

Reportable Diseases in Peterborough County-City 2012



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Table of Contents

Report Overview	2
Introduction	2
Notes.....	2
Data Sources	2
Disease Categories and Reporting.....	3
Summary Data Table Report Format.....	4
Executive Summary.....	5
List of Tables	7
List of Figures	7
1. Food and Waterborne Diseases.....	8
1.1 <i>Campylobacter</i> enteritis	9
1.2 Salmonellosis	10
1.3 Giardiasis	11
2. Sexually Transmitted and Blood Borne Infections.....	13
2.1 Chlamydia	14
2.2 Hepatitis C.....	17
2.3 Gonorrhoea.....	18
2.4 HIV/AIDS	19
3. Diseases Spread by Direct Contact and Respiratory Routes.....	21
3.1 Influenza	22
3.2 Group A streptococcal disease, invasive (iGAS)	23
3.3 <i>Streptococcus pneumoniae</i> , invasive (SPI).....	24
4. Vaccine Preventable Diseases (VPD); Vector-borne and Zoonotic Diseases; Other Reportable Diseases	26
5. Institutional Outbreaks	28
6. Conclusion.....	31
References	33

Report Overview

Introduction

This Reportable Diseases in Peterborough County and City 2012 report summarizes the incidence of reportable diseases among Peterborough County and City residents between 2005 and 2012.

Infectious diseases are caused by microorganisms (such as bacteria, parasites or viruses) or by the toxins they produce. These diseases are spread by: contact with infected persons or contaminated surfaces/articles, animals or insects; consumption of contaminated food or water; or exposure to airborne particles or other environmental sources.

In Ontario, there are over 60 diseases designated as reportable under the 1990 Health Protection and Promotion Act. Under this legislation, physicians, laboratories, hospitals, health departments, principals of schools, and superintendents of institutions are required to report these diseases to the local Medical Officer of Health. Reporting of diseases to the Health Unit is important for the follow-up of communicable diseases in order to prevent transmission to others, for the maintenance of surveillance data and for epidemiologic and program planning purposes. The list of reportable diseases can be found in Appendix A.

Notes

For the purposes of this report, Peterborough County-City Health Unit will be “PCCHU” and the regions of Peterborough County and the City of Peterborough will be “Peterborough”.

Because of the small population size of Peterborough many diseases are reported infrequently. Due to confidentiality issues, diseases with case counts of less than five will be reported as <5; rates and age/gender data will also be suppressed for these diseases. Similarly, to ensure confidentiality, where counts by age or gender are less than five, data will be suppressed.

Data Sources

The data presented in this report was obtained from several Ontario Ministry of Health databases. Peterborough reportable disease data was retrieved from the Integrated Public Health Information System (iPHIS) in April, 2013. Only ‘confirmed’ or ‘epidemiologically-linked’ diseases with an accurate episode date¹ between January 1, 2005 and December 31, 2012 were included in this report. For HIV/AIDS, the “carrier” status was also included. Aetiologic agent, subtype, age at illness, gender, exposure sources (e.g.: contaminated food) and exposure settings (e.g.: location such as farm, or travel) were also extracted, where available.

The Integrated Public Health Information System (iPHIS) is a centralized computer database system implemented at the PCCHU and in Health Units across Ontario in 2005. All suspect and confirmed

¹ Accurate Episode Date corresponds to the earliest date on record for the case according to the iPHIS hierarchy Symptom Date > Clinical Diagnosis Date > Specimen Collection Date > Lab Test Date > Reported Date

reportable diseases are entered into iPHIS. However, specific case definitions as defined in the Ontario Public Health Standards (OPHS) Infectious Diseases Protocol have to be met before a disease is considered confirmed. Cases are usually confirmed based on laboratory test results (serology, microbiology cultures, etc.) and symptoms. Consistent application of the case definitions ensures that disease rates are comparable provincially.

Ontario data were retrieved through the Ontario Public Health Portal hosted by eHealth Ontario. Data includes counts from the *STI* and *Outbreak* modules of iPHIS for confirmed and probable cases of reportable diseases with an accurate episode date from January 1 to December 31, 2012 as of February 6, 2012. Please note that these data, while relatively stable, are subject to change on subsequent pulls. Data have not been cleaned extensively and may include duplicate cases; however, this information can be used to provide a general comparison for Peterborough rates and some demographic data of reportable illnesses. Data are available in aggregate form.

Incidence rates are produced using population estimates obtained from Statistics Canada and are based on census counts adjusted for net undercoverage. Population estimates are extracted using the Ontario Ministry of Health and Long-Term Care's IntelliHEALTH Ontario database system and were extracted in November 2012. Population projection data in are provided by the Ontario Ministry of Finance.

Data on influenza immunization was obtained from the 2009-2010 Canadian Community Health Survey (CCHS) conducted by Statistics Canada. The CCHS collects health determinants, health status and health system utilization data from people aged 12 years or older living in households across Canada. Public health units produce estimates from CCHS data using the Ontario Share File provided by the Ministry of Health and Long-Term Care.

Disease Categories and Reporting

The diseases in this report were classified into the following categories:

Food and Waterborne Diseases: Amebiasis; *Campylobacter* enteritis; Cryptosporidium; Cyclospora; Giardiasis; Hepatitis A; Listeriosis; Salmonellosis (non-typhoidal *Salmonella*); Shigellosis; Typhoid fever; Verotoxin-producing *E. coli* (VTEC); and Yersiniosis.

Sexually Transmitted Infections and Blood Borne Diseases: Chlamydia; Gonorrhea; Hepatitis B and C; HIV/AIDS; and Syphilis.

Diseases Spread by Direct Contact and Respiratory Routes: Influenza; Meningococcal disease, invasive; Streptococcal infections, Group A invasive (iGAS) and Group B neonatal (GBN); *Streptococcus pneumoniae*, invasive (iPD); Tuberculosis (TB)

Vaccine Preventable Diseases (VPDs): Chickenpox (Varicella Zoster virus); Diphtheria; *Haemophilus influenzae* type b (Hib disease); Measles; Mumps; Pertussis; and Rubella

Vector-borne and Zoonotic Diseases: Lyme disease; Malaria; West Nile Virus (WNV)

Other Reportable Diseases: This list includes rare diseases such as leprosy, plague, Q fever, etc.

Note: Some diseases may fall into two or more categories (i.e.: influenza, hepatitis A, measles, etc.); however, the aforementioned categories represent the typical or primary transmission route for each organism. In the case of VPDs, the following diseases have vaccines covered by the Ontario Ministry of Health for all, or eligible, individuals: chickenpox, diphtheria, hepatitis B, hepatitis A, rabies, Hib disease, human papillomavirus (not reportable), measles, mumps, pertussis, pneumococcal diseases, poliomyelitis, rotavirus, rubella, tetanus, and infections caused by meningococcal bacterium types A, C, Y and W135.

There may be considerable under-reporting of actual cases for some diseases. For instance, when an infected person has mild clinical symptoms (e.g.: salmonellosis, influenza) they may not seek medical care and/or laboratory testing may not be performed. Infections such as invasive group A streptococcus (iGAS), which tend to have more severe clinical presentations, are more accurately reflected in surveillance data. Conversely, diseases such as hepatitis B are under-reported because many individuals are asymptomatic. Additionally, diagnoses based on laboratory testing tend to be more accurately reported than those that rely on clinical diagnostic criteria.

Summary Data Table Report Format

Number of reported cases: Reflects the number of cases with an accurate episode date between January 1st and December 31st of a given year.

5-year mean: The mean yearly case count of a given disease with an accurate episode date between January 1st 2007 and December 31st 2011.

Incidence rates (per 100,000): The number of all new cases in the reporting period divided by the Peterborough population during that time period, multiplied by 100,000. Population estimates were extracted from IntelliHEALTH data released by the Health Planning Branch at the Ministry of Health and Long-Term Care (MOHLTC). Unless specified, crude rates are reported.

Gender: The number and percent of cases that are male and female; five-year mean percentage of males and females also provided.

Mean age: Arithmetic mean (average) age of all cases in the reporting period; five-year mean age also provided.

Median age: The age that represents the midpoint for all case's ages of the reporting period; five-year median age also provided.

Age range: The ages of the youngest and oldest cases; age range over five years also provided. For cases under one year of age, less than one (<1) will be used.

95%CI: Is the 95% confidence interval. Nineteen times out of twenty the *true* value of an estimate falls within this range.

Executive Summary

There were 749 confirmed cases of reportable diseases in Peterborough with an accurate episode date between January 1, 2012 and December 31, 2012 which results in a crude rate of 523.7 cases per 100,000 population.

In 2011, there were 714 cases of reportable diseases (507.3 per 100,000 population) representing a 4.4% increase in the number of cases between 2011 and 2012 – see Table I.

There was an average of 62 incidences of reportable diseases each month in 2012 with the largest number reported in December (126) and the fewest in July (45). Just over one third (266 or 36.4%) of all cases in 2012 occurred in the fourth quarter (October through December) largely as a result of a number of community and institutional influenza outbreaks.

