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INTRODUCTION

This section summarizes reporting of communicable diseases in British Columbia during 1998. The numbers used to create this report were derived from the provincial Communicable Diseases Surveillance System (CDSS). CDSS is an electronic surveillance system where communicable diseases data are collected from all health regions in the province, stored and analyzed centrally to provide the provincial scope of disease impact on British Columbians.

The number of 1998 cases summarized in this document encompasses deletions and revisions submitted to CDSS on or before February 28, 1999. As such, subsequent changes to 1998 reports are not reflected in this document.

It is important, when looking at these annual numbers, to be aware that there are many factors which can contribute to variations in reporting of communicable diseases on CDSS. These factors can generally be divided into **real** and **artifactual**. Factors which may cause **real changes** in the number of cases occurring over a given year include: changes in human demography (host), changes in a given organism (agent), ecological changes (environment), travel patterns, advances in technology, and lapses in or improvements in the public health infrastructure. **Artifactual factors** are those that do not affect the actual number of cases of a disease occurring, but affect the number of cases reported to public health. Artifactual factors may include changes in physician practices, changes in laboratory diagnostic techniques, changes in reporting requirements, and changes in societal knowledge, attitudes and behaviours.

In addition to routine surveillance activities, Epidemiology Services conducts enhanced or special surveillance on selected diseases of particular interest to health care providers and/or to the public. Enhanced or special surveillance is conducted on invasive group A streptococcal disease, influenza, measles, invasive meningococcal disease and hantavirus pulmonary syndrome.

Epidemiology Services strives to provide surveillance summaries that are maximally useful to public health professionals around the province. This Annual Summary is only one component of the surveillance process. Epidemiology Services also produces periodic surveillance summaries on diseases of interest. New analytical techniques and methods of data presentation are used and these summaries are posted on the BCCDCS Intranet web site for all health professionals to access.

If you have any suggestions, comment or feedback on this report, please forward them to Helen Ng, Epidemiology Services at helen.ng@bccdc.hnet.bc.ca. Thank you.

1998 Epidemiology Services Staff

Dr. Alison Bell, Director (January - February 1998)

Dr. Arlene King, Acting Director (February - December 1998)

Dr. Murray Fyfe, Acting Associate Director

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Dr. Mark Bigham, Physician Epidemiologist

Dr. Samuel Young, Field Epidemiologist (January - May 1998)

Dr. Jane Buxton, Federal Field Epidemiologist (June - December 1998)

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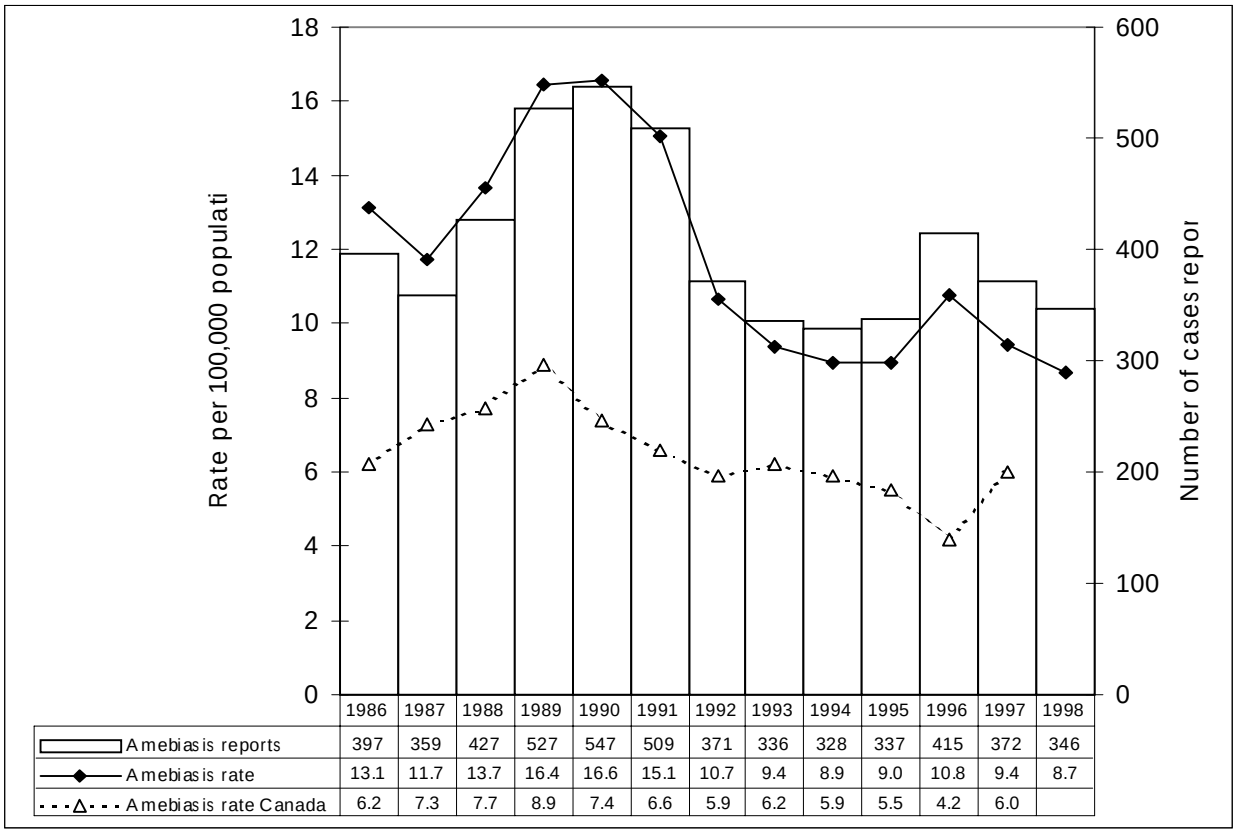
Kiran Bhachu, UVic Coop Student (May - December 1998)

AMEBIASIS

Figure 1.1 Amebiasis Reports and Rates, 1986 - 1998



	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Amebiasis reports	397	359	427	527	547	509	371	336	328	337	415	372	346
Amebiasis rate	13.1	11.7	13.7	16.4	16.6	15.1	10.7	9.4	8.9	9.0	10.8	9.4	8.7
Amebiasis rate Canada	6.2	7.3	7.7	8.9	7.4	6.6	5.9	6.2	5.9	5.5	4.2	6.0	

Reporting of amebiasis has changed little during the past 7 years in BC. In 1998, there were 346 cases reported for an annual provincial rate of 8.7 cases per 100,000. No seasonal pattern was present. With the exception of a single case in Thompson, all reported cases were in the south western area of the province. Reporting was highest in Vancouver (29.8 cases per 100,000) and Upper Island (28.8 cases per 100,000). Males accounted for 70% of cases. Reporting rates were highest among young adults aged 25 to 39.

Figure 1.2 Amebiasis Reports by Week, 1998

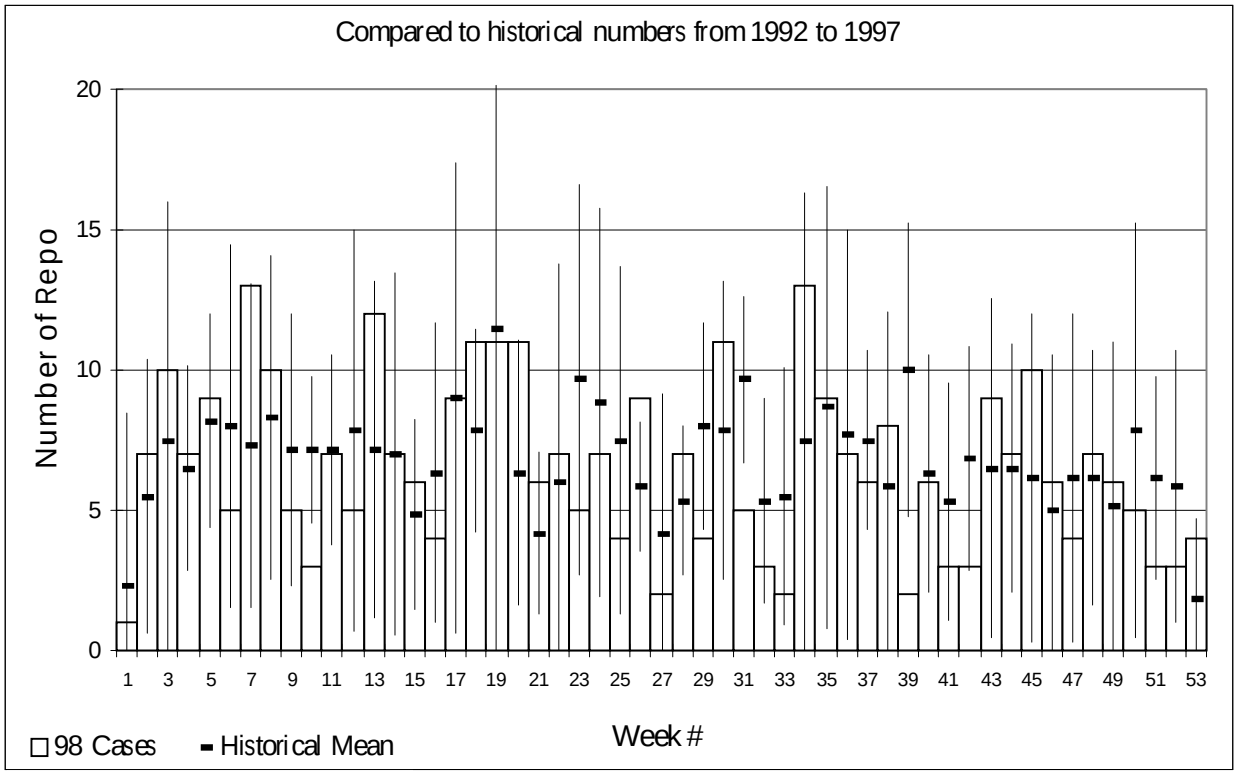
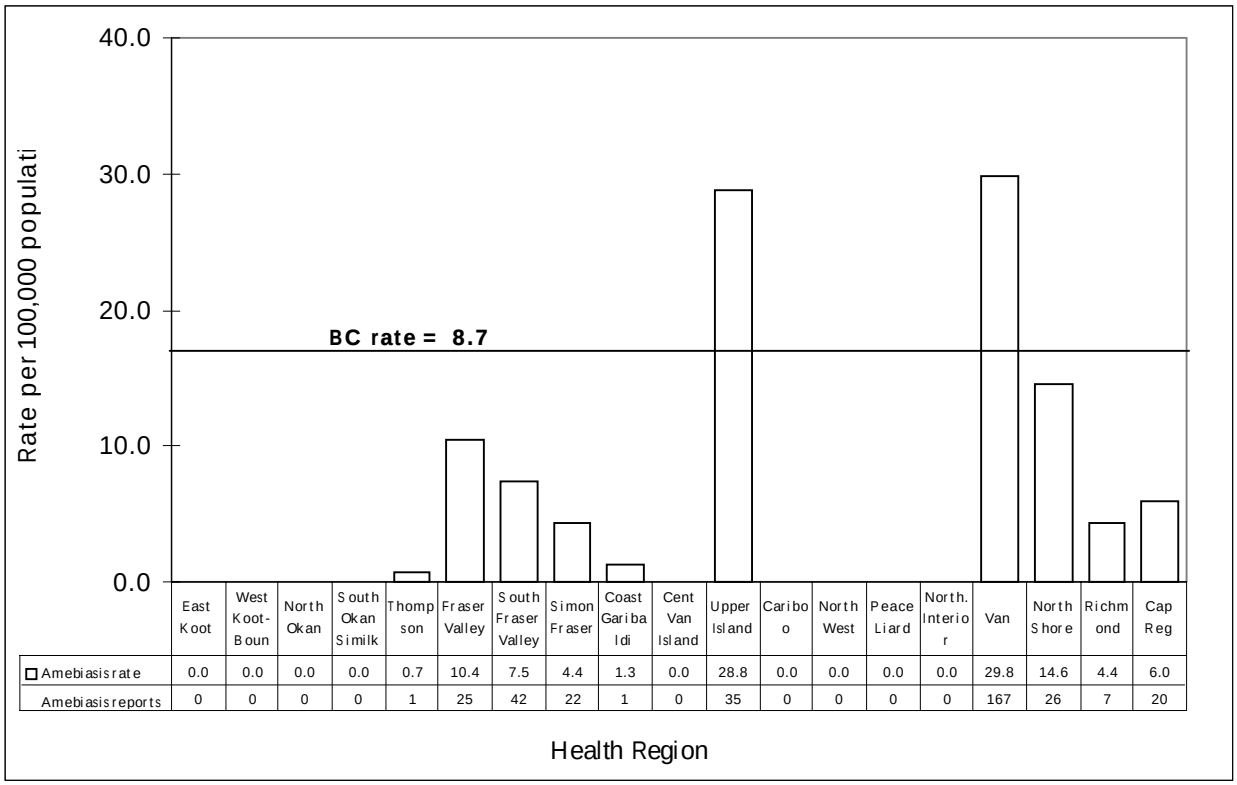
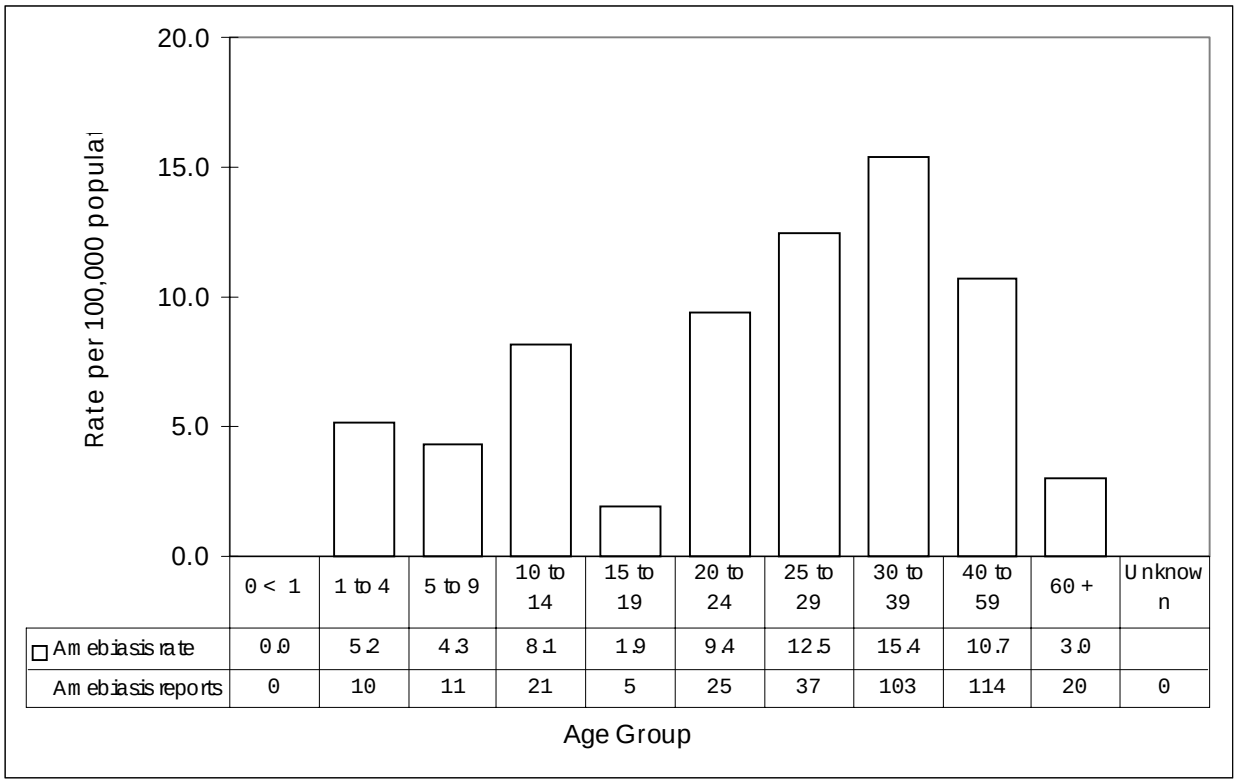


Figure 1.3 Amebiasis Rates by Health Region



	East Koot	West Koot-Boun	North Okan	South Okan Similk	Thompson	Fraser Valley	South Fraser Valley	Simon Fraser	Coast Garibaldi	Cent Van Island	Upper Island	Caribo	North West	Peace Liard	North. Interior	Van	North Shore	Richmond	Cap Reg
Amebiasis rate	0.0	0.0	0.0	0.0	0.7	10.4	7.5	4.4	1.3	0.0	28.8	0.0	0.0	0.0	0.0	29.8	14.6	4.4	6.0
Amebiasis reports	0	0	0	0	1	25	42	22	1	0	35	0	0	0	0	167	26	7	20

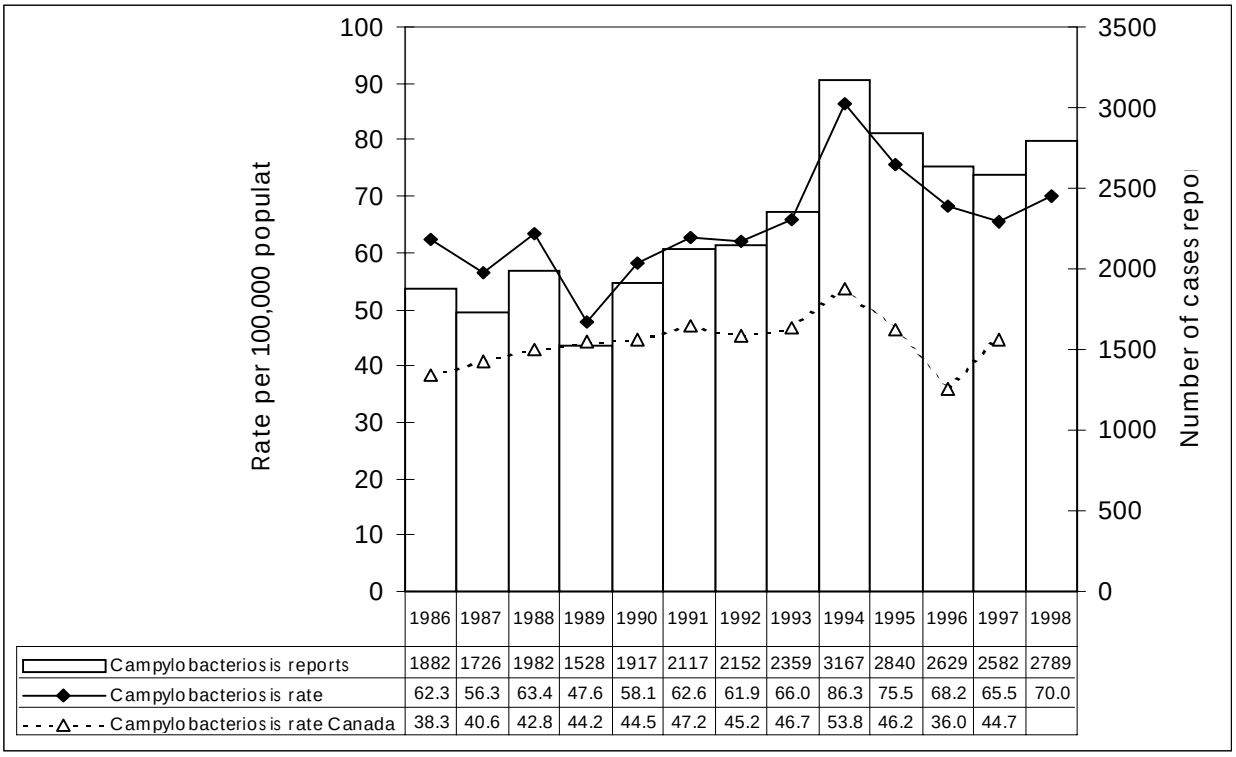
Figure 1.4 Amebiasis Rates by Age Group, 1998



	0 < 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 39	40 to 59	60 +	Unknown
Amebiasis rate	0.0	5.2	4.3	8.1	1.9	9.4	12.5	15.4	10.7	3.0	
Amebiasis reports	0	10	11	21	5	25	37	103	114	20	0

CAMPLYOBACTERIOSIS

Figure 2.1 Camplyobacteriosis Reports and Rates, 1986 - 1998



	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Campylobacteriosis reports	1882	1726	1982	1528	1917	2117	2152	2359	3167	2840	2629	2582	2789
Campylobacteriosis rate	62.3	56.3	63.4	47.6	58.1	62.6	61.9	66.0	86.3	75.5	68.2	65.5	70.0
Campylobacteriosis rate Canada	38.3	40.6	42.8	44.2	44.5	47.2	45.2	46.7	53.8	46.2	36.0	44.7	

Campylobacteriosis remains the most commonly reported enteric communicable disease in BC. In 1998 reporting increased to 2789 cases (70 cases per 100,000 population). This was largely due to an increase above expected during June and July (weeks 26 through 29). An investigation did not identify a common source which accounted for this increase.

There was considerable variation in reporting between regions, with the highest rates in the Lower Mainland and on Vancouver Island. The age distribution showed a bimodal pattern with the highest reporting rates among children aged 1 to 4 years and young adults aged 25 to 29 years.

Figure 2.2 Campylobacteriosis Reports by Week, 1998

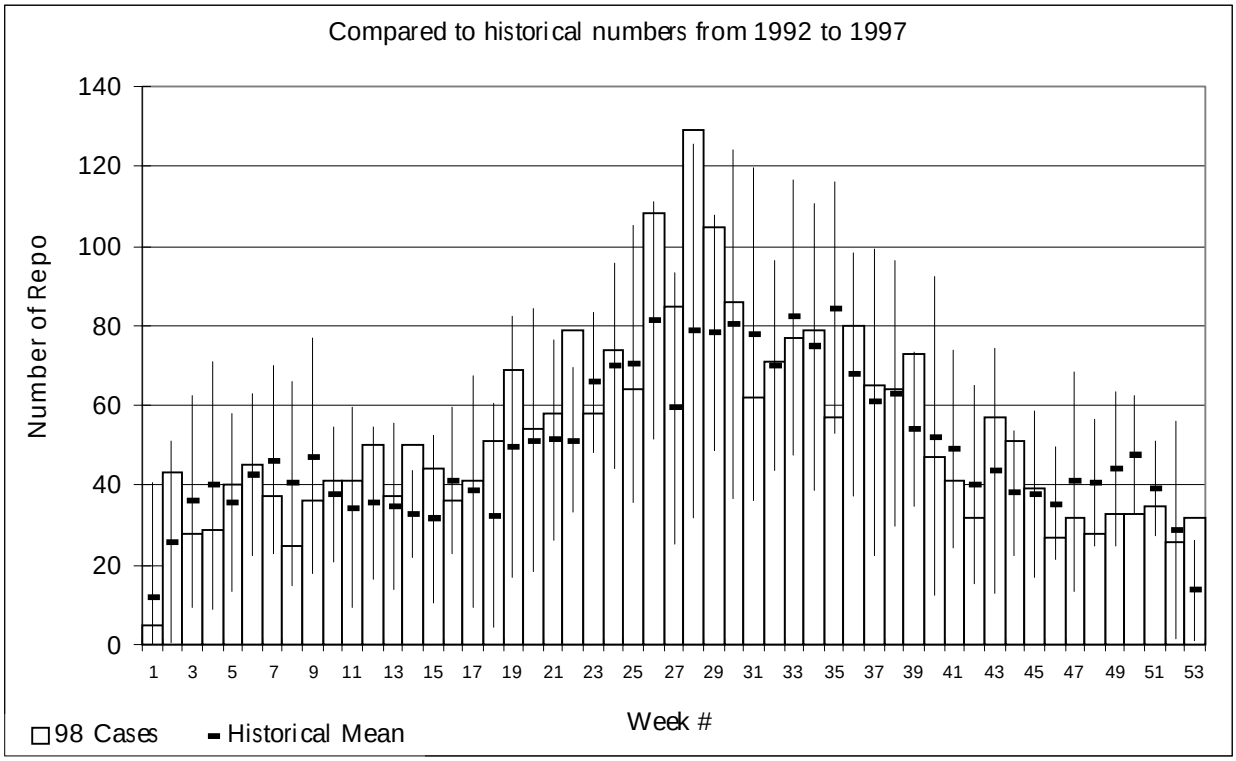
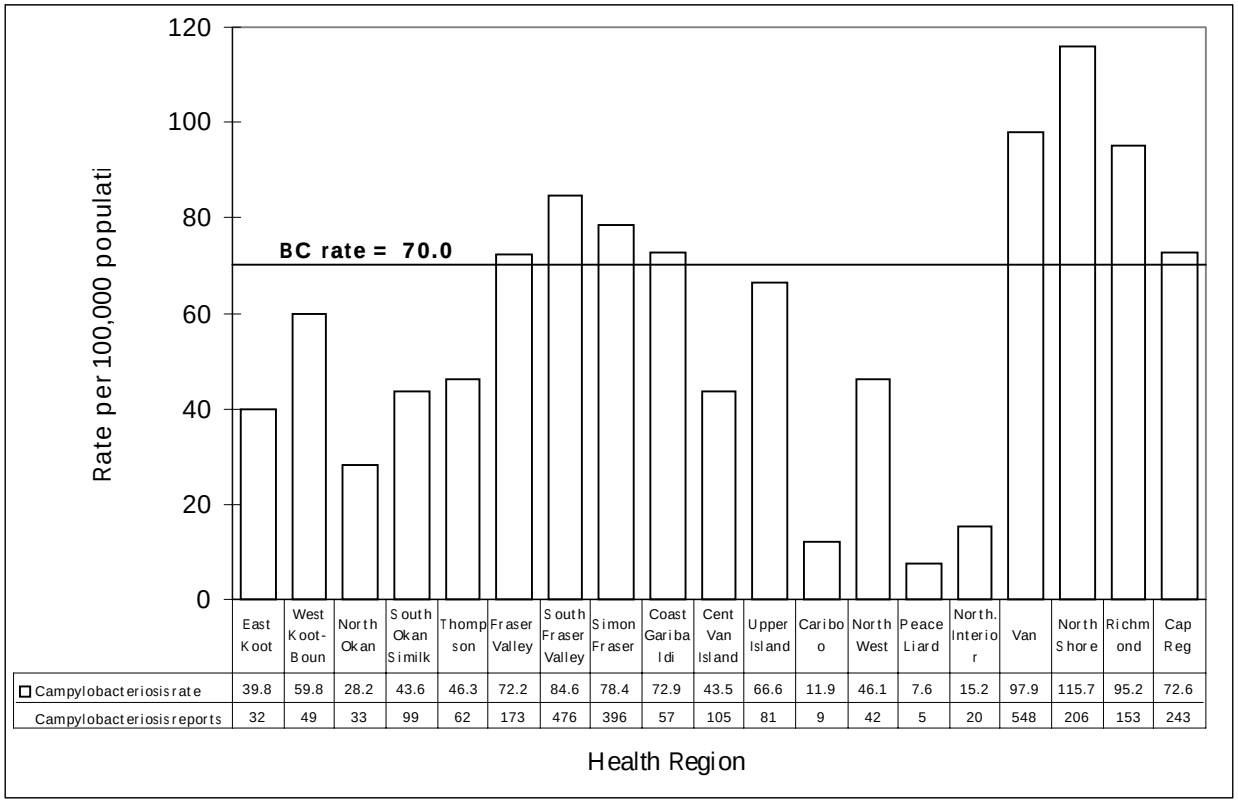
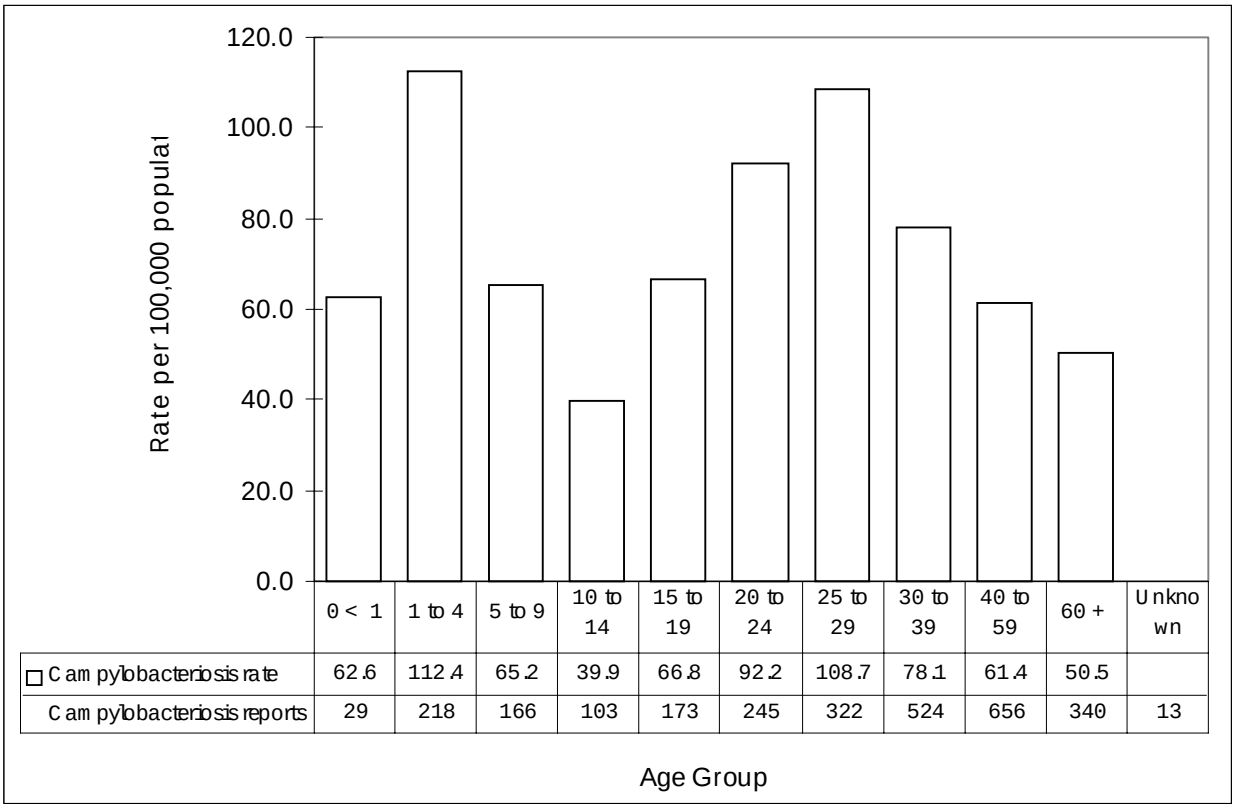


Figure 2.3 Campylobacteriosis Rates by Health Region, 1998



	East Koot	West Koot-Boun	North Okan	South Okan Similk	Thompson	Fraser Valley	South Fraser Valley	Simon Fraser	Coast Garibaldi	Cent Van Island	Upper Island	Cariboo	North West	Peace Liard	North. Interior	Van	North Shore	Richmond	Cap Reg
Campylobacteriosis rate	39.8	59.8	28.2	43.6	46.3	72.2	84.6	78.4	72.9	43.5	66.6	11.9	46.1	7.6	15.2	97.9	115.7	95.2	72.6
Campylobacteriosis reports	32	49	33	99	62	173	476	396	57	105	81	9	42	5	20	548	206	153	243

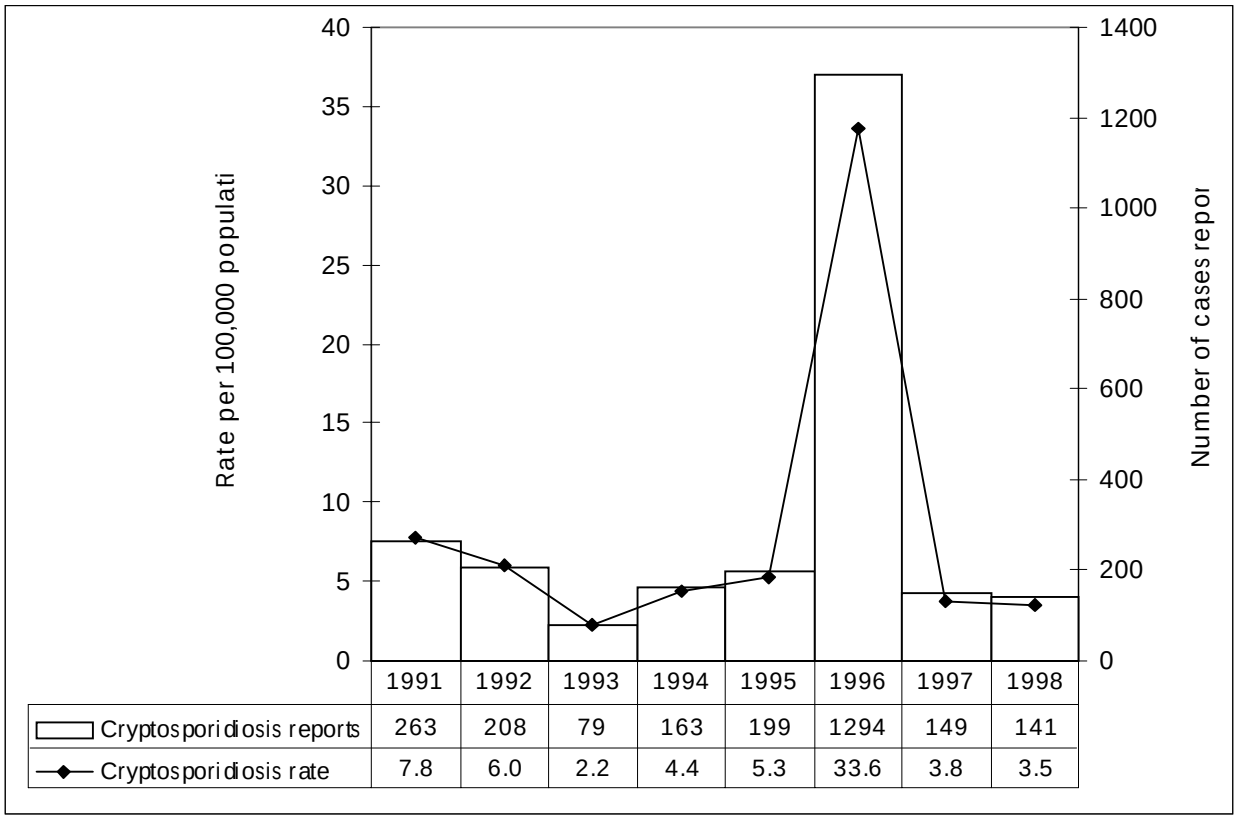
Figure 2.4 Campylobacteriosis Rates by Age Group, 1998



	0 < 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 39	40 to 59	60 +	Unknown
Campylobacteriosis rate	62.6	112.4	65.2	39.9	66.8	92.2	108.7	78.1	61.4	50.5	
Campylobacteriosis reports	29	218	166	103	173	245	322	524	656	340	13

CRYPTOSPORIDIOSIS

Figure 3.1 Cryptosporidiosis Reports and Rates, 1991 - 1998



	1991	1992	1993	1994	1995	1996	1997	1998
Cryptosporidiosis reports	263	208	79	163	199	1294	149	141
Cryptosporidiosis rate	7.8	6.0	2.2	4.4	5.3	33.6	3.8	3.5

There were 141 cases of cryptosporidiosis reported during 1998 for a provincial rate of 3.5 cases per 100,000. The highest reporting rate was among children aged 1 to 4 years.

An outbreak occurred in Chilliwack during April with 10 confirmed cases identified.

Most of the cases were distributed in an area of Chilliwack which was supplied primarily by a surface water source. This outbreak accounted for the high reporting rate in Fraser Valley during 1998 and the higher than expected reporting during weeks 16 through 18.

