Region of Waterloo Public Health Tuberculosis Program Report 2012

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Executive Summary

Tuberculosis (TB) is a curable infectious disease caused by the tuberculosis bacteria. The disease usually infects the lungs (pulmonary TB) but can also infect other parts of the body such as the kidneys, spine, and brain (non-pulmonary TB)\(^1\). Symptoms of TB disease include a cough that lasts two weeks or more, weight loss, fever, night sweats, and loss of appetite. This is considered to be the active form of the disease. Left untreated, the disease can be fatal.

Latent TB occurs when an individual inhales TB bacteria which lays dormant in their body. The infection is usually non-damaging to the body but may develop into TB disease over time if the body is not able to control the growth of the bacteria. Latent TB infection has no symptoms.

TB affects millions of people worldwide, but is less common in Canada. In Waterloo Region, TB case counts and rates from 2006 to 2011 remained relatively stable with an average rate of 2.8 cases per 100,000. The incidence rate of TB disease from 2006 to 2011 was lower in Waterloo Region than Ontario’s incidence rate. Locally, individuals 20 to 29 had the highest incidence rates of TB compared to other age groups.

As required by the Ontario Public Health Standards, Region of Waterloo Public Health’s Tuberculosis Program provides an array of TB related services to residents of Waterloo Region including clinical and case management services, health promotion to clients and health care providers, and data surveillance and reporting.

This program report contains information about TB and the TB Program at Region of Waterloo Public Health. This includes local data, clinical services offered at 99 Regina Street South, partnerships with various community organizations, data management processes, health promotion programming around World TB Day, and future considerations for the TB Program moving forward.

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\(^1\) The Canadian Lung Association (2012).
1.0 Introduction

The Ontario Public Health Standards (OPHS) establish requirements for all public health programs and services, which include assessment and surveillance, health promotion and policy development, disease and injury prevention and health protection. The Tuberculosis Program at Region of Waterloo Public Health is responsible to the Board of Health for implementing the ten requirements outlined in the Tuberculosis Prevention and Control Standard. In addition, it adheres to the Tuberculosis Prevention and Control Protocol which outlines how the program should conduct its work. The overall goal of both the standard and protocol is to “prevent or reduce the burden of tuberculosis.” The Board of Health expected outcomes as outlined in the TB Standard are listed in Appendix A.

In order to meet the requirements outlined in the Tuberculosis Prevention and Control Standard and Protocol, the Region of Waterloo Public Health’s Tuberculosis Program (herein referred to as Public Health) provides a variety of services to residents and visitors of Waterloo Region. Clinical and case management services include:

- Providing clinics to manage cases of TB disease
- Providing Directly Observed Therapy to appropriate active cases of TB
- Providing clinics for TB skin testing, particularly for high risk clients
- Providing access to TB medication
- Managing contacts of active cases and individuals with latent TB infection

Other services include:

- Conducting surveillance of, and reporting data on, active and latent TB infection
- Engaging in health promotion and policy development activities with community partners, policy-makers, and health care providers that have clients/contacts from priority populations.

This is the first TB program report produced by Public Health. This report includes background information on TB; an overview of Public Health’s TB clinical services; case management activities; health promotion programming; and future considerations for the program.

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3 Directly observed therapy means that the person is observed taking their medication by a trained observer on all business days that treatment is required.
4 Priority populations are populations that are at risk and for whom public health interventions may be reasonably considered to have a substantial impact at the population level. Ontario Public Health Standards (2008). Ministry of Health and Long-Term Care.
2.0 Background

2.1 What is TB?

Tuberculosis is a curable infectious disease caused by the tuberculosis bacteria. TB disease usually infects the lungs (pulmonary TB) but can also infect other parts of the body such as the kidneys, spine, and brain (non-pulmonary TB)\(^5\). Pulmonary TB is contagious and people who are ill with pulmonary TB spread TB bacteria through the air by coughing, sneezing, and talking. Symptoms of TB disease include a cough that lasts two weeks or more, weight loss, fever, night sweats, and loss of appetite.

