdm09-like and 6 A/Texas/50/2012(H3N2)-like, and 19 were characterized as influenza B, including 15 B/Massachusetts/02/12-like

(Yamagata lineage) and 4 B/Brisbane/60/2008-like (Victoria lineage). Nationally, two non-BC viruses showed reduced HI titres with antiserum produced against A/California/07/09(H1N1)pdm09. For context, the WHO-recommended components for the 2013-14 and upcoming 2014-15 Northern hemisphere trivalent influenza vaccines (TIV) are listed below:

2013-14	2014-15*
A/California/07/2009 (H1N1)pdm09-like virus	A/California/07/2009 (H1N1)pdm09-like virus
A/Victoria/361/2011 (H3N2)-like virus†	A/Texas/50/2012(H3N2)-like virus
B/Massachusetts/2/2012-like virus (Yamagata lineage)	B/Massachusetts/2/2012-like virus (Yamagata lineage)

* WHO recommended viruses for the 2014-15 Northern hemisphere TIV are the same as those used for the 2013-14 Northern hemisphere TIV.

† A/Texas/50/2012 is an A/Victoria/361/2011(H3N2)-like virus that was used in the 2013-14 Northern hemisphere TIV. The WHO recommended that A/Texas/50/2012 be used as the A(H3N2) vaccine component because of antigenic changes in earlier A/Victoria/361/2011-like viruses following propagation in eggs.

d. Antiviral resistance assessment by the National Microbiology Laboratory

The NML routinely tests for susceptibility of selected influenza isolates to antiviral drugs recommended for treatment of influenza. From September 1, 2013 to April 24, 2014, all tested BC isolates [65 A(H1N1)pdm09, 7 A(H3N2)] were found to be resistant to amantadine, while all tested BC isolates [57 A(H1N1)pdm09, 2 A(H3N2), and 11 B] were sensitive to oseltamivir and zanamivir. Nationally, two non-BC A(H1N1)pdm09 isolates, out of 1,214 tested viruses, were found to be resistant to oseltamivir; both viruses had H275Y mutations. Subsequent to the current summary's reporting period ending week 17, three additional A(H1N1)pdm09 viruses in Canada (5/1373 or 0.4% in total for the season), including one from BC, were also identified to be oseltamivir resistant.

5. Sentinel influenza vaccine effectiveness (VE) monitoring

The resurgent A(H1N1)pdm09 activity in BC and elsewhere in Canada during the 2013-14 influenza season enabled mid-season assessment of influenza VE. Surveillance data and respiratory specimens were collected from patients presenting with ILI to sentinel physicians in the five largest provinces in Canada (BC, Alberta, Manitoba, Ontario and Quebec) participating in annual influenza VE monitoring.

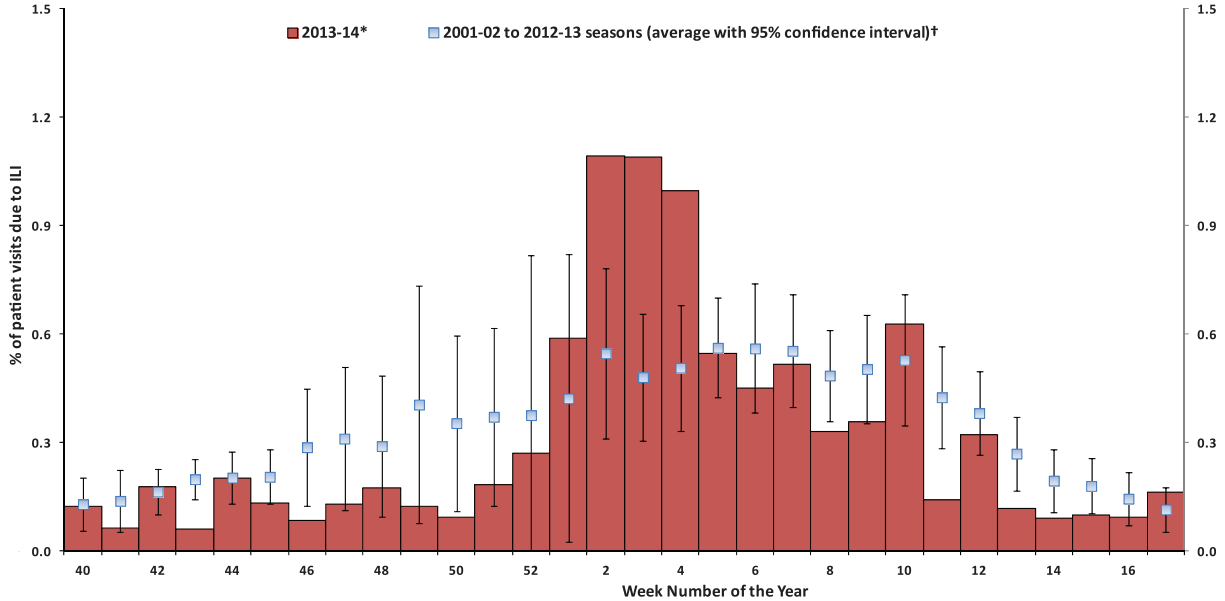
Interim adjusted-VE against medically-attended lab-confirmed influenza A(H1N1)pdm09 infection was 74% (95% CI: 58-83%), consistent with interim findings reported from the United States. Detailed virus characterization showed that sentinel viruses were antigenically similar and genetically well conserved relative to the vaccine strain. Interim findings were published in EuroSurveillance, an open-access peer-reviewed journal, in February 2014, available at: http://www.eurosurveillance.org/ViewArticle.aspx?ArticleId=20690.

2.1 Number of Reported Lab-Confirmed Influenza Outbreaks in Long-Term Care Facilities (LTCF) British Columbia, Week 40 to Week 17, 2003-04 to 2013-14 Seasons

Season	LTCF 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
2013-14	13

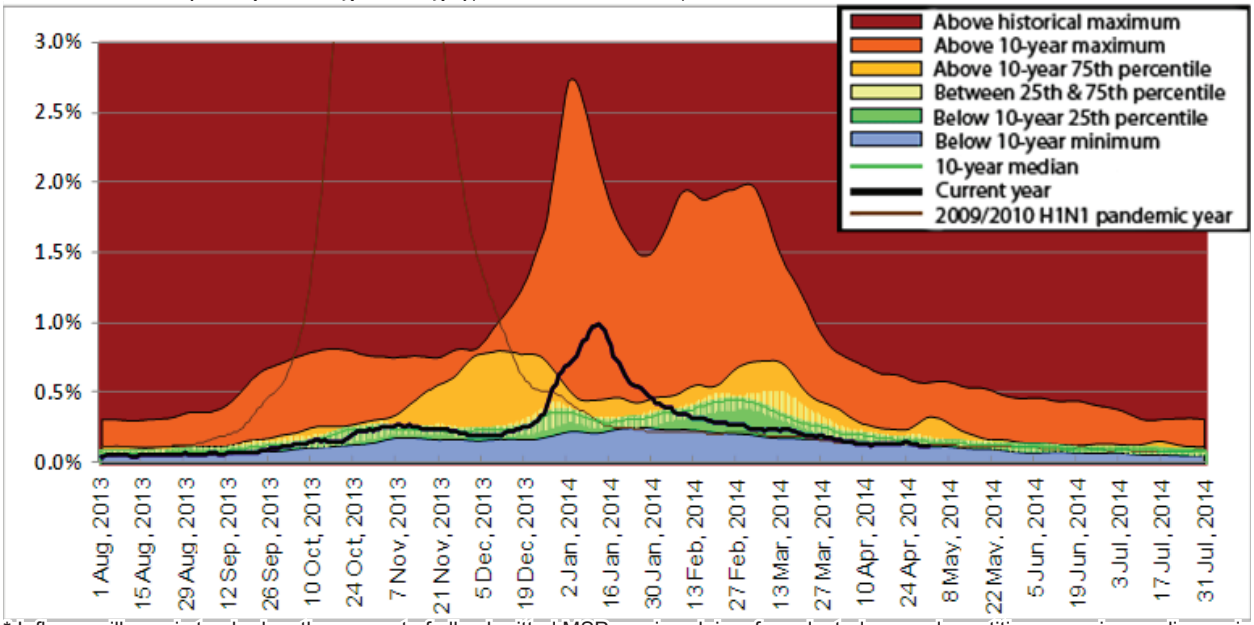
* Historical numbers may differ from previous annual reports due to restriction of data to lab-confirmed influenza outbreaks and retrospective reconciliation of data entry or reporting anomalies (e.g. duplicate reporting).

2.2 Percent of Patient Visits to Sentinel Physicians Due to Influenza-Like Illness (ILI) per Week Compared to Historical Average for the Past 10 Seasons, British Columbia, 2013-14 Season



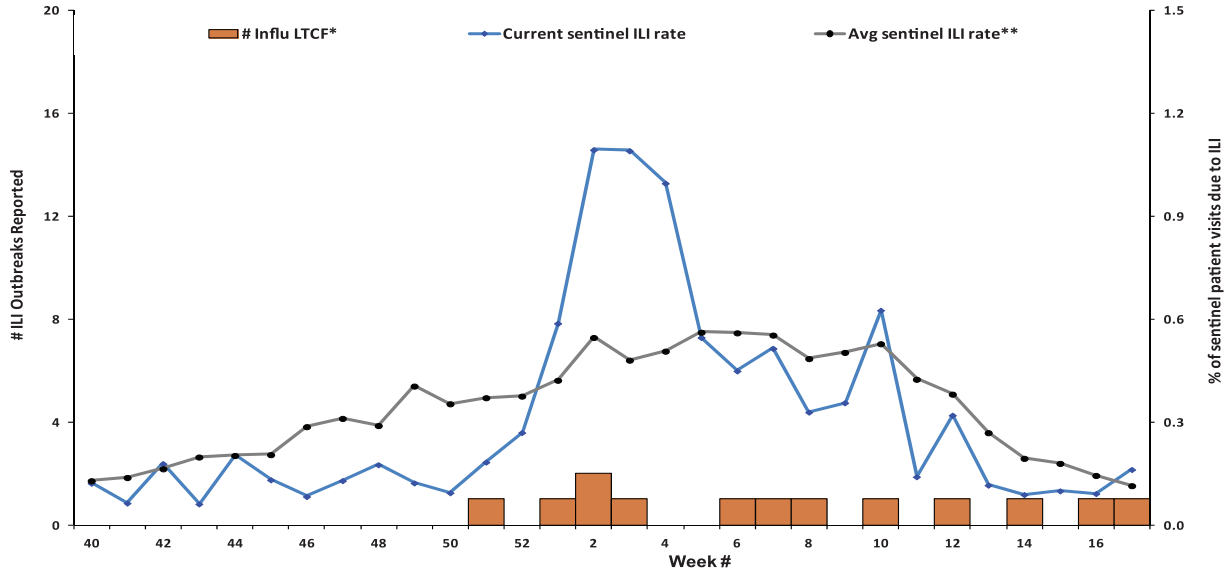
* Surveillance period includes week 40 (starting September 29, 2013) to week 17 (ending April 26, 2014), inclusive.
† Historical average includes 2001-02 to 2012-13 seasons, excluding 2008-09 and 2009-10 seasons due to atypical seasonality.

2.3 BC MSP General Practitioner Service Claims for Influenza Illness (Il) as a Proportion of All Submitted Service Claims (7-day Moving Average), British Columbia, 2013-14 Season*



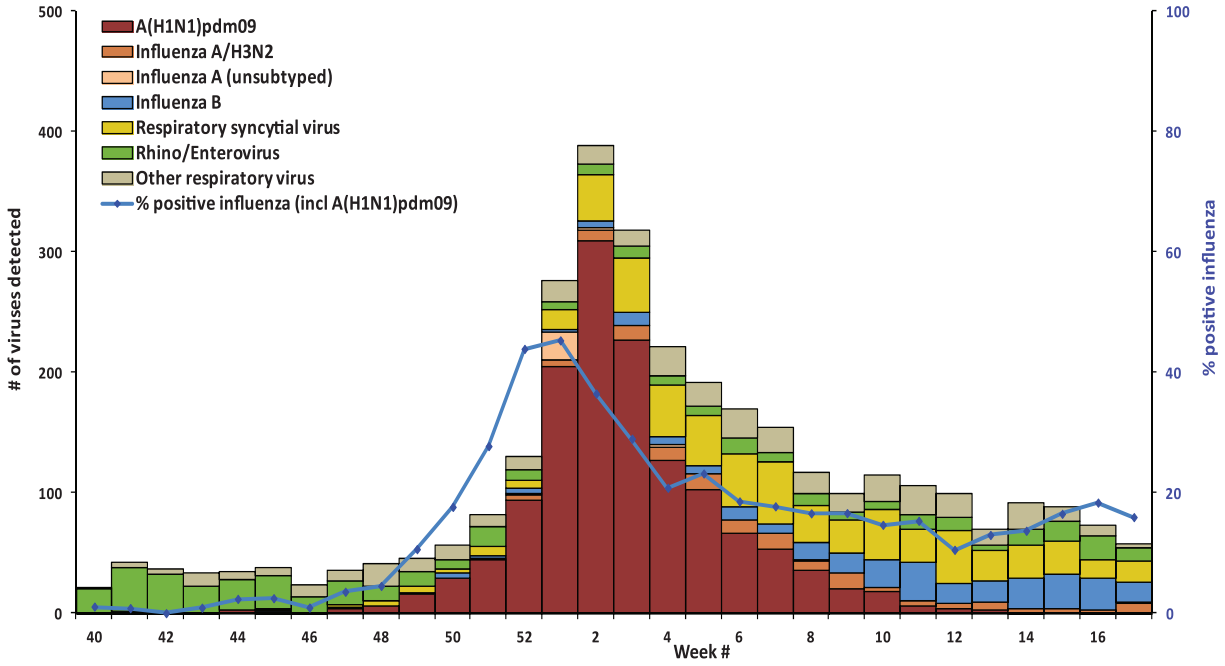
* Influenza illness is tracked as the percent of all submitted MSP service claims for selected general practitioner services a diagnosis of influenza (ICD-9 code 487). Data are provided by Population Health Surveillance and Epidemiology, BC Ministry of Health Services.
Note: Week beginning August 1, 2013 corresponds to calendar week 31; data are current to May 1, 2014.

2.4 Number of Lab-Confirmed Influenza Outbreaks in Long-term Care Facilities (LTCF) Reported to BCCDC per Week Compared to Current Sentinel Influenza-Like Illness (ILI) Rate and Historical Average for the Past 10 Seasons, British Columbia, 2013-14 Season

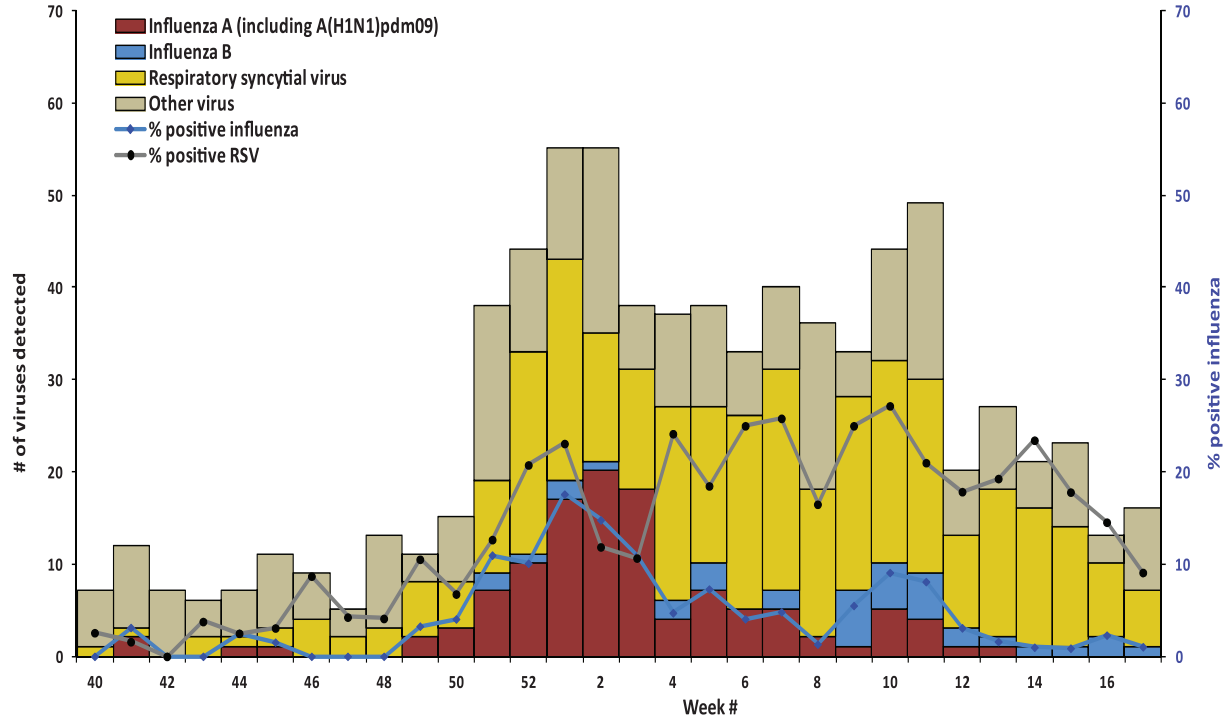


* Lab-confirmed influenza outbreak in LTCF is defined as 2 or more cases of ILI within 7-day period, with at least one specimen lab-confirmed as influenza.
** Historical average includes 2001-02 to 2012-13 seasons, excluding 2008-09 and 2009-10 seasons due to atypical seasonality.

2.5 Influenza and Other Virus Detections Among Respiratory Specimens, BC Public Health Microbiology & Reference Laboratory, British Columbia, 2013-14 Season



2.6 Influenza and Other Virus Detections Among Respiratory Specimens, BC Children's and Women's Health Centre Laboratory, British Columbia, 2013-14 Season



Measles

Seventeen confirmed measles cases were reported in 2013 (0.37 per 100,000 population). Nine cases were residents of Fraser Health and the remaining 8 were residents of Vancouver Coastal Health.

Eight cases (47%) were male and 9 cases were female. Only 4 cases, including two infants, were under 20 years old. Two cases were born before 1970, the year of birth prior to which immunity from wild type infection is generally assumed per recommendations of the National Advisory Committee on Immunization. Nine cases (53%) were reported as unimmunized against measles, including the two infants. Three cases (18%) had received one dose of measles containing vaccine (two by verbal history, one documented), 3 cases (18%) had undocumented childhood vaccines, 1 case (6%) had an unknown immunization history, and 1 case (6%) had received two documented doses of measles containing vaccine.

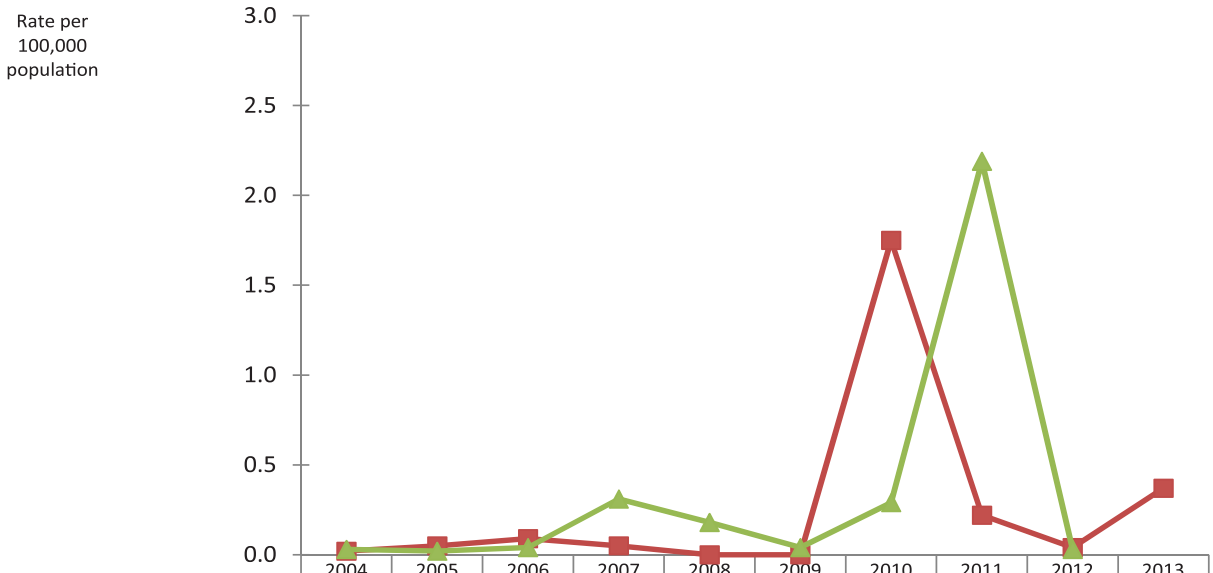
Five (30%) of the 17 cases were hospitalized, including both of the infant cases, one unimmunized child, one unimmunized adult, and one adult with an undocumented history of childhood vaccination.

Four distinct genotypes were identified and also 4 documented importations based on travel history available and genotyping data: one from Thailand, one from the Philippines, and two separate importations from the Netherlands.

For a more detailed report on 2013 measles in BC, see http://www.bccdc.ca/dis-cond/DiseaseStatsReports/VaccinePreventableDiseasesReports.htm

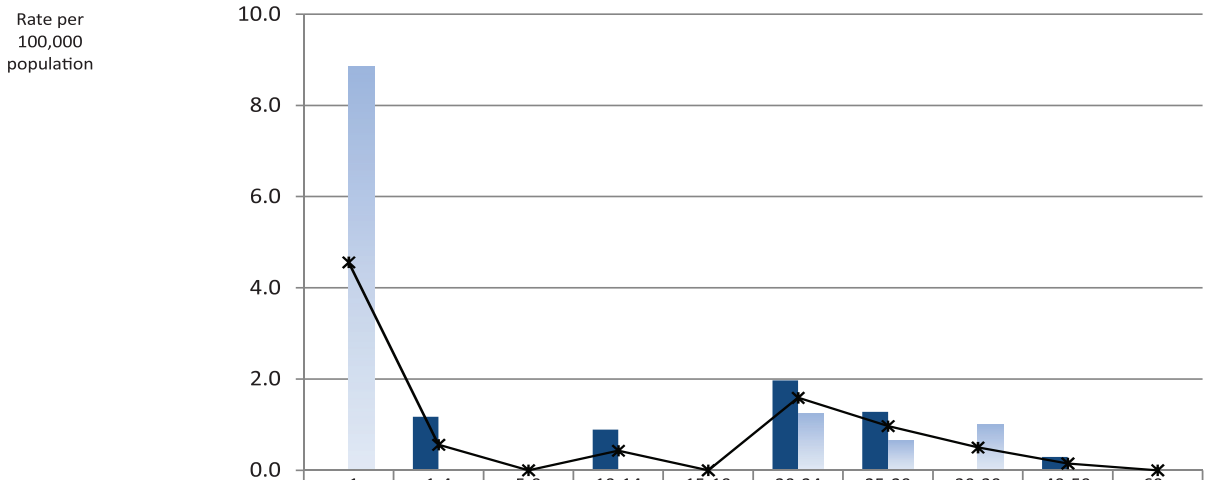
Information about the global distribution of measles genotypes is available from the World Health Organization at the following link: http://www.who.int/immunization/monitoring_surveillance/burden/vpd/surveillance_type/active/measles_monthlydata/en/index1.html

3.1 Measles Rates by Year, 2004-2013



	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
BC Measles Reports	1	2	4	2	0	0	78	10	2	17
BC Measles Rate	0.02	0.05	0.09	0.05	0.00	0.00	1.75	0.22	0.04	0.37
Canadian Measles Rate	0.03	0.02	0.04	0.31	0.18	0.04	0.29	2.19	0.03	

3.2 Measles Rates by Age Group and Sex, 2013



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Measles Rate - Female	0.0	1.2	0.0	0.9	0.0	2.0	1.3	0.0	0.3	0.0
Measles Rate - Male	8.9	0.0	0.0	0.0	0.0	1.2	0.7	1.0	0.0	0.0
Measles Rate	4.6	0.6	0.0	0.4	0.0	1.6	1.0	0.5	0.2	0.0
Measles Reports - Female	0	1	0	1	0	3	2	0	2	0
Measles Reports - Male	2	0	0	0	0	2	1	3	0	0
Measles Reports	2	1	0	1	0	5	3	3	2	0

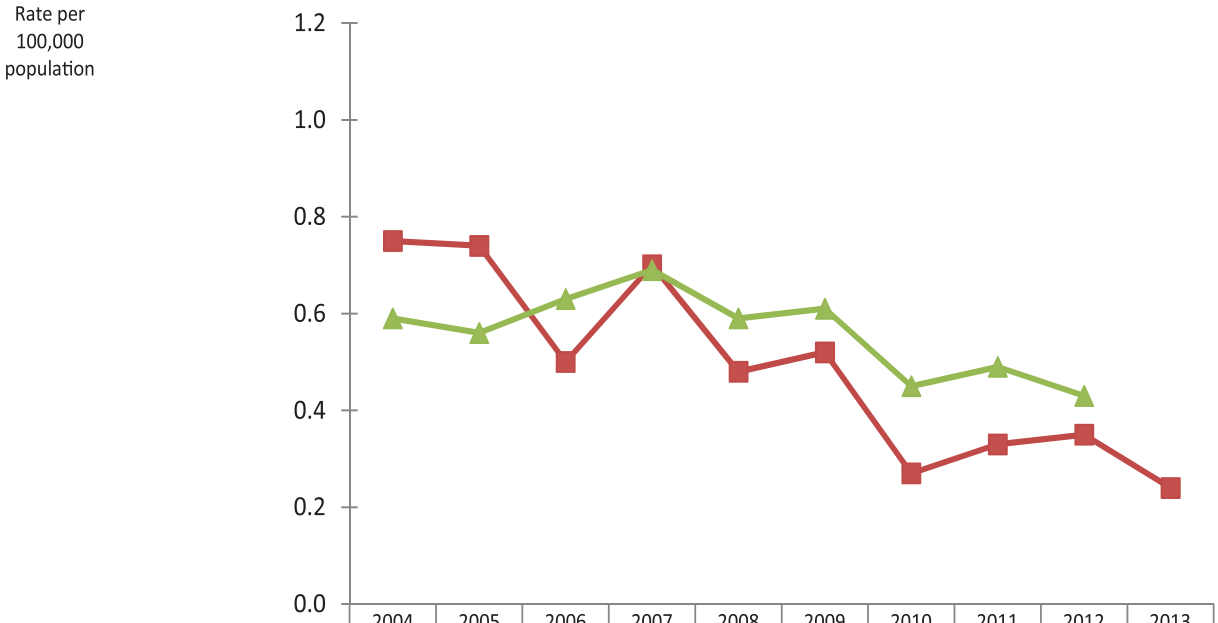
Meningococcal Disease (invasive)

Eleven invasive meningococcal disease (IMD) cases were reported in 2013. The numbers by serogroup were: 5 Y, 4 B and 2 C. One serogroup B case was fatal. There was no evidence of geographic clustering of cases and all were sporadic. The median age of cases from all serogroups was 59 years, with 5 cases aged ≤ 25 years (4 serogroup B and 1 serogroup Y).

The incidence of IMD has decreased from 0.8 cases per 100,000 population in 2004 to 0.2 cases per 100,000 population in 2013. This decline is substantially related to a dramatic downward trend in serogroup C disease. The incidence of serogroup C disease in 2004 was 0.5 cases per 100,000 population. In 2013, it was 0.04 cases per 100,000 population. The 2 serogroup C cases in 2013 were 66 and 84 years old. This reflects the impact of the infant and school-age catch-up meningococcal C conjugate immunization programs beginning in September 2003.

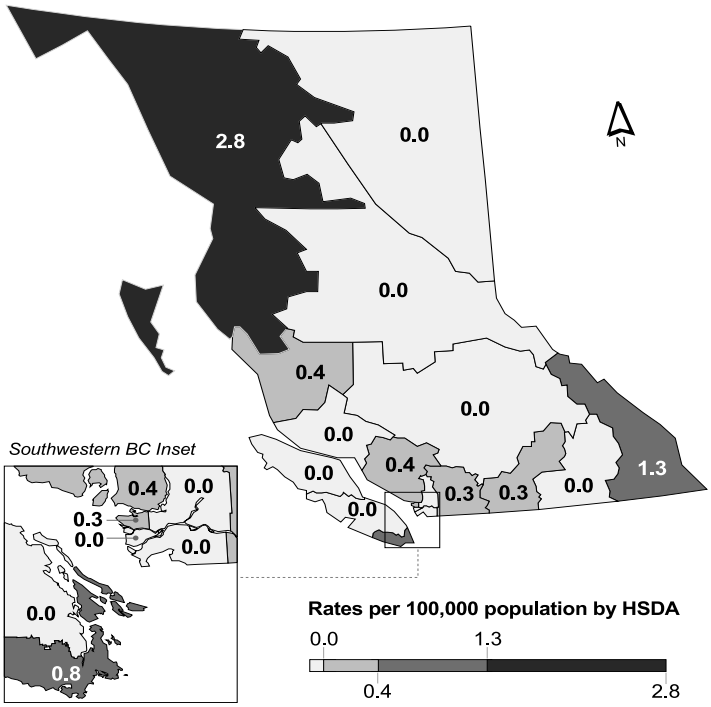
The most common serogroup in 2013 was serogroup Y, with an incidence of 0.1 cases per 100,000 population. The incidence of serogroup Y disease has historically been lower than either serogroups C or B and rates of group Y disease in the past decade fluctuated from 0.02 to 0.2 cases per 100,000 population per year. The second most common serogroup in 2013 was serogroup B, with an incidence of 0.1 cases per 100,000 population; in the past decade this incidence has ranged from 0.1 to 0.4 cases per 100,000 population per year.

4.1 Meningococcal Disease (invasive) Rates by Year, 2004-2013



	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
BC Meningococcal Reports	31	31	21	30	21	23	12	15	16	11
BC Meningococcal Rate	0.8	0.7	0.5	0.7	0.5	0.5	0.3	0.3	0.4	0.2
Canadian Meningococcal Rate	0.6	0.6	0.6	0.7	0.6	0.6	0.5	0.5	0.4	

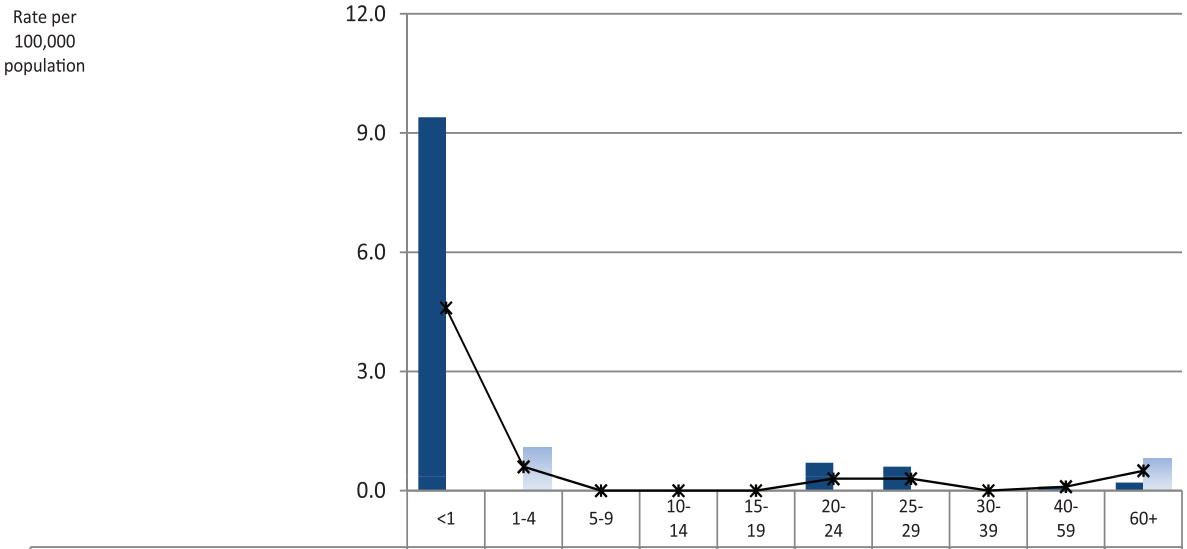
4.2 Meningococcal Disease (invasive) Rates by HSDA, 2013



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	1	1.3
12	Kootenay Boundary	0	0.0
13	Okanagan	1	0.3
14	Thompson Cariboo Shuswap	0	0.0
21	Fraser East	1	0.3
22	Fraser North	0	0.0
23	Fraser South	0	0.0
31	Richmond	0	0.0
32	Vancouver	2	0.3
33	North Shore/Coast Garibaldi	1	0.4
41	South Vancouver Island	3	0.8
42	Central Vancouver Island	0	0.0
43	North Vancouver Island	0	0.0
51	Northwest	2	2.8
52	Northern Interior	0	0.0
53	Northeast	0	0.0

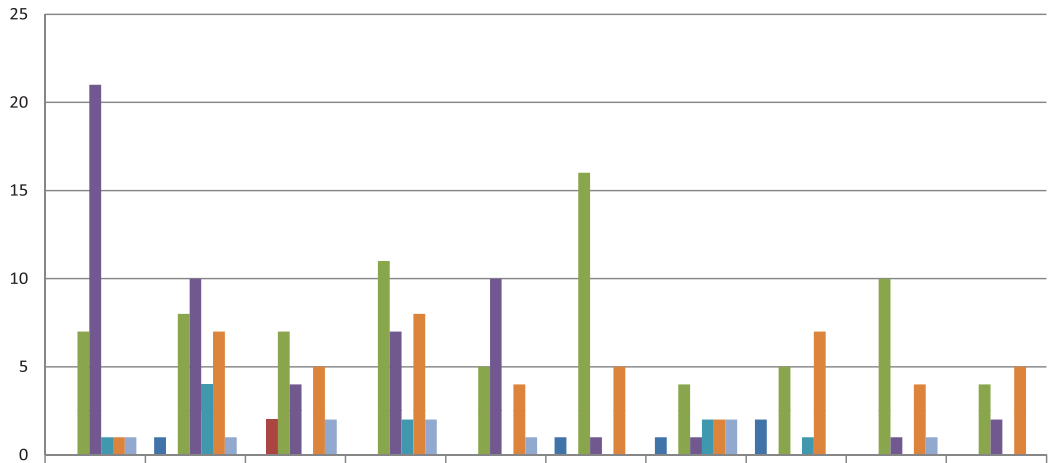
Note: Map classification by Jenks natural breaks method.

4.3 Meningococcal Disease (invasive) Rates by Age Group and Sex, 2013



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Meningococcal Rate - Female	9.4	0.0	0.0	0.0	0.0	0.7	0.6	0.0	0.1	0.2
Meningococcal Rate - Male	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8
Meningococcal Disease (invasive) Rate	4.6	0.6	0.0	0.0	0.0	0.3	0.3	0.0	0.1	0.5
Meningococcal Reports - Female	2	0	0	0	0	1	1	0	1	1
Meningococcal Reports - Male	0	1	0	0	0	0	0	0	0	4
Meningococcal Disease (invasive) Reports	2	1	0	0	0	1	1	0	1	5

4.4 Meningococcal Disease (invasive) Rates by Serotype and Year, 2013



	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
29E	0	1	0	0	0	1	1	2	0	0
A	0	0	2	0	0	0	0	0	0	0
B	7	8	7	11	5	16	4	5	10	4
C	21	10	4	7	10	1	1	0	1	2
W-135	1	4	0	2	0	0	2	1	0	0
Y	1	7	5	8	4	5	2	7	4	5
Nontypable/Unknown	1	1	2	2	1	0	2	0	1	0

Mumps

Fifty-eight confirmed mumps cases were reported in 2013 (1.27 per 100,000 population). Thirty three (57%) cases were male and 25 cases were female. The highest rate of mumps infection was among 15 to 19 year olds (4.3 per 100,000 population) followed by 20 to 24 year olds (3.8 per 100,000 population). No infant cases were reported and only one case was hospitalized. None of the cases under 10 years old had received any documented doses of MMR vaccine, most of the 10 to 19 year old cases had received 2 doses, most of the cases in their twenties had received 1 dose, and the vaccination history of cases 30 years and older was variable.

The genotype was identified for 17 cases, with 15 genotype G and 2 genotype C. Genotype G was reported in Canada, the USA, Europe, South East Asia, China, and Japan from 2005 to 2011 (WHO LabNet). The two genotype C cases were associated with travel to the Indian subcontinent; this same genotype was also reported elsewhere in Canada, the USA, Europe, and India (WHO LabNet).

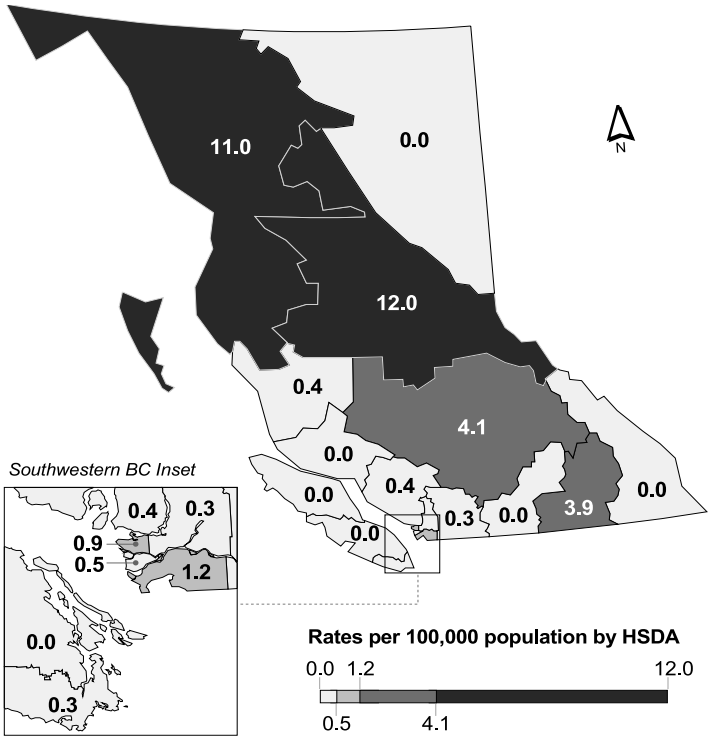
Mumps remains endemic in BC with a decline observed after 1997 in conjunction with the implementation of the 2nd dose MMR program, but a resurgence has been observed in BC since 2007 with higher levels of endemicity and periodic outbreaks since that time.

Global distribution of mumps genotypes: http://www.who.int/immunization/monitoring_surveillance/burden/vpd/surveillance_type/passive/mumps/en/

5.1 Mumps Rates by Year 2004-2013

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
BC Mumps Reports	5	7	3	25	108	25	11	132	8	58
BC Mumps Rate	0.12	0.17	0.07	0.58	2.48	0.57	0.25	2.93	0.18	1.27
Canadian Mumps Rate	0.10	0.24	0.13	3.37	2.25	0.56	2.24	0.80	0.14	

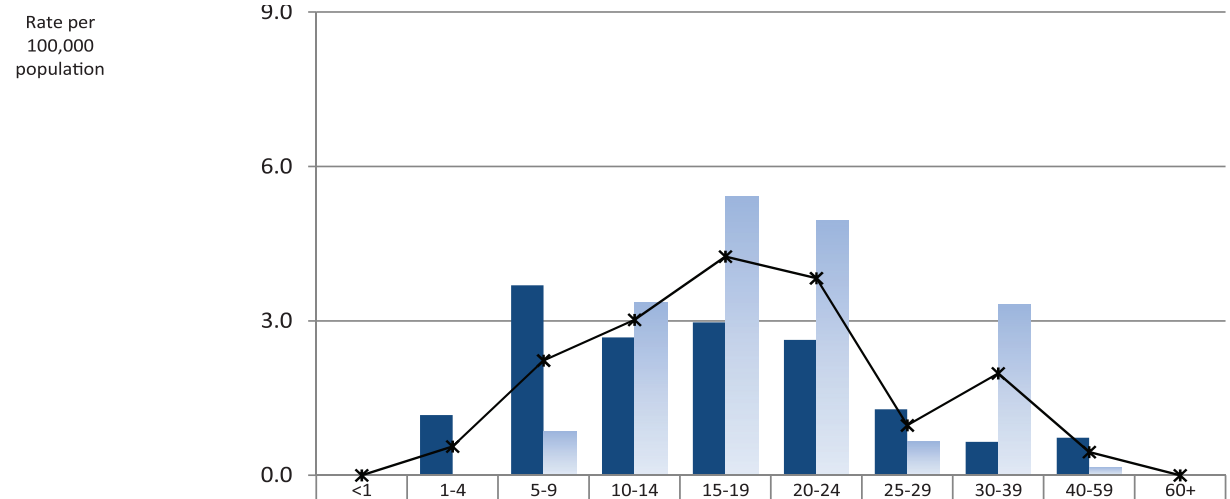
5.2 Mumps Rates by HSDA 2013



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	0	0.0
12	Kootenay Boundary	3	3.9
13	Okanagan	0	0.0
14	Thompson Cariboo Shuswap	9	4.1
21	Fraser East	1	0.3
22	Fraser North	2	0.3
23	Fraser South	9	1.2
31	Richmond	1	0.5
32	Vancouver	6	0.9
33	North Shore/Coast Garibaldi	1	0.4
41	South Vancouver Island	1	0.3
42	Central Vancouver Island	0	0.0
43	North Vancouver Island	0	0.0
51	Northwest	8	11.0
52	Northern Interior	17	12.0
53	Northeast	0	0.0

Note: Map classification by Jenks natural breaks method.

5.3 Mumps Rates by Age Group and Sex, 2013



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Mumps Rate - Female	0.0	1.2	3.7	2.7	3.0	2.6	1.3	0.7	0.7	0.0
Mumps Rate - Male	0.0	0.0	0.9	3.4	5.4	5.0	0.7	3.3	0.2	0.0
Mumps Rate	0.0	0.6	2.2	3.0	4.3	3.8	1.0	2.0	0.5	0.0
Mumps Reports - Female	0	1	4	3	4	4	2	2	5	0
Mumps Reports - Male	0	0	1	4	8	8	1	10	1	0
Mumps Reports	0	1	5	7	12	12	3	12	6	0

Pertussis

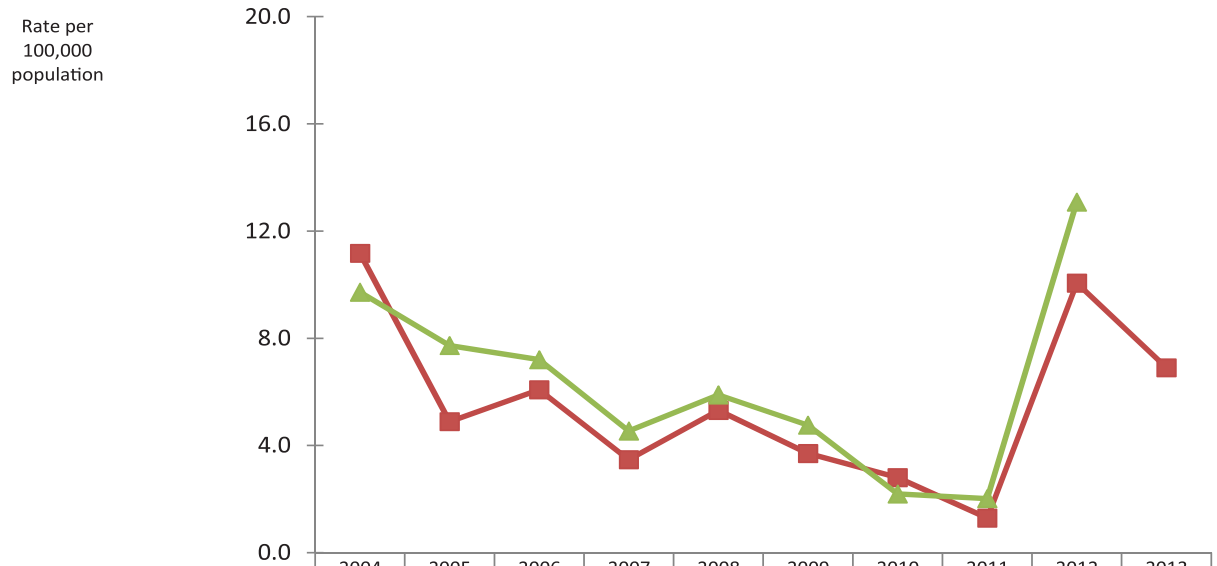
As elsewhere, pertussis remains an endemic disease in BC, with cyclical peaks occurring every 3-5 years. After substantial epidemics in the late 1990s and early 2000s with incidences ranging from 20 to 40 per 100,000 overall, BC experienced trough levels of pertussis in recent years. In 2013, pertussis incidence was also below these historical cyclical peaks in all health authorities of the province

However, as shown in Figure 6.1, a cyclical resurgence of pertussis occurred in 2012, driven primarily by reports from Vancouver Coastal (VCH) and Fraser (FHA) Health Authorities, resulting in an overall provincial incidence of 10 per 100,000. This was then followed in 2013 by an asynchronous cyclical peak and overall provincial incidence of 7 per 100,000 driven primarily by activity in Island Health Authority (VIHA) reaching 19-20 per 100,000 within certain HSDAs of VIHA (Figure 6.2). Localized outbreaks in the Kootenay Boundary HSDA were also reported in 2013, with incidence reaching 37 per 100,000 in this area (Figure 6.2).

As shown in Figure 6.3, the highest age-specific incidence in 2013 was in infants <1 year of age (71 per 100,000). A gradual increase in incidence from pre-school-aged children (12 per 100,000) to pre-teens/teens (28 per 100,000) is evident in these surveillance data, with lower age-specific incidence in older teens (<10 per 100,000) and adults (<5 per 100,000). This age-related pattern of pertussis activity in 2013 is consistent with historical cyclical peaks emphasizing risk in young infants and a shift in the age distribution toward pre-teens/teens evident since 2000 (during which peak age-related incidence exceeded 200 per 100,000 among pre-teens 10-13 years old).