Approximately two thirds (471 or 63.3%) of all the illnesses reported to PCCHU occurred in females. The average age of onset of illnesses in 2012 was 34.5 years of age (median: 24) with a range of less than one (<1) to 100 years old. When excluding chlamydia, which accounted for just over half (388 or 52.2%) of all reported illnesses to PCCHU, the average age increases to 46.9 years of age (median: 46) while the age range remains the same and 54.8% (n=195) of the reportable diseases occurred among females.

Table I. Number and proportion of communicable diseases by category in PCCHU; 2007-2012

Category	2012 n (%)	2011 n (%)	2010 n (%)	2009 n (%)	2008 n (%)	2007 n (%)
FW*	82 (10.9%)	64 (9.0%)	98 (14.7%)	83 (10.7%)	89 (13.1%)	90 (16.0%)
STI/BBI†	478 (63.8%)	461 (64.6%)	508 (76.3%)	457 (58.7%)	398 (58.7%)	339 (60.2%)
Direct and Respiratory	165 (22.0%)	171 (23.9%)	52 (7.8%)	235 (30.2%)	172 (25.4%)	123 (21.8%)
Other‡	24 (3.2%)	18 (2.5%)	8 (1.2%)	<5 (<1%)	19 (2.8%)	11 (2.0%)
Total	749	714	666	775	677	560

* food and waterborne

† sexually-transmitted infections and blood-borne infections

‡ includes vaccine preventable diseases, zoonotic diseases, and other rare diseases

Sexually-transmitted infections and blood-borne infections (STI/BBI) represented the largest category of reportable illnesses in 2012 with 63.8% of all cases reported to PCCHU. This category is a major contributor to the communicable disease burden due to the large numbers of chlamydia infections reported to PCCHU each year. However, for a second year, there was a reduction in the number of cases of chlamydia in Peterborough.

The proportion of illnesses reported to PCCHU that are spread by direct and respiratory routes remained consistent from 2011 to 2012. Influenza represents the largest contributor of respiratory illnesses at 81.2% of diseases spread by direct and respiratory routes and 17.9% of all reported diseases.

There was an increase in the number and relative frequency of reportable diseases caused by food and waterborne routes, largely due to an increase in the number of reported cases of giardiasis and salmonella. In addition, an outbreak of pertussis led to an increase in the number of reported vaccine preventable diseases (VPD), zoonotic, and rare diseases in Peterborough.

List of Tables

Table I. Number and proportion of communicable diseases by category in PCCHU; 2007-2012	5
Table 1. Food and Waterborne diseases in Peterborough, 2011-2012	8
Table 2. Campylobacter enteritis Summary Data	10
Table 3. Salmonellosis Summary Data	11
Table 4. Relative frequency of S. enteritidis cases in PCCHU, 2005-2012	11
Table 5. Giardiasis Summary Data	12
Table 6. STIs and BBIs in Peterborough, 2011-2012	13
Table 7. Chlamydia Summary Data	15
Table 8. Hepatitis C Summary Data.....	18
Table 9. Gonorrhea Summary Data	19
Table 10. HIV/AIDS Summary Data	20
Table 11. Direct Contact and Respiratory diseases in Peterborough, 2011-2012	21
Table 12. Influenza Summary Data	23
Table 13. iGAS Summary Data	24
Table 14. SPi Summary Data	25
Table 15. Pertussis Summary Data.....	27
Table 16. Institutional Outbreaks Reported to PCCHU by Setting.....	28
Table 17. Institutional Outbreaks Reported to PCCHU by Aetiologic Agent.....	29

List of Figures

Figure 1. Crude rate of campylobacter, salmonellosis, and giardiasis in Peterborough, 2005-2012	9
Figure 2. Crude rate of chlamydia, hepatitis C, and gonorrhea in PCCHU, 2005-2012	13
Figure 3. Number of cases of chlamydia in Peterborough females, 2005-2012.....	16
Figure 4. Age-specific rate of chlamydia in Peterborough females, 2005-2012.....	16
Figure 5. Number of cases of chlamydia in Peterborough males, 2005-2012.....	17
Figure 6. Age-specific rate of chlamydia in Peterborough males, 2005-2012.....	17
Figure 7. Crude rate of influenza, SPi, and iGAS in PCCHU, 2005-2012.....	22
Figure 8. Proportion of influenza cases by age group in Peterborough, 2007-11 & 2012	23
Figure 9. Time Series of Institutional Outbreaks Reported to PCCHU, 2010-11.....	30

1. Food and Waterborne Diseases

Foodborne diseases are illnesses acquired through the consumption of contaminated food or illnesses associated with consumption of a food infected by a specific bacterial, parasitic, or viral agent; similarly waterborne diseases are illnesses acquired through the consumption of contaminated water.

Transmission of these illnesses can also occur via fecal-oral contact with an infected person. Cases and/or outbreaks are recognized by the occurrence of the illness within a generally short time frame among individuals who have consumed the contaminated substance or have been in contact with an infected person. Foodborne disease outbreaks are among the most common causes of acute illness; however, many outbreaks go unreported and single cases are often difficult to identify unless there is a distinct clinical syndrome and/or the affected individual seeks medical attention.

In 2012 in Peterborough there were 82 reported cases of food and waterborne (FW) diseases representing 10.9% of all reported diseases and an increase of 28.1% over 2011 counts (Table 1). However, it is important to note 2011 counts of FW illnesses were the lowest reported in seven years.

The largest increase among FW diseases occurred in salmonellosis (18 in 2011 to 27 in 2012) due to an outbreak at a food premise late in the year which continued into 2013. The crude rates of FW diseases with counts greater than 5 rose slightly over 2011 rates (Figure 1).

Table 1. Food and Waterborne diseases in Peterborough, 2011-2012

Disease	2012		2011	
	Number of Cases	Proportion of All Cases (%)	Number of Cases	Proportion of All Cases (%)
Amebiasis	<5	<1	<5	<1
<i>Campylobacter enteritis</i>	29	3.9	27	3.8
Cryptosporidiosis	<5	<1	<5	<1
Cyclosporiasis	<5	<1	-	-
Giardiasis	12	1.6	6	<1
Hepatitis A	-	-	-	-
Legionellosis	<5	<1	<5	<1
Listeriosis	<5	<1	<5	<1
Salmonellosis	27	3.6	18	2.5
Shigellosis	-	-	<5	<1
Typhoid fever	-	-	-	-
Verotoxin producing <i>E. coli</i>	<5	<1	<5	<1
Yersiniosis	-	-	<5	<1

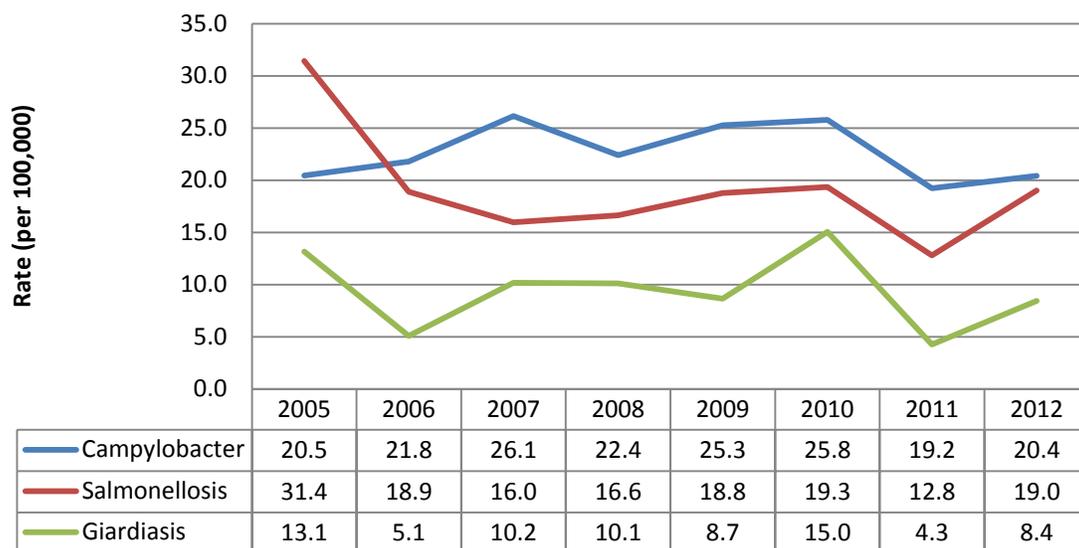


Figure 1. Crude rate of campylobacter, salmonellosis, and giardiasis in Peterborough, 2005-2012

1.1 *Campylobacter* enteritis

Campylobacteriosis is caused by the bacteria *Campylobacter jejuni* and, less commonly, *Campylobacter coli*. Symptoms can vary from mild to severe and are characterized by diarrhea, abdominal pain, malaise, fever, nausea and vomiting. Infection usually lasts from several days to several weeks and occurs as a result of ingestion of the organism in under-cooked meat, contaminated food or water, or contaminated milk or poultry. Cattle are common reservoirs. Person-to-person transmission appears uncommon.