Figure 3.2 Cryptosporidiosis Reports by Week, 1998

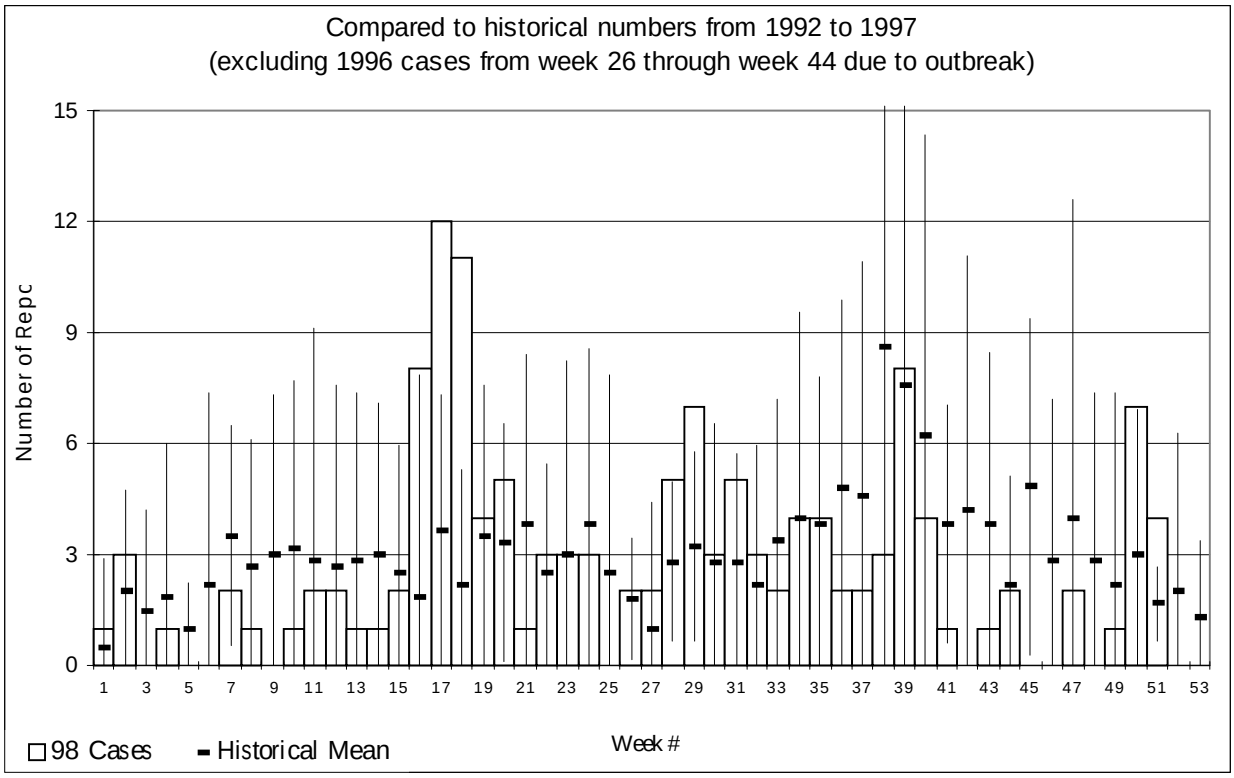
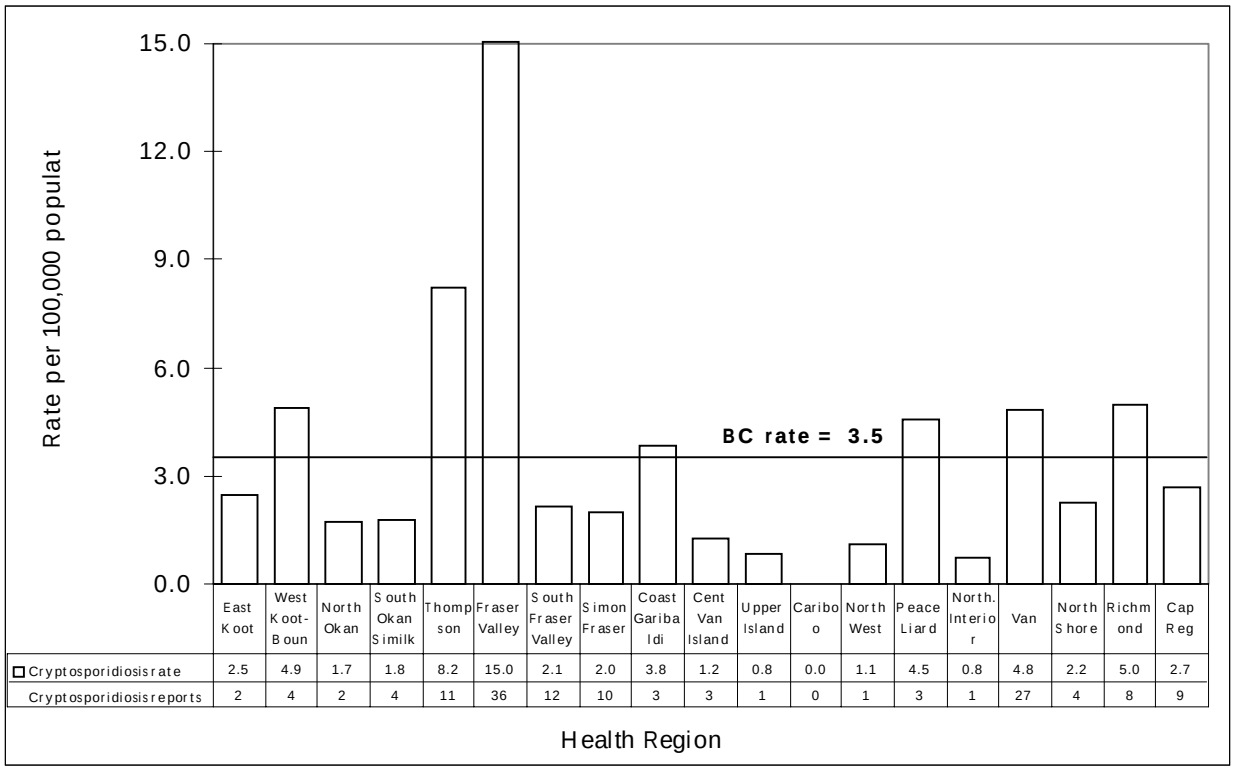
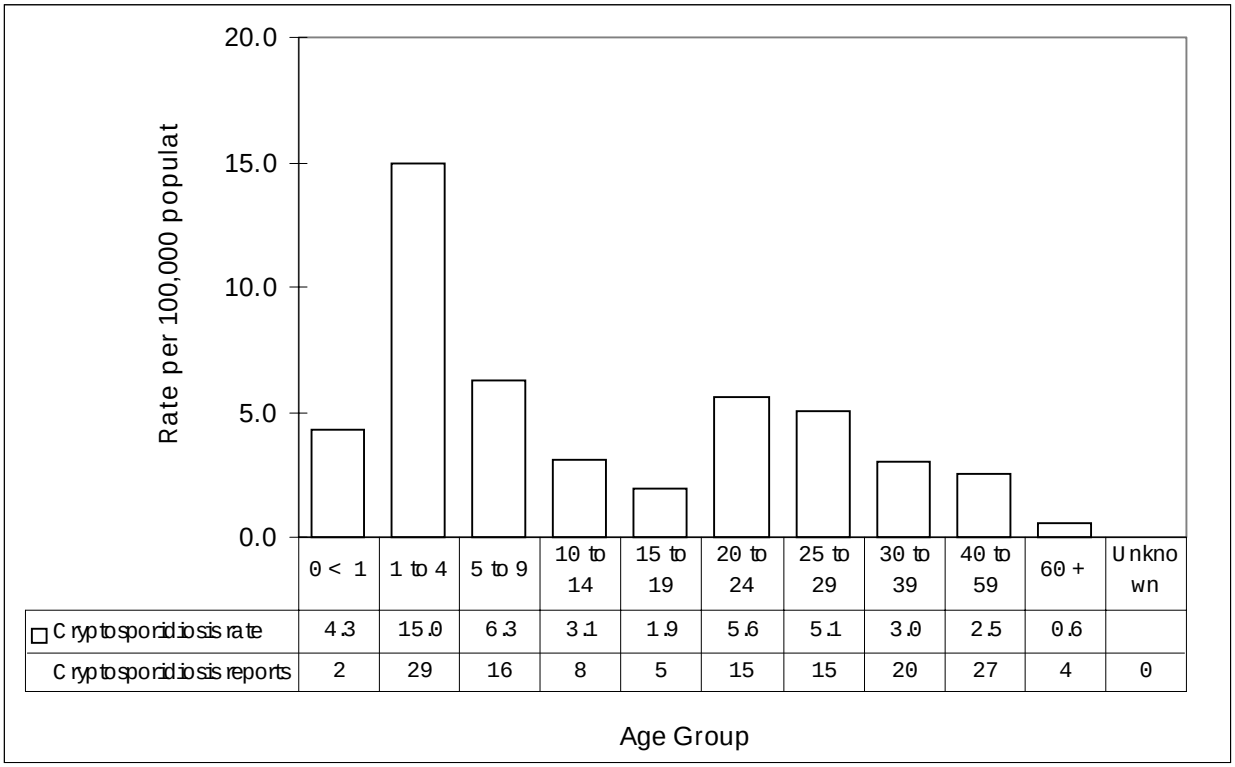


Figure 3.3 Cryptosporidiosis Rates by Health Region, 1998



	East Koot	West Koot-Boun	North Okan	South Okan Similk	Thompson	Fraser Valley	South Fraser Valley	Simon Fraser	Coast Garibaldi	Cent Van Island	Upper Island	Caribo	North West	Peace Liard	North. Interior	Van	North Shore	Richmond	Cap Reg
Cryptosporidiosis rate	2.5	4.9	1.7	1.8	8.2	15.0	2.1	2.0	3.8	1.2	0.8	0.0	1.1	4.5	0.8	4.8	2.2	5.0	2.7
Cryptosporidiosis reports	2	4	2	4	11	36	12	10	3	3	1	0	1	3	1	27	4	8	9

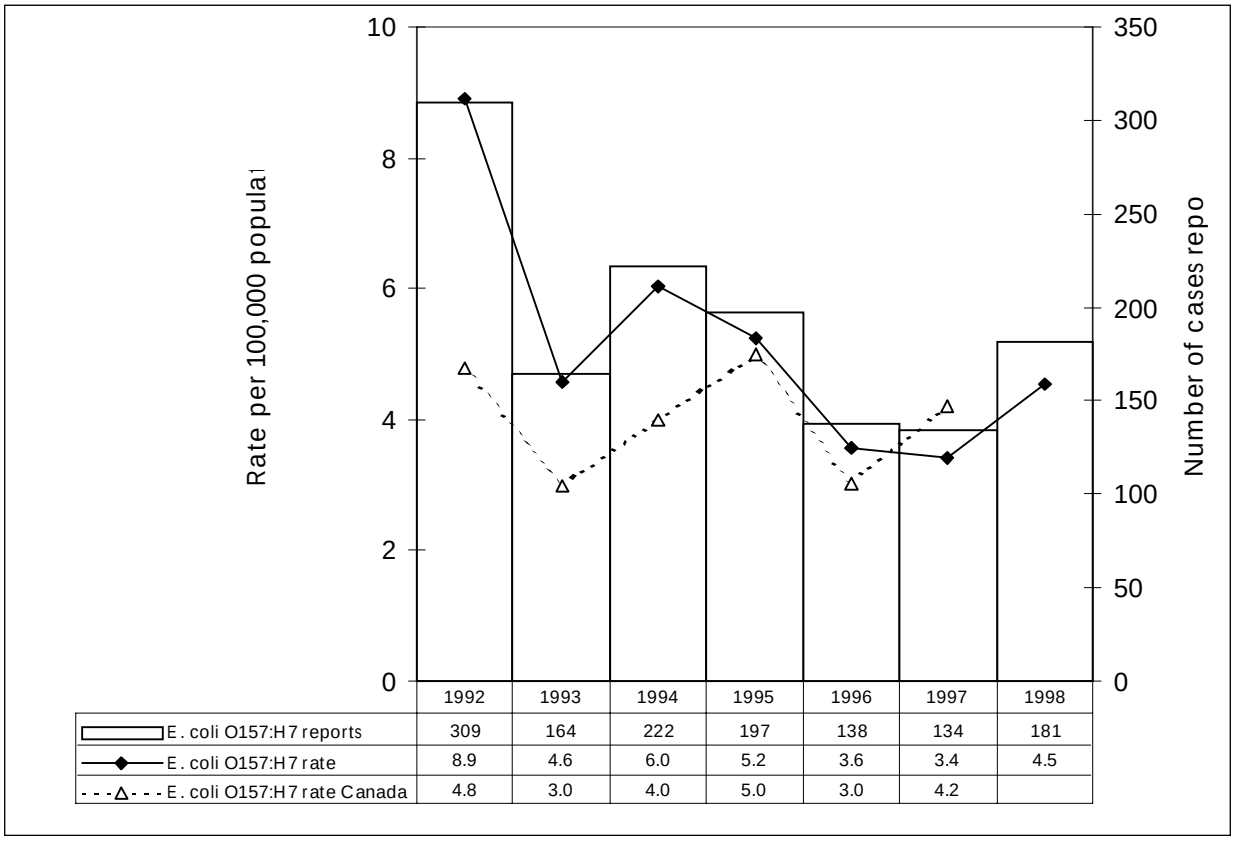
Figure 3.4 Cryptosporidiosis Rates by Age Group, 1998



	0 < 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 39	40 to 59	60 +	Unknown
Cryptosporidiosis rate	4.3	15.0	6.3	3.1	1.9	5.6	5.1	3.0	2.5	0.6	
Cryptosporidiosis reports	2	29	16	8	5	15	15	20	27	4	0

E. COLI O157: H7

Figure 4.1 *E. coli* O157:H7 Reports and Rates, 1992-1998



	1992	1993	1994	1995	1996	1997	1998
E. coli O157:H7 reports	309	164	222	197	138	134	181
E. coli O157:H7 rate	8.9	4.6	6.0	5.2	3.6	3.4	4.5
E. coli O157:H7 rate Canada	4.8	3.0	4.0	5.0	3.0	4.2	

Although there has been a general downward trend since 1992, reporting of *E coli* O157:H7 infections increased slightly in 1998 to 181 cases for a rate of 4.5 cases per 100,000 population. Reporting was above the provincial average rate in Thompson, South Okanagan, East and West Kootenay, Fraser Valley, South Fraser, Simon Fraser, Coast Garibaldi, and North West. Peak reporting was seen in the 1 to 4 year age group.

Routine molecular subtyping of isolates identified 2 clusters of cases in August and September. The first cluster of 5 cases was investigated but a common exposure was not identified. The second cluster of 9 cases was also investigated. Seven of the 9 cases had attended a large fair in Vancouver but a common exposure at the fair was not identified. These clusters accounted for above expected reporting during weeks 36 through 37.

Figure 4.2 *E. coli* O157:H7 Reports by Week, 1998

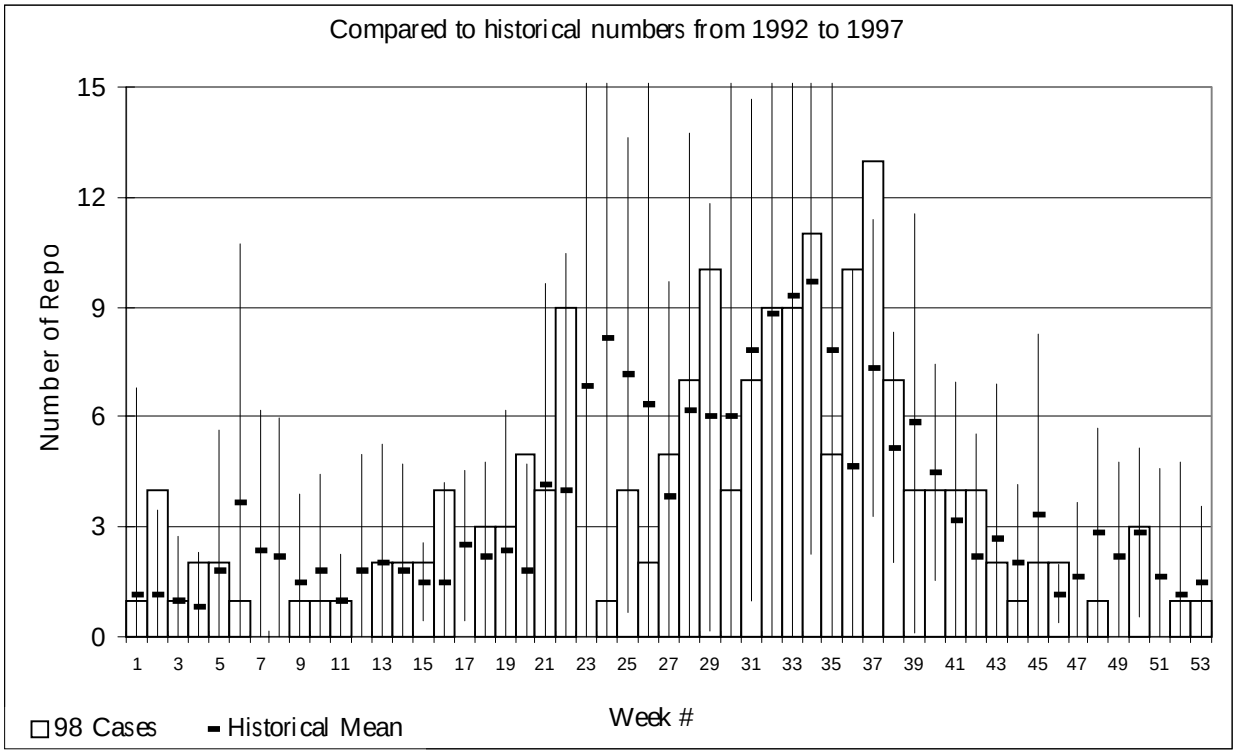
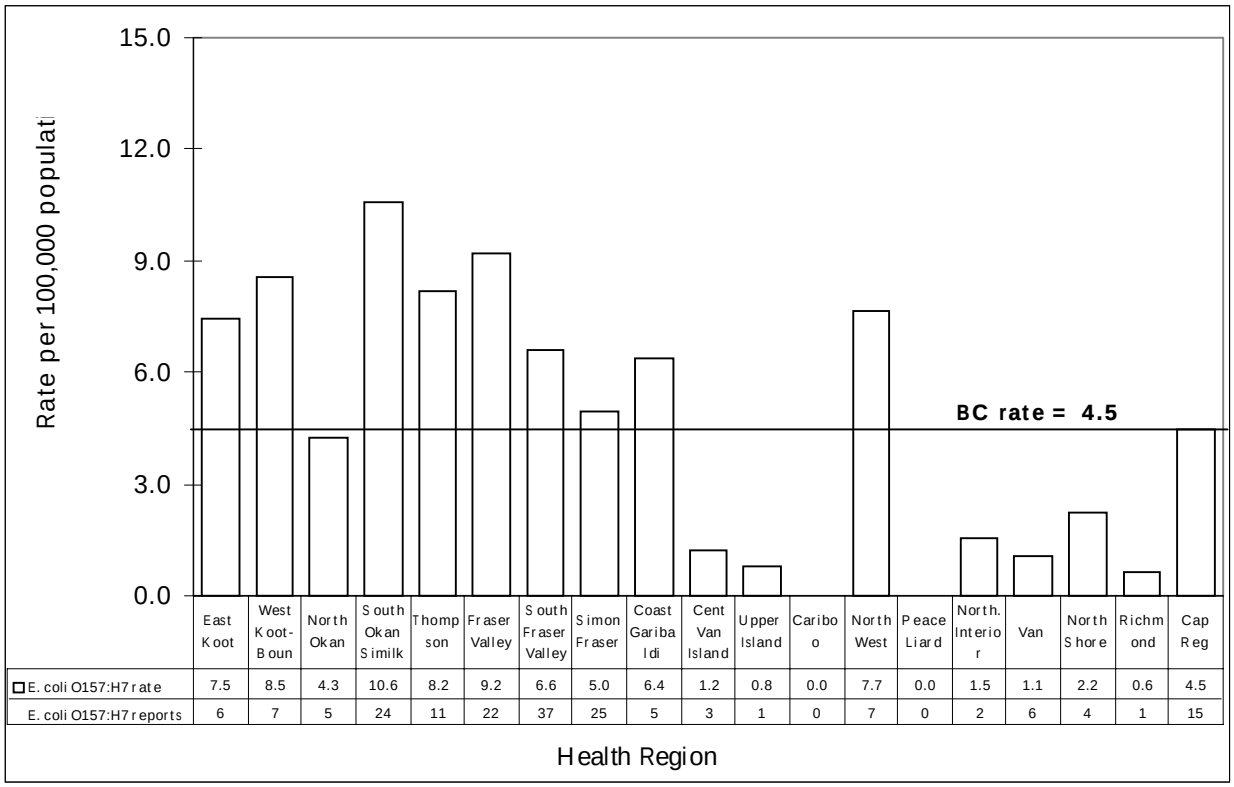
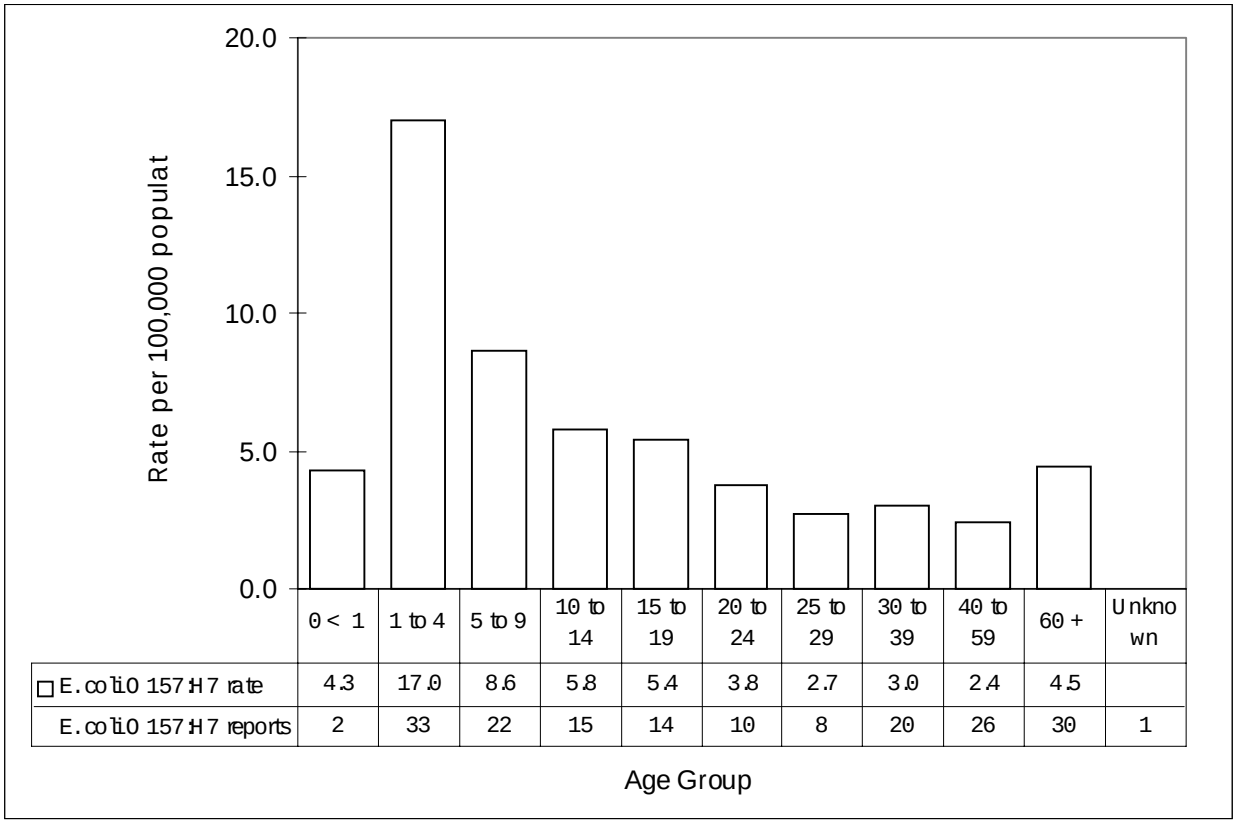


Figure 4.3 *E. coli* O157:H7 Rates by Health Region, 1998



	East Koot	West Koot-Boun	North Okan	South Okan Similk	Thompson	Fraser Valley	South Fraser Valley	Simon Fraser	Coast Garibaldi	Cent Van Island	Upper Island	Caribo	North West	Peace Liard	North. Interior	Van	North Shore	Richmond	Cap Reg
E. coli O157:H7 rate	7.5	8.5	4.3	10.6	8.2	9.2	6.6	5.0	6.4	1.2	0.8	0.0	7.7	0.0	1.5	1.1	2.2	0.6	4.5
E. coli O157:H7 reports	6	7	5	24	11	22	37	25	5	3	1	0	7	0	2	6	4	1	15

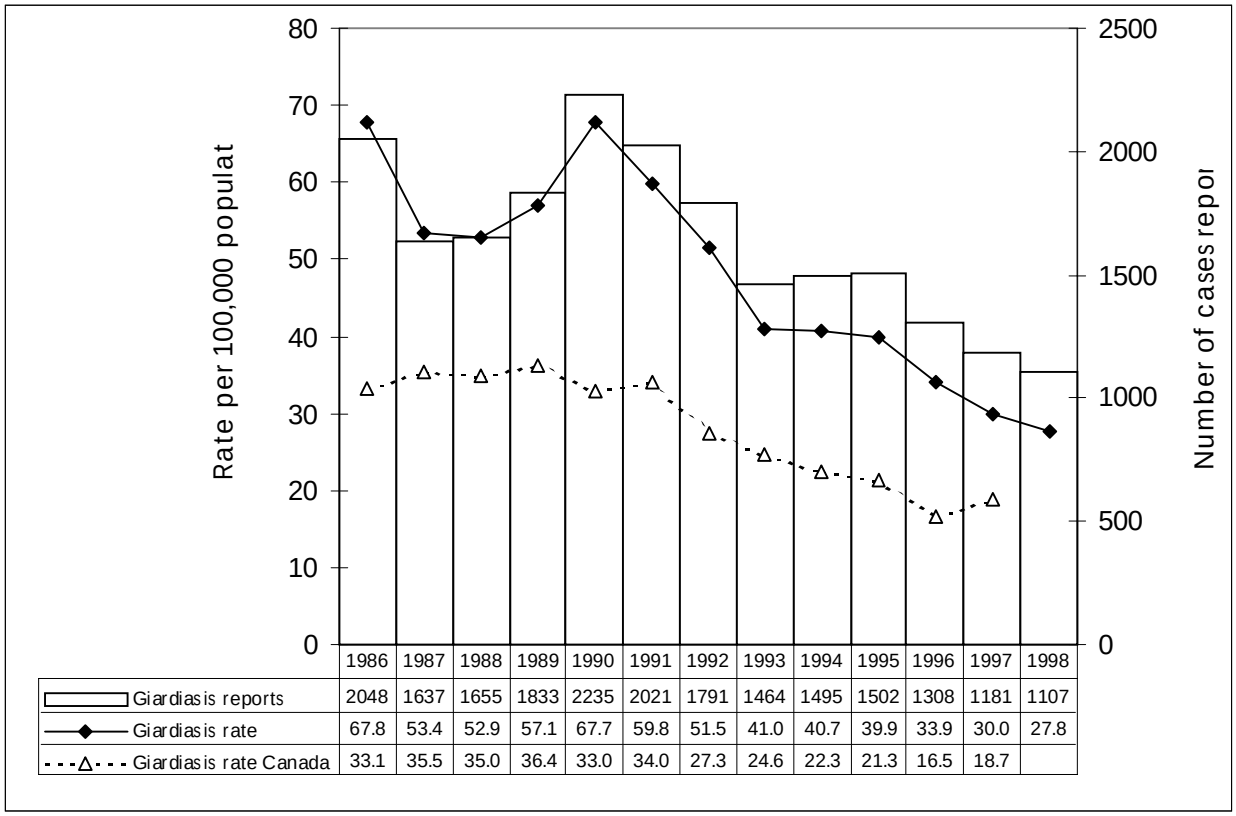
Figure 4.4 *E. coli* O157:H7 Rates by Age Group, 1998



	0 < 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 39	40 to 59	60 +	Unknown
E. coli O 157:H 7 rate	4.3	17.0	8.6	5.8	5.4	3.8	2.7	3.0	2.4	4.5	
E. coli O 157:H 7 reports	2	33	22	15	14	10	8	20	26	30	1

GIARDIASIS

Figure 5.1 Giardiasis Reports and Rates, 1986 - 1998



	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Giardiasis reports	2048	1637	1655	1833	2235	2021	1791	1464	1495	1502	1308	1181	1107
Giardiasis rate	67.8	53.4	52.9	57.1	67.7	59.8	51.5	41.0	40.7	39.9	33.9	30.0	27.8
Giardiasis rate Canada	33.1	35.5	35.0	36.4	33.0	34.0	27.3	24.6	22.3	21.3	16.5	18.7	

Giardiasis remains the most commonly reported parasitic gastrointestinal infection in BC. However, the reporting rate has continued to decline since 1990. In 1998 there were 1107 cases reported for a rate of 27.8 cases per 100,000. There is a bimodal age distribution with the highest rate in children 1 to 4 years (81.5 cases per 100,000) and a second peak in adults 30 to 39 years of age. The highest rates were seen in Coast Garibaldi (57.5 cases per 100,000 population) Vancouver, Fraser Valley, and North Shore.

Figure 5.2 Giardiasis Reports by Week, 1998

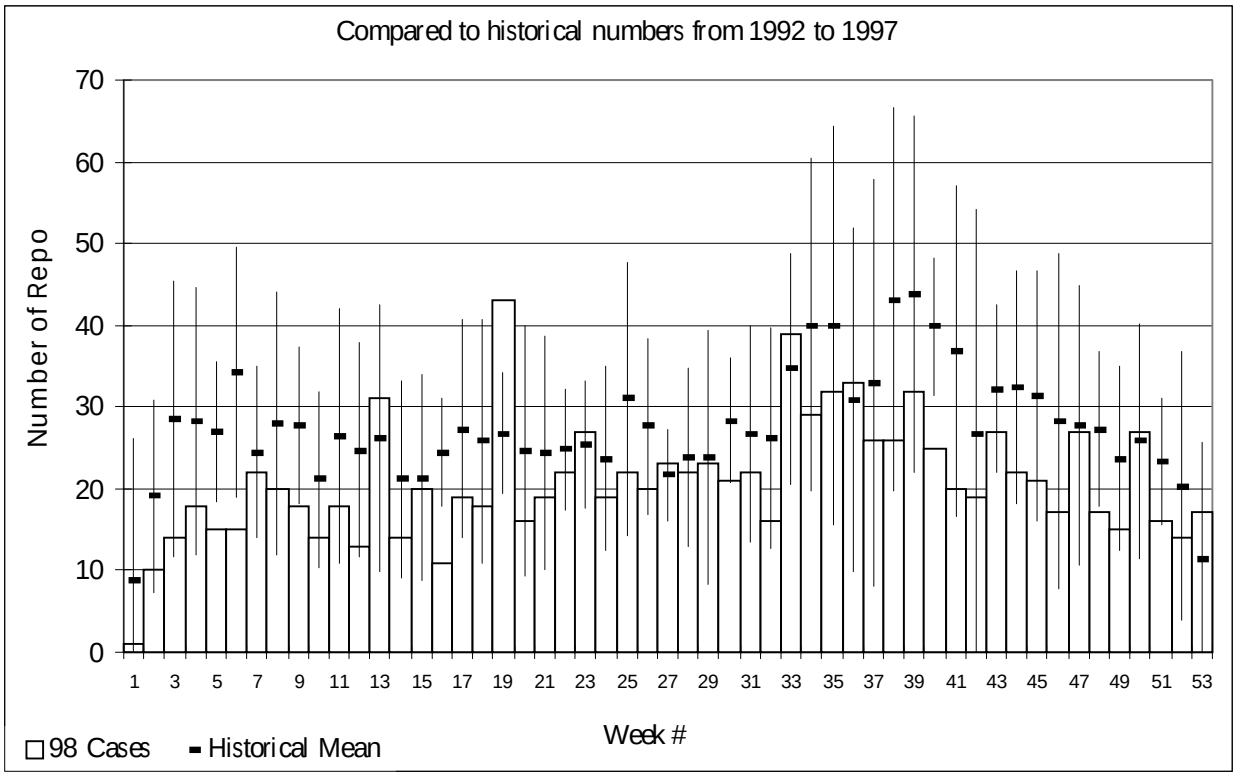
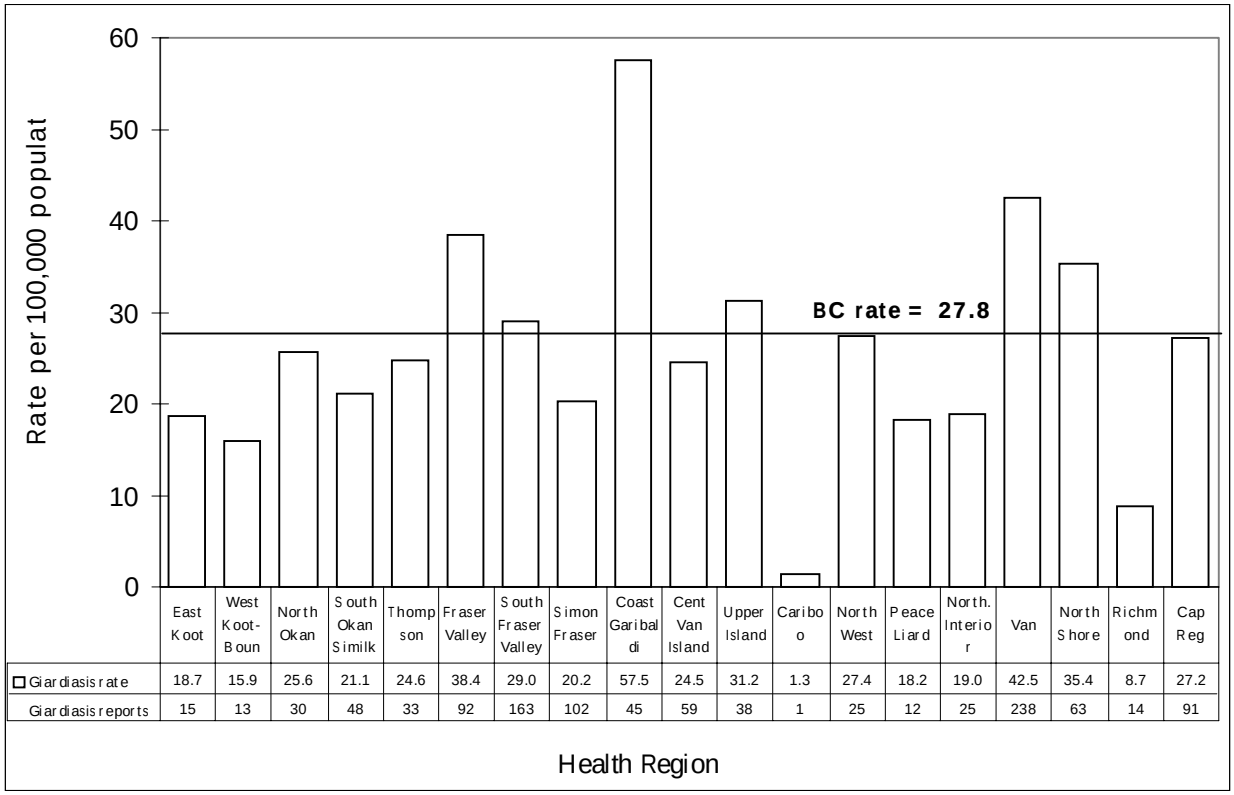
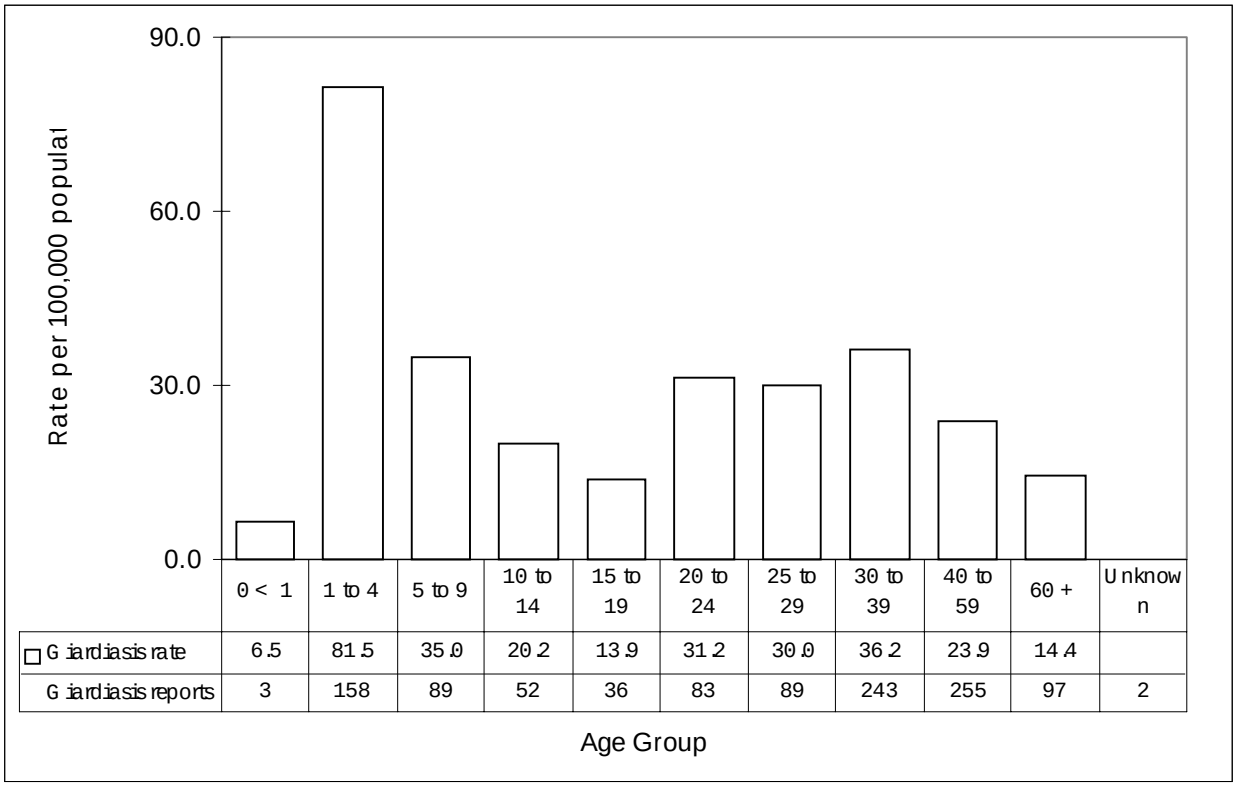


Figure 5.3 Giardiasis Rates by Health Region, 1998



	East Koot	West Koot-Boun	North Okan	South Okan Similk	Thompson	Fraser Valley	South Fraser Valley	Simon Fraser	Coast Garibaldi	Cent Van Island	Upper Island	Cariboo	North West	Peace Liard	North. Interior	Van	North Shore	Richmond	Cap Reg
Giardiasis rate	18.7	15.9	25.6	21.1	24.6	38.4	29.0	20.2	57.5	24.5	31.2	1.3	27.4	18.2	19.0	42.5	35.4	8.7	27.2
Giardiasis reports	15	13	30	48	33	92	163	102	45	59	38	1	25	12	25	238	63	14	91

Figure 5.4 Giardiasis Rates by Age Group, 1998



	0 < 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 39	40 to 59	60 +	Unknown
Giardiasis rate	6.5	81.5	35.0	20.2	13.9	31.2	30.0	36.2	23.9	14.4	
Giardiasis reports	3	158	89	52	36	83	89	243	255	97	2

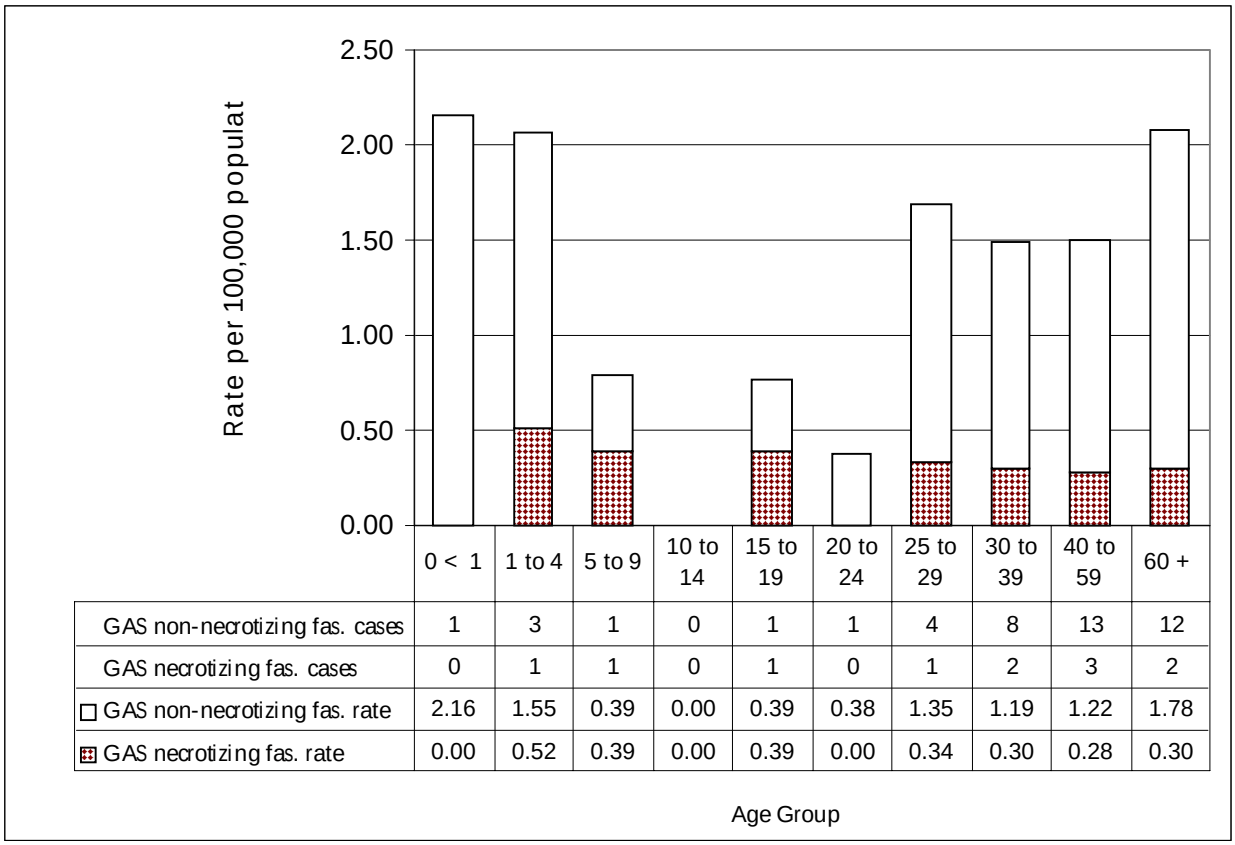
GROUP A STREPTOCOCCUS (INVASIVE)

Invasive group A streptococcus was made reportable and has been under enhanced surveillance in British Columbia since November 1997. Fifty-six cases of invasive group A streptococcus (33 male, 22 female and 1 unspecified) were reported in 1998. All cases were random occurring with no recognized outbreak of group A streptococcus and no secondary cases reported. Based on an average incidence of 86 cases identified each year during a 2 year enhanced laboratory surveillance study conducted between 1 April 1996 and 31 March 1998 (2.2 cases per 100,000), it is likely that significant under-reporting occurred in 1998. The 56 reported cases represents an overall incidence rate of 1.4 per 100,000 which, even after adjustment for under-reporting, remains well within the average 2 to 3 cases per 100,000 reported from other jurisdictions which there is surveillance of invasive group A streptococcus.