If healthy people inhale TB bacteria, they may develop inactive TB where the bacteria lay dormant in their body (inactive TB infection or latent TB infection). Latent TB infection is usually non-damaging to the body but may develop into TB disease over time if the body is not able to control the growth of the bacteria. Latent TB infection has no symptoms. People at highest risk of progression from latent to active TB may include recent contacts, the immunocompromised and recent arrivals to Canada.\(^6\)

The Mantoux tuberculin skin test (TST)\(^7\) is used to determine if a person has been infected. If the skin test is positive, a chest x-ray is required to rule out pulmonary TB disease. Persons with TB disease must be treated as the disease may be fatal if left untreated. In addition, treatment will prevent transmission of the disease. Persons with latent TB infection may be assessed for treatment. Treatment for latent TB infection is undertaken to prevent active disease in infected persons with positive skin tests where active diseases has been ruled out. TB treatment is available free of charge from Public Health for both active TB disease and latent TB infection.

2.2 Global/Canadian TB Perspective and Populations at Risk

TB affects more than two billion people worldwide. Ten per cent of these people will become sick with active TB disease at some point in their lives. In 2010, approximately 1.4 million deaths related to TB were reported worldwide\(^8\).

TB is less common in Canada. From 2002-2009, the number of reported cases of TB in Canada remained relatively stable (approximately 1,623 cases per year). From 1999 to 2009, the overall incidence rate decreased from 6 per 100,000 population to 4.7 per 100,000 population\(^9\). In 2009, individuals between the ages of 25 and 34 years made up the largest number of reported cases, accounting for 18 per cent of the total. In the same year, foreign-born individuals accounted for 63 per cent of all reported TB cases in Canada. Canadian-born non-Aboriginal and Canadian-born Aboriginal cases made up 15 per cent and 21 per cent of all reported cases respectively. However, the TB rate in the Canadian-born Aboriginal group continues to be the

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\(^5\) The Canadian Lung Association (2012).


\(^7\) A TB skin test is an injection placed under the skin of the forearm. If the patient has been exposed to TB in the past, they may develop a positive reaction to the skin test which will show up as a raised area at the site of the test. Occasionally a second TB test may be required (The Ontario Lung Association, 2012).


highest of the three groups, being almost six times that of the overall Canadian TB rate of 4.7 per 100,000\textsuperscript{10}.

Other populations at risk include:
- Persons in close contact with an individual infected with pulmonary TB;
- Persons born in or having travelled to a country with a high prevalence of TB;
- Immunosuppressed individuals or individuals with other underlying medical conditions;
- Individuals who received inadequate treatment of a previous TB infection; and
- Priority populations (e.g. homeless, under-housed, persons who use substances).

\textbf{2.3 Incidence of TB in Waterloo Region}

Historically, TB case counts and rates have remained relatively stable in Waterloo Region. Between 2006 and 2011, there were 85 reported cases of active TB disease which is an average rate of 2.8 cases per 100,000. In addition, the incidence rate of TB disease from 2006 to 2011 was lower in Waterloo Region than Ontario’s incidence rate (Figure 1).

Figure 1. Age-standardized active Tuberculosis incidence rates, by year, Waterloo Region and Ontario, 2006-2011.


In 2011, there were 12 confirmed cases of active TB in Waterloo Region. In terms of the epidemiology of the local cases:
- Six were male and six were female
- The average age of the cases at the time of diagnoses was 46.3 years (range of 21.9-73.7 years)
- Ten cases were born outside of Canada. The country of origin of the ten cases not born in Canada were:
  - Asia (six cases)
  - Africa (three cases)
  - Central and South America (one case)

One case demonstrated resistance to one or more TB drugs.

Eleven of the twelve cases completed their treatment regimen. One case is still being treated.

None of the cases were fatal.

The most significant known risk factor for active TB disease was lived in an endemic area. Refer to Table 1 for a full list of risk factors.

Table 1. Known risk factors for active TB cases, Waterloo Region, 2011

<table>
<thead>
<tr>
<th>Risk Factor</th>
<th>Proportion of total risk factors % (n=17)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lived in an endemic area</td>
<td>47%</td>
</tr>
<tr>
<td>Low body weight</td>
<td>12%</td>
</tr>
<tr>
<td>Abnormal chest x-ray (granuloma)</td>
<td>6%</td>
</tr>
<tr>
<td>Diabetes</td>
<td>6%</td>
</tr>
<tr>
<td>Organ/tissue transplant</td>
<td>6%</td>
</tr>
<tr>
<td>Smoker</td>
<td>6%</td>
</tr>
<tr>
<td>Substance use</td>
<td>6%</td>
</tr>
<tr>
<td>Underhoused/homeless</td>
<td>6%</td>
</tr>
<tr>
<td>Workplace</td>
<td>6%</td>
</tr>
</tbody>
</table>

Note: Of the 12 cases, two were missing risk factors; cases may have more than one reported risk factor.