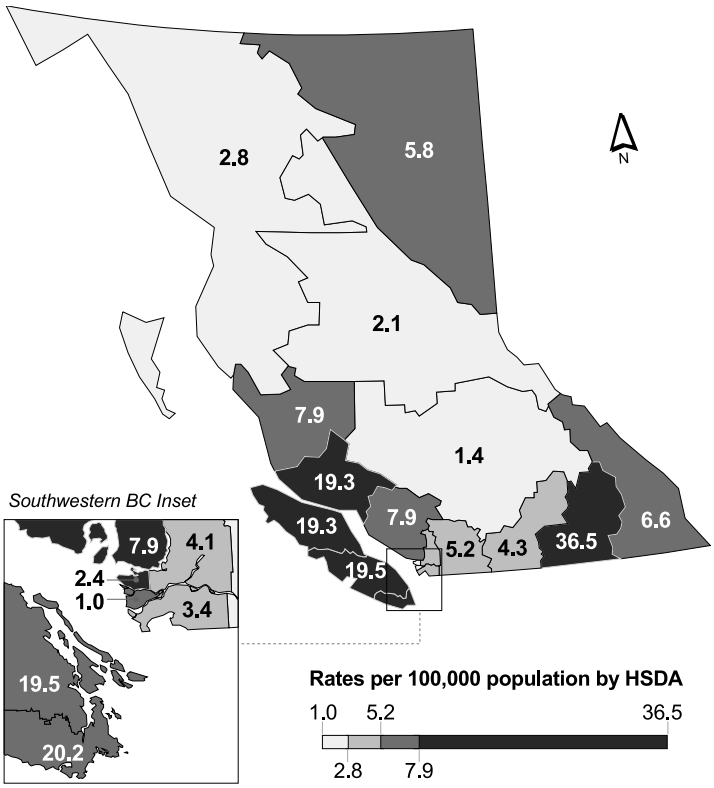
A comprehensive summary of overall and age-related pertussis surveillance trends in BC for the 20-year period spanning 1993 to 2013 was recently published in the Canada Communicable Disease Report (CCDR - February 2014). Trends are interpreted in the context of current and historic pertussis disease activity and immunization program scheduling, and the full report is available here: http://www.phac-aspc.gc.ca/publicat/ccdr-rmtc/14vol40/dr-rm40-03/dr-rm40-03-bc-eng.php.

6.1 Pertussis Rates by Year, 2004-2013



	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
BC Pertussis Reports	464	205	258	149	231	163	125	58	457	316
BC Pertussis Rate	11.2	4.9	6.1	3.5	5.3	3.7	2.8	1.3	10.1	6.9
Canadian Pertussis Rate	9.7	7.7	7.2	4.5	5.9	4.8	2.2	2.0	13.1	

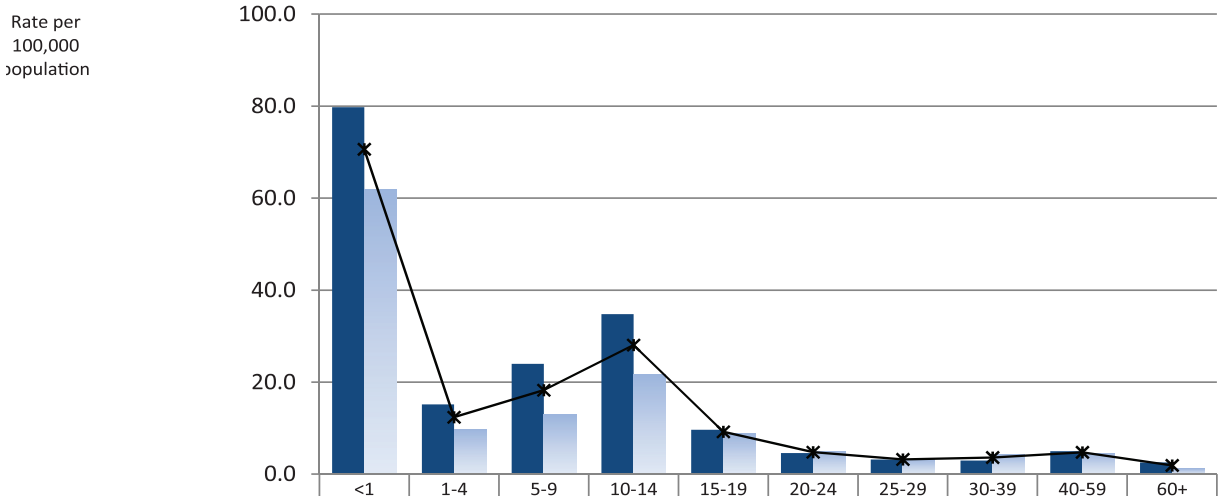
6.2 Pertussis Rates by HSDA 2013



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	5	6.6
12	Kootenay Boundary	28	36.5
13	Okanagan	15	4.3
14	Thompson Cariboo Shuswap	3	1.4
21	Fraser East	15	5.2
22	Fraser North	26	4.1
23	Fraser South	26	3.4
31	Richmond	2	1.0
32	Vancouver	16	2.4
33	North Shore/Coast Garibaldi	22	7.9
41	South Vancouver Island	75	20.2
42	Central Vancouver Island	51	19.5
43	North Vancouver Island	23	19.3
51	Northwest	2	2.8
52	Northern Interior	3	2.1
53	Northeast	4	5.8

Note: Map classification by Jenks natural breaks method.

6.3 Pertussis Rates by Age Group and Sex, 2013



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Pertussis Rate - Female	79.7	15.2	24.0	34.8	9.7	4.6	3.2	3.0	5.0	2.6
Pertussis Rate - Male	62.0	9.8	13.0	21.8	8.8	5.0	3.2	4.3	4.5	1.2
Pertussis Rate	70.6	12.4	18.3	28.1	9.2	4.8	3.2	3.6	4.8	1.9
Pertussis Reports - Female	17	13	26	39	13	7	5	9	34	14
Pertussis Reports - Male	14	9	15	26	13	8	5	13	30	6
Pertussis Reports	31	22	41	65	26	15	10	22	64	20

Pneumococcal disease, invasive (IPD)

Three hundred and sixty three cases of invasive pneumococcal disease (IPD) were reported in 2013 (7.9 per 100,000 population), similar to the 361 cases reported in 2012 (8.0 per 100,000 population) and higher than the 326 cases reported in 2011 (7.3 per 100,000 population).

The highest rates of IPD occurred among infants (20.5 per 100,000 population), those 1-4 years old (9.0 per 100,000 population) and those ≥60 years old (18.0 per 100,000 population). The rate of IPD among infants (<1 year of age) nearly doubled compared to the 2012 rate of disease in this age group (11.5 per 100,000). In both the youngest (<1 year of age) and oldest age groups (≥60 years of age), the rate of IPD among males is higher than in females.

Regions with the highest rates of disease were Vancouver Coastal Health (8.6 cases per 100,000 population) and Northern Health (8.8 per 100,000), both higher than the overall provincial rate.

Serotyping results were available for 62% (224/363) of cases. Enhanced surveillance is conducted for pediatric cases aged <17 years old to monitor the effectiveness of the pneumococcal conjugate vaccine program which began in BC in 2003. Among cases under 5 years old, 75% had serotyping results available (18/24), of which 17% (n=3) were due to serotypes covered by the 7-valent pneumococcal conjugate vaccine (PCV-7) and 28% (n=5) were due to the additional serotypes covered by the 13-valent vaccine (PCV-13). The remaining 10 cases (56%) were due to serotypes not covered by the conjugate vaccines.

The 18 cases with known serotype in children ≤59 months old were reviewed for preventability by the vaccine as used in the BC program with introduction of PCV-7 in 2003 and PCV-13 in 2010 without a catch-up program, with results as follows:

16 cases not preventable:

-10 cases due to serotypes not covered by PCV-13

-1 case due to serotype 19F (covered by both PCV-7 and PCV-13) in an infant up to date for first dose but too young to have received a 2nd dose of PCV-13

-1 case of serotype 14 (covered by both PCV-7 and PCV-13) in a child who had received 3 doses of PCV-7 and was a 'vaccine failure'

-1 each of serotype 19A and serotype 3 (covered by PCV-13 but not PCV-7) in children fully immunized with PCV-13 and 'vaccine failures'

-2 cases of serotype 19A in fully vaccinated children who had received PCV-7 vaccine

2 cases preventable:

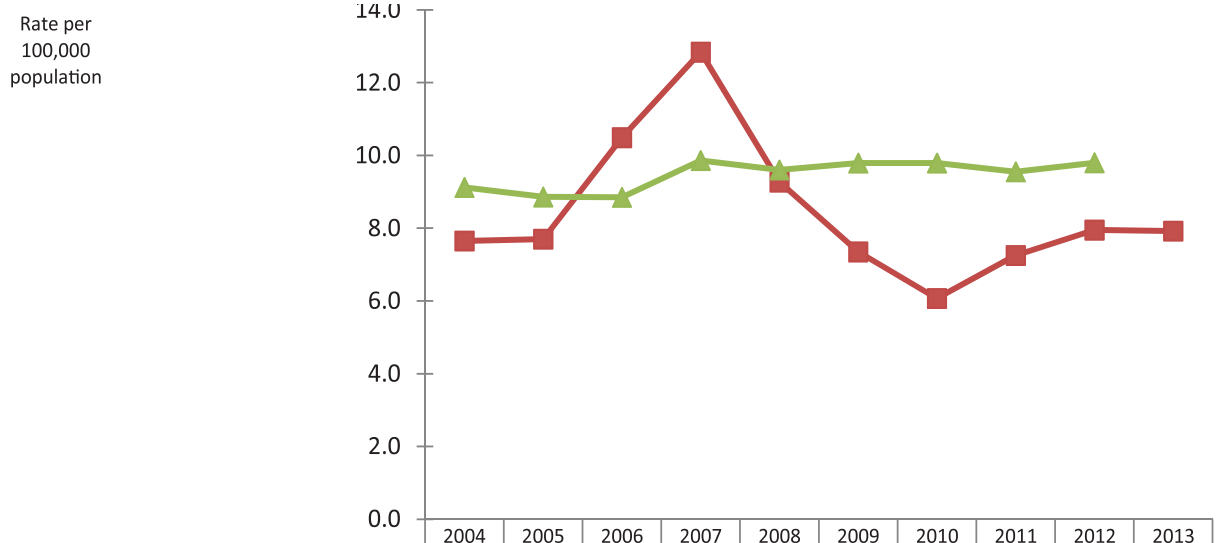
-1 case of serotype 18C (covered by both PCV-7 and PCV-13) in an unvaccinated child with parental refusal recorded on their record

-1 case of serotype 19A (covered by PCV-13 but not PCV-7) in an unvaccinated child

There was only one fatal IPD pediatric case; it was due to serotype 19A and occurred in a 5 year old child with no identified risk factors. The child was fully immunized with PCV-7, and thus non-preventable in the BC program without a catch-up component.

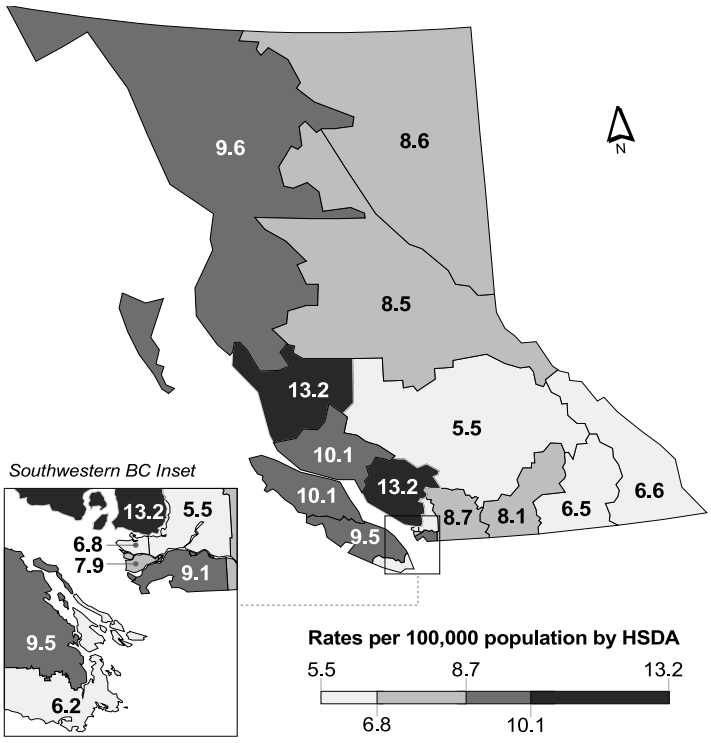
Among cases over 65 years of age, serotyping results were available for 58% (84/147) of cases, and 62% (52/84) were due to serotypes covered by the pneumococcal polysaccharide 23-valent (PPV-23) vaccine.

7.1 Pneumococcal Disease (invasive) Rates by Year, 2004-2013



	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
BC Invasive Pneumococcal Reports	318	323	445	551	403	324	271	326	361	363
BC Invasive Pneumococcal Rate	7.7	7.7	10.5	12.8	9.3	7.4	6.1	7.3	8.0	7.9
Canadian Invasive Pneumococcal Rate	9.1	8.9	8.9	9.9	9.6	9.8	9.8	9.6	9.8	

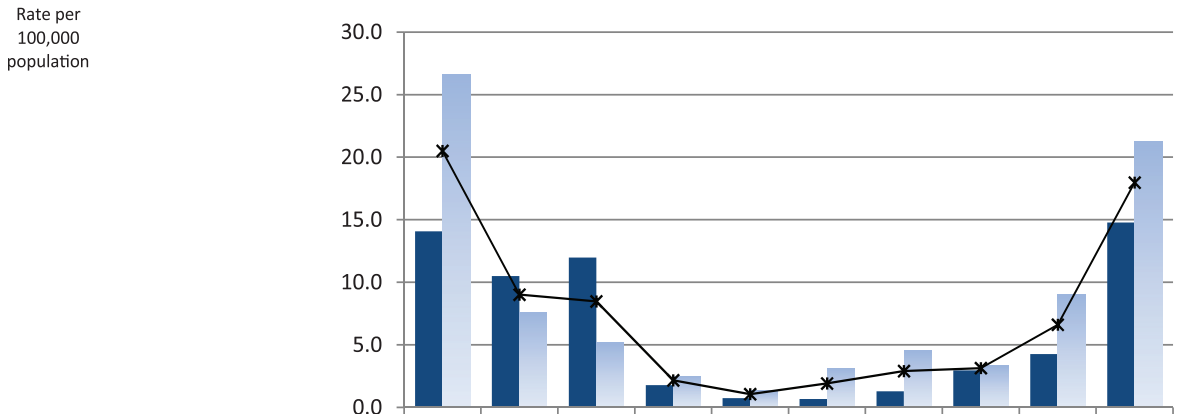
7.2 Pneumococcal Disease (invasive) Rates by HSDA, 2013



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	5	6.6
12	Kootenay Boundary	5	6.5
13	Okanagan	28	8.1
14	Thompson Cariboo Shuswap	12	5.5
21	Fraser East	25	8.7
22	Fraser North	35	5.5
23	Fraser South	70	9.1
31	Richmond	16	7.9
32	Vancouver	45	6.8
33	North Shore/Coast Garibaldi	37	13.2
41	South Vancouver Island	23	6.2
42	Central Vancouver Island	25	9.5
43	North Vancouver Island	12	10.1
51	Northwest	7	9.6
52	Northern Interior	12	8.5
53	Northeast	6	8.6

Note: Map classification by Jenks natural breaks method.

7.3 Pneumococcal Disease (invasive) Rates by Age Group and Sex, 2013



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Invasive Pneumococcal Rate - Female	14.1	10.5	12.0	1.8	0.7	0.7	1.3	3.0	4.3	14.8
Invasive Pneumococcal Rate - Male	26.6	7.6	5.2	2.5	1.4	3.1	4.5	3.3	9.0	21.3
Pneumococcal Disease (invasive) Rate	20.5	9.0	8.5	2.2	1.1	1.9	2.9	3.1	6.6	18.0
Invasive Pneumococcal Reports - Female	3	9	13	2	1	1	2	9	29	81
Invasive Pneumococcal Reports - Male	6	7	6	3	2	5	7	10	60	106
Pneumococcal Disease (invasive) Reports	9	16	19	5	3	6	9	19	89	188

Rubella

There were no cases of rubella reported in BC in 2013.

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

Tetanus

There were no cases of tetanus reported in BC in 2013.

From 2004 to 2012 there were 7 tetanus cases reported in BC: 4 cases in 2007, 1 case in 2008, 1 case in 2010, and 1 case in 2012. 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.

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

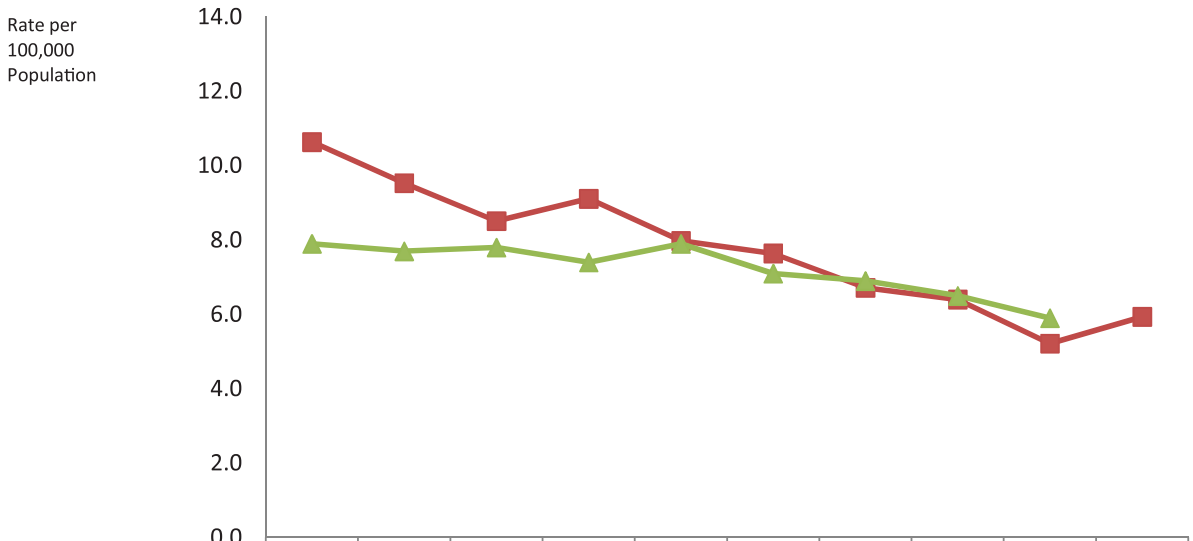
Sexually Transmitted and Bloodborne Pathogens

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

HIV

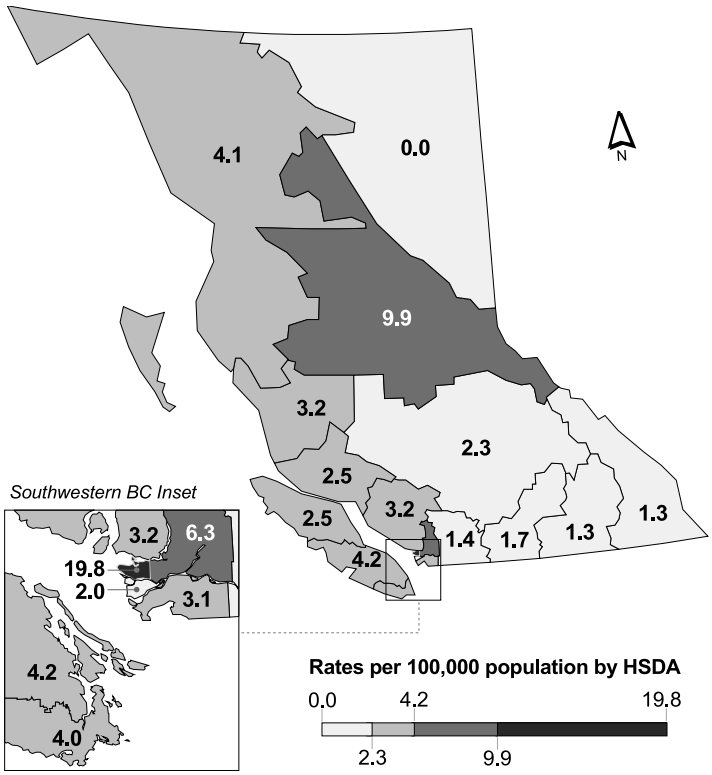
In 2013, the rate of new HIV diagnoses increased to 5.9 (272 cases) from 5.2 (237 cases) per 100,000 in 2012. Over 85% (239 cases) of new HIV diagnoses in 2013 were male, with the highest rates observed in males between 25-59 years of age. Across HSDAs, Vancouver (19.8 per 100,000; 130 cases), Northern Interior (9.9 per 100,000; 14 cases) and Fraser North (6.3 per 100,000; 40 cases) had the highest rates of new HIV diagnoses. Recent trends in HIV diagnoses in BC have been influenced by increased testing efforts related to the provincial Seek and Treat for Optimal Prevention of HIV/AIDS (STOP HIV/AIDS) Program.

10.1 HIV Rates by Year, 2004-2013



	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
BC HIV Reports	442	400	361	391	347	337	300	288	237	272
BC HIV Rate	10.6	9.5	8.5	9.1	8.0	7.6	6.7	6.4	5.2	5.9
Canadian HIV Rate	7.9	7.7	7.8	7.4	7.9	7.1	6.9	6.5	5.9	

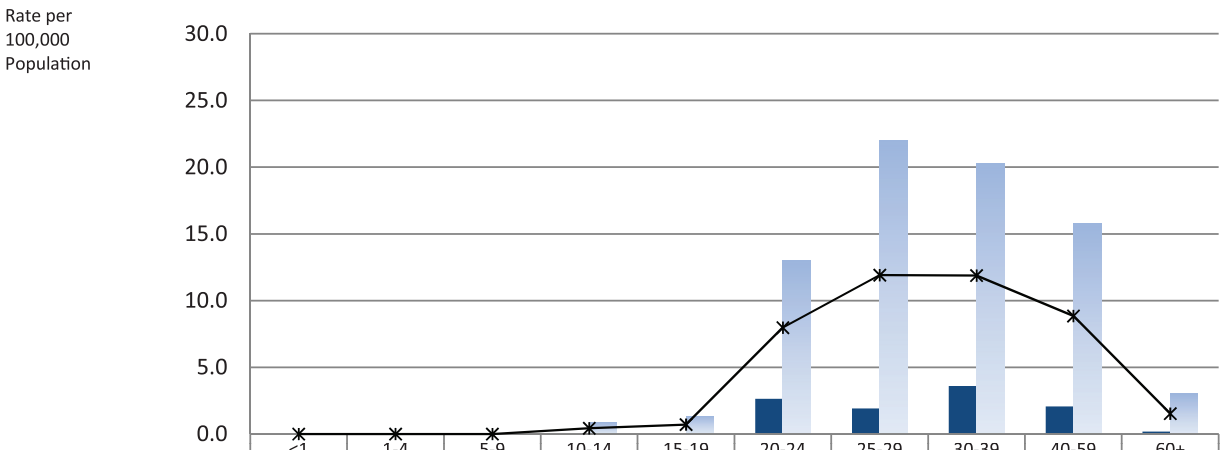
10.2 HIV Rates by HSDA, 2013



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	1	1.3
12	Kootenay Boundary	1	1.3
13	Okanagan	6	1.7
14	Thompson Cariboo Shuswap	5	2.3
21	Fraser East	4	1.4
22	Fraser North	40	6.3
23	Fraser South	24	3.1
31	Richmond	4	2.0
32	Vancouver	130	19.8
33	North Shore/Coast Garibaldi	9	3.2
41	South Vancouver Island	15	4.0
42	Central Vancouver Island	11	4.2
43	North Vancouver Island	3	2.5
51	Northwest	3	4.1
52	Northern Interior	14	9.9
53	Northeast	0	0.0

Note: Map classification by Jenks natural breaks method.

10.3 HIV Rates by Age Group and Sex, 2013

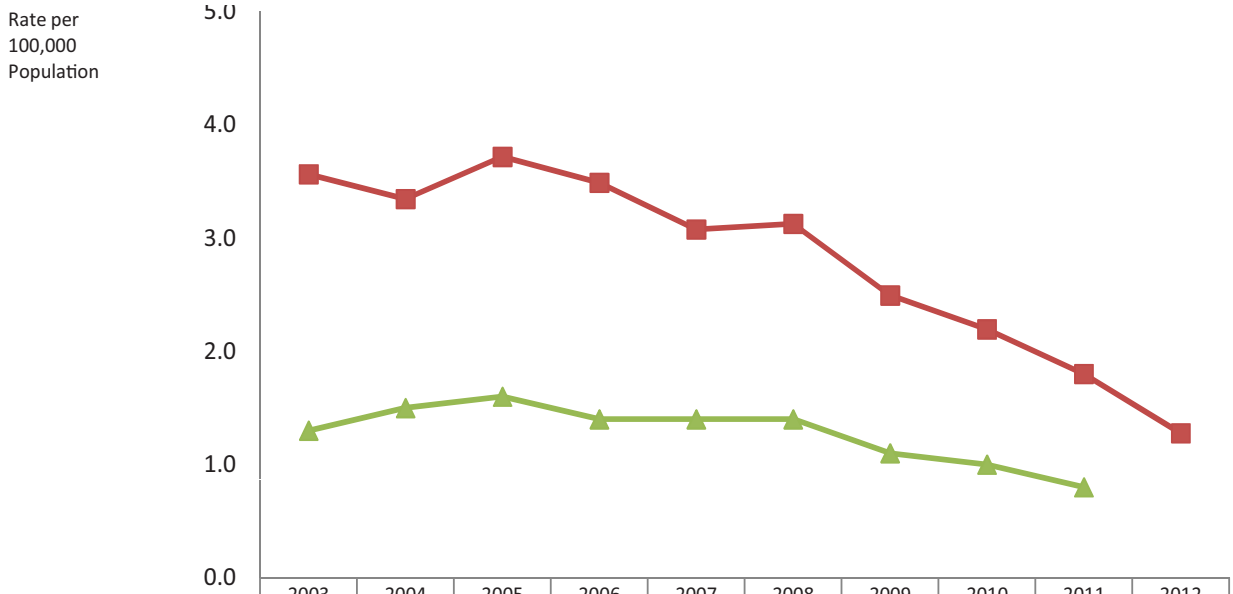


	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
HIV Rate - Female	0.0	0.0	0.0	0.0	0.0	2.6	1.9	3.6	2.1	0.2
HIV Rate - Male	0.0	0.0	0.0	0.8	1.4	13.0	22.0	20.3	15.8	3.0
HIV Rate - Total	0.0	0.0	0.0	0.4	0.7	8.0	11.9	11.9	8.8	1.5
HIV Reports - Female	0	0	0	0	0	4	3	11	14	1
HIV Reports - Male	0	0	0	1	2	21	34	61	105	15
HIV Reports - Total	0	0	0	1	2	25	37	72	119	16

AIDS

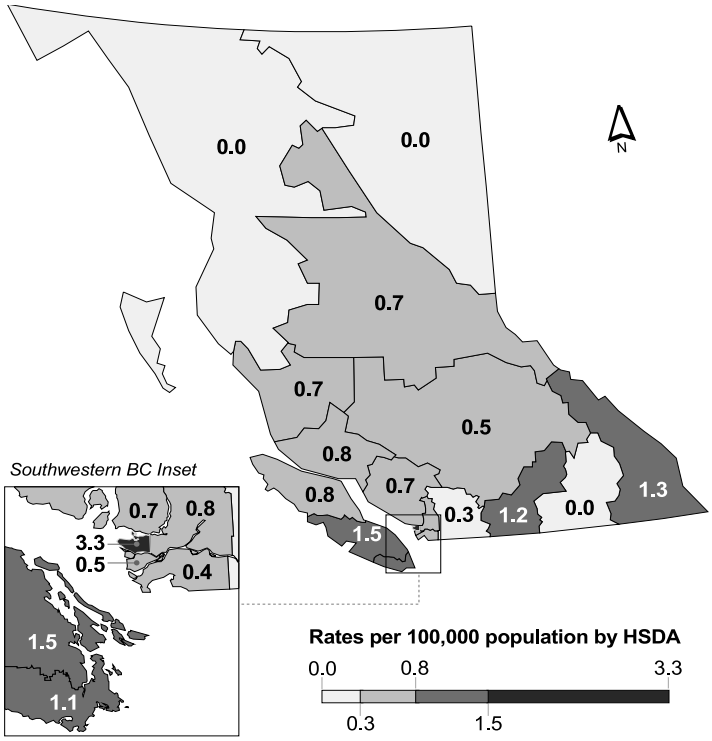
Due to the expected delays associated with AIDS reporting, this report only includes AIDS cases to 2012. In 2012, the rate of AIDS case reports in BC continued to decrease to 1.3 (58 cases) from 1.8 (81 cases) per 100,000 in 2011. Almost 80% (46 cases) of AIDS cases in 2012 were male, with the highest rates observed in males between 30-59 years of age. Across HSDAs, Vancouver (3.3 per 100,000; 22 cases) and Central Vancouver Island (1.5 per 100,000; 4 cases) had the highest rates of AIDS cases.

11.1 AIDS Rates by Year, 2003-2012



	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
BC AIDS Reports	147	139	156	148	132	136	110	98	81	58
BC AIDS Rate	3.6	3.3	3.7	3.5	3.1	3.1	2.5	2.2	1.8	1.3
Canadian AIDS Rate	1.3	1.5	1.6	1.4	1.4	1.4	1.1	1.0	0.8	

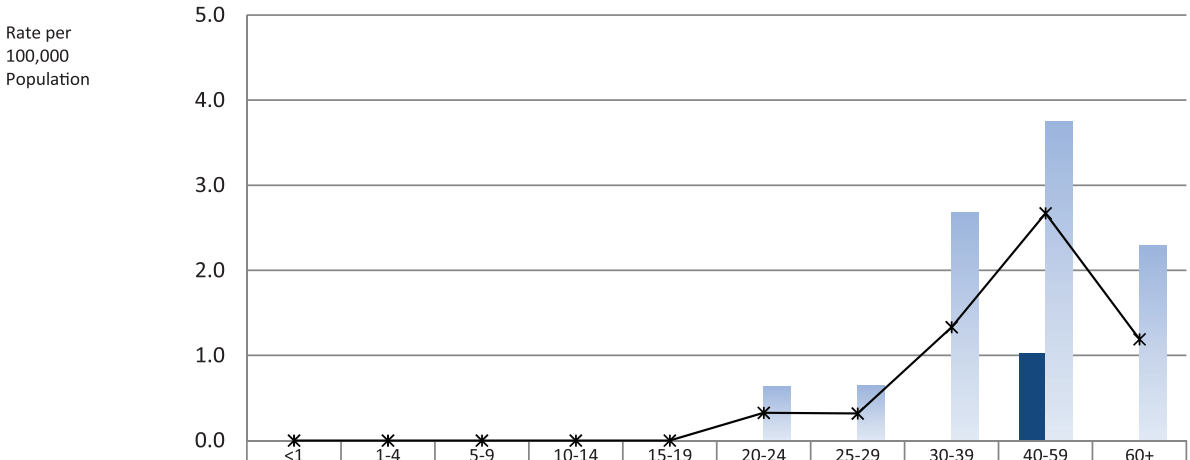
11.2 AIDS Rates by HSDA, 2012



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	1	1.3
12	Kootenay Boundary	0	0.0
13	Okanagan	4	1.2
14	Thompson Cariboo Shuswap	1	0.5
21	Fraser East	1	0.3
22	Fraser North	5	0.8
23	Fraser South	3	0.4
31	Richmond	1	0.5
32	Vancouver	22	3.3
33	North Shore/Coast Garibaldi	2	0.7
41	South Vancouver Island	4	1.1
42	Central Vancouver Island	4	1.5
43	North Vancouver Island	1	0.8
51	Northwest	0	0.0
52	Northern Interior	1	0.7
53	Northeast	0	0.0

Note: Map classification by Jenks natural breaks method.

11.3 AIDSRates by Age Group and Sex, 2012



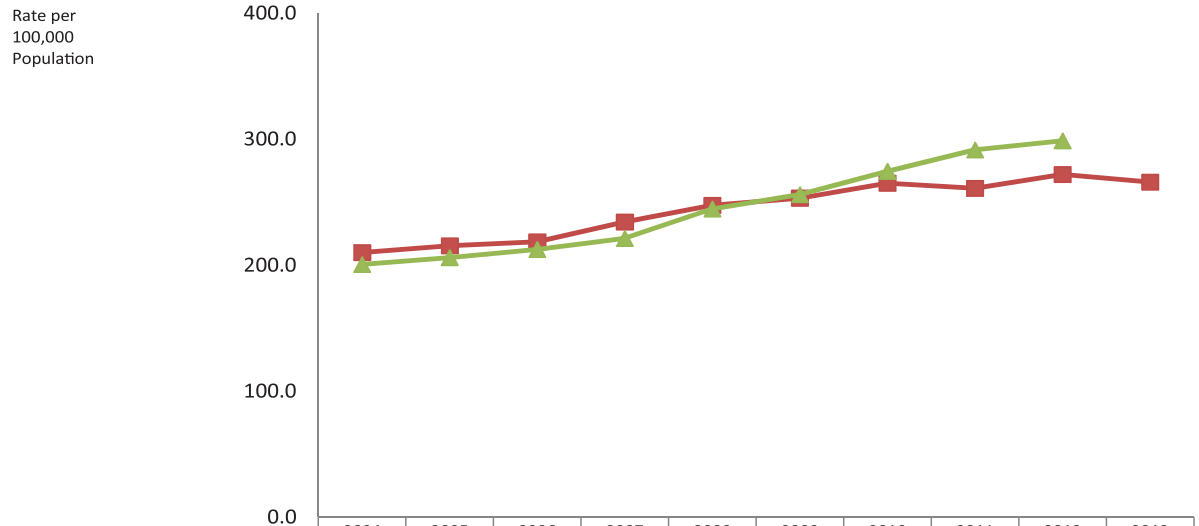
	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
AIDS Rate - Female	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
AIDS Rate - Male	0.0	0.0	0.0	0.0	0.0	0.6	0.6	2.7	3.7	2.3
AIDS Rate - Total	0.0	0.0	0.0	0.0	0.0	0.3	0.3	1.3	2.7	1.2
AIDS Reports - Female	0	0	0	0	0	0	0	0	7	0
AIDS Reports - Male	0	0	0	0	0	1	1	8	25	11
AIDS Reports - Total	0	0	0	0	0	1	1	8	36	12

Chlamydia **(genital)**

Genital *Chlamydia* rates have steadily been increasing since 1998. In 2013, the rate of genital *Chlamydia* in BC decreased to 266.0 (12,189 cases) from 272.1 (12,364 cases) per 100,000 in 2012. The highest rates of *Chlamydia* in 2013 were among young adults aged 20-24 years followed by young adult aged 25-29 years, influenced primarily by trends among females. In 2013, rates among HSDAs varied with the highest rates in Northeast (458.1 per 100,000; 318 cases), Northern Interior (418.1 per 100,000; 593 cases) and Vancouver (407.4 per 100,000; 2,678 cases), and the lowest rates in Northwest (186.0 per 100,000; 135 cases), Kootenay Boundary (187.5 per 100,000; 144 cases) and Fraser South (175.4 per 100,000; 1,344 cases).

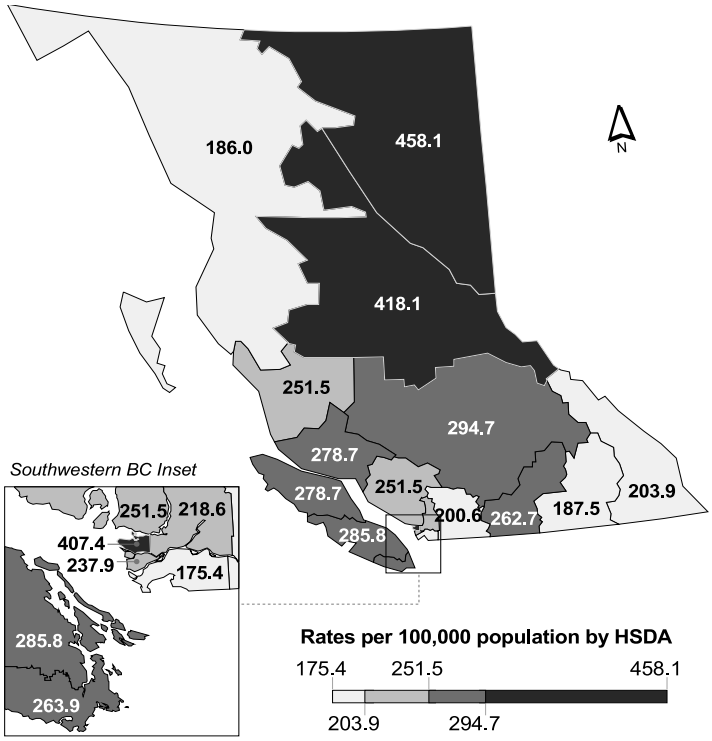
Due to a reporting delay, the number of *Chlamydia* infection cases for Northwest HSDA are not final in this report.

12.1 Genital Chlamydia Rates by Year, 2004-2013



	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
BC Genital Chlamydia Reports	8733	9040	9274	10060	10774	11176	11845	11745	12364	12189
BC Genital Chlamydia Rate	210.2	215.5	218.6	234.4	247.7	253.4	265.2	261.0	272.1	266.0
Canadian Genital Chlamydia Rate	200.7	206.2	212.7	221.3	244.8	256.2	274.7	291.6	298.8	

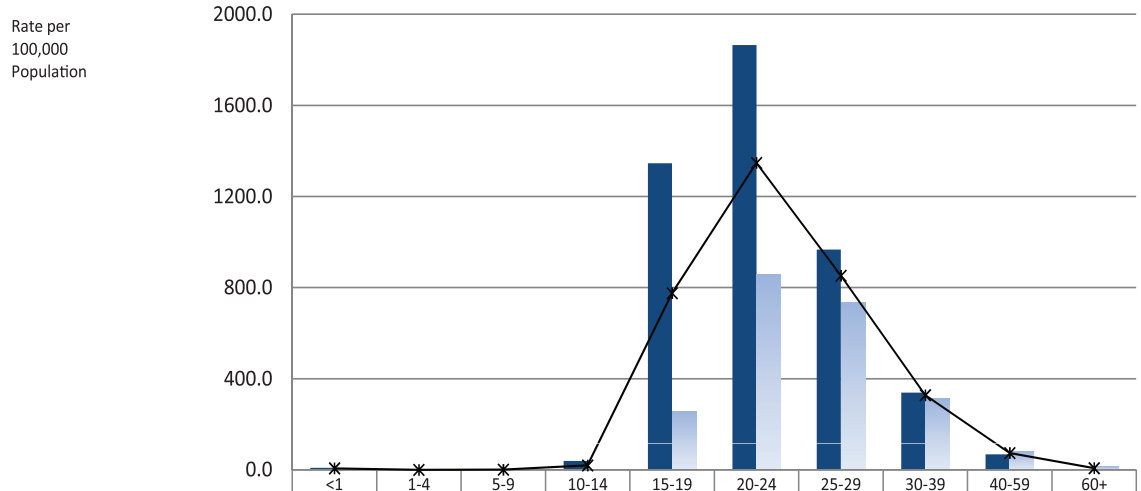
12.2 Genital Chlamydia Rates by HSDA, 2013



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	155	203.9
12	Kootenay Boundary	144	187.5
13	Okanagan	911	262.7
14	Thompson Cariboo Shuswap	642	294.7
21	Fraser East	576	200.6
22	Fraser North	1391	218.6
23	Fraser South	1344	175.4
31	Richmond	479	237.9
32	Vancouver	2678	407.4
33	North Shore/Coast Garibaldi	704	251.5
41	South Vancouver Island	979	263.9
42	Central Vancouver Island	749	285.8
43	North Vancouver Island	332	278.7
51	Northwest	135	186.0
52	Northern Interior	593	418.1
53	Northeast	318	458.1

Note: Map classification by Jenks natural breaks method.

12.3 Genital Chlamydia Rates by Age Group and Sex, 2013



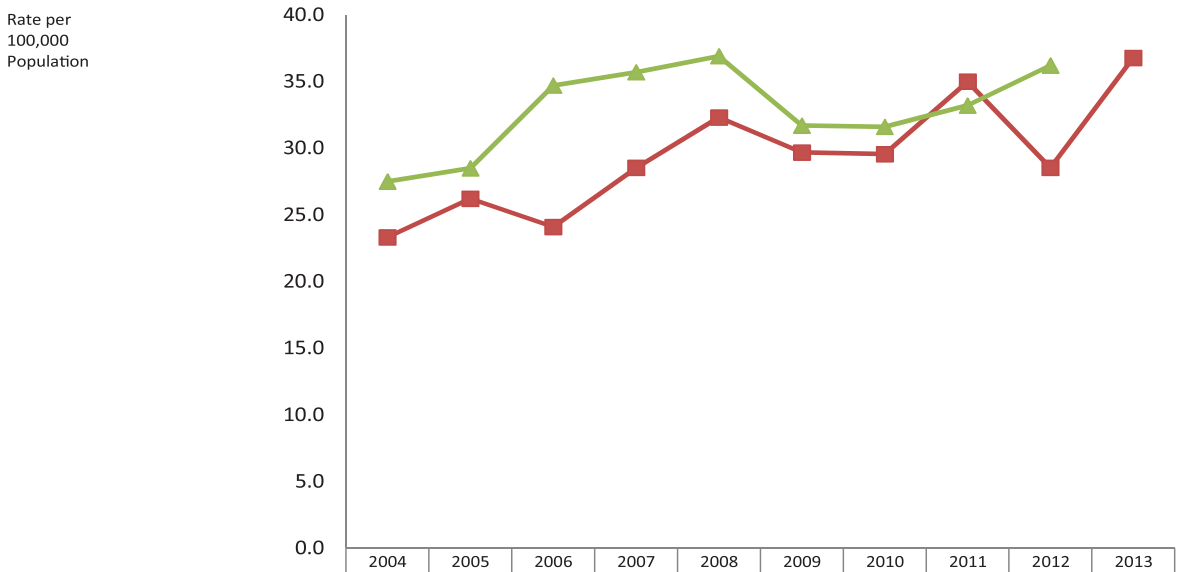
	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Genital Chlamydia Rate - Female	9.4	0.0	1.8	39.2	1345.8	1864.8	966.7	338.9	67.9	2.2
Genital Chlamydia Rate - Male	4.4	0.0	0.0	0.8	255.3	858.0	736.2	315.7	80.1	13.9
Genital Chlamydia Rate - Total	6.8	0.0	0.9	19.4	775.8	1347.7	852.5	327.9	73.9	7.7
Genital Chlamydia Reports - Female	2	0	2	44	1812	2835	1511	1035	462	12
Genital Chlamydia Reports - Male	1	0	0	1	377	1386	1137	949	533	69
Genital Chlamydia Reports - Total	3	0	2	45	2190	4226	2649	1987	995	81

Gonorrhea (genital)

In 2013, the rate of genital gonorrhea in BC increased to 36.8 (1,685 cases) from 28.5 (1,296 cases) per 100,000 in 2012. The highest rates in 2013 were among males aged 20-39 years and, for females the highest rates were among those aged 15-29 years. In 2013, rates among HSDAs vary with the highest rates in Vancouver (115.9 per 100,000; 762 cases), Northern Interior (37.4 per 100,000; 53 cases) and Fraser East (34.1 per 100,000; 98 cases), and the lowest rates in East Kootenay (2.6 per 100,000; 2 cases), Kootenay Boundary (6.5 per 100,000; 5 cases) and North Vancouver Island (9.2 per 100,000; 11 cases).

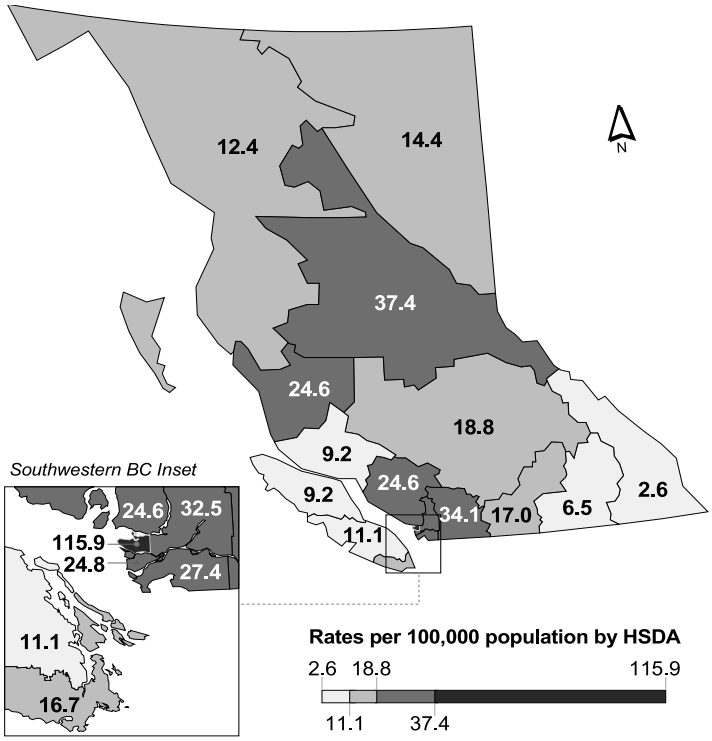
Due to a reporting delay, the number of Gonorrhea infection cases for Northwest HSDA are not final in this report.