Risk factor, survival and other epidemiologic data on reported cases are incomplete because a provincial policy on invasive group A streptococcus was not disseminated to Health Authorities until July 1998. Data collected from the 2 year enhanced laboratory surveillance study provide the best current evidence of the provincial epidemiology of this disease. Key facts from this study are summarized at the end of this section.

Six deaths occurred among 38 cases of invasive group A streptococcus for which survival data were available (case fatality rate 16%). Twelve of 56 cases (21%) presented with necrotizing fasciitis, 9 with concomitant septicemia. There were 3 deaths among 10 cases of necrotizing fasciitis for which survival data were available (case fatality rate 30%). Septicemia was reported in 41 other cases, 4 of whom were associated with streptococcal toxic shock syndrome, 2 of whom died (case fatality rate 50%). Single cases of invasive group A streptococcus associated with meningitis (causing death), arthritis, and a perinephric abscess also were reported.

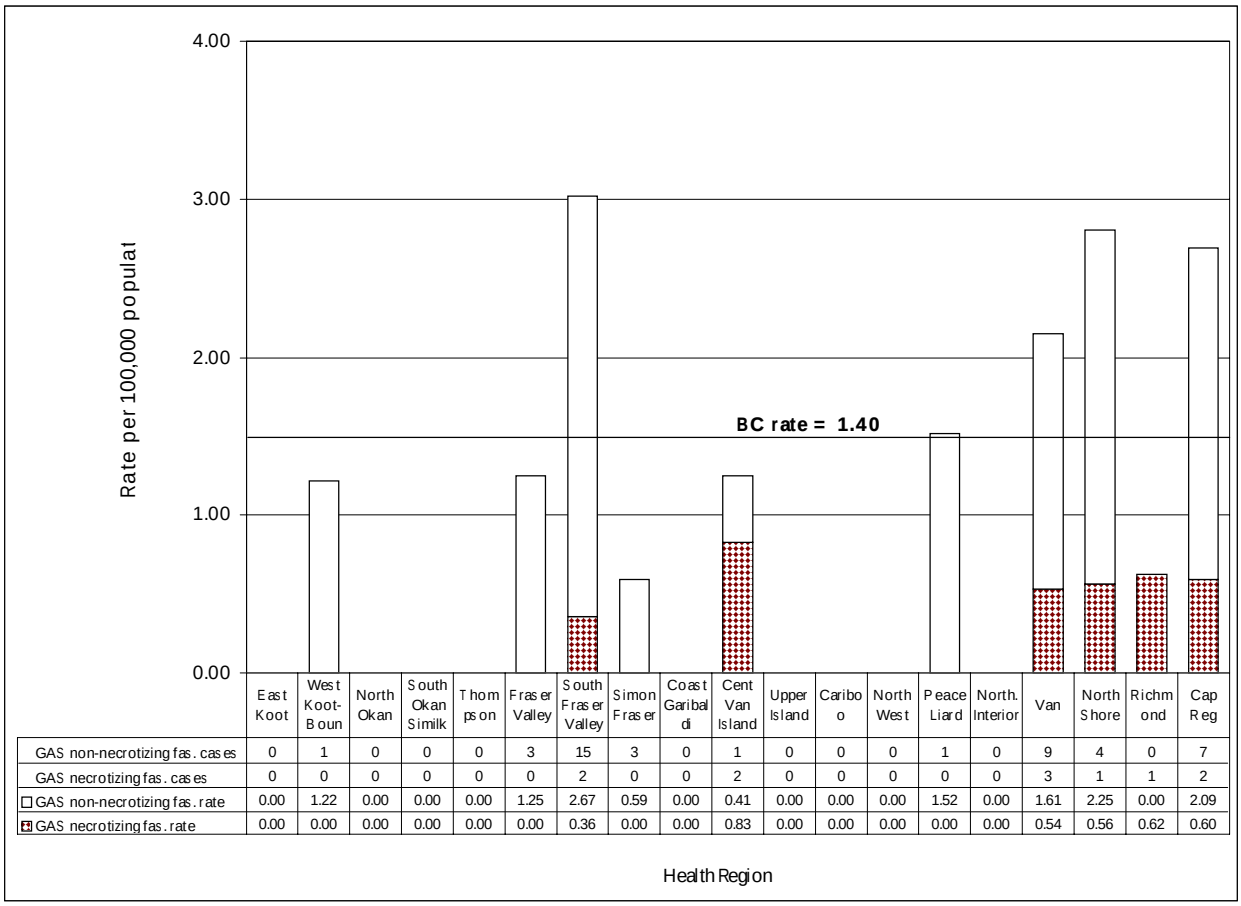
Figure 6.1 Invasive Group A Streptococcus Reports by Age Group, 1998



	0 < 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 39	40 to 59	60 +
GAS non-necrotizing fas. cases	1	3	1	0	1	1	4	8	13	12
GAS necrotizing fas. cases	0	1	1	0	1	0	1	2	3	2
GAS non-necrotizing fas. rate	2.16	1.55	0.39	0.00	0.39	0.38	1.35	1.19	1.22	1.78
GAS necrotizing fas. rate	0.00	0.52	0.39	0.00	0.39	0.00	0.34	0.30	0.28	0.30

Cases of invasive group A streptococcus occurred most frequently among adults: 46 of 56 cases (82%) occurred among persons 25 years of age and older (range: less than one month to 85 years). The age-specific incidence of invasive group A streptococcus shows a "U" shaped profile, with rates 50% higher (2.2 per 100,000) than the overall provincial rate among infants and children under 5 years and persons 60 years and older. A similar profile was apparent for the 6 reported deaths, with 1 death occurring in a 5 year old, and 5 deaths occurring among older persons ranging from 54 to 84 years of age. Two of the 5 older persons who died also suffered from diabetes mellitus, while a third person suffered from alcoholism.

Figure 6.2 Invasive Group A Streptococcus Rates by Health Region, 1998



	East Koot	West Koot-Boun	North Okan	South Okan Similk	Thom pson	Fraser Valley	South Fraser Valley	Simon Fraser	Coast Garibaldi	Cent Van Island	Upper Island	Caribo o	North West	Peace Liard	North. Interior	Van	North Shore	Richm ond	Cap Reg
GAS non-necrotizing fas. cases	0	1	0	0	0	3	15	3	0	1	0	0	0	1	0	9	4	0	7
GAS necrotizing fas. cases	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	3	1	1	2
GAS non-necrotizing fas. rate	0.00	1.22	0.00	0.00	0.00	1.25	2.67	0.59	0.00	0.41	0.00	0.00	0.00	1.52	0.00	1.61	2.25	0.00	2.09
GAS necrotizing fas. rate	0.00	0.00	0.00	0.00	0.00	0.00	0.36	0.00	0.00	0.83	0.00	0.00	0.00	0.00	0.00	0.54	0.56	0.62	0.60

Health Region

Fifty of 56 cases (89%) were reported from lower mainland Health Authorities and the Capital Region. Seventeen cases (30%) were reported from South Fraser Region which, along with North Shore Region (reporting 5 cases), had incidence rates of reported disease higher than the overall provincial rate (3 and 2.8 per 100,000 respectively). However, even these incidence rates are within the range reported by many jurisdictions for invasive group A streptococcal disease. There is no apparent epidemiologic explanation for the geographic distribution of reported cases, but case detection and reporting bias is a possible factor, at least in the South Fraser Region, as a result of significant media and public health attention devoted to a cluster of cases occurring in that Health Authority in 1997.

More complete epidemiologic data were available for 21 cases. The most common antecedent risk factor was some form of wound (chronic, traumatic or surgical), reported in 9 of 21 (43%) cases. Injection drug use and alcoholism were reported in 2 cases each (10%) and there were 5 cases (24%) with chronic or immunosuppressive disease.

Since this is not yet a vaccine-preventable disease, control

measures are restricted to the prevention of person to person transmission from cases. The key to preventing secondary cases of invasive group A streptococcus is effective case-finding, rapid laboratory confirmation and reporting to public health, contact tracing and timely provision of antibiotic chemoprophylaxis for identified close contacts. Improved reporting is a public health priority for the upcoming year which, along with more widespread reportability of invasive group A streptococcus from other Canadian provinces, will lead to better understanding of the epidemiology of this disease and effective measures to minimize the risk of serious disease in close contacts.

KEY FACTS FROM ENHANCED SURVEILLANCE STUDY OF INVASIVE GROUP A STREPTOCOCCUS

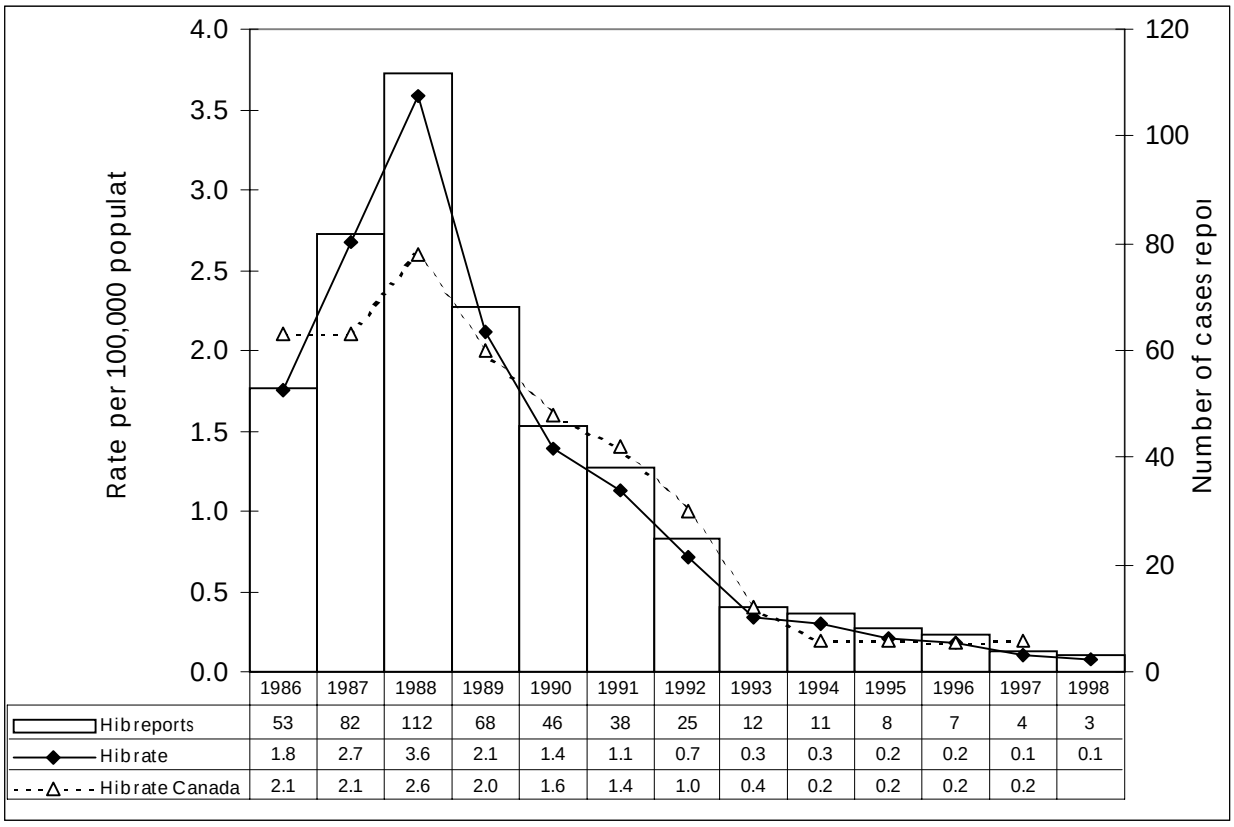
A 2 year enhanced surveillance study conducted in British Columbia from 1 April 1996 to 31 March 1998, identified 172 cases of invasive group A streptococcus over the 2 year period (i.e. an average 86 persons per year, corresponding to an incidence rate of 2.2 per 100,000). There were 92 (53%) male, 77 (45%) female, and 3 (2%) cases of unknown gender. The mean age was 39 years, with a range of 2-91 years. Among 136 persons for whom survival data were available, there were 14 deaths attributed to invasive group A streptococcus (case fatality rate 10%) with the highest mortality rate among older persons (50 years and older). Necrotizing fasciitis was diagnosed in 20 persons (approximately 10 persons per year, corresponding to an incidence rate of 2.5 per million). Six of the 20 cases of necrotizing fasciitis died (case fatality rate 30%).

More detailed epidemiologic data were available for 163 of 172 cases in this 2 year study. Cellulitis was associated with invasive group A streptococcal disease in 76 (44%) of the 172 cases, highlighting the importance of careful adherence to the reporting case definitions outlined in the provincial policy, to avoid false-positive reporting of cellulitis as necrotizing fasciitis.
Of 163 cases of invasive group A streptococcus:

- 55 (34%) were associated with recent injection drug use;
- 35 (21%) had a previous skin wound due to trauma, burns or surgery;
- 24 (15%) suffered from diseases associated with immunosuppression (e.g. HIV disease, cancer);
- 38 (23%) had other debilitating disease (e.g. chronic cardiopulmonary, liver or kidney disease or diabetes); and
- 2 (1%) had a preceding varicella (chickenpox) infection.

HAEMOPHILUS INFLUENZA TYPE B

Figure 7 Hib Reports and Rates, 1986 - 1998



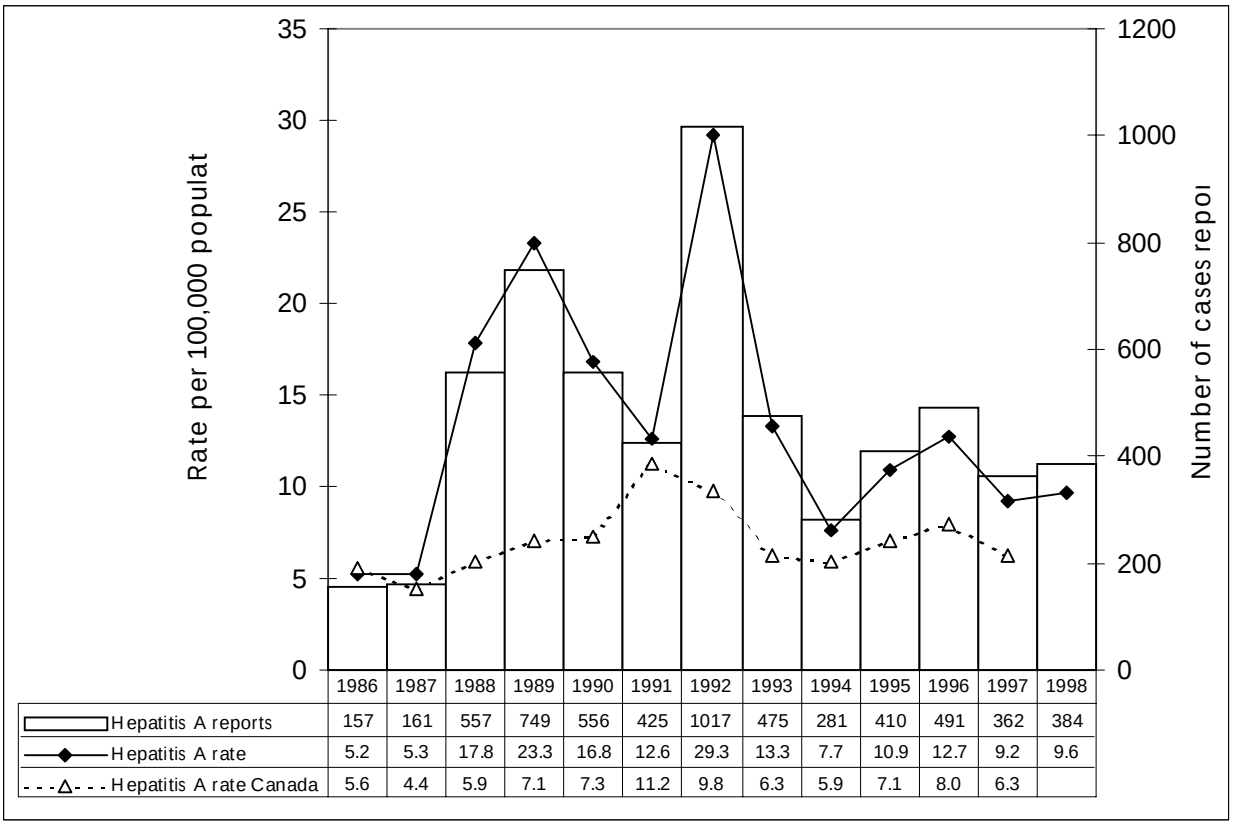
	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Hib reports	53	82	112	68	46	38	25	12	11	8	7	4	3
Hib rate	1.8	2.7	3.6	2.1	1.4	1.1	0.7	0.3	0.3	0.2	0.2	0.1	0.1
Hib rate Canada	2.1	2.1	2.6	2.0	1.6	1.4	1.0	0.4	0.2	0.2	0.2	0.2	

In 1998 there were 3 reports of invasive Hib disease corresponding to a rate of 0.1 per 100,000 population. This rate reflects a sustained reduction in the number of reported cases since introduction of conjugate vaccine. Of the three cases in 1998, one was from the Fraser Valley, one from Simon Fraser and one from Capital Region. Two of the three cases occurred in children aged 2 and 8 and one was not up to date with Hib immunization. One occurred in an adult female aged 40.

The Hib conjugate vaccine has, along with better treatment of the disease, dramatically reduced the occurrence of invasive Hib. Before Hib vaccine, 4 or 5 children died each year in BC from Hib meningitis or its complications. A universal immunization program using second generation Hib conjugate vaccine was introduced in BC in 1992 - no child has died in British Columbia from Hib since 1993. Continued success will be contingent upon achieving and maintaining high immunization coverage with a goal of 97% of BC children fully immunized by their second birthday.

HEPATITIS A

Figure 8.1 Hepatitis A Reports and Rates, 1986 - 1998



	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Hepatitis A reports	157	161	557	749	556	425	1017	475	281	410	491	362	384
Hepatitis A rate	5.2	5.3	17.8	23.3	16.8	12.6	29.3	13.3	7.7	10.9	12.7	9.2	9.6
Hepatitis A rate Canada	5.6	4.4	5.9	7.1	7.3	11.2	9.8	6.3	5.9	7.1	8.0	6.3	

Hepatitis A reporting in BC continues to be higher than the national average. In 1998 there were 384 cases reported for a provincial rate of 9.6 cases per 100,000 population. Seventy-five percent of reported cases were males and the highest rate was seen in young adults aged 25 to 29 (23.3 cases per 100,000). Enhanced surveillance through April, 1998 identified men who have sex with men (MSM) and injection drug users (IDU) as the 2 primary risk factors among reported cases.

An outbreak of hepatitis A among MSM in Vancouver began in late 1997 and continued into 1998. This outbreak also involved MSM on Vancouver Island in 1998. A control program using hepatitis A vaccine began in December 1997, and the number of cases related to this outbreak in Vancouver declined by April 1998. The effectiveness of this control program is reflected as a fall in reporting as 1998 progressed.

A provincial hepatitis A immunization program for IDUs and persons with hepatitis C commenced in April, 1998. Individuals with chronic hepatitis C infection may develop severe liver disease if they become infected with hepatitis A. IDUs are at increased risk of both hepatitis C and hepatitis A.

Figure 8.2 Hepatitis A Reports by Week, 1998

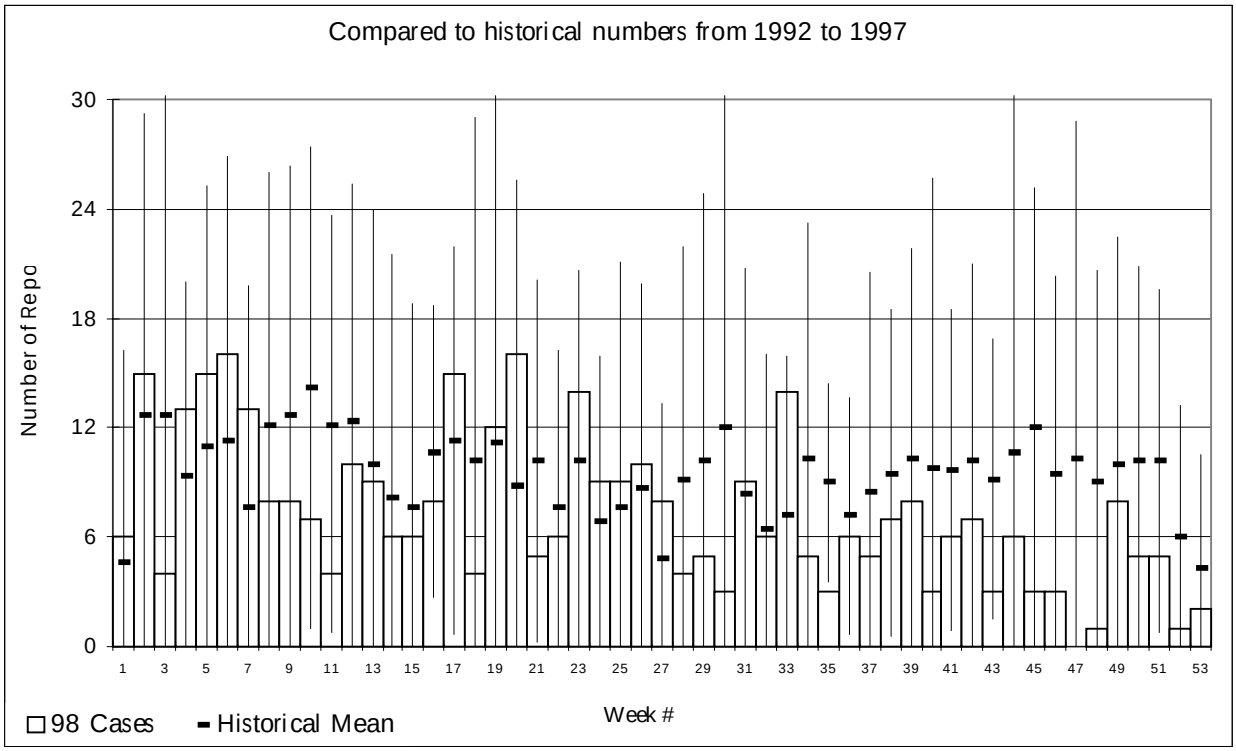
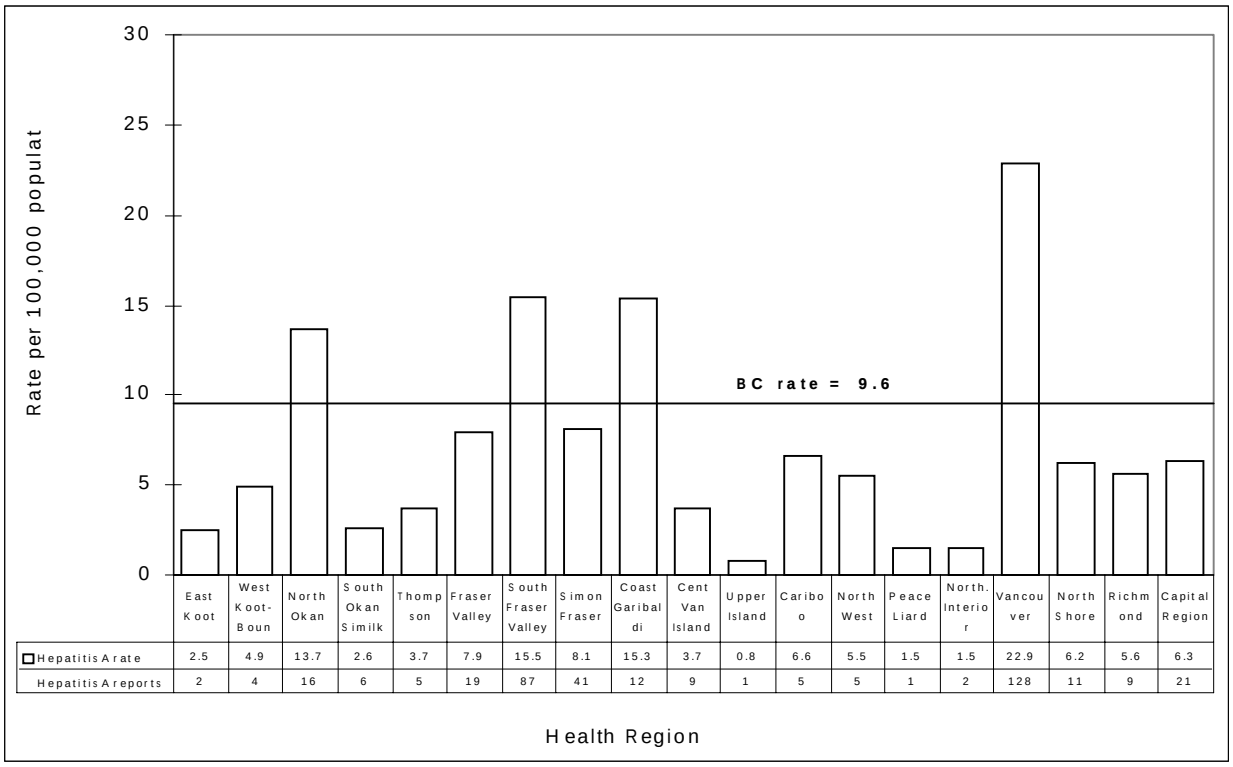
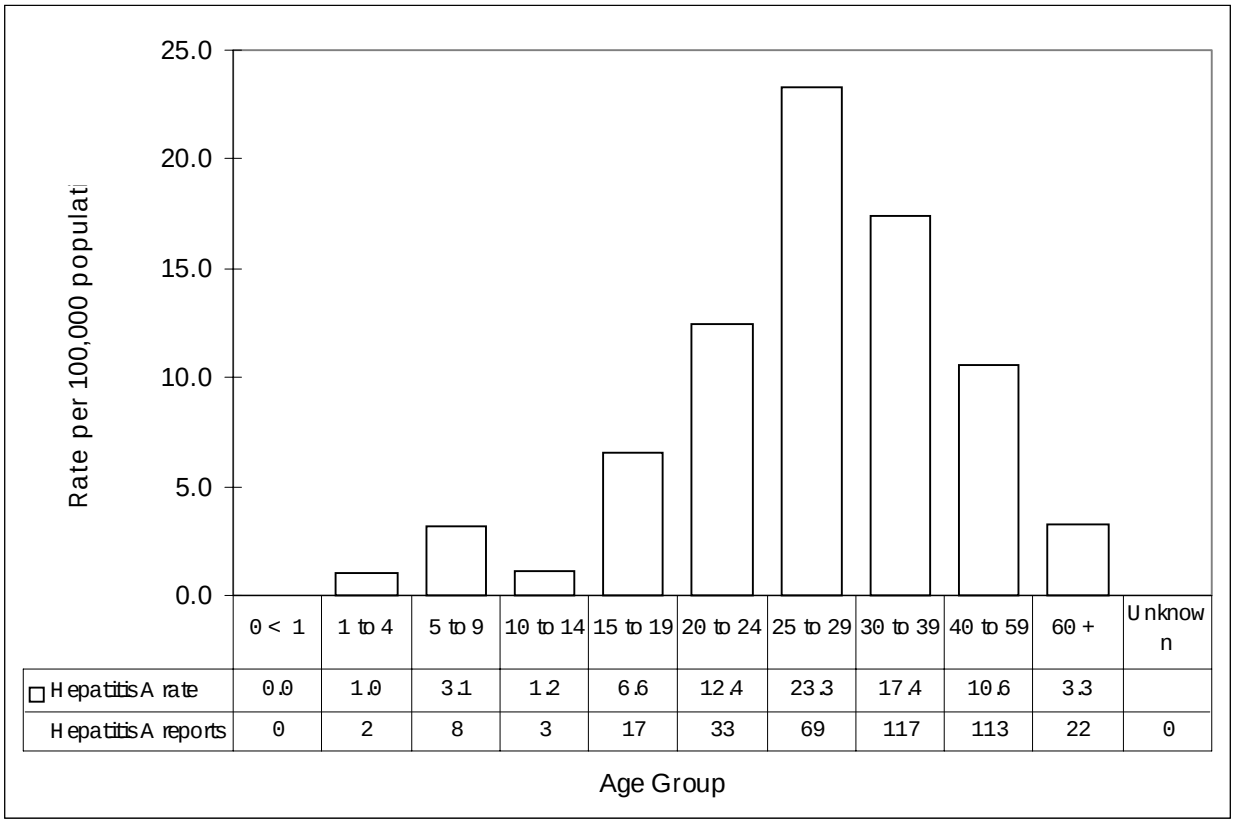


Figure 8.3 Hepatitis A Rates by Health Region, 1998



	East Koot	West Koot-Boun	North Okan	South Okan Similk	Thompson	Fraser Valley	South Fraser Valley	Simon Fraser	Coast Garibaldi	Cent Van Island	Upper Island	Cariboo	North West	Peace Liard	North. Interior	Vancouver	North Shore	Richmond	Capital Region
Hepatitis A rate	2.5	4.9	13.7	2.6	3.7	7.9	15.5	8.1	15.3	3.7	0.8	6.6	5.5	1.5	1.5	22.9	6.2	5.6	6.3
Hepatitis A reports	2	4	16	6	5	19	87	41	12	9	1	5	5	1	2	128	11	9	21

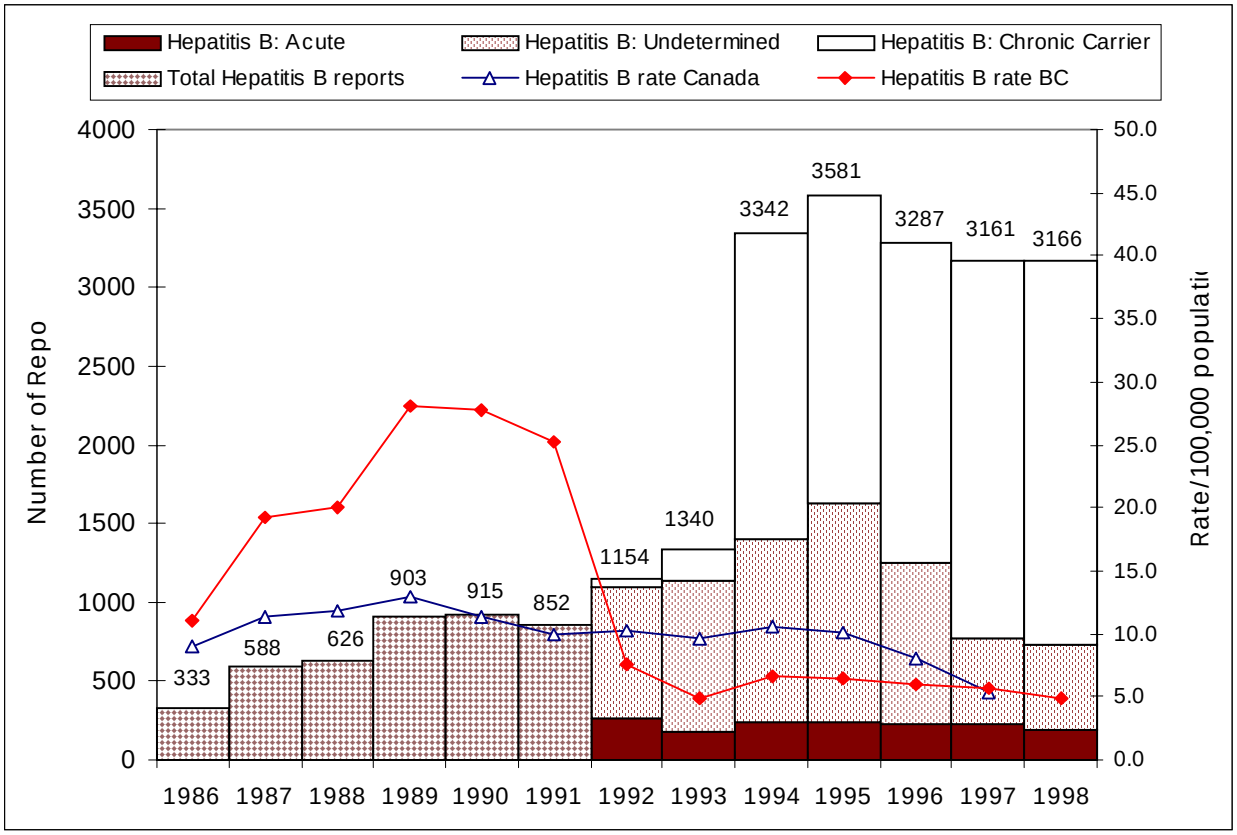
Figure 8.4 Hepatitis A Rates by Age Group, 1998



	0 < 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 39	40 to 59	60 +	Unknown
Hepatitis A rate	0.0	1.0	3.1	1.2	6.6	12.4	23.3	17.4	10.6	3.3	
Hepatitis A reports	0	2	8	3	17	33	69	117	113	22	0

HEPATITIS B

Figure 9.1 Hepatitis B Reports and Rates, 1986 - 1998



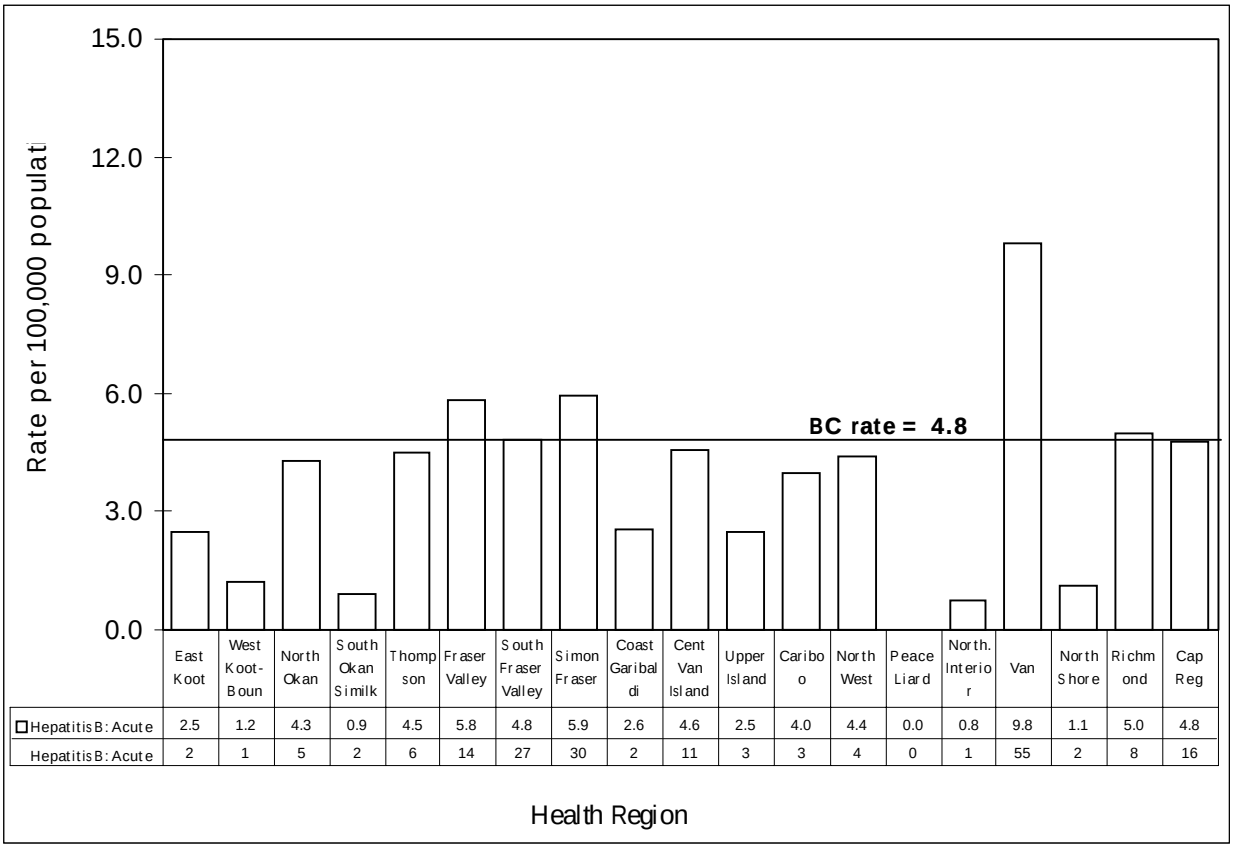
◆ Starting in 1992, 'Hepatitis B rate BC' is for acute hepatitis B only

There were 192 cases of acute hepatitis B (4.8 per 100,000) and 2,431 cases of chronic hepatitis B (61 per 100,000) reported in 1998. The rate of acute hepatitis B has decreased 37% since 1992, when a rate of 7.6 per 100,000 was observed. In addition, 543 cases were reported (17% of all reported cases of hepatitis B) that could not be classified as either acute or chronic on the basis of available information. On the other hand, the number of reported chronic cases has increased each year since 1992, when the reporting case definition for hepatitis B was refined to require reporting as acute, chronic or undetermined cases. The rate of hepatitis B in BC, shown in figure 9.1 reflects this change, indicating the rate of acute hepatitis B from 1992 onwards. Seventy-six per cent of all reported cases of hepatitis B in 1998 were chronic, compared with only 60 of 1,154 (5%) in 1992. The increasing proportion of chronic to total reported cases is significantly correlated with the decreasing proportion of total cases categorized as undetermined [from 831

of 1,154 (72%) in 1992 to 543 of 3,166 (17%) in 1998] and is also an artifact reflecting the higher probability of case finding among the larger population of prevalent chronic cases.

