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

2014

Prepared by:

Communicable Disease Prevention and Control Services (CDPACS)

September 3, 2015

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

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

Contents Page

2014 Highlights

The year 2014 was characterized by moderate and stable levels of many reportable communicable diseases. However, several outbreaks punctuated the year; most noteworthy were the emergence of enterovirus D68, the large measles outbreak in Fraser East and the early and intense influenza season.

Vaccine-preventable diseases

The 2014-15 influenza season was characterized by early and intense influenza A (H3N2) activity with a record number of facility outbreaks. Two travel-related influenza A (H7N9) cases occurred in January 2014; these are the first A (H7N9) imported cases reported in North America. The incidence of measles was the highest it has been since 1986 due to a large outbreak in an underimmunised community in Fraser East. Pertussis incidence was low throughout the province except in parts of Northern Health due to an outbreak affecting mainly children. The incidence of invasive meningococcal disease and mumps were low and the incidence of invasive pneumococcal disease, stable.

Sexually-transmitted and bloodborne pathogens

The rate of new diagnoses of HIV remained stable while the rate of AIDS continued to decline. Reports of genital chlamydia and gonorrhea have been increasing. The rates of infectious syphilis continued to be high in 2014, primarily in adult males living in Vancouver. Acute hepatitis B infection rates remained low and stable. Chronic hepatitis B and hepatitis C infection rates remain high but stable.

Respiratory diseases

In the fall of 2014, enterovirus D68 emerged in North America and led to 211 infections in BC of which five had neurological disease and three died. The rate of tuberculosis remains stable.

Enteric, food and waterborne diseases

Twenty-four enteric disease outbreaks were reported in 2014, with *Salmonella* and norovirus causing the majority. An unresolved outbreak of locally-acquired *Cyclospora* infection led to a higher incidence in 2014 than in recent years. The incidence of shiga-toxigenic *E. coli* (STEC) infection decreased in 2014; no outbreaks were reported. The hepatitis A infection rate remained low, with the majority of cases being travel-related. The incidence of *Salmonella* infection increased to the highest rate in decades due to a resurgence of *Salmonella* Enteritidis associated with poultry products. The incidence of *Vibrio i*nfection (mainly *V. parahaemolyticus)* continues to increase for unknown reasons reaching a high of 70 cases in 2014, the ma¬jority of which were associated with the consumption of raw oysters.

Vectorborne and zoonotic diseases

The incidence of Lyme Disease in BC remains low and restricted to southern parts of the province, although eastern Canada has seen a rapid emergence. Rabies exposures have remained constant, the majority of which occurred outside of Canada. No human case of West Nile Virus infection was reported.

Others

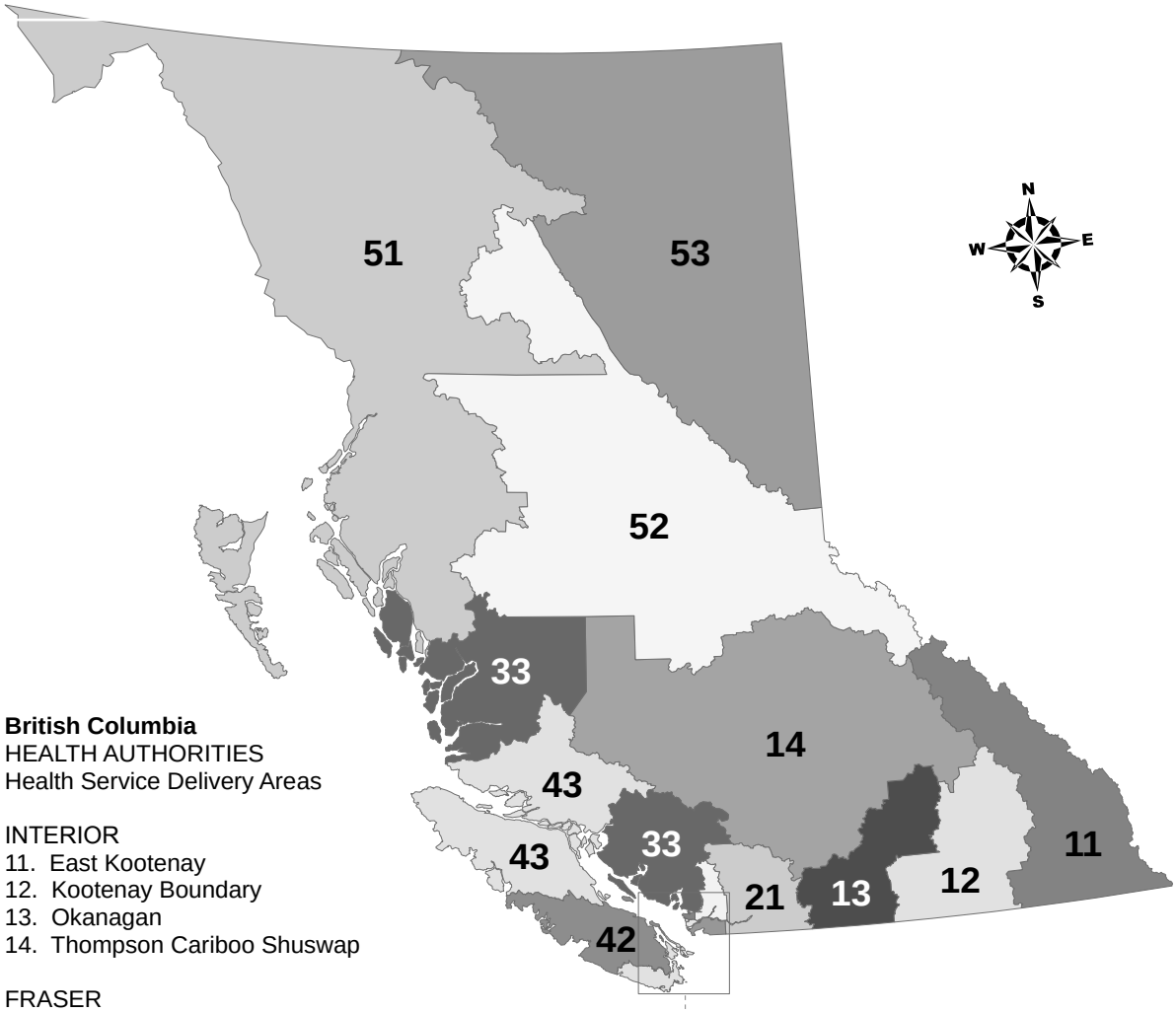
E. coli resistance to ciprofloxacin and vancomycin-resistant enterococci has increased over time. An outbreak of legionellosis occurred in Fraser South. The incidence of *Cryptococcus gattii* infection remains low and stable with the majority of cases still reported from Central Vancouver Island and Fraser East.

Dr. Eleni Galanis

Interim Medical Director,

Communicable Disease Prevention and Control Services, BCCDC

British Columbia Health Service Delivery Areas



British Columbia
HEALTH AUTHORITIES
Health Service Delivery Areas

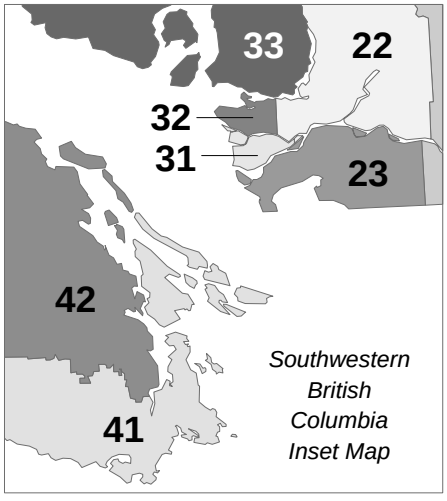
INTERIOR
11. East Kootenay
12. Kootenay Boundary
13. Okanagan
14. Thompson Cariboo Shuswap

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



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

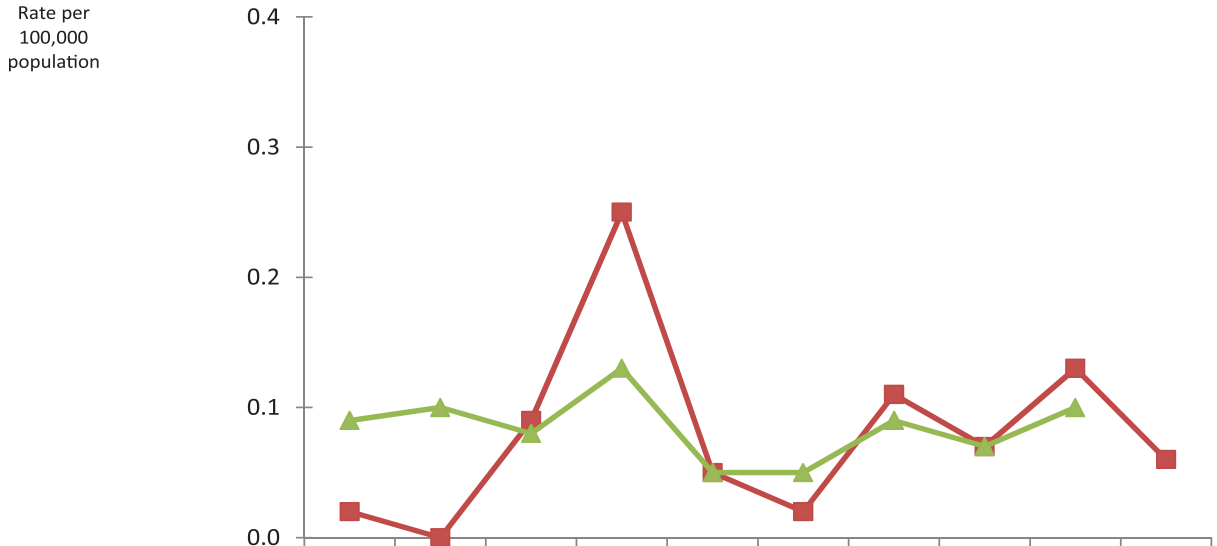
Diseases Preventable by Vaccination

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

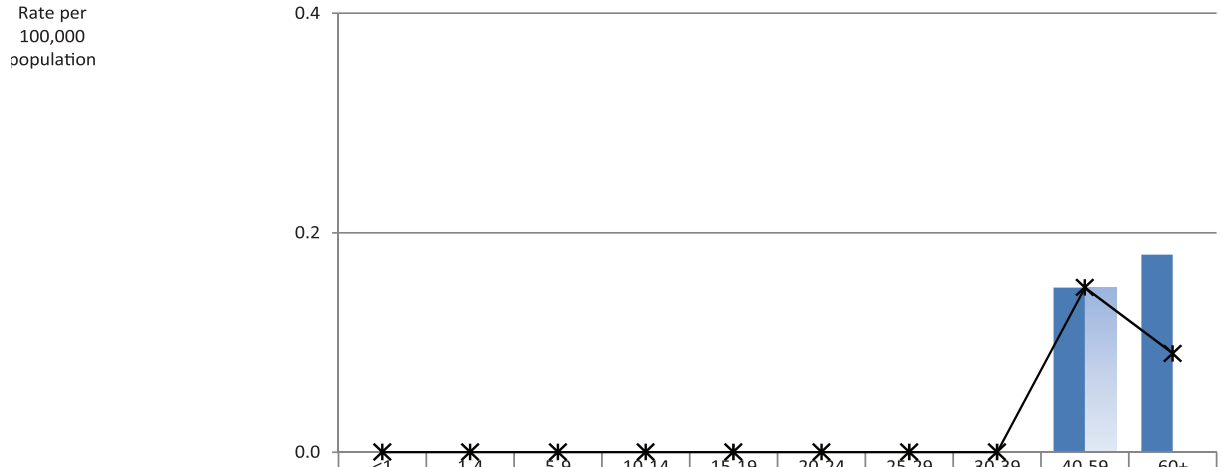
Three cases of invasive Haemophilus influenzae type b (Hib) disease were reported in 2014. No cases were reported in children. All cases were aged ≥ 40 years; one was male and two were female. Hib vaccine is routinely given in infancy with a booster dose in the second year of life. Its use in adults 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, 2005-2014



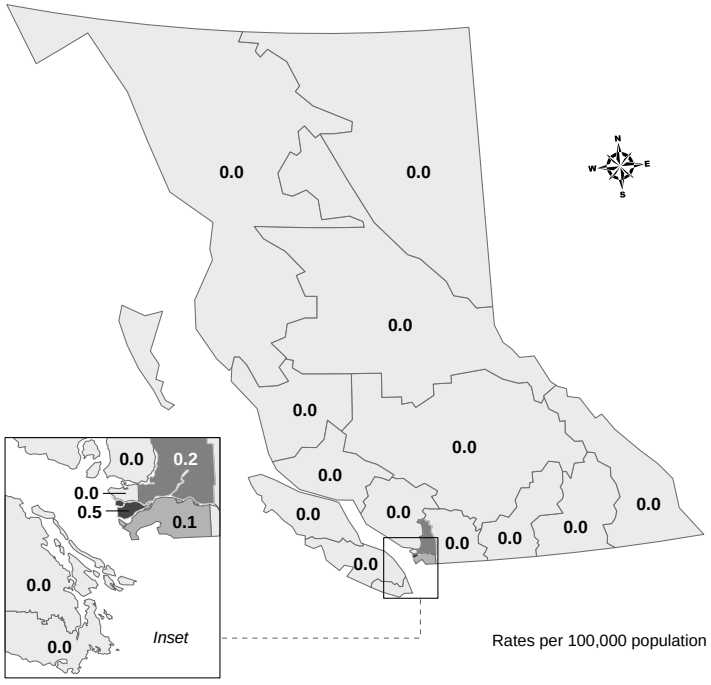
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
BC Invasive Hib Reports	1	0	4	11	2	1	5	3	6	3
BC Invasive Hib Rate	0.02	0.00	0.09	0.25	0.05	0.02	0.11	0.07	0.13	0.06
Canadian Hib Rate	0.09	0.10	0.08	0.13	0.05	0.05	0.09	0.07	0.10	

1.2 Haemophilus influenzae type b (Hib), invasive Rates by Age Group and Sex, 2014



	<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	0.2
Invasive Hib Rate - Male	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0
Invasive Hib Rate	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1
Invasive Hib Reports - Female	0	0	0	0	0	0	0	0	1	1
Invasive Hib Reports - Male	0	0	0	0	0	0	0	0	1	0
Invasive Hib Reports	0	0	0	0	0	0	0	0	2	1

1.3 Haemophilus influenzae type b (Hib), invasive Rates by HSDA, 2014



ID	Health Service Delivery Area	Cases	Rate
11	East Kootenay	0	0.0
12	Kootenay Boundary	0	0.0
13	Okanagan	0	0.0
14	Thompson Cariboo Shuswap	0	0.0
21	Fraser East	0	0.0
22	Fraser North	1	0.2
23	Fraser South	1	0.1
31	Richmond	1	0.5
32	Vancouver	0	0.0
33	North Shore/Coast Garibaldi	0	0.0
41	South Vancouver Island	0	0.0
42	Central Vancouver Island	0	0.0
43	North Vancouver Island	0	0.0
51	Northwest	0	0.0
52	Northern Interior	0	0.0
53	Northeast	0	0.0

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 2014-15 influenza season, spanning week 40 (starting September 28, 2014) through week 17 (ending May 2, 2015).

Influenza surveillance in BC consists of monitoring major trends in influenza activity and circulating viruses to inform prevention and control programs, including vaccine effectiveness. 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. A surveillance pilot for monitoring influenza-related severe outcomes was also newly implemented for the 2014-15 season.

Since 2004, the BCCDC has 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 national Sentinel Practitioner Surveillance Network (SPSN), 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 2014-15 influenza season in BC was characterized by early and intense influenza A(H3N2) activity, followed by low-level, late-season influenza B circulation. Early indicators (e.g. facility outbreaks, lab detections) of influenza activity during the 2014-15 season began in late September (week 39-40). Activity increased starting in late November (weeks 47-48) and peaked during a 4-week period from late December to early January (weeks 52-2). Multiple community indicators (e.g. sentinel physician reporting, MSP visits) suggested higher than expected activity during this peak period. The 2014-15 influenza season also saw a record number of long-term care facility outbreaks (n=165), the highest number recorded over the past 11 seasons and almost double the number reported during the 2012-13 season (n=91), the last season of dominant A(H3N2) activity and formerly the season with the highest recorded number of facility outbreaks. Elderly adults ≥65 years comprised the majority of influenza detections during the 2014-15 season, driven in part by the record number of facility outbreaks. Findings from the severe outcome surveillance pilot mirrored trends seen in other surveillance indicators with the majority of severe cases due to A(H3N2) and predominantly affecting elderly adults. In mid-season analysis from the BCCDC-led national Sentinel Practitioner Surveillance Network (SPSN), interim estimates of vaccine effectiveness showed little to no protection from this season's influenza vaccine, even among working-age adults, consistent with substantial vaccine mismatch against circulating, antigenically drifted A(H3N2) viruses.

1. Sentinel physician reporting of ILI

During the 2014-15 influenza season (week 40 to week 17), 36 active sentinel sites (each with one or more contributing practitioners) representing all regional health authorities in BC contributed to sentinel ILI surveillance. The proportion of patient visits due to ILI seen by these sentinel sites was generally higher than or within expected historical ranges throughout the influenza season until early February (week 5), after which proportions were generally at or below 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 sharp rise beginning in late December (week 52), exceeding 10-year 75th percentiles until mid-February (week 6) and gradually returning to expected seasonal levels thereafter (Figure 2.3). Provincial rates peaked in early January (weeks 1-2), with some expected regional variation observed across health authorities.

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. Lab-confirmed influenza outbreaks are defined as ILI outbreaks where at least one specimen has tested positive for an influenza virus. 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 2014-15 influenza season (week 40 to week 17), 172 lab-confirmed influenza outbreaks in facilities were reported to BCCDC, including 165 from LTCFs and 7 from acute care (Figure 2.4). In all but 13 of these outbreaks influenza A was detected; influenza B was detected in 12 outbreaks, and one facility had both influenza A and B detected. Of the 113 out of 159 influenza A outbreaks where subtype information was available, all were influenza A(H3N2). Two LTCF outbreaks where influenza A(H3N2) was detected were additionally reported with onset in week 39 (i.e. prior to the start of the influenza surveillance period, not shown on Figure 2.4), suggesting earlier than usual influenza activity. In no other season since the 2009 pandemic have LTCF outbreaks been reported prior to week 45. Lab-confirmed influenza B outbreaks continued to be reported beyond week 17, the end of the influenza surveillance period (also not shown on Figure 2.4), consistent with late-season circulation of influenza B viruses.

The 2014-15 season was associated with the highest number of LTCF outbreaks recorded over the past 11 seasons, spanning 2003-04 to 2013-14 (Table 2.1, Figure 2.5). During the 2014-15 season, a total of 165 LTCF outbreaks were reported, almost double the number reported during the 2012-13 season (n=91), the last season of dominant A(H3N2) activity and formerly the season with the highest recorded number of facility outbreaks. Conversely, seasons of dominant A(H1N1) activity (such as 2009 pandemic and 2013-14 season) were associated with the fewest number of reported outbreaks. The record number of LTCF outbreaks this season is likely due to a combination of factors, including dominant circulation of antigenically drifted (i.e. vaccine-mismatched) A(H3N2) viruses, increased susceptibility among elderly adults to A(H3N2) 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. Although there have been no major changes in recent years, differences in influenza diagnosis and outbreak reporting protocols over time should also be taken into account, particularly when comparing the most recent to the most distant seasons.

In addition to LTCF reports, 52 ILI outbreaks were reported from schools during the 2014-15 influenza season, including 6 where influenza A was detected [1 A(H3N2) and 5 subtype unknown] and 2 where influenza B was detected. The number of ILI school outbreaks this season is comparable to the prior 2013-14 season (n=46, with 5 lab-confirmed as influenza) but is about one-half that of the 2012-13 season (n=96, with 13 lab-confirmed as influenza), the last prior season of dominant A(H3N2) activity.

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 requested. 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 2014-15 influenza season (week 40 to week 17), the BC PHMRL tested 9,933 patients for respiratory viruses. Of these, 2,621 (26%) were positive for influenza, including 2,305 (88%) with influenza A [2,280 A(H3N2), 16 A(H1N1)pdm09, 2 A(H7N9), and 7 influenza A un-subtyped], 314 (12%) with influenza B, and 2 (<1%) additional patients, both elderly adults, who had 2 lab-confirmed influenza infections during the course of the 2014-15 season, one due to influenza A(H3N2) and one due to influenza B. Two cases of avian influenza A(H7N9) were detected in late January in a BC couple who had recently returned from travelling in China. These are the first documented cases of human infection with A(H7N9) imported to North America. For a description of these BC H7N9 cases, see: www.bccdc.ca/NR/rdonlyres/2C1CE-FEE-1708-49CC-A6E0-5EF0C97EB987/0/Full_ERVUpdate_H7N9_20150131.pdf

Overall, influenza A(H3N2) was the dominant subtype throughout most of the 2014-15 season, with some low-level influenza B activity observed late in the season and continuing past week 17 (Figure 2.6). Influenza positivity at the BC PHMRL increased above 10% starting in late November (weeks 47-48), peaked at >40% in late December and early-to-mid January (week 52-1) and then gradually decreased. During this peak period, A(H3N2) viruses comprised approximately 97% of all influenza detections. Influenza B viruses comprised over 50% of all influenza detections starting in late February (week 8) until the end of season. The majority of influenza infections were detected among elderly adults ≥65 years of age during the 2014-15 influenza season, contributed in part by a record number of influenza outbreaks reported in LTCFs.

Among other respiratory viruses, RSV was the second most commonly detected respiratory virus after influenza throughout most of the 2014-15 season (week 48-12), concurrent with heightened influenza circulation, while entero/rhinoviruses were commonly detected at the beginning (week 40-47) and end (week 13-17) of the season. Other respiratory viruses were also sporadically detected.

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

During the 2014-15 influenza season (week 40 to week 17), the BC Children's and Women's Health Centre Laboratory conducted 3,560 tests for influenza A and 2,785 tests for influenza B. Of these, 120 (3%) tests were positive for influenza A and 24 (1%) tests were positive for influenza B. As with laboratory surveillance at the BC PHMRL, influenza A was the predominant influenza virus detected, followed by a smaller late-season wave of influenza B (Figure 2.7). RSV was the mostly commonly detected virus among the non-influenza respiratory viruses.

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, 2014 to April 30, 2015, 43 BC isolates were sent to NML for strain characterization, including 28 influenza A(H3N2) and 15 influenza B. Of the 28 A(H3N2) viruses antigenically characterized, only one (4%) was similar to A/Texas/50/2012(H3N2), the WHO-recommended A(H3N2) component for the 2014-15 Northern Hemisphere influenza vaccine used this season. The remaining 27 (96%) viruses were instead similar to A/Switzerland/9715293/2013(H3N2), the WHO-recommended A(H3N2) component for next season's 2015-16 Northern Hemisphere influenza vaccine, consistent with antigenic drift in circulating viruses (i.e. vaccine mismatch). Of the 15 influenza B viruses antigenically characterized, 14 (93%) were similar to B/Massachusetts/02/12 (Yamagata lineage) and 1 (7%) was similar to B/Brisbane/60/2008 (Victoria lineage).

Due to difficulties in growing A(H3N2) viruses for antigenic characterization by HI assay during the 2014-15 season, genetic characterization (i.e. sequencing) was performed on 29 BC A(H3N2) isolates that did not grow to sufficient titres for HI assay. Of the 29 A(H3N2) viruses genetically characterized, 28 (97%) belonged to a genetic group that typically shows reduced titres to A/Texas/50/2012 due to amino acid mutations at antigenic sites, again consistent with antigenic drift (i.e. vaccine mismatch). The remaining one (3%) virus belonged to a genetic group that does not show reduced titres to A/Texas/50/2012.

For context, the WHO-recommended components for the 2014-15 and upcoming 2015-16 Northern Hemisphere trivalent influenza vaccines (TIV) are listed below:

2014-15*	2015-16†
A/California/07/2009(H1N1) pdm09-like virus	A/California/07/2009(H1N1)pdm09-like virus‡
A/Texas/50/2012(H3N2)-like virus	A/Switzerland/9715293/2013(H3N2)-like virus§
B/Massachusetts/2/2012-like virus (Yamagata lineage)	B/Phuket/3073/2013-like virus (Yamagata lineage)**

* These recommended strains are the same as those used for the 2013-14 Northern Hemisphere vaccine.

† These recommended strains are the same as those that will be used for the 2015 Southern Hemisphere vaccine.

‡ The A/California/07/2009 recommended strain has been retained as the A(H1N1) component since the 2009 pandemic and has been included in the North-

ern Hemisphere vaccine since 2010-11.

§ A/South Australia/55/2014, A/Norway/466/2014, and A/Stockholm/6/2014 are A/Switzerland/9715293/2013-like viruses. Recommended strain is considered antigenically distinct from the A/Texas/50/2012-like virus recommended for the 2014-15 Northern Hemisphere vaccine and clusters within the emerging phylogenetic clade 3C.3a.

** Recommended strain is the same influenza B/Yamagata lineage as the B/Massachusetts/2/2012-like virus recommended for the 2014-15 Northern Hemisphere vaccine but represents a phylogenetic clade-level change from clade 2 to clade 3. A different clade 3 virus (B/Wisconsin/1/2010-like) was previously included in the influenza vaccine for the 2012-13 season.

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, 2014 to April 30, 2015, 57 influenza A(H3N2) viruses from BC were tested against amantadine and all were resistant; 73 influenza viruses [58 A(H3N2) and 15 influenza B] were tested against oseltamivir and all were sensitive; and 72 influenza viruses [57 A(H3N2) and 15 influenza B] were tested against zanamivir and all were sensitive. Nationally, one non-BC A(H3N2) virus, out of 1,313 tested viruses, was found to be sensitive to amantadine and one non-BC A(H3N2) virus, out of 867 tested viruses, was found to be resistant to oseltamivir.

5. Influenza Hospitalizations

On December 1, 2014, the BCCDC and the regional Health Authorities implemented an influenza severe outcome surveillance (SOS) pilot in BC for monitoring lab-confirmed influenza hospitalizations. Since implementation of the influenza SOS pilot to week 17, a total of 790 lab-confirmed influenza hospitalizations were reported to BCCDC. The vast majority of severe influenza cases during the 2014-15 season were due to influenza A, predominately A(H3N2) where subtype information was available; however, an increasing proportion of cases toward the end of the season were influenza B, consistent with other provincial surveillance indicators (Figure 2.8). Elderly adults were disproportionately represented among influenza-related hospitalizations this season, as is typically observed during A(H3N2)-dominant seasons. While individuals ≥65 years of age comprise <20% of the BC population, they comprised >70% of influenza hospitalizations reported (Figure 2.9). Similarly, while individuals ≥80 years old make up <5% of the BC population, they comprised about half of all influenza-related hospitalizations. The median age of cases overall was 79 years (range: <1 year to >100 years). The majority of cases (>80%) had one or more pre-existing chronic comorbidity. During the first season of the influenza SOS pilot, a lower median age was identified among hospitalized patients with lab-confirmed influenza self-identifying as Aboriginal (median age=51 years) compared to those who did not (median age=80 years). The reasons for this surveillance signal are unclear and likely multi-factorial.

6. Sentinel influenza vaccine effectiveness (VE) monitoring

Interim estimates of vaccine effectiveness against medically attended, lab-confirmed influenza for the 2014-15 influenza vaccine were derived in January 2015 using surveillance data and respiratory specimens collected from patients presenting with ILI to sentinel physicians participating in the BCCDC-led Canadian Sentinel Practitioner Surveillance Network (SPSN) in BC, Alberta, Ontario and Quebec.

Of the characterized viruses contributing to VE analysis, virtually all (99%) were A(H3N2) viruses from early in the epidemic that clustered with phylogenetic clades considered antigenically distinct from the vaccine strain. Consistent with this substantial vaccine mismatch in circulating viruses, little to no protection against the dominant circulating A(H3N2) viruses was found by the Canadian SPSN in mid-season analysis. VE against medically attended, lab-confirmed A(H3N2) infection was estimated at -8%, with 95% confidence intervals (CIs) spanning -50% to 23%. When analyses were restricted to non-elderly adults 20-64 years old, VE was 2% (95% CI: -49 to 36%).

Mid-season findings were published in EuroSurveillance, an open-access peer-reviewed journal, in January 2015: http://www.eurosurveillance.org/Viewarticle.aspx?ArticleId=21022

Virologic analyses identifying vaccine mismatch were also communicated earlier in the season by SPSN investigators to inform real-time adjustments to the Association of Medical Microbiology and Infection Disease (AMMI) Canada antiviral guidelines for outbreak control in anticipation of this low VE, see: http://www.pulsus.com/journals/abstract.jsp?sCurrPg=abstract&jnlKy=3&atlKy=13292&isuKy=1247&isArt=t&fromfold=Current+Issue&fold=Abstract

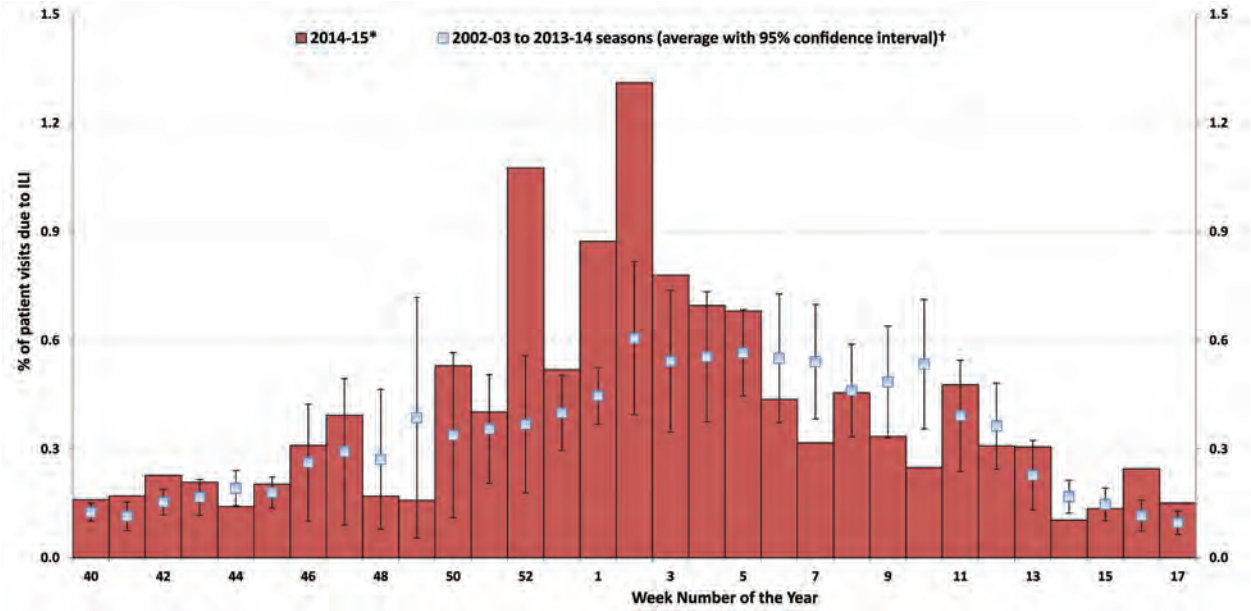
2.1 Number of Reported Lab-Confirmed Influenza Outbreaks in Long-Term Care Facilities (LTCF) British Columbia, Week 40 to Week 17, 2003-04 to 2014-15 Seasons

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
2014-15†	165

* 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).

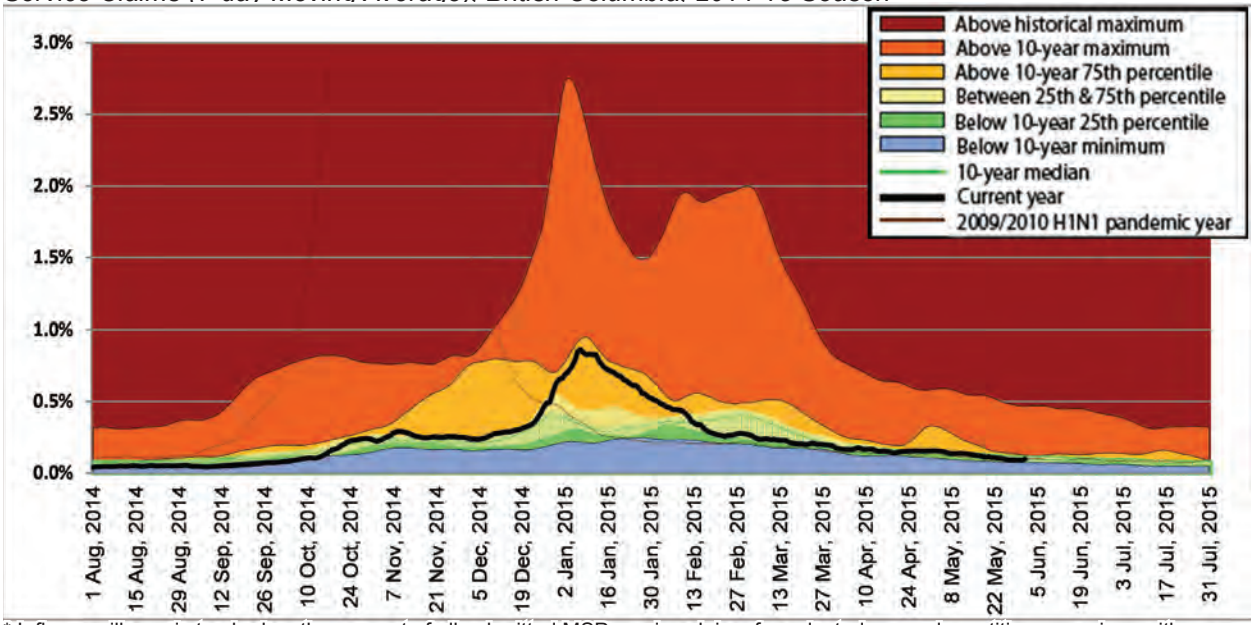
† Includes one lab-confirmed influenza outbreak reported in an assisted living facility.

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, 2014-15 Season



* Surveillance period includes week 40 (starting September 28, 2014) to week 17 (ending May 2, 2015), inclusive.
† Historical average includes 2002-03 to 2013-14 seasons, excluding 2008-09 and 2009-10 seasons due to atypical seasonality.

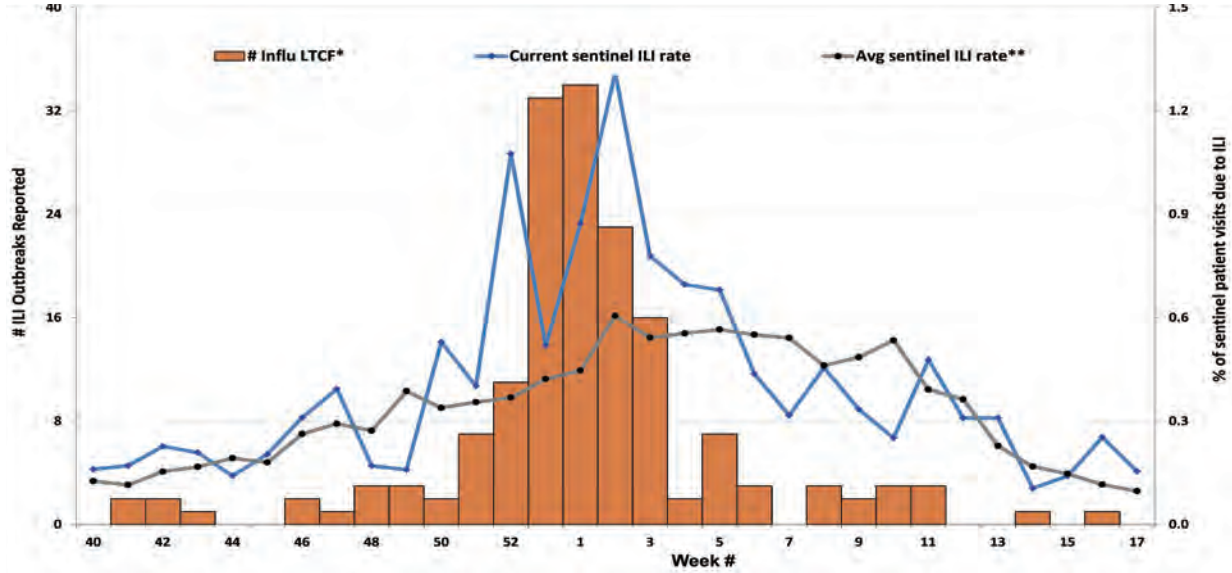
2.3 BC MSP General Practitioner Service Claims for Influenza Illness (Il) as a Proportion of All Submitted Service Claims (7-day Moving Average), British Columbia, 2014-15 Season*



* Influenza illness is tracked as the percent of all submitted MSP service claims for selected general practitioner services with a diagnosis of influenza (ICD-9 code 487). Data are provided by Population Health Surveillance and Epidemiology, BC Ministry of Health Services.

Note: Week including August 1, 2014 corresponds to calendar week 31; data are current to June 1, 2015.

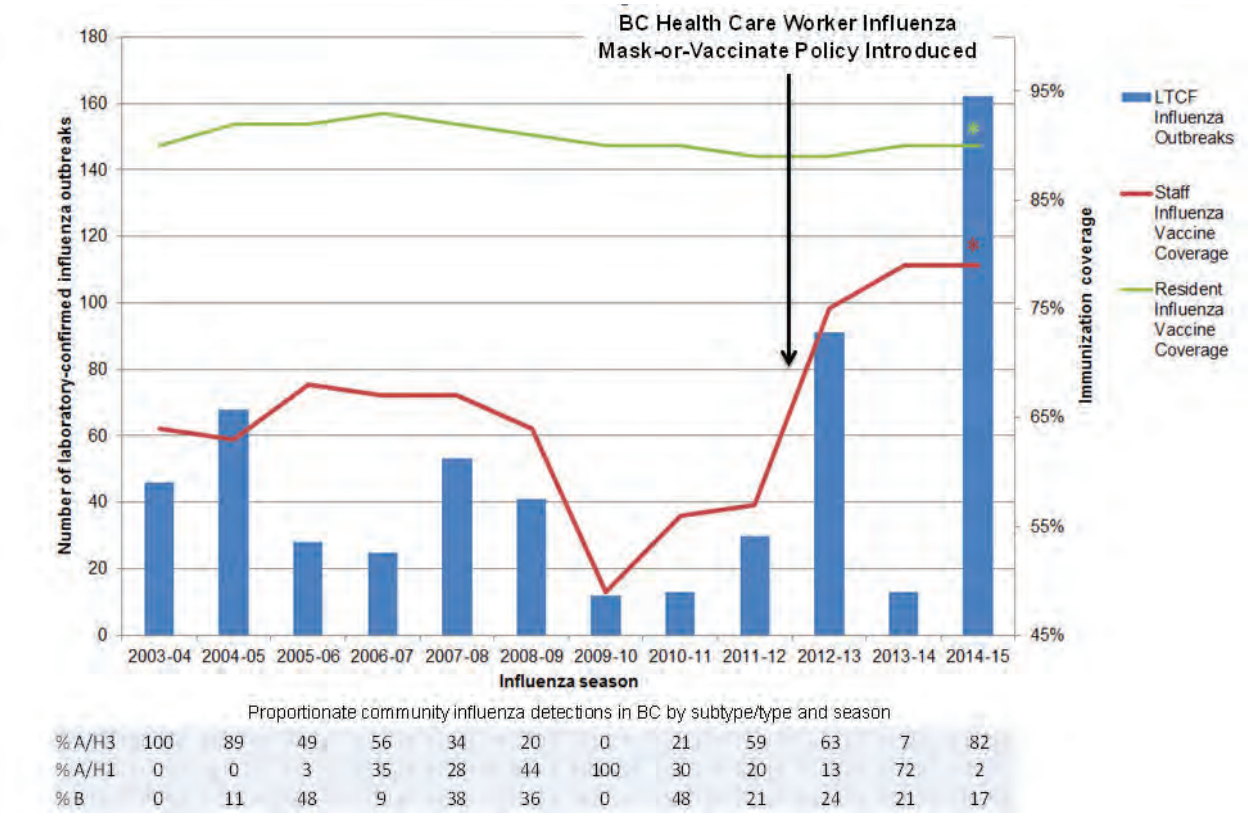
2.4 Number of Lab-Confirmed Influenza Outbreaks in Long-term Care Facilities (LTCF) Reported to BCCDC per Week Compared to Current Sentinel Influenza-Like Illness (ILI) Rate and Historical Average for the Past 10 Seasons, British Columbia, 2014-15 Season



* Lab-confirmed influenza outbreak in a 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 2002-03 to 2013-14 seasons, excluding 2008-09 and 2009-10 seasons due to atypical seasonality.

2.5 Number of reported lab-confirmed influenza outbreaks in long-term care facilities (LTCF) and influenza vaccine coverage among residents and staff, British Columbia, week 40 to week 17, 2003-04 to 2014-15



Proportionate community influenza detections in BC by subtype/type and season

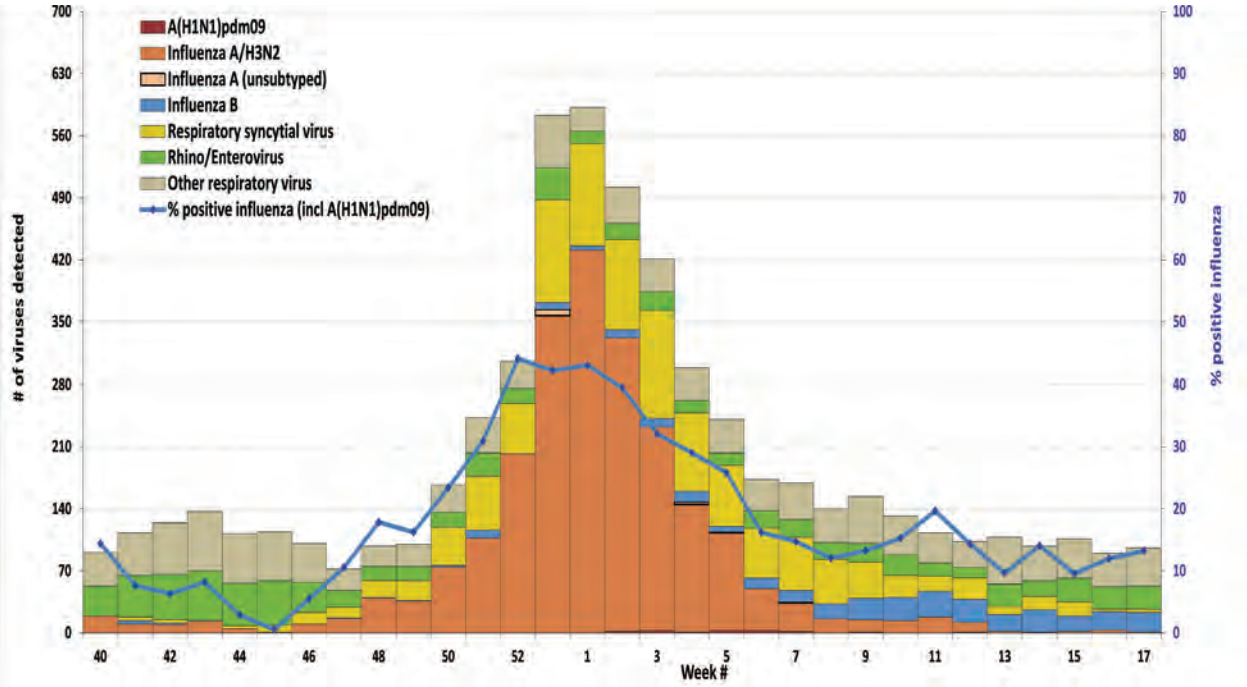
	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
% A/H3	100	89	49	56	34	20	0	21	59	63	7	82
% A/H1	0	0	3	35	28	44	100	30	20	13	72	2
% B	0	11	48	9	38	36	0	48	21	24	21	17

* Influenza vaccination coverage among care facility residents and staff adapted from: www.bccdc.ca/imm-vac/BCImmunizationCov/flucoverage/default.htm. Estimates for 2013-14 and 2014-15 have not yet been posted.

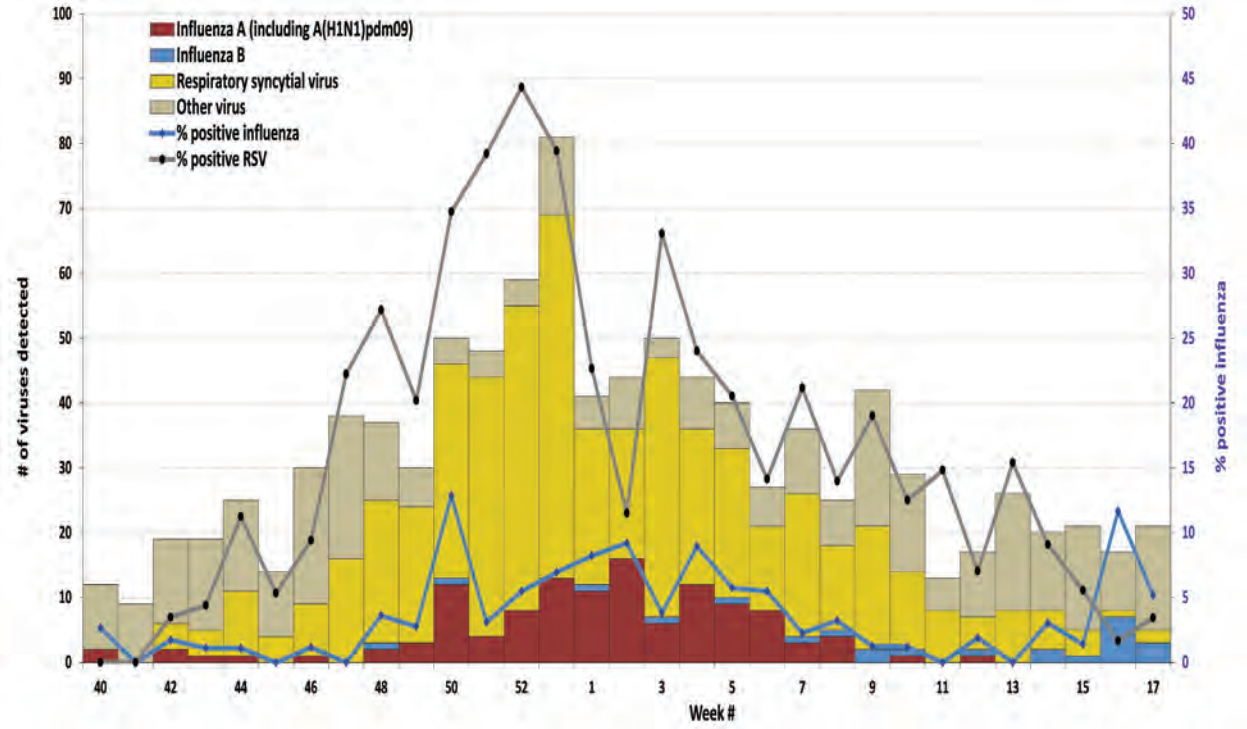
Proportionate influenza subtype/type distributions for BC were adapted from archived summary reports published in the Canada Communicable Disease Report for the 2003-04 to 2006-07 seasons and from publications of the Canadian Sentinel Physician Surveillance Network (SPSN) [BC-specific] for the 2007-08 to 2013-14 seasons. Preliminary data are shown for 2014-15.

Historic outbreak tallies are from the BC Annual Summary of Reportable Diseases: www.bccdc.ca/NR/rdonlyres/D8C85F70-804C-48DB-8A64-6009C9FD49A3/0/2013CDAnnualReportFinal.pdf. Tallies for 2014-15 are preliminary and may be adjusted with final data reconciliation. Influenza outbreaks are defined according to the national FluWatch case definition of two or more cases of influenza-like illness within a 7 day period including at least one laboratory-confirmed case: www.phac-aspc.gc.ca/fluwatch/14-15/def14-15-eng.php.