Similar to Canadian data, younger adults made up the largest number of reported TB cases. In Waterloo Region, individuals 20 to 29 had the highest incidence rates of TB compared to other age groups (Figure 2).

Figure 2. Active Tuberculosis incidence rates, by age group and sex, Waterloo Region, 2006-2011.

3.0 Clinical Services

3.1 Active TB Clinic

The model for case management of TB cases in Waterloo Region changed in 1991 from one practitioner to a group of local respirologists who rotated through a clinic hosted by, and supported by nurses from Region of Waterloo Public Health. The clinic continues to operate under this model and there are currently eight respirologists on the roster. The partnership allows for comprehensive TB case management and offers clients coordinated and expert care in the management of their TB disease.

3.1.1 Overview of Active TB Clinical Services Provided

The active TB clinic at Public Health is held bi-monthly on Tuesday mornings from approximately 9:00 a.m. to 1:00 p.m. at 99 Regina St. South in Waterloo. Appointments range in duration depending on the needs of the client and can be from 20 minutes to one hour. On average, five to seven appointments are booked for each clinic. The cost of the appointment itself is covered by one of three sources:

- the Ontario Health Insurance Program (OHIP);
- a private insurance plan such as the University Health Insurance Plan (UHIP) which is typically utilized by international students; or
- TB Uninsured Persons Program (TB-UP) – a program funded by the Ministry of Health and Long-Term Care that covers the cost of diagnostic tests and treatment for TB. TB-UP is available for persons who are not covered by OHIP, the Interim Federal Health Program, or any other private health insurance plan.

Clients at the clinic are seen on a referral basis from local family physicians. Clinic appointments involve a physical assessment, review of medical imaging, assessment of blood work, and other relevant medical information. The respirologist may recommend treatment for active or inactive TB, or order further investigation to rule out TB. Public Health Nurses also meet with all clients on treatment for active or latent TB requiring follow-up to ensure proper case and contact management and to provide the appropriate health education and referrals.

3.1.2 Active TB Clinic Attendance

The number of visits to the active TB clinic remained relatively stable from 2008-2011 (Figure 3). The higher clinic attendance in 2007 was related to the arrival of several large refugee groups new to Waterloo Region.
Figure 3. Annual visits to the Public Health TB clinic, 2007-2011.

Source: Region of Waterloo Public Health Tuberculosis Program data

3.2 TB Skin Testing Clinic

The TB skin testing clinic at Public Health is held every Tuesday by appointment only. The clinic offers both daytime and evening clinic appointments. Unless required for medical investigation or treatment purposes, the fee for a TB skin test at Public Health is $12.00.

A TB skin test identifies persons infected by the TB bacteria requiring further assessment to rule out active TB disease. One step and two step tests are offered. A one step test uses a single TB skin test to determine a diagnosis. Two step tests involve the administration of two tests, one to four weeks apart, to rule out a false negative test. Two step tests are recommended for persons who:

- Require subsequent (serial) testing (e.g. health care workers);
- Are residents or staff of a long-term care facility;
- Are from countries with a high prevalence of TB; or
- Are undergoing medical investigation.

3.2.1 TB Skin Test Clinic Attendance

The number of visits to the TB skin testing clinic increased between 2007 and 2011 (Refer to Figure 4). This increase is partially due to an expansion in TB skin testing clinic hours implemented as part of the 2010 Infectious Diseases, Dental and Sexual Health Division reorganization (September 2010 implementation date). The reorganization introduced evening appointments to increase and improve client access to clinical services.

Figure 4. Number of visits to the TB skin testing clinic by year, 2007-2011

Source: Region of Waterloo Public Health Tuberculosis Program data
3.2.2 Partnership with Local University

In 2002, Public Health assisted the University of Waterloo in the development of a TB screening program. The purpose of this program was to:

- Identify undiagnosed active cases of pulmonary TB in order to ensure adequate treatment and prevent transmission to other individuals; and to
- Identify persons with latent TB infection at high risk of developing active TB in order to provide treatment.

