COMMUNICABLE DISEASES

HALDIMAND & NORFOLK HEALTH STATUS REPORT 2004

SARS AIDS WEST NILE VIRUS HEPATITUS A SALMONELLA PERTUSSIS tETANUS INFLUENZA SYPHILLIS CHLAMYDIA RABIES VIRAL MENINGITIS LYME DISEASE GONORRHEA MEASLES TUBERCULOSIS E COLI ANTHRAX

Message from the Acting Medical Officer of Health, Dr. Jeff Tschirhart…

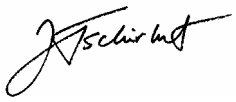
The Health Status-Communicable Disease Report 2004 is the first in a series of focused reports being done by the Health Unit to highlight important health issues in Haldimand-Norfolk. The Health Unit completed a comprehensive Health Status Report in 2002.

Central to public health is the surveillance, control and prevention of communicable diseases. During the early part of the 1970's, researchers believed that the battle with infectious disease was all but over. Decades of improvements in nutrition, housing, sanitation, and discoveries of vaccines and antibiotics resulted in the steady decline in the morbidity and mortality of infectious diseases.

The last decade of the 20th century painted a less optimistic view point however, as each year saw the emergence of at least one new communicable disease. The introduction of West Nile virus to North America with human cases in Haldimand-Norfolk in 2002 reinforces the need to have sensitive surveillance systems locally. The SARS outbreak in 2003 clearly emphasized how vulnerable our residents are to global threats of disease in a time of rapid travel and a highly mobile population.

Staff from the Health Unit work in collaboration with many organizations to help prevent, control and continue active surveillance of communicable diseases. The information contained in this Report is intended to assist each partner in doing their part in keeping the residents of Haldimand and Norfolk Counties healthy.

Sincerely,



Jeff Tschirhart, M.D., C.C.F.P.
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Acknowledgements

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The authors of this report would like to thank the following staff at the Haldimand-Norfolk Health Unit for their contribution in reviewing drafts of the Haldimand-Norfolk Communicable Diseases Report 2004.

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EXECUTIVE SUMMARY

The Haldimand-Norfolk Health Unit is pleased to present our first focused Health Status Report on Communicable Diseases in Haldimand-Norfolk. The goal of the report was to provide the general public, media, physicians and other health care professionals with an overview of communicable diseases in Haldimand-Norfolk over the last 11 years (1993-2003). This report took a broad perspective looking at sexually transmitted diseases, diseases spread by close personal contact, food and waterborne diseases, vaccine preventable diseases and zoonotic and exotic diseases. Although SARS and West Nile virus have received a great deal of attention, all communicable diseases are important components of public health and require ongoing surveillance. This summary presents some of the key highlights of the report. The reader is encouraged to review the full report for additional information on communicable diseases in Haldimand-Norfolk. The complete report can be downloaded from the Health Unit website (www.haldimand-norfolk.org/health/publications).

Introduction - Overview

- The top 3 reported diseases in Haldimand-Norfolk were Chlamydia, Campylobacter and Hepatitis C.
- For males, Campylobacter was the highest reported disease in Haldimand-Norfolk.
- For females, Chlamydia was the highest reported disease in Haldimand-Norfolk.

Sexually Transmitted Diseases

- Chlamydia and Gonorrhea are the two most frequently reported STDs in Haldimand-Norfolk.
- The Chlamydia incidence rates in Haldimand-Norfolk are much lower than the incidence rates in Ontario (1993-2000).
- From 1993-2000, the average Gonorrhea incidence rate in Ontario was 25/100,000 compared to 3/100,000 for Haldimand-Norfolk.
- In 2000, the Hepatitis C incidence rate for Ontario and Haldimand-Norfolk were very close (Ontario 47/100,000 & Haldimand-Norfolk 42/100,000).

Diseases Spread by Close Personal Contact

- The Ontario Tuberculosis incidence rates have been much higher than the Tuberculosis rates in Haldimand-Norfolk (1993-2000).
- The average Group A Streptococcal (GAS) infections was 2.3/100,000 in Haldimand-Norfolk and 1.6/100,000 in Ontario (1993-2000).
- The incidence rates of Group B Streptococcal (GBS) are very low in Haldimand-Norfolk and Ontario (1993-2000).

Food and Waterborne Diseases

- The Amebiasis incidence rate was consistently higher in Ontario than Haldimand-Norfolk (1993-2000).
- The average incidence rate for Campylobacteriosis in Haldimand-Norfolk was 43.3/100,000 compared to 52/100,000 in Ontario.
- Generally, the incidence rates of Salmonella have been higher in Ontario than Haldimand-Norfolk. There was no difference in the incidence rates of males and females in Haldimand-Norfolk.
- The average Yersiniosis incidence rate in Ontario (3.9/100,000) was over double the Haldimand-Norfolk rate (1.5/100,000). Still, the average incidence rate was very low both for Ontario and Haldimand-Norfolk.

Vaccine Preventable Diseases

- The average incidence rate for Influenza was 11.7/100,000 in Haldimand-Norfolk and 13.4/100,000 in Ontario.
- The incidence rates of Measles have remained very low in Haldimand-Norfolk and Ontario, with the exception of an outbreak in 1995.
- The average Pertussis incidence rate for the years 1993-2000 was 5.5/100,000 for Haldimand-Norfolk and 12.4/100,000 for Ontario. Pertussis is believed to be under-reported in Haldimand-Norfolk.

Zoonotic and Exotic Diseases

- No cases of SARS were reported in Haldimand-Norfolk during the two outbreaks in Ontario in 2003.
- Haldimand-Norfolk had three cases of West Nile virus in 2002, no cases in 2003 and no cases up to August 6, 2004.
- The incidence rates for Lyme disease have been very low in Haldimand-Norfolk and Ontario.
- During the period 1993-2003, there were no reported cases of Diphtheria, Haemorrhagic Fever, Leprosy, Brucellosis, Cholera, Malaria, Paratyphoid Fever, or Tularemia in Haldimand-Norfolk.

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"Communicable Diseases have seen an increase of public concern due to the emergence of West Nile virus and SARS"

Wayne Tucker
Epidemiologist
Haldimand-Norfolk Health Unit
2004

INTRODUCTION

Communicable diseases are caused by living organisms (bacteria, viruses, fungi, etc.) or by the toxins such organisms produce. They are spread directly, via contact with an infected animal or person, or indirectly through contact with objects touched by an infected individual or through the consumption of contaminated food or water.

The diseases presented in this report have been divided into five categories; diseases spread by personal contact, those that are food or waterborne, those that can be commonly prevented by vaccination, sexually transmitted diseases and zoonotic and exotic diseases. These are not immutable categories, since there is some overlap, but rather are delineations of convenience.

Hospitals, health care professionals, labs and schools are mandated to report specific "reportable diseases" to the local Medical Officer of Health, who is then mandated to report instances of those diseases to the provincial Ministry of Health and Long-Term Care. A list of these diseases is provided in Appendix I.

Included in this report are descriptions of diseases that are not endemic in the Haldimand-Norfolk area, such as SARS. They are included due to their prominence in the media and in the public consciousness.

DATA INTERPRETATION

All the figures in this report contain 'age-standardized incidence rates' for Haldimand-Norfolk and Ontario, plus 'number of cases' in Haldimand-Norfolk. These rates take into consideration the age population differences between Haldimand-Norfolk and Ontario, and produce incidence rates that are very comparable. All of the incidence rates are based on per 100,000 population. For example, an incidence rate of 2.5/100,000 means that there are approximately 2.5 cases of a particular disease per 100,000 people. The time period covered by the Haldimand-Norfolk data was 1993-2003 or 11 years of communicable diseases data. This report provides Ontario comparison data for the time period 1993-2000. No Ontario data was available for 2001 to 2003 at time of publication of this report.

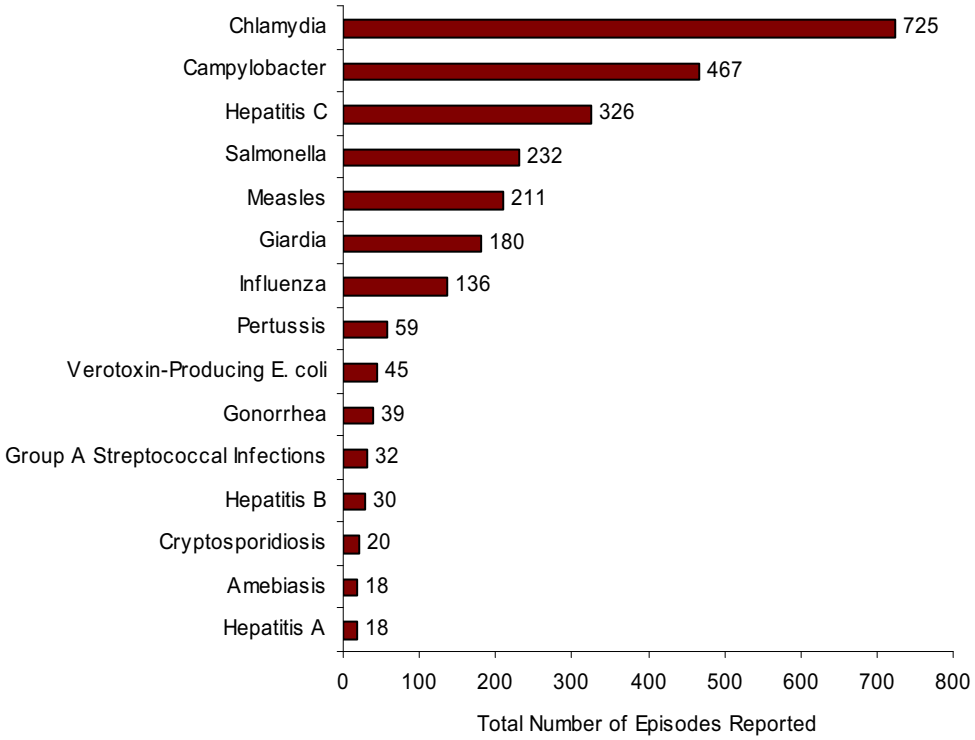
All of the data contained in the graphs can be found in the Appendices. The Appendix also contains additional data not included in the graphs. For example, the male and female age-standardized incidence rates and number of cases for Haldimand-Norfolk are reported in the appendix section. See Appendices III, IV, V and VI for this additional data.

OVERVIEW

Figure 1 lists the top 15 reported diseases in Haldimand-Norfolk over the time period 1993-2003 (excludes Chickenpox). Clearly, Chlamydia, Campylobacter, Hepatitis C, Salmonella, Measles, Giardia, and Influenza account for the majority of the cases during this time period. Figure 1 combined the data for males and females. There were a total of 2690 cases of communicable diseases reported in Haldimand-Norfolk during the period 1993-2003.

Figure 1 - Top 15 Most Reported Diseases in Haldimand & Norfolk (1993-2003)

Data: Excludes Chickenpox



Figures 2 and 3 look at the top 15 most reported diseases separately for males and females. The top 15 for males was similar to the overall total (males and females combined). The top 3 reported diseases for males were Campylobacter, Hepatitis C and Chlamydia. There were a total of 1216 cases of communicable diseases reported for males in Haldimand-Norfolk during the time period 1993-2003, or 45% of the total number of cases. In contrast, the top 7 reported diseases for females, was the same as the total number of cases. For females, Chlamydia was the number one reported disease. There were a total of 1474 cases of communicable diseases reported for females in Haldimand-Norfolk during the time period 1993-2003, or 55% of the total number of cases.

Figure 2 - Males - Top 15 Most Reported Diseases in Haldimand & Norfolk (1993-2003)

Data: Excludes Chickenpox

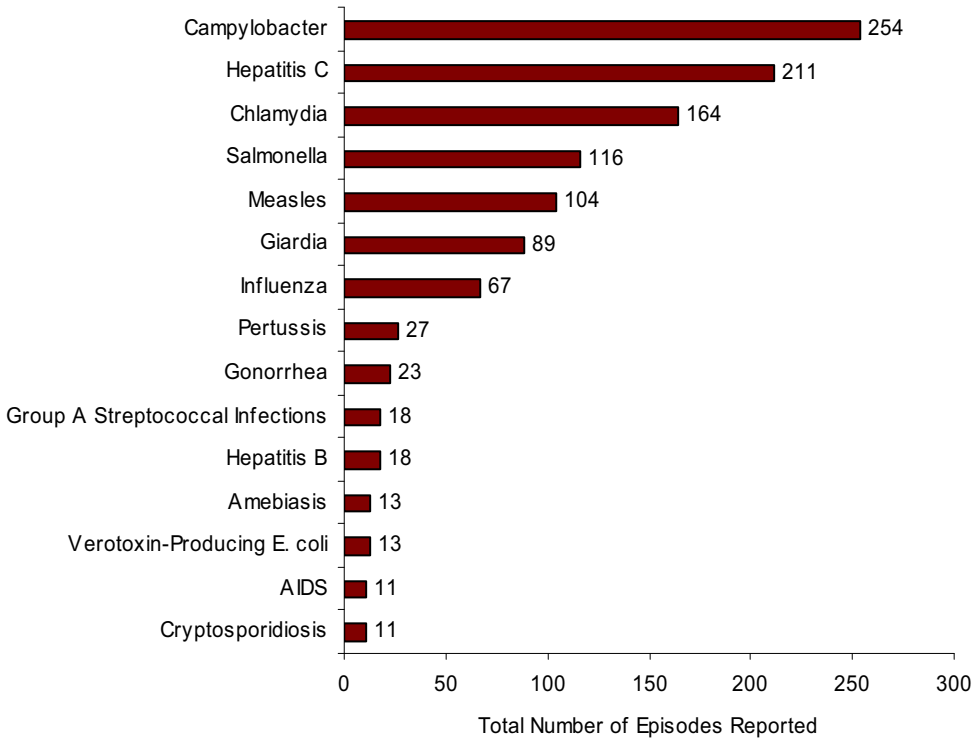
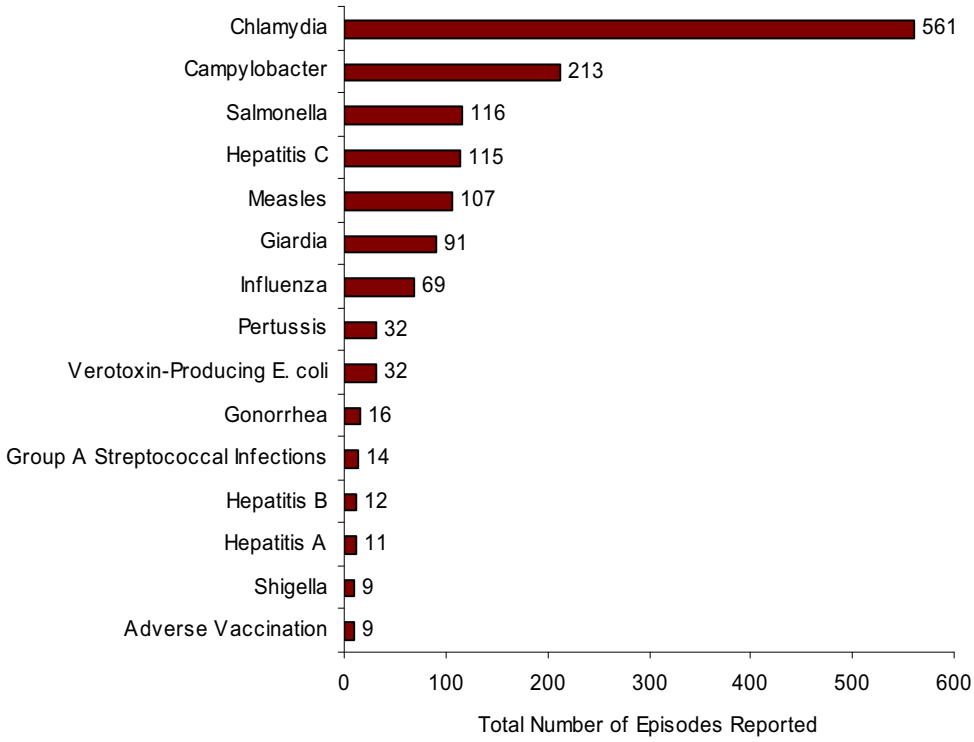


Figure 3 - Females - Top 15 Most Reported Diseases in Haldimand & Norfolk (1993-2003)

Data: Excludes Chickenpox



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"Both Chlamydia and Gonorrhoea, the two most frequently reported STDs in Haldimand-Norfolk, are preventable with consistent use of condoms."

Eve Bellekom
Public Health Nurse
Haldimand-Norfolk Health Unit
2004

SEXUALLY TRANSMITTED DISEASES

Sexually transmitted diseases (STDs) are caused by a variety of bacteria and viruses found in blood and body fluids (semen, vaginal fluids, breast milk and saliva). Such infections are transmitted when the fluids of an infected individual come into contact with those of another, most commonly through sexual contact. Transmission can also be effected through blood transfusions and the sharing of hypodermic needles.

In Haldimand-Norfolk, the most common STDs are Chlamydia and Gonorrhea, reflecting the situation found elsewhere in Ontario. Though not an STD, Hepatitis C is included in this category because it is transmitted via contact with blood. Hepatitis C is prevalent in the region.

CHLAMYDIA

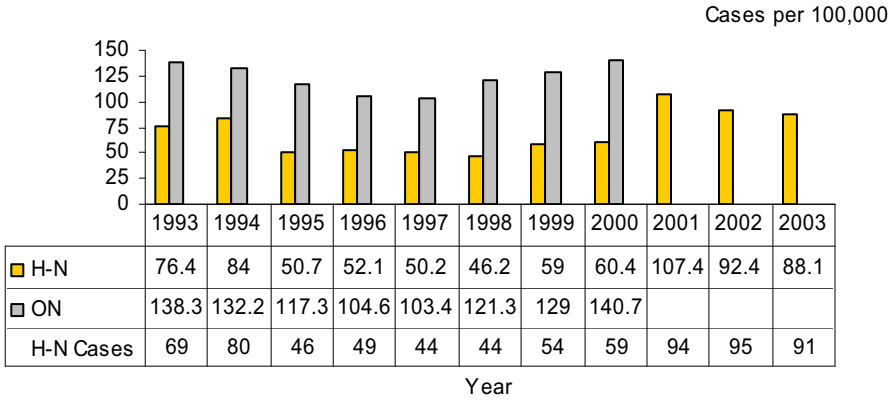
Genital Chlamydia is caused by the bacterium *Chlamydia trachomatis*. The most common symptoms are urinary pain and genital discharge. Females are disproportionately affected by the complications of this infection and, left untreated, may experience Pelvic Inflammatory disease (PID), which in turn can cause tubal infertility, chronic pelvic pain and ectopic pregnancy. Infection during pregnancy can result in eye or lung infections in the newborn. Genital Chlamydia infection also increases the risk of HIV transmission. The majority of individuals infected with Chlamydia have no symptoms, thus serving as a "silent" reservoir for the spread of this infection. However, the infection can be effectively treated with an appropriate oral antibiotic.[1]

Young women are more likely than young men to receive regular medical care, such as PAP testing, and are therefore more likely to have an existing Chlamydia infection diagnosed. It is therefore not surprising that women consistently show a higher rate of infection than men, with young women showing a higher rate than older women. Figure 4 shows the age-standardized incidence rates of Chlamydia in Haldimand-Norfolk and Ontario from 1993-2003. It is very clear that the incidence rates in Haldimand-Norfolk are much lower than the Ontario incidence rates over this time period.