13.1 Genital Gonorrhea Rates by Year, 2004-2013



	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
BC Genital Gonorrhea Reports	969	1100	1022	1224	1405	1309	1320	1574	1296	1685
BC Genital Gonorrhea Rate	23.3	26.2	24.1	28.5	32.3	29.7	29.6	35.0	28.5	36.8
Canadian Genital Gonorrhea Rate	27.5	28.5	34.7	35.7	36.9	31.7	31.6	33.2	36.2	

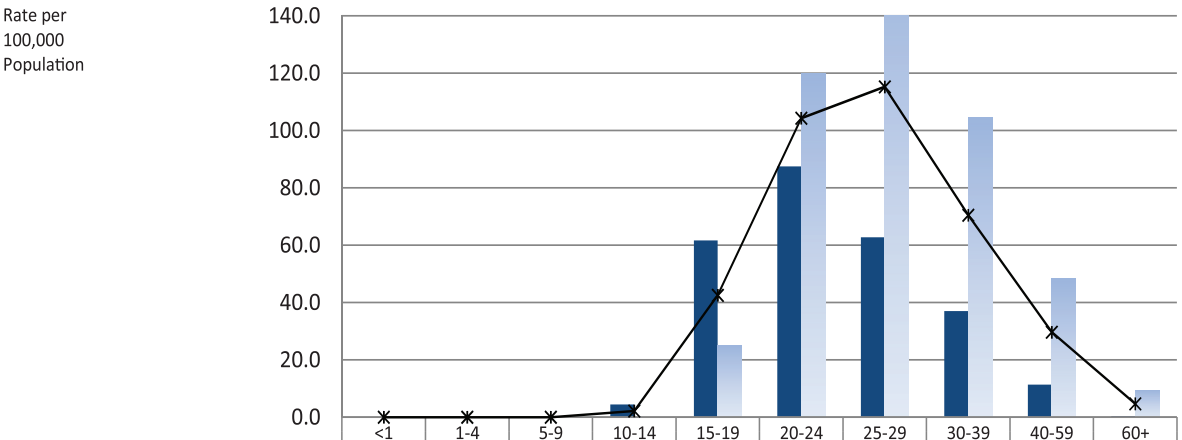
13.2 Genital Gonorrhea Rates by HSDA, 2013



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	2	2.6
12	Kootenay Boundary	5	6.5
13	Okanagan	59	17.0
14	Thompson Cariboo Shuswap	41	18.8
21	Fraser East	98	34.1
22	Fraser North	207	32.5
23	Fraser South	210	27.4
31	Richmond	50	24.8
32	Vancouver	762	115.9
33	North Shore/Coast Garibaldi	69	24.6
41	South Vancouver Island	62	16.7
42	Central Vancouver Island	29	11.1
43	North Vancouver Island	11	9.2
51	Northwest	9	12.4
52	Northern Interior	53	37.4
53	Northeast	10	14.4

Note: Map classification by Jenks natural breaks method.

13.3 Genital Gonorrhea Rates by Age Group and Sex, 2013



	<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	4.5	61.6	87.5	62.7	37.0	11.3	0.4
Genital Gonorrhea Rate - Male	0.0	0.0	0.0	0.0	25.1	120.1	165.8	104.5	48.3	9.4
Genital Gonorrhea Rate - Total	0.0	0.0	0.0	2.2	42.5	104.3	115.2	70.5	29.7	4.7
Genital Gonorrhea Reports - Female	0	0	0	5	83	133	98	113	77	2
Genital Gonorrhea Reports - Male	0	0	0	0	37	194	256	314	321	47
Genital Gonorrhea Reports - Total	0	0	0	5	120	327	358	427	399	49

Hepatitis B

Most cases of hepatitis B reported each year in BC are chronic infections; that is an infection which has persisted for more than six months. The vast majority of these chronic infections are identified in persons who have emigrated from a country where hepatitis B infection is endemic and were probably infected at birth. Infants infected through vertical (mother-to-child) transmission are very likely (about 90%) to develop chronic hepatitis B infection. Infants and young children are also more likely to be asymptomatic when acutely infected than older children and adults. Timely post exposure prophylaxis (hepatitis B immunoglobulin and hepatitis B vacccine at birth followed by hepatitis B vaccine at 2, 4, and 6 months of age), can considerably reduce the risk of the infant becoming infected with hepatitis B.

Hepatitis B vaccination has reduced the number of individuals newly infected with hepatitis B in BC. High risk individuals are eligible for publicly funded vaccine. A publicly funded hepatitis B vaccination program for students in grade 6 was introduced in 1992 and a province wide infant program in 2011. 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 as a result of symptoms of chronic hepatitis B infection such as cirrhosis. Acute hepatitis B is suspected when a person has symptoms (such as pale stools, dark urine and jaundice) and is confirmed to be infected by hepatitis B surface antigen and a postive anti-hepatitis B core IgM. As the number of acute cases reported in BC is now 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 or undetermined, but as these are asymptomatic they are usually chronic infections.

Hepatitis B - Chronic and Unknown

The rates of chronic and unknown hepatitis B had declined in BC until 2012 (1084 cases). However in 2013 there was a slight increase to 1177 cases for a rate of 25.7 per 100,000 population; this is down from more than 3,000 cases each year in the 1990s. Increases in reported cases may be as a result of increased testing and identification rather than an actual increase of hepatitis B cases. Inconsistencies of provincial chronic hepatitis B reporting make comparison to national trends impossible.

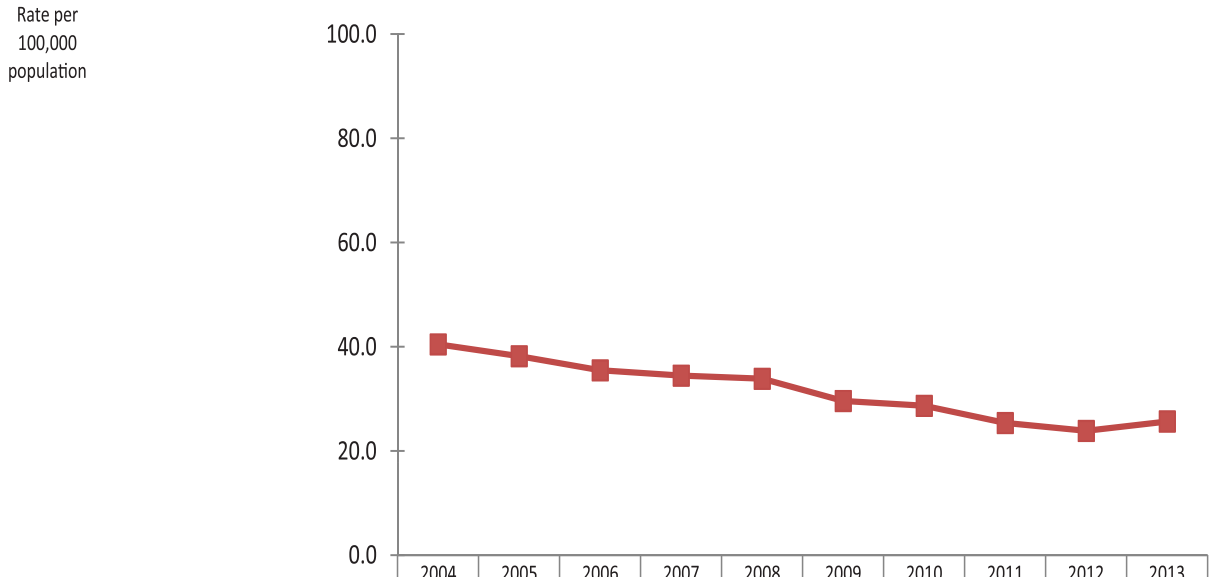
Demographic data show the highest rates of reported chronic and unknown cases are in 25-29; 30-39 and 40-59 year age groups. Chronic and unknown hepatitis B cases were distributed fairly evenly between sexes: 573 (49% female); males 601 (51%). However, females have a higher rate than males in the age groups 20-24, 25-29 and 30-39 years. This is likely due in part to females seeking health care more often than males especially for prenatal screening.

As in previous years, Richmond, Vancouver and Fraser North, regions of high immigration from endemic regions, demonstrate rates well above all other areas (107.8, 69.4 and 33 per 100,000 population respectively) and above the overall provincial rate of 25.7 per 100,000.

Hepatitis B - Acute

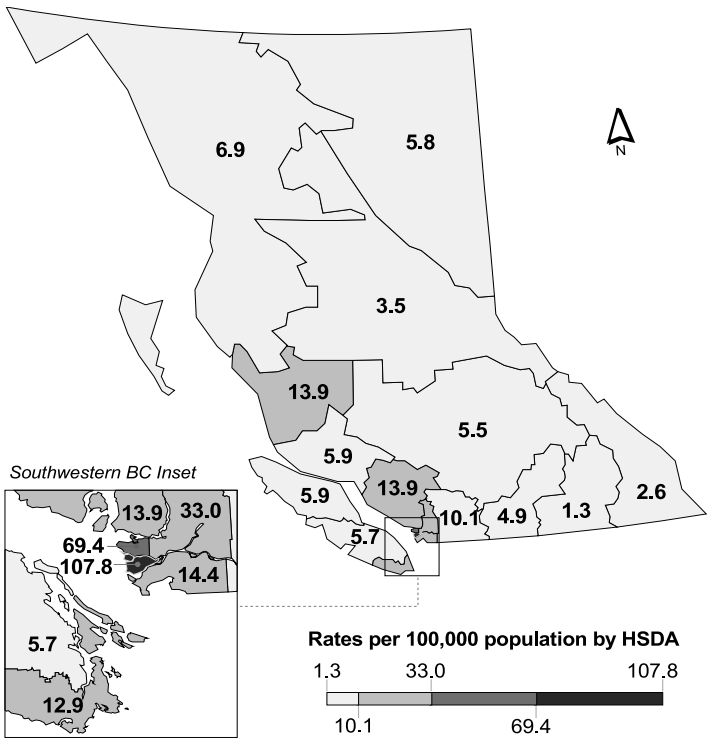
The total number of acute hepatitis B cases reported in 2013 was 11, the same number as reported in 2010, yielding a rate of 0.2 per 100,000 population which is a third of the rate in 2009. The number of cases is provisional and may change with follow-up testing at 6 months. In 2013, no cases were identified in individuals less than 25 years of age. Cases were predominantly in males (10 male, 1 female). Vancouver Health Service Delivery Area (HSDA) reported 5 cases; with the remaining 6 cases distributed throughout the other Health Authorities except no cases were reported on Vancouver Island.

14.1 Chronic and Unknown Hepatitis B Rates by Year, 2004-2013



	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
BC Hepatitis B: Chronic and Unknown	1682	1603	1505	1480	1473	1307	1281	1142	1084	1177
BC Hepatitis B: Chronic and Unknown Rate	40.5	38.2	35.5	34.5	33.9	29.6	28.7	25.4	23.9	25.7

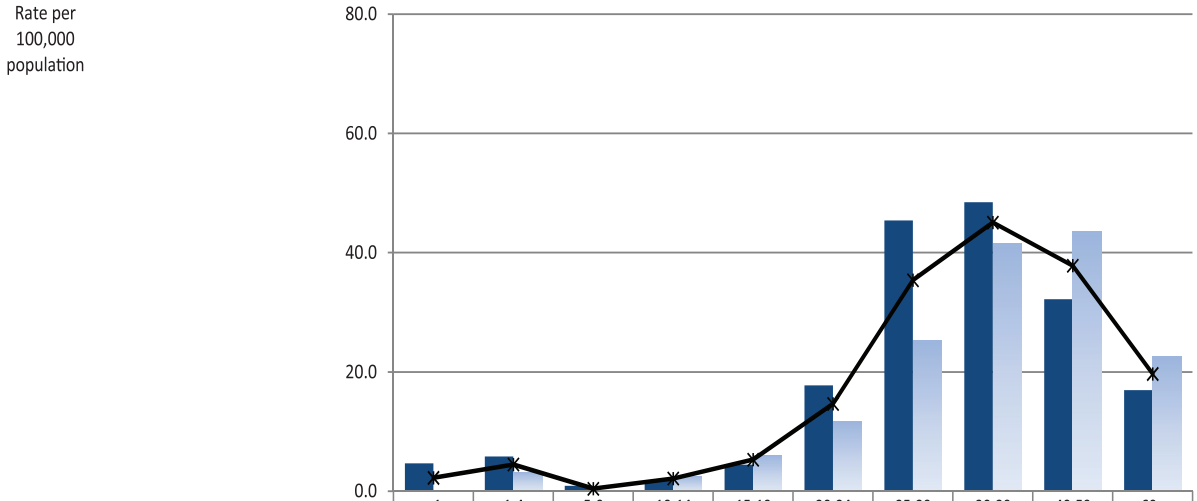
14.2 Chronic and Unknown Hepatitis B Rates by HSDA, 2013



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	2	2.6
12	Kootenay Boundary	1	1.3
13	Okanagan	17	4.9
14	Thompson Cariboo Shuswap	12	5.5
21	Fraser East	29	10.1
22	Fraser North	210	33.0
23	Fraser South	110	14.4
31	Richmond	217	107.8
32	Vancouver	456	69.4
33	North Shore/Coast Garibaldi	39	13.9
41	South Vancouver Island	48	12.9
42	Central Vancouver Island	15	5.7
43	North Vancouver Island	7	5.9
51	Northwest	5	6.9
52	Northern Interior	5	3.5
53	Northeast	4	5.8

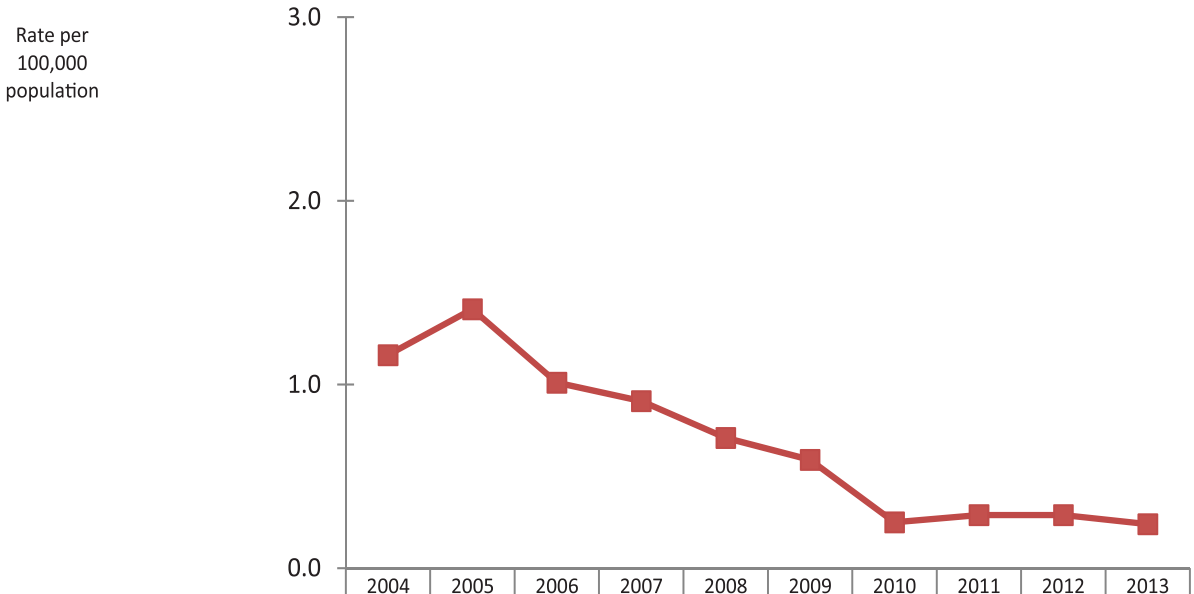
Note: Map classification by Jenks natural breaks method.

14.3 Chronic and Unknown Hepatitis B Rates by Age Group and Sex, 2013



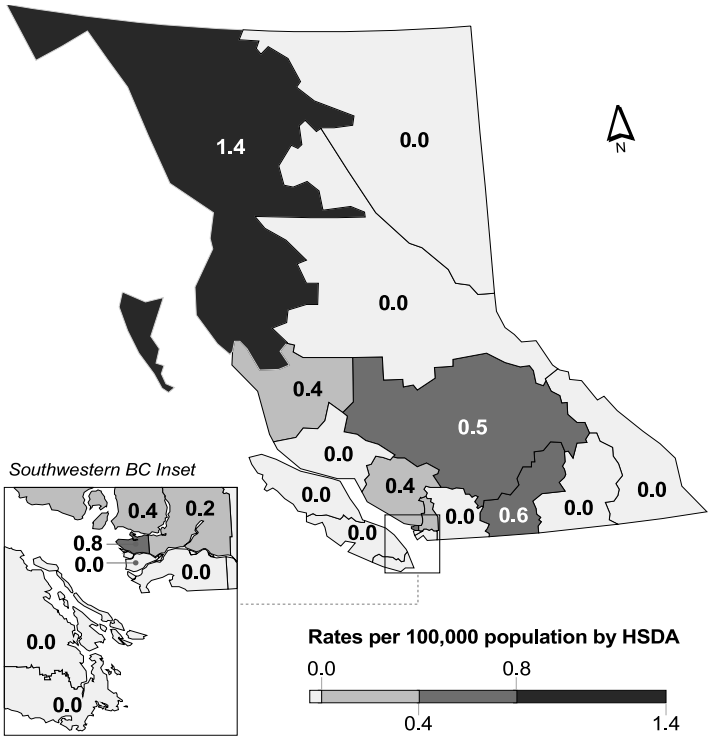
	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Hepatitis B: Chronic and Unknown Rate - Female	4.7	5.8	0.9	1.8	4.5	17.8	45.4	48.5	32.2	17.0
Hepatitis B: Chronic and Unknown Rate - Male	0.0	3.3	0.0	2.5	6.1	11.8	25.3	41.6	43.6	22.7
Hepatitis B: Chronic and Unknowns Rate	2.3	4.5	0.4	2.2	5.3	14.7	35.4	45.1	37.8	19.7
Hepatitis B: Chronic and Unknown Reports - Female	1	5	1	2	6	27	71	148	219	93
Hepatitis B: Chronic and Unknown Reports - Male	0	3	0	3	9	19	39	125	290	113
Hepatitis B: Chronic and Unknowns Reports	1	8	1	5	15	46	110	273	509	206

14.4 Acute Hepatitis B Rates by Year, 2004-2013



	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
BC Hepatitis B: Acute Reports	48	59	43	39	31	26	11	13	13	11
BC Hepatitis B: Acute Rate	1.2	1.4	1.0	0.9	0.7	0.6	0.3	0.3	0.3	0.2

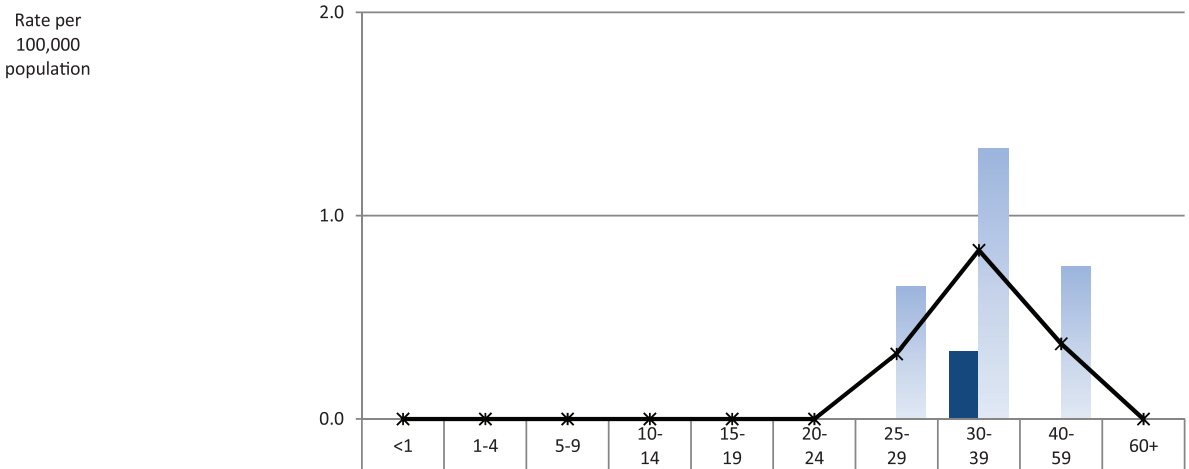
14.5 Acute Hepatitis B Rates by HSDA, 2013



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	1	0.5
21	Fraser East	0	0.0
22	Fraser North	1	0.2
23	Fraser South	0	0.0
31	Richmond	0	0.0
32	Vancouver	5	0.8
33	North Shore/Coast Garibaldi	1	0.4
41	South Vancouver Island	0	0.0
42	Central Vancouver Island	0	0.0
43	North Vancouver Island	0	0.0
51	Northwest	1	1.4
52	Northern Interior	0	0.0
53	Northeast	0	0.0

Note: Map classification by Jenks natural breaks method.

14.6 Acute Hepatitis B Rates by Age Group and Sex, 2013



	<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	0.0	0.0	0.3	0.0	0.0
Hepatitis B: Acute Rate - Male	0.0	0.0	0.0	0.0	0.0	0.0	0.7	1.3	0.8	0.0
Acute Hepatitis B Rate	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.8	0.4	0.0
Hepatitis B: Acute Reports - Female	0	0	0	0	0	0	0	1	0	0
Hepatitis B: Acute Reports - Male	0	0	0	0	0	0	1	4	5	0
Acute Hepatitis B Reports	0	0	0	0	0	0	1	5	5	0

Hepatitis C

People may be tested for hepatitis C virus (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. In 2012, the US Centers for Disease Control and Prevention recommended persons born during 1945 and 1965 (baby boomers) should be tested for hepatitis C virus;[1] the US recommendation likely led to an increase in testing in BC. Overall, the rate of hepatitis C testing occurring in BC has increased annually, with a sharper increase in 2012 and 2013.[2] Thus the increase in cases of HCV identified is likely due to increased testing and not an increase of cases.

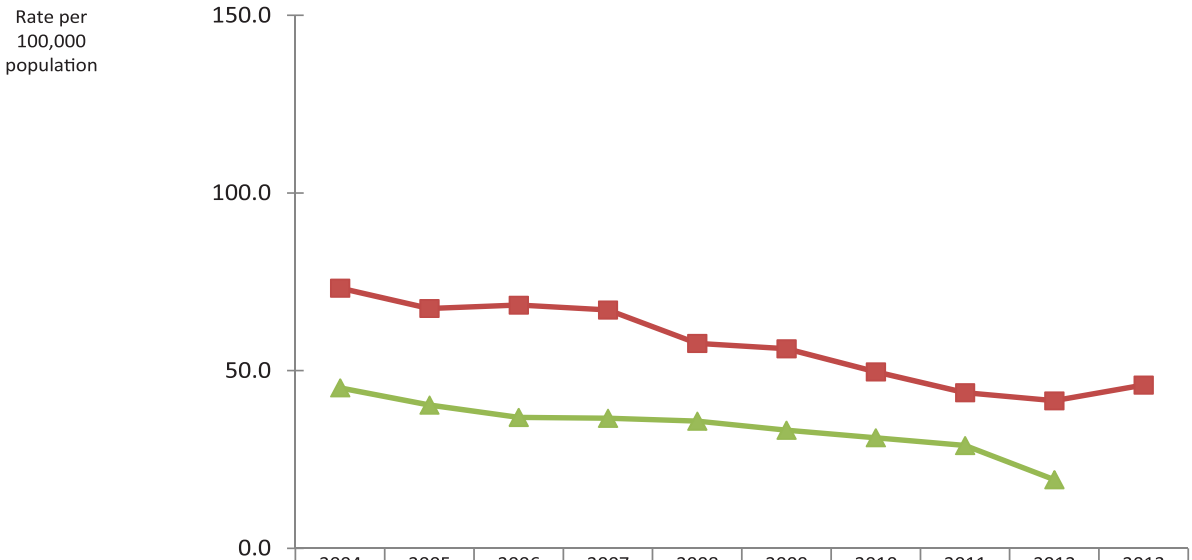
In 2013, a total of 2105 cases were reported for a rate of 45.9 per 100,000. This is an increase from 1886 cases the previous year. The hepatitis C rate in BC has consistently been above the Canadian rate. Overall, males are overrepresented (65%). However, the rate in females 15-19, 20-24 and 25-29 years exceeded the rate in males, likely associated with females more frequently accessing health care, including for contraception and pregnancy care. Males exceeded rates of females in the older age groups (above 30 years) and males had more than twice the rate of females in 40-59 year olds. Few cases were reported in children, with just six cases less than 15 years of age.

Rates in Health Service Delivery Areas (HSDA) ranged from a low of 20.4 in Richmond to a high of 77 per 100,000 in Fraser East followed by 64.9 in Northern Interior; other HSDA reporting greater than 50 per 100,000 were Vancouver, North Vancouver Island, Kootenay Boundary and Central Vancouver Island.

1. Recommendations for the Identification of Chronic Hepatitis C Virus Infection Among Persons Born During 1945–1965. MMWR (2012) 61(4)

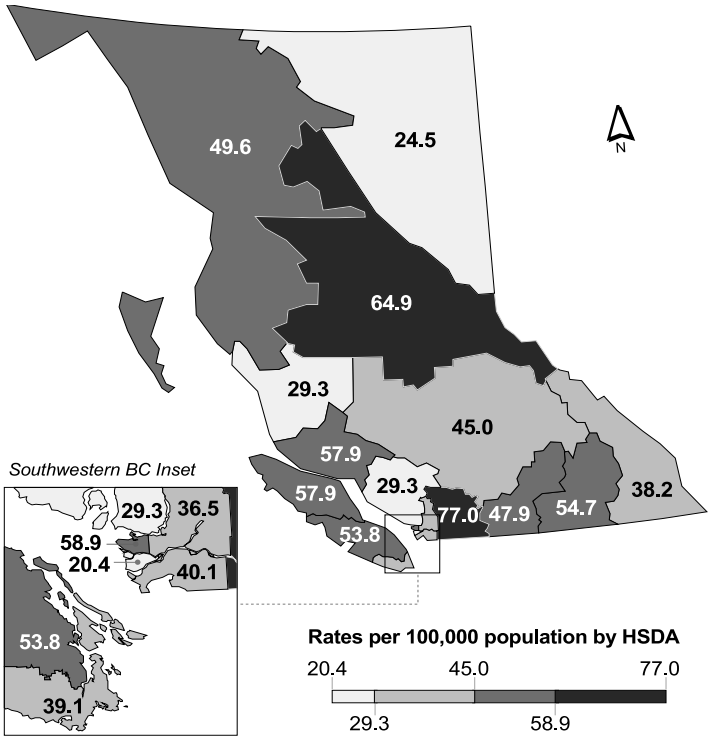
2. BC Public Health Microbiology Reference Laboratory

15.1 Hepatitis C Rates by Year, 2004-2013



	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
BC Hepatitis C Reports	3042	2832	2903	2879	2509	2476	2217	1970	1886	2105
BC Hepatitis C Rate	73.2	67.5	68.4	67.1	57.7	56.1	49.6	43.8	41.5	45.9
Canadian Hepatitis C Rate	45.2	40.3	36.9	36.6	35.8	33.3	31.1	28.9	19.3	

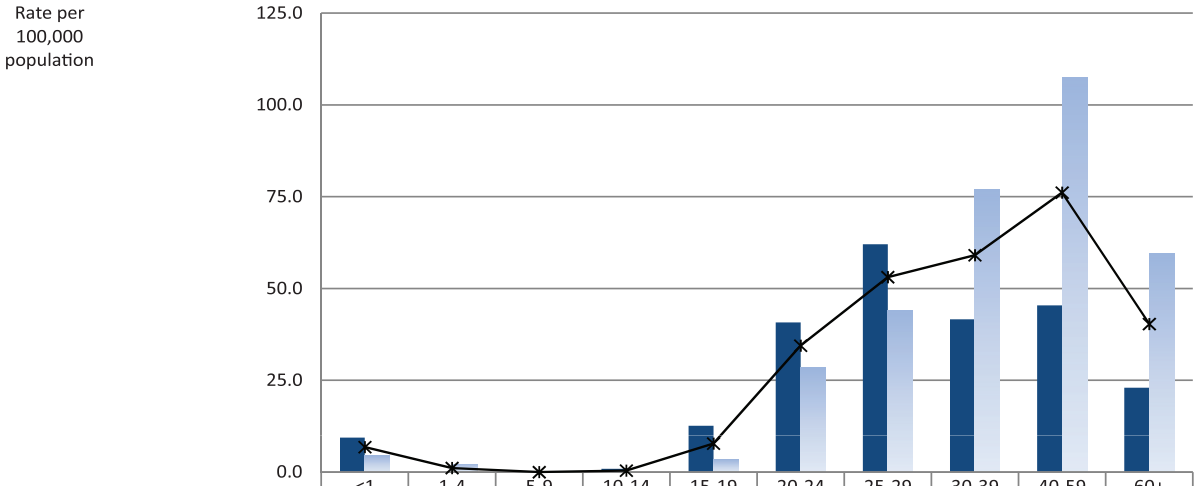
15.2 Hepatitis C Rates by HSDA, 2013



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	29	38.2
12	Kootenay Boundary	42	54.7
13	Okanagan	166	47.9
14	Thompson Cariboo Shuswap	98	45.0
21	Fraser East	221	77.0
22	Fraser North	232	36.5
23	Fraser South	307	40.1
31	Richmond	41	20.4
32	Vancouver	387	58.9
33	North Shore/Coast Garibaldi	82	29.3
41	South Vancouver Island	145	39.1
42	Central Vancouver Island	141	53.8
43	North Vancouver Island	69	57.9
51	Northwest	36	49.6
52	Northern Interior	92	64.9
53	Northeast	17	24.5

Note: Map classification by Jenks natural breaks method.

15.3 Hepatitis C Rates by Age Group and Sex, 2013

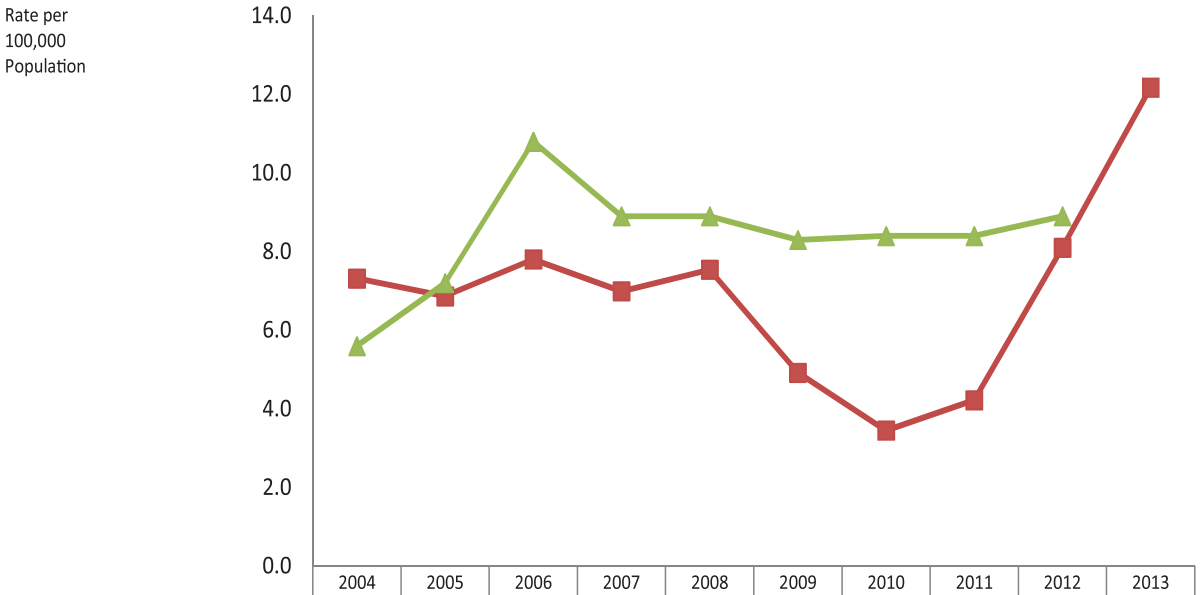


	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Hepatitis C Rate - Female	9.4	0.0	0.0	0.9	12.6	40.8	62.1	41.6	45.4	23.0
Hepatitis C Rate - Male	4.4	2.2	0.0	0.0	3.4	28.5	44.0	76.9	107.4	59.5
Hepatitis C Rate	6.8	1.1	0.0	0.4	7.8	34.4	53.1	59.1	76.1	40.3
Hepatitis C Reports - Female	2	0	0	1	17	62	97	127	309	126
Hepatitis C Reports - Male	1	2	0	0	5	46	68	231	714	296
Hepatitis C Reports	3	2	0	1	22	108	165	358	1024	422

Infectious Syphilis

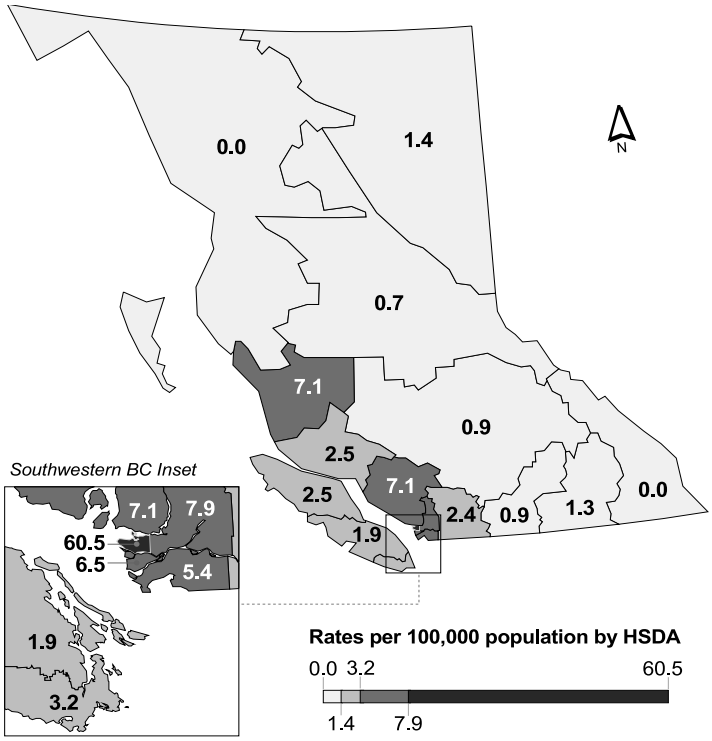
In 2013, the rate of infectious syphilis (i.e., primary, secondary and early latent) in BC increased to 12.2 (558 cases) from 8.1 (368 cases) per 100,000, reversing a downward trend between 2008 and 2010. Over 95% (536 cases) of infectious syphilis cases in 2013 were male, with the highest rates observed in males between 25-59 years of age. Across HSDAs, Vancouver (60.5 per 100,000; 398 cases), Fraser North (7.9 per 100,000; 50 cases) and North Shore/ Coast Garibaldi (7.1 per 100,000; 20 cases) had the highest rates of infectious syphilis in 2013.

16.1 Infectious Syphilis Rates by Year, 2004-2013



	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
BC Infectious Syphilis Reports	304	288	331	300	328	217	154	190	368	558
BC Infectious Syphilis Rate	7.3	6.9	7.8	7.0	7.5	4.9	3.4	4.2	8.1	12.2
Canadian Infectious Syphilis Rate	5.6	7.2	10.8	8.9	8.9	8.3	8.4	8.4	8.9	

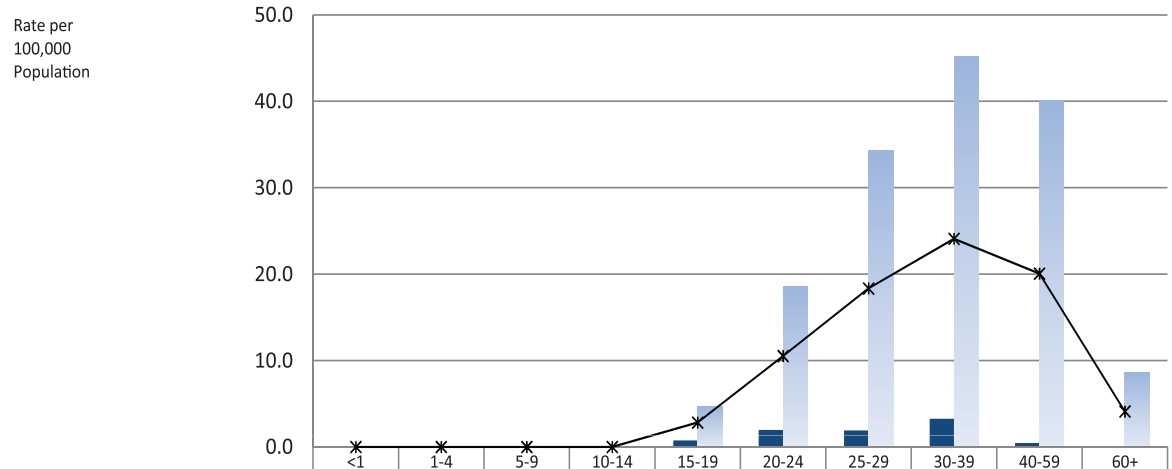
16.2 Infectious Syphilis Rates by HSDA, 2013



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	0	0.0
12	Kootenay Boundary	1	1.3
13	Okanagan	3	0.9
14	Thompson Cariboo Shuswap	2	0.9
21	Fraser East	7	2.4
22	Fraser North	50	7.9
23	Fraser South	41	5.4
31	Richmond	13	6.5
32	Vancouver	398	60.5
33	North Shore/Coast Garibaldi	20	7.1
41	South Vancouver Island	12	3.2
42	Central Vancouver Island	5	1.9
43	North Vancouver Island	3	2.5
51	Northwest	0	0.0
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, 2013



	<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	0.7	2.0	1.9	3.3	0.4	0.0
Infectious Syphilis Rate - Male	0.0	0.0	0.0	0.0	4.7	18.6	34.3	45.2	40.1	8.6
Infectious Syphilis Rate - Total	0.0	0.0	0.0	0.0	2.8	10.5	18.3	24.1	20.1	4.1
Infectious Syphilis Reports - Female	0	0	0	0	1	3	3	10	3	0
Infectious Syphilis Reports - Male	0	0	0	0	7	30	53	136	267	43
Infectious Syphilis Reports - Total	0	0	0	0	8	33	57	146	270	43

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

Disease Transmitted by Respiratory Routes

Streptococcal Disease (invasive) Group A
Tuberculosis

Streptococcal Disease (invasive) Group A (GAS)

The rate of reported cases of invasive GAS disease in BC did not change from 2012 to 2013, at 3.2 per 100,000 population in both years. This is similar to the reported rates prior to the peak in 2007-2008.

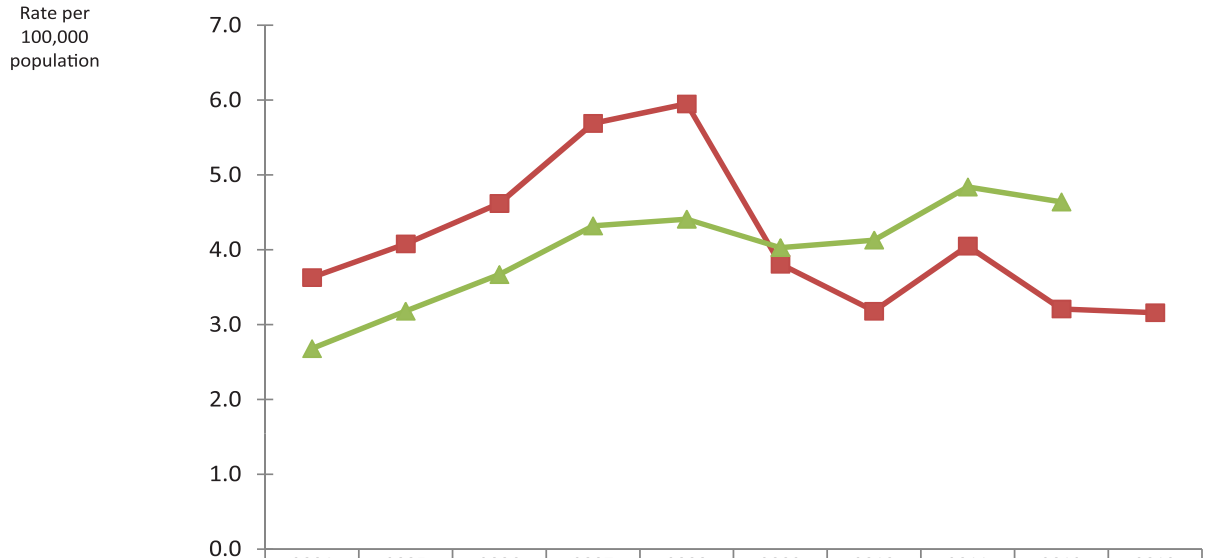
The highest incidence was in infant males (8.9 cases/100,000 population) and males aged ≥ 60 years (5.4 cases/100,000 population).

Of the 145 confirmed cases in 2013, 3 (2.1%) had toxic shock syndrome and 10 (6.9%) had necrotizing fasciitis.

The case fatality rate was 6.2% (9 deaths). Between 2004 and 2012, annual case fatality rates ranged from 3.7% to 13.2%. All deaths in 2013 were in adults aged ≥ 24 years.

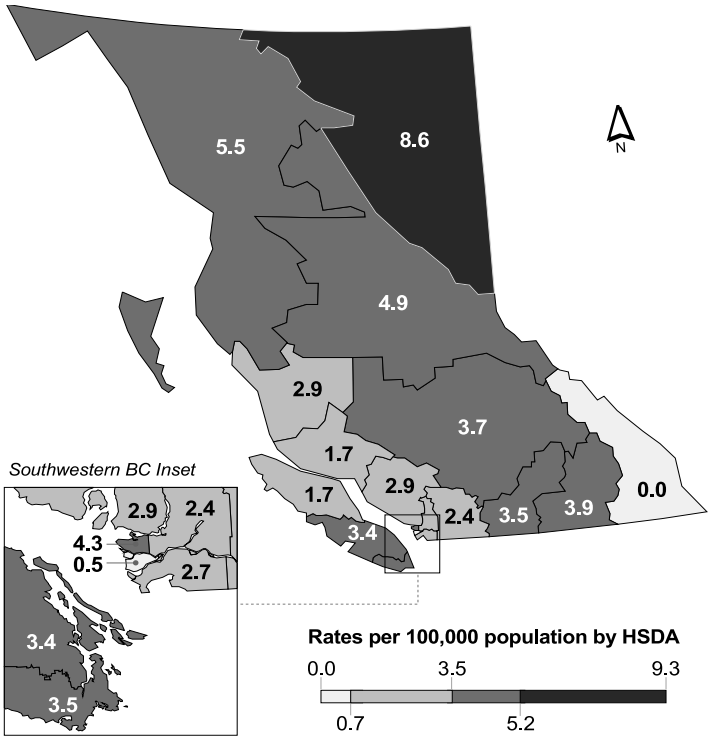
Isolates from 124 (86.6%) confirmed cases were typed by the National Microbiology Laboratory. Of these, the most common emm types were 1 (21.0%), 89 (12.9%) and 28 (10.5%). In 2003 through 2012, the most common emm types among cases with typing results were types 1 (17.7%), 59 (12.4%) and 12 (5.3%).

17.1 Streptococcal Disease (invasive) Group A Rates by Year, 2004-2013



	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
BC iGAS Reports	151	171	196	244	259	168	142	182	146	145
BC iGAS Rate	3.6	4.1	4.6	5.7	6.0	3.8	3.2	4.1	3.2	3.2
Canadian iGAS Rate	2.7	3.2	3.7	4.3	4.4	4.0	4.1	4.8	4.6	

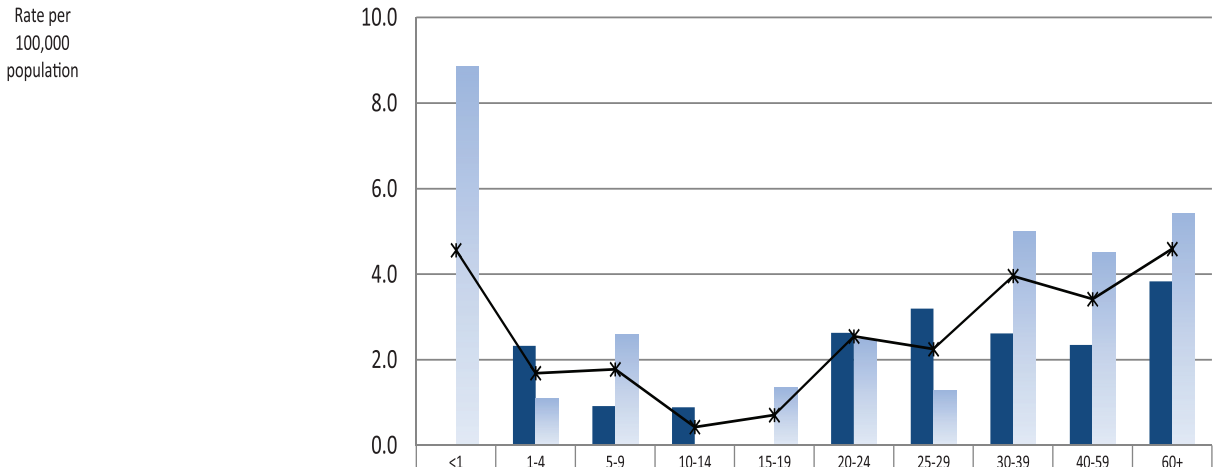
17.2 Streptococcal Disease (invasive) Group A Rates by HSDA, 2013



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	0	0.0
12	Kootenay Boundary	3	3.9
13	Okanagan	12	3.5
14	Thompson Cariboo Shuswap	8	3.7
21	Fraser East	7	2.4
22	Fraser North	15	2.4
23	Fraser South	21	2.7
31	Richmond	1	0.5
32	Vancouver	28	4.3
33	North Shore/Coast Garibaldi	8	2.9
41	South Vancouver Island	13	3.5
42	Central Vancouver Island	9	3.4
43	North Vancouver Island	2	1.7
51	Northwest	4	5.5
52	Northern Interior	7	4.9
53	Northeast	6	8.6

Note: Map classification by Jenks natural breaks method.

