TORONTO

REPORT FOR ACTION

Hepatitis B and C in Toronto: Preventing chronic viral hepatitis infections and complications

Date: May 29, 2017
To: Board of Health
From: Medical Officer of Health
Wards: All

SUMMARY

Hepatitis B and C infections are reportable to the Medical Officer of Health under the Health Protection and Promotion Act. Hepatitis B and C viruses infect the liver. Untreated, chronic hepatitis B and C infections can lead to cirrhosis and liver cancer. Hepatitis B and C are the 5th and 1st most burdensome infections in Ontario, respectively (1). Specifically, hepatitis B is responsible for approximately 350 deaths and 7,000 years-of-life-lost each year in Ontario through liver cancer and cirrhosis, and hepatitis C is estimated to cause approximately 400 deaths annually (1).

Hepatitis B is transmitted through blood and other infected body fluids such as through sexual contact, unsafe injection practices, perinatal transmission (from mom to baby), as well as through household contact with a chronic hepatitis B carrier (2). Risk factors for hepatitis B infection include being born in an endemic area, having multiple sex partners and exposure to unsafe injection practices. Hepatitis C is also a blood-borne infection. Risk factors for hepatitis C in Canada include current or former injection drug use, receiving a blood transfusion prior to 1992, being born in a country with a high prevalence of chronic hepatitis C, or exposure to inadequate infection control practices when receiving medical care or invasive personal services (2).

Chronic hepatitis B and C infections are defined as the failure to clear the virus after six months. The probability of developing chronic hepatitis B is higher among younger individuals: it is up to 90% in infants <1 year of age, (3;4). Unlike hepatitis B, which is much more likely to become chronic in infants, hepatitis C progresses to a chronic infection in approximately 75% of all patients infected (5).

In Toronto, there is a disproportionate burden of liver cancer compared to the rest of Ontario likely because we have higher numbers of at-risk populations for chronic hepatitis B and hepatitis C infections and some of these populations may be marginalized from mainstream health care services.

There are many opportunities currently available to help reduce this important disease burden. For hepatitis C, the recent development of highly effective medications for treatment and the negotiation of drug prices with the pan-Canadian Pharmaceutical Alliance have opened a window for policy decisions on whom to treat as well as the need to (re)evaluate the evidence for and against population screening for chronic HCV infection (6;7).

For hepatitis B, an up-front investment in immunization of infants and high-risk populations of all ages against hepatitis B is an equitable strategy to reduce the overall burden of chronic hepatitis B and its complications. Improved diagnosis and better linkage to specialized care after diagnosis are strategies to decrease complications associated with both chronic hepatitis B and C infections.

RECOMMENDATIONS

The Medical Officer of Health recommends that:

1. The Board of Health request that the Ministry of Health and Long-Term Care continue to expand access to publicly-funded treatment for chronic viral hepatitis.

2. The Board of Health request that the Government of Canada work with the provinces and research funding institutes to prioritize funding for research needed to inform the public health response to chronic viral hepatitis.

3. The Board of Health request that the Government of Canada work with the provinces to develop and articulate goals and indicators as part of a coordinated viral hepatitis strategy.

4. The Board of Health request that the Ministry of Health and Long-Term Care, the Local Health Integration Networks, and the Ontario Medical Association, explore strategies to enable hepatitis B and C screening as per the Canadian Collaboration for Immigrant and Refugee Health's guidelines;

5. The Board of Health request that the Local Health Integration Networks in Toronto, in partnership with the Ministry of Health and Long-Term Care, develop and pilot-test care referral pathways linking persons chronically-infected with hepatitis B and C with appropriate specialized care;

6. The Board of Health request that the Ministry of Health and Long-Term Care update the Ontario immunization schedule to:
    a. change the timing of the publicly-funded hepatitis B immunization program from grade 7 to infancy, and
    b. expand the eligibility criteria for the high-risk hepatitis B immunization program to include all recommended doses and all high-risk populations, regardless of age;

7. The Board of Health forward this report to the Minister of Health and Long-Term Care, the five Local Health Integration Networks in Toronto, Public Health Ontario, Cancer Care Ontario, the Ontario Medical Association, the Chief Medical Officer of Health, the Ontario Public Health Association, the Association of Local Public Health Agencies, the federal Minister of Health, the Public Health Agency of Canada, the Canadian Liver Foundation, and the Canadian College of Family Physicians.

FINANCIAL IMPACT

There are no financial implications arising from this report.