Figure 4 – Age Standardized Incidence Rates of Chlamydia in Haldimand, Norfolk and Ontario, 1993-2003

Data: Age-Standardized Incidence Rates per 100,000 people. Data not available for Ontario 2001-2003.

Sources: Ontario data from RDIS, Ontario Ministry of Health & Long-Term Care. Haldimand & Norfolk data from RDIS, Haldimand-Norfolk Health Unit.



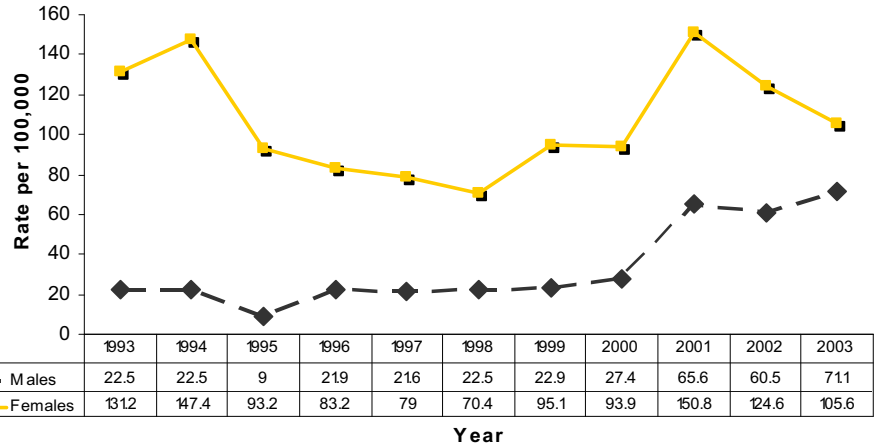
	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
H-N	76.4	84	50.7	52.1	50.2	46.2	59	60.4	107.4	92.4	88.1
ON	138.3	132.2	117.3	104.6	103.4	121.3	129	140.7			
H-N Cases	69	80	46	49	44	44	54	59	94	95	91

Figure 5 shows the age-standardized incidence rates for males and females in Haldimand-Norfolk over the last 11 years. The incidence rates for females have been consistently much higher than males, although in the last 3 years the incidence rate for males has come closer to the female incidence rate. The average age-standardized incidence rate for males over the time period 1993-2003 was 33.4/100,000 compared to 107/100,000 for females.

Figure 5 - Age-Standardized Incidence Rates of Chlamydia in Haldimand & Norfolk by Sex, 1993-2003

Data: Age-Standardized Incidence Rates per 100,000 people. Data not available for Ontario 2001-2003.

Sources: Ontario data from RDIS, Ontario Ministry of Health & Long-Term Care. Haldimand & Norfolk data from RDIS, Haldimand-Norfolk Health Unit.



	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Males	22.5	22.5	9	21.9	21.6	22.5	22.9	27.4	65.6	60.5	71.1
Females	131.2	147.4	93.2	83.2	79	70.4	95.1	93.9	150.8	124.6	105.6

GONORRHEA

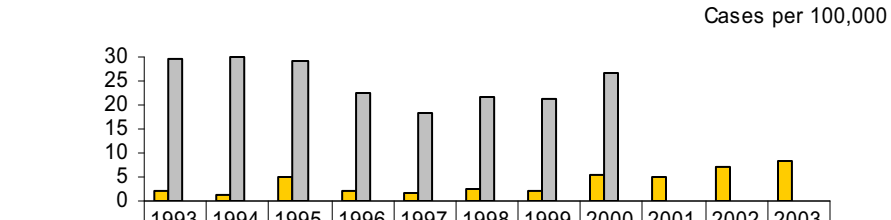
Gonorrhea is caused by the bacterium *Neisseria gonorrhoeae*. Resistance to antibiotics has been increasing. Females are disproportionately affected by the complications of this infection. Untreated infection in females may lead to pelvic inflammatory disease (PID), which in turn may cause tubal infertility, chronic pelvic pain and life-threatening ectopic pregnancy. In either sex, rectal and pharyngeal infections can occur. Infection increases the risk of HIV infection. The majority of infected females do not have symptoms, whereas the majority of infected males do. Asymptomatic carriers act as a "silent" reservoir for the spread of this infection; however, the infection can be easily treated with an appropriate antibiotic. [2]

The age-standardized rates for Ontario are much higher than the Haldimand-Norfolk rates (Figure 6). From 1993 to 2000 the average age-standardized rate for Ontario was 25/100,000 compared to 3/100,000 for Haldimand-Norfolk. The number of gonorrhea cases in Haldimand-Norfolk has remained at 5 or less over the same time period.

Figure 6 - Age-Standardized Incidence Rates for Gonorrhea Haldimand, Norfolk and Ontario, 1993-2003

Data: Age-Standardized Incidence Rates per 100,000 people. Data not available for Ontario 2001-2003.

Sources: Ontario data from RDIS, Ontario Ministry of Health & Long-Term Care. Haldimand & Norfolk data from RDIS, Haldimand-Norfolk Health Unit.



	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
H-N	2	1.1	5.1	2.1	1.6	2.4	2.2	5.3	4.8	6.9	8.3
ON	29.5	30	29	22.7	18.3	21.7	21.4	26.8			
H-N Cases	2	1	5	2	1	2	2	5	4	6	9

Year

HEPATITIS

Hepatitis is a viral infection of the liver. In Canada, there are three common forms of the disease; A, B and C, of which only Hepatitis B is considered a sexually transmitted disease. Hepatitis C is included in this category because it is primarily a blood-borne disease. (For a discussion of Hepatitis A, see the section on 'Food and Waterborne Diseases'.)

Hepatitis B

Hepatitis B is spread by direct exposure to the blood or body fluids, such as semen, of an infected individual. Persons who inject drugs or have multiple sexual partners are at risk of exposure. As well, infected mothers can transmit the disease to their infants. Symptoms include loss of appetite, nausea and vomiting, stomach pain, fatigue and a yellowing of the skin and eyes (jaundice). Some people carry the virus for the rest of their lives after infection; these people may develop cirrhosis (scarring) of the liver, liver failure or liver cancer.[3]

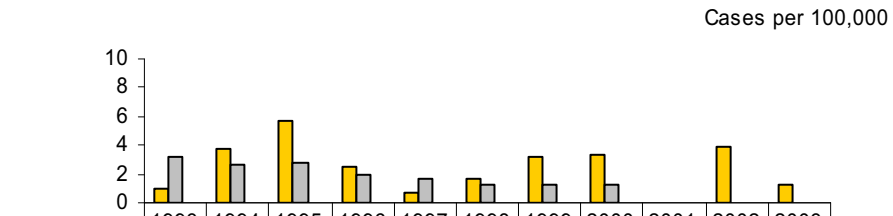
The disease is preventable through immunization, and universal vaccination of all Grade 7 students was initiated in Ontario in 1994. A Hepatitis B vaccination programme for high-risk individuals, such as injection drug users and STD patients, is also in place in Ontario.

The Hepatitis B age-standardized incidence rates in Figure 7 shows little difference between Haldimand-Norfolk and Ontario. The average age-standardized incidence rate for the years 1993-2000 was 2.7/100,000 for Haldimand-Norfolk and 2.0/100,000 for Ontario.

Figure 7 - Age-Standardized Incidence Rates of Hepatitis B in Haldimand, Norfolk and Ontario 1993-2003

Data: Age-Standardized Incidence Rates per 100,000 people. Data not available for Ontario 2001-2003.

Sources: Ontario data from RDIS, Ontario Ministry of Health & Long-Term Care. Haldimand & Norfolk data from RDIS, Haldimand-Norfolk Health Unit.



	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
H-N	1	3.7	5.7	2.5	0.7	1.7	3.2	3.4	0	3.9	1.3
ON	3.2	2.6	2.8	2	1.6	1.2	1.2	1.2			
H-N Cases	1	4	6	2	1	2	4	4	0	4	2

Year

Hepatitis C

The Hepatitis C virus was first identified in 1989, and the disease became reportable in Ontario in October of 1991. Most Hepatitis C infections either have no symptoms or have a mild clinical illness.[4] The virus is acquired primarily through activities that involve the exchange of blood, such as the sharing of needles. Many individuals currently infected became so through the transfusion of blood or blood products prior to 1990. In May of 1990, universal Hepatitis C screening of blood donors was instituted in Ontario.

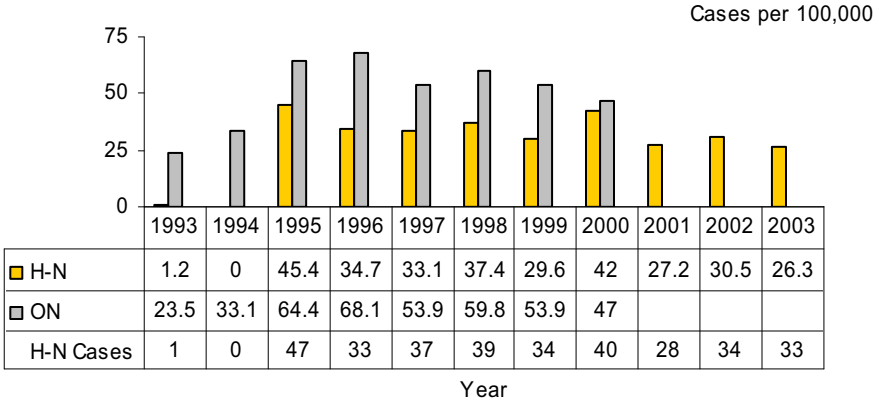
Symptoms of Hepatitis C infection include loss of appetite, nausea and vomiting, stomach pain, extreme fatigue and a yellowing of the skin and eyes (jaundice). About 85% of infected people carry the virus for the rest of their lives. These people may develop cirrhosis (scarring) of the liver and liver failure. There is no vaccine available for the prevention of Hepatitis C.[5]

Figure 8 shows the reporting trend of cases in Haldimand-Norfolk from 1993-2003. Hepatitis C is the third most commonly reported of the major reportable diseases in Haldimand-Norfolk, after Chlamydia and Campylobacter. The sharp increase in Hepatitis C infections in 1995 was not due to an outbreak, but rather to a significant change in the ability to detect infection via a blood test. The age-standardized incidence rates for Ontario have generally been higher than Haldimand-Norfolk. In 2000, the incidence rates for Ontario and Haldimand-Norfolk were very close (Haldimand-Norfolk 42/100,000 & Ontario 47/100,000). Over the time period 1995 to 2000 the average age-standardized incidence rate for Haldimand-Norfolk was 37/100,000 compared to 57.8/100,000 people in Ontario.

Figure 8 - Age-Standardized Incidence Rates of Hep C in Haldimand, Norfolk and Ontario 1993-2003

Data: Age-Standardized Incidence Rates per 100,000 people. Data not available for Ontario 2001-2003.

Sources: Ontario data from RDIS, Ontario Ministry of Health & Long-Term Care. Haldimand & Norfolk data from RDIS, Haldimand-Norfolk Health Unit.



	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
H-N	1.2	0	45.4	34.7	33.1	37.4	29.6	42	27.2	30.5	26.3
ON	23.5	33.1	64.4	68.1	53.9	59.8	53.9	47			
H-N Cases	1	0	47	33	37	39	34	40	28	34	33

AIDS

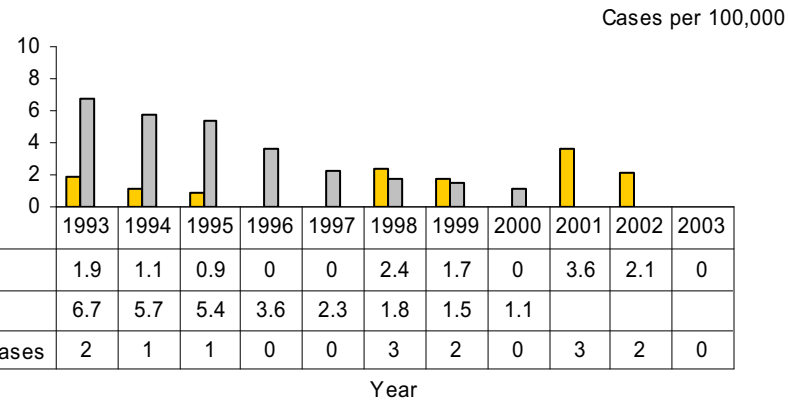
HIV (Human Immunodeficiency Virus) attacks the immune system. AIDS (Acquired Immunodeficiency Syndrome) is the advanced form of HIV infection. Most of the serious effects of AIDS occur when an affected person is no longer able to defend against infection by other opportunistic organisms. Treatment via a 'cocktail' of anti-retroviral medications is proving successful in extending the life of infected individuals; however, there is yet no cure.

Over the time period 1993-2001, the age-standardized incidence rates for Ontario have generally been higher than the Haldimand-Norfolk rates (Figure 9). The rate in Ontario has shown a decline since 1993. The average age-standardized incidence rate for the years 1993-2000 for Ontario is 3.5/100,000 compared to 1/100,000 for Haldimand and Norfolk. There have been 14 AIDS cases in Haldimand-Norfolk over the last 11 years (1993-2003).

Figure 9 - Age-Standardized Incidence Rates of AIDS in Haldimand, Norfolk and Ontario, 1993-2003

Data: Age-Standardized Incidence Rates per 100,000 people. Data not available for Ontario 2001-2003.

Sources: Ontario data from RDIS, Ontario Ministry of Health & Long-Term Care. Haldimand & Norfolk data from RDIS, Haldimand-Norfolk Health Unit.



	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
H-N	1.9	1.1	0.9	0	0	2.4	1.7	0	3.6	2.1	0
ON	6.7	5.7	5.4	3.6	2.3	1.8	1.5	1.1			
H-N Cases	2	1	1	0	0	3	2	0	3	2	0

Syphilis

Syphilis is caused by the bacterium *Treponema pallidum*. It has often been called 'the great imitator' because so many of the signs and symptoms are indistinguishable from those of other disease. Syphilis is passed from person-to-person through direct contact with a syphilis sore, usually during sexual contact. Sores occur mainly on the external genitals, vagina, anus, or in the rectum, but can also occur on the lips and in the mouth. Pregnant women with the disease can pass it to their fetus, risking miscarriage, stillbirth or prematurity.[7]

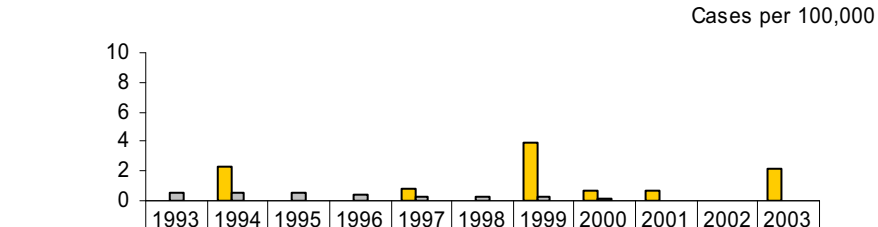
Untreated, a third of cases will suffer further infection of the brain, nerves, eyes, heart, blood vessels, liver, bones or joints, and risk death. While the infection can be effectively treated with an appropriate antibiotic, it does increase the transmission of HIV.[8]

The Syphilis age-standardized incidence rates for Ontario and Haldimand-Norfolk are shown in Figure 10. The incidence rates for both Ontario and Haldimand-Norfolk have remained very low over the time period 1993-2000. There have been only 12 reported cases of Syphilis in Haldimand-Norfolk over the last 11 years.

Figure 10 - Age-Standardized Incidence Rates of Syphilis in Haldimand, Norfolk and Ontario, 1993-2003

Data: Age-Standardized Incidence Rates per 100,000 people. Data not available for Ontario 2001-2003.

Sources: Ontario data from RDIS, Ontario Ministry of Health & Long-Term Care. Haldimand & Norfolk data from RDIS, Haldimand-Norfolk Health Unit.



	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
H-N	0	2.3	0	0	0.8	0	3.9	0.7	0.7	0	2.1
ON	0.6	0.6	0.5	0.4	0.3	0.3	0.3	0.2			
H-N Cases	0	3	0	0	1	0	3	1	1	0	3

Year

"The travel time to Canada from anywhere in the world is less than the incubation period for nearly all infectious diseases, for example SARS."

Dr. J. Tschirhart
(Acting) Medical Officer of Health
2004

DISEASES SPREAD BY CLOSE PERSONAL CONTACT

Diseases spread by close contact are often spread through contact with nasal or throat secretions, such as those produced in cases of Streptococcal infection. As a result, such diseases are commonly passed between family members.

Congenital Cytomegalovirus (CMV)

Human CMV is a common virus that affects most people some time during their lives, but rarely causes illness. It is a member of the herpes virus group, and can be present in the human body without causing illness; however, it can be activated later in life, causing illness. Those affected may experience fever, swollen glands and fatigue. People with weakened immune systems are at risk for more severe complications, such as pneumonia or eye infections.[9]

Ten percent of infants who acquire CMV in utero will later develop some type of disability such as hearing loss, learning disabilities or mental retardation.[9] Congenital CMV infection is a reportable disease in Ontario.

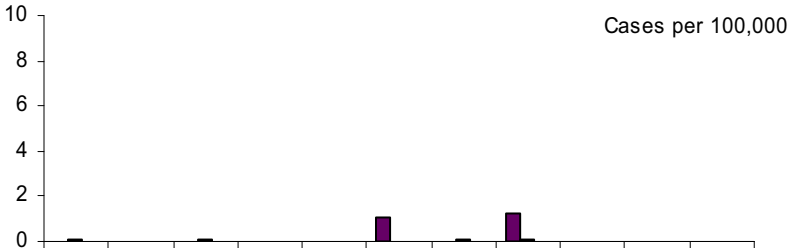
CMV is spread via contact with body fluids; saliva, urine, breast milk, blood, semen, etc. It can also be spread through blood transfusions and organ transplants. While it can be contracted through sexual contact, it is most commonly spread through non-sexual means.[9]

In Haldimand-Norfolk, there have only been 2 cases of Congenital CMV reported in the 1993-2003 time period, as shown in Figure 11. The age-standardized incidence rates for both Haldimand-Norfolk and Ontario have remained very low over the last 11 years.