17.3 Streptococcal Disease (invasive) Group A Rates by Age Group and Sex, 2013



	<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	0.0	2.3	0.9	0.9	0.0	2.6	3.2	2.6	2.4	3.8
Streptococcal Disease, Group A, Invasive Rate - Male	8.9	1.1	2.6	0.0	1.4	2.5	1.3	5.0	4.5	5.4
Streptococcal Disease, Group A, Invasive Rate	4.6	1.7	1.8	0.4	0.7	2.6	2.3	4.0	3.4	4.6
Streptococcal Disease, Group A, Invasive Reports - Female	0	2	1	1	0	4	5	8	16	21
Streptococcal Disease, Group A, Invasive Reports - Male	2	1	3	0	2	4	2	15	30	27
Streptococcal Disease, Group A, Invasive Reports	2	3	4	1	2	8	7	24	46	48

Tuberculosis

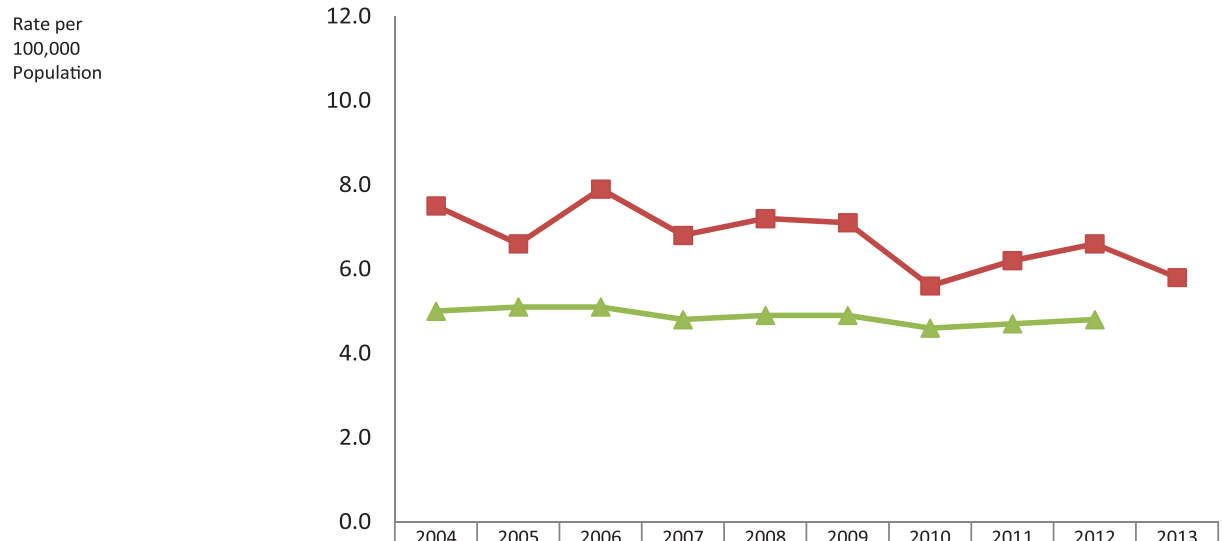
In 2013 there were 264 cases of reported tuberculosis in British Columbia, for a rate of 5.8 per 100,000, a 9% decrease in the number and 8% decrease in the rate of reported cases compared to 2012.

Rates for health regions vary across the province. The Vancouver, Fraser South, Richmond and Fraser North health service delivery areas have rates exceeding the provincial rate (5.8/ 100,000 population). The highest incidence was reported from Vancouver and Fraser South (9.6 and 9.0/ 100,000 population respectively) while the lowest was in Kootenay Boundary, North Vancouver Island and Central Vancouver Island (none, 0.8, and 1.5/ 100,000 population respectively).

Compared to 2012, the rate of tuberculosis increased in Northwest, Fraser North, Northeast, East Kootenay, North Shore/Coast Garibaldi, Fraser South and Fraser East with Northwest showing the largest increase in rate of tuberculosis (from 1.3 to 5.5/ 100,000 population). In Northern Interior, Richmond, North Vancouver Island, Thompson Cariboo Shuswap, Central Vancouver Island, South Vancouver Island, Kootenay Boundary, Okanagan and Vancouver the rate of tuberculosis decreased with Northern Interior and Richmond showing the largest decrease in rate of tuberculosis (from 8.3 to 2.1 and from 12.5 to 8.9/ 100,000 population respectively).

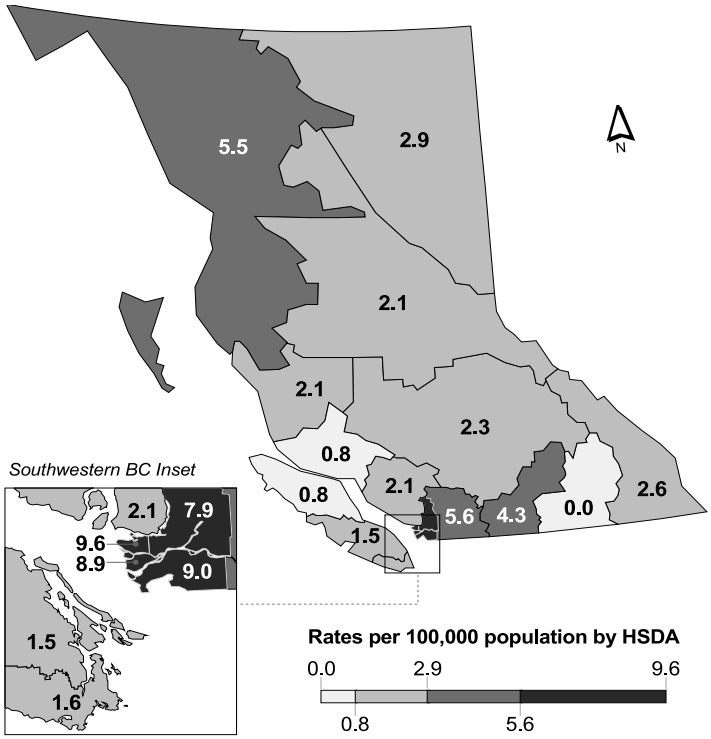
The age specific rates are shown in figure 20.3. Overall, the tuberculosis rate was higher in men than in women (6.3 vs 5.2 per 100,000). For the age group 0-19 years the rate of tuberculosis was higher in women than in men (1.7 vs 1.4 per 100,000). In those >= 40 years old, the rate of tuberculosis in men was higher than in women (9.5 vs 6.8 per 100,000).

20.1 Tuberculosis Rates by Year, 2004-2013



	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
BC Tuberculosis active cases	310	277	336	292	312	315	251	277	299	264
BC Tuberculosis Rate	7.5	6.6	7.9	6.8	7.2	7.1	5.6	6.2	6.6	5.8
Canadian Tuberculosis Rate	5.0	5.1	5.1	4.8	4.9	4.9	4.6	4.7	4.8	

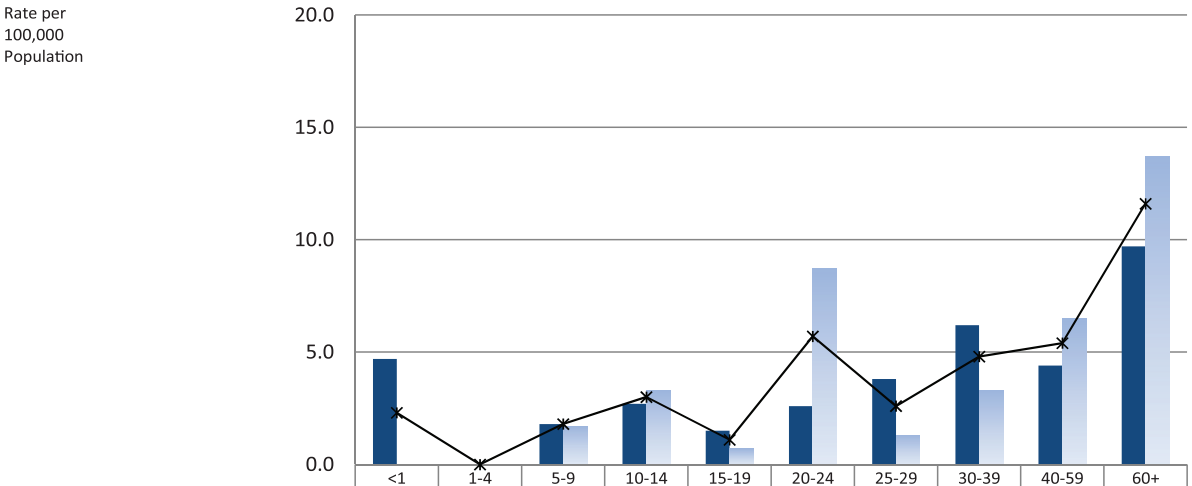
20.2 Tuberculosis Rates by HSDA, 2013



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	2	2.6
12	Kootenay Boundary	0	0.0
13	Okanagan	15	4.3
14	Thompson Cariboo Shuswap	5	2.3
21	Fraser East	16	5.6
22	Fraser North	50	7.9
23	Fraser South	69	9.0
31	Richmond	18	8.9
32	Vancouver	63	9.6
33	North Shore/Coast Garibaldi	6	2.1
41	South Vancouver Island	6	1.6
42	Central Vancouver Island	4	1.5
43	North Vancouver Island	1	0.8
51	Northwest	4	5.5
52	Northern Interior	3	2.1
53	Northeast	2	2.9

Note: Map classification by Jenks natural breaks method.

20.3 Tuberculosis Rates by Age Group and Sex, 2013



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Tuberculosis Rate -Female	4.7	0.0	1.8	2.7	1.5	2.6	3.8	6.2	4.4	9.7
Tuberculosis Rate -Male	0.0	0.0	1.7	3.3	0.7	8.7	1.3	3.3	6.5	13.7
Tuberculosis Rate	2.3	0.0	1.8	3.0	1.1	5.7	2.6	4.8	5.4	11.6
Tubercolosis Reports - Female	1	0	2	3	2	4	6	19	30	53
Tuberculosis Reports Reports - Male	0	0	2	4	1	14	2	10	43	68
Tuberculosis Reports	1	0	4	7	3	18	8	29	73	121

Antimicrobial Resistant Organism Surveillance in BC

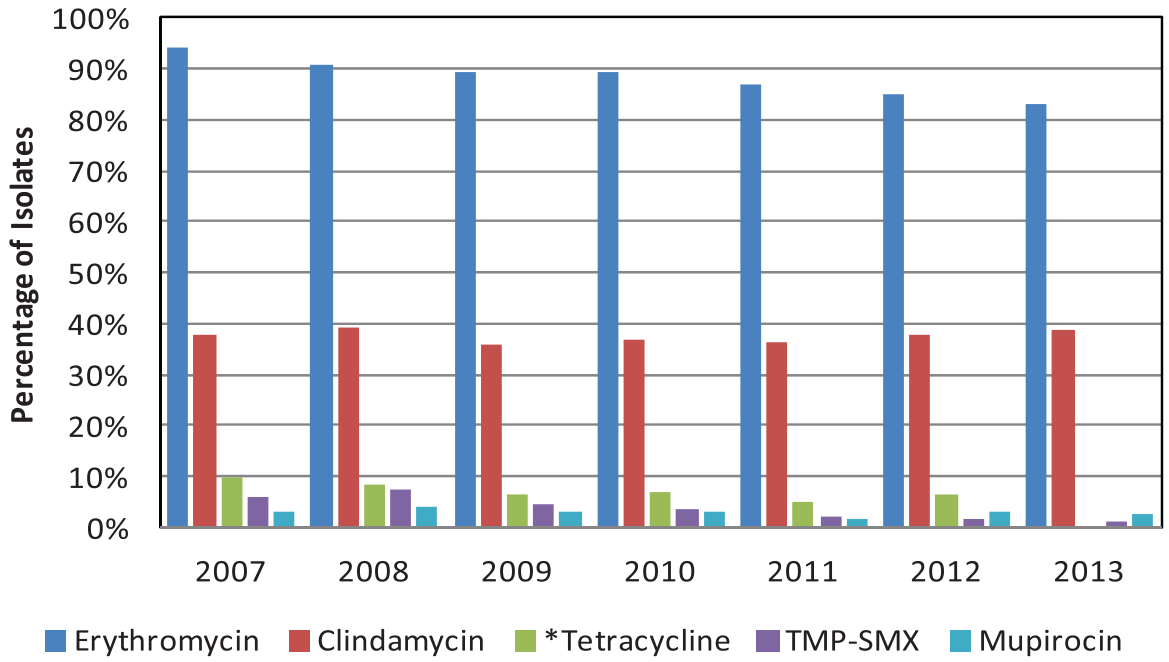
Highlights in Trends in Antibiotic Resistance

- From 2008 to 2013, the proportion of *Staphylococcus aureus* that were resistant to methicillin (MRSA) fluctuated between 16.1% and 27.9%, but remained below the peak of 30.5% observed in 2007. The rate was 23.2% of S. *aureus* isolates in 2013. During 2013, MRSA isolates tested showed resistance to erythromycin (82.8%) and clindamycin (38.6%) but considerably lower rates of resistance to TMP-SMX (1.4%), tetracyclines (6.7%), and mupirocin (2.8%).[Figure 21.1] Susceptibility to linezolid, a recommended second-line antibacterial treatment of community-associated MRSA complications, remains at around 100% (data not shown).
- Resistance of *Escherichia coli* to ciprofloxacin, a commonly prescribed antibiotic for treatment of urinary tract infection, has shown a slight yet significant increase over the years and is currently at 24.9% in 2013 ($p<0.01$) (Figure 21.2). Similarly, *E.coli* isolates demonstrate moderate levels of resistance to TMP-SMX, currently at a rate of 25.2%. Resistance to nitrofurantoin shows a decreasing trend over the years and remains low at 2.5% in 2013 ($p<0.01$).
- From 2007 to 2013, *Streptococcus pneumoniae* isolates have demonstrated a stable rate of resistance to most tested antibacterial agents. In 2013, *S. pneumoniae* isolates tested non-susceptible against erythromycin, penicillin and TMP-SMX at rates of 26.2%, 11.6%, and 20.2% respectively.
- *Streptococcus pyogenes* isolates remain highly susceptible to amoxicillin-clavulanate, penicillin and cephalothin. Resistance rates of *S. pyogenes* to erythromycin and clindamycin have decreased significantly to 18% for each drug.
- *Enterococcus* spp. isolates remain highly susceptible to ampicillin (97%) and nitrofurantoin (99%). Isolates identified as vancomycin-resistant *Enterococci* (VRE) increased slightly to 1.5% ($p<0.001$). Resistance to ciprofloxacin is slightly decreasing and is currently at 23.8 % in 2013.
- Resistance of *Klebsiella pneumoniae* isolates to ciprofloxacin, amikacin, and gentamycin remain low at 4.1%, 0.2% and 1.6% respectively in 2013. (Klebsiella is highly resistant to ampicillin). In addition, the resistance to TMX-SMX shows a slight decreasing trend from 10.8% in 2007 to 7.8% ($p<0.01$).
- *Proteus mirabilis* isolates show a stable rate of resistance to ciprofloxacin currently at (19.8%). In addition, isolates demonstrated a moderate level of resistance (30.2%) to TMP-SMX and a low level of resistance to gentamicin (6.2%) and amikacin (1.6%) in 2013.
- The percent of *Haemophilus influenza* isolates showing resistance to ampicillin fluctuates between 15% and 20% and is currently at 19.7% in 2013.

Full Length Report

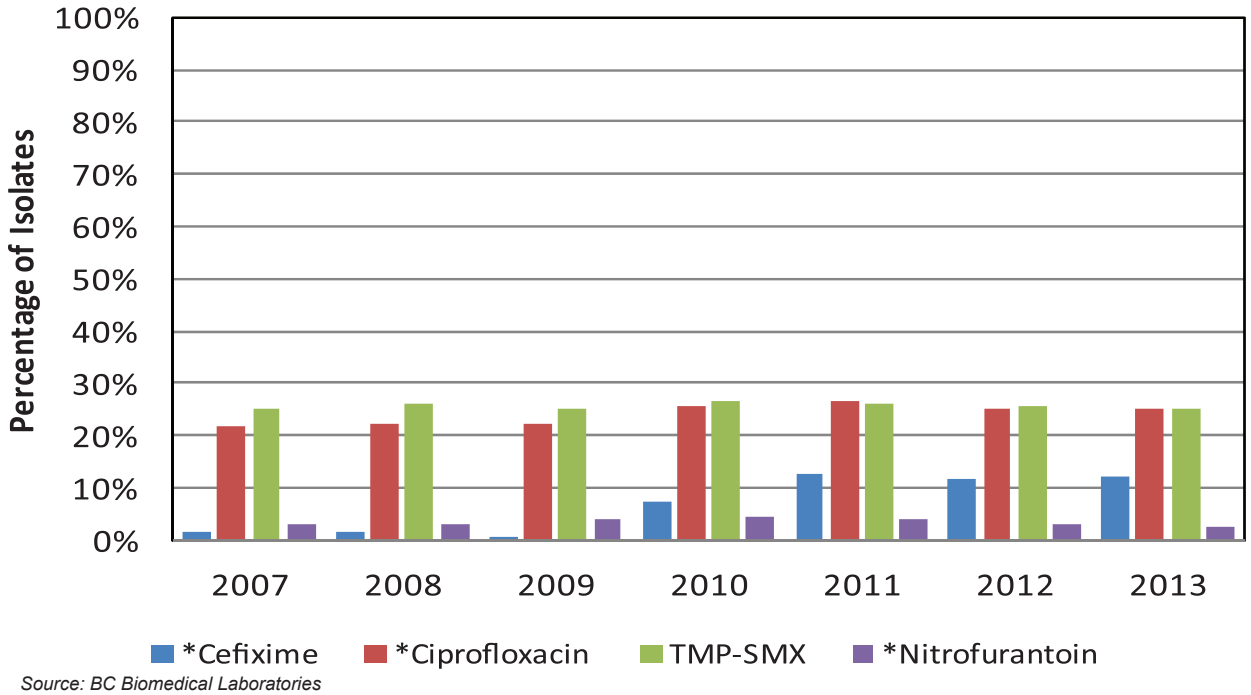
An updated report on trends of antimicrobial resistance in British Columbia will be compiled in a separate report – “Antimicrobial Resistance Trends in the Province of British Columbia.” Findings presented in this short summary are from analyses of data provided by BC Biomedical Laboratories (now part of LifeLabs Medical Laboratory Services), an outpatient laboratory network serving the Fraser and Vancouver Coastal Health Authorities in BC, from 2007 to 2013. This year, these data will be enhanced through collaboration with the parent company (LifeLabs) to more completely represent the spectrum of microbiology across the province. As part of the Do Bugs Need Drugs? program, the focus of this surveillance is primarily on community resistance patterns, thus trends may differ from those reported for institutions. Spearman rank correlation test was used to test the significance of changes in resistance over time (2007-2013). The most recent update on this report will be published online at http://www.bccdc.ca/dbnd.

21.1 MRSA Resistance to Erythromycin, Clindamycin, Tetracycline, TMP-SMX and Mupirocin (2007-2013)



** 2013 data missing unavailable due to changes in methodology for testing of susceptibility.*
Source: BC Biomedical Laboratories

21.2 E.coli Resistance to Cefixime, Ciprofloxacin, TMP-SMX, Nitrofurantoin (2007-2013)



Source: BC Biomedical Laboratories

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

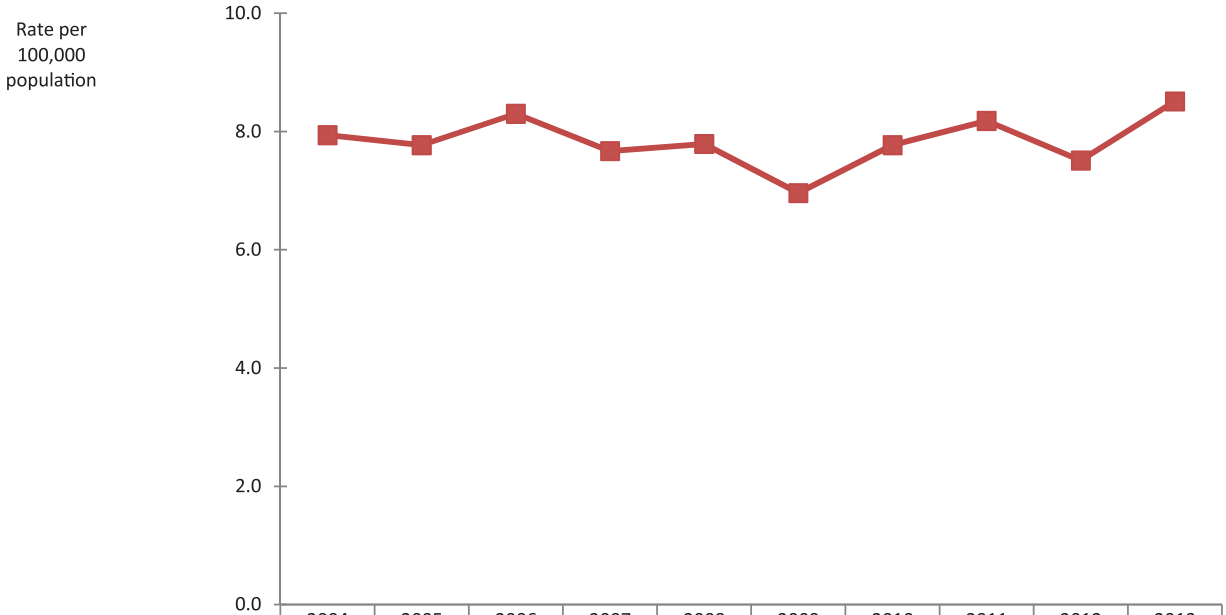
Enteric, Food and Waterborne Diseases

Amebiasis
Botulism
Campylobacteriosis
Cryptosporidiosis
Cyclosporiasis
Shigatoxigenic E. coli
Giardiasis
Hepatitis A
Listeriosis
Salmonellosis, Typhoid Fever and Paratyphoid Fever
Shigellosis
Vibrio Infection
Yersiniosis

Amebiasis

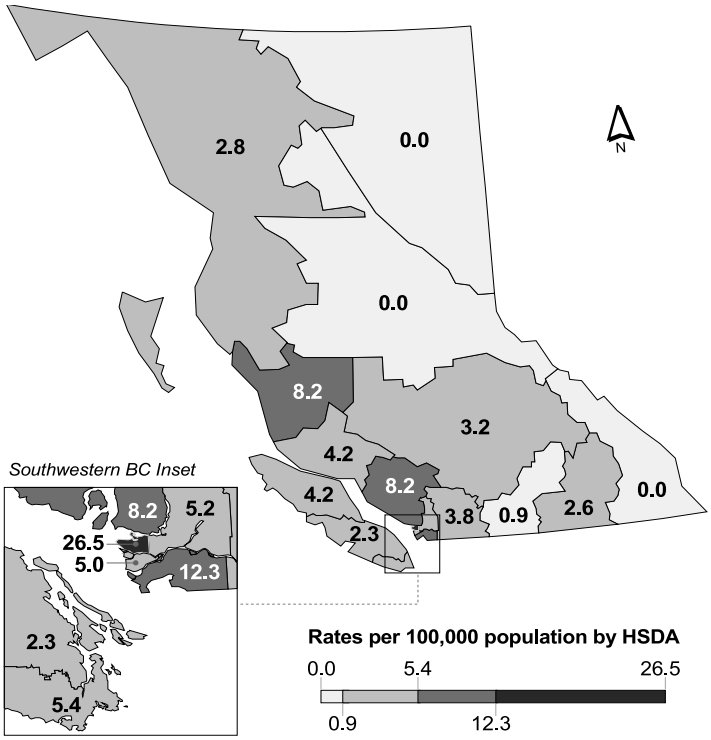
Throughout the last ten years, the rate of amebiasis in BC has remained fairly constant. The 2013 provincial rate was 8.5/100,000. No outbreaks were reported in 2013. Cases were reported throughout the year with slight peaks in early winter and summer. The reporting rate remained highest in males aged 30-59 years. This may in part be due to sexual transmission between men who have sex with men. Vancouver, as in previous years, reported the highest number of cases and the highest rate of illness (26.5/100,000).

25.1 Amebiasis by Year, 2004-2013



	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
BC Amebiasis Reports	330	326	352	329	339	307	347	368	341	390
BC Amebiasis Rate	7.9	7.8	8.3	7.7	7.8	7.0	7.8	8.2	7.5	8.5

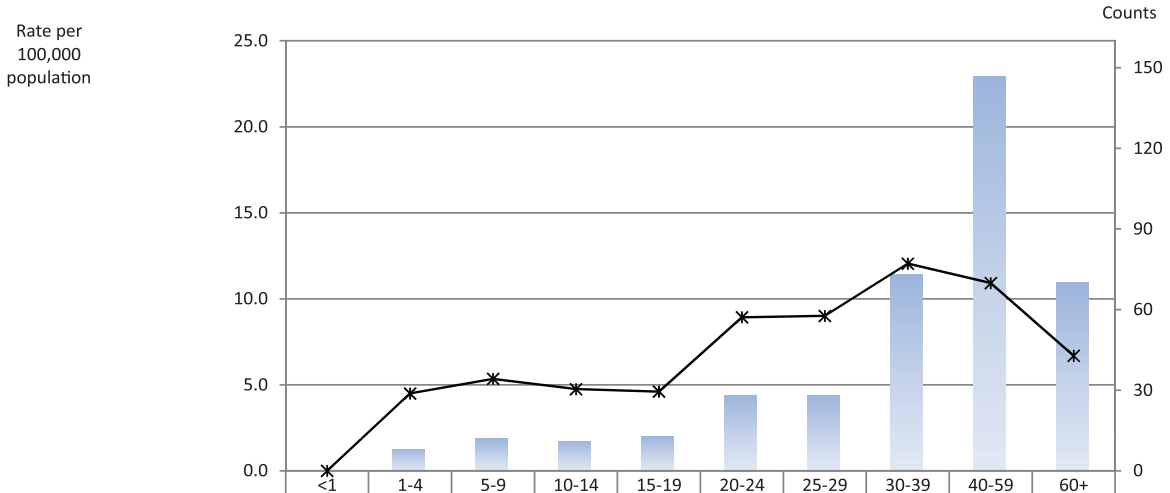
25.2 Amebiasis Rates by HSDA, 2013



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	0	0.0
12	Kootenay Boundary	2	2.6
13	Okanagan	3	0.9
14	Thompson Cariboo Shuswap	7	3.2
21	Fraser East	11	3.8
22	Fraser North	33	5.2
23	Fraser South	94	12.3
31	Richmond	10	5.0
32	Vancouver	174	26.5
33	North Shore/Coast Garibaldi	23	8.2
41	South Vancouver Island	20	5.4
42	Central Vancouver Island	6	2.3
43	North Vancouver Island	5	4.2
51	Northwest	2	2.8
52	Northern Interior	0	0.0
53	Northeast	0	0.0

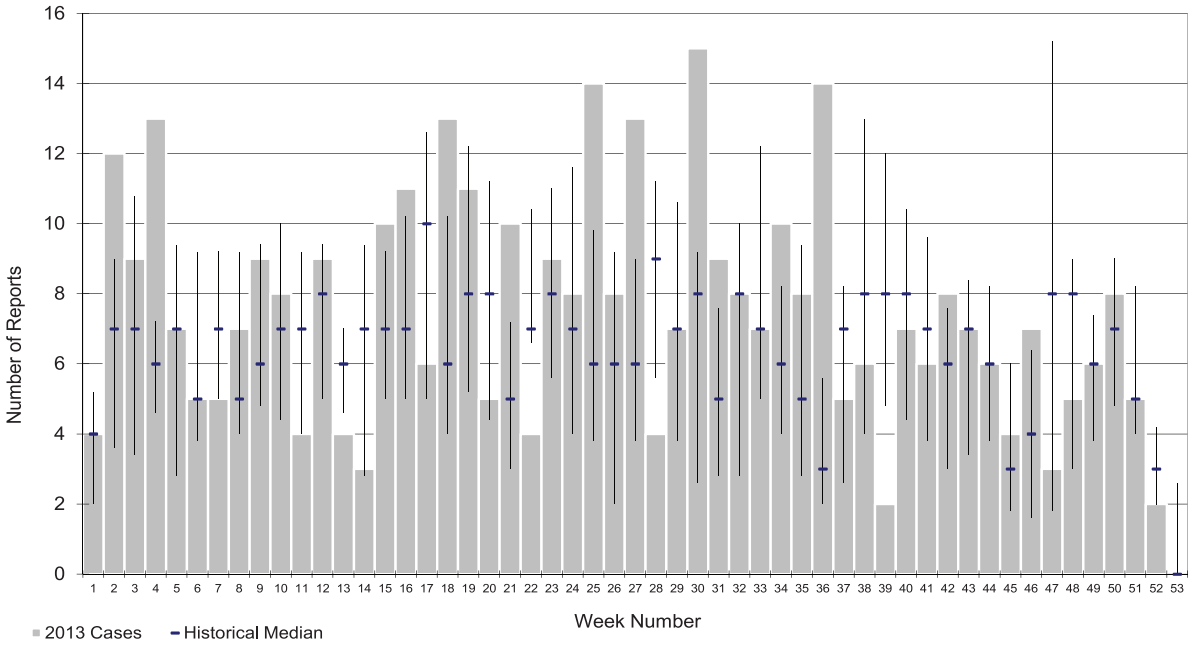
Note: Map classification by Jenks natural breaks method.

25.3 Amebiasis Rates by Age Group and Sex, 2013



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Amebiasis Reports - Female	0	3	5	7	7	15	13	23	27	9
Amebiasis Reports - Male	0	5	7	4	6	13	15	50	120	61
Amebiasis Reports - Total	0	8	12	11	13	28	28	73	147	70
Amebiasis Rate - Female	0.0	3.5	4.6	6.2	5.2	9.9	8.3	7.5	4.0	1.6
Amebiasis Rate - Male	0.0	5.4	6.0	3.4	4.1	8.1	9.7	16.6	18.0	12.3
Amebiasis Rate - Total	0.0	4.5	5.4	4.8	4.6	8.9	9.0	12.1	10.9	6.7

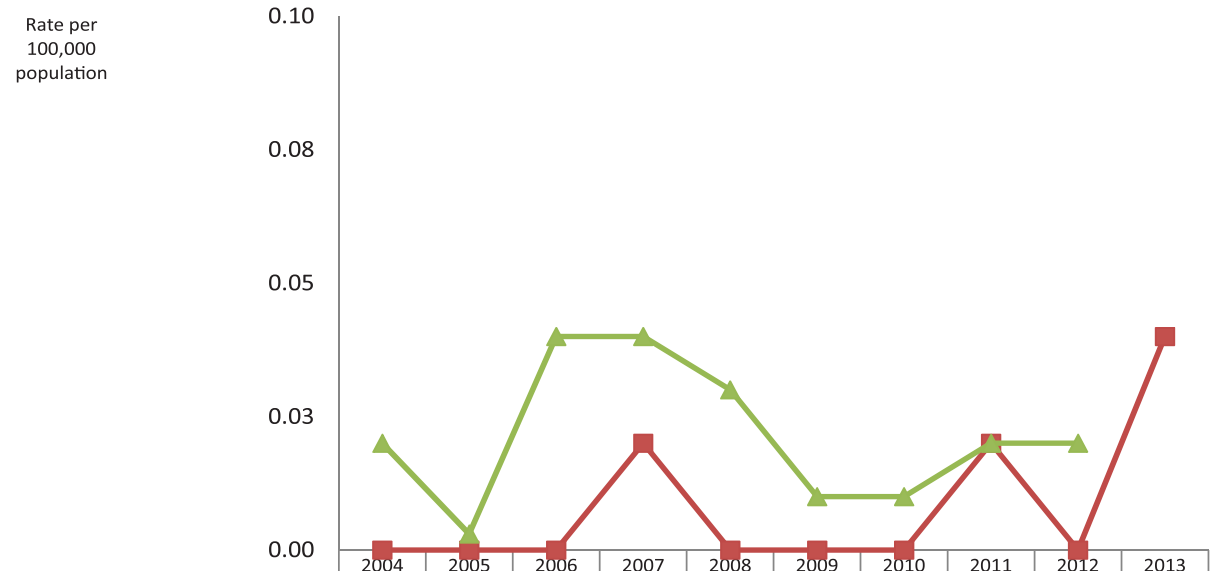
25.4 2013 Amebiasis Reports Compared to Historical Median and the 10th and 90th Percentiles Around the Median (2004 to 2012)



Botulism

In 2013, two cases of botulism were reported, one each in Island Health and Northern Health Authorities. Botulism remains rare in BC with only 4 cases reported in the last decade. Both 2013 cases were over the age of 60 years and were associated with consumption of high risk foods: home canned produce and fermented fish roe.

26.1 Botulism by Year, 2004-2013

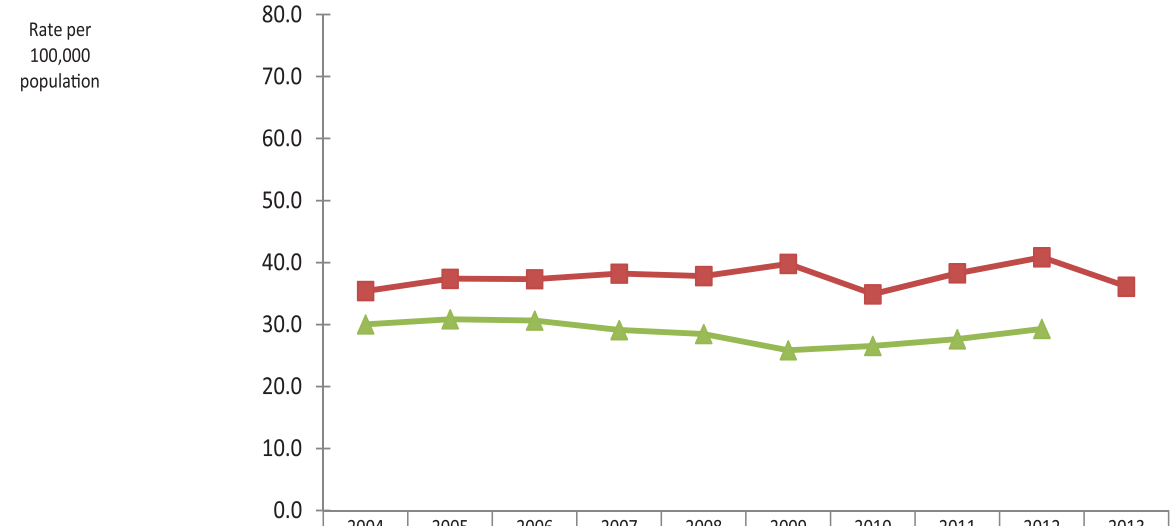


	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
BC Botulism Reports	0	0	0	1	0	0	0	1	0	2
BC Botulism Rate	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.02	0.00	0.04
Canadian Botulism Rate	0.02	0.00	0.04	0.04	0.03	0.01	0.01	0.02	0.02	

Campylobacteriosis

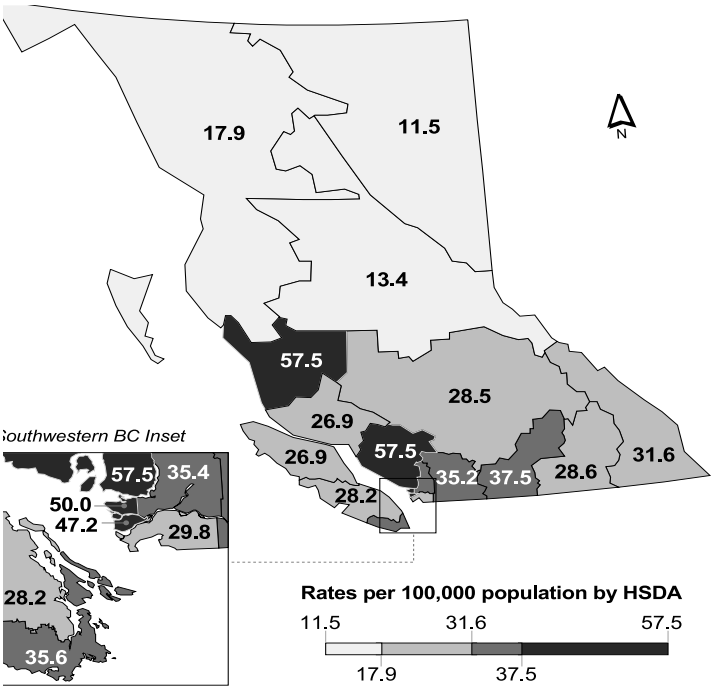
Campylobacteriosis was the most commonly reported enteric disease with a total of 1655 cases in 2013. The incidence rate has been stable since 2004 and has remained above the national average. Similar to past years, rates were highest among children aged 1 to 4 years, particularly among males, and adults between 20 and 39 years, again among males. The highest rate was once again reported from North Shore/Coast Garibaldi (57.5/100,000). This was followed by other HSDAs in Vancouver Coastal. As in most years, the number of cases reported was higher during late summer, between weeks 27 and 36. No outbreaks were reported.

27.1 Campylobacteriosis Rates by Year, 2004-2013



	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
BC Campylobacteriosis Reports	1471	1569	1583	1640	1645	1755	1558	1722	1856	1655
BC Campylobacteriosis Rate	35.4	37.4	37.3	38.2	37.8	39.8	34.9	38.3	40.9	36.1
Canadian Campylobacteriosis Rate	30.0	30.9	30.6	29.1	28.5	25.9	26.6	27.6	29.3	

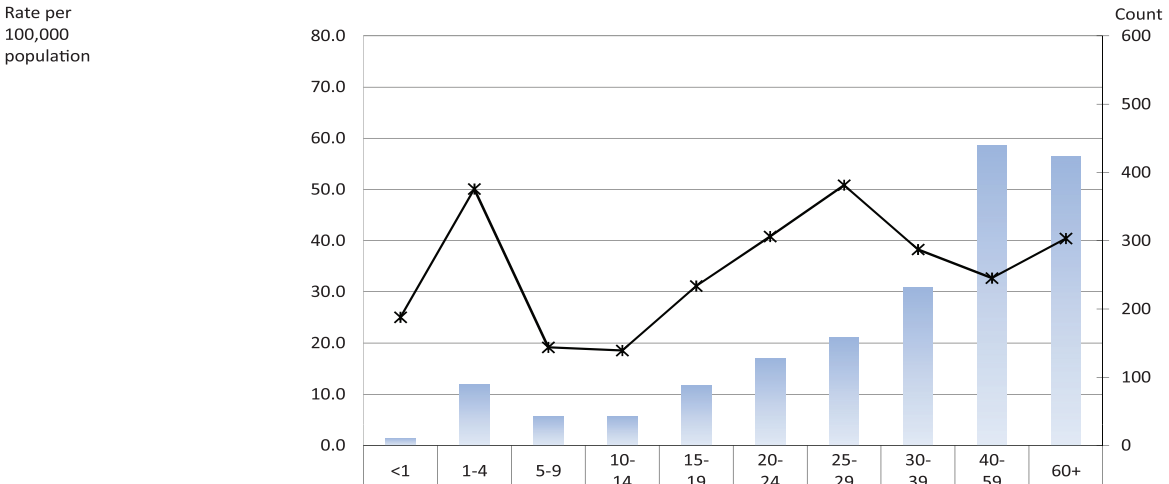
27.2 Campylobacteriosis Rates by HSDA, 2013



HSDA	Health Service Delivery Area	Cases	Ra
11	East Kootenay	24	31
12	Kootenay Boundary	22	28
13	Okanagan	130	37
14	Thompson Cariboo Shuswap	62	28
21	Fraser East	101	35
22	Fraser North	225	35
23	Fraser South	228	29
31	Richmond	95	47
32	Vancouver	329	50
33	North Shore/Coast Garibaldi	161	57
41	South Vancouver Island	132	35
42	Central Vancouver Island	74	28
43	North Vancouver Island	32	26
51	Northwest	13	17
52	Northern Interior	19	13
53	Northeast	8	11

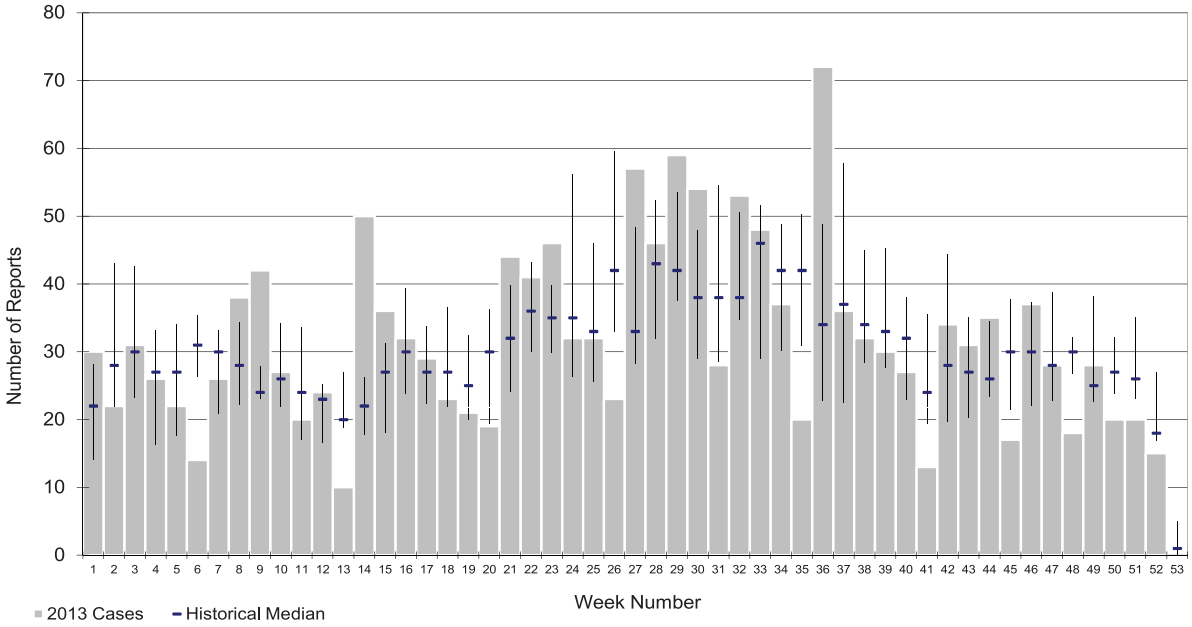
Note: Map classification by Jenks natural breaks method

27.3 Campylobacteriosis Rates by Age Group and Sex, 2013



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Campylobacteriosis Reports - Female	4	37	12	17	25	52	69	103	200	211
Campylobacteriosis Reports - Male	7	52	31	26	63	76	89	129	240	212
Campylobacteriosis Reports - Total	11	89	43	43	88	128	158	232	440	423
Campylobacteriosis Rate - Female	18.8	43.1	11.1	15.2	18.6	34.2	44.2	33.7	29.4	38.5
Campylobacteriosis Rate - Male	31.0	56.6	26.8	21.8	42.7	47.1	57.6	42.9	36.1	42.6
Campylobacteriosis Rate - Total	25.1	50.1	19.2	18.6	31.2	40.8	50.9	38.3	32.7	40.4

27.4 2013 Campylobacteriosis Reports Compared to Historical Median and the 10th and 90th Percentiles Around the Median (2004 to 2012)

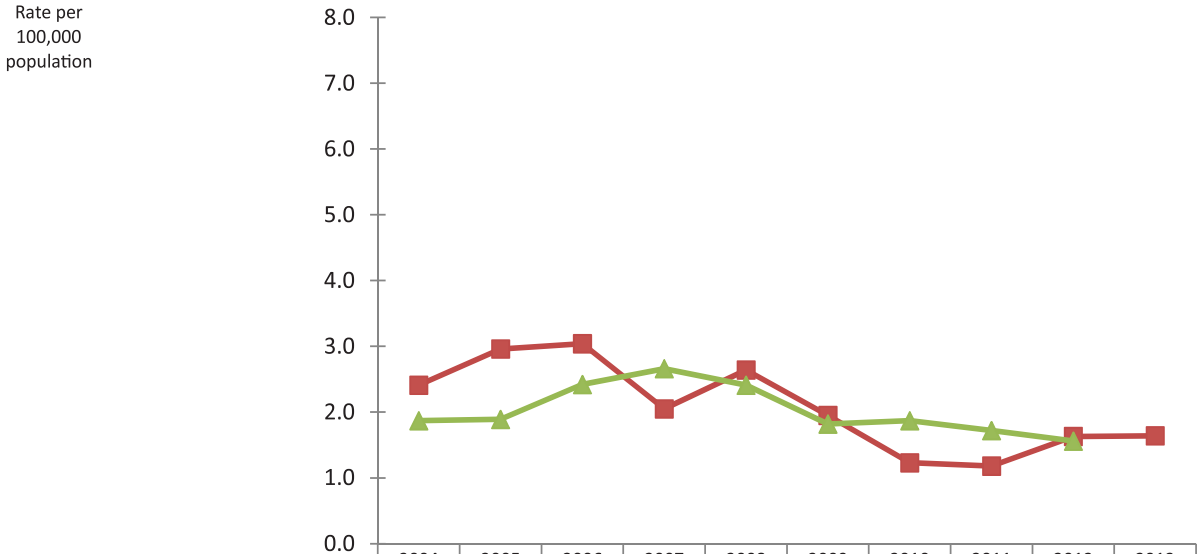


Cryptosporidiosis

In 2013, 75 cases (1.6/100,000) of cryptosporidiosis were reported, very similar to 2012 and a slight increase as compared to 2010-2011. The highest rate was reported from Thompson Cariboo Shuswap, followed by Vancouver and North Shore Coast/Garibaldi.

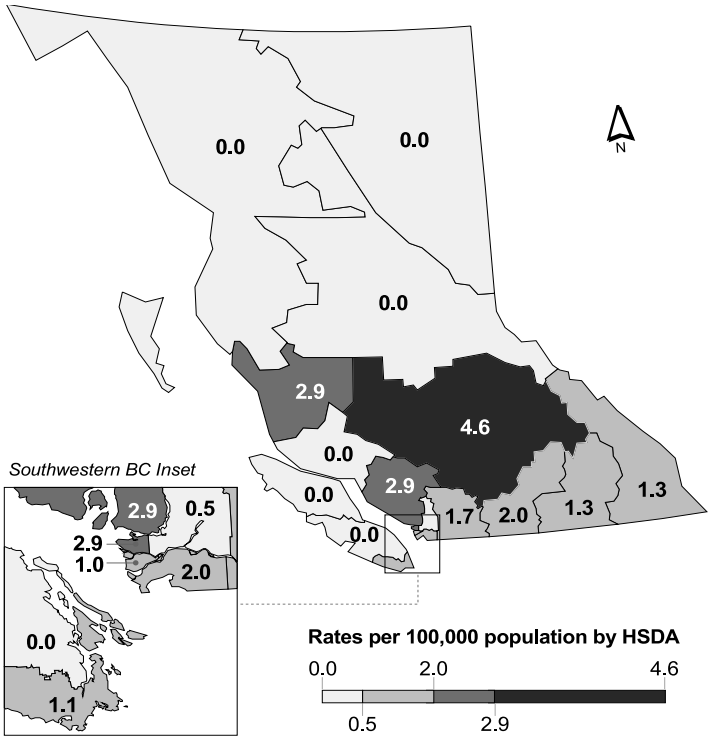
Similar to previous years, the incidence was highest in children aged 1-4 years. No outbreaks were reported, but as expected, a slight peak was evident in the late summer-early fall.

