Alcohol Use, Health and Impaired Driving in Oxford County

Population Health Assessment
Southwestern Public Health
June 2018

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Acknowledgements

I would like to thank Laura Gibbs, Mary Van Den Neucker and Carolyn Richards for their feedback during the review process. I would like to thank Shelly Delanghe, GIS Analyst at Oxford County for providing mapping support. I would also like to thank Adam Sherk, Canada Graduate Scholar/Research Associate at the Canadian Institute for Substance Use Research, University of Victoria for assistance with using and interpreting the International Model of Alcohol Harms and Policies (InterMAHP) tool.

The COMPASS study is supported by the Canadian Institutes of Health Research (OOP-110788; grant awarded to S. Leatherdale: MOP-114875; grant awarded to S. Leatherdale: PJT – 149092; grant awarded to S. Leatherdale: and PJT - 148562; grant awarded to S. Leatherdale) and by Health Canada (1617-HQ-000012; contract awarded to S. Leatherdale).

How to cite this document:
MacLeod M, Deroo J. Alcohol use, health and impaired driving in Oxford County. Woodstock, ON: Southwestern Public Health; 2018.

Contents

Summary

Alcohol contributes to over 200 diseases and injuries, including cancers, hypertension, heart disease, stroke, diabetes, lower respiratory tract infections and HIV.[1] Previous research showing health benefits from moderate alcohol consumption has been found to overestimate health benefits while underestimating health risks.[2,3] Some key findings from this population health assessment focusing on alcohol use, health and impaired driving are:

- From 2015-2016, 21.8% of Oxford County residents aged 19 years and older exceeded the low-risk alcohol drinking guideline (LRADG) aimed at reducing long-term risks of chronic diseases and 47.7% exceeded the guideline aimed at reducing short-term risks. Oxford County residents aged 19 to 44 years were more likely to exceed the second guideline than Ontario residents of the same age (70.9% versus 57.1%).

- From 2015-2016, 37.2% of Oxford County residents consumed alcohol when they were underage (i.e., 12 to 18 years old). Over three-quarters (77.1%) of grade 9-12 students in southwestern Ontario reported that it was very easy or easy to get alcohol.[4]

- From 2008-2012, on average 44 deaths per year were attributable to alcohol among Oxford County residents aged 15 years and older. Most of these deaths were from cardiovascular conditions and cancers. From 2012-2016, on average 2,202 hospitalizations per year were attributable to alcohol. Many of these hospitalizations were from unintentional injuries.

- Males 12 years and older in most Oxford County municipalities were more likely to consume alcohol that exceeds cancer prevention guidelines than their Ontario counterparts. Consumption was particularly high among males in Woodstock, Zorra and East Zorra-Tavistock.

- From 2013-2014, 3.6% of licensed drivers in Oxford County reported that they drove a motor vehicle within one hour of consuming two or more drinks. Over three times as many residents 12 years and older (11.2%) reported that they were a passenger in a vehicle with a driver who had been drinking.

Alcohol Use, Health and Impaired Driving in Oxford County

Background

In Canada, drinking alcohol is a personal choice and a social norm for many people. It is often associated with celebrations or events such as weddings, sports games and festivals and promoted as a way to relax.[5] The popularity of alcohol is evident by the profitability of the alcohol industry. From 2016-2017, Ontarians spent $8,237,342 on alcoholic beverages such as spirits, wines, beers and ciders purchased from liquor authorities and other retail outlets.[6] The majority of this spending was on beer and wine. In total, Ontarians purchased over one million litres of alcohol.[6] From these sales, the Ontario liquor authorities had a net profit of $2 billion.[7]

There are many personal factors that affect patterns of alcohol use, such as age, income, education, employment and stressful life events.[5] These patterns (e.g., amount and frequency of alcohol use) affect how alcohol impacts health, in addition to other factors such as an individual's sex, genetics, metabolism, use of medications, underlying health conditions and use of other substances.[1,5] These factors interact in complex ways to affect health. For example, the Canadian Institute for Health Information (CIHI) found that although fewer Canadians with the lowest incomes were heavy drinkers, they were more than twice as likely to be hospitalized for health conditions caused entirely by alcohol.[8]

Despite the belief that alcohol can have protective effects against some health conditions, more recent research has demonstrated that the benefits of alcohol consumption are overestimated, and the health risks are underestimated.[2,3] Many of the benefits reported in these studies were the result of comparing moderate drinkers to non-drinkers, which included former drinkers who abstain from alcohol.[3] It has been shown that many people who abstain from drinking alcohol do so because they have experienced negative health outcomes.[3] Therefore, moderate drinkers' health would look better in comparison to abstainers, leading to overestimated health benefits.

The types of health conditions caused by alcohol consumption are wide ranging. Generally, alcohol has been found to contribute to over 200 diseases and injuries, including neuropsychiatric conditions, gastrointenstinal diseases, cancers, cardiovascular diseases, endocrine conditions and infectious diseases.[1] Despite these proven health risks, many people are unaware of how drinking could harm their health. The low level of knowledge about the health risks of alcohol is not surprising given the influence that the alcohol industry wields. For example, this past December, the Yukon Government was forced to stop a project funded by Health Canada to put warning labels on alcohol bottles, including those warning the public about the link between cancer and alcohol use.[9] The project was halted due to threat of legal action from the alcohol industry. Unfortunately, the Yukon Government did not feel they could financially sustain a legal battle despite the fact that they had full authority to label the bottles; as a result, they suspended the project.[10]

The low-risk alcohol drinking guidelines (LRADGs) were created to increase awareness of the health risks of alcohol use and influence health behaviour. However, it is important to note that despite lowering risk, the LRADGs do not mean that alcohol use is harmless.[11] Specifically, the five LRADGs are:

1. Reduce long-term health risks by planning non-drinking days every week and drinking no more than 10 drinks a week for women (no more than 2 drinks a day on most days) and no more than 15 drinks a week for men (no more than 3 drinks a day on most days).
2. Reduce short-term health risks by drinking no more than three drinks (women) or four drinks (men) on any single occasion.
3. Do not drink under certain circumstances, including when driving a vehicle, using machinery or tools, taking medication or drugs that interact with alcohol, living with mental or physical health issues, doing dangerous physical activity, caring for the safety of others and when making important decisions.
4. Do not drink while pregnant, planning to become pregnant or before breastfeeding.
5. Delay drinking until the late teens for children and youth.

In addition to the LRADGs, several federal and provincial policies have been shown to effectively reduce harm through decreasing alcohol consumption and risky drinking behaviours.[8] These policies include minimum pricing and taxes on alcohol, restrictions on alcohol sales (i.e., through restrictions on hours, days, locations, events, an individual's level of intoxication and legal minimum age), legal blood alcohol concentration (BAC) when driving a motor vehicle and

regulations on alcohol advertising.[1] Additional local municipal alcohol policies exist and are currently publicly available for all Oxford County municipalities except East Zorra-Tavistock.[12] Please see Appendix A for more information about alcohol policies. These population-based approaches are often used in combination with individual-level strategies such as screening for problematic alcohol consumption, brief intervention and referral (i.e., coordinating early intervention and treatment for individuals at risk) to provide a comprehensive approach to reducing alcohol-related harms.[8]

However, recent changes to provincial policies, in particular around the location of alcohol sales, may impact their effectiveness. Access to alcohol, which is associated with increased alcohol-related harms, has been increased as new policies allowing alcohol to be sold in farmer's markets, grocery stores and online have been enacted in the last two years.[13] Similar changes in British Columbia with partial privatization of alcohol sales resulted in increased access to alcohol.[14] Recently, British Columbia was found to have higher alcohol sales and consumption than the Canadian average, and had the highest hospitalization rate due to alcohol when compared to all provinces.[8]

Policies are most effective when they are regularly updated and strictly enforced. Unfortunately, Canada's/Ontario's policies have not been amended to address changes to the cultural and retail landscape. For example, alcohol marketing guidelines have not been updated since 1996, now more than 20 years ago.[15] Furthermore, research has found that the alcohol industry does not adhere to these self-regulated guidelines and these guidelines do not address prominent marketing channels such as social media, text messaging and branded merchandise which may increase alcohol-related harms, particularly among youth.[16]

Public health units are required to undertake this type of population health assessment by the Ministry of Health and Long-Term Care as part of the Ontario Public Health Standards.[17] This information can be used to inform the planning and delivery of local programs, policy and services aimed at reducing alcohol-related harms by preventing or delaying alcohol use, preventing problematic alcohol use, modifying health services to meet population needs and connecting people with treatment services.[18]

Currently, Southwestern Public Health works towards increasing protective factors in individuals, families and communities that support decreased harmful drinking or delayed drinking among youth. Our work includes the following activities:

- advocate and support healthy public policy on alcohol
- track changes in rates of alcohol use and harm
- support community coalitions that work towards preventing and delaying alcohol use, such as the Oxford Drug Awareness Committee (ODAC) and working groups involved in the creation of a local drug strategy
- work with school boards to help prevent and delay alcohol use among students
- promote the Rethink Your Drinking awareness campaign, which encourages low-risk drinking in order to reduce short and long-term health risks associated with alcohol use

These activities aim to address the root causes of risky and harmful drinking in Oxford County to improve health and wellbeing.

Purpose

The purpose of this report is to understand the behaviours, health status and related harms associated with alcohol use among Oxford County residents. A previous Oxford County Public Health report noted that Oxford County residents may experience more long-term and short-term alcohol-related health consequences; in fact, alcohol was the number one presenting problem substance among residents seeking substance use services.[19] These findings prompted a more in depth look at local alcohol use and health outcomes. This report is the first to focus on alcohol use, health outcomes and impaired driving among Oxford County residents. A recent report completed in 2017 focused on this issue among Elgin St. Thomas residents;[20] therefore data was limited to Oxford County.

This report compiles information from several sources to provide a comprehensive picture of current alcohol use, health and impaired driving among Oxford County residents. Please see Appendix B for more information about the data sources and methods used in this report. This information is often compared to other geographies such as the South West Local Health Integration Network (SW LHIN) and Ontario for context. Where possible, indicators are presented and compared for different subgroups within the population, such as by sex and age and within smaller geographic areas (e.g., dissemination areas, police service areas).

Self-reported Alcohol Use

From 2015-2016, 78.6% of Oxford County residents aged 12 years and older reported that they were current drinkers in the past 12 months, whereas 13.5% were former drinkers and 7.9% never consumed alcohol in their life (i.e., were abstainers). These proportions were similar to Ontario residents with 74.7% identifying as current drinkers and 11.8% identifying as former drinkers. However, Oxford County residents were less likely to be abstainers compared to Ontario (13.5%).

Males were more likely to be regular drinkers than females

Over half (60.6%) of Oxford County residents were regular drinkers (i.e., reported drinking once per month or more frequently) and 18.0% were occasional drinkers (i.e., reported drinking less than once per month). Similar proportions were found among Ontario residents more broadly with 57.7% identifying as regular drinkers and 17.0% identifying as occasional drinkers. Among both Oxford County and Ontario residents, males were more likely to be regular drinkers than females. In Ontario only, females were more likely to be occasional drinkers or non-drinkers than males (Table 1).

Table 1. Type of drinking by sex, residents 12 years and older, Oxford County and Ontario, 2015-2016

Type of drinker	Oxford County		Ontario	
	Males	Females	Males	Females
Regular	68.7% (62.3%-75.1%)	52.6% (45.1%-60.0%)	65.0% (63.7%-66.4%)	50.7% (49.4%-52.0%)
Occasional	13.0%[E] (7.1%-18.9%)	23.0% (16.9%-29.0%)	13.2% (12.2%-14.3%)	20.6% (19.5%-21.6%)
Did not drink in past 12 months	18.3% (14.4%-22.2%)	24.5% (17.7%-31.3%)	21.7% (20.6%-22.9%)	28.8% (27.7%-29.9%)

The superscript 'E' denotes high sampling variability and estimates should be interpreted with caution.
Source: Canadian Community Health Survey (2015-2016), Statistics Canada, Share File, Ontario MOHLTC.

However, self-reported alcohol use may be an underestimate of actual alcohol consumption as people may not be aware that they are consuming more than one standard drink[a] (e.g., tall boys of beer), have difficulty remembering how much they drank or may purposefully underreport how much alcohol they drink on surveys; these effects are known as recall bias and social desirability bias, respectively.[5]

Drinking in Excess of the LRADGs

This section includes information about Oxford County and Ontario residents exceeding Guidelines 1, 2 or both as well as information relevant to Guidelines 4 and 5. Limited information is available to capture Guideline 3 (situations in which to abstain from alcohol); impaired driving – a significant component of this guideline - is discussed at the end of the report. The impact of alcohol on health outcomes is introduced here but will be discussed further in the health outcomes section of the report.