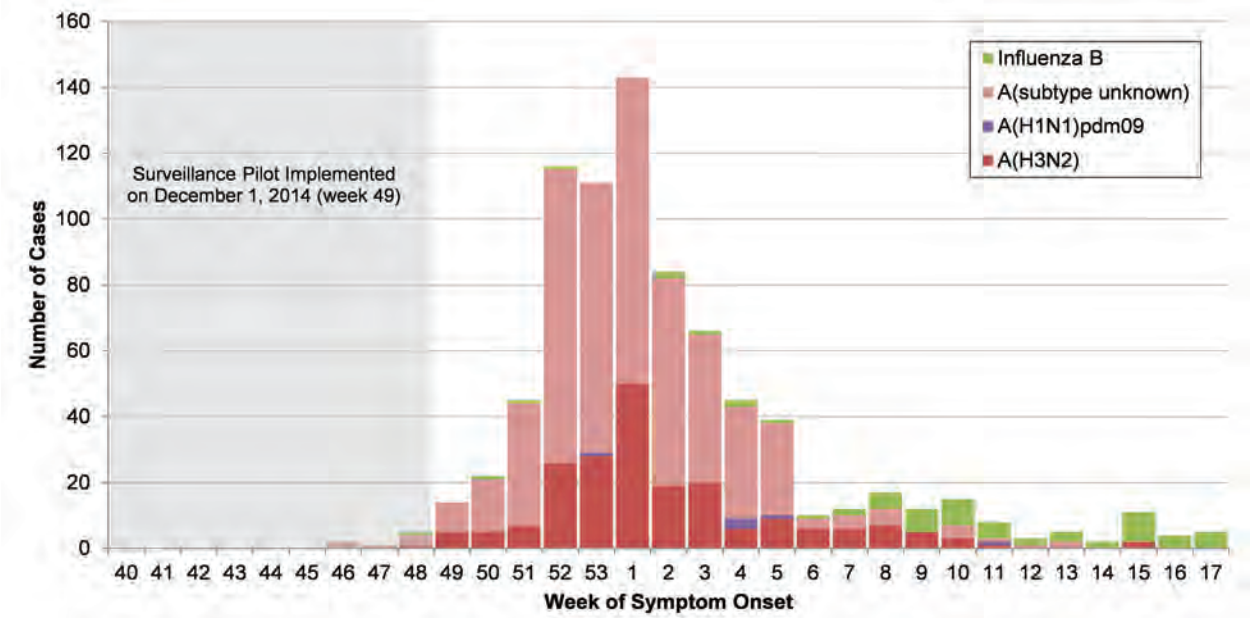
2.6 Influenza and Other Virus Detections Among Respiratory Specimens, BC Public Health Microbiology & Reference Laboratory, British Columbia, 2014-15 Season



2.7 Influenza and Other Virus Detections Among Respiratory Specimens, BC Children's and Women's Health Centre Laboratory, British Columbia, 2014-15 Season



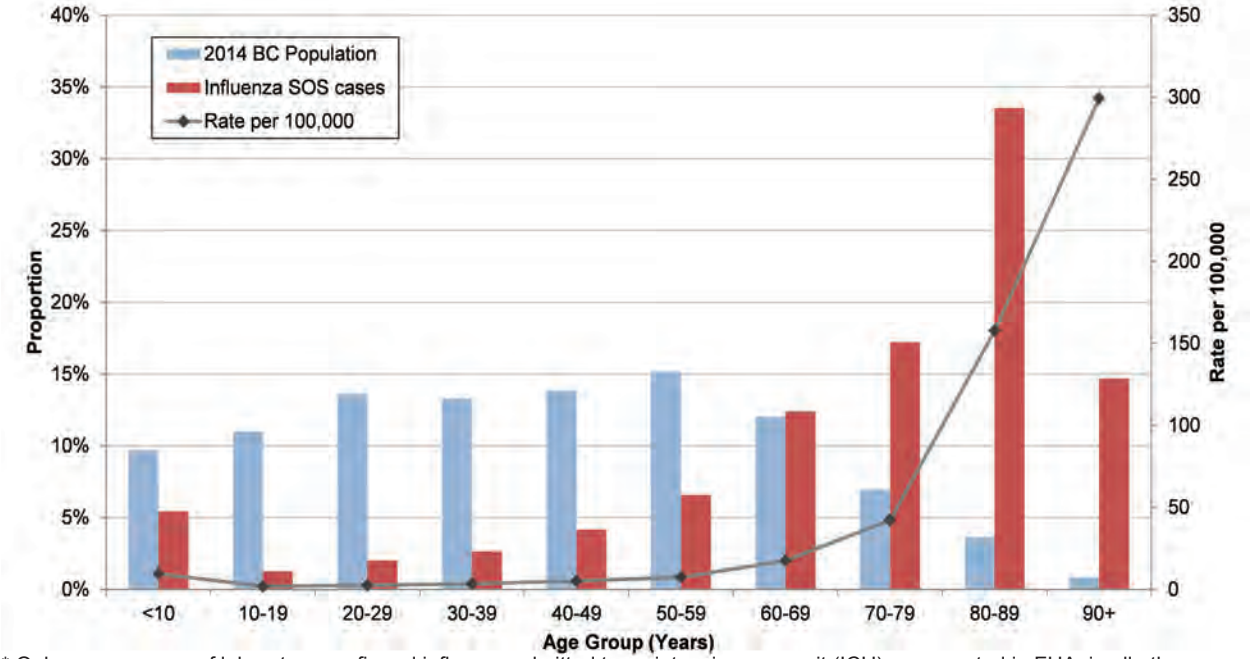
2.8 Number of lab-confirmed influenza hospitalizations by week of symptom onset,† British Columbia, 2014-15 season, December 1, 2014 to May 2, 2015*



* Only severe cases of laboratory-confirmed influenza admitted to an intensive care unit (ICU) are reported in FHA; in all other Health Authorities, both hospitalizations and ICU admissions are reported.

† Symptom onset date was imputed as hospital admission date minus two days where symptom onset was unknown.

2.9 Age distribution of lab-confirmed influenza hospitalizations compared to 2014 BC population, British Columbia, 2014-15 season, December 1, 2014 to May 2, 2015*



* Only severe cases of laboratory-confirmed influenza admitted to an intensive care unit (ICU) are reported in FHA; in all other Health Authorities, both hospitalizations and ICU admissions are reported.

Measles

Three hundred forty three confirmed measles cases were reported in 2014 (7.41 per 100,000 population), a number higher than any year since 1986. A large outbreak consisting of 325 confirmed cases occurred in Fraser East HSDA from late February to mid-June. An additional 18 confirmed measles cases were not associated with the Fraser East outbreak; these were reported by three regional Health Authorities: 14 by Vancouver Coastal, 3 by Fraser Health, and 1 by Island Health. There were no measles cases reported in Interior or Northern Health in 2014.

Overall, there were more male cases (N=181, 53%) than female cases (N=162, 47%). Age distribution of cases was as follows: five (1%) infant cases, 17 (5%) cases 1 to 4 years old, 280 (82%) cases 5 to 19 years old, and 41 (12%) cases 20 to 59 years old.

The large Fraser East outbreak was associated with a religious community that objects to vaccination. Most cases were students of one school, and the true number of cases was likely higher due to under-reporting. All but five outbreak cases were among members of this community. Only 33 (10%) cases were laboratory confirmed and 292 (90%) were epidemiologically-linked confirmed. Almost all cases were unvaccinated against measles (281, 86%) or had unknown immunization history (42, 13%); one case had received one dose of measles containing vaccine and one case had received two doses. Three cases were hospitalized, including one with encephalitis; none had a fatal outcome. The outbreak genotype was D8 MVs/Taunton.GBR/27.12 sequence-variant. The community was linked to the Netherlands, which had a large outbreak from May 2013 to March 2014 with over 2600 cases reported and the same genotype sequence-variant. A more detailed report of this outbreak has been published in Canada Communicable Diseases Report.[1]

Of the 18 non-outbreak cases, two cases were infected in the Philippines, 13 cases had unknown source of exposure, and three cases were linked to one each of these unknown source cases. Ten cases (56%) were unvaccinated, four adult cases (22%) had undocumented measles immunization, and four additional adult cases (22%) had unknown immunization history. Five cases were hospitalized: two infants and three adults; there were no fatal outcomes. Fifteen cases were genotype B3 MVi/Harare.ZWE/38.09 sequence-variant. One case was D8 MVs/Taunton. GBR/27.12 sequence-variant, which was the Fraser East outbreak strain but this case had no known exposure to any of the outbreak cases.

For a more detailed report on 2014 measles in BC:

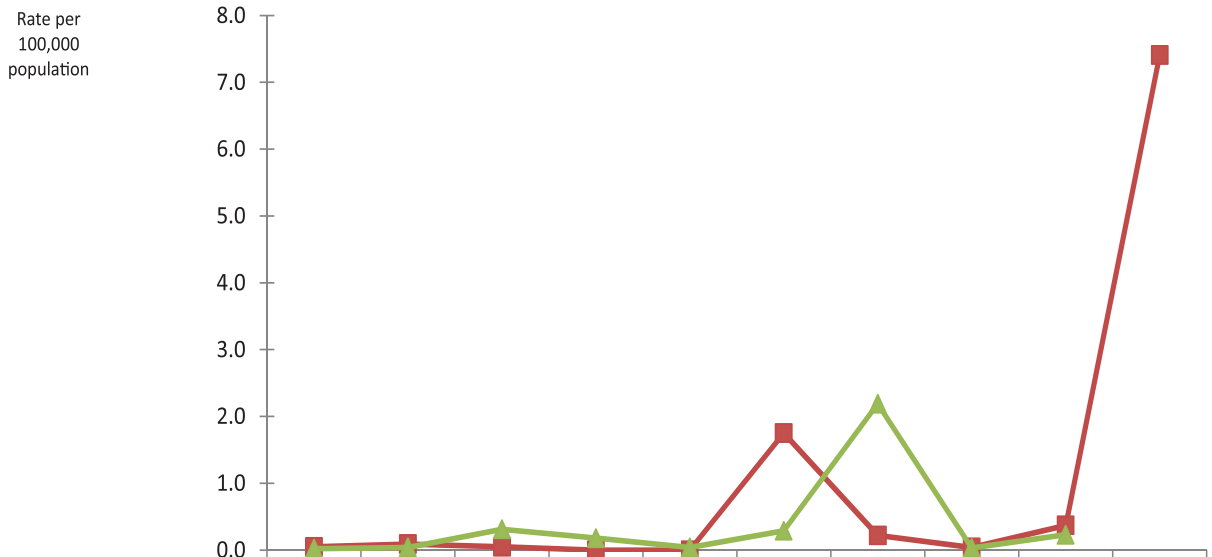
http://www.bccdc.ca/dis-cond/DiseaseStatsReports/VaccinePreventableDiseasesReports.htm

Global distribution of measles genotypes:

http://www.who.int/immunization/monitoring_surveillance/burden/vpd/surveillance_type/active/measles_monthlydata/en/index1.html

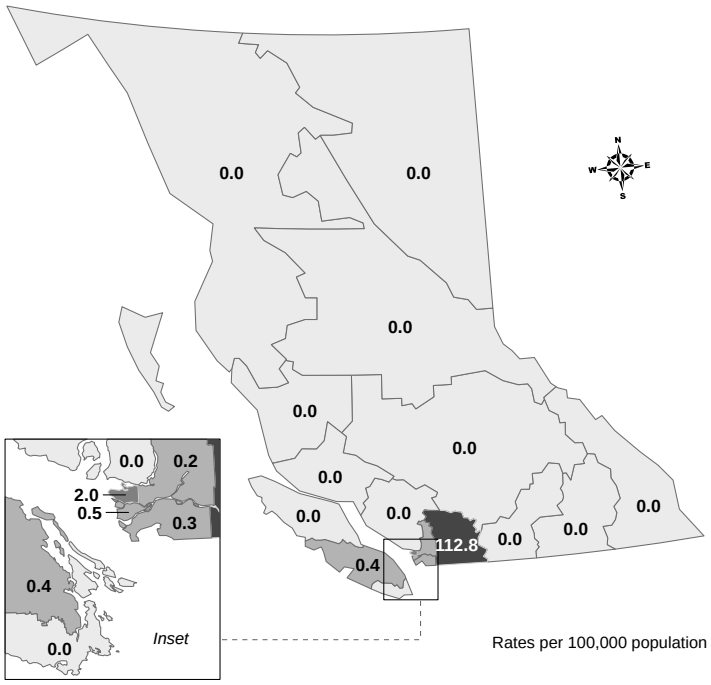
[1] Naus M, Puddicombe D, Murti M, Fung C, Stam R, Loadman S, Krajden M, Tang P, Lem M. Outbreak of measles in an unvaccinated population, British Columbia, 2014. Canada Communicable Disease Report 2015;41(7):169-74. http://www.phac-aspc.gc.ca/publicat/ccdr-rmtc/15vol41/dr-rm41-07/ar-02-eng.php

3.1 Measles Rates by Year, 2005-2014



	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
BC Measles Reports	2	4	2	0	0	78	10	2	17	343
BC Measles Rate	0.05	0.09	0.05	0.00	0.00	1.75	0.22	0.04	0.37	7.41
Canadian Measles Rate	0.02	0.04	0.31	0.18	0.04	0.29	2.19	0.03	0.23	

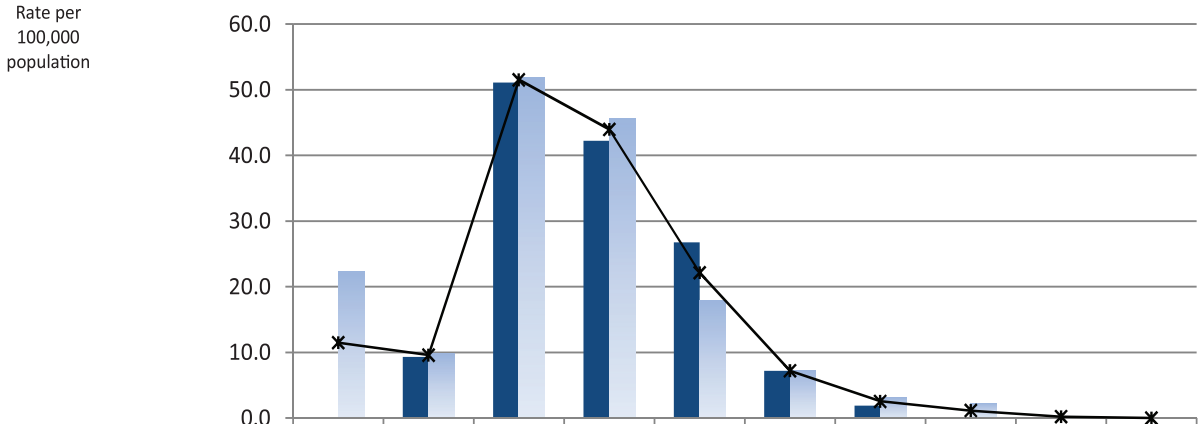
3.2 Measles Rates by HSDA, 2014



ID	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	325	112.8
22	Fraser North	1	0.2
23	Fraser South	2	0.3
31	Richmond	1	0.5
32	Vancouver	13	2.0
33	North Shore/Coast Garibaldi	0	0.0
41	South Vancouver Island	0	0.0
42	Central Vancouver Island	1	0.4
43	North Vancouver Island	0	0.0
51	Northwest	0	0.0
52	Northern Interior	0	0.0
53	Northeast	0	0.0

Rates per 100,000 population by HSDA

3.3 Measles Rates by Age Group and Sex, 2014



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Measles Rate - Female	0.0	9.3	51.1	42.2	26.8	7.2	1.9	0.0	0.2	0.0
Measles Rate - Male	22.3	9.9	51.9	45.6	17.9	7.2	3.2	2.3	0.3	0.0
Measles Rate	11.5	9.6	51.5	43.9	22.2	7.2	2.6	1.1	0.2	0.0
Measles Reports - Female	0	8	56	47	36	11	3	0	1	0
Measles Reports - Male	5	9	61	54	26	12	5	7	2	0
Measles Reports	5	17	117	101	62	23	8	7	3	0

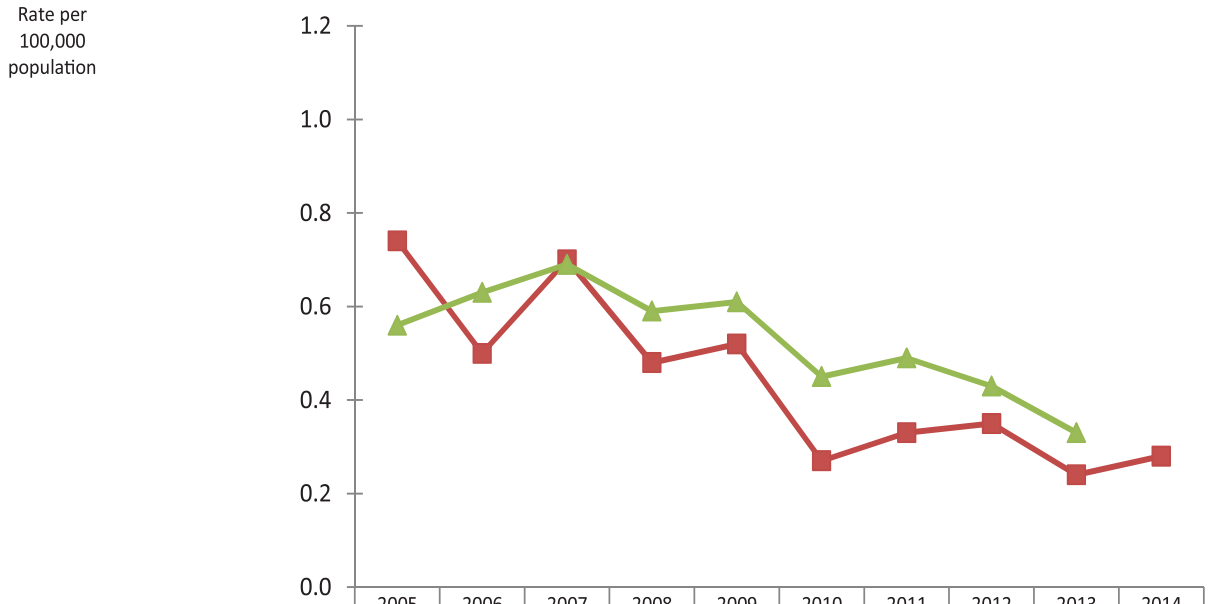
Meningococcal Disease (invasive)

Thirteen invasive meningococcal disease (IMD) cases were reported in 2014. The numbers by serogroup were: 6 B, 5 Y, 1 C and 1 W-135. None of these cases were fatal. There was no evidence of geographic clustering of cases and all were sporadic. The median age of cases was 23 years, with seven cases aged ≤ 25 years (three serogroup B and four serogroup Y).

The incidence of IMD has decreased from 0.7 cases per 100,000 population in 2005 to 0.3 cases per 100,000 population in 2014. This decline is substantially related to a dramatic downward trend in serogroup C disease. The incidence of serogroup C disease in 2005 was 0.2 cases per 100,000 population. In 2014 it was 0.02 cases per 100,000 population. The one serogroup C case in 2014 was 67 years old. This reflects the impact of the infant and school-age catch-up meningococcal C conjugate immunization programs beginning in September 2003.

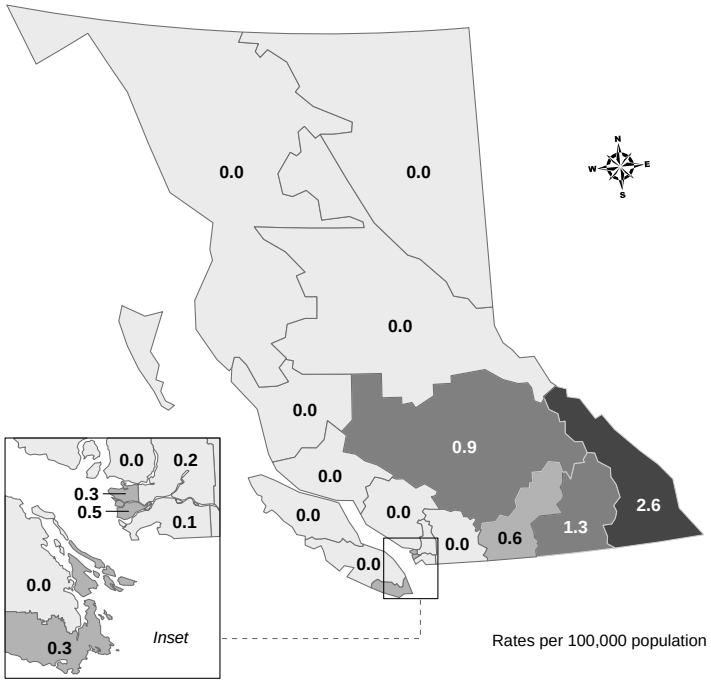
The two most common serogroups in 2014 were serogroups B (0.13 cases per 100,000 population) and Y (0.11 cases per 100,000 population). In the past decade, the incidence of serogroup B disease has fluctuated between 0.09 and 0.4 cases per 100,000 population per year and the incidence of serogroup Y disease has fluctuated between 0.04 and 0.2 cases per 100,000 population per year.

4.1 Meningococcal Disease (invasive) Rates by Year, 2005-2014

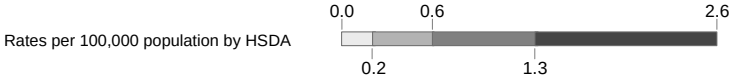


	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
BC Meningococcal Reports	31	21	30	21	23	12	15	16	11	13
BC Meningococcal Rate	0.7	0.5	0.7	0.5	0.5	0.3	0.3	0.4	0.2	0.3
Canadian Meningococcal Rate	0.6	0.6	0.7	0.6	0.6	0.5	0.5	0.4	0.3	

4.2 Meningococcal Disease (invasive) Rates by HSDA, 2014

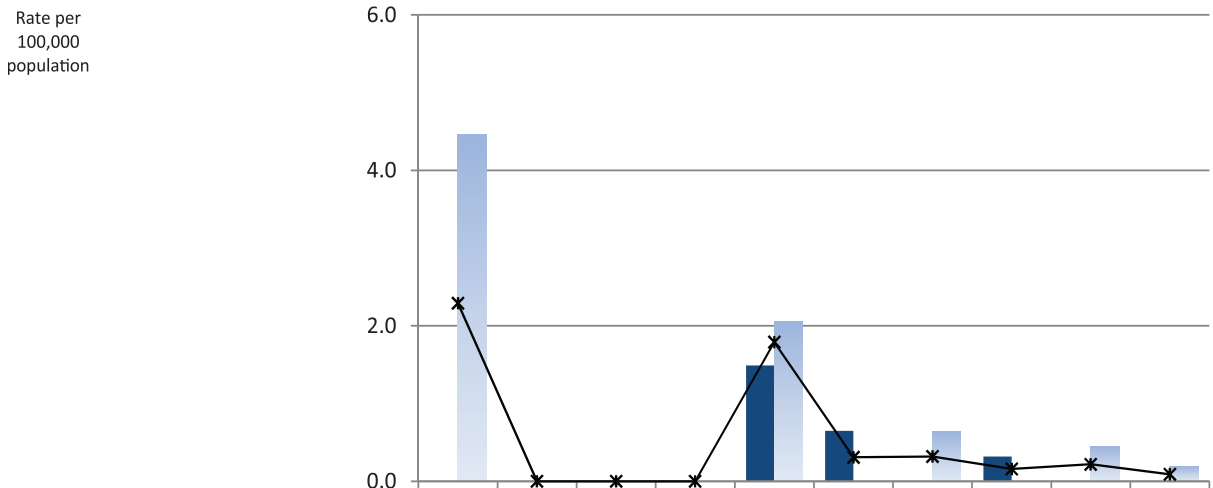


ID	Health Service Delivery Area	Cases	Rate
11	East Kootenay	2	2.6
12	Kootenay Boundary	1	1.3
13	Okanagan	2	0.6
14	Thompson Cariboo Shuswap	2	0.9
21	Fraser East	0	0.0
22	Fraser North	1	0.2
23	Fraser South	1	0.1
31	Richmond	1	0.5
32	Vancouver	2	0.3
33	North Shore/Coast Garibaldi	0	0.0
41	South Vancouver Island	1	0.3
42	Central Vancouver Island	0	0.0
43	North Vancouver Island	0	0.0
51	Northwest	0	0.0
52	Northern Interior	0	0.0
53	Northeast	0	0.0



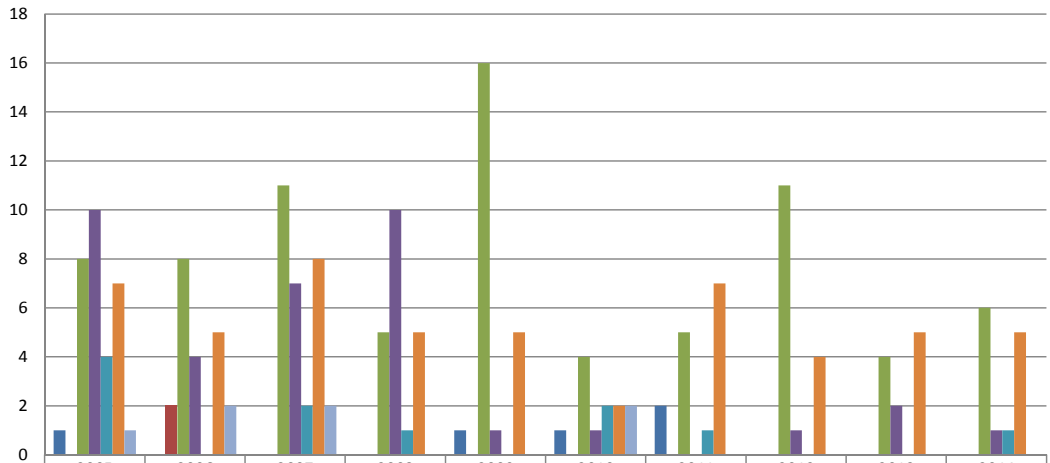
Rates per 100,000 population by HSDA

4.3 Meningococcal Disease (invasive) Rates by Age Group and Sex, 2014



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Meningococcal Rate - Female	0.0	0.0	0.0	0.0	1.5	0.7	0.0	0.3	0.0	0.0
Meningococcal Rate - Male	4.5	0.0	0.0	0.0	2.1	0.0	0.6	0.0	0.5	0.2
Meningococcal Disease (invasive) Rate	2.3	0.0	0.0	0.0	1.8	0.3	0.3	0.2	0.2	0.1
Meningococcal Reports - Female	0	0	0	0	2	1	0	1	0	0
Meningococcal Reports - Male	1	0	0	0	3	0	1	0	3	1
Meningococcal Disease (invasive) Reports	1	0	0	0	5	1	1	1	3	1

4.4 Meningococcal Disease (invasive) Cases by Serotype and Year, 2005-2014



	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
29E	1	0	0	0	1	1	2	0	0	0
A	0	2	0	0	0	0	0	0	0	0
B	8	8	11	5	16	4	5	11	4	6
C	10	4	7	10	1	1	0	1	2	1
W-135	4	0	2	1	0	2	1	0	0	1
Y	7	5	8	5	5	2	7	4	5	5
Nontypable/Unknown	1	2	2	0	0	2	0	0	0	0

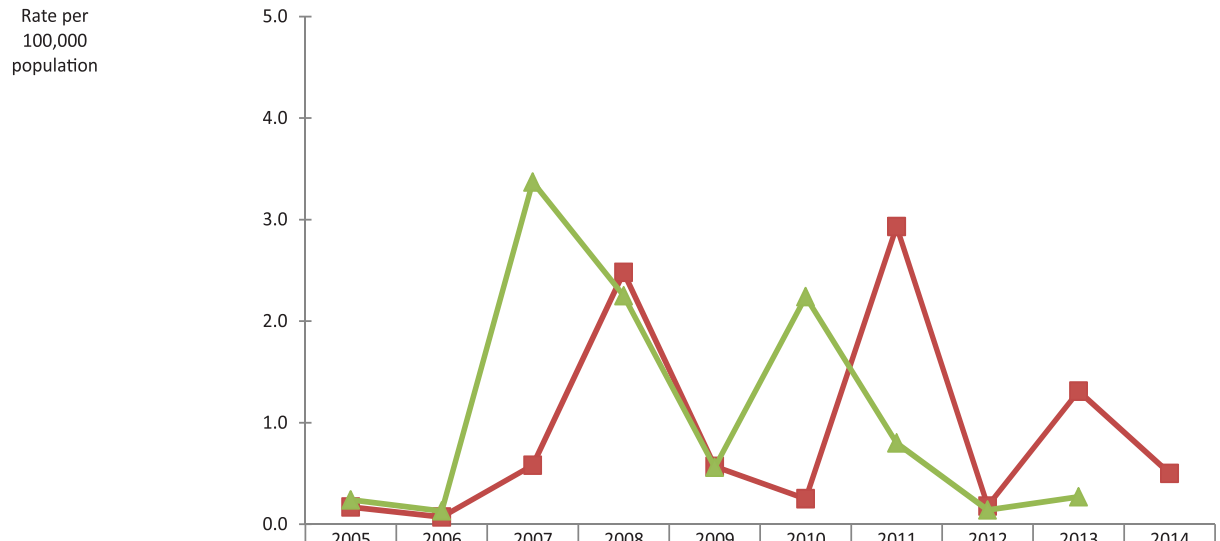
Mumps

Twenty three confirmed mumps cases were reported in 2014 (0.50 per 100,000 population). Cases were reported from four regional Health Authorities: 15 in Vancouver Coastal, 6 in Fraser Health, 1 in Interior Health, and 1 in Island Health. No mumps cases were reported in Northern Health in 2014.

Thirteen cases (57%) were PCR confirmed, seven cases (30%) were IgM confirmed, and three cases (13%) were epidemiologically-linked confirmed. More cases were male (N=13, 57%) than female (N=10, 43%). One case (4%) was 5 to 9 years old, four cases (17%) were 20 to 29 years old, 12 cases (52%) were 30 to 39 years old, and 6 cases (26%) were 40 years or older. One case (4%) was unvaccinated, five cases (22%) had one dose of mumps containing vaccine, three cases (13%) had two doses, three adult cases (13%) had undocumented mumps immunization, and eleven adult cases (48%) had unknown immunization history. Five cases had a history of travel compatible with acquisition outside of Canada, ten cases had an unknown source, two cases were household contacts of the same case with unknown source, and six cases were compatible with contact with an unrecognized case at a social gathering. One case was hospitalized; there were no serious complications. Genotype was determined for 12 cases and all were G which has been the predominant genotype in Europe and North America from 2005 to 2011.

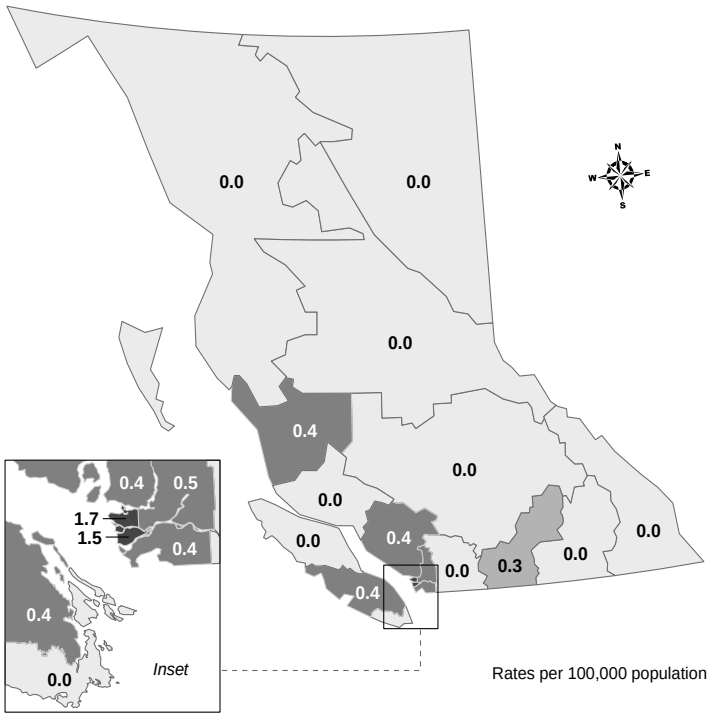
Global distribution of mumps genotypes: http://www.who.int/immunization/monitoring_surveillance/burden/vpd/surveillance_type/passive/mumps/en/

5.1 Mumps Rates by Year 2005-2014

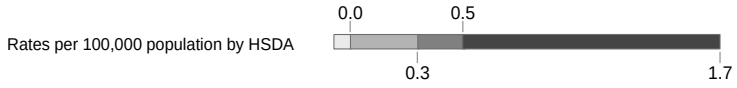


	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
BC Mumps Reports	7	3	25	108	25	11	132	8	60	23
BC Mumps Rate	0.17	0.07	0.58	2.48	0.57	0.25	2.93	0.18	1.31	0.50
Canadian Mumps Rate	0.24	0.13	3.37	2.25	0.56	2.24	0.80	0.14	0.27	

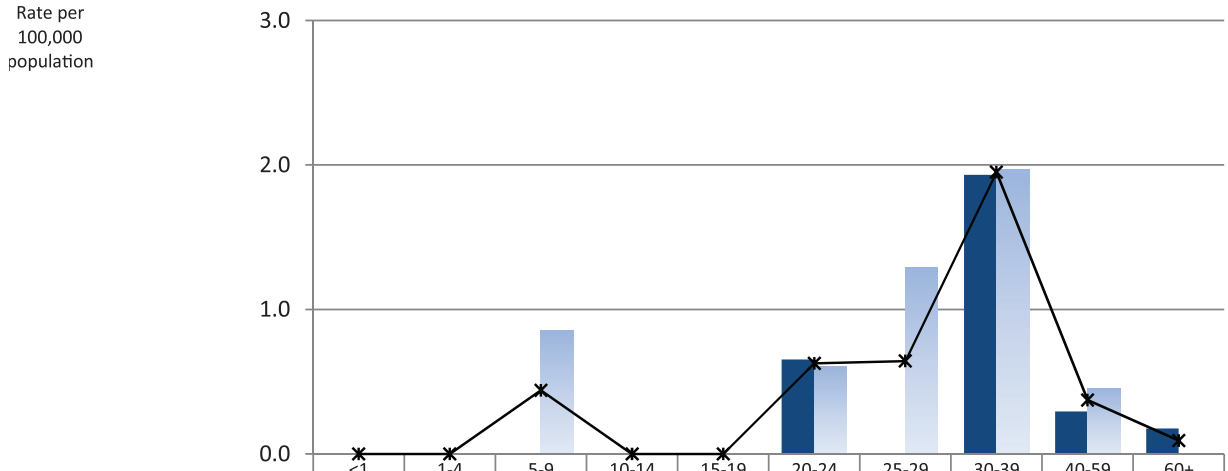
5.2 Mumps Rates by HSDA 2014



ID	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	3	0.5
23	Fraser South	3	0.4
31	Richmond	3	1.5
32	Vancouver	11	1.7
33	North Shore/Coast Garibaldi	1	0.4
41	South Vancouver Island	0	0.0
42	Central Vancouver Island	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



5.3 Mumps Rates by Age Group and Sex, 2014



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Mumps Rate - Female	0.0	0.0	0.0	0.0	0.0	0.7	0.0	1.9	0.3	0.2
Mumps Rate - Male	0.0	0.0	0.9	0.0	0.0	0.6	1.3	2.0	0.5	0.0
Mumps Rate	0.0	0.0	0.4	0.0	0.0	0.6	0.6	1.9	0.4	0.1
Mumps Reports - Female	0	0	0	0	0	1	0	6	2	1
Mumps Reports - Male	0	0	1	0	0	1	2	6	3	0
Mumps Reports	0	0	1	0	0	2	2	12	5	1

Pertussis

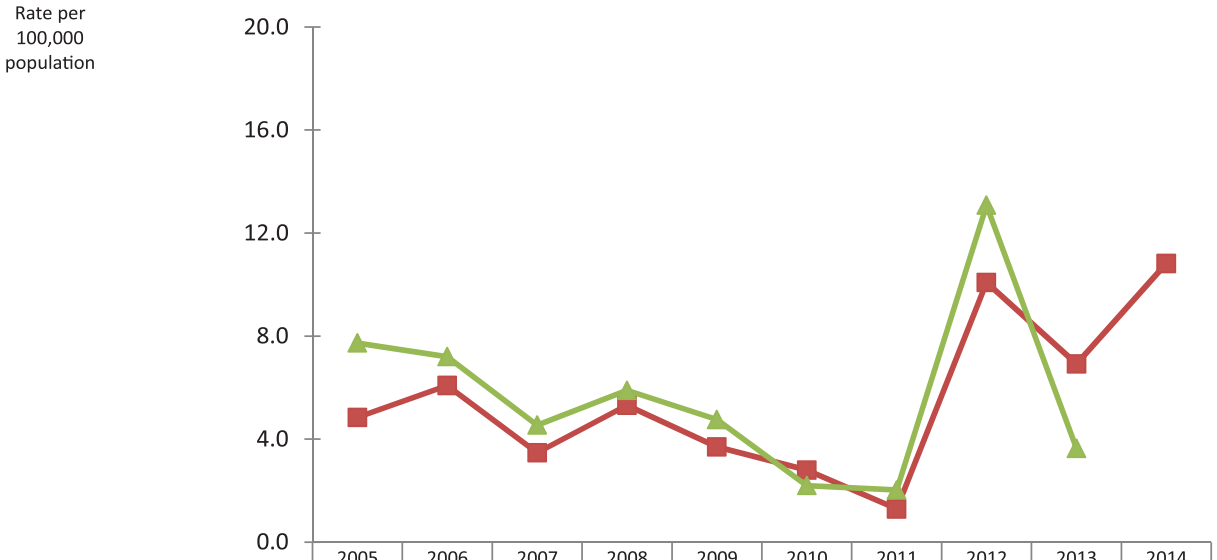
As elsewhere, pertussis remains an endemic disease in BC, with cyclical peaks occurring every 3-5 years. After substantial epidemics in the late 1990s and early 2000s with incidence rates ranging from 20 to 40 per 100,000 overall, BC experienced trough levels of pertussis from 2005 to 2011. However, as shown in Figure 6.1, a cyclical resurgence of pertussis occurred in 2012, driven primarily by reports from Vancouver Coastal (VCHA) and Fraser (FHA) Health Authorities, followed by an asynchronous cyclical peak affecting the Vancouver Island Health Authority (VIHA) in 2013.

In 2014, provincial incidence for confirmed pertussis cases was 11 per 100,000, higher than in 2013 (7 per 100,000) but comparable to 2012 (10 per 100,000). Pertussis incidence in 2014 remained below historic cyclical peaks in all regions of the province, with the exception of Northern Health Authority (NHA) where a large outbreak was declared in the spring of 2014 affecting the Haida Gwaii and Prince Rupert regions of the Northwest HSDA. Recognizing the small underlying population in the affected areas, incidence rates in the Northwest HSDA reached 164 per 100,000 with 121 confirmed pertussis cases reported in 2014 (Figure 6.2), about six-times higher than a prior historical peak in 2008 involving 21 confirmed cases (28 per 100,000) and more than double the rate in 2000 involving 58 confirmed cases (68 per 100,000) when the province overall experienced one of the largest cyclical peaks in recent history. Heightened pertussis activity was also observed in the Kootenay Boundary HSDA in 2014, with 57 cases reported and an incidence of 73 per 100,000.

As shown in Figure 6.3, the highest age-specific incidence in 2014 was in infants <1 year old at 96 per 100,000, followed by pre-school-aged children (1-4 years), elementary school-aged children (5-9 years), and pre-teens/teens (10-14 years), with incidence ranging from 34 to 36 per 100,000 in these non-infant age groups. Lower age-specific incidence was observed in older teens 15-19 years old (17 per 100,000) immediately following the Grade 9 booster dose and in adults ≥20 years old (≤6 per 100,000).

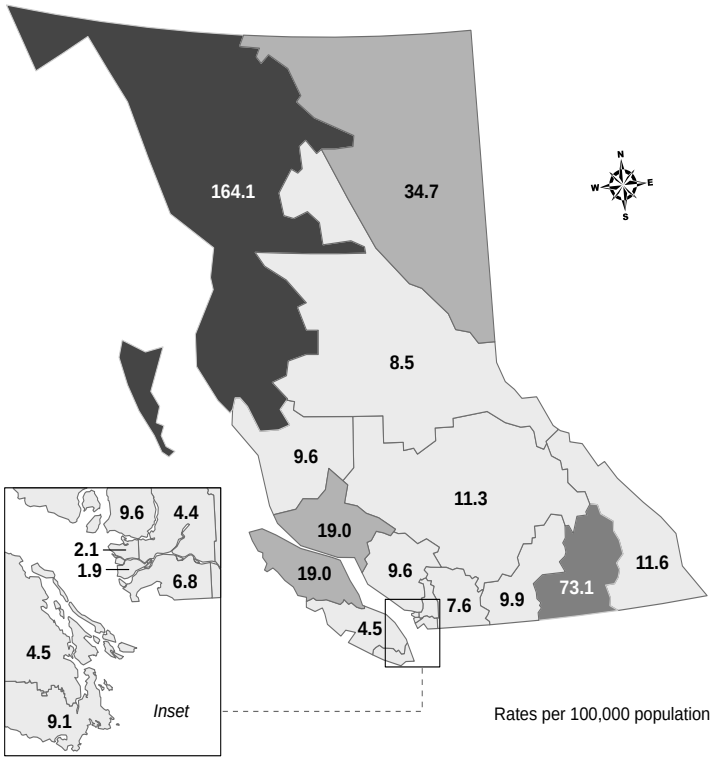
In Northwest HSDA, a similar age-related pattern was observed but at higher incidence rates, recognizing further instability in those rates with smaller population size within age strata. The highest age-specific incidence was again seen in infants <1 year old, with rates exceeding 1,000 cases per 100,000 in this age group. Incidence dropped to 227 per 100,000 in pre-school-aged children (1-4 years) and then gradually increased to 319 per 100,000 in elementary school-aged children (5-9 years) and 366 per 100,000 in pre-teens/teens (10-14 years). Incidence remained high in older teens 15-19 years old (272 per 100,000) and young adults 20-24 year old (241 per 100,000), but dropped to <100 per 100,000 in adults ≥25 years old. This age distribution is consistent with prior cyclical peaks emphasizing risk in young infants, with a secondary age-related peak observed in pre-teens/teens.

6.1 Pertussis Rates by Year, 2005-2014

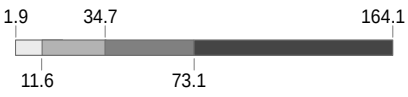


	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
BC Pertussis Reports	203	258	149	231	163	125	58	458	317	501
BC Pertussis Rate	4.8	6.1	3.5	5.3	3.7	2.8	1.3	10.1	6.9	10.8
Canadian Pertussis Rate	7.7	7.2	4.5	5.9	4.8	2.2	2.0	13.1	3.6	

6.2 Pertussis Rates by HSDA 2014

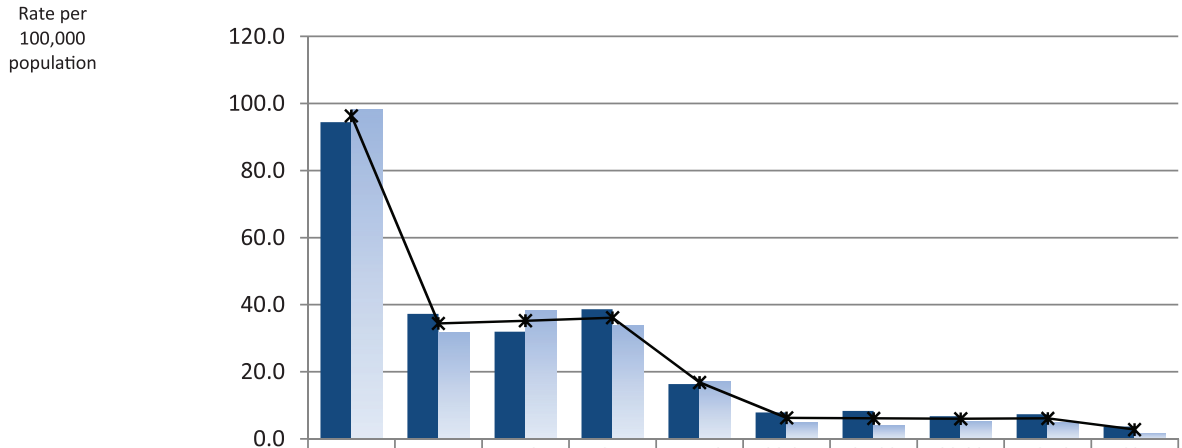


ID	Health Service Delivery Area	Cases	Rate
11	East Kootenay	9	11.6
12	Kootenay Boundary	57	73.1
13	Okanagan	35	9.9
14	Thompson Cariboo Shuswap	25	11.3
21	Fraser East	22	7.6
22	Fraser North	28	4.4
23	Fraser South	53	6.8
31	Richmond	4	1.9
32	Vancouver	14	2.1
33	North Shore/Coast Garibaldi	27	9.6
41	South Vancouver Island	34	9.1
42	Central Vancouver Island	12	4.5
43	North Vancouver Island	23	19.0
51	Northwest	121	164.1
52	Northern Interior	12	8.5
53	Northeast	25	34.7



Rates per 100,000 population by HSDA

6.3 Pertussis Rates by Age Group and Sex, 2014



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Pertussis Rate - Female	94.4	37.3	31.9	38.6	16.3	7.9	8.3	6.8	7.3	3.7
Pertussis Rate - Male	98.2	31.8	38.3	33.8	17.2	4.8	3.9	5.2	4.8	1.7
Pertussis Rate	96.4	34.4	35.2	36.1	16.8	6.3	6.1	6.0	6.1	2.8
Pertussis Reports - Female	20	32	35	43	22	12	13	21	50	21
Pertussis Reports - Male	22	29	45	40	25	8	6	16	32	9
Pertussis Reports	42	61	80	83	47	20	19	37	82	30

Pneumococcal disease, invasive (IPD)

Three hundred and eighty one cases of invasive pneumococcal disease (IPD) were reported in 2014 (8.2 per 100,000 population), slightly higher than the 363 cases reported in 2013 (7.9 per 100,000 population) and the 361 cases reported in 2012 (8.0 per 100,000 population).

Serotyping results were available for 83% (314/381) of cases. Among cases 65 years of age and over, serotyping results were available for 82% (126/155), and 59% (74/126) were due to serotypes covered by PPV-23 vaccine.

Regions with the highest rates of IPD were Island Health (9.5 cases per 100,000 population) and Northern Health (9.0 per 100,000), both higher than the provincial rate.

The highest rates of IPD were reported among infants (13.8 per 100,000 population), those 1-4 years old (9.0 per 100,000 population) and those ≥60 years old (16.6 per 100,000 population). The rate of IPD in both the youngest (<1 year of age) and oldest age groups (≥60 years of age) was higher among females than males.

For pediatric cases ≤16 years old, a total of 44 cases were reported, including 22 cases aged ≤5 years. None had a fatal outcome. The clinical presentation of cases was similar in the under 5 and 5-16 year age groups, with only one case of meningitis reported. Thirty-four percent of cases presented as bacteremic pneumonia, and 18% as bacteremia without focus. Clinical presentation was not reported for 45% of cases.

Among cases ≤5 years old, 22% did not have serotype results (5/22), 18% (n=3) were due to one of the 6 additional serotypes covered by the 13-valent vaccine (PCV-13) but not the 7-valent vaccine (PCV-7) and the remaining 82% (n=14) were due to serotypes not covered by the conjugate vaccines; none were due to one of the 7 serotypes covered by the original conjugate 7-valent vaccine.

Cases ≤5 years old were reviewed for preventability by the vaccines as used in the BC program with introduction of PCV-7 in 2003, PCV-13 in June 2010 without a catch-up program, and recommendations for use of polysaccharide 23-valent vaccine (PPV-23) in high risk children with results as follows:

15 cases were not preventable:

-13 cases were due to serotypes not covered by PCV-13.

- 2 cases were fully vaccinated and are considered “vaccine failures”: one each of serotype 19A and serotype 3 in children fully immunized with PCV-13.

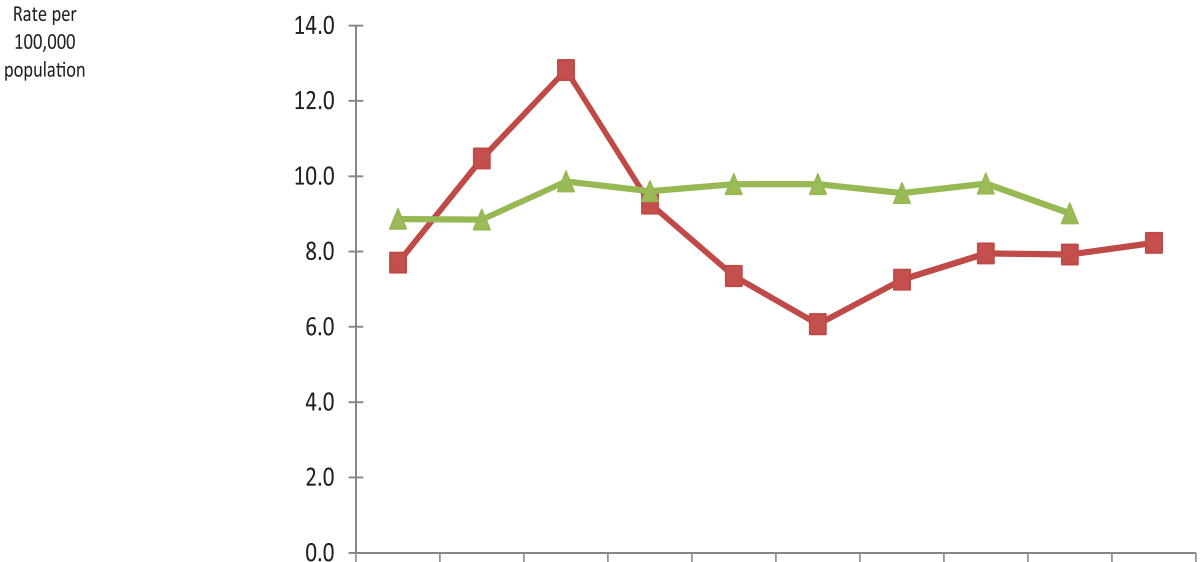
2 cases were preventable and are considered “program failures”:

-1 case of serotype 22F in a high-risk child (26 months of age) vaccinated with 4 doses of PCV-13, but not immunized with PPV-23 at 2 years of age.

- 1 case of serotype 7F in an unimmunized 3 year old child

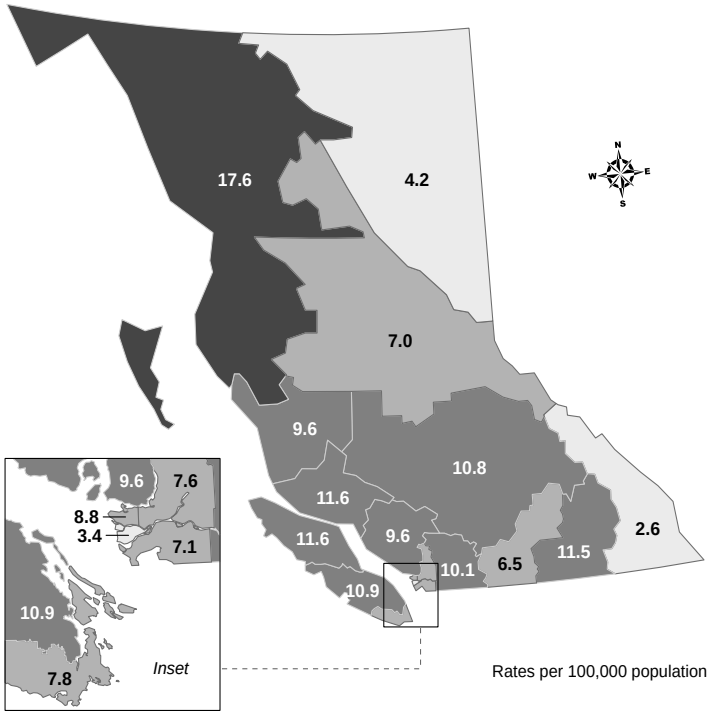
.