28.1 Cryptosporidiosis Rates by Year, 2004-2013



	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
BC Cryptosporidiosis Reports	100	124	129	88	115	86	55	53	74	75
BC Cryptosporidiosis Rate	2.4	3.0	3.0	2.1	2.6	2.0	1.2	1.2	1.6	1.6
Canadian Cryptosporidiosis Rate*	1.9	1.9	2.4	2.7	2.4	1.8	1.9	1.7	1.6	

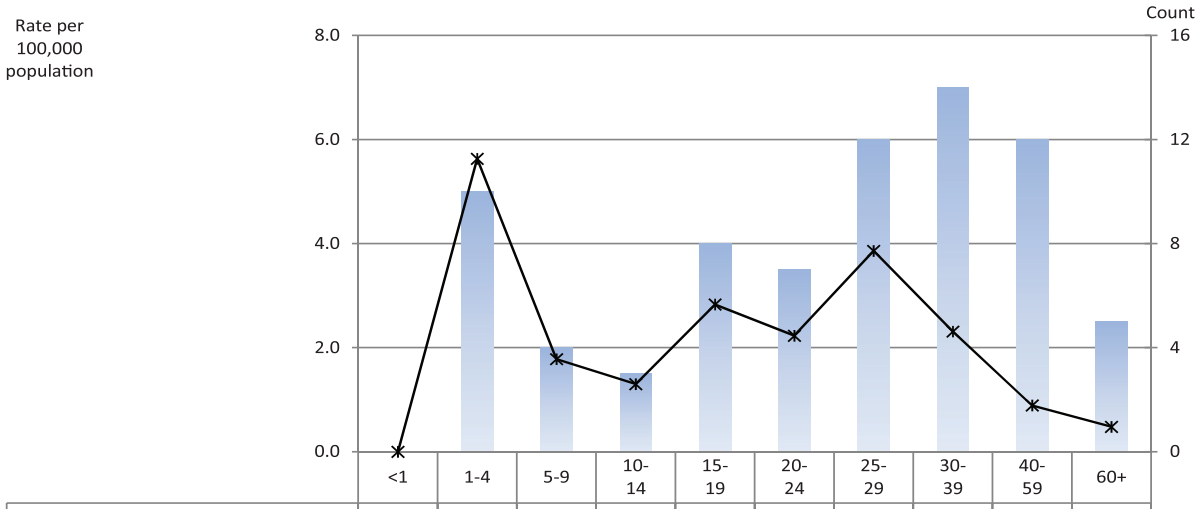
28.2 Cryptosporidiosis Rates by HSDA, 2013



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	1	1.3
12	Kootenay Boundary	1	1.3
13	Okanagan	7	2.0
14	Thompson Cariboo Shuswap	10	4.6
21	Fraser East	5	1.7
22	Fraser North	3	0.5
23	Fraser South	15	2.0
31	Richmond	2	1.0
32	Vancouver	19	2.9
33	North Shore/Coast Garibaldi	8	2.9
41	South Vancouver Island	4	1.1
42	Central Vancouver Island	0	0.0
43	North Vancouver Island	0	0.0
51	Northwest	0	0.0
52	Northern Interior	0	0.0
53	Northeast	0	0.0

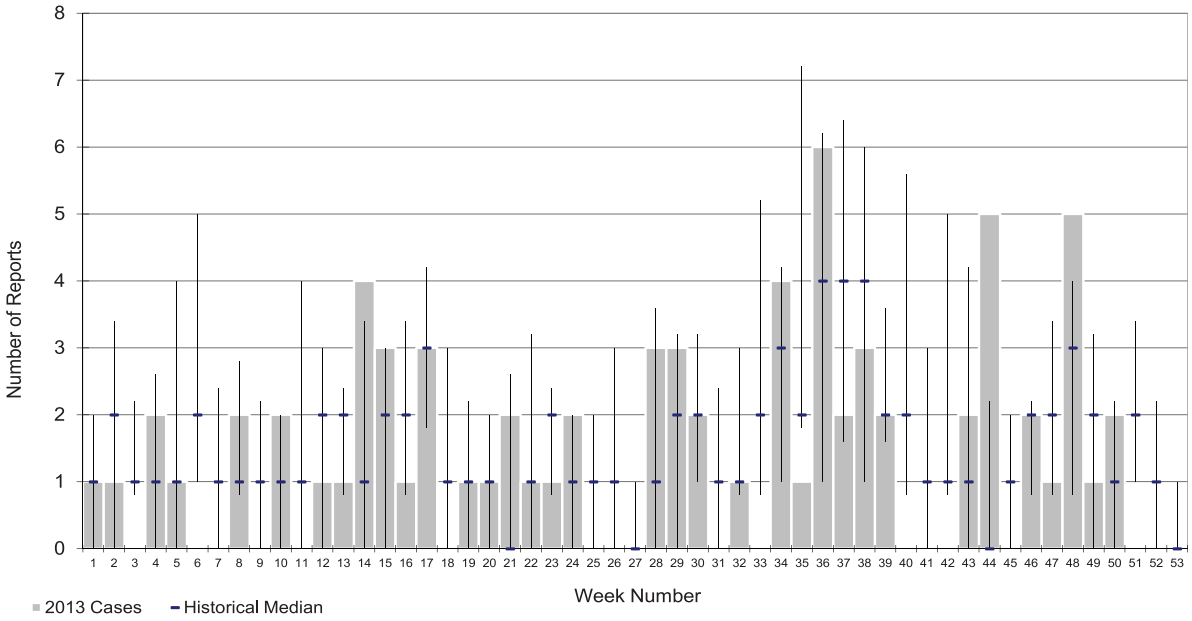
Note: Map classification by Jenks natural breaks method.

28.3 Cryptosporidiosis Rates by Age Group and Sex, 2013



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Cryptosporidiosis Reports - Female	0	4	3	1	5	3	5	8	4	2
Cryptosporidiosis Reports - Male	0	6	1	2	3	4	7	6	8	3
Cryptosporidiosis Reports - Total	0	10	4	3	8	7	12	14	12	5
Cryptosporidiosis Rate - Female	0.0	4.7	2.8	0.9	3.7	2.0	3.2	2.6	0.6	0.4
Cryptosporidiosis Rate - Male	0.0	6.5	0.9	1.7	2.0	2.5	4.5	2.0	1.2	0.6
Cryptosporidiosis Rate - Total	0.0	5.6	1.8	1.3	2.8	2.2	3.9	2.3	0.9	0.5

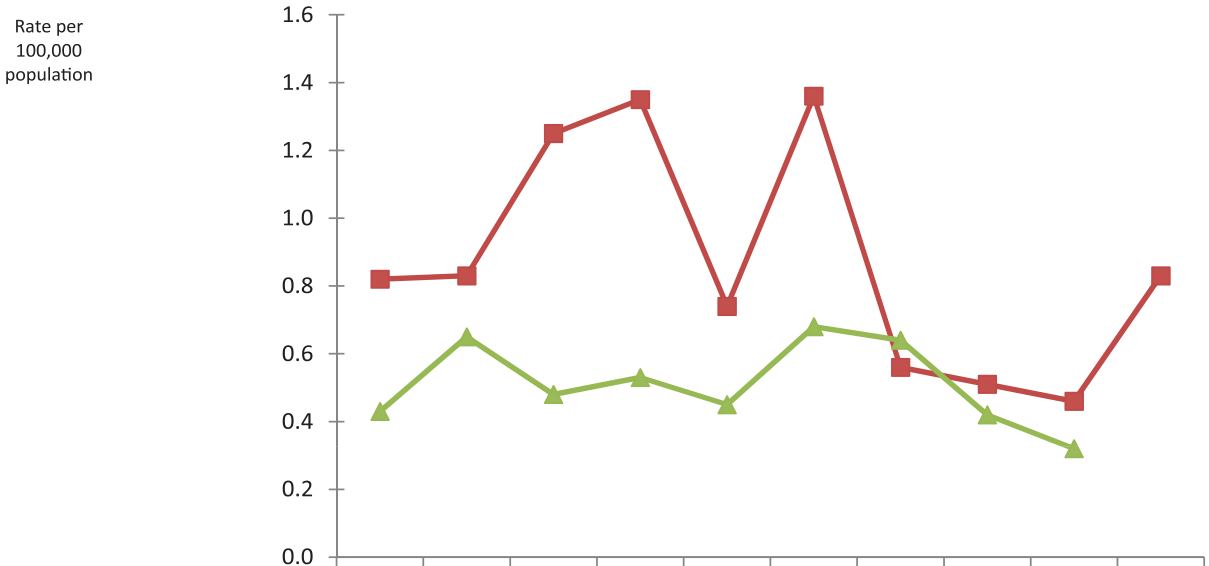
28.4 2013 Cryptosporidiosis Reports Compared to Historical Median and the 10th and 90th Percentiles Around the Median (2004 to 2012)



Cyclosporiasis

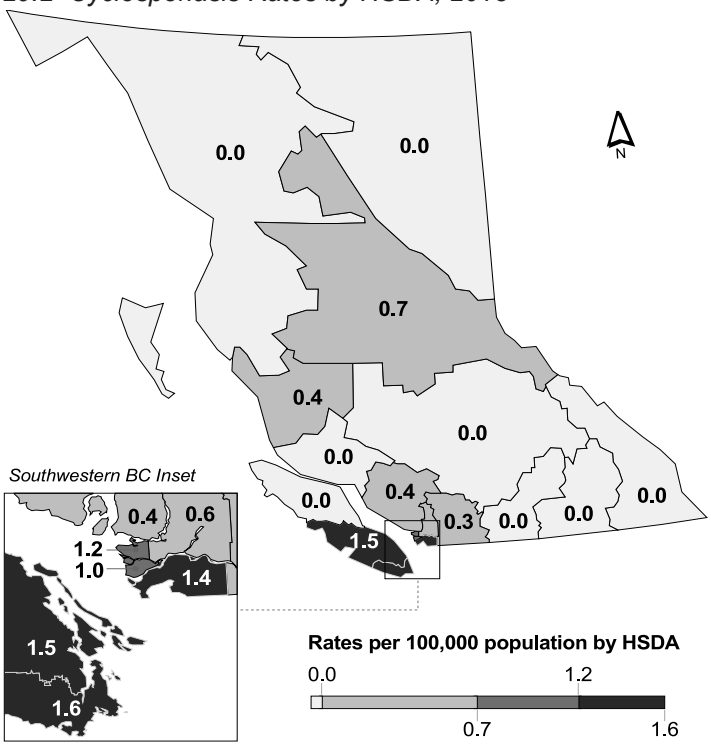
The number of cyclosporiasis cases (38) in 2013 was higher than it has been in recent years. This was largely due to an outbreak among BC residents who had not traveled to an endemic country. The outbreak was thought to be associated with an imported food product but remained unsolved. Previous annual peaks have been due to local outbreaks associated with fresh produce (2006, 2007) or travel to endemic areas (2009). About half (45.5%) of the infections in 2013 were a result of travel to endemic areas. The incidence rate was highest in adults aged 40-59 years. The majority of cases were reported in the spring and summer. The peak in weeks 27-28 was associated with the outbreak mentioned above.

29.1 Cyclosporiasis Rates by Year, 2004-2013



	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
BC Cyclosporiasis Reports	34	35	53	58	32	60	25	23	21	38
BC Cyclosporiasis Rate	0.8	0.8	1.3	1.4	0.7	1.4	0.6	0.5	0.5	0.8
Canadian Cyclosporiasis Rate	0.4	0.7	0.5	0.5	0.5	0.7	0.6	0.4	0.3	

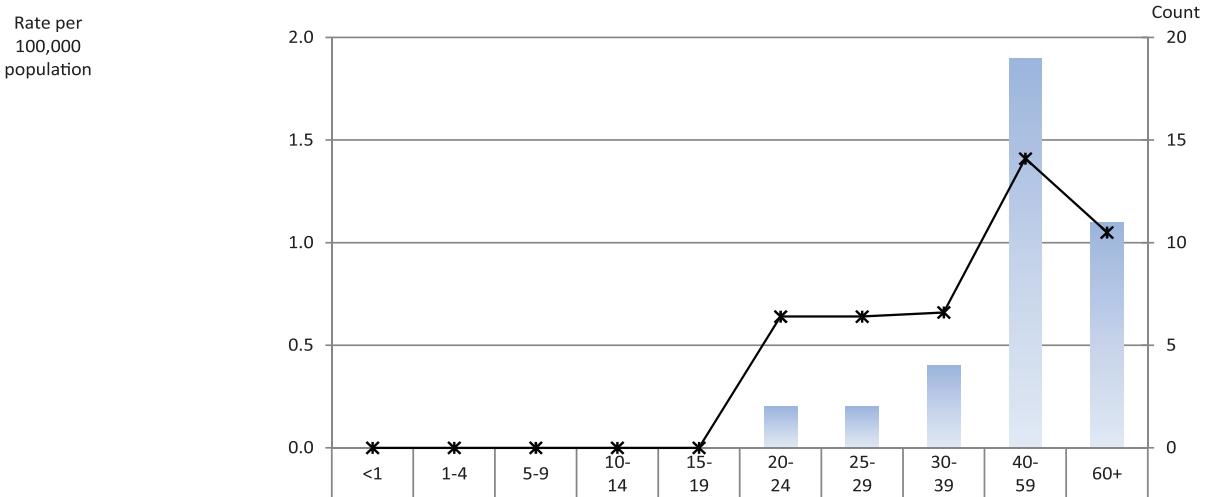
29.2 Cyclosporiasis Rates by HSDA, 2013



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	4	0.6
23	Fraser South	11	1.4
31	Richmond	2	1.0
32	Vancouver	8	1.2
33	North Shore/Coast Garibaldi	1	0.4
41	South Vancouver Island	6	1.6
42	Central Vancouver Island	4	1.5
43	North Vancouver Island	0	0.0
51	Northwest	0	0.0
52	Northern Interior	1	0.7
53	Northeast	0	0.0

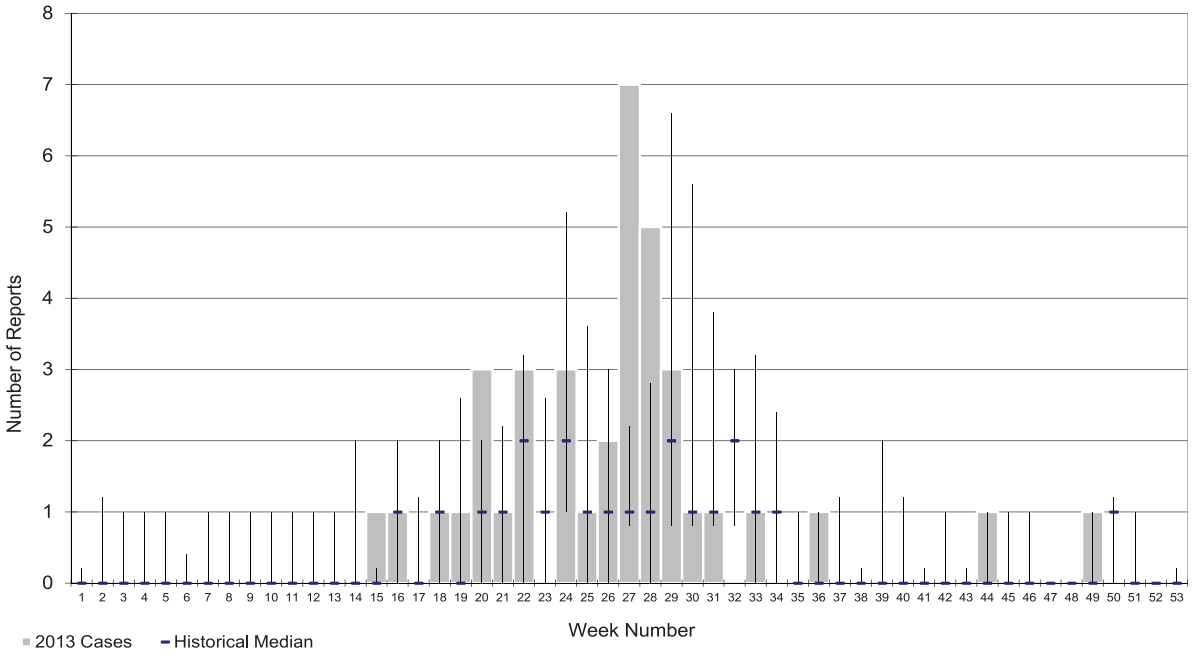
Note: Map classification by Jenks natural breaks method.

29.3 Cyclosporiasis Rates by Age Group and Sex, 2013



	<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	0	2	1	2	10	5
Cyclosporiasis Reports - Male	0	0	0	0	0	0	1	2	9	6
Cyclosporiasis Reports - Total	0	0	0	0	0	2	2	4	19	11
Cyclosporiasis Rate - Female	0.0	0.0	0.0	0.0	0.0	1.3	0.6	0.7	1.5	0.9
Cyclosporiasis Rate - Male	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.7	1.4	1.2
Cyclosporiasis Rate -Total	0.0	0.0	0.0	0.0	0.0	0.6	0.6	0.7	1.4	1.1

29.4 2013 Cyclosporiasis Reports Compared to Historical Median and the 10th and 90th Percentiles Around the Median (2004 to 2012)



Shigatoxigenic *E.coli*

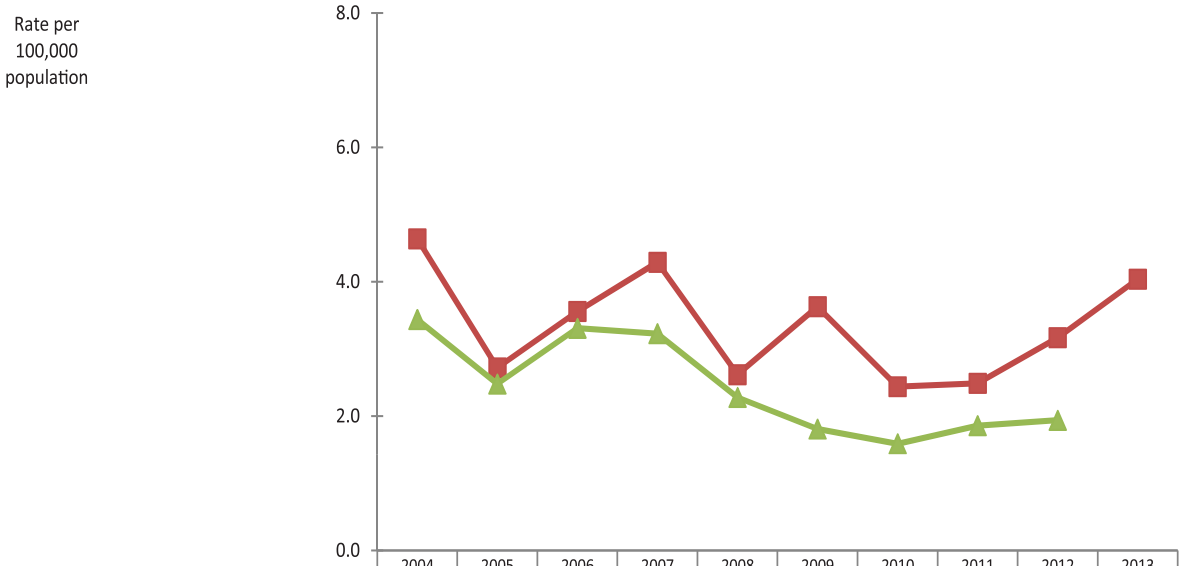
There were 185 cases of shigatoxigenic *E. coli* infection reported in BC in 2013, 12.6% of which were associated with international travel. After decreasing for a few years, the rate has been increasing since 2010. The high rate (4.0/100,000) and the peaks in the spring and fall are due to several outbreaks which occurred in 2013.

An unsolved outbreak of five cases of *E. coli* O157:H7 occurred in the spring in Vancouver Coastal Health. A multi-regional Fraser Health restaurant-associated outbreak of *E. coli* O157:H7 affecting three cases occurred in the spring. A multi-provincial unsolved outbreak of *E. coli* O157:H7 with five BC cases occurred in Interior Health in the fall. Thirteen BC cases of *E. coli* O157:H7 were part of a national outbreak associated with BC unpasteurized gouda cheese which lasted from July to October.

The highest rates were reported from North Vancouver Island (the reasons for this are unknown) and from Thomspon Cariboo Shuswap, which was the epicentre of two outbreaks in 2013. Incidence was highest in children aged 1-4 years and those aged 10-24 years.

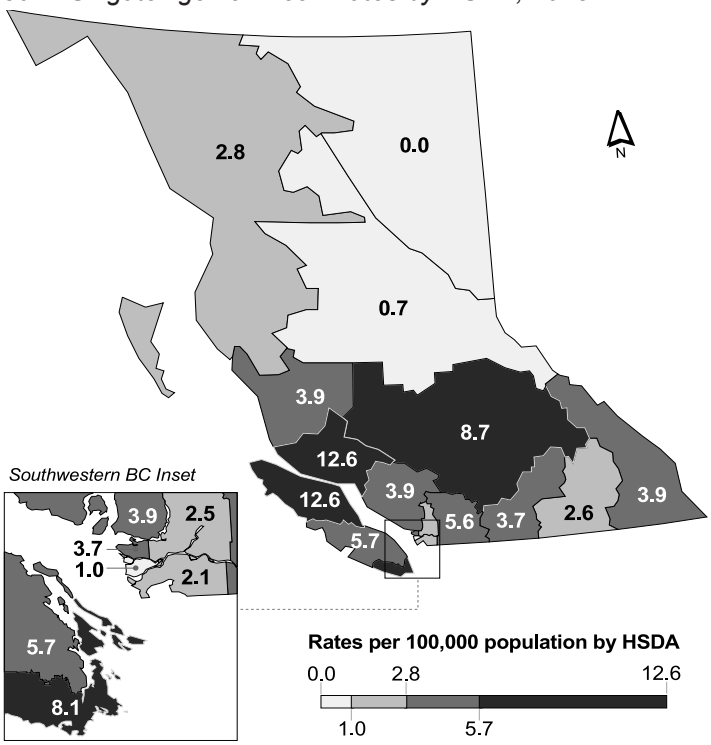
O157 continues to be the most common serogroup diagnosed and reported in BC.

30.1 Shigatoxigenic E. coli by Year, 2004-2013



	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
BC Shigatoxigenic E.coli Infection Reports	193	114	151	184	114	160	109	112	144	185
BC Shigatoxigenic E.coli Infection Rate	4.6	2.7	3.6	4.3	2.6	3.6	2.4	2.5	3.2	4.0
Canadian Shigatoxigenic E.coli Infection Rate	3.4	2.5	3.3	3.2	2.3	1.8	1.6	1.9	1.9	

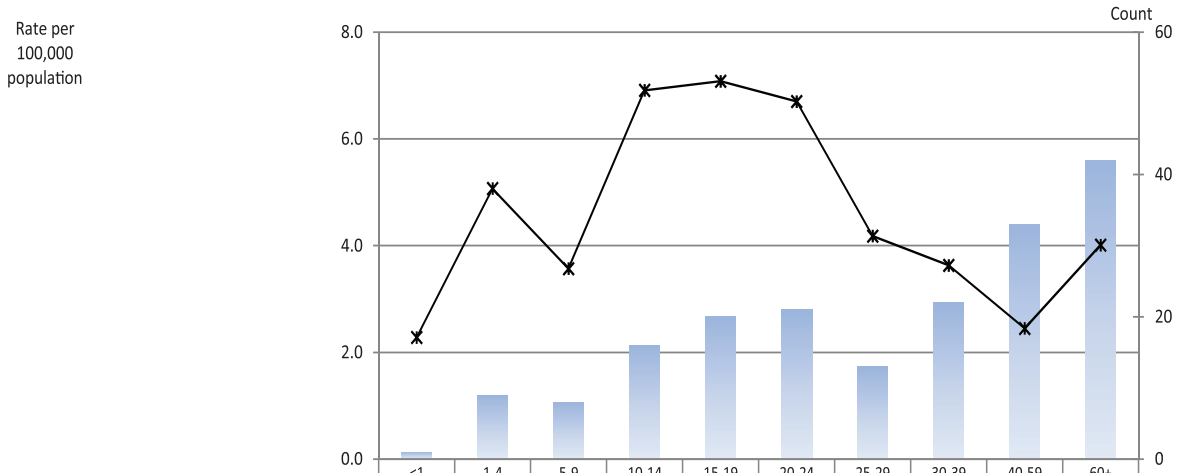
30.2 Shigatoxigenic E. coli Rates by HSDA, 2013



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	3	3.9
12	Kootenay Boundary	2	2.6
13	Okanagan	13	3.7
14	Thompson Cariboo Shuswap	19	8.7
21	Fraser East	16	5.6
22	Fraser North	16	2.5
23	Fraser South	16	2.1
31	Richmond	2	1.0
32	Vancouver	24	3.7
33	North Shore/Coast Garibaldi	11	3.9
41	South Vancouver Island	30	8.1
42	Central Vancouver Island	15	5.7
43	North Vancouver Island	15	12.6
51	Northwest	2	2.8
52	Northern Interior	1	0.7
53	Northeast	0	0.0

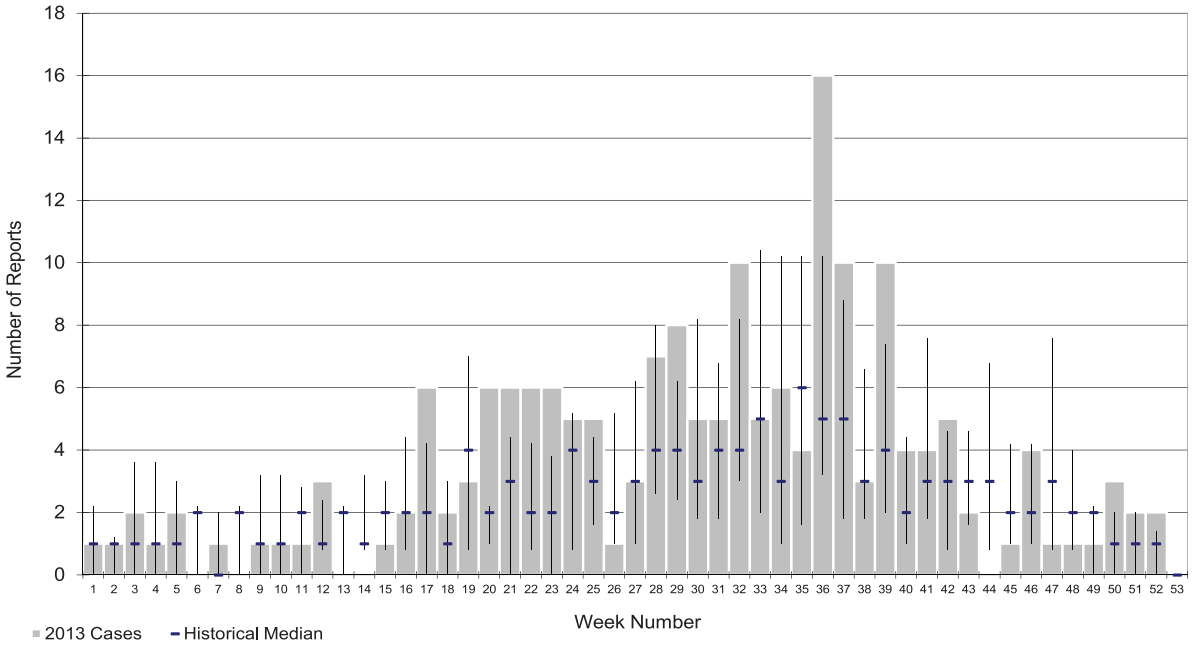
Note: Map classification by Jenks natural breaks method.

30.3 Shigatoxigenic E. coli Rates by Age Group and Sex, 2013



	<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	5	9	13	8	9	16	21	26
Shigatoxigenic E.coli Infection Reports - Male	1	3	3	7	7	13	4	6	12	16
Shigatoxigenic E.coli Infection Reports	1	9	8	16	20	21	13	22	33	42
Shigatoxigenic E.coli Infection Rate - Female	0.0	7.0	4.6	8.0	9.7	5.3	5.8	5.2	3.1	4.7
Shigatoxigenic E.coli Infection Rate - Male	4.4	3.3	2.6	5.9	4.7	8.1	2.6	2.0	1.8	3.2
Shigatoxigenic E.coli Infection Rate - Total	2.3	5.1	3.6	6.9	7.1	6.7	4.2	3.6	2.5	4.0

30.4 2013 Shigatoxigenic E. coli Reports Compared to Historical Median and the 10th and 90th Percentiles Around the Median (2004 to 2012)



30.5 2013 Shigatoxigenic E. coli serogroup distribution, 2013

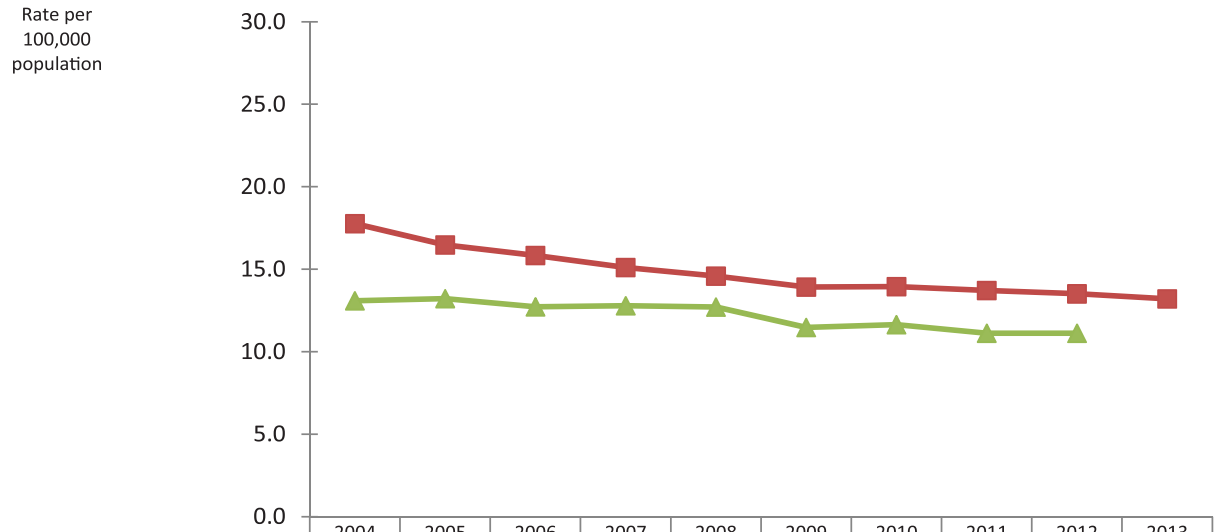
Rank	Serogroup	Number of Isolates	Proportion
1	O157	103	76.9%
2	O26	9	6.7%
3	O121	7	5.2%
4	O103	3	2.2%
5	O111	2	1.5%
	Unknown/unidentified	10	7.5%
	Total	134	100.0%

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

Giardiasis

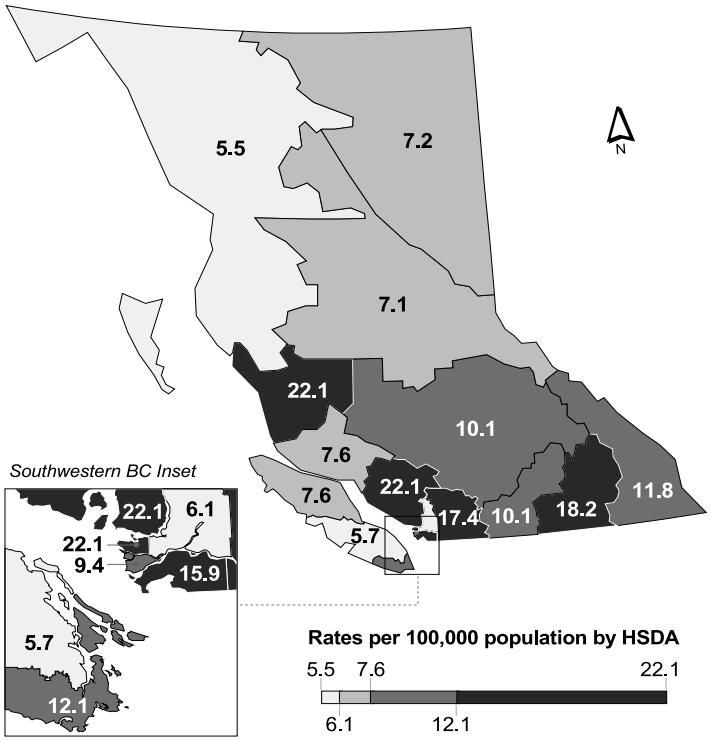
Annual rates of giardiasis in BC were slightly lower in 2013 as compared to previous years with 605 cases reported (13.2/ 100,000). Rates were higher in males than females in all age groups except 0-1 and 15-19 years, with the highest rates reported in children 1-4 years old and adult males 20-39 years old. 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 North Shore/Coast Garibaldi, Vancouver, Fraser East and Fraser South.

31.1 Giardiasis Rates by Year, 2004-2013



	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
BC Giardiasis Reports	738	691	672	648	634	614	623	617	614	605
BC Giardiasis Rate	17.8	16.5	15.8	15.1	14.6	13.9	14.0	13.7	13.5	13.2
Canadian Giardiasis Rate	13.1	13.2	12.7	12.8	12.7	11.5	11.6	11.1	11.1	

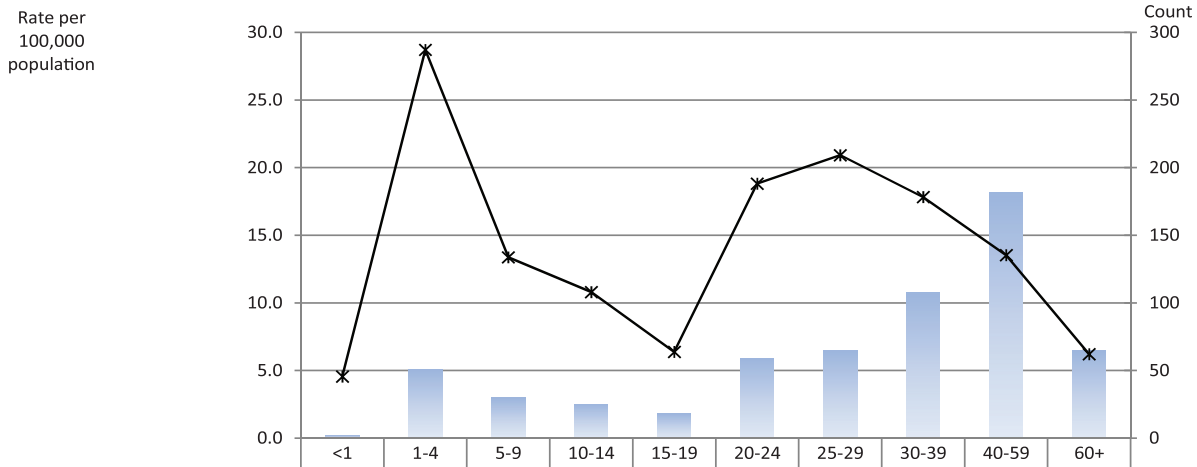
31.2 Giardiasis Rates by HSDA, 2013



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	9	11.8
12	Kootenay Boundary	14	18.2
13	Okanagan	35	10.1
14	Thompson Cariboo Shuswap	22	10.1
21	Fraser East	50	17.4
22	Fraser North	39	6.1
23	Fraser South	122	15.9
31	Richmond	19	9.4
32	Vancouver	145	22.1
33	North Shore/Coast Garibaldi	62	22.1
41	South Vancouver Island	45	12.1
42	Central Vancouver Island	15	5.7
43	North Vancouver Island	9	7.6
51	Northwest	4	5.5
52	Northern Interior	10	7.1
53	Northeast	5	7.2

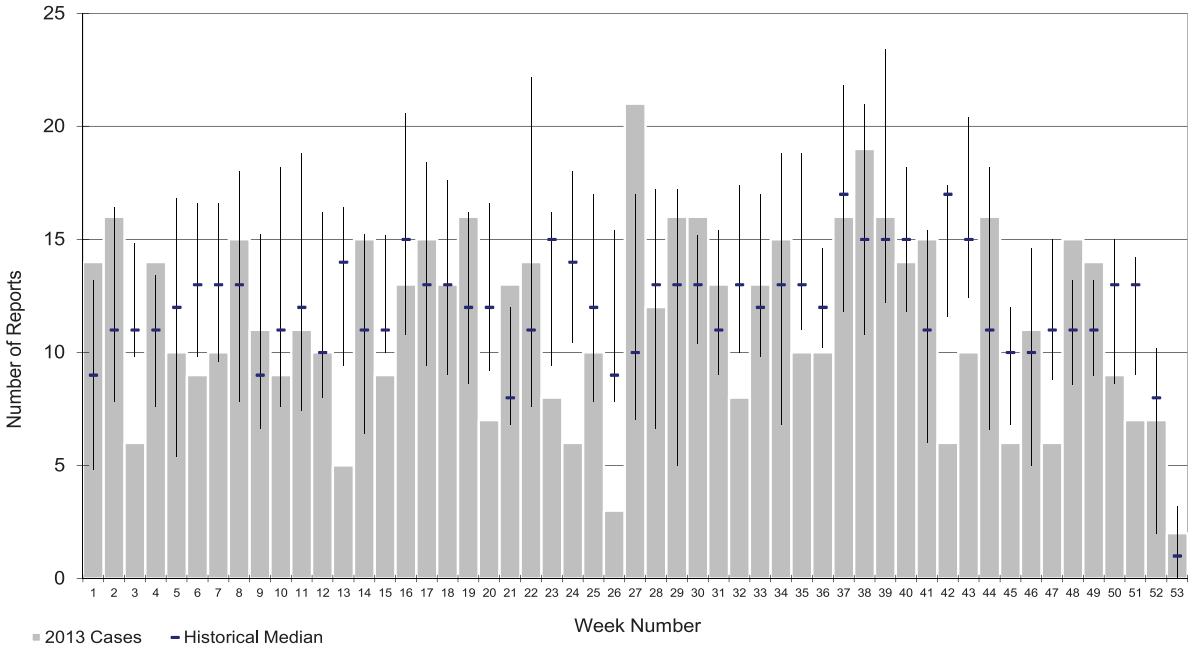
Note: Map classification by Jenks natural breaks method.

31.3 Giardiasis Rates by Age Group and Sex, 2013



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Giardiasis Reports - Female	1	20	14	10	12	20	28	41	69	22
Giardiasis Reports - Male	1	31	16	15	6	39	37	67	113	43
Giardiasis Reports - Total	2	51	30	25	18	59	65	108	182	65
Giardiasis Rate - Female	4.7	23.3	12.9	8.9	8.9	13.2	17.9	13.4	10.1	4.0
Giardiasis Rate - Male	4.4	33.7	13.8	12.6	4.1	24.1	24.0	22.3	17.0	8.6
Giardiasis Rate - Total	4.6	28.7	13.4	10.8	6.4	18.8	20.9	17.8	13.5	6.2

31.4 2013 Giardiasis Reports Compared to Historical Median and the 10th and 90th Percentiles Around the Median (2004 to 2012)



Hepatitis A

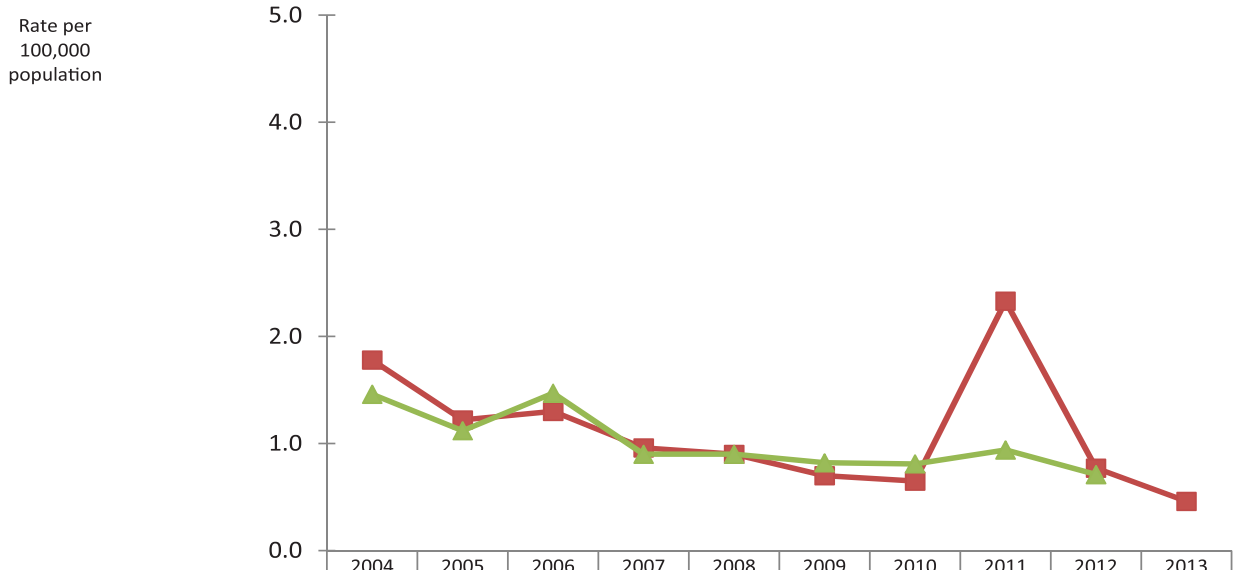
In 2013, there was a total of 21 cases of hepatitis A reported in British Columbia (BC), the lowest number of annual cases ever reported in BC, yielding a rate of 0.5 per 100,000 population. The highest number of hepatitis A cases (over 1,000) occurred in 1992. Since that time hepatitis A vaccine has been offered to high risk groups identified through surveillance. For details of persons eligible for hepatitis A vaccine, see Immunization Manual (http://www.bccdc.ca/dis-cond/comm-manual/CDManualChap2.htm) . However it should be remembered that many children and some adults have no or mild symptoms; thus the reported hepatitis A cases are an underestimate of those infected.

In 2011, an increase of hepatitis A cases reported was largely due to an outbreak in Central Vancouver Island of about 80 cases.[1] Six cases of hepatitis A in 2012 were associated with the consumption of a contaminated frozen fruit blend.[2] In 2013 reported cases were roughly equal in both sexes (11 females, 10 males) and almost two-thirds (13) of the cases were aged between 30 and 59 years. The highest rate was in the Northwest but as this was only 2 cases the rate is unstable due to small numbers. Fraser Health reported 8 cases, and Vancouver Coastal Health reported 7 cases. Hepatitis A cases were identified throughout the year. The majority of cases of hepatitis A in BC were associated with travel to, or visitors from endemic regions. This is despite the recommendation that travelers to hepatitis A endemic regions should receive hepatitis A vaccine before travel.