Public Health’s role was to provide education, consultation, and guidance on how to set up the screening program. The program is for newly admitted students who have been living and/or pursuing their education outside of Canada and require a TB skin test before undertaking their studies. Currently, the University of Waterloo functions independently and Public Health provides education, training, and consultation as required.

From 2002 to 2010, the number of TB skin tests completed at the University of Waterloo increased from 335 tests in 2002 to 1,636 tests in 2010. The proportion of positive skin test results, however, remained relatively stable during that time period.

3.2.3 Partnership and Referrals from Local Health Care Providers

Health care providers provide TB skin tests to their patients and are required to report positive skin tests to Public Health. Healthcare providers may also refer their patients to Public Health’s active TB clinic to be further assessed for latent or active infection. Additionally, Public Health is available to local health care providers for consultation around patient specific concerns.

3.3 Clinical Services for Priority Populations

Public Health also provides clinical services to priority populations in partnership with Reception House Waterloo Region, a temporary home for government-assisted refugees. Approximately 280 newly-arrived refugees and about 100 secondary migrants are served each year\(^\text{11}\).

Most clients of Reception House come from countries with a high incidence of TB, and areas with compromised living conditions (e.g. refugee camps). Public Health partners with Reception House to provide onsite skin testing to their clients. This process facilitates client convenience and timely referrals for further assessment if needed. Reception House staff also provide translation, caseworkers and other supports which make it conducive to serving these new residents onsite rather than Public Health’s clinics.

From 2008 to 2011, 544 TB skin tests were conducted by Public Health nurses at Reception House (Refer to Table 2).

\(^{11}\) Reception House Waterloo Region (2012).
4.0 Case and Contact Management

The Ministry of Health and Long-Term Care (MOHLTC) outlines the basic principles of care for persons with or suspected of having TB. These principles include:

- A diagnosis is established promptly and accurately;
- Standardized treatment regimens of proven efficacy are used with appropriate treatment support and supervision;
- The response to treatment is monitored; and
- The essential public health responsibilities are carried out.

Public Health plays an integral role in the management of TB cases. TB cases are received via physician referral, the Canadian Immigration Canada (CIC) medical surveillance program, or Public Health’s TB skin test clinic. Public Health assumes responsibility for monitoring TB cases and ensuring appropriate follow-up as outlined by the Ministry of Health and Long-Term Care.

4.1 Active Case Management

According to the Tuberculosis Prevention and Control Protocol, responsibilities for active case management (TB disease) include, but are not limited to:

- Ensuring an initial investigation commences within 24 hours of receiving the case report;
- Conducting a contact investigation to identify the source case and possible transmission;
- Educating the patient and family about the disease process, communicability of TB, treatment protocol and public health supervision;
- Recognizing those individuals who may not adhere to medication guidelines (e.g. children, homeless, those with bias against treatment) and placing them on Directly Observed Therapy (DOT);
- Fulfilling the minimum requirements for ongoing follow-up;
- Discharging patients once the prescribed treatment has been completed; and
- Reporting all information to the Ministry of Health and Long-Term Care through the Integrated Public Health Information System\(^\text{12}\) (iPHIS).

Refer to Section 2.3 for local data on the number of active TB cases managed each year.

\(^\text{12}\) iPHIS is an information system for public health reporting and surveillance in Ontario, under the Health Protection and Promotion Act (HPPA). iPHIS is used by front-line public health professionals in Ontario for case and contact follow-up and outbreak management of reportable diseases (MOHLTC, 2012).
4.2 Latent TB Infection Case Management

Latent TB infection is not infectious; however, individuals are at increased risk of developing active TB disease. According to the MOHLTC’s Tuberculosis Prevention and Control Guidance Document, management of latent TB infection cases should include:

- Documenting and reporting the case in iPHIS;
- Ensuring the patient is not infectious;
- Conducting a contact investigation for the possible source case;
- Advising the patient about the side effects of TB medication;
- Assessing the patient’s ability to comply with medication and medical follow-up;
- Assessing the need for Directly Observed Therapy (DOT);
- Connecting with the patient at one month and every two months thereafter until treatment completion; and
- Connecting with the treating physician as required and discharging the patient from iPHIS as appropriate.

Public Health will actively report (yearly) on confirmed latent TB infections in its annual report on infectious diseases starting in 2014 (for infections in the 2013 calendar year).