DECISION HISTORY

At the July 4, 2016 meeting, the Board of Health received a report from the Medical Officer of Health titled Implementing Supervised Injection Services in Toronto; this report stated that 'the main goals of these health services are to reduce the spread of infectious diseases such as HIV and hepatitis.'
http://www.toronto.ca/legdocs/mmis/2016/hl/bgrd/backgroundfile-94548.pdf

COMMENTS

Chronic hepatitis B in Toronto

In Toronto, approximately 936 to1,440 new cases of chronic hepatitis B were reported to public health each year from 2009 to 2014 (see Figure 1). Cases of chronic hepatitis B are declining most likely due to vaccination programs. Among newly reported cases of chronic hepatitis B, there were slightly more males than females. Persons with chronic hepatitis B were more likely to reside in neighbourhoods with a higher proportion of foreign-born persons (see Figure 2). These findings are in line with what is known about the epidemiology of hepatitis B in Canada, where chronic hepatitis B primarily affects persons born in countries where chronic hepatitis B is common (8-10), including China, the Philippines, other areas of South East Asia, the Middle East, and Africa (11).

Chronic hepatitis C in Toronto

In Toronto, approximately 512 to 671 new cases of chronic hepatitis C were reported to public health each year from 2011 to 2014 (see Figure 3). Among these newly reported cases of chronic hepatitis C, there were approximately twice as many males than females. It is estimated that approximately 60% of chronic hepatitis C cases in Canada are among current or former injection drug users, 20% are among persons born in countries where chronic hepatitis C is common, and 11% received contaminated blood products prior to 1992 (12) (see Figure 4).

Complications from chronic hepatitis B and C in Toronto

In Toronto, the incidence of liver cancer has increased by about 2.5 times since the mid-1980s. Similarly, in Canada, the incidence of liver cancer has increased threefold since the early 1980s (13). (Figure 5) This increase in the incidence of primary liver cancer in Canada is thought to be attributable to chronic hepatitis B and C infections. The increase in chronic viral hepatitis is at least partly due to a higher proportion of residents born in countries where hepatitis B, and to a lesser extent hepatitis C, are more common (14). Similarly, rates of liver cancer in Toronto, Peel, and York are higher than in other health units; these jurisdictions have a higher proportion of residents born in countries where hepatitis B and C are common (15).

Strategies to prevent Hepatitis B and C infections and related Complications

Knowing the burden of chronic viral hepatitis in Toronto, there are several strategies that could be put in place to prevent the downstream complications associated with these infections. This report outlines strategies to:

1. Prevent transmission
2. Reduce the risk of complications through timely diagnosis and referral to care
3. Increase access to treatment, and
4. Inform and improve our public health response.

1. Preventing transmission of hepatitis B and C

Toronto Public Health (TPH) runs a number of programs to prevent the transmission of hepatitis B and C. Public health case and contact management includes working with primary care providers to investigate new cases of hepatitis B and C to identify potential sources of infection and counselling infected individuals on how to not spread the virus to others. TPH ensures adequate infection prevention and control practices in personal service settings (such as tattoo parlours) through an inspection program and harm reduction programs such as the needle exchange programs (i.e. The Works) and the planned supervised injection services. Additional programs to prevent the transmission of hepatitis B and C include sexual health education and promotion.

Preventing hepatitis B transmission through immunization

Hepatitis B specifically is a vaccine preventable disease. Ontario has had a universal grade 7 hepatitis B immunization program since 1994. Completing the recommended vaccine series provides a very high level of protection against infection. In addition, Ontario provides publicly funded vaccine to certain high-risk groups such as men who have sex with men, household contacts of hepatitis B carriers and children who have emigrated from areas of the world where hepatitis B is more common.

However, there are opportunities to strengthen Ontario's immunization program. Babies infected with hepatitis B in infancy are much more likely to develop a chronic infection than those infected later in life (16). Providing immunization in grade 7 instead of in infancy misses this critical period when the acquisition of hepatitis B can be the most harmful (8;17). Since 2009, the World Health Organization has recommended that hepatitis B immunization be started as soon as possible after birth, even in countries

where hepatitis B is uncommon (18). In a recent update, the National Advisory Committee on Immunization (NACI) found that infants who receive a full series of hepatitis B immunizations do not need booster doses later in life (19).