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

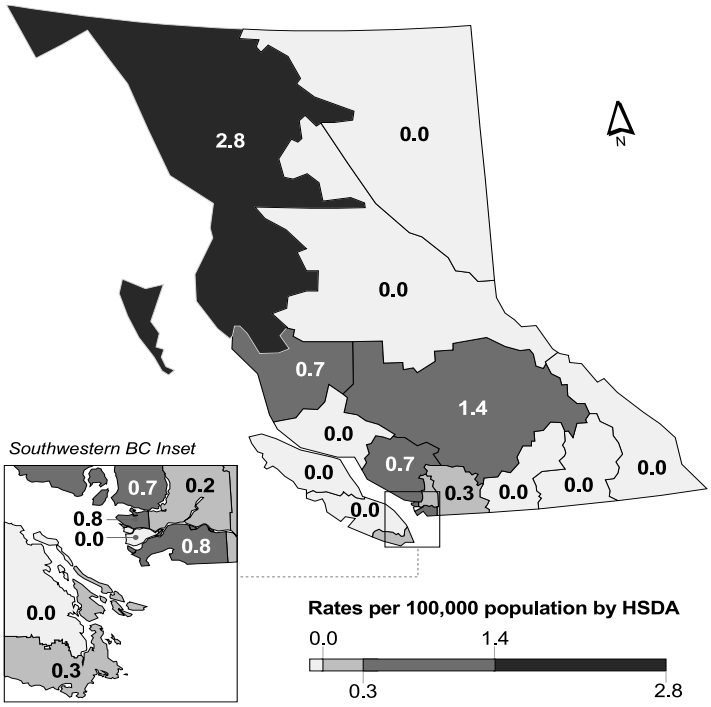
2. Swinkels H, Kuo M, Embree G, Stone J, Trerise S, Brisdon S, Louie K, Asplin R, Stiller A, Abraham T, Gill I, Rice G, Andonov A, Henry B, Buxton JA. Established surveillance, loyalty cards and collaboration allow early identification of a hepatitis A outbreak in British Columbia, Canada 2012. Eurosurveillance (2014) 19(18) http://www.eurosurveillance.org/ViewArticle.aspx?ArticleId=20792

32.1 Hepatitis A Rates by Year, 2004-2013



	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
BC Hepatitis A Reports	74	51	55	41	39	31	29	105	35	21
BC Hepatitis A Rate	1.8	1.2	1.3	1.0	0.9	0.7	0.7	2.3	0.8	0.5
Canadian Hepatitis A Rate	1.5	1.1	1.5	0.9	0.9	0.8	0.8	0.9	0.7	

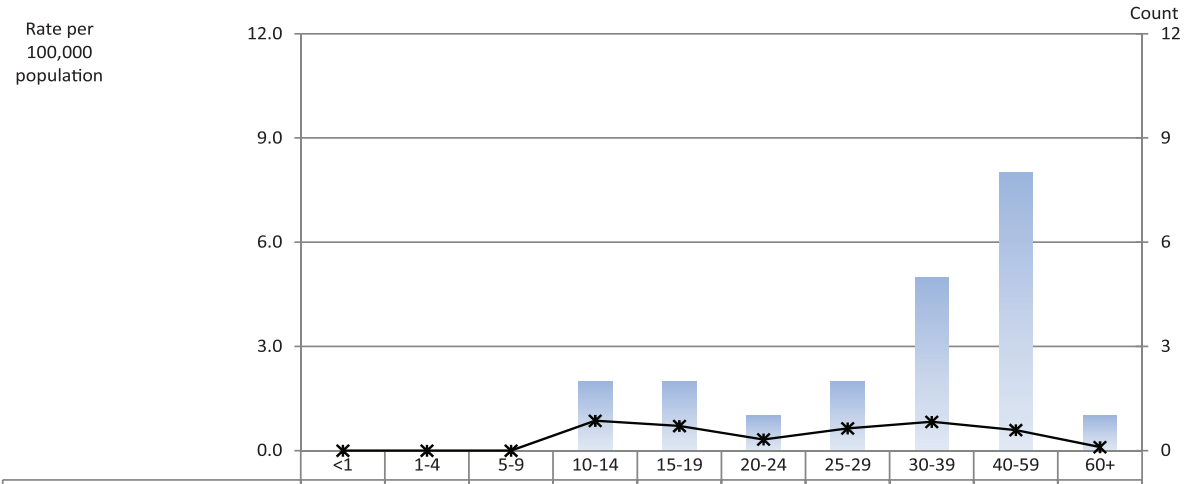
32.2 Hepatitis A Rates by HSDA, 2013



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	3	1.4
21	Fraser East	1	0.3
22	Fraser North	1	0.2
23	Fraser South	6	0.8
31	Richmond	0	0.0
32	Vancouver	5	0.8
33	North Shore/Coast Garibaldi	2	0.7
41	South Vancouver Island	1	0.3
42	Central Vancouver Island	0	0.0
43	North Vancouver Island	0	0.0
51	Northwest	2	2.8
52	Northern Interior	0	0.0
53	Northeast	0	0.0

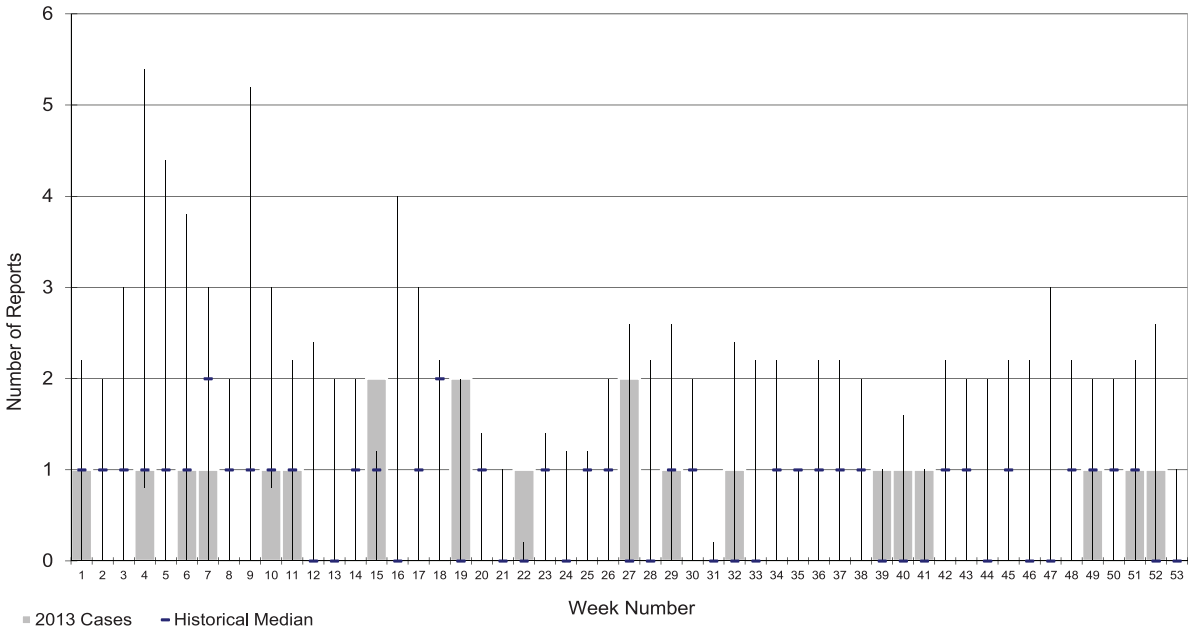
Note: Map classification by Jenks natural breaks method.

32.3 Hepatitis A Rates by Age Group and Sex, 2013



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Hepatitis A Reports - Female	0	0	0	1	1	0	1	3	5	0
Hepatitis A Reports - Male	0	0	0	1	1	1	1	2	3	1
Hepatitis A Reports - Total	0	0	0	2	2	1	2	5	8	1
Hepatitis A Rate - Female	0.0	0.0	0.0	0.9	0.7	0.0	0.6	1.0	0.7	0.0
Hepatitis A Rate - Male	0.0	0.0	0.0	0.8	0.7	0.6	0.7	0.7	0.5	0.2
Hepatitis A Rate - Total	0.0	0.0	0.0	0.9	0.7	0.3	0.6	0.8	0.6	0.1

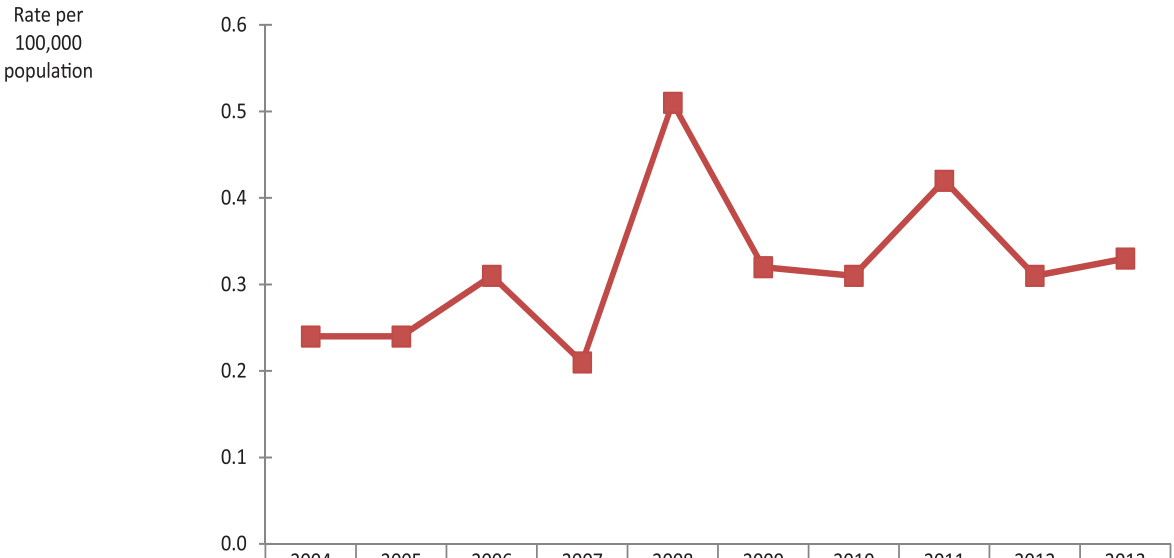
32.4 2013 Hepatitis A Reports Compared to Historical Median and the 10th and 90th Percentiles Around the Median (2004 to 2012)



Listeriosis

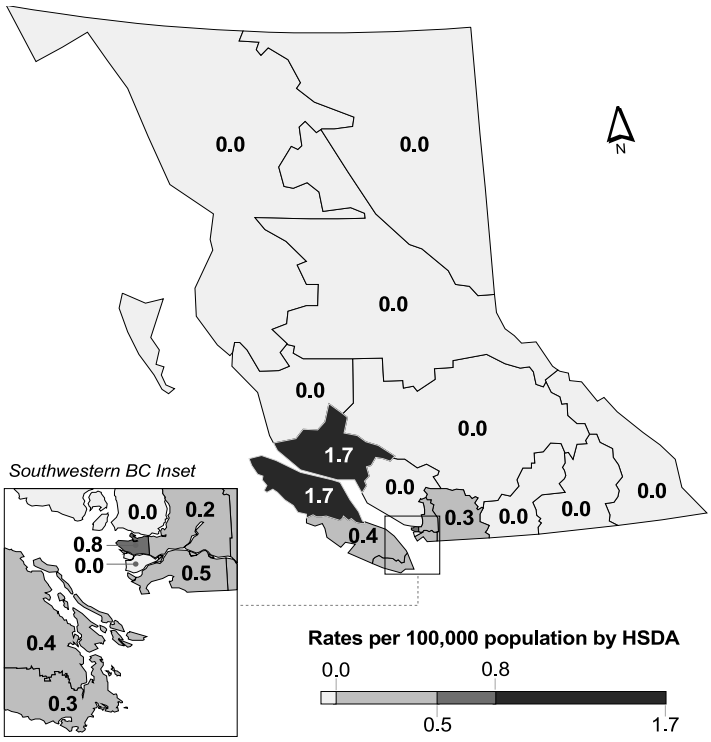
Fifteen cases of invasive listeriosis were reported in 2013; 12.5% of the infections were associated with international travel. The incidence (0.3 per 100,000) has remained stable since 2009. Rates were highest among adults aged sixty years and older. Cases occurred throughout the year. No outbreaks were reported. Rates were highest in North Vancouver Island and Vancouver, but these represented a small number of cases (2 and 5, respectively).

33.1 Listeriosis Rates by Year, 2004-2013



	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
BC Listeriosis Reports	10	10	13	9	22	14	14	19	14	15
BC Listeriosis Rate	0.2	0.2	0.3	0.2	0.5	0.3	0.3	0.4	0.3	0.3

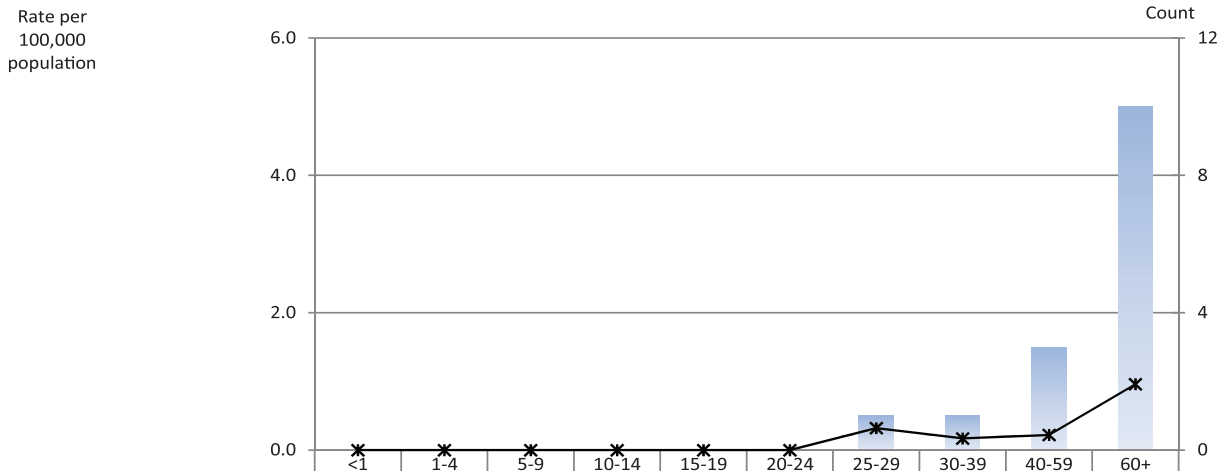
33.2 Listeriosis Rates by HSDA, 2013



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	1	0.2
23	Fraser South	4	0.5
31	Richmond	0	0.0
32	Vancouver	5	0.8
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	1.7
51	Northwest	0	0.0
52	Northern Interior	0	0.0
53	Northeast	0	0.0

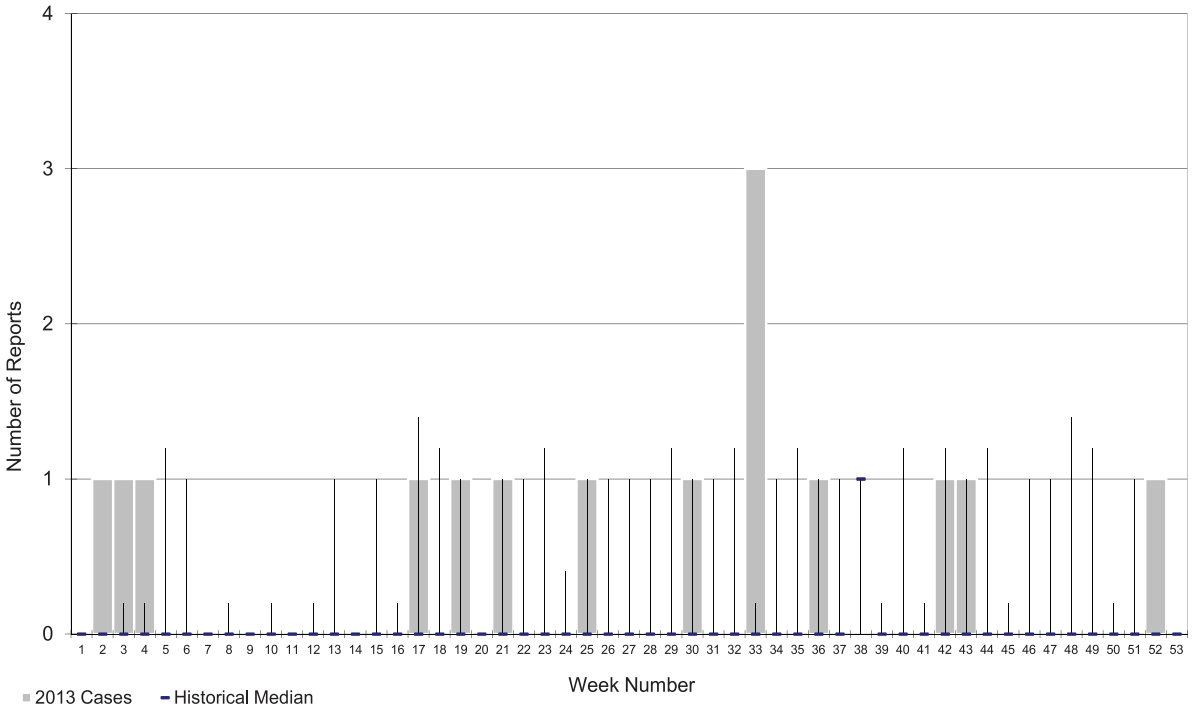
Note: Map classification by Jenks natural breaks method.

33.3 Listeriosis Rates by Age Group and Sex, 2013



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Listeriosis Reports - Female	0	0	0	0	0	0	1	0	1	2
Listeriosis Reports - Male	0	0	0	0	0	0	0	1	2	8
Listeriosis Reports - Total	0	0	0	0	0	0	1	1	3	10
Listeriosis Rate - Female	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.2	0.4
Listeriosis Rate - Male	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	1.6
Listeriosis Rate - Total	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.2	0.2	1.0

33.4 2013 Listeriosis Reports Compared to Historical Median and the 10th and 90th Percentiles Around the Median (2004 to 2012)



Salmonellosis, Typhoid Fever and Paratyphoid Fever*

In 2013, 845 cases of salmonellosis were reported for a rate of 18.4 per 100,000. *Salmonella* infection continues to be the second most commonly reported enteric disease in BC. Overall, 33.6% of *Salmonella* infections were associated with international travel. The salmonellosis rate decreased for the first time in 2012 after a sustained increase since 2007. The rate in 2013 continued to decrease and was comparable with 2007. This decrease was due to the end of a *Salmonella* Enteritidis outbreak that started in 2008.

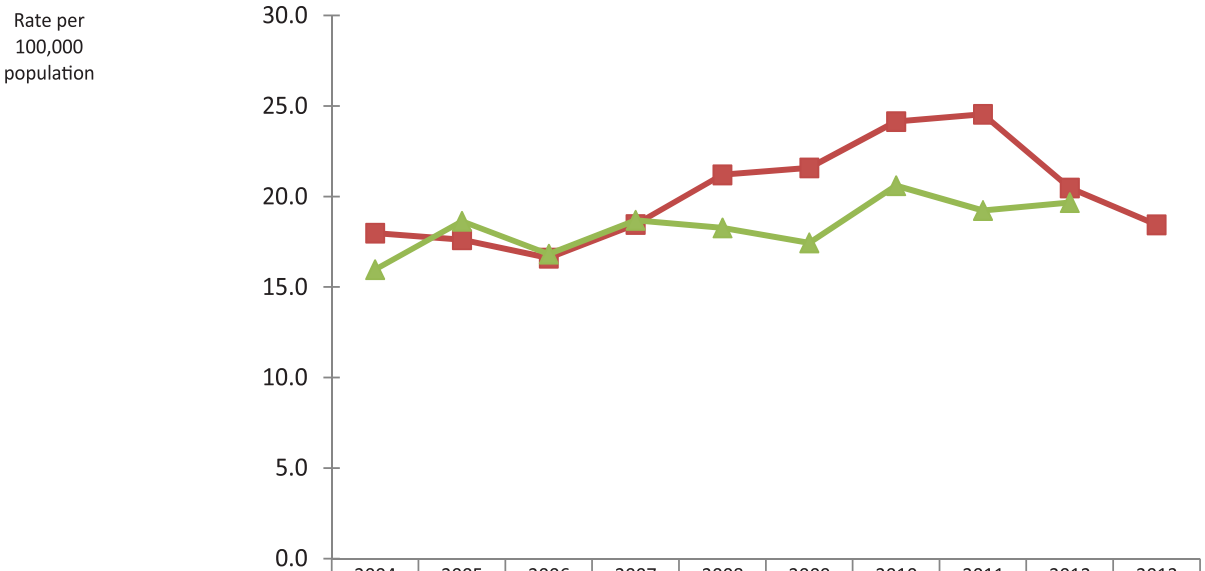
Rates were highest in children 1-5 years of age and among residents of South Vancouver Island, North Shore Coast/ Garibaldi and Vancouver. Cases were reported throughout the year with a slight peak in the summer.

Typhoid and paratyphoid fever rates decreased slightly in 2013. Twenty cases (0.4/100,000) of typhoid fever were reported and 78.9% were associated with international travel. Fifteen cases (0.3/100,000) of paratyphoid fever were reported and 56.3% were associated with international travel. The highest incidence of typhoid fever was in adults aged 30-39 years and for paratyphoid fever was in children aged 10-14 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.* Typhimurium and *S.* Heidelberg were the most commonly reported serotypes in 2013. The proportion of *S*. Enteritidis and *S.* Typhimurium was similar to 2012. There were two outbreaks of *S*. Enteritidis in Fraser Health Authority in September and November 2013 with 3 and 9 laboratories confirmed cases, respectively. Both outbreaks were associated with the consumption of poor quality, ungraded eggs. *S.* Heidelberg decreased from 9.5% in 2012 to 5.5% in 2013. The proportion of *S.* Newport increased from 2.4% in 2012 to 4.3% in 2013 due to an outbreak with 15 laboratory confirmed cases associated with a restaurant in Island Health in July. *S.* Paratyphi B var. Java was reported in the top 10 serotypes in 2013 likely due to an outbreak that occurred in June in Vancouver Coastal and Fraser Health Authority with 5 laboratory confirmed cases; the source of infection was not identified.

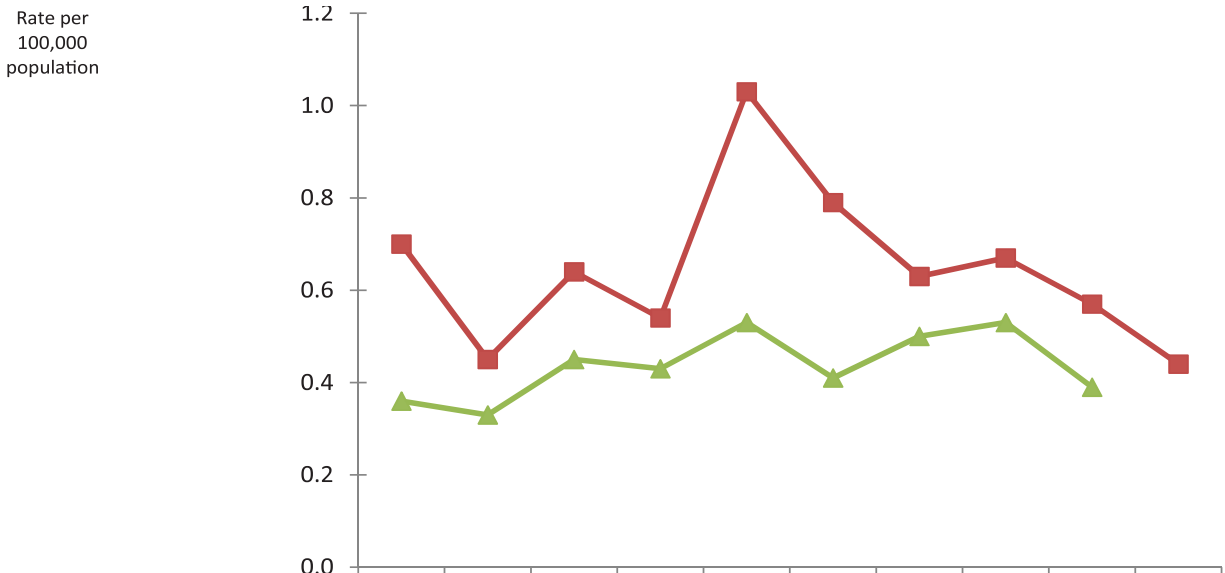
*All cases of *Salmonella* infection reported through iPHIS, including S. Typhi and S. Paratyphi, have been included in the overall numbers and rates by year, the rates by age and sex, the geographical distribution of cases and the cases reported by week. *S.* Typhi (Typhoid fever) and *S.* Paratyphi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

34.1 Salmonellosis Rates by Year, 2004-2013



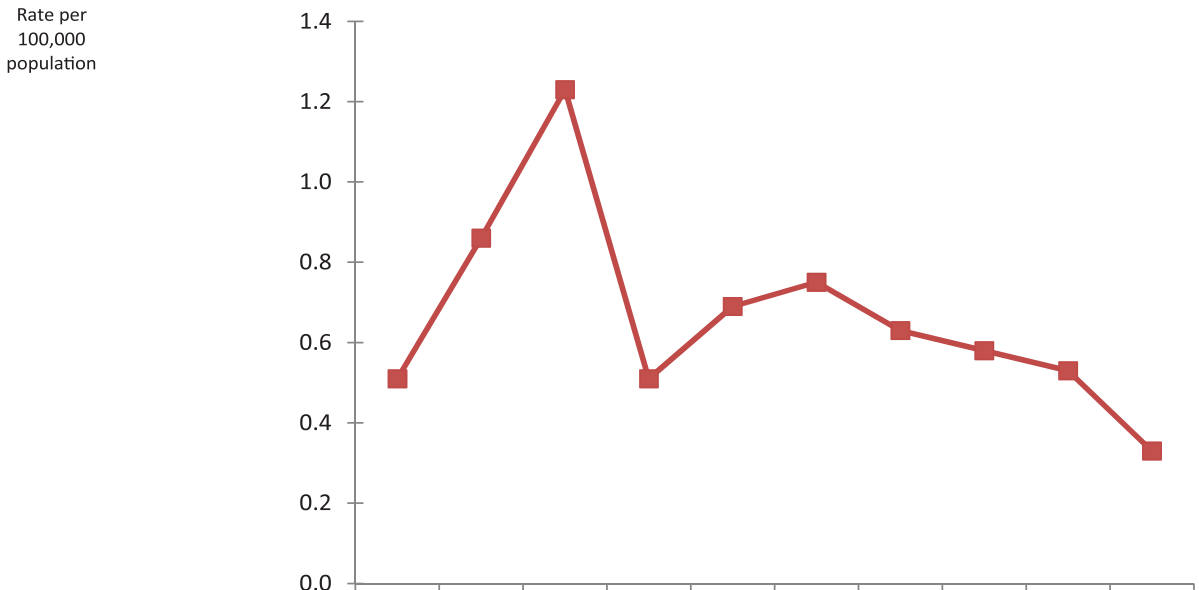
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
BC Salmonellosis Reports	747	739	704	792	922	952	1078	1104	930	845
BC Salmonellosis Rate	18.0	17.6	16.6	18.5	21.2	21.6	24.1	24.5	20.5	18.4
Canadian Salmonellosis Rate	16.0	18.6	16.8	18.7	18.3	17.4	20.6	19.2	19.7	

34.2 Typhoid Fever Rates by Year, 2004-2013



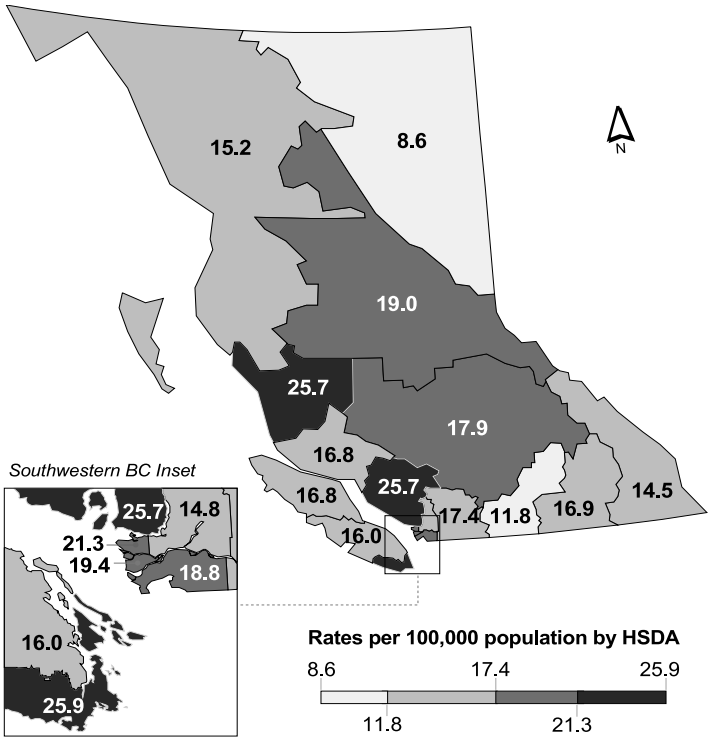
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
BC Typhoid Fever Reports	29	19	27	23	45	35	28	30	26	20
BC Typhoid Fever Rate	0.7	0.5	0.6	0.5	1.0	0.8	0.6	0.7	0.6	0.4
Canadian Typhoid Fever Rate	0.4	0.3	0.5	0.4	0.5	0.4	0.5	0.5	0.4	

34.3 Paratyphoid Fever Rates by Year, 2004-2013



	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
BC Paratyphoid Fever Reports	21	36	52	22	30	33	28	26	24	15
BC Paratyphoid Fever Rate	0.5	0.9	1.2	0.5	0.7	0.8	0.6	0.6	0.5	0.3

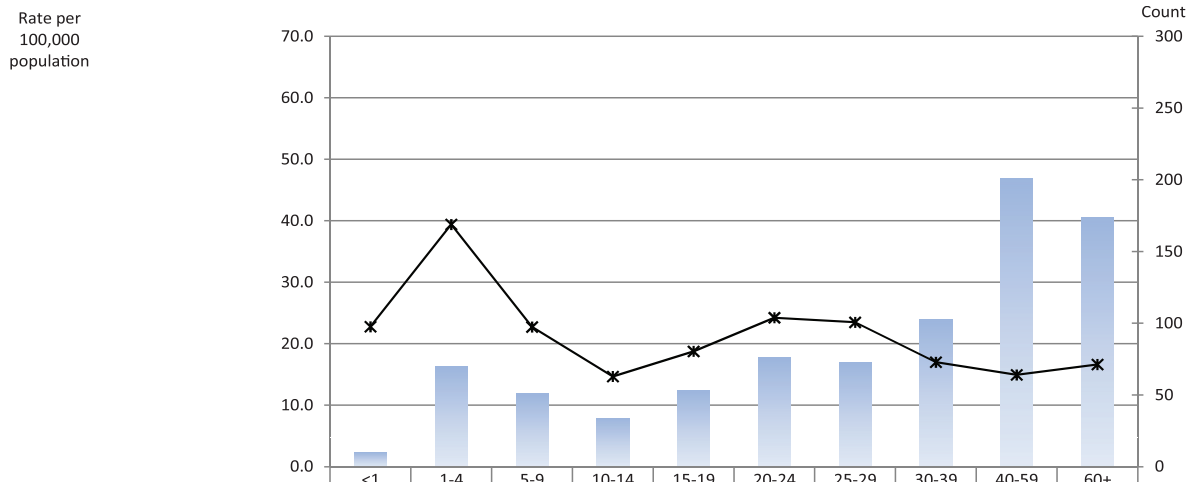
34.4 Salmonellosis Rates by HSDA, 2013



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	11	14.5
12	Kootenay Boundary	13	16.9
13	Okanagan	41	11.8
14	Thompson Cariboo Shuswap	39	17.9
21	Fraser East	50	17.4
22	Fraser North	94	14.8
23	Fraser South	144	18.8
31	Richmond	39	19.4
32	Vancouver	140	21.3
33	North Shore/Coast Garibaldi	72	25.7
41	South Vancouver Island	96	25.9
42	Central Vancouver Island	42	16.0
43	North Vancouver Island	20	16.8
51	Northwest	11	15.2
52	Northern Interior	27	19.0
53	Northeast	6	8.6

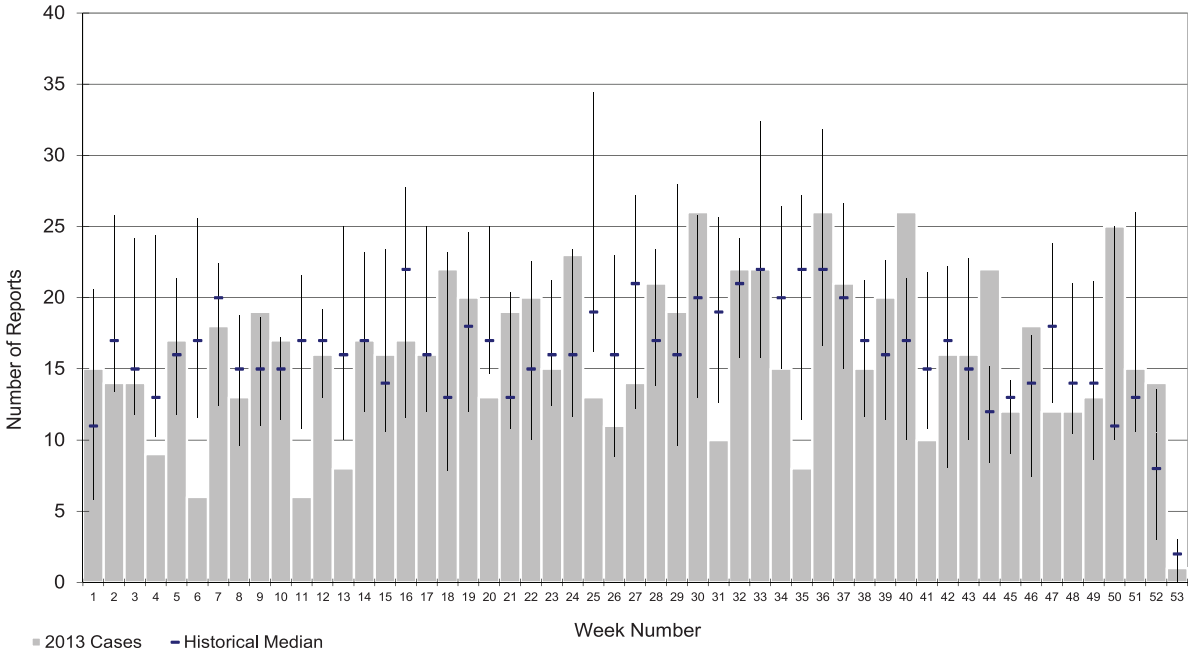
Note: Map classification by Jenks natural breaks method.

34.5 Salmonellosis Rates by Age Group and Sex, 2013



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Salmonellosis Reports - Female	4	26	25	16	29	44	33	46	106	97
Salmonellosis Reports - Male	6	44	26	18	24	32	40	57	95	77
Salmonellosis Reports - Total	10	70	51	34	53	76	73	103	201	174
Salmonellosis Rate - Female	18.8	30.3	23.0	14.3	21.5	28.9	21.1	15.1	15.6	17.7
Salmonellosis Rate - Male	26.6	47.9	22.4	15.1	16.3	19.8	25.9	19.0	14.3	15.5
Salmonellosis Rate - Total	22.8	39.4	22.7	14.7	18.8	24.2	23.5	17.0	14.9	16.6

34.6 2013 Salmonellosis Reports Compared to Historical Median and the 10th and 90th Percentiles Around the Median (2004 to 2012)



34.7 Salmonella serotype distribution, 2013

Rank	Serotype	Number of Cases	Proportion
1	Enteritidis	324	36.7%
2	Typhimurium	67	7.6%
3	Heidelberg	49	5.5%
4	Newport	38	4.3%
5	I 4,5,12:i:-	29	3.3%
6	Paratyphi B var. Java	25	2.8%
7	Typhi	24	2.7%
8	Agona	21	2.4%
9	Infantis	19	2.2%
10	Stanley	16	1.8%
10	Paratyphi A	16	1.8%
	Others	255	28.9%
	Total	883	100.0%

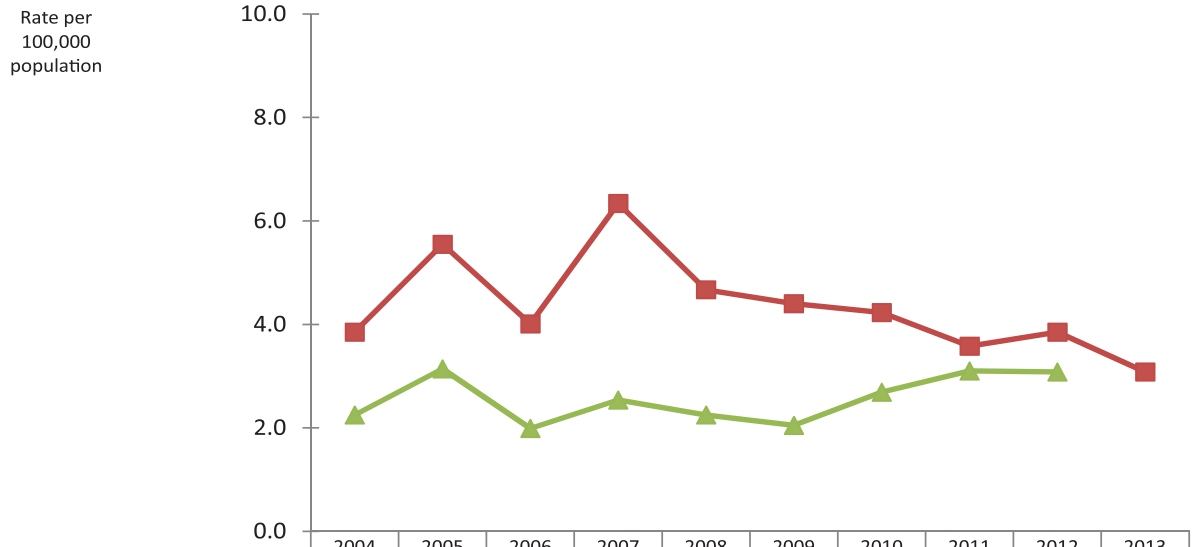
Note: Serotype distribution is based on BC PHMRL data. Numbers may vary from those reported in iPHIS.

Shigellosis

In 2013, 141 cases of shigellosis were reported; 61.9% were associated with international travel. The incidence rate (3.1/100,000) has been decreasing since 2007. Incidence rates were highest among children aged 1-4 years, females aged 20-29 and males aged 30-39 years. Shigellosis can be transmitted via food and from person-to-person, including via sexual contact. The higher rates in adults may in part be due to sexual transmission. Cases were reported throughout the year. Rates continue to be highest in Vancouver (8.1/100,000). No new outbreaks were reported.

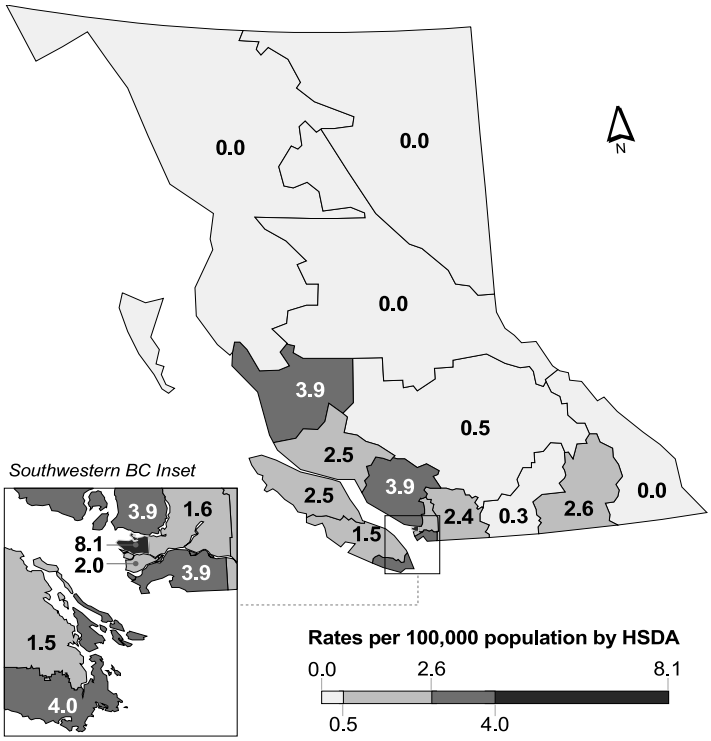
S. flexneri was the most common species reported, followed closely by *S.* sonnei.

35.1 Shigellosis Rates by Year, 2004-2013



	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
BC Shigellosis Reports	160	233	170	272	203	194	189	161	175	141
BC Shigellosis Rate	3.9	5.6	4.0	6.3	4.7	4.4	4.2	3.6	3.9	3.1
Canadian Shigellosis Rate	2.3	3.1	2.0	2.5	2.3	2.1	2.7	3.1	3.1	

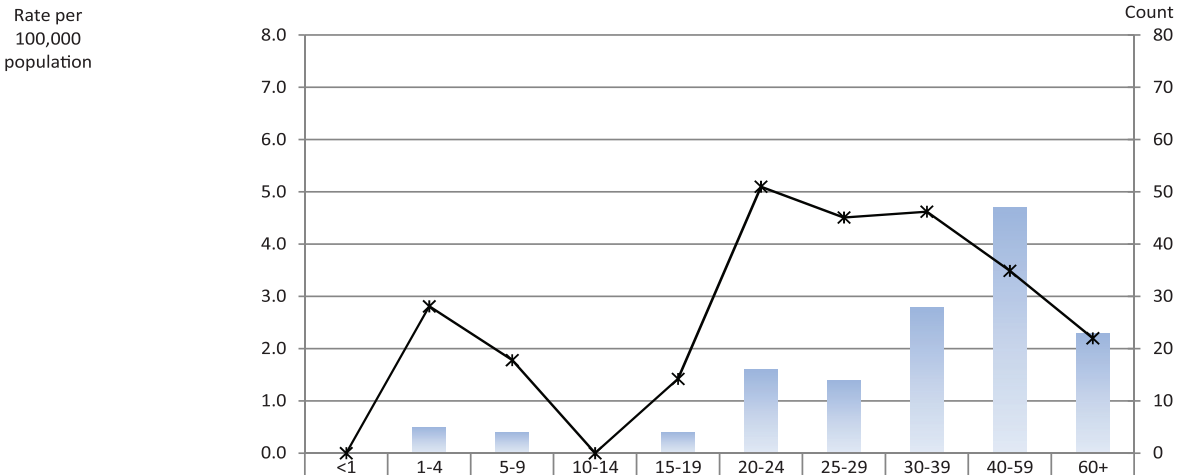
35.2 Shigellosis Rates by HSDA, 2013



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	0	0.0
12	Kootenay Boundary	2	2.6
13	Okanagan	1	0.3
14	Thompson Cariboo Shuswap	1	0.5
21	Fraser East	7	2.4
22	Fraser North	10	1.6
23	Fraser South	30	3.9
31	Richmond	4	2.0
32	Vancouver	53	8.1
33	North Shore/Coast Garibaldi	11	3.9
41	South Vancouver Island	15	4.0
42	Central Vancouver Island	4	1.5
43	North Vancouver Island	3	2.5
51	Northwest	0	0.0
52	Northern Interior	0	0.0
53	Northeast	0	0.0

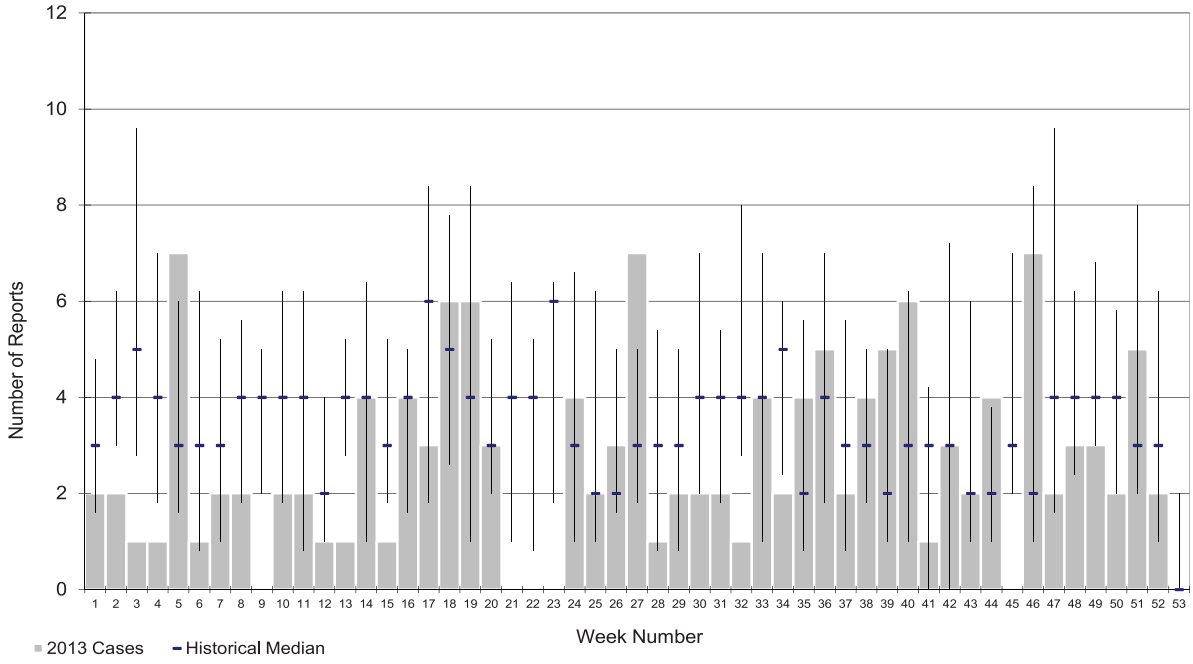
Note: Map classification by Jenks natural breaks method.

35.3 Shigellosis Rates by Age Group and Sex, 2013



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Shigellosis Reports - Female	0	4	3	0	2	9	7	9	18	12
Shigellosis Reports - Male	0	1	1	0	2	7	6	19	29	11
Shigellosis Reports - Total	0	5	4	0	4	16	14	28	47	23
Shigellosis Rate - Female	0.0	4.7	2.8	0.0	1.5	5.9	4.5	3.0	2.7	2.2
Shigellosis Rate - Male	0.0	1.1	0.9	0.0	1.4	4.3	3.9	6.3	4.4	2.2
Shigellosis Rate - Total	0.0	2.8	1.8	0.0	1.4	5.1	4.5	4.6	3.5	2.2

35.4 2013 Shigellosis Reports Compared to Historical Median and the 10th and 90th Percentiles Around the Median (2004 to 2012)



35.5 Shigella species distribution, 2013

Rank	Species	Number of Cases	Proportion
1	*flexneri*	63	48.8%
2	*sonnei*	57	44.2%
3	*boydii*	4	3.1%
4	*dysenteriae*	4	3.1%
	Unknown/unspecified	1	0.8%
	Total	129	100.0%

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

Vibrio Infection*

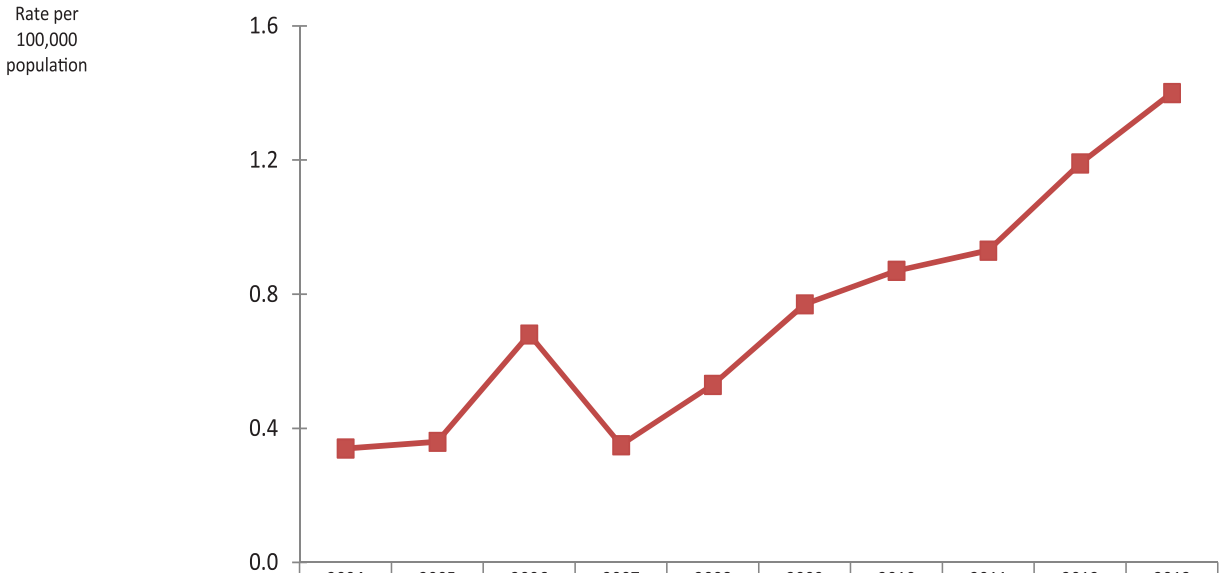
The incidence of *Vibrio* infections have been increasing since 2008 with the highest rate reported in 2013 (1.4/100,000). Sixty-four cases were reported of which 14.6% were associated with international travel. The reason for this increase in incidence is unknown. Typically cases are reported mostly from coastal regions; in 2013 the highest incidence rates were reported from North Vancouver Island and North Shore/Coast Garibaldi. North Vancouver Island, Fraser South and Fraser North experienced notable increases in cases in 2013 as compared to 2012.