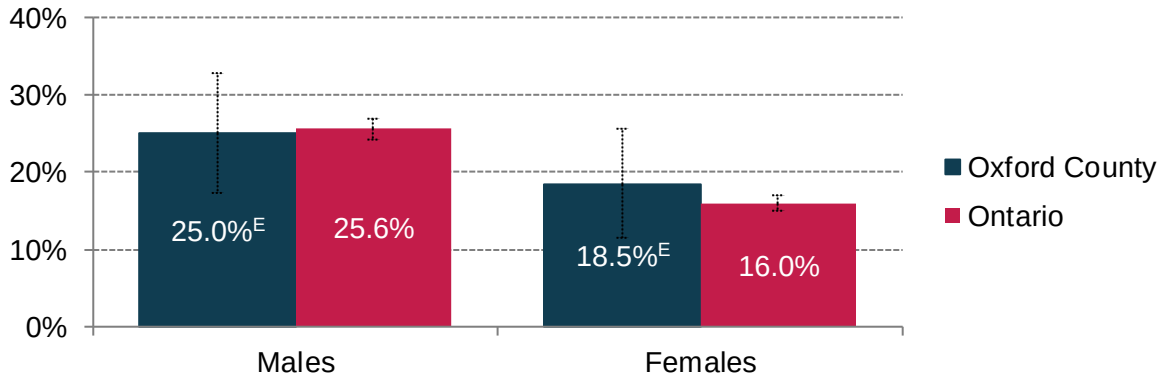
Guidelines 1 and 2: Long-term and short-term health risks

From 2015-2016, 21.8% of Oxford County residents aged 19 years and older (excluding pregnant and breastfeeding women) exceeded Guideline 1 aimed at reducing the long-term risk of chronic diseases (e.g., heart disease, liver disease, digestive problems, cancer).[1] This proportion was similar to that of Ontario residents at 20.7%. Within Oxford County, there were no differences by sex. However, in Ontario, males were more likely to exceed this guideline than females (Figure 1).

[a] In Canada, a standard drink contains about 13.6 grams of pure alcohol. For different types of alcohol, that means:

- beer, cider or coolers: 341 ml (12 ounces) or one bottle with 5% alcohol content
- wine: 142 ml (5 ounces) or one glass with 12% alcohol content
- distilled alcohol such as rum, gin and vodka: 43 ml (1.5 ounces) of 40% alcohol content[11]

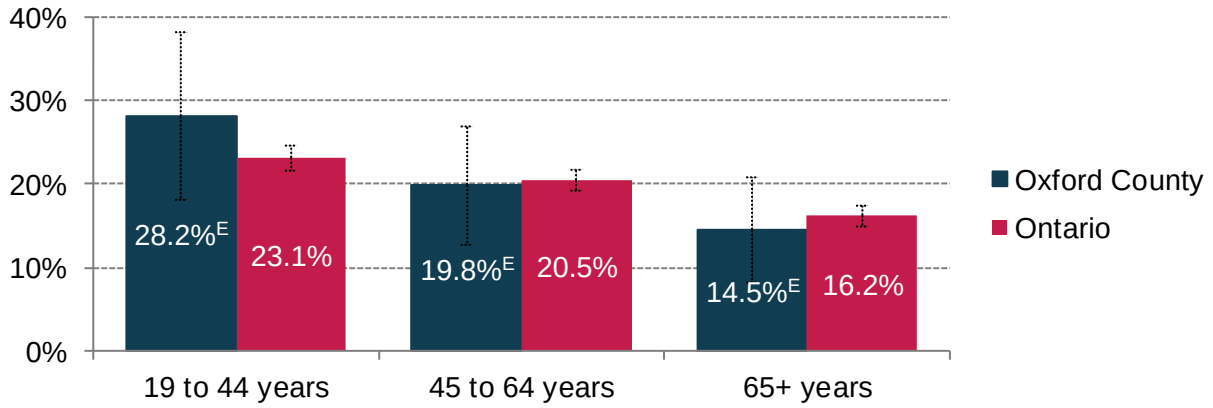
Figure 1. Exceeded Guideline 1 by sex, Oxford County and Ontario, 2015-2016



The superscript 'E' denotes high sampling variability and estimates should be interpreted with caution.
Source: Canadian Community Health Survey (2015-2016), Statistics Canada, Share File, Ontario MOHLTC.

Within Oxford County, there were no differences by age. However, in Ontario, people 65 years and older were less likely to exceed Guideline 1 than both younger age groups (Figure 2).

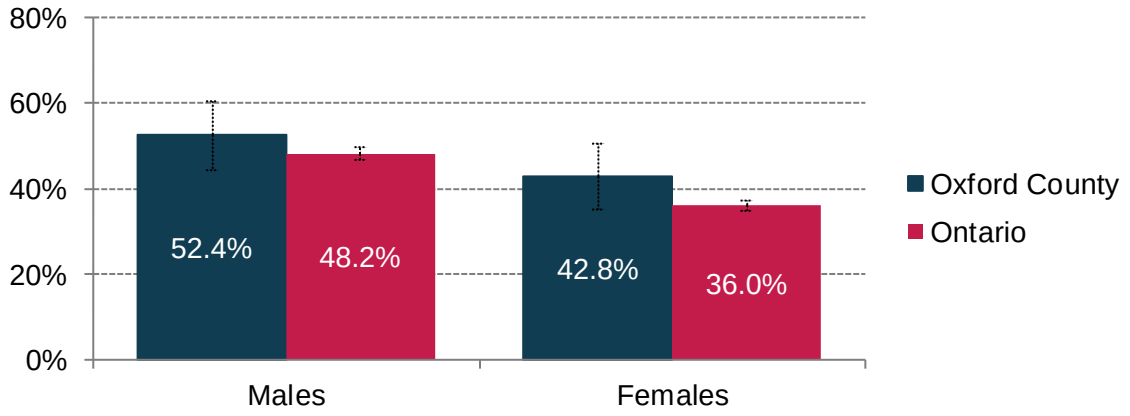
Figure 2. Exceeded Guideline 1 by age group, Oxford County and Ontario, 2015-2016



The superscript 'E' denotes high sampling variability and estimates should be interpreted with caution.
Source: Canadian Community Health Survey (2015-2016), Statistics Canada, Share File, Ontario MOHLTC.

From 2015-2016, over twice as many (47.7%) of Oxford County residents aged 19 years and older (excluding pregnant and breastfeeding women) exceeded Guideline 2 aimed at reducing the short-term risks of alcohol use, such as injuries, alcohol poisoning, risky sexual behaviours and violence.[1] This proportion was similar to Ontario at 42.1%. Within Oxford County, there were no differences by sex. However, in Ontario, males were more likely to exceed this guideline than females (Figure 3).

Figure 3. Exceeded Guideline 2 by sex, Oxford County and Ontario, 2015-2016

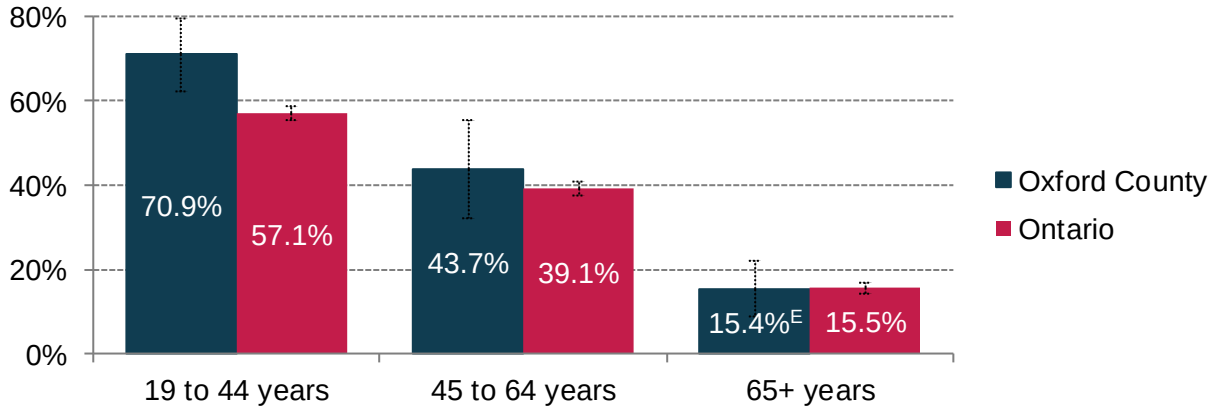


Source: Canadian Community Health Survey (2015-2016), Statistics Canada, Share File, Ontario MOHLTC.

Within both Oxford County and Ontario, there was an age gradient evident with younger residents more likely to exceed Guideline 2 than older residents. The per cent of residents exceeding this guideline decreased with every increasing age group (Figure 4). Oxford County residents aged 19 to 44 years were more likely to exceed this guideline than Ontario residents of the same age (70.9% versus 57.1%).

Oxford County residents aged 19 to 44 years were more likely to exceed Guideline 2 aimed at preventing short-term risks of alcohol use than Ontario residents of the same age

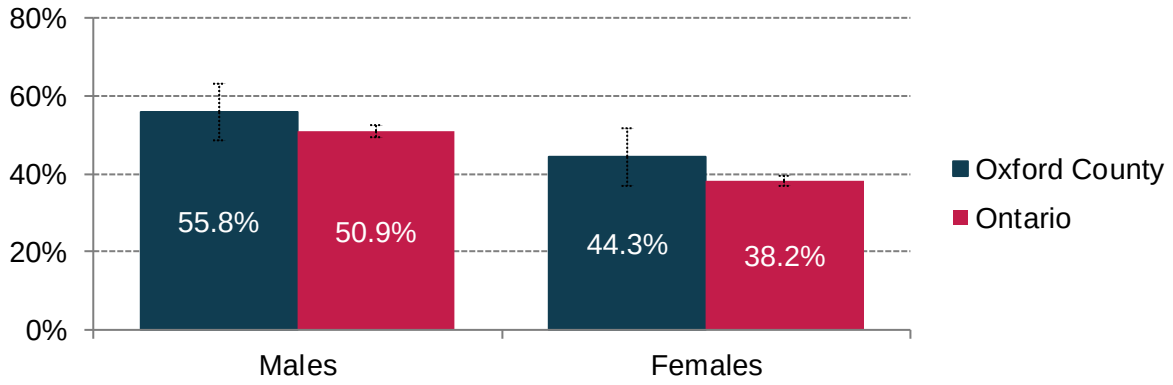
Figure 4. Exceeded Guideline 2 by age group, Oxford County and Ontario, 2015-2016



The superscript 'E' denotes high sampling variability and estimates should be interpreted with caution.
Source: Canadian Community Health Survey (2015-2016), Statistics Canada, Share File, Ontario MOHLTC.

Overall, 50.1% of Oxford County residents aged 19 years and older exceeded either Guideline 1 or 2, which was similar to Ontario at 44.5%. Within Oxford County, there were no differences by sex. However, in Ontario, males were more likely to exceed either guideline than females (Figure 5).

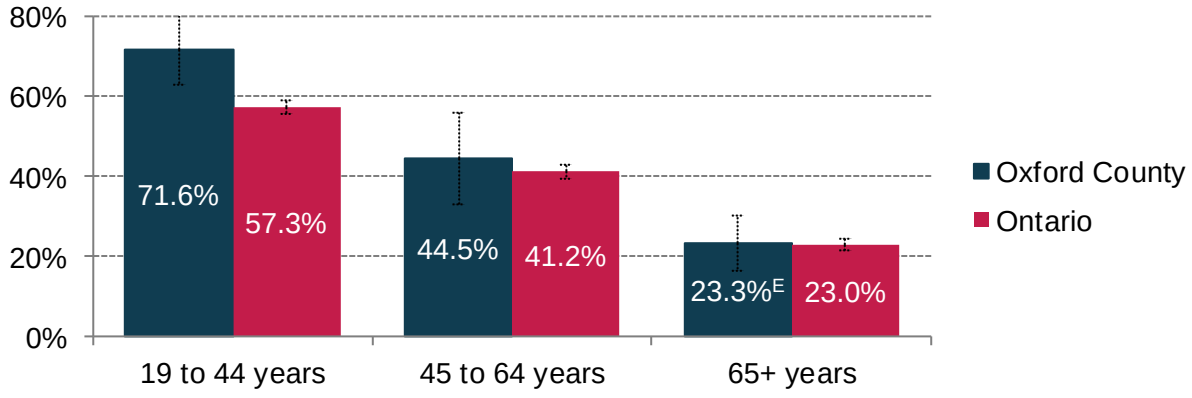
Figure 5. Exceeded either Guideline 1 or 2 by sex, Oxford County and Ontario, 2015-2016



Source: Canadian Community Health Survey (2015-2016), Statistics Canada, Share File, Ontario MOHLTC.

Within Oxford County, there were no differences by age. However, in Ontario there was a clear age gradient: the per cent of residents exceeding either guideline decreased as age increased (Figure 6). Additionally, Oxford County residents aged 19 to 44 years were more likely to exceed either guideline than Ontario residents of the same age (71.6% versus 57.3%). These findings appear to be largely driven by the results for those exceeding Guideline 2.

Figure 6. Exceeded either Guideline 1 or 2 by age group, Oxford County and Ontario, 2015-2016



The superscript 'E' denotes high sampling variability and estimates should be interpreted with caution.
Source: Canadian Community Health Survey (2015-2016), Statistics Canada, Share File, Ontario MOHLTC.