The National Advisory Committee on Immunization (NACI) also provides a list of high-risk populations who should be offered immunization against hepatitis B (19); some of these high-risk populations, including adults born in countries where chronic hepatitis B is common, are not currently eligible for publicly-funded immunization against hepatitis B in Ontario. In addition, only the 2nd and 3rd doses of hepatitis B vaccine are listed as publically funded for certain high risk groups such as patients on renal dialysis. Dialysis units have been associated with outbreaks of hepatitis B, including in Toronto, so this represents an important gap. All doses of Hepatitis B vaccine should be publicly funded for all high-risk groups identified by NACI.

2. Timely Diagnosis and Referral to Care

For those individuals infected with either hepatitis B or C, early diagnosis of the infection and timely access to medical care and treatment can prevent or reduce the risk of developing complications.

Diagnosing chronic hepatitis B and C infections
Chronic hepatitis B and C infections are typically asymptomatic for decades and may be diagnosed late unless at-risk individuals are tested for the infection (11). Approximately half of all Canadians with chronic hepatitis B and 44% of those with chronic hepatitis C (2;20) are unaware of their infection. In Canada, the median age at diagnosis for acute hepatitis C (25-29 years) is about 20 years younger than the median age at diagnosis for chronic hepatitis C (45-49 years); this suggests a delay in the diagnosis of chronic hepatitis C (11). Identifying infected individuals may be important for counselling about preventing transmission, monitoring disease progression, and offering treatment to prevent end-stage liver disease and hepatocellular carcinoma (8). In 2013, the US Preventive Services Task Force (USPSTF) recommended one-time hepatitis C screening for all Americans born between 1945-1965 (6). The Canadian Task Force for Preventive Health Care (CTFPHC) recently recommended against population based screening of the general Canadian population (7). An important barrier to implementing screening in Canada was the lack of access to publicly funded treatment (21).

Despite the lack of a population based screening recommendation, it is important to note that some of the populations at risk for these infections belong to marginalized groups. It is important that health care providers have the appropriate knowledge and tools to ensure that at-risk populations are tested as per testing guidelines for these infections. The Canadian Collaboration for Immigrant and Refugee Health's (CCIRH) guidelines recommend one-time screening for hepatitis B and C for all new immigrants and refugees from countries where hepatitis B and C are common (22). This is particularly important considering Toronto is home to many of these populations. It is therefore important that different health care agencies in Ontario work together to ensure that at-risk populations are tested appropriately considering the levels of underdiagnoses for these infections.

Ensuring timely referral to specialized medical care
Primary care providers play a key role in the early diagnosis and management of hepatitis B and C (11). However, a survey of family medicine trainees revealed poor knowledge of how to manage chronic hepatitis, including the interpretation of serological tests for hepatitis B, inappropriate referrals, and failure to recognize cirrhosis (23). Liver specialists frequently report that patients who present with late-stage disease have had their disease diagnosed many years previously, but were told that their slightly elevated blood result was “nothing to worry about” (11). Better linkage of chronic hepatitis B and C patients with specialized care was identified as a priority in the Ontario Hepatitis C Task Force's "Proposed Strategy to Address Hepatitis C in Ontario 2009 – 2014" (24). However, gaps remain in ensuring appropriate and timely care for these patients. A pilot project in New York City found that patient navigators working with a multidisciplinary care team improved the odds that patients would start and complete hepatitis C treatment (25). The "Patients First" plan from the Ministry of Health and Long-Term Care (MOHLTC) may present an opportunity for the Local Health Integration Networks in Toronto to help organize pilot projects that examine referral care pathways for patients to ensure linkage to care for those with chronic hepatitis B and C infection (26).

3. Strategies to improve access to treatment

Treating chronic hepatitis B and C infections to prevent complications
The treatment of chronic hepatitis B and C can help reduce liver fibrosis (scarring) and cirrhosis, and is expected to reduce the risk of developing liver cancer (11). Hepatitis B treatment usually suppresses, but does not eradicate, the virus. However, suppression of the virus and reduction of inflammation can stop further liver damage (11). Patients with chronic hepatitis B require prolonged or continuous treatment with oral anti-viral medications to control the hepatitis B virus (8). In contrast, treatment of hepatitis C with newer direct-acting antiviral medications can suppress the hepatitis C virus for prolonged periods of time. Hepatitis C can now be technically cured in many patients with chronic infection (11).