Cases occurred mostly in adults, with the highest incidence in males aged 40-59 years. The majority of cases were reported from weeks 27 to 40, with a peak in week 32, consistent with the annual summer season.

V. parahaemolyticus is the most common species to cause infection in BC. Illness is mostly associated with consumption of raw or undercooked shellfish during the summer months.

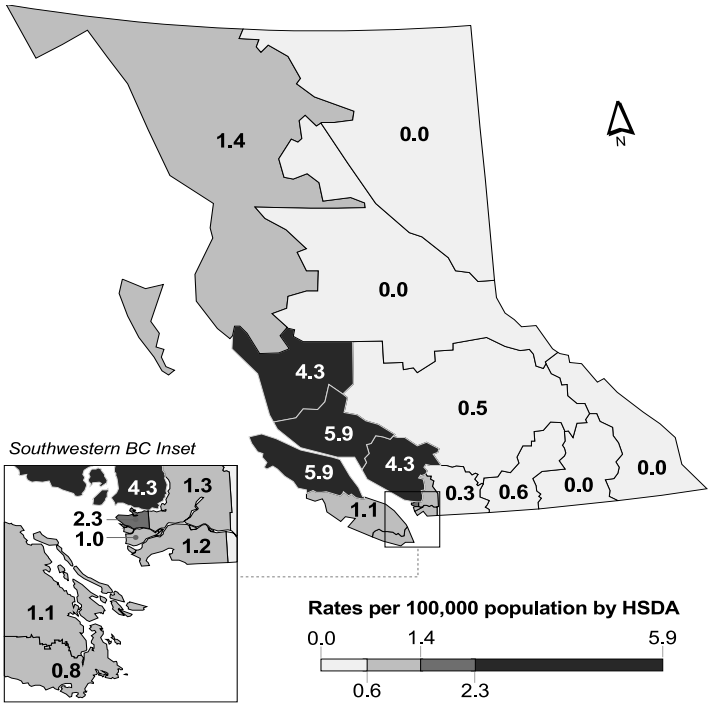
* Previously this section was titled *Vibrio parahaemolyticus*. This has been updated to reflect all *Vibrio* infections. The data have not changed.

36.1 Vibrio Infection Rates by Year, 2004-2013



	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
BC Vibrio Infection Reports	14	15	29	15	23	34	39	42	54	64
BC Vibrio Infection Rate	0.3	0.4	0.7	0.4	0.5	0.8	0.9	0.9	1.2	1.4

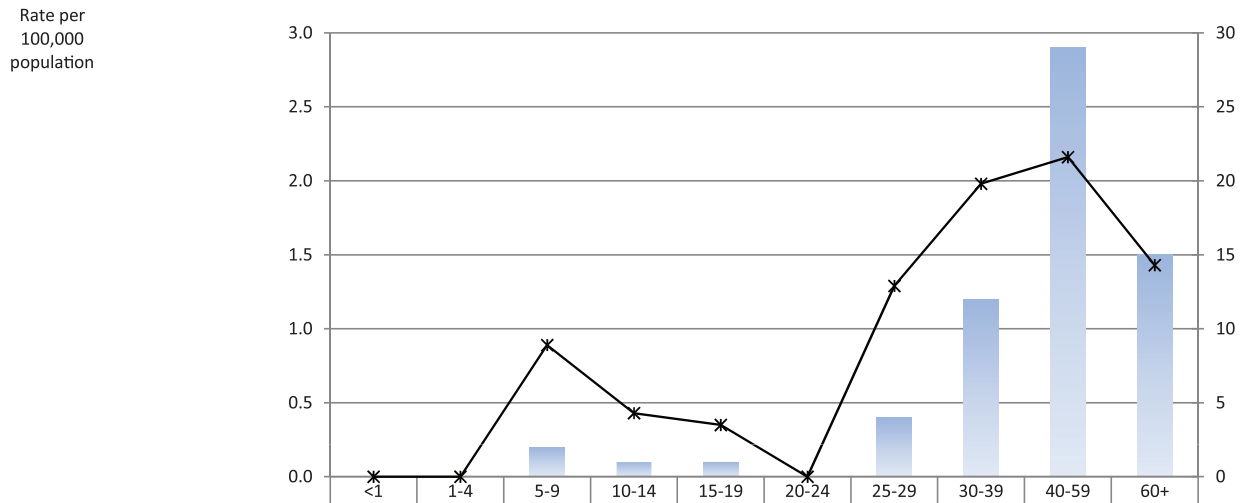
36.2 Vibrio Infection Rates by HSDA, 2013



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	1	0.5
21	Fraser East	1	0.3
22	Fraser North	8	1.3
23	Fraser South	9	1.2
31	Richmond	2	1.0
32	Vancouver	15	2.3
33	North Shore/Coast Garibaldi	12	4.3
41	South Vancouver Island	3	0.8
42	Central Vancouver Island	3	1.1
43	North Vancouver Island	7	5.9
51	Northwest	1	1.4
52	Northern Interior	0	0.0
53	Northeast	0	0.0

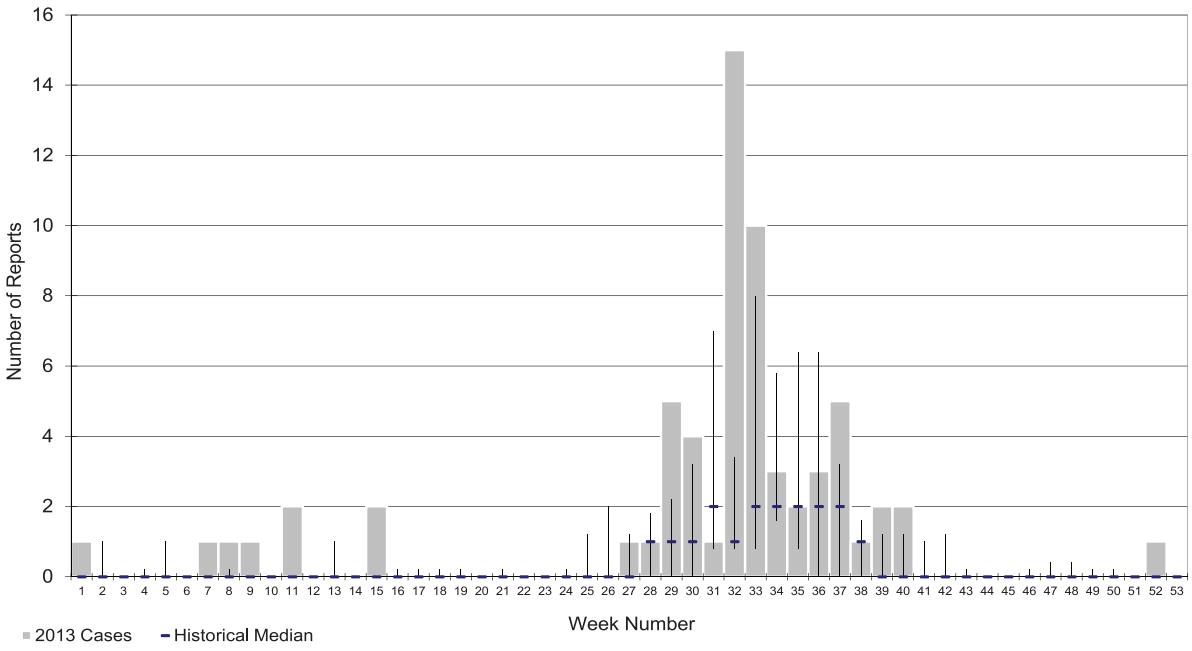
Note: Map classification by Jenks natural breaks method.

36.3 Vibrio Infection Rates by Age Group and Sex, 2013



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Vibrio Infection Reports - Female	0	0	1	0	0	0	1	6	10	6
Vibrio Infection Reports - Male	0	0	1	1	1	0	3	6	19	9
Vibrio Infection Reports - Total	0	0	2	1	1	0	4	12	29	15
Vibrio Infection Rate - Female	0.0	0.0	0.9	0.0	0.0	0.0	0.6	2.0	1.5	1.1
Vibrio Infection Rate - Male	0.0	0.0	0.9	0.8	0.7	0.0	1.9	2.0	2.9	1.8
Vibrio Infection Rate - Total	0.0	0.0	0.9	0.4	0.4	0.0	1.3	2.0	2.2	1.4

36.4 2013 Vibrio Infection Reports Compared to Historical Median and the 10th and 90th Percentiles Around the Median (2004 to 2012)



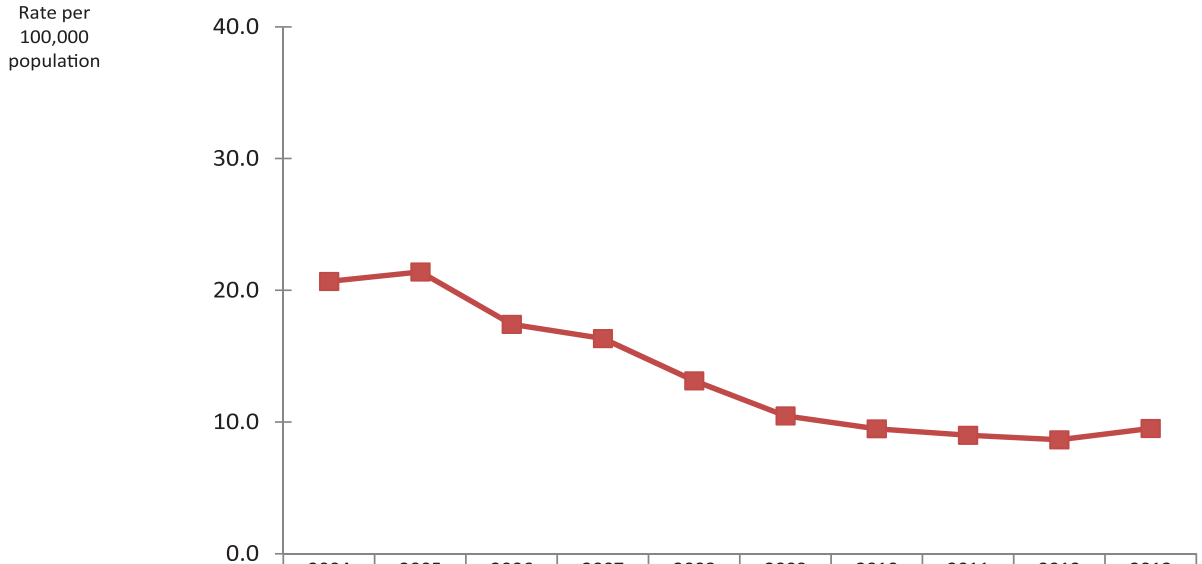
36.5 Vibrio species distribution, 2013

Rank	Species	Number of Cases	Proportion
1	*Parahaemolyticus*	57	89.1%
2	*Fluvalis*	2	3.1%
3	*Alginolyticus*	1	1.6%
4	*Hollisae*	1	1.6%
	Unknown	3	4.7%
	Total	64	100.0%

Yersiniosis

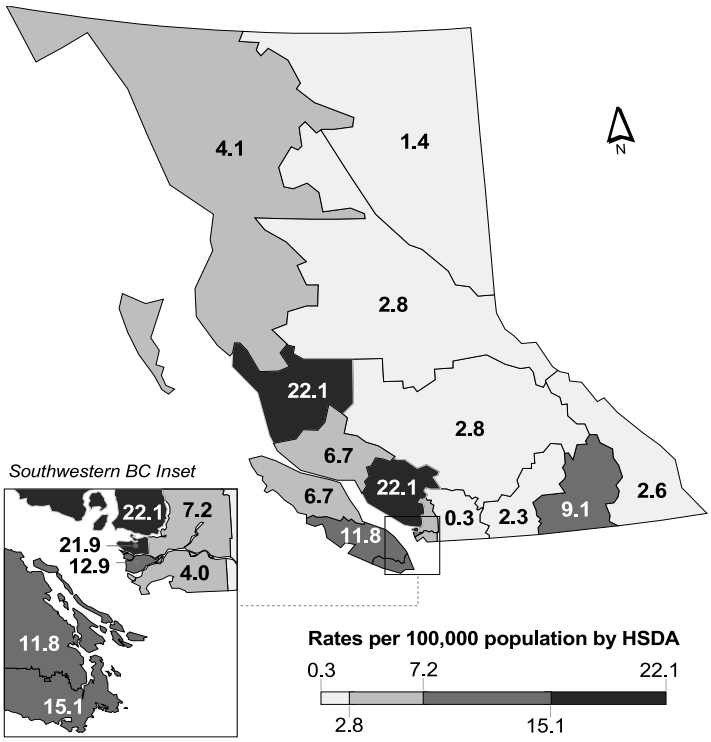
In 2013, 436 cases (9.5/100,000) of yersiniosis were reported, a slight increase from last year. Incidence remains highest in children aged 1-4 years and adults aged 20-29 years. Like previous years, there was significant geographic variation with the highest rates reported from Vancouver Coastal Health and Island Health Authorities. Cases were reported throughout the year, with a slight peak in summer. No outbreaks were reported.

37.1 Yersiniosis Rates by Year, 2004-2013



	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
BC Yersiniosis Reports	859	898	739	701	571	462	424	405	393	436
BC Yersiniosis Rate	20.7	21.4	17.4	16.3	13.1	10.5	9.5	9.0	8.7	9.5

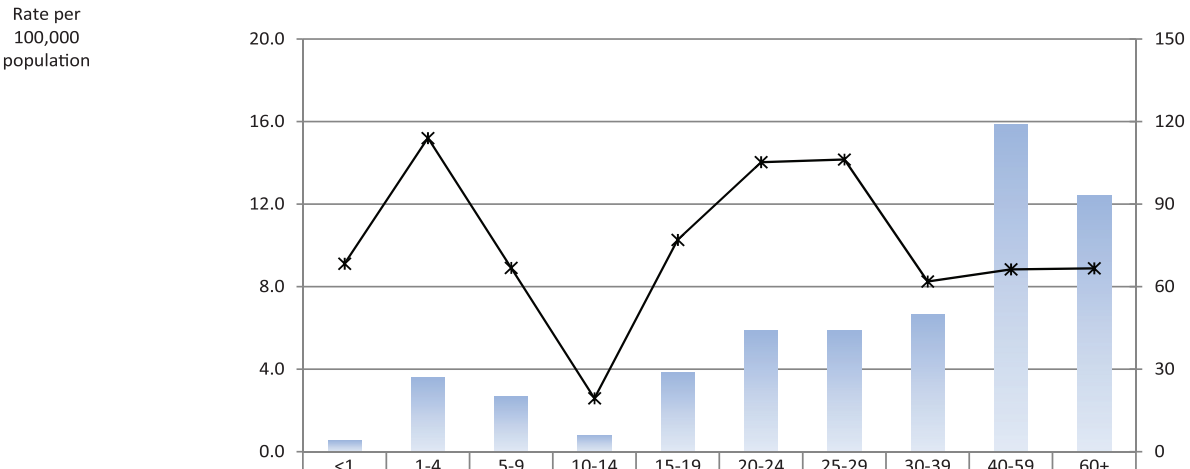
37.3 Yersiniosis Rates by HSDA, 2013



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	2	2.6
12	Kootenay Boundary	7	9.1
13	Okanagan	8	2.3
14	Thompson Cariboo Shuswap	6	2.8
21	Fraser East	1	0.3
22	Fraser North	46	7.2
23	Fraser South	31	4.0
31	Richmond	26	12.9
32	Vancouver	144	21.9
33	North Shore/Coast Garibaldi	62	22.1
41	South Vancouver Island	56	15.1
42	Central Vancouver Island	31	11.8
43	North Vancouver Island	8	6.7
51	Northwest	3	4.1
52	Northern Interior	4	2.8
53	Northeast	1	1.4

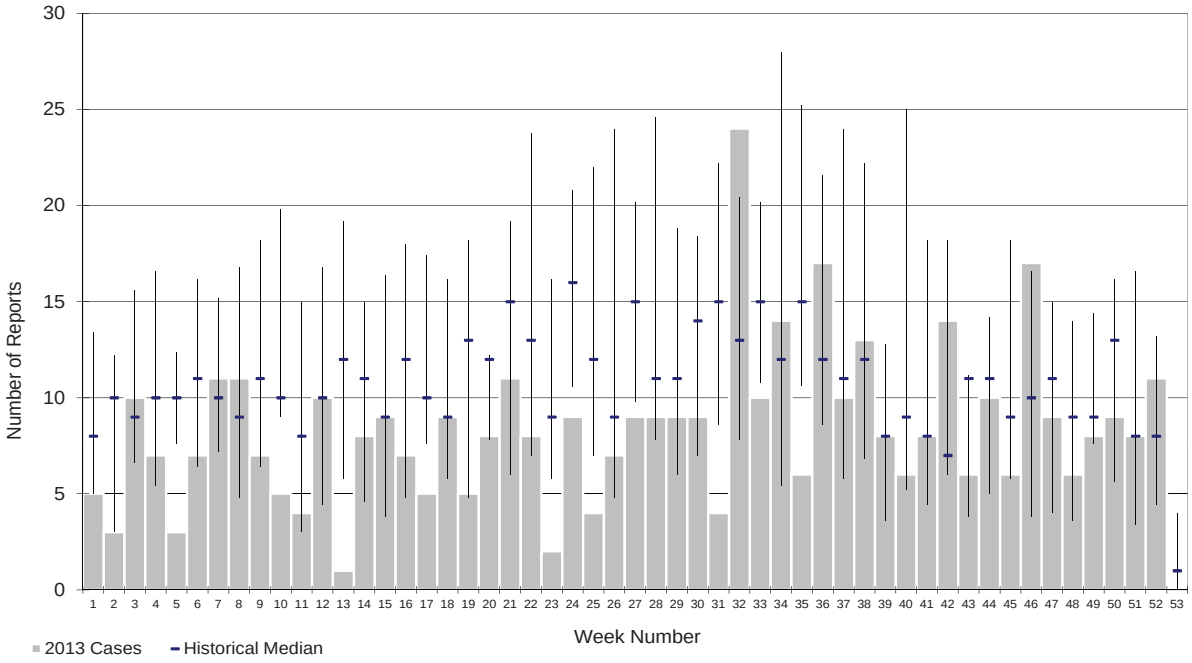
Note: Map classification by Jenks natural breaks method.

37.4 Yersiniosis Rates by Age Group and Sex, 2013



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Yersiniosis Reports - Female	0	9	7	1	16	26	23	27	72	51
Yersiniosis Reports - Male	4	18	13	5	13	18	21	23	47	42
Yersiniosis Reports - Total	4	27	20	6	29	44	44	50	119	93
Yersiniosis Rate - Female	0.0	10.5	6.5	0.9	11.9	17.1	14.7	8.8	10.6	9.3
Yersiniosis Rate - Male	17.7	19.6	11.2	4.2	8.8	11.1	13.6	7.7	7.1	8.4
Yersiniosis Rate - Total	9.1	15.2	8.9	2.6	10.3	14.0	14.2	8.3	8.8	8.9

37.4 2013 Yersiniosis Reports Compared to Historical Median and the 10th and 90th Percentiles Around the Median (2004 to 2012)

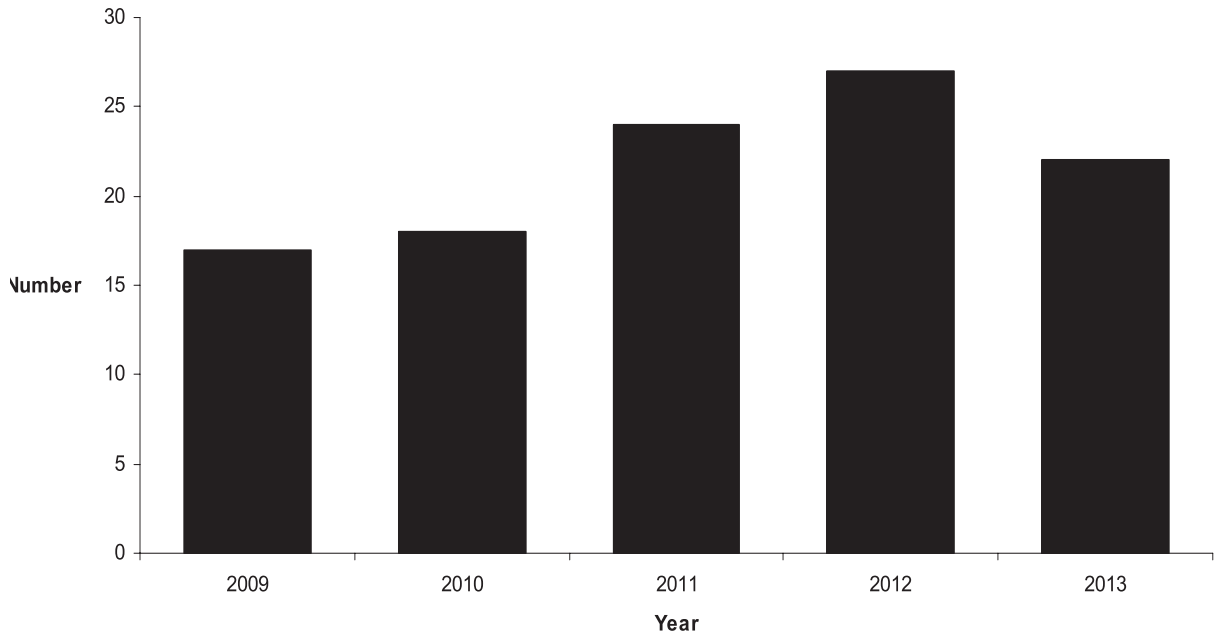


Outbreaks of Gastroenteritis

In August 2008, a national web-enabled outbreak reporting tool was launched in BC. The objective of the surveillance of enteric outbreaks in BC is to describe and understand the trends in, and burden of, enteric outbreaks.

In 2013, 21 enteric outbreaks affecting 341 people were investigated and reported provincially (this excludes viral long-term care facility outbreaks). Seven outbreaks were reported by the BCCDC, four by Fraser Health, four by Interior Health, four by Island Health, two by Vancouver Coastal Health and none by Northern Health. Four were caused by *Salmonella*, four by *E. coli* O157:H7, two by *C. botulinum* (1 person each), one each by norovirus, *C. perfringens* and *Cyclospora* and eight had an unknown etiology. Six (28.6%) occurred in food service establishments, six in the community, five in private functions and four in other settings. Thirteen (61.9%) outbreaks were transmitted via the foodborne route (four via infected foodhandlers, two eggs, two mixed foods, one seafood, one dairy, one canned produce and two unknown), one was spread from person-to-person and seven had an unknown mode of transmission.

38.1 Reported enteric outbreaks investigated by year, British Columbia, 2009-2013



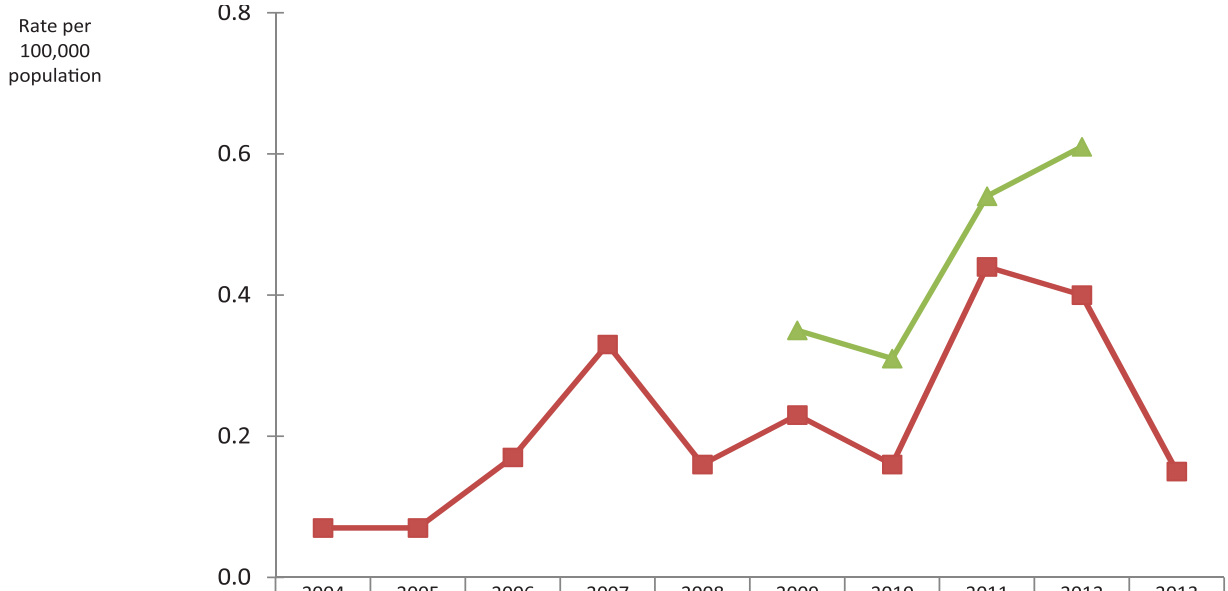
Vectorborne and Zoonotic Diseases

Lyme Disease
Rabies Exposure
West Nile Virus

Lyme Disease

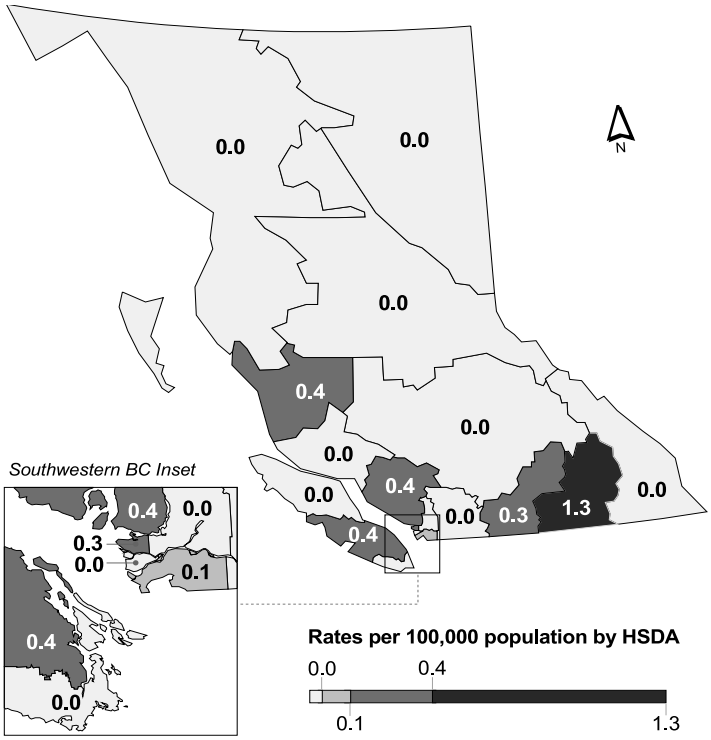
There continues to be a low endemic risk of Lyme Disease in BC. There were 7 cases of clinical or laboratory confirmed disease (0.2 per 100,000) reported in 2013. The incidence in 2013 decreased compared to 2011 and 2012 and was similar to years prior to 2011. Two cases reported travel and likely acquired their infection outside of BC. Incidence is highest in males between the ages of 5-9 years (0.9 per 100,000) although cases are reported throughout a variety of age groups. The highest incidence was reported in Kootenay Boundary, but this only represents a single case.

32.1 Lyme Disease Rates by Year, 2004-2013



	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
BC Lyme Reports	3	3	7	14	7	10	7	20	18	7
BC Lyme Rate	0.1	0.1	0.2	0.3	0.2	0.2	0.2	0.4	0.4	0.2
Canadian Lyme Rate						0.4	0.3	0.5	0.6	

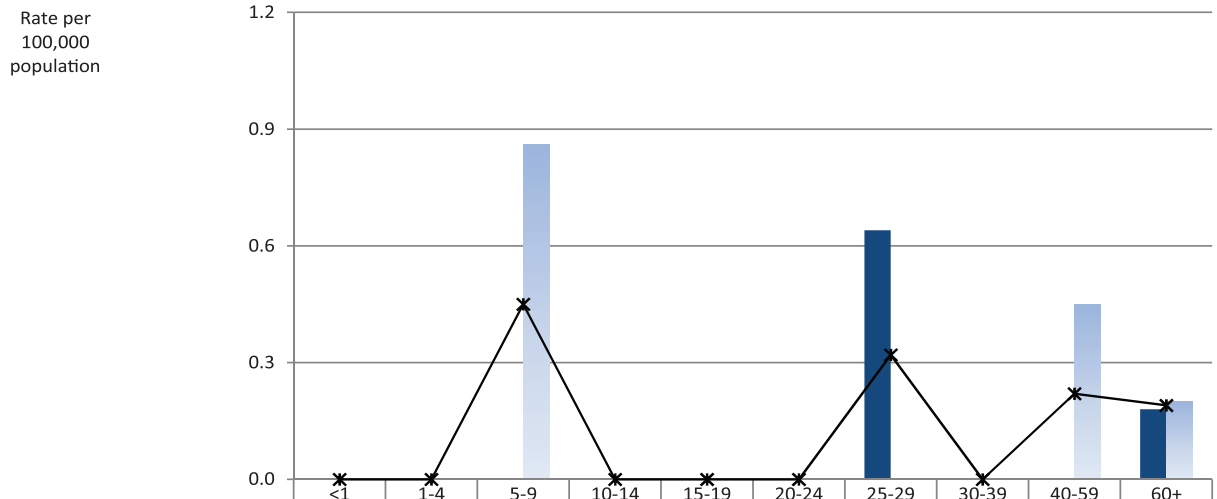
32.2 Lyme Disease Rates by HSDA, 2013



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	0	0.0
12	Kootenay Boundary	1	1.3
13	Okanagan	1	0.3
14	Thompson Cariboo Shuswap	0	0.0
21	Fraser East	0	0.0
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	0.4
41	South Vancouver Island	0	0.0
42	Central Vancouver Island	1	0.4
43	North Vancouver Island	0	0.0
51	Northwest	0	0.0
52	Northern Interior	0	0.0
53	Northeast	0	0.0

Note: Map classification by Jenks natural breaks method.

32.3 Lyme Disease Rates by Age Group and Sex, 2013



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Lyme Rate - Female	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.2
Lyme Rate - Male	0.0	0.0	0.9	0.0	0.0	0.0	0.0	0.0	0.5	0.2
Lyme Rate - Total	0.0	0.0	0.5	0.0	0.0	0.0	0.3	0.0	0.2	0.2
Lyme Reports - Female	0	0	0	0	0	0	1	0	0	1
Lyme Reports - Male	0	0	1	0	0	0	0	0	3	1
Lyme Reports - Total	0	0	1	0	0	0	1	0	3	2

Rabies Exposures*

The rate of reported rabies exposures 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 increased slightly since 2010, with 168 exposures or 3.7/100,000 in 2013 (Figure 34.1). In 2013, 102 (60.7%) exposures occurred during international travel; this number has increased in recent years.

Vancouver/Richmond reported the greatest number of exposures overall at 46 (Figure 34.2); 38 (82.6%) of these occurred during international travel. As in previous years, the highest rate of exposure was reported from Kootenay Boundary (10.4/100,000) where four (50.0%) exposures occurred locally. The HSDAs with the greatest proportion of exposures occurring within BC included East Kootenay, Thompson Cariboo Shushwap, Northwest and Northeast. Four exposures were reported as occurring in other Canadian jurisdictions.

The highest rates of exposure were reported from individuals aged 15 to 29 years (Figure 34.3). In general, the proportion of exposures occurring internationally was greater for most age groups, except in adults aged >30 year where the proportion occurring internationally and in BC/Canada is approximately the same.

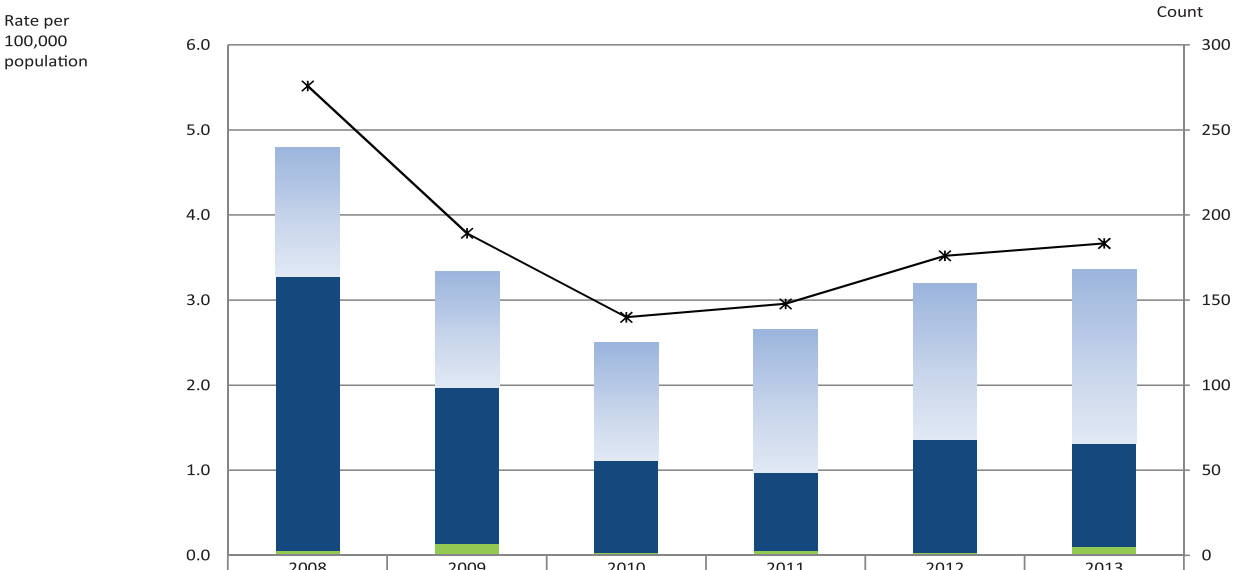
Most BC/Canada exposures were reported between June and September when bats are active (Figure 34.4). International exposures occurred throughout the year with the highest number reported in the winter months.

The majority (74%) of exposures occurring in BC/Canada involved bats, the only rabies reservoir in BC (Figure 34.5). Dogs accounted for 62% of international exposures.

As in recent years, the majority (64.3%) of exposures were due to bites (Figure 34.6). Fewer were due to handling of an animal, scratches and contact with saliva. For the fifth year in a row, no exposures due to a bat found in the same room or an animal nearby were reported.

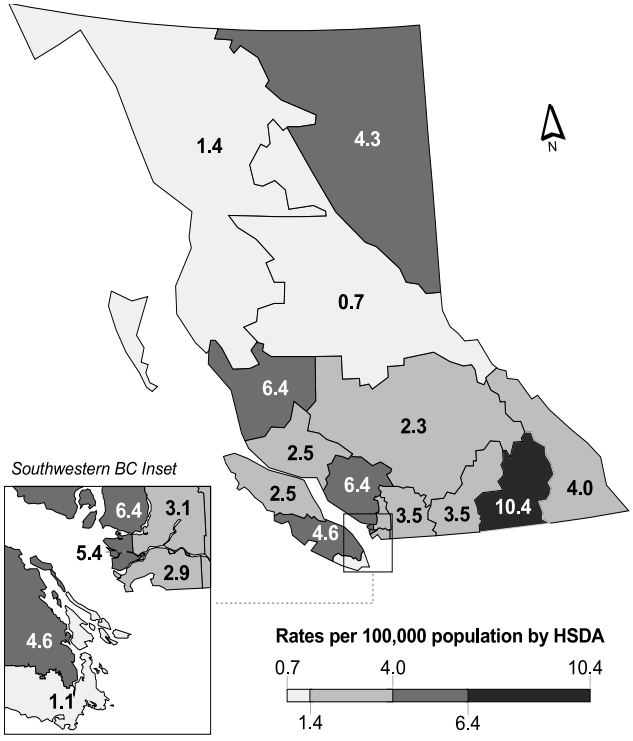
*The terms “exposure” denotes a report of an individual exposed to an animal which presents a risk of rabies infection. Several individuals exposed to one animal would result in several exposures.

34.1 Rabies Exposures Rates by Year, 2008-2013



	2008	2009	2010	2011	2012	2013
Outside Canada	76	68	69	84	92	102
Inside BC/Canada	161	92	54	46	66	61
Other (Blank)	3	7	2	3	2	5
Rates per 100,000	5.5	3.8	2.8	3.0	3.5	3.7

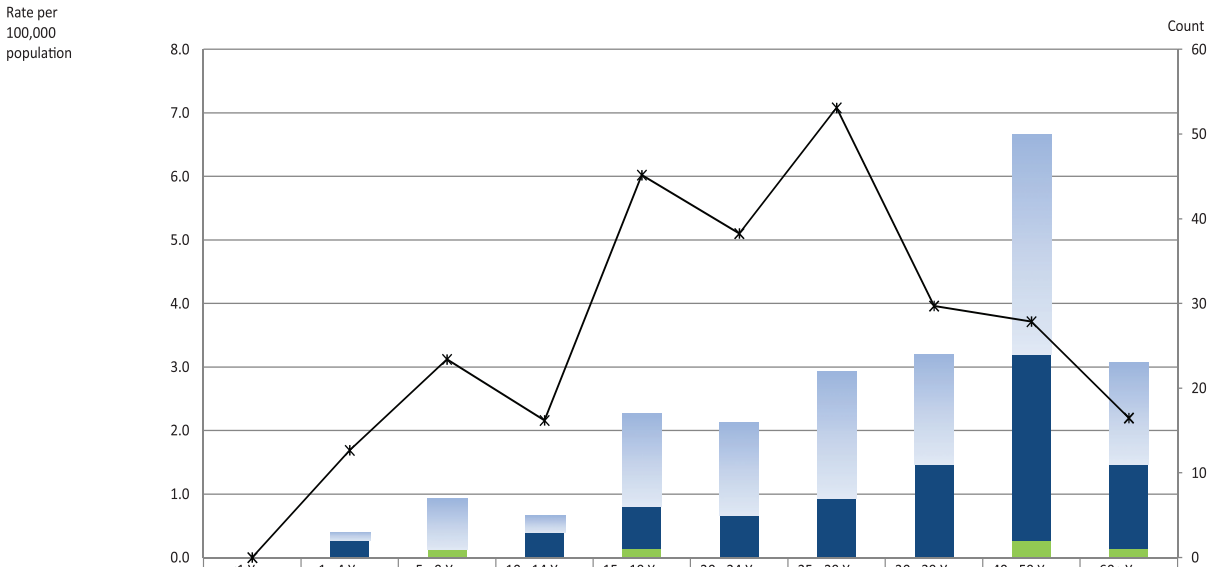
34.2 Rabies Exposure Rates by HSDA, 2013



HSDA	Health Service Delivery Area	Exps.	Rate	BC/Can. Exps.	Int'l Exps.
11	East Kootenay	3	4.0	3	0
12	Kootenay Boundary	8	10.4	4	4
13	Okanagan	12	3.5	6	6
14	Thompson Cariboo Shuswap	5	2.3	5	0
21	Fraser East	10	3.5	5	5
22	Fraser North	20	3.1	3	17
23	Fraser South	22	2.9	9	13
31/32	Richmond/Vancouver	46	5.4	8	38
33	North Shore/Coast Garibaldi	18*	6.4	6	7
41	South Vancouver Island	4	1.1	2	2
42	Central Vancouver Island	12	4.6	8	4
43	North Vancouver Island	3	2.5	2	1
51	Northwest	1	1.4	1	0
52	Northern Interior	1	0.7	0	1
53	Northeast	3	4.3	3	0

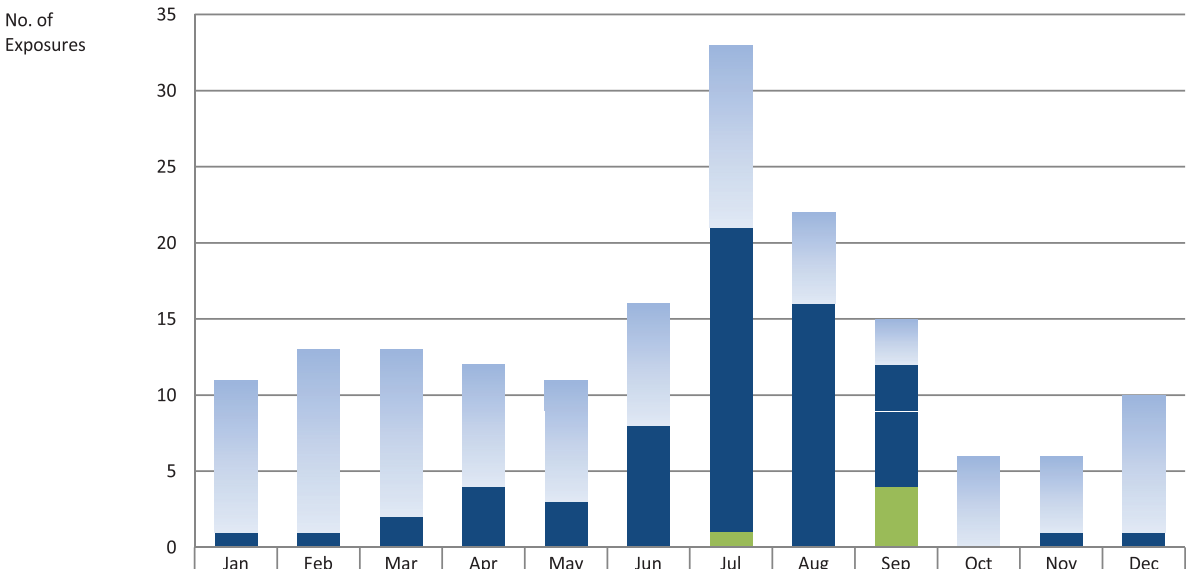
*Note: the location of 5 exposures in NSCG were not reported.

34.3 Rabies Exposures by Age Group, 2013



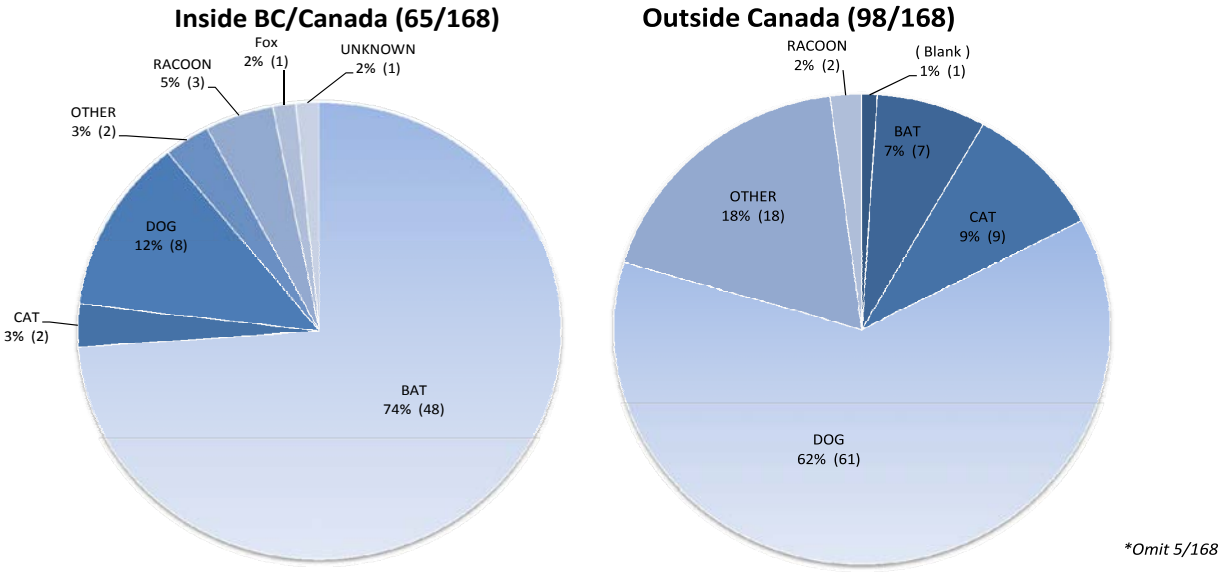
	<1 Year	1 - 4 Years	5 - 9 Years	10 - 14 Years	15 - 19 Years	20 - 24 Years	25 - 29 Years	30 - 39 Years	40 - 59 Years	60+ Years
Outside Canada	0	1	6	2	11	11	15	13	26	12
Inside BC/Canada	0	2	0	3	5	5	7	11	22	10
Other (Blank)	0	0	1	0	1	0	0	0	2	1
Rate per 100,000	0.0	1.7	3.1	2.2	6.0	5.1	7.1	4.0	3.7	2.2

34.4 Rabies Exposures by Month, 2013



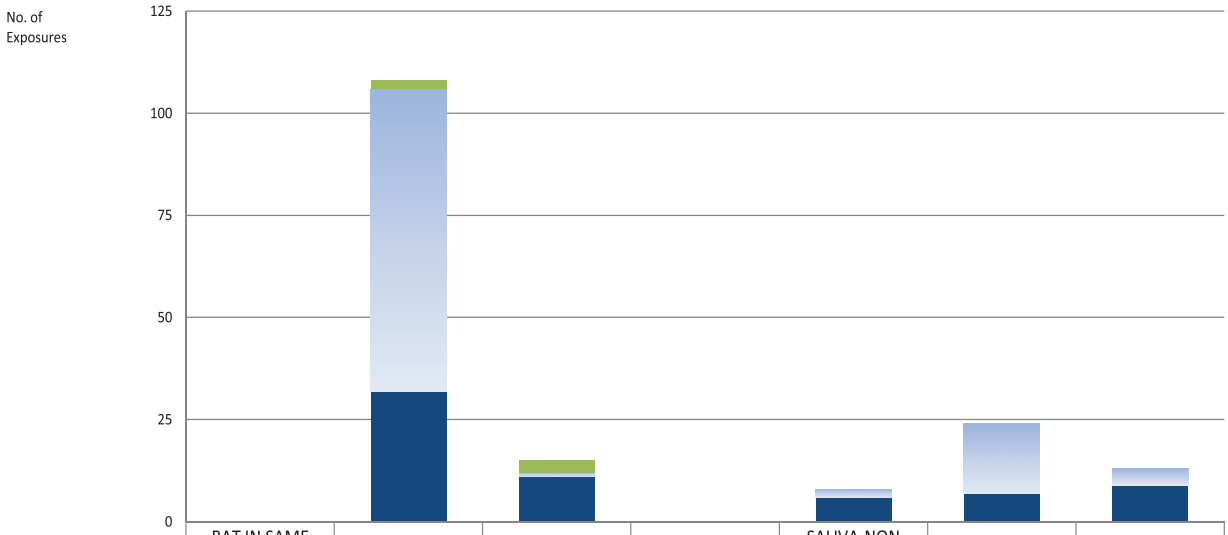
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Outside Canada	10	12	11	8	8	8	12	6	3	6	5	9
Inside BC/Canada	1	1	2	4	3	8	20	16	8	0	1	1
Other (Blank)	0	0	0	0	0	0	1	0	4	0	0	0

34.5 Rabies Exposures by Percentage of Animal Species Involved, 2013



*Omit 5/168

34.6 Rabies Exposures by Type of Exposure, 2013



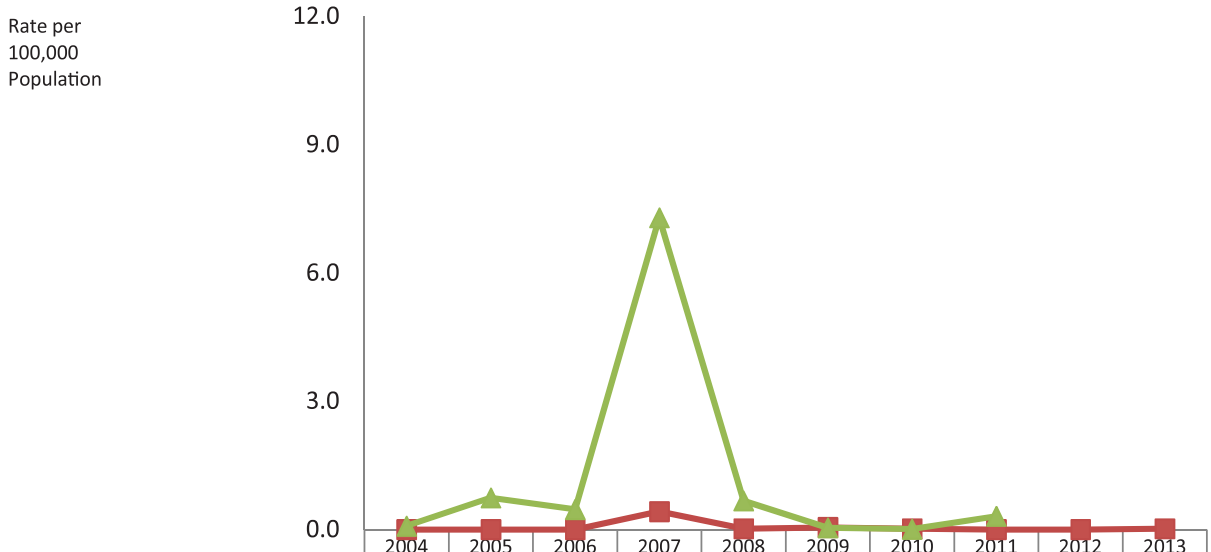
	BAT IN SAME ROOM	BITE	HANDLING	NEARBY	SALIVA-NON BITE	SCRATCH	UNKNOWN
Other (Blank)	0	2	3	0	0	0	0
Outside Canada	0	74	1	0	2	17	4
Inside BC/Canada	0	32	11	0	6	7	9

West Nile Virus

During the 2013 WNV season in BC positive indicators included: 1 human infection, 1 horse infection, 1 positive bird and 1 positive mosquito pool. All positive indicators were reported from the Southern or Central Okanagan. In 2013, 108 human cases were reported in Canada and in the US, 2469 cases were reported.