Figure 11 - Age-Standardized Incidence Rates of CMV in Haldimand-Norfolk and Ontario, 1993-2003

Data: Age-Standardized Incidence Rates per 100,000 people. Data not available for Ontario 2001-2003.

Sources: Ontario data from RDIS, Ontario Ministry of Health & Long-Term Care. Haldimand & Norfolk data from RDIS, Haldimand-Norfolk Health Unit.



	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
H-N	0	0	0	0	0	1.1	0	1.2	0	0	0
ON	0.06	0.03	0.06	0.03	0.04	0.03	0.11	0.07			
H-N Cases	0	0	0	0	0	1	0	1	0	0	0

Year

Group A Streptococcal (GAS) Infections

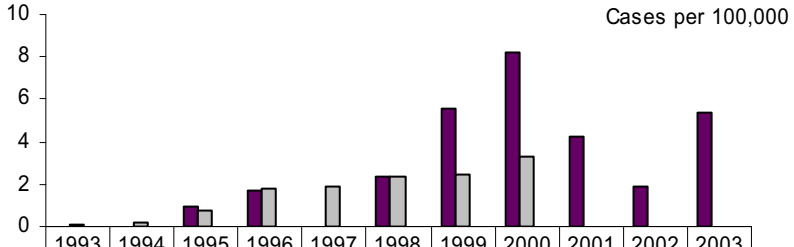
The bacterium responsible for GAS can lead to many common infections such as pharyngitis, tonsillitis, scarlet fever and ear infections. More rarely, GAS leads to flesh-eating disease (necrotizing fasciitis) and toxic shock[55]. GAS infection may occur when an individual has open sores or breaks in the skin that allow bacteria to enter the tissue, or when immunity has been compromised by chronic illness.

There are typically few cases of severe GAS infection in the Haldimand-Norfolk region each year, as shown in Figure 12. In 1999 and 2000, the age-standardized incidence rate for GAS was slightly higher in Haldimand-Norfolk than Ontario. The average age-standardized incidence rate for GAS was 2.3/100,000 in Haldimand-Norfolk and 1.6/100,000 in Ontario (1993-2000).

Figure 12 - Age-Standardized Incidence Rates of GAS in Haldimand-Norfolk and Ontario, 1993-2003

Data: Age-Standardized Incidence Rates per 100,000 people. Data not available for Ontario 2001-2003.

Sources: Ontario data from RDIS, Ontario Ministry of Health & Long-Term Care. Haldimand & Norfolk data from RDIS, Haldimand-Norfolk Health Unit.



	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
H-N	0	0	0.9	1.7	0	2.4	5.6	8.2	4.2	1.9	5.4
ON	0.1	0.2	0.8	1.8	1.9	2.4	2.5	3.3			
H-N Cases	0	0	1	2	0	3	6	9	3	2	6

Year

Group B Streptococcal (GBS) Neonatal Infections

GBS bacteria are transmitted from mother to infant during the birth process, and are a major cause of serious infections in infants from birth to 3 months of age, though older children and adults can also become infected.[10]

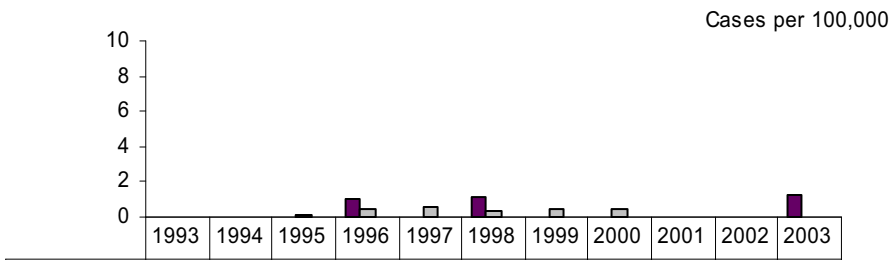
In pregnant women, GBS can cause bladder and womb infections (amniotitis and endometriosis) and stillbirth. GBS can also cause pneumonia, meningitis, soft tissue infections or a systemic infection.[10]

As seen in Figure 13, there have only been 3 cases of neonatal GBS in Haldimand-Norfolk from 1993-2003. The age-standardized incidence rates for both Haldimand-Norfolk and Ontario have remained very low.

Figure 13 - Age-Standardized Incidence Rates of Neonatal GBS in Haldimand-Norfolk and Ontario, 1993-2003

Data: Age-Standardized Incidence Rates per 100,000 people. Data not available for Ontario 2001-2003.

Sources: Ontario data from RDIS, Ontario Ministry of Health & Long-Term Care. Haldimand & Norfolk data from RDIS, Haldimand-Norfolk Health Unit.



	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
H-N	0	0	0	1	0	1.1	0	0	0	0	1.3
ON	0	0	0.1	0.5	0.6	0.3	0.5	0.5			
H-N Cases	0	0	0	1	0	1	0	0	0	0	1

Meningitis

Meningitis is an infection of spinal fluid and the membrane that surround the brain. It is also called Spinal Meningitis, and is usually caused by a viral or bacterial infection. Knowing whether Meningitis is caused by a virus or bacterium is important because the severity of illness and the treatment differ. Viral Meningitis is generally less severe and resolves without specific treatment, while bacterial Meningitis can be quite severe and may result in brain damage, hearing loss, learning disability or death.

Bacterial Meningitis

Before the 1990s, *Haemophilus influenzae type b* (HiB) was the leading cause of bacterial Meningitis, but the new vaccines being given to all children as part of their routine immunizations have reduced the occurrence of invasive disease due to HiB. (Please refer to the HiB discussion in the section on Vaccine Preventable Diseases.) Today, *Streptococcus pneumoniae* and *Neisseria meningitidis* are the leading causes of bacterial Meningitis.

Meningococcal Disease

Meningococcal disease is a rare bacterial infection caused by *Neisseria meningitidis*. The bacteria lodge in the nose and throat and are spread by face-to-face contact, including kissing, coughing, sneezing and the sharing of cigarettes, food and beverages.

While up to one in four people may carry the bacteria without becoming sick, 0.001% of the Ontario population will develop the actual disease. These people can develop blood poisoning or Meningitis 2-10 days after being exposed.

In Canada, children under 1 year of age are at highest risk, followed by those under 5 and those between 15 and 19 years old. Bacterial Meningitis can be treated with a number of effective antibiotics whose appropriate use reduces the risk of dying from the disease to below 15%, although the risk remains higher among the elderly.[12]

In Ontario, there were 3 Meningococcal disease outbreaks between 1999 and 2001. The first occurred in February and March 1999 among elementary and high school students in Windsor Essex County; there were 3 cases including 1 death. A mass immunization campaign was initiated using quadrivalent meningococcal vaccine and targeting day-care centres and elementary and high school students in a confined geographic area. Approximately 5000 doses of vaccine were distributed and an estimated 80% of targeted individuals immunized. A second outbreak occurred in London-Middlesex County between February and May 2001 among individuals 2 to 24 years of age. A total of 6 cases were identified, and no deaths occurred. A mass immunization campaign was initiated using quadrivalent and bivalent polysaccharide meningococcal vaccine for those aged 2 to 24 years of age. An estimated 93% of targeted individuals were immunized. The third Meningitis disease outbreak occurred in Toronto between May and August 2001 among men who have sex with men (MSM) in the 20 to 44 year age group. Six cases were identified, including two deaths. A mass immunization campaign was initiated that targeted all MSM in Toronto; 3850 doses of polysaccharide vaccine were distributed.[12b]

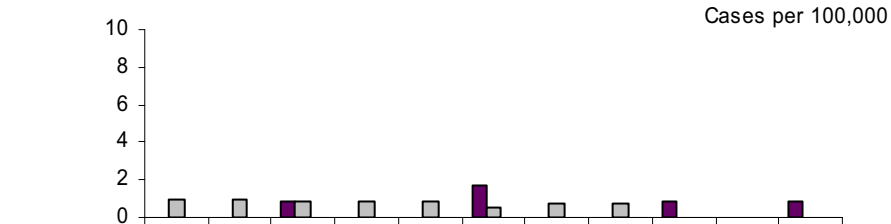
Current "polysaccharide" meningococcal vaccines, are 75% to 90% effective in adolescents and adults, approximately 50% effective in children 2 to 10 years of age, but provide no protection for children under the age of 2 years. The protective effect of the vaccine is short-lived, lasting 2 to 5 years.[13] New “conjugate” vaccines, which offer long term protection against some strains of Meningococcal disease are available in Canada. Polysaccharide and conjugate vaccines are available in Ontario and will become publicly funded in 2004/2005.

As seen in Figure 14, there have been a total of 5 cases of Meningococcal disease in Haldimand-Norfolk in the 1993-2003 period. During this period the average age-standardized incidence rate in Haldimand-Norfolk was .3/100,000 compared to .8/100,000. Clearly, the incidence rate of Meningococcal disease was very rare in both Haldimand-Norfolk and Ontario.

Figure 14 -- Age-Standardized Incidence Rates of Meningococcal Disease in Haldimand-Norfolk and Ontario, 1993-2003

Data: Age-Standardized Incidence Rates per 100,000 people. Data not available for Ontario 2001-2003.

Sources: Ontario data from RDIS, Ontario Ministry of Health & Long-Term Care. Haldimand & Norfolk data from RDIS, Haldimand-Norfolk Health Unit.



	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
H-N	0	0	0.9	0	0	1.7	0	0	0.8	0	0.8
ON	1	1	0.9	0.9	0.8	0.5	0.7	0.7			
H-N Cases	0	0	1	0	0	2	0	0	1	0	1

Year

Viral Meningitis

Viral (or aseptic) Meningitis is a relatively common but rarely serious clinical syndrome with multiple viral causes. Diagnosis is usually made through the examination of cerebral-spinal fluid. Reservoir, mode of transmission, incubation period, period of communicability and susceptibility and resistance vary with the specific infectious agent.

Tuberculosis (TB)

Tuberculosis is caused by a bacterium called *Mycobacterium tuberculosis*. Its effects are most noticeable in, but are not limited to, the lungs. Organisms are released into the air when a person infected with active pulmonary TB coughs. Anyone who then inhales these airborne organisms may then become infected. The vast majority of people with the Tuberculosis bacterium in their bodies never develop the disease or become contagious; only 10% of such people progress to active infection.[15]

Before WWII, more than 14,000 new cases of Tuberculosis were reported in Canada each year, and over 17,000 infected individuals were placed in sanatoriums. The last Canadian sanatorium closed in the 1970s, and since 1987 the number of new cases has remained constant, at about 2000 annually.[15]

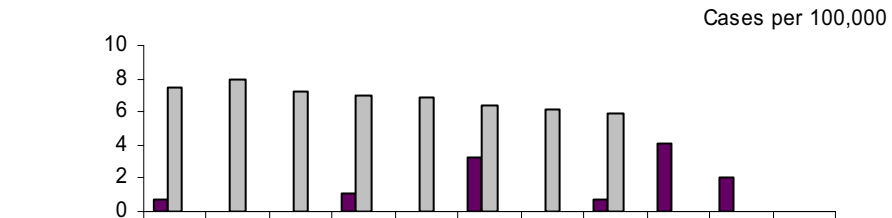
While Tuberculosis has traditionally been successfully treated with a full course of antibiotic treatment, non-compliance has allowed the emergence of drug-resistant Tuberculosis, which has been reported in Canada for decades.[15] Moreover, on the global scene, co-infection with HIV
has allowed the prevalence rates of both diseases to accelerate in regions with low levels of disease control.

There have been only 13 cases of Tuberculosis in Haldimand-Norfolk over the last 11 years (1993-2003). The average age-standardized incidence rate (1993-2000) in Haldimand-Norfolk was .7/100,000 compared to 6.9/100,000 in Ontario (Figure 15).

Figure 15 - Age-Standardized Incidence Rate of Tuberculosis in Haldimand-Norfolk and Ontario, 1993-2003

Data: Age-Standardized Incidence Rates per 100,000 people. Data not available for Ontario 2001-2003.

Sources: Ontario data from RDIS, Ontario Ministry of Health & Long-Term Care. Haldimand & Norfolk data from RDIS, Haldimand-Norfolk Health Unit.



	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
H-N	0.7	0	0	1.1	0	3.2	0	0.7	4.1	2.1	0
ON	7.5	8	7.2	7	6.9	6.4	6.1	5.9			
H-N Cases	1	0	0	1	0	4	0	1	3	3	0

Year

"Food and waterborne diseases are underreported due to inaccurate diagnoses (You have food poisoning or you have the flu)."

Glen Steen
Program Coordinator - Healthy Environment
Haldimand-Norfolk Health Unit
February, 2004

FOOD AND WATERBORNE DISEASES

Diseases spread by food and water are caused by a host of different organisms that have been introduced into our food and/or water supply, usually through the faeces of an infected person or animal. Many of these diseases can also be spread from one person to another if hands are not thoroughly washed after using the toilet. All of these diseases may cause diarrhea of variable severity. Some may require medical intervention, such as antibiotic therapy, while other diseases are mild enough not to require any special treatment.

The highest incidence for many of these diseases is among children under 5 years of age. This may be due to poor personal hygiene or to the decreased robustness of children's immune systems.

AMEBIASIS

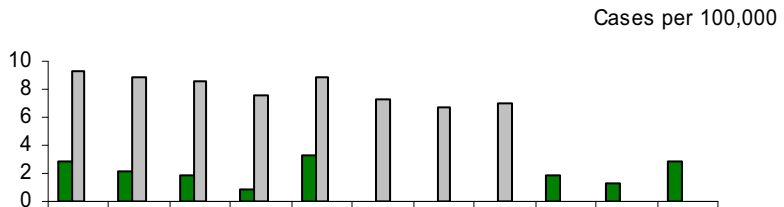
Amebiasis in Canada is most common among immigrants or travellers from developing countries with poor sanitation. It is caused by the parasite *Entamoeba histolytica.* On average, about 1 in 10 people who are exposed become sick from the infection. The symptoms often are quite mild and can include loose stools, stomach pain, and stomach cramping. Amebic dysentery, a severe form of amebiasis, is associated with stomach pain, bloody stools, and fever. Rarely, the organism invades the liver and forms an abscess. Even less commonly, it spreads to other parts of the body, such as the lungs or brain.[16] Amebiasis is treatable with antibiotics, while good hygiene, safe drinking water and proper food handling are the best course for minimizing transmission.

Figure 16 shows the age-standardized incidence rate and number of yearly cases of Amebiasis in Haldimand-Norfolk from 1993-2003. The numbers have been consistently small, never exceeding 4 cases per year. The average age-standardized incidence rate was 1.4/100,000 for Haldimand-Norfolk and 8/100,000 for Ontario. The Amebiasis incidence rate was certainly higher in Ontario than Haldimand-Norfolk.

Figure 16 - Age-Standardized Incidence Rate of Amebiasis in Haldimand-Norfolk and Ontario, 1993-2003

Data: Age-Standardized Incidence Rates per 100,000 people. Data not available for Ontario 2001-2003.

Sources: Ontario data from RDIS, Ontario Ministry of Health & Long-Term Care. Haldimand & Norfolk data from RDIS, Haldimand-Norfolk Health Unit.



	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
H-N	2.9	2.2	1.9	0.9	3.3	0	0	0	1.8	1.3	2.9
ON	9.3	8.8	8.6	7.6	8.8	7.3	6.7	7			
H-N Cases	3	2	2	1	4	0	0	0	2	1	3

Year

ATYPICAL MYCOBACTERIUM

Atypical Mycobacterium infection refers to infection by any one of a number of species of mycobacterium, commonly found in our environment. Two of the four most common species cause lung disease similar to Tuberculosis, while the other two cause skin infections. One outcome is Mycobacterium avium complex (MAC), which is the most common non-Tuberculosis mycobacterium infection associated with AIDS. It causes fever, swollen glands, diarrhea, fatigue, weight loss and shortness of breath.[17] Most cases require treatment with a course of antibiotics.

Most infections with these organisms are believed to arise from environmental exposure to organisms in infected water, soil, dust, or aerosols. Person-to-person and animal-to-animal transmission of atypical mycobacteria is not an important factor in acquisition of infection with these organisms.[18] Although many people are exposed to non-Tuberculosis mycobacterium, only a few of these exposures result in chronic infection or disease.

There have been only 9 cases of Atypical Mycobacterium in Haldimand-Norfolk from 1993 to 2003. The age-standardized incidence rate for Haldimand-Norfolk was 1.9 in 2003. No Ontario data was available for comparison.

CAMPYLOBACTERIOSIS

Campylobacter jejuni is the most common bacterial cause of diarrhea illness in Ontario. The diarrhea may be bloody and can be accompanied by nausea and vomiting. Most cases are associated with handling or eating raw or undercooked poultry, while other cases result from contact with unpasteurized milk or the stool of infected animals.[19]

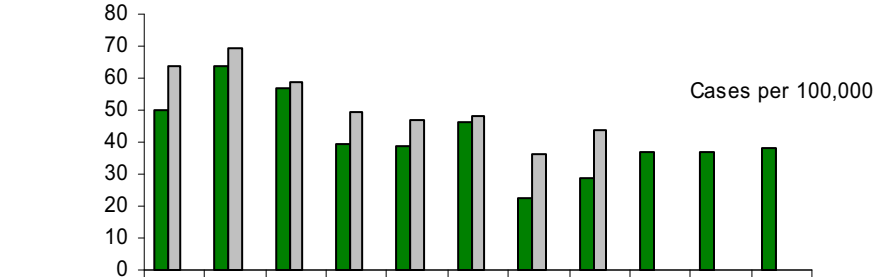
Virtually all infected persons will recover completely within 2-5 days, though some may require as long as 10 days. Long-term complications are very rare, but include arthritis and, in 0.1% of cases, an auto-immune nervous system disorder called Guillain-Barré syndrome.[19]

Campylobacteriosis is the second most reported of the major reportable diseases in Haldimand-Norfolk. Figure 17 shows the disease's yearly frequency and incidence for the period 1993-2003. The average age-standardized incidence rate was 43.3/100,000 in Haldimand-Norfolk, compared to 52/100,000 in Ontario. The incidence rate was slightly higher in Ontario.