7.1 Pneumococcal Disease (invasive) Rates by Year, 2005-2014

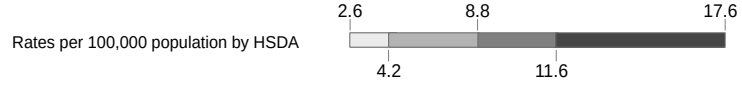


	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
BC Invasive Pneumococcal Reports	323	444	550	403	324	271	326	361	363	381
BC Invasive Pneumococcal Rate	7.7	10.5	12.8	9.3	7.4	6.1	7.3	8.0	7.9	8.2
Canadian Invasive Pneumococcal Rate	8.9	8.9	9.9	9.6	9.8	9.8	9.6	9.8	9.0	

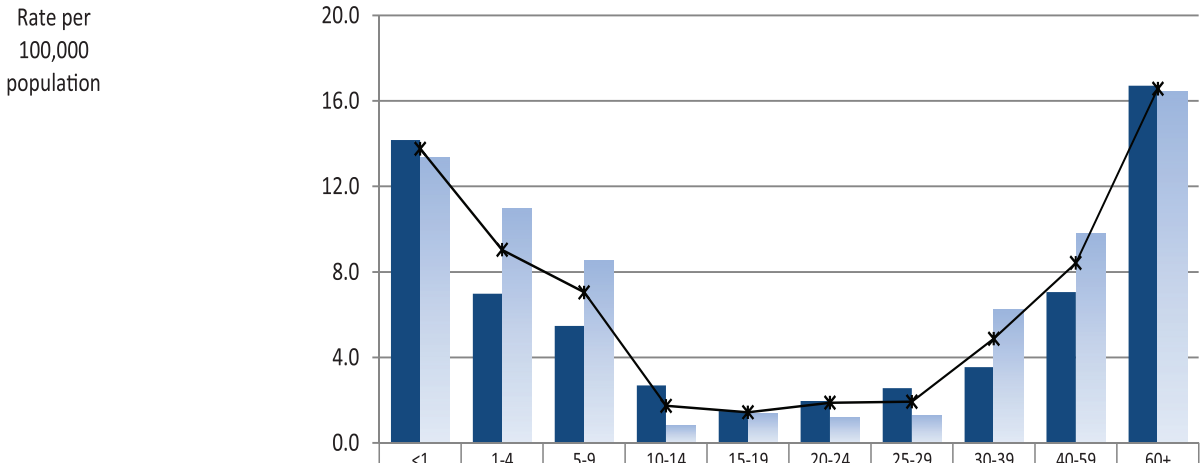
7.2 Pneumococcal Disease (invasive) Rates by HSDA, 2014



ID	Health Service Delivery Area	Cases	Rate
11	East Kootenay	2	2.6
12	Kootenay Boundary	9	11.5
13	Okanagan	23	6.5
14	Thompson Cariboo Shuswap	24	10.8
21	Fraser East	29	10.1
22	Fraser North	49	7.6
23	Fraser South	55	7.1
31	Richmond	7	3.4
32	Vancouver	58	8.8
33	North Shore/Coast Garibaldi	27	9.6
41	South Vancouver Island	29	7.8
42	Central Vancouver Island	29	10.9
43	North Vancouver Island	14	11.6
51	Northwest	13	17.6
52	Northern Interior	10	7.0
53	Northeast	3	4.2



7.3 *Pneumococcal Disease (invasive) Rates by Age Group and Sex, 2014*



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Invasive Pneumococcal Rate - Female	14.2	7.0	5.5	2.7	1.5	2.0	2.6	3.5	7.1	16.7
Invasive Pneumococcal Rate - Male	13.4	11.0	8.5	0.8	1.4	1.2	1.3	6.2	9.8	16.4
Pneumococcal Disease (invasive) Rate	13.8	9.0	7.0	1.7	1.4	1.9	1.9	4.9	8.4	16.6
Invasive Pneumococcal Reports - Female	3	6	6	3	2	3	4	11	48	95
Invasive Pneumococcal Reports - Male	3	10	10	1	2	2	2	19	65	85
Pneumococcal Disease (invasive) Reports	6	16	16	4	4	6	6	30	113	180

*In 2014 one case of IPD was reported with gender = transgender. The age and sex of this case are not presented in the chart but the case is included in the total number listed for 2014.

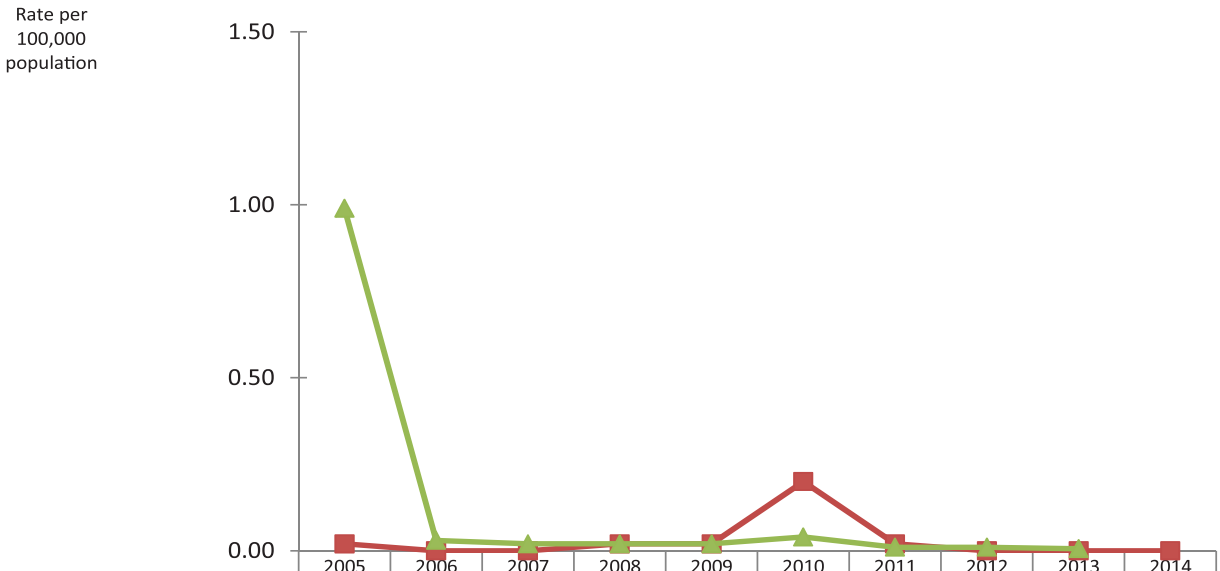
Rubella

No rubella cases were reported in 2014. One case was reported in 2011, nine cases in 2010, and one case was reported in each of 2009, 2008, and 2005.

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

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

8.1 Rubella Rates by Year, 2005-2014



	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
BC Rubella Reports	1	0	0	1	1	9	1	0	0	0
BC Rubella Rate	0.02	0.00	0.00	0.02	0.02	0.20	0.02	0.00	0.00	0.00
Canadian Rubella Rate	0.99	0.03	0.02	0.02	0.02	0.04	0.01	0.01	0.01	

Tetanus

There was one confirmed case of tetanus reported in BC in 2014, with a diagnosis based on clinical criteria. This male case in his 40s presented at an emergency department a few days after stepping on a nail and sustaining a puncture wound to the foot. The man was treated with TIG and Td vaccine prior to laboratory testing. Previous receipt of three undocumented doses of tetanus containing vaccine were reported but none within the previous 10 years. The client was discharged after one night in hospital and recovered.

From 2005 to 2013 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

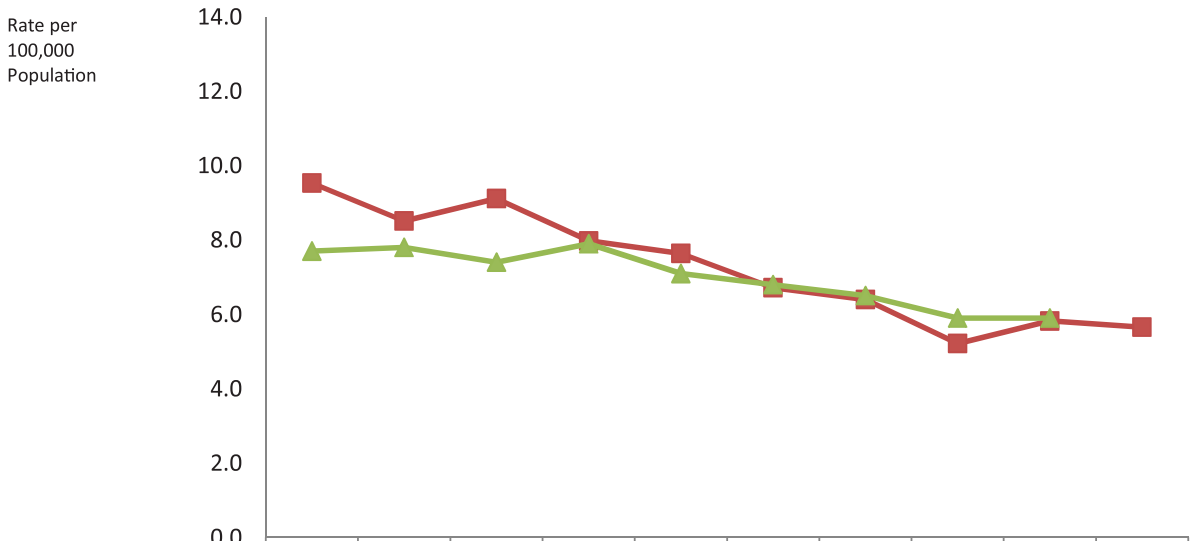
HIV
AIDS
Chlamydia (genital)
Gonorrhea (genital)
Hepatitis B
Hepatitis C
Infectious Syphilis

HIV

In 2014, the rate of new HIV diagnoses decreased slightly to 5.7 (262 cases) from 5.8 (267 cases) per 100,000 in 2013. Over 80% (216 cases) of new HIV diagnoses in 2014 were male, with the highest rates observed in males between 20-39 years of age. In 2014, rates among HSDAs varied with the highest rates in Vancouver (20.2 per 100,000; 133 cases) and Northwest (6.8 per 100,000; 5 cases), and the lowest rates in East Kootenay (0.0 per 100,000; 0 cases) and Kootenay Boundary (1.3 per 100,000; 1 case). Recent trends in HIV diagnoses in BC have been influenced by increasing testing efforts related the provincial Seek and Treat for Optimal Prevention of HIV/AIDS (STOP HIV/AIDS) Program.

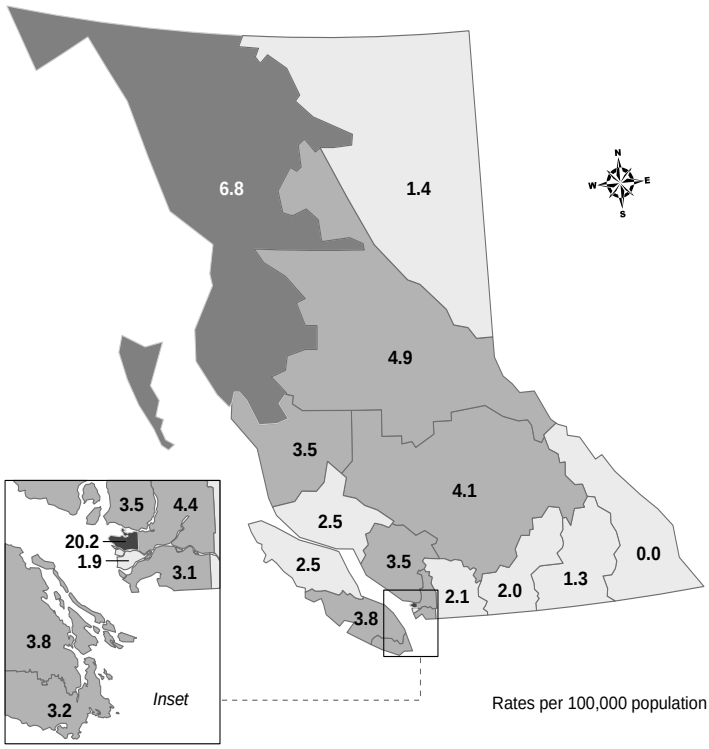
More detailed information on HIV trends in BC is available in the HIV Annual Report which is available as http://www.bccdc.ca/util/about/annreport/default.htm.

10.1 HIV Rates by Year, 2005-2014

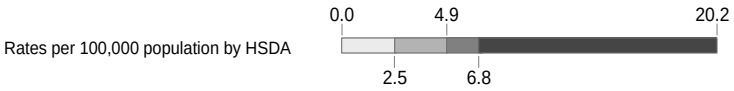


	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
BC HIV Reports	400	361	391	347	337	300	288	237	267	262
BC HIV Rate	9.5	8.5	9.1	8.0	7.6	6.7	6.4	5.2	5.8	5.7
Canadian HIV Rate	7.7	7.8	7.4	7.9	7.1	6.8	6.5	5.9	5.9	

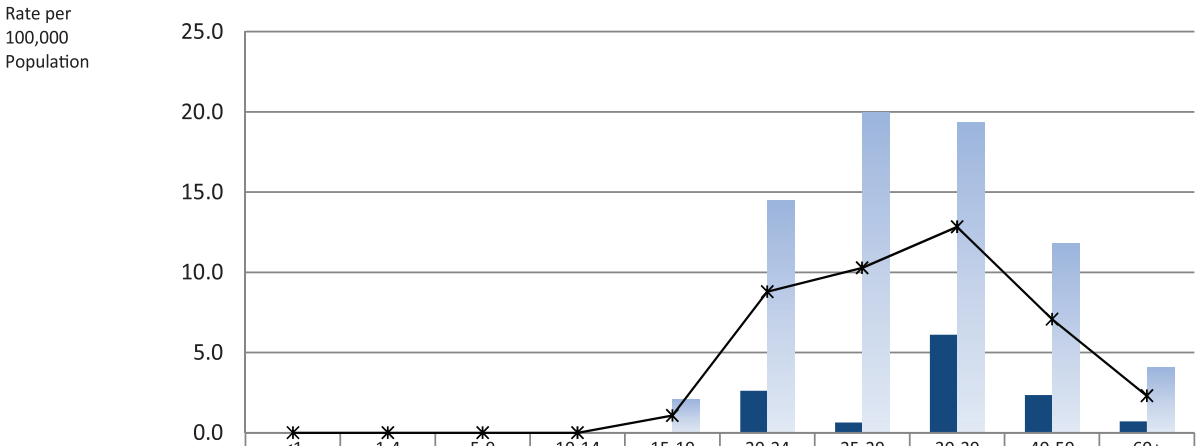
10.2 HIV Rates by HSDA, 2014



ID	Health Service Delivery Area	Cases	Rate
11	East Kootenay	0	0.0
12	Kootenay Boundary	1	1.3
13	Okanagan	7	2.0
14	Thompson Cariboo Shuswap	9	4.1
21	Fraser East	6	2.1
22	Fraser North	28	4.4
23	Fraser South	24	3.1
31	Richmond	4	1.9
32	Vancouver	133	20.2
33	North Shore/Coast Garibaldi	10	3.5
41	South Vancouver Island	12	3.2
42	Central Vancouver Island	10	3.8
43	North Vancouver Island	3	2.5
51	Northwest	5	6.8
52	Northern Interior	7	4.9
53	Northeast	1	1.4



10.3 HIV Rates by Age Group and Sex, 2014

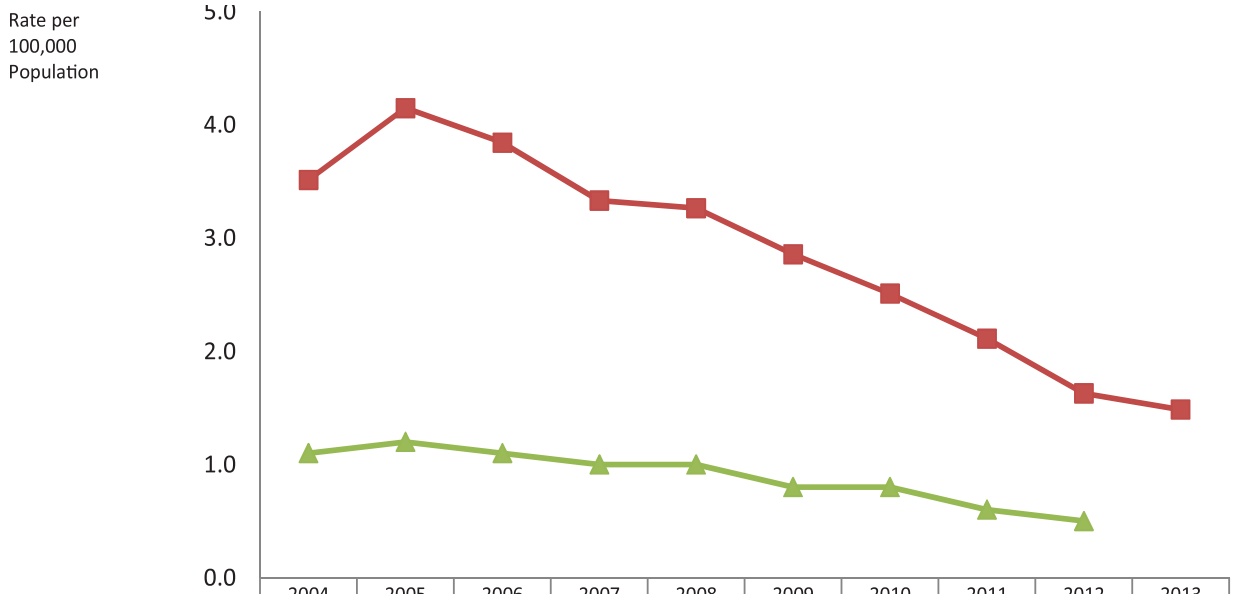


	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
HIV Rate - Female	0.0	0.0	0.0	0.0	0.0	2.6	0.6	6.1	2.4	0.7
HIV Rate - Male	0.0	0.0	0.0	0.0	2.1	14.5	20.0	19.4	11.8	4.1
HIV Rate - Total	0.0	0.0	0.0	0.0	1.1	8.8	10.3	12.8	7.1	2.3
HIV Reports - Female	0	0	0	0	0	4	1	19	16	4
HIV Reports - Male	0	0	0	0	3	24	31	59	78	21
HIV Reports - Total	0	0	0	0	3	28	32	79	95	25

AIDS

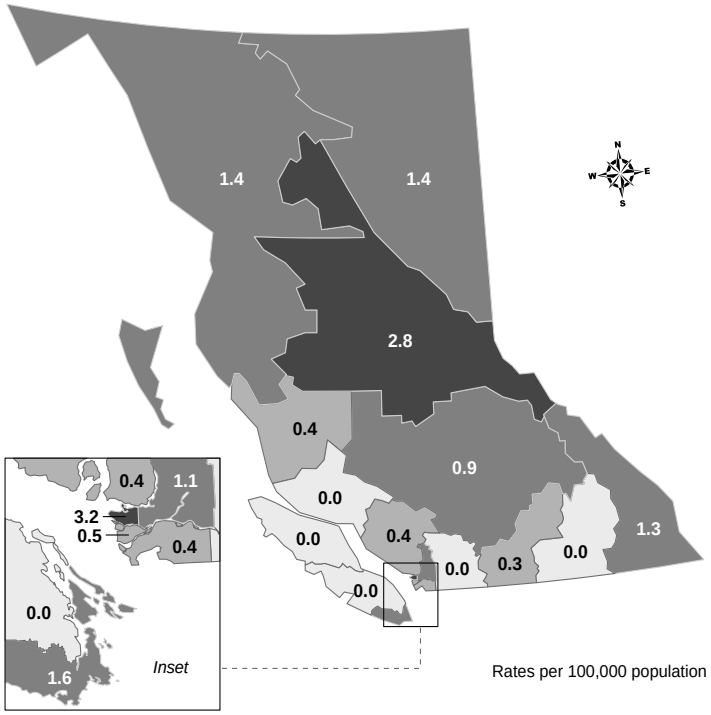
Due to the expected delays associated with AIDS reporting, this report only includes AIDS cases to 2013. In 2013, the rate of AIDS case reports in BC decreased slightly to 1.5 (68 cases) from 1.6 (74 cases) per 100,000 in 2012. Over 50% (38 cases) of AIDS cases in 2013 were male, with the highest rates observed in males between 30-59 years of age. Across HSDAs, Vancouver (3.2 per 100,000; 21 cases) and Northern Interior (2.8 per 100,000; 4 cases) had the highest rates of AIDS cases in 2013.

11.1 AIDS Rates by Year, 2004-2013

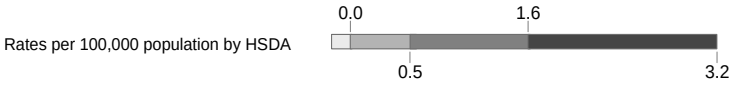


	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
BC AIDS Reports	146	174	163	143	142	126	112	95	74	68
BC AIDS Rate	3.5	4.1	3.8	3.3	3.3	2.9	2.5	2.1	1.6	1.5
Canadian AIDS Rate	1.1	1.2	1.1	1.0	1.0	0.8	0.8	0.6	0.5	

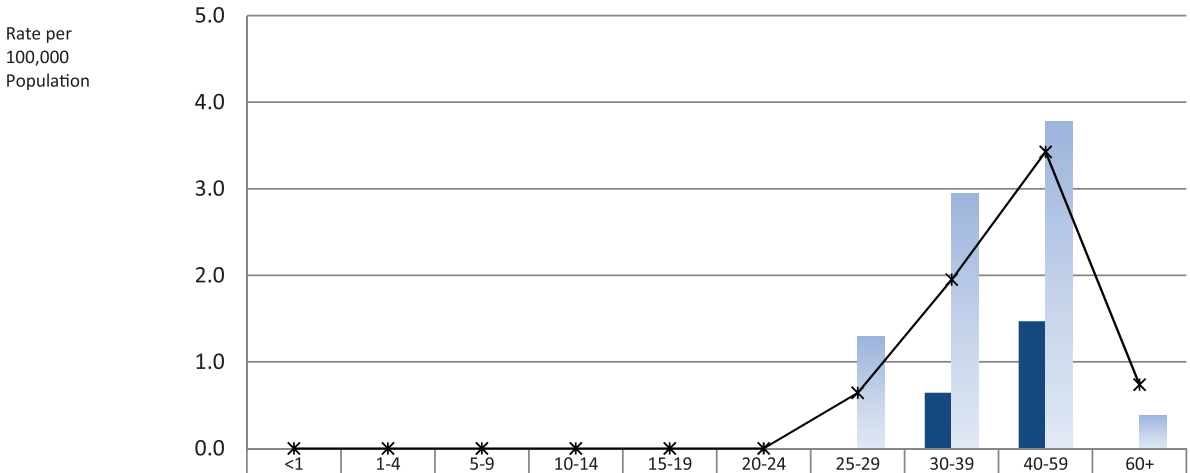
11.2 AIDS Rates by HSDA, 2013



ID	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	2	0.9
21	Fraser East	0	0.0
22	Fraser North	7	1.1
23	Fraser South	3	0.4
31	Richmond	1	0.5
32	Vancouver	21	3.2
33	North Shore/Coast Garibaldi	1	0.4
41	South Vancouver Island	6	1.6
42	Central Vancouver Island	0	0.0
43	North Vancouver Island	0	0.0
51	Northwest	1	1.4
52	Northern Interior	4	2.8
53	Northeast	1	1.4



11.3 AIDSRates by Age Group and Sex, 2013



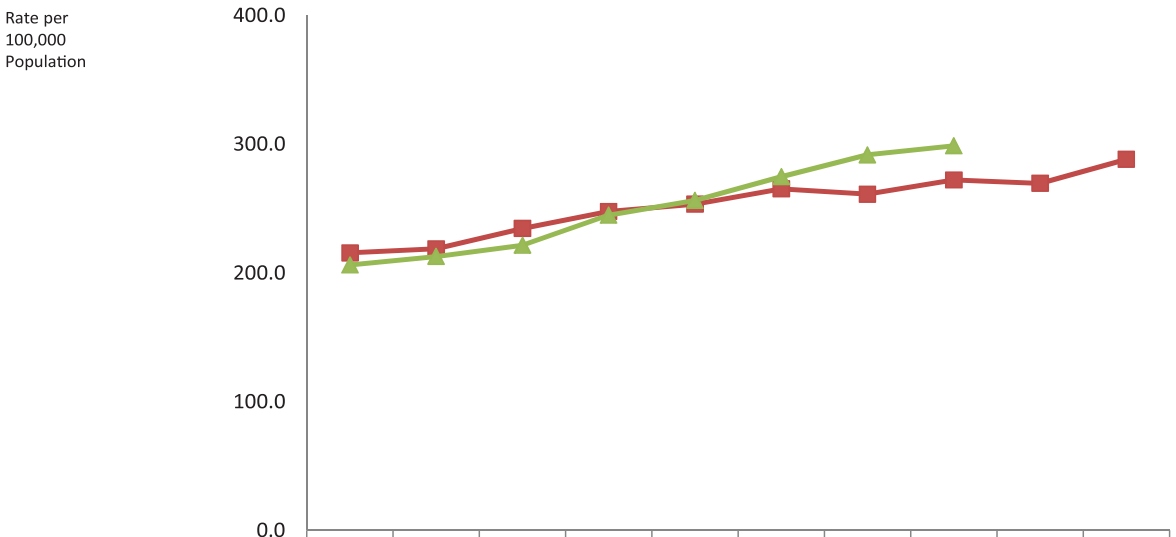
	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
AIDS Rate - Female	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	1.5	0.0
AIDS Rate - Male	0.0	0.0	0.0	0.0	0.0	0.0	1.3	3.0	3.8	0.4
AIDS Rate - Total	0.0	0.0	0.0	0.0	0.0	0.0	0.6	1.9	3.4	0.7
AIDS Reports - Female	0	0	0	0	0	0	0	2	10	0
AIDS Reports - Male	0	0	0	0	0	0	2	9	25	2
AIDS Reports - Total	0	0	0	0	0	0	2	12	46	8

Chlamydia **(genital)**

Genital chlamydia rates have steadily been increasing since 1998. In 2014, the rate of genital chlamydia in BC increased to 288.2 (13,346 cases) from 269.5 (12,352 cases) per 100,000 in 2013. The highest rates of chlamydia in 2014 were among young adults aged 20-29 years, influenced primarily by trends among females. In 2014, rates among HSDAs varied with the highest rates in Vancouver (480.8 per 100,000; 3,166 cases) and Northwest (478.8 per 100,000; 353 cases), and the lowest rates in Fraser East (187.4 per 100,000; 540 cases) and East Kootenay (188.5 per 100,000; 146 cases).

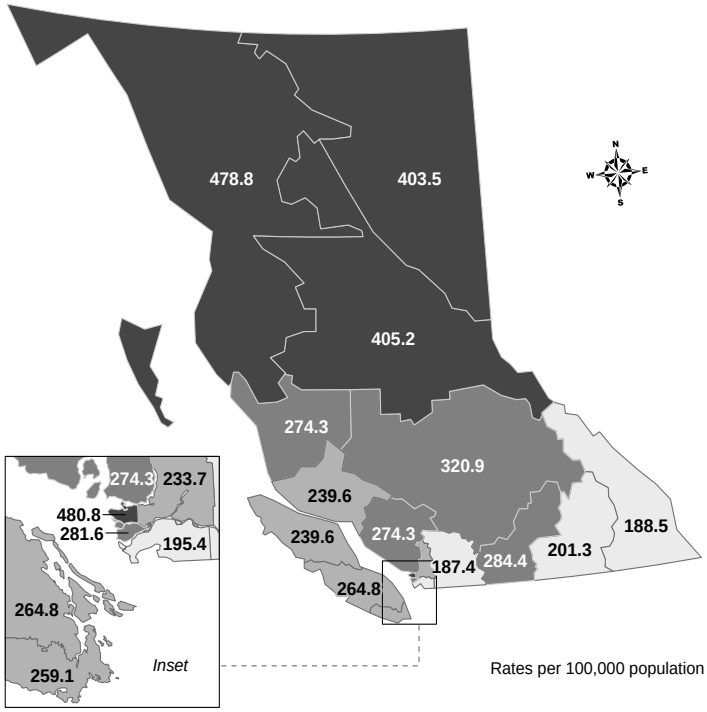
More detailed information on chlamydia trends in BC is available in the STI Annual Report which is available at http://www.bccdc.ca/util/about/annreport/default.htm.

12.1 Genital Chlamydia Rates by Year, 2005-2014



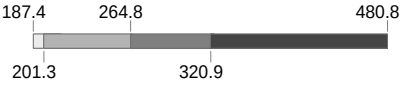
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
BC Genital Chlamydia Reports	9040	9273	10060	10774	11176	11844	11745	12365	12352	13346
BC Genital Chlamydia Rate	215.5	218.6	234.4	247.7	253.4	265.2	261.0	272.2	269.5	288.2
Canadian Chlamydia Rate	206.2	212.7	221.3	244.8	256.2	274.7	291.6	298.7		

12.2 Genital Chlamydia Rates by HSDA, 2014

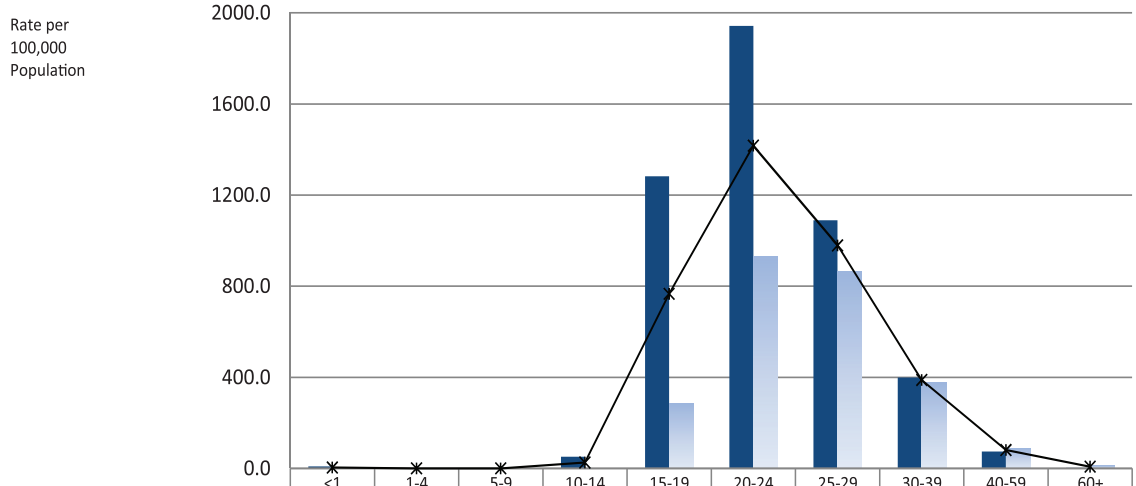


ID	Health Service Delivery Area	Cases	Rate
11	East Kootenay	146	188.5
12	Kootenay Boundary	157	201.3
13	Okanagan	1007	284.4
14	Thompson Cariboo Shuswap	710	320.9
21	Fraser East	540	187.4
22	Fraser North	1500	233.7
23	Fraser South	1518	195.4
31	Richmond	578	281.6
32	Vancouver	3166	480.8
33	North Shore/Coast Garibaldi	775	274.3
41	South Vancouver Island	965	259.1
42	Central Vancouver Island	705	264.8
43	North Vancouver Island	290	239.6
51	Northwest	353	478.8
52	Northern Interior	575	405.2
53	Northeast	291	403.5

Rates per 100,000 population by HSDA



12.3 Genital Chlamydia Rates by Age Group and Sex, 2014



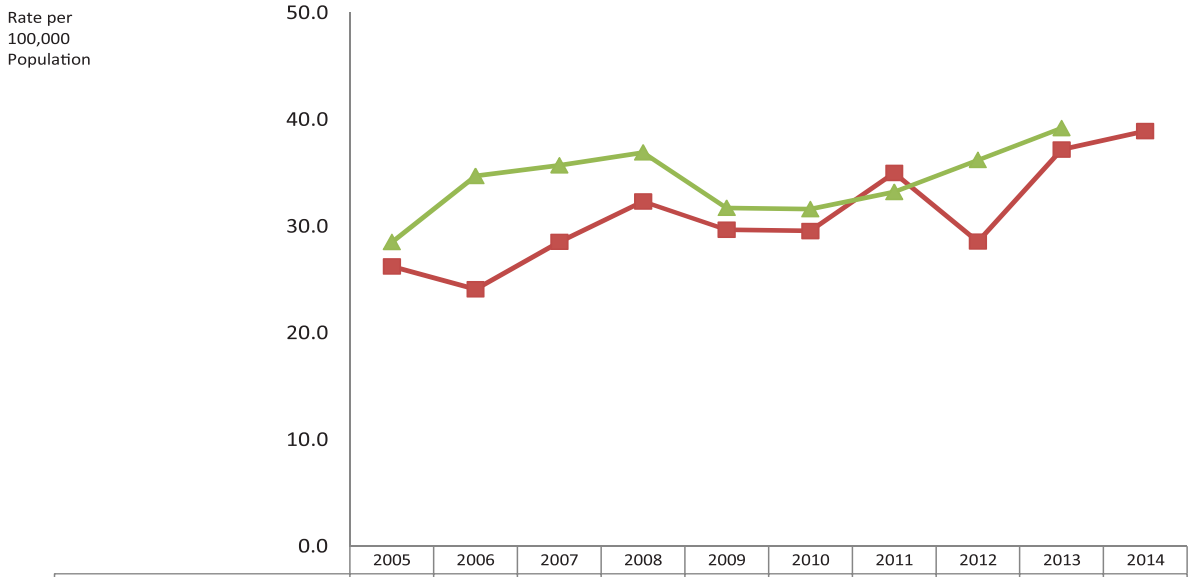
	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Genital Chlamydia Rate - Female	9.4	0.0	0.0	51.2	1282.6	1942.4	1089.6	399.2	73.9	2.8
Genital Chlamydia Rate - Male	0.0	0.0	0.0	2.5	287.0	930.7	866.5	377.0	88.5	13.0
Genital Chlamydia Rate - Total	4.6	0.0	0.0	26.1	766.8	1417.1	979.5	388.3	81.2	7.6
Genital Chlamydia Reports - Female	2	0	0	57	1726	2969	1703	1240	503	16
Genital Chlamydia Reports - Male	0	0	0	3	417	1544	1344	1149	586	67
Genital Chlamydia Reports - Total	2	0	0	60	2146	4517	3050	2390	1090	83

Gonorrhea (genital)

In 2014, the rate of genital gonorrhea in BC increased to 38.9 (1,802 cases) from 37.2 (1,704 cases) per 100,000 in 2013. The highest rates in 2014 were among males aged 20-39 years and, for females the highest rates were among those aged 15-29 years. In 2014, the rates among HSDAs varied with the highest rates in Vancouver (124.4 per 100,000; 819 cases) and Northwest (46.1 per 100,000; 34 cases), and the lowest rates in East Kootenay (3.9 per 100,000; 3 cases) and Central Vancouver Island (8.3 per 100,000; 22 cases).

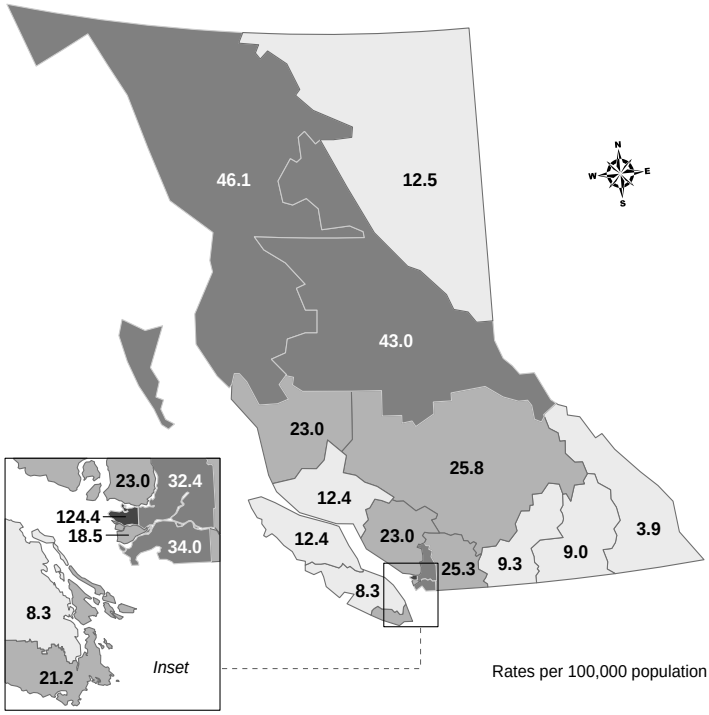
More detailed information on gonorrhea trends in BC is available in the STI Annual Report which is available at http://www.bccdc.ca/util/about/annreport/default.htm.

13.1 Genital Gonorrhea Rates by Year, 2005-2014

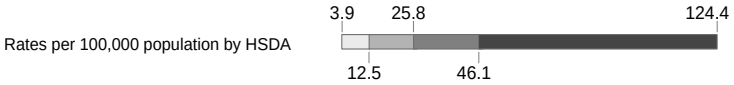


	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
BC Genital Gonorrhea Reports	1100	1022	1224	1405	1309	1320	1574	1297	1704	1802
BC Genital Gonorrhea Rate	26.2	24.1	28.5	32.3	29.7	29.6	35.0	28.6	37.2	38.9
Canadian Gonorrhea Rate	28.5	34.7	35.7	36.9	31.7	31.6	33.2	36.2	39.2	

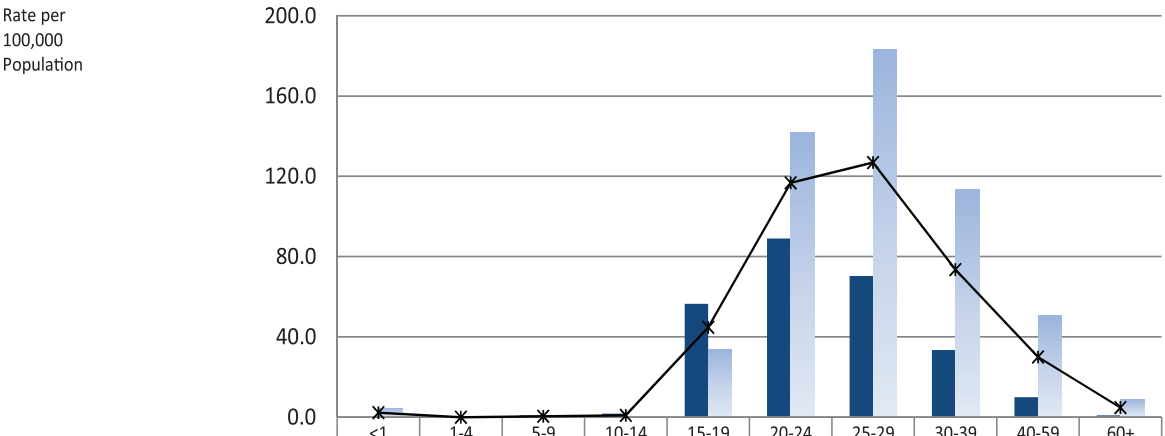
13.2 Genital Gonorrhea Rates by HSDA, 2014



ID	Health Service Delivery Area	Cases	Rate
11	East Kootenay	3	3.9
12	Kootenay Boundary	7	9.0
13	Okanagan	33	9.3
14	Thompson Cariboo Shuswap	57	25.8
21	Fraser East	73	25.3
22	Fraser North	208	32.4
23	Fraser South	264	34.0
31	Richmond	38	18.5
32	Vancouver	819	124.4
33	North Shore/Coast Garibaldi	65	23.0
41	South Vancouver Island	79	21.2
42	Central Vancouver Island	22	8.3
43	North Vancouver Island	15	12.4
51	Northwest	34	46.1
52	Northern Interior	61	43.0
53	Northeast	9	12.5



13.3 Genital Gonorrhea Rates by Age Group and Sex, 2014



	<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	0.9	1.8	56.5	89.0	70.4	33.5	10.0	0.9
Genital Gonorrhea Rate - Male	4.5	0.0	0.0	0.0	33.7	141.7	183.1	113.5	50.5	9.1
Genital Gonorrhea Rate - Total	2.3	0.0	0.4	0.9	44.7	116.7	126.9	73.4	30.0	4.8
Genital Gonorrhea Reports - Female	0	0	1	2	76	136	110	104	68	5
Genital Gonorrhea Reports - Male	1	0	0	0	49	235	284	346	334	47
Genital Gonorrhea Reports - Total	1	0	1	2	125	372	395	452	402	52

Hepatitis B

Hepatitis B infections with detectable hepatitis B surface antigen (HBsAg) more than six months are classified as chronic infections, and constitute the majority of reported cases of hepatitis B in BC. The majority of chronic infections involve people who have emigrated from hepatitis B endemic countries (such as in East / South East Asia, much of Africa). In BC, routine HBsAg testing is performed in all pregnant women to identify infants at risk and ensure appropriate post exposure prophylaxis is administered.

The diagnosis of acute hepatitis B is confirmed through laboratory testing for hepatitis B surface antigen, and the presence of anti-hepatitis B core IgM antibody. To detect the presence of chronic hepatitis B, generally laboratory testing is done as a part of prenatal screening, or when tests are sent as a result of a patient having symptoms (cirrhosis), or as part of testing for insurance purposes. Accurate diagnosis of acute versus chronic hepatitis B is important when attempting to determine trends in diagnosis, treatment, and control of infection, particularly with respect to acute hepatitis B as the number of cases reported in BC is very small. By convention, when it is not known if a case is acute or chronic, it is classified as unknown / undetermined (these tend to be chronic infections as they are asymptomatic).

Hepatitis B - Chronic and Unknown

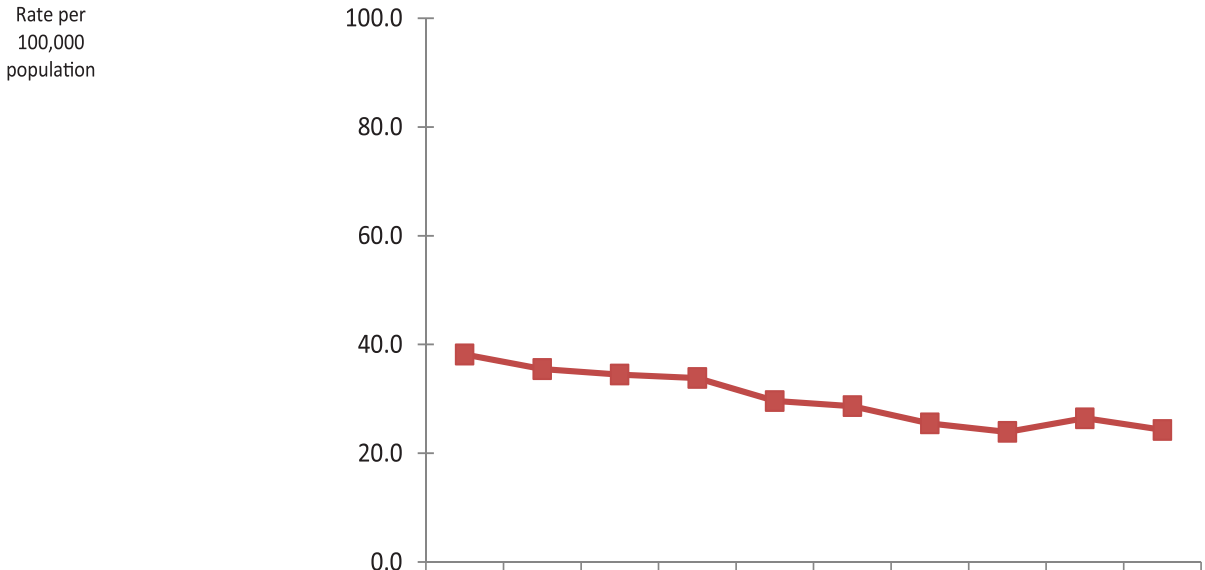
The rates of chronic and unknown hepatitis B reported in 2013 have been revised. The total number of cases in 2013 increased from 1177 to 1211 (34 additional cases). There were 1126 cases of chronic or unknown hepatitis B in 2014, representing a decline of 85 cases, and continuing the decline from the 1990's when more than 3000 cases a year were reported (Figure 14.1). Due to variations in provincial standards for tracking hepatitis B, comparisons are difficult to make nationally.

As in previous years, regions which have high rates of immigration from hepatitis B endemic regions had the highest rate including Richmond (96.5), Vancouver (60.8), and Fraser North (35.4) which were well above the provincial rate of 24.3 per 100,000 population (Figure 14.2). Demographically, the highest rates of chronic hepatitis B infection are noted in the 25-29, 30-39, and 40-59 year age groups, and while the overall rates are similar for male and female (24.6 and 23.9 respectively) females have higher rates in the 20-24, 25-29, and 30-39 year age groups (Figure 14.3). This could be attributed to increased detection due to more frequent use of medical resources by females and increased testing especially for prenatal screening.

Hepatitis B - Acute

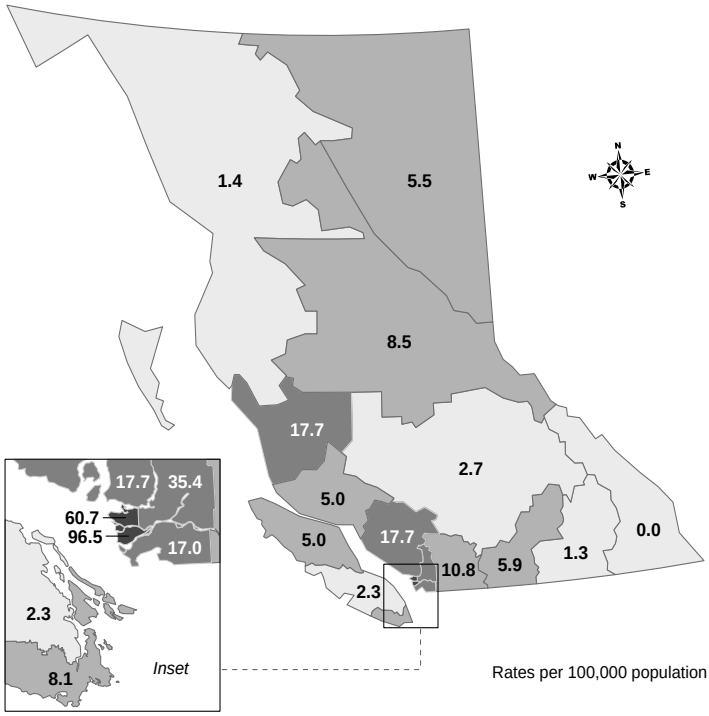
In 2014 there were 14 acute hepatitis B cases reported, an increase of three cases from the previous year. This rate continues to be stable in acute hepatitis B cases after the 26 cases observed in 2009, resulting in a rate of 0.3 per 100,000 (Figure 14.4). Nine males and five female cases were noted in 2014 (Figure 14.6), in contrast to the 10 male cases and single female case in 2013. Vancouver had three cases, and each health authority reported at least one case (Figure 14.5).