4.3 Immigration & Medical Surveillance

The purpose of medical surveillance is to identify TB disease and TB infection among new immigrants to Canada in order to prevent the spread of TB in the community. Newcomers are screened for TB using a chest x-ray. Individuals with an abnormal chest x-ray are provided with appropriate medical follow-up and offered TB treatment if required. This information is documented through online reporting with the Ministry of Health and Long-Term Care and forwarded onto Citizenship and Immigration Canada.

Public Health initiates and continues medical surveillance for a period up to two years or until the person has been discharged (active TB in recent arrivals to Canada often develops within the first two to five years of their immigration). When Public Health receives a referral the responsibilities of the health unit include:

- Contacting the person by letter, telephone, or in person;
- Advising the person of the signs and symptoms of active disease, requirements of medical surveillance, instructions on how to obtain Ontario Health Insurance Plan (OHIP) coverage, and the need to inform Public Health of an address change; and
- Ensuring all the appropriate medical information is included on the medical assessment form.

From 2007 to 2011, an average of 104 individuals per year were referred to Region of Waterloo Public Health for medical surveillance (Refer to Table 3).
Table 3. Number of individuals referred to Public Health for TB medical surveillance, 2007-2011.

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of Skin Tests Performed</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>121</td>
</tr>
<tr>
<td>2008</td>
<td>105</td>
</tr>
<tr>
<td>2009</td>
<td>86</td>
</tr>
<tr>
<td>2010</td>
<td>123</td>
</tr>
<tr>
<td>2011</td>
<td>87</td>
</tr>
<tr>
<td>Average per year</td>
<td>104</td>
</tr>
</tbody>
</table>

Source: Region of Waterloo Public Health Tuberculosis Program data

5.0 Health Promotion

5.1 Annual World TB Day

World TB Day, falling on March 24th each year, is a global initiative aimed at increasing awareness of TB disease. This world-wide initiative is steered by the Stop TB Partnership (www.stoptb.org). Each year, Public Health receives $2,000 from the Ministry of Health and Long-Term Care in funding to carry out local World TB Day activities.

Public Health contributes to World TB Day differently each year. In 2012, Public Health mailed over 300 World TB Day packages to physicians in Waterloo Region. The physicians’ package was comprised of:

- Primary care provider letter (local TB rates, screening recommendations, TB medication information, TB clinic role, instructions on how to report cases of TB, website and online resources)
- New TB skin test Quick Guide (a resource developed by Public Health for primary care providers)
- TB ruler for measuring/reading skin test results

In 2011, Public Health provided local physicians and pharmacists with TB information packages.
6.0 Future Considerations

6.1 Population Growth

The immigrant population in Waterloo Region continues to grow. The region has the seventh highest per capita immigrant population of all urban areas in Canada\textsuperscript{13} and Statistics Canada reported that immigrants comprised 22 per cent of the Waterloo Region population in 2006, up from 21 per cent in 2001\textsuperscript{14}. Statistics Canada predicts that in 2031, the immigrant population is expected to increase to be between 26.6 and 32.2 per cent of the total population in Waterloo Region. The majority of newcomers will come from TB endemic countries. Future immigrant population projections for Waterloo Region and how this will impact our local TB case management will continue to be monitored.

6.2 Maintaining quality TB programs and services

Public Health will continue to update health practitioners with information on local TB patterns and incidence rates. Assisting primary care practitioners to understand their essential role in educating and assessing the need for treatment of their patients with latent TB infection will continue to be an important focus of the TB program activities. The primary means of educating health practitioners will be through physician updates and World TB Day activities.

\textsuperscript{13} \url{http://chd.region.waterloo.on.ca/en/researchResourcesPublications/resources/Number_Immigrants.pdf}

Appendix A

Tuberculosis Prevention and Control Standard Board of Health Outcomes

- The board of health achieves timely and effective detection and identification of TB trends, emerging risks, and associated risk factors.
- The board of health is aware of and uses epidemiology to influence the development of healthy public policy and its programs and services to prevent and reduce the burden of TB.
- The board of health has effective partnerships with committees, advisory bodies, networks, and community organizations to address the prevention and control of TB.
- Public health risks associated with active TB are mitigated.
- Individuals with infectious TB are isolated.
- Individuals with active TB (cases) receive the appropriate medication.
- Individuals with active TB or LTBI are identified.
- Individuals with LTBI are offered appropriate treatment.