Guideline 4: Alcohol exposure during pregnancy

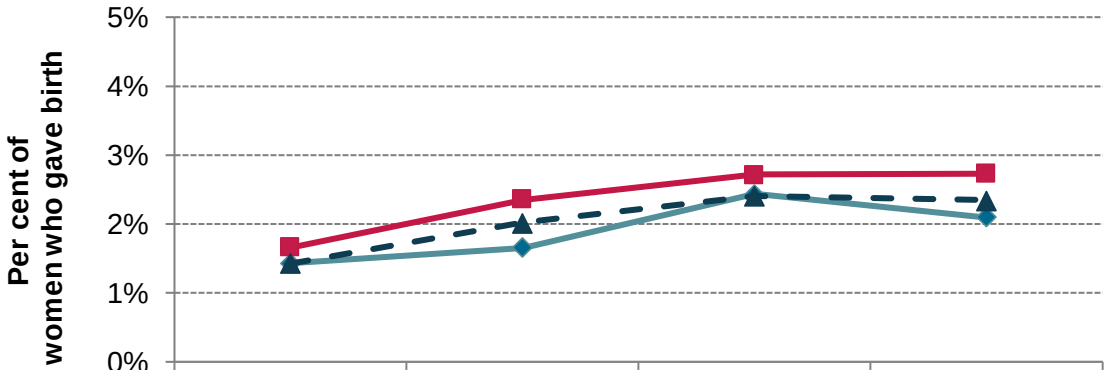
Drinking alcohol during pregnancy can lead to low birth weight, preterm births, spontaneous abortions, intrauterine growth restriction and a brain injury in unborn babies known as fetal alcohol spectrum disorder (FASD).[21] FASD is a lifelong condition that can cause mild to severe physical, mental, behavioural and learning difficulties.[22] Often, the effects of the mother's alcohol use are not seen until later in the baby's life when they are diagnosed in later childhood. The effects of alcohol on FASD depends on the amount of alcohol consumed at one time, how often it is consumed and the stage of the pregnancy when it is consumed.[23] However, it can also be affected by stress, the mother's age, nutrition, smoking and other substance use.[23] In order to reduce the risk of FASD, women who are planning to become pregnant should stop drinking alcohol before pregnancy.[11] However, there may be circumstances when women do not know they are pregnant. In those cases, women should stop drinking alcohol immediately once they become aware of the pregnancy.[11] Nationally, it is estimated that 1 in 100 babies are affected by FASD every year, which is higher than the prevalence of autism spectrum disorder and Down syndrome.[24]

From 2013 to 2016 in Oxford County, on average 2% of women who gave birth (including live births and stillbirths) consumed alcohol during pregnancy (Figure 7). The amount of alcohol consumed varied between less than one drink per month to more than one drink per week and included binge drinking. This proportion is comparable to other health regions with similar socioeconomic characteristics and Ontario.[b] Although it is not possible to obtain data for other individual health units, a recent report found that 2-3% of women who gave birth consumed alcohol in Elgin St. Thomas over the same time period.[20] However, this data may be an underestimate due to the stigma associated with drinking alcohol during pregnancy.

On average, 2% of women who gave birth consumed alcohol during pregnancy

[b] This is based on Statistics Canada 2011 peer group methodology to effectively compare health regions with similar socioeconomic characteristics. For Oxford County, the peer group is an urban-rural mix (Peer Group A), which consists of 15 Ontario public health units: Brant County; Eastern Ontario; Elgin St. Thomas; Haldimand-Norfolk; Haliburton, Kawartha, Pine Ridge (HKPR); Hamilton; Hastings and Prince Edward Counties, Kingston, Frontenac, Lennox and Addington (KFL&A); Lambton; Leeds, Grenville and Lanark; Middlesex-London; Niagara; Oxford County; Peterborough; and Windsor-Essex.[25]

Figure 7. Alcohol exposure during pregnancy by year, Oxford County, Peer Group and Ontario, 2013-2016



	2013	2014	2015	2016
Oxford County	1.4%	1.7%	2.4%	2.1%
Peer Group	1.7%	2.4%	2.7%	2.7%
Ontario	1.4%	2.0%	2.4%	2.3%

Source: PHU – Pregnancy standard report, Better Outcomes Registry & Network (BORN) Information System (2013-2016), BORN Ontario, Date extracted: January 16, 2018.

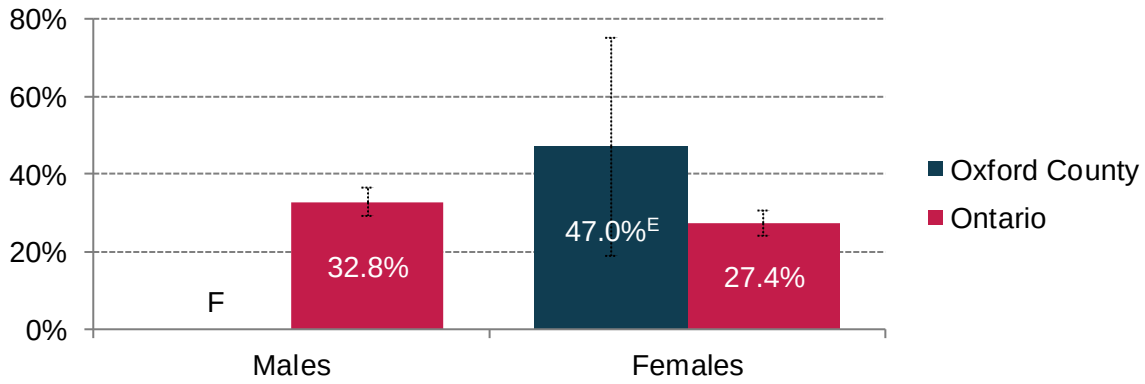
Guideline 5: Youth drinking

Although you must be 19 years old to purchase alcohol in Ontario, youth do have access to alcohol. In southwestern Ontario, 77.1% of grade 9-12 students reported that it was very easy or easy to get alcohol.[4] Youth are at particular risk for negative health outcomes from alcohol because their brains are still developing. In particular, alcohol use can affect the development of the frontal lobe, the part of the brain that is responsible for planning, strategizing, organizing, impulse control, concentration and attention.[26] As new drinkers, youth are also more likely to engage in high risk drinking behaviours such as binge drinking, which can increase the risk of alcohol poisoning and injuries.[26] Importantly, drinking patterns that are established during adolescence are a predictor of drinking patterns in adulthood.[5] Parents play a key role in influencing their child's use of alcohol. Research shows there are six effective strategies that parents can use to help prevent or delay alcohol use: parental monitoring, positive parent-child communication, general discipline, positive role modelling, positive parent-child relationship quality and not providing alcohol to your child.[27]

37.2% of Oxford County residents consumed alcohol when they were underage

From 2015-2016, 37.2% of Oxford County residents consumed alcohol when they were underage (i.e., 12 to 18 years old), which was similar to Ontario at 30.2%. There was no difference between males and females (Figure 8). Currently, this is the only available information about youth drinking for Oxford County residents. However, there are several data sources available for larger geographies, such as southwestern Ontario. We expect additional local information for youth will be available in the future through the 2018/19 Ontario Student Drug Use and Health Survey (OSDUHS).[4]

Figure 8. Underage drinking by sex, Oxford County and Ontario, 2015-2016

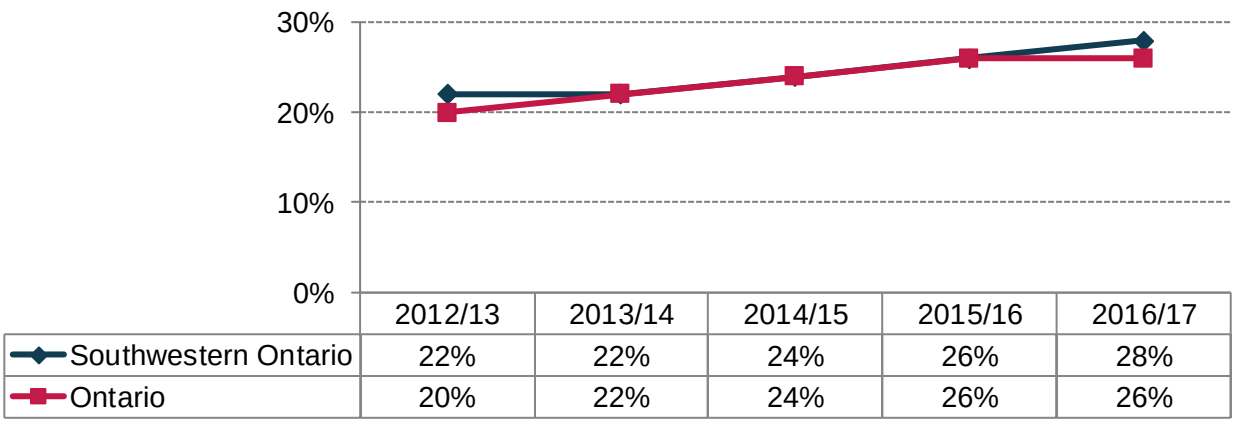


The superscript 'E' denotes high sampling variability and estimates should be interpreted with caution. The 'F' denotes that the estimate was suppressed due to extremely high sampling variability.
Source: Canadian Community Health Survey (2015-2016), Statistics Canada, Share File, Ontario MOHLTC.

To better understand trends in youth drinking, a longitudinal study among secondary school students, the Cohort Study of Obesity, Marijuana use, Physical activity, Alcohol use, Smoking and Sedentary behaviour (COMPASS) results to date for southwestern Ontario[c] are presented. Based on COMPASS, 28% of secondary school students (grades 9 through 12) in southwestern Ontario never consumed alcohol in 2016/17.[28] This was similar for males and females and has increased slightly over time for southwestern Ontario and Ontario since 2012/13 (Figure 9).

[c] This includes schools within the boundaries of Elgin St. Thomas, Grey Bruce, Huron County, Middlesex-London, Oxford County, Perth County and Windsor-Essex.

Figure 9. Never consumed alcohol, grade 9-12 students, by year, southwestern Ontario and Ontario, 2012/13-2016/17



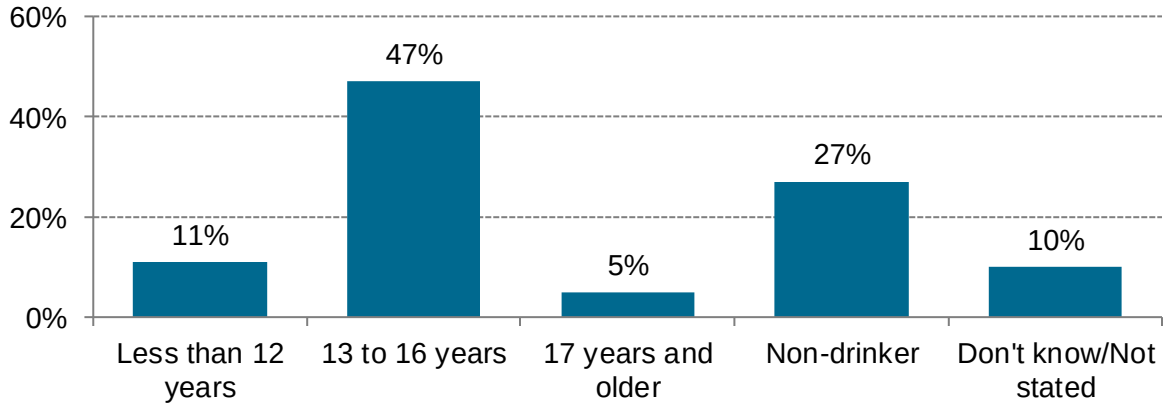
	2012/13	2013/14	2014/15	2015/16	2016/17
Southwestern Ontario	22%	22%	24%	26%	28%
Ontario	20%	22%	24%	26%	26%

Source: COMPASS study (2012/13-2016/17), University of Waterloo.

In southwestern Ontario for the most recent year, 18% of students consumed alcohol less than once a month, 15% had only a sip of alcohol and 12% consumed it two or three times a month. Overall, 51% had more than a sip of alcohol in the past 12 months.

Among grade 12 students in southwestern Ontario, almost half (47%) first had a drink of alcohol that was more than a sip when they were 13 to 16 years old (Figure 10). When broken down further, 15% were 15 years old, 14% were 14 years old, 11% were 16 years old and 7% were 13 years old when they had their first drink of alcohol. These proportions were similar to Ontario.