14.1 Chronic and Unknown Hepatitis B Rates by Year, 2005-2014



	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
BC Hepatitis B: Chronic and Unknown	1602	1506	1479	1472	1307	1280	1146	1086	1211	1126
BC Hepatitis B: Chronic and Unknown Rate	38.2	35.5	34.5	33.8	29.6	28.7	25.5	23.9	26.4	24.3

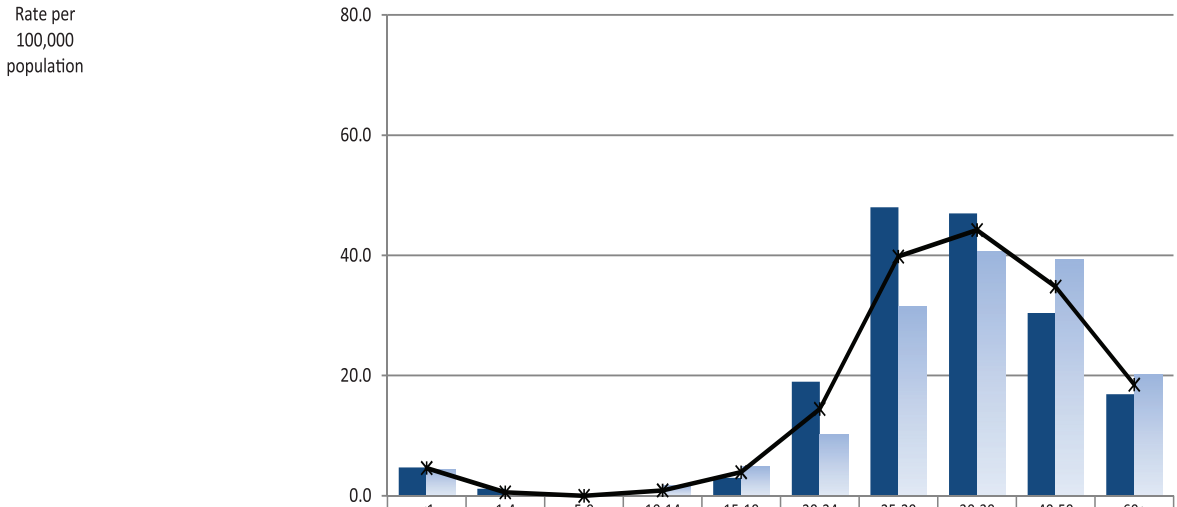
14.2 Chronic and Unknown Hepatitis B Rates by HSDA, 2014



ID	Health Service Delivery Area	Cases	Rate
11	East Kootenay	0	0.0
12	Kootenay Boundary	1	1.3
13	Okanagan	21	5.9
14	Thompson Cariboo Shuswap	6	2.7
21	Fraser East	31	10.8
22	Fraser North	227	35.4
23	Fraser South	132	17.0
31	Richmond	198	96.5
32	Vancouver	400	60.7
33	North Shore/Coast Garibaldi	50	17.7
41	South Vancouver Island	30	8.1
42	Central Vancouver Island	6	2.3
43	North Vancouver Island	6	5.0
51	Northwest	1	1.4
52	Northern Interior	12	8.5
53	Northeast	4	5.5

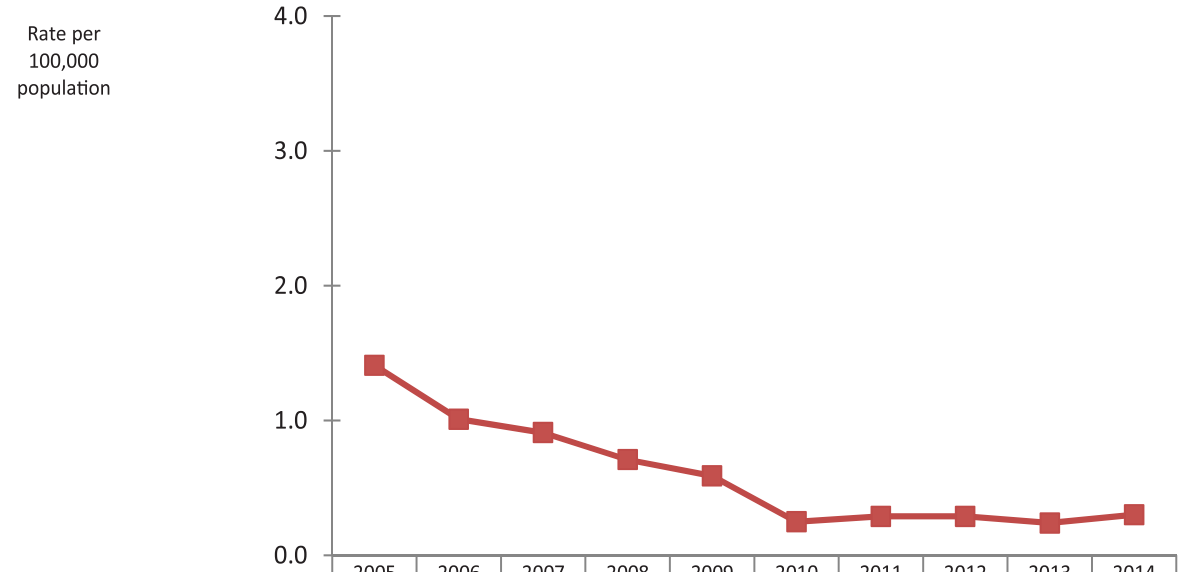
Rates per 100,000 population by HSDA

14.3 Chronic and Unknown Hepatitis B Rates by Age Group and Sex, 2014



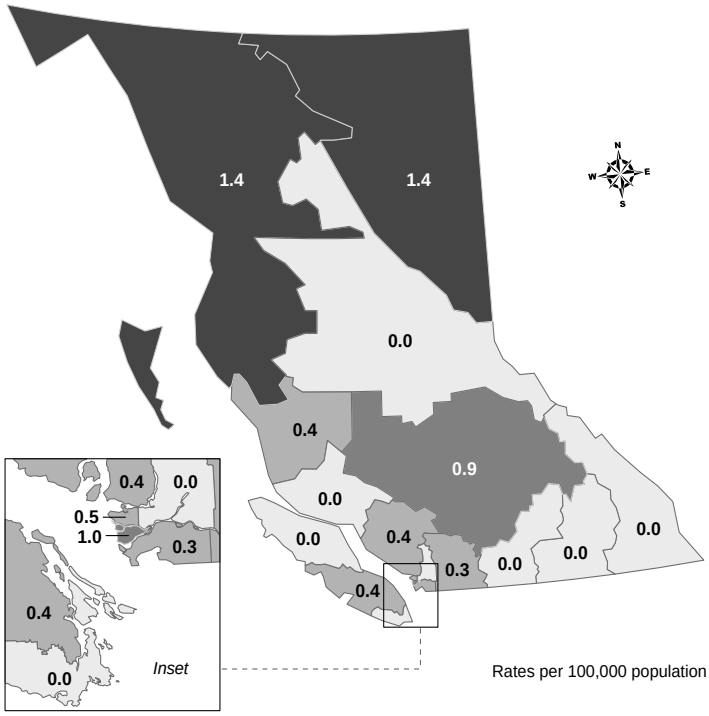
	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Hepatitis B: Chronic and Unknown Rate - Female	4.7	1.2	0.0	0.0	3.0	19.0	48.0	47.0	30.4	16.9
Hepatitis B: Chronic and Unknown Rate - Male	4.5	0.0	0.0	1.7	4.8	10.2	31.6	40.7	39.3	20.3
Hepatitis B: Chronic and Unknowns Rate	4.6	0.6	0.0	0.9	3.9	14.4	39.8	44.2	34.8	18.5
Hepatitis B: Chronic and Unknown Reports - Female	1	1	0	0	4	29	75	146	207	96
Hepatitis B: Chronic and Unknown Reports - Male	1	0	0	2	7	17	49	124	260	105
Hepatitis B: Chronic and Unknowns Reports	2	1	0	2	11	46	124	272	467	201

14.4 Acute Hepatitis B Rates by Year, 2005-2014



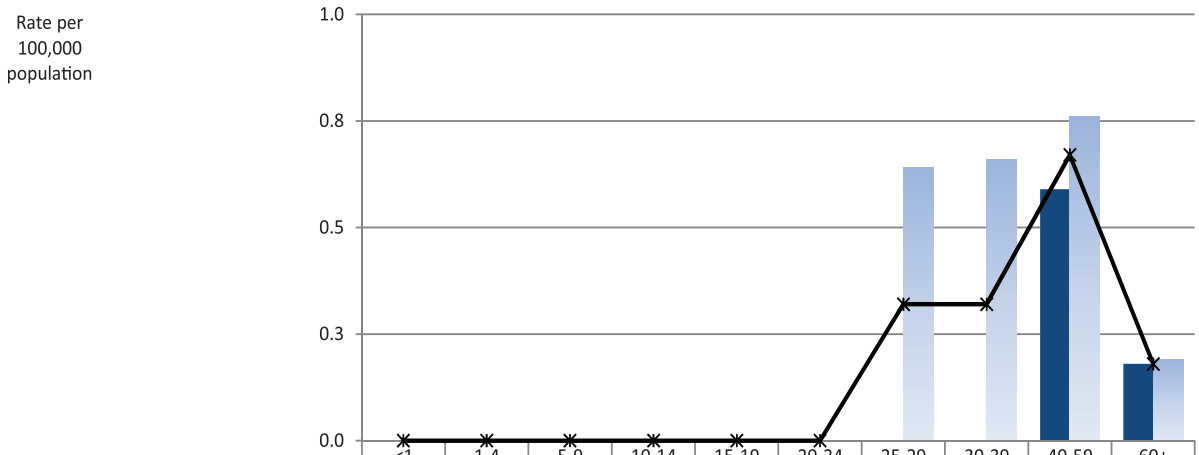
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
BC Hepatitis B: Acute Reports	59	43	39	31	26	11	13	13	11	14
BC Hepatitis B: Acute Rate	1.4	1.0	0.9	0.7	0.6	0.3	0.3	0.3	0.2	0.3

14.5 Acute Hepatitis B Rates by HSDA, 2014



ID	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	2	0.9
21	Fraser East	1	0.3
22	Fraser North	0	0.0
23	Fraser South	2	0.3
31	Richmond	2	1.0
32	Vancouver	3	0.5
33	North Shore/Coast Garibaldi	1	0.4
41	South Vancouver Island	0	0.0
42	Central Vancouver Island	1	0.4
43	North Vancouver Island	0	0.0
51	Northwest	1	1.4
52	Northern Interior	0	0.0
53	Northeast	1	1.4

14.6 Acute Hepatitis B Rates by Age Group and Sex, 2014



	<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	0.0	0.6	0.2
Hepatitis B: Acute Rate - Male	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.7	0.8	0.2
Acute Hepatitis B Rate	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.7	0.2
Hepatitis B: Acute Reports - Female	0	0	0	0	0	0	0	0	4	1
Hepatitis B: Acute Reports - Male	0	0	0	0	0	0	1	2	5	1
Acute Hepatitis B Reports	0	0	0	0	0	0	1	2	9	2

Hepatitis C

Hepatitis C infections are identified through laboratory testing, which is indicated for individuals with current or past risk factors for infection, to investigate the symptoms of liver disease or as part of insurance testing. Overall, the rate of hepatitis C testing in BC has increased annually with a sharp increase noted in the years 2012 and 2013 [1]. This testing increase may be partly due to the US Centres for Disease Control and Prevention recommending that "baby boomers" (people born between 1945 – 1965) should be tested for the hepatitis C virus [2]. In BC, additional testing will likely occur due to the recently announced "Generation Hep" program [3]. Increased testing can lead to identification of hepatitis C cases in persons who were infected remotely.

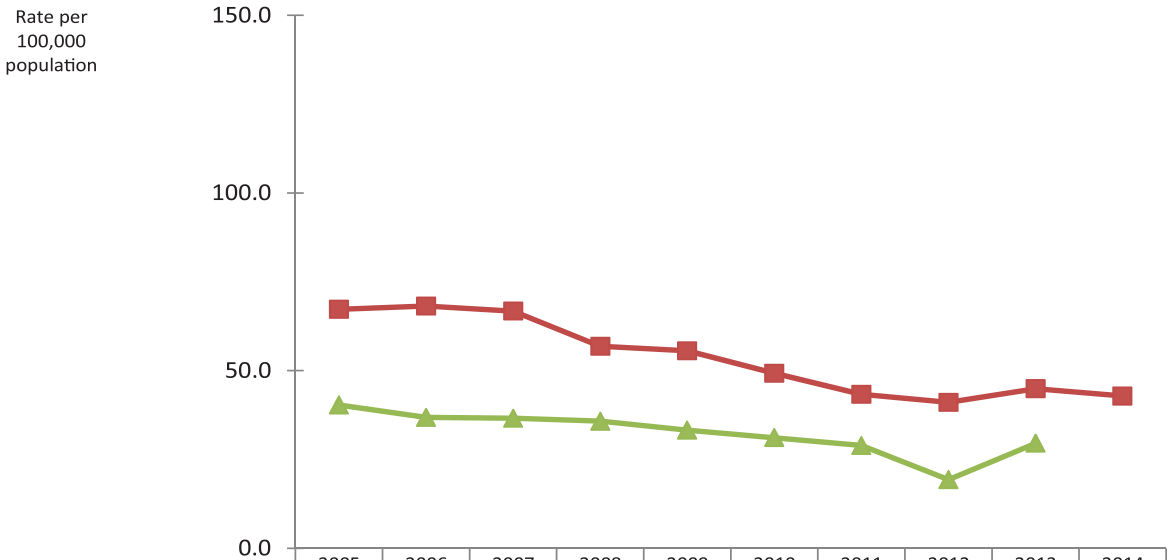
There were 1985 hepatitis C cases reported in 2014, resulting in a rate of 42.9 cases per 100,000. This represents a small decrease from 2058 cases reported in 2013 (a rate of 44.9 cases per 100,000). There were slightly more female cases than male in the 15-19 and 20-24 year age groups, which may be attributed to increased detection resulting from increased medical system access for issues such as pregnancy, contraception, etc. As in 2013, the rates in males in older age groups (over 30) were much higher than the rates in females. Only 6 cases were noted in persons aged less than 15 years, the same number as in 2013. When considered by Health Service Delivery Area, the highest rate was noted in Fraser East at 71.8 cases per 100,000 (note that Fraser East also had the highest rate in 2013 at 77 per 100,000) followed by Northern Interior with a rate of 70.5 (which was also second highest in 2013 at 64.9). The lowest rate was noted in Richmond at 17.1 cases per 100,000 (also the lowest in 2013 at 20.4 per 100,000). Other areas with high (greater than or equal to 50 cases per 100,000) rates were the Northwest (52.9), North Vancouver Island (54.5), Vancouver (50.0), and Thompson Cariboo Shuswap (51.1).

1. BC Public Health Microbiology Reference Laboratory

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

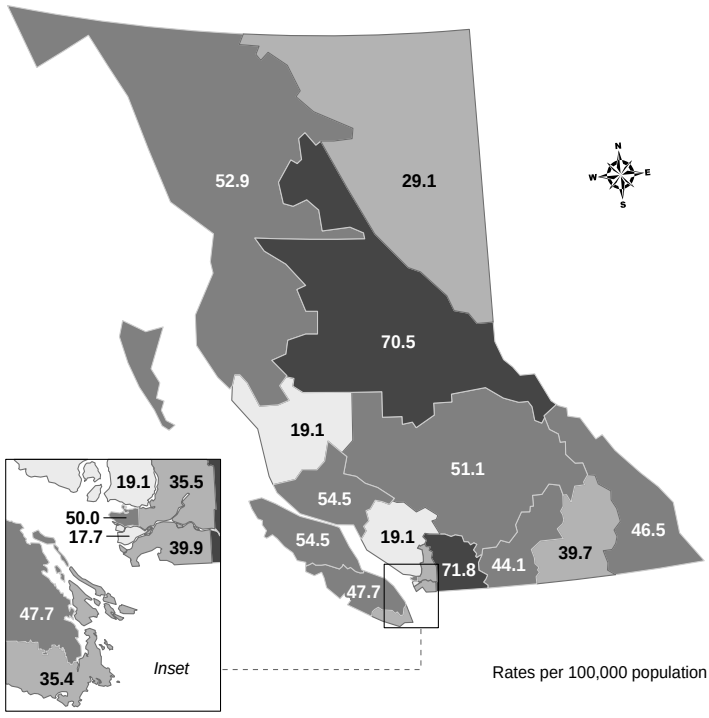
3. Generation Hep. Generation Hep.com. Downloaded from http://www.generationhep.com on July 27, 2015.

15.1 Hepatitis C Rates by Year, 2005-2014



	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
BC Hepatitis C Reports	2822	2891	2863	2473	2452	2201	1950	1866	2058	1985
BC Hepatitis C Rate	67.3	68.2	66.7	56.9	55.6	49.3	43.3	41.1	44.9	42.9
Canadian Hepatitis C Rate	40.3	36.9	36.6	35.8	33.3	31.1	28.9	19.3	29.6	

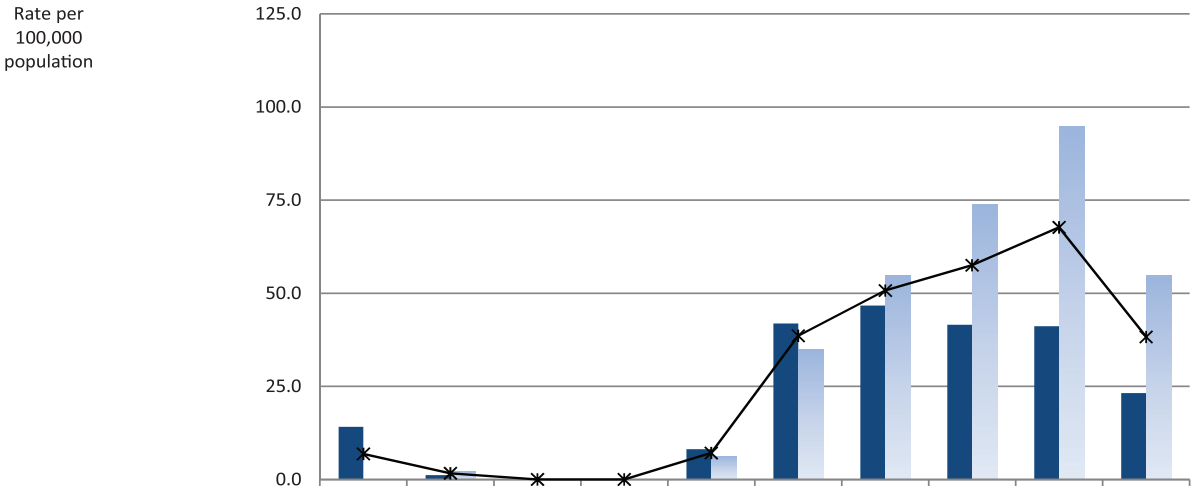
15.2 Hepatitis C Rates by HSDA, 2014



ID	Health Service Delivery Area	Cases	Rate
11	East Kootenay	36	46.5
12	Kootenay Boundary	31	39.7
13	Okanagan	156	44.1
14	Thompson Cariboo Shuswap	113	51.1
21	Fraser East	207	71.8
22	Fraser North	228	35.5
23	Fraser South	310	39.9
31	Richmond	35	17.1
32	Vancouver	329	50.0
33	North Shore/Coast Garibaldi	54	19.1
41	South Vancouver Island	132	35.4
42	Central Vancouver Island	127	47.7
43	North Vancouver Island	66	54.5
51	Northwest	39	52.9
52	Northern Interior	100	70.5
53	Northeast	21	29.1

Rates per 100,000 population by HSDA

15.3 Hepatitis C Rates by Age Group and Sex, 2014



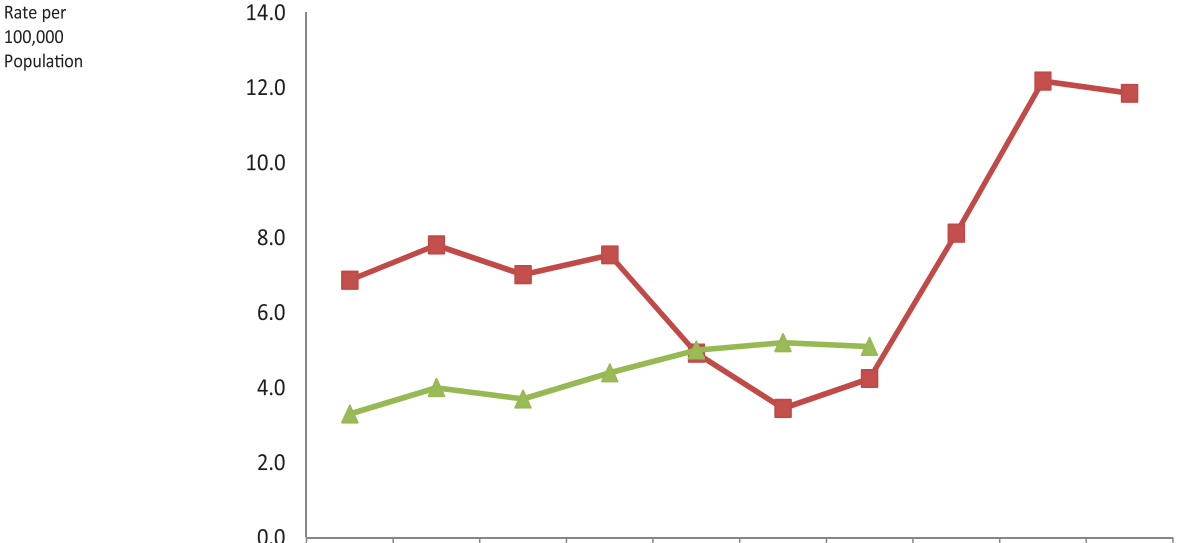
	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Hepatitis C Rate - Female	14.2	1.2	0.0	0.0	8.2	41.9	46.7	41.5	41.2	23.2
Hepatitis C Rate - Male	0.0	2.2	0.0	0.0	6.2	35.0	54.8	73.8	94.7	54.9
Hepatitis C Rate	6.9	1.7	0.0	0.0	7.1	38.6	50.7	57.5	67.7	38.3
Hepatitis C Reports - Female	3	1	0	0	11	64	73	129	280	132
Hepatitis C Reports - Male	0	2	0	0	9	58	85	225	627	284
Hepatitis C Reports	3	3	0	0	20	123	158	354	908	416

Infectious Syphilis

In 2014, the rate of infectious syphilis (i.e., primary, secondary and early latent) in BC decreased slightly to 11.9 (549 cases) from 12.2 (558 cases) per 100,000 in 2013. Over 95% (524 cases) of infectious syphilis cases in 2014 were male, with the highest rates observed in males between 25-59 years of age. In 2014, the rates among HSDAs varied with the highest rates in Vancouver (57.4 per 100,000; 378 cases) and Fraser North (8.6 per 100,000; 55 cases), and the lowest rates in both East Kootenay and Northeast (0.0 per 100,000; 0 cases).

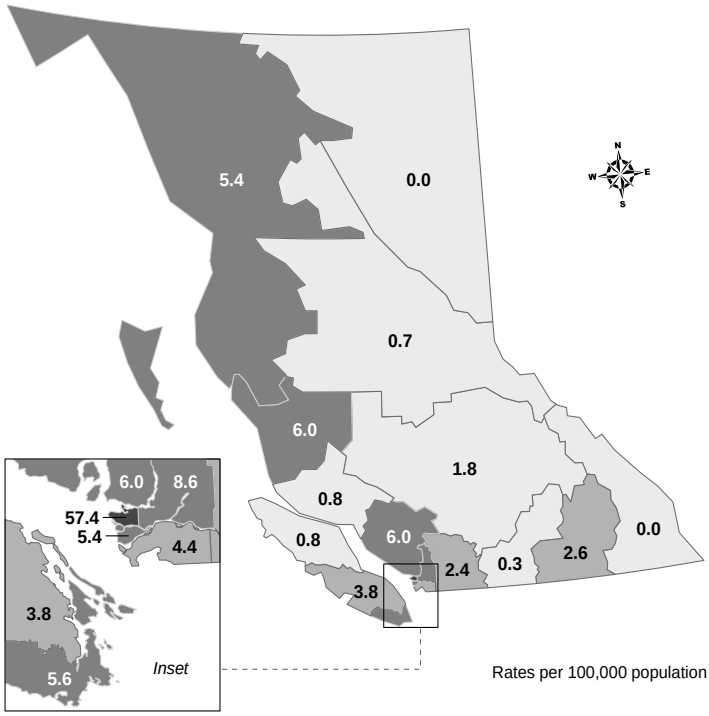
More detailed information on syphilis trends in BC is available in the STI Annual Report which is available as http://www.bccdc.ca/util/about/annreport/default.htm.

16.1 Infectious Syphilis Rates by Year, 2005-2014



	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
BC Infectious Syphilis Reports	288	331	301	328	217	154	191	369	558	549
BC Infectious Syphilis Rate	6.9	7.8	7.0	7.5	4.9	3.4	4.2	8.1	12.2	11.9
Canadian Infectious Syphilis Rate	3.3	4.0	3.7	4.4	5.0	5.2	5.1			

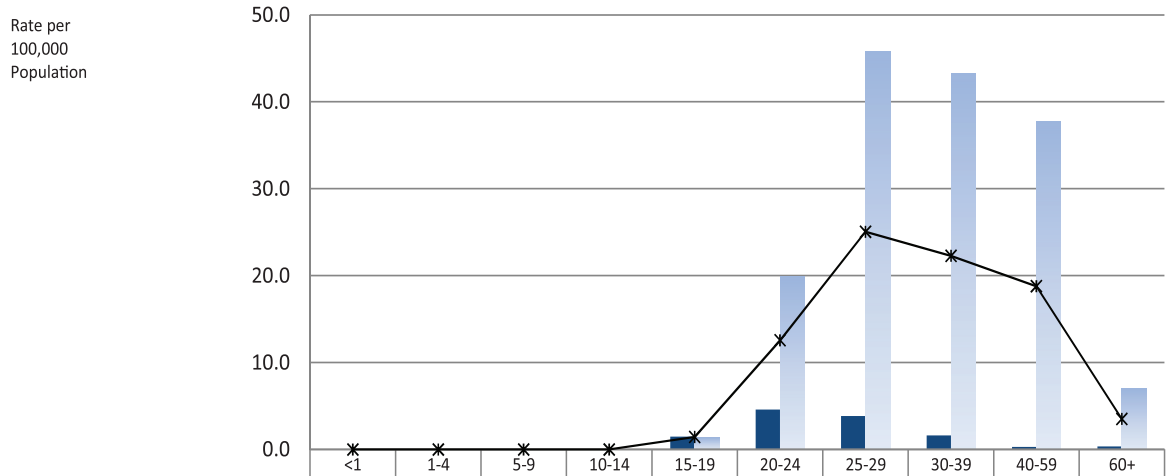
16.2 Infectious Syphilis Rates by HSDA, 2014



ID	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	4	1.8
21	Fraser East	7	2.4
22	Fraser North	55	8.6
23	Fraser South	34	4.4
31	Richmond	11	5.4
32	Vancouver	378	57.4
33	North Shore/Coast Garibaldi	17	6.0
41	South Vancouver Island	21	5.6
42	Central Vancouver Island	10	3.8
43	North Vancouver Island	1	0.8
51	Northwest	4	5.4
52	Northern Interior	1	0.7
53	Northeast	0	0.0

Rates per 100,000 population by HSDA

16.3 Infectious Syphilis Rates by Age Group and Sex, 2014



	<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	1.5	4.6	3.8	1.6	0.3	0.4
Infectious Syphilis Rate - Male	0.0	0.0	0.0	0.0	1.4	19.9	45.8	43.3	37.8	7.0
Infectious Syphilis Rate - Total	0.0	0.0	0.0	0.0	1.4	12.5	25.0	22.3	18.8	3.5
Infectious Syphilis Reports - Female	0	0	0	0	2	7	6	5	2	2
Infectious Syphilis Reports - Male	0	0	0	0	2	33	71	132	250	36
Infectious Syphilis Reports - Total	0	0	0	0	4	40	78	137	252	38

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

Disease Transmitted by Respiratory Routes

Enterovirus D68 (EV-D68)
Streptococcal Disease (invasive) Group A
Tuberculosis

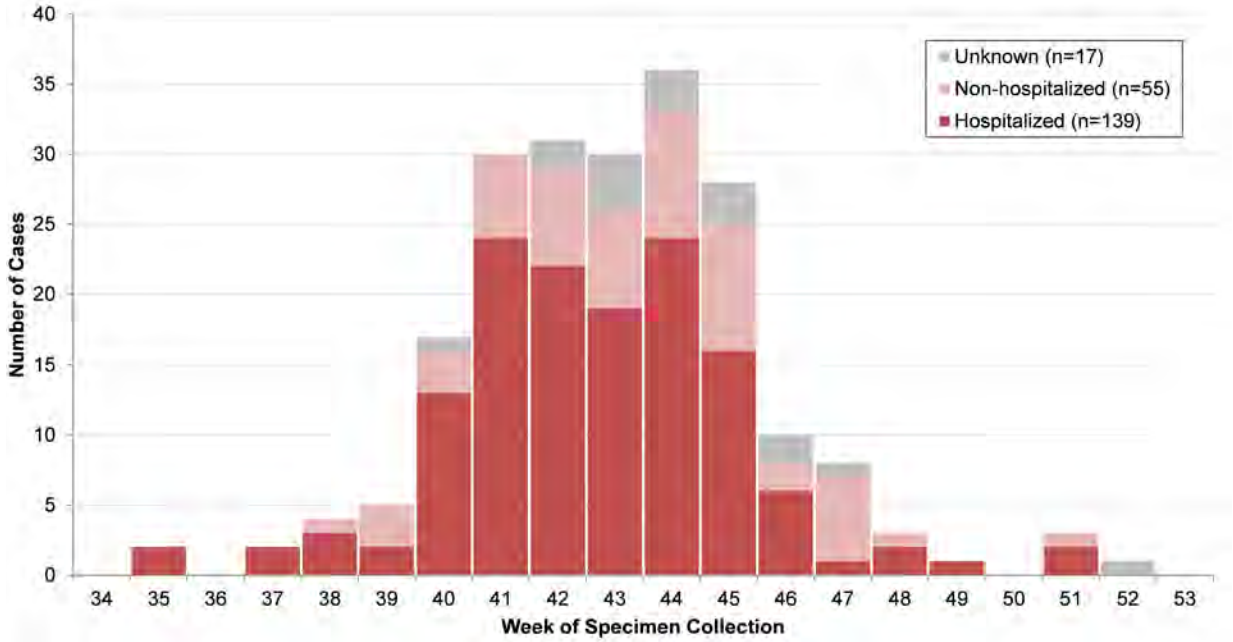
Enterovirus D68 (EV-D68)

Enterovirus D68 (EV-D68) is a rare but known non-polio enterovirus that causes mild to severe respiratory illness. In the late summer and fall of 2014, EV-D68 was associated with an outbreak of severe respiratory illness in the United States and Canada. In September 2014, the BCCDC in collaboration with regional health authorities and the Public Health Agency of Canada implemented time-limited, enhanced surveillance for EV-D68. Detailed enhanced surveillance data were collected on all lab-confirmed cases of EV-D68 in BC to October 31, 2014, with partial data collection continuing until December 31, 2014.

Since August 28, 2014, 211 cases of EV-D68 infection were detected in BC, of which at least 139 were severe cases requiring hospitalization. Hospitalization status was unknown for 17 cases. EV-D68 detections in BC increased beginning in late September (week 39), with >80% of cases detected over a six-week period from October to early November (week 40-45) (Figure 40.1). The median age of severe cases requiring hospitalization was 8 years (range: <1 year to >90 years). About two-thirds were reported in children <10 years of age. Males were over-represented among hospitalized cases, with a male-to-female ratio of 1.4.

During the enhanced surveillance period, the BCCDC was notified of five cases of neurologic illness (three paediatric, two adult) and three deaths (one child <5 years old, one young adult, one elderly adult) associated with EV-D68 infection. However, it remains unclear to what extent EV-D68 infection caused or contributed to these severe manifestations. As with other respiratory viruses, including enteroviruses, a proportion of all EV-D68 cases may experience more severe sequelae, although the risk for most individuals remains low.

40.1 Number of lab-confirmed enterovirus D68 (EV-D68) cases by hospitalization status and week of specimen collection, British Columbia, August 28 to December 31, 2014*



** Counts are based on number of patients; where multiple specimens per patient were collected, the earlier collection date was used if specimens were collected on different days.*

Streptococcal Disease (invasive) Group A (iGAS)

The rate of confirmed cases of invasive Group A Streptococcal disease (iGAS) in BC was 3.6 cases per 100,000 population in 2014. This is similar to the reported iGAS rates in previous years, with the exception of the 2007 and 2008 peak incidence years.

The highest incidence rates were in males aged 40-59 years and ≥ 60 years with rates of 6.0 cases and 5.8 cases per 100,000 population, respectively.

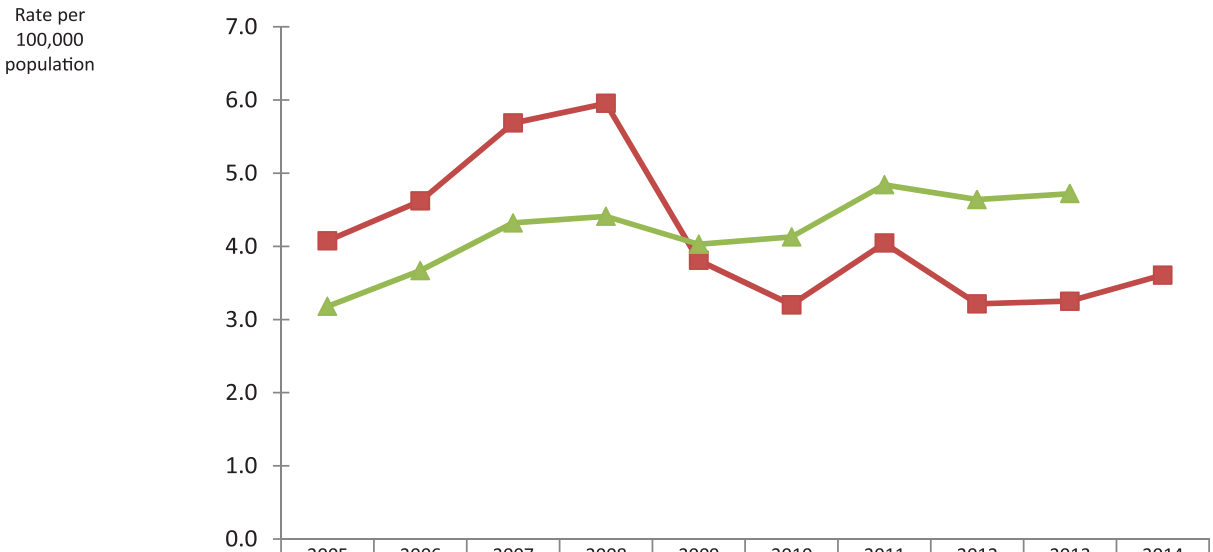
Cases occurred in 14 of the 16 Health Service Delivery Areas, with rates ranging from 1.7 to 10.3 cases per 100,000 population. The highest rate was in the Kootenay Boundary region; however, no clusters were identified. The eight cases in Kootenay Boundary occurred over 11 months, had a broad age range (7-86 years) and had seven different emm types.

Of the 167 confirmed cases in 2014, seventeen (10%) were reported as clinical syndromes of toxic shock syndrome and thirteen (8%) with necrotizing fasciitis.

The case fatality rate was 7.2%. Between 2005 and 2013, annual case fatality rates have ranged from 6.0% to 13.2%. Of the twelve deaths in 2014, one was in an infant presenting with pneumonia; the other eleven deaths were in adults over the age of 30 years.

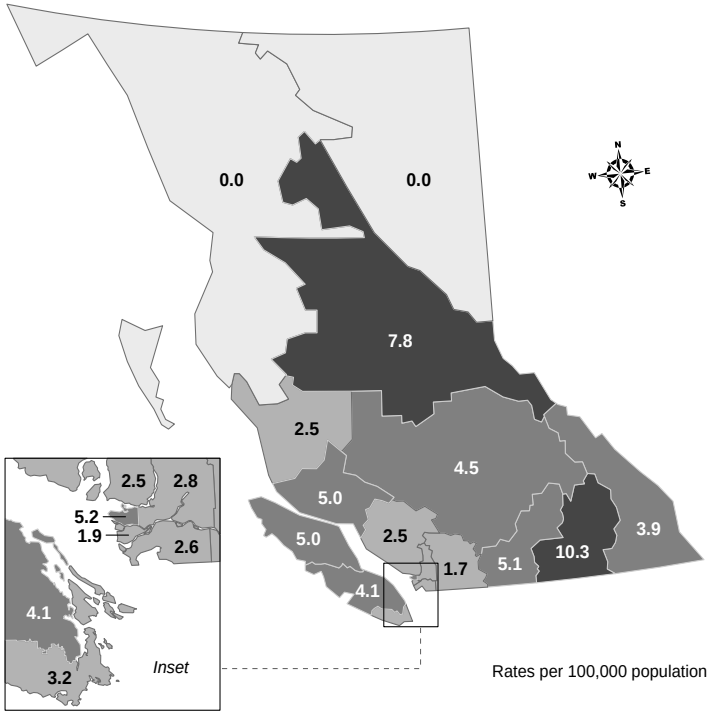
Isolates from 137 (82%) confirmed cases were typed by the National Microbiology Laboratory. The most common emm types were 1 (14%), 89 (10%) and 28 (8%); these were the three most common emm types seen at the national level in 2014. In 2005 through 2013 the most common emm types among cases with typing results were types 1 (12%), 59 (9%) and 89 (4%).

17.1 Streptococcal Disease (invasive) Group A Rates by Year, 2005-2014

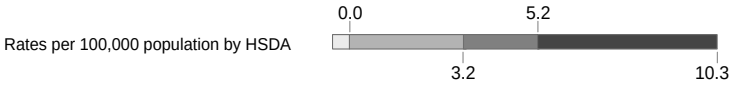


	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
BC iGAS Reports	171	196	244	259	168	143	182	146	149	167
BC iGAS Rate	4.1	4.6	5.7	6.0	3.8	3.2	4.0	3.2	3.3	3.6
Canadian iGAS Rate	3.2	3.7	4.3	4.4	4.0	4.1	4.8	4.6	4.7	

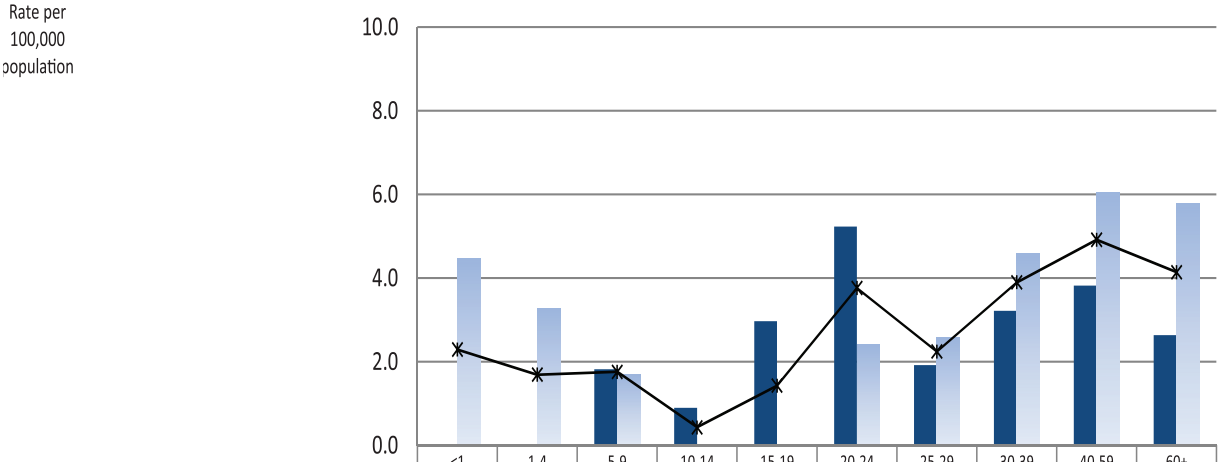
17.2 Streptococcal Disease (invasive) Group A Rates by HSDA, 2014



ID	Health Service Delivery Area	Cases	Rate
11	East Kootenay	3	3.9
12	Kootenay Boundary	8	10.3
13	Okanagan	18	5.1
14	Thompson Cariboo Shuswap	10	4.5
21	Fraser East	5	1.7
22	Fraser North	18	2.8
23	Fraser South	20	2.6
31	Richmond	4	1.9
32	Vancouver	34	5.2
33	North Shore/Coast Garibaldi	7	2.5
41	South Vancouver Island	12	3.2
42	Central Vancouver Island	11	4.1
43	North Vancouver Island	6	5.0
51	Northwest	0	0.0
52	Northern Interior	11	7.8
53	Northeast	0	0.0



17.3 Streptococcal Disease (invasive) Group A Rates by Age Group and Sex, 2014



	<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	0.0	1.8	0.9	3.0	5.2	1.9	3.2	3.8	2.6
Streptococcal Disease, Group A, Invasive Rate - Male	4.5	3.3	1.7	0.0	0.0	2.4	2.6	4.6	6.0	5.8
Streptococcal Disease, Group A, Invasive Rate	2.3	1.7	1.8	0.4	1.4	3.8	2.2	3.9	4.9	4.1
Streptococcal Disease, Group A, Invasive Reports - Female	0	0	2	1	4	8	3	10	26	15
Streptococcal Disease, Group A, Invasive Reports - Male	1	3	2	0	0	4	4	14	40	30
Streptococcal Disease, Group A, Invasive Reports	1	3	4	1	4	12	7	24	66	45

Tuberculosis

In 2014 there were 279 cases of reported tuberculosis in British Columbia, for a rate of 6.0 per 100,000, a 5.4% increase in the number and 3.3% increase in the rate of reported cases compared to 2013.

Rates for Health Regions vary across the province. The Vancouver, Richmond, Fraser South and Fraser North health service delivery areas have rates exceeding the provincial rate (6.0 per 100,000 population). The highest incidence was reported from Vancouver and Richmond (12.6 and 11.7 per 100,000 population respectively) while the lowest was in East Kootenay and North Vancouver Island (0and 0.8 per 100,000 population respectively).

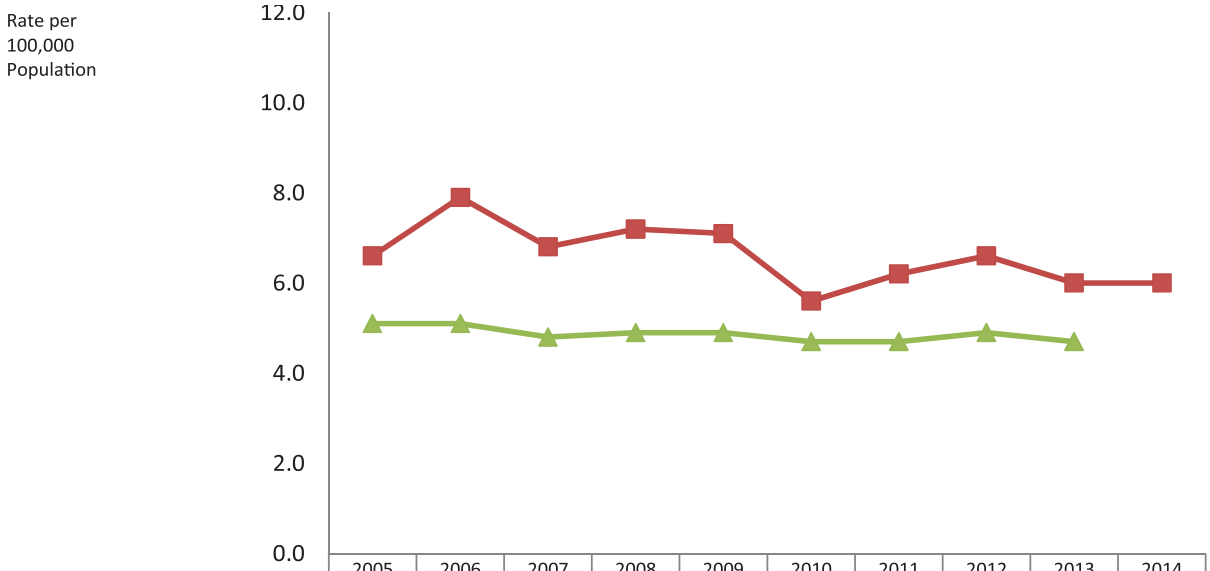
Compared to 2013, the rate of tuberculosis increased in Vancouver, Richmond, Kootenay Boundary, Thompson Cariboo Shuswap, North Shore/Coast Garibaldi, South Vancouver Island and Fraser South with Vancouver showing the largest increase in rate of tuberculosis (from 9.6 to 12.6 per 100,000 population). In North Vancouver Island and Central Vancouver Island the rates remained the same. In East Kootenay, Okanagan, Northwest, Fraser East, Fraser North, Northern Interior and Northeast the rate of tuberculosis decreased with East Kootenay and Okanagan showing the largest decrease in rate of tuberculosis (from 2.6 to none and from 4.3 to 2.3 per 100,000 population respectively).

The age specific rates are shown in figure 20.3. The rate was highest in people >= 60 years. Overall, the tuberculosis rate was higher in men than in women (6.7 vs 5.3 per 100,000). For the age group 0-39 years the rate of tuberculosis was higher in women than in men (3.8 vs 3.3 per 100,000). In those >=40 years old, the rate of tuberculosis in men was higher than in women (10.0 vs 6.6 per 100,000).

The higher active TB rate observed in BC relative to the Canadian average may be due to a large number of foreign-born individuals entering the province from high-incidence countries. It must be noted that BC has a more inclusive case definition than does the Public Health Agency of Canada (PHAC), which may elevate our rates slightly compared to the Canadian rate. 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).

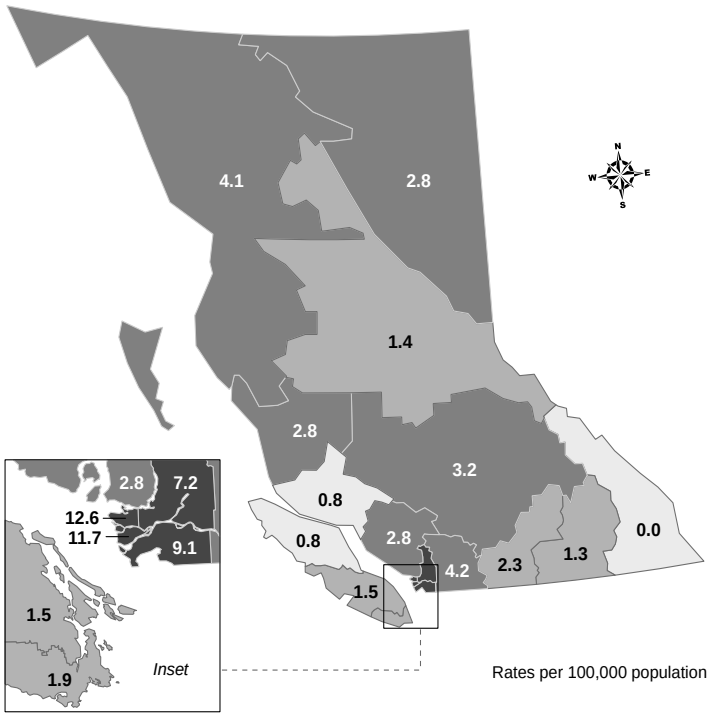
.

20.1 Tuberculosis Rates by Year, 2005-2014

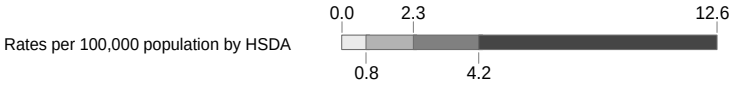


	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
BC Tuberculosis active cases	277	336	292	313	315	251	277	299	273	279
BC Tuberculosis Rate	6.6	7.9	6.8	7.2	7.1	5.6	6.2	6.6	6.0	6.0
Canadian Tuberculosis Rate	5.1	5.1	4.8	4.9	4.9	4.7	4.7	4.9	4.7	

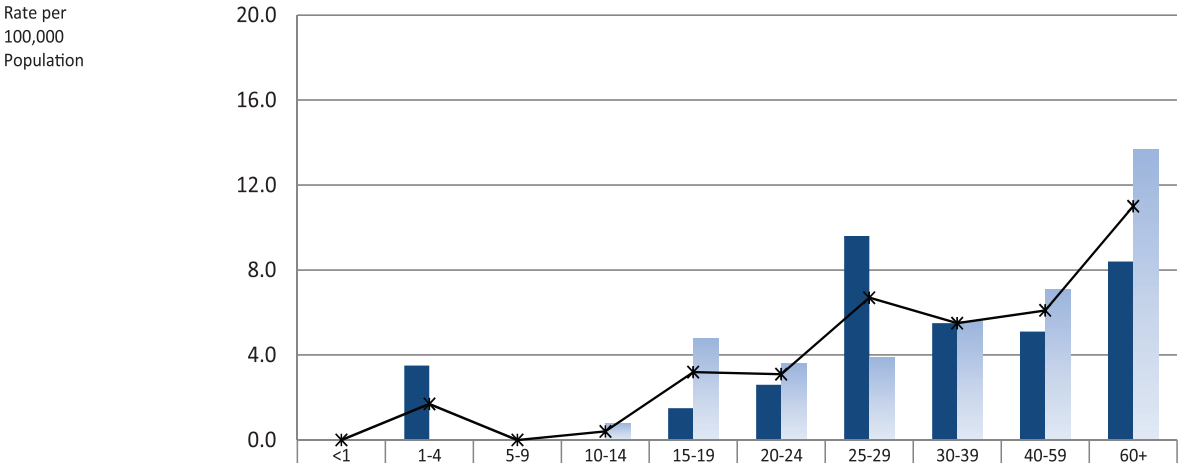
20.2 Tuberculosis Rates by HSDA, 2014



ID	Health Service Delivery Area	Cases	Rate
11	East Kootenay	0	0.0
12	Kootenay Boundary	1	1.3
13	Okanagan	8	2.3
14	Thompson Cariboo Shuswap	7	3.2
21	Fraser East	12	4.2
22	Fraser North	46	7.2
23	Fraser South	71	9.1
31	Richmond	24	11.7
32	Vancouver	83	12.6
33	North Shore/Coast Garibaldi	8	2.8
41	South Vancouver Island	7	1.9
42	Central Vancouver Island	4	1.5
43	North Vancouver Island	1	0.8
51	Northwest	3	4.1
52	Northern Interior	2	1.4
53	Northeast	2	2.8



20.3 Tuberculosis Rates by Age Group and Sex, 2014



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Tuberculosis Rate -Female	0.0	3.5	0.0	0.0	1.5	2.6	9.6	5.5	5.1	8.4
Tuberculosis Rate -Male	0.0	0.0	0.0	0.8	4.8	3.6	3.9	5.6	7.1	13.7
Tuberculosis Rate	0.0	1.7	0.0	0.4	3.2	3.1	6.7	5.5	6.1	11.0
Tuberculosis Reports - Female	0	3	0	0	2	4	15	17	35	48
Tuberculosis Reports - Male	0	0	0	1	7	6	6	17	47	71
Tuberculosis Reports	0	3	0	1	9	10	21	34	82	119

Antimicrobial Resistant Organism Surveillance in BC

As a component of The Do Bugs Need Drugs? program evaluation, trends in resistance are analyzed and compiled in a report using data on antimicrobial susceptibility testing from 90% of community laboratories in British Columbia (BC). Spearman rank correlation tests are used to assess changes in resistance patterns over time (2007 – 2014). The findings below are based on analyses of anonymized, line-listed data provided by LifeLabs Laboratories (BC Biomedical component). Data from other LifeLabs laboratories are currently pending. The updated report, entitled "Antimicrobial Resistance Trends in the Province of British Columbia", will be published online at www.bccdc.ca/dbnd. For healthcare-associated infections (e.g. MRSA, CPO, and C. difficile), please visit the Provincial Infection Control Network of British Columbia (PICNet) at: https://www.picnet.ca/surveillance/latest-surveillance-reports/

Highlights in Trends in Antibiotic Resistance

- From 2007 to 2014, the proportion of *Staphylococcus aureus (S. aureus)* that were resistant to methicillin (MRSA) fluctuated, yet remained below the peak of 30.5 % observed in 2007. In 2014, 23.3% of *S.aureus* isolates were MRSA and showed resistance to erythromycin (81.0%) and clindamycin (36.6%) but considerably lower rate of resistance to TMP-SMX (1.3%), tetracyclines (6.7%), and mupirocin (2.3) [Figure 21.1]. Susceptibility to linezolid, a recommended second-line antibacterial agent for community associated MRSA infections requiring treatment, remains around 100% (data not shown).
- Resistance of *Escherichia coli (E. 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 23.8% in 2014 (p<0.01) [Figure 21.2]. Similarly, *E.coli* isolates demonstrated moderate levels of resistance to TMP-SMX, currently at a rate of 24.0%. Resistance to nitrofurantoin shows a decreasing trend over the years and remains low at 2.1% in 2014 (p<0.01).
- From 2007 to 2014, *Streptococcus pneumoniae* (*S. pneumoniae*) isolates have demonstrated a stable rate of resistance to most tested antibacterial agents. In 2014, *S. pneumoniae* isolates tested non-susceptible against erythromycin, penicillin, and TMP-SMX at rates of 35.2%, 18.7%, and 20.6%, respectively.
- *Streptococcus pyogenes (S. pyogenes) i*solates remain 100% susceptible to penicillin, amoxicillin-clavulanate, and cephalothin. Resistance rates of *S. pyogenes* to erythromycin and clindamycin have decreased significantly to 12% (p<0.01) for each drug.
- *Enterococcus spp.* isolates remained highly susceptible to ampicillin (97%) and nitrofurantoin (99%). Isolates identified as vancomycin-resistant Enterococci (VRE) increased slightly to 1.2% in 2014 (p<0.01). Resistance to ciprofloxacin has significantly decreased and is currently at 22.3% (p<0.01).
- Resistance of *Klebsiella pneumoniae (K. pneumonia)* isolates to ciprofloxacin, amikacin, and gentamycin remain low at 4.2%, 0.3%, and 2.6% respectively in 2014.
- *Proteus mirabilis (P. mirabilis)* isolates showed a slight decrease in rate of resistance to ciprofloxacin, currently at 17.8% (p<0.05). In addition, *P. mirabilis* isolates demonstrated a moderate level of resistance (30.7%) to TMP-SMX and a low level of resistance to gentamicin (7.4%) and amikacin (1.3%) in 2014. The susceptibility to nitrofurantoin remains around 100%.
- The percent of *Haemophilus influenza* isolates showing resistance to ampicillin was 23.5% in 2014.
- Approximately 13.1% of *E. coli* isolates exhibit an Extended spectrum *β-lactamase* (ESBL) – like phenotype and showed a slight increase over the last eight years (p<0.05). The percent of *K. pneumonia* and *P. mirabilis* isolates demonstrating an ESBL-like phenotype decreased significantly from 8.5% in 2007 to 4.2% and from 12.5% to 4.9% in 2014, respectively (*K. pneumonia*: p=0.037 and *P.mirabilis*: p=0.004).
    - In 2014, 70.8% of ESBL-like *E. coli* isolates were non-susceptible to fluoroquinolones. Aminoglycoside and TMP-SMX non-susceptibility rates were estimated at 30.0% and 49.6%, respectively. The proportion of

of ESBL-like *E. coli* isolates non-susceptible to more than one class of antimicrobial has remained relatively stable from 2007 to 2014 (p=0.233). However, the proportion of ESBL-like *E. coli* isolates that are non-susceptible to all three classes of antibiotics has decreased from 24.9% in 2007 to 16.9% in 2014 (p=0.004) [Figure 21.3].