Treatment for chronic hepatitis B is typically lifelong; its cost ranges from $7,000 to $9,000 per person per year (11). About two-thirds of Canadians require public assistance to pay for hepatitis B treatment; this typically limits therapeutic choices to the least expensive drugs which, unfortunately, may also be the least potent and the most likely to lead to drug resistance (11;27). The major barrier to early treatment for hepatitis B is the provincial limitation on reimbursement (27): in Ontario, publicly-funded treatment for hepatitis B is only available for persons aged over 40 years with severe fibrosis (stages F3 or cirrhosis).

Restrictions on publicly-funded treatment for chronic hepatitis B and C may have been put in place because of the high costs of treatment. However, current eligibility criteria for publicly-funded treatment may also lead to inequity, because most private insurers continue to reimburse all hepatitis B and C treatments, regardless of age and liver fibrosis staging (11). Efforts to lower the cost of direct-acting antivirals used to treat chronic hepatitis B and C infection involve advocating for a national bulk purchasing strategy for pharmaceuticals (28). The recent 2017 agreement with the pan-Canadian Pharmaceutical Alliance (pCPA) to charge the provinces lower prices for hepatitis C

medications could allow Ontario to review its current restrictions on access to hepatitis C medication to make treatment accessible to more patients.

4. Strategies to inform the public health response to chronic viral hepatitis

Research Needs
Funding awarded by federal agencies for research on viral hepatitis is currently not proportionate to the burden of disease when compared with other similar infectious diseases (11). Some research priorities for hepatitis C specifically include understanding the effectiveness of treatment to reduce the complications of hepatitis C to help guide decision-making on access to medication. Further, a better understanding of how early treatment impacts the transmission of hepatitis C in communities such as among people who inject drugs, can help public health develop and advocate for effective interventions. Research is needed to understand and improve the under-diagnosis of viral hepatitis and optimal testing strategies. Furthermore, hepatitis B therapies haven't advanced at the same pace of hepatitis C therapies and research may help in this area.

Articulating Goals and Indicators as part of a Federal viral hepatitis strategy
In 2016, the World Health Organization published the first global health sector strategy on viral hepatitis. The strategy recommends key directions to eliminate viral hepatitis as a public health threat by 2030 (WHO 2016). It also recommends that individual countries have local plans to ensure they have efficient, coordinated responses. While Canada has an integrated strategy on sexually transmitted infections and blood-borne infections (including viral hepatitis), it would be helpful to have clearly articulated Provincial or federal goals and indicators to ensure we consistently monitor and publicly report our efforts on expanding prevention, diagnosis and appropriate treatment for all populations at risk. This will allow us to ensure an effective public health response is maintained.

Summary

These recommendations, while not exhaustive, are initiatives that could be implemented in Toronto to improve chronic viral hepatitis prevention and control. This report recommends an up-front investment in immunization of infants and high-risk populations of all ages against hepatitis B as an equitable strategy to reduce the overall burden of chronic hepatitis B and its complications. Similarly, timely diagnosis and better linkage to specialized care after diagnosis are strategies to decrease complications associated with chronic hepatitis B and C. Access to treatment is critical for both hepatitis B and C. Further research is needed to inform the public health response to chronic hepatitis, as well as a clear articulation of local goals and indicators to help monitor our progress on chronic viral hepatitis prevention and control.

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ATTACHMENTS

Figure 1. Number and rates of newly reported chronic hepatitis B infections by year; Toronto, 2009 – 2014.

Figure 2. Newly reported cases of chronic hepatitis B infections* by neighbourhood; Toronto, 2011 – 2014.

Figure 3. Number and rates of newly reported chronic hepatitis C infections* by year; Toronto, 2011 – 2014.

Figure 4. Newly reported cases of chronic hepatitis C infections by neighbourhood; Toronto, 2011-2014.