The number of *campylobacter* enteritis cases reported to PCCHU in 2012 was similar to 2011 and slightly fewer than expected (30 to 36 cases per year). Cases of *campylobacter* enteritis were somewhat younger than previous years and a greater proportion of cases were female compared to the five-year average (Table 2). The majority of cases in 2012 (27 or 93.1%) were caused by *C. jejuni* while the remainder were caused by an unspecified species. Crude rates of *campylobacter* infections were slightly smaller than the province. Most exposure settings in 2012 were missing or unknown (16 or 59.3%). Where data was available, community exposure settings were implicated in most cases (10 or 34.5%). Exposure sources implicated with infections included poultry/bird or animal related (4 or 13.8%) though most sources were unknown or missing. Similar exposure settings and sources were commonly implicated between 2007 and 2011.

Table 2. Campylobacter enteritis Summary Data

	2012	5-yr Mean (2007-11)	Ontario 2012
Number of Reported Cases	29	33.0	3,837
Incidence (per 100,00 population)	19.3	20.4	28.4
Males	13 (44.8%)	57.6%	54.4%
Females	16 (55.2%)	42.4%	45.5%
Age at Onset (Years)			
Mean	40.6	43.6	
Median	40	47	
Range	0 – 90	<1 – 87	

1.2 Salmonellosis

Salmonellosis is a bacterial infection that manifests itself as a sudden onset of headache, diarrhea, fever, abdominal cramps and sometimes vomiting. The infection may persist for several days but does not require treatment unless the patient becomes severely dehydrated or the infection spreads from the gastrointestinal tract to the bloodstream or other body sites. There are numerous species of *Salmonella* serotypes that are pathogenic to humans and can be transmitted by ingestion of foods contaminated with the organism including: raw or undercooked beef or poultry; milk and milk products; shellfish; and eggs. Person-to-person transmission can also occur if hands are not properly washed following bathroom use. Outbreaks have also been linked to the consumption of contaminated fruits and vegetables. Pet turtles, lizards, and snakes are other potential sources of exposure.

There was a small increase of salmonellosis reported to PCCHU in 2012 compared to 2011, likely as a result of a community outbreak associated with a food premise, driving the counts of salmonellosis higher than what would be expected based on five-year averages. In addition, cases of salmonellosis in 2012 tended to be younger than expected. Despite the increase in salmonellosis, crude rates remained somewhat lower than the province and the gender distribution differed as well, with a greater proportion of female cases in Peterborough (Table 3). While many of the cases in 2012 were related to the food premise outbreak, historically, poultry and/or other food related sources have accounted for 60.7% of exposure sources when known and community and travel settings (82.9%, where known) have been implicated in salmonellosis.

Table 3. Salmonellosis Summary Data

	2012	5-yr Mean (2007-11)	Ontario 2012
Number of Reported Cases	27	23.2	3,021
Incidence (per 100,00 population)	19.0	16.7	22.3
Males	11 (40.7%)	45.7%	48.7%
Females	16 (59.3%)	54.3%	51.1%
Age at Onset (Years)			
Mean	30.4	39.3	
Median	22	40	
Range	<1 – 70	<1 – 90	

Numerous species of *Salmonella* were responsible for salmonellosis in 2012; however a single subtype was isolated during the outbreak (*S. typhimurium*) and accounted for 51.9% of salmonella subtypes in 2012 compared to 12.9% of all subtypes between 2007 and 2011. Between 2007 and 2011, *S. enteritidis* accounted for roughly one third (31.9%) of cases compared to 7.4% in 2012 (Table 4). Three cases each of *S. infantis* and two cases *S. Thompson* were reported in 2012 compared with two *S. infantis* and *S. Thompson* each between 2007 and 2011. The remaining cases were classified as *Heidelberg*, *Tennessee*, or unspecified.

Table 4. Relative frequency of *S. enteritidis* cases in PCCHU, 2005-2012

Year	2007	2008	2009	2010	2011	2012
<i>S. enteritidis</i> (n %)	8 (36.4%)	4 (17.4%)	10 (38.5%)	11 (40.7%)	4 (22.2)	2 (7.4%)
All Salmonellosis	22	23	26	27	18	27

1.3 Giardiasis

Giardiasis is an infection of the small intestine caused by the protozoa *Giardia lamblia*, *G. intestinalis* or *G. duodenalis*; however, only *Giardia lamblia* is reportable. Clinically, giardiasis can remain asymptomatic; bring on acute, self-limiting diarrhea; or lead to intestinal symptoms such as chronic diarrhea, abdominal cramps, bloating, fatigue, malabsorption and weight loss. Humans are the principle reservoir, though beavers and other wild and domestic animals are also reservoirs. Person-to-person transmission occurs by hand-to-mouth transfer of cysts from the feces of an infected individual; localized outbreaks also occur from ingestion of cysts in fecally contaminated untreated drinking and recreational water (via inadvertent consumption of water while swimming).

There are typically a small number of giardiasis cases reported to PCCHU; in 2012 there was an increase in the number of cases compared to 2011; however counts were still within expected ranges. Cases of giardiasis in 2012 were also slightly younger than what has been seen historically. Crude rates of giardiasis in Peterborough are similar to those in Ontario (Table 5). In 2012, very few cases of giardiasis had a reported exposure source; historically, where recorded, recreational and drinking water accounted for 71.4% of exposure sources in Peterborough. Similarly, few of the exposure settings were known in 2012; travel accounted for 83.3% of known exposure settings among giardiasis cases between 2007 and 2011.

Table 5. Giardiasis Summary Data

	2012	5-yr Mean (2007-11)	Ontario 2012
Number of Reported Cases	12	13.4	1,244
Incidence (per 100,00 population)	8.4	9.7	9.2
Males	5 (41.7%)	58.8%	59.8%
Females	7 (58.3%)	41.2%	40.1%
Age at Onset (Years)			
Mean	36.8	41.5	
Median	34	38	
Range	5 – 69	1 – 106	

2. Sexually Transmitted and Blood Borne Infections

Sexually transmitted infections (STIs) and blood borne infections (BBIs) are diseases caused by infectious agents in body fluids such as semen, vaginal secretions, breast milk, saliva and blood. Transmission occurs primarily from person-to-person through sexual contact. Other routes of transmission include direct entry into the blood via shared needles or other drug equipment, transfusions, and perinatal transmission from mother to infant. In 2012 in Peterborough there were 478 cases of STIs and BBIs representing the largest fraction of communicable diseases reported to PCCHU at 63.6% (Table 6). Counts of STI/BBIs in 2012 increased 2.8% from 2011 as a result of increases in the number of gonorrhea and hepatitis C cases reported to PCCHU (92.3% and 35.0% increases, respectively). There was a reduction in the number of chlamydia cases and crude rate reduction for the second year in a row in Peterborough (Figure 2).

Table 6. STIs and BBIs in Peterborough, 2011-2012

Disease	2012		2011	
	Number of Cases	Proportion of All Cases (%)	Number of Cases	Proportion of All Cases (%)
Chlamydia	388	51.8	402	56.6
Gonorrhea	25	3.3	13	1.8
Hepatitis B	<5	<1	<5	<1
Hepatitis C	54	7.2	40	5.6
HIV/AIDS	5	<1	<5	<1
Syphilis (all)	<5	<1	<5	<1

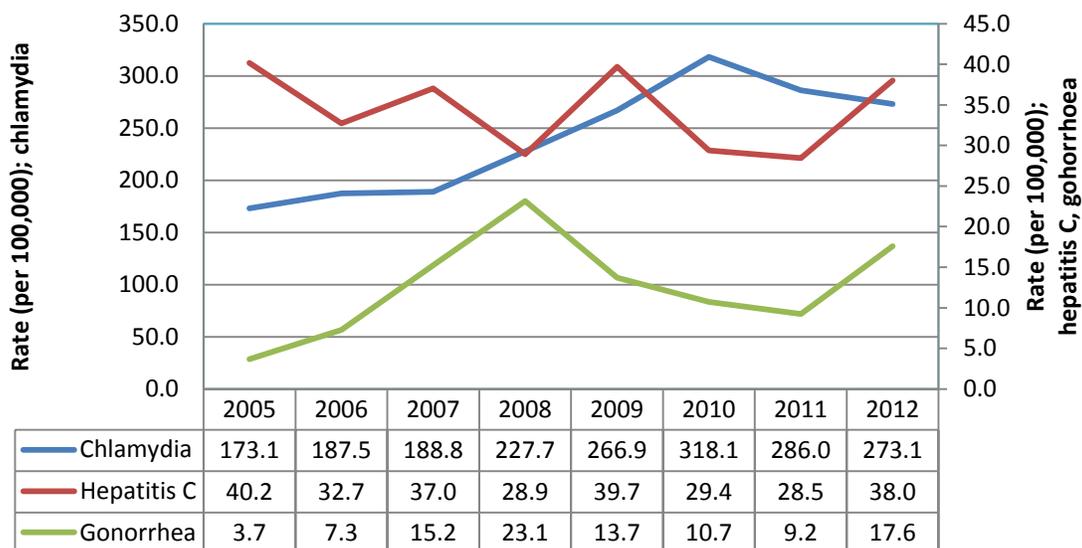


Figure 2. Crude rate of chlamydia, hepatitis C, and gonorrhea in PCCHU, 2005-2012

2.1 Chlamydia

Chlamydia is the most widespread bacterial STI in Canada and is most common among teenagers and young adults. It is transmitted through vaginal, anal and oral sex and can also be transmitted from mother to child during childbirth. In women, symptoms can include: vaginal discharge; burning sensation when urinating; pain in the lower abdomen, sometimes with fever and chills; pain during intercourse; and vaginal bleeding between periods or after intercourse. However, approximately 70% of infected females have no symptoms and when left untreated can develop pelvic inflammatory disease (PID). PID can present with abdominal pain, fever, internal abscesses and long-lasting pelvic pain; effects also include scarring of the fallopian tubes, which can cause infertility and increase the chance of potentially life-threatening ectopic or tubal pregnancies.