The 2013 BC West Nile Virus Surveillance Program Report is available at http://www.bccdc.ca/dis-cond/a-z/_w/WestNileVirus/Surveillance/WNV_2013_Surveillance.htm

35.1 West Nile Virus Rates by Year, 2004-2013



	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
BC West Nile Virus Reports	0	0	0	18	1	2	1	0	0	1
BC West Nile Virus Rate	0.0	0.0	0.0	0.4	0.0	0.1	0.0	0.0	0.0	0.0
Canadian West Nile Virus Rate	0.1	0.7	0.5	7.3	0.7	0.0	0.0	0.3		

Environmental Pathogens

Cryptococcus gattii

Legionellosis

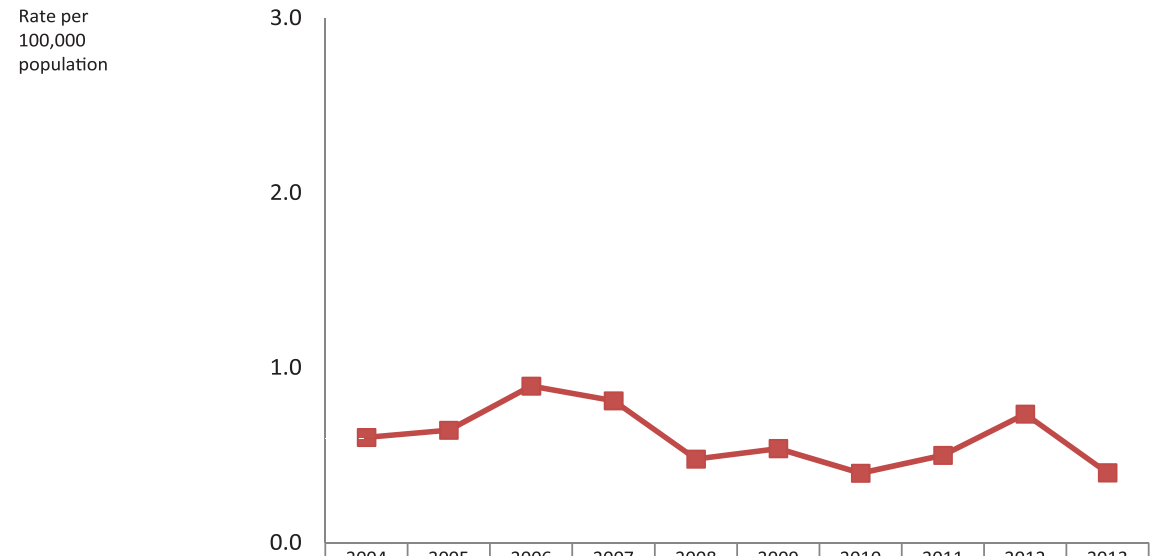
Cryptococcus gattii

The numbers presented in this section are based on information generated through enhanced surveillance for C. gattii infection. For the first time, only culture-confirmed cases are reported and presented in this report.

In 2013, 17 cases (0.4/100,000) of *C. gattii* infection were reported. The incidence has remained low. As seen in previous years, all cases occurred in adults.

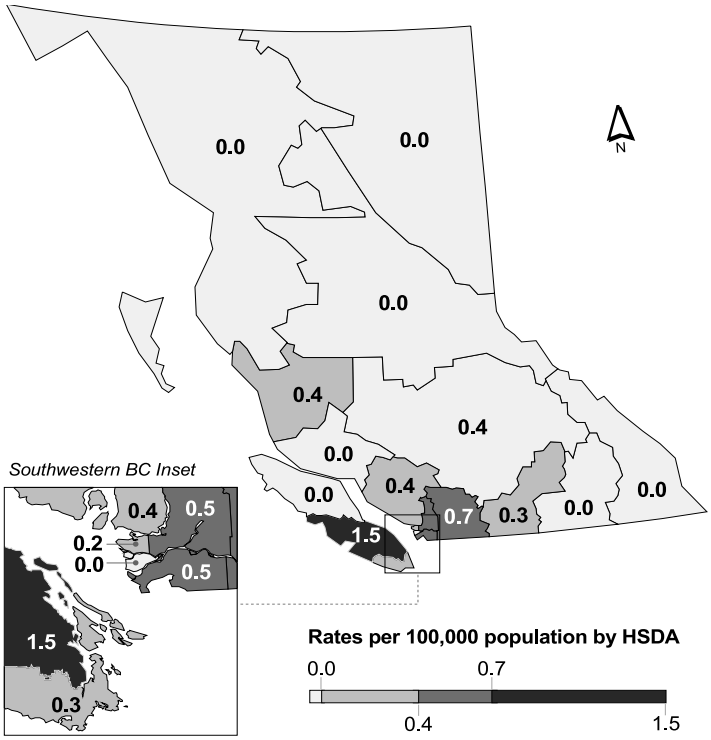
The majority of the cases (12) were reported from the mainland. As in recent years, the highest rates were reported from Central Vancouver Island and the Fraser Health Authority.

36.1 Crytococcus gattii Rates by Year, 2004-2013



	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
BC Cryptococcus gattii Reports	25	27	38	35	21	24	18	23	34	17
BC Cryptococcus gattii Rate	0.6	0.6	0.9	0.8	0.5	0.5	0.4	0.5	0.7	0.4

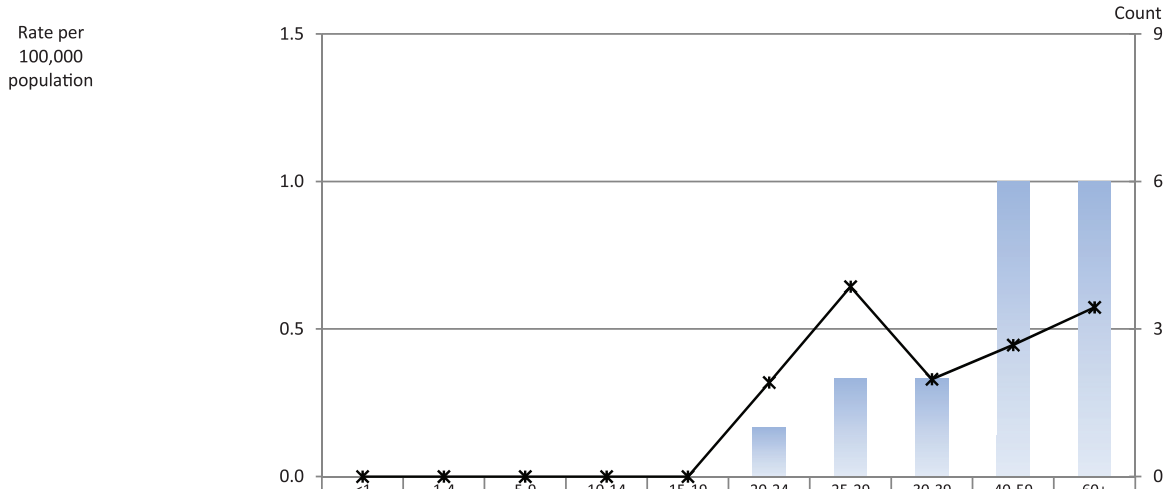
36.2 *Crytococcus gattii Rates by HSDA, 2013*



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	2	0.7
22	Fraser North	3	0.5
23	Fraser South	4	0.5
31	Richmond	0	0.0
32	Vancouver	1	0.2
33	North Shore/Coast Garibaldi	1	0.4
41	South Vancouver Island	1	0.3
42	Central Vancouver Island	4	1.5
43	North Vancouver Island	0	0.0
51	Northwest	0	0.0
52	Northern Interior	0	0.0
53	Northeast	0	0.0

Note: Map classification by Jenks natural breaks method.

36.3 *Crytococcus gattii Rates by Age Group and Sex, 2013*

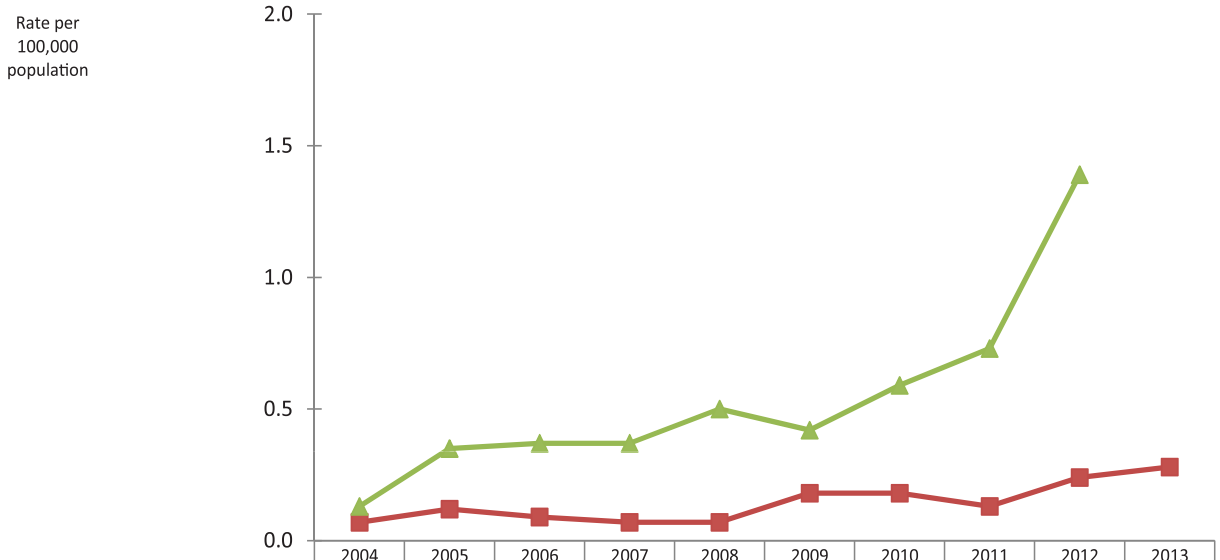


	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Cryptococcus gattii Reports - Female	0	0	0	0	0	0	1	1	3	5
Cryptococcus gattii Reports - Male	0	0	0	0	0	1	1	1	3	1
Cryptococcus gattii Reports	0	0	0	0	0	1	2	2	6	6
Cryptococcus gattii Rate -Female	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.3	0.4	0.9
Cryptococcus gattii Rate -Male	0.0	0.0	0.0	0.0	0.0	0.6	0.6	0.3	0.5	0.2
Cryptococcus gattii Rates	0.0	0.0	0.0	0.0	0.0	0.3	0.6	0.3	0.4	0.6

Legionellosis

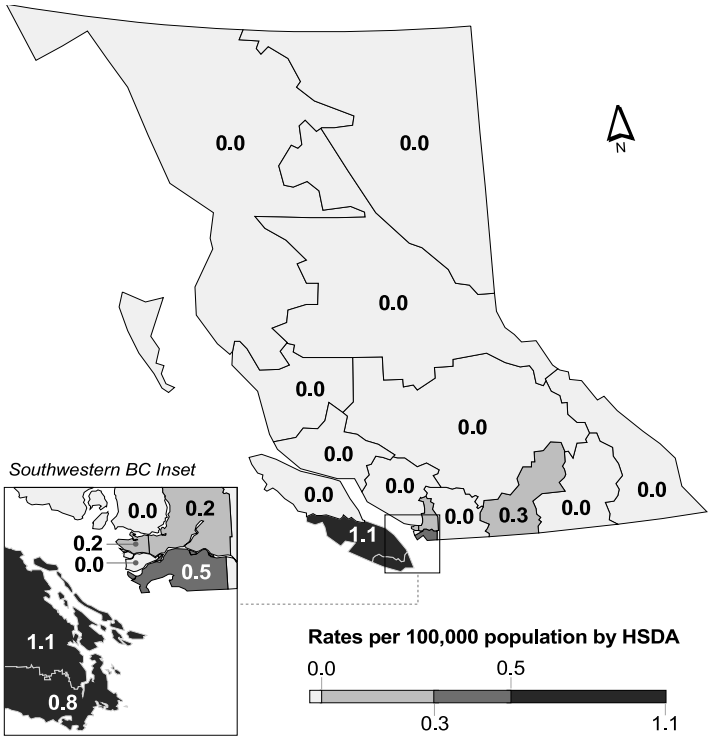
In 2013, 13 cases of legionellosis were reported, the highest number in the last decade. The rates have also been increasing nationally. Reasons for this increase are not clear. Most of the cases were reported from Vancouver Island and Fraser Health Authority. Eleven of the cases occurred in males aged 40 years and older. Cases occurred throughout the year and no outbreaks were reported.

37.1 Legionellosis Rates by Year, 2004-2013



	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Legionellosis Reports	3	5	4	3	3	8	8	6	11	13
Legionellosis Rate	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.3
Canadian Legionellosis Rate	0.1	0.4	0.4	0.4	0.5	0.4	0.6	0.7	1.4	

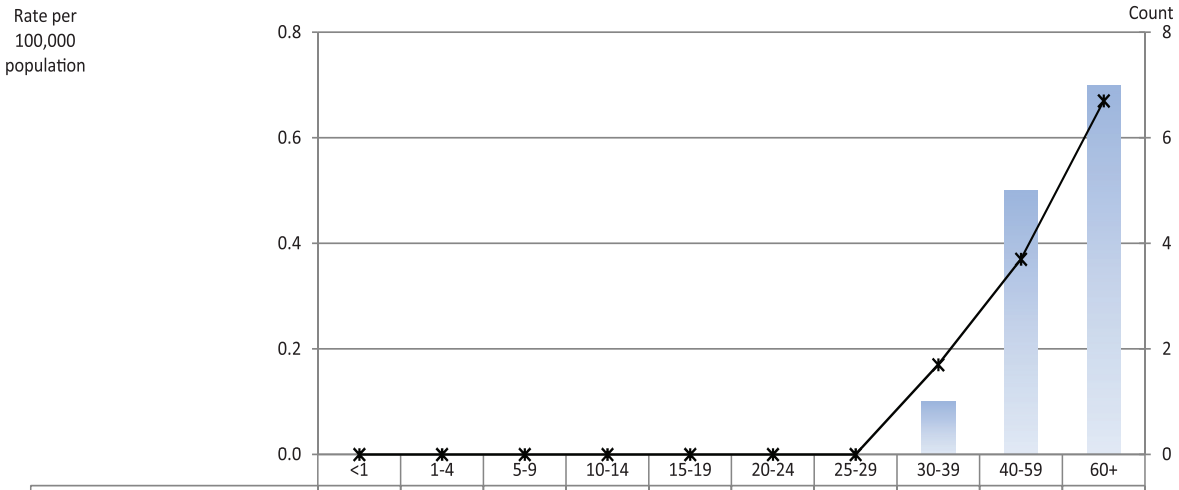
37.2 Legionellosis Rates by HSDA, 2013



HSDA	Health Service Delivery Area	Cases	Rate
11	East Kootenay	0	0.0
12	Kootenay Boundary	0	0.0
13	Okanagan	1	0.3
14	Thompson Cariboo Shuswap	0	0.0
21	Fraser East	0	0.0
22	Fraser North	1	0.2
23	Fraser South	4	0.5
31	Richmond	0	0.0
32	Vancouver	1	0.2
33	North Shore/Coast Garibaldi	0	0.0
41	South Vancouver Island	3	0.8
42	Central Vancouver Island	3	1.1
43	North Vancouver Island	0	0.0
51	Northwest	0	0.0
52	Northern Interior	0	0.0
53	Northeast	0	0.0

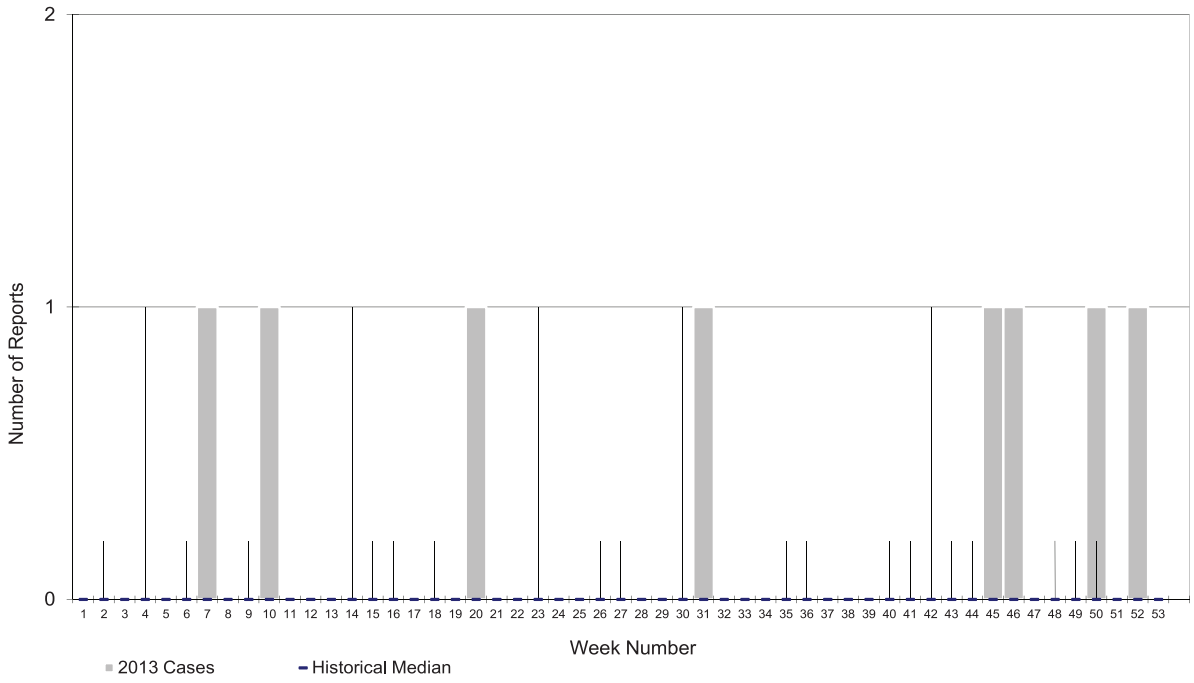
Note: Map classification by Jenks natural breaks method.

37.3 Legionellosis Rates by Age Group and Sex, 2013



	<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	1	0	1
Legionellosis Reports - Male	0	0	0	0	0	0	0	0	5	6
Legionellosis Reports - Total	0	0	0	0	0	0	0	1	5	7
Legionellosis Rate - Female	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.2
Legionellosis Rate - Male	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	1.2
Legionellosis Rate - Total	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.4	0.7

37.1 2013 Legionellosis Reports Compared to Historical Median and the 10th and 90th Percentiles Around the Median (2004 to 2012)



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

Reportable Communicable Diseases in BC, March 2013

Schedule A: Reportable by all sources, including Laboratories

Acquired Immune Deficiency Syndrome
Anthrax
Botulism
Brucellosis
Cholera
Congenital infections:
    Toxoplasmosis, Rubella,Cytomegalovirus, Herpes Simplex, Varicella-zoster, Hepatitis B Virus, Listeriosis and any other congenital infection
Creutzfeldt-Jacob Disease
Cryptococcus neoformans
Cryptosporidiosis
Cyclospora Infection
Diffuse Lamellar Keratitis (DLK)
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
H5 and H7 strains of the Influenza virus
Haemophilus Influenzae Disease, All Invasive, by Type
Hantavirus Pulmonary Syndrome
Hemolytic Uremic Syndrome
Hemorrhagic Viral Fevers
Hepatitis Viral:
    Hepatitis A
    Hepatitis B
    Hepatitis C
    Hepatitis E
    Other Viral Hepatitis
Human Immunodeficiency Virus
Invasive Group A Streptococcal Disease
Invasive Streptococcus Pneumoniae Infection
Leprosy
Lyme Disease
Measles

Meningitis: All causes
    (i) Bacterial:
    Hemophilus
    Pneumococcal
    Other
    (ii) Viral
Meningococcal Disease:
    All Invasive
    Including Primary Meningococcal Pneumonia and Primary Meningococcal Conjunctivitis
Mumps
Neonatal Group B Streptococcus Infection
Paralytic Shellfish Poisoning (PSP)
Pertussis (Whooping Cough)
Plague
Poliomyelitis
Rabies
Reye's Syndrome
Rubella:
    Congenital Rubella Syndrome
Severe Acute Respiratory Syndrome
Smallpox
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
Cryptococcus neoformans
Herpes Genitalis
Human Immunodeficiency Virus
Influenza virus, including the H5 and H7 strains
Legionellosis
Leptospirosis
Listeriosis
Malaria
Q Fever
Rickettsial Diseases
Severe Acute Respiratory Syndrome
Smallpox
Tularemia
West Nile Virus Infection

As per Health Act Communicable Disease Regulation includes amendments up to B.C. Reg. 380/2012, March 18, 2013
http://www.bclaws.ca/EPLibraries/bclaws_new/document/ID/freeside/12_4_83#section2

2013 BC Selected Reportable Disease CASE REPORTS by Health Service Delivery Area

	BC TOTAL	INTERIOR					FRASER			
	Provincial Total	East Kootenay	Kootenay Boundary	Okanagan	Thompson Cariboo	**Interior Total**	Fraser East	Fraser North	Fraser South	**Fraser Total**
2013 Population Estimate	**4581978**	**76015**	**76794**	**346817**	**217840**	**717466**	**287180**	**636422**	**766273**	**1689875**
AIDS (2012)*	**58**	1	0	4	1	**6**	1	5	3	**9**
Amebiasis	**390**	0	2	3	7	**12**	11	33	94	**138**
Campylobacteriosis	**1655**	24	22	130	62	**238**	101	225	228	**554**
Chlamydia^	**12189**	155	144	911	642	**1852**	576	1391	1344	**3311**
Cryptococcus gattii	**17**	0	0	1	0	**1**	2	3	4	**9**
Cryptosporidiosis	**75**	1	1	7	10	**19**	5	3	15	**23**
Cyclosporiasis	**38**	0	0	0	0	**0**	1	4	11	**16**
E. coli, Shigatoxigenic	**185**	3	2	13	19	**37**	16	16	16	**48**
Giardiasis	**605**	9	14	35	22	**80**	50	39	122	**211**
Gonorrhea^	**1685**	2	5	59	41	**107**	98	207	210	**515**
Hepatitis A	**21**	0	0	0	3	**3**	1	1	6	**8**
Hepatitis B Acute	**11**	0	0	2	1	**3**	0	1	0	**1**
Hepatitis B Chronicand Unknown	**1177**	2	1	17	12	**32**	29	210	110	**349**
Hepatitis C	**2105**	29	42	166	98	**335**	221	232	307	**760**
Haemophilus influenzae b, invasive	**6**	0	0	0	0	**0**	0	2	0	**2**
HIV^	**272**	1	1	6	5	**13**	4	40	24	**68**
Listeriosis	**15**	0	0	0	0	**0**	1	1	4	**6**
Lyme	**7**	0	1	1	0	**2**	0	0	1	**1**
Malaria	**54**	2	3	0	1	**6**	5	10	14	**29**
Measles	**17**	0	0	0	0	**0**	2	4	3	**9**
Meningococcal Disease, invasive	**11**	1	0	1	0	**2**	1	0	0	**1**
Mumps	**58**	0	3	0	9	**12**	1	2	9	**12**
Paratyphoid Fever	**15**	0	0	0	0	**0**	3	2	7	**12**
Pertussis	**316**	5	28	15	3	**51**	15	26	26	**67**
Pneumococcal Disease, invasive	**363**	5	5	28	12	**50**	25	35	70	**130**
Rubella	**0**	0	0	0	0	**0**	0	0	0	**0**
Salmonellosis	**845**	11	13	41	39	**104**	50	94	144	**288**
Shigellosis	**141**	0	2	1	1	**4**	7	10	30	**47**
Streptococcus Group A invasive	**145**	0	3	12	8	**23**	7	15	21	**43**
Syphilis (infectious)^	**558**	0	1	3	2	**6**	7	50	41	**98**
Tuberculosis	**264**	2	0	15	5	**22**	16	50	69	**135**
Typhoid Fever	**20**	0	0	0	0	**0**	2	2	13	**17**
Vibrio Infections	**57**	0	0	1	1	**2**	1	7	8	**16**
West Nile	**1**	0	0	1	0	**1**	0	0	0	**0**
Yersinlosis	**436**	2	7	8	6	**23**	1	46	31	**78**
Less Common Diseases										
Botulism	**1**	0	0	0	0	**0**	0	0	0	**0**
Brucellosis	**2**	0	0	1	0	**1**	0	0	0	**0**
Cholera Serogroup non O1 O139	**1**	0	0	0	0	**0**	0	1	0	**1**
Creutzfeldt–Jakob disease	**1**	0	0	0	0	**0**	0	0	0	**0**
Diphtheria	**2**	0	0	0	0	**0**	0	0	0	**0**
Hantavirus	**2**	0	0	1	0	**1**	0	0	0	**0**
Legionellosis	**13**	0	0	1	0	**1**	0	1	4	**5**
Leptospirosis	**1**	0	0	0	0	**0**	0	0	0	**0**
Neonatal Group B Streptococcal	**8**	0	0	0	0	**0**	0	1	0	**1**
Tularemia	**1**	0	0	1	0	**1**	0	0	0	**0**

Note: In 2013, there were no reported cases of Anthrax, Cholera Sergogroup O1O139, Viral Hemorrhagic Fevers, Leprosy, Plague, Poliomyelitis, Rabies, Rubella, Severe Acute Respiratory Syndrome, Tetanus, Trichinosis, 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**
201303	**657386**	**279968**	**1138657**	**370913**	**262105**	**119126**	**752144**	**72592**	**141830**	**69414**	**283836**
1	22	2	**25**	4	4	1	**9**	0	1	0	**1**
10	174	23	**207**	20	6	5	**31**	2	0	0	**2**
95	329	161	**585**	132	74	32	**238**	13	19	8	**40**
479	2678	704	**3861**	979	749	332	**2060**	135	593	318	**1046**
0	1	1	**2**	1	4	0	**5**	0	0	0	**0**
2	19	8	**29**	4	0	0	**4**	0	0	0	**0**
2	8	1	**11**	6	4	0	**10**	0	1	0	**1**
2	24	11	**37**	30	15	15	**60**	2	1	0	**3**
19	145	62	**226**	45	15	9	**69**	4	10	5	**19**
50	762	69	**881**	62	29	11	**102**	9	53	10	**72**
0	5	2	**7**	1	0	0	**1**	2	0	0	**2**
0	5	1	**6**	0	0	0	**0**	1	0	0	**1**
217	456	39	**712**	48	15	7	**70**	5	5	4	**14**
41	387	82	**510**	145	141	69	**355**	36	92	17	**145**
0	3	0	**3**	0	0	0	**0**	0	1	0	**1**
4	130	9	**143**	15	11	3	**29**	3	14	0	**17**
0	5	0	**5**	1	1	2	**4**	0	0	0	**0**
0	2	1	**3**	0	1	0	**1**	0	0	0	**0**
0	14	1	**15**	2	1	0	**3**	0	1	0	**1**
1	0	7	**8**	0	0	0	**0**	0	0	0	**0**
0	2	1	**3**	3	0	0	**3**	2	0	0	**2**
1	6	1	**8**	1	0	0	**1**	8	17	0	**25**
0	2	0	**2**	0	0	0	**0**	0	1	0	**1**
2	16	22	**40**	75	51	23	**149**	2	3	4	**9**
16	45	37	**98**	23	25	12	**60**	7	12	6	**25**
0	0	0	**0**	0	0	0	**0**	0	0	0	**0**
39	140	72	**251**	96	42	20	**158**	11	27	6	**44**
4	53	11	**68**	15	4	3	**22**	0	0	0	**0**
1	28	8	**37**	13	9	2	**24**	4	7	6	**17**
13	398	20	**431**	12	5	3	**20**	0	1	1	**2**
18	63	6	**87**	6	4	1	**11**	4	3	2	**9**
1	1	1	**3**	0	0	0	**0**	0	0	0	**0**
2	14	10	**26**	3	3	6	**12**	1	0	0	**1**
0	0	0	**0**	0	0	0	**0**	0	0	0	**0**
26	144	62	**232**	56	31	8	**95**	3	4	1	**8**
0	0	0	**0**	1	0	0	**1**	0	0	0	**0**
0	0	0	**0**	1	0	0	**1**	0	0	0	**0**
0	0	0	**0**	0	0	0	**0**	0	0	0	**0**
0	0	0	**0**	1	0	0	**1**	0	0	0	**0**
0	2	0	**2**	0	0	0	**0**	0	0	0	**0**
0	0	0	**0**	0	0	0	**0**	1	0	0	**1**
0	1	0	**1**	3	3	0	**6**	0	0	0	**0**
0	0	0	**0**	0	1	0	**1**	0	0	0	**0**
0	2	0	**2**	1	0	2	**3**	1	1	0	**2**
0	0	0	**0**	0	0	0	**0**	0	0	0	**0**

*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. Due to a reporting delay, the number of *chlamydia* and gnoorrhea infection cases for Northwest HSDA are not final in this report.

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

2013 BC Selected Reportable Disease CASE RATES by Health Service Delivery Area

	BC TOTAL	INTERIOR					FRASER			
	Provincial Total	East Kootenay	Kootenay Boundary	Okanagan	Thompson Cariboo	**Interior Total**	Fraser East	Fraser North	Fraser South	**Fraser Total**
2013 Population Estimate	**4581978**	**76015**	**76794**	**346817**	**217840**	**717466**	**287180**	**636422**	**766273**	**1689875**
AIDS (2012)*	**1.3**	1.3	0.0	1.2	0.5	**0.8**	0.3	0.8	0.4	**0.5**
Amebiasis	**8.5**	0.0	2.6	0.9	3.2	**1.7**	3.8	5.2	12.3	**8.2**
Campylobacteriosis	**36.1**	31.6	28.7	37.5	28.5	**33.2**	35.2	35.4	29.8	**32.8**
Chlamydia^	**266.0**	203.9	187.5	262.7	294.7	**258.1**	200.6	218.6	175.4	**195.9**
Cryptococcus gattii	**0.4**	0.0	0.0	0.3	0.0	**0.1**	0.7	0.5	0.5	**0.5**
Cryptosporidiosis	**1.6**	1.3	1.3	2.0	4.6	**2.7**	1.7	0.5	2.0	**1.4**
Cyclosporiasis	**0.8**	0.0	0.0	0.0	0.0	**0.0**	0.4	0.6	1.4	**1.0**
E. coli, Shigatoxigenic	**4.0**	4.0	2.6	3.8	8.7	**5.2**	5.6	2.5	2.1	**2.8**
Giardiasis	**13.2**	11.8	18.2	10.1	10.1	**11.2**	17.4	6.1	15.9	**12.5**
Gonorrhea^	**36.8**	2.6	6.5	17.0	18.8	**14.9**	34.1	32.5	27.4	**30.5**
Hepatitis A	**0.5**	0.0	0.0	0.0	1.4	**0.4**	0.4	0.2	0.8	**0.5**
Hepatitis B Acute	**0.2**	0.0	0.0	0.6	0.5	**0.4**	0.0	0.2	0.0	**0.1**
Hepatitis B Chronicand Unknown	**25.7**	2.6	1.3	4.9	5.5	**4.5**	10.1	33.0	14.4	**20.7**
Hepatitis C	**45.9**	38.2	54.7	47.9	45.0	**46.7**	77.0	36.5	40.1	**45.0**
Haemophilus influenzae b, invasive	**0.1**	0.0	0.0	0.0	0.0	**0.0**	0.0	0.3	0.0	**0.1**
HIV^	**5.9**	1.3	1.3	1.7	2.3	**1.8**	1.4	6.3	3.1	**4.0**
Listeriosis	**0.3**	0.0	0.0	0.0	0.0	**0.0**	0.4	0.2	0.5	**0.4**
Lyme	**0.2**	0.0	1.3	0.3	0.0	**0.3**	0.0	0.0	0.1	**0.1**
Malaria	**1.2**	2.6	3.9	0.0	0.5	**0.8**	1.7	1.6	1.8	**1.7**
Measles	**0.4**	0.0	0.0	0.0	0.0	**0.0**	0.7	0.6	0.4	**0.5**
Meningococcal Disease, invasive	**0.2**	1.3	0.0	0.3	0.0	**0.3**	0.4	0.0	0.0	**0.1**
Mumps	**1.3**	0.0	3.9	0.0	4.1	**1.7**	0.4	0.3	1.2	**0.7**
Paratyphoid Fever	**0.3**	0.0	0.0	0.0	0.0	**0.0**	1.0	0.3	0.9	**0.7**
Pertussis	**6.9**	6.6	36.5	4.3	1.4	**7.1**	5.2	4.1	3.4	**4.0**
Pneumococcal Disease, invasive	**7.9**	6.6	6.5	8.1	5.5	**7.0**	8.7	5.5	9.1	**7.7**
Rubella	**0.0**	0.0	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**
Salmonellosis	**18.4**	14.5	16.9	11.8	17.9	**14.5**	17.4	14.8	18.8	**17.0**
Shigellosis	**3.1**	0.0	2.6	0.3	0.5	**0.6**	2.4	1.6	3.9	**2.8**
Streptococcus Group A invasive	**3.2**	0.0	3.9	3.5	3.7	**3.2**	2.4	2.4	2.7	**2.5**
Syphilis (infectious)^	**12.2**	0.0	1.3	0.9	0.9	**0.8**	2.4	7.9	5.4	**5.8**
Tuberculosis	**5.8**	2.6	0.0	4.3	2.3	**3.1**	5.6	7.9	9.0	**8.0**
Typhoid Fever	**0.4**	0.0	0.0	0.0	0.0	**0.0**	0.7	0.3	1.7	**1.0**
Vibrio Infections	**1.2**	0.0	0.0	0.3	0.5	**0.3**	0.4	1.1	1.0	**1.0**
West Nile	**0.0**	0.0	0.0	0.3	0.0	**0.1**	0.0	0.0	0.0	**0.0**
Yersinlosis	**9.5**	2.6	9.1	2.3	2.8	**3.2**	0.4	7.2	4.1	**4.6**
Less Common Diseases										
Botulism	**0.02**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**
Brucellosis	**0.04**	0.00	0.00	0.29	0.00	**0.14**	0.00	0.00	0.00	**0.00**
Cholera Serogroup non O1 O139	**0.02**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.16	0.00	**0.06**
Creutzfeldt–Jakob disease	**0.02**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**
Diphtheria	**0.04**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**
Hantavirus	**0.04**	0.00	0.00	0.29	0.00	**0.14**	0.00	0.00	0.00	**0.00**
Legionellosis	**0.28**	0.00	0.00	0.29	0.00	**0.14**	0.00	0.16	0.52	**0.30**
Leptospirosis	**0.02**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**
Neonatal Group B Streptococcal	**0.17**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.16	0.00	**0.06**
Tularemia	**0.02**	0.00	0.00	0.29	0.00	**0.14**	0.00	0.00	0.00	**0.00**

Note: In 2013, there were no reported cases of Anthrax, Cholera Sergogroup O1O139, Viral Hemorrhagic Fevers, Leprosy, Plague, Poliomyelitis, Rabies, Rubella, Severe Acute Respiratory Syndrome, Tetanus, Trichinosis, 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**
201303	**657386**	**279968**	**1138657**	**370913**	**262105**	**119126**	**752144**	**72592**	**141830**	**69414**	**283836**
0.5	3.3	0.7	**2.2**	1.1	1.5	0.8	1.2	0.0	0.7	0.0	**0.4**
5.0	26.5	8.2	**18.2**	5.4	2.3	4.2	**4.1**	2.8	0.0	0.0	**0.7**
47.2	50.1	57.5	**51.4**	35.6	28.2	26.9	**31.6**	17.9	13.4	11.5	**14.1**
237.9	407.4	251.5	**339.1**	263.9	285.8	278.7	**273.9**	186.0	418.1	458.1	**368.5**
0.0	0.2	0.4	**0.2**	0.3	1.5	0.0	**0.7**	0.0	0.0	0.0	**0.0**
1.0	2.9	2.9	**2.6**	1.1	0.0	0.0	**0.5**	0.0	0.0	0.0	**0.0**
1.0	1.2	0.4	**1.0**	1.6	1.5	0.0	**1.3**	0.0	0.7	0.0	**0.4**
1.0	3.7	3.9	**3.3**	8.1	5.7	12.6	**8.0**	2.8	0.7	0.0	**1.1**
9.4	22.1	22.2	**19.9**	12.1	5.7	7.6	**9.2**	5.5	7.1	7.2	**6.7**
24.8	115.9	24.6	**77.4**	16.7	11.1	9.2	**13.6**	12.4	37.4	14.4	**25.4**
0.0	0.8	0.7	**0.6**	0.3	0.0	0.0	**0.1**	2.8	0.0	0.0	**0.7**
0.0	0.8	0.4	**0.5**	0.0	0.0	0.0	**0.0**	1.4	0.0	0.0	**0.4**
107.8	69.4	13.9	**62.5**	12.9	5.7	5.9	**9.3**	6.9	3.5	5.8	**4.9**
20.4	58.9	29.3	**44.8**	39.1	53.8	57.9	**47.2**	49.6	64.9	24.5	**51.1**
0.0	0.5	0.0	**0.3**	0.0	0.0	0.0	**0.0**	0.0	0.7	0.0	**0.4**
2.0	19.8	3.2	**12.6**	4.0	4.2	2.5	**3.9**	4.1	9.9	0.0	**6.0**
0.0	0.8	0.0	**0.4**	0.3	0.4	1.7	**0.5**	0.0	0.0	0.0	**0.0**
0.0	0.3	0.4	**0.3**	0.0	0.4	0.0	**0.1**	0.0	0.0	0.0	**0.0**
0.0	2.1	0.4	**1.3**	0.5	0.4	0.0	**0.4**	0.0	0.7	0.0	**0.4**
0.5	0.0	2.5	**0.7**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**
0.0	0.3	0.4	**0.3**	0.8	0.0	0.0	**0.4**	2.8	0.0	0.0	**0.7**
0.5	0.9	0.4	**0.7**	0.3	0.0	0.0	**0.1**	11.0	12.0	0.0	**8.8**
0.0	0.3	0.0	**0.2**	0.0	0.0	0.0	**0.0**	0.0	0.7	0.0	**0.4**
1.0	2.4	7.9	**3.5**	20.2	19.5	19.3	**19.8**	2.8	2.1	5.8	**3.2**
8.0	6.9	13.2	**8.6**	6.2	9.5	10.1	**8.0**	9.6	8.5	8.6	**8.8**
0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**
19.4	21.3	25.7	**22.0**	25.9	16.0	16.8	**21.0**	15.2	19.0	8.6	**15.5**
2.0	8.1	3.9	**6.0**	4.0	1.5	2.5	**2.9**	0.0	0.0	0.0	**0.0**
0.5	4.3	2.9	**3.3**	3.5	3.4	1.7	**3.2**	5.5	4.9	8.6	**6.0**
6.5	60.5	7.1	**37.9**	3.2	1.9	2.5	**2.7**	0.0	0.7	1.4	**0.7**
8.9	9.6	2.1	**7.6**	1.6	1.5	0.8	**1.5**	5.5	2.1	2.9	**3.2**
0.5	0.2	0.4	**0.3**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**
1.0	2.1	3.6	**2.3**	0.8	1.1	5.0	**1.6**	1.4	0.0	0.0	**0.4**
0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**
12.9	21.9	22.2	**20.4**	15.1	11.8	6.7	**12.6**	4.1	2.8	1.4	**2.8**
0.00	0.00	0.00	**0.00**	0.27	0.00	0.00	**0.13**	0.00	0.00	0.00	**0.00**
0.00	0.00	0.00	**0.00**	0.27	0.00	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	0.00	0.00	**0.13**	0.00	0.00	0.00	**0.00**
0.00	0.30	0.00	**0.18**	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**	1.38	0.00	0.00	**0.35**
0.00	0.15	0.00	**0.09**	0.81	1.14	0.00	**0.80**	0.00	0.00	0.00	**0.00**
0.00	0.00	0.00	**0.00**	0.00	0.38	0.00	**0.13**	0.00	0.00	0.00	**0.00**
0.00	0.30	0.00	**0.18**	0.27	0.00	1.68	**0.40**	1.38	0.71	0.00	**0.70**
0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**

*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. Due to a reporting delay, the number of *chlamydia* and gnoorrhea infection cases for Northwest HSDA are not final in this report.

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 2014 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 and invasive group A streptococcal disease 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 2012. The 2013 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. The BC total age group and sex numbers for AIDS, chlamydia (genital), gonorrhea (genital), HIV and syphilis (infectious) is the sum of the following genders: female, male, transgender and gender unknown.

6. All active TB case data is extracted from the Integrated Public Health Information System (iPHIS). Population estimates come from BC Stats (http://www.bcstats.gov.bc.ca/Home.aspx).

7. TB incidence in BC is higher than the Canadian average because of the large number of foreign-born individuals entering BC from countries with high TB incidence, and because of a higher prevalence of key comorbidities in BC compared to Canada as a whole.Additional information on the epidemiology of TB can be found in the BCCDC TB Annual Report (http://www.bccdc.ca/util/about/annreport/default.htm).

8. 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

9. 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* Infections and yersiniosis have not been nationally notifiable diseases in the period 2003 through 2012.

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

11. 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).

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

13. 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. 2013 national rates are unavailable currently until data updates are finalized.

14. Population estimates come from BC Stats (http://www.bcstats.gov.bc.ca/Home.aspx). 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) .

15. While we endeavour to include data on the majority of reportable diseases in this publication, data on some are not included. For information on the incidence of these diseases in 2013 in British Columbia, please contact epidserv@bccdc.ca.

Contributors

Communicable Disease Prevention and Control Service
Dr. Bonnie Henry, Medical Director
Dr. Jane Buxton, Physician Epidemiologist
Dr. David Patrick, Physician Epidemiologist
Dr. Danuta Skowronski, Physician Epidemiologist
Dr. Eleni Galanis, Physician Epidemiologist and Editor
Catharine Chambers, Epidemiologist
Nuria Chapinal, Epidemiologist
Marshall Taylor, Epidemiologist
Mei Chong, Biostatistician
Sunny Mak, Senior Medical Geographer
Lisan Kwindt, Research and Surveillance Assistant
Helen Li, Surveillance Analyst
Sophie Li, Surveillance Analyst
Wrency Tang, Surveillance Analyst
Sophie Wang, MPH practicum student

Immunization and Vaccine Preventable Disease
Dr. Monika Naus, Medical Director
Samara David, Epidemiologist
David Puddicombe, Epidemiologist
Lauren MacDonald, Epidemiologist

Clinical Prevention Services
Dr. Mark Gilbert, Medical Lead
Dr. Victoria Cook, TB Medical Lead
Theodora Consolacion, Epidemiologist
Travis Hottes, Epidemiologist
David Roth, Epidemiologist
Elsie Wong , Federal Field Surveillance Officer
Fay Hutton, Surveillance Analyst
Sung Jae Lee, Surveillance Analyst
Stanley Wong, Surveillance Analyst
Gloria Mui, Registry Clerk