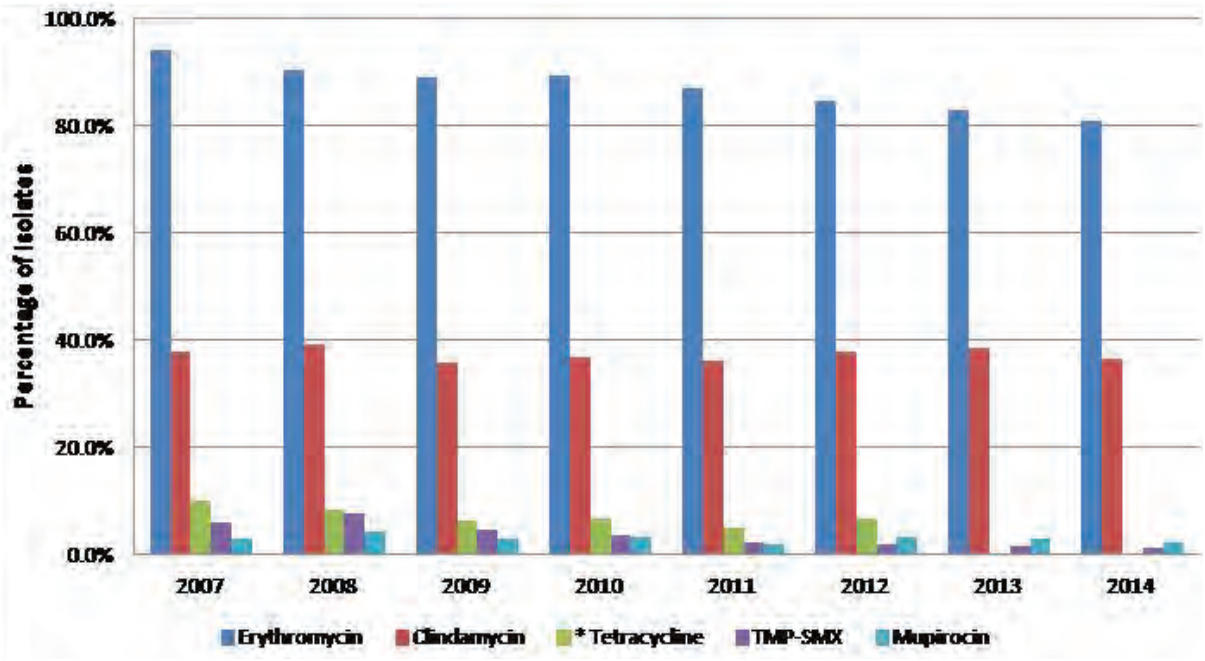
- According to the British Columbia Public Health Microbiology and Reference Laboratory (BCPHMRL) Laboratory Trends report [1,2], 190 patients with Carbapenemase-Producing Organisms (CPO) have been identified between 2008 and September, 2014. Prior to 2010, only one patient in 2008 and 2009 were identified to carry CPO; however increasing number of cases are being identified each year. In 2014 (January - September), 74 cases were identified with CPO. The majority of patients infected with CPO carried the NDM-1 gene (73.0%), followed by 13.5% of patients infected with organisms carrying the OXA-48 gene.

References:

1. BC Public Health Microbiology and Reference Laboratory. Laboratory Trends; 2014 Apr. Available from: http://www.bccdc.ca/NR/rdonlyres/654D5209-8A41-46DC-BF3A-0884D26DC-CD6/0/Apr2014LaboratoryTrends.pdf

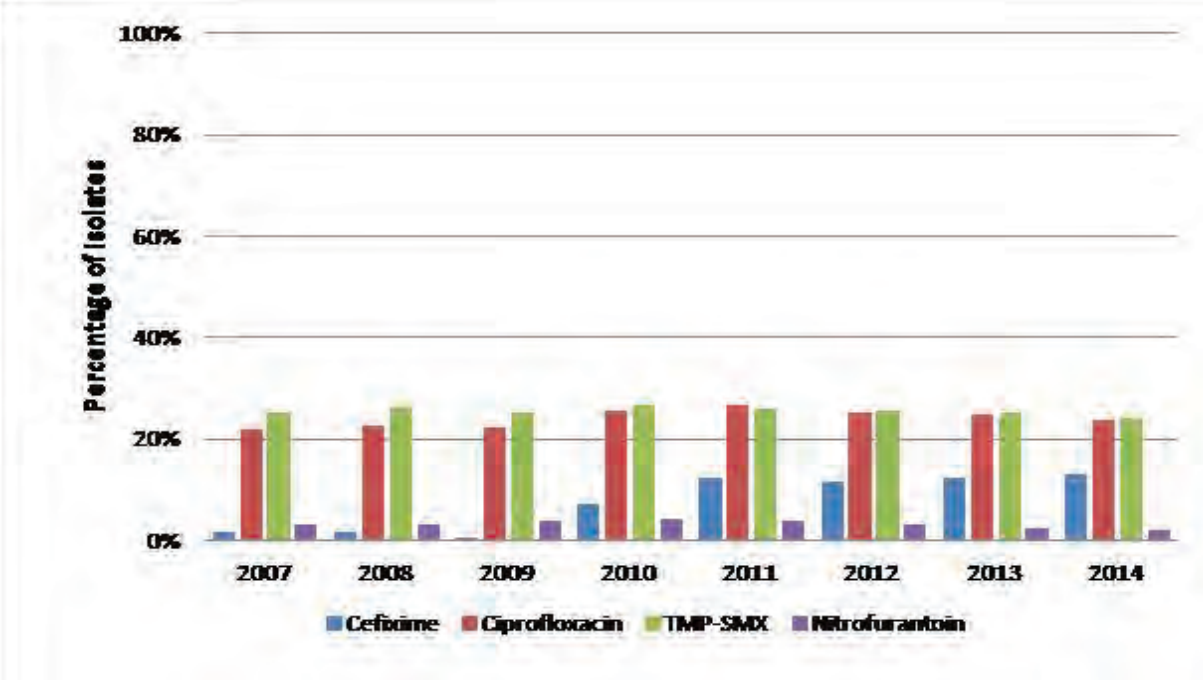
2. BC Public Health Microbiology and Reference Laboratory. Laboratory Trends; 2014 Sep. Available from: http://www.bccdc.ca/NR/rdonlyres/50760A45-6C83-4F9C-833C-878E48A931A3/0/Sept2014LaboratoryTrends.pdf

21.1 MRSA Resistance to Erythromycin, Clindamycin, Tetracycline, TMP-SMX and Mupirocin (2007-2014)



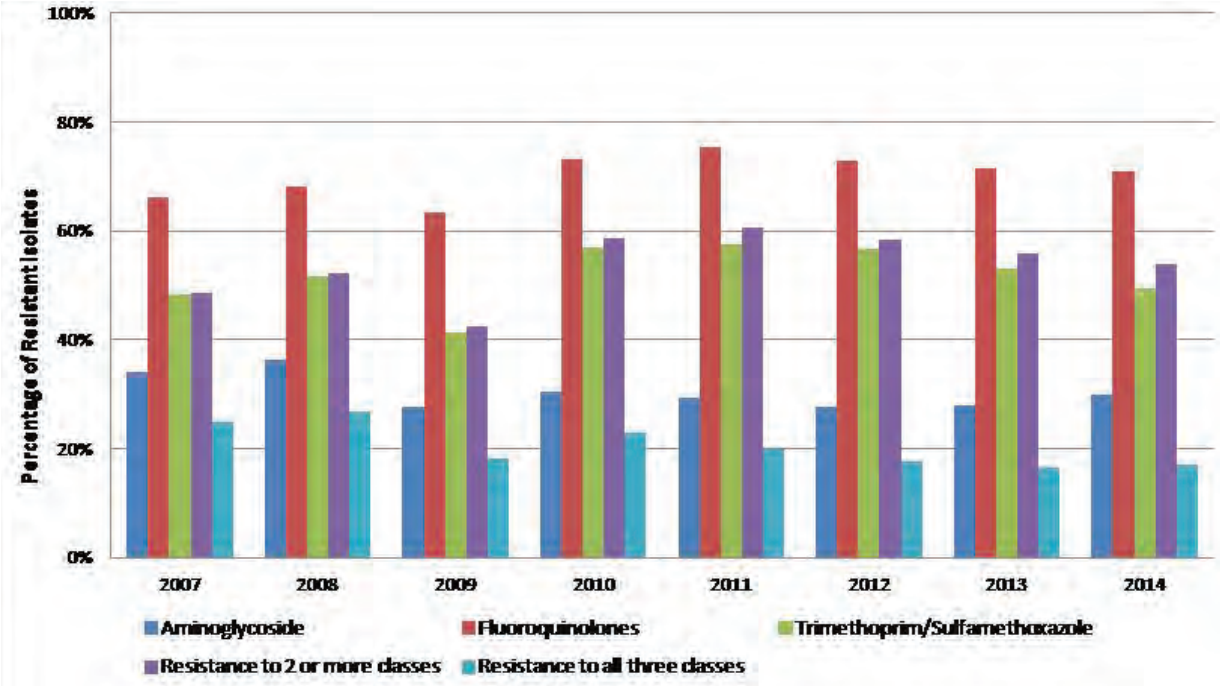
Source: BC Biomedical Laboratories (part of LifeLabs)
** 2013 and 2014 data unavailable due to changes in methodology for testing of susceptibility.*

21.2 E.coli Resistance to Cefixime, Ciprofloxacin, TMP-SMX, Nitrofurantoin (2007-2014)



Source: BC Biomedical Laboratories (part of LifeLabs)

21.3 ESBL-like E.coli Resistance to Aminoglycoside, Fluoroquinolones , TMP-SMX, and multiple classes (2007-2014)



Source: BC Biomedical Laboratories (part of LifeLabs)

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

Enteric, Food and Waterborne Diseases

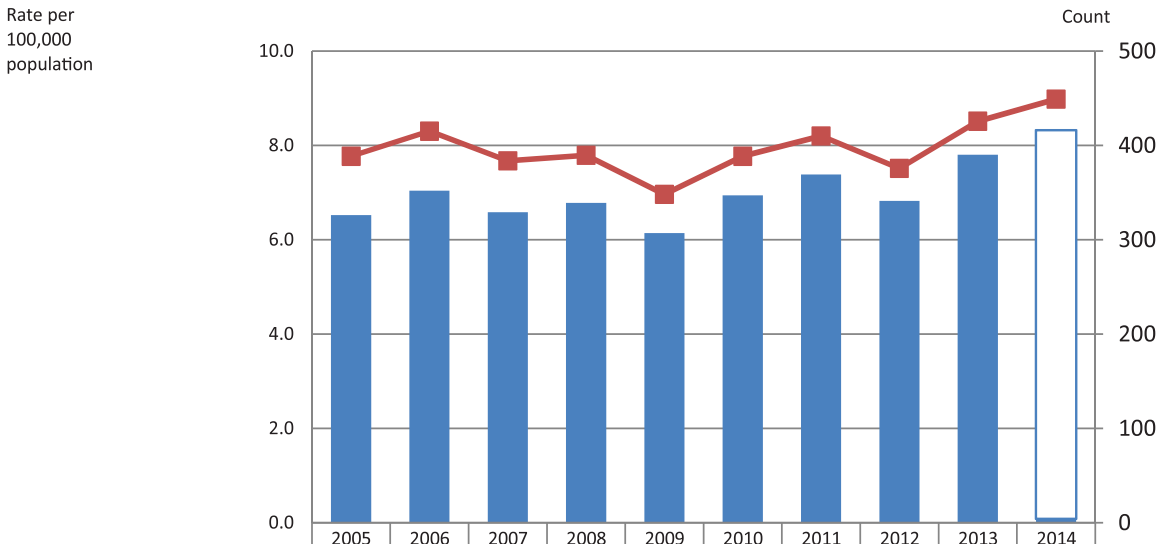
Amebiasis
Campylobacteriosis
Cryptosporidiosis
Cyclosporiasis
Shigatoxigenic *E. coli*
Giardiasis
Hepatitis A
Listeriosis
Salmonellosis, Typhoid Fever and Paratyphoid Fever
Shigellosis
Vibrio Infection
Yersiniosis

Amebiasis

Throughout the last ten years, the rate of amebiasis in BC has remained fairly constant. The 2014 provincial rate was 9.0 per 100,000 which is the highest in this ten year period. No outbreaks were reported in 2014. Cases were reported throughout the year. The reporting rate remained highest in males aged 25-59 years. This may in part be due to 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 (19.1 per 100,000).

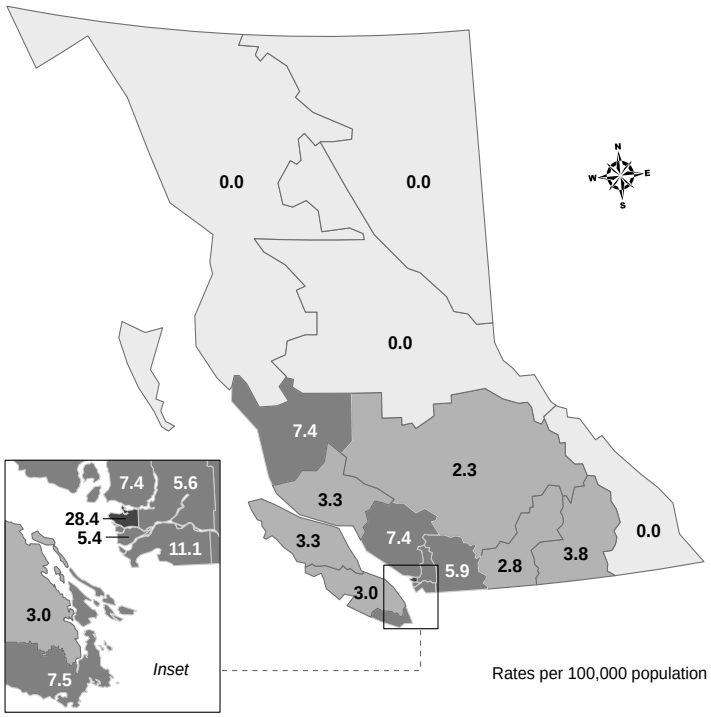
In 2014, the case definition for amebiasis was changed (http://www.bccdc.ca/dis-cond/a-z/_a/Amebiesis/amebiasisCaseDefinition.htm) to report cases with *Entamoeba histolytica* as confirmed cases and all other species as probable cases. This more accurately reflects cases infected with a pathogenic E*ntamoeba* species. In 2014, of the 414 cases reported as amebiasis, only 4 were confirmed as *E. histolytica*. This indicates that while individuals may be diagnosed with an amebiasis infection, few of them are confirmed to be infected with the pathogenic strain.

25.1 Amebiasis by Year, 2005-2014

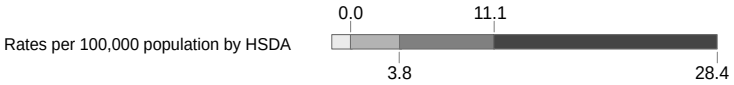


	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
BC Amebiasis Probable	0	0	0	0	0	0	0	0	0	412
BC Amebiasis Confirmed	326	352	329	339	307	347	369	341	390	4
BC Amebiasis Rate	7.8	8.3	7.7	7.8	7.0	7.8	8.2	7.5	8.5	9.0

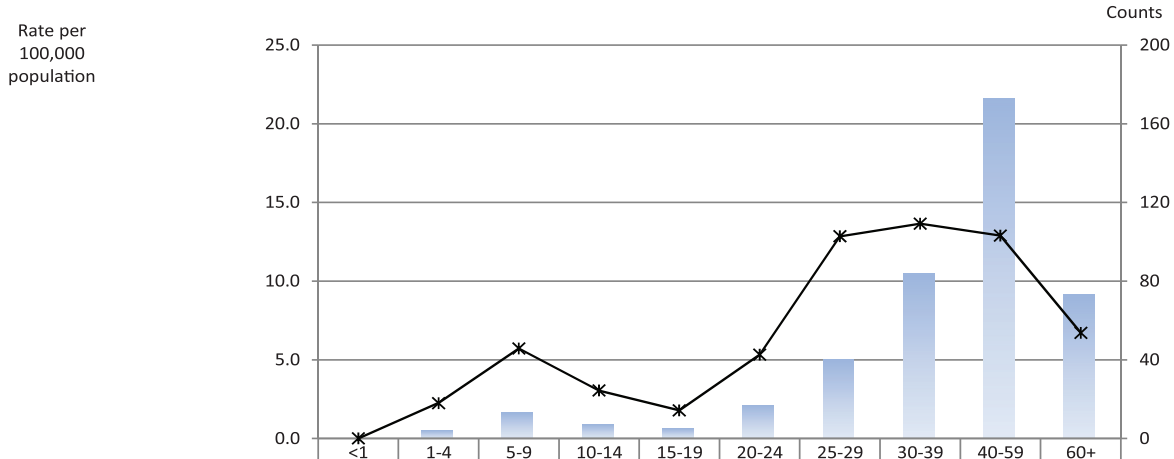
25.2 Amebiasis Rates by HSDA, 2014



ID	Health Service Delivery Area	Cases	Rate
11	East Kootenay	0	0.0
12	Kootenay Boundary	3	3.8
13	Okanagan	10	2.8
14	Thompson Cariboo Shuswap	5	2.3
21	Fraser East	17	5.9
22	Fraser North	36	5.6
23	Fraser South	86	11.1
31	Richmond	11	5.4
32	Vancouver	187	28.4
33	North Shore/Coast Garibaldi	21	7.4
41	South Vancouver Island	28	7.5
42	Central Vancouver Island	8	3.0
43	North Vancouver Island	4	3.3
51	Northwest	0	0.0
52	Northern Interior	0	0.0
53	Northeast	0	0.0



25.3 Amebiasis Rates by Age Group and Sex, 2014

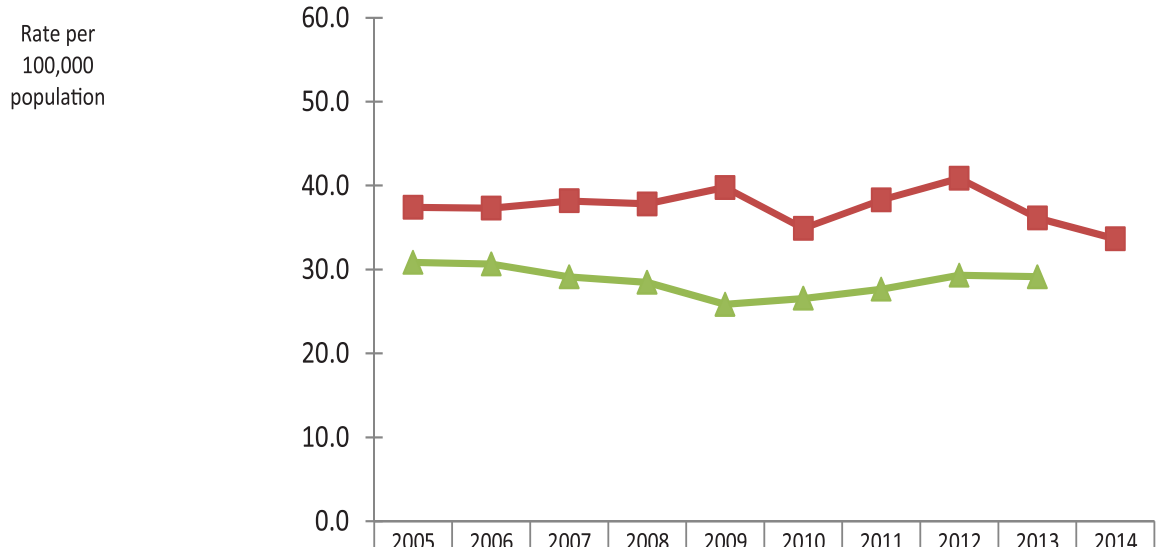


	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Amebiasis Reports - Female	0	1	3	3	2	6	12	18	28	19
Amebiasis Reports - Male	0	3	10	4	3	11	28	66	145	54
Amebiasis Reports - Total	0	4	13	7	5	17	40	84	173	73
Amebiasis Rate - Female	0.0	1.2	2.7	2.7	1.5	3.9	7.7	5.8	4.1	3.3
Amebiasis Rate - Male	0.0	3.3	8.5	3.4	2.1	6.6	18.1	21.7	21.9	10.4
Amebiasis Rate - Total	0.0	2.3	5.7	3.0	1.8	5.3	12.8	13.6	12.9	6.7

Campylobacteriosis

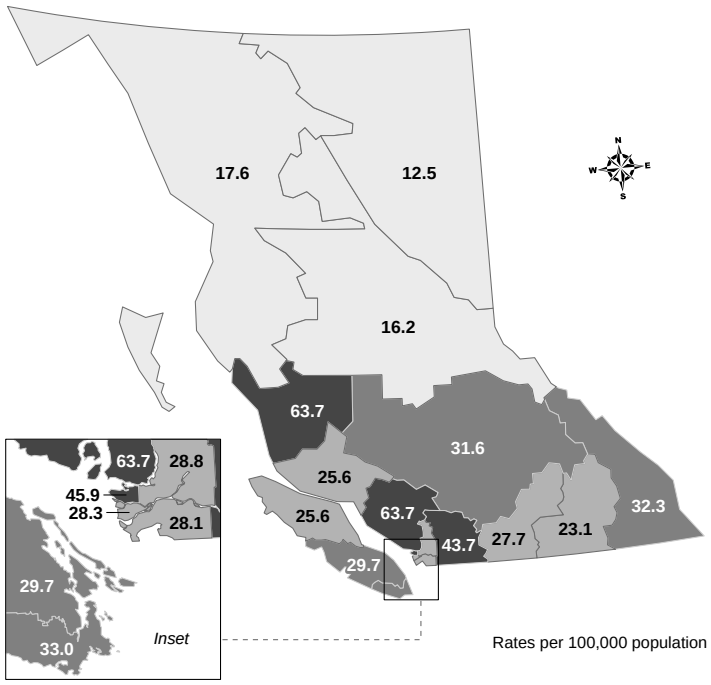
Campylobacteriosis was the most commonly reported enteric disease with a total of 1558 cases in 2014. The incidence rate has been stable since 2004 and has remained above the national average. Similar to past years, rates were highest among children aged 1 to 4 years, particularly among males, and adults between 20 and 39 years, again among males. The highest rate was once again reported from North Shore/Coast Garibaldi (63.7 per 100,000). As in most years, the number of cases reported was higher during the summer. No outbreaks were reported.

27.1 Campylobacteriosis Rates by Year, 2005-2014



	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
BC Campylobacteriosis Reports	1569	1583	1638	1645	1754	1558	1722	1856	1656	1558
BC Campylobacteriosis Rate	37.4	37.3	38.2	37.8	39.8	34.9	38.3	40.9	36.1	33.6
Canadian Campylobacteriosis Rate	30.9	30.6	29.1	28.5	25.9	26.6	27.6	29.3	29.1	

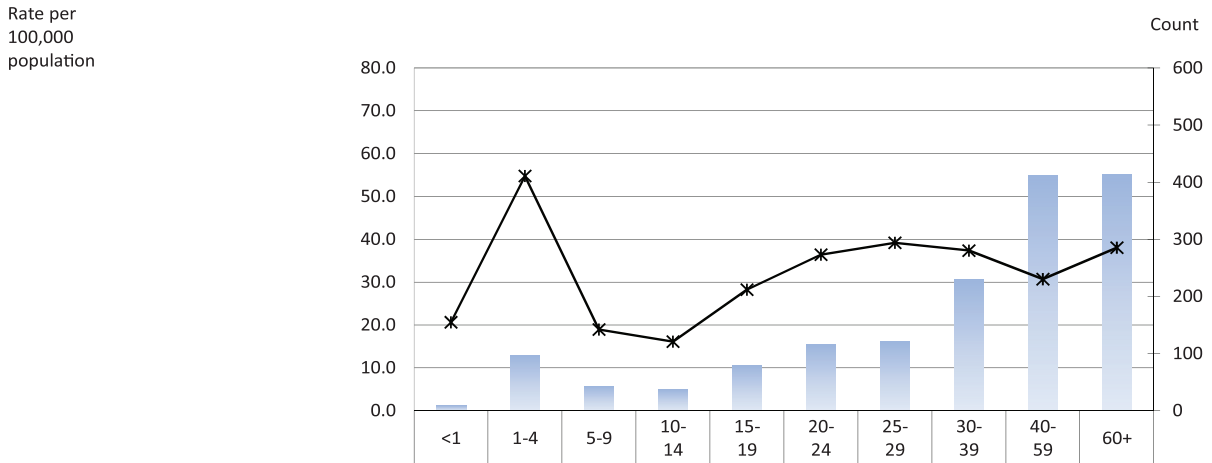
27.2 Campylobacteriosis Rates by HSDA, 2014



ID	Health Service Delivery Area	Cases	Rate
11	East Kootenay	25	32.3
12	Kootenay Boundary	18	23.1
13	Okanagan	98	27.7
14	Thompson Cariboo Shuswap	70	31.6
21	Fraser East	126	43.7
22	Fraser North	185	28.8
23	Fraser South	218	28.1
31	Richmond	58	28.3
32	Vancouver	302	45.9
33	North Shore/Coast Garibaldi	180	63.7
41	South Vancouver Island	123	33.0
42	Central Vancouver Island	79	29.7
43	North Vancouver Island	31	25.6
51	Northwest	13	17.6
52	Northern Interior	23	16.2
53	Northeast	9	12.5

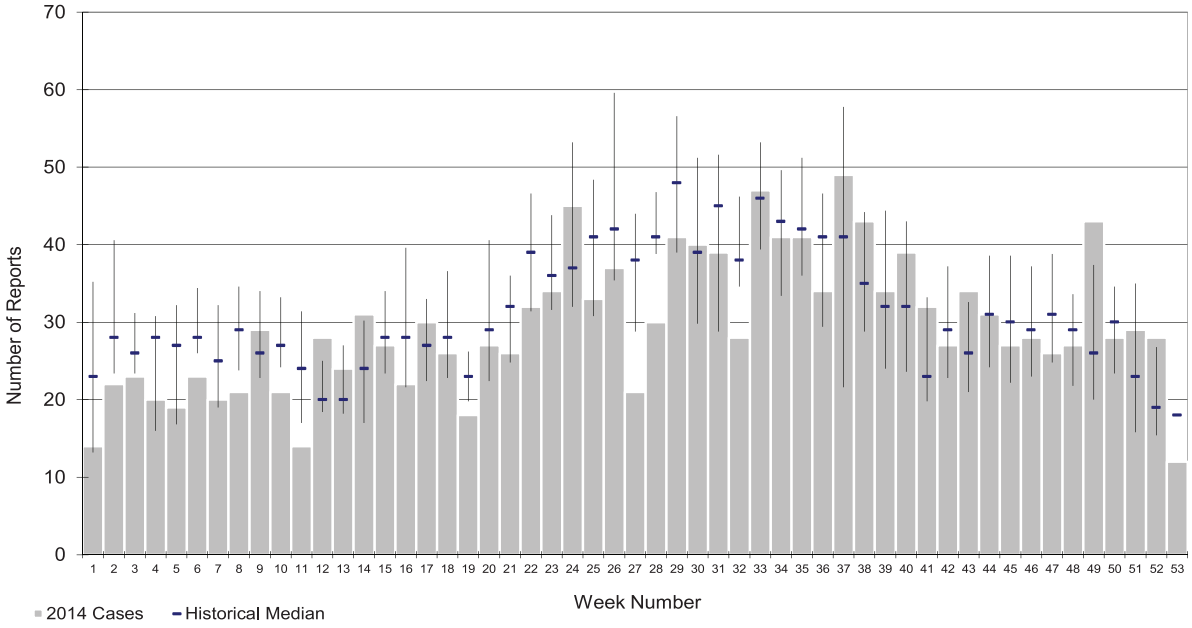
Rates per 100,000 population by HSDA

27.3 Campylobacteriosis Rates by Age Group and Sex, 2014



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Campylobacteriosis Reports - Female	5	43	17	15	29	49	57	107	190	204
Campylobacteriosis Reports - Male	4	54	26	22	50	67	65	123	222	209
Campylobacteriosis Reports - Total	9	97	43	37	79	116	122	230	412	413
Campylobacteriosis Rate - Female	23.6	50.1	15.5	13.5	21.5	32.1	36.5	34.4	27.9	35.9
Campylobacteriosis Rate - Male	17.8	59.2	22.1	18.6	34.4	40.4	41.9	40.4	33.5	40.4
Campylobacteriosis Rate - Total	20.6	54.8	18.9	16.1	28.2	36.4	39.2	37.4	30.7	38.0

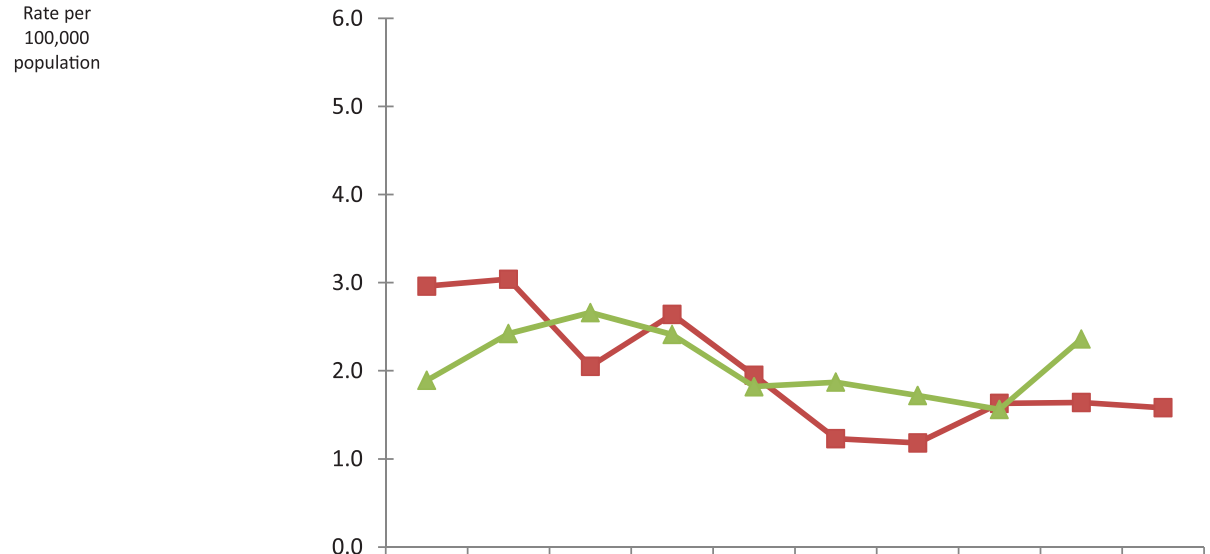
27.4 2014 Campylobacteriosis Reports Compared to Historical Median and the 10th and 90th Percentiles Around the Median (2005 to 2013)



Cryptosporidiosis

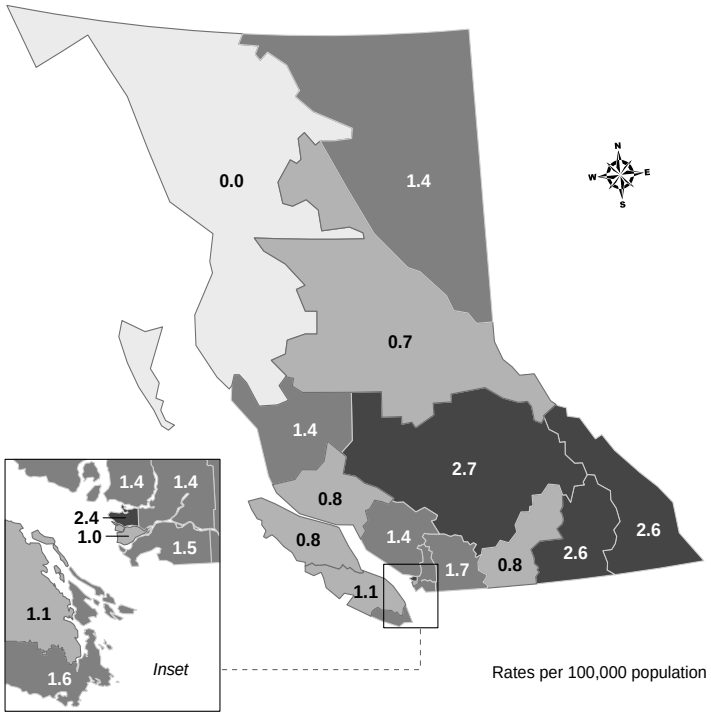
In 2014, 73 cases (1.6 per 100,000) of cryptosporidiosis were reported, a rate very similar to the last few years. The highest rates were reported in 3 Interior Health HSDAs and Vancouver. This is consistent with the most common exposures including water and immigration from an endemic country. Similar to previous years, the incidence was highest in children aged 1-4 years. No outbreaks were reported and no seasonal peaks were observed.

28.1 Cryptosporidiosis Rates by Year, 2005-2014

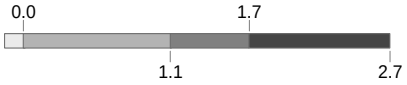


	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
BC Cryptosporidiosis Reports	124	129	88	115	86	55	53	74	75	73
BC Cryptosporidiosis Rate	3.0	3.0	2.1	2.6	2.0	1.2	1.2	1.6	1.6	1.6
Canadian Cryptosporidiosis Rate	1.9	2.4	2.7	2.4	1.8	1.9	1.7	1.6	2.4	

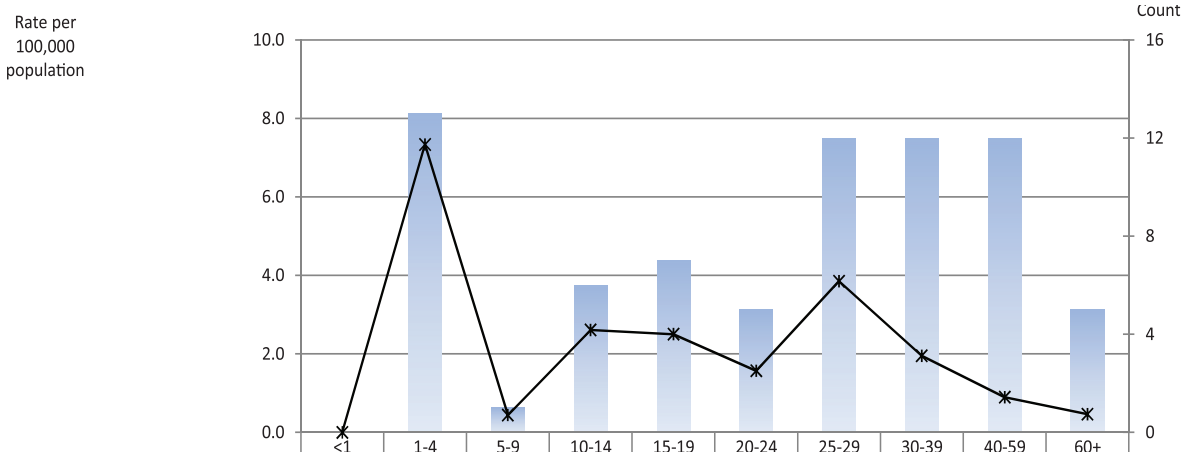
28.2 Cryptosporidiosis Rates by HSDA, 2014



ID	Health Service Delivery Area	Cases	Rate
11	East Kootenay	2	2.6
12	Kootenay Boundary	2	2.6
13	Okanagan	3	0.8
14	Thompson Cariboo Shuswap	6	2.7
21	Fraser East	5	1.7
22	Fraser North	9	1.4
23	Fraser South	12	1.5
31	Richmond	2	1.0
32	Vancouver	16	2.4
33	North Shore/Coast Garibaldi	4	1.4
41	South Vancouver Island	6	1.6
42	Central Vancouver Island	3	1.1
43	North Vancouver Island	1	0.8
51	Northwest	0	0.0
52	Northern Interior	1	0.7
53	Northeast	1	1.4



28.3 Cryptosporidiosis Rates by Age Group and Sex, 2014

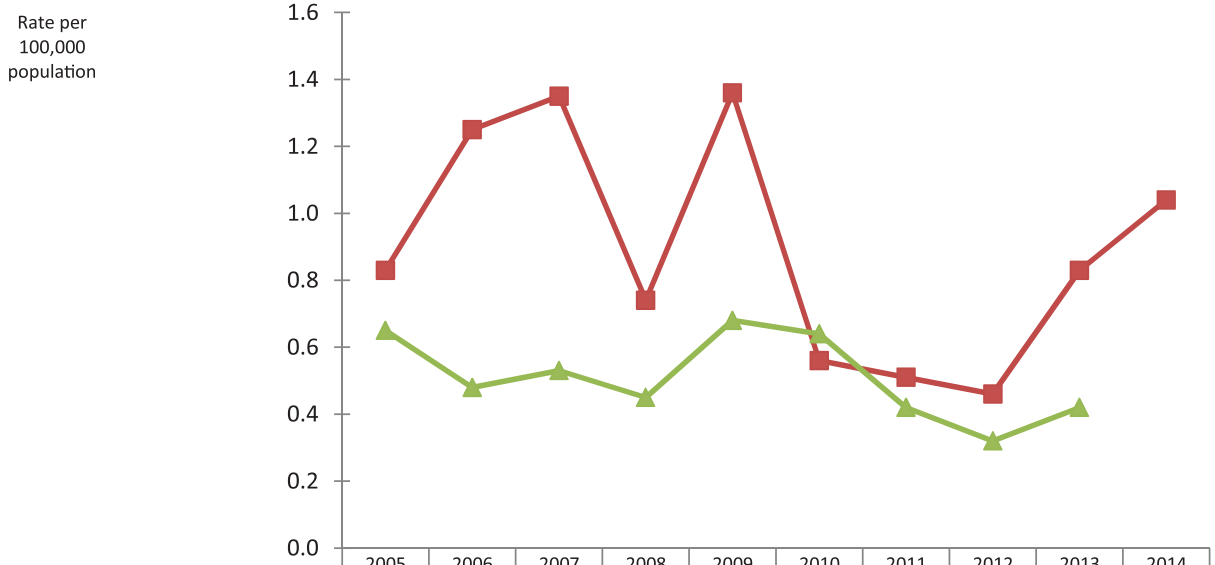


	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Cryptosporidiosis Reports - Female	0	7	0	4	4	3	6	3	8	1
Cryptosporidiosis Reports - Male	0	6	1	2	3	2	6	9	4	4
Cryptosporidiosis Reports - Total	0	13	1	6	7	5	12	12	12	5
Cryptosporidiosis Rate - Female	0.0	8.1	0.0	3.6	3.0	2.0	3.8	1.0	1.2	0.2
Cryptosporidiosis Rate - Male	0.0	6.6	0.9	1.7	2.1	1.2	3.9	3.0	0.6	0.8
Cryptosporidiosis Rate - Total	0.0	7.3	0.4	2.6	2.5	1.6	3.9	1.9	0.9	0.5

Cyclosporiasis

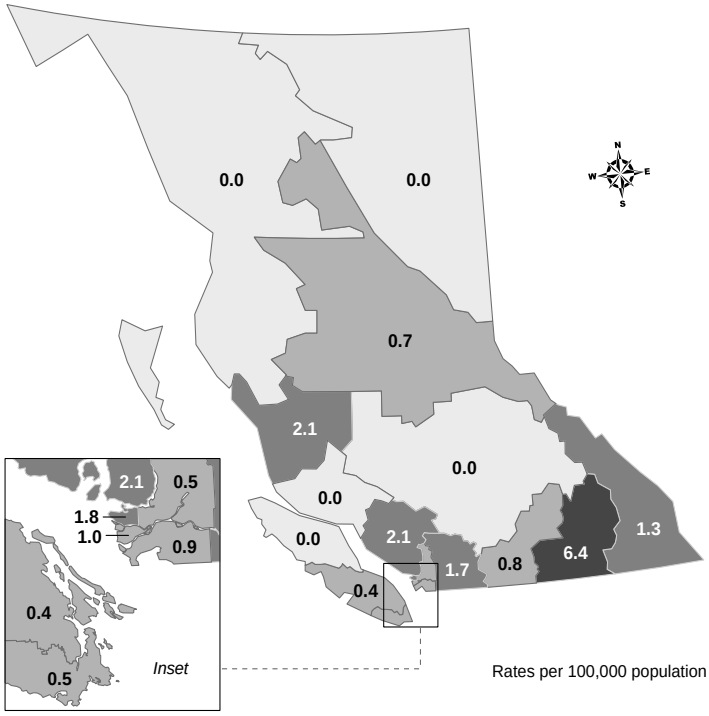
The number of cyclosporiasis cases (48) in 2014 was higher than it has been in recent years. This increase was largely due to an outbreak among BC residents who had not traveled to an endemic country and likely associated with fresh imported produce. Previous peaks have been due to local outbreaks associated with fresh produce (2006, 2007, 2013) or travel to endemic areas (2009). Of the cases reported in 2014, 31.6% were a result of travel to endemic areas. The incidence rate was highest in adults aged 30-39 years and similar overall among males and females. The majority of cases were reported in the spring and summer. The peak in weeks 26-32 was associated with the outbreak mentioned above.

29.1 Cyclosporiasis Rates by Year, 2005-2014

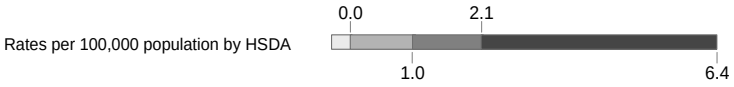


	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
BC Cyclosporiasis Reports	35	53	58	32	60	25	23	21	38	48
BC Cyclosporiasis Rate	0.8	1.3	1.4	0.7	1.4	0.6	0.5	0.5	0.8	1.0
Canadian Cyclosporiasis Rate	0.65	0.48	0.53	0.45	0.68	0.64	0.42	0.32	0.42	

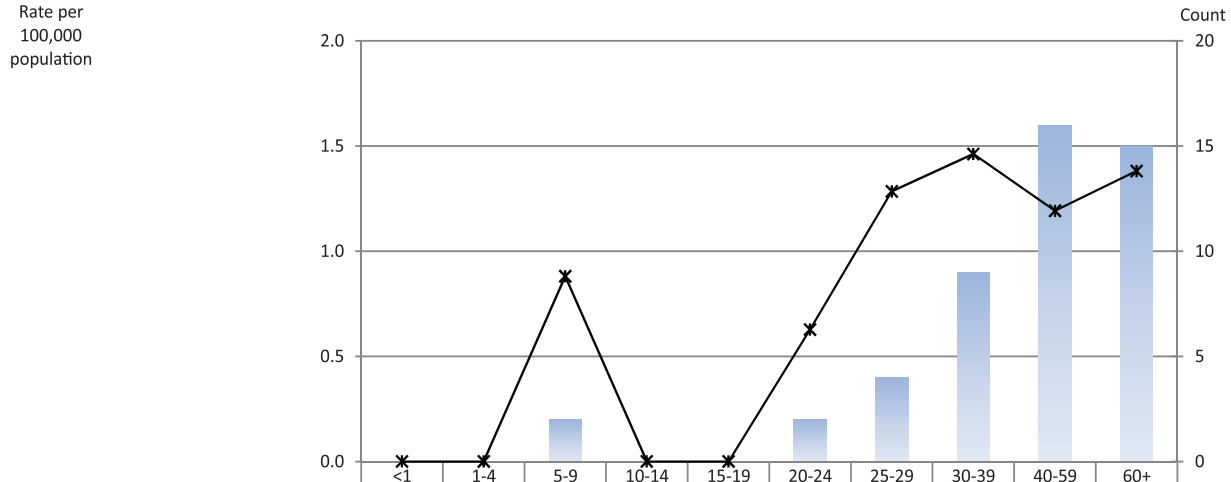
29.2 Cyclosporiasis Rates by HSDA, 2014



ID	Health Service Delivery Area	Cases	Rate
11	East Kootenay	1	1.3
12	Kootenay Boundary	5	6.4
13	Okanagan	3	0.8
14	Thompson Cariboo Shuswap	0	0.0
21	Fraser East	5	1.7
22	Fraser North	3	0.5
23	Fraser South	7	0.9
31	Richmond	2	1.0
32	Vancouver	12	1.8
33	North Shore/Coast Garibaldi	6	2.1
41	South Vancouver Island	2	0.5
42	Central Vancouver Island	1	0.4
43	North Vancouver Island	0	0.0
51	Northwest	0	0.0
52	Northern Interior	1	0.7
53	Northeast	0	0.0

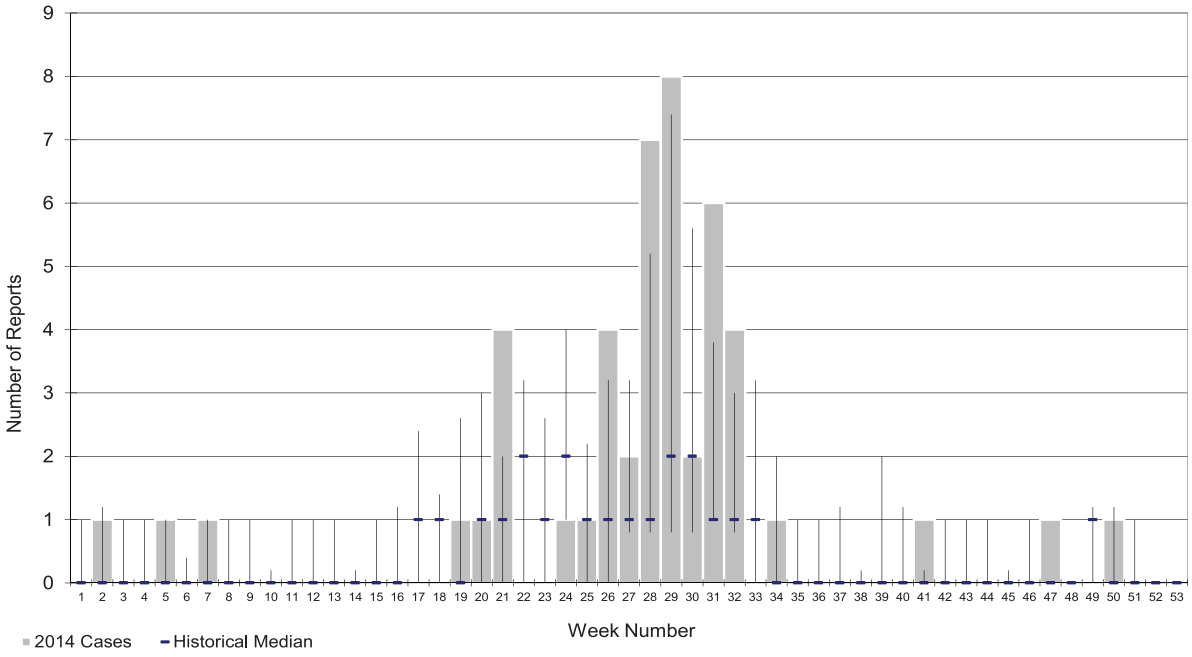


29.3 Cyclosporiasis Rates by Age Group and Sex, 2014



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Cyclosporiasis Reports - Female	0	0	1	0	0	1	2	6	8	6
Cyclosporiasis Reports - Male	0	0	1	0	0	1	2	3	8	9
Cyclosporiasis Reports - Total	0	0	2	0	0	2	4	9	16	15
Cyclosporiasis Rate - Female	0.0	0.0	0.9	0.0	0.0	0.7	1.3	1.9	1.2	1.1
Cyclosporiasis Rate - Male	0.0	0.0	0.9	0.0	0.0	0.6	1.3	1.0	1.2	1.7
Cyclosporiasis Rate -Total	0.0	0.0	0.9	0.0	0.0	0.6	1.3	1.5	1.2	1.4

29.4 2014 Cyclosporiasis Reports Compared to Historical Median and the 10th and 90th Percentiles Around the Median (2005 to 2013)



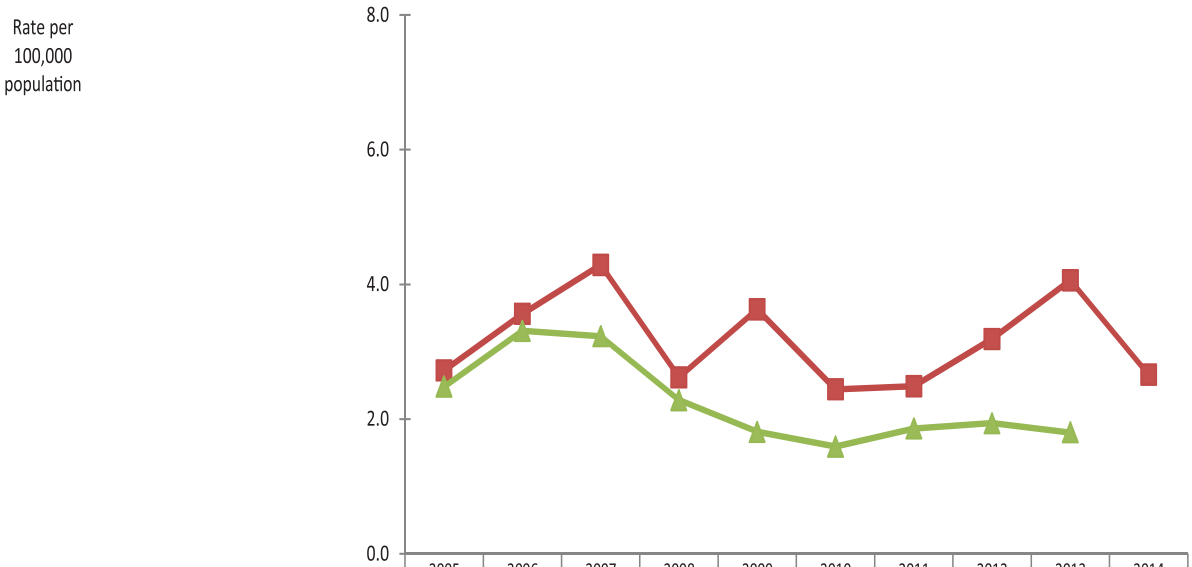
Shigatoxigenic *E.coli* Infection

There were 123 cases of shigatoxigenic *E. coli* infection reported in BC in 2014, 30.8% of which were associated with international travel. The incidence in 2014 (2.7 per 100,000) is a decrease after multiple years of increasing incidence. There were no outbreaks caused by *E. coli i*n 2014, which may be responsible for this decrease.