Symptoms of chlamydial infection in men can include: discharge from the penis; burning sensation when urinating; burning or itching at the opening of the penis; and pain and/or swelling in the testicles. Approximately 50% of infected males exhibit no symptoms. Lack of treatment in man can lead to scarring of the urethra, making urination difficult and occasionally causing infertility. Although rare, both sexes are at risk of a type of arthritis known as Reiter's Syndrome - an inflammation and swelling caused by the spread of the infection through the bloodstream into the joints. Consistent and correct use of condoms is an effective measure in preventing the transmission of chlamydia (and other STIs).

Chlamydia is the communicable disease most frequently reported to PCCHU, making up just over half (51.8%) of all reportable diseases and the large majority of STI/BBIs (81.2%) in 2012. It is important to note that while rates and incidences of chlamydia are high, each occurrence of the disease is captured, and there may be many individuals who are engaging in high risk behaviours resulting in repeated infections.

Cases of chlamydia in Peterborough were at their highest in 2010 (444); since then, the number of cases has decreased by 12.6% to 388 (Table 7). This is the second consecutive year where case counts of chlamydia have declined in Peterborough. Still, since 2005 the number of cases has increased by 63.7%, paralleling a trend occurring in Ontario. Some of the increase seen in Peterborough since 2005 may be a partially attributable to better screening programs and more sensitive testing procedures. Age ranges of chlamydia cases were typical, though there was a slight increase in the proportion of females in 2012 compared to 2007 through 2011. Rates in Peterborough were slightly elevated compared to the province.

Table 7. Chlamydia Summary Data

	2012	5-yr Mean (2007-11)	Ontario 2012
Number of Reported Cases	388	358.2	36,395
Incidence (per 100,00 population)	273.1	257.5	268.9
Males	112 (28.9%)	32.2%	36.4%
Females	276 (71.1%)	67.8%	63.5%
Age at Onset (Years)			
Mean	23.1	22.3	
Median	22	21	
Range	13 - 55	<1 – 64	

Chlamydia rates are highest among young adults in Peterborough: between 2007 and 2011, 81.7% of all cases among females were between the ages of 15 and 24 years of age; during the same time frame among males, 68.4% of all cases belonged to the same age cohort. In 2012, this trend among age groups continued, as teenagers and young adults made up the majority of new cases (73.9% of cases in females and 62.5% in males). The number of cases of chlamydia among females was fairly consistent between 2011 and 2012, though the number of cases among those aged 20 to 24 decreased by approximately 13% (Figure 3). While they represent 17.7% of cases in 2012, the rate among women age 25 to 29 years old has more than doubled from 4.6 per 1,000 women in 2007 to 9.6 per 1,000 in 2012 (Figure 4). Among males, the number of incidences of chlamydia occurring among those aged 15 to 19 and 20 to 24 decreased for the second year in a row while cases among men aged 25 to 29 remained stable (Figure 5). Since 2007, the number of cases among men 30 years of age and older has doubled from 9 to 18 in 2012. In general, rates of chlamydia among men have been in decline since 2010 (Figure 6).