Figure 10. Age first had more than a sip of alcohol, grade 12 students, by age group, southwestern Ontario and Ontario, 2016/17

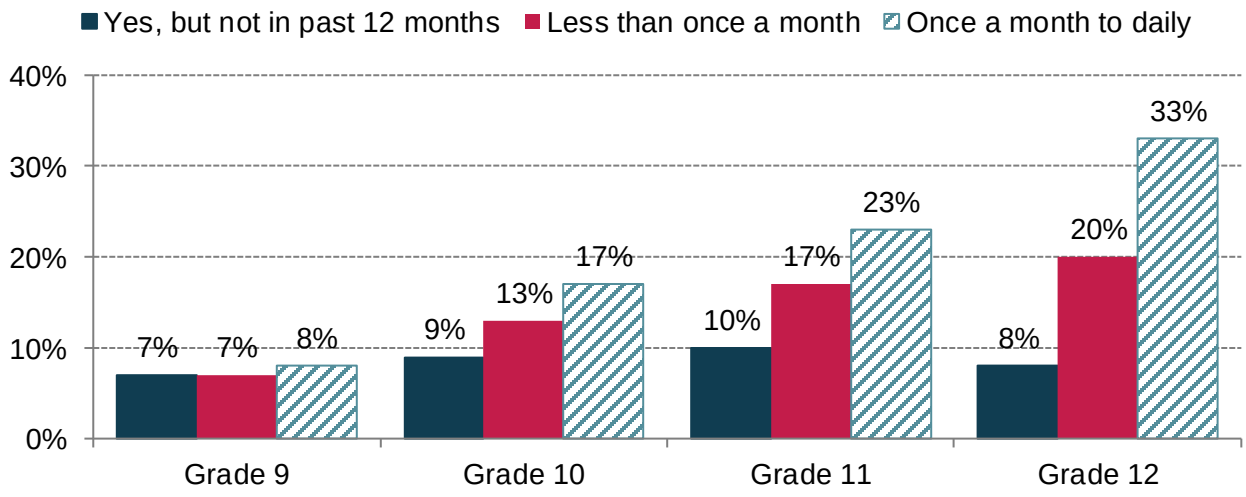


Note: non-drinkers include those who have never consumed alcohol and those who only had a sip of alcohol.
Source: COMPASS study (2012/13-2016/17), University of Waterloo.

In 2016/17, 21% of grade 9 to 12 students in southwestern Ontario reported binge drinking (i.e., had five or more drinks of alcohol on one occasion) at least once a month. Less than one-fifth (14%) reported binge drinking less than once a month, 11% reported never binge drinking and 8% did not binge drink in the past 12 months. Binge drinking increased with each grade, with 33% of grade 12 students binge drinking at least once a month to daily and 20% binge drinking less than once a month (Figure 11). Binge drinking is a high risk behaviour because it can increase the risk of injuries, impaired driving, violence, risky sexual behaviours (e.g., unwanted or unprotected sex) and unintended pregnancy.[1]

Binge drinking increased with each grade

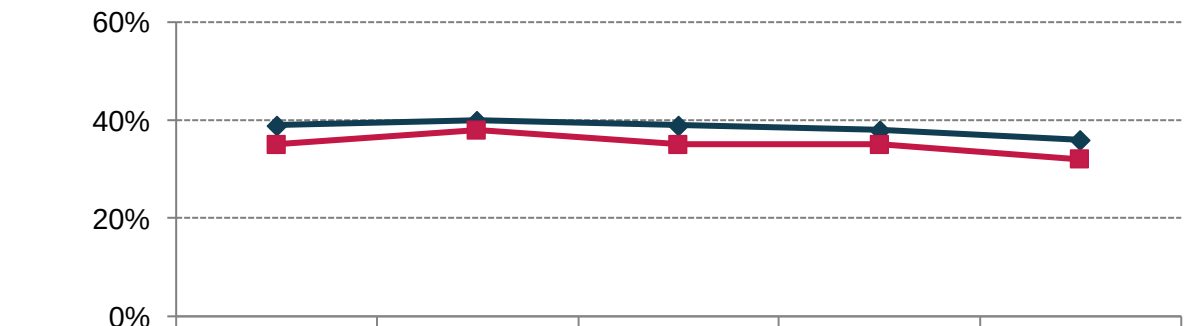
Figure 11. Binge drinking, grade 9-12 students, by grade, southwestern Ontario, 2016/17



Source: COMPASS study (2012/13-2016/17), University of Waterloo.

Over time, the per cent of students in southwestern Ontario reporting any binge drinking (i.e., less than once a month to daily) has remained fairly consistent around 30% to 40%, with a slight decrease in recent years (Figure 12). Binge drinking was similar between males and females.

Figure 12. Binge drinking, grade 9-12 students, by sex and year, southwestern Ontario, 2012/13-2016/17

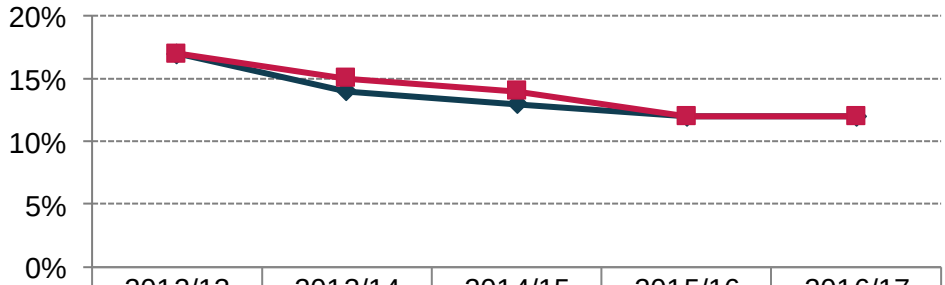


	2012/13	2013/14	2014/15	2015/16	2016/17
Male	39%	40%	39%	38%	36%
Female	35%	38%	35%	35%	32%

Source: COMPASS study (2012/13-2016/17), University of Waterloo.

Over time in both southwestern Ontario and Ontario more broadly, the per cent of students mixing alcohol with energy drinks in the past 12 months has decreased from 17% to 12% (Figure 13). Mixing alcohol with energy drinks is a high-risk behaviour because energy drinks contain caffeine, plant-based stimulants and sugars, which mask signs of alcohol impairment.[29] As a result, people may consume more alcohol and become more impaired than they realize, even to the point of alcohol poisoning. This behaviour increases the risk of injury, unwanted or unprotected sex and impaired driving.[1] It can also lead to side effects such as heart palpitations, problems sleeping, agitation and anxiety.[30] Importantly, although caffeine and energy drinks mask signs of impairment, they do not reduce blood alcohol concentration or help "sober up" someone who has been drinking.[29]

Figure 13. Mixed alcohol with energy drinks in the past 12 months, grade 9-12 students, by year, southwestern Ontario and Ontario, 2012/13-2016/17



	2012/13	2013/14	2014/15	2015/16	2016/17
Southwestern Ontario	17%	14%	13%	12%	12%
Ontario	17%	15%	14%	12%	12%

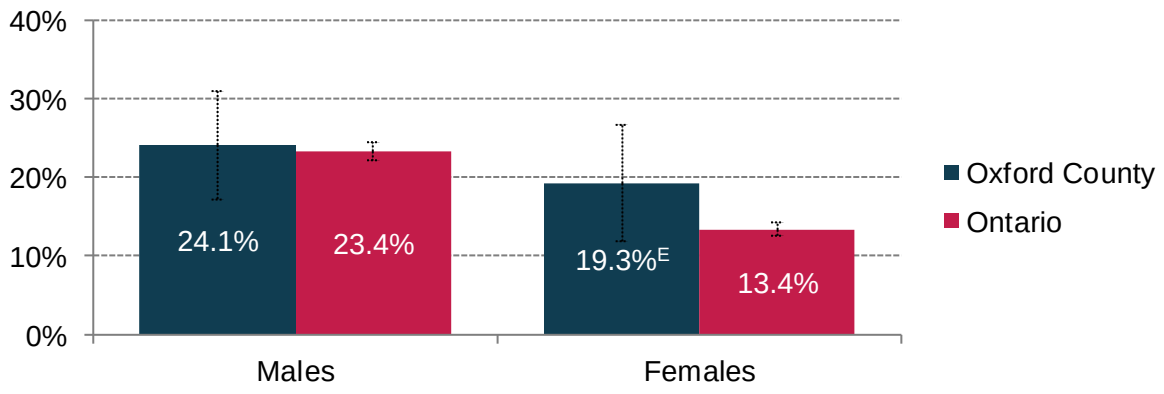
Source: COMPASS study (2012/13-2016/17), University of Waterloo.

Heavy Drinking

Episodes of heavy drinking involve drinking more alcohol than is recommended to reduce short-terms risks from alcohol use as per the LRADGs

Heavy drinking is measured as five or more drinks on at least one occasion per month in the past 12 months for males and four or more drinks for females. From 2015-2016, 21.7% of Oxford County residents aged 12 years and older were considered heavy drinkers. This proportion was similar to Ontario at 18.3%. Among Oxford County residents, there was no difference between males and females. However, in Ontario, males were more likely to have episodes of heavy drinking compared to females (Figure 14).

Figure 14. Heavy drinking by sex, residents 12 years and older, Oxford County and Ontario, 2015-2016



The superscript 'E' denotes high sampling variability and estimates should be interpreted with caution.
Source: Canadian Community Health Survey (2015-2016), Statistics Canada, Share File, Ontario MOHLTC.

Short-term heavy drinking can have many different health effects which can increase the risk of injuries and health problems, such as drowsiness, reduced inhibition, loss of coordination, reduced decision-making skills, confusion, negative mood, violence, vomiting, irregular heart beat and respiratory depression.[5]

Hazardous or Harmful Drinking

Hazardous or harmful drinking in the past 12 months is based on the Alcohol Use Disorders Identification Test (AUDIT). The AUDIT was developed by the World Health Organization as a screening tool to identify excessive drinking.[31] It includes 10 questions which cover three domains (Table 2). The AUDIT conveys that alcohol use disorders are associated with heavy drinking but are not diagnosed by use alone. Diagnosis is typically based on the Diagnostic and Statistical Manual of Mental Disorders (5th ed.; DSM-V).[32] The DSM-V defines substance use disorders along a continuum of severity rather than as distinct conditions. There are a variety of criteria that must be met with severity being defined by how many criteria a person fits.

Table 2. Alcohol Use Disorders Identification Test (AUDIT) content[31]

Domains	Question content
Hazardous alcohol use	Frequency of drinking Typical quantity of alcohol Frequency of heavy drinking
Dependence symptoms	Impaired control over drinking Increased importance of drinking in life Morning drinking
Harmful alcohol use	Guilt after drinking Blackouts Alcohol-related injuries Others concerned about drinking

Using combined data from 2012-2015, 11.9% of residents in the SW LHIN were considered hazardous or harmful drinkers, similar to Ontario at 13.7%.[33] This proportion was slightly higher among secondary school students (grades 9 through 12) in southwestern Ontario. In 2017, almost one-fifth of students (17.6%) were considered hazardous or harmful drinkers.[4] Unfortunately, this data is not available for Oxford County residents.

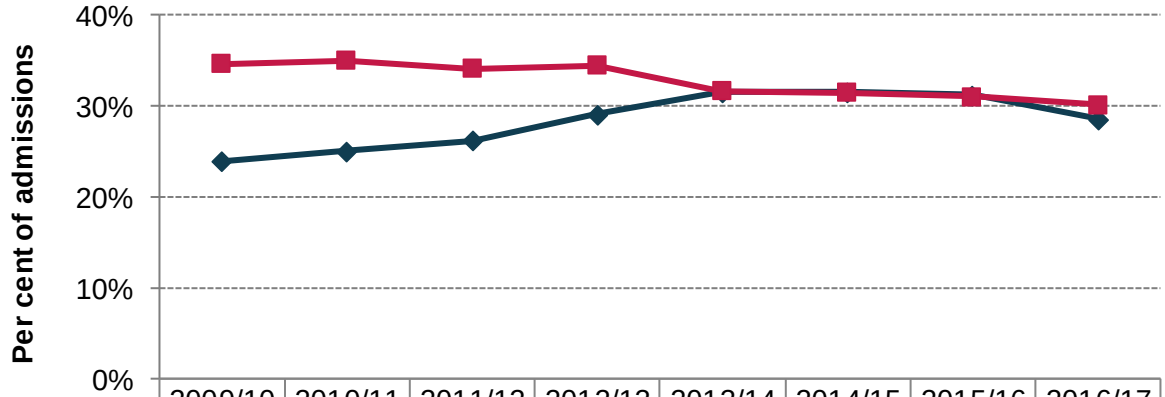
Substance Use Services

Alcohol has addictive potential that can result in individuals seeking substance use treatment. The Centre for Addiction and Mental Health (CAMH) estimates that about 1 in 20 people who drink are dependent on alcohol.[34] Alcohol dependence can lead to serious health issues, harm relationships and cause financial and legal problems. Despite these consequences, it can be extremely difficult for someone who is dependent on alcohol to stop drinking.

During the 2016/2017 fiscal year (i.e., October 2016 to September 2017), there were 462 new admissions by Oxford County residents to Ministry of Health and Long-Term Care (Ministry)-funded substance use treatment services.[19] This may underestimate the number of admissions to substance use services by Oxford County residents more broadly as people may seek services that are not funded by the Ministry. During this time, the most common presenting problem substance among Oxford County residents was alcohol (28.5%).[19] This proportion was similar to Ontario residents, at 30.1%. In the past, slightly fewer Oxford County residents sought treatment for alcohol use compared to Ontario residents, but over the last four fiscal years the trends have become similar (Figure 15).

For Oxford County residents seeking treatment, alcohol was the most common presenting problem substance

Figure 15. Ministry-funded substance use treatment services admissions with alcohol as the presenting problem substance by fiscal year, Oxford County and Ontario, FY2009/10-FY2016/17



	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17
Oxford County	23.9%	25.0%	26.2%	29.1%	31.5%	31.5%	31.2%	28.5%
Ontario	34.6%	34.9%	34.1%	34.4%	31.6%	31.4%	31.0%	30.1%

Source: Drug and Alcohol Treatment Information System (DATIS) Central Database (FY2009/10-FY2016/17), Centre for Addiction and Mental Health, Date Extracted: February 20, 2018.