Figure 17 - Age-Standardized Incidence Rate of Campylobacteriosis in Haldimand-Norfolk and Ontario, 1993-2003

Data: Age-Standardized Incidence Rates per 100,000 people. Data not available for Ontario 2001-2003.

Sources: Ontario data from RDIS, Ontario Ministry of Health & Long-Term Care. Haldimand & Norfolk data from RDIS, Haldimand-Norfolk Health Unit.



	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
H-N	50.3	63.5	56.7	39.4	38.8	46.2	22.4	29	36.8	36.9	38.4
ON	63.7	69.3	58.8	49.3	47.1	47.9	36.3	43.7			
H-N Cases	52	63	57	43	40	44	24	28	35	40	41

Year

GIARDIASIS

Giardiasis is caused by *Giardia lamblia*, a parasite that lives in the intestines of animals and people. Found throughout the world, it is recognized as one of the leading causes of waterborne disease. Infection leads to loose or watery stool, upset stomach and stomach cramps, though some people have no symptoms. In otherwise healthy people, these symptoms can last 2-6 weeks.[20]

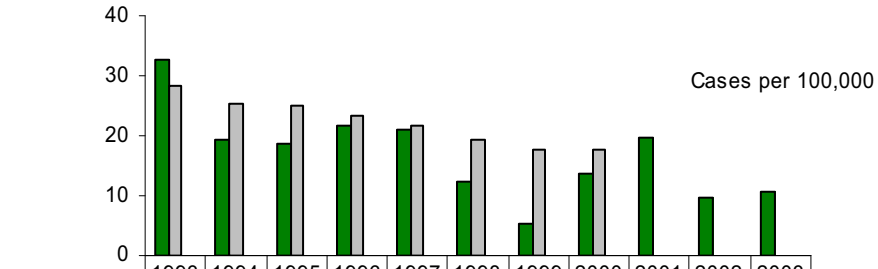
Spread via the faecal-oral route, persons who are at particular risk include children who attend child care centres, international travellers, hikers, campers, swimmers and those who drink water from an untreated source. Several prescription treatments are available for treating active cases, while good hygiene, drinking treated water and maintaining safe food-handling practices are the best methods for reducing or avoiding transmission.

For the most part, the Giardiasis incidence rate for Ontario has been higher than Haldimand-Norfolk for the time period 1993-2000 (Figure 18). The average age-standardized incidence rate (1993-2003) for Haldimand-Norfolk was 18.1/100,000 compared to 22.3/100,000 for Ontario.

Figure 18 - Age-Standardized Incidence Rate of Giardiasis in Haldimand-Norfolk and Ontario, 1993-2003

Data: Age-Standardized Incidence Rates per 100,000 people. Data not available for Ontario 2001-2003.

Sources: Ontario data from RDIS, Ontario Ministry of Health & Long-Term Care. Haldimand & Norfolk data from RDIS, Haldimand-Norfolk Health Unit.



	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
H-N	32.7	19.2	18.8	21.6	20.9	12.2	5.4	13.7	19.8	9.6	10.8
ON	28.5	25.3	25.1	23.3	21.6	19.2	17.8	17.8			
H-N Cases	33	19	19	22	21	13	5	12	16	9	11

Year

HEPATITIS A

Hepatitis A is a viral liver infection. Symptoms include fever, malaise, abdominal discomfort, nausea and jaundice. Unlike Hepatitis B and C, the infection tends to have less severe consequences and chronic liver infection does not occur. However, 10% of infected persons will have prolonged or relapsing symptoms for a 6-9 month period. No specific treatment is available for infected persons.[21]

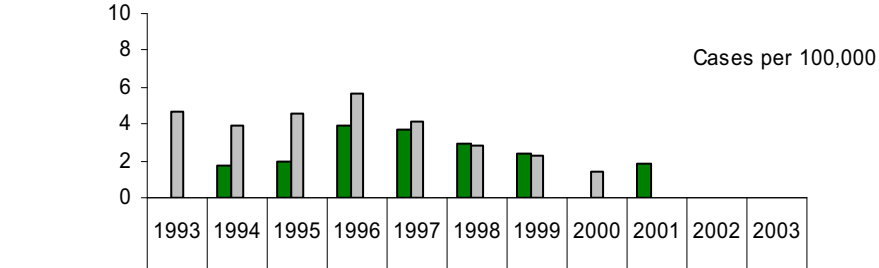
The disease is transmitted via the faecal-oral route, and hence is more common in the developing world. Immunization is typically effected through the administration of either immune globulin or a vaccination formulation of inactive viruses. Good hygiene, immunization of travellers and safe food-handling are the best courses of prevention.

There are typically fewer than five cases per year in Haldimand-Norfolk. The average age-standardized incidence rate in Haldimand-Norfolk was 2.1/100,000 for the time period 1993-2000, compared to 3.7/100,000 for Ontario (Figure 19). The average incidence rate in Ontario was almost double the Haldimand-Norfolk rate.

Figure 19 - Age-Standardiized Incidence Rate of Hepatitis A - Haldimand-Norfolk and Ontario, 1993-2003

Data: Age-Standardized Incidence Rates per 100,000 people. Data not available for Ontario 2001-2003.

Sources: Ontario data from RDIS, Ontario Ministry of Health & Long-Term Care. Haldimand & Norfolk data from RDIS, Haldimand-Norfolk Health Unit.



	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
H-N	0	1.7	2	3.9	3.7	2.9	2.4	0	1.8	0	0
ON	4.7	3.9	4.6	5.6	4.1	2.8	2.3	1.4			
H-N Cases	0	2	2	4	4	3	3	0	2	0	0

Year

LEGIONELLOSIS

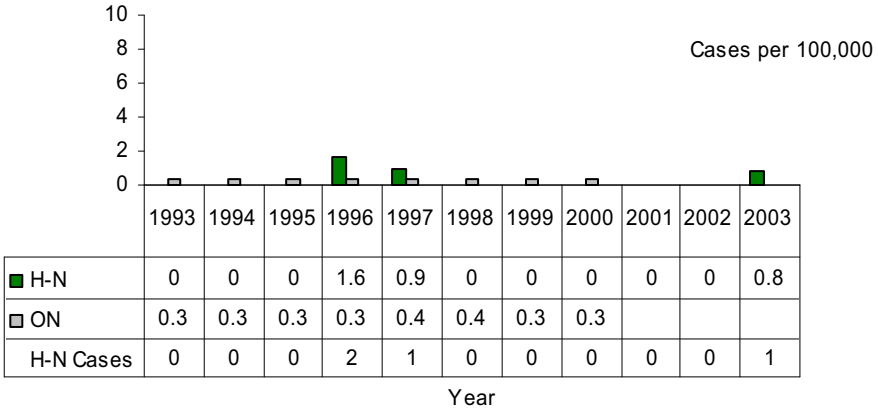
Legionellosis is an infection caused by the bacterium *Legionella pneumophila*. The disease has two distinct forms; Pontiac fever, which is the milder of the two forms, and Legionnaires' disease, the more severe form of infection which includes pneumonia, and which acquired its name in 1976 when an outbreak of pneumonia occurred among persons attending a convention of the American Legion in Philadelphia.[11]

Legionellosis is very rare in Haldimand-Norfolk. As shown in Figure 20, from 1993-2003 there have only been 4 cases reported. The age-standardized incidence rates for both Haldimand-Norfolk and Ontario have remained very low.

Figure 20 - Age-Standardized Incidence Rates of Legionellosis in Haldimand-Norfolk and Ontario, 1993-2003

Data: Age-Standardized Incidence Rates per 100,000 people. Data not available for Ontario 2001-2003.

Sources: Ontario data from RDIS, Ontario Ministry of Health & Long-Term Care. Haldimand & Norfolk data from RDIS, Haldimand-Norfolk Health Unit.



	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
H-N	0	0	0	1.6	0.9	0	0	0	0	0	0.8
ON	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.3			
H-N Cases	0	0	0	2	1	0	0	0	0	0	1

LISTERIOSIS

Listeriosis is a serious infection caused by eating food contaminated with the bacterium *Listeria monocytogenes*. Carrying a fatality rate of 20%, the disease affects primarily pregnant women, newborns, and adults with weakened immune systems.[22]

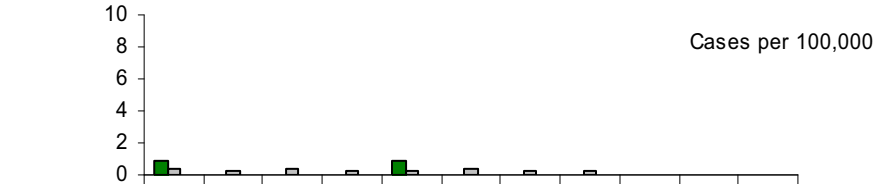
Symptoms include fever, muscle aches, and sometimes gastrointestinal symptoms, such as nausea or diarrhea. If infection spreads to the nervous system, symptoms such as headache, stiff neck, confusion, loss of balance, or convulsions can occur. Infected pregnant women may experience only a mild, flu-like illness; however, infections during pregnancy can lead to miscarriage or stillbirth, premature delivery, or infection of the newborn.[22]

Since 1993, there have been only two cases in Haldimand-Norfolk. The age-standardized incidence rates have been very low for both Haldimand-Norfolk and Ontario (Figure 21).

Figure 21 - Age-Standardized Incidence Rate of Listeriosis in Haldimand-Norfolk and Ontario, 1993-2003

Data: Age-Standardized Incidence Rates per 100,000 people. Data not available for Ontario 2001-2003.

Sources: Ontario data from RDIS, Ontario Ministry of Health & Long-Term Care. Haldimand & Norfolk data from RDIS, Haldimand-Norfolk Health Unit.



	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
H-N	0.9	0	0	0	0.9	0	0	0	0	0	0
ON	0.4	0.3	0.4	0.2	0.3	0.4	0.3	0.3			
H-N Cases	1	0	0	0	1	0	0	0	0	0	0

Year

SALMONELLOSIS

Salmonellosis is caused by bacteria belonging to the family Salmonella. The types most often reported as the cause of human illness in Canada are *S. typhimurium* and *S. enteritidis*, although over 2000 species of Salmonella are known.[23] Most persons infected with Salmonella develop diarrhea, fever, and abdominal cramps 12 to 72 hours after infection. The illness usually lasts 4 to 7 days, and most persons recover without treatment; however, in some persons the diarrhea may be so severe that hospitalization is necessary. In these patients, untreated Salmonella infection may spread from the intestines to the blood stream, and then to other body sites and can cause death. The elderly, infants, and those with impaired immune systems are more likely to have a severe illness.[24]

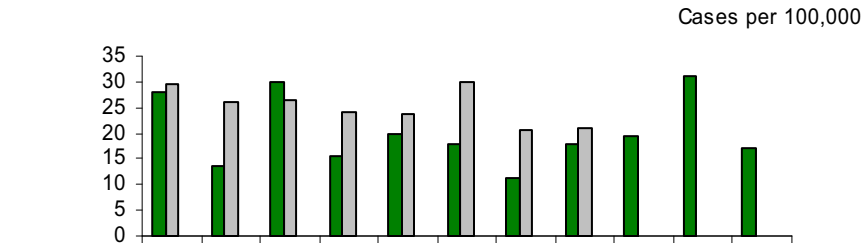
Cases of Salmonella infection are usually associated with contaminated food of animal origin, such as poultry, pork and eggs; but all foods can be contaminated. Salmonella can also be associated with pets, including dogs, cats and turtles.

Generally, the incidence rate of Salmonella has been higher in Ontario than Haldimand-Norfolk. The average age-standardized rate in Haldimand-Norfolk was 19.2 per 100,000 for the years 1993 to 2000, compared to 25.2/100,000 in Ontario (Figure 22). There was no difference in the average age-standardized incidence rates of males (20.1/100,000) and females (20.2/100,000) over the period 1993-2003.

Figure 22 - Age-Standardized Incidence Rate of Salmonella in Haldimand-Norfolk and Ontario, 1993-2003

Data: Age-Standardized Incidence Rates per 100,000 people. Data not available for Ontario 2001-2003.

Sources: Ontario data from RDIS, Ontario Ministry of Health & Long-Term Care. Haldimand & Norfolk data from RDIS, Haldimand-Norfolk Health Unit.



	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
H-N	28	13.6	29.9	15.7	19.7	17.7	11.2	17.9	19.4	31.1	17.3
ON	29.5	26	26.4	24.3	23.8	30	20.6	21			
H-N Cases	28	13	32	18	19	19	12	18	20	33	20

Year

SHIGELLOSIS

Shigellosis is an infectious disease caused by a group of bacteria called *Shigella*. Most infected persons develop diarrhea (often bloody), fever and stomach cramps starting 1 to 2 days after exposure. The disease usually resolves itself in 5 to 7 days. In some persons, especially young children and the elderly, the diarrhea can be severe enough to warrant hospitalization. A severe infection with high fever may also be associated with seizures in children less than 2 years old. Some persons who are infected may have no symptoms at all, but may still pass the Shigella bacteria to others.[25]

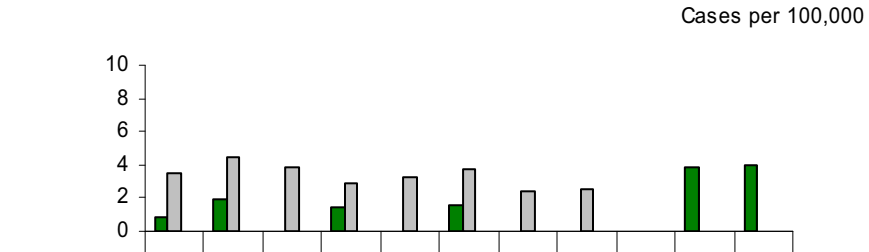
Occurrence is worldwide, with transmission usually occurring along the faecal-oral route. It accounts for more than 600,000 yearly deaths worldwide, with two thirds of all deaths occurring in children under 10 years of age. Outbreaks are common in areas of overcrowding where sanitation is poor, such as jails, institutions for children, daycare centres, mental hospitals and crowded refugee camps. Multi-antibiotic resistant strains have appeared worldwide, resulting from wide spread use of antibiotics.[26]

There have only been 13 cases of Shigellosis in Haldimand-Norfolk over the last 11 years (1993-2003). During the time period 1993-2000, the age-standardized Shigellosis incidence rate has consistently been higher in Ontario, compared to Haldimand-Norfolk (Figure 23). The average age-standardized incidence rate in Haldimand-Norfolk was .7/100/000, compared to 3/100,000 in Ontario.

Figure 23 - Age-Standardized Incidence Rate of Shigellosis in Haldimand-Norfolk and Ontario, 1993-2003

Data: Age-Standardized Incidence Rates per 100,000 people. Data not available for Ontario 2001-2003.

Sources: Ontario data from RDIS, Ontario Ministry of Health & Long-Term Care. Haldimand & Norfolk data from RDIS, Haldimand-Norfolk Health Unit.



	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
H-N	0.9	1.9	0	1.5	0	1.6	0	0	0	3.9	4
ON	3.5	4.5	3.9	2.9	3.3	3.7	2.4	2.5			
H-N Cases	1	2	0	1	0	1	0	0	0	4	4

Year

VEROTOXIN-PRODUCING *ESCHERICHIA COLI* (VTEC)

Found in the intestines of healthy cattle, VTEC is an emerging cause of food borne illness. It is the source of the epidemic associated with the municipal water supply in Walkerton, Ontario. Prior to this event, most outbreaks were associated with the eating of undercooked or contaminated hamburger or ground meat products.[27] Person-to-person contact in families and child care centres is an important route of transmission. Infection can also occur after drinking raw milk, and after swimming in or drinking sewage-contaminated water.[28]

Resulting diarrhea ranges in severity from mild with no blood in the stools to severe with stools that are virtually all blood. There is little or no fever associated with this infection. Most people recover without antibiotic treatment within 5 to 10 days after exposure.[28]

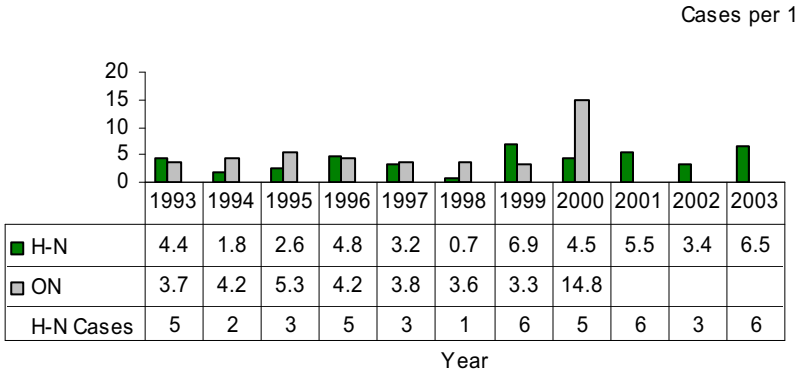
Children under 5 years of age and the elderly are susceptible to a complication called "hemolytic uremic syndrome" (HUS), in which the red blood cells are destroyed and the kidneys fail. HUS is a life-threatening condition usually treated in an intensive care unit. Blood transfusions and kidney dialysis are often required.[28]

There have been fewer than 7 cases per year in Haldimand-Norfolk (1993-2003). The average age-standardized incidence rate (1993-2000) was 3.6/100,000 in Haldimand-Norfolk, compared to 5.4/100,000 in Ontario (Figure 24). The average age-standardized incidence rate was higher in Ontario than Haldimand-Norfolk.

Figure 24 - Age-Standardized Incidence Rate of Verotoxin-Producing Escherichia Coli in Haldimand-Norfolk and Ontario, 1993-2003

Data: Age-Standardized Incidence Rates per 100,000 people. Data not available for Ontario 2001-2003.

Sources: Ontario data from RDIS, Ontario Ministry of Health & Long-Term Care. Haldimand & Norfolk data from RDIS, Haldimand-Norfolk Health Unit.