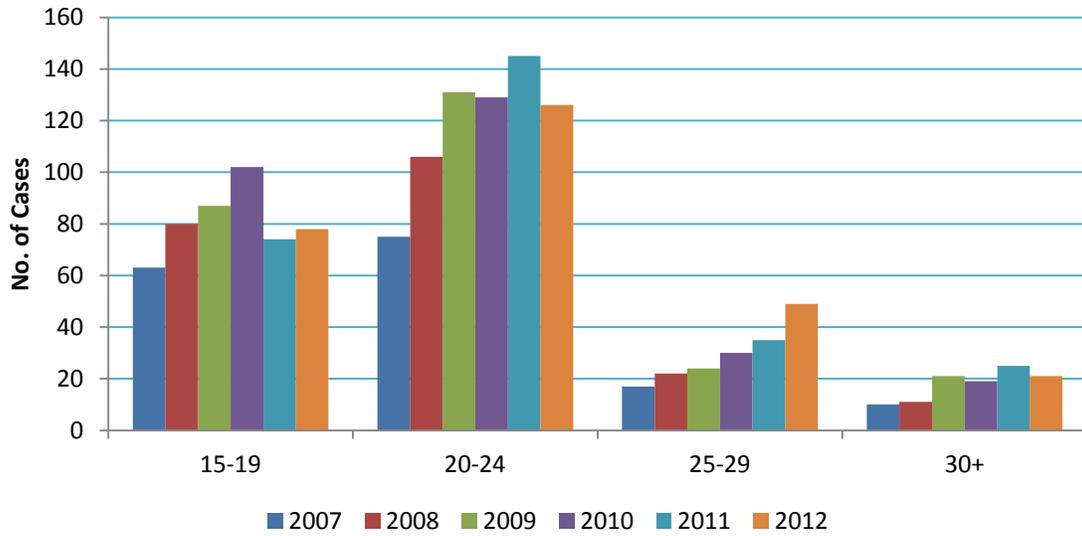


Figure 3. Number of cases of chlamydia in Peterborough females, 2005-2012

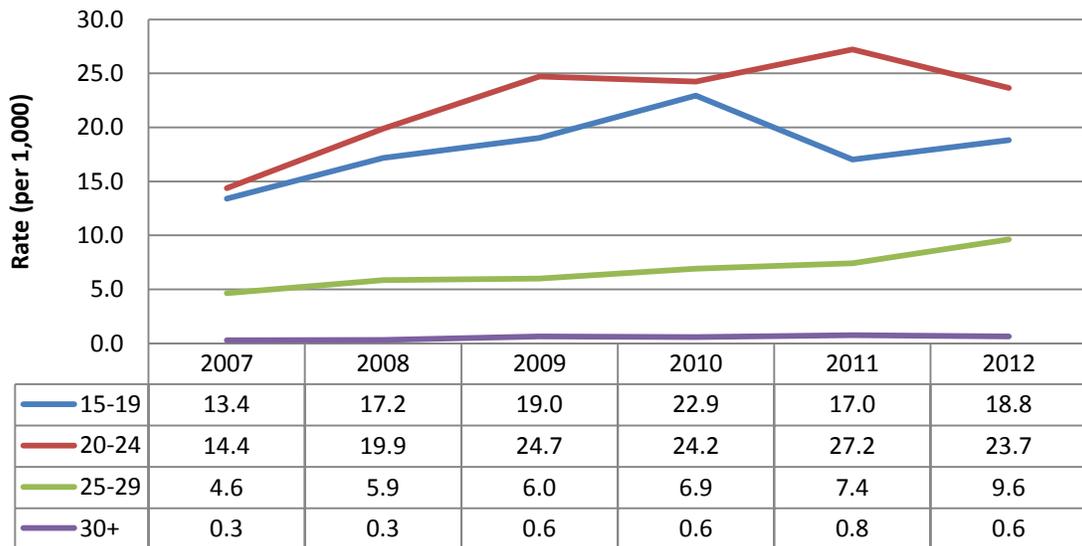


Figure 4. Age-specific rate of chlamydia in Peterborough females, 2005-2012

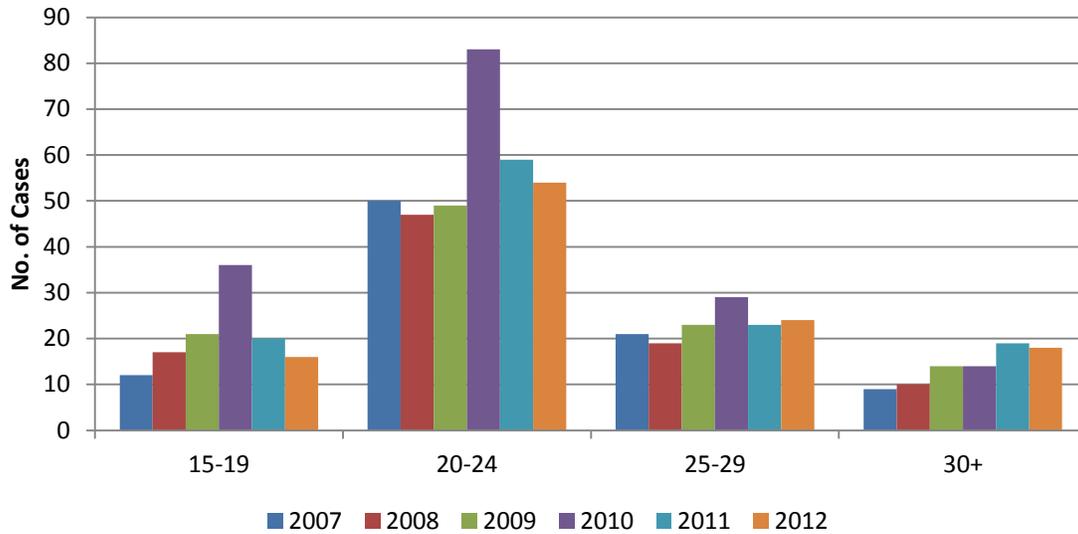


Figure 5. Number of cases of chlamydia in Peterborough males, 2005-2012

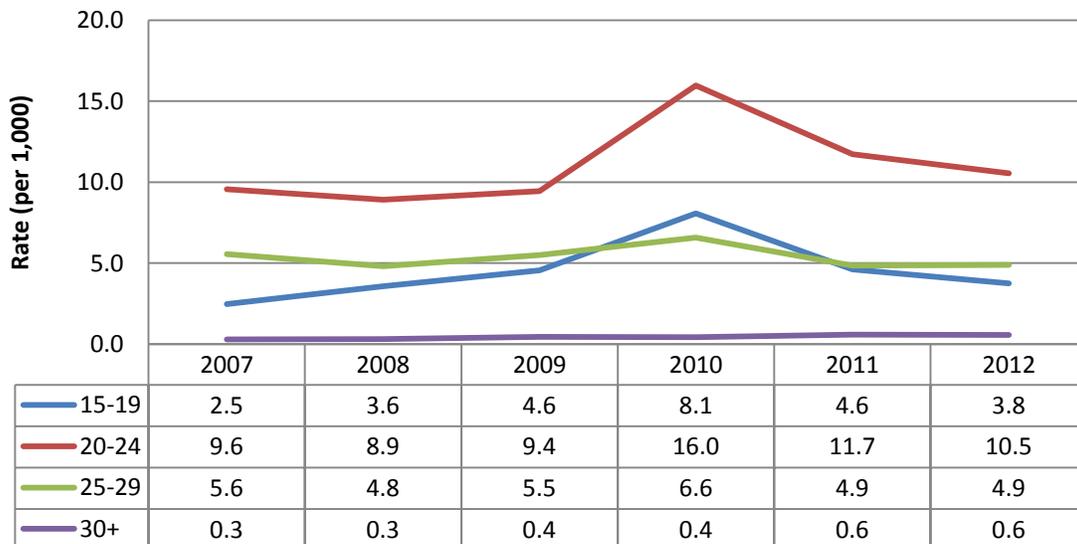


Figure 6. Age-specific rate of chlamydia in Peterborough males, 2005-2012

2.2 Hepatitis C

Hepatitis C is a chronic disease of the liver caused by the hepatitis C virus. Only 25% of people who acquire hepatitis C develop acute symptoms within the first six months while 70-80% of people progress to chronic infection. These individuals become carriers of the virus and potentially transmit the infection to others. For those who experience symptoms, the most commonly reported include fatigue, lethargy, reduced appetite, sore muscles and joints, nausea, abdominal pain or jaundice. Individuals who progress to chronic infection can develop cirrhosis, leading to severe liver damage; a small number

of people may get liver cancer. Transmission is primarily through contact with the blood of an infected person; transmission may also occur perinatally or through sexual contact, though these routes appear less common. High-risk groups for infection include people who share drug use equipment, health care workers, hemodialysis patients, and recipients of blood products or transfusions before 1992. Harm-reduction programs, such as those which exchange clean and sterile drug-using equipment can be an effective method of preventing hepatitis C transmission among this group.

Hepatitis C is the second most commonly reported STI/BBI reported to PCCHU and the number of cases reported in 2012 was slightly more than expected after a 35.0% increase over 2011 counts and the crude rate was higher than Ontario (Table 8). Males continue to account for roughly two thirds of all hepatitis C cases in Peterborough (61.1%). Approximately two thirds (63.0%) of the hepatitis C cases diagnosed in 2012 were over the age of 40. The 40 to 54 age cohort has represented the age group most frequently diagnosed with hepatitis C since 2005.

Table 8. Hepatitis C Summary Data

	2012	5-yr Mean (2007-11)	Ontario 2012
Number of Reported Cases	54	45.4	4,090
Incidence (per 100,00 population)	38.0	32.7	30.2
Males	33 (61.1%)	38.3%	59.9%
Females	21 (38.9%)	61.7%	39.7%
Age at Onset (Years)			
Mean	42.9	43.4	
Median	48	45	
Range	<1 – 74	<1 – 86	

2.3 Gonorrhea

Gonorrhea is a bacterial STI caused by *Neisseria gonorrhoea* and differs in men and women in course, severity, and ease of recognition. In men, infection presents as acute purulent discharge from the penis within two to seven days after exposure. In females, infection is often asymptomatic, though some women experience vaginal discharge and vaginal bleeding after intercourse. Transmission occurs through sexual contact and an infected individual can continue to transmit the disease for months if left untreated. Gonorrhea is treatable often with a single dose of antibiotics; however, some 32 strains of the bacteria have become resistant to standard antibiotics. Treating patients infected with gonorrhea will become more difficult if resistant strains continue to increase. If left untreated, gonorrhea can cause serious complications including PID in women and infertility for both sexes.

After some years of decreasing incidence in Peterborough, there was a doubling in the number of cases of gonorrhea in 2012 and correspondingly an increase in the crude rate of gonorrhea infection. Despite

the increase, case counts were within expected ranges. Just over half of the cases (14 or 56.0%) in 2012 occurred between the months of August and October compared to 22.0% of all cases between 2007 and 2011. Male and female cases have been generally equally represented locally since 2007, however, the slight majority of cases in 2012 were female (Table 9). Typical of many STIs, youth and young adults are primarily affected with 88.0% of cases in 2012 under the age of 30. Crude rates of gonorrhoeal infection in Peterborough were elevated compared to Ontario.

Table 9. Gonorrhoea Summary Data

	2012	5-yr Mean (2007-11)	Ontario 2012
Number of Reported Cases	25	20.0	4,084
Incidence (per 100,00 population)	38.0	14.4	30.2
Males	11 (44.0%)	49.5%	58.3%
Females	14 (56.0%)	50.5%	41.5%
Age at Onset (Years)			
Mean	28.0	27.7	
Median	27	24	
Range	19 – 45	12 – 69	

2.4 HIV/AIDS

The human immunodeficiency virus (HIV) is a retrovirus of which two types have been identified: type 1 (HIV-1) and type 2 (HIV-2). Symptoms of acute HIV infection while difficult to diagnose and non-specific and may include fever, arthralgia or myalgia, rash, lymphadenopathy, sore throat, fatigue, headache, oral ulcers and or genital ulcers, weight loss, nausea, vomiting or diarrhea. The infection is transmitted from person to person transmission through unprotected sexual intercourse; contact with infected body fluids such as sexual fluids, blood, breast milk, and cerebrospinal fluid (CSF); the use of HIV-contaminated needles and syringes and some drug paraphernalia, including sharing by injection drug users; transfusion of infected blood or its components, organ and tissue transplants and mother to child transmission; and contact of abraded skin or mucosa with body secretions such as blood, CSF or semen. The Ontario Advisory Committee on HIV/AIDS has identified five HIV at-risk populations in Ontario: gay and bisexual men; African and Caribbean Ontarians; people who use injection drugs; Aboriginal Peoples; and women (who are members of the above populations or engage in HIV risk activity with them).

Acquired Immunodeficiency Syndrome (AIDS) is a severe, life threatening clinical condition and is advanced HIV related disease. This syndrome represents the late clinical stage of HIV infection resulting from progressive damage to the immune system, leading to one or more of many opportunistic infections and cancers of which bacterial pneumonia is one of the common presentations.

There are typically few reported cases of HIV/AIDS to PCCHU, with 21 cases reported to the health unit since 2005 and an average of 2.6 cases per year (Table 10). Cases reported to the health unit in 2012 were slightly younger than previous years.

Table 10. HIV/AIDS Summary Data

	2012	5-yr Mean (2007-11)	Ontario 2012
Number of Reported Cases	5	2.6	817
Incidence (per 100,00 population)	3.5	1.9	6.0
Males	-	37.5%	77.4
Females	-	62.5%	21.8
Age at Onset (Years)			
Mean	34.4	44.1	
Median	38	44	
Range	21 – 45	21 – 66	

3. Diseases Spread by Direct Contact and Respiratory Routes

These are diseases caused by infectious agents transmitted through direct contact or airborne spread; transmission occurs via droplet contact – coughing or sneezing, or airborne transmissions, where the microorganism remains in the air for long periods of time. For the purpose of this report, this section refers to: influenza; meningococcal disease, invasive; streptococcal infections, group A invasive (iGAS) and group B neonatal (GBN); *Streptococcus pneumoniae*, invasive (SPi); and tuberculosis (TB). Other diseases may also be spread through this mode of transmission (e.g.: chickenpox, measles, etc.) but are not discussed here.

In 2012 in Peterborough there were 165 cases of reportable diseases spread by direct contact or respiratory routes, representing 22.0% of the all reported diseases (Table 11). Influenza makes up the largest contributor to this group with 134 cases reported in 2012 (81.2%). Rates of these illnesses tend to vary, with the only discernible trend occurring among iGAS rates, which have increased since 2005 (Figure 7).