Health Outcomes

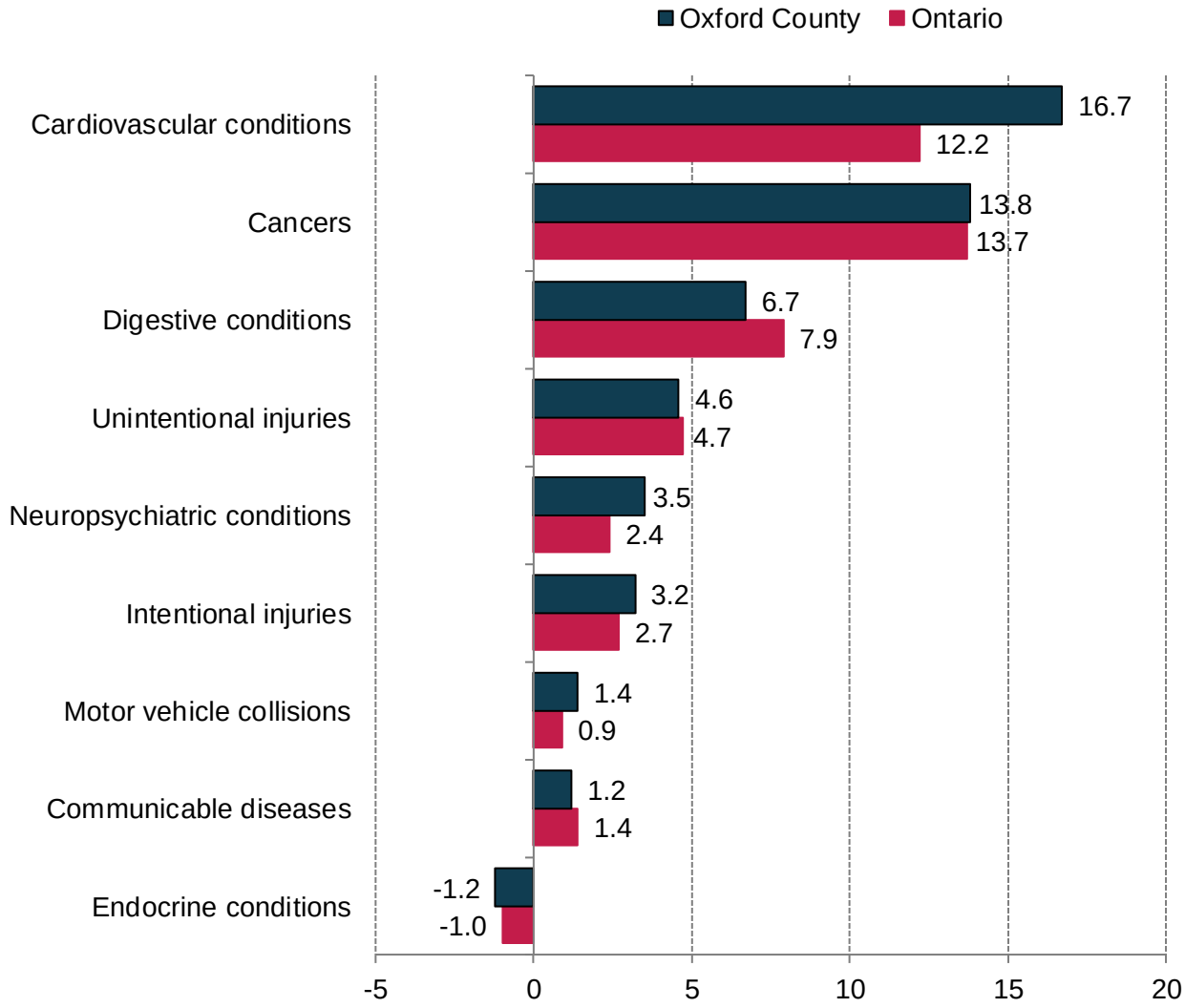
Alcohol-attributable Deaths

Alcohol-attributable deaths indicate how many deaths could be avoided if Oxford County residents did not consume alcohol. There are some conditions that are 100% attributable to alcohol (i.e., are caused entirely by alcohol), such as alcohol-induced liver disease and alcohol-induced pancreatitis. However, alcohol-attributable deaths can also include other conditions that are partly attributable to alcohol (e.g., hypertension, breast cancer, epilepsy). The conditions attributable to alcohol use were based on the Canadian Institute for Substance Use Research (CISUR)'s International Model of Alcohol Harms and Policies (InterMAHP) tool.[35] These conditions include communicable diseases, cancers, endocrine conditions, neuropsychiatric conditions, cardiovascular conditions, digestive conditions, motor vehicle collisions and unintentional and intentional injuries.[35] This tool was developed based on recent scientific evidence showing causation between alcohol consumption and health outcomes.[35] A more detailed list of conditions is included in Appendix B.

Using data over a five-year period (from 2008-2012), there were on average 44 deaths per year that had a primary cause attributable to alcohol among Oxford County residents aged 15 years and older. This equates to a crude rate of 49.7 per 100,000 population. Oxford County residents typically had similar rates of alcohol-attributable deaths compared to Ontario, except for deaths from cardiovascular conditions (e.g., hypertension, ischaemic heart disease, haemorrhagic stroke). Cardiovascular conditions were the top cause of alcohol-attributable deaths among Oxford County residents whereas cancers were the number one cause in Ontario (Figure 16). Cancer is discussed in more detail later in the report.

Cardiovascular conditions were the top cause of alcohol-attributable deaths among Oxford County residents

Figure 16. Five-year average crude rate (per 100,000 population) of deaths attributable to alcohol by health condition group, residents 15 years and older, Oxford County and Ontario, 2008-2012 (combined)



Source: Ontario Mortality Data (2008-2012), Ontario Ministry of Health and Long-Term Care, IntelliHEALTH ONTARIO, Date Extracted: March 7, 2018 and May 7, 2018 & Canadian Community Health Survey (2015-2016), Statistics Canada, Share File, Ontario MOHLTC & Statistics Canada. Table 183-0023 - Sales and per capita sales of alcoholic beverages by liquor authorities and other retail outlets, by value, volume, and absolute volume, annual, CANSIM (database) (accessed: April 30, 2018) & Statistics Canada. 2017. Oxford, CTY [Census division], Ontario and Ontario [Province] (table). Census Profile. 2016 Census. Statistics Canada Catalogue no. 98-316-X2016001. Ottawa. Released November 29, 2017. https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/index.cfm?Lang=E (accessed April 30, 2018) & Sherk A, Stockwell T, Rehm J, Dorocicz J, Shield KD. The International Model of Alcohol Harms and Policies (InterMAHP). Version 1.0: December 2017. Victoria, BC: Canadian Institute for Substance Use Research, University of Victoria; 2017. Available from: www.intermahp.cisur.ca

Alcohol-attributable Hospitalizations

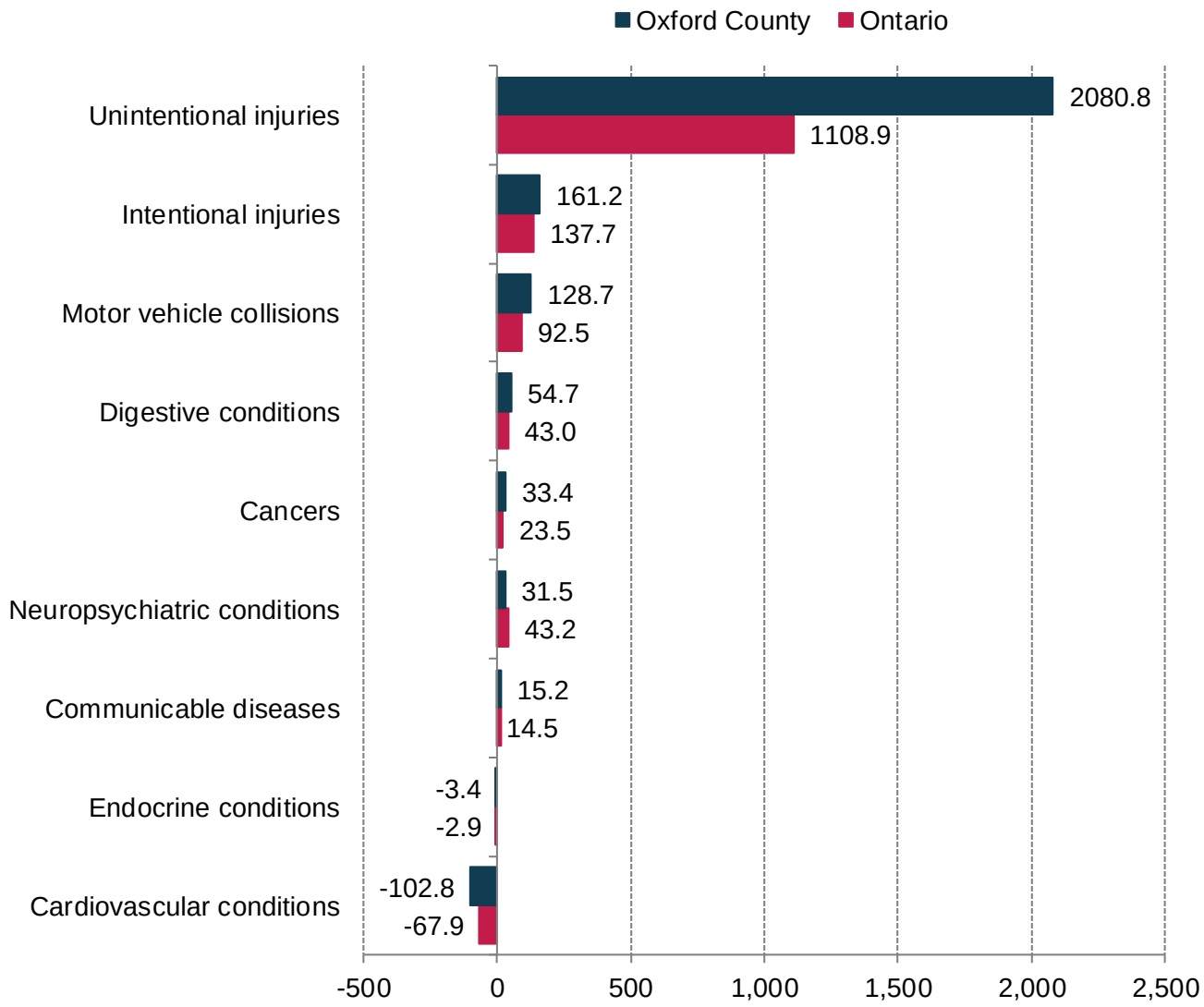
Alcohol-attributable hospitalizations indicate what proportion of hospitalizations could disappear if Oxford County residents did not consume alcohol. As is the case for alcohol-attributable deaths, there are hospitalizations for some conditions that are 100% attributable to alcohol and some that are partly attributable to alcohol. The conditions included here are the same as those used above for alcohol-attributable deaths, based on the InterMAHP tool.[35] Importantly, hospitalizations for injuries do not account for injuries caused by another person's drinking. Similarly, conditions that do not directly affect the person drinking alcohol, such as FASD, are not included.

Using data over a five-year period (from 2012-2016), there were on average 2,202 hospitalizations per year that were attributable to alcohol among Oxford County residents aged 15 years and older. This equates to a crude rate of 2,400.6 per 100,000 population. Most of these hospitalizations were from unintentional injuries such as falls, fires, drowning, accidental poisoning by alcohol and accidental poisoning by other substances (Figure 17). Compared to Ontario, Oxford County residents had nearly twice the rate of alcohol-attributable hospitalizations from unintentional injuries. This may be partly related to the higher proportion of Oxford County residents aged 19 to 44 years exceeding the LRADG addressing short-term risks of alcohol use (including injuries) relative to Ontario. Otherwise, Oxford County residents had similar rates of alcohol-attributable hospitalizations compared to Ontario.

Compared to Ontario, Oxford County residents had nearly twice the rate of alcohol-attributable hospitalizations from unintentional injuries

Interestingly, endocrine conditions such as diabetes and cardiovascular conditions had negative rates, indicating a positive effect of alcohol use on hospitalizations. However, cardiovascular conditions were the top cause of alcohol-attributable deaths among Oxford County residents. Therefore, any benefits from potentially reduced hospitalizations may not equate to a reduction in deaths from the same cause. In terms of endocrine conditions, the potential reduction in hospitalizations and deaths appear to be minimal (i.e., three hospitalizations and one death per year) which likely does not outweigh the other risks of alcohol use.