	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
H-N	4.4	1.8	2.6	4.8	3.2	0.7	6.9	4.5	5.5	3.4	6.5
ON	3.7	4.2	5.3	4.2	3.8	3.6	3.3	14.8			
H-N Cases	5	2	3	5	3	1	6	5	6	3	6

YERSINIOSIS

Yersiniosis is an infectious disease caused by a bacterium of the genus *Yersinia*. Infection can cause a variety of symptoms depending on the age of the person infected. It occurs most often in young children, whose common symptoms are fever, abdominal pain, and diarrhea, which is often bloody. Symptoms typically develop 4 to 7 days after exposure and may last 1 to 3 weeks or longer. In older children and adults, right-sided abdominal pain and fever may be the predominant symptoms, and may be confused with appendicitis. In a small proportion of cases, complications such as skin rash, joint pains, or spread of bacteria to the bloodstream can occur.[29]

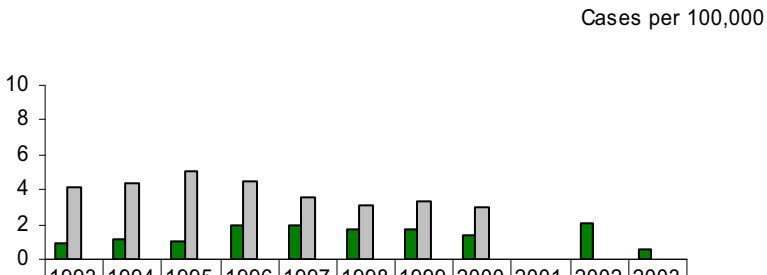
Infection is most often acquired by eating contaminated food, especially raw or undercooked pork products. The preparation of raw pork intestines may be particularly risky. Drinking contaminated unpasteurized milk or untreated water can also transmit the infection. Occasionally, infection occurs after contact with infected animals. Rarely, transmission occurs along the faecal-oral route or through blood transfusions.[29]

As shown in Figure 25, there are typically one or two cases per year in Haldimand-Norfolk. The incidence rates in Ontario have consistently been higher than Haldimand-Norfolk. The average age-standardized incidence rate (1993-2000) in Haldimand-Norfolk was 1.5/100,000 compared to the Ontario rate of 3.9/100,000.

Figure 25 - Age-Standardized Incidence Rate of Yersinoisis in Haldimand-Norfolk and Ontario, 1993-2003

Data: Age-Standardized Incidence Rates per 100,000 people. Data not available for Ontario 2001-2003.

Sources: Ontario data from RDIS, Ontario Ministry of Health & Long-Term Care. Haldimand & Norfolk data from RDIS, Haldimand-Norfolk Health Unit.



	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
H-N	0.9	1.2	1	1.9	1.9	1.7	1.7	1.4	0	2.1	0.6
ON	4.1	4.4	5.1	4.5	3.6	3.1	3.3	3			
H-N Cases	1	1	1	2	2	2	1	2	0	2	1

Year

"Vaccination has greatly reduced the morbidity and mortality associated with infectious diseases. This has recently been demonstrated by the decrease in the number of cases of Heamophilus Influenza B meningitis in children."

Joan Beckett
Registered Nurse
Haldimand-Norfolk Health Unit
February 2004

VACCINE PREVENTABLE DISEASES

Diseases in this category are typically caused by viruses or bacteria, and are highly contagious. Outbreaks of vaccine preventable diseases occur in the developed world when there is a decline in immunization rates, or when the vaccine formulation (such as the yearly influenza vaccine formulation) is insufficiently targeted to the season's pathogen.

Some diseases are so widely vaccinated against such as Rubella, that they very rarely appear in the Haldimand-Norfolk area. A vaccination schedule is provided in Appendix I.

CHICKENPOX

Highly contagious and very common, chickenpox is caused by the *varicella-zoster* virus. Most infections occur in children. Chickenpox causes a mild illness with slight fever and an itchy rash. Adults can develop severe complications, including pneumonia. Since everyone who has ever been infected carries the virus for the rest of his life, the disease can reappear later in life as a painful rash called shingles. A childhood vaccine is available in Ontario and will become publicly funded in 2004/2005.

In a non-immune woman, Chickenpox infection early in pregnancy can result in deformities of the newborn in about 2% of cases. Also, a newborn whose mother develops Chickenpox 5 days before and up to 2 days after birth is at risk for severe Chickenpox.[31] It is estimated that more than 90% of individuals in temperate climates have acquired Chickenpox by the time they reach 14 years of age.[32]

Because Chickenpox is such a common childhood illness, it is under reported. Therefore, the recorded cases of Chickenpox do not accurately reflect the true extent of the disease in Haldimand-Norfolk.

HAEMOPHILUS INFLUENZAE TYPE B (HIB)

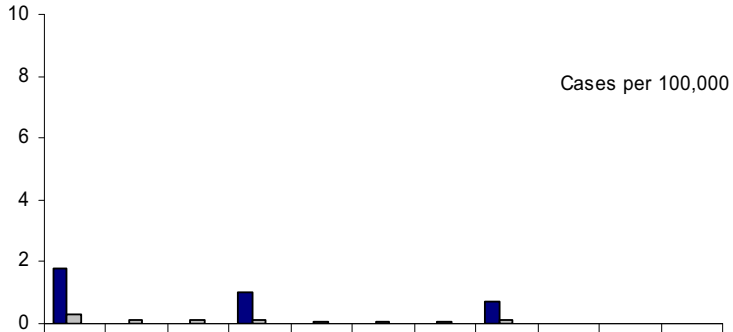
The Hib bacterium causes several serious diseases, including meningitis and pneumonia, and leads to death in young children. Indeed, prior to the 1988 conjugate vaccine, Hib was the most common cause of meningitis in young children.[33] (See Meningitis in 'Diseases Spread by Personal Contact'.)

The number of yearly infections in Haldimand-Norfolk is typically quite small. From 1993 to 2003 there were only 4 cases of Hib in Haldimand-Norfolk (Figure 26). It is believed that this low incidence rate is due to improvements made in the Hib vaccine in 1992, which makes it more efficacious in children 6 months and younger. The age-standardized incidence rates for Haldimand-Norfolk and Ontario were very low.

Figure 26 - Age-Standardized Incidence Rate of Haemophilus Influenzae Type B in Haldimand-Norfolk and Ontario, 1993-2003

Data: Age-Standardized Incidence Rates per 100,000 people. Data not available for Ontario 2001-2003.

Sources: Ontario data from RDIS, Ontario Ministry of Health & Long-Term Care. Haldimand & Norfolk data from RDIS, Haldimand-Norfolk Health Unit.



	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
H-N	1.8	0	0	1	0	0	0	0.7	0	0	0
ON	0.3	0.12	0.11	0.09	0.06	0.06	0.04	0.09			
H-N Cases	2	0	0	1	0	0	0	1	0	0	0

Year

INFLUENZA

Although Influenza symptoms, such as fever, headache, cough and muscle aches, are similar to those of the common cold, they often arise more suddenly, are more severe and are more likely to result in serious complications, such as pneumonia..[33] Ontario's universal flu immunization program, implemented in 2000, is unique in Canada. The vaccine is free for all provincial residents aged six months or older.

Influenza can be fatal for weak or elderly people, so vaccination is widely recommended. There were a total of 14 institutional Influenza outbreaks in Haldimand-Norfolk between 1997 and 2003. Institutions include long term care facilities, acute care facilities and retirement homes.

Every few decades, a mutation arises which renders a more lethal strain of the Influenza virus. The Spanish flu pandemic of 1918 is the most famous result of such a mutation; it caused the death of 25-40 million people worldwide and affected mostly young, healthy people.

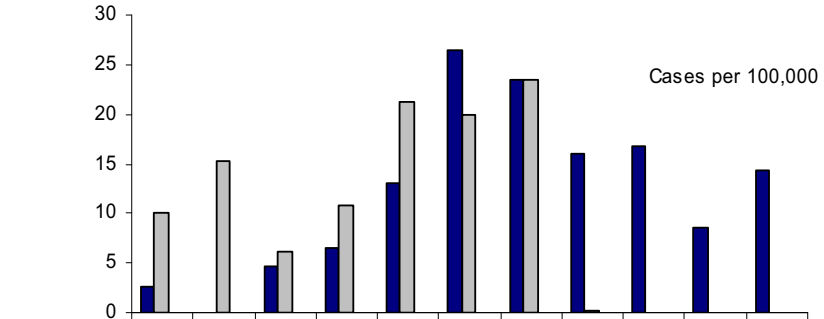
In preparation for an outbreak of similar potency in the future, Canadian health officials take seriously the formulation, production, stockpiling and distribution of appropriate seasonal Influenza vaccines.

Please note that Influenza cases are reported seasonally (July to June), and not by calendar year. For example, the July 1992 to June 1993 data represents the 1993 seasonal data. The average age-standardized incidence rate for Influenza was 11.7/100,000 in Haldimand-Norfolk and 13.4/100,000 in Ontario for the time period 1993-2000 (Figure 27). Influenza is underreported in Haldimand-Norfolk and Ontario.

Figure 27 - Age-Standardized Incidence Rate of Influenza in Haldimand-Norfolk and Ontario, 1993-2003

Data: Age-Standardized Incidence Rates per 100,000 people. Data not available for Ontario 2001-2003. Influenza data is reported seasonally. i.e. July to June. For example: the 1993 year includes cases from July 1992 to June 1993.

Sources: Ontario data from RDIS, Ontario Ministry of Health & Long-Term Care. Haldimand & Norfolk data from RDIS, Haldimand-Norfolk Health Unit.



	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
H-N	2.6	0.09	4.6	6.6	13	26.4	23.5	16.1	16.7	8.5	14.3
ON	10.1	15.3	6.2	10.9	21.3	20	23.5	0.2			
H-N Cases	3	1	5	8	16	29	25	15	14	7	13

Year

INVASIVE PNEUMOCOCCAL DISEASE (IPD)

Pneumococcal diseases are infections caused by the bacteria *Streptococcus pneumoniae*, also known as pneumococcus. Pneumococcal disease is a leading cause of serious illness in children and adults throughout the world. When the bacteria invade the lungs they cause the most common form of community-acquired bacterial *pneumonia*. Bacterial invasion of the bloodstream causes *bacteremia* and invasion of the covering of the brain causes *meningitis*. Pneumococci may also cause otitis media (middle ear infection) and sinusitis. Currently there are more than 90 known pneumococcal types; the ten most common types account for approximately 62 percent of invasive disease worldwide.[34]

Anyone can get Pneumococcal disease. But some groups are at particularly high risk for Pneumococcal disease or its complications. These groups include the elderly and those with compromised immune systems. The bacteria are spread through contact between persons who are ill or who carry the bacteria in their throat. Transmission is mostly through the spread of respiratory droplets from the nose or mouth of a person with a Pneumococcal infection. It is common for people, especially children, to carry the bacteria in their throats without being ill from it.[34] A publicly funded vaccine is available.

IPD infections became reportable in Ontario in 2001. However, prior to 2002 IPD statistics were combined with instances of encephalitis, so no cases are presented prior to that date. In 2003, the age-standardized incidence rate for IPD was 11.5/100,000 or 13 cases in Haldimand-Norfolk. No Ontario data was available for comparison purposes.

MEASLES

Measles is one of the most contagious of all viruses, with about 40 million infections worldwide and 1-2 million deaths. Measles causes rash, cough and fever, and can lead to ear infection, pneumonia, conjunctivitis, diarrhea, seizures, brain damage and death. Prior to universal vaccination for measles, nearly every Canadian had been infected with the disease before they reached adulthood.[33]

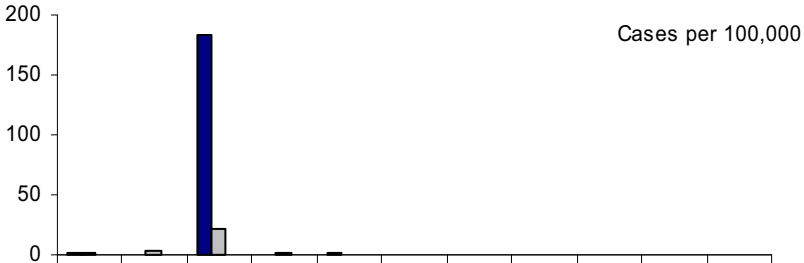
The disease is highly contagious and is transmitted via contact with respiratory secretions. Transmitted from 4 days prior to the onset of the rash to 4 days after, 90% of the susceptible close contacts of a case will also become infected with the Measles virus. The virus remains active and contagious on infected surfaces for up to 2 hours. Measles spreads so easily that anyone who is not immunized will probably get it. The Schwarz vaccine is used today, consisting of live attenuated viruses. People born before 1957 have likely lived through several epidemics of measles before the first measles vaccines were licensed. As a result, 95-98% of such people are likely to already be immune to the disease, and do not require vaccination.[35]

There was a Measles outbreak in Haldimand-Norfolk in 1995 that resulted in 209 cases. Other areas of Ontario also experienced localized outbreaks. As a result of these outbreaks Ontario adopted an immunization schedule that includes two doses of Measles vaccine. Previously, only one dose of vaccine was recommended. See Figure 28 for the age-standardized incidence rates for Ontario and Haldimand-Norfolk (1993-2003).

Figure 28 - Age-Standardized Incidence Rate of Measles in Haldimand-Norfolk and Ontario, 1993-2003

Data: Age-Standardized Incidence Rates per 100,000 people. Data not available for Ontario 2001-2003.

Sources: Ontario data from RDIS, Ontario Ministry of Health & Long-Term Care. Haldimand & Norfolk data from RDIS, Haldimand-Norfolk Health Unit.



	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
H-N	1	0	183	0	1.1	0	0	0	0	0	0
ON	1	3.1	21.6	1.7	0.2	0.1	0	0.1			
H-N Cases	1	0	209	0	1	0	0	0	0	0	0

Year

MUMPS

Prior to routine immunization, Mumps was a common viral childhood infection. Symptoms include fever and swelling of the salivary glands. It can cause damage to the salivary glands, brain and reproductive organs. Resulting complications include deafness and sterility.[33] Deaths are rare, occurring in 1-3 of every 10,000 cases.[36]

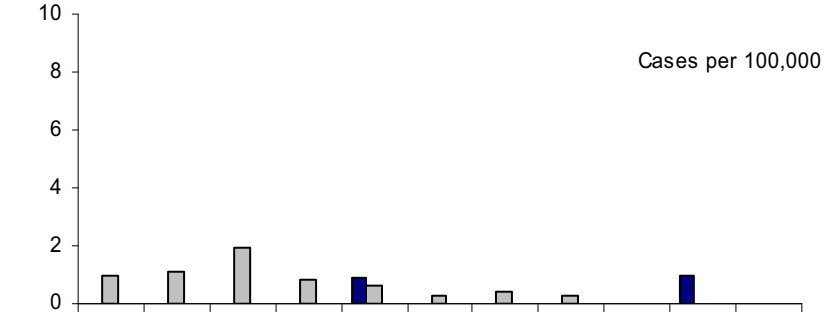
The virus is primarily acquired through contact with respiratory droplets, and replicates in nasopharynx and lymph nodes. Up to 20% of mumps infections are asymptomatic, and an additional 40% may have only non-specific or primarily respiratory symptoms.[36]

Mumps is very rare in Haldimand-Norfolk, with only 2 cases reported during the period 1993-2003. The age-standardized incidence rate for Mumps was very low in both Haldimand-Norfolk and Ontario (Figure 29).

Figure 29 - Age-Standardized Incidence Rate of Mumps in Haldimand-Norfolk and Ontario, 1993-2003

Data: Age-Standardized Incidence Rates per 100,000 people. Data not available for Ontario 2001-2003.

Sources: Ontario data from RDIS, Ontario Ministry of Health & Long-Term Care. Haldimand & Norfolk data from RDIS, Haldimand-Norfolk Health Unit.



	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
H-N	0	0	0	0	0.9	0	0	0	0	1	0
ON	1	1.1	1.9	0.8	0.6	0.3	0.4	0.3			
H-N Cases	0	0	0	0	1	0	0	0	0	1	0

Year

PERTUSSIS

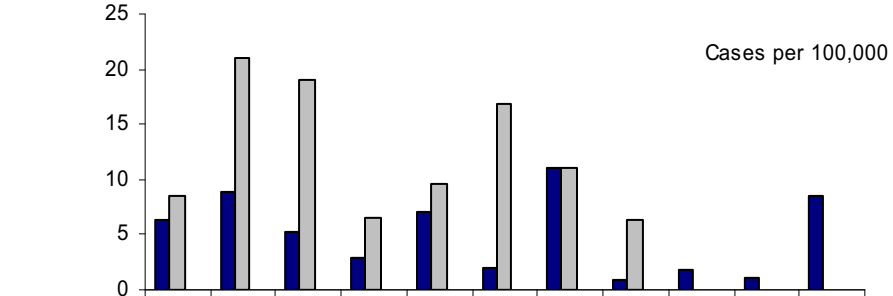
Also called whooping cough, Pertussis is caused by the bacterium *Bordatella pertussis*. Its most common symptom is a very severe cough. Complications from Pertussis infection are more common among the very young and include pneumonia, brain damage and death. Neurologic complications, such as seizures and encephalopathy, may occur as a result of hypoxia from coughing, or perhaps from a toxin.[37] Transmission most commonly occurs by the respiratory route, through contact with respiratory droplets, or by contact with airborne droplets of respiratory secretions.

The yearly incidence of Pertussis is believed to be under reported in Haldimand-Norfolk. The average age-standardized Pertussis incidence rate for the years 1993-2000 was 5.5/100,000 for Haldimand-Norfolk and 12.4/100,000 for Ontario (Figure 30). Clearly, the average incidence rate was higher in Ontario than Haldimand-Norfolk during this time period.

Figure 30 - Age-Standardized Incidence Rate of Pertussis in Haldimand-Norfolk and Ontario, 1993-2003

Data: Age-Standardized Incidence Rates per 100,000 people. Data not available for Ontario 2001-2003.

Sources: Ontario data from RDIS, Ontario Ministry of Health & Long-Term Care. Haldimand & Norfolk data from RDIS, Haldimand-Norfolk Health Unit.



	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
H-N	6.3	8.9	5.3	2.9	7.1	2	11	0.9	1.8	1	8.6
ON	8.6	21.1	19	6.6	9.6	16.9	11	6.4			
H-N Cases	7	10	6	3	8	2	11	1	2	1	8

Year

RUBELLA

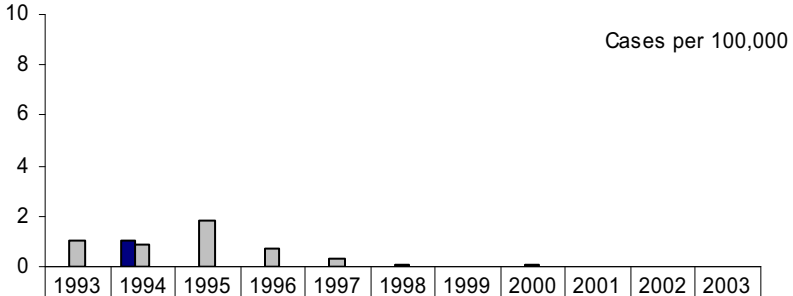
Rubella is also called German measles. Caused by a virus, it is usually a mild illness characterized by a rash, swollen lymph nodes and fever[33]; however, Congenital Rubella syndrome will occur in the offspring of non-immune pregnant women if infection occurs in the first trimester. The severe birth defects of congenital rubella syndrome include blindness, deafness and mental retardation.