Table 11. Direct Contact and Respiratory diseases in Peterborough, 2011-2012

Disease	2012		2011	
	Number of Cases	Proportion of All Cases (%)	Number of Cases	Proportion of All Cases (%)
Group A streptococcal disease, invasive (iGAS)	15	2.0	7	1.0
Group B streptococcal disease, neonatal (GBN)	<5	<1	<5	<1
Influenza	134	17.9	143	20.1
Meningococcal disease, invasive	-	-	<5	<1
<i>Streptococcus pneumoniae</i> , invasive (SPi)	14	1.9	19	2.7
Tuberculosis (all types)	<5	<1	<5	<1

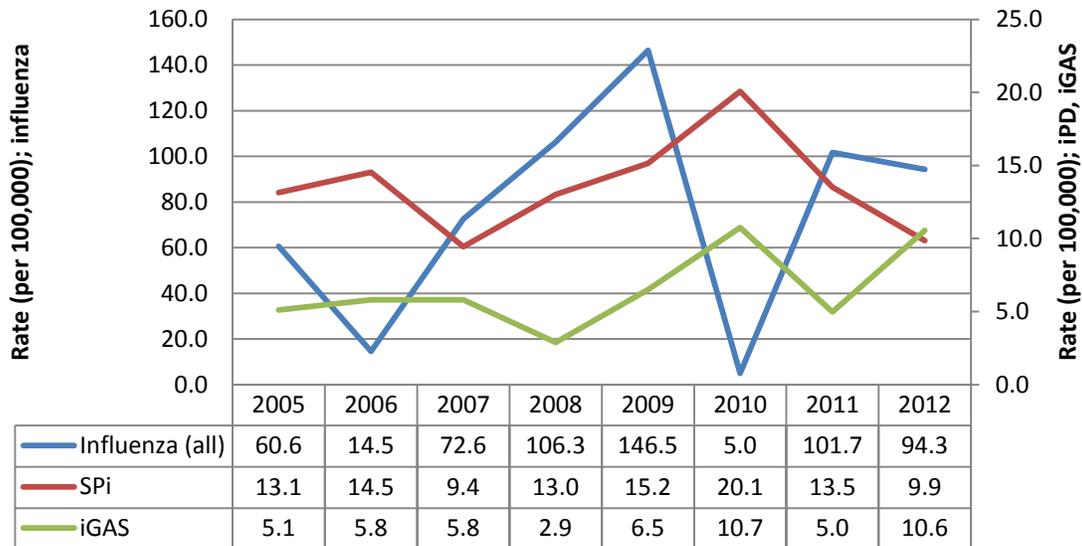


Figure 7. Crude rate of influenza, SPI, and iGAS in PCCHU, 2005-2012

3.1 Influenza

Influenza is a respiratory infection caused by the influenza virus; slightly different strains circulate every year, resulting in predictable influenza ‘seasons’ that usually take place during winter months. Influenza typically starts with a headache, chills and cough, followed rapidly by fever, loss of appetite, muscle aches and fatigue, running nose, sneezing, watery eyes and throat irritation. Nausea, vomiting and diarrhea may also occur, especially in children. Most people recover from influenza within a week or ten days, however, some individuals – those over 65 years of age and adults and children with chronic conditions, such as diabetes and cancer – are at greater risk of more severe complications, such as pneumonia. Between 2,000 and 8,000 Canadians can die of influenza and its complications annually depending on the severity of the season and/or the match between the seasonal vaccine and the circulating strain.

There were slightly fewer cases of influenza reported to PCCHU in 2012 than in 2011 and represented 17.9% of all reportable illnesses. Of the 134 cases of influenza reported, nearly two thirds were female (88 or 65.7%) and just over half (76 or 56.7%) were 65 years of age or older (Table 12). Most cases of influenza reported to PCCHU in 2012 were influenza A (110 or 82.1%) and of those that were sub-typed the large majority were H3 (69 or 95.8%). Compared to previous years, cases of influenza reported to PCCHU in 2012 were older, chiefly as a result of a number institutional outbreaks typically infecting individuals aged 80 years and older (Figure 8). The rate of influenza infection in Peterborough was 53.3% greater than the province; however, as influenza is typically under-reported and will typically only be recorded in iPHIS if confirmed by a public health laboratory, it is not unusual to see variable rates. In addition, business practices of entering influenza data into iPHIS may vary from Health Unit to Health Unit thereby influencing counts and rates.

Table 12. Influenza Summary Data

	2012	5-yr Mean (2007-11)	Ontario 2011
Number of Reported Cases	134	120.0	8,325
Incidence (per 100,00 population)	94.3	86.4	61.5
Males	46 (34.3%)	31.8%	45.8%
Females	88 (65.7%)	68.2%	53.8%
Age at Onset (Years)			
Mean	62.4	54.5	
Median	76	56	
Range	<1 – 100	<1 – 105	

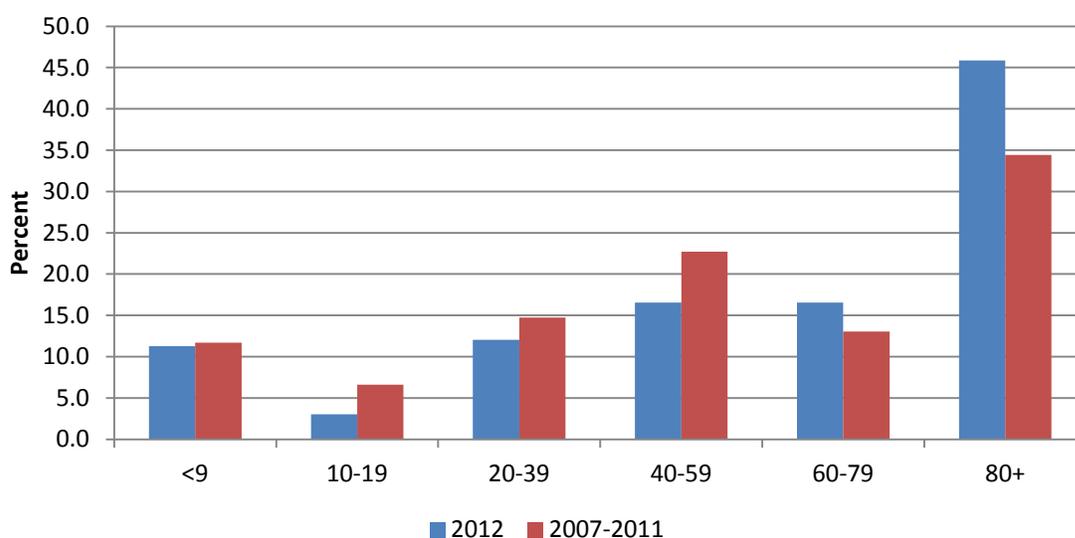


Figure 8. Proportion of influenza cases by age group in Peterborough, 2007-11 & 2012

3.2 Group A streptococcal disease, invasive (iGAS)

Invasive Group A streptococcal (iGAS) disease is caused by *Streptococcus pyogenes* (*S. pyogenes*). The most common clinical presentations for iGAS are skin or soft tissue infections, bacteremia, pneumonia, streptococcal toxic shock syndrome (STSS) and necrotizing fasciitis (NF) – “flesh eating disease”. *S. pyogenes* may colonize the throat of individuals (carriers) without causing symptoms and may be passed from person to person. Transmission generally occurs from person to person most commonly by: droplet spread when an infected individual coughs or sneezes; direct or indirect contact of the oral or nasal mucus membranes with infectious respiratory secretions; and sharing of contaminated needles.

Symptoms of the onset of iGAS may be non-specific and include pain, swelling, fever, chills, influenza-like symptoms, generalized muscle aches, generalized macular rash, nausea, vomiting, diarrhea, malaise or joint pain. Symptoms of NF include fever and a red painful swelling of tissue, which spreads rapidly; death may occur in 12 to 24 hours. NF, while less severe than STSS, still has a mortality rate of about 20%. Symptoms of STSS include infection of the primary site of iGAS and/or NF, plus hypotension, respiratory distress syndrome, renal impairment, rapid onset of shock and multi-organ failure; STSS has a mortality rate of up to 81%. Susceptibility to iGAS increases among individuals with underlying conditions including HIV infection, cancer, heart disease, diabetes, lung disease and alcohol abuse. Older individuals, persons with chronic diseases, persons in institutions and pregnant women also appear to be at higher risk of iGAS.

Incidence of iGAS is generally low in Peterborough – between less than five and 15 cases per year since 2007 (Table 13); since 2007 there have been 58 cases of iGAS and a nearly equal distribution of cases among men and women. Just over one third of the cases (37.9%) have been 65 years of age or older. The number of cases reported to PCCHU in 2012 was slightly higher than expected and cases were slightly older than expected. Crude rates were two and a half times greater than Ontario; however, historically crude rates are similar.