Figure 5: Predicted Age Standardized Incidence Rates of Liver Cancer by Region

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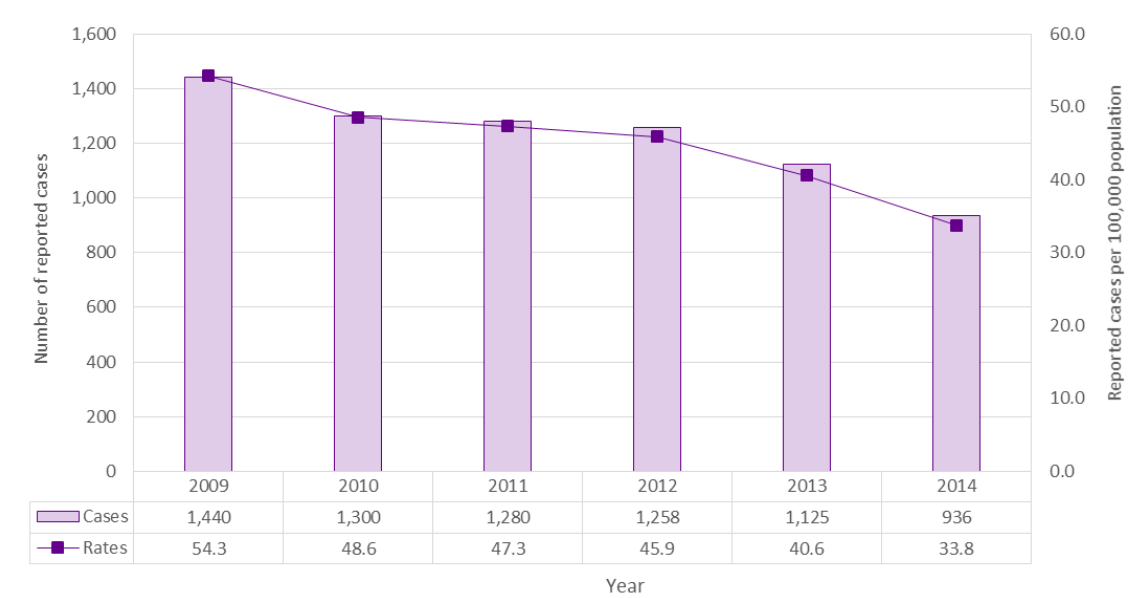
Figure 1. Number and rates of newly reported chronic hepatitis B infections by year; Toronto, 2009 – 2014.



Source: Ontario Ministry of Health and Long-Term Care, integrated Public Health Information System (iPHIS), extracted August 30, 2016.
*The chronic hepatitis B infections definition is summarized in the Infectious Disease Protocol of the Ontario Public Health Standards. Please refer to technical notes for details.

Figure 2. Newly reported cases of chronic hepatitis B infections* by neighbourhood; Toronto, 2011 – 2014.

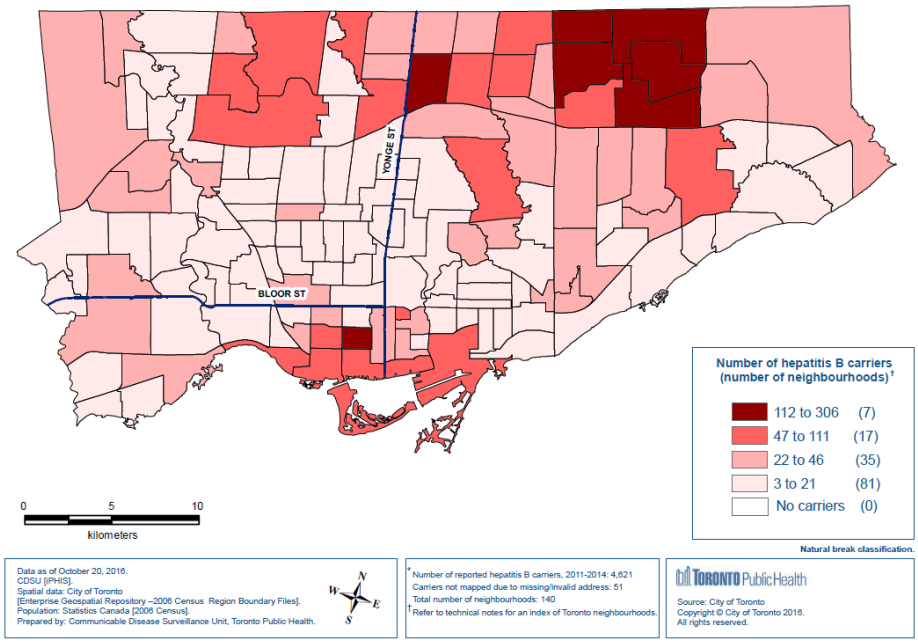
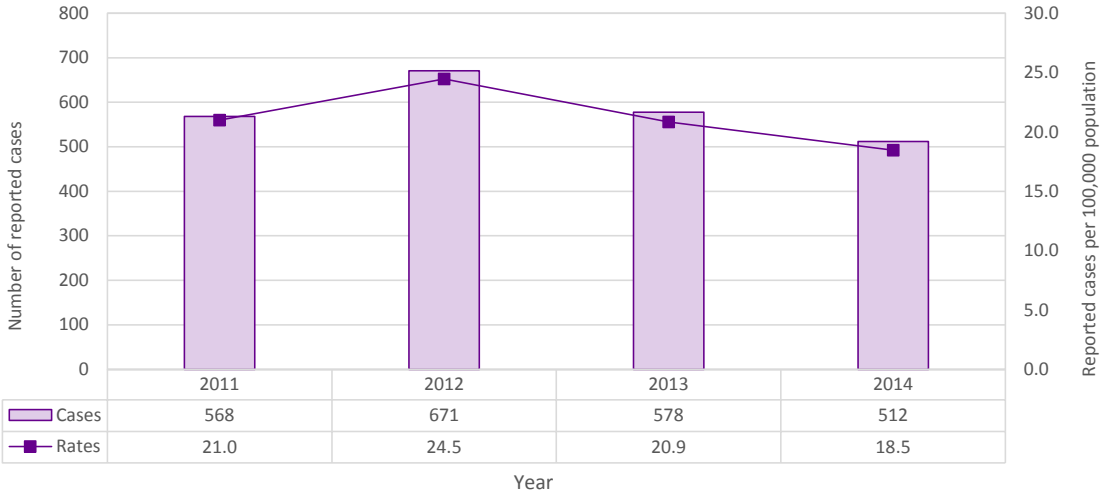