There has only been 1 case of Rubella in Haldimand-Norfolk over the last 11 years (1993-2003). The age-standardized incidence rates for Rubella have been very low in Haldimand-Norfolk and Ontario (Figure 31).

Figure 31 - Age-Standardized Incidence Rate of Rubella in Haldimand-Norfolk and Ontario, 1993-2003

Data: Age-Standardized Incidence Rates per 100,000 people. Data not available for Ontario 2001-2003.

Sources: Ontario data from RDIS, Ontario Ministry of Health & Long-Term Care. Haldimand & Norfolk data from RDIS, Haldimand-Norfolk Health Unit.



	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
H-N	0	1	0	0	0	0	0	0	0	0	0
ON	1	0.9	1.8	0.7	0.3	0.1	0	0.1			
H-N Cases	0	1	0	0	0	0	0	0	0	0	0

Year

TETANUS

Tetanus is a potentially fatal disease caused by the *Clostridium tetani* bacterium, whose spores are commonly found in our environment, including in soil and household dust. Infection is often as a result of puncture wounds or burns. Immunization has been available in Canada since 1940.

Vaccination against Tetanus begins in infancy. For adolescents and adults, booster doses are necessary every ten years. There have been no cases reported in Haldimand-Norfolk from 1993-2003.

POLIO

Polio (poliomyelitis) is a viral disease spread primarily by the fecal-oral route. It leads to paralysis in about 1% of infected persons. The Salk vaccine was introduced in 1953 and led to the official declaration in 1994 that polio had been eliminated from the Americas.

For many years, there have been no cases of Polio reported in Haldimand-Norfolk.

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"SARS was a wakeup call for the world."

Karen Boughner
Manager
Haldimand-Norfolk Health Unit
2004

ZOONOTIC AND EXOTIC DISEASES

Zoonotic diseases are those that are transferred to humans through intimate contact with animals, both domestic and wild, while exotic diseases are those that are rare in Ontario.

BRUCELLOSIS

Brucellosis is caused by the bacterium *Brucella*, which lives naturally in many domesticated animals. It is transmitted to humans by ingestion of unpasteurized milk and milk products from infected cows, goats or pigs; or by direct contact with infected animal body fluids and products of conception. Not common in Canada, Brucellosis is characterized by fever, headache, weakness, profuse sweating, chills, joint pain, depression, weight loss and generalized aching.[38]

Direct person-to-person spread of Brucellosis is extremely rare. Mothers who are breast-feeding may transmit the infection to their infants. Sexual transmission has also been reported. For both sexual and breast-feeding transmission, if the infant or person at risk is treated for Brucellosis, their risk of becoming infected will probably be eliminated within 3 days. Although uncommon, transmission may also occur via contaminated tissue transplantation.[39]

Brucellosis is treated with antibiotics. Mortality is low, less than 2%, and is usually associated with endocarditis.[39] There have been no cases reported in Haldimand-Norfolk for many years.

CHOLERA

Cholera is an acute enteric disease caused by the bacteria *Vibrio cholerae*. The disease is characterized by sudden onset of painless watery diarrhea. If untreated, Cholera can progress to rapid dehydration, circulatory collapse, renal failure and death. The infection is acquired by eating food or water contaminated by the stool or vomit of an infected person.[41]

The majority of cases of Cholera occur in developing countries that do not have access to the level of hygiene enjoyed by Canadians. Sporadic cases in North America are usually due to travellers returning from countries where Cholera is still a problem. Cholera is rare in Canada, 27 cases have been reported since 1986.[41] In 1998, there was one case in Ontario[6], while there have been no cases in Haldimand-Norfolk for many years.

DIPHTHERIA

Diphtheria is a disease that affects primarily the upper respiratory system and is caused by the bacterium *Corynebacterium diphtheriae*. It is most commonly spread through person-to-person contact. Symptoms include the development of a thick gray membrane in the nose, mouth and/or throat, which can expand down the airways if not treated. Diphtheria can be prevented by a vaccine, and because of Canada's vaccination program there have been very few cases of Diphtheria in Canada since the early 1980s.[42]

From 1993-2003, there were no cases of Diphtheria reported in Haldimand-Norfolk.

HAEMORRHAGIC FEVERS

In general, the term "viral haemorrhagic fever" is used to describe a severe multi-organ syndrome. Characteristically the overall vascular system is damaged and the body's ability to regulate itself is impaired. These symptoms are often accompanied by haemorrhage; however, the bleeding is rarely life-threatening. While some types of haemorrhagic fever viruses can cause relatively mild illnesses, many of these viruses, such as Ebola, Yellow fever and Dengue fever, cause severe, life-threatening disease. They are exceptionally rare in North America.[43] Any causes of Haemorrhagic fever diagnosed in Canada would cause a public health emergency.

From 1993-2003, there were no cases of Haemorrhagic fever reported in Haldimand-Norfolk.

LEPROSY

Also called Hansen's disease, Leprosy is caused by the bacillus *Mycobacterium leprae*, which multiplies very slowly and mainly affects the skin, nerves, and mucous membranes. Although the mode of transmission remains uncertain, most investigators think that the infection is usually spread from person-to-person in respiratory droplets. Worldwide, 1-2 million persons are permanently disabled as a result of Leprosy; however, persons receiving antibiotic treatment or having completed treatment are considered free of active infection.[44]

The disease is almost unknown in the developed world, though in 1998 there was 1 case of Leprosy in Ontario.[6] From 1993-2003, there were no cases reported in Haldimand-Norfolk.

Lyme Disease

Lyme disease is a bacterial infection transmitted by the bite of an infected ixodid tick. Within 1 to 2 weeks of being infected, a 'bull's eye' rash may appear at the location of the tick bite. Other symptoms include fever, headache, and muscle or joint pain. Some cases are without early symptoms, while others complain of flu-like symptoms without a rash.[45] Lyme disease is endemic in many areas of the United States including the Atlantic Coast.

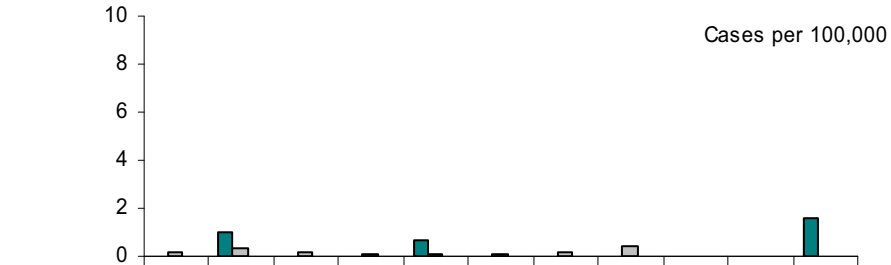
After several days or weeks, the bacteria may spread throughout the body of an infected person. These people can get symptoms such as rashes in other parts of the body, pain that seems to move from joint to joint, and signs of inflammation of the heart or nerves. If the disease is not treated, a few patients can get additional symptoms, such as swelling and pain in major joints or mental changes, months after getting infected.[45]

In Southern Ontario, areas within the Long Point Provincial Park, Rondeau Provincial Park and Point Pelee National Park support colonies of the Ixodes scapalaris (deer tick). The bacteria that cause Lyme disease, *Borrelia burgdorferi*, has been isolated from the deer ticks in these areas. More recently, smaller colonies of deer ticks have been identified in the Turkey Point area. From 1993-2003, there were a total of 4 cases reported in Haldimand-Norfolk (Figure 32). The age-standardized incidence rates for Lyme disease have been very low in Haldimand-Norfolk and Ontario (1993-2000).

Figure 32 - Age-Standardized Incidence Rate of Lyme Disease in Haldimand-Norfolk and Ontario, 1993-2003

Data: Age-Standardized Incidence Rates per 100,000 people. Data not available for Ontario 2001-2003.

Sources: Ontario data from RDIS, Ontario Ministry of Health & Long-Term Care. Haldimand & Norfolk data from RDIS, Haldimand-Norfolk Health Unit.



	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
H-N	0	1	0	0	0.7	0	0	0	0	0	1.6
ON	0.2	0.3	0.2	0.1	0.1	0.1	0.2	0.4			
H-N Cases	0	1	0	0	1	0	0	0	0	0	2

MALARIA

Malaria is an acute, relapsing or chronic infection caused by one of four malaria (Plasmodium) parasites. Severe infection can cause cerebral malaria with seizures, coma, kidney failure and death. Malaria no longer occurs in temperate zone countries such as Canada, but is a major cause of illness and death in many tropical and subtropical areas in South America, Southeast Asia and parts of sub-Saharan Africa. The occurrence of antibiotic-resistant malaria in many parts of the world is a major concern. All reported cases in Canada have acquired their infections while travelling abroad.[46]

From 1993-2003, there were no cases of Malaria reported in Haldimand-Norfolk.

PARATYPHOID FEVER

Paratyphoid fever is a life-threatening illness caused by three types of the Salmonella bacteria. Cases of Paratyphoid fever rarely occur in Canada. Twenty-four cases were reported in 1995. The number of cases has remained relatively constant over the past decade, ranging between 16 and 35 cases per year.[48] The clinical picture is milder than, but similar to Typhoid fever, which is still common in the developing world, where it affects about 12.5 million persons each year.[48] There are about 10 cases of Paratyphoid for every case of Typhoid.[47]

Faecal-oral transmission accounts for individual cases, and common-source outbreaks account for a large number of reported cases. Open water sources are easily contaminated by faecal matter. Raw vegetables, fruits and unpasteurized milk and milk products may become contaminated after being handled by infected farmers and workers.[47]

There were no reported cases of Paratyphoid fever in Haldimand-Norfolk during the time period 1993-2003.

Q FEVER

Q fever is caused by the bacterium *Coxiella burnetii*, which is distributed globally, primarily among cattle, sheep and goats. Infection of humans usually occurs by inhalation of these organisms from air that contains airborne barnyard dust contaminated by dried placental material, birth fluids, and excreta of infected herd animals. Humans are often very susceptible to the disease. Ingestion of contaminated milk is a less common mode of transmission. Other modes of transmission to humans, including tick bites and human-to-human transmission, are rare.[48]

Fever and flu-like symptoms can persist for 1-2 weeks, while 30-50% of infected persons will develop pneumonia. Additionally, a majority of patients have abnormal results on liver function tests and some will develop hepatitis. In general, most patients will recover to good health within several months without any treatment. Approximately, 1%-2% of people with acute Q fever die of the disease.[48]

Q fever is very rare in Haldimand-Norfolk and Ontario. Over the period 1993-2003 there was only 1 case of Q fever in Haldimand-Norfolk that was reported in 2003. In Ontario there were 77 cases of Q fever from 1993-2000 with 11 cases reported in 2000.

RABIES

Rabies is a fatal infection of the brain and spinal cord that is caused by a virus of the genus *Lyssavirus*. It is primarily a disease of animals, but can be transmitted to humans by way of a bite or a scratch from an infected mammal. Prevention of rabies after an exposure includes injection with rabies immune globulin and vaccine. Since 1925, 21 persons have died of Rabies in Canada.[49]

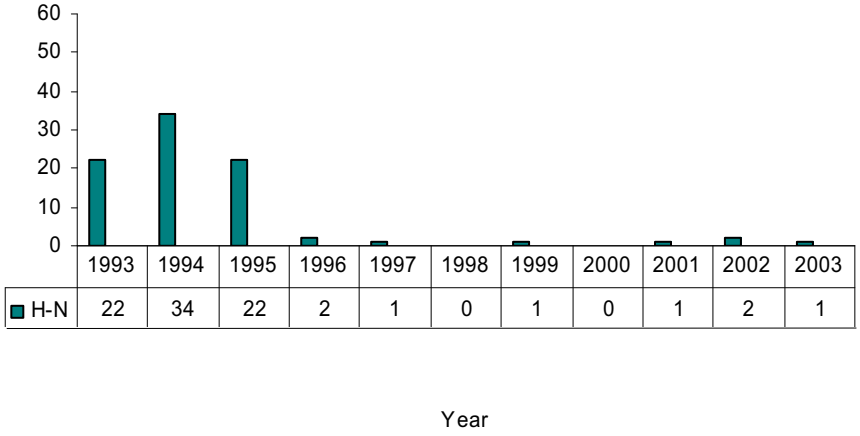
Symptoms usually appear 3 to 8 weeks after the virus enters the body and are characterized initially by headache, feeling unwell, sore throat, loss of appetite, nausea, muscle pain and a slight fever. As the illness progresses, the patient may lapse into a stage of pronounced excitement. Many patients experience difficulty in swallowing accompanied by the sensation of choking which, in turn, gives rise to hydrophobia (a fear of water). Delirium and convulsions may occur, followed by coma. Death is most frequently due to respiratory paralysis.[49]

In 1993 the Ministry of Natural Resources expanded the aerial dropping of fox Rabies vaccine (in bait) to the entire "Rabies" zone in Southern Ontario. This highly successful program is the reason that the number of animal Rabies cases has declined so dramatically.

There have been no human cases of Rabies reported in Ontario since 1967.[6] Figure 33 shows the numbers of rabid animals in Haldimand-Norfolk from 1993 to 2003.

Figure 33 - Number of Animals Infected with Rabies in Haldimand-Norfolk, 1993-2003

Source: Rabies Reported – http://www.gis.queensu.ca/reporter/



SARS

Severe Acute Respiratory Syndrome (SARS) is a viral disease which first became known to the World Health Organization in March of 2003, with outbreaks in parts of Asia (primarily China) and two linked outbreaks in Toronto. The last reported case in Canada had onset of illness in June of 2003 and has since recovered.

The disease is likely caused by a coronavirus. SARS begins with a high fever and may include body aches and diarrhea. After 2 to 7 days, patients may develop a dry cough. Most will develop pneumonia.[51]

The virus is thought to be transmitted through contact with respiratory droplets. A total of 8098 people worldwide became infected with SARS; of these, 774 died, providing a death rate of 9.6%.[51] No cases were reported in the Haldimand-Norfolk area during the two outbreaks in Ontario.

TULAREMIA

Tularemia is a potentially serious illness that occurs naturally in North America. It is caused by the bacterium *Francisella tularensis* found in animals (especially rodents, rabbits and hares). Symptoms include sudden fever, chills, headaches, diarrhea, muscle aches, joint pain, dry cough, progressive weakness. Some cases can also develop pneumonia, chest pain, bloody sputum and even cessation of breathing. Other symptoms of Tularemia depend on how a person was exposed to the Tularemia bacteria, and can include ulcers on the skin or mouth, swollen and painful lymph glands, swollen and painful eyes, and a sore throat.[52]

Tularemia is not known to be spread from person-to-person, but rather via contact with animals, the consumption of contaminated food or water or the inhalation of the bacteria.[52] From 1993-2003, there were no cases reported in Haldimand-Norfolk.

WEST NILE VIRUS (WNV) AND ENCEPHALITIS

West Nile virus (WNv) is a flavivirus commonly found in Africa, West Asia, the Middle-East and since 1999, North America. The virus can infect humans, birds, mosquitoes, horses and some other mammals. West Nile fever is a mild disease in people, characterized by flu-like symptoms. West Nile fever typically lasts only a few days and does not appear to cause any long-term health effects.[53]

More severe diseases caused by infection with West Nile virus are West Nile encephalitis, West Nile meningitis or West Nile meningoencephalitis. Encephalitis refers to an inflammation of the brain, meningitis is an inflammation of the membrane around the brain and the spinal cord, and meningoencephalitis refers to inflammation of the brain and the membrane surrounding it.[53] (For more discussion of types of meningitis, see the Meningitis section of Diseases Spread by Close Personal Contact.)

Over the period 1993-2003 there were only 3 cases of West Nile virus in Haldimand-Norfolk (All 3 cases occurred in 2002).

Mosquitoes transmit the virus to humans after becoming infected by feeding on the blood of birds which carry the virus. In Canada, the virus was first confirmed in birds in Ontario in 2001 and the first human infection was confirmed in Ontario in September of 2002.[54] For most Canadians, the risk of illness from West Nile virus is low, and the risk of serious health effects is even lower.

West Nile virus (WNv)– Surveillance (2004)

West Nile virus (WNv) surveillance in Haldimand and Norfolk involves the reporting of dead birds, mosquito pools and human cases. See Table 1 for a summary of the WNv surveillance program in Haldimand and Norfolk. As of August 6, 2004 there were no confirmed human cases of WNv in Haldimand or Norfolk in 2004. A total of 4 Crows have tested positive for WNv (3 Norfolk – 1 Haldimand). None of the 12 dead Blue Jays reported tested positive for WNv in Haldimand and Norfolk. Also, none of the mosquito pools tested positive for WNv. In addition to the above surveillance for WNv, the municipalities of Haldimand and Norfolk have larvicided standing water sites (64 Norfolk – 68 Haldimand) and the Health Unit has investigated standing water complaints (20 Norfolk – 12 Haldimand).

Table 1 – Summary of the 2004 West Nile virus Surveillance Program for Haldimand-Norfolk

West Nile virus Surveillance 2004	Year To Date 2004 (up to August 6)	
	Norfolk	Haldimand
# Dead Crows Reported	14	12
# Dead Blue Jays Reported	4	8
# Other Dead Birds Reported	66	22
# Crows Confirmed Positive for WNv	3	1
# Blue Jays Confirmed Positive for WNv	0	0
# Mosquito Pools Positive for WNv	0	0
# Confirmed Human Cases Reported	0	0
# Standing Water Sites Larvicided	64	68
# Standing Water Complaints	20	12

The application of larvicide to catch basins in populated areas was applied by both Counties on June 6, 2004, July 2, 2004, July 26, 2004 and August 25, 2004. The municipalities of Haldimand and Norfolk and the Haldimand-Norfolk Health Unit have taken a number of steps to help protect the residents of Haldimand and Norfolk from WNv. It is important for the residents of Haldimand and Norfolk to take the necessary precautions to protect themselves such as, wearing protective clothes (long-sleeved shirts, long pants, socks and shoes) and using insect repellent containing DEET to reduce the likelihood of getting bitten by mosquitos. See Figures 34 and 35 for a summary of the number of dead Crows and Blue Jays reported in Haldimand and Norfolk Counties in 2004. Some of the public reporting involved errors in properly identifying the type of bird.