Figure 17. Five-year average crude rate (per 100,000 population) of hospitalizations attributable to alcohol by health condition group, residents 15 years and older, Oxford County and Ontario, 2012-2016 (combined)



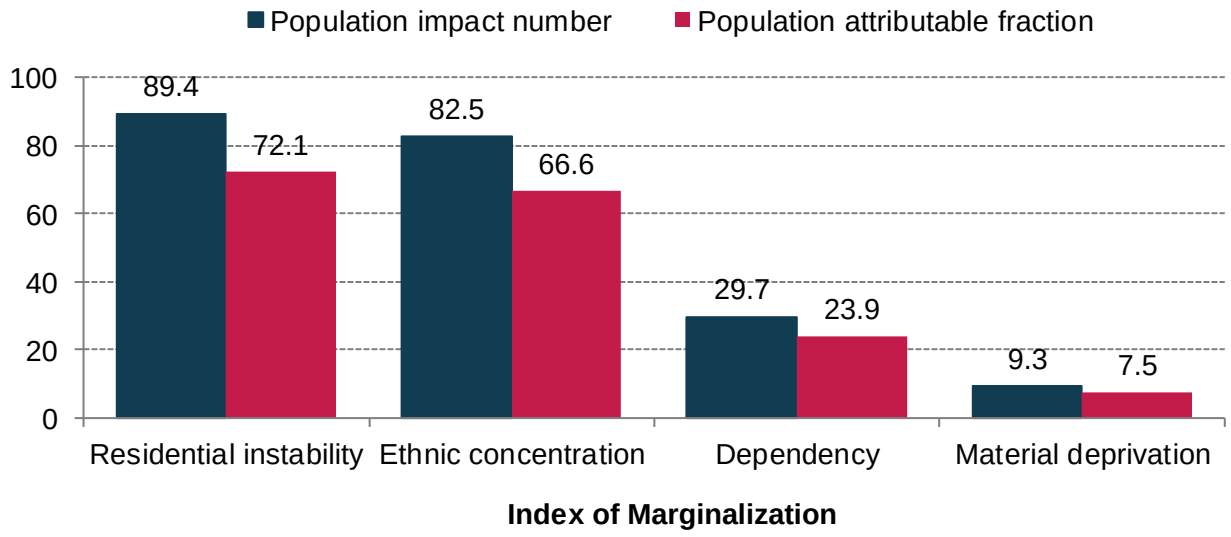
Source: Inpatient Discharges (2012-2016), Ontario Ministry of Health and Long-Term Care, IntelliHEALTH ONTARIO, Date Extracted: March 8, 2018 and May 4, 2018 & Ambulatory Emergency External Cause (2012-2016), Ontario Ministry of Health and Long-Term Care, IntelliHEALTH ONTARIO, Date Extracted: March 8, 2018 & Canadian Community Health Survey (2015-2016), Statistics Canada, Share File, Ontario MOHLTC & Statistics Canada. Table 183-0023 - Sales and per capita sales of alcoholic beverages by liquor authorities and other retail outlets, by value, volume, and absolute volume, annual, CANSIM (database) (accessed: April 30, 2018) & Statistics Canada. 2017. Oxford, CTY [Census division], Ontario and Ontario [Province] (table). Census Profile. 2016 Census. Statistics Canada Catalogue no. 98-316-X2016001. Ottawa. Released November 29, 2017. https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/index.cfm?Lang=E (accessed April 30, 2018) & Sherk A, Stockwell T, Rehm J, Dorocicz J, Shield KD. The International Model of Alcohol Harms and Policies (InterMAHP). Version 1.0: December 2017. Victoria, BC: Canadian Institute for Substance Use Research, University of Victoria; 2017. Available from: www.intermahp.cisur.ca

Local data also shows that alcohol-attributable hospitalizations for conditions 100% attributable to alcohol (e.g., acute intoxication, withdrawal, alcohol-induced liver disease) vary by how disadvantaged someone is, as was measured by:

1. Residential instability (e.g., population living alone, proportion of dwellings that are not owned, proportion of population that moved in the past 5 years)
2. Material deprivation or difficulty attaining basic needs
3. Dependency (i.e., concentrations of people who do not have income from employment)
4. Ethnic concentration (i.e., recent immigrants and people belonging to a visible minority group).[36]

In Oxford County, if each socioeconomic group experienced the same 100% alcohol-attributable hospitalization rate as the most advantaged group in terms of residential instability, there could be a reduction of 89 hospitalizations over a two-year period (i.e., population impact number) and the rate of 100% alcohol-attributable hospitalizations could be reduced by 72.1% (i.e., population attributable fraction; Figure 18). Meanwhile, reducing marginalization based on material deprivation could eliminate nine hospitalizations and reduce the rate of 100% alcohol-attributable hospitalizations by 7.5%.

Figure 18. Impact of marginalization on 100% alcohol-attributable hospitalizations, residents 15 years and older, Oxford County, 2011-2012 (combined)



Source: Public Health Ontario. Snapshots: Oxford County Public Health & Emergency Services: Health Inequities in Alcohol-Attributable Hospitalizations 2011-12. Toronto, ON: Ontario Agency for Health Protection and Promotion; 2018 May 7 [2018 May 9]. Available from: http://publichealthontario.ca/en/DataAndAnalytics/Snapshots/Pages/Alcohol-AH-Inequities.aspx

Cancer

Although most people tend to think about cancer in relation to smoking tobacco and ultraviolet radiation (UV) exposure, the LRADGs recognize that one of the major chronic health outcomes of alcohol use is cancer.[11] Alcohol consumption is a known risk factor for several types, including cancers of the mouth, pharynx, upper digestive tract, esophagus, colon and rectum, liver, bile duct, larynx and breast.[37] There is also limited evidence that alcohol consumption is a risk factor for pancreatic cancer.[37] In order to reduce the risk of cancers caused by alcohol among individuals who choose to drink, the World Cancer Research Fund (WCRF) and the American Institute for Cancer Research (AICR) recommend that men consume no more than two drinks per day and that women consume no more than one drink per day.[38]

Within the South West Local Health Integration Network (SW LHIN), Cancer Care Ontario identified that current alcohol consumption and alcohol consumption exceeding WCRF and AICR cancer prevention recommendations were priority areas to reduce cancer among adults and adolescents.[39] In particular, they highlight that the prevalence of these modifiable risk factors was higher than Ontario in Woodstock and in some cases, Ingersoll.[39] When taking a closer look at these modifiable risk factors by dissemination areas in Oxford County, it was found that male residents, 12 years and older had higher alcohol consumption than Ontarians in the areas of east Woodstock, Tillsonburg and certain areas in the municipalities of Blandford-Blenheim, Norwich and South-West Oxford (Figure 19). For females, higher alcohol consumption was more spread out throughout the county and was notably concentrated in the municipalities of Blandford-Blenheim, Woodstock and Ingersoll and in the south end of Tillsonburg (Figure 19).

For youth aged 12 to 18 years, higher alcohol consumption was more widespread throughout the county for both males and females; however, there were also more pockets where consumption was lower than Ontario (Figure 20).

Male residents 12 years and older had higher rates than Ontario for consumption exceeding cancer prevention recommendations throughout most of the county, including almost all of Woodstock, Zorra and East-Zorra Tavistock (Figure 21). Conversely, females 12 years and older were mostly similar to Ontario or marginally lower; however, there were some areas with higher alcohol consumption exceeding cancer prevention recommendations, including some areas near the towns of Thamesford, Springford and Otterville (Figure 21).

Figure 19. Current alcohol consumption, residents 12 years and older, by 2006 Census dissemination areas (DAs), Oxford County, 2000-2014 (combined)

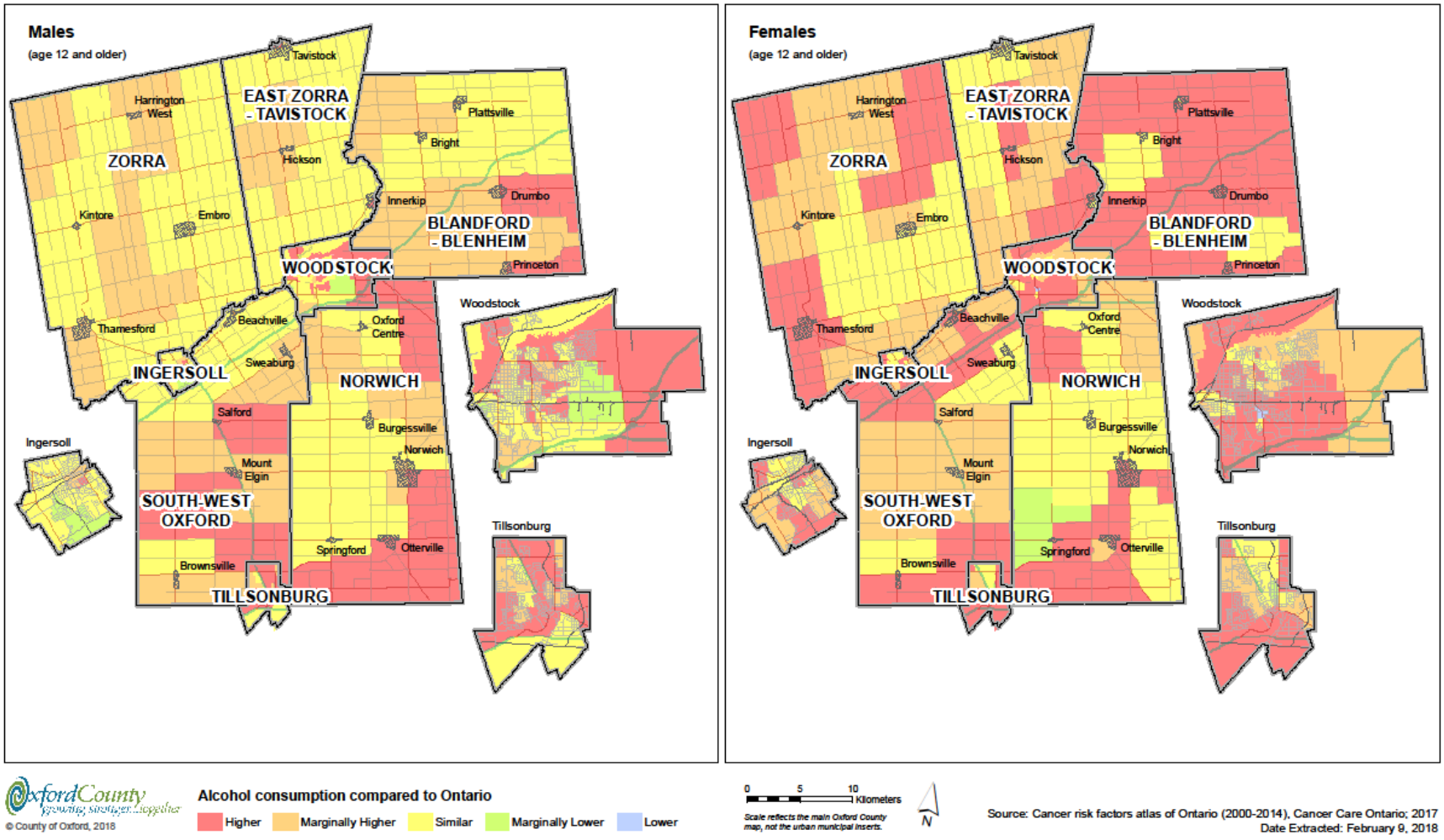


Figure 20. Current alcohol consumption, residents 12 to 18 years, by 2006 Census dissemination areas (DAs), Oxford County, 2000-2014 (combined)