The highest rates were reported from North Vancouver Island and East Kootenay. Incidence was highest in children aged 1-4 years. Cases were reported throughout the year with a slight increase seen in the late summer/early fall.

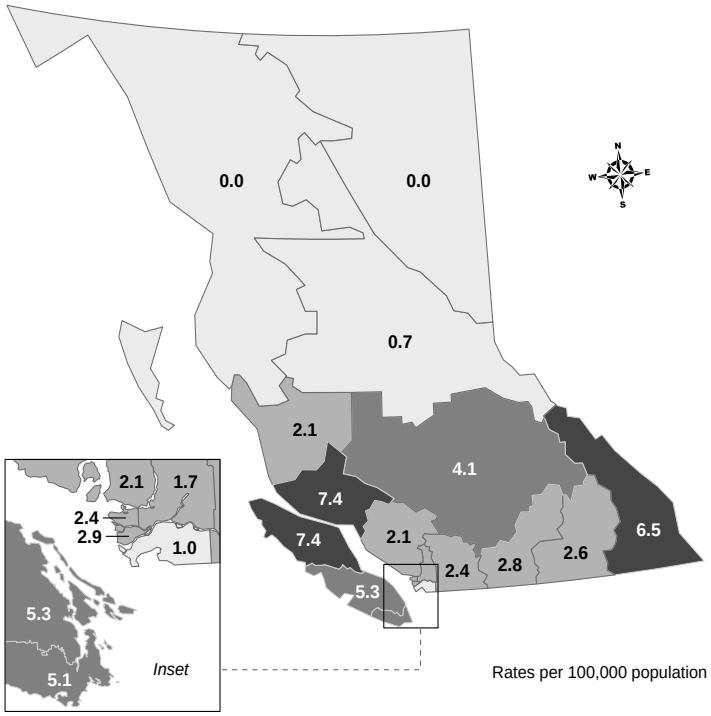
O157 continues to be the most common serogroup reported in BC, however the proportion decreased compared to 2013. In 2014 the number of isolates diagnosed as shiga-toxin positive only increased compared to 2013.

30.1 Shigatoxigenic E. coli by Year, 2005-2014

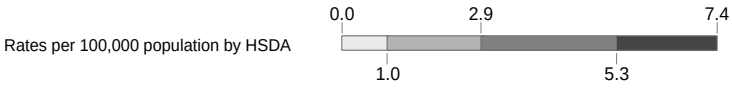


	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
BC Shigatoxigenic E.coli Infection Reports	114	151	184	114	160	109	112	145	186	123
BC Shigatoxigenic E.coli Infection Rate	2.7	3.6	4.3	2.6	3.6	2.4	2.5	3.2	4.1	2.7
Canadian Verotoxigenic Escherichia coli Infection Rate	2.5	3.3	3.2	2.3	1.8	1.6	1.9	1.9	1.8	

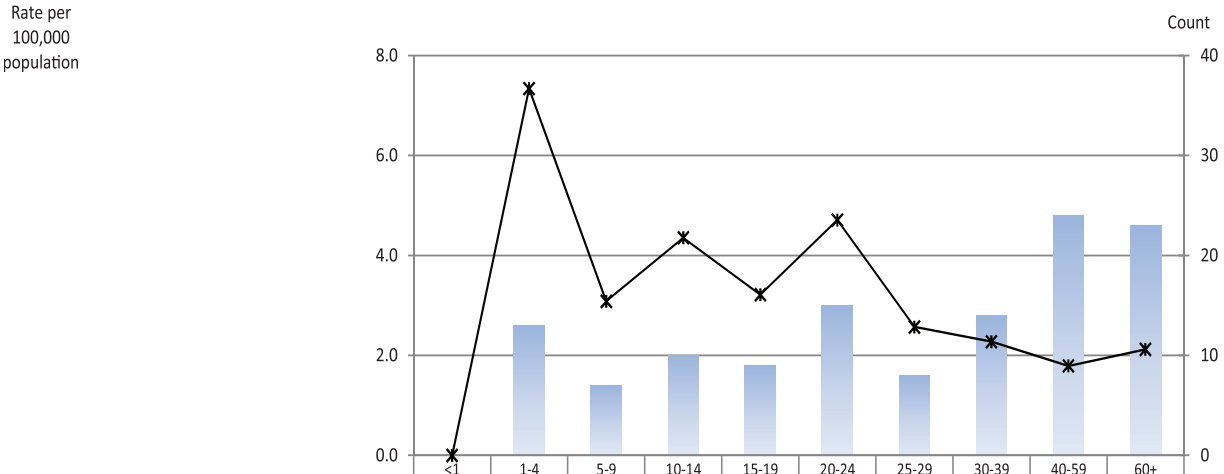
30.2 Shigatoxigenic E. coli Rates by HSDA, 2014



ID	Health Service Delivery Area	Cases	Rate
11	East Kootenay	5	6.5
12	Kootenay Boundary	2	2.6
13	Okanagan	10	2.8
14	Thompson Cariboo Shuswap	9	4.1
21	Fraser East	7	2.4
22	Fraser North	11	1.7
23	Fraser South	8	1.0
31	Richmond	6	2.9
32	Vancouver	16	2.4
33	North Shore/Coast Garibaldi	6	2.1
41	South Vancouver Island	19	5.1
42	Central Vancouver Island	14	5.3
43	North Vancouver Island	9	7.4
51	Northwest	0	0.0
52	Northern Interior	1	0.7
53	Northeast	0	0.0

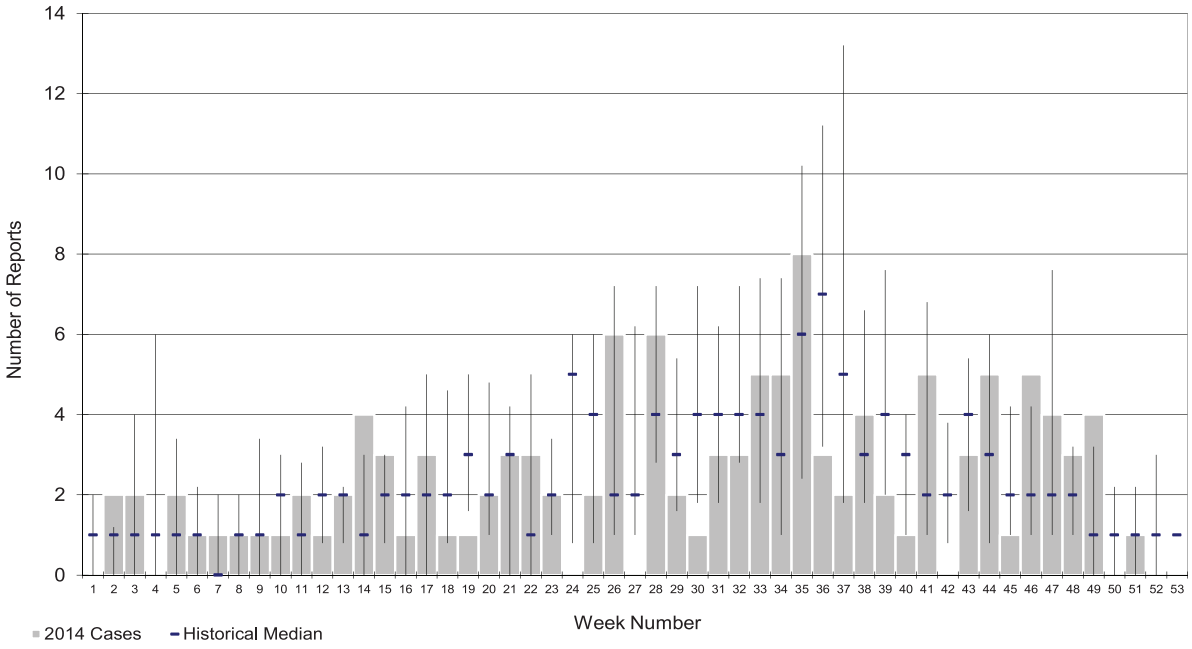


30.3 Shigatoxigenic E. coli Rates by Age Group and Sex, 2014



	<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	7	3	4	8	10	2	5	13	15
Shigatoxigenic E.coli Infection Reports - Male	0	6	4	6	1	5	6	9	11	8
Shigatoxigenic E.coli Infection Reports	0	13	7	10	9	15	8	14	24	23
Shigatoxigenic E.coli Infection Rate - Female	0.0	8.1	2.7	3.6	5.9	6.5	1.3	1.6	1.9	2.6
Shigatoxigenic E.coli Infection Rate - Male	0.0	6.6	3.4	5.1	0.7	3.0	3.9	3.0	1.7	1.5
Shigatoxigenic E.coli Infection Rate - Total	0.0	7.3	3.1	4.4	3.2	4.7	2.6	2.3	1.8	2.1

30.4 2014 Shigatoxigenic E. coli Reports Compared to Historical Median and the 10th and 90th Percentiles Around the Median (2005 to 2013)



30.5 2014 Shigatoxigenic E. coli Serogroup Distribution, 2014

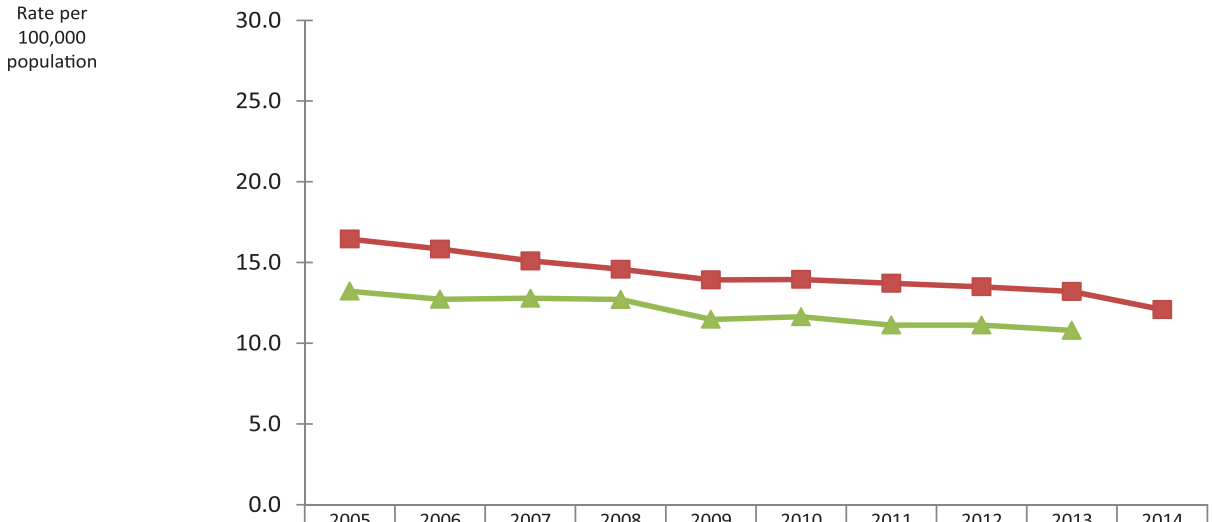
Rank	Serogroup	Number of Isolates	Proportion
1	O157	56	35.0%
2	O121	13	8.1%
2	O111	13	8.1%
3	026	8	5.0%
4	O103	3	1.9%
	Other	2	1.3%
	Shiga-toxin positive only	65	40.6%
	Total	160	100.0%

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

Giardiasis

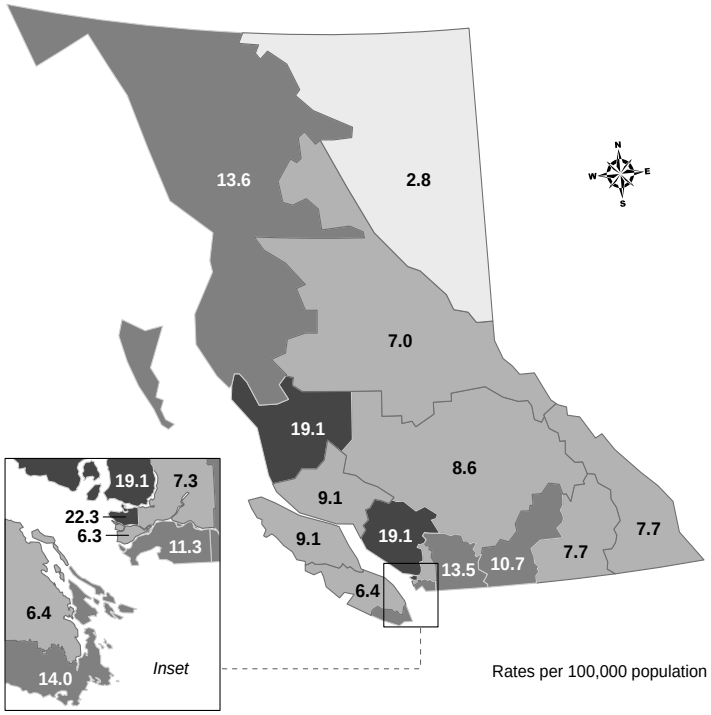
Annual rates of giardiasis have continued to decrease over time with 560 cases reported (12.1 per 100,000) in 2014. Rates were highest in Vancouver and North Shore/Coast Garibaldi. Rates were higher in males than females in most age groups, with the highest rates reported in children 1-4 years old and adult males 20-39 years old. There was no seasonal pattern and no outbreaks were detected.

31.1 Giardiasis Rates by Year, 2005-2014

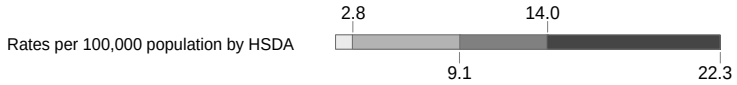


	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
BC Giardiasis Reports	690	672	648	634	614	623	617	613	605	560
BC Giardiasis Rate	16.5	15.8	15.1	14.6	13.9	14.0	13.7	13.5	13.2	12.1
Canadian Giardiasis Rate	13.2	12.7	12.8	12.7	11.5	11.6	11.1	11.1	10.8	

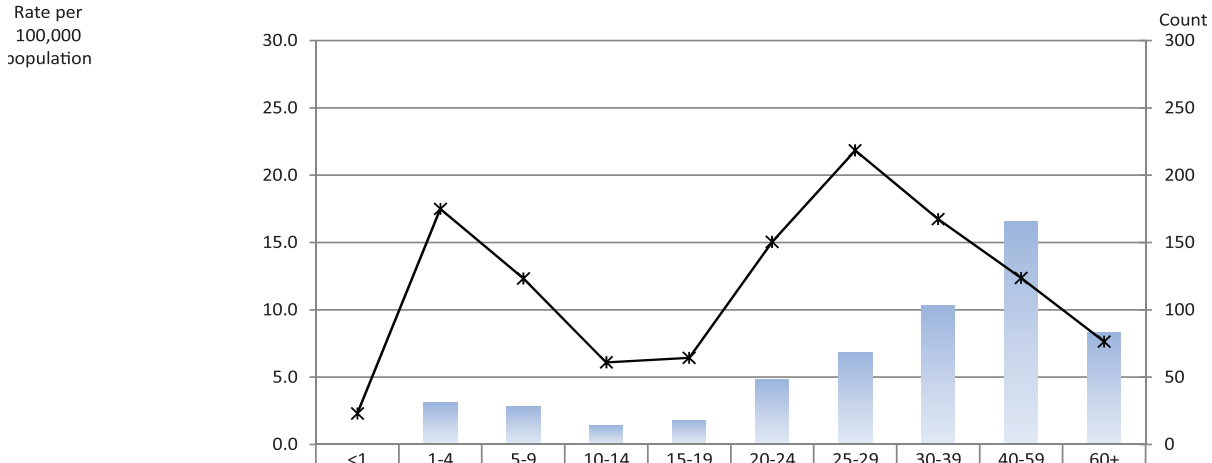
31.2 Giardiasis Rates by HSDA, 2014



ID	Health Service Delivery Area	Cases	Rate
11	East Kootenay	6	7.7
12	Kootenay Boundary	6	7.7
13	Okanagan	38	10.7
14	Thompson Cariboo Shuswap	19	8.6
21	Fraser East	39	13.5
22	Fraser North	47	7.3
23	Fraser South	88	11.3
31	Richmond	13	6.3
32	Vancouver	147	22.3
33	North Shore/Coast Garibaldi	54	19.1
41	South Vancouver Island	52	14.0
42	Central Vancouver Island	17	6.4
43	North Vancouver Island	11	9.1
51	Northwest	10	13.6
52	Northern Interior	10	7.0
53	Northeast	2	2.8



31.3 Giardiasis Rates by Age Group and Sex, 2014



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Giardiasis Reports - Female	0	13	12	9	4	22	21	34	61	35
Giardiasis Reports - Male	1	18	16	5	14	26	47	69	105	48
Giardiasis Reports - Total	1	31	28	14	18	48	68	103	166	83
Giardiasis Rate - Female	0.0	15.1	10.9	8.1	3.0	14.4	13.4	10.9	9.0	6.2
Giardiasis Rate - Male	4.5	19.7	13.6	4.2	9.6	15.7	30.3	22.6	15.9	9.3
Giardiasis Rate - Total	2.3	17.5	12.3	6.1	6.4	15.1	21.8	16.7	12.4	7.6

Hepatitis A

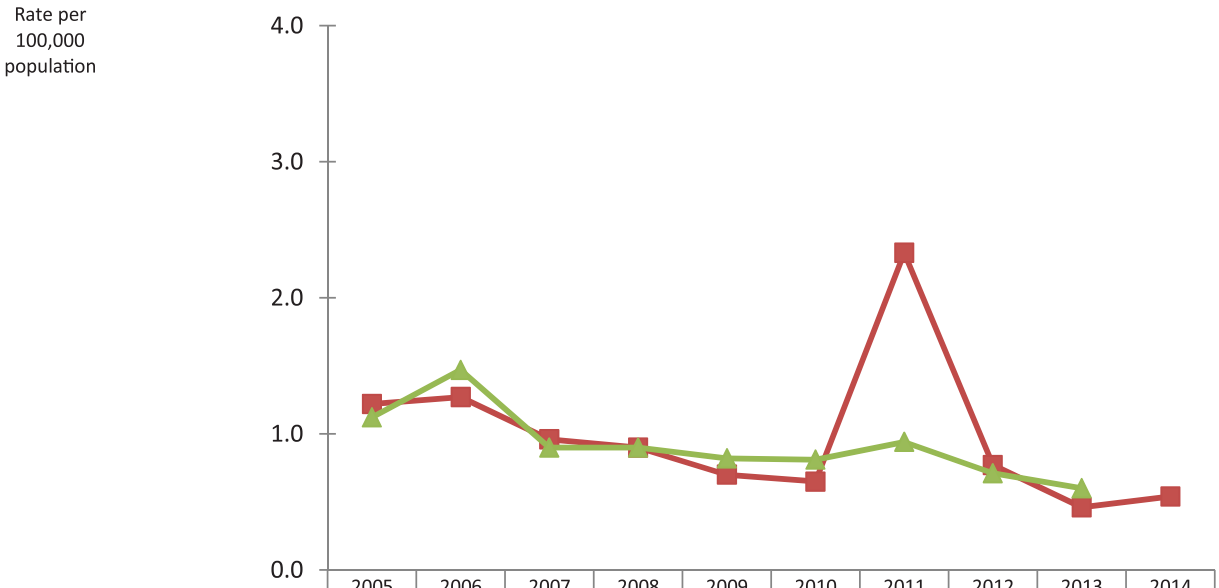
There were 25 cases of hepatitis A reported in BC in 2014, resulting in a rate of 0.5 cases per 100,000 population. This is a slight increase from the 21 cases reported in 2013. 2013 was the lowest ever reported number of hepatitis A cases in BC, and it was also below the Canadian 2013 hepatitis A rate of 0.6. In 1992, over 1000 cases were reported and cases have steadily declined since then. The reported number of hepatitis A cases is an underestimate of the actual number infected, since many children and some adults may have no or mild symptoms, or not seek medical attention and be tested. In 2011, an outbreak resulted in 80 cases occurring in Central Vancouver Island [1], producing an unusually high rate that year. In 2012, six cases of hepatitis A were associated with the consumption of a frozen fruit blend [2].

In 2014, the number of cases reported for male and female was approximately the same, with 13 and 12 cases noted respectively. As in 2013, nearly two-thirds of the cases occurred between the ages of 30-59 years. The highest rate was noted in the Northeast (3 cases, with a resulting rate of 4.2) however due to the small population this high rate is considered unstable (in 2013, the highest rate was noted in the Northwest, with 2 cases). Interior Health reported 5 cases, Fraser Health reported 9 cases (one more than in 2013), and Vancouver Coastal Health reported 7 cases, the same as the previous year. Fewer cases were noted during the summertime, and the majority of the cases of hepatitis A were associated with travel to hepatitis A endemic regions in unimmunized travellers.

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

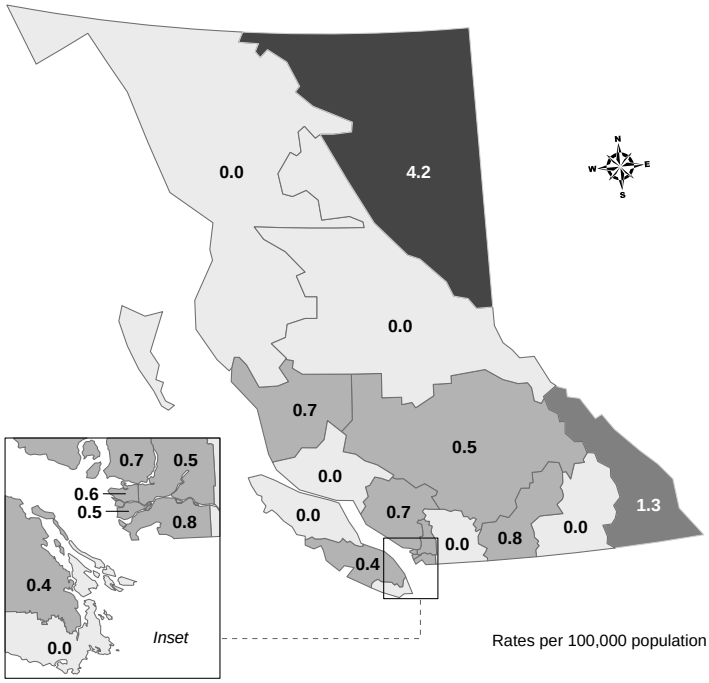
2. Swinkels H, Kuo M, Embree G, Stone J, Trerise S, Brisdon S, Louie K, Asplin R, Stiller A, Abraham T, Gill I, Rice G, Andonov A, Henry B, Buxton JA. Established surveillance, loyalty cards and collaboration allow early identification of a hepatitis A outbreak in British Columbia, Canada 2012. Eurosurveillance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

32.1 Hepatitis A Rates by Year, 2005-2014



	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
BC Hepatitis A Reports	51	54	41	39	31	29	105	35	21	25
BC Hepatitis A Rate	1.2	1.3	1.0	0.9	0.7	0.7	2.3	0.8	0.5	0.5
Canadian Hepatitis A Rate	1.1	1.5	0.9	0.9	0.8	0.8	0.9	0.7	0.6	

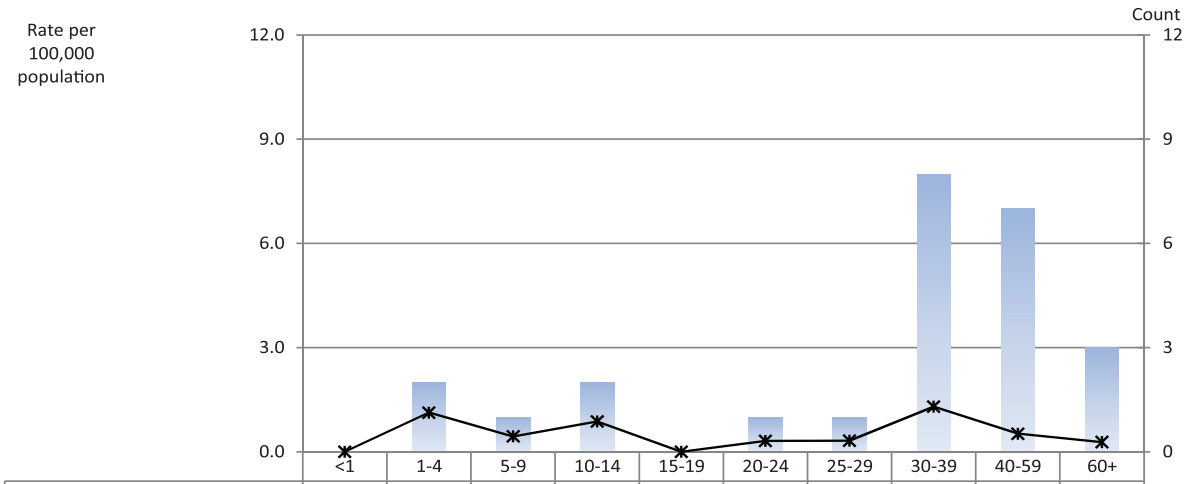
32.2 Hepatitis A Rates by HSDA, 2014



ID	Health Service Delivery Area	Cases	Rate
11	East Kootenay	1	1.3
12	Kootenay Boundary	0	0.0
13	Okanagan	3	0.8
14	Thompson Cariboo Shuswap	1	0.5
21	Fraser East	0	0.0
22	Fraser North	3	0.5
23	Fraser South	6	0.8
31	Richmond	1	0.5
32	Vancouver	4	0.6
33	North Shore/Coast Garibaldi	2	0.7
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	3	4.2

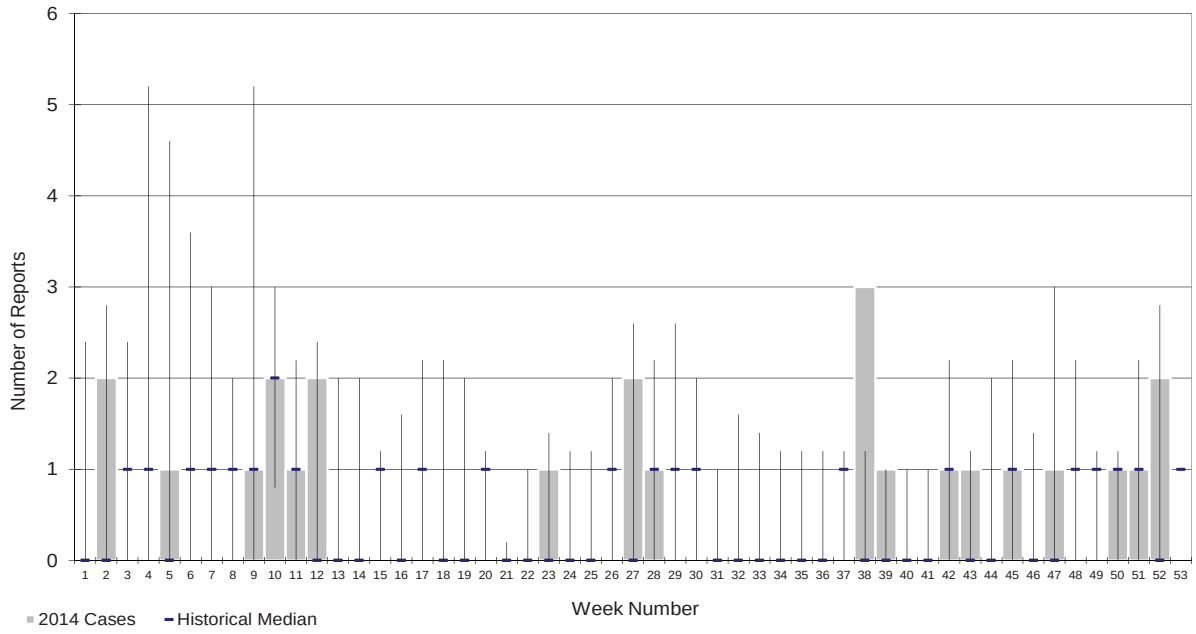
Rates per 100,000 population by HSDA

32.3 Hepatitis A Rates by Age Group and Sex, 2014



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Hepatitis A Reports - Female	0	0	1	2	0	0	0	5	4	0
Hepatitis A Reports - Male	0	2	0	0	0	1	1	3	3	3
Hepatitis A Reports - Total	0	2	1	2	0	1	1	8	7	3
Hepatitis A Rate - Female	0.0	0.0	0.9	1.8	0.0	0.0	0.0	1.6	0.6	0.0
Hepatitis A Rate - Male	0.0	2.2	0.0	0.0	0.0	0.6	0.6	1.0	0.5	0.6
Hepatitis A Rate - Total	0.0	1.1	0.4	0.9	0.0	0.3	0.3	1.3	0.5	0.3

32.4 2014 Hepatitis A Reports Compared to Historical Median and the 10th and 90th Percentiles Around the Median (2005 to 2013)



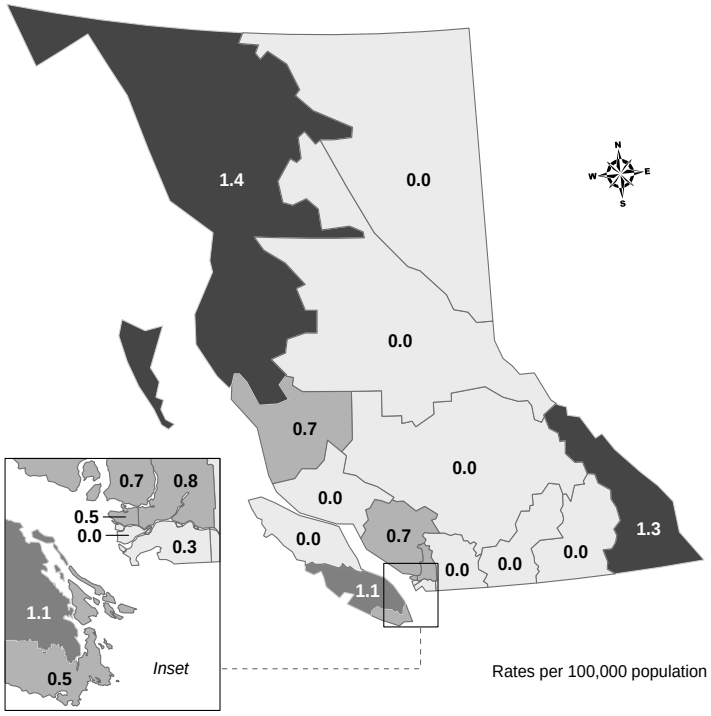
Listeriosis

Nineteen cases of invasive listeriosis were reported in 2014; no infections were associated with international travel. The incidence (0.4 per 100,000) has remained relatively stable since 2009. Apart from a single infant case, rates were highest among adults aged sixty years and older. Cases occurred throughout the year and no outbreaks were reported. Few cases were reported from each HSDA.

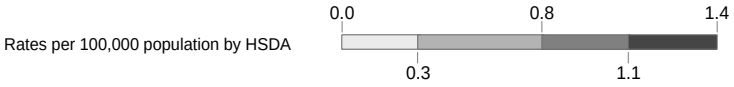
33.1 Listeriosis Rates by Year, 2005-2014

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
BC Listeriosis Rate	0.2	0.3	0.2	0.5	0.3	0.3	0.4	0.3	0.3	0.4
Canadian Listeriosis Rate			0.4	0.6	0.4	0.4	0.4	0.4	0.4	
BC Listeriosis Reports	10	13	9	22	14	14	19	14	15	19

33.2 Listeriosis Rates by HSDA, 2014



ID	Health Service Delivery Area	Cases	Rate
11	East Kootenay	1	1.3
12	Kootenay Boundary	0	0.0
13	Okanagan	0	0.0
14	Thompson Cariboo Shuswap	0	0.0
21	Fraser East	0	0.0
22	Fraser North	5	0.8
23	Fraser South	2	0.3
31	Richmond	0	0.0
32	Vancouver	3	0.5
33	North Shore/Coast Garibaldi	2	0.7
41	South Vancouver Island	2	0.5
42	Central Vancouver Island	3	1.1
43	North Vancouver Island	0	0.0
51	Northwest	1	1.4
52	Northern Interior	0	0.0
53	Northeast	0	0.0



33.3 Listeriosis Rates by Age Group and Sex, 2014

	<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	1	4	4
Listeriosis Reports - Male	1	0	0	0	0	0	0	0	0	8
Listeriosis Reports - Total	1	0	0	0	0	0	1	1	4	12
Listeriosis Rate - Female	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.3	0.6	0.7
Listeriosis Rate - Male	4.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5
Listeriosis Rate - Total	2.3	0.0	0.0	0.0	0.0	0.0	0.3	0.2	0.3	1.1

Salmonellosis, Typhoid Fever and Paratyphoid Fever*

In 2014, 1167 cases of salmonellosis were reported for a rate of 25.2 per 100,000. *Salmonella* infection continues to be the second most commonly reported enteric disease in BC. Overall, 32.0% of *Salmonella* infections were associated with international travel. After a decrease in incidence in 2012 and 2013, the incidence rate in 2014 increased to the highest level in the ten-year period similar to rates seen in 2010 and 2011. The increase in 2014 was due to a province-wide increase of *Salmonella Enteritidis*.

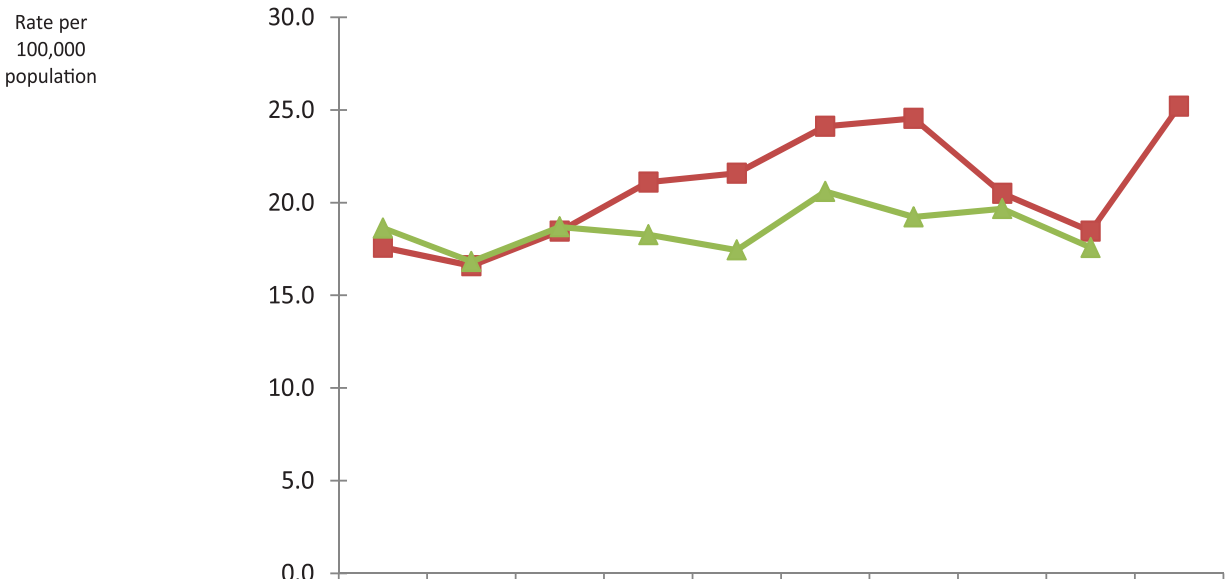
Rates were highest in children 0-5 years of age and among residents of Fraser Health Authority (particularly Fraser East and Fraser South), Northeast, North Vancouver Island and North Shore/Coast Garibaldi. Cases were reported throughout the year with a slight peak in the summer.

Thirty-one cases (0.7 per 100,000) of typhoid fever were reported in 2014 and 85.7% were associated with international travel. This is slight increase in incidence compared to 2013 but similar to 2010-2012. Twenty-six cases (0.6 per 100,000) of paratyphoid fever were reported and 82.4% were associated with international travel. There has been a steady decrease of paratyphoid infections since 2011. The highest incidence of typhoid fever was in children aged 1-4 years and adults aged 25-29. Similarly, the highest incidence of paratyphoid fever was in adults aged 25-29 years. Cases of typhoid and paratyphoid fever were mainly 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.* Newport were the most commonly reported serotypes in 2014. The proportion of *S*. Enteritidis increased compared to 2013, due to the large province-wide increase. *S.* Heidelberg decreased in proportion and was not part of the top 3 in 2014. *S.* Saintpaul and *S.* Javiana were included in the top 10 in 2014. This likely related to outbreaks investigated in 2014. A province-wide outbreak of *S.* Javiana was likely associated with fresh produce and the *S.* Saintpaul increase was associated with an outbreak of multiple *Salmonella* serotypes associated with sprouted chia seed products. *S.* Newport was also part of this investigation which may have led to its position in the top 3.

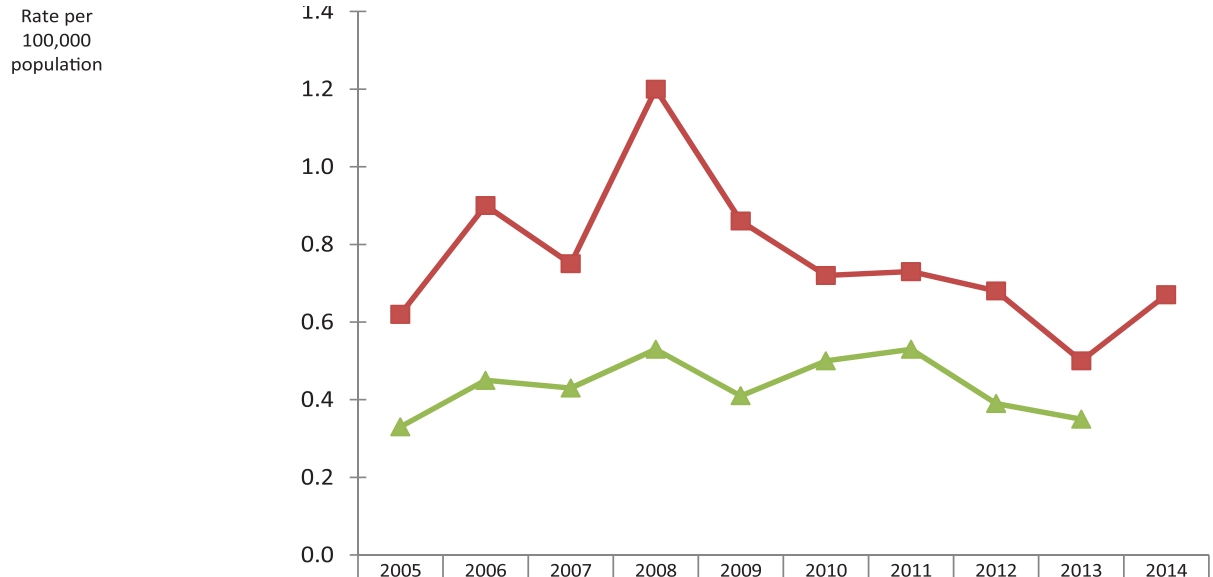
*All cases of *Salmonella* infection reported through Panorama, including *S.* Typhi and *S.* Paratyphi, have been included in the overall numbers and rates by year, the rates by age and sex, the geographical distribution of cases and the cases reported by week. *S.* Typhi (Typhoid fever) and *S.* Paratyphi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

34.1 Salmonellosis Rates by Year, 2005-2014



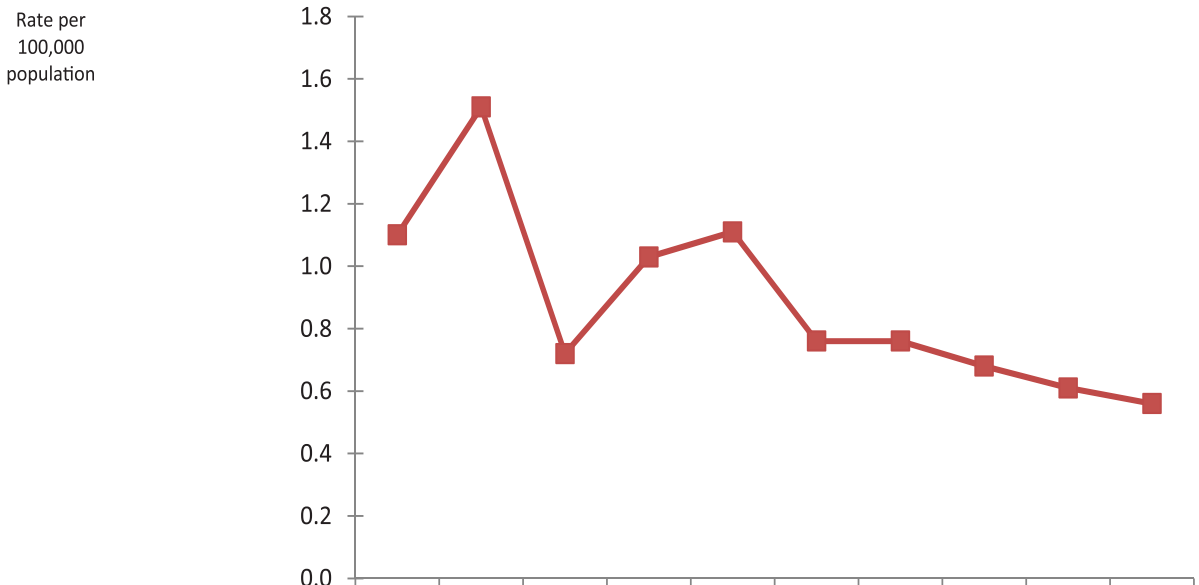
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
BC Salmonellosis Reports	738	704	792	918	952	1077	1104	931	846	1167
BC Salmonellosis Rate	17.6	16.6	18.5	21.1	21.6	24.1	24.5	20.5	18.5	25.2
Canadian Salmonellosis Rate	18.6	16.8	18.7	18.3	17.4	20.6	19.2	19.7	17.6	

34.2 Typhoid Fever Rates by Year, 2005-2014



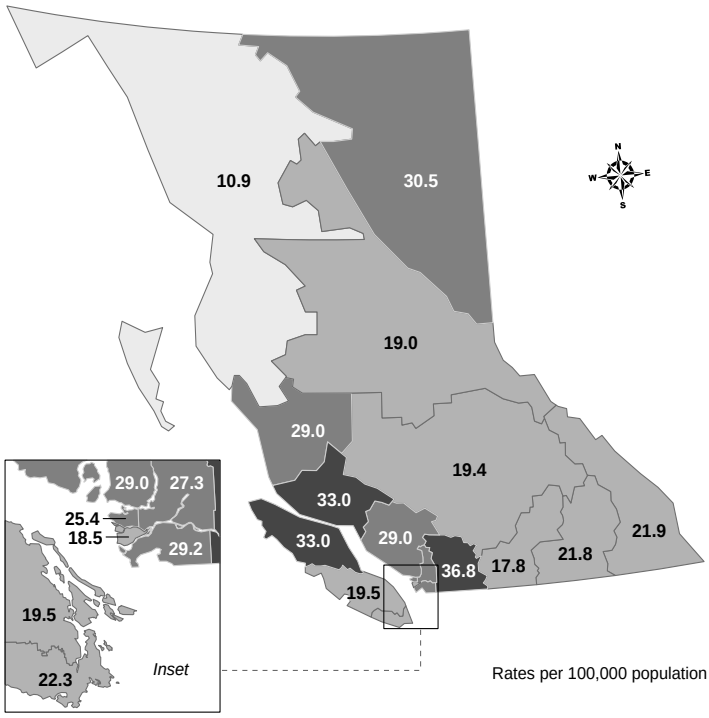
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
BC Typhoid Fever Reports	26	38	32	52	38	32	33	31	23	31
BC Typhoid Fever Rate	0.6	0.9	0.8	1.2	0.9	0.7	0.7	0.7	0.5	0.7
Canadian Typhoid Fever Rate	0.3	0.5	0.4	0.5	0.4	0.5	0.5	0.4	0.4	

34.3 Paratyphoid Fever Rates by Year, 2005-2014



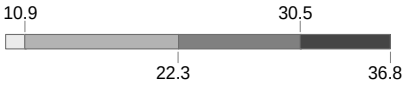
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
BC Paratyphoid Fever Reports	46	64	31	45	49	34	34	31	28	26
BC Paratyphoid Fever Rate	1.1	1.5	0.7	1.0	1.1	0.8	0.8	0.7	0.6	0.6

34.4 Salmonellosis Rates by HSDA, 2014

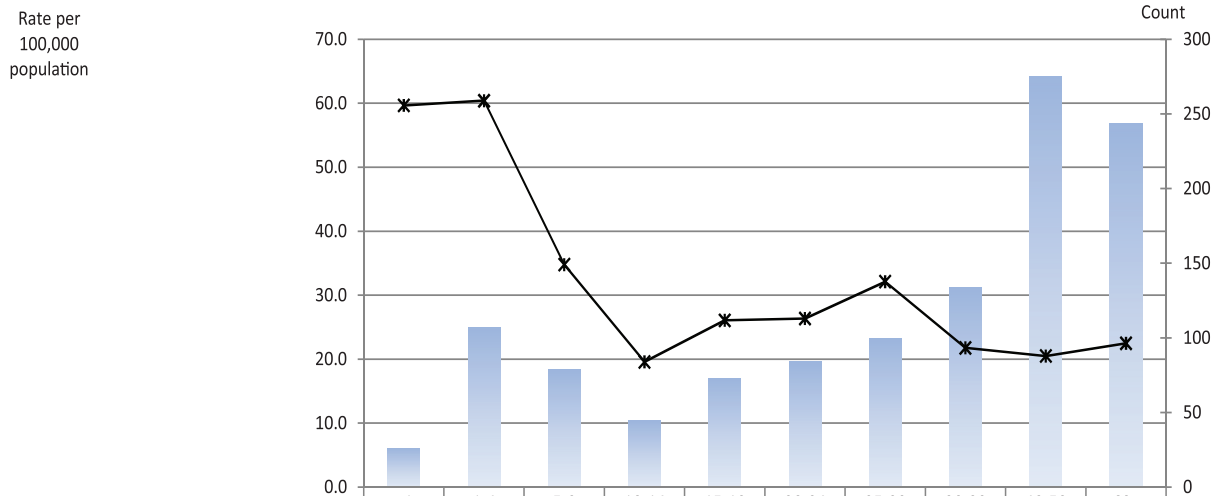


ID	Health Service Delivery Area	Cases	Rate
11	East Kootenay	17	21.9
12	Kootenay Boundary	17	21.8
13	Okanagan	63	17.8
14	Thompson Cariboo Shuswap	43	19.4
21	Fraser East	106	36.8
22	Fraser North	175	27.3
23	Fraser South	227	29.2
31	Richmond	38	18.5
32	Vancouver	167	25.4
33	North Shore/Coast Garibaldi	82	29.0
41	South Vancouver Island	83	22.3
42	Central Vancouver Island	52	19.5
43	North Vancouver Island	40	33.0
51	Northwest	8	10.9
52	Northern Interior	27	19.0
53	Northeast	22	30.5

Rates per 100,000 population by HSDA

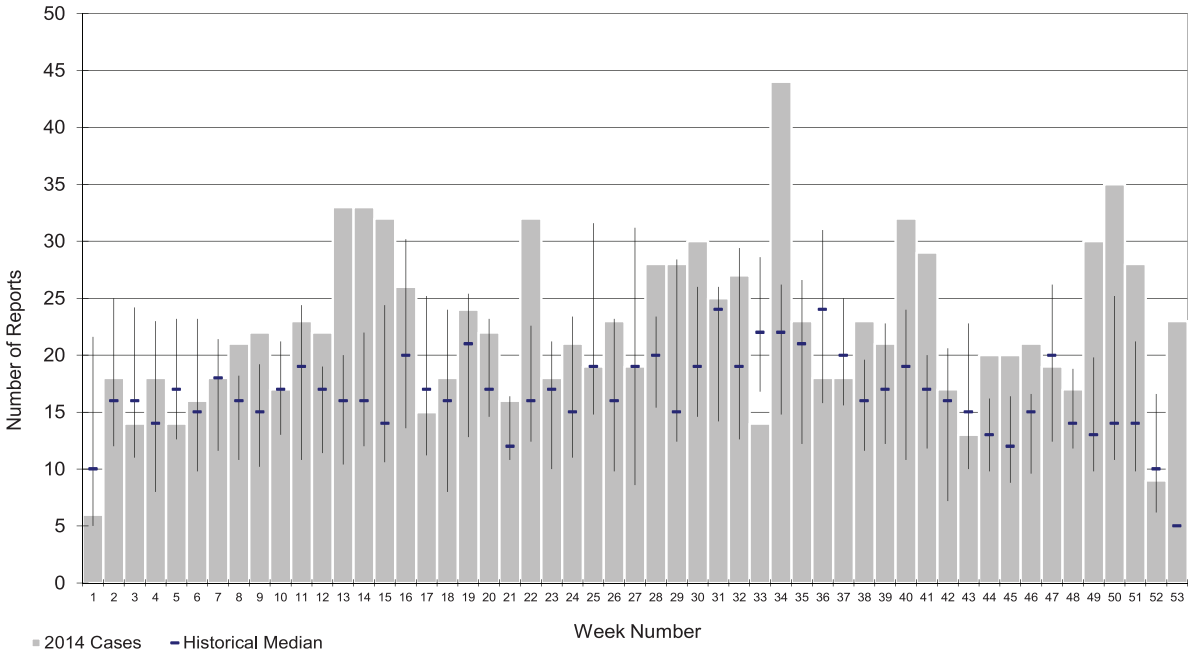


34.5 Salmonellosis Rates by Age Group and Sex, 2014



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Salmonellosis Reports - Female	12	48	41	11	42	41	59	62	146	140
Salmonellosis Reports - Male	14	59	38	34	30	43	41	72	129	104
Salmonellosis Reports - Total	26	107	79	45	73	84	100	134	275	244
Salmonellosis Rate - Female	56.7	55.9	37.4	9.9	31.2	26.8	37.8	20.0	21.5	24.6
Salmonellosis Rate - Male	62.5	64.7	32.3	28.7	20.6	25.9	26.4	23.6	19.5	20.1
Salmonellosis Rate - Total	59.6	60.4	34.8	19.6	26.1	26.4	32.1	21.8	20.5	22.5

34.6 2014 Salmonellosis Reports Compared to Historical Median and the 10th and 90th Percentiles Around the Median (2005 to 2013)



34.7 Salmonella Serotype Distribution, 2014

Rank	Serotype	Number of Cases	Proportion
1	Enteritidis	629	50.6%
2	Typhimurium	77	6.2%
3	Newport	34	2.7%
4	Newport	38	4.3%
4	Salmonella ssp I 4,5,12:i:-	33	2.6%
5	Heidelberg	32	2.5%
6	Typhi	31	2.5%
7	Stanley	28	2.3%
8	Saintpaul	28	2.3%
9	Infantis	25	2.0%
10	Javiana	24	1.9%
	Others	303	24.5%
	Total	1244	100.0%

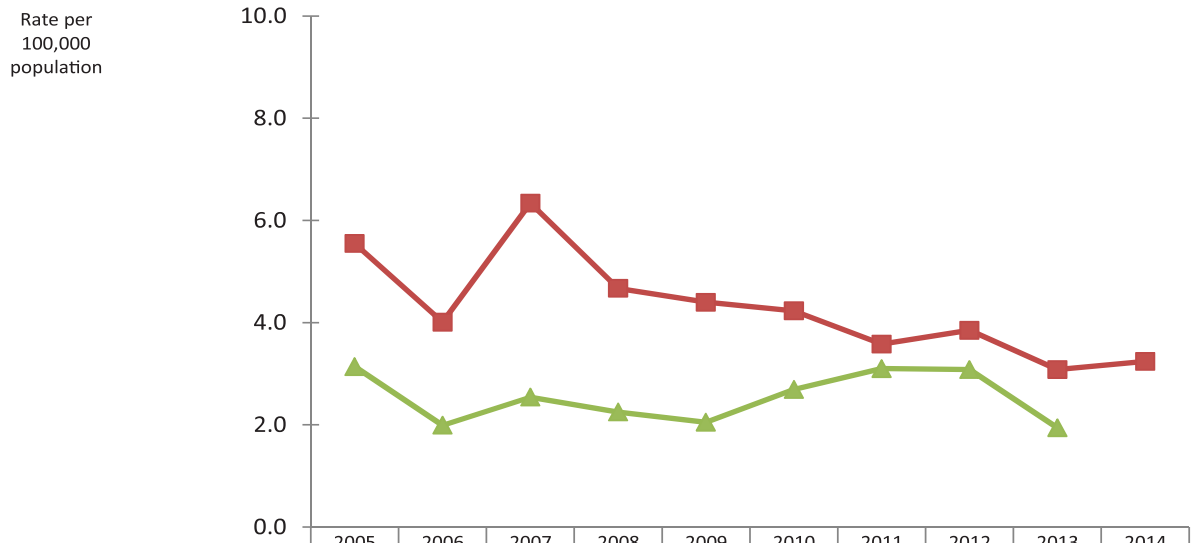
Note: Serotype distribution is based on BC PHMRL data. Numbers may vary from those reported in Panorama.