Figure 34 - Number of Dead Crows and Blue Jays Reported in Norfolk County, 2004

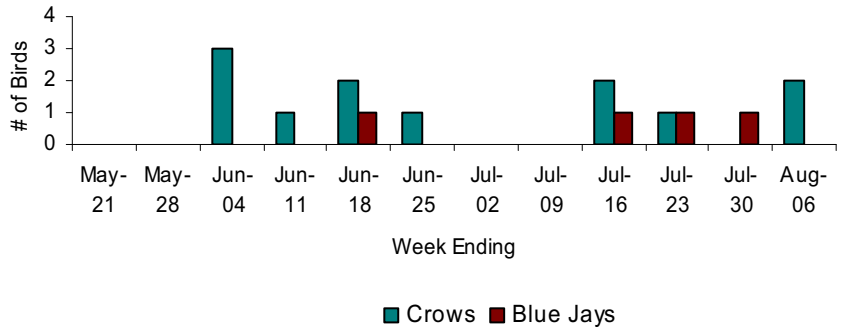
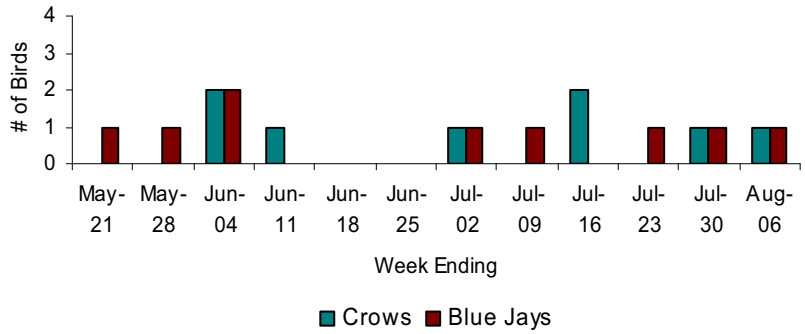


Figure 35 - Number of Dead Crows and Blue Jays Reported in Haldimand County, 2004



CONCLUSION

The goal of this Communicable Disease report was to provide the general public, media, physicians and other health professionals with an overview of communicable diseases in Haldimand and Norfolk over the last 11 years (1993-2003). The age-standardized rates for Haldimand and Norfolk were compared to the Ontario rates. This report is a useful resource document for anyone wanting to better understand communicable diseases in Haldimand and Norfolk.

This Communicable Disease report took a broad perspective looking at sexually transmitted diseases, diseases spread by close personal contact, food and waterborne diseases, vaccine preventable diseases and zoonotic and exotic diseases. Zoonotic and exotic diseases such as SARS and West Nile virus have received a great deal of attention. The SARS outbreaks in Toronto and other parts of the world resulted in significant public concern regarding this new communicable disease. There were no SARS cases reported in Haldimand and Norfolk Counties during these outbreaks. West Nile virus (WNv) continues to be a major issue for public health. Three cases of WNv were reported in Haldimand and Norfolk in 2002. Along with other Southern Ontario Health Units and municipalities, the Haldimand-Norfolk Health Unit is currently engaged in a strategy to help prevent the transmission of the virus to people. This strategy involves public education to reduce mosquito breeding areas (stagnant water) and prevent mosquito bites, WNv surveillance (mosquito traps, mapping of dead birds, etc.) and use of pesticides for mosquito larvae reduction.

Although SARS and WNv has received a great deal of recent attention, all communicable diseases are an important area for public health and require ongoing surveillance. See the Executive Summary for some of the highlights of this report. Also, for detailed information on communicable diseases in Haldimand and Norfolk see the Appendix.

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APPENDICES

APPENDIX I - REPORTABLE DISEASES IN ONTARIO, 2003

The following specified Reportable Diseases (Ontario Regulations 559/91 and amendments under the Health Protection and Promotion Act) are to be reported to the Local Medical Officer of Health. Diseases marked with an asterisk, and respiratory infection outbreaks in institutions, should be reported immediately to the Medical Officer of Health by telephone. Other diseases are to be reported by the next working day.

Acquired Immunodeficiency Syndrome (AIDS)
Amebiasis
*Anthrax
*Botulism
*Brucellosis
Campylobacter enteritis
Chancroid
Chickenpox (Varicella)
Chlamydia trachmoatis infections
Cholera
*Cryptosporidiosis
*Cyclosporiasis
Cytomegalovirus infection, congenital
*Diphtheria
*Encephalitis, including
  1. Primary, viral (including WNv)
  2. Post-infectious
  3. Vaccine-related
  4. Subacute sclerosing panencephalitis
  5. Unspecified
*Food poisoning, all causes
*Gastroenteritis, institutional outbreaks
*Giardiasis
Gonorrhea
*Haemophilus influenzae b disease, invasive
*Hantavirus Pulmonary Syndrome
*Hemorrhagic fevers, including:
  1. Ebola virus disease
  2. Lassa Fever
  3. Marburg virus disease
  4. Other viral causes
*Hepatitis, viral
  1. Hepatitis A
  2. Hepatitis B
  3. Hepatitis C
  4. Hepatitis D (Delta hepatitis)
Herpes, Neonatal
Influenza
*Legionelloisis
Leprosy
*Listeriosis
Lyme Disease
Malaria
*Measles
*Meningitis, acute
  1. bacterial
  2. viral
  3. other
*Meningococcal disease, invasive
Mumps
Ophthalmia neonatorum
Paratyphoid Fever
Pertussis (Whooping Cough)
*Plague
*Poliomyelitis, acute
Psittacosis/Ornithosis
*Q Fever
*Rabies
*Respiratory infection outbreaks in institutions
Rubella
Rubella, congenital syndrome
Salmonellosis
*Severe Acute Respiratory Syndrome (SARS)
*Smallpox
*Shigellosis
*Streptococcal infections, Group A invasive
Streptococcal infections, Group B neonatal
Streptococcus pneumoniae, invasive
Syphilis
Tetanus
Transmissible Spongiform Encephalopathy, including:
  1. Creutzfeldt-Jakob Disease, all types
  2. Gerstmann-Strussler-Scheinker Syndrome
  3. Fatal Familial Insomnia
  4. Kuru
Trichinosis
Tuberculosis
*Tularemia
Typhoid Fever
*Verotoxin-producing E.coli infection indicator conditions including HUS
*Yellow Fever
Yersiniosis

APPENDIX II - VACCINE COVERAGE RATES AND SCHEDULE

There are a number of publicly funded vaccines that are routinely provided to the residents of Haldimand-Norfolk. The following table summarizes the diseases that these vaccines target.

Diseases	Recommended Age and Frequency of Vaccination
Diphtheria	At 2, 4, 6 & 18 months, 4-6 years, 14-16 years and every 10 years thereafter
Tetanus	At 2, 4, 6 & 18 months, 4-6 years, 14-16 years and every 10 years thereafter
Polio	At 2, 4, 6 & 18 months, 4-6 years, 14-16 years
Pertussis	At 2, 4, 6 & 18 months, 4-6 years, 14-16 years
Haemophilus Influenzae Type B	At 2, 4, 6 & 18 months
Measles, Mumps & Rubella	12 months & 4-6 years
Hepatitis B	12-13 years in 2 separate doses 4-6 months apart
Influenza	annually for those 6 months and older
Pneumococcal infections	for high risk populations

As per the Immunization of School Pupils Act, the Haldimand-Norfolk Health Unit collects vaccination coverage data for six vaccines (Diphtheria, Tetanus, Polio, Pertussis, HiB and Measles, Mumps & Rubella) for children in elementary and high schools, and school-based Hepatitis B vaccinations for Grade 7 students. There are no reliable community-wide estimates of vaccine coverage rates for adults.

Haldimand-Norfolk has a high level of childhood vaccination coverage, with an average of 86% of children born between 1988 and 1992 being up-to-date with respect to the six vaccinations being monitored. Of these children, those born in 1988 had the highest coverage rate at 91%.

In the 1988-1992 cohort, vaccine coverage rates dropped somewhat in adolescence. By age 17, about 80% of students had received the recommended inoculations and among Grade 7 students in the 1983-1988 birth cohorts, 87% were vaccinated in school against Hepatitis B.

By January 1, 2005, three new publicly funded vaccines will be added to the recommended schedules of routine childhood immunizations – vaccines for chickenpox, meningococcal meningitis and pneumococcal disease.

Vaccine	Who Qualifies	When Available	Diseases Prevented
Pneumococcal Conjugate	▪ High-risk children 24 to 59 months of age ▪ All children born on or after Jan 1, 2004 ▪ High-risk children under 2 years of age	July 2004 January 2005 Available now	Invasive pneumococcal diseases (meningitis, pneumonia and infection of the bloodstream)
Varicella	▪ Children born on or after Sept 1, 2003 can receive the vaccine on or shortly after their first birthday ▪ Five-year-old children who have not yet had chickenpox ▪ Certain high-risk people (all ages)	September 2004 January 2005 January 2005	Chickenpox and its complications (e.g. bacterial skin infections)
Meningococcal Conjugate C	▪ Children born on or after Sept 1, 2003 can receive the vaccine on or shortly after their first birthday ▪ Children 12 years of age, youth aged 15-19, and high-risk people of all ages ▪ People in close contact with a person who has a vaccine-preventable meningococcal disease	September 2004 January 2005 Available now	Invasive meningococcal disease (IMD), including meningitis and meningococcemia (meningococcal infection of the blood)

APPENDIX III

Part A - Communicable Diseases, Haldimand-Norfolk - Total Age-Standardized Incidence Rates - 1993-2003 – (Cases per 100,000)

Communicable Diseases	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Adverse Vaccination	1.9	0.8	0	3.6	0.8	1.1	0.8	0	0	0	2.6
AIDS	1.9	1.1	0.9	0	0	2.4	1.7	0	3.6	2.1	0
Amebiasis	2.9	2.2	1.9	0.9	3.3	0	0	0	1.8	1.3	2.9
Animal Rabies	0	0	0	0	0	0	0	0	0	0	0
Atypical Mycobacterium	0	0	0	0	0	0	1.4	0.8	0	0.6	1.9
Campylobacter	50.3	63.5	56.7	39.4	38.8	46.2	22.4	29	36.8	36.9	38.4
Chlamydia	76.4	84	50.7	52.1	50.2	46.2	59	60.4	107.4	92.4	88.1
Congenital Cytomegalovirus	0	0	0	0	0	1.1	0	1.2	0	0	0
Cryptosporidiosis	0	0	0	1.9	1.4	4.1	0	0.8	1.2	5.5	3.7
Encephalitis	0	0	0	0.9	3.2	3	0.8	1.6	0	1.6	0
GAS*	0	0	0.9	1.7	0	2.4	5.6	8.2	4.2	1.9	5.4
GBS*	0	0	0	1	0	1.1	0	0	0	0	1.3
Giardia	32.7	19.2	18.8	21.6	20.9	12.2	5.4	13.7	19.8	9.6	10.8
Gonorrhea	2	1.1	5.1	2.1	1.6	2.4	2.2	5.3	4.8	6.9	8.3
Hepatitis A	0	1.7	2	3.9	3.7	2.9	2.4	0	1.8	0	0
Hepatitis B	1	3.7	5.7	2.5	0.7	1.7	3.2	3.4	0	3.9	1.3
Hepatitis C	1.2	0	45.4	34.7	33.1	37.4	29.6	42	27.2	30.5	26.3
Hepatitis Non	0	0	0	0	0	0	0	0	0	0	0
HiB*	1.8	0	0	1	0	0	0	0.7	0	0	0
Influenza	2.6	.09	4.6	6.6	13.0	26.4	23.5	16.1	16.7	8.5	14.3
IPD*	0	0	0	0	0	0	0	0	0	0	11.5
Legion	0	0	0	1.6	0.9	0	0	0	0	0	0.8
Listeria	0.9	0	0	0	0.9	0	0	0	0	0	0
Lyme Disease	0	1	0	0	0.7	0	0	0	0	0	1.6
Measles	1	0	183	0	1.1	0	0	0	0	0	0
Meningococcal	0	0	0.9	0	0	1.7	0	0	0.8	0	0.8
Mumps	0	0	0	0	0.9	0	0	0	0	1	0
Pertussis	6.3	8.9	5.3	2.9	7.1	2	11	0.9	1.8	1	8.6
Q Fever	0	0	0	0	0	0	0	0	0	0	0.6
Rubella C	0	1	0	0	0	0	0	0	0	0	0
Salmonella	28	13.6	29.9	15.7	19.7	17.7	11.2	17.9	19.4	31.1	17.3
Shigella	0.9	1.9	0	1.5	0	1.6	0	0	0	3.9	4
Syphilis	0	2.3	0	0	0.8	0	3.9	0.7	0.7	0	2.1
Tuberculosis	0.7	0	0	1.1	0	3.2	0	0.7	4.1	2.1	0
Verotoxin-Producing E. coli	4.4	1.8	2.6	4.8	3.2	0.7	6.9	4.5	5.5	3.4	6.5
Yersinia	0.9	1.2	1	1.9	1.9	1.7	1.7	1.4	0	2.1	0.6

* GAS - Group A Streptococcal Infections
* GBS - Group B Streptococcal Infections
* HiB - Haemophilus Influenzae Type B
* IPD - Invasive Pneumococcal Disease

Part B - Communicable Diseases, Haldimand-Norfolk - Male Age-Standardized Incidence Rates - 1993-2003 (Cases per 100,000)

Communicable Diseases	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Adverse Vaccination	0	0	0	1.6	0	2.2	0	0	0	0	2.6
AIDS	3.8	2.2	1.9	0	0	4.6	1.6	0	4.2	1.4	0
Amebiasis	3.6	1.9	3.7	1.8	6.5	0	0	0	1.5	2.7	2.2
Animal Rabies	0	0	0	0	0	0	0	0	0	0	0
Atypical Mycobacterium	0	1.7	0	0	0	0	1.4	1.5	0	0	1.3
Campylobacter	55.6	79.4	63.8	27.4	48.6	46	25.8	32	40.9	40.6	39.7
Chlamydia	22.5	22.5	9	21.9	21.6	22.5	22.9	27.4	65.6	60.5	71.1
Congenital Cytomegalovirus	0	0	0	0	0	0	0	2.5	0	0	0
Cryptosporidiosis	0	0	0	2.1	0	6.2	0	1.6	2.5	5.8	3.2
Encephalitis	0	0	0	0	4.6	1.8	0	1.8	0	1.3	0
GAS*	0	0	1.8	2.1	0	1.5	4.4	8.2	3.2	3.7	6.1
GBS*	0	0	0	2.1	0	2.2	0	0	0	0	2.6
Giardia	35.2	21.8	21.3	7.7	15.6	10.8	9.9	18	25.4	8.9	12.7
Gonorrhea	2	2.2	6.3	2.4	0	3.3	1.6	6.6	9.9	8.4	9
Hepatitis A	0	1.8	2.2	3.3	4.1	2.6	1.6	0	1.3	0	0
Hepatitis B	0	5.2	9.5	4.8	0	3.5	0	1.6	0	4.9	2.5
Hepatitis C	0.0	0	62.6	40.5	42.7	51.6	29.6	49.4	34.8	48	26.3
Hepatitis Non	0	0	0	0	0	0	0	0	0	0	0
HiB*	0	0	0	2.1	0	0	0	0	0	0	0
Influenza	3.4	0	5.1	6.8	11.7	27	23.2	15.4	13.6	9.1	20.9
IPD*	0	0	0	0	0	0	0	0	0	0	15.7
Legion	0	0	0	1.6	1.7	0	0	0	0	0	0
Listeria	1.6	0	0	0	1.8	0	0	0	0	0	0
Lyme Disease	0	1.9	0	0	0	0	0	0	0	0	1.6
Measles	1.9	0	182.4	0	0	0	0	0	0	0	0
Meningococcal	0	0	1.7	0	0	0	0	0	0	0	1.5
Mumps	0	0	0	0	1.7	0	0	0	0	2	0
Pertussis	3.7	8.9	7.2	3.8	7.5	2.2	9.9	0	0	2	7.3
Q Fever	0	0	0	0	0	0	0	0	0	0	1.3
Rubella C	0	0	0	0	0	0	0	0	0	0	0
Salmonella	27.3	12.3	25.8	20.1	21	14.9	8.5	15.3	27.3	30.6	17.8
Shigella	1.8	2	0	0	0	3.3	0	0	0	1.3	0
Syphilis	0	3.1	0	0	0	0	4.5	0	1.3	0	0
Tuberculosis	1.4	0	0	0	0	2.8	0	1.3	3.9	1.2	0
Verotoxin-Producing E. coli	1.7	2.3	2	2.1	3.8	1.7	0	1.5	0	4.2	0
Yersinia	5.4	1.9	5.1	1.6	1.6	0	3.2	0	1.7	2.6	0

* GAS - Group A Streptococcal Infections
* GBS - Group B Streptococcal Infections
* HiB - Haemophilus Influenzae Type B
* IPD - Invasive Pneumococcal Disease

Part C - Communicable Diseases, Haldimand-Norfolk - Female Age-Standardized Incidence Rates - 1993-2003 (Cases per 100,000)

Communicable Diseases	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Adverse Vaccination	3.8	1.7	0	5.5	1.5	0	1.6	0	0	0	2.5
AIDS	0	0	0	0	0	0	1.8	0	3	2.8	0
Amebiasis	2	2.5	0	0	0	0	0	0	2	0	3.6
Animal Rabies	0	0	0	0	0	0	0	0	0	0	0
Atypical Mycobacterium	0	1.6	0	0	0	0	1.4	0	0	1.3	2.5
Campylobacter	45.1	48.1	49.7	50.8	28.8	46	19.1	26.7	33.1	33.4	37.1
Chlamydia	131.2	147.4	93.2	83.2	79	70.4	95.1	93.9	150.8	124.6	105.6
Congenital Cytomegalovirus	0	0	0	0	0	2.1	0	0	0	0	0
Cryptosporidiosis	0	0	0	1.8	2.9	2.1	0	0	0	5.2	4.1
Encephalitis	0	0	0	1.8	1.8	4.1	1.6	1.5	0	1.7	0
GAS*	0	0	0	1.4	0	3.2	6.6	7.9	5.6	0	4.7
GBS*	0	0	0	0	0	0	0	0	0	0	0
Giardia	30	16.8	16.3	35.3	26	13.3	1.2	9.6	14.6	10.3	8.8
Gonorrhea	2	0	3.9	1.8	3.1	1.7	2.7	4.1	0	5.5	7.6
Hepatitis A	0	1.7	1.9	4.5	3.2	3.3	3.3	0	2	0	0
Hepatitis B	2	2.1	1.8	0	1.5	0	6.3	5.2	0	2.8	0
Hepatitis C	2.5	0	28	28.4	23.4	23.3	29.8	34.3	20.2	13	26.1
Hepatitis Non	0	0	0	0	0	0	0	0	0	0	0
HiB*	3.6	0	0	0	0	0	0	1.5	0	0	0
Influenza	1.8	1.9	4.1	6.5	14.4	26.3	24.0	16.6	20.0	7.9	7.8
IPD*	0	0	0	0	0	0	0	0	0	0	6.8
Legion	0	0	0	1.7	0	0	0	0	0	0	1.6
Listeria	0	0	0	0	0	0	0	0	0	0	0
Lyme Disease	0	0	0	0	1.5	0	0	0	0	0	1.6
Measles	0	0	183.3	0	2.1	0	0	0	0	0	0
Meningococcal	0	0	0	0	0	3.3	0	0	1.7	0	0
Mumps	0	0	0	0	0	0	0	0	0	0	0
Pertussis	8.9	8.9	3.5	2	6.7	1.8	12	1.8	3.6	0	10
Q Fever	0	0	0	0	0	0	0	0	0	0	0
Rubella C	0	1.9	0	0	0	0	0	0	0	0	0
Salmonella	28.9	14.9	34.1	11.7	18.5	20.6	13.5	20.1	11.9	31.3	17.1
Shigella	0	1.9	0	3	0	0	0	0	0	6.5	8
Syphilis	0	1.6	0	0	1.7	0	3.2	1.5	0	0	4.4
Tuberculosis	0	0	0	2.3	0	3.4	0	0	4.3	2.9	0
Verotoxin-Producing E. coli	0	0	0	1.8	0	1.7	3.2	1.4	0	0	1.2
Yersinia	3.4	1.8	0	7.9	4.8	1.4	10.1	9.1	9.3	4.3	12.9