Figure 3. Number and rates of newly reported chronic hepatitis C infections* by year; Toronto, 2011 – 2014.



Source: Public Health Ontario Laboratory Data, received September 2016.

*A chronic hepatitis C infection is defined as a Toronto resident with detectable levels of HCV RNA in two specimens collected and tested at at least six months apart. Please refer to technical notes for details.

Figure 4. Newly reported cases of chronic hepatitis C infections by neighbourhood; Toronto, 2011-2014.

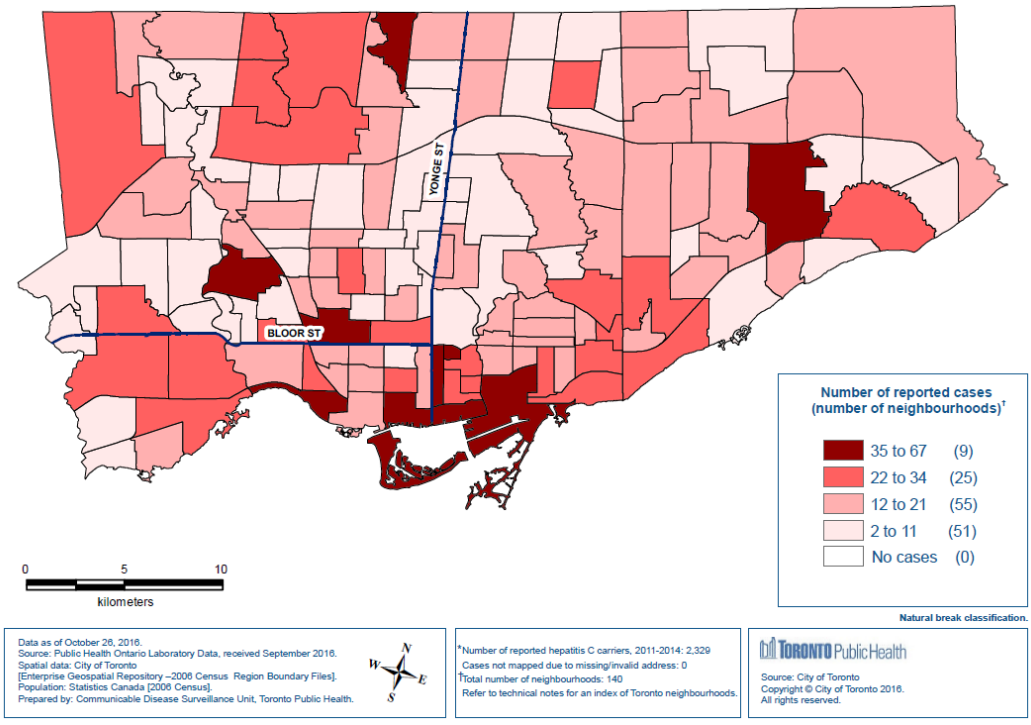


Figure 5: Predicted Age Standardized Incidence Rates of Liver Cancer by Region

Source: Public Health Agency of Canada (Spring 2015 Cancer incidence in Canada: trends and projections (1983–2032), accessed May 12, 2017)