British Columbia's rate of 4.8 acute cases per 100,000 approximates the preliminary 1998 national rate of 5.6 per 100,000. Caution is required when comparing reported provincial and national rates of hepatitis B infection because of inconsistent methods for reporting hepatitis B infection - some provinces only report acute cases while others report all cases. Until 1997, British Columbia's reported rate of hepatitis B comprised acute plus undetermined cases, which undoubtedly overestimated acute cases, since the majority of undetermined cases represent chronic infection.

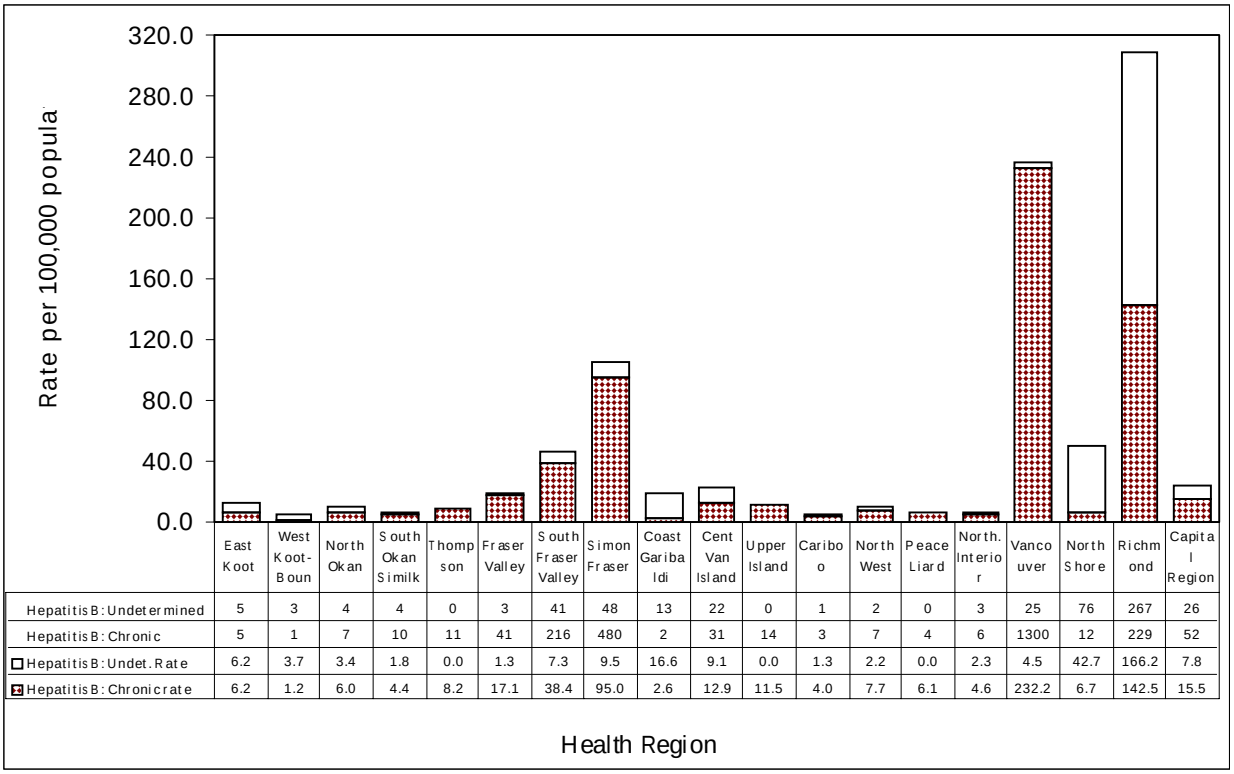
Figure 9.2 Acute Hepatitis B Rates by Health Region, 1998



	East Koot	West Koot-Boun	North Okan	South Okan Similk	Thompson	Fraser Valley	South Fraser Valley	Simon Fraser	Coast Garibaldi	Cent Van Island	Upper Island	Cariboo	North West	Peace Liard	North. Interior	Van	North Shore	Richmond	Cap Reg
Hepatitis B: Acute	2.5	1.2	4.3	0.9	4.5	5.8	4.8	5.9	2.6	4.6	2.5	4.0	4.4	0.0	0.8	9.8	1.1	5.0	4.8
Hepatitis B: Acute	2	1	5	2	6	14	27	30	2	11	3	3	4	0	1	55	2	8	16

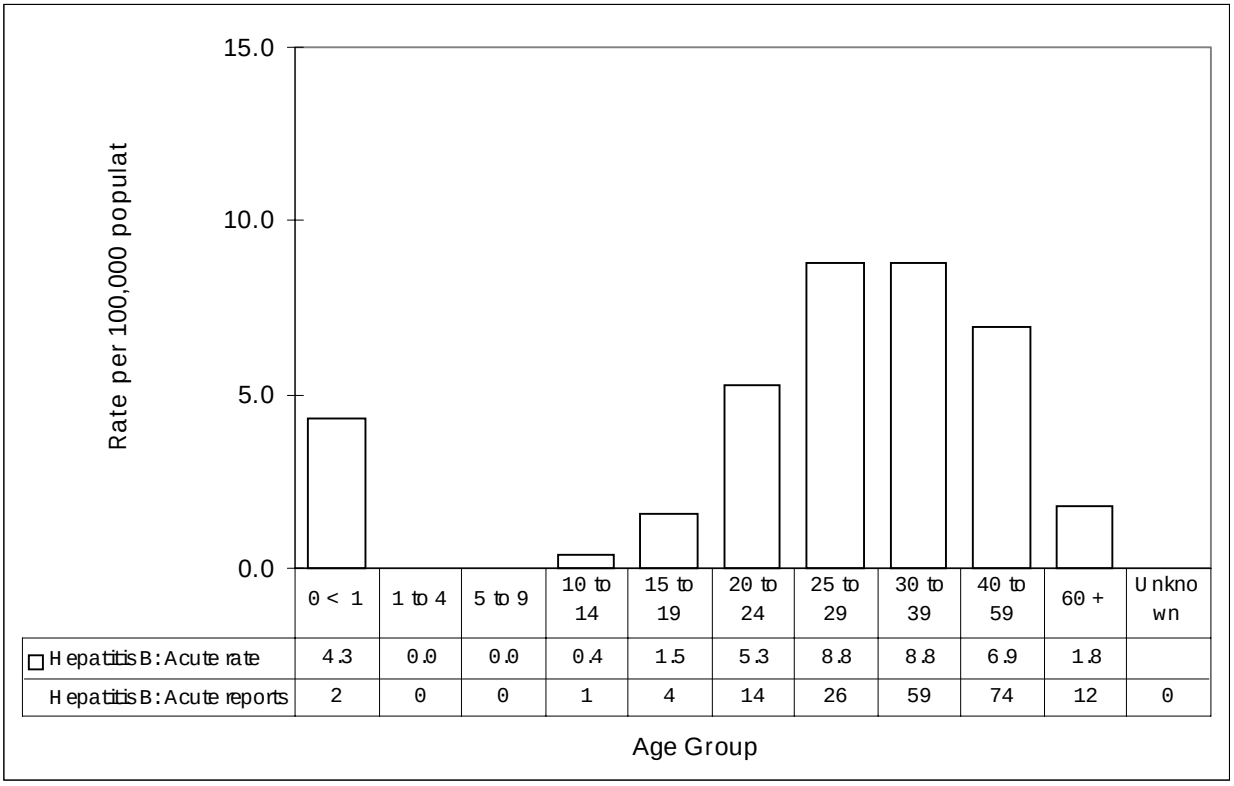
The distribution of chronic hepatitis B largely reflects historic patterns of immigration to British Columbia from regions having high prevalence of hepatitis B infection - over 90% of chronic cases were reported from 3 lower mainland health regions: Vancouver/Richmond, Simon Fraser and South Fraser. These 3 regions also accounted for 120/192 (63%) of reported acute cases. A marked urban/rural demarcation of acute hepatitis B was apparent, with 152/192 (79%) of cases from lower mainland and Capital Health regions, reflecting a higher probability of exposure related to contact with chronic carriers or high risks behaviors such as injection drug use.

Figure 9.3 Chronic and Undetermined Hepatitis B Rates by Health Region, 1998



	East Koot	West Koot-Boun	North Okan	South Okan Similk	Thompson	Fraser Valley	South Fraser Valley	Simon Fraser	Coast Garibaldi	Cent Van Island	Upper Island	Cariboo	North West	Peace Liard	North. Interior	Vancouver	North Shore	Richmond	Capital Region
Hepatitis B: Undetermined	5	3	4	4	0	3	41	48	13	22	0	1	2	0	3	25	76	267	26
Hepatitis B: Chronic	5	1	7	10	11	41	216	480	2	31	14	3	7	4	6	1300	12	229	52
Hepatitis B: Undet. Rate	6.2	3.7	3.4	1.8	0.0	1.3	7.3	9.5	16.6	9.1	0.0	1.3	2.2	0.0	2.3	4.5	42.7	166.2	7.8
Hepatitis B: Chronic rate	6.2	1.2	6.0	4.4	8.2	17.1	38.4	95.0	2.6	12.9	11.5	4.0	7.7	6.1	4.6	232.2	6.7	142.5	15.5

Figure 9.4 Hepatitis B Rates by Age Group, 1998



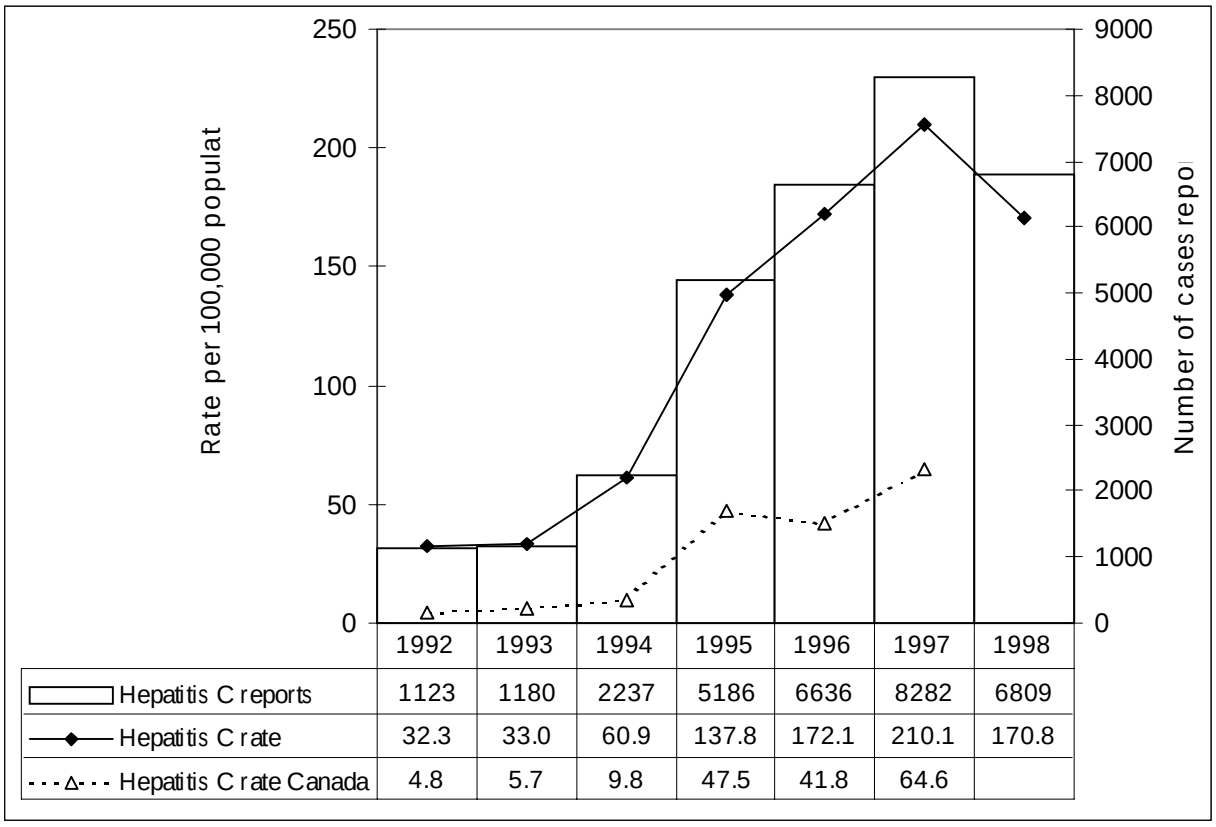
	0 < 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 39	40 to 59	60 +	Unknown
Hepatitis B: Acute rate	4.3	0.0	0.0	0.4	1.5	5.3	8.8	8.8	6.9	1.8	
Hepatitis B: Acute reports	2	0	0	1	4	14	26	59	74	12	0

Ninety-six per cent of cases of acute infection occurred in persons 20 years and older, with two-thirds (133 of 192) clustered between ages 30 to 59. There were 2 acute cases reported in infants under 1. Age stratified rates of acute disease showed an bimodal distribution, with a rate of 4.3 per 100,000 among infants under 1, cresting at 8.8 per 100,000 among young adults 25 to 39 years old. It is unknown whether the 2 reported cases in infants had been identified as high risk infants on the basis of prenatal screening for maternal chronic hepatitis B infection. Since acute hepatitis B infection among infants and young children is not usually clinically apparent and therefore unreported, it is likely that the disease burden of acute hepatitis B infection significantly exceeds reported cases. Moreover, because 90% of infected infants develop chronic hepatitis B disease, the long term adverse health consequences associated with infection in early life are especially serious.

A universal infant hepatitis B immunization program could potentially prevent ninety-five per cent or more of hepatitis B infections acquired in infancy or childhood. The Vancouver/Richmond Health Board and North Shore Health introduced such a program in September 1998 and February 1999 respectively. The British Columbia Centre for Disease Control (BCCDC) has recommended that the BC Ministry of Health provide funding for a province-wide infant hepatitis B immunization program, along with a catch-up program for high risk children (including children under 7 years who have immigrated from regions where hepatitis B is highly prevalent) and for other children who have not yet been vaccinated through the current universal grade 6 hepatitis B immunization program. An infant program would prevent between 3 to 10 reported cases and 30 to 100 actual cases of hepatitis B in children 12 years and under each year in British Columbia. Obtaining funding for a province-wide infant program and its implementation are important priorities for BCCDC over the next year.

HEPATITIS C

Figure 10.1 Hepatitis C Reports and Rates, 1992 - 1998

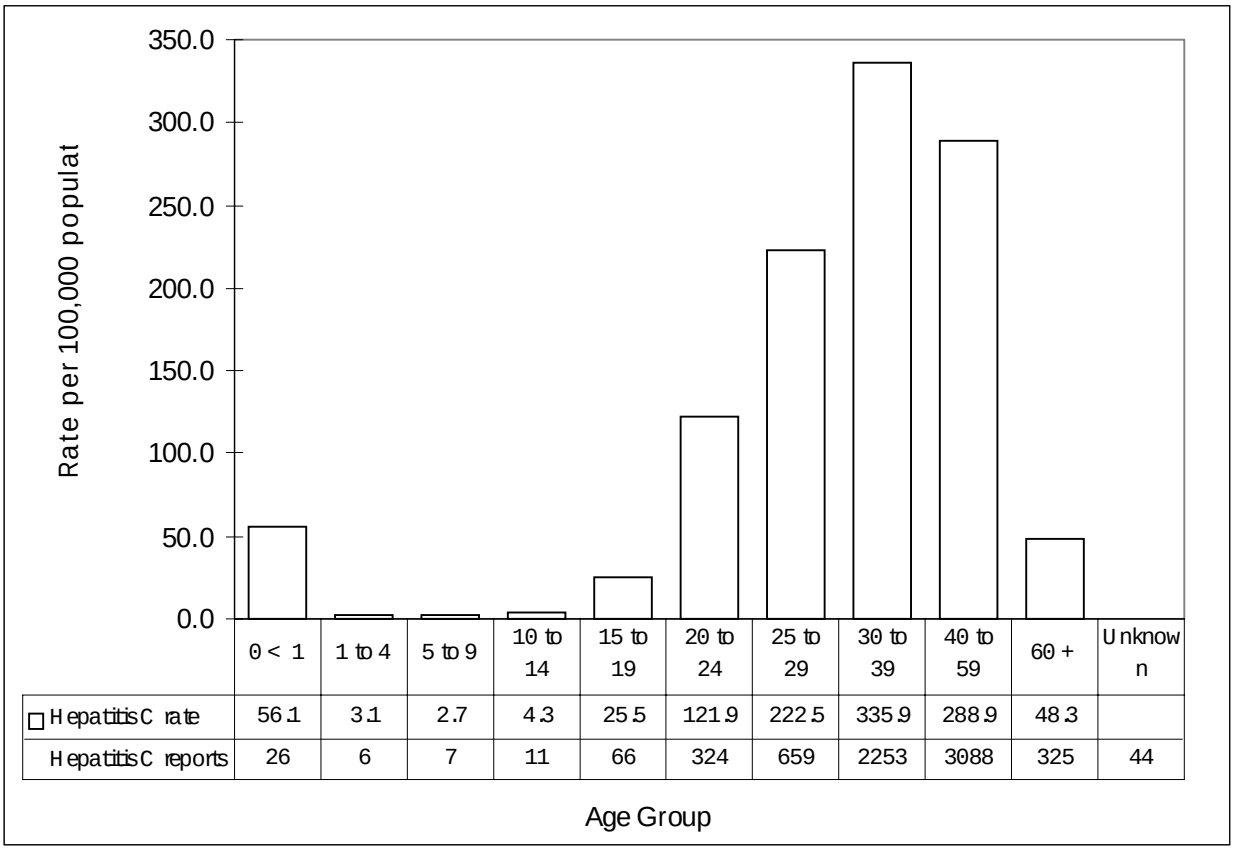


	1992	1993	1994	1995	1996	1997	1998
Hepatitis C reports	1123	1180	2237	5186	6636	8282	6809
Hepatitis C rate	32.3	33.0	60.9	137.8	172.1	210.1	170.8
Hepatitis C rate Canada	4.8	5.7	9.8	47.5	41.8	64.6	

There were 6,809 cases of hepatitis C reported in 1998, representing an overall provincial rate of 171 cases per 100,000. This is an 18% decrease from the 1997 case count and is the first year since hepatitis C was made reportable in British Columbia in 1992 that the year-on-year case count has decreased. Since most newly reported cases of hepatitis C likely represent chronically infected persons, the significant decrease in reported cases in 1998 is likely the result of the shrinking pool of previously undetected prevalent, chronic cases. A cumulative total of over 31,000 cases of hepatitis C has been reported in British Columbia since 1992. On the basis of seroprevalence studies conducted in British Columbia blood donors and antenatal blood samples, an estimated 1% of the population may be infected with hepatitis C. Therefore, approximately three-quarters of the prevalent cases are estimated to have been detected in the 7 years since hepatitis C was made reportable. In addition, the extensive look-back campaign initiated in 1997 in British Columbia to identify persons potentially exposed to hepatitis C as a result of receiving blood or blood products between January 1985 to June 1990, contributed to increased case finding in 1997.

Nevertheless, the rate of hepatitis C in British Columbia remains over 3 times the national rate of 54.4 per 100,000. Other significant epidemiologic features are the age and gender distributions of reported cases. Two-thirds of cases (4,447 of 6,809) were male, consistent with the preponderance of males among injection drug users. Injection drug use is the single most significant risk factor for hepatitis C infection in British Columbia, with prevalence rates of over 90% identified in a cohort of injection drug users in Vancouver.

Figure 10.2 Hepatitis C Rates by Age Group, 1998

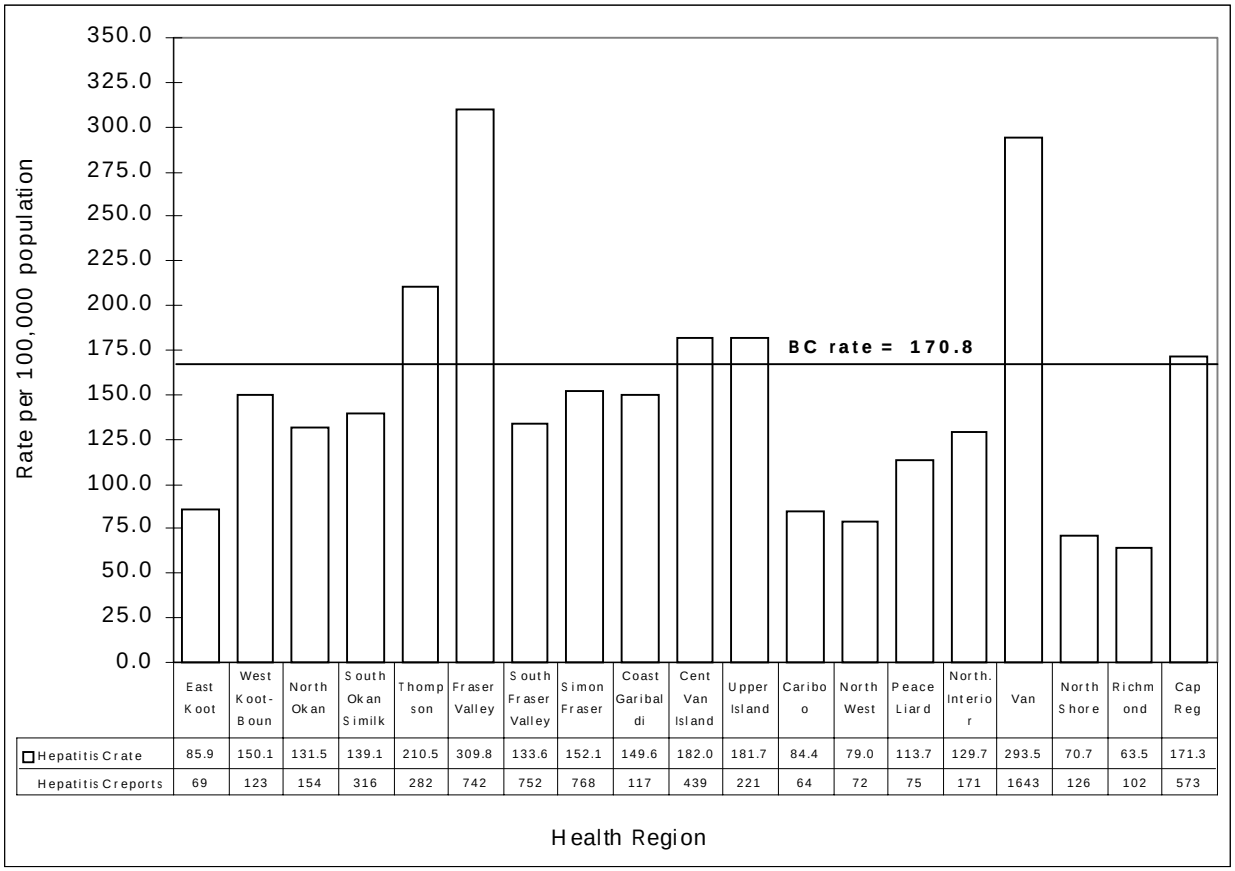


	0 < 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 39	40 to 59	60 +	Unknown
Hepatitis C rate	56.1	3.1	2.7	4.3	25.5	121.9	222.5	335.9	288.9	48.3	
Hepatitis C reports	26	6	7	11	66	324	659	2253	3088	325	44

The age distribution of reported cases follows a bimodal profile, with 32 cases reported among children under 5 years, 26 (81%) of these among infants under 1. However, a number of these reported cases in infants may be falsely positive, as a result of passively acquired maternal antibody. There is currently no consistent national case definition for diagnosis of hepatitis C in infants under 1. Some authorities recommend deferring a diagnosis of hepatitis C in a child until after 12 months of age because of limitations of currently available laboratory diagnostic tests for hepatitis C virus. Nevertheless, based on studies of maternal-infant transmission of hepatitis C virus, at least 5% (1 to 2 infants) of reported cases among infants probably represent infection acquired

congenitally or in the perinatal period. The majority of cases were reported among adults, particularly between 30 to 59 years of age, an age range accounting for 5,341 cases (78% of all cases).

Figure 10.3 Hepatitis C Rates by Health Region, 1998



	East Koot	West Koot-Boun	North Okan	South Okan Similk	Thompson	Fraser Valley	South Fraser Valley	Simon Fraser	Coast Garibaldi	Cent Van Island	Upper Island	Caribo	North West	Peace Liard	North. Interior	Van	North Shore	Richmond	Cap Reg
Hepatitis C rate	85.9	150.1	131.5	139.1	210.5	309.8	133.6	152.1	149.6	182.0	181.7	84.4	79.0	113.7	129.7	293.5	70.7	63.5	171.3
Hepatitis C reports	69	123	154	316	282	742	752	768	117	439	221	64	72	75	171	1643	126	102	573

The regional distribution of reported cases shows a trend to urban/rural polarization. Vancouver reported the highest number of cases (1,643 of 6,809, or 24% of total cases) - a rate 294 cases per 100,000, 72% above the overall provincial rate of 171 per 100,000. In general, rural health regions had rates of reported hepatitis C below the provincial rate, with exceptions being the Thompson, Central and Upper Vancouver Island regions, that report rates above the average. However, two urban health regions, Richmond and North Shore, had lower rates of reported hepatitis C (64 and 71 cases per 100,000 respectively). These differences in distribution may reflect several epidemiologic factors, such as migration patterns and social networks of persons with high risk behaviors, particularly injection drug use.

In April 1998, the British Columbia Ministry of Health introduced a hepatitis A immunization program for all persons infected with hepatitis C and to injection drug users. Individuals with chronic hepatitis C infection are at increased risk of life-threatening hepatitis if they

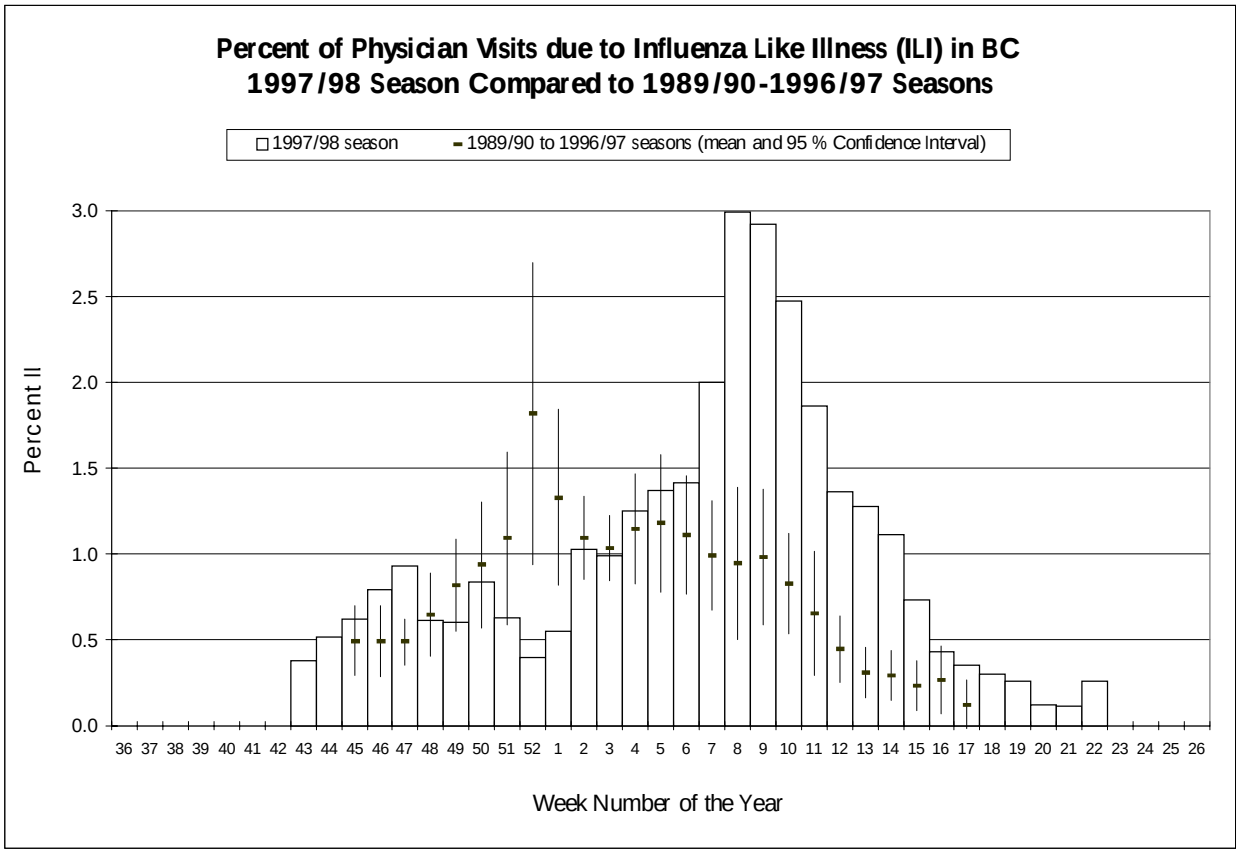
become infected with the hepatitis A virus. Injection drug users are also offered the hepatitis A vaccine because of the high proportion who are infected with hepatitis C. As well, a high rate of hepatitis A infection has been observed among injection drug users. BC Centre for Disease Control will be working with regional health authorities over the coming year to evaluate uptake of the hepatitis A vaccine among this high risk population.

INFLUENZA

Influenza surveillance in BC consists of reports from a network of sentinel physicians, laboratory reports from the virology section of the Provincial Laboratory and health unit reports of influenza-like illness (ILI) activity in local long term care facilities and schools across BC. By all measures, the 1997/98 influenza season was particularly severe.

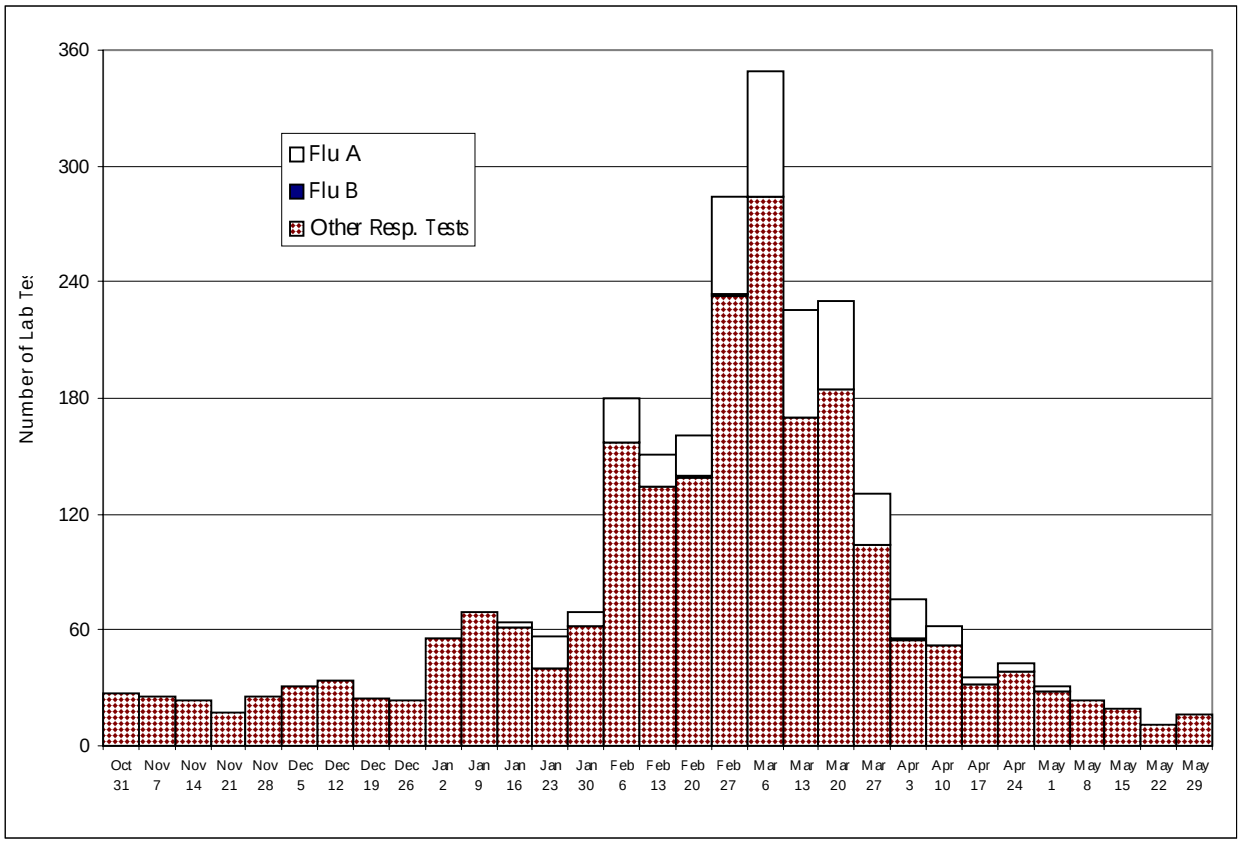
Surveillance reporting by 44 physicians across BC began the week of October 20, 1997. Sentinel reporting was characterized by a peak in activity between late January and late March with continued activity into early May. The total number of patients and the percentage of visits due to ILI are represented in Figure 11.1. The distribution shows delayed and heightened activity during the 1997/98 season compared to the previous seven influenza seasons.

Figure 11.1 BC ILI Activity Reported by Sentinel Physicians Network, 1997/1998 Season



Three hundred and seventy six (376) detections of influenza were confirmed by the Provincial Laboratory during the 1997/98 influenza season in British Columbia. Of those, greater than 99% were influenza A (three influenza B detections). Influenza A/Sydney/05/97 (H3N2)-like virus was the predominant pathogen identified. Laboratory detection of influenza began during the week of January 16 and continued to early May with peak detection from late January to mid-April. Figure 11.2 shows the distribution of influenza virus detection by Provincial Laboratory from October, 1997 to May, 1998.