* GAS - Group A Streptococcal Infections
* GBS - Group B Streptococcal Infections
* HiB - Haemophilus Influenzae Type B
* IPD - Invasive Pneumococcal Disease

APPENDIX IV

Part A - Communicable Diseases, Haldimand-Norfolk -Total Cases - 1993-2003

Communicable Diseases	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Adverse Vaccination	2	1	0	4	1	1	1	0	0	0	2
AIDS	2	1	1	0	0	3	2	0	3	2	0
Amebiasis	3	2	2	1	4	0	0	0	2	1	3
Animal Rabies	0	0	0	0	0	0	0	0	0	0	0
Atypical Mycobacterium	0	2	0	0	0	0	2	1	0	1	3
Campylobacter	52	63	57	43	40	44	24	28	35	40	41
Chlamydia	69	80	46	49	44	44	54	59	94	95	91
Congenital Cytomegalovirus	0	0	0	0	0	1	0	1	0	0	0
Cryptosporidiosis	0	0	0	2	2	4	0	1	1	6	4
Encephalitis	0	0	0	1	3	3	1	2	0	2	0
GAS*	0	0	1	2	0	3	6	9	3	2	6
GBS*	0	0	0	1	0	1	0	0	0	0	1
Giardia	33	19	19	22	21	13	5	12	16	9	11
Gonorrhea	2	1	5	2	1	2	2	5	4	6	9
Hepatitis A	0	2	2	4	4	3	3	0	2	0	0
Hepatitis B	1	4	6	2	1	2	4	4	0	4	2
Hepatitis C	1	0	47	33	37	39	34	40	28	34	33
Hepatitis Non	0	0	0	0	0	0	0	0	0	0	0
HiB*	2	0	0	1	0	0	0	1	0	0	0
Influenza	3	1	5	8	16	29	25	15	14	7	13
IPD*	0	0	0	0	0	0	0	0	0	0	13
Legion	0	0	0	2	1	0	0	0	0	0	1
Listeria	1	0	0	0	1	0	0	0	0	0	0
Lyme Disease	0	1	0	0	1	0	0	0	0	0	2
Measles	1	0	209	0	1	0	0	0	0	0	0
Meningococcal	0	0	1	0	0	2	0	0	1	0	1
Mumps	0	0	0	0	1	0	0	0	0	1	0
Pertussis	7	10	6	3	8	2	11	1	2	1	8
Q Fever	0	0	0	0	0	0	0	0	0	0	1
Rubella C	0	1	0	0	0	0	0	0	0	0	0
Salmonella	28	13	32	18	19	19	12	18	20	33	20
Shigella	1	2	0	1	0	1	0	0	0	4	4
Syphilis	0	3	0	0	1	0	3	1	1	0	3
Tuberculosis	1	0	0	1	0	4	0	1	3	3	0
Verotoxin-Producing E. coli	1	1	1	2	2	2	1	2	0	2	1
Yersinia	5	2	3	5	3	1	6	5	6	3	6

* GAS - Group A Streptococcal Infections
* GBS - Group B Streptococcal Infections
* HiB - Haemophilus Influenzae Type B
* IPD - Invasive Pneumococcal Disease

Part B - Communicable Diseases, Haldimand-Norfolk - Male Cases - 1993-2003

Communicable Diseases	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Adverse Vaccination	0	0	0	1	0	1	0	0	0	0	1
AIDS	2	1	1	0	0	3	1	0	2	1	0
Amebiasis	2	1	2	1	4	0	0	0	1	1	1
Animal Rabies	0	0	0	0	0	0	0	0	0	0	0
Atypical Mycobacterium	0	1	0	0	0	0	1	1	0	0	1
Campylobacter	29	39	32	16	26	21	14	15	21	20	21
Chlamydia	10	11	4	10	9	10	9	12	26	29	34
Congenital Cytomegalovirus	0	0	0	0	0	0	0	1	0	0	0
Cryptosporidiosis	0	0	0	1	0	3	0	1	1	3	2
Encephalitis	0	0	0	0	2	1	0	1	0	1	0
GAS*	0	0	1	1	0	1	3	5	1	2	4
GBS*	0	0	0	1	0	1	0	0	0	0	1
Giardia	18	11	11	4	8	6	4	7	10	4	6
Gonorrhea	1	1	3	1	0	1	1	3	4	3	5
Hepatitis A	0	1	1	2	2	1	1	0	1	0	0
Hepatitis B	0	3	5	2	0	2	0	1	0	3	2
Hepatitis C	0	0	33	20	24	28	17	25	18	28	18
Hepatitis Non	0	0	0	0	0	0	0	0	0	0	0
HiB*	0	0	0	1	0	0	0	0	0	0	0
Influenza	2	0	3	4	6	14	12	7	6	4	9
IPD*	0	0	0	0	0	0	0	0	0	0	9
Legion	0	0	0	1	1	0	0	0	0	0	0
Listeria	1	0	0	0	1	0	0	0	0	0	0
Lyme Disease	0	1	0	0	0	0	0	0	0	0	1
Measles	1	0	103	0	0	0	0	0	0	0	0
Meningococcal	0	0	1	0	0	0	0	0	0	0	1
Mumps	0	0	0	0	1	0	0	0	0	1	0
Pertussis	2	5	4	2	4	1	5	0	0	1	3
Q Fever	0	0	0	0	0	0	0	0	0	0	1
Rubella C	0	0	0	0	0	0	0	0	0	0	0
Salmonella	14	6	14	11	10	8	5	8	13	17	10
Shigella	1	1	0	0	0	1	0	0	0	1	0
Syphilis	0	2	0	0	0	0	2	0	1	0	0
Tuberculosis	1	0	0	0	0	2	0	1	1	1	0
Verotoxin-Producing E. coli	1	1	1	1	2	1	0	1	0	2	0
Yersinia	3	1	3	1	1	0	2	0	1	1	0

* GAS - Group A Streptococcal Infections
* GBS - Group B Streptococcal Infections
* HiB - Haemophilus Influenzae Type B
* IPD - Invasive Pneumococcal Disease

Part C - Communicable Diseases, Haldimand-Norfolk - Female Cases - 1993-2003

Communicable Diseases	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Adverse Vaccination	2	1	0	3	1	0	1	0	0	0	1
AIDS	0	0	0	0	0	0	1	0	1	1	0
Amebiasis	1	1	0	0	0	0	0	0	1	0	2
Animal Rabies	0	0	0	0	0	0	0	0	0	0	0
Atypical Mycobacterium	0	1	0	0	0	0	1	0	0	1	2
Campylobacter	23	24	25	27	14	23	10	13	14	20	20
Chlamydia	59	69	42	39	35	34	45	47	68	66	57
Congenital Cytomegalovirus	0	0	0	0	0	1	0	0	0	0	0
Cryptosporidiosis	0	0	0	1	2	1	0	0	0	3	2
Encephalitis	0	0	0	1	1	2	1	1	0	1	0
GAS*	0	0	0	1	0	2	3	4	2	0	2
GBS*	0	0	0	0	0	0	0	0	0	0	0
Giardia	15	8	8	18	13	7	1	5	6	5	5
Gonorrhea	1	0	2	1	1	1	1	2	0	3	4
Hepatitis A	0	1	1	2	2	2	2	0	1	0	0
Hepatitis B	1	1	1	0	1	0	4	3	0	1	0
Hepatitis C	1	0	14	13	13	11	17	15	10	6	15
Hepatitis Non	0	0	0	0	0	0	0	0	0	0	0
HiB*	2	0	0	0	0	0	0	1	0	0	0
Influenza	1	1	2	4	10	15	13	8	8	3	4
IPD*	0	0	0	0	0	0	0	0	0	0	4
Legion	0	0	0	1	0	0	0	0	0	0	1
Listeria	0	0	0	0	0	0	0	0	0	0	0
Lyme Disease	0	0	0	0	1	0	0	0	0	0	1
Measles	0	0	106	0	1	0	0	0	0	0	0
Meningococcal	0	0	0	0	0	2	0	0	1	0	0
Mumps	0	0	0	0	0	0	0	0	0	0	0
Pertussis	5	5	2	1	4	1	6	1	2	0	5
Q Fever	0	0	0	0	0	0	0	0	0	0	0
Rubella C	0	1	0	0	0	0	0	0	0	0	0
Salmonella	14	7	18	7	9	11	7	10	7	16	10
Shigella	0	1	0	1	0	0	0	0	0	3	4
Syphilis	0	1	0	0	1	0	1	1	0	0	3
Tuberculosis	0	0	0	1	0	2	0	0	2	2	0
Verotoxin-Producing E. coli	0	0	0	1	0	1	1	1	0	0	1
Yersinia	2	1	0	4	2	1	4	5	5	2	6

* GAS - Group A Streptococcal Infections
* GBS - Group B Streptococcal Infections
* HiB - Haemophilus Influenzae Type B
* IPD - Invasive Pneumococcal Disease

APPENDIX V

Part A - Ontario Age-Standardized Incidence Rates - Total

Below are the age-standardized incidence rates (given as the number of cases per 100,000 population) for selected communicable diseases in Ontario for the years 1993 to 2003.

Selected Reportable Diseases	1993	1994	1995	1996	1997	1998	1999	2000
AIDS	6.7	5.7	5.4	3.6	2.3	1.8	1.5	1.1
Amebiasis	9.3	8.8	8.6	7.6	8.8	7.3	6.7	7.0
Brucellosis	0.03	0.04	0.03	0.02	0.02	0.04	0.02	0.02
Campylobacter	63.7	69.3	58.8	49.3	47.1	47.9	36.3	43.7
Chancroid	0.0	0.0	0.0	0.01	0.0	0.0	0.0	0.0
Chlamydia	138.3	132.2	117.3	104.6	103.4	121.3	129.0	140.7
Cholera	0.07	0.01	0.03	0.01	0.0	0.01	0.0	0.0
Cryptosporidiosis	0.0	0.0	0.03	2.44	2.07	1.70	1.91	2.04
Cyclospariasis	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.037
Cytomegalovirus	0.06	0.03	0.06	0.03	0.04	0.03	0.11	0.07
Encephalitis/Meningitis	2.6	3.4	3.0	2.9	2.7	4.1	3.9	3.5
Giardiasis	28.5	25.3	25.1	23.3	21.6	19.2	17.8	17.8
Gonorrhea (All Types)	29.5	30.0	29.0	22.7	18.3	21.7	21.4	26.8
Group A Streptococcal	0.1	0.2	0.8	1.8	1.9	2.4	2.5	3.3
Group B Streptococcal	0.0	0.0	0.1	0.5	0.6	0.3	0.5	0.5
Haemophilus Influenzae	0.30	0.12	0.11	0.09	0.06	0.06	0.04	0.09
Hepatitis A	4.7	3.9	4.6	5.6	4.1	2.8	2.3	1.4
Hepatitis B	3.2	2.6	2.8	2.0	1.6	1.2	1.2	1.2
Hepatitis C	23.5	33.1	64.4	68.1	53.9	59.8	53.9	47.0
Hepatitis D	NA	NA	NA	NA	NA	NA	NA	NA
Hepatitis Non A,B,C,D	NA	NA	NA	NA	NA	NA	NA	NA
Herpes, Neonatal	0.02	0.05		0.05	0.03	0.02	0.09	0.01
HIV+	NA	NA	NA	NA	NA	NA	NA	NA
Influenza	10.1	15.3	6.2	10.9	21.3	20.0	23.5	0.2
Legionella Infections	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.3
Leprosy	0.07	0.09	0.04	0.05	0.03	0.02	0.05	0.03
Listeriosis	0.4	0.3	0.4	0.2	0.3	0.4	0.3	0.3
Lyme Disease	0.2	0.3	0.2	0.1	0.1	0.1	0.2	0.4
Malaria	2.4	2.1	2.3	4.0	4.2	1.4	1.5	1.5
Measles	1.0	3.1	21.6	1.7	0.2	0.1	0.0	0.1
Meningococcal Meningitis	1.0	1.0	0.9	0.9	0.8	0.5	0.7	0.7
Mumps	1.0	1.1	1.9	0.8	0.6	0.3	0.4	0.3
Ophthalmia Neonatorum	0.09	0.03	0.08	0.12	0.08	0.07	0.07	0.03
Paratyphoid Fever	0.1	0.1	0.1	0.1	0.0	0.1	0.2	0.1
Pertussis	8.6	21.1	19.0	6.6	9.6	16.9	11.0	6.4
Psittacosis/Ornithosis	0.06	0.02	0.02	0.04	0.0	0.0	0.0	0.02
Q Fever	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Rubella	1.0	0.9	1.8	0.7	0.3	0.1	0.0	0.1
Rubella, Congenital Syndrome	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Salmonellosis	29.5	26.0	26.4	24.3	23.8	30.0	20.6	21.0
Shigellosis	3.5	4.5	3.9	2.9	3.3	3.7	2.4	2.5
Syphilis	0.6	0.6	0.5	0.4	0.3	0.3	0.3	0.2

Selected Reportable Diseases	1993	1994	1995	1996	1997	1998	1999	2000
Tetanus	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Trichinosis	0.06	0.0	0.0	0.0	0.01	0.0	0.0	0.0
Tuberculosis	7.5	8.0	7.2	7.0	6.9	6.4	6.1	5.9
Typhoid Fever	0.5	0.4	0.4	0.2	0.3	0.4	0.4	0.5
Verotoxin-Producing E. coli	3.7	4.2	5.3	4.2	3.8	3.6	3.3	14.8
Yersiniosis	4.1	4.4	5.1	4.5	3.6	3.1	3.3	3.0

Part B - Ontario Communicable Diseases -Number of Cases

Below is the number of cases for selected communicable diseases in Ontario for the years 1993 to 2003.

Selected Reportable Diseases	1993	1994	1995	1996	1997	1998	1999	2000
AIDS	718	619	604	404	256	207	172	131
Amebiasis	990	949	928	839	979	829	764	811
Brucellosis	3	4	3	2	2	4	2	2
Campylobacter	6809	7471	6389	5396	5204	5346	4081	4955
Chancroid	0	0	0	1	0	0	0	0
Chlamydia	14353	13611	12025	10649	10564	12423	13315	14702
Cholera	7	1	3	1	0	1	0	0
Cryptosporidiosis	0	0	3	266	225	185	205	221
Cyclospariasis	0	0	0	0	0	0	0	5
Cytomegalovirus	7	3	7	3	4	3	11	7
Encephalitis/Meningitis	281	361	324	320	298	445	437	390
Giardiasis	3051	2713	2713	2551	2378	2127	1979	1993
Gonorrhea (All Types)	3063	3129	2995	2322	1894	2256	2249	2839
Group A Streptococcal	9	22	87	206	224	275	303	400
Group B Streptococcal	0	0	14	52	59	30	47	52
Haemophilus Influenzae	33	13	12	10	7	7	4	11
Hepatitis A	496	428	501	616	455	318	260	155
Hepatitis B	335	275	304	223	170	137	135	136
Hepatitis C	2565	3640	7328	7811	6245	7005	6478	5745
Hepatitis D	NA	NA	NA	NA	NA	NA	NA	NA
Hepatitis Non A,B,C,D	NA	NA	NA	NA	NA	NA	NA	NA
Herpes, Neonatal	2	5	0	5	3	2	9	1
HIV+	NA	NA	NA	NA	NA	NA	NA	NA
Influenza*	1132	1728	699	1252	2501	2343	2829	24
Legionella Infections	30	35	33	36	45	45	44	42
Leprosy	8	10	5	6	4	2	6	3
Listeriosis	48	35	44	26	36	51	31	37
Lyme Disease	18	33	19	16	17	16	22	42
Malaria	254	224	254	443	464	158	166	178
Measles	102	325	2306	189	21	9	2	9
Meningococcal Meningitis	110	110	93	95	82	51	81	80
Mumps	100	122	198	83	63	32	43	33
Ophthalmia Neonatorum	10	3	9	13	9	7	7	3
Paratyphoid Fever	10	12	15	12	4	12	17	12
Pertussis	920	2276	2055	723	1044	1864	1213	714
Psittacosis/Ornithosis	6	2	2	4	0	0	0	2
Q Fever	3	6	12	10	9	8	18	11
Rubella	110	91	197	72	29	15	3	9
Rubella, Congenital Syndrome		2	1	0	1		0	1

Selected Reportable Diseases	1993	1994	1995	1996	1997	1998	1999	2000
Salmonellosis	3202	2813	2887	2668	2622	3333	2296	2359
Shigellosis	369	482	429	313	369	406	266	282
Syphilis	63	62	58	47	32	30	30	21
Tetanus	3	1	2	1	1	2	1	1
Trichinosis	6	0	0	0	1	0	0	0
Tuberculosis	806	864	797	778	776	741	696	697
Typhoid Fever	53	45	44	23	31	45	42	53
Verotoxin-Producing E. Coli	392	458	583	467	427	402	372	1708
Yersiniosis	446	480	559	492	400	343	361	333

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GIARDIA RUBELLA INFLUENZA CAMPYLOBACTER AMEBIASIS RABIES

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