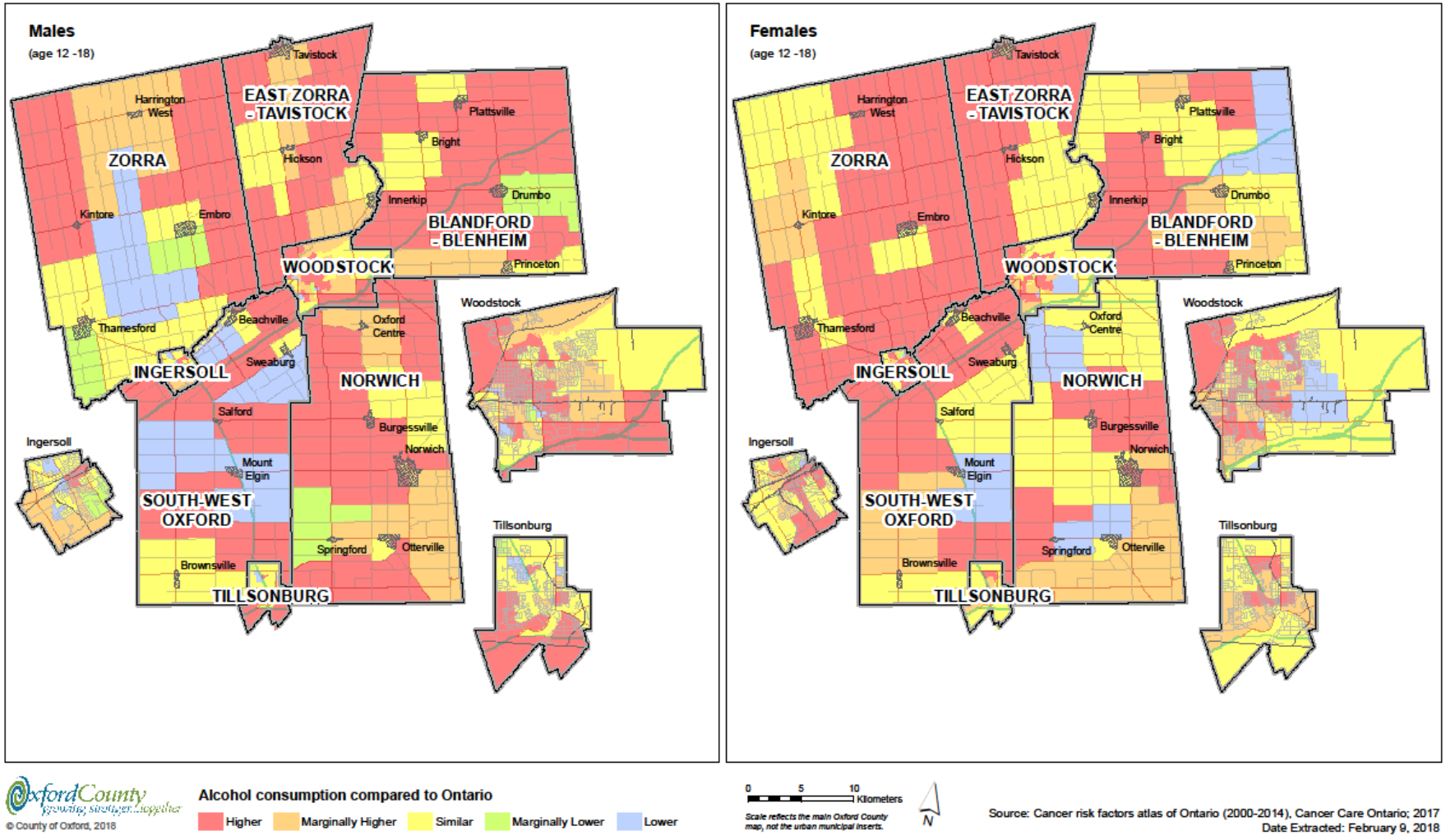
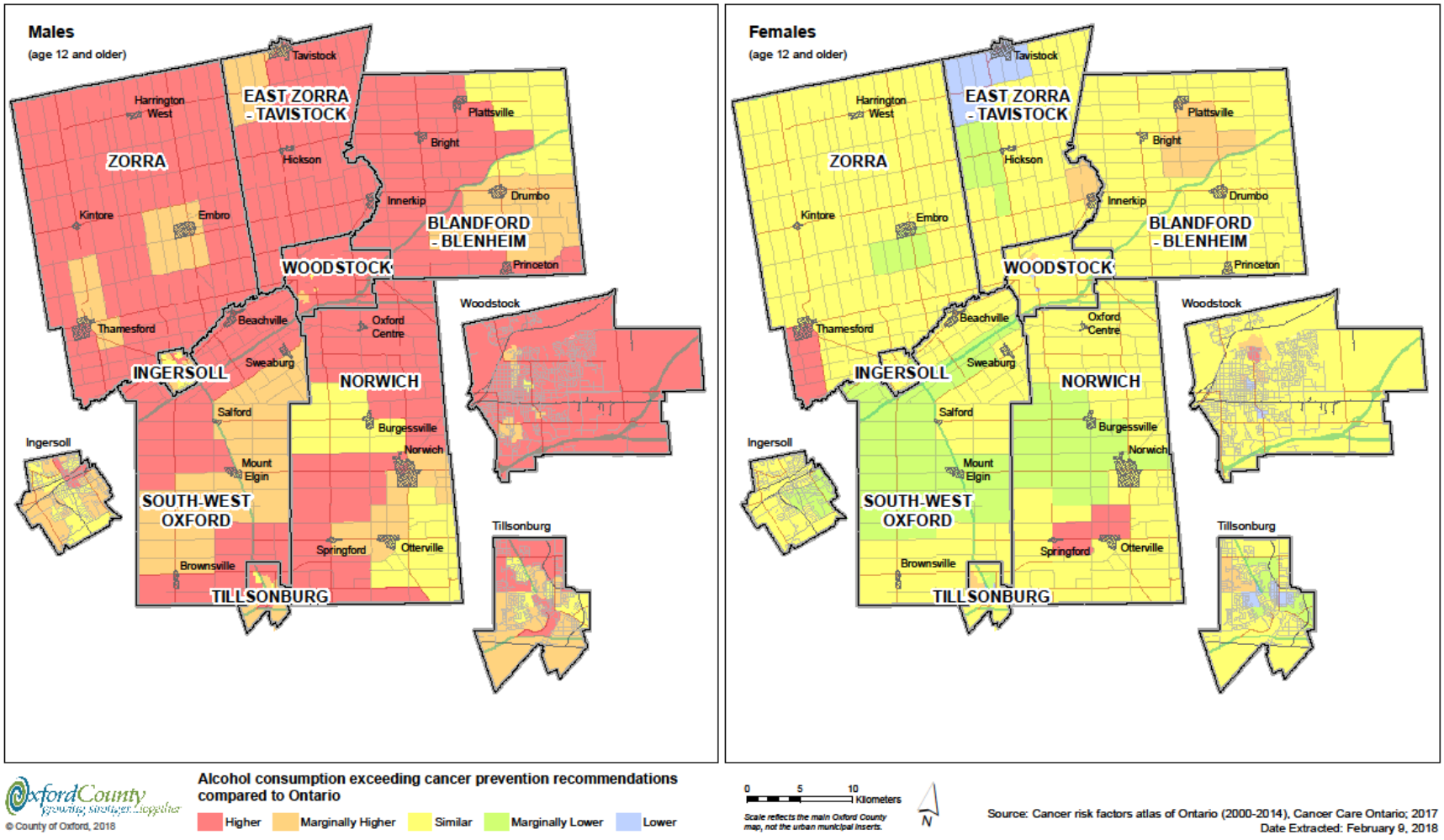


Figure 21. Alcohol consumption exceeding cancer prevention recommendations, residents 12 years and older, by 2006 Census dissemination areas (DAs), Oxford County, 2000-2014 (combined)



Impaired Driving

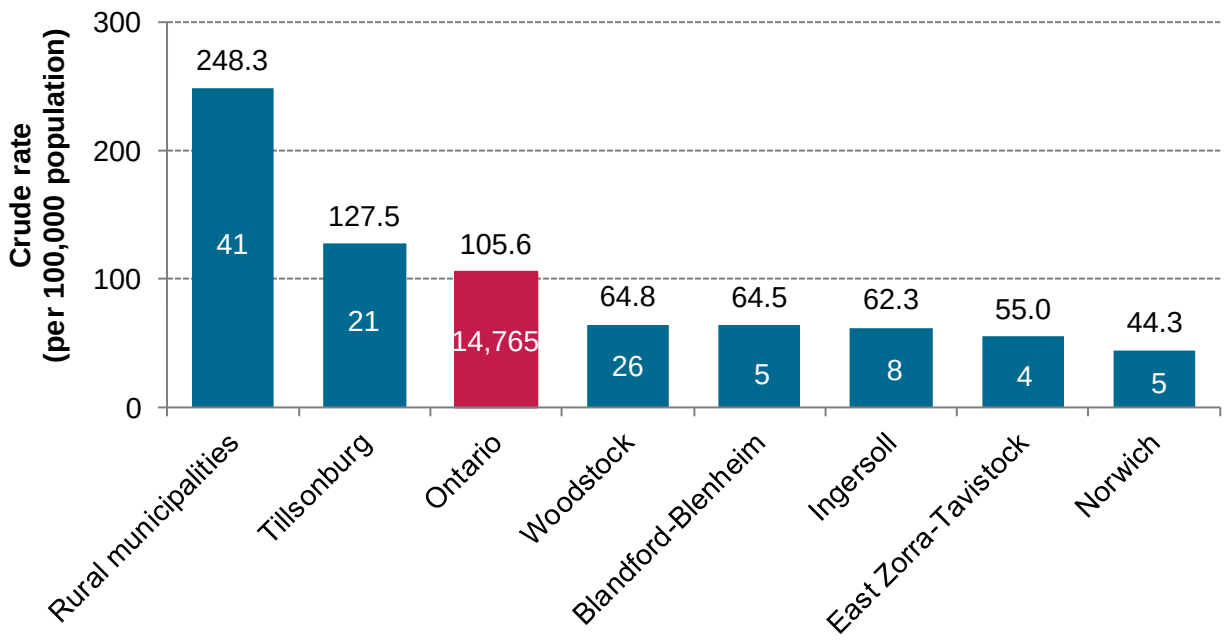
Although police reports of impaired driving by alcohol and drugs have decreased over the last 30 years, impaired driving still remains one of the most common criminal offences.[40] In 2016, there were 14,765 impaired driving incidents reported by police in Ontario for a rate of 105.6 per 100,000 population.[41] Nationally, the majority of impaired driving incidents involved males and young adults (20-24 years), and over half occurred between 11 p.m. and 4 a.m.[40] In Canada, impaired driving charges due to alcohol are based on a maximum legal blood alcohol concentration (BAC) of 80 mg of alcohol in 100 ml of blood, or 0.08 BAC.[42] However, in Ontario, there may also be penalties for driving in the "warn range" with a BAC between 0.05 and 0.08. Some groups of people are not permitted to have any alcohol in their system while driving, including people 21 years old and younger and novice drivers of any age. There are many factors that affect an individual's BAC, including how fast one drinks, how many drinks a person has, gender, body weight and the amount of food in one's stomach.[42] Even one drink before driving can impair someone's ability to react quickly and can affect vision and attention to surroundings.

In Oxford County, police reports of impaired driving varied by location of police services. All reports were from the Ontario Provincial Police (OPP) except for Woodstock, which was reported by Woodstock Police Service. Overall, the highest rate of impaired driving was reported in the rural municipalities,[d] with 41 incidents in 2016 at a rate of 248.3 per 100,000 population. This was followed by Tillsonburg, with 21 incidents in 2016 at a rate of 127.5 per 100,000. All other areas had a lower rate than Ontario (Figure 22). Importantly, this data does not distinguish impairment from alcohol versus other substances.

The highest rate of impaired driving was reported in the rural municipalities

[d] The rural municipalities are based on the Uniform Crime Reporting Survey and are not defined by Statistics Canada. However, they may include Zorra and South-West Oxford as they were the only Oxford County municipalities not included as a police service area.

Figure 22. Impaired driving incidents, number and crude rate (per 100,000 population), Oxford County police service areas and Ontario, 2012-2016 (combined)



Source: Statistics Canada. Table 252-0077 - Incident-based crime statistics, by detailed violations and police services, Ontario, annual (number unless otherwise noted) (accessed: February 09, 2018). Available from: http://www5.statcan.gc.ca/cansim/a26?lang=eng&id=2520077

In terms of impaired driving from alcohol use, 3.6% of licensed drivers in Oxford County reported that in the past 12 months they drove a motor vehicle within one hour of consuming two or more drinks. Meanwhile, over three times as many residents aged 12 years and older (11.2%) reported that they were a passenger in a vehicle with a driver who had two or more drinks in the past hour (Table 3). The findings were similar to residents in Ontario.

Table 3. Self-reported impaired driving from alcohol use, licensed drivers and passengers 12 years and older, Oxford County and Ontario, 2013-2014

In the past 12 months	Oxford County	Ontario
Drove a motor vehicle within one hour of having 2+ drinks	3.6%[E] (1.6%-5.6%)	2.7% (2.4%-3.0%)
Passenger in a motor vehicle with a driver that had 2+ drinks within the previous hour	11.2%[E] (6.7%-15.8%)	6.9% (6.4%-7.5%)

The superscript 'E' denotes high sampling variability and estimates should be interpreted with caution.
Source: Canadian Community Health Survey (2013-2014), Statistics Canada, Share File, Ontario MOHLTC.

Unfortunately, data for impaired driving when using off-road vehicles (e.g., ATVs, snowmobiles) was not reportable for Oxford County. However, 1.2% of Ontarians reported driving an off-road vehicle after consuming two or more drinks in the previous hour. Similarly, 1.5% of Ontarians reported being a passenger on an off-road vehicle with someone who had been drinking. Notably, over three-quarters of residents felt that these questions did not apply to them, perhaps because they did not own or know somebody with an off-road vehicle.

While self-reported data provides additional information to supplement police-reported impaired driving incidents, it is still likely an underestimate of the prevalence of impaired driving. As this behaviour has negative connotations, people may be less likely report it through a telephone survey (i.e., social desirability bias). Additionally, it is unlikely that all instances of impaired driving are detected by police.