Figure 11.2 Respiratory Lab Tests Performed by Provincial Laboratory, 1997/1998 Season



During the 1997/98 influenza season there were 62 outbreaks of influenza-like illness in long term care facilities. There were 141 *known* deaths and 109 *known* hospitalizations associated with these outbreaks. In addition, there were 125 reports of outbreaks with absenteeism above 10% in schools across BC. The majority of these outbreaks were reported during February and March 1998. These outbreaks represent an increase over previous years. For example, during the 1996/97 influenza season, there were less than ten ILI outbreaks reported in long term care facilities and less than 100 reports of school outbreaks during the influenza season.

Review of hospital discharge data and vital statistics mortality data for the 1997/1998 influenza season also points to more severe activity compared to previous years. The rates of death due to influenza as a direct cause per million BC population during February and March of 1998 were higher than any found during any month of the previous 8 years. Similarly, the rate of hospitalization due to influenza per million BC population and per million persons 65 years and over during March 1998 were the highest found during any month of the previous 5 years.

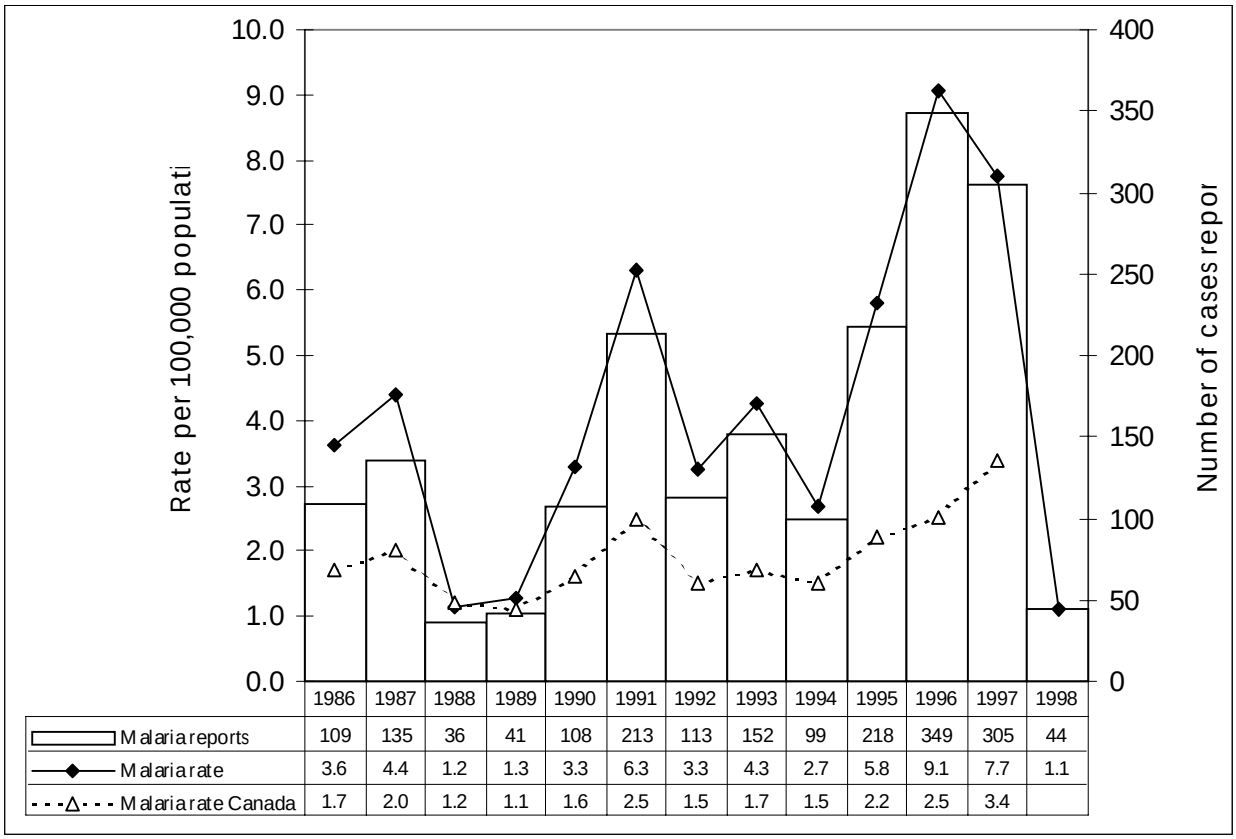
During the 1997/98 influenza season A/Sydney was not included in the influenza vaccine. In fact, this novel drift had not been anticipated as one of the circulating strains in North America. It was first identified in Australia and New Zealand in June 1997. In Canada, the A/Sydney-like strain was first isolated from passengers aboard a cruise ship that sailed from New York to Montreal in September 1997. The passengers had visited Australia earlier during the voyage.

Although A/Sydney was not included in the vaccine, the related A/Nanching/933/95 (H3N2)-like strain was included and likely provided some cross-protection. Investigations of outbreaks of influenza A/Sydney virus in three long term care facilities and a military base in the United States in December 1997 and January 1998 suggest that the vaccine provided little protection against illness but may have reduced mortality.

Increased ILI outbreak activity in long term care facilities during the 1997/98 influenza season stimulated renewed interest in complementary measures to protect vulnerable residents. During the 1997/98 season, attempts were increasingly made to manage outbreaks with a combination of influenza vaccination of residents and staff, environmental control and amantadine prophylaxis. Prior to this, amantadine had only infrequently been used in the control of outbreaks in BC. The 1997/98 influenza season represented a transition year in progress toward amantadine prophylaxis becoming the standard of practice in outbreak control. This led many regions to establish stronger lines of communication between long term care facilities, infection control and public health. It also led to the adoption of guidelines for efficient reporting of outbreaks and implementation of antiviral prophylaxis. These guidelines and the infrastructure to support them will enable more effective outbreak intervention during inter-pandemic periods and will establish the framework for influenza control when pandemic activity occurs.

MALARIA

Figure 12.1 Malaria Reports and Rates, 1986 - 1998



	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Malaria reports	109	135	36	41	108	213	113	152	99	218	349	305	44
Malaria rate	3.6	4.4	1.2	1.3	3.3	6.3	3.3	4.3	2.7	5.8	9.1	7.7	1.1
Malaria rate Canada	1.7	2.0	1.2	1.1	1.6	2.5	1.5	1.7	1.5	2.2	2.5	3.4	

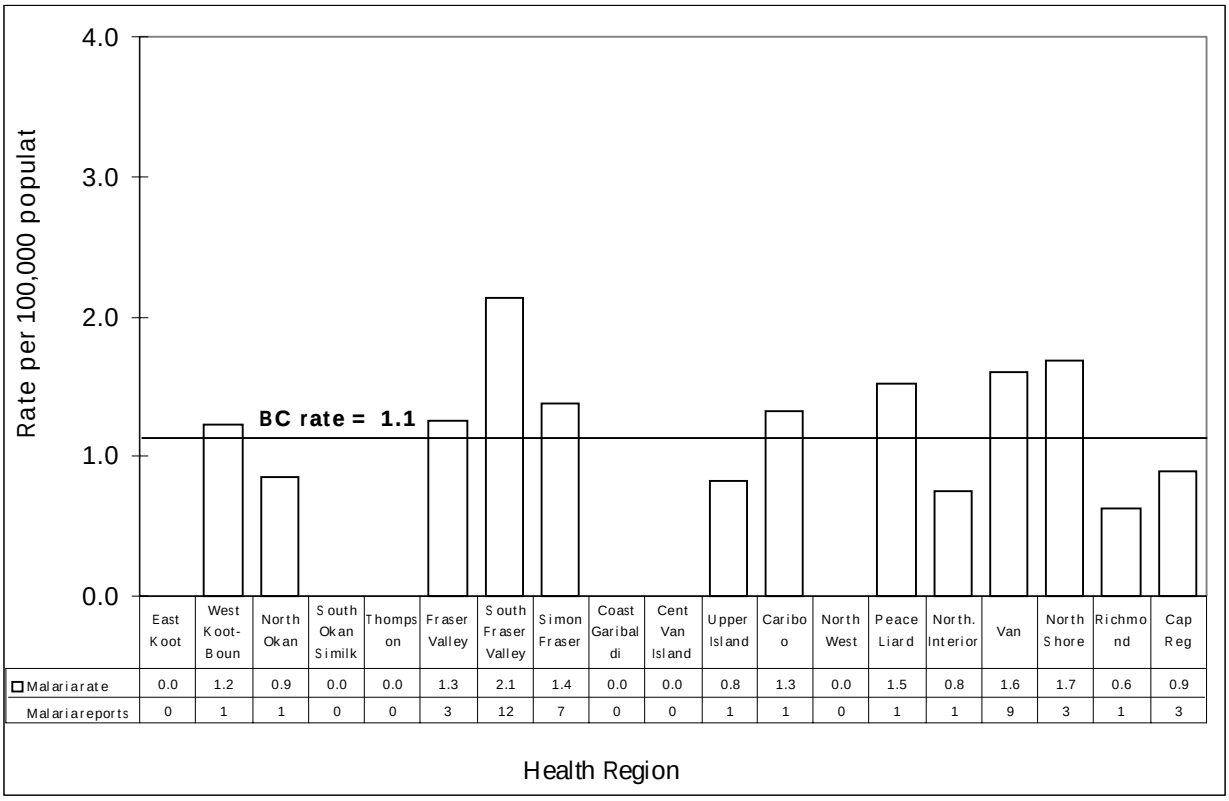
In 1998, a marked decline in reporting was observed in all parts of the province. Forty-four cases were reported for a reporting rate of 1.1 cases per 100,000 population. This was the lowest level since 1989, and it followed 3 high years from 1995 through 1997. The South Fraser and Fraser Valley regions experienced the most notable declines where rates fell from 28.2 and 16.6 cases per 100,000 population respectively in 1997 to 2.1 and 1.3 cases per 100,000 population respectively in 1998. The highest reporting rate was observed among persons 25 to 29 years of age.

A 1995/1996 study found that the high reporting rate for malaria in South Fraser was primarily related to travel to the Punjab. South Fraser has consistently had the highest reporting rates in B.C.

Three factors may have played a role in the decline in malaria reporting:

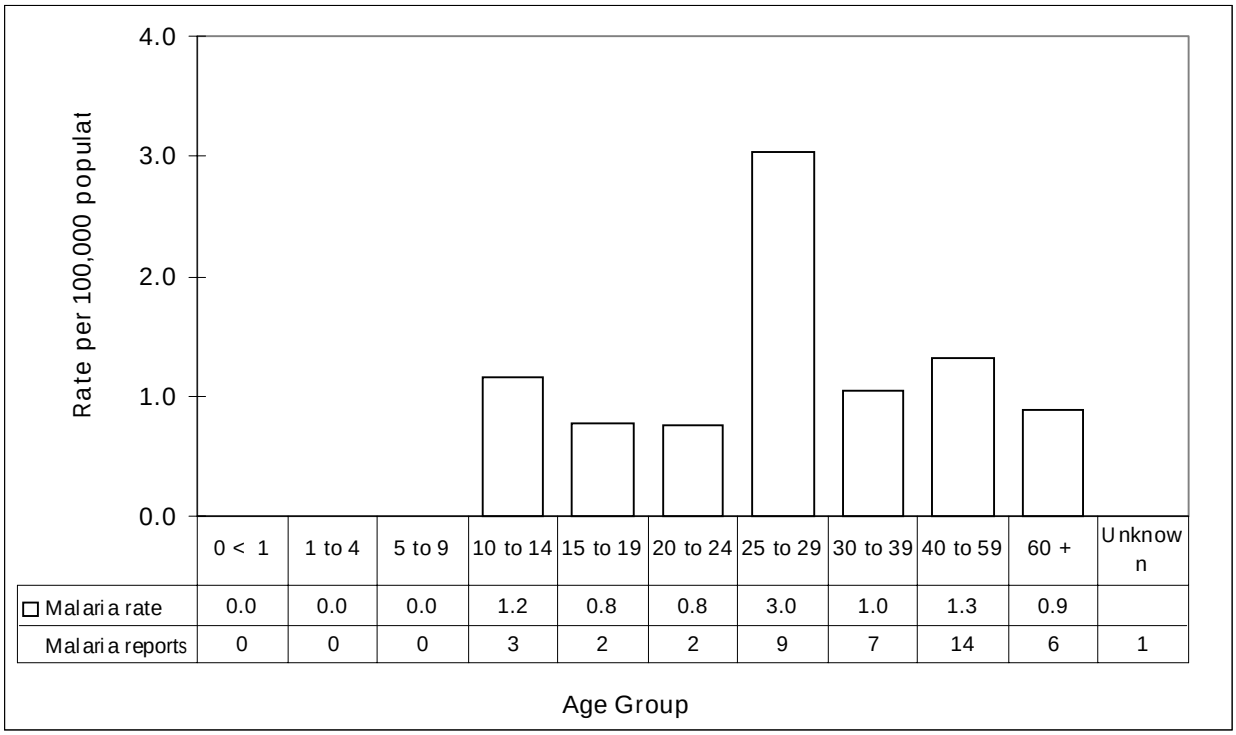
(1) A fall in the number of travelers to the Punjab;
(2) Variations in the mosquito vector population in some areas of India; and
(3) Improved use of antimalarial drugs and insect repellents by travelers.

Figure 12.2 Malaria Rates by Health Region, 1998



	East Koot	West Koot-Boun	North Okan	South Okan Similk	Thompson	Fraser Valley	South Fraser Valley	Simon Fraser	Coast Garibaldi	Cent Van Island	Upper Island	Caribo	North West	Peace Liard	North. Interior	Van	North Shore	Richmond	Cap Reg
Malaria rate	0.0	1.2	0.9	0.0	0.0	1.3	2.1	1.4	0.0	0.0	0.8	1.3	0.0	1.5	0.8	1.6	1.7	0.6	0.9
Malaria reports	0	1	1	0	0	3	12	7	0	0	1	1	0	1	1	9	3	1	3

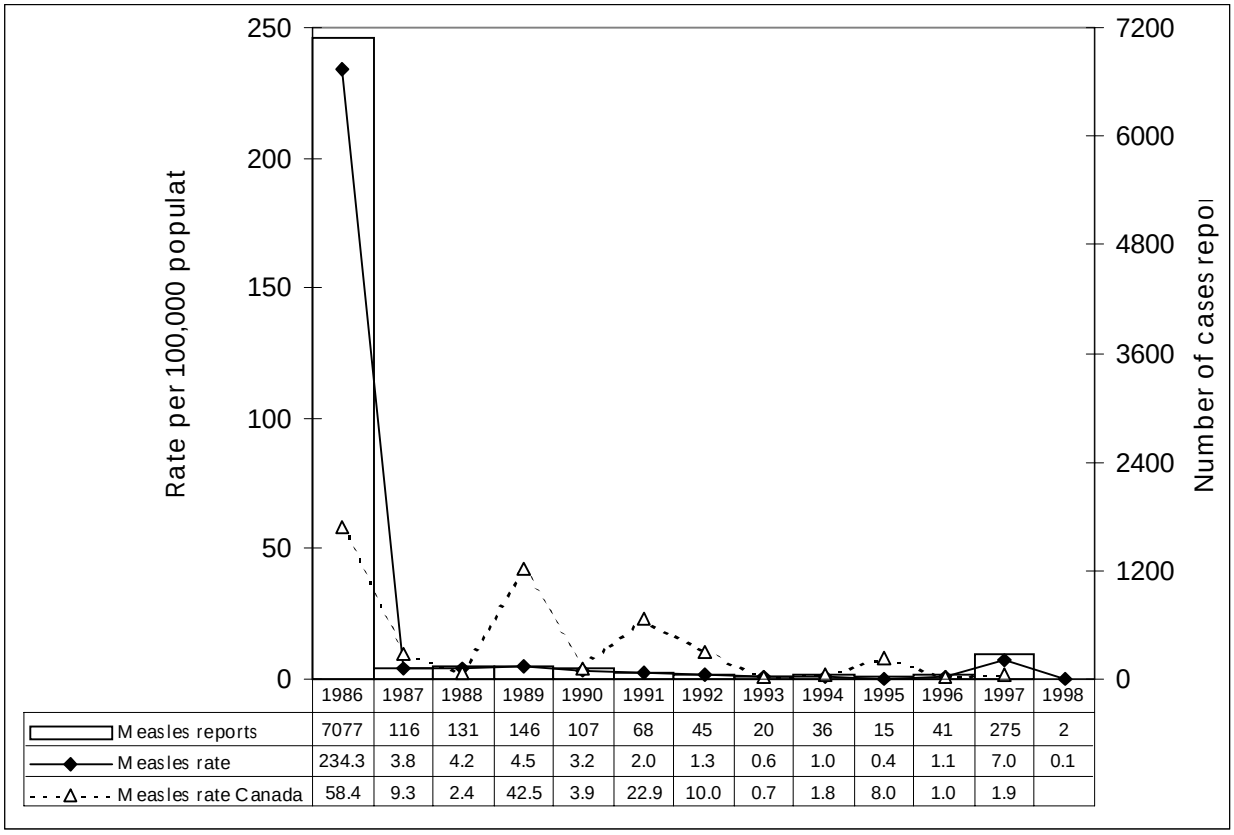
Figure 12.3 Malaria Rates by Age Group, 1998



	0 < 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 39	40 to 59	60 +	Unknown
Malaria rate	0.0	0.0	0.0	1.2	0.8	0.8	3.0	1.0	1.3	0.9	
Malaria reports	0	0	0	3	2	2	9	7	14	6	1

MEASLES

Figure 13 Measles Reports and Rates, 1986 - 1998



	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Measles reports	7077	116	131	146	107	68	45	20	36	15	41	275	2
Measles rate	234.3	3.8	4.2	4.5	3.2	2.0	1.3	0.6	1.0	0.4	1.1	7.0	0.1
Measles rate Canada	58.4	9.3	2.4	42.5	3.9	22.9	10.0	0.7	1.8	8.0	1.0	1.9	

In 1998, BC achieved the goal of a measles rate below 1 per 100,000. There were two measles case reports - one was a nine month old clinical case from Central Vancouver Island in whom serology was not sought and in whom urine culture was negative but too delayed to rule out measles. The other was a twice (distantly) immunized eleven year old from Vancouver with serologic confirmation. Neither had traveled outside BC or Canada during their incubation periods.

It is possible that the first case of measles reported in BC in 1998 would have been ruled out if serology had been done. The second case, twice immunized, may have been a false positive although associated serology was otherwise only weakly reactive for HHV6 IgM. There were no secondary cases reported subsequent to either case and no evidence of sustained transmission.

There were further clinical reports in 1998 that were subsequently ruled out by serology and/or throat or urine culture. This is the lowest number of measles cases ever reported in BC and corresponds to a rate of 0.1 per 100,000.

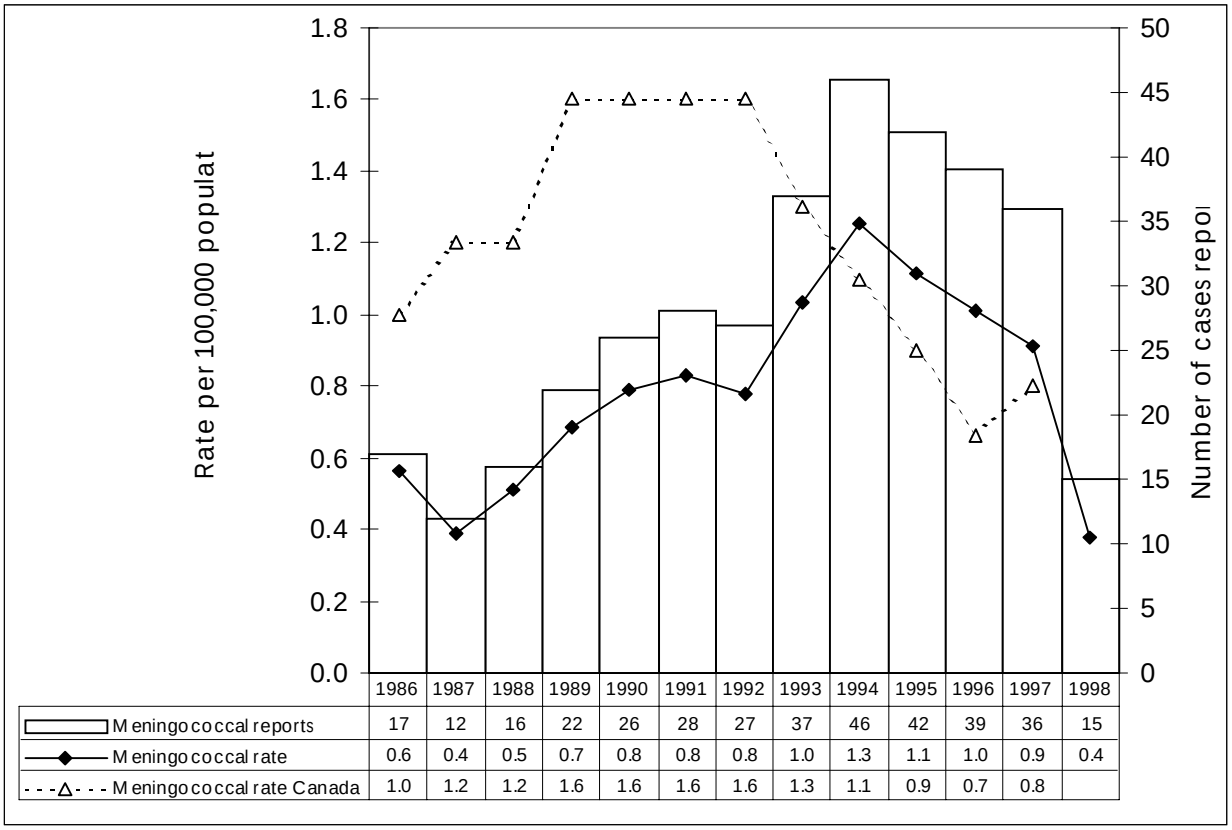
This low rate reflects significant public health effort in BC aimed at protecting children with two doses of measles vaccine. A two-dose program was launched on April 1, 1996 with the introduction of a routine second dose of MMR at 18 months of age, and the start of a province-wide mass MR catch-up campaign for those aged 19 months to 18 years.

In 1997, an outbreak of measles amongst students of Simon Fraser University resulted in spillover into neighboring areas and other age groups. Two hundred and seventy-five cases of measles were reported. This led to efforts to immunize all college-age students in BC with a second dose of measles vaccine. Without this and the earlier two-dose immunization for children, the outbreak in 1997 would have resulted in many more cases.

In 1998, we are witnessing the benefits of these initiatives. Continued success will depend upon achieving and maintaining high immunization coverage and aggressive case and contact follow-up.

MENINGOCOCCAL DISEASE (INVASIVE)

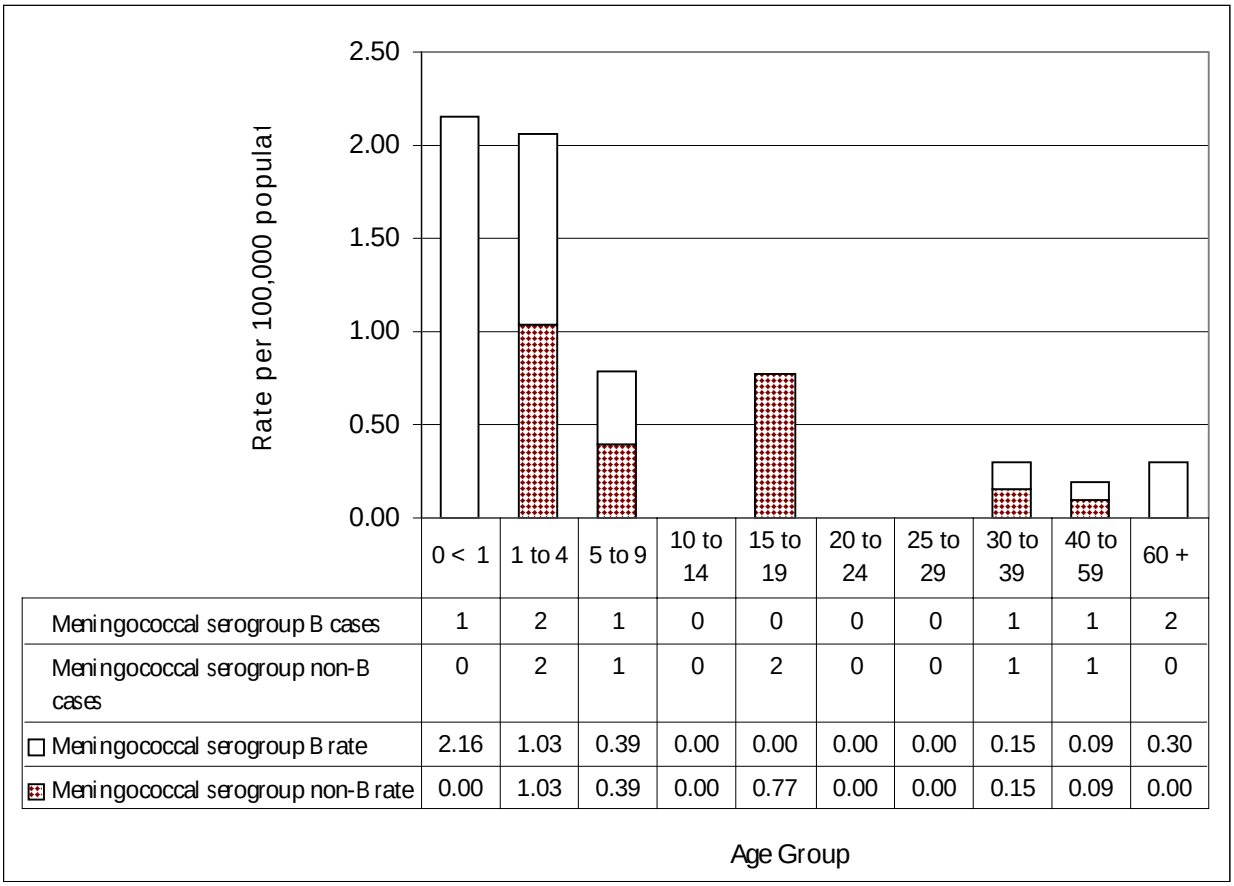
Figure 14.1 Invasive Meningococcal Disease Reports and Rates, 1986 - 1998



	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Meningococcal reports	17	12	16	22	26	28	27	37	46	42	39	36	15
Meningococcal rate	0.6	0.4	0.5	0.7	0.8	0.8	0.8	1.0	1.3	1.1	1.0	0.9	0.4
Meningococcal rate Canada	1.0	1.2	1.2	1.6	1.6	1.6	1.6	1.3	1.1	0.9	0.7	0.8	

Fifteen confirmed cases of invasive meningococcal disease in 1998 (6 male and 9 female) is the lowest number of reported cases in British Columbia since 1987. This represents an overall incidence rate of 0.4 cases per 100,000, less than half of either the provincial rate experienced the previous year or the mean provincial rate over the past 10 years (both 0.9 per 100,000). This mirrors the national trend, with a Canada-wide incidence rate 50% lower than in 1997. There were no known deaths. There were no meningococcal disease clusters, outbreaks or secondary cases reported. In at least 2 instances, laboratory results were restricted to a finding of gram negative diplococci in cerebral spinal fluid, which does not meet the Canadian surveillance case definition. Although not included as cases for surveillance purposes, these may nevertheless prompt public health action with respect to case contact follow-up and management.

Figure 14.2 Invasive Meningococcal Disease Rates by Age Group, 1998

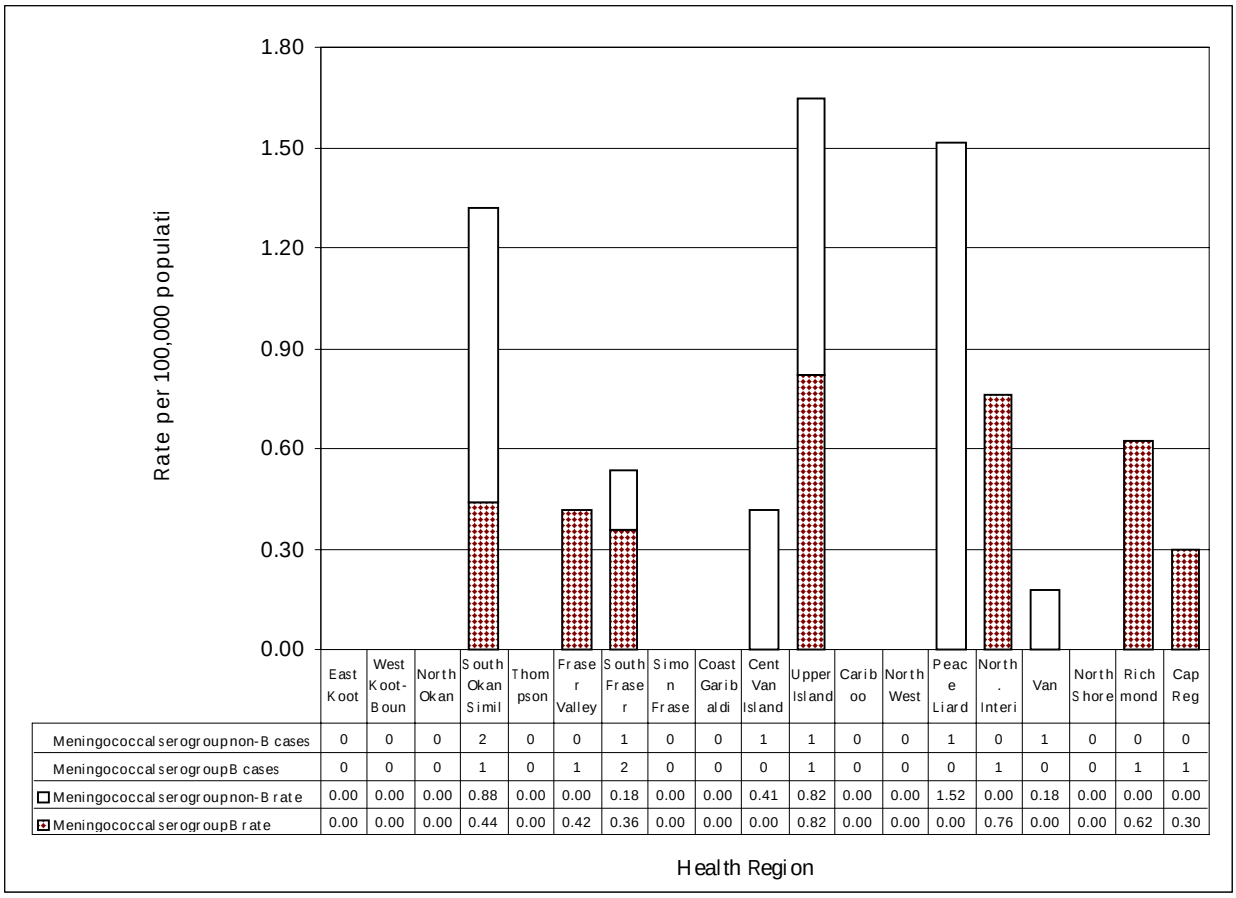


	0 < 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 39	40 to 59	60 +
Meningococcal serogroup B cases	1	2	1	0	0	0	0	1	1	2
Meningococcal serogroup non-B cases	0	2	1	0	2	0	0	1	1	0
Meningococcal serogroup B rate	2.16	1.03	0.39	0.00	0.00	0.00	0.00	0.15	0.09	0.30
Meningococcal serogroup non-B rate	0.00	1.03	0.39	0.00	0.77	0.00	0.00	0.15	0.09	0.00

Clinical presentation involved 8 with septicemia, 5 with meningitis and 2 persons with both septicemia and meningitis. Septicemia presentations were clustered among very old (2 of 8 cases over 70 years age) and young persons (5 of 8 cases 5 years and under). Meningitis cases were relatively evenly distributed over an age range spanning 1 to 42 years. As in previous non-outbreak years, the age-specific incidence rate of invasive meningococcal disease was highest among infants and young children (5 years and under), over 2 per 100,000, five times the overall provincial rate.

Six cases (40%) were serogroup B; 6 (40%) serogroup C; 2 (13%) serogroup W and 1 (7%) serogroup Y. Serogroups B and C, which together represent 80% of reported cases, were relatively evenly distributed by both clinical disease (meningitis vs septicemia) and age. Among cases presenting with septicemia, 4 were serogroup C and 4 serogroup B, while among meningitis cases, there were 3 serogroup B and 2 serogroup C. The 5 cases reported this year among infants and children under 5 years of age involved 2 serogroup B; 2 serogroup C; and 1 serogroup Y.

Figure 14.3 Invasive Meningococcal Disease Rates by Health Region, 1998



	East Koot	West Koot-Boun	North Okan	South Okan Simil	Thompson	Fraser Valley	South Fraser	Simon Frase	Coast Garibaldi	Cent Van Island	Upper Island	Cariboo	North West	Peace Liard	North. Interi	Van	North Shore	Richmond	Cap Reg
Meningococcal serogroup non-B cases	0	0	0	2	0	0	1	0	0	1	1	0	0	1	0	1	0	0	0
Meningococcal serogroup B cases	0	0	0	1	0	1	2	0	0	0	1	0	0	0	1	0	0	1	1
Meningococcal serogroup non-B rate	0.00	0.00	0.00	0.88	0.00	0.00	0.18	0.00	0.00	0.41	0.82	0.00	0.00	1.52	0.00	0.18	0.00	0.00	0.00
Meningococcal serogroup B rate	0.00	0.00	0.00	0.44	0.00	0.42	0.36	0.00	0.00	0.00	0.82	0.00	0.00	0.00	0.76	0.00	0.00	0.62	0.30

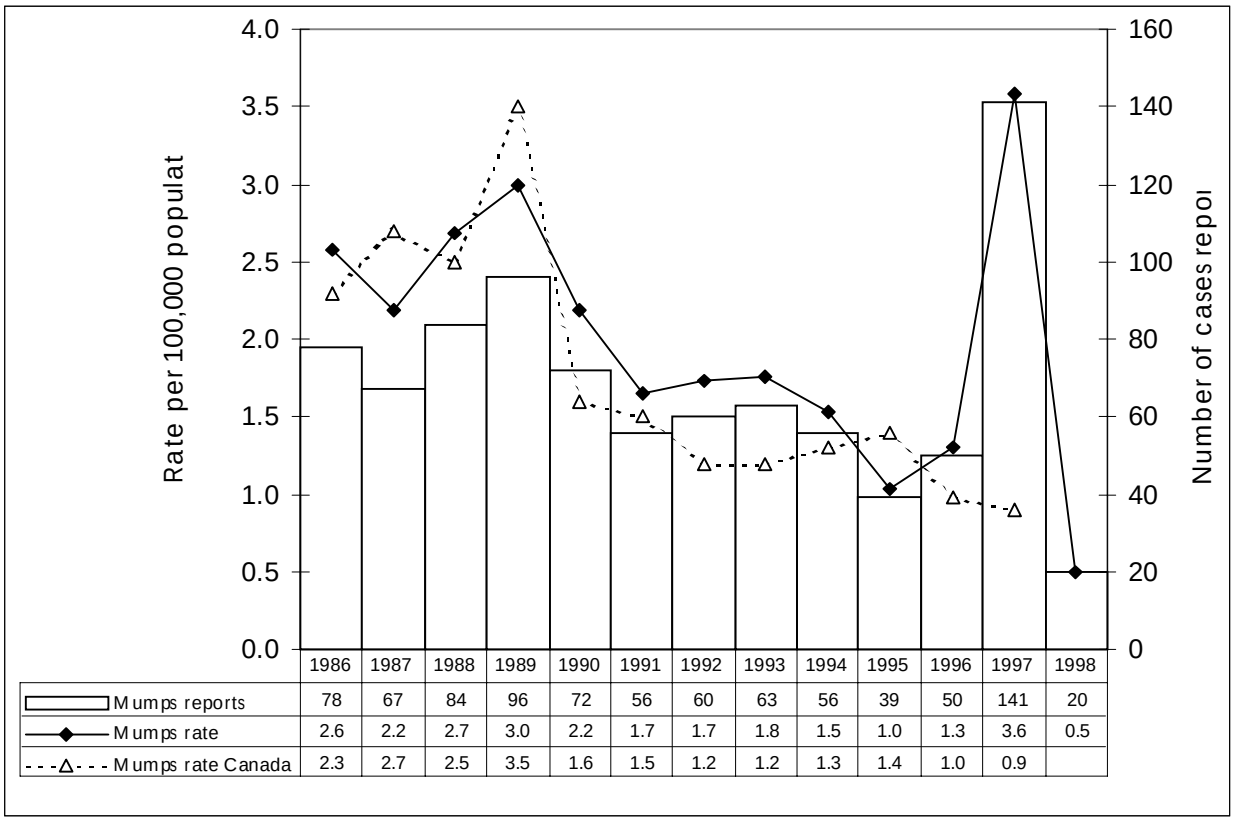
There was no significant regional clustering of disease in 1998, with cases widely scattered throughout the province, from both urban and rural Health Authorities. None of the meningococccal isolates recovered this year in British Columbia demonstrated antimicrobial resistance to a panel of antibiotics that included penicillin, ciproflaxacin, ceftriaxone, or rifampin.