Table 13. iGAS Summary Data

	2012	5-yr Mean (2007-11)	Ontario 2012
Number of Reported Cases	15	8.6	598
Incidence (per 100,00 population)	10.6	5.3	4.4
Males	9 (60.0%)	46.5%	52.5%
Females	6 (40.0%)	53.5%	47.5%
Age at Onset (Years)			
Mean	69.7	51.4	
Median	78	51	
Range	18 – 94	<1 – 95	

3.3 *Streptococcus pneumoniae*, invasive (SPi)

Pneumococcal disease is an infection caused by the bacterium *Streptococcus pneumoniae* (*S. pneumoniae*) also known as pneumococcus. The most common types of pneumococcal infections include middle ear infections (otitis media), sinus infections, lung infections (pneumonia), blood stream infections (bacteremia), and meningitis; these infections are considered to be "invasive" when the bacteria is present in a normally sterile site (i.e.: blood). Only invasive infections are considered reportable. Invasive pneumococcal disease (SPi) most often presents as bacteremic pneumonia, meningitis and other clinical manifestations such as endocarditis or septic arthritis. Symptoms of

pneumonia may include: a sudden onset with shaking chills, fever, shortness of breath or rapid breathing, chest pain and a productive cough.

Pneumococci are ubiquitous and usually colonize in the upper respiratory tract of healthy persons (carriers); the only reservoir is humans. Transmission occurs mostly through the spread of respiratory droplets from the nose or mouth, by direct oral contact or indirectly through articles freshly soiled with respiratory discharges from infected persons. The risk of disease is highest in persons 65 years of age and older, children less than 2 years of age, and those persons with certain medical conditions that put them at increased risk for invasive pneumococcal disease.

There was a slight reduction in the number of cases and the average age of persons infected with SPi in Peterborough in 2012 compared to previous years (Table 14); crude rates of SPi are the lowest seen in Peterborough since 2007 and were similar to the province. Subtype 7F was the most frequently reported subtype in 2012 (5 or 35.7%) and accounted for 17.2% of subtypes between 2007 and 2011. Types 11A, 16F, 19A, 23A, 24B and 6C were also reported to PCCHU.

Table 14. SPi Summary Data

	2012	5-yr Mean (2007-11)	Ontario 2012
Number of Reported Cases	14	19.8	1,245
Incidence (per 100,00 population)	9.9	14.2	9.2
Males	7 (50.0%)	43.4%	56.2%
Females	7 (50.0%)	56.6%	43.6%
Age at Onset (Years)			
Mean	50.6	60.3	
Median	64	65	
Range	<1 – 91	1 – 95	

4. Vaccine Preventable Diseases (VPD); Vector-borne and Zoonotic Diseases; Other Reportable Diseases

Vaccine preventable diseases (VPD) are those communicable diseases that can be prevented by routine vaccination. As a result, these diseases are generally only seen in sporadic outbreaks in unimmunized populations or individuals who are not up to date with respect to their vaccination schedule; the schedule is available online (see Reference list). Up-to-date diphtheria, tetanus, polio, measles, mumps, and rubella vaccinations are required in order for children to attend Ontario schools. Those immunizations plus *haemophilus influenzae* type B and pertussis immunizations are required for day care. There are also two publicly funded vaccines which confer protection against pneumococcal infection and disease; a summary of this disease can be found in *Section 3. Diseases Spread by Direct Contact and Respiratory Routes*.

Any disease or infection that is naturally transmissible from vertebrate animals to humans and vice-versa is classified as a zoonosis; this can include infections from bacteria, viruses, fungi, parasites, or other agents such the prion responsible for variant Creutzfeldt-Jakob Disease (vCJD). Vector-borne diseases are transmitted to humans and animals through blood-feeding arthropods, such as mosquitoes, ticks and fleas; examples include Lyme disease and malaria.

In 2012 in Peterborough, pertussis was the only reportable VPD, vector-borne, zoonotic, or rare/other disease which occurred at a frequency of greater than five cases. Pertussis, also known as whooping cough, is an acute bacterial infection that attacks the tracheobronchial tree of the respiratory tract. The infection can be divided into three stages: catarrhal stage is characterized by mild upper respiratory tract symptoms with a mild occasional cough; paroxysmal stage presents with an increase in the severity and frequency of the cough and paroxysms are characterized by repeated violent coughs where the high pitched inspiratory “whoop” may occur commonly followed by vomiting; and the convalescent stage is the gradual recovery period. Pertussis is endemic worldwide and occurs relatively frequently across Ontario. Humans are the only known reservoir and cases are most common among children.

Pertussis had not been reported in Peterborough since 2007, when less than five cases occurred. Fifteen cases of pertussis were reported to PCCHU in 2012 beginning in February during an outbreak that lasted five months; most cases (11 or 73.3%) occurred in May and June. The majority of cases were under the age of 15 (13 or 86.7%) and the average age of cases was just under ten (Table 15). Males and females were generally equally represented. The majority of cases (12 or 80.0%) reported to PCCHU were either unimmunized or had not completed the full schedule of vaccinations.

Table 15. Pertussis Summary Data

	2012	5-yr Mean (2007-11)	Ontario 2012
Number of Reported Cases	15	<1	798
Incidence (per 100,00 population)	10.6	<1	5.9
Males	8 (53.3%)	-	44.1%
Females	7 (46.7%)	-	55.9%
Age at Onset (Years)			
Mean	9.5	-	
Median	8	-	
Range	<1 – 33	-	

5. Institutional Outbreaks

Outbreaks occurring in a daycare, school, food premise, and health care or residential setting require a public health response. There were 42 outbreaks reported to PCCHU in 2012 compared to 49 in 2011 with an equal mix of enteric and respiratory outbreaks (Table 16). On average, enteric outbreaks were larger than respiratory and were responsible for a much larger number of illnesses. Approximately one third (16 or 38.1%) of outbreaks reported to PCCHU in 2012 occurred in retirement residences (RR); long-term care facilities (LTC) also accounted for roughly one third of outbreaks (15 or 35.7%). Outbreaks in RRs accounted for 512 (41.1%) of all illnesses associated outbreak while LTCs accounted for 479 (38.4%) ill individuals. One particular LTC reported four outbreaks in 2012 to PCCHU while two separate LTCs each had three outbreaks throughout the year. Hospitalization was required for 24 individuals who fell ill as a result of an outbreak.

Table 16. Institutional Outbreaks Reported to PCCHU by Setting

		Enteric	Respiratory	Total
Outbreaks		21 (50.0%)	21 (50.0%)	42
Total Cases		776	469	1,245
Avg. Cases		37	22	30
Setting	Hospital	-	-	-
	LTC	4 (19.0%)	11 (52.4%)	15 (35.7%)
	RR	10 (47.6%)	6 (28.6%)	16 (38.1%)
	School	1 (4.8%)	1 (4.8%)	2 (4.8%)
	Child Care	1 (4.8%)	3 (14.3%)	4 (9.5%)
	Community*	5 (23.8%)	-	5 (11.9%)

* includes food premises

A large number of institutional outbreaks (15 or 35.7%) were of unknown aetiologic agent. Where available, norovirus accounted for most of the outbreaks (8 or 19.0%) followed by rhinovirus at 11.9% (Table 17); this is similar to the outbreak pattern in 2011. However, there were fewer infectious agents causing outbreaks in 2012: eight aetiologic agents were identified compared to 12 in 2011.

Table 17. Institutional Outbreaks Reported to PCCHU by Aetiologic Agent

Aetiologic Agent	2012		2011	
	Outbreaks	Total Illnesses	Outbreaks	Total Illnesses
<i>C. difficile</i>	-	-	1 (2.0%)	5
Coronavirus	4 (9.5%)	161	1 (2.0%)	53
ECHO virus	-	-	1 (2.0%)	9
Influenza A	5 (11.9%)	62	3 (6.1%)	54
Influenza A; RSV	-	-	2 (4.1%)	57
Influenza B	1 (2.4%)	18	-	-
Influenza B; RSV	-	-	1 (2.0%)	23
hMPV*	-	-	2 (4.1%)	58
hMPV; RSV; Rhinovirus	-	-	1 (2.0%)	13
Norovirus	8 (19.0%)	425	10 (20.4%)	464
Parainfluenza	-	-	2 (4.1%)	30
Pertussis	1 (2.4%)	8	-	-
Rhinovirus	5 (11.9%)	133	5 (10.2%)	105
Rhinovirus; RSV†	-	-	1 (2.0%)	13
RSV	1 (2.4%)	22		
Rotavirus	-	-	3 (6.1%)	72
Salmonella (all types)	2 (4.8%)	21	1 (2.0%)	15
Unknown	15 (35.7%)	395	15 (30.6%)	149
TOTAL	42	1,245	49	1,120

* human metapneumovirus

† respiratory syncytial virus

Just over half of the institutional outbreaks in Peterborough occurred in the fourth quarter (October to December) of 2012 when there were 22 (52.3%) outbreaks reported to PCCHU. The first few months of 2012 also saw a relatively large number of outbreaks reported (17 or 40.4%) between January and April; similar patterns occurred in 2010 and 2011. There was twice the number of enteric outbreaks compared to respiratory outbreaks (11 and 6, respectively) in the early months of 2012, though the types of outbreaks were generally equally represented in the fourth quarter (10 and 12, respectively).