Considerations and Next Steps

This report focusing on alcohol use, health and impaired driving among Oxford County residents can be used to inform public health programs, services and alcohol policy. There were several indicators that suggest that residents may be at increased risk of negative health outcomes from alcohol use. For example, it was found that younger adults and males were more likely to exceed the LRADGs, especially Guideline 2 aimed at preventing short-term risks of alcohol use such as injuries. Oxford County residents aged 19 to 44 years were more likely to exceed this guideline than their Ontario counterparts. Accordingly, Oxford County residents had a higher rate of alcohol-attributable hospitalizations from unintentional injuries compared to Ontario. Similarly, males may be at increased risk of alcohol-related cancers compared to Ontarians more broadly based on their alcohol consumption. Although awareness of these differences and education are important, these types of individual interventions are expected to have less of a population impact compared to public health actions that address:

1. upstream socioeconomic factors that influence health (e.g., residential instability),
2. systematic changes to the environment that make healthy decisions easier,
3. long-lasting protective interventions and
4. clinical interventions.[43]

There may also be opportunities to address harmful alcohol behaviours geographically. For example, among females, higher alcohol consumption was notably concentrated in the municipalities of Blandford-Blenheim, Woodstock and Ingersoll and in the south end of Tillsonburg. Other recent data showed that impaired driving incidents were higher in rural areas and Tillsonburg relative to Ontario. Related to impaired driving, these areas may benefit from enhanced strategies, countermeasures or services to prevent impaired driving, such as designated driving services or increased availability of taxis or public transit.

Although limited data was available for Oxford County youth, research among southwestern Ontario secondary school students supports that youth and parents are important populations to continue to engage to delay drinking. Most students stated that alcohol was easily available and almost half first had more than a sip of alcohol between the ages of 13 to 16 years. Furthermore, one-third of youth reported binge drinking, which was found to increase by grade, and about one in ten students reported mixing alcohol with energy drinks. Comparatively, students were more likely to be considered hazardous or harmful drinkers than adults. Initiatives that promote effective parenting strategies, including parental monitoring, positive parent-child communication, general discipline, positive role modelling, positive parent-child relationship quality and not providing alcohol to children may be one way to delay youth drinking.[27]

A recent Icelandic study demonstrated the importance of implementing long-term prevention approaches to reduce alcohol use among adolescents.[44] The authors found that over 17 years, as prevention measures such as parental monitoring, parental social involvement and participation in organized sports increased and risk factors such as attendance at parties decreased, alcohol use also decreased. In 1997, 39.5% of grade 9 and 10 students (ages: 14 to 16 years) consumed alcohol in the past 30 days – this decreased to 7.1% in 2014. Similarly, 29.6% of students reported being drunk in the past 30 days in 1997 compared to 3.6% in 2014. Importantly, there was no standard intervention 'prevention package' available during this time. Instead, local community members such as researchers, policy makers and practitioners collaborated to implement tailored initiatives that were priorities for their communities based on evidence. This approach was found to increase commitment and be more sustainable than short-term programs with fixed beginnings and ends. However, although there was an association between these prevention measures and alcohol use, this type of study cannot prove causation. Additionally, this study could not estimate how alcohol use was affected by other corresponding prevention efforts such as national media campaigns and legislative mandates to decrease visibility and access to alcohol.

This report also highlights the importance of advocating for stronger provincial policies around pricing strategies, hours of sale and marketing, such as including a public health voice in regulating alcohol advertising as opposed to current industry self-regulation.[45] There is also an opportunity to partner with community stakeholders such as businesses, health care providers, law enforcement and municipalities to develop stronger alcohol policies that can address issues not covered in provincial and federal policies (Appendix A). This may involve strategies such as identifying priority neighbourhoods to limit alcohol retailers and licensed establishments, setting outlet density limits and banning alcohol advertising and sponsorship on municipal properties and at municipal events.[46,47] Interestingly, the Canadian Institute for Health Information (CIHI) found that the most effective strategies to reduce alcohol harms were alcohol pricing policies and screening for heavy drinking.[8] Considering multiple approaches will be important to develop comprehensive strategies that effectively address alcohol-related harms.

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Appendix A: Alcohol Policies

Table 4. Current alcohol policies and opportunities for municipalities[8,46,48-50]

Approach to Policy	Reason	Examples	Jurisdiction	Additional opportunities for municipalities
System of control	To reduce the availability of alcohol through restriction of alcohol sales and distribution	Retail system is controlled by government rather than private sector Liquor Control Board of Ontario (LCBO)	Provincial Provincial	Create a new business licence category for supermarket retailers selling alcohol
Physical availability	Reduce intake by limiting access to and sources of alcohol	Limiting outlet density and hours of sale through regulation Ontario recently released control by allowing alcohol to be sold in grocery stores and farmers' markets	Provincial Provincial	Establish limits regarding the number of liquor licensed establishments by neighborhood Establish location restrictions to protect sensitive land uses, such as schools and parks and to address clustering with minimum distances between alcohol outlets Prohibit sale of wine at farmers' markets within jurisdiction

Approach to Policy	Reason	Examples	Jurisdiction	Additional opportunities for municipalities
Pricing	Reduce the intake of alcohol by increasing the cost	Taxes on alcohol, minimum price regulations, indexing prices to inflation and pricing on alcohol content	Provincial	Establish a minimum price for alcohol beverages as a condition of granting a business licence
Screening, Brief Intervention and Referrals (SBIR)	Identify people with risky drinking behavior and provide appropriate health care advice	Fee codes for implementing SBIR, Practice Guidelines/ Position Statements, SBIR reflected in provincial alcohol strategy Currently no provincial strategy in place for Ontario and no fees codes for implementing SBIR	Provincial Provincial	
Drinking and driving countermeasures	Reduce collisions and harms caused by driving when impaired by alcohol	Blood alcohol concentration (BAC) limits Fines, driver's licence suspensions, ignition interlock systems, education on impairment, Penalties if caught driving with a BAC above zero while you are 21 years and under or a novice driver, warn range when BAC is between 0.05 and 0.08	Federal Provincial Provincial	
Minimum legal age to drink alcohol	Reduce youth access to alcohol thereby decreasing use and harm among underage youth	Laws for legal drinking age and enforcement Legal age to drink and buy alcohol is 19 years of age in Ontario	Provincial Provincial	

Approach to Policy	Reason	Examples	Jurisdiction	Additional opportunities for municipalities
Training for alcohol servers and management	Reduce drinking by underage youth and over service to intoxicated patrons	Program status, quality and enforcement To serve alcohol you must have a certificate from the Smart Serve training program as enforced by the Alcohol and Gaming Commission of Ontario (AGCO)	Provincial Provincial	
Marketing and advertising	Regulate the content, placement and number of advertisements to decrease exposure to alcohol advertising and marketing	AGCO administers the *Liquor Licence Act* and the *Liquor Control Act*, complaints-based enforcement of guidelines interpreted by alcohol industry Canadian Radio-television and Telecommunications Commission (CRTC) code for broadcast advertising of alcohol beverages	Provincial Federal	Establish policies controlling the promotion of alcoholic beverages on municipally-owned lands or facilities
Warning labels and signs	Increase public awareness of the risks associated with alcohol consumption	Sandy's Law, Bill 43, is an amendment to the *Liquor Licence Act* that requires signs warning not to drink while pregnant where alcohol is sold Warning labels on alcohol containers	Provincial Federal	Ensure that Sandy's Law is enforced at farmers' markets where wine is sold

Appendix B: Data Notes

This report summarizes information from a variety of data sources available to Public Health. The methods used, and geography presented depends on the data source. More detail about the data sources where estimates were calculated by the author (i.e., were not pre-packaged by another source) can be found below.

Canadian Community Health Survey (CCHS)

The Canadian Community Health Survey (CCHS) is a national telephone survey that collects information about health status, health care utilization and determinants of health from the population aged 12 years and older. The CCHS excludes people living on reserves and other Indigenous settlements, full-time members of the Canadian Forces and people living in institutions. Data is self-reported and may be subject to recall bias and social desirability bias. 'Don't know' and 'not stated' responses were removed from analysis when they represented less than 5% (combined) of the unweighted sample. This assumes that data are missing at random, which is not always the case. Data from 2015-2016 onwards is not comparable to previous years due to substantial changes in sampling methodology and content.

The error bars in figures and the per cents in brackets that follow each per cent estimate in the tables using CCHS data are the confidence intervals (CIs). Each estimate is based on the survey sample, and a CI is a range of values that describes the uncertainty surrounding an estimate.[51] The 95% CI shows a range of values that have a 95% chance of including the true estimate in the population if the survey was repeated. The larger a 95% CI, the more caution should be used when using the estimate. CIs that don't overlap show statistically significant differences between groups. Statistically significant results indicate the finding is unlikely to be due to chance alone.

Discharge Abstract Database (DAD)

DAD contains information about hospital discharges and therefore does not capture people treated and released from emergency departments, those treated in doctors' offices or clinics or those who did not seek treatment in a hospital. This may underestimate the burden of alcohol-

attributable hospitalizations. The data submitted by hospitals is validated by CIHI and released to public health units on a quarterly basis through IntelliHEALTH ONTARIO. Table 5 outlines the International Statistical Classification of Diseases and Related Health Problems, 10th Revision, Canada (ICD-10-CA) codes used to capture alcohol-attributable hospitalizations. Importantly, an individual may be hospitalized and discharged for the same reason more than once over the time period; therefore, hospitalizations cannot measure disease incidence.

Table 5. Description of hospitalizations for conditions attributable to alcohol use[35]

Condition group	Condition	ICD-10-CA codes
Communicable diseases	Tuberculosis	A15-A19
	HIV	B20-B24, Z21
	Lowe respiratory tract infections	J09-J22
Cancer	Oral cavity and pharynx cancer	C00-C05, C08-C10, C12-C14, D00.0
	Esophageal cancer, squamous cell carcinoma	C15, D00.1
	Colorectal cancer	C18-C21, D01.0-D01.4
	Liver cancer	C22, D01.5
	Pancreatic cancer	C25, D01.7
	Laryngeal cancer	C32, D02.0
	Breast cancer	C50, D05
Endocrine conditions	Type 2 diabetes mellitus	E11, E13, E14
	Alcohol-induced pseudo-Cushing's syndrome	E24.4
Neuropsychiatric conditions	Alcoholic psychoses	F10.0, F10.3-F10.9
	Alcohol abuse	F10.1
	Alcohol dependence syndrome	F10.2
	Degeneration of nervous system due to alcohol	G31.2
	Epilepsy	G40, G41
	Alcoholic polyneuropathy	G62.1
	Alcoholic myopathy	G72.1
Cardiovascular conditions	Hypertension	I10-I15
	Ischaemic heart disease	I20-I25
	Alcoholic cardiomyopathy	I42.6
	Atrial fibrillation and cardiac arrhythmia	I47-I49
	Haemorrhagic stroke	I60-I62, I69.0-I69.2
	Ischaemic stroke	I63-I67, I69.3-I69.4
	Esophageal varices	I85
Digestive conditions	Alcoholic gastritis	K29.2
	Liver cirrhosis	K70, K74
	Acute pancreatitis	K85.0, K85.1, K85.8, K85.9
	Chronic pancreatitis	K86.1-K86.9
	Alcohol-induced pancreatitis	K85.2, K86.0

National Ambulatory Care Reporting System (NACRS)

NACRS contains information about unscheduled emergency department visits. The data submitted by emergency departments is validated by CIHI and released to public health units on a quarterly basis through IntelliHEALTH ONTARIO. NACRS can also be used to obtain information about inpatients that were admitted from the emergency room to critical care units/operating rooms, other units within a hospital or to another acute care facility. This information was used to capture injury-related hospitalizations attributable to alcohol. Table 6 outlines the ICD-10-CA codes included under injury hospitalizations attributable to alcohol. Many of the ICD-10-CA codes are external causes and an individual can have more than one external cause diagnosis for each hospitalization. However, only one hospitalization will be counted within each of the categories. There may be some overlap between the categories.

Table 6. Description of injury hospitalizations attributable to alcohol use[35]

Condition group	Condition	ICD-10-CA codes
Motor vehicle collisions	Motor vehicle collisions	V codes (please see the InterMAHP user guide[35] for a complete list), Y85.0
Unintentional injuries	Falls	W00-W19, Y30
	Drowning	W65-W74
	Fires	X00-X09, Y26
	Accidental poisoning by substances other than alcohol	T36-T50, T52-T65, T96-T97, X40-X44, X46-X49, Y10-Y14, Y16-Y19
	Accidental poisoning by alcohol	T51, X45, Y15
	Other unintentional injuries	V codes (please see the InterMAHP user guide[35] for a complete list), W20-W64, W75-W84, X10-X33, Y20, Y22-Y25, Y27-Y29, Y31-Y34, Y85.9, Y86, Y87.2, Y89.9
Intentional injuries	Intentional self-poisoning by substances other than alcohol	T36-T50, T52-T65, T96-T97, X60-X64, X66-X69
	Intentional self-poisoning by alcohol	T51, X65
	Other intentional self-harm	X70-X84, Y87.0
	Assault or homicide	X85-Y09, Y87.1
	Other intentional injuries	Y35, Y89.0

Ontario Mortality Data (Vital Statistics)

Ontario Mortality Data is obtained through the Office of the Registrar General, Service Ontario, which receives information from death certificates completed by physicians. This information is released to public health units through IntelliHEALTH ONTARIO and includes only the primary (i.e., underlying) cause of death. There may be some uncertainty when classifying the underlying cause of death when comorbidities are present.

Population Estimates

Population estimates were used as the denominator to calculate rates. Population estimates are based on the 2011 Census counts adjusted for net under-coverage and changes in the population between Census day and July 1st (i.e., births, deaths and migration). Estimates are produced for July 1st by the Demography Division at Statistics Canada and were obtained through IntelliHEALTH ONTARIO.

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