Shigellosis

In 2014, 150 cases of shigellosis were reported; 38.8% were associated with international travel. Incidence rates were highest among males aged 25-59 years, females aged 20-39 years and children aged 1-4 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 with a slight increase in December 2014. Rates continue to be highest in Vancouver (8.7 per 100,000). No new outbreaks were reported.

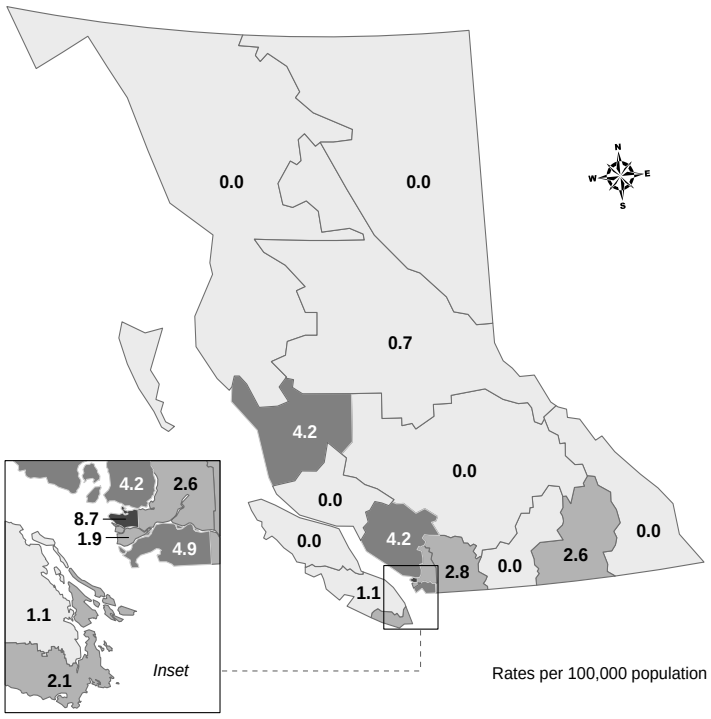
S. flexneri was the most common species reported, followed closely by *S.* sonnei.

35.1 Shigellosis Rates by Year, 2005-2014

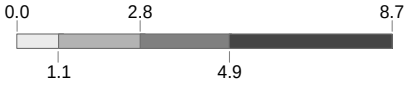


	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
BC Shigellosis Reports	233	170	272	203	194	189	161	175	141	150
BC Shigellosis Rate	5.6	4.0	6.3	4.7	4.4	4.2	3.6	3.9	3.1	3.2
Canadian Shigellosis Rate	3.1	2.0	2.5	2.3	2.1	2.7	3.1	3.1	1.9	

35.2 Shigellosis Rates by HSDA, 2014

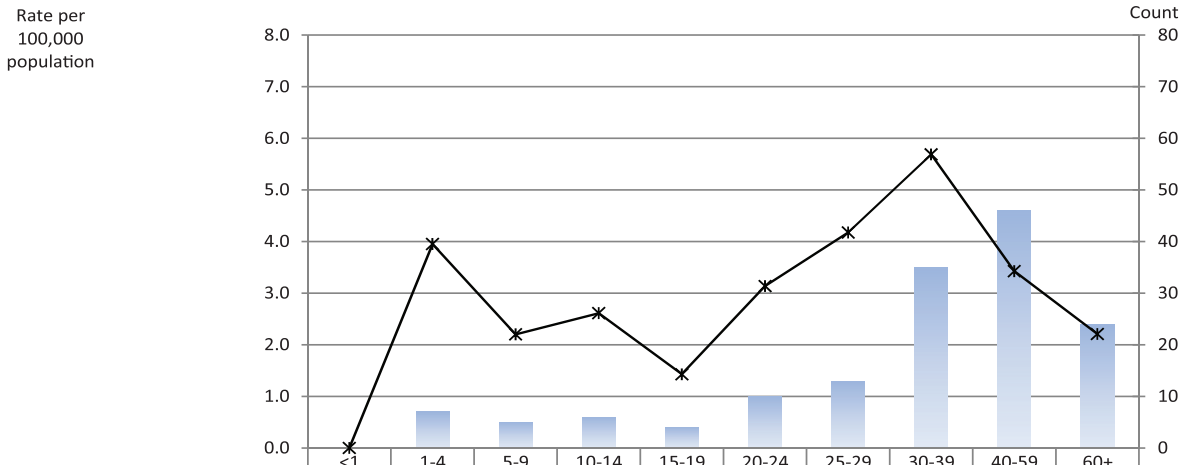


ID	Health Service Delivery Area	Cases	Rate
11	East Kootenay	0	0.0
12	Kootenay Boundary	2	2.6
13	Okanagan	0	0.0
14	Thompson Cariboo Shuswap	0	0.0
21	Fraser East	8	2.8
22	Fraser North	17	2.6
23	Fraser South	38	4.9
31	Richmond	4	1.9
32	Vancouver	57	8.7
33	North Shore/Coast Garibaldi	12	4.2
41	South Vancouver Island	8	2.1
42	Central Vancouver Island	3	1.1
43	North Vancouver Island	0	0.0
51	Northwest	0	0.0
52	Northern Interior	1	0.7
53	Northeast	0	0.0



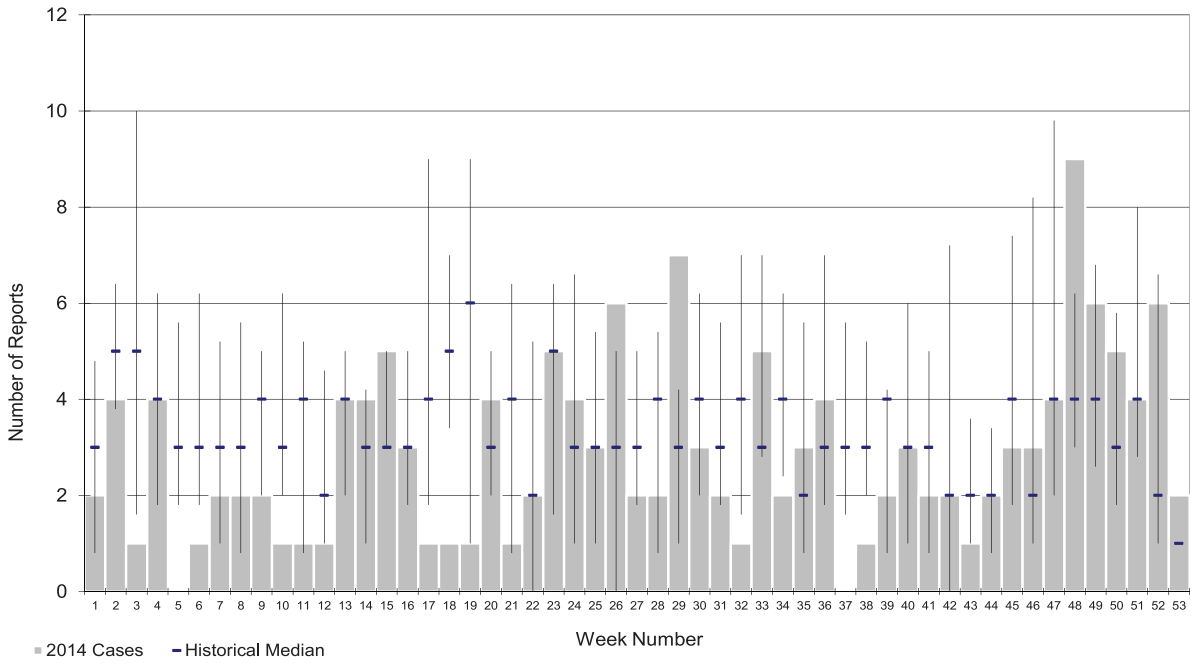
Rates per 100,000 population by HSDA

35.3 Shigellosis Rates by Age Group and Sex, 2014



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Shigellosis Reports - Female	0	2	3	1	4	8	6	14	12	10
Shigellosis Reports - Male	0	5	2	5	0	2	7	21	34	14
Shigellosis Reports - Total	0	7	5	6	4	10	13	35	46	24
Shigellosis Rate - Female	0.0	2.3	2.7	0.9	3.0	5.2	3.8	4.5	1.8	1.8
Shigellosis Rate - Male	0.0	5.5	1.7	4.2	0.0	1.2	4.5	6.9	5.1	2.7
Shigellosis Rate - Total	0.0	4.0	2.2	2.6	1.4	3.1	4.2	5.7	3.4	2.2

35.4 2014 Shigellosis Reports Compared to Historical Median and the 10th and 90th Percentiles Around the Median (2005 to 2013)



35.5 Shigella Species Distribution, 2014

Rank	Species	Number of Cases	Proportion
1	*flexneri*	65	48.9%
2	*sonnei*	52	39.1%
3	*boydii*	9	6.8%
4	*dysenteriae*	4	3.0%
	Unknown/unspecified	2	1.5%
	Total	133	100.0%

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

Vibrio Infection*

The incidence of *Vibrio* infections has been increasing since 2008 with the highest rate reported in 2014 (1.5 per 00,000). Seventy-one cases were reported of which 6.4% were associated with international travel. The reason for this increase in incidence is unknown.

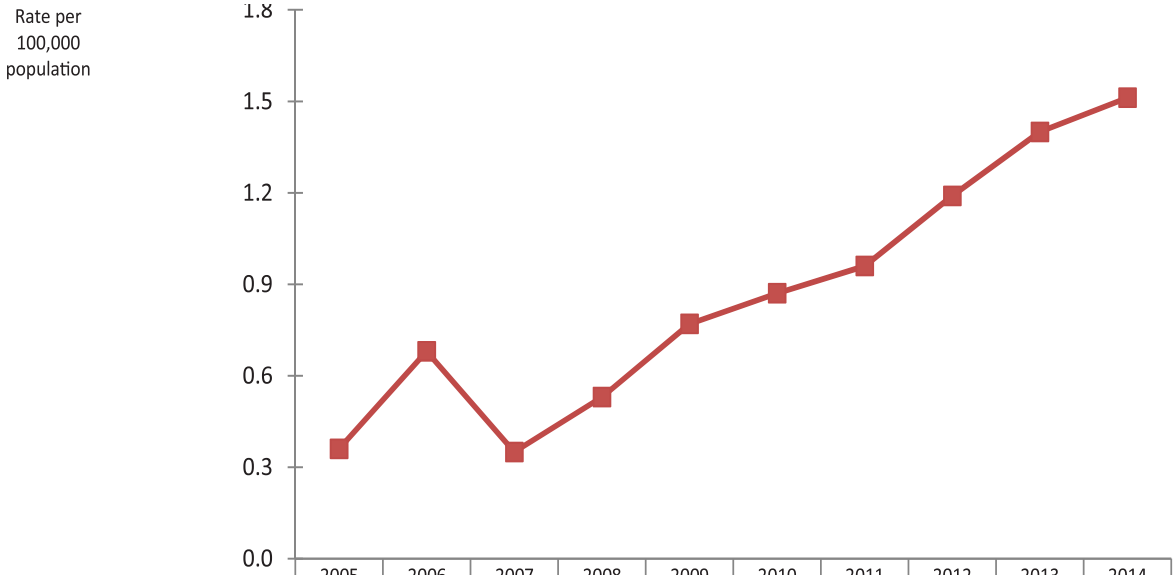
Typically cases are reported mostly from coastal regions; in 2014 the highest incidence rates were reported from North Shore/Coast Garibaldi and Central Vancouver Island.

All cases occurred in adults, with the highest incidence in males aged 25-29 years. The majority of cases were reported from weeks 30 to 39, with a peak in week 33, consistent with the annual summer season where *Vibrio* infections are most often associated with the consumption of raw or undercooked shellfish.

V. *parahaemolyticus* is the most common species to cause infection in BC.

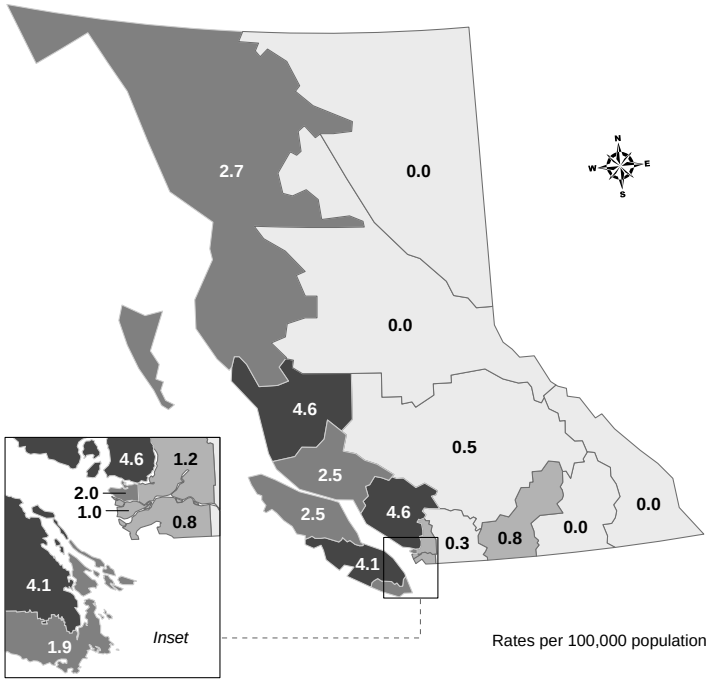
* Includes all *Vibrio* infections excluding *Vibrio* cholera.

36.1 Vibrio Infection Rates by Year, 2005-2014



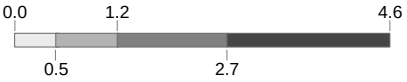
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
BC Vibrio Infection Reports	15	29	15	23	34	39	43	54	64	70
BC Vibrio Infection Rate	0.4	0.7	0.4	0.5	0.8	0.9	1.0	1.2	1.4	1.5

36.2 Vibrio Infection Rates by HSDA, 2014

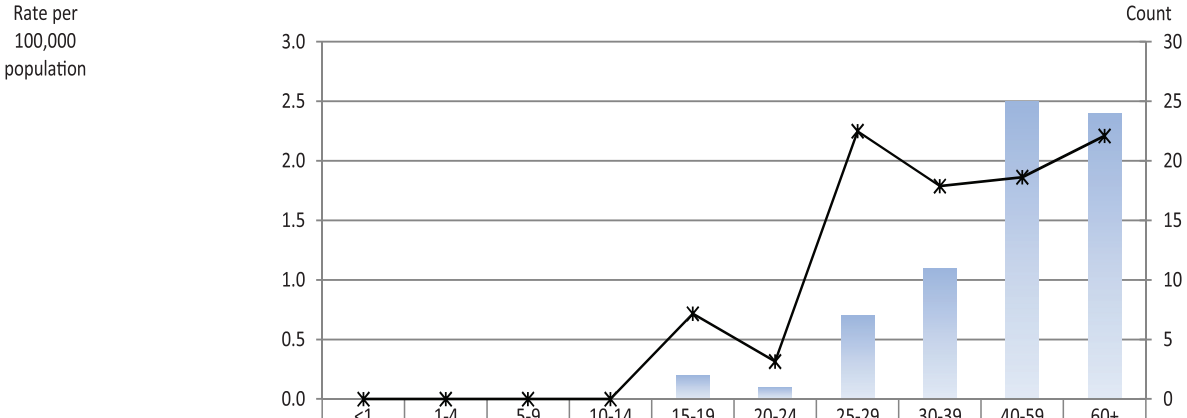


ID	Health Service Delivery Area	Cases	Rate
11	East Kootenay	0	0.0
12	Kootenay Boundary	0	0.0
13	Okanagan	3	0.8
14	Thompson Cariboo Shuswap	1	0.5
21	Fraser East	1	0.3
22	Fraser North	8	1.2
23	Fraser South	6	0.8
31	Richmond	2	1.0
32	Vancouver	13	2.0
33	North Shore/Coast Garibaldi	13	4.6
41	South Vancouver Island	7	1.9
42	Central Vancouver Island	11	4.1
43	North Vancouver Island	3	2.5
51	Northwest	2	2.7
52	Northern Interior	0	0.0
53	Northeast	0	0.0

Rates per 100,000 population by HSDA

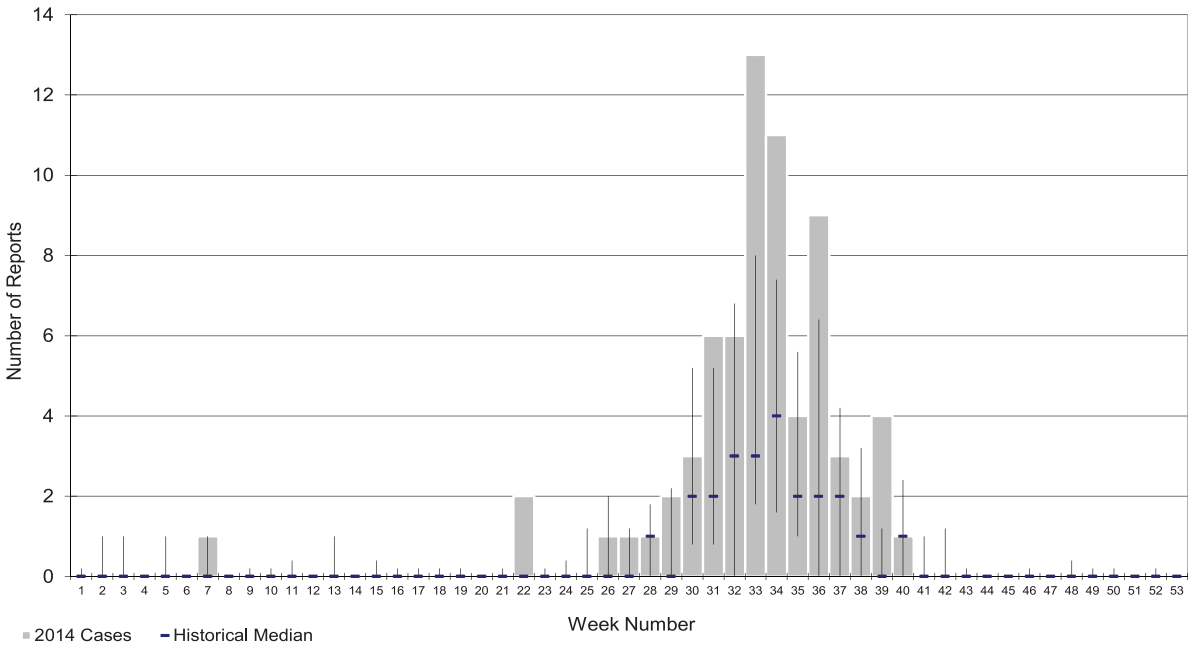


36.3 Vibrio Infection Rates by Age Group and Sex, 2014



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Vibrio Infection Reports - Female	0	0	0	0	1	1	1	4	11	7
Vibrio Infection Reports - Male	0	0	0	0	1	0	6	7	14	17
Vibrio Infection Reports - Total	0	0	0	0	2	1	7	11	25	24
Vibrio Infection Rate - Female	0.0	0.0	0.0	0.0	0.7	0.7	0.6	1.3	1.6	1.2
Vibrio Infection Rate - Male	0.0	0.0	0.0	0.0	0.7	0.0	3.9	2.3	2.1	3.3
Vibrio Infection Rate - Total	0.0	0.0	0.0	0.0	0.7	0.3	2.2	1.8	1.9	2.2

36.4 2014 Vibrio Infection Reports Compared to Historical Median and the 10th and 90th Percentiles Around the Median (2005 to 2013)



36.5 Vibrio Species Distribution, 2014

Rank	Species	Number of Cases	Proportion
1	*Parahaemolyticus*	64	90.1%
2	*Fluvalis*	4	5.6%
	Unknown	3	4.2%
	Total	71	100.0%

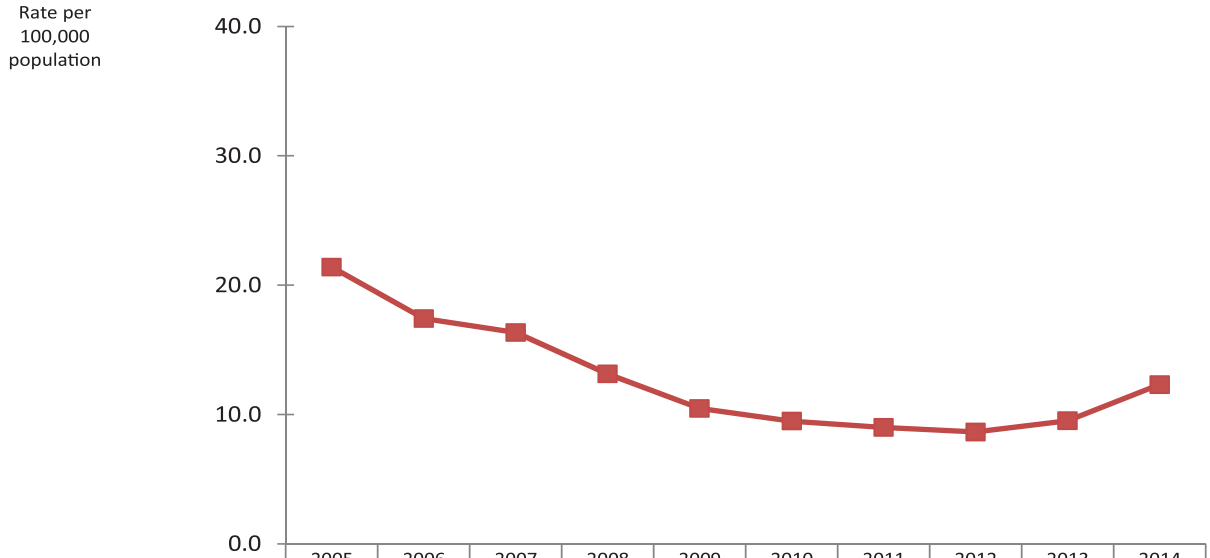
Note: Species distribution is based on Panorama data.

Yersiniosis

In 2014, 570 cases (12.3 per 100,000) of yersiniosis were reported. This is an increase compared to previous years, The reasons for this increase are unknown. Incidence was highest in children aged 1-4 years and adults aged 25-29 years and >=60 years.

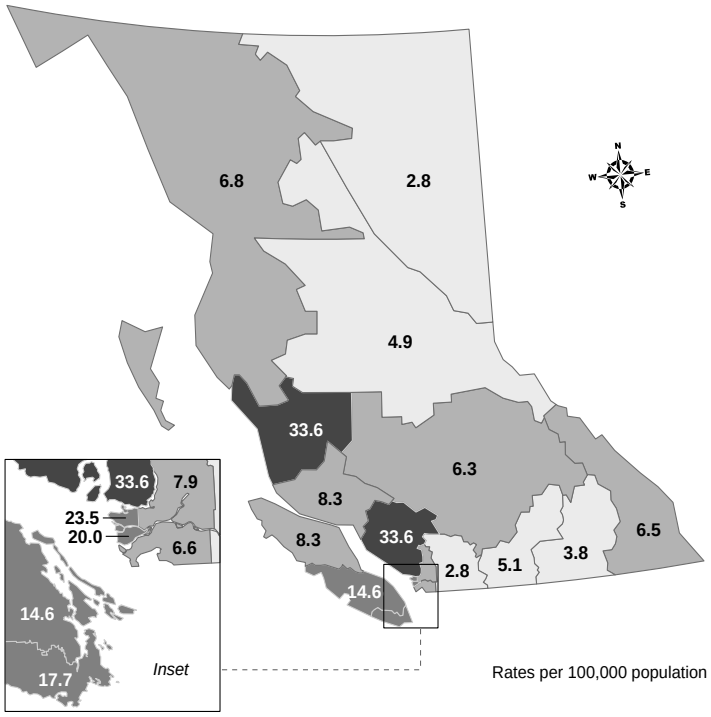
Like previous years, there was significant geographic variation with the highest rates reported from Vancouver Coastal and Vancouver Island Health Authorities. Cases were reported throughout year. No outbreaks were reported.

37.1 Yersiniosis Rates by Year, 2005-2014

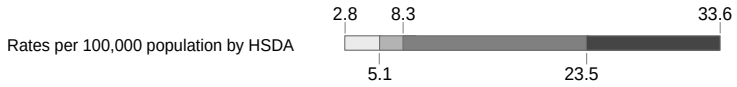


	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
BC Yersiniosis Reports	898	739	701	571	462	424	405	393	436	570
BC Yersiniosis Rate	21.4	17.4	16.3	13.1	10.5	9.5	9.0	8.7	9.5	12.3

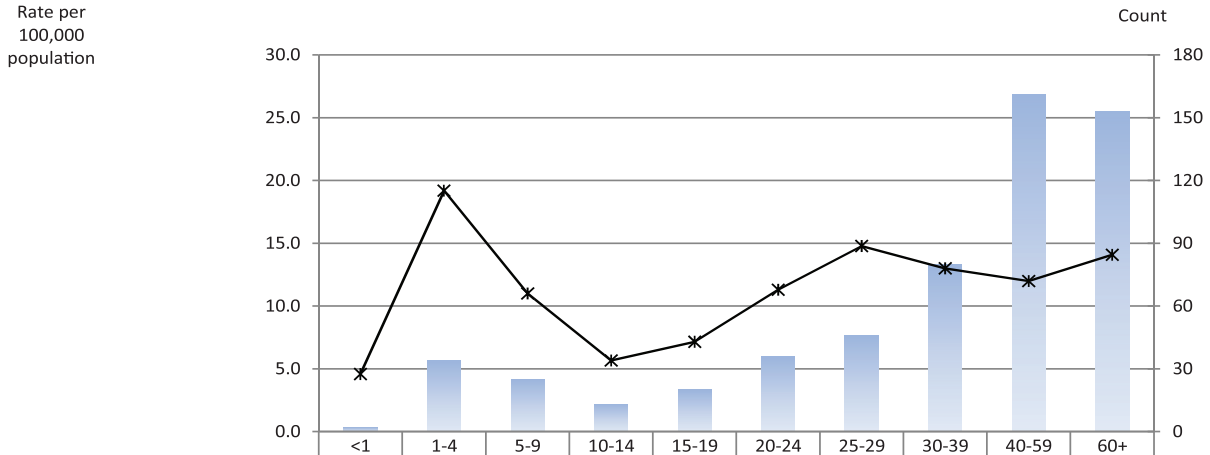
37.3 Yersiniosis Rates by HSDA, 2014



ID	Health Service Delivery Area	Cases	Rate
11	East Kootenay	5	6.5
12	Kootenay Boundary	3	3.8
13	Okanagan	18	5.1
14	Thompson Cariboo Shuswap	14	6.3
21	Fraser East	8	2.8
22	Fraser North	51	7.9
23	Fraser South	51	6.6
31	Richmond	41	20.0
32	Vancouver	155	23.5
33	North Shore/Coast Garibaldi	95	33.6
41	South Vancouver Island	66	17.7
42	Central Vancouver Island	39	14.6
43	North Vancouver Island	10	8.3
51	Northwest	5	6.8
52	Northern Interior	7	4.9
53	Northeast	2	2.8



37.4 Yersiniosis Rates by Age Group and Sex, 2014



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Yersiniosis Reports - Female	1	14	14	5	12	20	28	39	100	99
Yersiniosis Reports - Male	1	20	11	8	8	16	18	41	61	54
Yersiniosis Reports - Total	2	34	25	13	20	36	46	80	161	153
Yersiniosis Rate - Female	4.7	16.3	12.8	4.5	8.9	13.1	17.9	12.6	14.7	17.4
Yersiniosis Rate - Male	4.5	21.9	9.4	6.8	5.5	9.6	11.6	13.5	9.2	10.4
Yersiniosis Rate - Total	4.6	19.2	11.0	5.7	7.1	11.3	14.8	13.0	12.0	14.1

Enteric disease outbreaks in BC

Gastroenteritis epidemics are reportable in BC. Regional and provincial partners implemented surveillance of enteric outbreaks in August 2008 in order to describe trends, improve understanding, conduct source attribution, assess control measures and resource use and record important information.

A national, secure web-enabled outbreak reporting tool using the Canadian Network for Public Health Intelligence (CNPHI) is used for reporting. Outbreaks can be entered by all Health Authorities and the BC Centre for Disease Control (BCCDC).

The objective of this report is to describe trends in outbreaks investigated and reported in BC in 2014. Facility-based viral outbreaks were excluded. Data were extracted from CNPHI on May 4, 2015.

In 2014, 24 outbreaks were reported by four Health Authorities and BCCDC (Table 38.1).

The number of outbreaks was comparable with previous years, where 14-24 occurred each year (Figure 38.2).

Bacteria and viruses caused the largest number of outbreaks in 2014.The pathogen was confirmed in 17 (70.8%) of the outbreaks; the majority of these were bacterial (Table 38.3). Clinical cases were more often reported in outbreaks caused by viruses. Over 400 of the clinical cases were associated with one outbreak in a school. Over 400 of the lab-confirmed cases were associated with a single investigation of *Salmonella* Enteritidis in the province. Parasitic outbreaks had a longer duration (Table 38.3).

Outbreaks occurred in a variety of settings. The three most common settings were food service establishment, community and school (Table 38.4).

The most common mode of transmission was foodborne (N=13) (Table 38.5). Of the waterborne outbreaks, one was associated with drinking water and one with recreational water.

Among the 13 foodborne outbreaks, 9 (69.2%) identified a specific food sources (Table 38.6). Eggs and produce were the most commonly reported sources in 2014. There were no outbreaks caused by meat or dairy. Food handlers contributed to the contamination of a food source in 2 outbreak caused by norovirus (n=1) and an unknown pathogen (n=1).

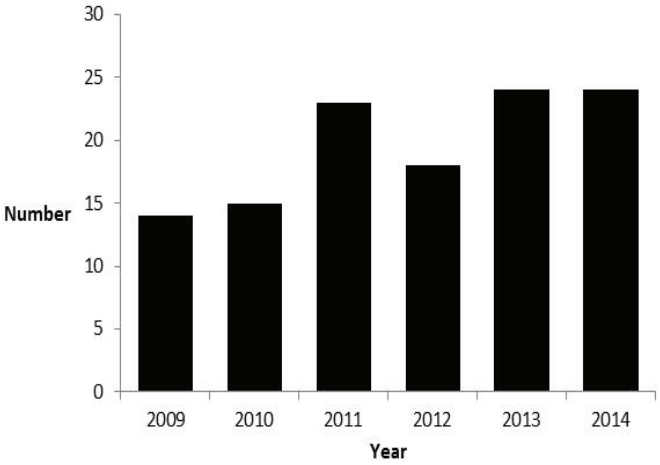
Among foodborne outbreaks, factors that contributed to the identification of a source included: cases with a history of exposure to the implicated source (11), inadequate cooking (5), identification of food contaminated at source (5) and traceback (4).

The most common interventions used in foodborne outbreaks included education (9), closing the facility (2) and sanitizing the facility (3). Product recall and public communication was done for 1 foodborne outbreak of *Salmonella* associated with chia seeds and powder.

38.1 Enteric disease outbreaks by reporting organization, BC, 2014

Reporting Organization	Number of outbreaks
Fraser Health Authority	6
Interior Health Authority	4
Northern Health Authority	0
Vancouver Coastal Health	7
Island Health Authority	1
BCCDC	6
Total	24

38.2: Number of Outbreaks By Year Investigation Started, BC, 2009-2014



38.3 Characteristics of Enteric Outbreaks by Pathogen Type, BC, 2014 (N=24)

	Bacterial (N=11)	Viral (N=10)	Parasitic (n=1)	Unknown (N=2)	Total
Number of lab confirmed outbreaks	10	6	1	0	17
Total number of lab confirmed cases	490	13	23	0	526
Total number of clinical cases	33	889	0	106	1028
Total number of hospitalizations	5	1	1	0	7
Total number of deaths	0	0	0	0	0
Median duration of outbreak (days)	6 (1-364)	5 (1-26)	98	16 (6-25)	17 (2-85)
Causative agent	*Salmonella* (10)	Norovirus (6)	*Cyclospora* (1)		

38.4 Outbreak by Setting Type, BC, 2014

Outbreak setting	Number of outbreaks
Food service establishment	10 (41.7%)
Community	6 (25.0%)
School	2 (8.3%)
More than 1 setting	1 (4.2%)
Workplace	1 (4.2%)
Event	1 (4.2%)
Camp	1 (4.2%)
Unknown	2 (8.3%)
Total	24

38.5 Outbreaks by Mode of Transmission, BC, 2014

Outbreak mode of transmission	Number of outbreaks
Foodborne	13 (54.2%)
Person-to-person	6 (25.0%)
Waterborne	2 (8.3%)
Animal-to-person	1 (4.2%)
Unknown	2 (8.3%)
Total	24

38.6 Source of Foodborne Outbreaks by Pathogen, BC, 2014

	Cyclospora	Norovirus	*Salmonella*	Unknown	Total
Eggs	0	0	2	0	2
Produce-fresh	1	0	1	0	2
Seafood	0	1	0	0	1
Seeds	0	0	1	0	1
Unknown	0	1	3	1	5
Other	0	0	1	1	2
Total	1	2	8	2	13

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

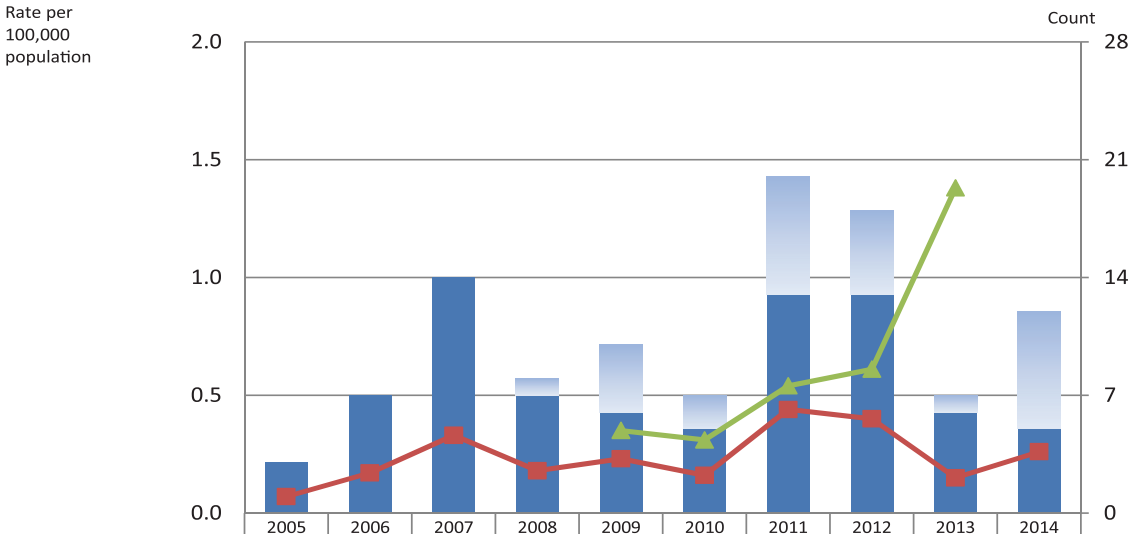
Vectorborne and Zoonotic Diseases

Lyme Disease
Rabies Exposure

Lyme Disease

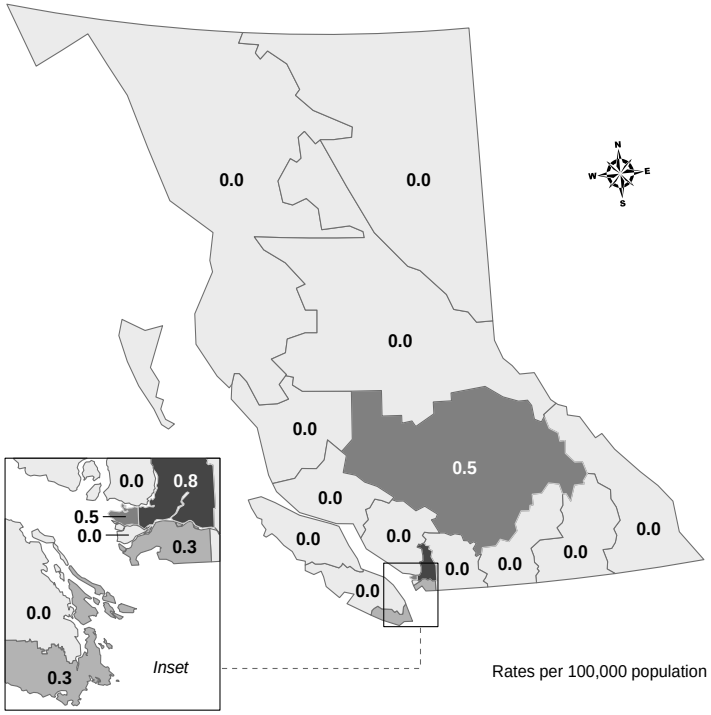
There continues to be a low endemic risk of Lyme Disease in BC. There were 12 cases of clinical or laboratory-confirmed disease (0.3 per 100,000) reported in 2014. Generally, the majority of infections reported in BC are lab-confirmed. However, in 2014 the number of cases that were lab-confirmed or clinical was approximately equal. Four cases reported travel and likely acquired their infection outside of BC. Incidence is highest among children aged <10 years and adults 40-59 years. Incidence was highest in Fraser North, Vancouver and Thompson Cariboo Shuswap.

32.1 Lyme Disease Rates by Year, 2005-2014

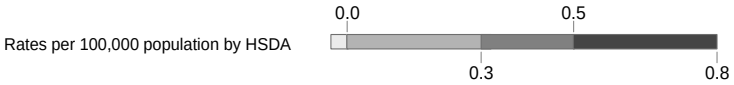


	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
BC Lyme Clinical	0	0	0	1	4	2	7	5	1	7
BC Lyme Confirmed	3	7	14	7	6	5	13	13	6	5
BC Lyme Rate	0.1	0.2	0.3	0.2	0.2	0.2	0.4	0.4	0.2	0.3
Canadian Lyme Rate					0.4	0.3	0.5	0.6	1.4	

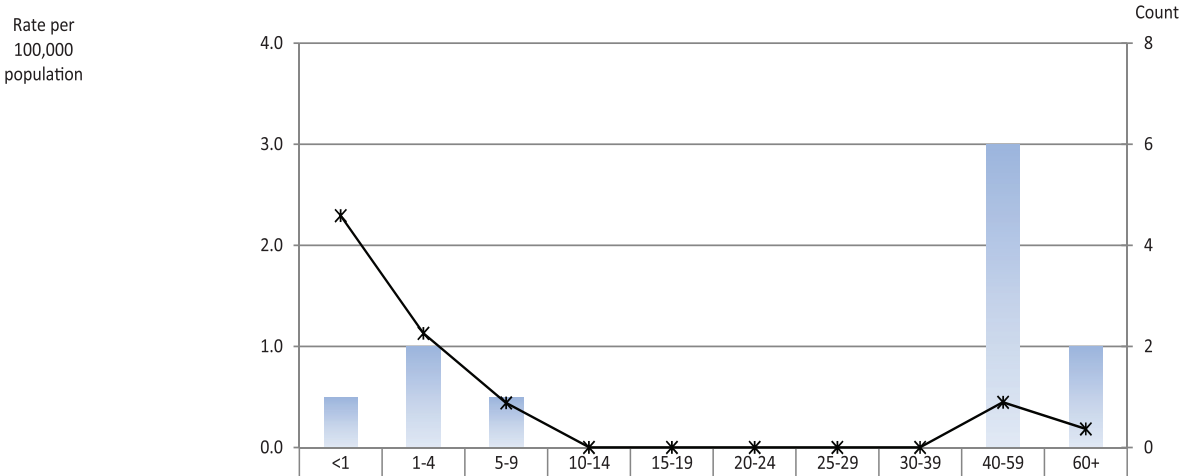
32.2 Lyme Disease Rates by HSDA, 2014



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



32.3 Lyme Disease Rates by Age Group and Sex, 2014



	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Lyme Reports - Female	1	0	1	0	0	0	0	0	6	1
Lyme Reports - Male	0	2	0	0	0	0	0	0	0	1
Lyme Reports - Total	1	2	1	0	0	0	0	0	6	2
Lyme Rate - Female	4.7	0.0	0.9	0.0	0.0	0.0	0.0	0.0	0.9	0.2
Lyme Rate - Male	0.0	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
Lyme Rate - Total	2.3	1.1	0.4	0.0	0.0	0.0	0.0	0.0	0.4	0.2

Rabies Exposures*

On April 1 2014, Canadian provinces and territories took on the risk assessment and management of animal rabies from the Canadian Food Inspection Agency. In BC, the Health Authorities became responsible for managing animals which exposed humans. This entails a risk assessment and the submission of the animal to the laboratory for rabies testing. It was anticipated that this change in practice could lead to changes in reported human exposures.

However, the rate of reported rabies exposures in BC has remained constant in the last few years. It 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 172 exposures or 3.7 per 100,000 in 2014. Overall, 99 (57.6%) exposures occurred during international travel; this proportion has remained stable in recent years.

As compared to 2013, a few HSDAs reported much higher rates of human exposures in 2014, including North and South Vancouver Island and Thompson Cariboo Shushwap. Vancouver/Richmond reported the greatest number of exposures overall at 37, but the majority (75.7%) occurred during international travel. The highest rates of exposure were reported from North Vancouver Island (7.4 per 100,000) where seven (77.8%) exposures occurred locally and Thompson Cariboo Shushwap (7.2 per 100,000) where 12 (75.0%) occurred locally.

The highest rates of exposure were reported in young children and young adults. In general, the proportion of exposures occurring internationally was greater for most age groups, except in young children.

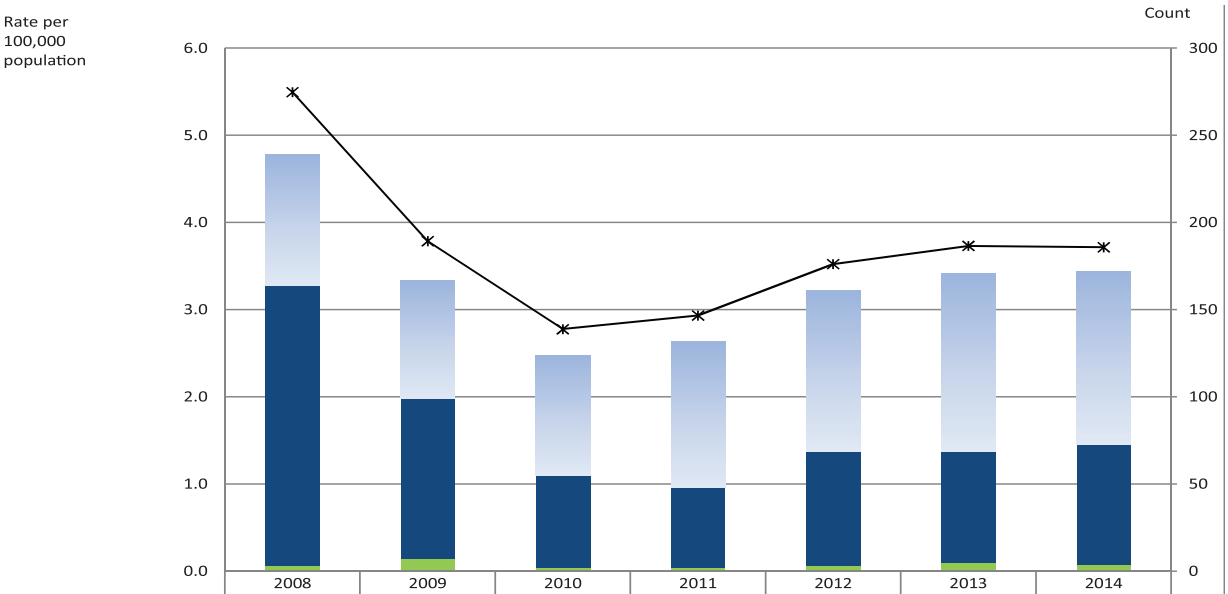
Most BC/Canada exposures were reported between July and September when bats are active. International exposures occurred throughout the year with the highest number reported in the winter months.

The majority (81%) of exposures occurring in BC/Canada involved bats, the only rabies reservoir in BC. Dogs accounted for 49% of international exposures.

As in recent years, the majority (57.0%) of exposures were due to bites. Fewer were due to handling of an animal, scratches and contact with saliva.

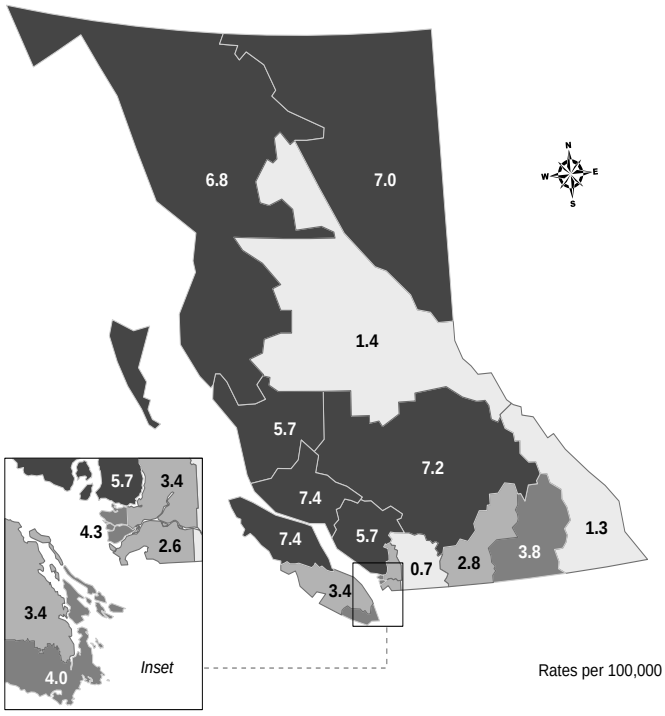
*The terms “exposure” denotes a report of an individual exposed to an animal which presents a risk of rabies infection. Several individuals exposed to one animal would result in several exposure reports.