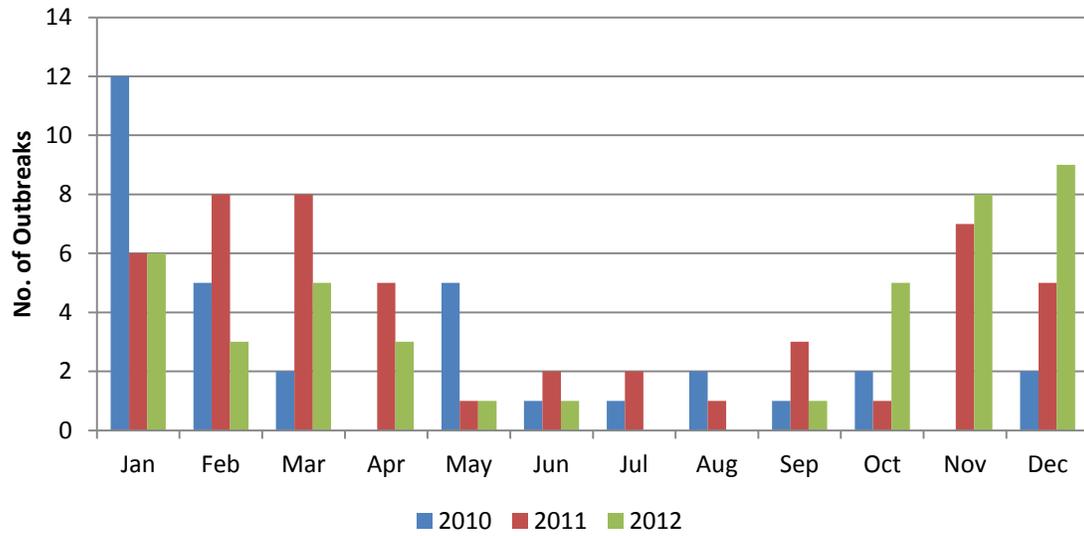


Figure 9. Time Series of Institutional Outbreaks Reported to PCCHU, 2010-11

6. Conclusion

As noted in the *Ontario Burden of Infectious Disease Study*, communicable diseases continue to contribute to our collective health and wellness. In Ontario there are over seven million infectious disease episodes and approximately 5,000 deaths every year. In fact, a large proportion of the burden of illness can be attributed to a small number of pathogens for which highly effective targeted interventions (e.g., vaccines) or non-specific interventions (e.g.: hand washing, condoms) already exist. As such, prevention of, and education about communicable illnesses remains an important role for public health.

In Peterborough in 2012, two pathogens accounted for nearly 80% of the 749 confirmed cases of reportable diseases: chlamydia (51.8%) and influenza (17.9%). Large increases in the number of chlamydia cases have driven a trend of increasing counts of reportable illnesses: since 2005, the number of cases reported to PCCHU has increased 63.7% from 237 to 388 in 2012. This report, however, indicates that this trend is in decline and for the second year in a row there has been a reduction in the total number of chlamydia cases. Given the growing numbers of tests being performed, and the continued recommendations for annual screening of sexually active females, this may be an indication that PCCHU is making progress in messaging regarding prevention. Correct and consistent use of condoms for sexually active individuals continues to be the most effective means of preventing infection with chlamydia and other STIs.

There has been an average of 105 reported cases of influenza per year since 2005 in Peterborough and influenza has accounted for approximately 15% of all reportable illnesses per year. However, influenza is typically under-reported as a case requires public health laboratory confirmation from a nasopharyngeal swab and many individuals infected with influenza are not tested. Therefore, the burden of influenza and its related complications is likely to be much larger than reported. Vaccination has been shown to be effective against laboratory confirmed influenza. How well the flu vaccine works (or its ability to prevent illness) can range widely from season to season in part by who gets vaccinated and the “match” between the seasonal vaccine and the virus types circulating in the community. According to the National Advisory Committee on Immunization, it is suggested that immunization programs focus on those at high risk from influenza-related complications (e.g.: people over age of 65; children; persons with underlying health conditions), those capable of spreading influenza to individuals at high risk of complications (e.g.: health care providers), and those who provide essential community services. Despite the potential benefits, in 2009/10 only 60.8% (95%CI: 57.1-64.4) of Peterborough residents report ever receiving an influenza vaccine and, of those, just under half (46.9%; 95%CI: 41.5-52.4) were immunized in the past 12 months. The most frequently cited reason for not receiving the influenza vaccine in the past year was that the respondent did not think it was necessary (61.4%; 95%CI: 59.4-63.3).

Other highlights from this report and the 2012 year include: a pertussis outbreak lasting five months with most cases either unimmunized or had not completed the full schedule of vaccinations; a doubling in the number of cases of gonorrhoea reported to PCCHU; and West Nile Virus being reported PCCHU for the first time since 2006. As for pertussis and gonorrhoea, infection with the respective pathogens can be prevented by either targeted or non-specific interventions. Immunization continues to be one of the most cost-effective tools in protecting against communicable diseases.

Along with PCCHU's work with reportable diseases, the Board of Health also partners with other health care providers such as the Peterborough Regional Health Centre and long-term care facilities to prevent and control non-reportable illnesses such as infestations and healthcare acquired infections. Though this work is not reflected in this report it is considered an important and valuable part of public health's role in this community.

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Public Health Ontario. Ontario public health portal. Diseases data for 2011. Available: <https://www.publichealthontario.ca/portal/server.pt/community/home/209>

Appendix A: Reportable Diseases

<p>Acquired Immunodeficiency Syndrome (AIDS)</p> <p>Amebiasis</p> <p>*Anthrax</p> <p>*Botulism</p> <p>*Brucellosis</p> <p>Campylobacter enteritis</p> <p>Chancroid</p> <p>Chickenpox (Varicella)</p> <p>Chlamydia trachomatis infections</p> <p>*Cholera</p> <p><i>Clostridium difficile</i> associated disease (CDAD) outbreaks in public hospitals</p> <p>*Cryptosporidiosis</p> <p>*Cyclosporiasis</p> <p>Cytomegalovirus infection, congenital</p> <p>*Diphtheria</p> <p>*Encephalitis, including:</p> <ol style="list-style-type: none"> 1. *Primary, viral 2. Post-infectious 3. Vaccine-related 4. Subacute sclerosing panencephalitis 5. Unspecified <p>*Food poisoning, all causes</p> <p>*Gastroenteritis, institutional outbreaks</p> <p>*Giardiasis, except asymptomatic cases</p> <p>Gonorrhoea</p> <p>*Haemophilus influenzae b disease, invasive</p> <p>*Hantavirus Pulmonary Syndrome</p>	<p>*Hemorrhagic fevers, including:</p> <ol style="list-style-type: none"> 1. *Ebola virus disease 2. *Marburg virus disease 3. *Other viral causes <p>*Hepatitis, viral</p> <ol style="list-style-type: none"> 1. *Hepatitis A 2. Hepatitis B 3. Hepatitis C 4. Hepatitis D (Delta hepatitis) <p>Herpes, neonatal</p> <p>Influenza</p> <p>*Lassa Fever</p> <p>*Legionellosis</p> <p>Leprosy</p> <p>*Listeriosis</p> <p>Lyme Disease</p> <p>Malaria</p> <p>*Measles</p> <p>*Meningitis, acute</p> <ol style="list-style-type: none"> 1. *Bacterial 2. Viral 3. Other <p>*Meningococcal disease, invasive</p> <p>Mumps</p> <p>Ophthalmia neonatorum</p> <p>*Paratyphoid Fever</p> <p>Pertussis (Whooping Cough)</p> <p>*Plague</p> <p>*Poliomyelitis, acute</p> <p>Psittacosis/Ornithosis</p> <p>*Q Fever</p> <p>*Rabies</p> <p>*Respiratory infection outbreaks in Institutions</p> <p>*Rubella</p> <p>Rubella, congenital syndrome</p> <p>Salmonellosis</p>	<p>*Severe Acute Respiratory Syndrome (SARS)</p> <p>*Shigellosis</p> <p>*Smallpox</p> <p>*Streptococcal infections, Grp A invasive</p> <p>Streptococcal infections, Grp B neonatal</p> <p><i>Streptococcus pneumoniae</i>, invasive</p> <p>Syphilis</p> <p>Tetanus</p> <p>Transmissible Spongiform Encephalopathy, including:</p> <p>Creutzfeldt-Jakob Disease, all types</p> <ol style="list-style-type: none"> ii. Gerstmann-Straüssler- Scheinker Syndrome iii. Fatal Familial Insomnia iv. Kuru <p>Trichinosis</p> <p>Tuberculosis</p> <p>*Tularemia</p> <p>*Typhoid Fever</p> <p>*Verotoxin-producing E. coli Infection indicator conditions including Hemolytic Uremic Syndrome</p> <p>*West Nile Virus illness, including:</p> <ol style="list-style-type: none"> i. West Nile fever ii. West Nile neurological manifestations <p>*Yellow Fever</p> <p>Yersiniosis</p>
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Source: Ontario Ministry of Health, 1996

Diseases marked * (and Influenza in institutions) should be reported **immediately** to the Medical Officer of Health by telephone.