The current licenced polysaccharide quadravalent meningococcal vaccine only protects against meningococcal serogroups A, C, W-135 and Y. This vaccine is unsuitable for a universal immunization program because its protective efficacy is variable among the 4 serogroups with the duration of protection probably limited to 3 years or less, and even shorter in children under 2 years of age. Even if the current vaccine provided better, longer lasting protection, it would not protect against the 40% of cases reported in British Columbia in 1998 that were caused by serogroup B. Its current recommended use is limited to those at high risk of exposure or serious disease: persons with anatomic or functional asplenia; individuals undergoing bone marrow transplant; travelers to regions of the world experiencing high rates of endemic meningococcal transmission,

and for outbreak control. Clinical trials in Canada and elsewhere are continuing of conjugate meningococcal vaccines directed at serogroup B, as well as serogroups represented in the current vaccine, that offer the potential for better meningococcal prevention and control in the future. In the meantime, the cornerstone of effective control of meningococcal disease remains to be effective case-finding, rapid laboratory confirmation and reporting to public health, contact tracing and timely provision of antibiotic chemoprophylaxis for identified close contacts.

MUMPS

Figure 15.1 Mumps Reports and Rates, 1986 - 1998

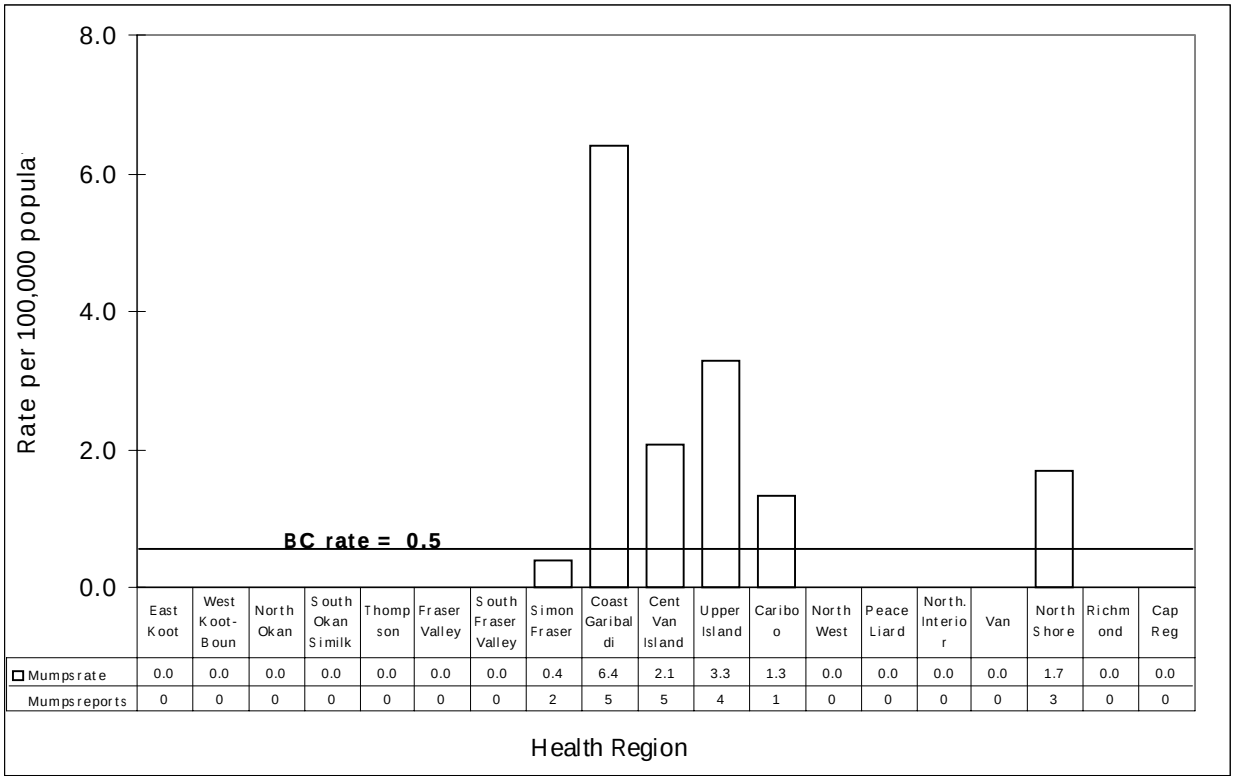


	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Mumps reports	78	67	84	96	72	56	60	63	56	39	50	141	20
Mumps rate	2.6	2.2	2.7	3.0	2.2	1.7	1.7	1.8	1.5	1.0	1.3	3.6	0.5
Mumps rate Canada	2.3	2.7	2.5	3.5	1.6	1.5	1.2	1.2	1.3	1.4	1.0	0.9	

Despite a pocket of increased mumps activity beginning in November in Coast Garibaldi, the number of mumps cases reported in BC in 1998 was the lowest recorded with 20 cases. This corresponds with a rate of 0.5 per 100,000 population.
Coast Garibaldi reported the highest rate for mumps with 6.4 cases per 100,000 population, followed by Upper Island with 3.3 cases per 100,000 and Central Vancouver Island with 2.1 cases per 100,000.

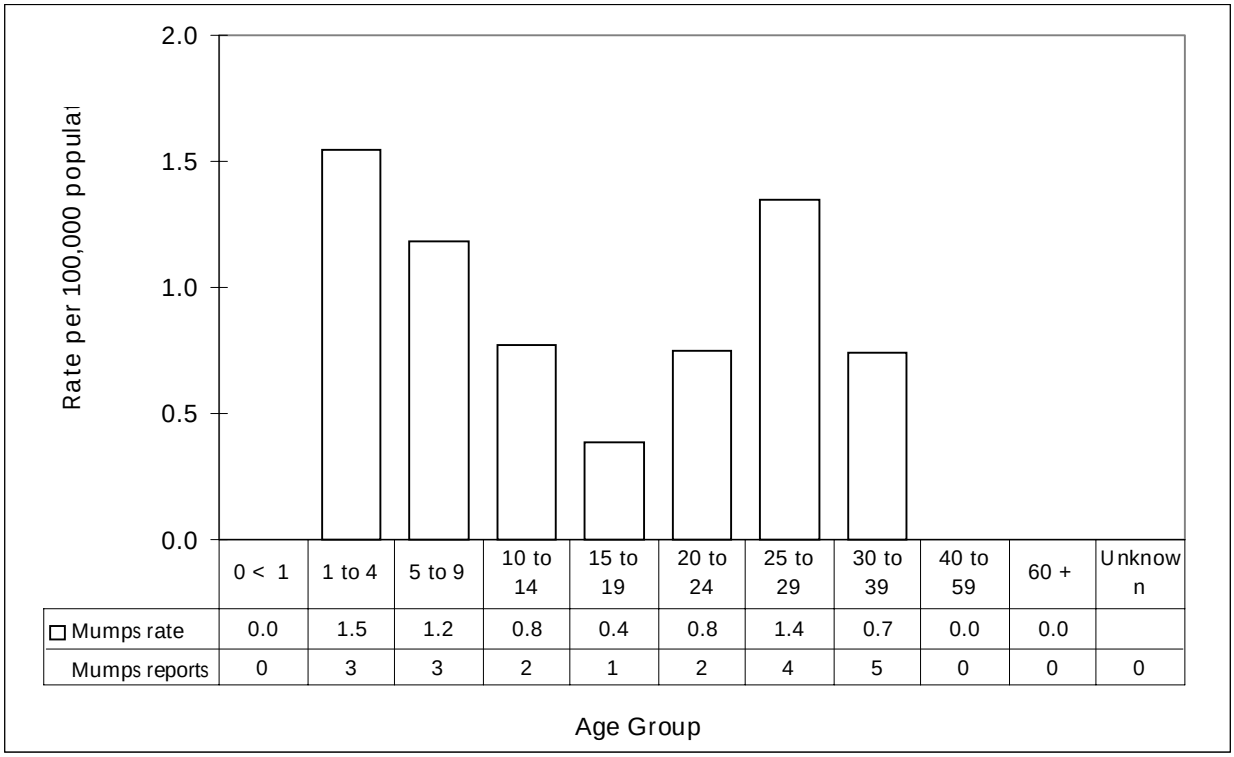
Mumps surveillance and assessment of immunization uptake continues to be necessary to ensure adequate and sustained coverage in children as well as adults.

Figure 15.2 Mumps Rates by Health Region, 1998



	East Koot	West Koot-Boun	North Okan	South Okan Similk	Thompson	Fraser Valley	South Fraser Valley	Simon Fraser	Coast Garibaldi	Cent Van Island	Upper Island	Caribo o	North West	Peace Liard	North. Interior	Van	North Shore	Richmond	Cap Reg
Mumps rate	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	6.4	2.1	3.3	1.3	0.0	0.0	0.0	0.0	1.7	0.0	0.0
Mumps reports	0	0	0	0	0	0	0	2	5	5	4	1	0	0	0	0	3	0	0

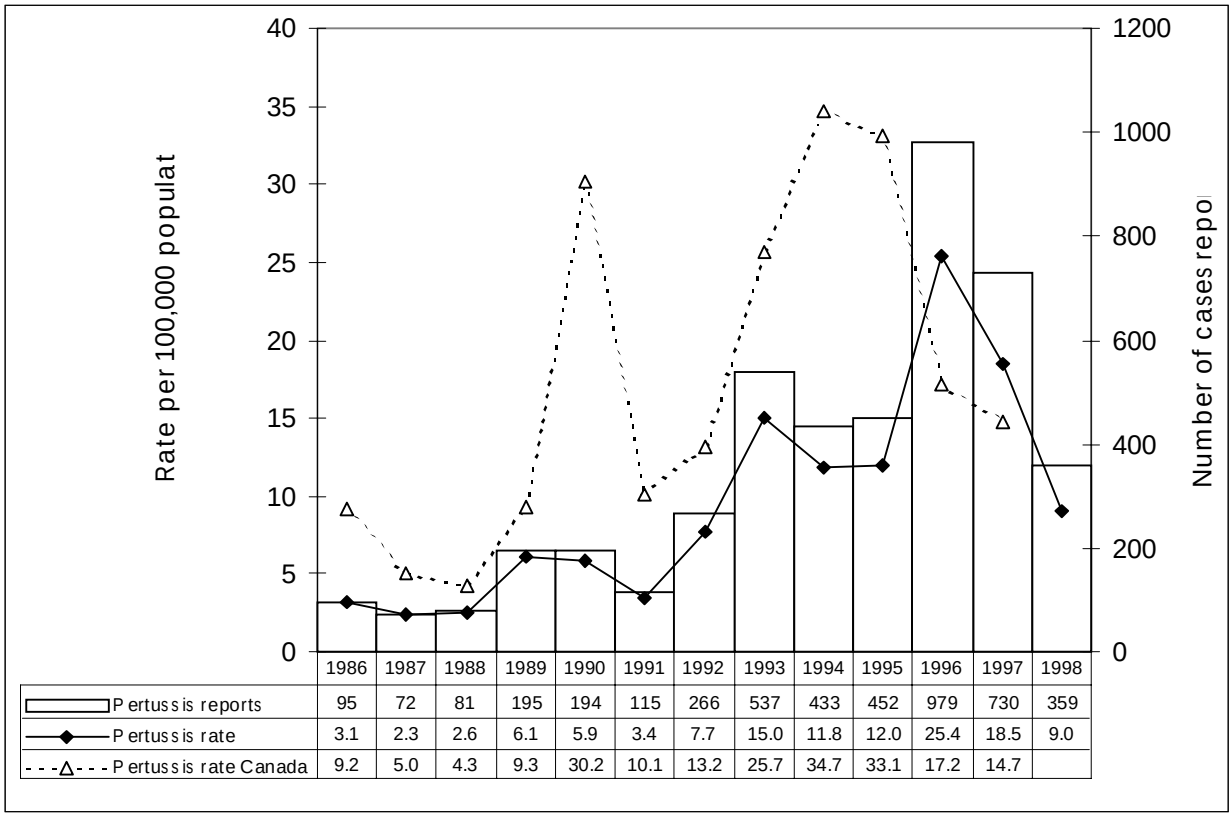
Figure 15.3 Mumps Rates by Age Group, 1998



	0 < 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 39	40 to 59	60 +	Unknown
Mumps rate	0.0	1.5	1.2	0.8	0.4	0.8	1.4	0.7	0.0	0.0	
Mumps reports	0	3	3	2	1	2	4	5	0	0	0

PERTUSSIS

Figure 16.1 Pertussis Reports and Rates, 1986 - 1998

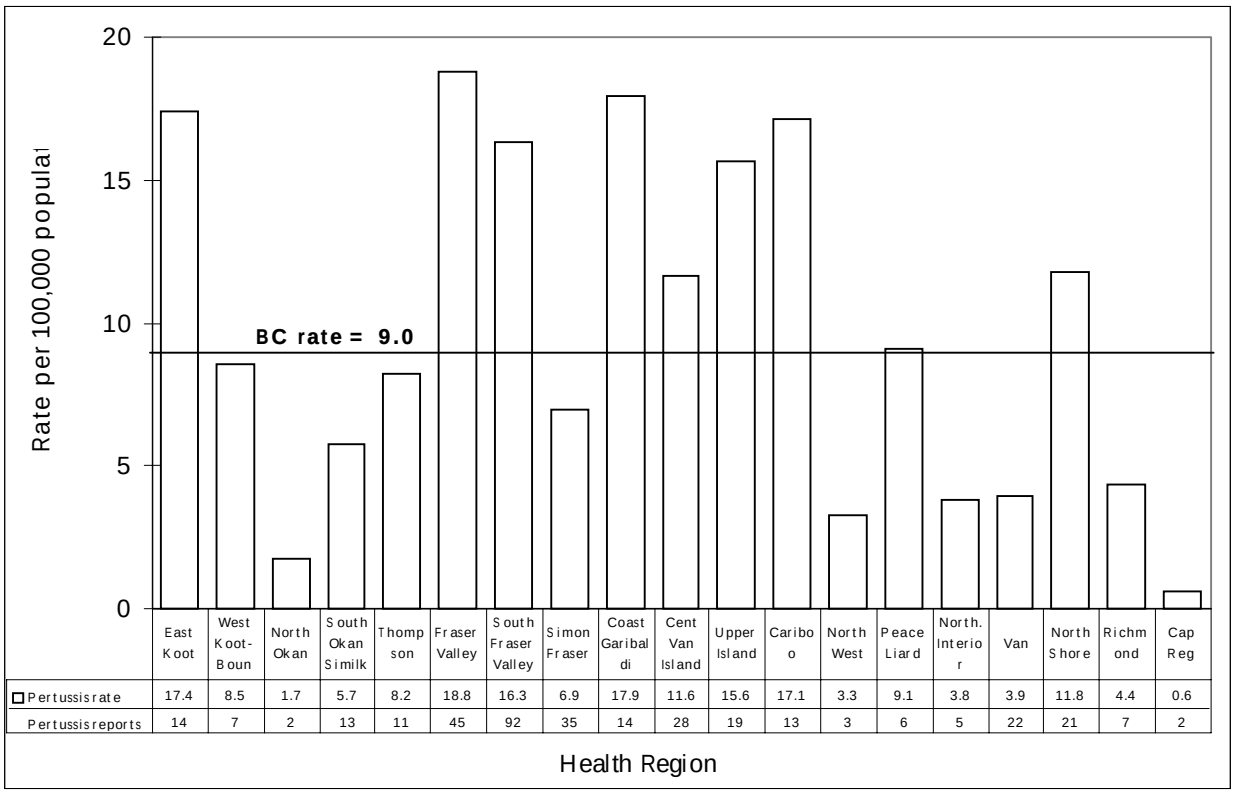


	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Pertussis reports	95	72	81	195	194	115	266	537	433	452	979	730	359
Pertussis rate	3.1	2.3	2.6	6.1	5.9	3.4	7.7	15.0	11.8	12.0	25.4	18.5	9.0
Pertussis rate Canada	9.2	5.0	4.3	9.3	30.2	10.1	13.2	25.7	34.7	33.1	17.2	14.7	

In 1998, BC experienced its lowest level of pertussis activity since 1992 although in general, rates are still higher than those witnessed in the 1980s. In 1998, there were 359 cases of pertussis reported corresponding to a rate of 9 per 100,000. This represents a halving of reports from 1997 and almost a 2/3 reduction from 1996. Nevertheless, there were pockets of significant activity in 1998 in the Fraser Valley, Coast Garibaldi, East Kootenay, Cariboo and South Fraser Valley, and the highest rates continue to be in infants. It is essential to remember that pertussis activity has historically been cyclic. High immunization levels must be maintained in order to sustain a reduction in the burden of this disease.

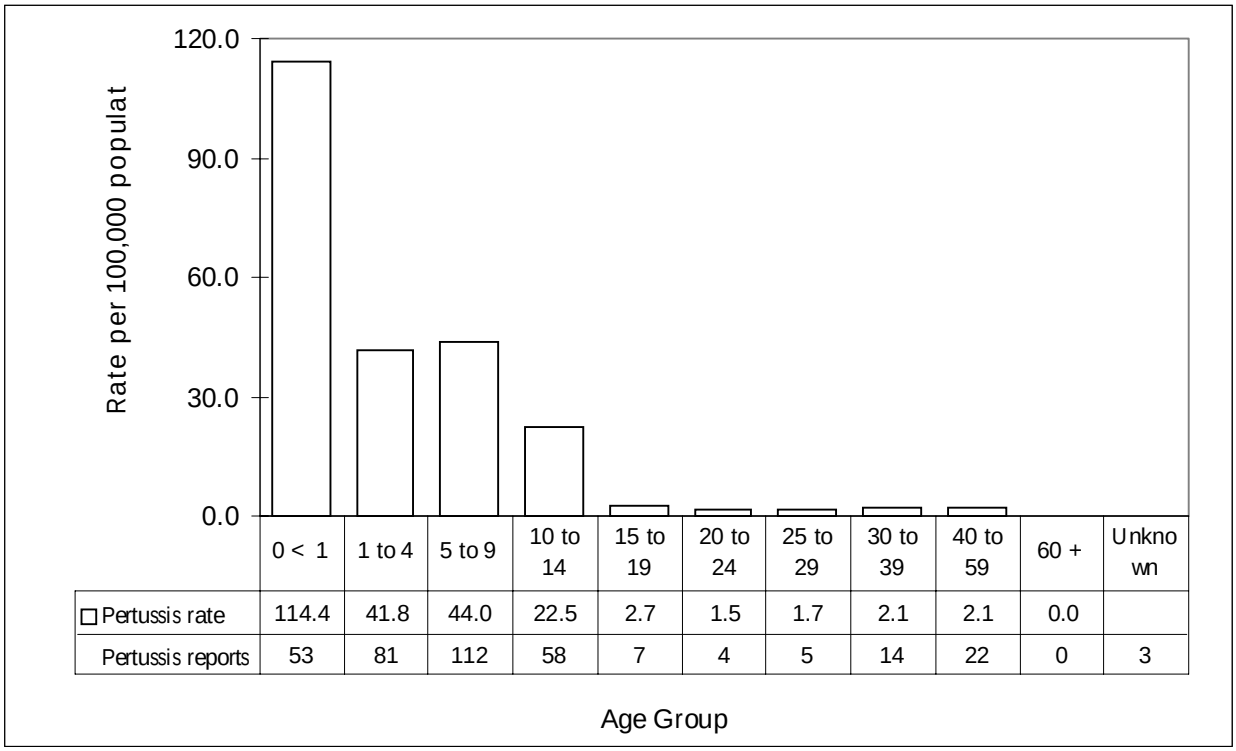
In August, 1997 BC introduced acellular pertussis vaccine into the routine childhood immunization schedule. This vaccine is associated with fewer side effects and higher efficacy than the previously used whole cell pertussis vaccine. It is too early to conclude what impact, if any, this change may have had on the incidence of pertussis during 1998 but it is likely to lead to improved compliance and protection.

Figure 16.2 Pertussis Rates by Health Region, 1998



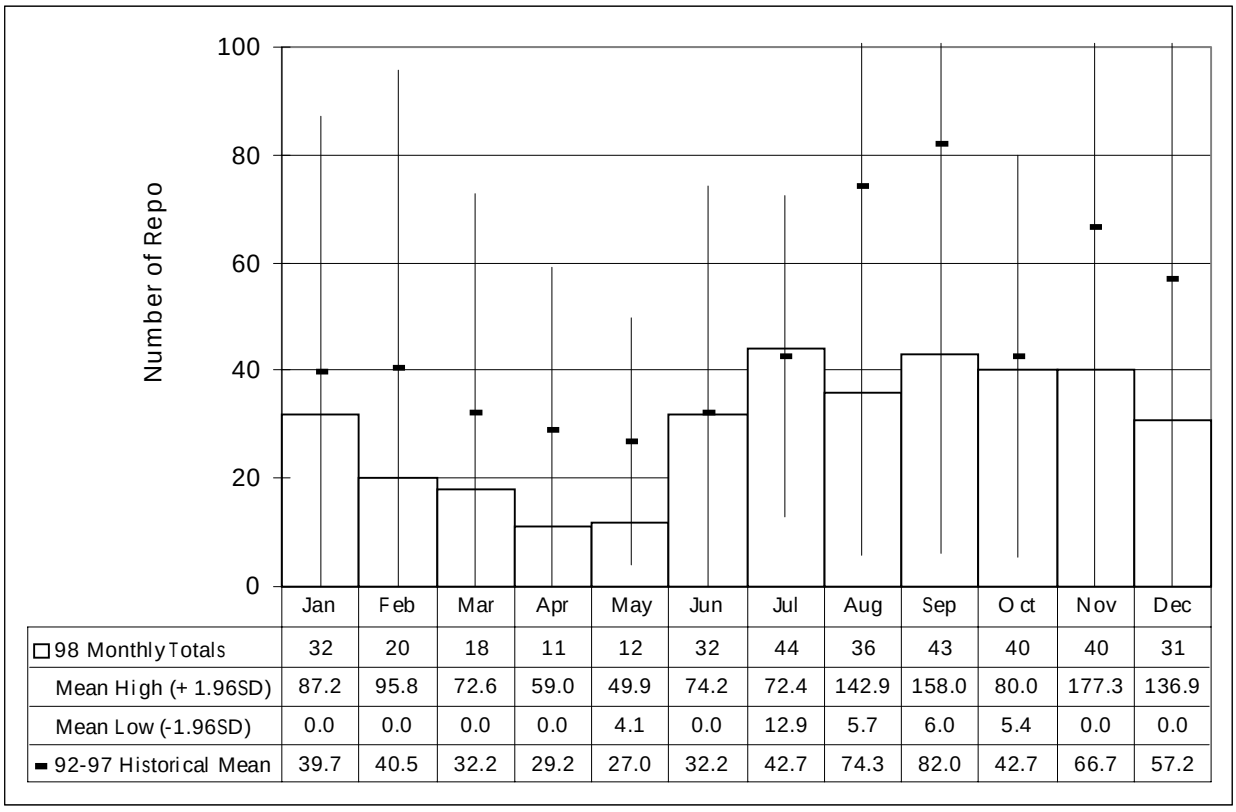
While pertussis activity in Canada has increased generally during the 1990s compared to the 1980s, the greatest relative increase has been amongst persons 15 years of age and older. Licensure of an adolescent/adult acellular pertussis vaccine (TdcP) is anticipated in 1999. This vaccine will enable us to target the reservoir of adolescents and adult pertussis activity which poses an ongoing risk to susceptible infants and children.

Figure 16.3 Pertussis Rates by Age Group, 1998



	0 < 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 39	40 to 59	60 +	Unknown
Pertussis rate	114.4	41.8	44.0	22.5	2.7	1.5	1.7	2.1	2.1	0.0	
Pertussis reports	53	81	112	58	7	4	5	14	22	0	3

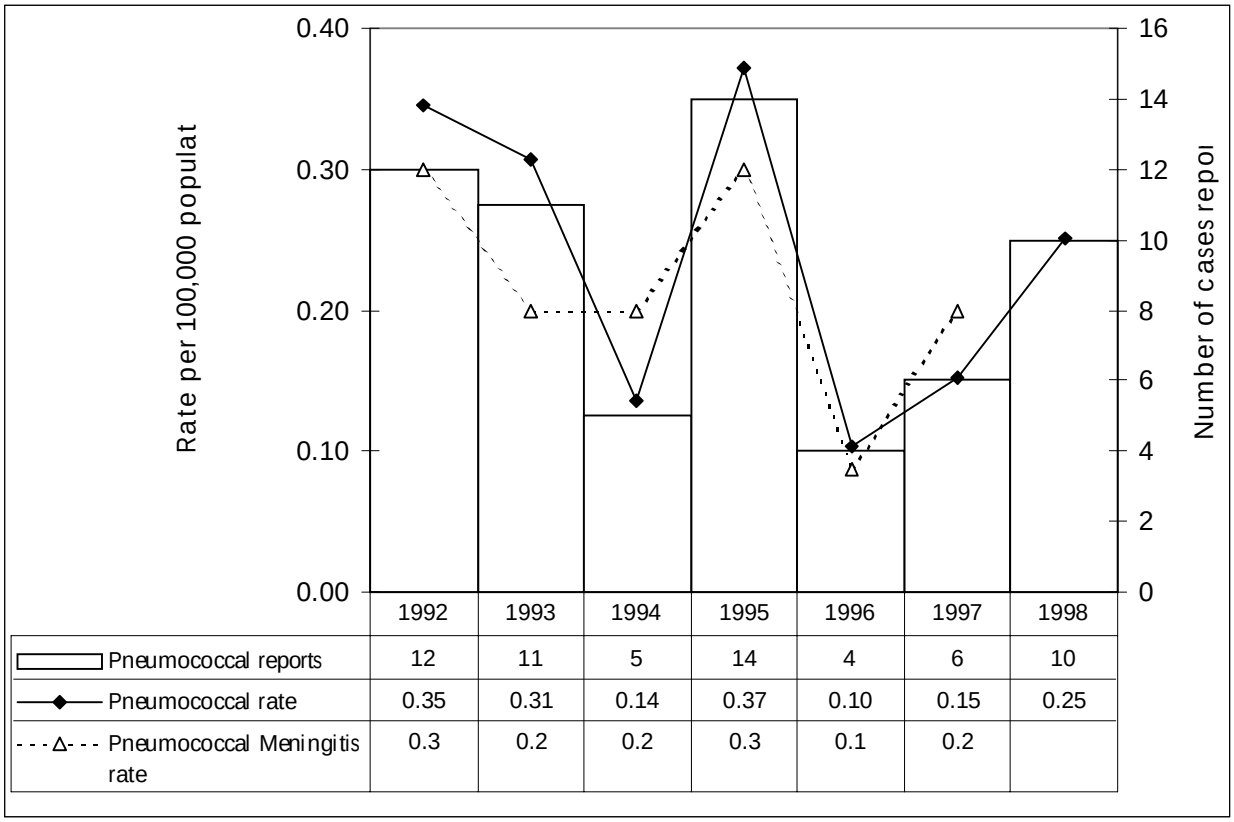
Figure 16.4 Pertussis Reports by Month, 1998



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
98 Monthly Totals	32	20	18	11	12	32	44	36	43	40	40	31
Mean High (+ 1.96SD)	87.2	95.8	72.6	59.0	49.9	74.2	72.4	142.9	158.0	80.0	177.3	136.9
Mean Low (-1.96SD)	0.0	0.0	0.0	0.0	4.1	0.0	12.9	5.7	6.0	5.4	0.0	0.0
92-97 Historical Mean	39.7	40.5	32.2	29.2	27.0	32.2	42.7	74.3	82.0	42.7	66.7	57.2

PNEUMOCOCCAL DISEASE (INVASIVE)

Figure 17.1 Pneumococcal Disease Reports and Rates, 1992 - 1998

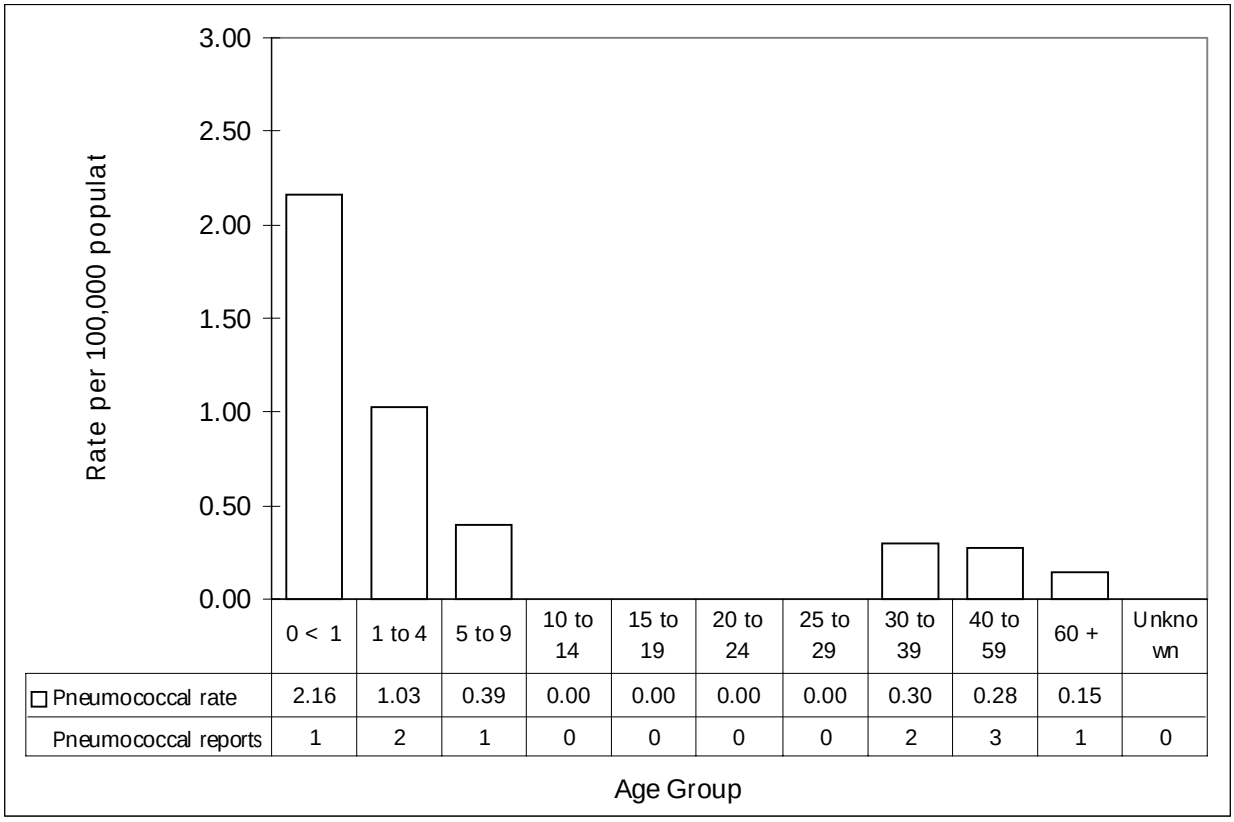


	1992	1993	1994	1995	1996	1997	1998
Pneumococcal reports	12	11	5	14	4	6	10
Pneumococcal rate	0.35	0.31	0.14	0.37	0.10	0.15	0.25
Pneumococcal Meningitis rate	0.3	0.2	0.2	0.3	0.1	0.2	

The only form of invasive pneumococcal disease currently reportable in British Columbia is meningitis. Ten cases were reported in 1998, compared with 6 the previous year, and an average of 9 cases over each of the previous 6 years (1992-1997). This represents an overall rate of 0.25 cases per 100,000 compared with an average 0.23 cases per 100,000 over the previous 6 years. All cases occurred randomly with no recognized outbreak of invasive pneumococcal disease and no secondary cases reported.

Pneumococcal meningitis is likely under-reported. A review of acute hospitalization data for the period 1992 to 1996 revealed an average of 16 cases hospitalized for this condition each year. However, an average of only 9 cases were reported over this same 5 year period. Under-reporting is a well-recognized limitation of passive surveillance. Over the period studied for pneumococcal meningitis, under-reported cases represented an average 7 of 16 (44%) of cases that were identified from acute hospitalization data.

Figure 17.2 Pneumococcal Rates by Age Group, 1998



	0 < 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 39	40 to 59	60 +	Unknown
Pneumococcal rate	2.16	1.03	0.39	0.00	0.00	0.00	0.00	0.30	0.28	0.15	
Pneumococcal reports	1	2	1	0	0	0	0	2	3	1	0

A bimodal shaped profile of disease incidence by age was observed, with cases clustered among infants and children under 5 years (3 of 10 cases) and adults 40 years and older (4 of 10 cases). The highest age-specific incidence rates occurred among infants and children under 5, whose rate of pneumococcal meningitis was approximately 5 times (1.25 per 100,000) the overall provincial rate (0.25 per 100,000). Survival data are not available.

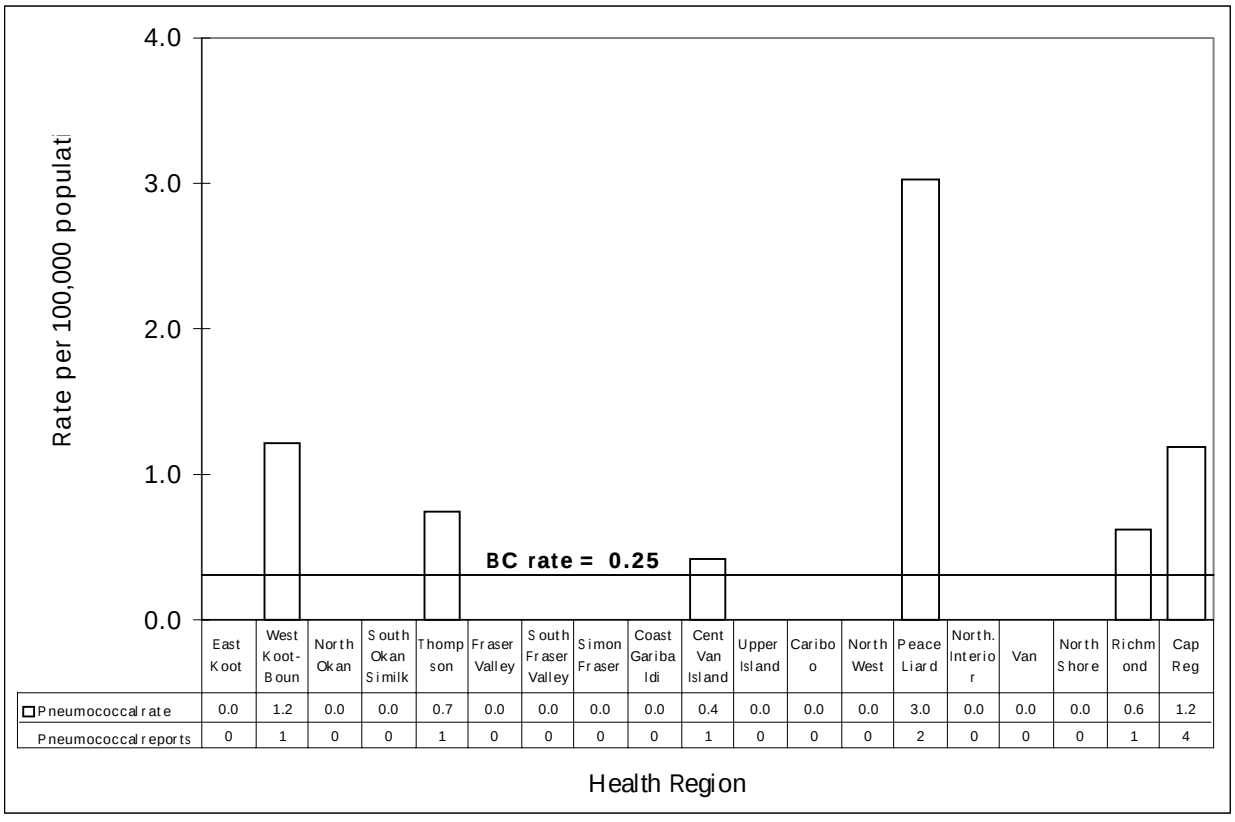
It is anticipated that all syndromes of invasive pneumococcal disease, including meningitis, septicemia, pneumonia, or instances when *Streptococcus pneumoniae* is isolated from a normally sterile body site, will be made reportable provincially and nationally in 1999. A special surveillance study funded by the British Columbia Centre for Disease Control Society is also expected to get underway in 1999, to conduct surveillance on the epidemiology of antimicrobial resistance in pneumococcal bacteria. These initiatives will facilitate evaluation of the provincial pneumococcal immunization program, which was expanded in April 1998 to provide publicly funded pneumococcal vaccine to all British Columbians 65 years and older.

Funding has been requested from the British Columbia Ministry of Health to further expand the program, to catch-up

all persons between 2 and 64 years of age who are at high risk of serious invasive pneumococcal disease, and for whom pneumococcal vaccination is recommended by the National Advisory Committee on Immunization. Immunizing this group will prevent an estimated 8 to 21 deaths, 151 to 373 hospitalizations, and between $1.1 to $2.8 million in direct health care costs each year. By April 2001, all such persons entering a high risk category will be eligible for publicly funded pneumococcal vaccine as part of the provincial immunization program. Clinical trials are also continuing in Canada and elsewhere on conjugate pneumococcal vaccines that offer the potential for better prevention and control of pneumococcal disease, and which may expand the indications for which pneumococcal immunization is recommended.

Public health priorities over the next year for prevention of invasive pneumococcal disease are achieving high pneumococcal immunization coverage among persons over 65 and acquiring funding to expand the provincial pneumococcal immunization program to include catch-up of high risk persons 2 to 64 years of age.