34.1 Rabies Exposures Rates by Year, 2009-2014



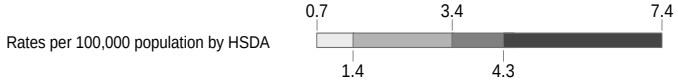
	2008	2009	2010	2011	2012	2013	2014
Outside Canada	75	68	69	84	92	102	99
Inside BC/Canada	161	92	53	46	66	64	69
Other (Blank)	3	7	2	2	3	5	4
Rates per 100,000	5.5	3.8	2.8	2.9	3.5	3.7	3.7

34.2 Rabies Exposure Rates by HSDA, 2014

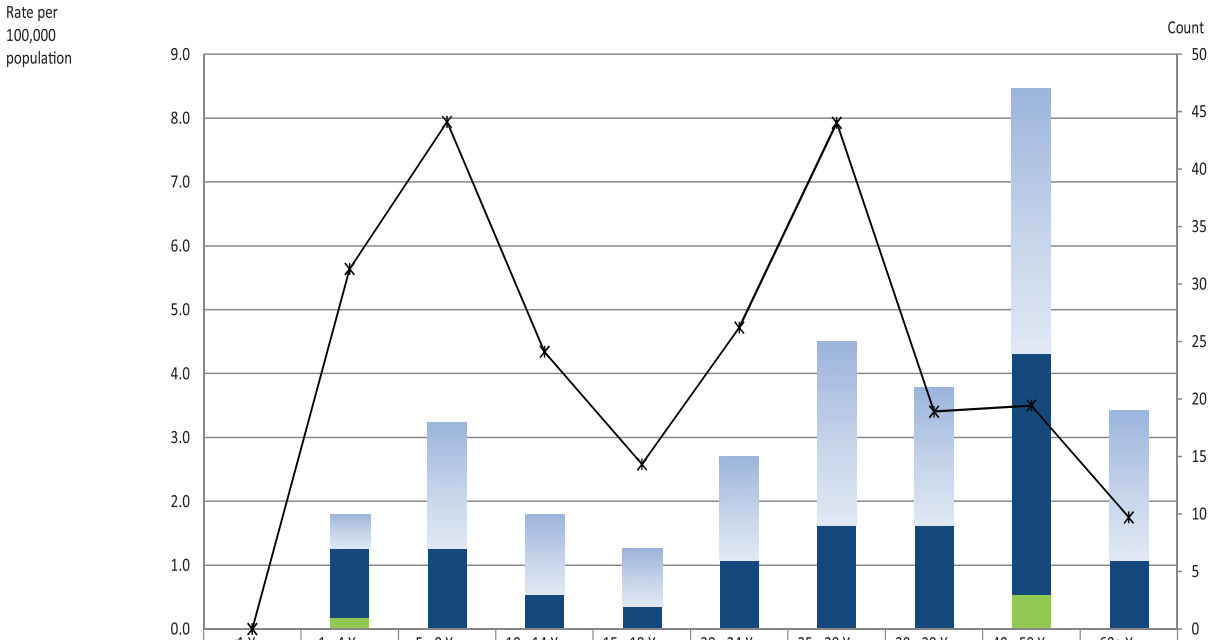


ID	Health Service Delivery Area	Exps.	Rate	BC/Can. Exps.	Int'l Exps.
11	East Kootenay	1	1.3	0	1
12	Kootenay Boundary	3	3.8	3	0
13	Okanagan	10	2.8	5	5
14	Thompson Cariboo Shuswap	16	7.2	12	4
21	Fraser East	2	0.7	2	0
22	Fraser North	22	3.4	3	19
23	Fraser South	*20	2.6	4	15
31/32	Richmond/Vancouver	*37	4.3	8	28
33	North Shore/Coast Garibaldi	*16	5.7	2	12
41	South Vancouver Island	15	4.0	7	8
42	Central Vancouver Island	9	3.4	5	4
43	North Vancouver Island	9	7.4	7	2
51	Northwest	5	6.8	4	1
52	Northern Interior	2	1.4	2	0
53	Northeast	5	7.0	5	0

*Note: The location of 4 exposures (1 FS; 1 Rich/Van; 2 NSCG) were not reported.

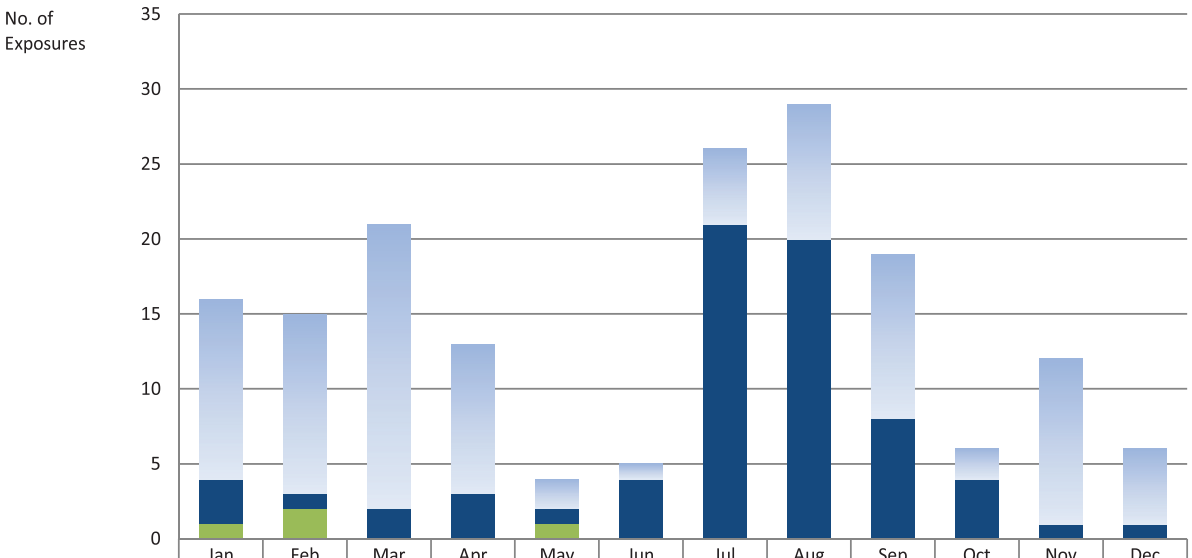


34.3 Rabies Exposures by Age Group, 2014



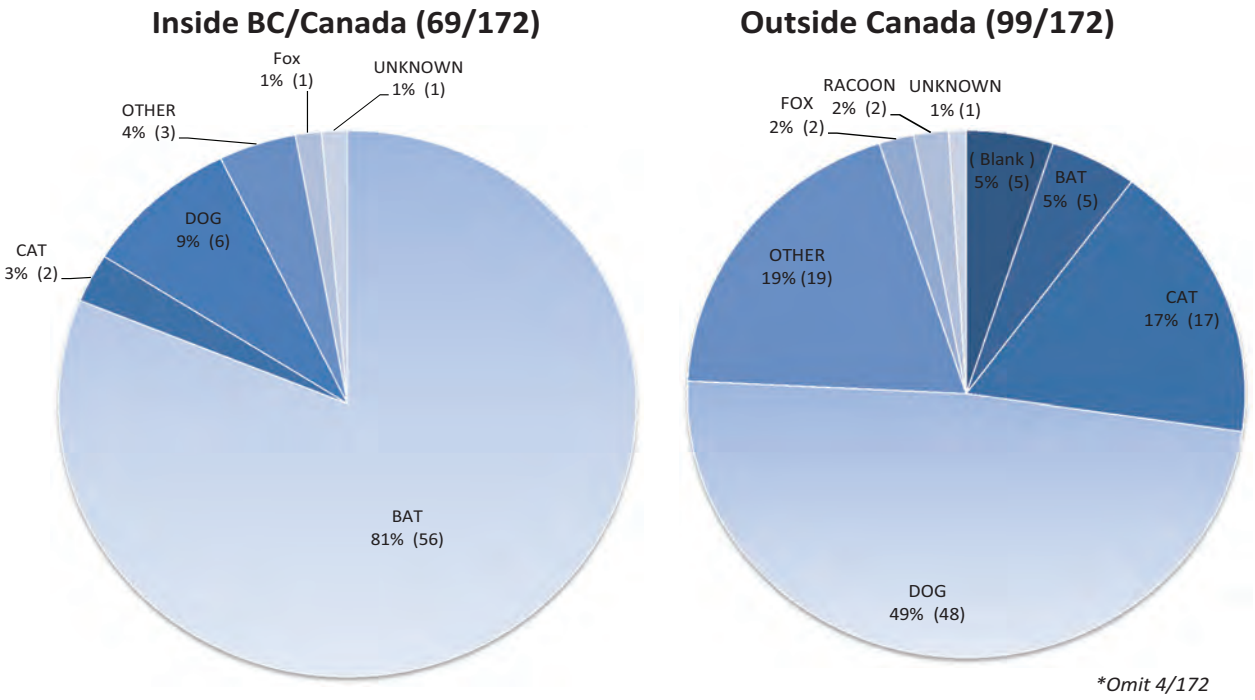
	<1 Year	1 - 4 Years	5 - 9 Years	10 - 14 Years	15 - 19 Years	20 - 24 Years	25 - 29 Years	30 - 39 Years	40 - 59 Years	60+ Years
Outside Canada	0	3	11	7	5	9	16	12	23	13
Inside BC/Canada	0	6	7	3	2	6	9	9	21	6
Other (Blank)	0	1	0	0	0	0	0	0	3	0
Rate per 100,000	0.0	5.6	7.9	4.3	2.6	4.7	7.9	3.4	3.5	1.7

34.4 Rabies Exposures by Month, 2014



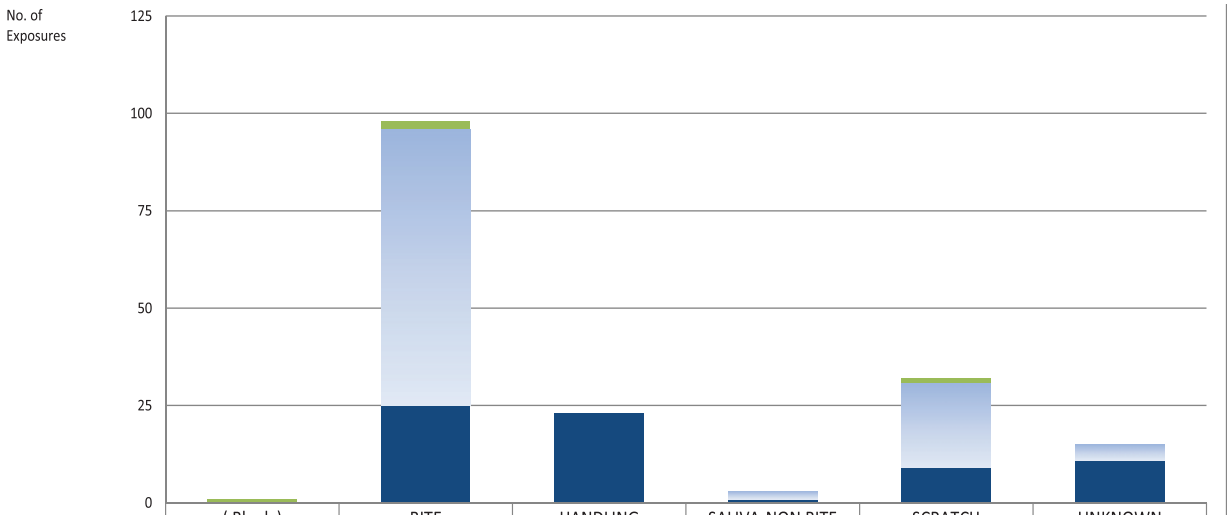
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Outside Canada	12	12	19	10	2	1	5	9	11	2	11	5
Inside BC/Canada	3	1	2	3	1	4	21	20	8	4	1	1
Other (Blank)	1	2	0	0	1	0	0	0	0	0	0	0

34.5 Rabies Exposures by Percentage of Animal Species Involved, 2014



*Omit 4/172

34.6 Rabies Exposures by Type of Exposure, 2014



	(Blank)	BITE	HANDLING	SALIVA-NON BITE	SCRATCH	UNKNOWN
Other (Blank)	1	2	0	0	1	0
Outside Canada	0	71	0	2	22	4
Inside BC/Canada	0	25	23	1	9	11

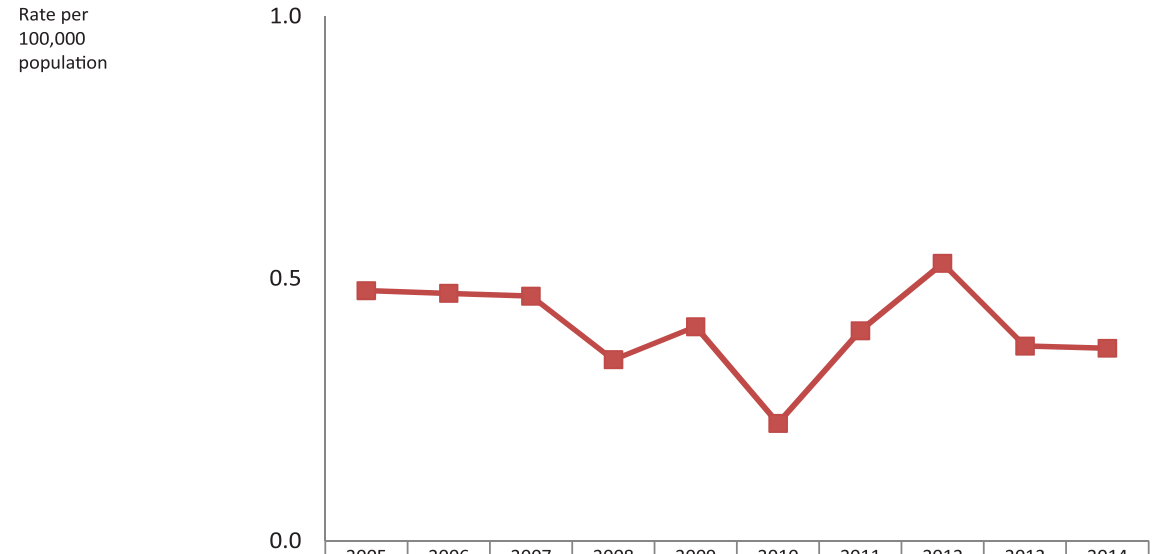
Environmental Pathogens

Cryptococcus gattii
Legionellosis

Cryptococcus gattii Infection

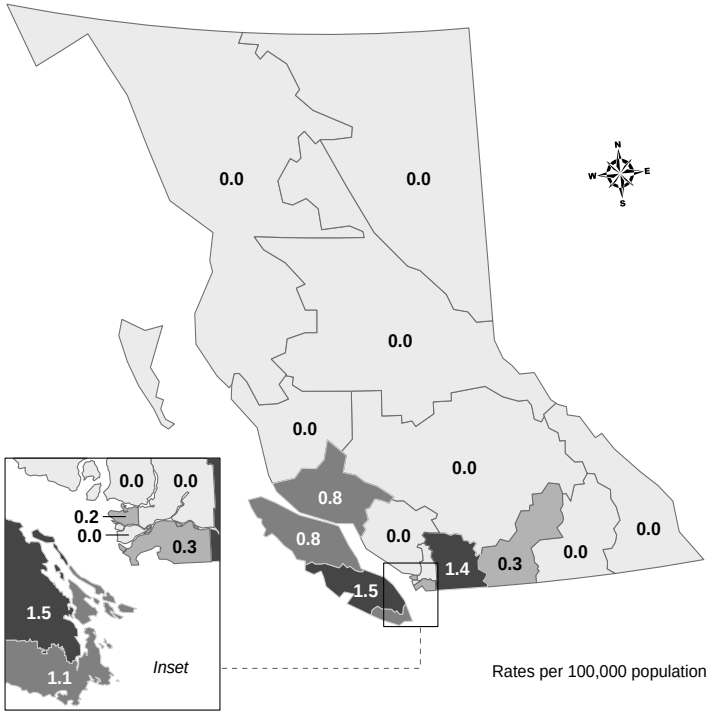
In 2014, 17 cases (0.4 per 100,000) of *C. gattii* infection were reported. The incidence has remained stable. All but one case occurred in adults. Half of the cases (8) were reported from the mainland. As in recent years, the highest rates were reported from Central Vancouver Island and Fraser East.

36.1 Crytococcus gattii Rates by Year, 2005-2014

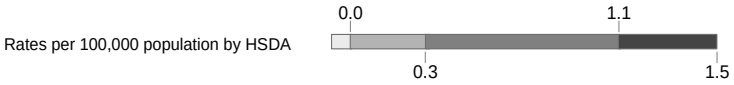


	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
BC Cryptococcus gattii Reports	20	20	20	15	18	10	18	24	17	17
BC Cryptococcus gattii Rate	0.5	0.5	0.5	0.3	0.4	0.2	0.4	0.5	0.4	0.4

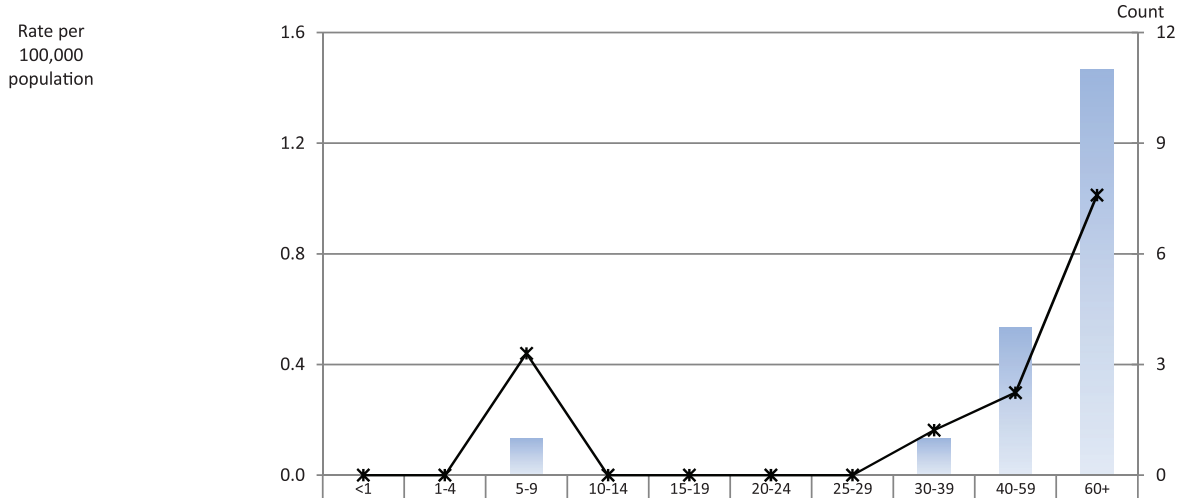
36.2 Crytococcus gattii Rates by HSDA, 2014



ID	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	4	1.4
22	Fraser North	0	0.0
23	Fraser South	2	0.3
31	Richmond	0	0.0
32	Vancouver	1	0.2
33	North Shore/Coast Garibaldi	0	0.0
41	South Vancouver Island	4	1.1
42	Central Vancouver Island	4	1.5
43	North Vancouver Island	1	0.8
51	Northwest	0	0.0
52	Northern Interior	0	0.0
53	Northeast	0	0.0



36.3 Crytococcus gattii Rates by Age Group and Sex, 2014

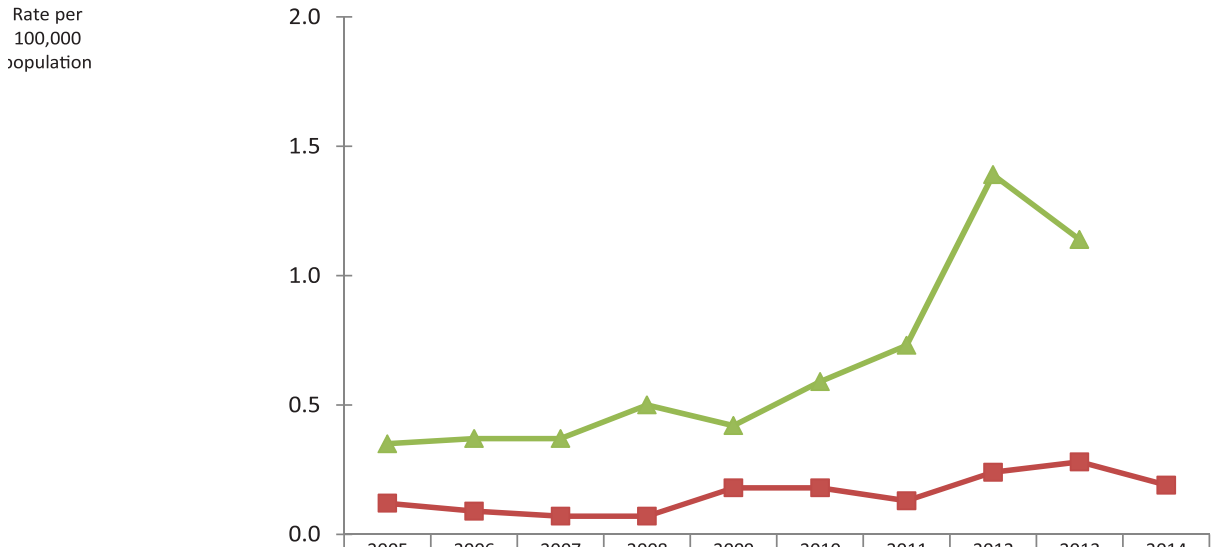


	<1	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-59	60+
Cryptococcus gattii Reports - Female	0	0	0	0	0	0	0	1	0	5
Cryptococcus gattii Reports - Male	0	0	1	0	0	0	0	0	4	6
Cryptococcus gattii Reports	0	0	1	0	0	0	0	1	4	11
Cryptococcus gattii Rate -Female	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.9
Cryptococcus gattii Rate -Male	0.0	0.0	0.9	0.0	0.0	0.0	0.0	0.0	0.6	1.2
Cryptococcus gattii Rates	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.2	0.3	1.0

Legionellosis

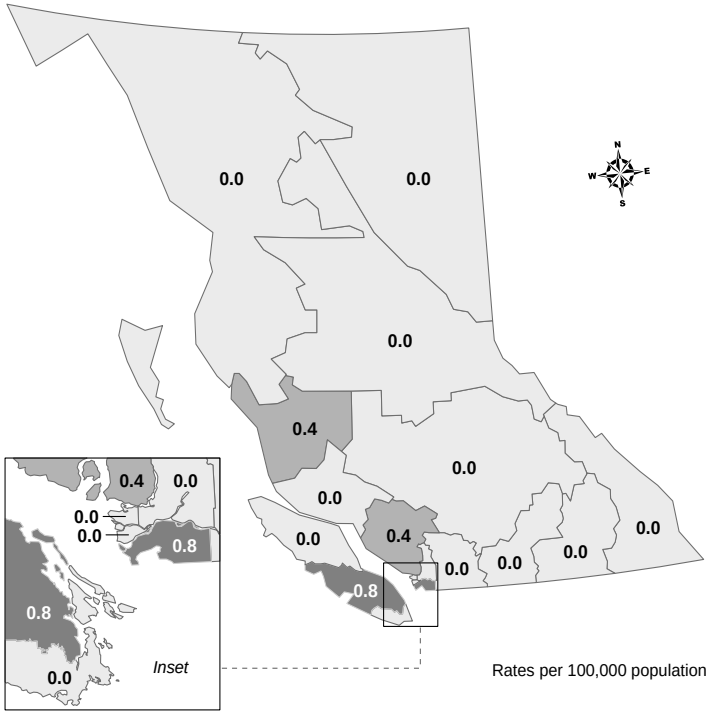
In 2014, 9 cases of legionellosis were reported, a slight decrease compared to 2013. Most of the cases were reported from Fraser Health Authority (n=6). Fraser Health investigated a cluster of legionellosis cases in the fall/winter of 2014. Although the outbreak was not solved, it was believed to have been associated with a local food service establishment. All BC cases were adults >= 30 years. Cases occurred throughout the year, with slight clustering in the fall and winter months.

37.1 Legionellosis Rates by Year, 2005-2014

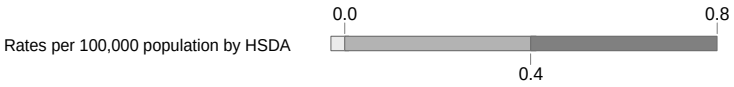


	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Legionellosis Reports	5	4	3	3	8	8	6	11	13	9
Legionellosis Rate	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.3	0.2
Canadian Legionellosis Rate	0.4	0.4	0.4	0.5	0.4	0.6	0.7	1.4	1.1	

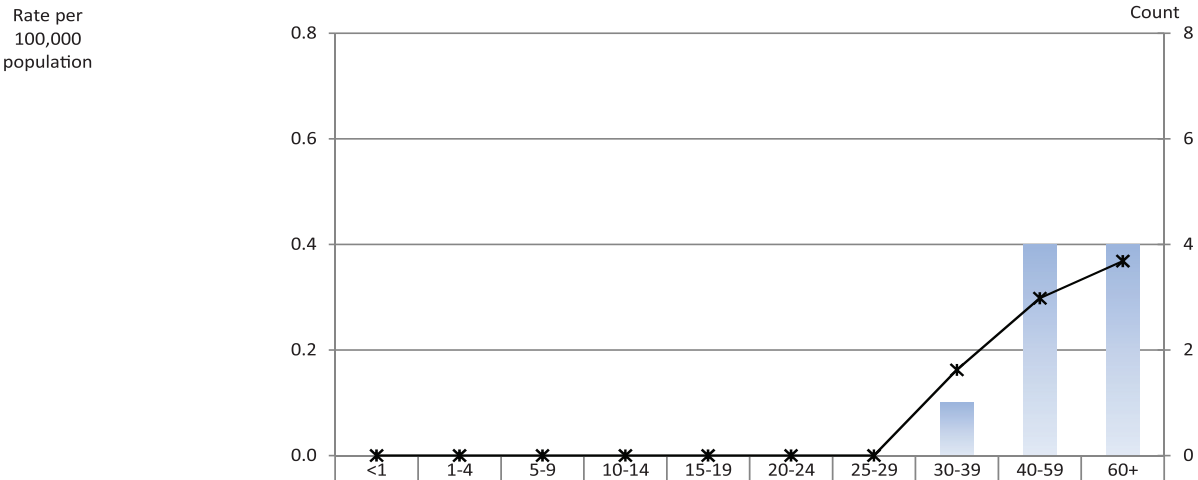
37.2 Legionellosis Rates by HSDA, 2014



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

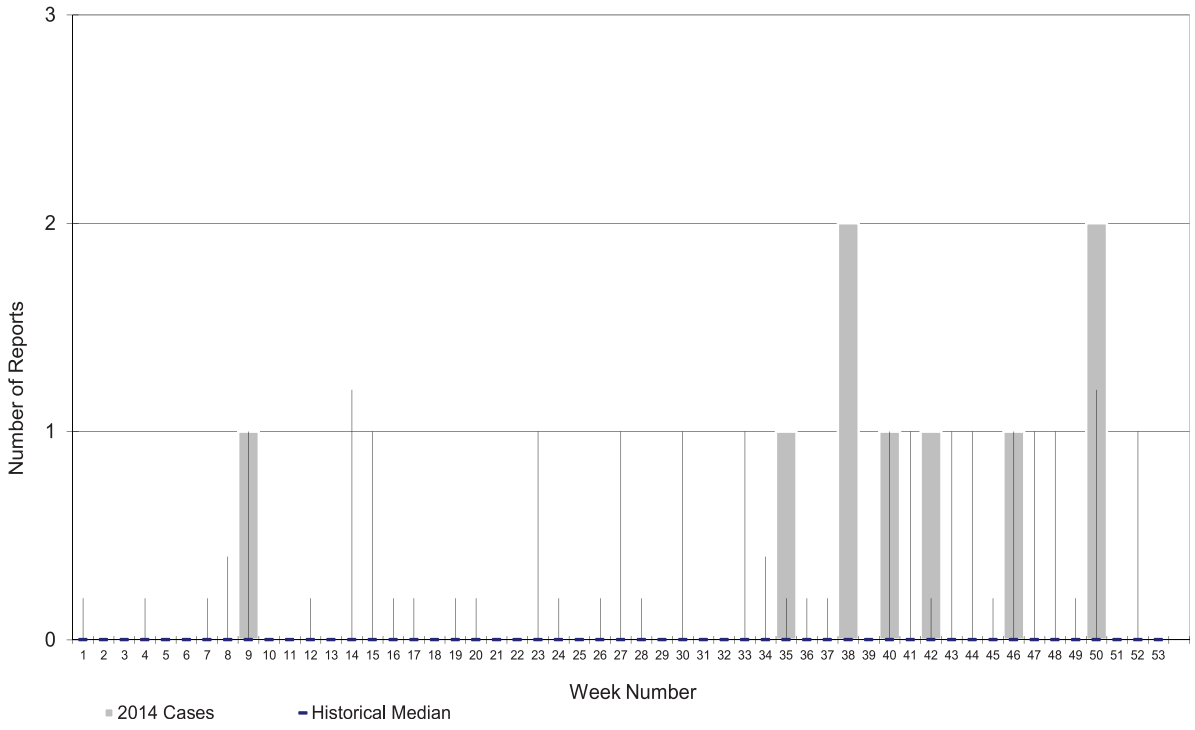


37.3 Legionellosis Rates by Age Group and Sex, 2014



	<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	1	3
Legionellosis Reports - Male	0	0	0	0	0	0	0	0	3	1
Legionellosis Reports - Total	0	0	0	0	0	0	0	1	4	4
Legionellosis Rate - Female	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.1	0.5
Legionellosis Rate - Male	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.2
Legionellosis Rate - Total	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.4

37.1 2014 Legionellosis Reports Compared to Historical Median and the 10th and 90th Percentiles Around the Median (2005 to 2013)



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

2014 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**
2014 Population Estimate	**4631302**	**77468**	**77997**	**354017**	**221230**	**730712**	**288170**	**641965**	**776689**	**1706824**
AIDS (2013)*	**49**	1	0	1	2	**4**	0	7	3	**10**
Amebiasis	**416**	0	3	10	5	**18**	17	36	86	**139**
Campylobacteriosis	**1558**	25	18	98	70	**211**	126	185	218	**529**
Chlamydia^	**13276**	146	157	1007	710	**2020**	540	1500	1518	**3558**
Cryptococcus gattii	**17**	0	0	1	0	**1**	4	0	2	**6**
Cryptosporidiosis	**73**	2	2	3	6	**13**	5	9	12	**26**
Cyclosporiasis	**48**	1	5	3	0	**9**	5	3	7	**15**
E. coli, Shigatoxigenic	**123**	5	2	10	9	**26**	7	11	8	**26**
Giardiasis	**559**	6	6	38	19	**69**	39	47	88	**174**
Gonorrhea^	**1787**	3	7	33	57	**100**	73	208	264	**545**
Hepatitis A	**25**	1	0	3	1	**5**	0	3	6	**9**
Hepatitis B Acute	**15**	0	0	0	2	**2**	1	0	3	**4**
Hepatitis B Chronicand Unknown	**1124**	0	1	21	6	**28**	31	227	131	**389**
Hepatitis C	**1984**	36	31	156	113	**336**	207	228	310	**745**
Haemophilus influenzae b, invasive	**3**	0	0	0	0	**0**	0	1	1	**2**
HIV^	**260**	0	1	7	9	**17**	6	28	24	**58**
Listeriosis	**19**	1	0	0	0	**1**	0	5	2	**7**
Lyme	**12**	0	0	0	1	**1**	0	5	2	**7**
Malaria	**26**	1	2	1	1	**5**	4	2	4	**10**
Measles	**343**	0	0	0	0	**0**	325	1	2	**328**
Meningococcal Disease, invasive	**13**	2	1	2	2	**7**	0	1	1	**2**
Mumps	**23**	0	0	1	0	**1**	0	3	3	**6**
Paratyphoid Fever	**26**	0	0	4	0	**4**	1	3	12	**16**
Pertussis	**501**	9	57	35	25	**126**	22	28	53	**103**
Pneumococcal Disease, invasive	**381**	2	9	23	24	**58**	29	49	55	**133**
Salmonellosis	**1167**	17	17	63	43	**140**	106	175	227	**508**
Shigellosis	**150**	0	2	0	0	**2**	8	17	38	**63**
Streptococcus Group A invasive	**167**	3	8	18	10	**39**	5	18	20	**43**
Syphilis (infectious)^	**546**	0	2	1	4	**7**	7	55	34	**96**
Tuberculosis	**279**	0	1	8	7	**16**	12	46	71	**129**
Typhoid Fever	**31**	0	0	1	1	**2**	3	3	17	**23**
Vibrio Infections	**70**	0	0	3	1	**4**	1	8	6	**15**
Yersinlosis	**570**	5	3	18	14	**40**	8	51	51	**110**
Less Common Diseases										
Brucellosis	**2**	0	0	0	0	**0**	0	0	1	**1**
Cholera Serogrp non O1O139	**2**	0	0	0	0	**0**	1	0	1	**2**
Cholera Serogrp O1O139	**2**	0	0	0	0	**0**	1	0	0	**1**
Creutzfeldt Jacob Disease	**5**	0	0	2	0	**2**	0	0	0	**0**
Hantavirus	**1**	0	0	0	0	**0**	0	0	0	**0**
Legionellosis	**9**	0	0	0	0	**0**	0	0	6	**6**
Leptospirosis	**3**	0	0	0	0	**0**	0	0	0	**0**
Neonatal Group B Streptococcal Infection~	**8**	0	0	0	0	**0**	0	0	1	**1**
Tularemia	**1**	0	0	0	0	**0**	0	0	0	**0**
Yellowfever	**1**	0	0	0	0	**0**	0	1	0	**1**

Note: In 2014, there were no reported cases of Anthrax, Botulism, Diphtheria (toxigenic) Acute , Viral Hemorrhagic Fevers, Leprosy, Plague, Poliomyelitis, Rabies, Rubella, Severe Acute Respiratory Syndrome, Trichinosis or West Nile. Diphtheria carriers (toxigenic) were not reported, which is a change from previous annual reports.

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**
205262	**658485**	**282565**	**1146312**	**372463**	**266231**	**121031**	**759725**	**73719**	**141895**	**72115**	**287729**
1	21	1	**23**	6	0	0	**6**	1	4	1	**6**
11	187	21	**219**	28	8	4	**40**	0	0	0	**0**
58	302	180	**540**	123	79	31	**233**	13	23	9	**45**
578	3166	775	**4519**	965	705	290	**1960**	353	575	291	**1219**
0	1	0	**1**	4	4	1	**9**	0	0	0	**0**
2	16	4	**22**	6	3	1	**10**	0	1	1	**2**
2	12	6	**20**	2	1	0	**3**	0	1	0	**1**
6	16	6	**28**	19	14	9	**42**	0	1	0	**1**
13	147	54	**214**	52	17	11	**80**	10	10	2	**22**
38	819	65	**922**	79	22	15	**116**	34	61	9	**104**
1	4	2	**7**	0	1	0	**1**	0	0	3	**3**
2	3	1	**6**	0	1	0	**1**	1	0	1	**2**
198	400	50	**648**	30	6	6	**42**	1	12	4	**17**
35	329	54	**418**	132	127	66	**325**	39	100	21	**160**
1	0	0	**1**	0	0	0	**0**	0	0	0	**0**
4	133	10	**147**	12	10	3	**25**	5	7	1	**13**
0	3	2	**5**	2	3	0	**5**	1	0	0	**1**
0	3	0	**3**	1	0	0	**1**	0	0	0	**0**
3	5	0	**8**	1	0	1	**2**	0	1	0	**1**
1	13	0	**14**	0	1	0	**1**	0	0	0	**0**
1	2	0	**3**	1	0	0	**1**	0	0	0	**0**
3	11	1	**15**	0	1	0	**1**	0	0	0	**0**
2	0	0	**2**	1	1	1	**3**	0	1	0	**1**
4	14	27	**45**	34	12	23	**69**	121	12	25	**158**
7	58	27	**92**	29	29	14	**72**	13	10	3	**26**
38	167	82	**287**	83	52	40	**175**	8	27	22	**57**
4	57	12	**73**	8	3	0	**11**	0	1	0	**1**
4	34	7	**45**	12	11	6	**29**	0	11	0	**11**
11	378	17	**406**	21	10	1	**32**	4	1	0	**5**
24	83	8	**115**	7	4	1	**12**	3	2	2	**7**
0	2	0	**2**	2	0	0	**2**	0	2	0	**2**
2	13	13	**28**	7	11	3	**21**	2	0	0	**2**
41	155	95	**291**	66	39	10	**115**	5	7	2	**14**
0	1	0	**1**	0	0	0	**0**	0	0	0	**0**
0	0	0	**0**	0	0	0	**0**	0	0	0	**0**
0	1	0	**1**	0	0	0	**0**	0	0	0	**0**
0	1	0	**1**	0	2	0	**2**	0	0	0	**0**
0	0	1	**1**	0	0	0	**0**	0	0	0	**0**
0	0	1	**1**	0	2	0	**2**	0	0	0	**0**
0	1	0	**1**	1	1	0	**2**	0	0	0	**0**
0	1	1	**2**	1	0	0	**1**	2	2	0	**4**
0	0	0	**0**	0	1	0	**1**	0	0	0	**0**
0	0	0	**0**	0	0	0	**0**	0	0	0	**0**

*AIDS case reports are for 2013. The 2014 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.

~ The rates for neonatal group B Streptococcal infection are calculated based on the population under 12 months of age, instead of the entire BC population.

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

2014 BC Selected Reportable Disease CASE RATES (per 100,000 population) 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**
2014 Population Estimate	**4631302**	**77468**	**77997**	**354017**	**221230**	**730712**	**288170**	**641965**	**776689**	**1706824**
AIDS (2013)*	**1.1**	1.3	0.0	0.3	0.9	**0.5**	0.0	1.1	0.4	**0.6**
Amebiasis	**9.0**	0.0	3.8	2.8	2.3	**2.5**	5.9	5.6	11.1	**8.1**
Campylobacteriosis	**33.6**	32.3	23.1	27.7	31.6	**28.9**	43.7	28.8	28.1	**31.0**
Chlamydia^	**286.7**	188.5	201.3	284.4	320.9	**276.4**	187.4	233.7	195.4	**208.5**
Cryptococcus gattii	**0.4**	0.0	0.0	0.3	0.0	**0.1**	1.4	0.0	0.3	**0.4**
Cryptosporidiosis	**1.6**	2.6	2.6	0.8	2.7	**1.8**	1.7	1.4	1.5	**1.5**
Cyclosporiasis	**1.0**	1.3	6.4	0.8	0.0	**1.2**	1.7	0.5	0.9	**0.9**
E. coli, Shigatoxigenic	**2.7**	6.5	2.6	2.8	4.1	**3.6**	2.4	1.7	1.0	**1.5**
Giardiasis	**12.1**	7.7	7.7	10.7	8.6	**9.4**	13.5	7.3	11.3	**10.2**
Gonorrhea^	**38.6**	3.9	9.0	9.3	25.8	**13.7**	25.3	32.4	34.0	**31.9**
Hepatitis A	**0.5**	1.3	0.0	0.8	0.5	**0.7**	0.0	0.5	0.8	**0.5**
Hepatitis B Acute	**0.3**	0.0	0.0	0.0	0.9	**0.3**	0.3	0.0	0.4	**0.2**
Hepatitis B Chronicand Unknown	**24.3**	0.0	1.3	5.9	2.7	**3.8**	10.8	35.4	16.9	**22.8**
Hepatitis C	**42.9**	46.5	39.7	44.1	51.1	**46.0**	71.8	35.5	39.9	**43.6**
Haemophilus influenzae b, invasive	**0.1**	0.0	0.0	0.0	0.0	**0.0**	0.0	0.2	0.1	**0.1**
HIV^	**5.6**	0.0	1.3	2.0	4.1	**2.3**	2.1	4.4	3.1	**3.4**
Listeriosis	**0.4**	1.3	0.0	0.0	0.0	**0.1**	0.0	0.8	0.3	**0.4**
Lyme	**0.3**	0.0	0.0	0.0	0.5	**0.1**	0.0	0.8	0.3	**0.4**
Malaria	**0.6**	1.3	2.6	0.3	0.5	**0.7**	1.4	0.3	0.5	**0.6**
Measles	**7.4**	0.0	0.0	0.0	0.0	**0.0**	112.8	0.2	0.3	**19.2**
Meningococcal Disease, invasive	**0.3**	2.6	1.3	0.6	0.9	**1.0**	0.0	0.2	0.1	**0.1**
Mumps	**0.5**	0.0	0.0	0.3	0.0	**0.1**	0.0	0.5	0.4	**0.4**
Paratyphoid Fever	**0.6**	0.0	0.0	1.1	0.0	**0.5**	0.3	0.5	1.5	**0.9**
Pertussis	**10.8**	11.6	73.1	9.9	11.3	**17.2**	7.6	4.4	6.8	**6.0**
Pneumococcal Disease, invasive	**8.2**	2.6	11.5	6.5	10.8	**7.9**	10.1	7.6	7.1	**7.8**
Salmonellosis	**25.2**	21.9	21.8	17.8	19.4	**19.2**	36.8	27.3	29.2	**29.8**
Shigellosis	**3.2**	0.0	2.6	0.0	0.0	**0.3**	2.8	2.6	4.9	**3.7**
Streptococcus Group A invasive	**3.6**	3.9	10.3	5.1	4.5	**5.3**	1.7	2.8	2.6	**2.5**
Syphilis (infectious)^	**11.8**	0.0	2.6	0.3	1.8	**1.0**	2.4	8.6	4.4	**5.6**
Tuberculosis	**6.0**	0.0	1.3	2.3	3.2	**2.2**	4.2	7.2	9.1	**7.6**
Typhoid Fever	**0.7**	0.0	0.0	0.3	0.5	**0.3**	1.0	0.5	2.2	**1.3**
Vibrio Infections	**1.5**	0.0	0.0	0.8	0.5	**0.5**	0.3	1.2	0.8	**0.9**
Yersinlosis	**12.3**	6.5	3.8	5.1	6.3	**5.5**	2.8	7.9	6.6	**6.4**
Less Common Diseases										
Brucellosis	**0.04**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.13	**0.06**
Cholera Serogrp non O1O139	**0.04**	0.00	0.00	0.00	0.00	**0.00**	0.35	0.00	0.13	**0.12**
Cholera Serogrp O1O139	**0.04**	0.00	0.00	0.00	0.00	**0.00**	0.35	0.00	0.00	**0.06**
Creutzfeldt Jacob Disease	**0.11**	0.00	0.00	0.56	0.00	**0.27**	0.00	0.00	0.00	**0.00**
Hantavirus	**0.02**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**
Legionellosis	**0.19**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.77	**0.35**
Leptospirosis	**0.06**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**
Neonatal Group B Streptococcal Infection~	**18.4**	0.0	0.0	0.0	0.0	**0.0**	0.0	0.0	12.0	**5.4**
Tularemia	**0.02**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**
Yellowfever	**0.02**	0.00	0.00	0.00	0.00	**0.00**	0.00	0.16	0.00	**0.06**

Note: In 2014, there were no reported cases of Anthrax, Botulism, Diphtheria (toxigenic) Acute , Viral Hemorrhagic Fevers, Leprosy, Plague, Poliomyelitis, Rabies, Rubella, Severe Acute Respiratory Syndrome, Trichinosis or West Nile. Diphtheria carriers (toxigenic) were not reported, which is a change from previous annual reports.

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**
205262	**658485**	**282565**	**1146312**	**372463**	**266231**	**121031**	**759725**	**73719**	**141895**	**72115**	**287729**
0.5	3.2	0.4	**2.0**	1.6	0.0	0.0	0.8	1.4	2.8	1.4	**2.1**
5.4	28.4	7.4	**19.1**	7.5	3.0	3.3	**5.3**	0.0	0.0	0.0	**0.0**
28.3	45.9	63.7	**47.1**	33.0	29.7	25.6	**30.7**	17.6	16.2	12.5	**15.6**
281.6	480.8	274.3	**394.2**	259.1	264.8	239.6	**258.0**	478.8	405.2	403.5	**423.7**
0.0	0.2	0.0	**0.1**	1.1	1.5	0.8	**1.2**	0.0	0.0	0.0	**0.0**
1.0	2.4	1.4	**1.9**	1.6	1.1	0.8	**1.3**	0.0	0.7	1.4	**0.7**
1.0	1.8	2.1	**1.7**	0.5	0.4	0.0	**0.4**	0.0	0.7	0.0	**0.3**
2.9	2.4	2.1	**2.4**	5.1	5.3	7.4	**5.5**	0.0	0.7	0.0	**0.3**
6.3	22.3	19.1	**18.7**	14.0	6.4	9.1	**10.5**	13.6	7.0	2.8	**7.6**
18.5	124.4	23.0	**80.4**	21.2	8.3	12.4	**15.3**	46.1	43.0	12.5	**36.1**
0.5	0.6	0.7	**0.6**	0.0	0.4	0.0	**0.1**	0.0	0.0	4.2	**1.0**
1.0	0.5	0.4	**0.5**	0.0	0.4	0.0	**0.1**	1.4	0.0	1.4	**0.7**
96.5	60.7	17.7	**56.5**	8.1	2.3	5.0	**5.5**	1.4	8.5	5.5	**5.9**
17.1	50.0	19.1	**36.5**	35.4	47.7	54.5	**42.8**	52.9	70.5	29.1	**55.6**
0.5	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**
1.9	20.2	3.5	**12.8**	3.2	3.8	2.5	**3.3**	6.8	4.9	1.4	**4.5**
0.0	0.5	0.7	**0.4**	0.5	1.1	0.0	**0.7**	1.4	0.0	0.0	**0.3**
0.0	0.5	0.0	**0.3**	0.3	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.0**
1.5	0.8	0.0	**0.7**	0.3	0.0	0.8	**0.3**	0.0	0.7	0.0	**0.3**
0.5	2.0	0.0	**1.2**	0.0	0.4	0.0	**0.1**	0.0	0.0	0.0	**0.0**
0.5	0.3	0.0	**0.3**	0.3	0.0	0.0	**0.1**	0.0	0.0	0.0	**0.0**
1.5	1.7	0.4	**1.3**	0.0	0.4	0.0	**0.1**	0.0	0.0	0.0	**0.0**
1.0	0.0	0.0	**0.2**	0.3	0.4	0.8	**0.4**	0.0	0.7	0.0	**0.3**
1.9	2.1	9.6	**3.9**	9.1	4.5	19.0	**9.1**	164.1	8.5	34.7	**54.9**
3.4	8.8	9.6	**8.0**	7.8	10.9	11.6	**9.5**	17.6	7.0	4.2	**9.0**
18.5	25.4	29.0	**25.0**	22.3	19.5	33.0	**23.0**	10.9	19.0	30.5	**19.8**
1.9	8.7	4.2	**6.4**	2.1	1.1	0.0	**1.4**	0.0	0.7	0.0	**0.3**
1.9	5.2	2.5	**3.9**	3.2	4.1	5.0	**3.8**	0.0	7.8	0.0	**3.8**
5.4	57.4	6.0	**35.4**	5.6	3.8	0.8	**4.2**	5.4	0.7	0.0	**1.7**
11.7	12.6	2.8	**10.0**	1.9	1.5	0.8	**1.6**	4.1	1.4	2.8	**2.4**
0.0	0.3	0.0	**0.2**	0.5	0.0	0.0	**0.3**	0.0	1.4	0.0	**0.7**
1.0	2.0	4.6	**2.4**	1.9	4.1	2.5	**2.8**	2.7	0.0	0.0	**0.7**
20.0	23.5	33.6	**25.4**	17.7	14.6	8.3	**15.1**	6.8	4.9	2.8	**4.9**
0.00	0.15	0.00	**0.09**	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**
0.00	0.15	0.00	**0.09**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**
0.00	0.15	0.00	**0.09**	0.00	0.75	0.00	**0.26**	0.00	0.00	0.00	**0.00**
0.00	0.00	0.35	**0.09**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**
0.00	0.00	0.35	**0.09**	0.00	0.75	0.00	**0.26**	0.00	0.00	0.00	**0.00**
0.00	0.15	0.00	**0.09**	0.27	0.38	0.00	**0.26**	0.00	0.00	0.00	**0.00**
0.0	18.5	42.6	**21.0**	31.9	0.0	0.0	**15.8**	233.1	135.8	0.0	**117.4**
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	0.00	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 2013. The 2014 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.

~ The rates for neonatal group B Streptococcal infection are calculated based on the population under 12 months of age, instead of the entire BC population.

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), and beginning September 2014, through Panorama. 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 and amebiasis for which probable cases are included.

2. Numbers in this report were generated in June 2015 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 Panorama reports, including by case classification (i.e., confirmed and clinical status).

4. All data for influenza, invasive meningococcal disease, invasive group A streptococcal disease, *Cryptococcus gattii* infection, MRSA and VRE, as well as 2011 through 2014 data for measles, mumps, and rubella, are collected through enhanced surveillance systems. Data for invasive pneumococcal disease are collected through both Panorama (all age groups) and through enhanced surveillance (pediatric cases ≤16 years of age). Invasive meningococcal disease and invasive group A streptococcal disease are reported using episode date. Measles, mumps, and rubella are reported using reported date for 2005 through 2010 and episode date for 2011 through 2014. *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 2014 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. 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/AntibioticRe-

sistance

8. Amebiasis, cryptosporidiosis and listeriosis were removed from national surveillance in January 2000. Listeriosis was made reportable nationally again in 2007. Lyme disease became nationally notifiable in 2009; methicillin resistant *Staphylococcus aureus*, vancomycin resistant enterococci, *Vibrio* Infections and yersiniosis have not been nationally notifiable diseases in the period 2005 through 2014.

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

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

11. National rates are provided by the Public Health Agency of Canada -Division of Surveillance and Risk Assessment. The 2013 national rates are preliminary. In 2011, New Brunswick and Prince Edward Island did not report cyclosporiasis hence the population of those 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. 2014 national rates are unavailable currently until data updates are finalized.

12. 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) .

13. While we endeavour to include data on the majority of reportable diseases in this publication, data on some are not included. For information on the incidence of these diseases in 2014 in British Columbia, please contact epidserv@bccdc.ca.

Contributors

Communicable Disease Prevention and Control Service
Dr. Eleni Galanis, Interim Medical Director and Editor
Dr. Jane Buxton, Physician Epidemiologist
Dr. David Patrick, Physician Epidemiologist
Dr. Danuta Skowronski, Physician Epidemiologist
Catharine Chambers, Epidemiologist
Diana George, Epidemiologist
Marsha Taylor, Epidemiologist
Sunny Mak, Senior Medical Geographer
Lisan Kwindt, Research and Surveillance Assistant
Helen Li, Surveillance Analyst
Sophie Li, Surveillance Analyst
Wrency Tang, Surveillance Analyst
Alice Wong, Surveillance Analyst
Dr. Andrew Deonarine, PGY-4 Public Health and Preventative Medicine, UBC
Ja Yong Lee, 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. Jason Wong, Physician Epidemiologist
Dr. Victoria Cook, TB Medical Lead
David Roth, Epidemiologist
Elsie Wong , Federal Field Surveillance Officer
Fay Hutton, Surveillance Analyst
Sung Jae Lee, Surveillance Analyst
Aileen Chiu, Registry Clerk