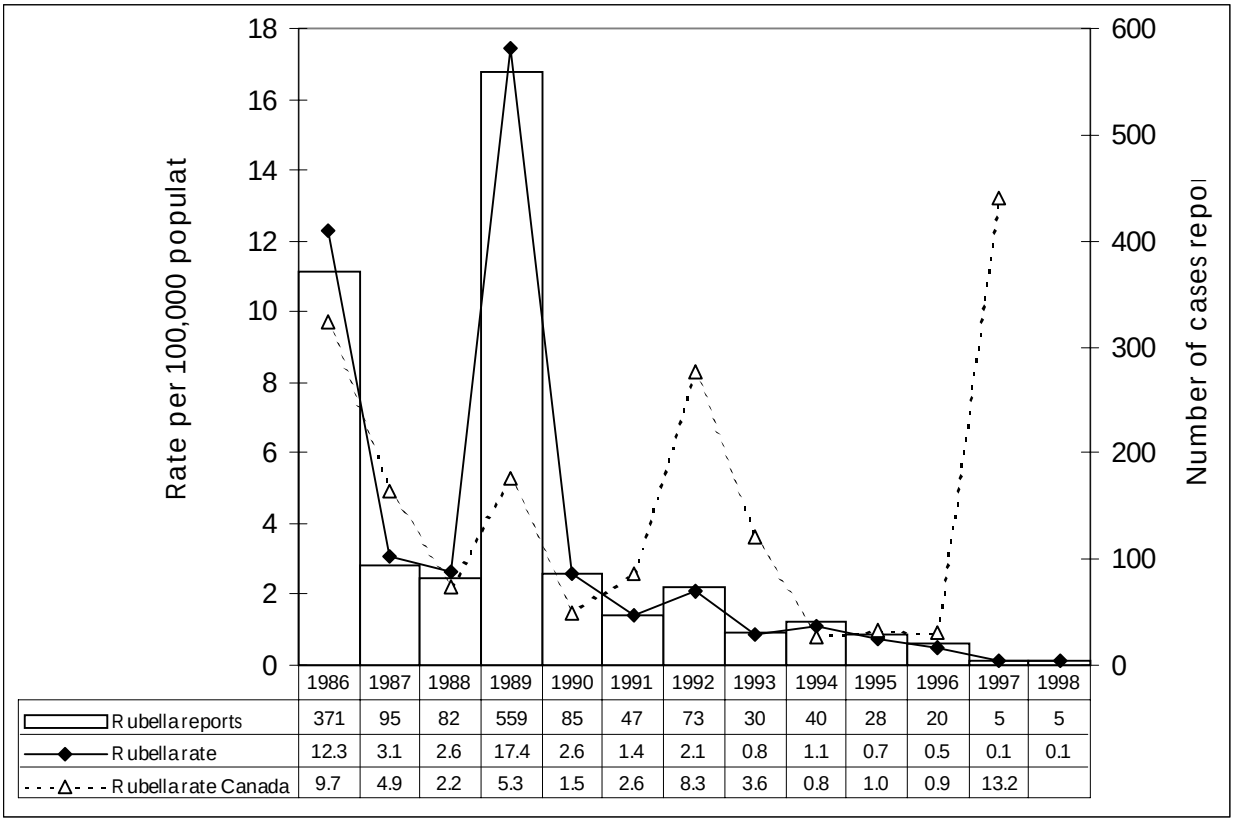
Figure 17.3 Pneumococcal Disease Rates by Health Region, 1998



	East Koot	West Koot-Boun	North Okan	South Okan Similk	Thompson	Fraser Valley	South Fraser Valley	Simon Fraser	Coast Garibaldi	Cent Van Island	Upper Island	Caribo o	North West	Peace Liard	North. Interior	Van	North Shore	Richmond	Cap Reg
Pneumococcal rate	0.0	1.2	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	3.0	0.0	0.0	0.0	0.6	1.2
Pneumococcal reports	0	1	0	0	1	0	0	0	0	1	0	0	0	2	0	0	0	1	4

RUBELLA

Figure 18 Rubella Reports and Rates, 1986 - 1998



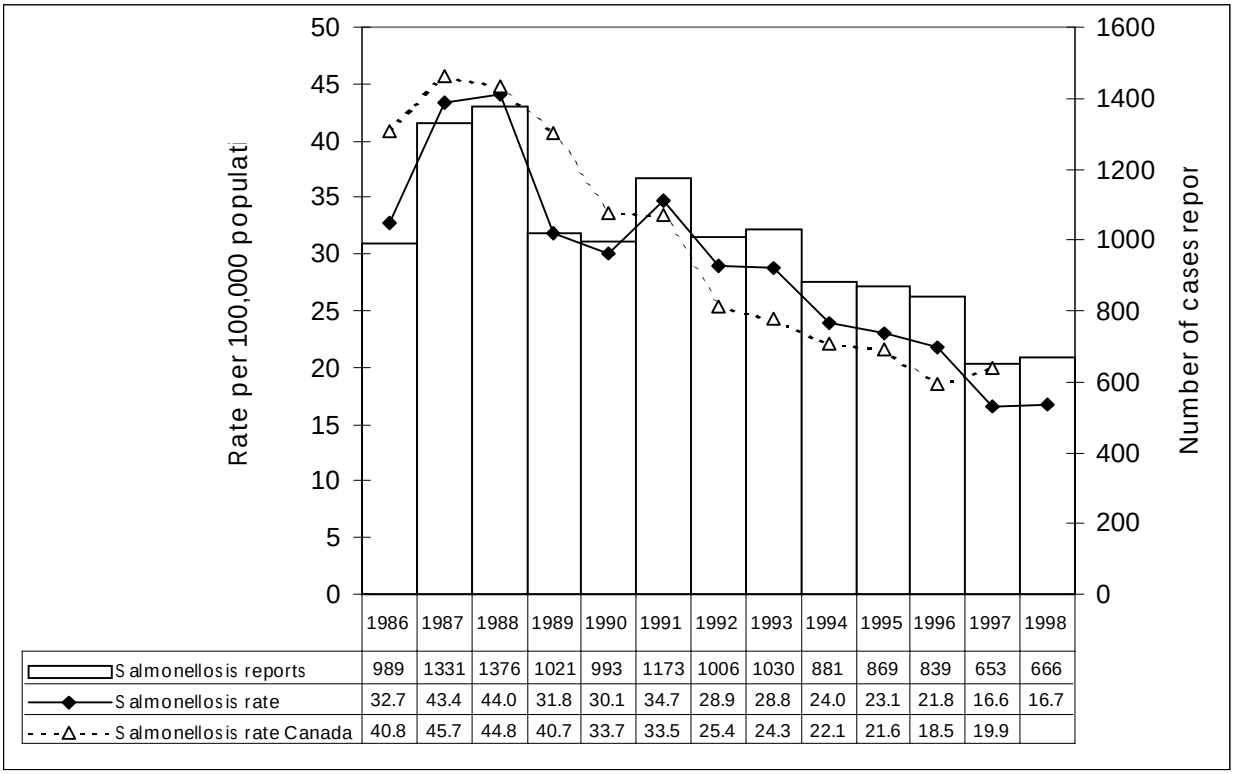
	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Rubella reports	371	95	82	559	85	47	73	30	40	28	20	5	5
Rubella rate	12.3	3.1	2.6	17.4	2.6	1.4	2.1	0.8	1.1	0.7	0.5	0.1	0.1
Rubella rate Canada	9.7	4.9	2.2	5.3	1.5	2.6	8.3	3.6	0.8	1.0	0.9	13.2	

In 1998 there were 5 cases of rubella reported. This corresponds with a rate of 0.1 cases per 100,000 population. Three of these cases, aged 43, 23 and 67 were reported from Vancouver. Capital Region reported one case in a 32 year old female and South Okanagan Similkameen reported a case in a 38 year old female.

In BC, there were no reports of congenital rubella syndrome (CRS) in 1998 but in 1997, two reports were made in children who were born in 1985 and 1995. The major objective of rubella vaccination is the prevention of rubella infection in pregnancy and the prevention of CRS. For this reason, in addition to routine two-dose immunization in childhood, rubella vaccine should be given to all women of childbearing age without documented proof of immunity. Similarly, serologic testing for rubella antibody should be a routine procedure during prenatal care for those without serologic evidence of immunity or documented prior immunization. It is essential that all women found to be susceptible receive rubella vaccine (preferably as MMR).

SALMONELLOSIS

Figure 19.1 Salmonellosis Reports and Rates, 1986 - 1998



	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Salmonellosis reports	989	1331	1376	1021	993	1173	1006	1030	881	869	839	653	666
Salmonellosis rate	32.7	43.4	44.0	31.8	30.1	34.7	28.9	28.8	24.0	23.1	21.8	16.6	16.7
Salmonellosis rate Canada	40.8	45.7	44.8	40.7	33.7	33.5	25.4	24.3	22.1	21.6	18.5	19.9	

Reporting of salmonellosis has shown a downward trend since 1988 in BC. In 1998 there were 666 cases reported for a provincial rate of 16.7 cases per 100,000 population. Coast Garibaldi had the highest regional rate at 40.9 cases per 100,000 population. Children less than 1 year of age had the highest reporting rate at 62.5 cases per 100,000 population, with a second peak in young adults aged 20 through 24 years of age.

The most frequent *Salmonella* serotypes reported during 1998 were: Typhimurium (27%), Enteritidis (17%) and Heidelberg (10%). A high proportion of isolated Salmonella Typhimurium are resistant to one or more antimicrobial agents. Further information on *Salmonella* serotypes isolated in 1998 can be found in the Provincial Laboratory Annual Report.

An outbreak of infection with Salmonella Enteritidis involved a number of Canadian provinces in March and April, 1998. An investigation in eastern Canada identified cheese found in a nationally distributed packaged lunch tray product as the source of this outbreak. Implicated lots of this product were recalled in late March and early April. Thirteen cases related to this outbreak were identified in BC resulting in a peak in reporting for the year in April.

Figure 19.2 Salmonellosis Reports by Week, 1998

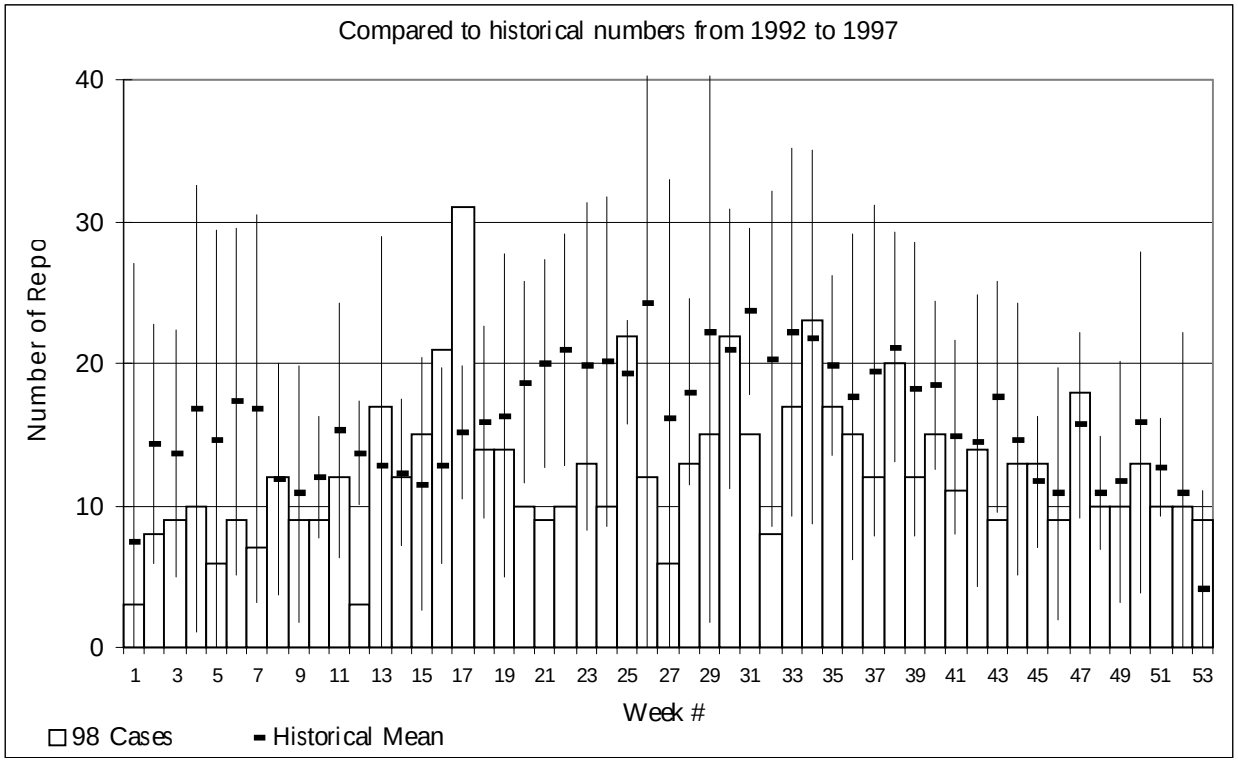
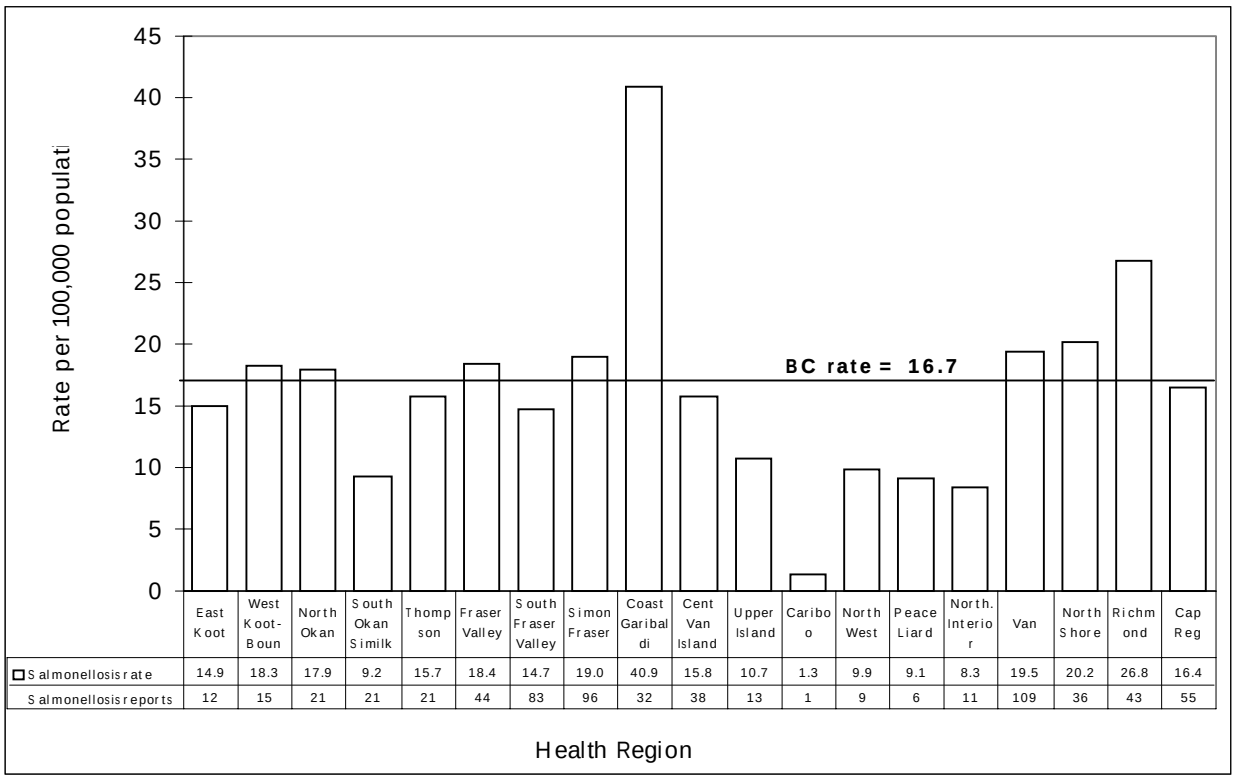
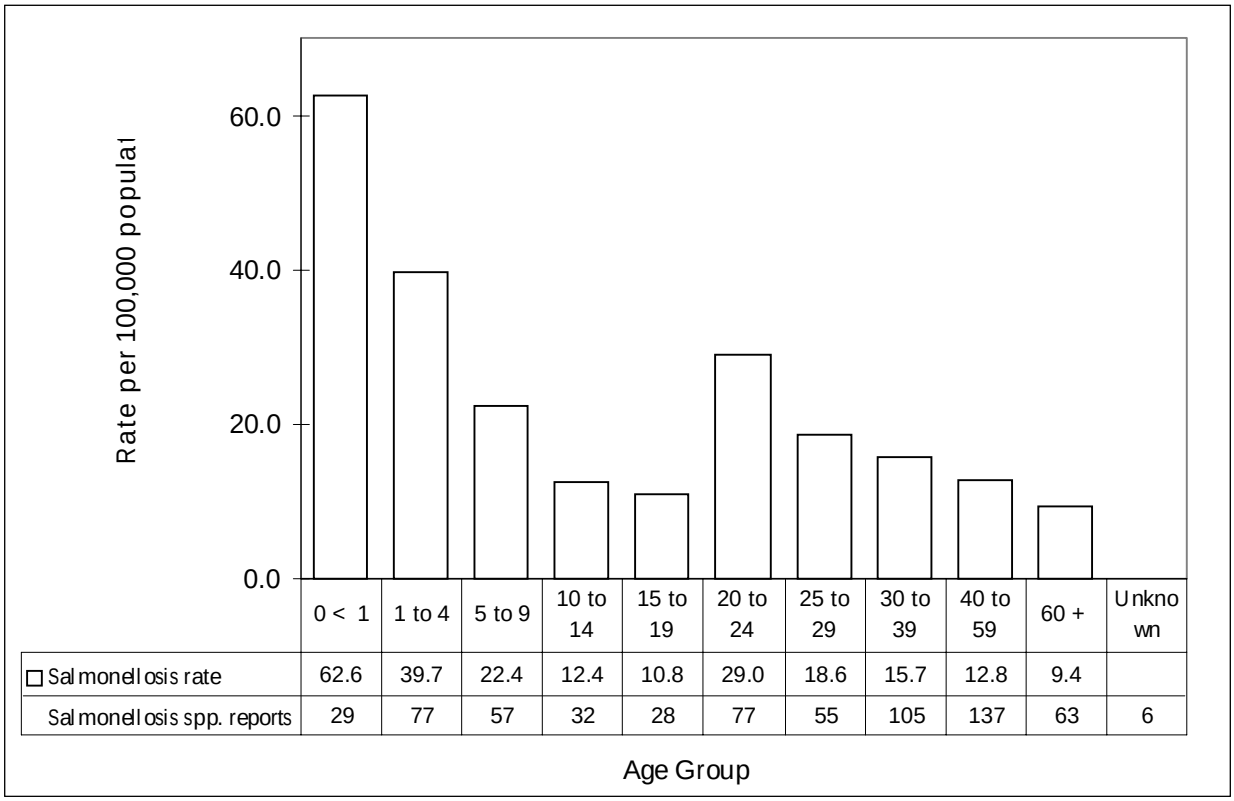


Figure 19.3 Salmonellosis Rates by Health Region, 1998



	East Koot	West Koot-Boun	North Okan	South Okan Similk	Thompson	Fraser Valley	South Fraser Valley	Simon Fraser	Coast Garibaldi	Cent Van Island	Upper Island	Caribo	North West	Peace Liard	North. Interior	Van	North Shore	Richmond	Cap Reg
Salmonellosis rate	14.9	18.3	17.9	9.2	15.7	18.4	14.7	19.0	40.9	15.8	10.7	1.3	9.9	9.1	8.3	19.5	20.2	26.8	16.4
Salmonellosis reports	12	15	21	21	21	44	83	96	32	38	13	1	9	6	11	109	36	43	55

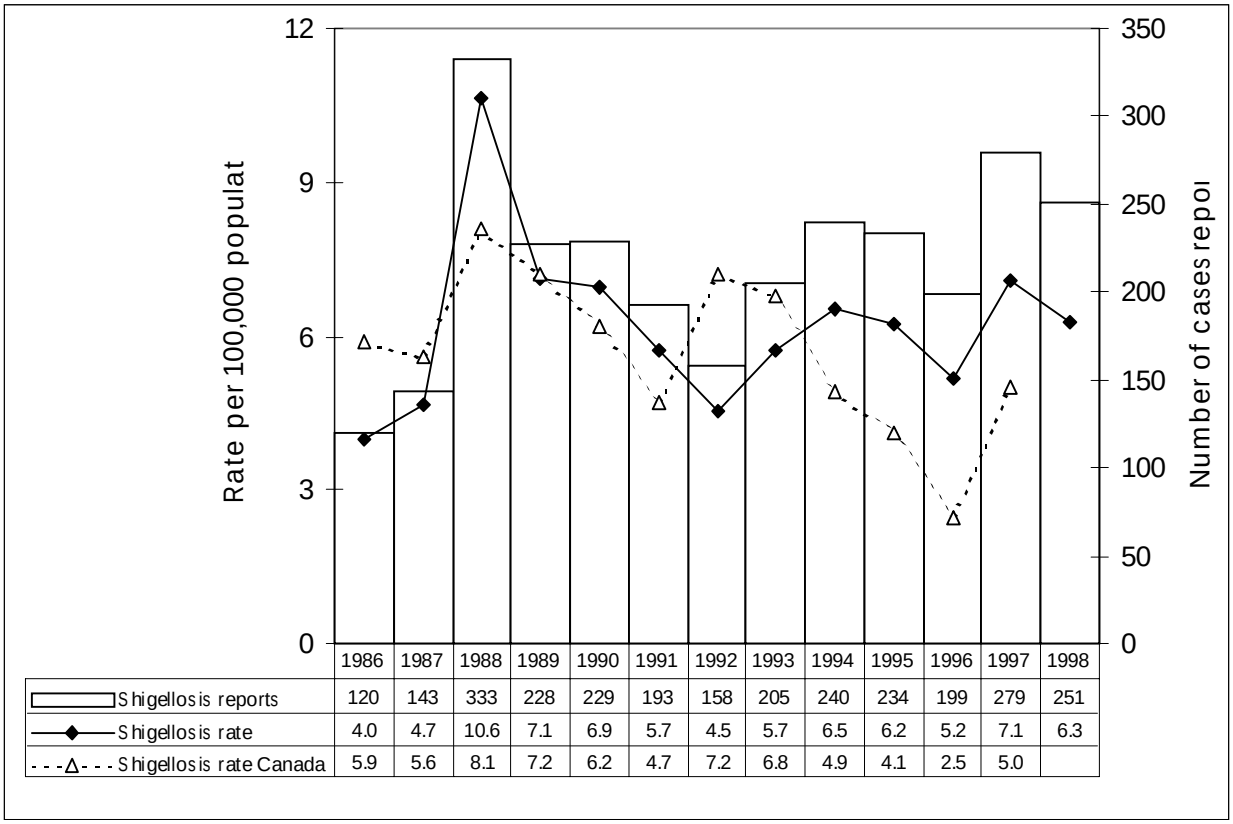
Figure 19.4 Salmonellosis Rates by Age Group, 1998



	0 < 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 39	40 to 59	60 +	Unknown
Salmonellosis rate	62.6	39.7	22.4	12.4	10.8	29.0	18.6	15.7	12.8	9.4	
Salmonellosis spp. reports	29	77	57	32	28	77	55	105	137	63	6

SHIGELLOSIS

Figure 20.1 Shigellosis Reports and Rates, 1986 - 1998



	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Shigellosis reports	120	143	333	228	229	193	158	205	240	234	199	279	251
Shigellosis rate	4.0	4.7	10.6	7.1	6.9	5.7	4.5	5.7	6.5	6.2	5.2	7.1	6.3
Shigellosis rate Canada	5.9	5.6	8.1	7.2	6.2	4.7	7.2	6.8	4.9	4.1	2.5	5.0	

There were 251 cases of infection with *Shigella* reported in BC during 1998 for a rate of 6.3 cases per 100,000 population. Coast Garibaldi had the highest regional rate at 11.5 cases per 100,000 population. Peaks in reporting occurred among children aged 1 through 4 and adults aged 25 through 29 years of age.

A number of outbreaks of infection with *Shigella sonnei* were identified in Canada and the United States between July and October 1998. Epidemiological and laboratory evidence identified fresh parsley as the source of these outbreaks. An outbreak with this species also affected individuals who attended a gathering in Cranbrook in October. Lab-confirmed cases of this outbreak, however, resided in other health regions. A cohort study found an association between illness and two types of sauces served at the gathering, but not with parsley. Pulsed field gel electrophoresis (PFGE) showed that the Cranbrook strain was slightly different than the parsley related outbreak strain.

Figure 20.2 Shigellosis Reports by Week, 1998

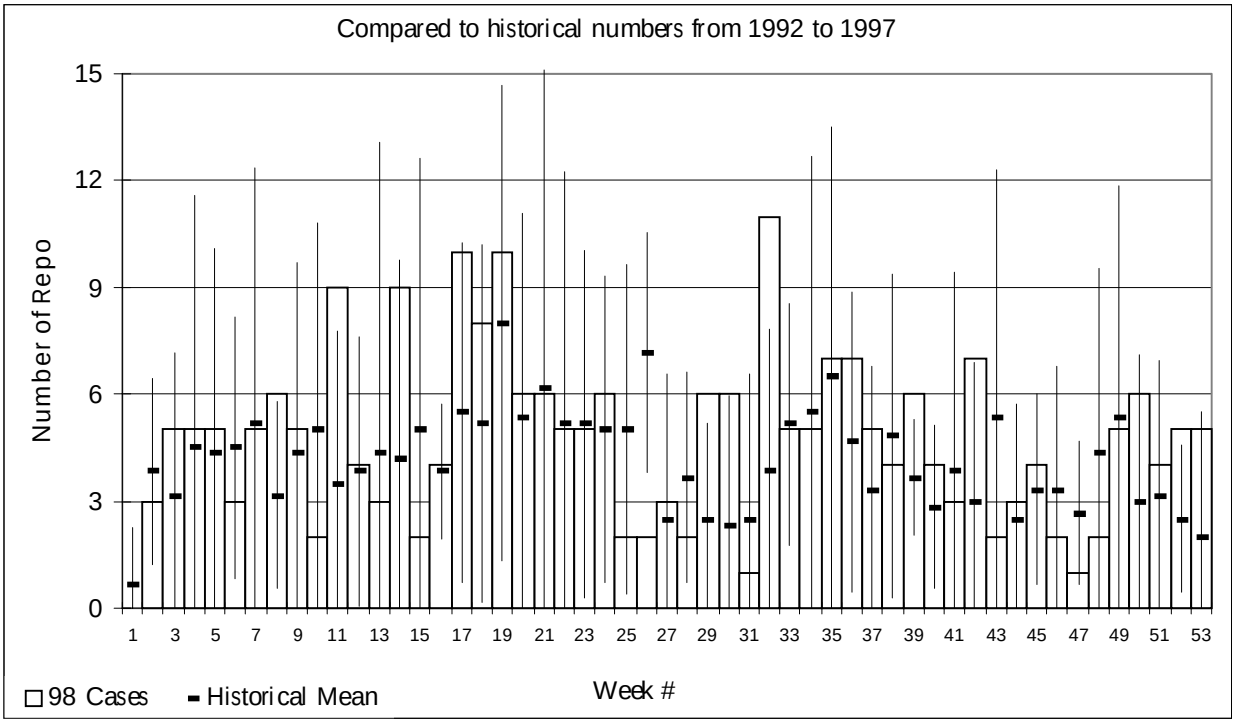
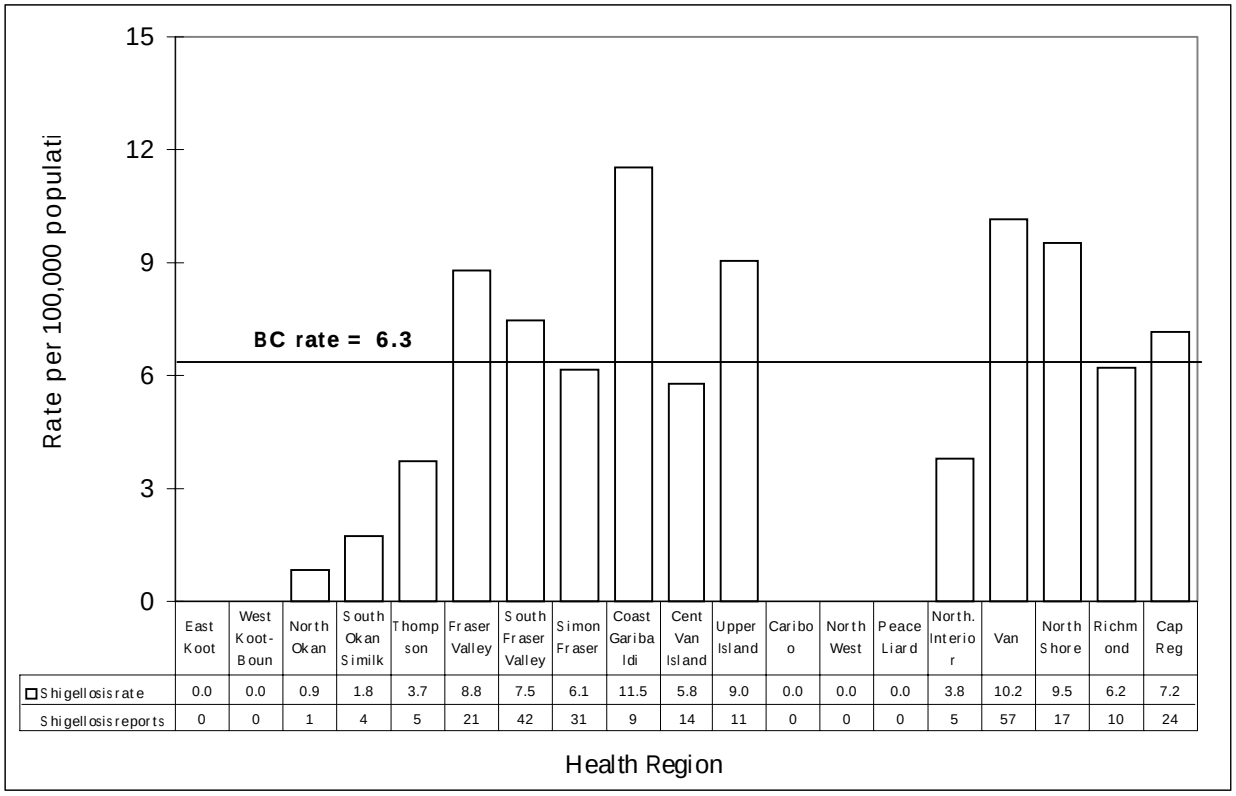
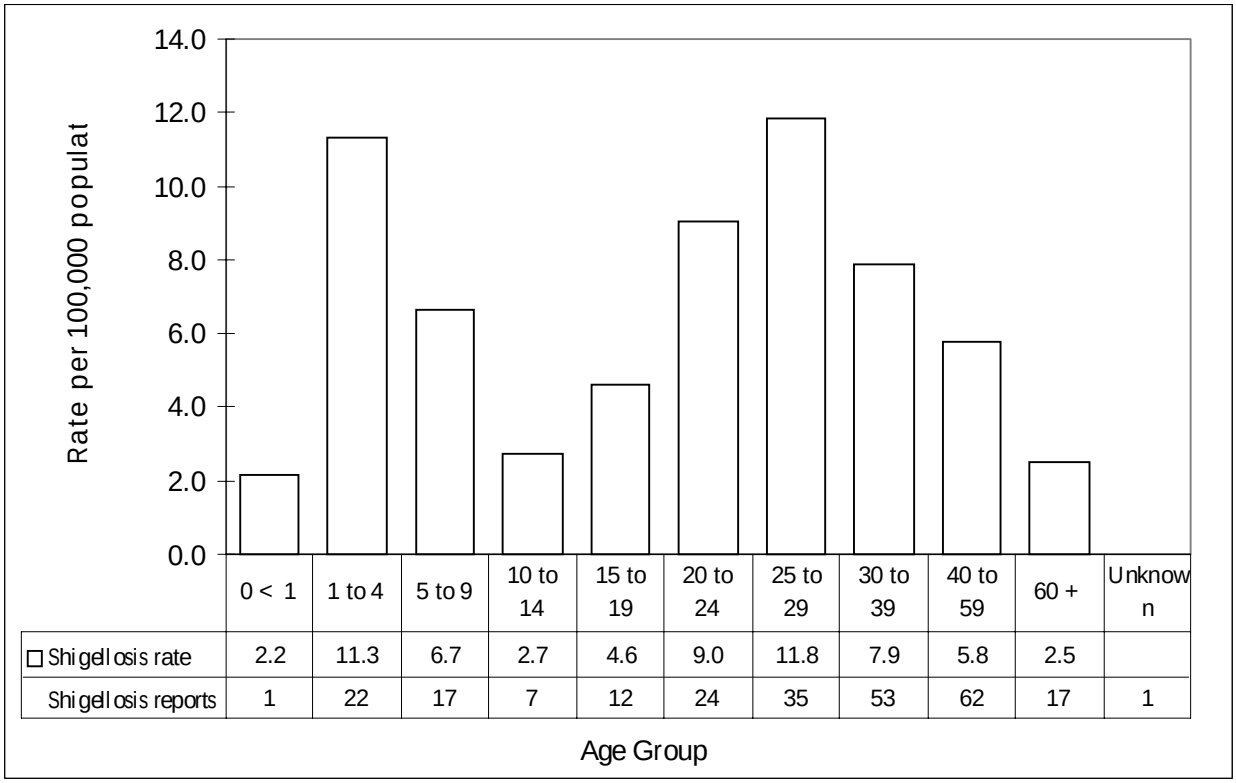


Figure 20.3 Shigellosis Rates by Health Region, 1998



	East Koot	West Koot-Boun	North Okan	South Okan Similk	Thompson	Fraser Valley	South Fraser Valley	Simon Fraser	Coast Garibaldi	Cent Van Island	Upper Island	Caribo	North West	Peace Liard	North. Interior	Van	North Shore	Richmond	Cap Reg
Shigellosis rate	0.0	0.0	0.9	1.8	3.7	8.8	7.5	6.1	11.5	5.8	9.0	0.0	0.0	0.0	3.8	10.2	9.5	6.2	7.2
Shigellosis reports	0	0	1	4	5	21	42	31	9	14	11	0	0	0	5	57	17	10	24

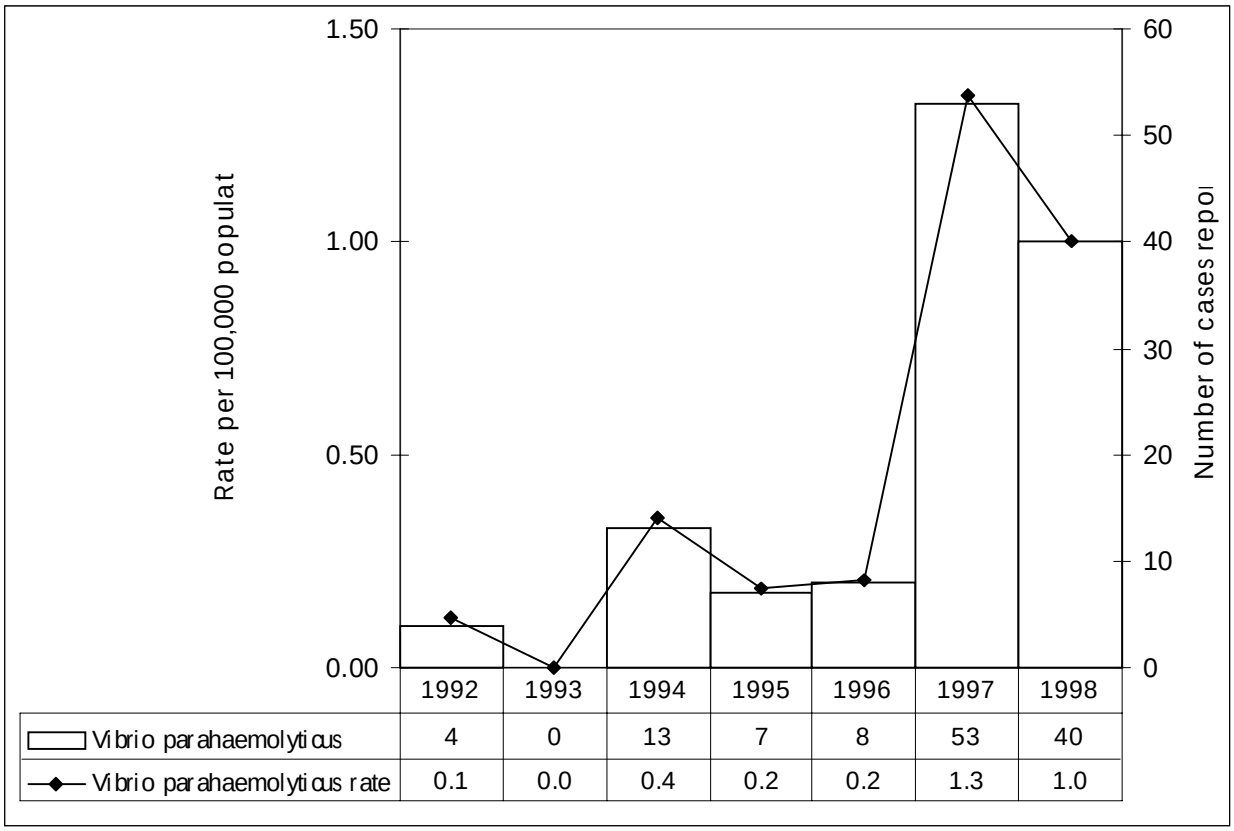
Figure 20.4 Shigellosis Rates by Age Group, 1998



	0 < 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 39	40 to 59	60 +	Unknown
Shigellosis rate	2.2	11.3	6.7	2.7	4.6	9.0	11.8	7.9	5.8	2.5	
Shigellosis reports	1	22	17	7	12	24	35	53	62	17	1

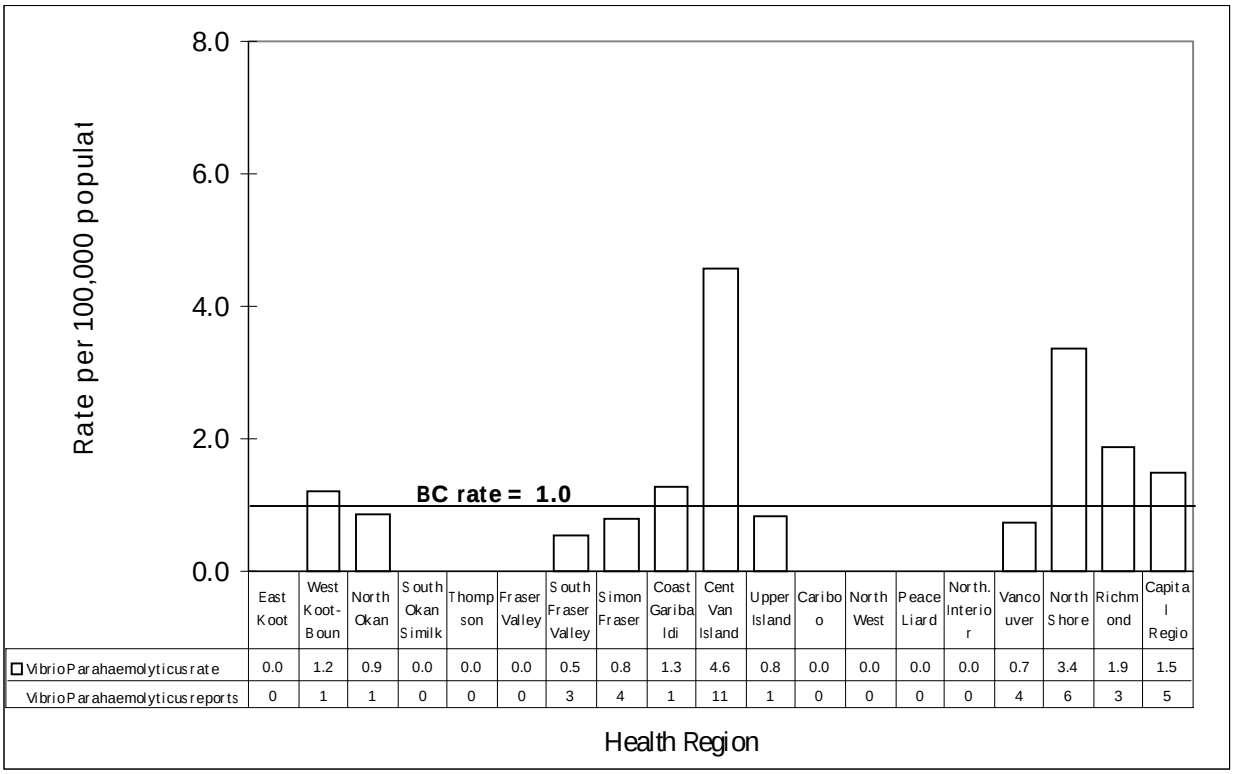
VIBRIO PARAHAEMOLYTICUS

Figure 21.1 *Vibrio parahaemolyticus* Reports and Rates, 1992 - 1998



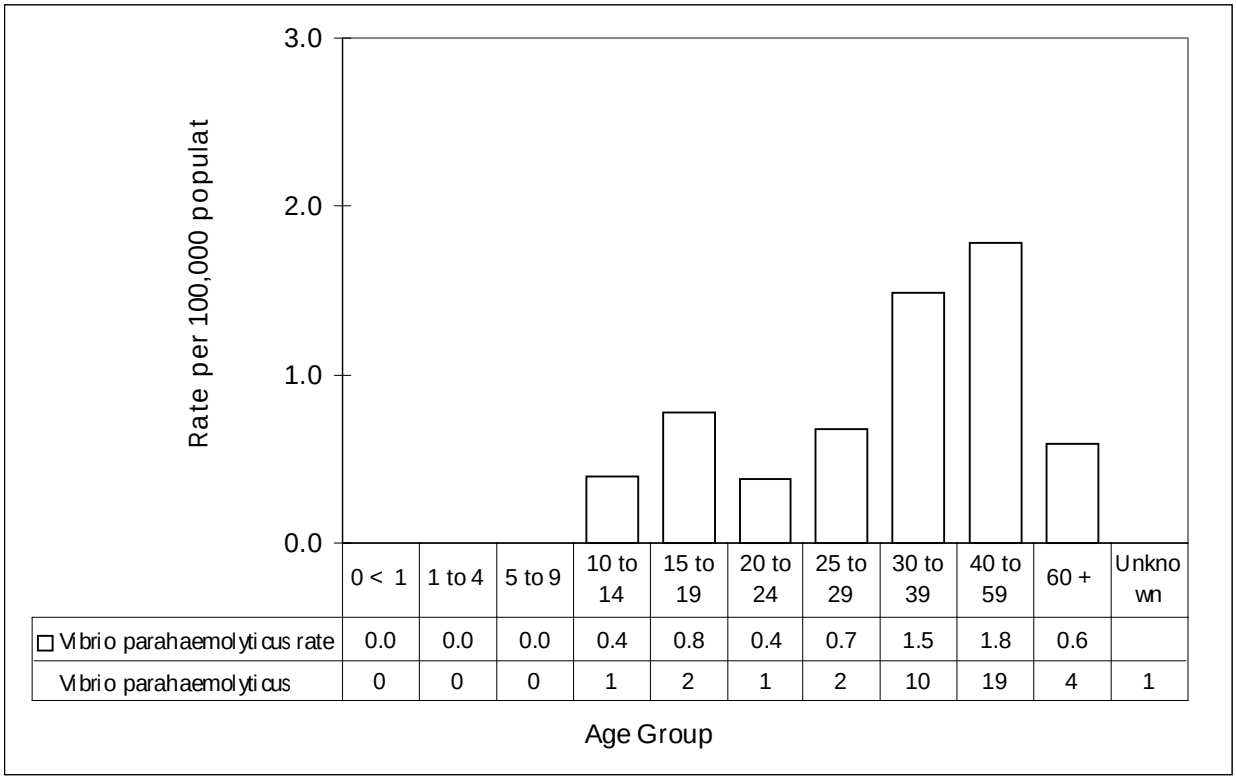
Forty cases of Vibrio parahaemolyticus gastroenteritis were reported during 1998, down from 53 cases in 1997. Twenty-three of the 40 cases had illness onset dates in July, August or September. Surveillance questionnaires were received for 19 of the 23 cases (82%) reported between 1 July and 30 September. Fifteen of the 19 (79%) reported that they had eaten raw or undercooked oysters prior to illness onset.

Figure 21.2 *Vibrio parahaemolyticus* Rates by Health Region, 1998



	East Koot	West Koot-Boun	North Okan	South Okan Similk	Thompson	Fraser Valley	South Fraser Valley	Simon Fraser	Coast Garibaldi	Cent Van Island	Upper Island	Caribo	North West	Peace Liard	North. Interior	Vancouver	North Shore	Richmond	Capital Regio
Vibrio Parahaemolyticus rate	0.0	1.2	0.9	0.0	0.0	0.0	0.5	0.8	1.3	4.6	0.8	0.0	0.0	0.0	0.0	0.7	3.4	1.9	1.5
Vibrio Parahaemolyticus reports	0	1	1	0	0	0	3	4	1	11	1	0	0	0	0	4	6	3	5

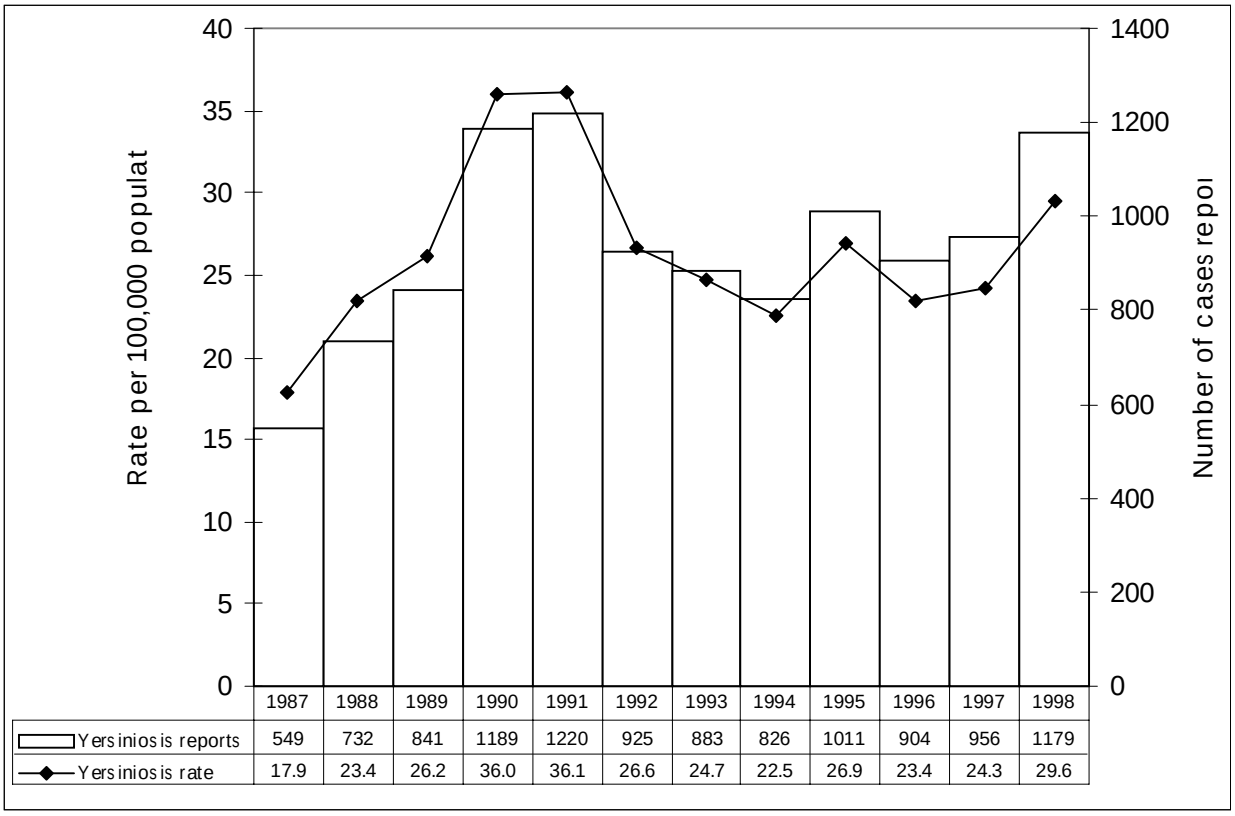
Figure 21.3 *Vibrio parahaemolyticus* Rates by Age Group, 1998



	0 < 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 39	40 to 59	60 +	Unknown
Vibrio parahaemolyticus rate	0.0	0.0	0.0	0.4	0.8	0.4	0.7	1.5	1.8	0.6	
Vibrio parahaemolyticus	0	0	0	1	2	1	2	10	19	4	1

YERSINIOSIS

Figure 22.1 Yersiniosis Reports and Rates, 1987 - 1998



	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Yersiniosis reports	549	732	841	1189	1220	925	883	826	1011	904	956	1179
Yersiniosis rate	17.9	23.4	26.2	36.0	36.1	26.6	24.7	22.5	26.9	23.4	24.3	29.6

Yersiniosis reporting in BC rose to its highest level since 1991. There were 1179 cases reported during 1998 for a provincial rate of 29.6 cases per 100,000 population. *Yersinia enterocolitica* accounts for the majority of cases reported. The regions with the highest rates (North Shore, Richmond, Vancouver, Coast Garibaldi) are served primarily by an outpatient lab which performs cold enrichment on stool specimens. The highest reporting rate was seen among children 1 to 4 years of age.

An outbreak of infection with *Yersinia pseudotuberculosis* in November was partly responsible for the higher rate of yersiniosis in 1998. Seventy-four confirmed cases distributed in the lower mainland and Prince George were identified during the outbreak. A case control study found an association with homogenized milk. A trace-back and an environmental investigation conducted by the Canadian Food Inspection Agency (CFIA) did not identify any deficiencies which could account for the association.

Figure 22.2 Yersiniosis Reports by Week, 1998

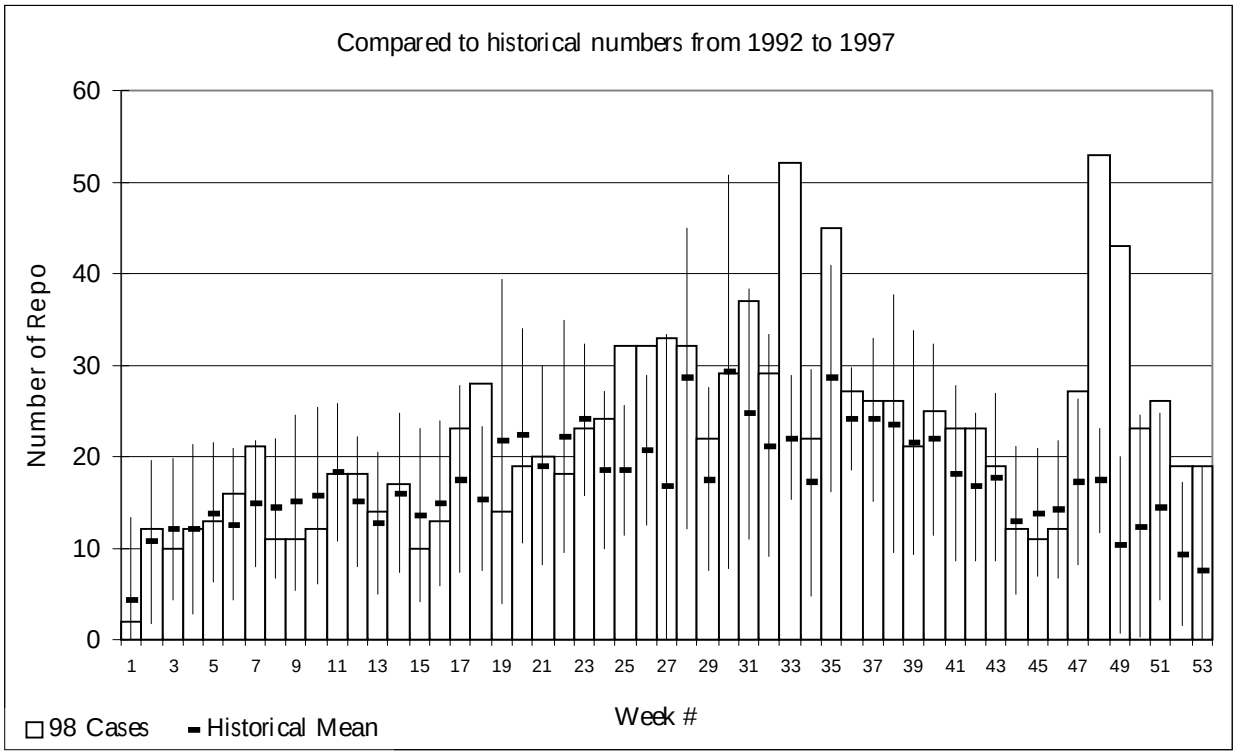
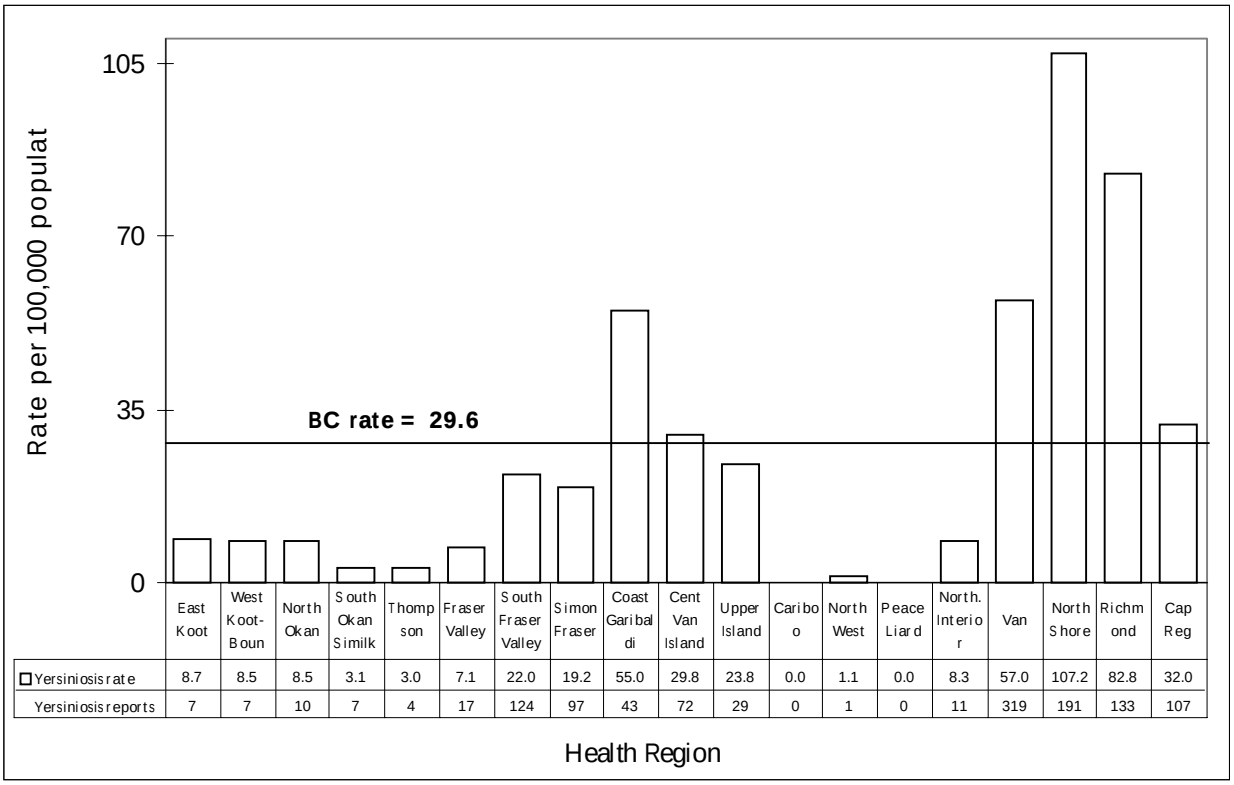
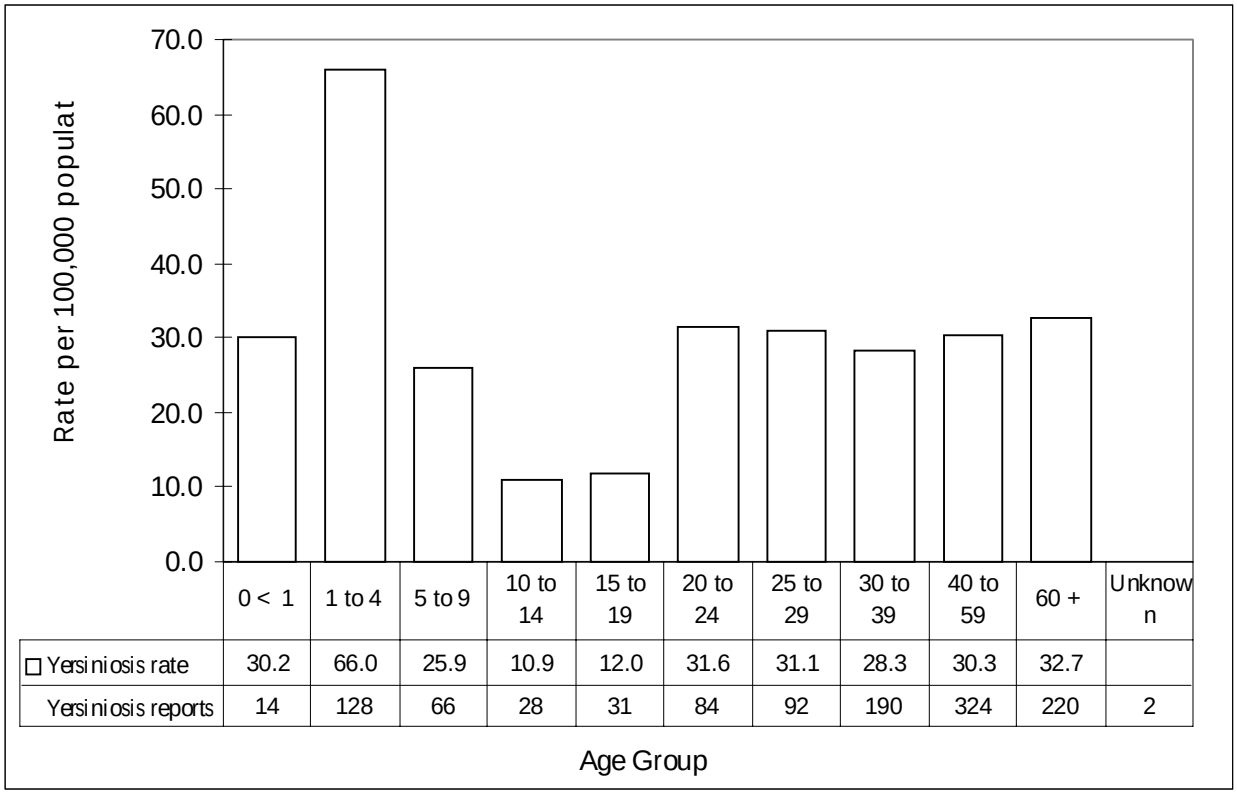


Figure 21.3 Yersiniosis Rates by Health Region, 1998



	East Koot	West Koot-Boun	North Okan	South Okan Similk	Thompson	Fraser Valley	South Fraser Valley	Simon Fraser	Coast Garibaldi	Cent Van Island	Upper Island	Caribo	North West	Peace Liard	North. Interior	Van	North Shore	Richmond	Cap Reg
Yersiniosis rate	8.7	8.5	8.5	3.1	3.0	7.1	22.0	19.2	55.0	29.8	23.8	0.0	1.1	0.0	8.3	57.0	107.2	82.8	32.0
Yersiniosis reports	7	7	10	7	4	17	124	97	43	72	29	0	1	0	11	319	191	133	107

Figure 22.4 Yersiniosis Rates by Age Group, 1998



	0 < 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 39	40 to 59	60 +	Unknown
Yersiniosis rate	30.2	66.0	25.9	10.9	12.0	31.6	31.1	28.3	30.3	32.7	
Yersiniosis reports	14	128	66	28	31	84	92	190	324	220	2

LESS COMMON DISEASES

BOTULISM

No cases were reported in 1998.

HANTAVIRUS PULMONARY SYNDROME

No cases were reported in 1998.

LEPROSY

Two cases were reported in 1998. This compares with no cases in 1997 and 1996, and one case each in 1995 and 1994.

LISTERIOSIS

Two cases were reported in 1998. This compares with 2 cases in 1997, and 1 case each in 1995 and 1996.

LYME DISEASE

Reports of Lyme Disease continue to be uncommon in BC. In 1998 there were 7 cases reported, up from a single case reported in 1997.

TRICHINOSIS

Two cases were reported in 1998. Both cases reported were in the Central Vancouver Island region.

TYPHOID

Twenty typhoid cases were reported in BC during 1998.

LIST OF REPORTABLE COMMUNICABLE DISEASES IN BC

Reflecting amendments to the CD Regulations made by Order In Council on April 30, 1998.

SCHEDULE A:
(reportable by all sources including laboratories)

Anthrax
Acquired Immune Deficiency Syndrome
Botulism
Brucellosis
Cholera
Congenital Infections:
- Toxoplasmosis, Rubella, Cytomegalovirus, Herpes Simplex, Varicella-Zoster, Hepatitis B Virus, Listeriosis and any other congenital infection

Cryptosporidiosis
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
Hantavirus Pulmonary Syndrome
Hemorrhagic Viral Fevers
Hemolytic Uremic Syndrome (HUS)
Hepatitis Viral:
- Hepatitis A
- Hepatitis B
- Hepatitis C
- Other Viral Hepatitis

Invasive Group A Streptococcal Disease
Leprosy
Lyme Disease
Measles
Meningitis: All causes
- (i) Bacterial: Hemophilus
  Pneumococcal
  Other
- (ii) Viral

Meningococcal Disease:
- Bacteremia
- Meningitis

Mumps
Neonatal Group B Streptococcal Infection
Pertussis (Whooping Cough)
Plague
Poliomyelitis
Rabies
Reye Syndrome
Rubella: Congenital Rubella Syndrome
Tetanus
Tuberculosis
Typhoid Fever and Paratyphoid Fever
Venereal Disease:
- Chancroid
- Gonorrhea - all sites
- Syphilis

Waterborne Illness:
- All causes

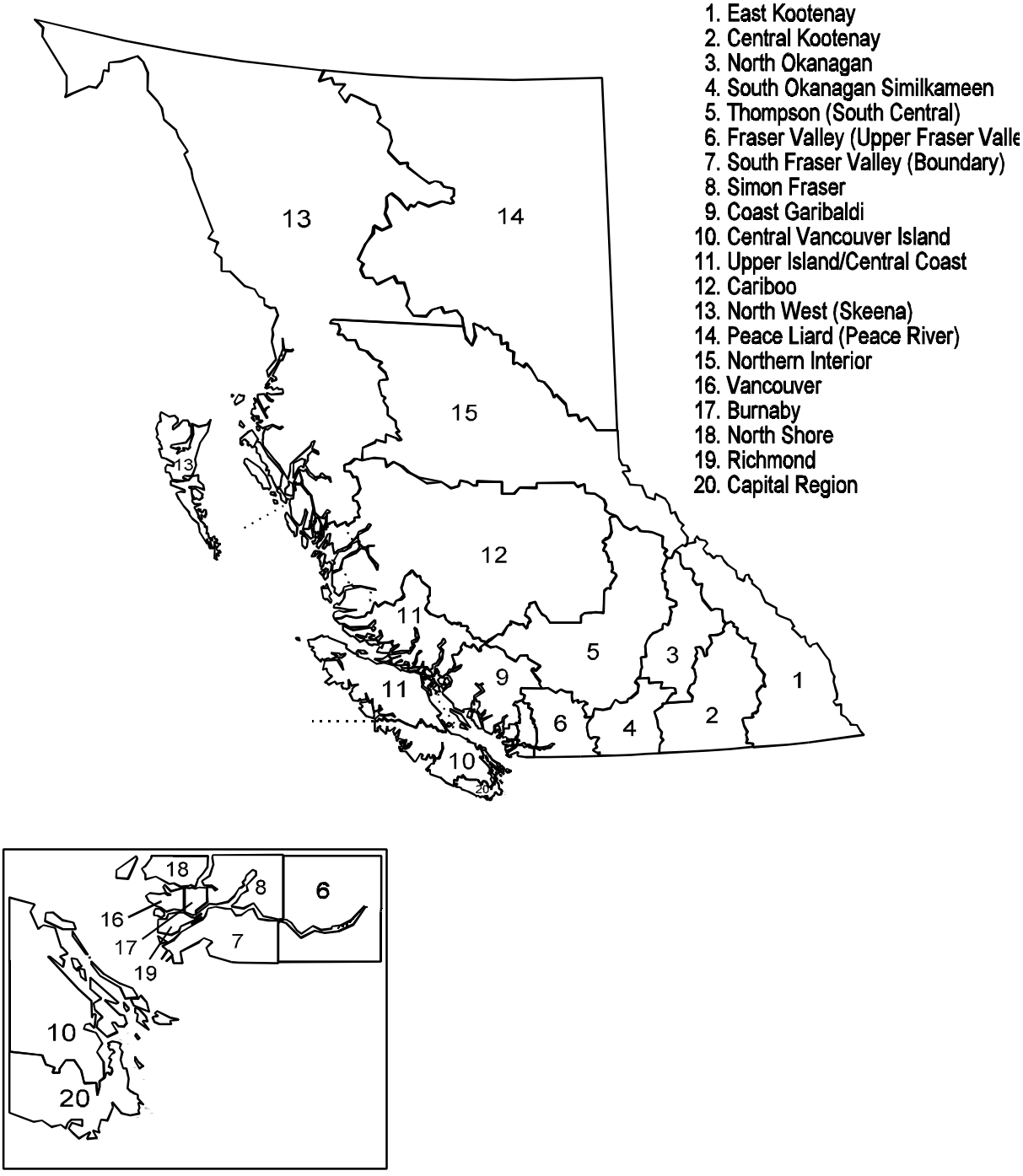
Yellow Fever

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
Herpes Genitalis
Influenza
Legionellosis
Leptospirosis
Malaria
Methicillin-Resistant Staphylococcus Aureus (MRSA)
Q Fever
Rickettsial Diseases
Vancomycin-Resistant Enterococci (VRE)

British Columbia



1998 B.C. Selected Diseases Reports by Health Authorities

Disease Reports	BC Total	East Koot	West Koot-Boun	North Okan	South Okan Similk	Thompson	Fraser Valley	South Fraser Valley	Simon Fraser	Coast Garibaldi	Cent Van Island	Upper Island	Cariboo	North West	Peace Liard	North. Interior	Vancouver	North Shore	Richmond	Capital Region
Amebiasis reports	**346**	0	0	0	0	1	25	42	22	1	0	35	0	0	0	0	167	26	7	20
Campylobacteriosis repo	**2789**	32	49	33	99	62	173	476	396	57	105	81	9	42	5	20	548	206	153	243
Cryptosporidiosis reports	**141**	2	4	2	4	11	36	12	10	3	3	1	0	1	3	1	27	4	8	9
E. coli O157:H7 reports	**181**	6	7	5	24	11	22	37	25	5	3	1	0	7	0	2	6	4	1	15
Giardiasis reports	**1107**	15	13	30	48	33	92	163	102	45	59	38	1	25	12	25	238	63	14	91
Haemophilus influ. b repo	**3**	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1
Hepatitis A reports	**384**	2	4	16	6	5	19	87	41	12	9	1	5	5	1	2	128	11	9	21
Hepatitis B: Acute	**192**	2	1	5	2	6	14	27	30	2	11	3	3	4	0	1	55	2	8	16
Hepatitis B: Undetermine	**543**	5	3	4	4	0	3	41	48	13	22	0	1	2	0	3	25	76	267	26
Hepatitis B: Chronic	**2431**	5	1	7	10	11	41	216	480	2	31	14	3	7	4	6	1300	12	229	52
Hepatitis C reports	**6809**	69	123	154	316	282	742	752	768	117	439	221	64	72	75	171	1643	126	102	573
Malaria reports	**44**	0	1	1	0	0	3	12	7	0	0	1	1	0	1	1	9	3	1	3
Measles reports	**2**	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0
Meningococcal (Invasive	**15**	0	0	0	3	0	1	3	0	0	1	2	0	0	1	1	1	0	1	1
Mumps reports	**20**	0	0	0	0	0	0	0	2	5	5	4	1	0	0	0	0	3	0	0
Pertussis reports	**359**	14	7	2	13	11	45	92	35	14	28	19	13	3	6	5	22	21	7	2
Pneumococcal reports	**10**	0	1	0	0	1	0	0	0	0	1	0	0	0	2	0	0	0	1	4
Rubella reports	**5**	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	3	0	0	1
Salmonellosis reports	**666**	12	15	21	21	21	44	83	96	32	38	13	1	9	6	11	109	36	43	55
Shigellosis reports	**251**	0	0	1	4	5	21	42	31	9	14	11	0	0	0	5	57	17	10	24
Streptococcal Group A re	**56**	0	1	0	0	0	3	17	3	0	3	0	0	0	2	0	12	5	1	9
Vibrio Parahaemolyticus i	**40**	0	1	1	0	0	0	3	4	1	11	1	0	0	0	0	4	6	3	5
Yersiniosis reports	**1179**	7	7	10	7	4	17	124	97	43	72	29	0	1	0	11	319	191	133	107
Less Common Diseases																				
Botulism reports	**0**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hantavirus reports	**1**	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Leprosy reports	**2**	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0
Listeriosis reports	**2**	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0
Lyme Disease reports	**7**	0	1	0	1	0	1	0	1	0	0	1	0	1	0	0	1	0	0	0
Trichinosis reports	**2**	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0
Typhoid reports	**20**	0	0	0	0	0	5	10	2	0	0	0	0	0	0	0	1	0	2	0

1998 B.C. Selected Diseases Rates by Health Authorities

	BC Total	East Koot	West Koot-Boun	North Okan	South Okan Similk	Thompson	Fraser Valley	South Fraser Valley	Simon Fraser	Coast Garibaldi	Cent Van Island	Upper Island	Cariboo	North West	Peace Liard	North. Interior	Vancouver	North Shore	Richmond	Capital Region
1998 Population	3,987,011	80,355	81,967	117,151	227,143	133,957	239,540	562,799	505,035	78,233	241,223	121,628	75,854	91,137	65,966	131,861	559,831	178,107	160,649	334,575
Disease Rates per 100,000 Population:																				
Amebiasis rate	**8.7**	0.0	0.0	0.0	0.0	0.7	10.4	7.5	4.4	1.3	0.0	28.8	0.0	0.0	0.0	0.0	29.8	14.6	4.4	6.0
Campylobacteriosis rate	**70.0**	39.8	59.8	28.2	43.6	46.3	72.2	84.6	78.4	72.9	43.5	66.6	11.9	46.1	7.6	15.2	97.9	115.7	95.2	72.6
Cryptosporidiosis rate	**3.5**	2.5	4.9	1.7	1.8	8.2	15.0	2.1	2.0	3.8	1.2	0.8	0.0	1.1	4.5	0.8	4.8	2.2	5.0	2.7
E. coli O157:H7 rate	**4.5**	7.5	8.5	4.3	10.6	8.2	9.2	6.6	5.0	6.4	1.2	0.8	0.0	7.7	0.0	1.5	1.1	2.2	0.6	4.5
Giardiasis rate	**27.8**	18.7	15.9	25.6	21.1	24.6	38.4	29.0	20.2	57.5	24.5	31.2	1.3	27.4	18.2	19.0	42.5	35.4	8.7	27.2
Haemophilus influenza b	**0.1**	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
Hepatitis A rate	**9.6**	2.5	4.9	13.7	2.6	3.7	7.9	15.5	8.1	15.3	3.7	0.8	6.6	5.5	1.5	1.5	22.9	6.2	5.6	6.3
Hepatitis B: Acute rate	**4.8**	2.5	1.2	4.3	0.9	4.5	5.8	4.8	5.9	2.6	4.6	2.5	4.0	4.4	0.0	0.8	9.8	1.1	5.0	4.8
Hepatitis B: Undet. Rate	**13.6**	6.2	3.7	3.4	1.8	0.0	1.3	7.3	9.5	16.6	9.1	0.0	1.3	2.2	0.0	2.3	4.5	42.7	166.2	7.8
Hepatitis B: Chronic rate	**61.0**	6.2	1.2	6.0	4.4	8.2	17.1	38.4	95.0	2.6	12.9	11.5	4.0	7.7	6.1	4.6	232.2	6.7	142.5	15.5
Hepatitis C rate	**170.8**	85.9	150.1	131.5	139.1	210.5	309.8	133.6	152.1	149.6	182.0	181.7	84.4	79.0	113.7	129.7	293.5	70.7	63.5	171.3
Malaria rate	**1.1**	0.0	1.2	0.9	0.0	0.0	1.3	2.1	1.4	0.0	0.0	0.8	1.3	0.0	1.5	0.8	1.6	1.7	0.6	0.9
Measles rate	**0.1**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0
Meningococcal (Invasive	**0.4**	0.0	0.0	0.0	1.3	0.0	0.4	0.5	0.0	0.0	0.4	1.6	0.0	0.0	1.5	0.8	0.2	0.0	0.6	0.3
Mumps rate	**0.5**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	6.4	2.1	3.3	1.3	0.0	0.0	0.0	0.0	1.7	0.0	0.0
Pertussis rate	**9.0**	17.4	8.5	1.7	5.7	8.2	18.8	16.3	6.9	17.9	11.6	15.6	17.1	3.3	9.1	3.8	3.9	11.8	4.4	0.6
Pneumococcal rate	**0.25**	0.0	1.2	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	3.0	0.0	0.0	0.0	0.6	1.2
Rubella rate	**0.1**	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.3
Salmonellosis rate	**16.7**	14.9	18.3	17.9	9.2	15.7	18.4	14.7	19.0	40.9	15.8	10.7	1.3	9.9	9.1	8.3	19.5	20.2	26.8	16.4
Shigellosis rate	**6.3**	0.0	0.0	0.9	1.8	3.7	8.8	7.5	6.1	11.5	5.8	9.0	0.0	0.0	0.0	3.8	10.2	9.5	6.2	7.2
Streptococcal Group A ra	**1.4**	0.0	1.2	0.0	0.0	0.0	1.3	3.0	0.6	0.0	1.2	0.0	0.0	0.0	3.0	0.0	2.1	2.8	0.6	2.7
Vibrio Parahaemolyticus r	**1.0**	0.0	1.2	0.9	0.0	0.0	0.0	0.5	0.8	1.3	4.6	0.8	0.0	0.0	0.0	0.0	0.7	3.4	1.9	1.5
Yersiniosis rate	**29.6**	8.7	8.5	8.5	3.1	3.0	7.1	22.0	19.2	55.0	29.8	23.8	0.0	1.1	0.0	8.3	57.0	107.2	82.8	32.0
Less Common Diseases																				
Botulism rate	**0.0**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hantavirus rate	**0.0**	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Leprosy rate	**0.1**	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Listeriosis rate	**0.1**	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lyme Disease rate	**0.2**	0.0	1.2	0.0	0.4	0.0	0.4	0.0	0.2	0.0	0.0	0.8	0.0	1.1	0.0	0.0	0.2	0.0	0.0	0.0
Trichinosis rate	**0.1**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Typhoid rate	**0.5**	0.0	0.0	0.0	0.0	0.0	2.1	1.8	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	1.2	0.0